The

ADVISOR

FERRAZ SHAWMUT IS NOW MERSEN

MERSEN

Fuses | Fuse Blocks & Holders | Power Distribution Blocks | Surge Protection Devices
Circuit Protection Accessories | Disconnect Switches | Heatsinks & Cooling Systems | High Power Switches






The Advisor

More Products. More Resources. More For You Than Ever Before.



A Different Kind of Advisor

A lot has changed with this latest edition of the Advisor. You'll find 756 additional products including, high power switches, heatsinks and cooling, medium voltage fuses, surge protection devices, and our new Helio Protection fuse line.

There's a new Resources & Tools section with time-saving services like electrical services and the Fuse Control™ program, as well as handy tools like Select-A-Fuse software®, Protection Intelligence Quotient Quizzes, and R-Tools®, our online 3D heatsink thermal modeling tool.

In an effort to produce a more "green" catalog, we've done more with less. There are more products, but fewer pages. Product performance data (time current curves, peak let thru data, etc.) has been moved out of the catalog and onto our website. Our goal was two-fold, to print a leaner catalog and provide a method for ensuring that you have the most up-to-date data available at any given time. As part of our on-going sustainability initiatives we also took great care in selecting a more environmentally-friendly paper stock. The results — a more streamlined, information packed catalog than ever before!



Your Trusted Advisor

You've come to rely on the Advisor for advice. Advice on choosing the right fuse for the application. On coordinating it with upstream and downstream devices. On heatsink configurations. On complying with international standards. On selecting the right surge protection. And on a whole range of other complicated electrical protection and business issues.

A Team of Advisors Dedicated to Your Field

You can rest easy knowing a team of experts is ready to help you work through the application challenges you face. Our experts have extensive experience in product-specific disciplines including:

Power Controls – LV/MV motor control centers, control panels, HVAC, and material handling

Power Electronics – Drives, soft starters, UPS, rectifiers, inverters, frequency converters, induction heating, rail propulsion, and welding

Power Transmission & Distribution – Switchgear, switchboards, panelboards, load centers, PF correction, surge protection, rail current collection, rail grounding

Power Low Voltage Distribution – Substations, transformers, transmission lines, PF correction

Expert Advice When You Need It

Mersen expertise extends out into the field and into the world at large. For a complete listing of our North American sales offices, global manufacturing, and technical services support contacts visit us at:
us-ferrazshawmut.mersen.com.

Contact Us

T 978.462.6662
F 978.462.0181
info.nby@mersen.com
us-ferrazshawmut.mersen.com



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Control Circuits	Class CC and Midget Fuses	A, C
Electronic Circuit Protection	Midget Miniature, Micro and PC Mount Fuses	C
General Circuits (Lighting, Resistance, Heating)	Class J - AJT, A4J	A, B
	Class RK1 - A2D, A2K (250V): A6D, A6K (600V)	A, B
	Class RK5 - TR (250V); TRS (600V)	B
	Class K [50,000A I.R.] - OT (250V), OTS (600V)	B
	Class H [10,000A I.R.] - NRN, CRN (250V) Canadian, NRS, CRS (600V) Canadian	F
Loads Requiring "No-Damage" Protection	Amp-Trap 2000 Fuses Sized for IEC Type 2 - Class J - AJT; Class L - A4BQ; Class RK1 - A2D (250V), A6D (600V); Class CC - ATDR, ATQR	A
Mains, Feeders, Branch Circuits		
Low Voltage - Above 600A	Class L - A4BQ, A4BY, A4BT	A, B
- 600A and less	Class J or Class RK1 - AJT, A4J, A2D/A6D, A2K/A6K	A, B
Medium Voltage	E" Rated - A055 (5kV), A155 (15kV), 9F60 & 9F62 Series	E
Motors		
Low Voltage - Above 600A	Class L - A4BQ, A4BY, A4BT	A, B
- 600A and less	Class J - AJT, Class RK1 - A2D (250V), A6D (600V) or Class RK5 - TR (250V), TRS (600V)	A, B
Medium Voltage	"R" Rated - A240R (2.4kV), A480R (4.8kV), A072 (7.2kV), 9F60	E
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1500V to 36V (High Power)	HA, NORD, PBD	L
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Air Cooled	Fabfin, Hollowfin, Mixed Metals, Integrated, Copper, Dual Base Plate, Extrusion, Heatpipes, Embedded Pipes	M
Liquid Cooled	Aquasink, Aquamax (Copper & Aluminum), Aquasurf	M
Transformers		
Low Voltage - Above 600A	Class L - A4BY, A4BT	B
- 600A and less	Class J - AJT or Class RK5 - TR 250V), TRS (600V)	A, B
Medium Voltage	"E" Rated - A055 (5kV), A155 (15kV), 9F60 & 9F62 Series	E
Control Transformers	Class CC - ATQR	A
Welders	Welder Protectors - A4BX (Type 150) - Class K Dims., A4BX (Type 150J) - Class J Dims.	G

The following are U.S. Trademarks of Mersen USA Newburyport-MA, LLC and apply to the products described herein:

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Amp-Trap® OEM Central™ Select-A-Fuse® Surge-Trap® SPD UltraSafe™
FabFin® Hollowfin® Aquasink® Aquamax® Aquasurf® Aquamax® R-Tools® 3D Heatsink Modeling

Amp-Trap 2000® Fuses

For Type 2, No Damage circuit protection in all the configurations you need.



Your problem: You need maximum overcurrent protection to prevent costly damage to today's highly sensitive motor and electrical-system components. That way, plant shutdowns, replacement costs, and repair bills are kept to an absolute minimum.

Our solution: By opening in less than 1/4 cycle under short circuit conditions, Amp-Trap 2000 fuses current limit enough to prevent undue downstream damage — and therefore comply with the extra-stringent IEC, Type-2 standard. In addition to being the industries most current-limiting fuses, the time-delay feature allows for motor starting and transformer inrush current without nuisance opening adding to the reliability and longevity of your electrical system.

Want more information fast? For more technical or application-specific information, please call our Amp-Trap 2000 experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

A Amp-Trap 2000 Fuses

- Class J / AJT A2
- Class L / A4BQ A4
- Class RK1 / A2D-R & A6D-R..... A6
- Class CC / ATDR..... A8
- Class CC / ATQR..... A10

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AJT Time-delay/Class J

SmartSpot® with maximum circuit protection

Amp-Trap 2000® SmartSpot AJT fuses now provide a visual open fuse indicator. With advanced material technology the AJT fuse provides IEC Type 2 No Damage protection to main, feeder, and branch circuits, for all types of loads — yet, they require only half the mounting space needed for 600VAC Class RK fuses. AJT's time-delay characteristics are ideal for handling typical motor and transformer inrush currents, while also providing superior current-limiting ability.

Features/Benefits:

- Solid state SmartSpot visual blown fuse indicator
- Time-delay for motor starting and transformer inrush
- 300kA interrupting rating - self-certified, UL witnessed tests
- Extremely current-limiting for low peak let-thru current
- Most current-limiting UL class fuse
- Recommended for Arc Flash energy reduction
- Small footprint requires less mounting space and allows smaller, more economical fuse blocks
- Easy 2-to-1 selectivity for prevention of nuisance shutdowns
- Unique Class J dimensions prevent replacement errors
- High-visibility orange label gives instant brand recognition
- Metal-embossed date and catalog number for traceability and lasting identification
- Fiberglass body provides dimensional stability in harsh industrial settings
- High-grade silica filler ensures fast arc quenching
- Optional EI indicator/switch mount for AJT70 to 600 open fuse indication

Highlights:

- SmartSpot indicator
- Time-delay
- Highly current-limiting
- Arc Flash mitigating
- DC ratings
- Optional mechanical indicator (70 to 600A fuses)

Applications:

- Motor circuits
- Mains
- Feeders
- Branch circuits
- Lighting, heating & general loads
- Transformers
- Control panels
- Circuit breaker back-up
- Bus duct
- Load centers

Note: See motor fuse applications tables on page P7



Ratings:

Volts : 600VAC or less
: 500VDC or less
Amps : 1 to 600A
IR : 200kA I.R. AC
: 100kA I.R. DC
(Self-certified for 600VAC, 300kA I.R., UL witnessed).

Approvals:

AJT (1-600):

- UL listed to standard 248-8 File E2137
- DC listed to UL standard 248
- CSA certified to standard C22.2 No. 248.8
- IEC 269-2-1

AJT (70-600) EI:

- UL listed
- DC tested to UL standard 248

AJT Time-delay/Class J

Catalog Numbers (amps)

AJT1	AJT4-1/2	AJT25	AJT125
AJT1-1/4	AJT5	AJT30	AJT150
AJT1-1/2	AJT5-6/10	AJT35	AJT175
AJT1-6/10	AJT6	AJT40	AJT200
AJT1-8/10	AJT6-1/4	AJT45	AJT225
AJT2	AJT7	AJT50	AJT250
AJT2-1/4	AJT8	AJT60	AJT300
AJT2-1/2	AJT9	AJT70	AJT350
AJT2-8/10	AJT10	AJT80	AJT400
AJT3	AJT12	AJT90	AJT450
AJT3-2/10	AJT15	AJT100	AJT500
AJT3-1/2	AJT17-1/2	AJT110	AJT600
AJT4	AJT20		

Note: SmartSpot visual indicator is not available (1-7A)

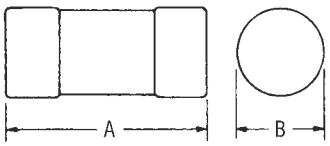
Recommended Fuse Blocks With Box Connectors for Amp-Trap® Class J Fuses

Fuse Ampere Rating	Catalog Number 600V or Less	
	1 Pole	3 Pole
0-30	US3J1I	US3J3I
31-60	US6J1I	US6J3I
61-100	61036J	61038J
101-200	62001J	62003J
201-400	64031J	64033J
401-600	6631J	6633J

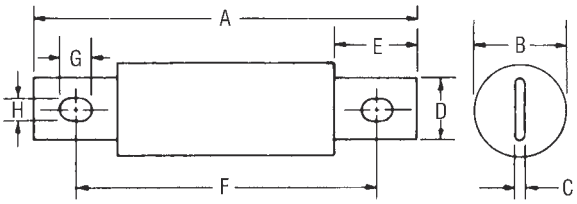
A variety of pole configurations and termination provisions are available, see section H.

Dimensions

Ampere Rating	A		B		C		D		E		F		G		H	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1-30	2-1/4	57	13/16	21	-	-	-	-	-	-	-	-	-	-	-	-
31-60	2-3/8	60	1-1/16	27	-	-	-	-	-	-	-	-	-	-	-	-
61-100	4-5/8	117	1-1/16	27	1/8	3.2	3/4	19	1	25	3-5/8	92	3/8	10	9/32	7
101-200	5-3/4	146	1-5/8	41	3/16	4.8	1-1/8	29	1-3/8	35	4-3/8	111	3/8	10	9/32	7
201-400	7-1/8	181	2-1/8	54	1/4	6.3	1-5/8	41	1-7/8	48	5-1/4	133	17/32	14	13/32	10
401-600	8	203	2-1/2	64	3/8	9.5	2	51	2-1/8	54	6	152	11/16	18	17/32	13

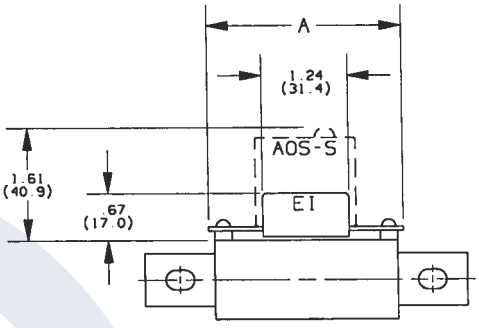


1-60A

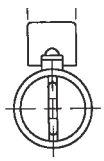


70-600A

Optional Indicator/Microswitch Mount (EI) Dimensions:



Note: Fuses with the EI option are designed to work with the AOS-S or AOS-Q add-on switch, which is ordered separately. See page J6 for details.



Catalog Number	A
AJT (70-100)-EI	2.8 (71.0)
AJT (110-200)-EI	3.22 (81.8)
AJT (225-400)-EI	3.24 (82.2)
AJT (450-600)-EI	3.61 (91.8)

A4BQ Time-delay/Class L

Put the highest current-limitation...at your service

Amp-Trap 2000® A4BQ fuses are 20% more current-limiting than any other Class L fuse on the market. When correctly coordinated, they bring a superior level of protection to service entrance equipment. Downstream circuit components have maximum protection against short circuit let-thru current. A4BQ's built-in, 4-second time-delay characteristic (at 500% of rated current) accommodates harmless inrush currents without nuisance opening.

Features/Benefits:

- Fastest operation under short circuit conditions: Let-thru currents are typically 20% lower, with a corresponding let-thru energy (clearing I^2t) up to 40% lower than the next fastest Class L fuse
- Time-delay for high inrush loads such as motors and transformers, without nuisance opening
- 300kA interrupting rating - self-certified, UL witnessed tests
- Most current-limiting for lowest peak let-thru current; even at fault currents up to 300kA
- Recommended for Arc Flash energy reduction
- Pure silver links ensure lowest let-thru current and longer fuse life
- Easy 2-to-1 selectivity for prevention of nuisance shutdowns and "blackouts"
- Rejection-style design prevents replacement errors
- High-visibility orange label gives instant brand recognition
- Reduced inventory because A4BQ can replace all older types of Class L fuses now in-service
- Metal-embossed date and catalog number for traceability and lasting identification
- Fiberglass body provides dimensional stability in harsh industrial settings
- High-grade silica filler ensures fast arc quenching

Highlights:

- Time-delay
- Industry's most current-limiting class L fuse
- Arc Flash mitigating
- Pure silver elements
- AC & DC rated
- Optional mechanical TA indicator (100-6000A)

Please contact factory for special trigger actuator

Applications:

- Mains
- Feeders
- Large motors
- Lighting, heating & general loads
- Circuit breaker back-up
- DC rated: UPS DC links, battery disconnects, other DC applications



Ratings:

Volts : 600VAC
: 500VDC
Amps : AC - 100 to 6000A
: DC - 601 to 3000A
IR : 200kA I.R. AC
: 100kA I.R. DC
(Self-certified for 600VAC, 300kA I.R., UL witnessed).

Approvals:

A4BQ (100-6000)

- UL listed to standard 248-10 (601-6000A) File E2137
- DC listed to UL standard 248 (601-3000A)
- CSA certified to standard C22.2 No. 248.10 (601-6000A)
- UL recognized (100-600A)

A4BQ (100-6000) - TA

- UL listed (601-6000A)
- UL recognized (100-600A)

A4BQ Time-delay/Class L

Catalog Numbers (amps)

A4BQ100	A4BQ500	A4BQ1000	A4BQ2000
A4BQ150	A4BQ600	A4BQ1200	A4BQ2500
A4BQ200	A4BQ601	A4BQ1350	A4BQ2501
A4BQ250	A4BQ650	A4BQ1400	A4BQ3000
A4BQ300	A4BQ700	A4BQ1500	A4BQ3500
A4BQ350	A4BQ750	A4BQ1600	A4BQ3800
A4BQ400	A4BQ800	A4BQ1800	A4BQ4000
A4BQ450	A4BQ900	A4BQ1900	A4BQ5000
			A4BQ6000

Note: For remote blown fuse trigger actuator option add "-TA" to end of catalog number. Example: A4BQ1600-TA

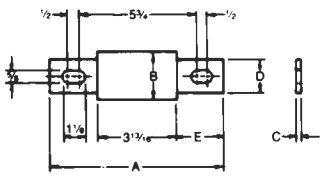
Recommended Fuse Blocks for Amp-Trap® Class L Fuses

Fuse Ampere Rating	Catalog Number 600V or Less 3 Pole
100-800	P48F
801-1200	P412F

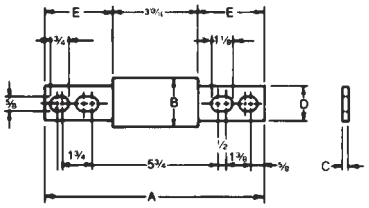
Catalog number P48F is UL recognized
Catalog number P412F is self-certified

Dimensions

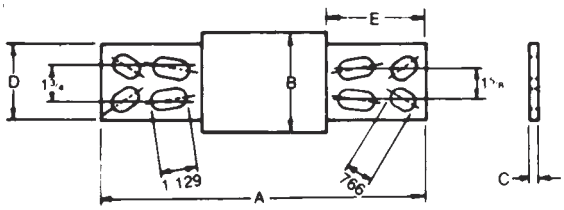
Ampere Rating	A		B		C		D		E	
	in	mm	in	mm	in	mm	in	mm	in	mm
100-600	8-5/8	219	2	51	5/16	8	1-5/8	41	2-13/32	61
601-800	8-5/8	219	2-1/2	63	3/8	9	2	51	2-13/32	61
801-1200	10-3/4	273	2-1/2	63	3/8	9	2	51	3-15/32	88
1201-1600	10-3/4	273	3	76	7/16	11	2-3/8	60	3-15/32	88
1601-2000	10-3/4	273	3-1/2	89	1/2	12	2-3/4	70	3-15/32	88
2001-2500	10-3/4	273	4-1/2	114	3/4	19	3-1/2	89	3-15/32	88
2501-3000	10-3/4	273	5	127	3/4	19	4	102	3-15/32	88
3001-4000	10-3/4	273	5-3/4	146	3/4	19	4-3/4	121	3-15/32	88
4001-5000	10-3/4	273	6-1/4	159	1	25	5-1/4	133	3-15/32	88
5001-6000	10-3/4	273	7-1/8	181	1	25	5-3/4	146	3-15/32	88



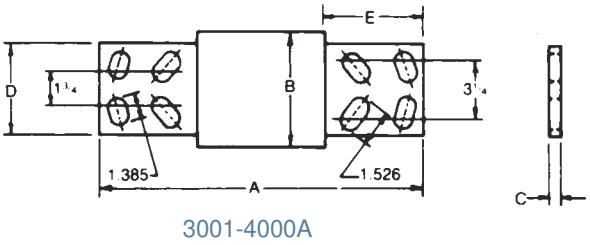
100-800A



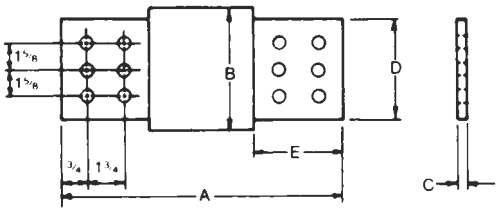
801-2000A



2001-3000A



3001-4000A



4001-6000A

Safety Note: Class L fuses are dimensioned for one-way interchangeability. A Class L fuse of any lower ampere rating can be substituted for a given Class L fuse.

A2D-R & A6D-R Time-delay/Class RK1

Upgrade yesterday's circuits to today's Type 2 protection

The Amp-Trap 2000® SmartSpot® A2D-R and A6D-R fuses feature a visual open fuse indicator and provide IEC Type 2 No Damage protection to main, feeder, and branch circuits for all types of loads. With time-delay characteristics for handling harmless in-rush currents, current-limiting ability and a wide range of ratings (from 1 to 600 Amperes), A2D-R and A6D-R fuses give excellent protection for all your applications.



Features/Benefits:

- Solid state SmartSpot visual blown fuse indicator
- Time-delay for motor starting and transformer inrush currents without nuisance opening
- 600VAC & 600VDC dual rated
- 300kA interrupting rating - self-certified, UL witnessed tests
- Extremely current-limiting for low peak let-thru current
- Recommended for Arc Flash energy reduction
- Easy 2-to-1 selectivity for prevention of nuisance shut downs and "black outs"
- Rejection-style design prevents replacement errors (when used with recommended fuse blocks)
- High-visibility orange label gives instant brand recognition
- Reduced inventory by taking the place of class RK5, K, and H fuses
- Metal-embossed date and catalog number for easier traceability and lasting identification
- Fiberglass body provides dimensional stability in harsh industrial settings

Ratings:

A2D-R

Volts : 250VAC/DC
Amps : 1/10 to 600A (AC)
: 15 to 600A (DC)
IR : 200kA I.R. AC
: 100kA I.R. DC

A6D-R

Volts : 600VAC/DC
Amps : 1/10 to 600A
IR : 200kA I.R. AC
: 100kA I.R. DC

(Self-certified for 300kA I.R., UL witnessed.)

Highlights:

- SmartSpot indicator
- Time-delay
- Current-limiting
- Arc Flash mitigating
- Plated terminals

Applications:

- Motors
- Safety switches
- Transformers
- Branch circuit protection
- Disconnects
- Control panels
- All general-purpose circuits

Note: See motor fuse applications tables on page P7

Approvals:

- UL listed to standard 248-12 File E2137
- DC listed to UL standard 248
- CSA certified to standard C22.2 No. 248.12

A2D-R & A6D-R Time-delay/Class RK1

Catalog Numbers (amps)

250V			600V		
A2D1/10R	A2D3-1/2R	A2D50R	A6D1/10R	A6D3-1/2R	A6D50R
A2D15/100R	A2D4R	A2D60R	A6D15/100R	A6D4R	A6D60R
A2D2/10R	A2D4-1/2R	A2D70R	A6D2/10R	A6D4-1/2R	A6D70R
A2D3/10R	A2D5R	A2D75R	A6D3/10R	A6D5R	-
A2D4/10R	A2D5-6/10R	A2D80R	A6D4/10R	A6D5-6/10R	A6D80R
A2D1/2R	A2D6R	A2D90R	A6D1/2R	A6D6R	A6D90R
A2D6/10R	A2D6-1/4R	A2D100R	A6D6/10R	A6D6-1/4R	A6D100R
A2D8/10R	A2D7R	A2D110R	A6D8/10R	A6D7R	A6D110R
A2D1R	A2D8R	A2D125R	A6D1R	A6D8R	A6D125R
A2D1-1/8R	A2D9R	A2D150R	A6D1-1/8R	A6D9R	A6D150R
A2D1-1/4R	A2D10R	A2D175R	A6D1-1/4R	A6D10R	A6D175R
A2D1-4/10R	A2D12R	A2D200R	A6D1-4/10R	A6D12R	A6D200R
A2D1-6/10R	A2D15R	A2D225R	A6D1-6/10R	A6D15R	A6D225R
A2D1-8/10R	A2D17-1/2R	A2D250R	A6D1-8/10R	A6D17-1/2R	A6D250R
A2D2R	A2D20R	A2D300R	A6D2R	A6D20R	A6D300R
A2D2-1/4R	A2D25R	A2D350R	A6D2-1/4R	A6D25R	A6D350R
A2D2-1/2R	A2D30R	A2D400R	A6D2-1/2R	A6D30R	A6D400R
A2D2-8/10R	A2D35R	A2D450R	A6D2-8/10R	A6D35R	A6D450R
A2D3R	A2D40R	A2D500R	A6D3R	A6D40R	A6D500R
A2D3-2/10R	A2D45R	A2D600R	A6D3-2/10R	A6D45R	A6D600R

Note: SmartSpot visual indicator is not available (1/10-7A)

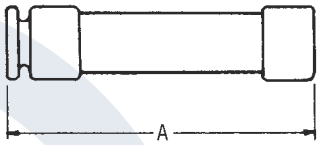
Recommended Fuse Blocks With Box Connectors for Amp-Trap® Class RK1 Fuses

Fuse Ampere Rating	Catalog Number			
	250V or Less		600V or Less	
	1 Pole	3 Pole	1 Pole	3 Pole
0-30	20306R	20308R	60306R	60308R
31-60	20606R	20608R	60606R	60608R
61-100	21036R	21038R	61036R	61038R
101-200	22001R	22003R	62001R	62003R
201-400	24001R	24003R	64001R	64003R
401-600	2631R	2633R	6631R	6633R

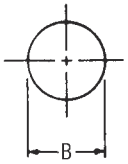
A variety of pole configurations and termination provisions is available, see section H.

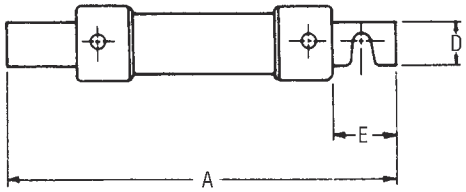
Dimensions

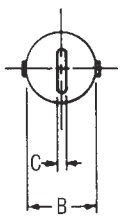
Ampere Rating	A		B		C		D		E	
	In	mm	In	mm	In	mm	In	mm	In	mm
250V-A2D										
0-30	2	51	9/16	14	-	-	-	-	-	-
31-60	3	76	13/16	21	-	-	-	-	-	-
61-100	5-7/8	149	1-1/16	27	1/8	3	3/4	19	1	25
101-200	7-1/8	181	1-9/16	40	3/16	5	1-1/8	28	1-3/8	35
201-400	8-5/8	219	2-1/16	53	1/4	6	1-5/8	41	1-7/8	48
401-600	10-3/8	264	2-9/16	66	1/4	6	2	51	2-1/4	57
600V-A6D										
0-30	5	127	13/16	21	-	-	-	-	-	-
31-60	5-1/2	139	1-1/16	27	-	-	-	-	-	-
61-100	7-7/8	200	1-5/16	34	1/8	3	3/4	19	1	25
101-200	9-5/8	244	1-13/16	46	3/16	5	1-1/8	28	1-3/8	35
201-400	11-5/8	295	2-9/16	66	1/4	6	1-5/8	41	1-7/8	48
401-600	13-3/8	340	3-1/8	80	1/4	6	2	51	2-1/4	57



0-60A







61-600A

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

ATDR Time-delay/Class CC

The best protection for today's small motors

Amp-Trap 2000® ATDR small-dimension fuses can provide IEC Type 2 No Damage protection to your facility's increasingly sensitive branch circuit components and small motors – minimizing the risk of fault-related damage. ATDR Class CC fuses deliver the best time-delay characteristics in their class with excellent cycling ability for small motor loads.



Features/Benefits:

- Time-delay for motor starting inrush currents without nuisance opening
- Highly current-limiting for low peak let-thru current
- Improved cycling ability for frequent motor starts/stops without nuisance fuse opening
- Rejection-style design prevents replacement errors (when used with recommended fuse blocks)
- High-visibility orange label ensures instant brand recognition, simplifies replacement
- Metal-embossed date and catalog number for traceability and lasting identification
- Fiberglass body provides dimensional stability in harsh industrial settings
- High-grade silica filler ensures fast arc quenching and optimum current-limitation

Ratings:

Volts : 600VAC
: 300VDC
Amps : 1/4 to 30A
IR : 200kA I.R. AC
: 100kA I.R. DC

Highlights:

- Time-delay
- Best choice for small motor protection
- Highly current-limiting
- AC & DC rated

Applications:

- Small motors
- Contactors
- Lighting, heating & general loads
- Branch circuit protection

Note: See motor fuse applications tables on page P7

Approvals:

- UL listed to standard 248-4 File E2137
- CSA certified to standard C22.2 No. 248.4
- DC listed to UL standard 248

ATDR Time-delay/Class CC

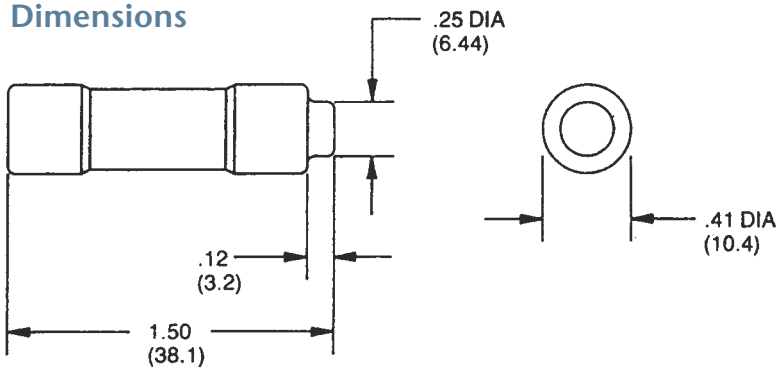
Catalog Numbers (amps)

ATDR1/4	ATDR1-1/2	ATDR3	ATDR6	ATDR12
ATDR1/2	ATDR1-6/10	ATDR3-2/10	ATDR6-1/4	ATDR15
ATDR8/10	ATDR1-8/10	ATDR3-1/2	ATDR7	ATDR17-1/2
ATDR1	ATDR2	ATDR4	ATDR7-1/2	ATDR20
ATDR1-1/8	ATDR2-1/4	ATDR4-1/2	ATDR8	ATDR25
ATDR1-1/4	ATDR2-1/2	ATDR5	ATDR9	ATDR30
ATDR1-4/10	ATDR2-8/10	ATDR5-6/10	ATDR10	

Recommended Fuse Blocks for Class CC Fuses

Number of Poles	Catalog Numbers			
	UltraSafe™ Indicating Fuse Holder	Screw Connector w/ Double Quick Connects	Pressure Plate Connector w/ Double Quick Connects	Copper Box Connector
ADDER		30310R	30320R	30350R
1	USCC1I	30311R	30321R	30351R
2	USCC2I	30312R	30322R	30352R
3	USCC3I	30313R	30323R	30353R
3	USFMCCI			

Dimensions



ATQR Time-delay/Class CC

Take control of fault currents headed for your control transformer

ATQR small-dimension fuses feature time-delay characteristics ideally suited for the high inrush currents of control transformers, solenoids, and similar inductive loads. Mersen's ATQR fuses provide superior protection for the branch circuits of electrical distribution systems.



Features/Benefits:

- Time-delay for control transformer inrush loads without nuisance opening
- Highly current-limiting for low peak let-thru current
- Rejection-style design prevents replacement errors (when used with recommended fuse blocks)
- High visibility orange label ensures instant brand recognition, and simplifies replacement
- Metal-embossed date and catalog number for traceability and lasting identification
- Fiberglass body provides dimensional stability in harsh industrial settings
- High-grade silica filler ensures fast arc quenching and high current limitation

Highlights:

- Time-delay
- Best choice for small transformer protection
- Current-limiting

Applications:

- Control transformers
- Solenoids
- Inductive loads
- Lighting, heating & general-purpose loads

Note: See motor fuse applications tables on page P7

Ratings:

Volts : 600VAC
: 300VDC
Amps : 1/10 to 30A
IR : 200kA I.R. AC
: 100kA I.R. DC

Approvals:

- UL listed to standard 248-4 File E2137
- DC listed to UL standard 248
- CSA certified to standard C22.2 No. 248.4

ATQR Time-delay/Class CC

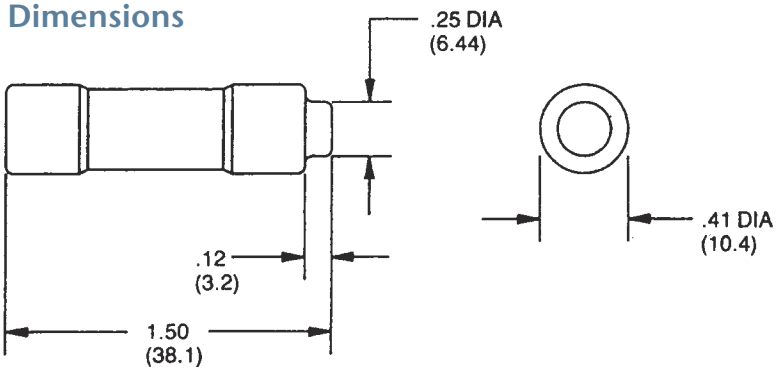
Catalog Numbers (amps)

ATQR1/10	ATQR8/10	ATQR2-8/10	ATQR7-1/2
ATQR1/8	ATQR1	ATQR3	ATQR8
ATQR3/16	ATQR1-1/8	ATQR3-2/10	ATQR9
ATQR2/10	ATQR1-1/4	ATQR3-1/2	ATQR10
ATQR1/4	ATQR1-4/10	ATQR4	ATQR12
ATQR3/10	ATQR1-1/2	ATQR4-1/2	ATQR15
ATQR4/10	ATQR1-6/10	ATQR5	ATQR17-1/2
ATQR1/2	ATQR1-8/10	ATQR5-6/10	ATQR20
ATQR6/10	ATQR2	ATQR6	ATQR25
ATQR3/4	ATQR2-1/4	ATQR6-1/4	ATQR30
	ATQR2-1/2	ATQR7	

Recommended Fuse Blocks for Class CC Fuses

Number of Poles	Catalog Numbers			
	UltraSafe™ Indicating Fuse Holder	Screw Connector w/ Double Quick Connects	Pressure Plate Connector w/ Double Quick Connects	Copper Box Connector
ADDER		30310R	30320R	30350R
1	USCC1I	30311R	30321R	30351R
2	USCC2I	30312R	30322R	30352R
3	USCC3I	30313R	30323R	30353R
3	USFMCCI			

Dimensions



North American Power Fuses

The most popular North American power fuses to meet the most popular protection priorities



Your problem: Today, you need a time-delay power fuse that can handle normal surges. Tomorrow, it's a power fuse with a high interrupting rating and the added security of rejection dimensions. The day after that, one of those economical one-time power fuses will do the trick. But where can you turn for all three?

Our solution: Mersen's comprehensive power fuse offering covers a complete range of applications and a complete range of circuit-protection needs. Whether it's the characteristics of our Tri-Onic® Time-delay fuses. The high current-limiting capacity of our original Amp-Trap® power fuses. The cost-efficient protection of our One-Time fuses. Or some other application-specific power fuse solution.

Want more information fast? For more technical or application-specific information, please call our power fuse experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

B North American Power Fuses

- Class RK5 / Tri-Onic® TR & TRS B2
- Class RK5 / Tri-Onic® TRS-RDC B4
- Class J / Amp-Trap® HSJ B6
- Class J / Amp-Trap® A4J B8
- Class L / Amp-Trap® A4BY B10
- Class L / Amp-Trap® A4BT B12
- Class T / Amp-Trap® A3T & A6T B14
- Class RK1 / Amp-Trap® A2K & A6K .. B16
- Class G / Amp-Trap® AG B18
- Class CC / Amp-Trap® ATMR B19
- Class K-5 / One-time OT & OTS B20
- Class H / Renewable RF & RFS B22
- Plug Fuses B24

FERRAZ SHAWMUT IS NOW MERSEN

MERSEN

TR-R & TRS-R Time-delay/Class RK5

The industry's most popular fuse for motor circuit protection

With advanced material technology added to the existing product, the Tri-Onic® TR and TRS current-limiting time-delay fuses are engineered for overcurrent protection of motors and transformers, service entrance equipment, feeder and branch circuits. Tri-Onic fuse's proven time-delay characteristic safely handles harmless starting currents and inrush currents associated with today's motors and transformers. Now available with optional SmartSpot® blown fuse indication technology.

Features/Benefits:

- Optional solid state SmartSpot blown fuse indicator
- Time-delay for motor start-ups and transformer inrush currents without nuisance opening
- Current-limiting for low peak let-thru current
- Rejection-style design prevents replacement errors (when used with recommended fuse blocks)
- Easy-to-read label for quick brand recognition and replacement
- Metal-embossed date and catalog number for traceability and lasting identification
- Fiberglass body provides dimensional stability in harsh industrial settings
- High-grade silica filler ensures fast arc quenching and high current limitation

Highlights:

- Time-delay
- Current-limiting
- AC & DC rated

Applications:

- Motor circuits
- Mains
- Feeders
- Branch circuits
- Transformers
- Service entrance equipment
- General-purpose equipment



Ratings:

TR-R

Volts : 250VAC
: 250VDC (.1-2.8A; 35-400A)
: 160VDC (3-30A; 450-600A)
Amps : 1/10 to 600A
IR : 200kA I.R. AC / 20kA I.R. DC

TRS-R

Volts : 600VAC
: 600VDC (.1-12A; 70-600A)
: 300VDC (15-60A)
Amps : 1/10 to 600A
IR : 200kA I.R. AC / 20kA I.R. DC

Approvals:

- UL listed to standard 248-12 File E2137
- CSA certified to standard C22.2 no. 248.12
- DC listed to UL standard 248 TRS only

TR-R & TRS-R Time-delay/Class RK5

Catalog Numbers (amps)

250V			600V		
TR1/10R*	TR3-1/2R*	TR50R	TRS1/10R*	TRS3-1/2R*	TRS50R
TR15/100R*	TR4R*	TR60R	TRS15/100R*	TRS4R*	TRS60R
TR2/10R*	TR4-1/2R*	TR70R	TRS2/10R*	TRS4-1/2R*	TRS70R
TR3/10R*	TR5R*	TR75R*	TRS3/10R*	TRS5R*	TRS75R*
TR4/10R*	TR5-6/10R*	TR80R	TRS4/10R*	TRS5-6/10R*	TRS80R
TR1/2R*	TR6R*	TRS90R	TRS1/2R*	TRS6R*	TRS90R
TR6/10R*	TR6-1/4R*	TR100R	TRS6/10R*	TRS6-1/4R*	TRS100R
TR8/10R*	TR7R*	TR110R	TRS8/10R*	TRS7R*	TRS110R
TR1R*	TR8R	TR125R	TRS1R*	TRS8R	TRS125R
TR1-1/8R*	TR9R	TR150R	TRS1-1/8R*	TRS9R	TRS150R
TR1-1/4R*	TR10R	TR175R	TRS1-1/4R*	TRS10R	TRS175R
TR1-4/10R*	TR12R	TR200R	TRS1-4/10R*	TRS12R	TRS200R
TR1-6/10R*	TR15R	TR225R	TRS1-6/10R*	TRS15R	TRS225R
TR1-8/10R*	TR17-1/2R	TR250R	TRS1-8/10R*	TRS17-1/2R	TRS250R
TR2R*	TR20R	TR300R	TRS2R*	TRS20R	TRS300R
TR2-1/4R*	TR25R	TR350R	TRS2-1/4R*	TRS25R	TRS350R
TR2-1/2R*	TR30R	TR400R	TRS2-1/2R*	TRS30R	TRS400R
TR2-8/10R*	TR35R	TR450R	TRS2-8/10R*	TRS35R	TRS450R
TR3R*	TR40R	TR500R	TRS3R*	TRS40R	TRS500R
TR3-2/10R*	TR45R	TR600R	TRS3-2/10R*	TRS45R	TRS600R

Note: Optional blown fuse visual indication available. To order, place "ID" at the end of the catalog number. Example: #TRS30RID
** Not available with optional blow fuse indicator.*
Tin plated end caps are available on Non-ID fuses less than 60A. Example Part # TRP30R, TRSP30R

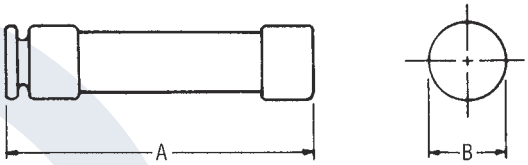
Recommended Fuse Blocks With Box Connectors For Tri-Onic® Class RK5 Fuses

Fuse Ampere Rating	Catalog Number			
	250V		600V	
	1-Pole	3 -Pole	1-Pole	3-Pole
0-30	20306R	20308R	60306R	60308R
31-60	20606R	20608R	60606R	60608R
61-100	21036R	21038R	61036R	61038R
101-200	22001R	22003R	62001R	62003R
201-400	24001R	24003R	64001R	64003R
401-600	2631R	2633R	6631R	6633R

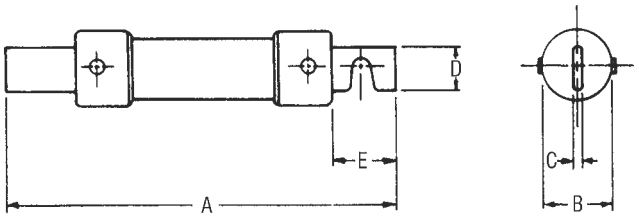
A variety of pole configurations and termination provisions are available. Refer to Section H for details.

Dimensions

Ampere Rating	A		B		C		D		E	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
250V-TR Fuses										
0-30	2	51	9/16	14	-	-	-	-	-	-
31-60	3	76	13/16	21	-	-	-	-	-	-
61-100	5-7/8	149	1-1/16	27	1/8	3	3/4	19	1	25
101-200	7-1/8	181	1-9/16	40	3/16	5	1-1/8	28	1-3/8	35
201-400	8-5/8	219	2-1/16	53	1/4	6	1-5/8	41	1-7/8	48
401-600	10-3/8	264	2-9/16	66	1/4	6	2	51	2-1/4	57
600V-TRS Fuses										
0-30	5	127	13/16	21	-	-	-	-	-	-
31-60	5-1/2	139	1-1/16	27	-	-	-	-	-	-
61-100	7-7/8	200	1-5/16	34	1/8	3	3/4	19	1	25
101-200	9-5/8	244	1-13/16	46	3/16	5	1-1/8	28	1-3/8	35
201-400	11-5/8	295	2-9/16	66	1/4	6	1-5/8	41	1-7/8	48
401-600	13-3/8	340	3-1/8	80	1/4	6	2	51	2-1/4	57



0-60A



61-600A

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

TRS-RDC Time-delay/Class RK5

DC Rated for tough DC applications

The Tri-Onic® DC fuse series is designed for DC circuit protection in surface and underground mines. The TRS-RDC is MSHA approved and meets the industry's most severe third party requirements for 600VDC rated fuses. The TRS-RDC is a time-delay fuse with essentially the same time-current characteristic as the standard Tri-Onic fuse.

Features/Benefits:

- DC rated for mine duty and other long time-constant applications
- Time-delay for motor start-ups and high inrush loads without nuisance opening
- Rugged glass melamine body for superior reliability in harsh environments

Highlights:

- Time-delay
- DC rated

Applications:

- Mine circuits
- Trailing cables
- Pump motors
- Rail heaters



Ratings:

Volts : 300VDC (0.1 to 30A)
: 600VDC (35 to 400A)
Amps : 1/10 to 400A
IR : 20kA I.R. DC
**consult factory for availability*

Approvals:

- MSHA approval no. 28-26-0

TRS-RDC Time-delay/Class RK5

Catalog Numbers (amps)

TRS1/10RDC	TRS1-1/4RDC	TRS3-1/2RDC	TRS12RDC	TRS70RDC
TRS15/100RDC	TRS1-4/10RDC	TRS4RDC	TRS15RDC	TRS80RDC
TRS2/10RDC	TRS1-6/10RDC	TRS4-1/2RDC	TRS17-1/2RDC	TRS90RDC
TRS3/10RDC	TRS1-8/10RDC	TRS5RDC	TRS20RDC	TRS100RDC
TRS4/10RDC	TRS2RDC	TRS5-6/10RDC	TRS30RDC	TRS125RDC
TRS1/2RDC	TRS2-1/4RDC	TRS6RDC	TRS35RDC	TRS150RDC
TRS6/10RDC	TRS2-1/2RDC	TRS6-1/4RDC	TRS40RDC	TRS175RDC
TRS8/10RDC	TRS2-8/10RDC	TRS8RDC	TRS45RDC	TRS200RDC
TRS1RDC	TRS3RDC	TRS9RDC	TRS50RDC	TRS250RDC
TRS1-1/8RDC	TRS3-2/10RDC	TRS10RDC	TRS60RDC	TRS300RDC
				TRS400RDC

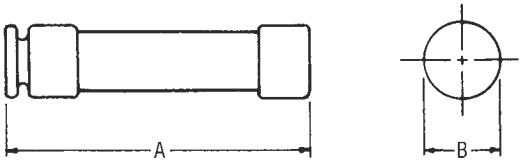
Recommended Fuse Blocks With Box Connectors For Tri-Onic® Class RK5 Fuses

Fuse Ampere Rating	Catalog Number 250V 1-Pole	250V 3-Pole	600V 1-Pole	600V 3-Pole
0-30	20306R	20308R	60306R	60308R
31-60	20606R	20608R	60606R	60608R
61-100	21036R	21038R	61036R	61038R
101-200	22001R	22003R	62001R	62003R
201-400	24001R	24003R	64001R	64003R

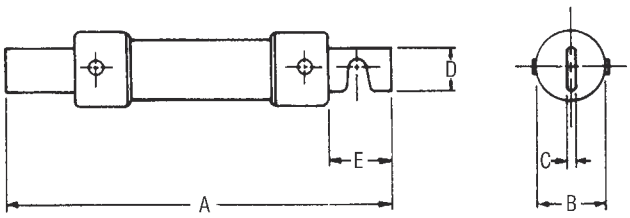
A variety of pole configurations and termination provisions are available. Refer to Section H for details.

Dimensions

Ampere Rating	A In.	A mm	B In.	B mm	C In.	C mm	D In.	D mm	E In.	E mm
0-30	5	127	13/16	21	-	-	-	-	-	-
31-60	5-1/2	139	1-1/16	27	-	-	-	-	-	-
61-100	7-7/8	200	1-5/16	34	1/8	3	3/4	19	1	25
101-200	9-5/8	244	1-13/16	46	3/16	5	1-1/8	28	1-3/8	35
201-400	11-5/8	295	2-9/16	66	1/4	6	1-5/8	41	1-7/8	48



0-60 Amperes



61-400 Amperes

HSJ High Speed/Class J

Protect your wiring and power semiconductors with a single fuse

The High Speed J (HSJ) fuse combines the low I^2t of a semiconductor fuse and the branch circuit performance of a Class J UL listed fuse. This fuse was designed for the starting characteristics of solid state motor controllers. The HSJ can provide branch circuit protection per NEC requirements, as well as very low I^2t for protection of power semiconductors such as Diodes, SCR's, GTO's and SSR's.

Features/Benefits:

- Optimized over-load capability for withstanding elevated levels of current during electronic motor controller starts
- Low I^2t (low thermal energy)
- Excellent cycling ability for frequent starts/stops without nuisance opening

Highlights:

- Current-limiting
- AC & DC ratings
- Low I^2t
- Compact size

Applications:

- Branch circuits
- Control panels
- Electronic motor controllers
- Phase controllers
- Drives
- Soft-starters
- Solid state relays



Ratings:

Volts : 600VAC
: 500VDC
Amps : 1 to 600A (AC)
: 15 to 600A (DC)
IR : 200kA I.R. AC
: 100kA I.R. DC
: L/R =10mS or less
(Self Certified for 600VAC, 300kA I.R., UL witnessed.)

Approvals:

- UL listed to standard 248-8 File E2137
- CSA certified to standard C22.2 no. 248.8
- DC listed to UL 248

HSJ High Speed/Class J

Catalog Numbers (amps)

HSJ1	HSJ90
HSJ3	HSJ100
HSJ6	HSJ110
HSJ10	HSJ125
HSJ15	HSJ150
HSJ17-1/2	HSJ175
HSJ20	HSJ200
HSJ25	HSJ225
HSJ30	HSJ250
HSJ35	HSJ300
HSJ40	HSJ350
HSJ45	HSJ400
HSJ50	HSJ450
HSJ60	HSJ500
HSJ70	HSJ600
HSJ80	

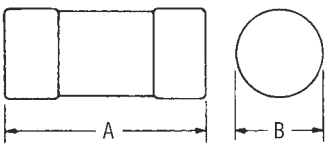
Recommended Fuse Blocks With Box Connectors for Amp-Trap® Class J Fuses

Fuse Ampere Rating	Catalog Number 600V or Less	
	1-Pole	3-Pole
0-30	US3J1I	US3J3I
31-60	US6J1I	US6J3I
61-100	61036J	61038J
101-200	62001J	62003J
201-400	64031J	64033J
401-600	6631J	6633J

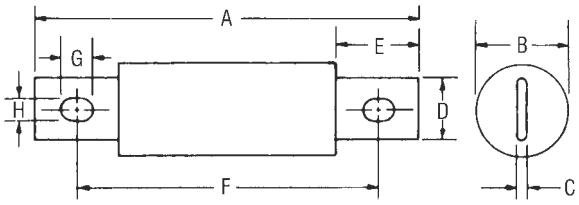
A variety of pole configurations and termination provisions are available. Refer to Section H for details.

Dimensions

Ampere Rating	A		B		C		D		E		F		G		H	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1-30	2-1/4	57	13/16	21	-	-	-	-	-	-	-	-	-	-	-	-
31-60	2-3/8	60	1-1/16	27	-	-	-	-	-	-	-	-	-	-	-	-
61-100	4-4/8	117	1-1/8	29	1/8	3.2	3/4	19	1	25	3-5/8	92	3/8	10	9/32	7
101-200	5-3/4	146	1-5/8	41	3/16	4.8	1-1/8	29	1-3/8	35	4-3/8	111	3/8	10	9/32	7
201-400	7-1/8	181	2-1/8	54	1/4	6.3	1-5/8	41	1-7/8	48	5-1/4	133	17/32	13	13/32	10
401-600	8	203	2-1/2	64	3/8	9.5	2	51	2-1/8	54	6	152	11/16	18	17/32	13



1-60A



61-600A

A4J Fast Acting/Class J

For excellent current-limiting protection

A4J Class J fuses deliver excellent current-limiting protection to a wide variety of applications. Their unique dimensions prevent the substitution of other fuses with lower voltage ratings, interrupting ratings, or current-limiting capability.

Features/Benefits:

- High current limitation for low peak let-thru current
- Unique dimensions prevent replacement by other fuse classes
- Fiberglass body provides dimensional stability in harsh industrial environments
- Easy-to-read imprint label for quick recognition and replacement

Highlights:

- Fast-acting
- Very current-limiting
- DC ratings

Applications:

- Capacitors
- Load centers
- Panelboards
- Switchboards
- Bus duct
- Feeder circuits
- Circuit breakers
- Lighting, heating, and general loads



Ratings:

Volts : 600VAC
: 300VDC
Amps : 1 to 600A
IR : 200kA I.R. AC
: 100kA I.R. DC

Approvals:

- UL listed to standard 248-8 File E2137
- CSA certified to standard C22.2 no. 248.8
- DC listed to UL 248
- IEC 269-2-1

A4J Fast Acting/Class J

Catalog Numbers (amps)

A4J1	A4J50	A4J200
A4J3	A4J60	A4J225
A4J6	A4J70	A4J250
A4J10	A4J75	A4J300
A4J15	A4J80	A4J350
A4J20	A4J90	A4J400
A4J25	A4J100	A4J450
A4J30	A4J110	A4J500
A4J35	A4J125	A4J600
A4J40	A4J150	
A4J45	A4J175	

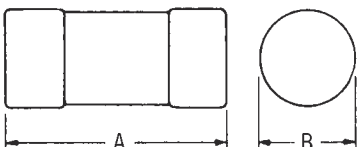
Recommended Fuse Blocks With Box Connectors for Amp-Trap® Class J Fuses

Fuse Ampere Rating	Catalog Number 600V or Less	
	1-Pole	3-Pole
0-30	US3J1I	US3J3I
31-60	US6J1I	US6J3I
61-100	61036J	61038J
101-200	62001J	62003J
201-400	64031J	64033J
401-600	6631J	

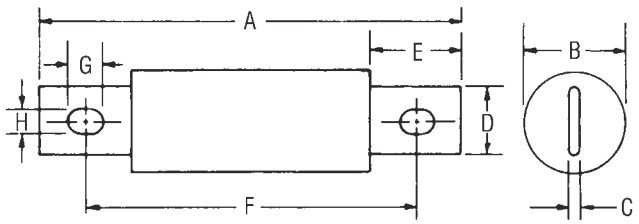
A variety of pole configurations and termination provisions are available. Refer to Section H for details.

Dimensions

Ampere Rating	A		B		C		D		E		F		G		H	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1-30	2-1/4	57	13/16	21	-	-	-	-	-	-	-	-	-	-	-	-
31-60	2-3/8	60	1-1/16	27	-	-	-	-	-	-	-	-	-	-	-	-
61-100	4-4/8	117	1-1/8	29	1/8	3.2	3/4	19	1	25	3-5/8	92	3/8	10	9/32	7
101-200	5-3/4	146	1-5/8	41	3/16	4.8	1-1/8	29	1-3/8	35	4-3/8	111	3/8	10	9/32	7
201-400	7-1/8	181	2-1/8	54	1/4	6.3	1-5/8	41	1-7/8	48	5-1/4	133	17/32	13	13/32	10
401-600	8	203	2-1/2	64	3/8	9.5	2	51	2-1/8	54	6	152	11/16	18	17/32	13



1-60A



61-600A

A4BY Class L

Count on the high interrupting rating of our most widely used class L fuse

When it comes to protecting service entrance equipment, feeder circuits, and circuit breakers, A4BY fuses are the industry's favorite. The A4BY is a 100% rated device and may be applied at continuous currents up to its ampere rating. A 4-second minimum time-delay at 500% rating allows the A4BY to pass normal current surges and to coordinate with ground fault relays.



Features/Benefits:

- Unique dimensions prevent replacement by other fuse classes
- Blade stamped catalog numbers for permanent identification
- Glass melamine body and plated terminals provide superior reliability in harsh environments

Highlights:

- Current-limiting
- 4-second time-delay
- DC ratings
- Uniform characteristics in all ampere ratings

Applications:

- Mains, feeders
- Circuit breakers
- Load centers
- Panelboards
- Switchboards
- Metering centers

Ratings:

Volts	: 600VAC
	: 300VDC
Amps	: 200 to 6,000A (AC)
	: 200 to 2,500A (DC)
IR	: 200kA.I.R. AC
	: 100kA I.R. DC

Approvals:

- UL listed to standard 248-10 (601-6000A) File E2137
- CSA certified to standard C22.2 No. 248.10 (601-6000A)
- Self-certified for DC per UL248 (601-6000A)

A4BY Class L

Catalog Numbers (amps)

A4BY200	A4BY801	A4BY2000
A4BY250	A4BY900	A4BY2001
A4BY300	A4BY1000	A4BY2200
A4BY350	A4BY1100	A4BY2500
A4BY400	A4BY1200	A4BY3000
A4BY450	A4BY1201	A4BY3001
A4BY500	A4BY1350	A4BY3500
A4BY600	A4BY1400	A4BY4000
A4BY601	A4BY1500	A4BY4001
A4BY650	A4BY1600	A4BY4500
A4BY700	A4BY1601	A4BY5000
A4BY750	A4BY1800	A4BY6000
A4BY800		

Note: For optional blown fuse trigger indicator add "-TI" to the end of part number. Example: A4BY1600-TI. Consult factory for availability.

Recommended Fuse Blocks for Amp-Trap® Class L Fuses

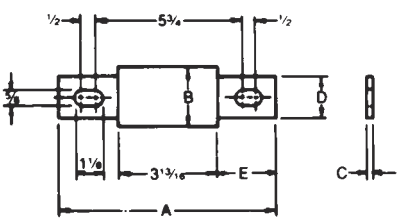
Fuse Ampere Rating	Catalog Number 600V or Less 3-Pole
100-800	P48F
801-1200	P412F

Catalog number P48F is UL recognized
Catalog number P412F is self-certified

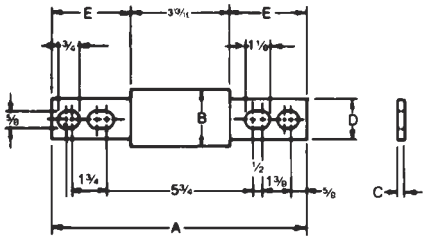
A variety of pole configurations and termination provisions are available. Refer to Section H for details.

Dimensions

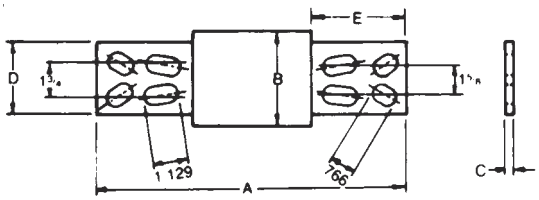
Ampere Rating	A		B		C		D		E	
	in	mm	in	mm	in	mm	in	mm	in	mm
200-600	8-5/8	219	2	51	5/16	8	1-5/8	41	2-13/32	61
801-1200	10-3/4	273	2-1/2	63	3/8	9	2	51	3-15/32	88
1201-1600	10-3/4	273	3	76	7/16	11	2-3/8	60	3-15/32	88
1601-2000	10-3/4	273	3-1/2	89	1/2	13	2-3/4	70	3-15/32	88
2001-2500	10-3/4	273	4-1/2	114	3/4	19	3-1/2	89	3-15/32	88
2501-3000	10-3/4	273	5	127	3/4	19	4	102	3-15/32	88
3001-4000	10-3/4	273	5-3/4	146	3/4	19	4-3/4	121	3-15/32	88
4001-5000	10-3/4	273	6-1/4	159	1	25	5-1/4	133	3-15/32	88



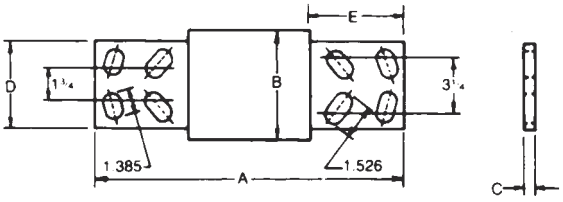
200-800A



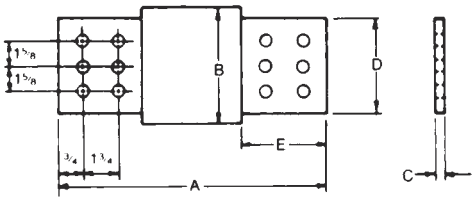
801-2000A



2001-3000A



3001-4000A



4001-6000A

A4BT Time-delay/Class L

When your heavier loads need protection A4BT fuses won't let you down

The high interrupting rating of A4BT current-limiting fuses is ideally suited for protecting mains, feeders, and general circuits. The 10-second time-delay at 500% of fuse rating is ideal for large motors and other loads with a high inrush. A4BT fuses are suitable for DC applications up to 500VDC. An A4BT fuse can be applied to normal loads up to its full ampere rating to allow 100% rating of equipment, while also providing superior current-limiting ability.

Features/Benefits:

- Unique dimensions prevent replacement by other fuse classes.
- Blade-stamped catalog numbers for permanent identification
- Glass melamine body and plated terminals provide superior reliability in harsh environments

Highlights:

- Current-limiting
- Full 10-second delay
- DC ratings
- Uniform characteristics in all ampere ratings

Applications:

- Motors
- Motor controllers
- Transformers
- Mains
- Feeders



Ratings:

Volts : 600VAC
: 500VDC
Amps : 200 to 2,000A
IR : 200kA I.R. AC
: 100kA I.R. DC

Approvals:

- UL Listed to standard 248-10 (601-2000A) File E2137
- CSA Certified to standard C22.2 No. 248.10 (601-2000A)
- Self-certified for DC per UL248 (601-2000)

A4BT Time-delay/Class L

Catalog Numbers (amps)

A4BT200	A4BT601	A4BT1100
A4BT250	A4BT650	A4BT1200
A4BT300	A4BT700	A4BT1400
A4BT350	A4BT750	A4BT1500
A4BT400	A4BT800	A4BT1600
A4BT450	A4BT900	A4BT1800
A4BT500	A4BT1000	A4BT2000
A4BT600		

Recommended Fuse Blocks for Amp-Trap® Class L Fuses

Fuse Ampere Rating	Catalog Number 600V or Less 3-Pole
100-800	P48F
801-1200	P412F

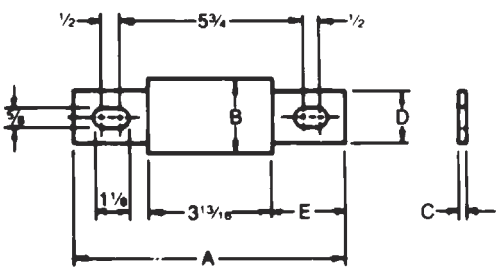
Catalog number P48F is UL recognized
Catalog number P412F is self-certified

A variety of pole configurations and termination provisions are available. Refer to Section H for details.

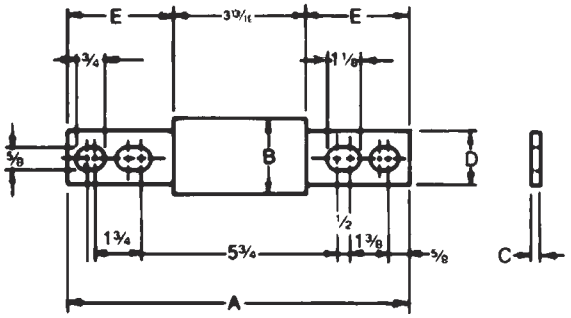
Dimensions

Ampere Rating	A		B		C		D		E	
	in	mm	in	mm	in	mm	in	mm	in	mm
200-600	8-5/8	219	2	51	5/16	8	1-5/8	41	2-13/32	61
601-800	8-5/8	219	2-1/2	63	3/8	9	2	51	2-13/32	61
801-1200	10-3/4	273	2-1/2	63	3/8	9	2	51	3-15/32	88
1201-1600	10-3/4	273	3	76	7/16	11	2-3/8	60	3-15/32	88
1601-2000	10-3/4	273	3-1/2	89	1/2	13	2-3/4	70	3-15/32	88

Safety Note: Class L fuses are dimensioned for one-way interchangeability.
A Class L fuse of any lower ampere rating can be substituted for a given Class L fuse.



200-800A



801-2000A

A3T & A6T Fast Acting/Class T

These small dimension fuses are the right fit... for a tight fit

Fast-acting A3T and A6T Class T fuses combine two highly desirable features - high current limitation and a small physical size. Their unique dimensions prevent the substitution of other fuses with lower voltage ratings or current-limiting capability. These fuses have glass melamine bodies for superior dimensional stability and catalog numbers stamped into the blades for permanent identification.



Features/Benefits:

- Extremely current-limiting for low peak let-thru current
- Unique dimensions prevent replacement by other fuse classes
- Blade-stamped catalog numbers for permanent identification
- Small physical size for greater design flexibility

Highlights:

- Fast-acting
- Extremely current-limiting
- Small physical size
- DC ratings

Applications:

- Loadcenters
- Panelboards
- Switchboards
- Circuit breakers
- Metering centers

Ratings:

A3T

Volts : 300VAC / 160VDC
Amps : 1 to 1200A
IR : 200kA I.R. AC
: 50kA I.R. DC

A6T

Volts : 600VAC / 300VDC
Amps: : 1 to 800A
IR : 200kA I.R. AC
: 100kA I.R. DC

Approvals:

- UL listed to standard 248-15 File E2137
- CSA certified to standard C22.2 no. 248.15
- DC listed to UL standard 248

A3T & A6T Fast Acting/Class T

Catalog Numbers (amps)

300V			600V		
A3T1	A3T60	A3T300	A6T1	A6T60	A6T300
A3T3	A3T70	A3T350	A6T3	A6T70	A6T350
A3T6	A3T80	A3T400	A6T6	A6T80	A6T400
A3T10	A3T90	A3T450	A6T10	A6T90	A6T450
A3T15	A3T100	A3T500	A6T15	A6T100	A6T500
A3T20	A3T110	A3T600	A6T20	A6T110	A6T600
A3T25	A3T125	A3T700	A6T25	A6T125	A6T700
A3T30	A3T150	A3T800	A6T30	A6T150	A6T800
A3T35	A3T175	A3T1000	A6T35	A6T175	
A3T40	A3T200	A3T1200	A6T40	A6T200	
A3T45	A3T225		A6T45	A6T225	
A3T50	A3T250		A6T50	A6T250	

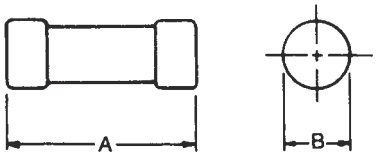
Recommended Fuse Blocks With Box Connectors for Amp-Trap® Class T Fuses

Ampere Rating	Catalog Number			
	300V		600V	
	1-Pole	3-Pole	1-Pole	3-Pole
1-30	30306T	30308T	60306T	60308T
31-60	30606T	30608T	60606T	60608T
61-100	31001T	31003T	61031T	61033T
101-200	32031T	32033T	62031T	62033T
201-400	34031T	34033T	64031T	–
401-600	36031T	–	66031T	–

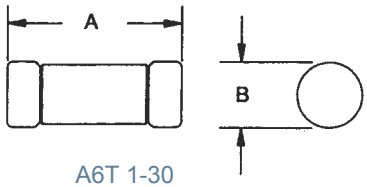
A variety of pole configurations and termination provisions are available. Refer to Section H for details.

Dimensions

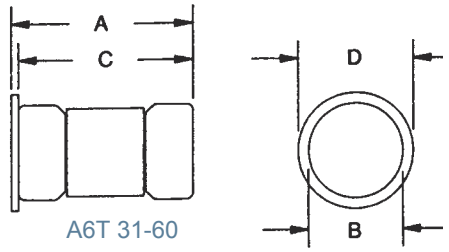
Ampere Rating	A		B		C		D		E		F		G	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
300V-A3T Fuses														
1-30	.88	22.4	.41	10.3	-	-	-	-	-	-	-	-	-	-
61-100	2.16	54.9	.81	20.6	.12	3.2	.75	19.0	1.56	39.6	.28	7.1	.82	20.8
101-200	2.44	62.0	1.06	26.9	.19	4.8	.88	22.4	1.70	43.2	.34	8.6	.83	21.1
601-800	3.38	85.8	2.08	52.8	.38	9.7	1.75	44.4	2.22	56.4	.55	14.0	.88	22.4
801-1200	4.00	102	2.52	64.0	.44	11.2	2.00	50.8	2.53	64.3	.61	15.5	1.03	26.2
600V-A6T Fuses														
1-30	1.50	38.1	.57	14.5	-	-	-	-	-	-	-	-	-	-
31-60	1.57	39.9	.81	20.6	1.51	38.4	1.00	25.4	-	-	-	-	-	-
61-100	2.95	75.0	.82	20.8	.12	3.2	.75	19.0	2.35	59.7	.28	7.1	1.58	40.1
101-200	3.26	82.8	1.07	27.2	.19	4.8	.88	22.4	2.51	63.7	.34	8.6	1.61	41.0
201-400	3.62	92.1	1.62	41.3	.25	6.4	1.00	25.4	2.72	69.1	.41	10.4	1.70	43.2
401-600	3.98	101.2	2.06	52.4	.31	7.9	1.25	31.8	2.95	75.0	.48	12.2	1.70	43.2
601-800	4.33	110.0	2.50	63.5	.37	9.5	1.75	44.4	3.17	80.5	.56	14.1	1.70	43.2



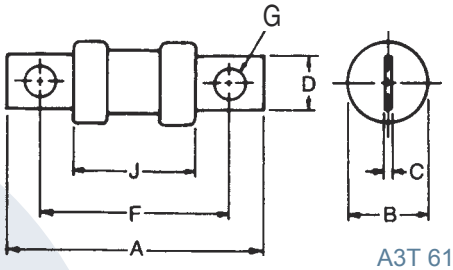
A3T 1-60



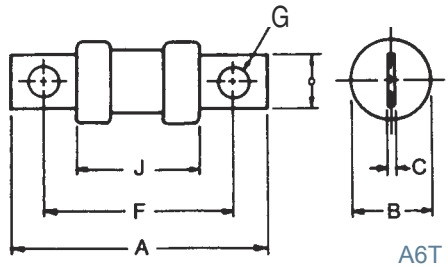
A6T 1-30



A6T 31-60



A3T 61-1200



A6T 61-800

A2K-R & A6K-R Fast Acting/Class RK1

These fast-acting fuses deliver a high degree of current limitation where you need it most

Current-limiting A2K and A6K fuses provide excellent protection where high available short circuit currents exist. These fast-acting fuses are particularly good for branch/feeder circuits and back-up protection.

Features/Benefits:

- Rejection style design prevents replacement by other fuse classes
- Fiberglass body provides dimensional stability in harsh industrial environments
- Easy-to-read imprint label for quick recognition and replacement
- High degree of current limitation for low peak let-thru current

Highlights

- Highly current-limiting
- Fast-acting
- Rejection style

Applications:

- Loadcenters
- Panelboards
- Switchboards
- Bus duct
- Feeder circuits
- Non-inductive loads
- Lighting circuits



Ratings:

A2K

Volts : 250VAC / DC
Amps : 1 to 600A
IR : 200kA I.R. AC
: 20kA I.R. DC

A6K

Volts : 600VAC / 300VDC
Amps: : 1 to 600A
IR : 200kA I.R. AC
: 20kA I.R. DC

Approvals:

- UL listed to standard 248-12 File E2137
- CSA certified to standard C22.2 No. 248.12
- Self-certified for DC per UL248

A2K-R & A6K-R Fast Acting/Class RK1

Catalog Numbers (amps)

250V			600V		
A2K1R	A2K35R	A2K175R	A6K1R	A6K35R	A6K175R
A2K3R	A2K40R	A2K200R	A6K3R	A6K40R	A6K200R
-	A2K45R	A2K225R	A6K4R	A6K45R	A6K225R
A2K5R	A2K50R	A2K250R	A6K5R	A6K50R	A6K250R
A2K6R	A2K60R	A2K300R	A6K6R	A6K60R	A6K300R
-	A2K70R	A2K350R	A6K8R	A6K70R	A6K350R
A2K10R	A2K80R	A2K400R	A6K10R	A6K80R	A6K400R
A2K15R	A2K100R	A2K500R	A6K15R	A6K100R	A6K500R
A2K20R	A2K110R	A2K600R	A6K20R	A6K110R	A6K600R
A2K25R	A2K125R		A6K25R	A6K125R	
A2K30R	A2K150R		A6K30R	A6K150R	

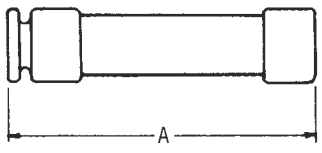
Recommended Fuse Blocks With Box Connectors For Amp-Trap® Class RK1 Fuses

Fuse Ampere Rating	Catalog Number			
	250V		600V	
	1-Pole	3-Pole	1-Pole	3-Pole
0-30	20306R	20308R	60306R	60308R
31-60	20606R	20608R	60606R	60608R
61-100	21036R	21038R	61036R	61038R
101-200	22001R	22003R	62001R	62003R
201-400	24001R	24003R	64001R	64003R
401-600	2631R	2633R	6631R	6633R

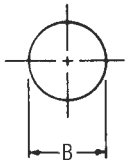
A variety of pole configurations and termination provisions are available. Refer to Section H for details.

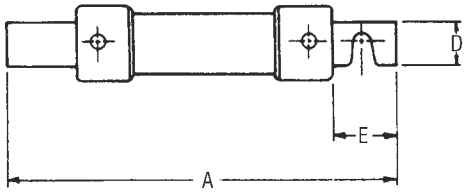
Dimensions

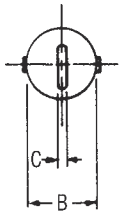
Ampere Rating	A		B		C		D		E	
	in	mm	in	mm	in	mm	in	mm	in	mm
250V-A2K Fuses										
0-30	2	51	9/16	14	-	-	-	-	-	-
31-60	3	76	13/16	21	-	-	-	-	-	-
61-100	5-7/8	149	1-1/16	27	1/8	3	3/4	19	1	25
101-200	7-1/8	181	1-9/16	40	3/16	5	1-1/8	28	1-3/8	35
201-400	8-5/8	219	2-1/16	53	1/4	6	1-5/8	41	1-7/8	48
401-600	10-3/8	264	2-9/16	66	1/4	6	2	51	2-1/4	57
600V-A6K Fuses										
0-30	5	127	13/16	21	-	-	-	-	-	-
31-60	5-1/2	139	1-1/16	27	-	-	-	-	-	-
61-100	7-7/8	200	1-5/16	34	1/8	3	3/4	19	1	25
101-200	9-5/8	244	1-13/16	46	3/16	5	1-1/8	28	1-3/8	35
201-400	11-5/8	295	2-9/16	66	1/4	6	1-5/8	41	1-7/8	48
401-600	13-3/8	340	3-1/8	80	1/4	6	2	51	2-1/4	57



0-60A







61-600A

AG Class G

Amp-Trap® AG fuses fit right in to a wide variety of industrial applications

The Mersen Amp-Trap AG fuse series is a complete line of Class G fuses. AG fuses safely fit a wide variety of applications. Class G fuses are made in four physical sizes and provide superior branch-circuit protection for lighting, heating, and appliance circuits.



Features/Benefits:

- Four unique sizes from ½-60 amperes do not allow inter-changeability with other fuse classes
- Fiberglass bodies provide dimensional stability in harsh industrial settings

Highlights:

- Current-limiting
- Time-delay (above 5A)

Applications:

- Lighting
- Heating*
- Appliances

**except in Canada where fuses must be "P" or "D" type.*

Ratings:

Volts : 600VAC (1/2 to 20A)
: 480VAC (25 to 60A)
Amps : 1/2 to 60A
IR : 100kA I.R. AC

Catalog Numbers (amps)

AG1/2	AG15
AG1	AG20
AG1-1/2	AG25
AG2	AG30
AG3	AG35
AG4	AG40
AG5	AG45
AG6	AG50
AG8	AG60
AG10	

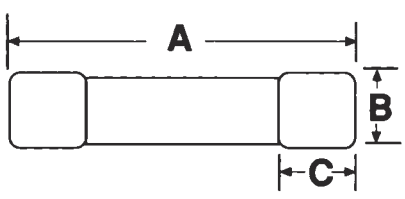
Approvals:

- UL listed to standard 248-5 File E2137
- CSA certified to standard C22.2 No. 248.5

Dimensions

Ampere Rating	A		B		C	
	in	mm	in	mm	in	mm
1/2-15A	1.31	33.3	.406	10.3	.28	7.1
20A	1.41	35.8	.406	10.3	.28	7.1
25, 30A	1.62	41.2	.406	10.3	.28	7.1
35-60A	2.25	57.2	.406	10.3	.50	

Cross Reference: AG will replace the following fuses: Bussmann SC, Littelfuse SLC



ATMR Fast Acting/Class CC

Small fuse - big protection for general circuits

Amp-Trap® ATMR fuses, in the Class CC family, are the smallest dimension 600VAC/DC fuses suitable for branch circuit protection. The ATMR is a popular choice for economical protection of control circuits and control circuit transformers where available short circuit currents exceed 10,000 amperes. ATMR's rejection dimensions prevent substitution by lesser rated fuses. These fast acting fuses give current-limiting protection to general circuits.



Features/Benefits:

- Rejection-style design prevents replacement errors when used with recommended fuse blocks
- Versatile design for individual component and branch circuit protection

Highlights:

- Fast-acting
- Very current-limiting

Applications:

- Control circuits
- Lighting
- General loads
- Branch circuit protection

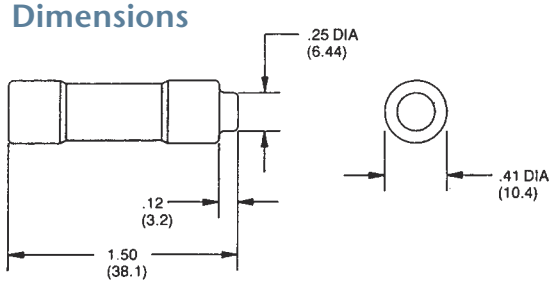
Ratings:

Volts : 600VAC / DC
Amps : 1/10 to 30A
IR : 200kA 1.R. AC
: 100kA 1.R. DC

Catalog Numbers (amps)

ATMR1/10	ATMR3-1/2
ATMR1/8	ATMR4
ATMR2/10	ATMR5
ATMR1/4	ATMR6
ATMR3/10	ATMR7
ATMR1/2	ATMR8
ATMR3/4	ATMR9
ATMR1	ATMR10
ATMR1-1/4	ATMR12
ATMR1-1/2	ATMR15
ATMR2	ATMR20
ATMR2-1/2	ATMR25
ATMR3	ATMR30

Dimensions



Approvals:

- UL Listed to Standard 248-4 File E2137
- CSA Certified to Standard C22.2 No. 248.4
- DC listed to UL Standard 248

Recommended Fuse Blocks For Amp-Trap® Class CC Fuses

Number of Poles	UltraSafe™ Indicating Fuse Holders	Screw Connector with Double Quick Connects	Pressure Plate Connector with Double Quick Connects	Cooper Box Connector
Adder		30310R	30320R	30350R
1	USCC1I	30311R	30321R	30351R
2	USCC2I	30312R	30322R	30352R
3	USCC3I	30313R	30323R	30353R
3	USFMCCI			

A variety of pole configurations and termination provisions are available. Refer to Section H for details.

OT/OTN/OTS Class K-5

For versatility and economy, these general purpose fuses are hard to beat

OT, OTN and OTS general purpose fuses provide low cost protection for feeder and branch circuits serving lighting, heating, and other non-motor loads. OT, OTN and OTS fuses will safely interrupt available short circuit currents up to 50,000 amperes in all ratings. OT, OTN and OTS fuses are not rejection fuses – care should be taken to ensure that replacement fuses do not have lower interrupting ratings than original fuses. OTN 15 through 60 satisfy the Canadian electrical code requirement for Type "P," low melting-point, non-time-delay fuses.

Features/Benefits:

- Easy to read imprint label for quick recognition and replacement
- Low cost for high protection value

Highlights:

- Versatile
- Lowest cost protection for circuits serving non-inductive loads

Applications:

- Feeders
- Branch circuits
- Resistive heating
- Residential and small commercial installations



Ratings:

OT
Volts : 250VAC / DC
Amps : 1 to 600A
IR : 50kA I.R. AC
: 20kA I.R. DC

OTN (Canada)*
Volts : 250VAC
Amps: : 15 to 60A
IR : 50kA I.R. AC

OT
Volts : 600VAC / 300VDC
Amps : 1 to 600A
IR : 50kA I.R. AC
: 20kA I.R. DC

Approvals:

- UL Listed to Standard 248-9 File E2137
- CSA Certified to Standard C22.2 No. 248.9*
- Self-certified for DC per UL248

*The Canadian Electrical Code requires these fuses in ratings 15 through 60A to be of the low melting point design use OTN 15-60.

OT/OTN/OTS Class K-5

Catalog Numbers (amps)

250V			600V		
OT1	OT30, OTN30*	OT125	OTS1	OTS30	OTS125
OT2	OT35, OTN35*	OT150	OTS2	OTS35	OTS150
OT3	OT40, OTN40*	OT175	OTS3	OTS40	OTS175
OT4	OT45, OTN45*	OT200	OTS4	OTS45	OTS200
OT5	OT50, OTN50*	OT225	OTS5	OTS50	OTS225
OT6	OT60, OTN60*	OT250	OTS6	OTS60	OTS250
OT7	OT65	OT300	–	–	OTS300
OT8	OT70	OT350	OTS8	OTS70	OTS350
OT10	OT75	OT400	OTS10	OTS75	OTS400
OT12	OT80	OT450	OTS12	OTS80	OTS450
OT15, OTN15*	OT90	OT500	OTS15	OTS90	OTS500
OT20, OTN20*	OT100	OT600	OTS20	OTS100	0TS600
OT25, OTN25*	OT110		OTS25	OTS110	

** In Canada*

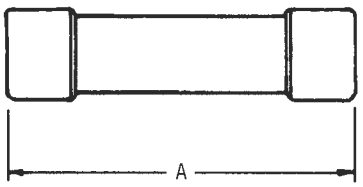
Recommended Fuse Blocks With Box Connectors For One-Time Class K-5 Fuses

Ampere Fuse Rating	Catalog Number			
	250V		600V	
	1-Pole	3-Pole	1-Pole	3-Pole
0-30	20306	20308	60306	60308
31-60	20606	20608	60606	60608
61-100	21036	21038	61036	61038
101-200	22001	22003	62001	62003
201-400	24001	24003	64001	64003
401-600	2631	2633	6631	6633

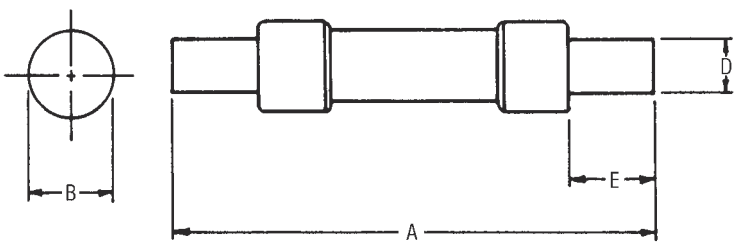
A variety of pole configurations and termination provisions are available. Refer to Section H for details.

Dimensions

Ampere Rating	A		B		C		D		E	
	in	mm	in	mm	in	mm	in	mm	in	mm
250V-OT, OTN Fuses										
0-30	2	51	9/16	14	-	-	-	-	-	-
31-60	3	76	13/16	21	-	-	-	-	-	-
61-100	5-7/8	149	1-1/16	27	1/8	3	3/4	19	1	25
101-200	7-1/8	181	1-9/16	40	3/16	5	1-1/8	28	1-3/8	35
201-400	8-5/8	219	2-1/16	53	1/4	6	1-5/8	41	1-7/8	48
401-600	10-3/8	264	2-9/16	66	1/4	6	2	51	2-1/4	57
600V-OTS Fuses										
0-30	5	127	13/16	21	-	-	-	-	-	-
31-60	5-1/2	139	1-1/16	27	-	-	-	-	-	-
61-100	7-7/8	200	1-5/16	34	1/8	3	3/4	19	1	25
101-200	9-5/8	244	1-13/16	46	3/16	5	1-1/8	28	1-3/8	35
201-400	11-5/8	295	2-9/16	66	1/4	6	1-5/8	41	1-7/8	48
401-600	13-3/8	340	3-1/8	80	1/4	6	2	51	2-1/4	57



0-60A



61-600A

RF/RFS Class H

Traditional protection for circuits with less than 10,000A

RF and RFS general purpose fuses are suitable for applications where available short circuit currents do not exceed 10,000 amperes. RF and RFS renewable fuses use matched RL and RLS die-cut zinc links from 1 to 600 amperes in 32 ratings.

Features/Benefits:

- Knurled bushings for ease of disassembly
- Rugged construction for maximum service life
- Precision die-cut renewal links renew quickly and give repeatable performance

Highlights:

- Renewable
- 32 Renewable link ratings

Applications:

- General purpose loads where short circuits are 10,000 amperes or less



Ratings:

RF

Volts : 250VAC
Amps : 1 to 600A
IR : 10kA I.R. AC

RFS

Volts : 600VAC
Amps: : 1 to 600A
IR : 10kA I.R. AC

Approvals:

- UL listed to standard 248-7 File E2137
- CSA certified to standard C22.2 no. 248.7

RF/RFS Class H

Catalog Numbers (amps)

250V			600V		
RF1/RL1	RF45/RL45	RF225/RL225	RFS1/RLS1	RFS45/RLS45	RFS225/RLS225
RF2/RL2	RF50/RL50	RF250/RL250	RFS2/RLS2	RFS50/RLS50	RFS250/RLS250
RF3/RL3	RF60/RL60	RF300/RL300	RFS3/RLS3	RFS60/RLS60	RFS300/RLS300
RF5/RL5	RF70/RL70	RF350/RL350	RFS5/RLS5	RFS70/RLS70	RFS350/RLS350
RF6/RL6	RF80/RL80	RF400/RL400	RFS6/RLS6	RFS80/RLS80	RFS400/RLS400
RF10/RL10	RF90/RL90	RF450/RL450	RFS10/RLS10	RFS90/RLS90	RFS450/RLS450
RF15/RL15	RF100/RL100	RF500/RL500	RFS15RLS15	RFS100/RLS100	RFS500/RLS500
RF20/RL20	RF110/RL110	RF600/RL600	RFS20/RLS20	RFS110/RLS110	RFS600/RLS600
RF25/RL25	RF125/RL125		RFS25/RLS25	RFS125/RLS125	
RF30/RL30	RF150/RL150		RFS30/RLS30	RFS150/RLS150	
RF35/RL35	RF175/RL175		RFS35/RLS35	RFS175/RLS175	
RF40/RL40	RF200/RL200		RFS40/RLS40	RFS200/RLS200	

Note: Order RF/RFS for Class H Renewable Fuse Order RL/RLS for Renewable Fuse Links

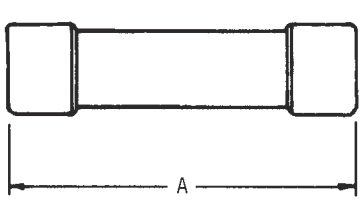
Recommended Fuse Blocks With Box Connectors For Renewable Class H

Ampere Fuse Rating	Catalog Number			
	250V		600V	
	1-Pole	3-Pole	1-Pole	3-Pole
0-30	20306	20308	60306	60308
31-60	20606	20608	60606	60608
61-100	21036	21038	61036	61038
101-200	22001	22003	62001	62003
201-400	24001	24003	64001	64003
401-600	2631	2633	6631	6633

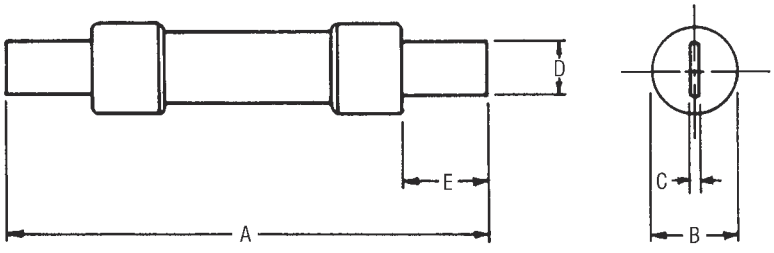
A variety of pole configurations and termination provisions are available. Refer to Section H for details.

Dimensions

Ampere Rating	A		B		C		D		E	
	in	mm	in	mm	in	mm	in	mm	in	mm
250V-RF Fuses										
0-30	2	51	9/16	14	-	-	-	-	-	-
31-60	3	76	13/16	21	-	-	-	-	-	-
61-100	5-7/8	149	1-1/16	27	1/8	3	3/4	19	1	25
101-200	7-1/8	181	1-9/16	40	3/16	5	1-1/8	28	1-3/8	35
201-400	8-5/8	219	2-1/16	53	1/4	6	1-5/8	41	1-7/8	48
401-600	10-3/8	264	2-9/16	66	1/4	6	2	51	2-1/4	57
600V-RFS Fuses										
0-30	5	127	13/16	21	-	-	-	-	-	-
31-60	5-1/2	139	1-1/16	27	-	-	-	-	-	-
61-100	7-7/8	200	1-5/16	34	1/8	3	3/4	19	1	25
101-200	9-5/8	244	1-13/16	46	3/16	5	1-1/8	28	1-3/8	35
201-400	11-5/8	295	2-9/16	66	1/4	6	1-5/8	41	1-7/8	48
401-600	13-3/8	340	3-1/8	80	1/4	6	2	51	2-1/4	57



0-60A



61-600A

Plug Fuses

Plug Fuses: G/GP/TD/GW/GTL/GT/GSL

Mersen Plug Fuses are for industrial and residential applications. Standard non-time delay fuses are for receptacle and lighting circuits. Standard time delay fuses are for motor loads. For Canadian requirements, a type “P” fuse is used for non-motor loads and type “D” fuses are used for electric heating and cycling loads circuits. Both fuses have low melting-point temperature elements. Low-Temp time delay plug fuses have thermal sensitivity are also for cycling loads and motor circuits. Type “S” plug fuses are time delay and tamper-resistant.

Catalog Numbers (amps)

Catalog Number						
Edison Base						Type S
Non-Time Delay UL	Non-Time Delay CSA	Time-delay UL	"P" Type Non-time Delay CSA	Low-Temp Time-delay UL	"D" Type Time-delay CSA	Rejection* Time-delay UL
GW3	G3	-	-	-	-	-
GW6	G6	-	-	-	-	-
GW10	G10	-	-	-	-	-
GW15	-	GTL15	GP15	GT15	TD15	GSL15
GW20	-	GTL20	GP20	GT20	TD20	GSL20
GW25	-	GTL25	GP25	GT25	TD25	GSL25
GW30	-	GTL30	GP30	GT30	TD30	GSL30

FR15 Rejector Rings available
FRW Rejection removal tool available to remove FR15
**Must be used with an SAG adaptor to fit an Edison base fuse holder.*

Type S Plug Fuse Adaptors

Cat.No./Rating	Fuse Range - Amps
SAG3-2/10	1-8/10 - 3-2/10
SAG6-1/4	3-1/2 - 6-1/4
SAG15	7 - 15
SAG20	20
SAG30	25 - 30

Type S adaptors screw into the Edison base and allow Type S fuses to be installed. Type S adaptors prevent the wrong ampere size fuse from being used.





Ratings:

Volts : 125VAC
Amps : 3 to 30A
IR : 10kA I.R. AC

Choice of Edison Base, Types “P”, “D”, or “S”

Approvals:

- UL Listed Guide JEFV, File E76208
- CSA Certified Class 142301, File 15525

Midget, Miniature & PC Mount Fuses

Maximum Protection.

Minimum Space.



Your problem: As different as their job descriptions are on paper — today's maintenance crews, specifying engineers, and OEM designers have one thing in common: They're all working with smaller electrical system components. Be it motor starters, transformers, or circuit-control equipment. So, where do you turn for small dimension fuses without a reduction in protective capacity?

Our solution: Our international range of midget and miniature dimension and new PC mount fuses offers you all the protection you require. A wide range of ratings. Special characteristics like time-delay and low I^2t. All within a footprint of 1-1/2" x 13/32" or less.

Want more information fast? For more technical or application-specific information, please call our Midget and Miniature Dimension fuse experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

C Midget, Miniature & PC Mount Fuses

Midget

- ATQ Time-Delay C2
- ATM Fast-Acting C3
- TRM Time-Delay C4
- OTM Fast-Acting C5
- DCT Special Purpose..... C6
- FSM Multi-Meter Fuse..... C7
- GGU Fast-Acting..... C8
- GFN Indicating Time-Delay C9
- SBS Fast-Acting..... C10

PC Mount

- PCF; PCS; PCT..... C11

Miniature

- GSA/GSA-V; GDL/GDL-V C15
- GGC/GGC-V; GGM/GGM-V..... C16
- GGA/GGA-V; GSC/GSC-V..... C17
- GSB/GSB-V; GDG/GDG-V..... C18
- GSD/GSD-V; GSF/GSF-V..... C19
- GGX; GAB; GSR-V C20
- SMG/SMG-V; STG/STG-V C21
- Radial Lead Micro Fuses MRF, MRT. C22
- SFRT; SFRB; SFRG; FSFE, SFRU . C23
- SLR, SMF, SHR C24
- Automotive Fuses - AF, AF2, AF3, AFH20, AFH30, AF2H30,AF3H60 .. C26

FERRAZ SHAWMUT IS NOW MERSEN

MERSEN

ATQ Time-Delay Midget Fuses

Amp-Trap® ATQ midget time-delay fuses are rated a full 500 volts AC with 42 ampere ratings from 1/10 to 30A. They are an excellent choice for supplemental protection of circuits up to 30A where the available short circuit current does not exceed 10,000A. (Not for Branch Circuit Protection).

Features/Benefits:

- Numerous ratings for a wide variety of applications up to 500VAC
- Time-delay (12 seconds at 200% rating) for circuits with high inrush current
- Can be used with UltraSafe™ Fuse holders
- 1 1/2" x 13/32" (10mm x 38mm) dimensions

Highlights:

- Time-delay

Applications:

- Supplemental protection of lighting, solenoid, motor and transformer circuits



Ratings:

Volts : 500VAC
Amps : 1/10 to 30A
I.R. : 10kA I.R.

Catalog Numbers (amps)

ATQ1/10	ATQ3/10	ATQ1-1/8	ATQ2	ATQ3-2/10	ATQ6	ATQ12
ATQ1/8	ATQ4/10	ATQ1-1/4	ATQ2-1/8	ATQ3-1/2	ATQ6-1/4	ATQ14
ATQ15/100	ATQ1/2	ATQ1-4/10	ATQ2-1/4	ATQ4	ATQ7	ATQ15
ATQ3/16	ATQ6/10	ATQ1-1/2	ATQ2-1/2	ATQ4-1/2	ATQ8	ATQ20
ATQ2/10	ATQ8/10	ATQ1-6/10	ATQ2-8/10	ATQ5	ATQ9	ATQ25
ATQ1/4	ATQ1	ATQ1-8/10	ATQ3	ATQ5-6/10	ATQ10	ATQ30

Recommended Fuse Blocks for Midget (10x38mm) Fuses

Number of Poles	Catalog Number			
	UltraSafe™ Indicating Fuse Holder	Screw Connector	Pressure Plate Connector	Copper Box Connector
Adder		30310	30320	30350
1	USM1I	30311	30321	30351
2	USM2I	30312	30322	30352
3	USM3I	30313	30323	30353
3	USFM10I			

Approvals:

- UL listed to standard 248-14 File E33925
- CSA Certified to Standard C22.2 No. 248.14

ATM Fast-Acting Midget Fuses

Amp-Trap® midget fast-acting ATM fuses are rated 600 volts AC and DC, with a 100kA interrupting rating. These ratings give the ATM a wide range of applications not covered by other midget fuses. In addition, ratings of 30/35, 30/40 and 30/50 amperes are offered for specific applications such as capacitor protection. These ATM fuses must still be considered 30A fuses because of their dimensions, but are able to withstand much higher inrush currents and tougher duty cycles. (Not for Branch Circuit Protection).

Features/Benefits:

- For supplemental protection of small motors and transformers
- Extended ratings for special protection of capacitors and circuits with high inrush currents
- 600VDC ratings for a wide variety of applications including photovoltaic and solar applications.
- Can be used with UltraSafe™ fuse holders
- 1 1/2" x 13/32" (10mm x 38mm) dimensions

Highlights:

- Fast-acting
- Special Ratings (Above 30A)

Applications:

- Supplemental protection of of circuits up to 600VAC and 600VDC with 100kA I.R.

Catalog Numbers (amps)

ATM1/10	ATM6
ATM1/8	ATM7
ATM2/10	ATM8
ATM1/4	ATM10
ATM1/2	ATM12
ATM3/4	ATM15
ATM1	ATM20
ATM1-1/2	ATM25
ATM2	ATM30
ATM3	ATM30/35*
ATM4	ATM30/40*
ATM5	ATM30/50*

** are not continuous current rated devices*

Recommended Fuse Blocks for Midget (10x38mm) Fuses

Number of Poles	Catalog Number			
	UltraSafe™ Indicating Fuse Holder	Screw Connector	Pressure Plate Connector	Copper Box Connector
Adder		30310	30320	30350
1	USM1I	30311	30321	30351
2	USM2I	30312	30322	30352
3	USM3I	30313	30323	30353
3	USFM10I			



Ratings:

Volts : 600VAC / DC
Amps : 1/10 to 30A
: (35 to 50A AC only)
I.R. : 100kA I.R.
: 10kA I.R. AC (35 to 50A)

Approvals:

- UL listed to standard 248-14 (1/10 to 30A) File E33925
- DC Listed to UL Standard 248-14 (1/10 to 30A)
- CSA Certified to Standard C22.2 No. 248.14 (1/10 to 30A)

TRM Time-Delay Midget Fuses

Tri-Onic® TRM time-delay midget fuses are rated 250 volts AC and are offered in ampere ratings from 1/10 to 30A. They have 12 seconds time-delay at 200% rating to provide supplemental protection of small motors, small transformers and other high inrush loads, plus many other 250 volt applications. (Not for Branch Circuit Protection).

Features/Benefits:

- Numerous ratings for a wide variety of applications
- 250VAC rating in all sizes up to 30A
- Time-delay for circuits with high inrush currrent
- Can be used with UltraSafe™ fuse holders
- 1 1/2" x 13/32" (10mm x 38mm) dimensions

Highlights:

- Time-delay

Applications:

- Small motors
- Small transformers
- Lighting circuits
- Control circuits



Ratings:

Volts : 250VAC
Amps : 1/10 to 30A
I.R. : 10kA I.R.

Catalog Numbers (amps)

TRM1/10	TRM6/10	TRM1-6/10	TRM3	TRM5-6/10	TRM10
TRM15/100	TRM8/10	TRM1-8/10	TRM3-2/10	TRM6	TRM12
TRM2/10	TRM1	TRM2	TRM3-1/2	TRM6-1/4	TRM15
TRM1/4	TRM1-1/8	TRM2-1/4	TRM4	TRM7	TRM20
TRM3/10	TRM1-1/4	TRM2-1/2	TRM4-1/2	TRM8	TRM25
TRM4/10	TRM1-4/10	TRM2-8/10	TRM5	TRM9	TRM30
TRM1/2					

Recommended Fuse Blocks for Midget (10x38mm) Fuses

Number of Poles	Catalog Number			
	UltraSafe™ Indicating Fuse Holder	Screw Connector	Pressure Plate Connector	Copper Box Connector
Adder		30310	30320	30350
1	USM1I	30311	30321	30351
2	USM2I	30312	30322	30352
3	USM3I	30313	30323	30353
3	USFM10I			

Approvals:

- UL listed to standard 248-14 File E33925
- CSA Certified to Standard C22.2 No. 248.14

OTM Fast-Acting Midget Fuses

One-time OTM midget fuses provide low-cost protection for 250 volt AC general purpose lighting, heating, control circuits, etc. where time-delay is not required. (Not for Branch Circuit Protection).

Features/Benefits:

- Low cost and fully rated for economy without compromise
- Can be used with UltraSafe™ fuse holders
- 1 1/2" x 13/32" (10mm x 38mm) dimensions

Highlights:

- Fast-acting

Applications:

- Supplemental protection of circuits up to 250VAC and 10kA



Ratings:

Volts : 250VAC
Amps : 1 to 30A
I.R. : 10kA I.R.

Catalog Numbers (amps)

OTM1
OTM2
OTM3
OTM4
OTM5
OTM6
OTM8
OTM10
OTM15
OTM20
OTM25
OTM30

Recommended Fuse Blocks for Midget (10x38mm) Fuses

Number of Poles	Catalog Number			
	UltraSafe™ Indicating Fuse Holder	Screw Connector	Pressure Plate Connector	Copper Box Connector
Adder		30310	30320	30350
1	USM1I	30311	30321	30351
2	USM2I	30312	30322	30352
3	USM3I	30313	30323	30353
3	USFM10I			

Approvals:

- UL Listed to standard 248-14 File E33925
- CSA Certified to Standard C22.2 No. 248.14

DCT Special Purpose Midget Fuses

Mersen DCT fuses were developed to meet requirements coming from new applications such as protection of photovoltaic cells, multi meters and compact on board traction equipment for auxiliary circuits. This high performance DC fuse in its compact size offers multiple competitive advantages particularly for international applications where DC voltage requirements are above 600V DC.



Features/Benefits:

- Low minimum breaking capacity (MBC)
- Compact size: 10 x 38 mm (13/32" x 1-1/2") size internationally accepted.
- Ferrule mount 1 to 30A for design versatility
- Can be used with UltraSafe™ fuse holders USM series
- 1 1/2" x 13/32" (10mm x 38mm) dimensions

Highlights:

- 750VAC / 1000VDC
- DC : L/R = 1mS

Applications:

- DC traction equipment
- Multi-meters
- Photovoltaic systems
- Semiconductor protection

Ratings:

Volts : 750VAC
: 1000VDC
Amps : 1 to 30A
I.R. : 100kA I.R. AC
: 50kA I.R. DC
MBC : 2.0 x I_n (AC)
: 1.3 x I_n (DC : 1 - 7A)
: 2.0 x I_n (DC : 8 - 30A)
L/R : 1mS

Approvals:

- UL Recognized component File E60314

Catalog Numbers, I^2t (at 50,000 Amps –1000VDC L/R = 1ms)

Catalog Number	Clearing $I^2t(A^2s)$	Watts Loss @ 80% Rating (W)	Watts Loss @ 100% Rating (W)
DCT1-2	-	0.2	0.32
DCT2-2	-	0.27	0.43
DCT3-2	-	0.9	1.4
DCT4-2	-	0.8	1.3
DCT5-2	-	0.9	1.4
DCT6-2	-	1.0	1.5
DCT7-2	-	1.1	1.5
DCT8-2	83	0.7	1.1
DCT10-2	127	0.9	1.5
DCT12-2	215	1.3	2.0
DCT15-2	495	1.9	3.0
DCT20-2	755	2.6	4.4
DCT25-2	970	2.9	5.3
DCT30-2	1650	3.0	5.8

Recommended Fuse Blocks for Midget (10x38mm) Fuses

Number of Poles	Catalog Number			
	UltraSafe™ Fuse Holder	Screw Connector	Pressure Plate Connector	Copper Box Connector
Adder		30310	30320	30350
1	USM1	30311	30321	30351
2	USM2	30312	30322	30352
3	USM3	30313	30323	30353

FSM Multi-Meter Fuse

Mersen has developed a true 1000V AC/DC fuse designed to protect both analog and digital multi-meters. These fuses cover all the industry's multi-meter requirements in three easy to use amperage ratings. Good for 1000V AC and DC, the FSM line of Mersen fuses are designed for the power electronics metering and controls market.

Features/Benefits:

- For the protection of multi-meters
- 1000V AC/DC for full range protection
- 100% Current rated for continuous current with L/R = 10mS carrying capability
- Glass melamine body and plated terminals provide superior reliability and performance

Highlights:

- Fast-acting
- Current-limiting

Applications

- Multi-meters

Catalog Numbers (amps)

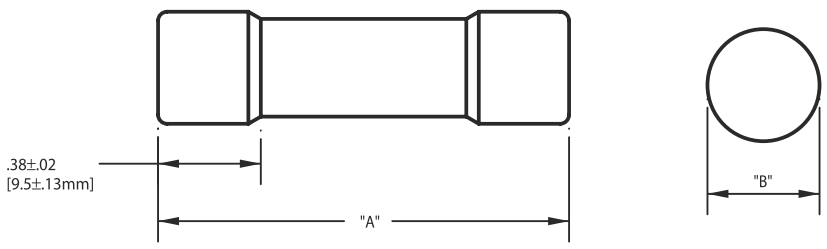
FSM44/100
FSM11
FSM15

Cross Reference

Mersen FSM replaces the
Bussmann: DMM-B
Littelfuse: FLU

Dimensions

Catalog No.	A	B
FSM44/100	1.375"	0.406"
FSM11	1.500"	0.406"
FSM15	1.500"	0.406"





Ratings:

Volts : 1000VAC / DC
Amps : 44/100A, 11A, 15A
I.R. : 20kA I.R.

Approvals:

- UL Recognized component File E60314

GGU Fast-Acting Midget Fuses

125 volt AC rated GGU fuses have midget fuse dimensions (1-1/2” long x 13/32” diameter). 20A-30A ratings have ceramic bodies, allowing use in higher ambient temperature conditions than other similar fuses. (Not for Branch Circuit Protection).

Features/Benefits:

- Glass body on 1-15A makes status of fusible element clearly visible
- Ceramic body on 20-30A allows use in higher temperature applications
- Medium lag for protection of circuits up to 30A and 125VAC
- Can be used with UltraSafe™ fuse holders (1-30A)
- 1 1/2” x 13/32” (10mm x 38mm) dimensions

Highlights:

- Fast-acting

Catalog Numbers (amps)

GGU1
GGU2
GGU3
GGU4
GGU5
GGU8
GGU10
GGU15
GGU20
GGU30

Recommended Fuse Blocks for Midget (10x38mm) Fuses

Number of Poles	Catalog Number			
	UltraSafe™ Indicating Fuse Holder	Screw Connector	Pressure Plate Connector	Copper Box Connector
Adder		30310	30320	30350
1	USM1I	30311	30321	30351
2	USM2I	30312	30322	30352
3	USM3I	30313	30323	30353
3	USFM10I			



Ratings:

Volts : 125VAC
Amps : 1 to 30A
I.R. : 10kA I.R.

Approvals:

- UL Listed 1-15A
- UL Recognized 20-30A

GFN Time-Delay Midget Fuses

GFN midget indicating fuses are available in ratings from 1/10 through 30A. These time-delay fuses have built-in blown fuse indicators which pop out at the end of the fuse to visually indicate when the fuse has operated to open the circuit. Indicators may be used to trip a switch for remote as well as visual annunciation.
(Not for Branch Circuit Protection).

Features/Benefits:

- Pin indicator provides visual indication of open fuse or actuates switch for remote signaling
- Numerous ratings for a wide variety of applications
- 12 second time-delay at 200% rating
- Can be used with UltraSafe™ fuse holders (1/10 - 10A)
- 1 1/2" x 13/32" (10mm x 38mm) dimensions

Highlights:

- Pin indicator
- Time-delay
- 12-30A double body

Applications:

- For supplemental protection of circuits where time-delay and blown fuse indication are required, such as solenoid circuits or control circuits.



Ratings:

Volts : 250VAC (0.1 - 10A)
: 125VAC (12 - 15A)
: 32VAC (20 - 30A)
Amps : 1/10 to 30A
I.R. : 200kA I.R., 250VAC, 0.1-10A
: 10kA I.R., 125VAC, 0.1-15A
: 10kA I.R., 32VAC, 20-30A

Approvals:

- UL Listed to standard 248-14 (1/10 to 15A) File E33925
- CSA Certified to Standard C22.2 No. 248.14 (1/10 to 15A)

Catalog Numbers (amps)

GFN1/10	GFN1	GFN2-1/2	GFN6-1/4
GFN1/8	GFN1-1/8	GFN2-8/10	GFN7
GFN15/100	GFN1-1/4	GFN3	GFN8
GFN2/10	GFN1-4/10	GFN3-2/10	GFN10
GFN1/4	GFN1-1/2	GFN3-1/2	GFN12*
GFN3/10	GFN1-6/10	GFN4	GFN15*
GFN4/10	GFN1-8/10	GFN4-1/2	GFN20*
GFN1/2	GFN2	GFN5	GFN25*
GFN6/10	GFN2-1/4	GFN5-6/10	GFN30*
GFN8/10		GFN6	

**Note: 12-30A is a double barrel fuse construction*

Recommended Fuse Blocks for Midget (10x38mm) Fuses

	Catalog Number			
Number of Poles	UltraSafe™ Indicating Fuse Holder	Screw Connector	Pressure Plate Connector	Copper Box Connector
Adder		30310	30320	30350
1	USM1I	30311	30321	30351
2	USM2I	30312	30322	30352
3	USM3I	30313	30323	30353
3	USFM10I			

SBS Fast-Acting Ferrule Fuses

Unique dimensions for today's smaller equipment and components. Fast-acting general purpose fuse developed in response to the industry's demand for smaller equipment and components. The only fuse in their size with a full 600 VAC rating for all ampere ratings by UL standard 248-14 and CSA No. 59.2, and are the only fuses of this size with an interrupting rating of 100kA RMS. SBS fuses are 1-3/8" long, smaller by 1/8" than most standard midget fuses and are available in 22 ampere ratings, from 2/10A to 30A. (Not for Branch Circuit Protection).



Features/Benefits:

- Small unique physical size for maximum design flexibility and non-interchangeability with other fuse classes
- Fiberglass body provides dimensional stability in harsh industrial environments
- Can be used with UltraSafe™ fuse holder
- 1 3/8" x 13/32" dimensions

Highlights:

- Fast-acting
- Unique dimensions

Applications:

- Control circuits
- Lighting ballasts
- Meter circuits
- Electronic circuits
- General purpose protection

Catalog Numbers (amps)

SBS2/10	SBS1-8/10	SBS10
SBS4/10	SBS2	SBS12
SBS1/2	SBS3	SBS15
SBS3/4	SBS4	SBS20
SBS8/10	SBS5	SBS25
SBS1	SBS6	SBS30
SBS1-1/2	SBS7	
SBS1-6/10	SBS8	

Cross Reference:

SBS will replace Bussmann BBS, Littelfuse BLS fuses

Ratings:

Volts : 600VAC
Amps : 2/10 to 30A
I.R. : 100kA I.R.

Approvals:

- UL Listed to standard 248-14 File E33925
- CSA Certified to Standard C22.2 No. 248.14

PCF Fast-Acting PC Mount Fuses

Fast-acting fuses for direct mounting on printed circuit boards.

Mersen's PCF series of fast-acting direct-mountable fuses addresses the increasing need for electrical protection at the PC board as current and voltage requirements push higher. These fuses help printed circuit board manufacturers reduce parts by eliminating clips and fuse blocks and allowing automated assembly. PCF fuses can be used for the protection of main frame power boards, small circuit breakers with low-interrupting ratings and other critical components. PCF fuses bring greatly-increased ampere, voltage and interrupting ratings to the board itself and are UL Component Recognized.



C

Highlights:

- Fast-acting
- PC board mount
- Three mounting styles

Applications:

- Protection of main frame power boards, circuit breakers, components

Ratings:

Volts : 600VAC / DC
Amps : 1 to 30A
I.R. : 100kA I.R.
L/R : ≤10ms

Catalog Numbers (amps)

Slot Mount	
PCF1-R	PCF8-R
PCF2-R	PCF10-R
PCF3-R	PCF12-R
PCF4-R	PCF15-R
PCF5-R	PCF20-R
PCF6-R	PCF25-R
PCF7-R	PCF30-R
Double Hole Mount	
PCF1-H	PCF8-H
PCF2-H	PCF10-H
PCF3-H	PCF12-H
PCF4-H	PCF15-H
PCF5-H	PCF20-H
PCF6-H	PCF25-H
PCF7-H	PCF30-H
	PCF30/50-H
Surface Mount	
PCF1-S	PCF8-S
PCF2-S	PCF10-S
PCF3-S	PCF12-S
PCF4-S	PCF15-S
PCF5-S	PCF20-S
PCF6-S	PCF25-S
PCF7-S	PCF30-S

Dimensions of the PCF Series are found on page C14

Approvals:

- UL Recognized Components File E60314

PCS Semiconductor PC Mount Fuses

Semiconductor protection fuses for direct mounting on printed circuit boards.

Mersen's PCS series of extremely fast-acting, direct-mountable fuses address the increasing need for electrical protection at the PC board as current and voltage requirements push higher. These fuses help printed circuit board manufacturers reduce parts by eliminating clips and fuse blocks and allowing automated assembly. PCS fuses are AC and DC rated and are extremely current-limiting. They will protect semiconductors, main frame boards, circuit breakers with low interrupting rating and other critical components. PCS fuses bring I^2t protection, higher voltage and interrupting ratings to the board itself and are UL Component Recognized.



Highlights:

- Extremely fast-acting
- PC board mount
- Three mounting styles

Applications:

- Protection of semiconductors, circuit breakers, critical components

Ratings:

Volts : 600VAC / DC
Amps : 5 to 40A
I.R. : 200kA I.R. AC
: 100kA I.R. DC
L/R : ≤10ms

Catalog Numbers (amps)

Slot Mount	
PCS5-R	PCS20-R
PCS8-R	PCS25-R
PCS10-R	PCS30-R
PCS12-R	PCS35-R
PCS15-R	PCS40-R
Double Hole Mount	
PCS5-H	PCS20-H
PCS8-H	PCS25-H
PCS10-H	PCS30-H
PCS12-H	PCS35-H
PCS15-H	PCS40-H
Surface Mount	
PCS5-S	PCS20-S
PCS8-S	PCS25-S
PCS10-S	PCS30-S
PCS12-S	PCS35-S
PCS15-S	PCS40-S

Dimensions of the PCS Series are found on page C14

Watts Loss Data

Ampere Rating	Watts Loss @ 80% Rating (w)	Watts Loss @ 100% Rating (w)
5	0.5	0.7
10	0.9	1.5
15	1.9	3.0
20	2.6	4.4
25	2.9	5.3
30	3.0	5.8
35	3.3	6.4
40	3.6	7.0

I^2t Data, 100kA

Ampere Rating	600VAC		600VDC L/R =10ms
	Melting I^2t (A^2s)	Clearing I^2t (A^2s)	Clearing I^2t (A^2s)
5	5	60	40
8	6.5	70	42
10	10	110	70
12	17	150	90
15	26	180	110
20	41	330	200
25	69	440	260
30	132	860	520
35	197	1300	780
40	276	1800	1100

Approvals:

- UL Recognized Components File E60314

PCT Time-Delay PC Mount Fuses

Time-delay fuses for direct mounting on printed circuit boards.

Mersen's PCT series of time-delay, direct-mountable fuses addresses the increasing need for electrical protection at the PC board as current and voltage requirements push higher. These fuses help printed circuit board manufacturers reduce parts by eliminating clips and fuse blocks and allowing automated assembly. PCT fuses can be used for the protection of main frame power boards, small circuit breakers with low interrupting ratings and other components. PCT fuses bring protection with time-delay, greatly increased ampere, voltage and interrupting ratings to the board itself and are UL Component Recognized.



Highlights:

- Time-delay
- PC board mount
- Three mounting styles

Applications:

- Protection of main frame power boards, circuit breakers, components

Ratings:

Volts : 500VAC
Amps : 1 to 30A
I.R. : 100kA I.R.

Catalog Numbers (amps)

Slot Mount	
PCT1-R	PCT8-R
PCT2-R	PCT10-R
PCT3-R	PCT12-R
PCT4-R	PCT15-R
PCT5-R	PCT20-R
PCT6-R	PCT25-R
Double Hole Mount	
PCT7-R	PCT30-R
PCT1-H	PCT8-H
PCT2-H	PCT10-H
PCT3-H	PCT12-H
PCT4-H	PCT15-H
PCT5-H	PCT20-H
PCT6-H	PCT25-H
Surface Mount	
PCT7-H	PCT30-H
PCT1-S	PCT8-S
PCT2-S	PCT10-S
PCT3-S	PCT12-S
PCT4-S	PCT15-S
PCT5-S	PCT20-S
PCT6-S	PCT25-S
PCT7-S	PCT30-S

Dimensions of the PCT Series are found on page C14

Approvals:

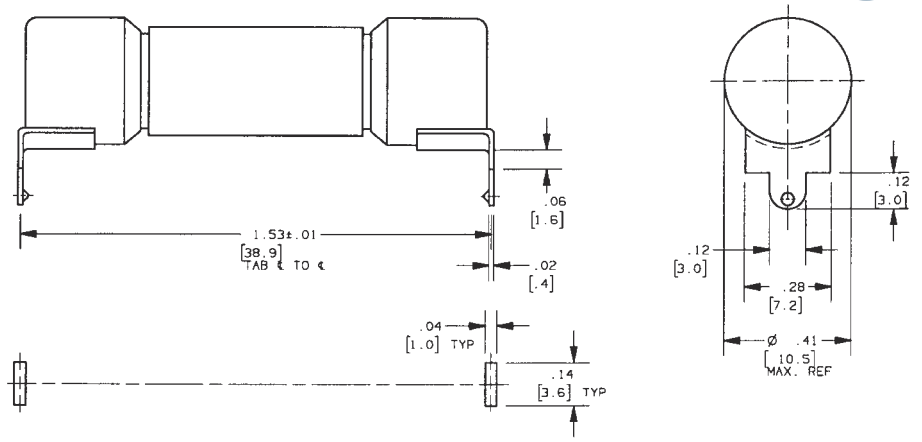
- UL Recognized Components File E60314

PCF/PCS/PCT Series PC Mount Fuses

Outline Dimensions

Slot Mount (Rectangular Holes)

PCF1-R thru PCF30-R
PCS5-R thru PCS40-R
PCT1-R thru PCT30-R

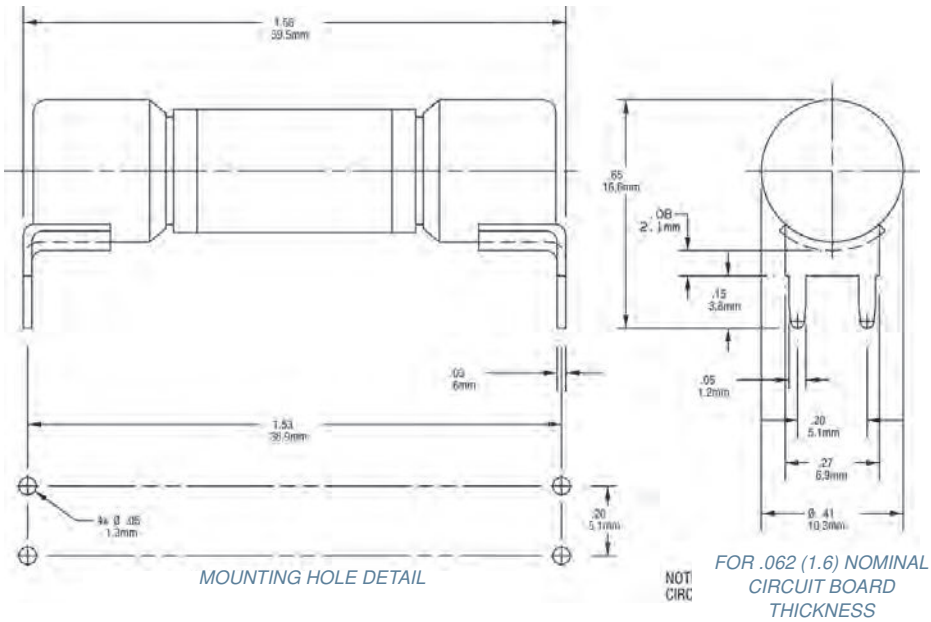


MOUNTING HOLE DETAIL

FOR .062 (1.6) NOMINAL CIRCUIT BOARD THICKNESS

Double Hole Mount (Round Holes)

PCF1-H thru PCF30-H
PCS5-H thru PCS40-H
PCT1-H thru PCT30-H

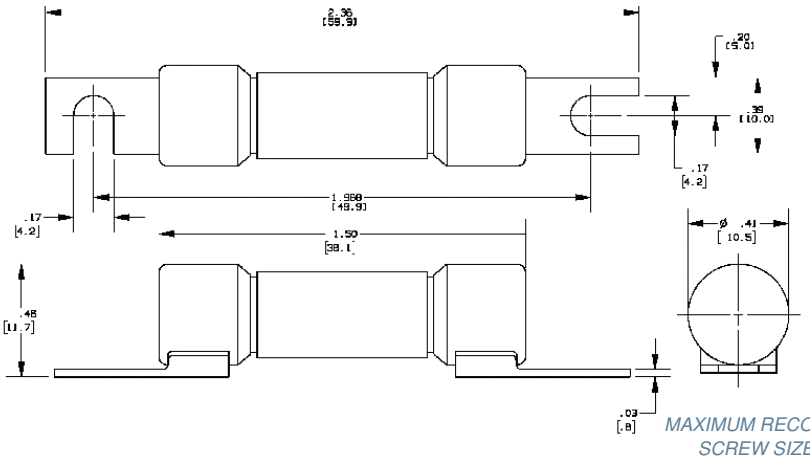


MOUNTING HOLE DETAIL

FOR .062 (1.6) NOMINAL CIRCUIT BOARD THICKNESS

Surface (Screw) Mount

PCF1-S thru PCF30-S
PCS5-S thru PCS40-S
PCT1-S thru PCT30-S



MAXIMUM RECOMMENDED SCREW SIZE 3.5MM

Electronic/Glass Fuses

GSA/GSA-V

- Ceramic body
- Time-delay
- 1/4" x 1-1/4"
- 1-1/2" Axial leads optional



1/16A through 8A, 250VAC, UL Listed - 10,12,15A, 250V UL Recognized
1/16A through 8A, 250VAC, CSA Certified - 10, 12, 15A, 250V CSA Recognized 20A, 250VAC, 25 & 30A, 125VAC

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
GSA1/16	GSA-V1/16	1/16A	250V	1
GSA1/10	GSA-V1/10	1/10A	250V	1
GSA1/8	GSA-V1/8	1/8A	250V	1
GSA15/100	GSA-V15/100	15/100A	250V	1
GSA175/1000	GSA-V175/1000	175/1000A	250V	1
GSA3/16	GSA-V3/16	3/16A	250V	1
GSA2/10	GSA-V2/10	2/10A	250V	1
GSA1/4	GSA-V1/4	1/4A	250V	1
GSA3/10	GSA-V3/10	3/10A	250V	1
GSA3/8	GSA-V3/8	3/8A	250V	1
GSA4/10	GSA-V4/10	4/10A	250V	1
GSA1/2	GSA-V1/2	1/2A	250V	1
GSA6/10	GSA-V6/10	6/10A	250V	1
GSA7/10	GSA-V7/10	7/10A	250V	1
GSA3/4	GSA-V3/4	3/4A	250V	1
GSA8/10	GSA-V8/10	8/10A	250V	1
GSA1	GSA-V1	1A	250V	1
GSA1-1/4	GSA-V1-1/4	1-1/4A	250V	2
GSA1-1/2	GSA-V1-1/2	1-1/2A	250V	2
GSA1-6/10	GSA-V1-6/10	1-6/10A	250V	2
GSA2	GSA-V2	2A	250V	2
GSA2-1/4	GSA-V2-1/4	2-1/4A	250V	2
GSA2-1/2	GSA-V2-1/2	2-1/2A	250V	2
GSA2-8/10	GSA-V2-8/10	2-8/10A	250V	2
GSA3	GSA-V3	3A	250V	2
GSA3-2/10	GSA-V3-2/10	3-2/10A	250V	2
GSA3-1/2	GSA-V3-1/2	3-1/2A	250V	2
GSA4	GSA-V4	4A	250V	3
GSA5	GSA-V5	5A	250V	3
GSA6	GSA-V6	6A	250V	3
GSA6-1/4	GSA-V6-1/4	6-1/4A	250V	3
GSA7	GSA-V7	7A	250V	3
GSA8	GSA-V8	8A	250V	3
GSA10	GSA-V10	10A	250V	4
GSA12	GSA-V12	12A	250V	4
GSA15	GSA-V15	15A	250V	4
GSA20	GSA-V20	20A	250V	5
GSA25	GSA-V25	25A	125V	6
GSA30	GSA-V30	30A	125V	6

1. *250VAC @ 35A I.R./125VAC @ 10kA I.R.*
2. *250VAC @ 100A I.R./125VAC @ 10kA I.R.*
3. *250VAC @ 200A I.R./125VAC @ 10kA I.R.*
4. *250VAC @ 750A I.R./125VAC @ 10kA I.R.*
5. *250VAC @ 400A I.R./125VAC @ 10KA I.R.*
6. *125VAC @ 400A I.R.*

GDL/GDL-V

- Glass body
- Time-delay
- 1/4" x 1-1/4"
- 1-1/2" Axial leads optional



1/16A through 8A, 250VAC, UL Listed and CSA Certified
10A through 15A, 125VAC, UL Listed and CSA Certified
20A through 30A, 32VAC, UL Listed to U.S. and Canadian safety standards

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
GDL1/16	GDL-V1/16	1/16A	250V	1
GDL1/10	GDL-V1/10	1/10A	250V	1
GDL1/8	GDL-V1/8	1/8A	250V	1
GDL15/100	GDL-V15/100	15/100A	250V	1
GDL175/1000	GDL-V175/1000	175/1000A	250V	1
GDL3/16	GDL-V3/16	3/16A	250V	1
GDL2/10	GDL-V2/10	2/10A	250V	1
GDL1/4	GDL-V1/4	1/4A	250V	1
GDL3/10	GDL-V3/10	3/10A	250V	1
GDL3/8	GDL-V3/8	3/8A	250V	1
GDL4/10	GDL-V4/10	4/10A	250V	1
GDL1/2	GDL-V1/2	1/2A	250V	1
GDL6/10	GDL-V6/10	6/10A	250V	1
GDL7/10	GDL-V7/10	7/10A	250V	1
GDL3/4	GDL-V3/4	3/4A	250V	1
GDL8/10	GDL-V8/10	8/10A	250V	1
GDL1	GDL-V1	1A	250V	1
GDL1-1/4	GDL-V1-1/4	1-1/4A	250V	2
GDL1-1/2	GDL-V1-1/2	1-1/2A	250V	2
GDL1-6/10	GDL-V1-6/10	1-6/10A	250V	2
GDL1-8/10	GDL-V1-8/10	1-8/10A	250V	2
GDL2	GDL-V2	2A	250V	2
GDL2-1/4	GDL-V2-1/4	2-1/4A	250V	2
GDL2-1/2	GDL-V2-1/2	2-1/2A	250V	2
GDL2-8/10	GDL-V2-8/10	2-8/10A	250V	2
GDL3	GDL-V3	3A	250V	2
GDL3-2/10	GDL-V3-2/10	3-2/10A	250V	2
GDL4	GDL-V4	4A	250V	3
GDL5	GDL-V5	5A	250V	3
GDL6	GDL-V6	6A	250V	3
GDL6-1/4	GDL-V6-1/4	6-1/4A	250V	3
GDL7	GDL-V7	7A	250V	3
GDL8	GDL-V8	8A	250V	3
GDL10	GDL-V10	10A	125V	4
GDL12	GDL-V12	12A	125V	4
GDL15	GDL-V15	15A	125V	4
GDL20	GDL-V20	20A	32V	5
GDL25	GDL-V25	25A	32V	5
GDL30	GDL-V30	30A	32V	5

1. *250VAC @ 35A I.R./125VAC @ 10kA I.R.*
2. *250VAC @ 100A I.R./125VAC @ 10kA I.R.*
3. *250VAC @ 200A I.R./125VAC @ 10kA I.R.*
4. *125VAC @ 10kA I.R.*
5. *32VAC @ 300A I.R.*

Electronic/Glass Fuses

GGC/GGC-V

- Glass body
- Fast-acting
- 1/4" x 1-1/4"
- 1-1/2" Axial leads optional



1/10A through 10A, 250VAC, UL Listed and CSA Certified 12A and 15A, 125VAC, UL Listed and CSA Certified - 20A through 30A, 32VAC

GGM/GGM-V

- Glass body
- Fast-acting
- 5mm x 20mm
- 1-1/2" Axial leads optional



1/16A through 3A, 250VAC, UL Listed and CSA Certified 4A through 8A, 125VAC, UL Listed and CSA Certified - 10A and 15A, 250VAC, UL Recognized

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
GGC1/10	GGC-V1/10	1/10A	250V	2
GGC1/8	GGC-V1/8	1/8A	250V	2
GGC15/100	GGC-V15/100	15/100A	250V	2
GGC175/1000	GGC-V175/1000	175/1000A	250V	2
GGC3/16	GGC-V3/16	3/16A	250V	2
GGC2/10	GGC-V2/10	2/10A	250V	2
GGC1/4	GGC-V1/4	1/4A	250V	2
GGC3/10	GGC-V3/10	3/10A	250V	2
GGC3/8	GGC-V3/8	3/8A	250V	2
GGC4/10	GGC-V4/10	4/10A	250V	2
GGC1/2	GGC-V1/2	1/2A	250V	2
GGC6/10	GGC-V6/10	6/10A	250V	2
GGC3/4	GGC-V3/4	3/4A	250V	2
GGC8/10	GGC-V8/10	8/10A	250V	2
GGC1	GGC-V1	1A	250V	2
GGC1-1/4	GGC-V1-1/4	1-1/4A	250V	2
GGC1-1/2	GGC-V1-1/2	1-1/2A	250V	2
GGC1-3/4	GGC-V1-3/4	1-3/4A	250V	2
GGC1-6/10	GGC-V1-6/10	1-6/10A	250V	2
GGC2	GGC-V2	2A	250V	2
GGC2-1/4	GGC-V2-1/4	2-1/4A	250V	2
GGC2-1/2	GGC-V2-1/2	2-1/2A	250V	2
GGC3	GGC-V3	3A	250V	2
GGC3-2/10	GGC-V3-2/10	3-2/10A	250V	3
GGC4	GGC-V4	4A	250V	2
GGC5	GGC-V5	5A	250V	2
GGC6	GGC-V6	6A	250V	2
GGC6-3/10	GGC-V6-3/10	6-3/10A	250V	2
GGC7	GGC-V7	7A	250V	2
GGC7-1/2	N/A	7-1/2A	250V	2
GGC8	GGC-V8	8A	250V	2
GGC10	GGC-V10	10A	250V	2
GGC12	GGC-V12	12A	125V	4
GGC15	GGC-V15	15A	125V	4
GGC20	GGC-V20	20A	32V	5
GGC25	GGC-V25	25A	32V	5
GGC30	GGC-V30	30A	32V	5

2. 250VAC @ 200A I.R./125VAC @ 10kA I.R.
3. 250VAC @ 10kA I.R.
4. 125VAC @ 10kA I.R.
5. 32VAC @ 1000A I.R.

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
GGM1/16	GGM-V1/16	1/16A	250V	2
GGM1/10	GGM-V1/10	1/10A	250V	3
GGM1/8	GGM-V1/8	1/8A	250V	3
GGM2/10	GGM-V2/10	2/10A	250V	3
GGM1/4	GGM-V1/4	1/4A	250V	3
GGM3/10	GGM-V3/10	3/10A	250V	3
GGM4/10	GGM-V4/10	4/10A	250V	1
GGM1/2	GGM-V1/2	1/2A	250V	3
GGM6/10	GGM-V6/10	6/10A	250V	1
GGM7/10	GGM-V7/10	7/10A	250V	3
GGM3/4	GGM-V3/4	3/4A	250V	3
GGM8/10	GGM-V8/10	8/10A	250V	1
GGM1	GGM-V1	1A	250V	3
GGM1-2/10	N/A	1-2/10A	250V	2
GGM1-1/4	GGM-V1-1/4	1-1/4A	250V	3
GGM1-1/2	GGM-V1-1/2	1-1/2A	250V	3
GGM1-6/10	GGM-V1-6/10	1-6/10A	250V	2
GGM2	GGM-V2	2A	250V	3
GGM2-1/2	GGM-V2-1/2	2-1/2A	250V	3
GGM3	GGM-V3	3A	250V	3
GGM4	GGM-V4	4A	125V	4
GGM5	GGM-V5	5A	125V	4
GGM6	GGM-V6	6A	125V	4
GGM7	GGM-V7	7A	125V	4
GGM8	GGM-V8	8A	125V	4
GGM10	GGM-V10	10A	250V	5
GGM15	GGM-V15	15A	250V	5

1. 250VAC @ 35A I.R./125VAC @ 10kA I.R.
2. 250VAC @ 100A I.R./125VAC @ 10kA I.R.
3. 250VAC @ 200A I.R./125VAC @ 10kA I.R.
4. 125VAC @ 10kA I.R.
5. 250VAC @ 100A I.R.

Electronic/Glass Fuses

GGA/GGA-V

- Glass body
- Time-delay
- 5mm x 20mm
- 1-1/2” Axial leads optional



1/10 through 3A, 250VAC, UL Listed and CSA Certified
4A and 5A, 125VAC, UL Listed and CSA Certified

GSC/GSC-V

- Glass / ceramic body
- Time-delay
- 5mm x 20mm
- 1-1/2” Axial leads optional



1/10A through 3A, 250VAC, UL Listed and CSA Certified - 4A through 8A, 125VAC, UL Listed and CSA Certified - 10A, 125VAC, UL and CSA Recognized

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
GGA1/10	GGA-V1/10	1/10A	250V	1
GGA1/8	GGA-V1/8	1/8A	250V	1
GGA2/10	GGA-V2/10	2/10A	250V	1
GGA1/4	GGA-V1/4	1/4A	250V	1
GGA3/10	GGA-V3/10	3/10A	250V	1
GGA4/10	GGA-V4/10	4/10A	250V	1
GGA1/2	GGA-V1/2	1/2A	250V	1
GGA6/10	GGA-6/10	6/10A	250V	1
GGA7/10	GGA-V7/10	7/10A	250V	1
GGA3/4	GGA-V3/4	3/4A	250V	1
GGA8/10	GGA-V8/10	8/10A	250V	1
GGA1	GGA-V1	1A	250V	2
GGA1-1/4	GGA-V1-1/4	1-1/4A	250V	2
GGA1-1/2	GGA-V1-1/2	1-1/2A	250V	2
GGA1-6/10	GGA-V1-6/10	1-6/10A	250V	2
GGA2	GGA-V2	2A	250V	2
GGA2-1/2	GGA-V2-1/2	2-1/2A	250V	2
GGA3	GGA-V3	3A	250V	2
GGA4	GGA-V4	4A	125V	3
GGA5	GGA-V5	5A	125V	3

1. 250VAC @ 35A I.R./125VAC @ 10kA I.R.
2. 250VAC @ 100A I.R./125VAC @ 10kA I.R.
3. 125VAC @ 10kA I.R.

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
GSC1/10	GSC-V1/10	1/10A	250V	1
GSC1/8	GSC-V1/8	1/8A	250V	1
GSC1/4	GSC-V1/4	1/4A	250V	1
GSC3/10	GSC-3/10	3/10A	250V	1
GSC4/10	GSC-V4/10	4/10A	250V	1
GSC1/2	GSC-V1/2	1/2A	250V	1
GSC6/10	GSC-V6/10	6/10A	250V	1
GSC7/10	GSC-V7/10	7/10A	250V	1
GSC3/4	GSC-V3/4	3/4A	250V	1
GSC8/10	GSC-V8/10	8/10A	250V	1
GSC1	GSC-V1	1A	250V	1
GSC1-1/4	GSC-V1-1/4	1-1/4A	250V	1
GSC1-1/2	GSC-V1-1/2	1-1/2A	250V	1
GSC1-6/10	GSC-V1-6/10	1-6/10A	250V	1
GSC2	GSC-V2	2A	250V	1
GSC2-1/2	GSC-V2-1/2	2-1/2A	250V	1
GSC3	GSC-V3	3A	250V	1
GSC4	GSC-V4	4A	125V	2
GSC5	GSC-V5	5A	125V	2
GSC6	GSC-V6	6A	125V	2
GSC7	GSC-V7	7A	125V	2
GSC8	GSC-V8	8A	125V	2
GSC10	GSC-V10	10A	125V	3

1. 250VAC @ 100A I.R./125VAC @ 10kA I.R.
2. 125VAC @ 10kA I.R.
3. 125VAC @ 1000A I.R.

Electronic/Glass Fuses

GSB/GSB-V

- Glass body
- Fast-acting
- 5mm x 20mm
- 1-1/2” Axial leads optional



1/16A through 10A, 250VAC, UL and CSA Recognized
1/16A through 6-3/10A, 250VAC, SEMKO Approved
1/16A through 6-3/10A, 250VAC, VDE Approved
IEC-127-2 Standard Sheet 2*

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
GSB1/16	GSB-V1/16	1/16A	250V	1
GSB8/100	GSB-V8/100	8/100A	250V	1
GSB1/10	GSB-V1/10	1/10A	250V	1
GSB1/8	GSB-V1/8	1/8A	250V	1
GSB16/100	GSB-V16/100	16/100A	250V	1
GSB2/10	GSB-V2/10	2/10A	250V	1
GSB1/4	GSB-V1/4	1/4A	250V	1
GSB315/1000	GSB-V315/1000	315/1000A	250V	1
GSB4/10	GSB-V4/10	4/10A	250V	1
GSB1/2	GSB-V1/2	1/2A	250V	1
GSB630/1000	GSB-V630/1000	630/1000A	250V	1
GSB8/10	GSB0-V8/10	8/10A	250V	1
GSB1	GSB-V1	1A	250V	1
GSB1-1/4	GSB-V1-1/4	1-1/4A	250V	1
GSB1-6/10	GSB-V1-6/10	1-6/10A	250V	1
GSB2	GSB-V2	2A	250V	1
GSB2-1/2	GSB-V2-1/2	2-1/2A	250V	1
GSB3-15/100	GSB-V3-15/100	3-15/100A	250V	1
GSB4	GSB-V4	4A	250V	2
GSB5	GSB-V5	5A	250V	3
GSB6-3/10	GSB-V6-3/10	6-3/10A	250V	4
GSB8	GSB-V8	8A	250V	5
GSB10	GSB-V10	10A	250V	6

1. 250VAC @ 35A I.R.
2. 250VAC @ 40A I.R.
3. 250VAC @ 50A I.R.
4. 250VAC @ 63A I.R.
5. 250VAC @ 80A I.R.
6. 250VAC @ 100A I.R.

**IEC Standards for 5x20mm fuses do not include ratings above 6.3 amperes.*

GDG/GDG-V

- Ceramic body
- Fast-acting
- 5mm x 20 mm
- 1-1/2” Axial leads optional



1/16A through 10A, 250VAC, UL & CSA Recognized
1/16A through 6-3/10A, 250VAC, SEMKO Approved
1/16A through 6-3/10A, 250VAC, VDE Approved
IEC 127-2 Standard Sheet 3*

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
GDG1/16	GDG-V1/16	1/16A	250V	1
GDG8/100	GDG-V8/100	8/100A	250V	1
GDG1/10	GDG-V1/10	1/10A	250V	1
GDG1/8	GDG-V1/8	1/8A	250V	1
GDG16/100	GDG-V16/100	16/100A	250V	1
GDG2/10	GDG-V2/10	2/10A	250V	1
GDG1/4	GDG-V1/4	1/4A	250V	1
GDG315/1000	GDG-V315/1000	315/1000A	250V	1
GDG4/10	GDG-V4/10	4/10A	250V	1
GDG1/2	GDG-V1/2	1/2A	250V	1
GDG630/1000	GDG-V630/1000	630/1000A	250V	1
GDG8/10	GDG-V8/10	8/10A	250V	1
GDG1	GDG-V1	1A	250V	1
GDG1-1/4	GDG-V1-1/4	1-1/4A	250V	1
GDG1-6/10	GDG-V1-6/10	1-6/10A	250V	1
GDG2	GDG-V2	2A	250V	1
GDG2-1/2	GDG-V2-1/2	2-1/2A	250V	1
GDG3-15/100	GDG-V3-15/100	3-15/100A	250V	1
GDG4	GDG-V4	4A	250V	2
GDG5	GDG-V5	5A	250V	3
GDG6-3/10	GDG-V6-3/10	6-3/10A	250V	4
GDG8	GDG-V8	8A	250V	5
GDG10	GDG-V10	10A	250V	6

1. 250VAC @ 35A I.R.
2. 250VAC @ 40A I.R.
3. 250VAC @ 50A I.R.
4. 250VAC @ 63A I.R.
5. 250VAC @ 80A I.R.
6. 250VAC @ 100A I.R.

**IEC Standards for 5x20mm fuses do not include ratings above 6.3 amperes.*

Electronic/Glass Fuses



GSD/GSD-V

- Ceramic body
- Fast-acting
- 5mm x 20mm
- 1-1/2” Axial leads optional

1/16A through 10A, 250VAC, UL & CSA Recognized
1A through 6-3/10A, 250 VAC, SEMKO Approved
1A through 6-3/10A, 250 VAC, VDE Approved
IEC 127-2 Standard Sheet 1*

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
GSD1/16	GSD-V1/16	1/16A	250V	1
GSD8/100	GSD-V8/100	8/100A	250V	1
GSD1/10	GSD-V1/10	1/10A	250V	1
GSD1/8	GSD-V1/8	1/8A	250V	1
GSD16/100	GSD-V16/100	16/100A	250V	1
GSD2/10	GSD-V2/10	2/10A	250V	1
GSD1/4	GSD-V1/4	1/4A	250V	1
GSD315/1000	GSD-V315/1000	315/1000A	250V	1
GSD4/10	GSD-V4/10	4/10A	250V	1
GSD1/2	GSD-V1/2	1/2A	250V	1
GSD630/1000	GSD-V630/1000	630/1000A	250V	1
GSD8/10	GSD-V8/10	8/10A	250V	1
GSD1	GSD-V1	1A	250V	1
GSD1-1/4	GSD-V1-1/4	1-1/4A	250V	1
GSD1-6/10	GSD-V1-6/10	1-6/10A	250V	1
GSD2	GSD-V2	2A	250V	1
GSD2-1/2	GSD-V2-1/2	2-1/2A	250V	1
GSD3-15/100	GSD-V3-15/100	3-15/100A	250V	1
GSD4	GSD-V4	4A	250V	1
GSD5	GSD-V5	5A	250V	1
GSD6-3/10	GSD-V6-3/10	6-3/10A	250V	1
GSD8	GSD-V8	8A	250V	1
GSD10	GSD-V10	10A	250V	1

1. 250VAC @ 1500A I.R.

**IEC Standards for 5x20mm fuses do not include ratings above 6.3 amperes.*



GSF/GSF-V

- Ceramic body
- Time-delay
- 5mm x 20 mm
- 1-1/2” Axial leads optional

1/2A through 8/10A, 250VAC
1A through 6-3/10A, 250VAC, SEMKO, VDE Approved
1A through 10A, 250VAC, UL and CSA Recognized
IEC-127-2 Standard Sheet 5*

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
GSF1/2	GSF-V1/2	1/2A	250V	1
GSF630/1000	GSF-V630/1000	630/1000A	250V	1
GSF8/10	GSF-V8/10	8/10A	250V	1
GSF1	GSF-V1	1A	250V	1
GSF1-1/4	GSF-V1-1/4	1-1/4A	250V	1
GSF1-6/10	GSF-V1-6/10	1-6/10A	250V	1
GSF2	GSF-V2	2A	250V	1
GSF2-1/2	GSF-V2-1/2	2-1/2A	250V	1
GSF3-15/100	GSF-V3-15/100	3-15/100A	250V	1
GSF4	GSF-V4	4A	250V	1
GSF5	GSF-V5	5A	250V	1
GSF6-3/10	GSF-V6-3/10	6-3/10A	250V	1
GSF8	GSF-V8	8A	250V	1
GSF10	GSF-V10	10A	250V	1

1. 250VAC @ 1500A I.R.

**IEC Standards for 5x20mm fuses do not include ratings above 6.3 amperes.*

Electronic/Glass Fuses

GGX

- Glass body
- Fast-acting
- 1/4" x 1"



1/2A through 2 1/2A, 250VAC, UL Listed
3A through 7A, 125V AC, UL Recognized
8A through 30A, 32V AC, UL Recognized

GAB

- Ceramic body
- Fast-acting
- 1/4" x 1-1/4"



1/8A through 20A, 250VAC, UL Listed and CSA Certified
25A through 30A, 250VAC

GSR-V

- Epoxy-component Plastic body
- Fast-acting
- 7.1mm body length



1/10A through 15A, 125VAC, UL Recognized and CSA Certified

Standard Fuse Ampere Ratings

Catalog Number	Ampere Rating	Volts	I.R.
GGX1/2	1/2A	250V	1
GGX3/4	3/4A	250V	1
GGX1	1A	250V	1
GGX1-1/2	1-1/2A	250V	2
GGX2	2A	250V	2
GGX2-1/2	2-1/2A	250V	3
GGX3	3A	125V	3
GGX4	4A	125V	3
GGX5	5A	125V	3
GGX6	6A	125V	3
GGX7	7A	125V	3
GGX8	8A	32V	4
GGX10	10A	32V	4
GGX12	12A	32V	4
GGX15	15A	32V	4
GGX20	20A	32V	4
GGX25	25A	32V	4
GGX30	30A	32V	4

1. 250VAC @ 35A I.R./125VAC @ 10kA I.R.
2. 250VAC @ 100A I.R./125VAC @ 10kA I.R.
3. 125VAC @ 10kA I.R.
4. 32VAC

Standard Fuse Ampere Ratings

Catalog Number	Ampere Rating	Volts	I.R.
GAB1/8	1/8A	250V	1
GAB1/4	1/4A	250V	1
GAB3/8	3/8A	250V	1
GAB1/2	1/2A	250V	1
GAB3/4	3/4A	250V	1
GAB1	1A	250V	1
GAB2	2A	250V	2
GAB2-1/2	2-1/2A	250V	2
GAB3	3A	250V	2
GAB4	4A	250V	3
GAB5	5A	250V	3
GAB6	6A	250V	3
GAB7	7A	250V	3
GAB8	8A	250V	3
GAB10	10A	250V	3
GAB12	12A	250V	4
GAB15	15A	250V	4
GAB20	20A	250V	5
GAB25	25A	250V	6
GAB30	30A	250V	6

1. 250VAC @ 35A I.R./125VAC @ 10kA I.R.
2. 250VAC @ 100A I.R./125VAC @ 10kA I.R.
3. 250VAC @ 200A I.R./125VAC @ 10kA I.R.
4. 250VAC @ 750A I.R./125VAC @ 10kA I.R.
5. 250VAC @ 1000A I.R./125VAC @ 10kA I.R.
6. 250VAC @ 400A I.R./125VAC @ 10kA I.R.

Standard Fuse Ampere Ratings

Catalog Number	Ampere Rating	Volts	I.R.
GSR-V1/10	1/10A	125V	1
GSR-V1/8	1/8A	125V	1
GSR-V1/4	1/4A	125V	1
GSR-V3/8	3/8A	125V	1
GSR-V1/2	1/2A	125V	1
GSR-V3/4	3/4A	125V	1
GSR-V1	1A	125V	1
GSR-V1-1/2	1-1/2A	125V	1
GSR-V2	2A	125V	1
GSR-V2-1/2	2-1/2A	125V	1
GSR-V3	3A	125V	1
GSR-V4	4A	125V	1
GSR-V5	5A	125V	1
GSR-V7	7A	125V	1
GSR-V10	10A	125V	1
GSR-V12	12A	125V	1
GSR-V15	15A	125V	1

1. 125VAC @ 50A AC/300A DC I.R.

Electronic/Glass Fuses



SMG/SMG-V

- Glass body
- Fast-acting
- 5 x 15mm 2AG
- 1-1/2” Axial leads optional

1/10A & 3/8A, 250VAC, UL Listed CSA Certified
1/8A through 7A, 350VAC, UL and CSA Recognized
8A & 10A, 125VAC



STG/STG-V

- Glass body
- Time-delay
- 5 x 15mm 2AG
- 1-1/2” Axial leads optional

3/8A 250VAC, UL Listed and CSA Certified
1/4A through 7A, 350VAC, UL and CSA Recognized

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
SMG1/10	SMG-V1/10	1/10A	250V	1
SMG1/8	SMG-V1/8	1/8A	350V	2
SMG1/4	SMG-V1/4	1/4A	350V	2
SMG3/8	SMG-V3/8	3/8A	250V	1
SMG1/2	SMG-V1/2	1/2A	350V	2
SMG3/4	SMG-V3/4	3/4A	350V	2
SMG1	SMG-V1	1A	350V	2
SMG1-1/2	SMG-V1-1/2	1-1/2A	350V	2
SMG2	SMG-V2	2A	350V	2
SMG2-1/2	SMG-V2-1/2	2-1/2A	350V	2
SMG3	SMG-V3	3A	350V	2
SMG3-1/2	SMG-V3-1/2	3-1/2A	350V	2
SMG4	SMG-V4	4A	350V	2
SMG5	SMG-V5	5A	350V	2
SMG6	SMG-V6	6A	350V	2
SMG7	SMG-V7	7A	350V	2
SMG8	SMG-V8	8A	125V	3
SMG10	SMG-V10	10A	125V	3

1. 250VAC @ 35A I.R./125VAC @ 10kA I.R.
2. 350VAC @ 100A I.R./140VDC @ 150A I.R.
3. 125VAC @ 10kA I.R.

Standard Fuse Ampere Ratings

Catalog Number	Axial Lead Cat. No	Ampere Rating	Volts	I.R.
STG1/4	STG-V1/4	1/4A	350V	2
STG3/8	STG-V3/8	3/8A	250V	1
STG1/2	STG-V1/2	1/2A	350V	2
STG6/10	STG-V6/10	6/10A	350V	2
STG3/4	STG-V3/4	3/4A	350V	2
STG8/10	STG-V8/10	8/10A	350V	2
STG1	STG-V1	1A	350V	2
STG1-1/4	STG-V1-1/4	1-1/4A	350V	2
STG1-1/2	STG-V1-1/2	1-1/2A	350V	2
STG2	STG-V2	2A	350V	2
STG2-1/2	STG-V2-1/2	2-1/2A	350V	2
STG3	STG-V3	3A	350V	2
STG3-1/2	STG-V3-1/2	3-1/2A	350V	2
STG4	STG-V4	4A	350V	2
STG5	STG-V5	5A	350V	2
STG6	STG-V6	6A	350V	2
STG7	STG-V7	7A	350V	2

1. 250VAC @ 35A I.R./125VAC @ 10kA I.R.
2. 350VAC @ 100A I.R./125VAC @ 10kA I.R.

Radial Lead Micro Fuses



MRF

- Fast-acting microfuse

Thermoplastic body
and cap, UL 94-V0
Pins are tin-lead plated copper alloy
Approvals: SEMKO, VDE, MITI, CE UL Recognized, CSA Accepted
50mA to 6.3A, 250VAC - UL Recognized and CSA Accepted

Standard Fuse Ampere Ratings

Catalog Number	Ampere Rating	Volts	Fuse Length
MRF50	50mA	250V	1
MRF63	63mA	250V	1
MRF80	80mA	250V	1
MRF100	100mA	250V	1
MRF125	125mA	250V	1
MRF160	160mA	250V	1
MRF200	200mA	250V	1
MRF250	250mA	250V	1
MRF315	315mA	250V	1
MRF400	400mA	250V	1
MRF500	500mA	250V	1
MRF630	630mA	250V	1
MRF800	800mA	250V	1
MRF1	1A	250V	1
MRF1.25	1.25A	250V	1
MRF1.6	1.6A	250V	1
MRF2	2A	250V	1
MRF2.5	2.5A	250V	1
MRF3.15	3.15A	250V	1
MRF4	4A	250V	1
MRF5	5A	250V	1
MRF6.3	6.3A	250V	1

1. 250VAC @ 50A I.R.



MRT

- Time-delay microfuse

Thermosplastic body
and cap, UL 94-V0
Pins are tin-lead plated copper alloy
Approvals: SEMKO, VDE, MITI, CE UL Recognized, CSA Accepted
80mA to 6.3A, 250VAC - UL Recognized and CSA Accepted

Standard Fuse Ampere Ratings

Catalog Number	Ampere Rating	Volts	Fuse Length
MRT80	80mA	250V	1
MRT100	100mA	250V	1
MRT125	125mA	250V	1
MRT160	160mA	250V	1
MRT200	200mA	250V	1
MRT250	250mA	250V	1
MRT315	315mA	250V	1
MRT400	400mA	250V	1
MRT500	500mA	250V	1
MRT630	630mA	250V	1
MRT800	800mA	250V	1
MRT1	1A	250V	1
MRT1.25	1.25A	250V	1
MRT1.6	1.6A	250V	1
MRT2	2A	250V	1
MRT2.5	2.5A	250V	1
MRT3.15	3.15A	250V	1
MRT4	4A	250V	1
MRT5	5A	250V	1
MRT6.3	6.3A	250V	1

1. 250VAC @ 50A I.R.

In-Line Fuse Holders SFRT, SFRB, SFRG, FSFE, SFRU



SFRT

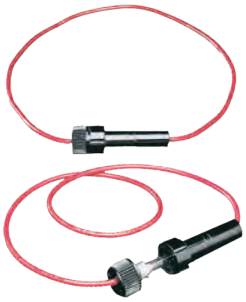
- Twist-lock
- In-line fuse holders for FSFE fuses.
- Used at 32V or less with fuses rated up to 20A when proper spring for fuse size is installed.



Standard Fuse Ampere Ratings

Catalog Number*	Fuse Installed
SFRT4	FSFE4
SFRT6	FSFE6
SFRT7-1/2	FSFE7-1/2
SFRT9	FSFE9
SFRT14	FSFE14
SFRT20	FSFE20

*Includes FSFE fuse



SFRB

- Bayonet knob
- In-line fuse holders for FSFE fuses.
- Used at 32V or less with fuses rated up to 20A when proper spring for fuse size is installed.

Standard Fuse Ampere Ratings

Catalog Number*	Fuse Installed
SFRB4	FSFE4
SFRB6	FSFE6
SFRB7-1/2	FSFE7-1/2
SFRB9	FSFE9
SFRB14	FSFE14
SFRB20	FSFE20

*Includes FSFE fuse



SFRG

- In-line fuse holder for 5 x 20mm fuses.
- Max. current rating for 5x20mm fuses - 10A @ 32V



SFRU

Universal in-line fuse holder - supplied with 15” loop of #14 AWG red vinyl insulated wire frame and three springs in different lengths to accomodate FSFE size fuses.



FSFE

- Glass body
- Fast-acting

4A through 30A, 32VAC/DC - UL Listed

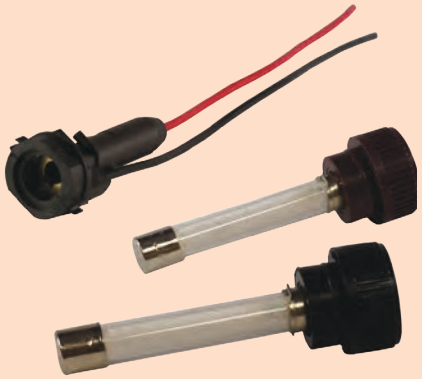
UL LISTED

Standard Fuse Ampere Ratings

Catalog Number	Ampere Rating	Volts	Fuse Length
FSFE4	4A	32V	5/8”
FSFE6	6A	32V	3/4”
FSFE7-1/2	7-1/2A	32V	7/8”
FSFE9	9A	32V	7/8”
FSFE14	14A	32V	1-1/16”
FSFE20	20A	32V	1-1/4”
FSFE30	30A	32V	1-7/16”

In-Line Fuses and Holders SLR, SMF, SHR

Mersen SLR and SMF in-line fuses are used to protect fluorescent lighting fixtures and ballasts. The SLR is a fast-acting fuse. SMF is a time-delay fuse. Both used to protect individual 300V fixtures. Mersen's SHR fuse holder has an integral clip for panel mounting to meet this requirement. The holder fits into a standard 7/8" knock-out or keyhole punch that provides anti-rotation. The SHR is available in a single or double wire version. The single wire version (SHR-1) allows insertion of #18 AWG ballast leads directly into the holder.



SLR Fuses Ratings:

Volts : 300VAC
: 125VAC
Amps : 1/2 to 15A
I.R. : 100kA I.R.
: 10kA I.R.

SMF Fuses Ratings:

Volts : 300VAC
: 125 VAC
Amps : 3/10 to 10A
I.R. : 100kA I.R.
: 10kA I.R.

SHR Fuse Holders Ratings:

Volts : 300VAC
Amps : 15A
Withstand Rating:
: 10kA I.R.
Dielectric Strength:
: 2,000V

Approvals:

- UL Listed
  File No. E10480
  CSA Certified

Approvals:

- UL Listed
  File No. E10480
  CSA Certified

Approvals:

- UL Recognized
  Component Guide
  IZLT2, UL File
  No. E52283

Highlights:

- Fast-acting
- Integral fuse & insulating cap

Highlights:

- Time-delay
- Integral fuse & insulating cap
- Designed specifically to handle ballast inrush currents

Highlights:

- Superior wire retention
- Thermoplastic insulator - 150° C RTI
- Single and two wire versions
- Two load plug-in ports available
- Integral mounting clip 0.062" thick panel
- Integral wire retention clip to hold #18 wire
- Tin plated, insulated #18 solid copper wire leads, 6" length

In-Line Fuses and Holders SLR, SMF, SHR

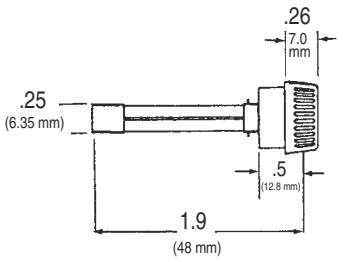
Catalog Numbers

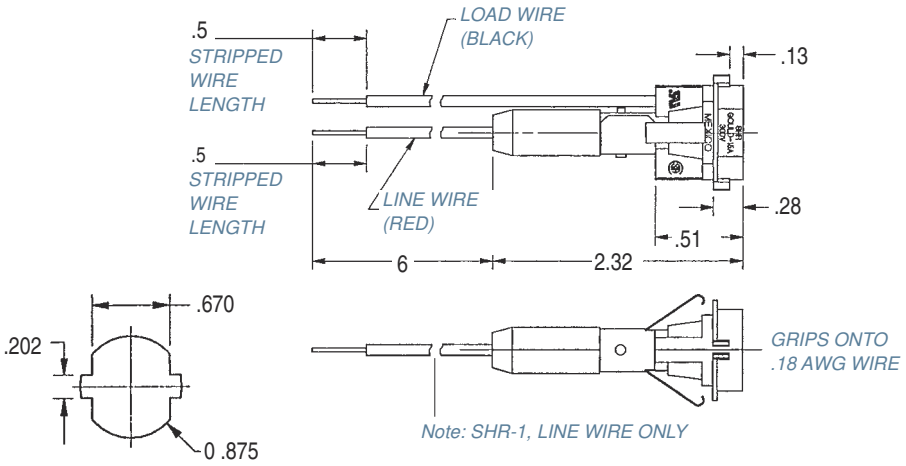
Ampere Rating	Catalog Numbers	
300mA		SMF3/10
500mA	SLR1/2	SMF1/2
600mA		SMF6/10
800mA		SMF8/10
1A	SLR1	S MF1
1-1/4A		SMF1-1/4
1-1/2A	SLR1-1/2	
1-6/10A	SLR1-6/10	SMF1-6/10
2A	SLR2	SMF2
2-1/2A	SLR2-1/2	SMF2-1/2
2-8/10A		SMF2-8/10
3A	SLR3	SMF3
3-2/10A		SMF3-2/10
4A	SLR4	SMF4
5A	SLR5	SMF5
6A	SLR6	
6 1/4A		SMF 6 1/4
7A	SLR7	SMF7
8A	SLR8	SMF8
9A	SLR9	
10A	SLR10	SMF10
12A	SLR12	
15A	SLR15	

Fuse Holders

Single Wire	Two Wire
SHR-1	SHR

Note: Both holders are compatible with all fluorescent light fuses





Automotive Fuses AF, AF2, AF3



AF

- Automotive fuse
- Fast-acting

1A through 40A, 32VAC/DC
1000 A I.R.

Standard Fuse Ampere Ratings

Catalog Number	Ampere Rating	Volts	Body Color
AF-1	1A	32V	BLACK
AF-2	2A	32V	GREY
AF-3	3A	32V	VIOLET
AF-4	4A	32V	PINK
AF-5	5A	32V	TAN
AF-7-1/2	7-1/2A	32V	BROWN
AF-10	10A	32V	RED
AF-15	15A	32V	BLUE
AF-20	20A	32V	YELLOW
AF-25	25A	32V	NATURAL
AF-30	30A	32V	GREEN
AF-35	35A	32V	BLUE GREEN
AF-40	40A	32V	AMBER



AF2

- Automotive fuse
- Fast-acting
- Plastic body/silver-plated terminals

2A through 30A, 32VDC
1000 A I.R.

Standard Fuse Ampere Ratings

Catalog Number	Ampere Rating	Volts	Body Color
AF2-2	2A	32V	GREY
AF2-3	3A	32V	VIOLET
AF2-4	4A	32V	PINK
AF2-5	5A	32V	TAN
AF2-7-1/2	7-1/2A	32V	BROWN
AF2-10	10A	32V	RED
AF2-15	15A	32V	BLUE
AF2-20	20A	32V	YELLOW
AF2-25	25A	32V	NATURAL
AF2-30	30A	32V	GREEN



AF3

- Automotive fuse
- Time-delay
- Plastic body/silver-plated terminals

20A through 80A, 32VDC, 1000 A I.R.

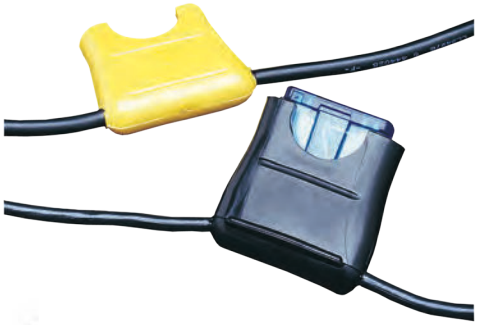
Standard Fuse Ampere Ratings

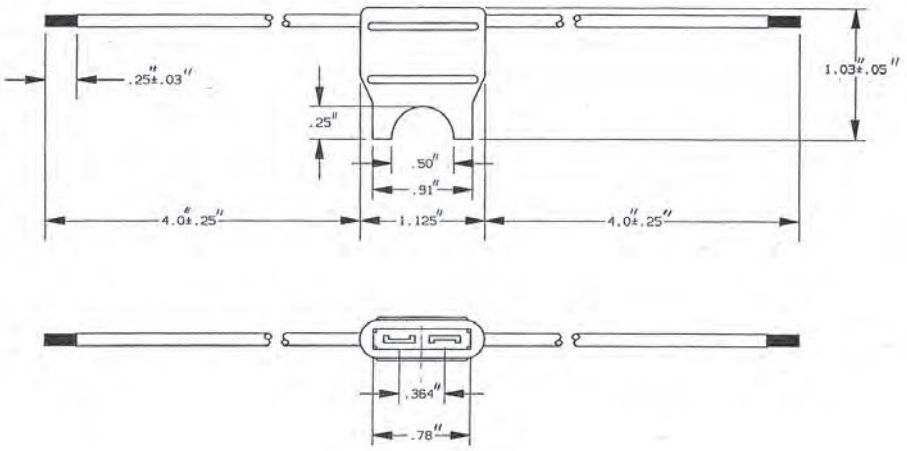
Catalog Number	Ampere Rating	Volts	Body Color
AF3-20	20A	32V	YELLOW
AF3-30	30A	32V	GREEN
AF3-40	40A	32V	AMBER
AF3-50	50A	32V	RED
AF3-60	60A	32V	BLUE
AF3-70	70A	32V	TAN
AF3-80	80A	32V	NATURAL

Automotive Fuse Holders AFH20, AFH30

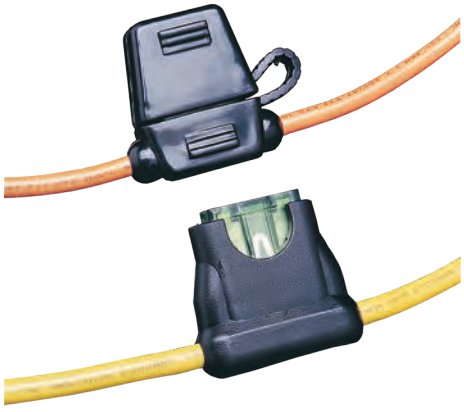
In-line fuseholders for blade type automobile fuses. 4” stranded wire leads are stripped back 1/4”.

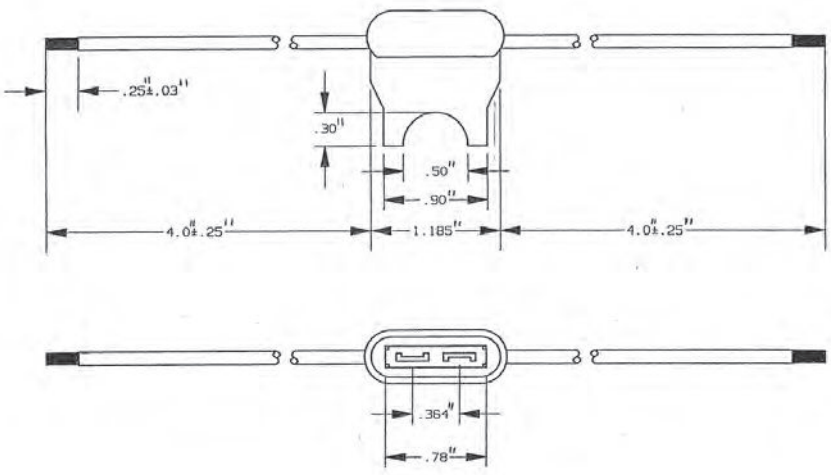
Catalog Number	Fuse Type & Max Amp	Volts	Body Color	AWG/Color
AFH20-14	AF Fuse/20A	32V	BLACK	#14/BLACK
AFH20-14Y	AF Fuse/20A	32V	YELLOW	#14/BLACK
AFH20-16	AF Fuse/20A	32V	YELLOW	#16/BLACK
AFH20-16Y	AF Fuse/20A	32V	YELLOW	#16/BLACK





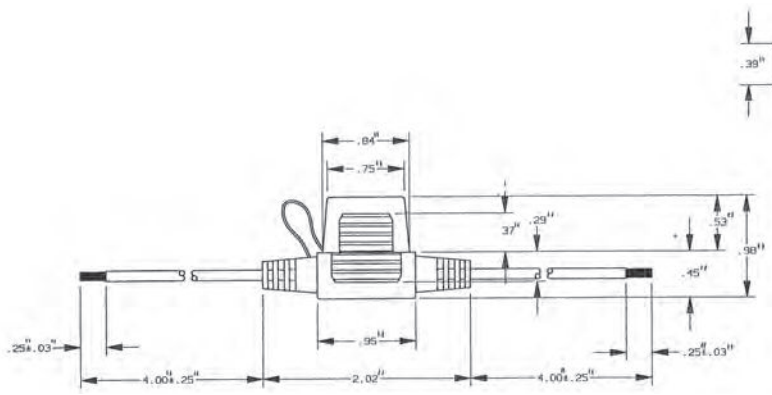
Catalog Number	Fuse Type & Max Amp	Volts	Body Color	AWG/Color
AFH30-12	AF Fuse/30A	32V	BLACK	#12/YELLOW
AFH30C	AF Fuse/30A	32V	BLACK	#12/ORANGE





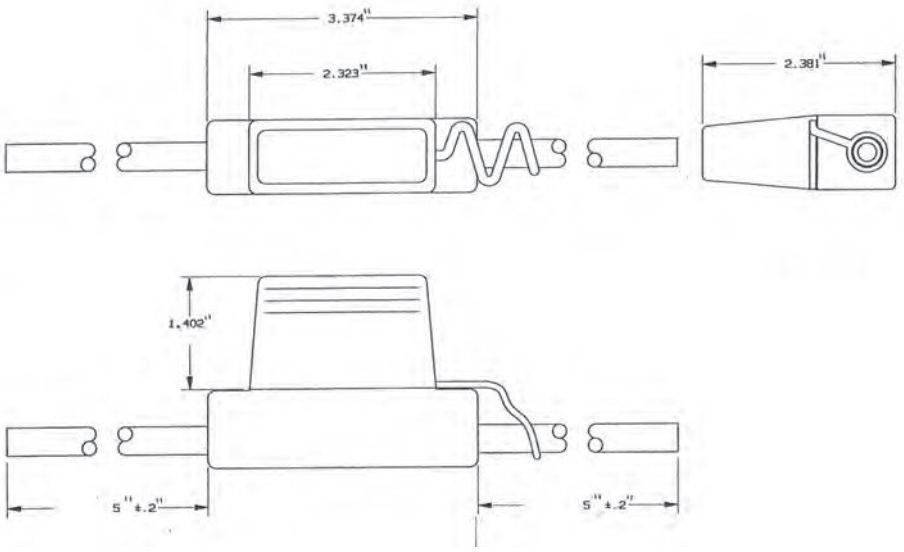
Automotive Fuse Holders AF2H30, AF3H60

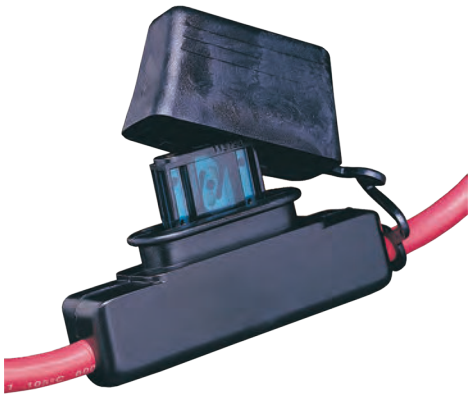
Catalog Number	Fuse Type & Max Amp	Volts	Body Color	AWG/Color
AF2H30C	AF Fuse/30A	32V	BLACK	#12/ORANGE





Catalog Number	Fuse Type & Max Amp	Volts	Body Color	AWG/Color
AF3H60C	AF Fuse/60A	32V	BLACK	#6/RED





Semiconductor Fuses

Semiconductor technology is widespread. Not by coincidence, so's our semiconductor fuse line.



Your problem: Hardly an electric-powered product exists today that doesn't rely on semiconductor technology to some degree. That means extending circuit protection to thyristors, triacs, diodes, and a host of other solid-state components — as well as a wide range of voltage requirements, unique mounting configurations, and special protection characteristics.

Our solution: Mersen affords OEM designers and equipment-maintenance personnel a comprehensive line of Form 101 semiconductor protection fuses in ratings from 130 to 1500VAC. Plus, Square Body North American and European-Dimension semiconductor fuses in 690/700 and 1250/ 1300V ratings (four sizes of each). Plus, compatible fuse blocks and acccessories such as blown-fuse indicatiors, Trigger® switch actuators, and add-on switches.

Want more information fast? For more technical or application-specific information, please call our Semiconductor Fuse experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

D Semiconductor Fuses

- Amp-Trap® Form 101 / A15QS D2
- Amp-Trap® Form 101 / A30QS D4
- Amp-Trap® Form 101 / A50QS D6
- Amp-Trap® Form 101 / A50P D8
- Amp-Trap® Form 101 / A60Q..... D10
- Amp-Trap® Form 101 / A60X D11
- Protistor® / A070gRB D13
- French Cylindrical / A70QS D14
- Amp-Trap® Form 101 / A70QS D16
- Amp-Trap® Form 101 / A70P D18
- Amp-Trap® Form 101 / A70Q..... D20
- Amp-Trap® Form 101 / A100P D22
- Amp-Trap® Form 101 / A120X D24
- Amp-Trap® Form 101 / A150X D25
- DIN 6,9gRB-URB;6,6gRB-URB D26
- British Standard..... D31
- PSC Square Body 690/700V..... D44
- PSC Square Body 1250/1300V..... D55
- French Cylindrical D63

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MERSEN

A15QS Semiconductor Protection Fuses

A15QS Amp-Trap® Form 101 Semiconductor Protection fuses were designed for the specific protection of diodes and other semiconductor devices rated 150VAC/DC. The A15QS product line's compact design is perfect for those applications that have limitations on available space.



Features/Benefits:

- Low I^2t minimizes damage to protected components on short circuit
- Controlled arc voltage reduces stress to circuit components during fuse clearing
- Choice of mounting types provides options for unique termination requirements

Highlights:

- Fast acting
- Current limiting
- Low I^2t
- Indicator options available

Applications:

- Protection of heavy duty devices such as electrochemical rectifiers

Ratings:

Volts : 150VAC / DC
Amps : 1 to 6000A
I.R. : 100kA I.R. AC
: 100kA I.R. DC

Catalog Numbering System

	A	15	QS	400 - 4	TI
Amp-Trap® Fuse	A				
Rated Volts - 150		15			
Style			QS		
Amperes*				400	
Mounting Types*					
Ferrule				1	
Ferrule, midget dims. (1-1/2" x 13/32")				2	
Blades, bolt-in				4	
Hockey puck, bolt-in				128	
Integral Blown-Fuse Indicator					TI
					IL

Trigger Indicator (see pg. J5)
IL Indicator (see pg. J6)



Single Pole Fuse Blocks for A15QS Fuses

Fuse Ampere Rating	Catalog No.
1-30	30311
31-60	U71006
500-600	P243G
40-450	P243D
800	ISC375

Approvals:

- UL recognized component UL File E60314
- AC: UL guide no. JFHR2 (1-4000A)
- DC tested to UL standard 198L parameters (1-4000A)

** For ampere ratings and types not listed, consult the factory.*
*** For harsh duty appllications, refer to the A13X product family. Consult the factory or A13X application information.*

A15QS Semiconductor Protection Fuses

Catalog Numbers (amps)

Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.
A15QS1-2	1	A15QS70-4	2	A15QS350-4TI	2	A15QS2000128IL	5
A15QS2-2	1	A15QS70-4TI	2	A15QS400-4	2	A15QS2500-128	4
A15QS3-2	1	A15QS80-4	2	A15QS400-4IL	3	A15QS2500-128IL	5
A15QS4-2	1	A15QS80-4TI	2	A15QS400-4TI	2	A15QS3000-128	4
A15QS5-2	1	A15QS90-4	2	A15QS450-4	2	A15QS3000-128IL	5
A15QS6-2	1	A15QS100-4	2	A15QS450-4IL	3	A15QS3500-128	6
A15QS7-2	1	A15QS100-4TI	2	A15QS500-4	2	A15QS4000-128	6
A15QS8-2	1	A15QS130-4	2	A15QS500-4IL	3	A15QS4000-128IL	7
A15QS10-2	1	A15QS130-4TI	2	A15QS600-4	2	A15QS4500-128	8
A15QS12-2	1	A15QS150-4	2	A15QS600-4IL	3	A15QS4500-128IL	
A15QS15-2	1	A15QS150-4IL	3	A15QS800-4	2	A15QS5000-128	8
A15QS20-2	1	A15QS150-4TI	2	A15QS1000-4	2	A15QS6000-128	8
A15QS25-2	1	A15QS175-4TI	2	A15QS1000-4IL	3		
A15QS30-2	1	A15QS200-4	2	A15QS1000-4TI	2		
A15QS35-1	1	A15QS200-4IL	3	A15QS1000-128	4		
A15QS40-1	1	A15QS250-4	2	A15QS1000-128IL	5		
A15QS404TI	2	A15QS250-4TI	2	A15QS1200-128	4		
A15QS45-1	1	A15QS300-4	2	A15QS1200-128IL	5		
A15QS50-1	1	A15QS300-4TI	2	A15QS1500-128	4		
A15QS50-4	2	A15QS300-4IL	3	A15QS1500-128IL	5		
A15QS60-1	1	A15QS350-4	2	A15QS2000-128	4		

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Dimensions

Outline Ref.	Mounting Type	Fig.	Dimensions - Inches (mm) A	B	C	D	E	F	G	H	Tap
A15QS1 to 30	2	1	.50 (38.1)	.41 (10.4)	- -	- -	- -	- -	- -	- -	- -
15QS35 to 60	1	1	2.00 (50.8)	.81 (20.6)	- -	- -	- -	- -	- -	- -	- -
A15QS20 to 450	4, 4TI*, 4IL*	2, 3*	2.66 (67.6)	1.13 (28.7)	1.16 (29.5)	2.19 (55.6)	1.91 (48.5)	.31 (7.9)	.74 (22.4)	.13 (4.8)	- -
A15QS500 to 1000	4, 4TI*, 4IL*	2, 3*	3.50 (88.9)	1.50 (38.1)	1.25 (31.8)	2.56 (65.0)	1.94 (49.3)	.41 (10.4)	1.00 (25.4)	.25 (6.4)	- -
A15QS750 to 2000	128, 128IL*	4, 5*	1.88 (47.8)	2.00 (50.8)	1.63 (41.4)	1.75 (44.5)	1.00 (25.4)	- -	- -	- -	3/8-24-1/2 Deep -
A15QS2500 to 3000	128, 128IL*	4, 5*	1.88 (47.88)	3.00 (76.2)	1.63 (41.4)	2.50 (63.5)	1.50 (38.1)	- -	- -	- -	1/2-20-1/2 Deep -
A15QS3500 to 4000	128, 128IL*	6, 7*	1.88 (47.88)	3.50 (88.9)	1.63 (41.4)	3.00 (76.2)	1.06 (27.0)	1.06 (27.0)	- -	- -	1/2-20-1/2 Deep -
A15QS4500 to 6000	128	8	2.38 (60.5)	5.75 (146)	1.88 (47.7)	5.00 (127)	1.50 (38.1)	1.50 (38.1)	- -	- -	1/2-20-1/2 Deep -

** Optional Trigger Indictator (TI) and (IL) indicator.*

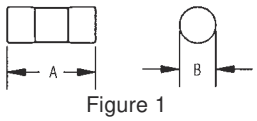


Figure 1

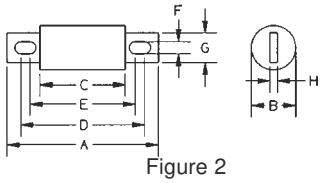


Figure 2

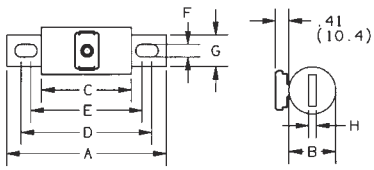


Figure 3

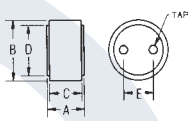


Figure 4

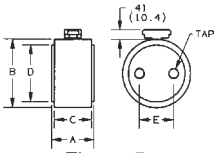


Figure 5

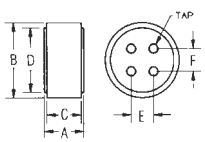


Figure 6

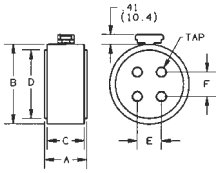


Figure 7

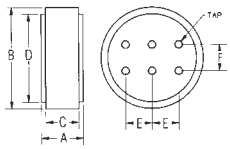


Figure 8

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

A30QS Semiconductor Protection Fuses

A30QS Amp-Trap® Semiconductor Protection fuses are intended for the protection of Power Semiconductors such as diodes, phase control SCR's and other power semiconductor devices. The A30QS is recommended for new applications providing solutions for your critical protection needs at 300V and less semiconductors.

Features/Benefits:

- Low I^2t minimizes damage to protected component on short circuit
- Controlled arc voltage reduces stress to circuit components during fuse clearing
- Choice of mounting types helps in equipment design

Highlights:

- Fast acting
- Current-limiting
- Low I^2t
- Indicator options available
- Superior DC capabilities

Applications:

- Protection of 300V (or less) heavy duty rectifiers and similar heavy duty power supplies

Catalog Numbering System

	A	30	QS	600	-	4	TI

Amp-Trap® Fuse A

Rated Volts - 25 30

Style QS

Amperes* 600

Mounting Types*
Ferrule 1
Blades, bolt-in 4
Hockey puck, bolt-in 128

Integral Blown-Fuse Indicator TI / IL
Trigger Indicator (see pg. J5)
IL Indicator (see pg. J6)

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*



Single Pole Fuse Blocks for A30QS Fuses

Fuse Ampere Rating	Catalog No.
1-30	70316 + US14
31-60	P243G
61-100	P243
101-200	P243
401-600	P243G
700-800	ISC375



Ratings:

Volts : 300VAC / DC
Amps : 1 to 4500A
I.R. : 200kA I.R. AC
: 100kA I.R. DC
L/R : 10ms

Approvals:

- UL recognized component UL File E60314
- AC: UL guide no. JFHR2 (35-4500A)

A30QS Semiconductor Protection Fuses

Catalog Numbers (amps)

Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.
A30QS1-1	1	A30QS100-4TI	3	A30QS600-4TI	3
A30QS2-1	1	A30QS125-4	3	A30QS600-4IL	4
A30QS3-1	1	A30QS130-4	3	A30QS700-4	4
A30QS4-1	1	A30QS150-4	3	A30QS700-128	5
A30QS5-1	1	A30QS150-4TI	3	A30QS800-4	3
A30QS6-1	1	A30QS175-4	3	A30QS800-4IL	4
A30QS7-1	1	A30QS200-4	3	A30QS800-128	5
A30QS8-1	1	A30QS200-4TI	3	A30QS1000-128	5
A30QS10-1	1	A30QS225-4	3	A30QS1000-128IL	5
A30QS12-1	1	A30QS250-4	3	A30QS1200-128	5
A30QS15-1	1	A30QS250-4TI	3	A30QS1500-128	6
A30QS20-1	1	A30QS300-4	3	A30QS1500-128IL	7
A30QS25-1	1			A30QS1600-128	6
A30QS30-1	1	A30QS300-4TI	3	A30QS2000-128	6
A30QS35-4	2	A30QS350-4	3	A30QS2000-128IL	7
A30QS40-4	2	A30QS400-4	3	A30QS2500-128	6
A30QS50-4	2	A30QS400-4IL	4	A30QS2500-128IL	7
A30QS60-4	2	A30QS400-4TI	3	A30QS3000-128	6
A30QS70-4	3	A30QS450-4	3	A30QS3500-128	6
A30QS80-4	3	A30QS500-4	3	A30QS3500-128IL	7
A30QS90-4	3	A30QS550-4	3	A30QS4000-128	6
A30QS100-4	3	A30QS600-4	3	A30QS4500-128	6

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Dimensions

Outline Ref.	Mounting Type	Fig.	Dimensions - Inches (mm) A	B	C	D	E	F	G	H	Tap
A30QS1 to 30	1	1	2.00 (51)	0.56 (14)	-	-	-	-	-	-	-
A30QS35 to 60	4	2	3.19 (81)	.081 (21)	1.63 (41)	2.50 (64)	2.25 (58)	0.34 (9)	.72 (18)	0.13 (3)	-
A30QS70 to 200	4	3	3.13 (80)	1.22 (31)	1.63 (41)	2.44 (62)	2.19 (55)	0.31 (8)	1.22 (31)	0.19 (5)	-
A30QS225 to 700	4, 4IL*	3,4*	3.84 (98)	1.50 (38)	1.59 (40)	3.10 (74)	2.28 (58)	0.41 (10)	1.00 (25)	0.25 (6)	-
A30QS700 to 1200	128	5	2.59 (66)	3.00 (76)	2.34 (59)	2.50 (64)	1.50 (38)	-	-	-	3/8-24-1/2 Deep (2)
A30QS1500 to 2500	128, 128IL*	6, 7*	2.59 (66)	3.50 (76)	2.34 (59)	3.00 (64)	1.50 (38)	1.50 -	-	-	3/8-24-1/2 Deep (4)
A30QS3000 to 4500	128, 128IL*	6, 7*	2.59	4.50	2.34	3.75	1.50	1.50	-	-	1/2-20-1/2 Deep (4)
A30QS3000 to 4500	128, 128IL*	6, 7*	2.59 (66)	4.50 (114)	2.34 (59)	3.75 (95)	1.50 (38)	1.50 (38)	-	-	1/2-20-1/2 Deep (4)

** Optional (IL) indicator.*

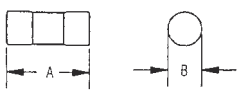


Figure 1

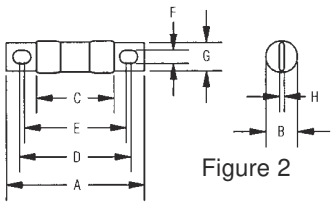


Figure 2

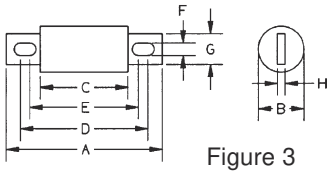


Figure 3

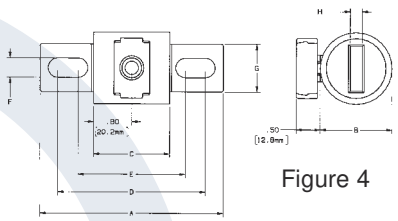


Figure 4

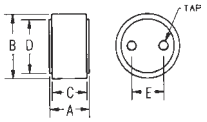


Figure 5

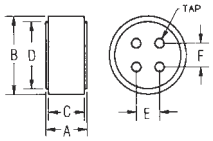


Figure 6

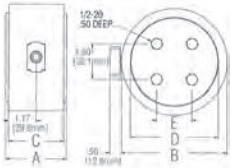


Figure 7

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

A50QS Semiconductor Protection Fuses

A50QS Amp-Trap® Form 101 fuses grew out of the need to improve the overall performance of semiconductor fuses in response to new equipment requirements. The A50QS encompasses the best protection features – lower I^2t to provide better protection for equipment, longer life when subjected to cyclic loading and lower watts loss. A50QS is today's best choice for the protection of dynamic solid state equipment such as motor drives, inverters, UPS, etc.



Features/Benefits:

- Lowest I^2t for greatest protection of semiconductor circuits
- Low watts loss for cooler operation
- Superior cycling ability gives an equipment design advantage
- State-of-the-art protection for 500V equipment
- Ultra compact sizes allow down-sizing of existing equipment

Highlights:

- 500V AC/DC rated
- Lowest I^2t
- Low watts loss
- Superior cycling ability

Applications:

- Protection of 500V or less motor drives, UPS, inverters, etc.

Ratings:

Volts : 500VAC / DC
Amps : 35 to 60A (AC)
: 70 to 1200A (AC)
: 35 to 1200A (DC)
I.R. : 200kA I.R. AC
: 100kA I.R. DC

Catalog Numbering System

	A	50	QS	250	-	4
Amp-Trap® Fuse	A					
Rated Volts - 500		50				
Style			QS			
Amperes*				250		
Mounting Types* Blades, bolt-in						4

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Approvals:

- UL recognized component UL File 60314
- AC: UL guide no. JFHR2
- DC Tested to UL standard 198L parameters (70-1200A)
- CSA Certified LR12636

Single Pole Fuse Blocks for A50QS Fuses

Fuse Ampere Rating	Mounting Type	Catalog No.
35-200	4	P243E
225-600	4	P266C
700-800	4	1SC375
900-1200	4	FH5OF5*

**(not UL)*



A50QS Semiconductor Protection Fuses

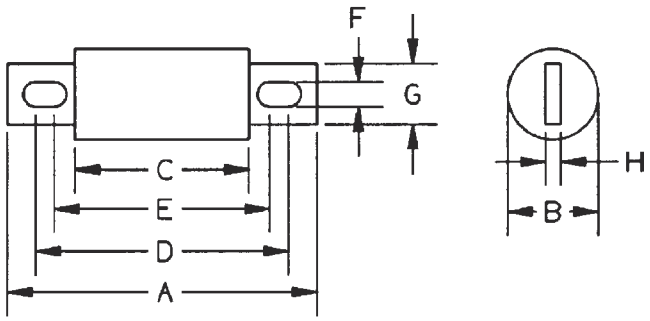
Catalog Numbers (amps)

A50QS35-4	A50QS250-4
A50QS40-4	A50QS300-4
A50QS50-4	A50QS350-4
A50QS60-4	A50QS400-4
A50QS70-4	A50QS450-4
A50QS80-4	A50QS500-4
A50QS90-4	A50QS600-4
A50QS100-4	A50QS700-4
A50QS125-4	A50QS800-4
A50QS150-4	A50QS900-4
A50QS175-4	A50QS1000-4
A50QS200-4	A50QS1200-4
A50QS225-4	

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Dimensions

Catalog Number	Mounting Type	Dimensions - Inches (mm)							
		A	B	C	D	E	F	G	H
A50QS35 to 100	4	3.63 (92.2)	1.00 (25.4)	2.13 (54.1)	2.94 (74.7)	2.75 (69.9)	0.31 (7.9)	0.75 (19.1)	0.13 (3.3)
A50QS125 to 200	4	3.63 (92.2)	1.22 (31.0)	2.13 (54.1)	2.94 (74.7)	2.81 (71.4)	0.31 (7.9)	1.00 (25.4)	0.19 (4.8)
A50QS225 to 400	4	4.34 (110)	1.50 (38.1)	2.09 (53.1)	3.41 (86.6)	2.78 (70.6)	0.41 (10.4)	1.00 (25.4)	0.25 (6.4)
A50QS450 to 600	4	4.47 (114)	2.00 (50.8)	2.22 (56.4)	3.53 (89.7)	2.91 (73.9)	0.41 (10.4)	1.50 (38.1)	0.25 (6.4)
A50QS700 to 800	4	6.47 (164.3)	2.38 (60.3)	2.22 (56.4)	5.00 (127.0)	3.44 (87.3)	.53 (13.5)	2.00 (50.8)	.38 (9.8)
A50QS900 to 1200	4	6.97 (177.0)	2.88 (76.2)	3.22 (81.8)	5.47 (138.9)	4.47 (113.5)	.63 (15.9)	2.38 (60.3)	.44 (11.1)



A50P Semiconductor Protection Fuses

A50P Amp-Trap® Form 101 Semiconductor Protection fuses were developed for DC drives, uninterruptable power supplies and similar applications requiring better protection (lower I^2t) and superior reliability. The A50P is typically used for replacement.

Features/Benefits:

- Low I^2t minimizes damage to protected components on short circuit
- Controlled arc voltage reduces stress to circuit components during fuse clearing
- Choice of mounting types helps in equipment design

Highlights:

- Very fast acting
- Current limiting
- Low I^2t
- Indicator options available

Applications:

- Protection of DC drives, UPS and other equipment of 500 volts or less



Ratings:

Volts : 500VAC
: 450VDC
Amps : 10 to 1200A (AC)
: 35 to 1000A (DC)
I.R. : 100kA I.R. AC
: 79kA I.R. DC
L/R : 10ms

Catalog Numbering System

	A	50	P	100	- 4	TI
Amp-Trap® Fuse	A					
Rated Volts - 500		50				
Style			P			
Amperes*				100		
Mounting Types*						
Ferrule					1	
Blades, bolt-in					4	
Integral Blown-Fuse Indicator						TI
						TA

Trigger Indicator (see pg. J5)
Trigger Actuator (see pg. J5)

** Contact technical services for applications data.*

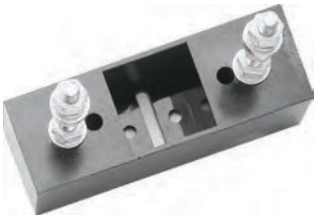
** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Approvals:

- UL Recognized Component UL File 60314
- AC: UL Guide No. JFHR2 (10-800A)
- DC: UL Guide No.JFHR2 (35-800A)

Single Pole Fuse Blocks for A50P Fuses

Fuse Ampere Rating	Mounting Type	Fuse Block Catalog No.
10-30	1	70316
35-60	4	P243G
70-200	4	P243E
225-600	4	P266C
700-800	4	1SC375
900-1000	4	FH50F5*



(not UL)

A50P Semiconductor Protection Fuses

Catalog Numbers (amps)

Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.
A50P10-1	1	A50P175-4	3	A50P450-4	3
A50P15-1	1	A50P175-4TI	3	A50P450-4TI	3
A50P20-1	1	A50P200-4	3	A50P500-4	3
A50P25-1	1	A50P200-4TA	4	A50P500-4TI	3
A50P30--1	1	A50P200-4TI	3	A50P600-4	3
A50P35-4	2	A50P225-4	3	A50P600-4TA	4
A50P40-4	2	A50P250-4	3	A50P600-4TI	3
A50P50-4	2	A50P250-4TA	4	A50P700-4	5
A50P60-4	2	A50P250-4TI	3	A50P700-4TA	6
A50P70-4	3	A50P275-4	3	A50P700-4TI	5
A50P80-4	3	A50P300-4	3	A50P800-4	5
A50P90-4	3	A50P300-4TA	4	A50P800-4TA	6
A50P100-4	3	A50P300-4TI	3	A50P800-4TI	5
A50P100-4TI	3	A50P325-4	3	A50P900-4	3
A50P125-4	3	A50P350-4	3	A50P1000-4	3
A50P125-4TA	4	A50P350-4TI	3	A50P1000-4TI	3
A50P125-4TI	3	A50P400-4	3	A50P1200-4	3
A50P150-4	3	A50P400-4TA	4	A50P1200-4TI	3
A50P150-4TI	3	A50P400-4TI	3		

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Dimensions

Outline Ref.	Mounting Type	Fig.	Dimensions - Inches (mm) A	B	C	D	E	F	G	H
A50P10 to 30	1	1	2.00	0.56	-	-	-	-	-	-
			(50.8)	(14.2)	-	-	-	-	-	-
A50P35 to 60	1DS*	1	2.25	0.81	-	-	-	-	-	-
			(57.2)	(20.6)	-	-	-	-	-	-
A50P35 to 60	4	2	3.19	0.81	1.63	2.50	2.25	0.34	0.72	0.13
			(81.0)	(20.6)	(41.4)	(63.5)	(57.2)	8.6)	(18.3)	(3.3)
A50P70 to 100	4	3	3.63	1.00	2.13	2.94	2.81	0.31	0.75	0.13
			(92.2)	(25.4)	(54.1)	(74.7)	(71.4)	(7.9)	(19.1)	(3.3)
A50P125 to 200	4, 4TA**	3, 4**	3.63	1.22	2.13	2.94	2.81	0.31	1.00	0.19
			(92.2)	(31.0)	(54.1)	(74.7)	(71.4)	(7.9)	(25.4)	(4.8)
A50P225 to 400	4, 4TA**	3, 4**	4.34	1.50	2.09	3.41	2.78	0.41	1.00	0.25
			(110)	(38.1)	(53.1)	(86.6)	(70.6)	(10.4)	(25.4)	(6.4)
A50P450 to 600	4, 4TA**	3, 4**	4.47	2.00	2.22	3.53	2.91	0.41	1.50	0.25
			(114)	(50.8)	(56.4)	(89.7)	(73.9)	(10.4)	(38.1)	(6.4)
A50P700 to 800	4, 4TA**	5, 6**	6.47	2.50	2.22	4.63	4.31	0.53	2.00	0.38
			(164)	(63.5)	(56.4)	(118)	(109)	(13.5)	(50.8)	(9.7)
A50P900 to 1200	4	3	6.97	3.00	3.22	4.97	***	0.63	2.38	0.44
			(177)	(76.2)	(81.8)	(126)	***	(16.0)	(60.5)	(11.1)

** Use with 60306J fuse block.*
*** Optional Trigger Actuator (TA)*
**** Mounting hole is round, diameter F.*



Figure 1

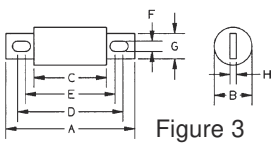


Figure 3

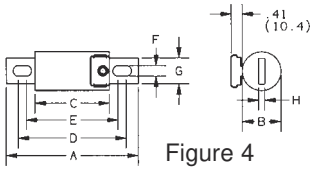


Figure 4

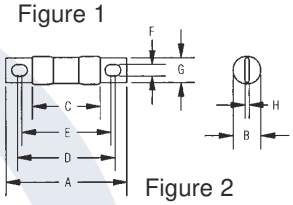


Figure 2

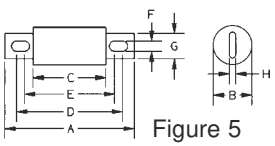


Figure 5

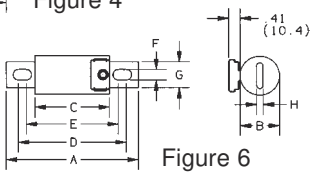


Figure 6

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

A60Q Semiconductor Protection Fuses

A60Q Amp-Trap® Form 101 Semiconductor Protection fuses feature the only 600V AC / DC rating in the industry of similar size (1-1/2" x 13/32") fuses protecting semiconductors. A60Q also has the lowest I^2t of all similar fuses and excellent cycling ability. Applications include inverters and small equipment requiring extremely fast response to faults, without the need to carry sustained heavy overloads.



Features/Benefits:

- Lowest I^2t of any fuse this size for greater protection
- Excellent cycling ability gives advantage in equipment design
- 600V AC / DC rated

Highlights:

- 600VAC/DC rated
- Extremely fast acting
- Current limiting
- Lowest I^2t
- Excellent cycling ability

Applications:

- Protection of small inverters and drives, and equipment requiring the highest degree of protection

Ratings:

Volts : 600VAC / DC
Amps : 5 to 40A (AC)
: 5 to 40A (DC)
I.R. : 200kA I.R. AC
: 100kA I.R. DC
L/R : 10ms

Catalog Numbering System

	A	60	Q	30	-	2
Amp-Trap® Fuse	A					
Rated Volts - 600		60				
Style			Q			
Amperes*				30		
Mounting Type Ferrule, midget dims. (1-1/2" x 13/32")						2

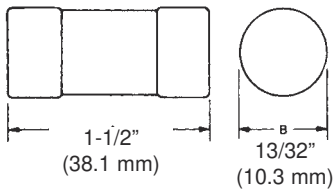
Catalog Numbers (amps)

A60Q5-2	A60Q20-2
A60Q6-2	A60Q25-2
A60Q8-2	A60Q30-2
A60Q10-2	A60Q35-2
A60Q12-2	A60Q40-2
A60Q15-2	

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Fuse Holders for A60Q Fuses

USM Series .....UltraSafe™ Fuse Holders
303 Series .....Midget Fuse Blocks



Approvals:

- UL Recognized component
- AC: UL guide JFHR2 File E60314
- DC: UL file E60314

A60X Semiconductor Protection Fuses

A60X Amp-Trap® Form 101 Semiconductor Protection fuses are popular for the protection of higher voltage heavy rectifiers such as traction rectifiers. They can carry long sustained overloads common with heavy duty apparatus. 700A through 2000A sizes are of compact, hockey-puck design, able to provide high power protection in a small space.

Features/Benefits:

- Low I^2t minimizes damage to protected components on short circuit
- Controlled arc voltage reduces stress to circuit components during fuse clearing
- Choice of mounting types helps in equipment design

Highlights:

- Fast acting
- Current limiting
- Low I^2t
- Indicator options available

Applications:

- Protection of heavy traction and electrochemical as well as rectifiers and other heavy-duty equipment



Ratings:

Volts : 600VAC
Amps : 1 to 2000A
I.R. : 100kA I.R. AC

Catalog Numbering System

	A	60	X	600	-	4	TI

Amp-Trap® Fuse — A

Rated Volts - 25 — 60

Style — X

Amperes* — 600

Mounting Types*
Ferrule — 1
Blades, bolt-in — 4
Hockey puck, bolt-in — 128

Integral Blown-Fuse Indicator — TI
Trigger Indicator (*see pg. J5*)
TA
Trigger Actuator (see pg. J5)

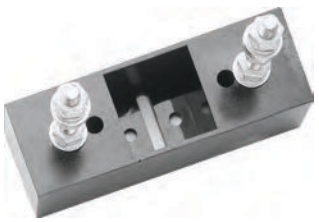
** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Approvals:

- UL recognized component UL file E60314
- AC: UL guide no. JFHR2 (35-800A)

Single Pole Fuse Blocks for A60X Fuses

Fuse Ampere Rating	Fuse Block Catalog No.
1-30	60316
31-60	P243C
61-100	P243C
101-200	P243C
201-400	P266A
401-600	P266A



A60X Semiconductor Protection Fuses

Catalog Numbers (amps)

Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.
A60X1-1	1	A60X80-4TA	4	A60X400-4	3
A60X2-1	1	A60X90-4	3	A60X400-4TA	4
A60X3-1	1	A60X100-4	3	A60X400-4TI	3
A60X4-1	1	A60X100-4TA	4	A60X450-4	3
A60X5-1	1	-	3	A60X450-4TA	4
A60X6-1	1	A60X125-4	3	A60X500-4	3
A60X7-1	1	A60X125-4TA	4	A60X500-4TA	4
A60X8-1	1	A60X150-4	3	A60X500-4TI	3
A60X10-1	1	A60X150-4TA	4	A60X600-4	3
A60X12-1	1	A60X175-4	3	A60X600-4TA	4
A60X15-1	1	A60X200-4	3	A60X600-4TI	3
A60X20-1	1	A60X200-4TA	4	A60X700-4	5
A60X25-1	1	A60X200-4TI	3	A60X700-128	7
A60X30-1	1	A60X225-4	3	A60X800-4	5
A60X35-4	2	A60X250-4	3	A60X800-4TA	6
A60X40-4	2	A60X250-4TA	4	A60X800-128	7
A60X45-4	2	A60X250-4TI	3	A60X1000-128	8
A60X50-4	2	A60X300-4	3	A60X1200-128	8
A60X55-4	2	A60X300-4TA	4	A60X1500-128	8
A60X60-4	2	A60X300-4TI	3	A60X1600-128	8
A60X70-4	3	A60X350-4	3	A60X1800-128	8
A60X80-4	3	A60X350-4TA	4	A60X2000-128	8

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

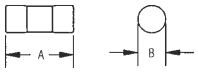


Figure 1

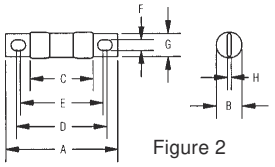


Figure 2

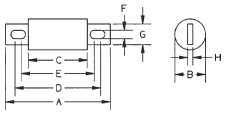


Figure 3

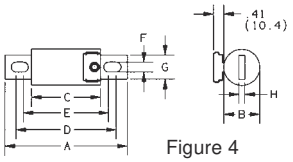


Figure 4

Dimensions

Outline Ref.	Mounting Type	Fig.	Dimensions - Inches (mm) A	B	C	D	E	F	G	H	Tap
A60X1 to 30	1	1	5.00	.81	-	-	-	-	-	-	-
			(127)	(20.6)	-	-	-	-	-	-	
A60X35 to 60	4	2	4.38	.81	2.78	3.69	3.44	.34	.72	.13	-
			(111)	(20.6)	(70.6)	(93.7)	(87.4)	(8.6)	(18.3)	(3.3)	
A60X70 to 100	4, 4TI*, 4TA	3, 4*	4.41	1.00	2.91	3.72	3.59	.31	.75	.13	-
			(112)	(25.4)	(73.9)	(94.5)	(91.2)	(7.9)	(19.1)	(3.3)	
A60X125 to 200	4, 4TI*, 4TA	3, 4*	4.41	1.22	2.91	3.72	3.59	.31	1.00	.19	-
			(112)	(31.0)	(73.9)	(94.5)	(91.2)	(7.9)	(25.4)	(4.8)	
A60X225 to 400	4, 4TI*, 4TA	3, 4*	5.13	1.50	2.88	4.19	3.56	.41	1.00	.25	-
			(130)	(38.1)	(73.2)	(106)	(90.4)	(10.4)	(25.4)	(6.4)	
A60X450 to 600	4, 4TI*, 4TA	3, 4*	5.13	2.00	2.88	4.06	3.69	.41	1.50	.25	-
			(130)	(50.8)	(73.2)	(103)	(93.7)	(10.4)	(38.1)	(6.4)	
A60X700 to 800	4, 4TA*	5, 6*	7.25	2.50	3.00	5.94	4.56	.53	2.00	.38	-
			(184)	(63.5)	(76.2)	(151)	(116)	(13.5)	(50.8)	(9.7)	
A60X700 to 800	128	7	4.00	3.00	3.75	2.50	1.50	-	-	-	3/8-24-1/2
			(102)	(76.2)	(95.3)	(63.5)	(38.1)	-	-	-	Deep
A60X1000 to 1200	128	8	4.00	3.50	3.75	3.00	1.50	1.50	-	-	3/8-24-1/2
			(102)	(88.9)	(95.3)	(76.2)	(38.1)	(38.1)	-	-	Deep
A60X1500 to 2000	128	8	4.00	4.50	3.75	3.75	1.50	1.50	-	-	1/2-20-1/2
			(102)	(114)	(95.3)	(95.3)	(38.1)	(38.1)	-	-	Deep

** Optional Trigger Actuator (TA) or Trigger Indicator (TI)*

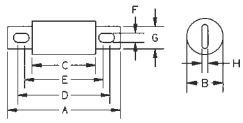


Figure 5

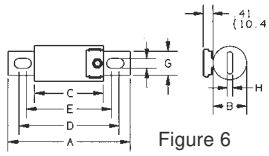


Figure 6

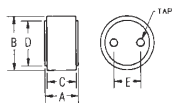


Figure 7

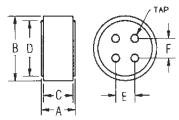


Figure 8

A070gRB Semiconductor Protection Fuses

The A070gRB is a fast acting, full range fuse utilized in the protection of inverters, UPS and other discrete semi-conductor devices



Features/Benefits:

- International 10 X 38 mm (1 1/2" X 13/32") size for worldwide acceptance
- Ferrule mount 1 to 30A for design versatility
- Low I^2t for improved semiconductor protection
- gR Class according to VDE 636-23 and IEC 269.4

Highlights:

- Extremely fast acting
- Current limiting
- Low I^2t
- Excellent cycling capability
- gR

Applications:

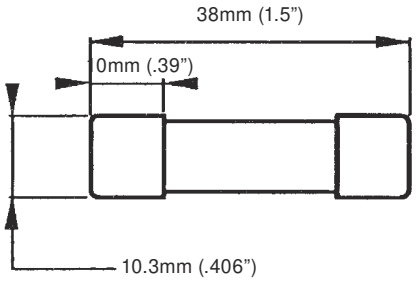
- Protection of small inverters, UPS systems, motor drives and similar 700V or less equipment

Ratings:

Volts : 700VAC
: 550VDC
Amps : 1 to 30A
I.R. : 160kA I.R. AC
: 10kA I.R. DC
L/R : 10ms

Catalog Numbers (amps)

Body Size (mm)	Ampere Rating	Rated Voltage (VAC)	Melting I^2t (A^2s)	Clearing I^2t @ Rated Voltage (A^2s)	Watts Loss @ 80% Rated Current	Watts Loss @ 100% Rated Current	Description	Catalog No.
10 X 38	1	700	0.075	0.28	0.57	0.9	A070GRC01T13	Z330279
	1.25		0.115	0.4	0.7	1.25	A070GRB1.25T13	X330001
	1.5		0.185	0.63	0.81	1.5	A070GRB1.5T13	Y330002
	2		0.42	1.43	1.1	2	A070GRB2T13	Z330003
	2.5		0.88	3	1.15	2.1	A070GRB02.5T13	A330004
	3		1.55	5.1	1.25	2.3	A070GRB03T13	B330005
	4		4	13.2	1.35	2.6	A070GRB04T13	C330006
	5		8.6	27.5	1.4	2.7	A070GRB05T13	D330007
	6		15	48.5	1.5	2.9	A070GRB06T13	E330008
	8		3.3	36.3	1.35	2.4	A070GRB08T13	F330009
	10		5.4	60.5	1.85	3.4	A070GRB10T13	G330010
	12.5		8.5	90.2	1.9	3.4	A070GRB12.5T13	H330011
	16		16	160	2.3	4.1	A070GRB16T13	J330012
	20		30	275	2.4	4.3	A070GRB20T13	K330013
	25		58	520	2.7	4.7	A070GRB25T13	L330014
	30		96	815	2.9	5	A070GRB30T13	M330015



Approvals:

- UL recognized component UL file E76491
- IEC 269-4 compliance
- AC: UL guide no. JFHR2

A70QS French Cylindrical

These Premium Amp-Trap® French cylindrical semiconductor fuses are an extension of the popular A7OQS product line. They are solid-fill 14mm and 22mm fuses, IEC rated 690VAC, 200kA Interrupting and 700VDC, 100kA interrupting at 10ms time constant. In addition, these fuses have an 890 VDC rating for capacitor discharge applications up to 2.5ms time constant. All ampere ratings are available with a striker. Applications include small inverter drives and UPS systems, with superior I^2t for improved protection and performance.



Features/Benefits:

- International 14x51mm (2”x9/16”) and 22x58mm (2-1/4”x13/16”) sizes for worldwide acceptance
- Ferrule mount up to 100A for design versatility
- Very low I^2t for improved semiconductor protection
- 690V IEC rated, tested at 760VAC; can be used up to 750VAC in U.S.
- 700VDC rated for DC protection of equipment with L/R ≤10ms
- Superior cycling ability for longer life on difficult cyclic loading applications
- aR characteristic for semiconductor short- circuit protection

Ratings:

Volts : 690VAC
: 700VDC
Amps : 10 to 100A
I.R. : 200kA I.R. AC
: 100kA I.R. DC
IEC : tested at 760VAC

Contact factory for details.

Highlights:

- 14 x 51 and 22 x 58 sizes
- 690VAC IEC rated (760VAC max.)
- 700VDC rated
- Superior cycling ability
- Low watts loss
- Optional striker for visual/remote Indication

Applications:

- Small inverters, UPS systems, motor drives and similar 700V or less equipment

Approvals:

- UL recognized component File E76491
- CSA Certified
- IEC 269-4 Compliance

Catalog Numbering System

	A70	QS	20	14F	1
Amp-Trap® Fuse	A				
Style/Design		60			
Amperes*			Q		
Size - 14F= 14x51mm 22F= 22x58mm				30	
Optional Striker-I					2

Fuseholder -see Section H.

A70QS French Cylindrical

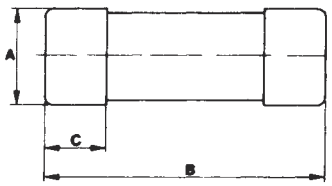
Ratings and Application Data

Body Size (mm)	Ampere Rating	Melting I^2t ($A^2s \times 10^3$)	Max Clearing I^2t @ 700VAC ($A^2s \times 10^3$)	Watts Loss @ Rated Current (W)	Catalog Number	
					No Striker	With Striker
14 x 51	6	0.0013	0.017	2.0	A70QS6-14F	A70QS6-14FI
	8	0.0024	0.027	2.8	A70QS8-14F	A70QS18-14FI
	10	0.0043	0.04	3.5	A70QS10-14F	A70QS10-14FI
	12	0.0054	0.06	4.4	A70QS12-14F	A70QS12-14FI
	16	0.0132	0.10	4.8	A70QS16-14F	A70QS16-14FI
	20	0.027	0.16	5.2	A70QS20-14F	A70QS20-14FI
	25	0.053	0.27	5.8	A70QS25-14F	A70QS25-14FI
	32	0.098	0.50	7.0	A70QS32-14F	A70QS32-14FI
	40	0.13	0.70	10.7	A70QS40-14F	A70QS40-14FI
	50	0.28	1.50	11.6	A70QS50-14F	A70QS50-14FI
22 x 58	10	0.0043	0.025	4.0	A70QS10-22F	A70QS10-22FI
	15	0.008	0.049	6.2	A70QS15-22F	A70QS15-22FI
	20	0.013	0.076	8.0	A70QS20-22F	A70QS20-22FI
	25	0.02	0.125	10.0	A70QS25-22F	A70QS25-22FI
	32	0.049	0.27	11.0	A70QS32-22F	A70QS32-22FI
	40	0.088	0.48	13.0	A70QS40-22F	A70QS40-22FI
	50	0.16	0.80	14.9	A70QS50-22F	A70QS50-22FI
	63	0.35	1.85	16.0	A70QS63-22F	A70QS63-22FI
	70	0.52	2.80	16.5	A70QS70-22F	A70QS70-22FI
	80	0.73	3.80	17.8	A70QS80-22F	A70QS80-22FI
	90	1.10	5.64	17.0	A70QS90-22F	A70QS90-22FI
	100	1.56	8.00	19.0	A70QS100-22F	A70QS100-22FI

**100kA, L/R = 11.6ms*

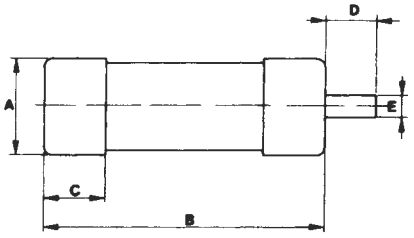
No Striker

Fuse Size	Dimensions-mm		
	A	B	C
14 X 51	14	51	14
22 X 58	22	58	16



With Striker

Fuse Size	Dimensions-mm				
	A	B	C	D	E
14 X 51	14	51	14	7.5	3.8
22 X 58	22	58	16	7.5	3.8



A70QS Amp-Trap® Form 101

A70QS Amp-Trap® Semiconductor Protection fuses were developed in response to the need for improved overall performance of 700V semiconductor fuses for new equipment requirements. A70QS fuses have lower I^2t for better protection, longer life when subjected to cyclic loading, plus lower watts loss. A70QS is the best choice to protect dynamic solid state equipment such as motor drives, UPS, etc.



Features/Benefits:

- Very Low I^2t for improved protection of equipment
- Superior cycling ability for long, reliable life on high cyclic loading
- Low watts loss for cooler operation
- 700V AC/DC rating gives greater design versatility
- Ultra compact sizes allow down-sizing of existing equipment

Highlights:

- 700V AC/DC rated
- Very low I^2t
- Low watts loss
- Superior cycling ability
- All available with indicator (IL)

Applications:

- Protection of 700V or less motor drives, UPS, inverters, etc.

Ratings:

Volts : 700VAC / DC
Amps : 35 to 800A
I.R. : 200kA I.R. AC
: 100kA I.R. DC
L/R : 10ms

Catalog Numbering System

A	70	QS	150	4

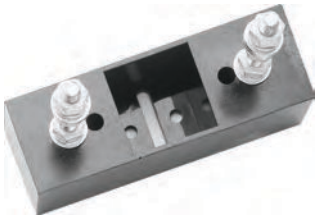
- **Amp-Trap® Fuse**
- **Rated Volts**
- **Style**
- **Amperes***
- **Mounting Types**
  Blades, bolt-in

Approvals:

- UL recognized component, AC/DC UL file E60314
- AC: guide no. JFHR2
- DC: tested to UL standard 198L parameters (35-800A)
- CSA certified File LR 12636

Single Pole Fuse Blocks for A70QS Fuses

Fuse Mounting Type	Fuse Ampere Rating	Catalog No.
A70QS-4	35-200	P243C
A70QS-4K	125-200	P266A
A70QS-4	225-600	P266A
A70QS-4K	450-600	FH70F3
A70QS-4	700-800	ISC375



A70QS Amp-Trap® Form 101

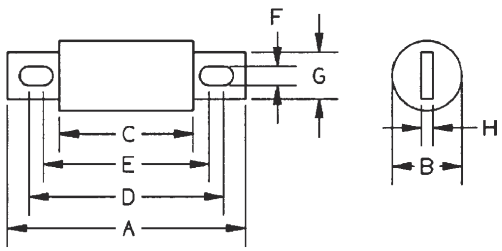
Catalog Numbers (amps)

A70QS35-4	A70QS100-4	A70QS200-4	A70QS450-4K
A70QS40-4	A70QS125-4	A70QS200-4K	A70QS500-4
A70QS50-4	A70QS125-4K	A70QS250-4	A70QS500-4K
A70QS60-4	A70QS150-4	A70QS300-4	A70QS600-4
A70QS70-4	A70QS150-4K	A70QS350-4	A70QS600-4K
A70QS80-4	A70QS175-4	A70QS400-4	A70QS700-4
A70QS90-4	A70QS175-4K	A70QS450-4	A70QS800-4

** For ampere ratings and styles not listed (including indicators), call Technical Services at 978-465-4853.*

Dimensions

Outline Ref.	Mounting Type	Dimensions - Inches (mm)							
		A	B	C	D	E	F	G	H
A70QS35 to 100	4	4.38 (111)	1.00 (25.4)	2.88 (73.0)	3.69 (93.6)	3.50 (88.9)	0.31 (7.9)	0.75 (19.0)	0.13 (3.2)
A70QS125 to 200	4	4.38 (111)	1.22 (31.0)	2.88 (73.0)	3.69 (93.6)	3.56 (90.5)	0.31 (7.9)	1.00 (25.4)	0.19 (4.8)
A70QS125 to 200	4K	5.09 (129)	1.22 (31.0)	2.88 (73.0)	4.19 (106)	3.50 (88.0)	0.41 (10.3)	1.00 (25.4)	0.19 (4.8)
A70QS225 to 400	4	5.09 (129)	1.50 (38.1)	2.84 (72.2)	4.16 (106)	3.53 (89.7)	0.40 (10.3)	1.50 (38.1)	0.25 (6.4)
A70QS450 to 600	4	5.09 (129)	2.00 (50.8)	2.84 (72.2)	4.16 (106)	3.53 (89.7)	0.41 (10.3)	1.50 (38.1)	0.25 (6.4)
A70QS450 to 600	4K	7.09 (180)	2.00 (50.8)	2.84 (72.2)	6.16 (156)	3.53 (89.7)	0.53 (13.5)	1.50 (38.1)	0.25 (6.4)
A70QS700 to 800	4	7.09 (180)	2.50 (63.5)	2.84 (72.2)	5.28 (134)	4.91 (125)	0.53 (13.5)	2.00 (50.8)	0.38 (9.5)



A70P Amp-Trap® Form 101

A70P Amp-Trap® Form 101 Semiconductor Protection fuses were developed for higher voltage AC and DC drives, UPS systems, reduced voltage motor starters and similar applications where lower I^2t and superior reliability are needed. A70P is a very popular fuse, available in a wide range of ratings. Typically used for replacement.

Features/Benefits:

- Low I^2t minimizes damage to protected components on short circuit
- Controlled arc voltage reduces stress to circuit components during fuse clearing
- Choice of mounting types helps in equipment design

Highlights:

- Very fast acting
- Current limiting
- Low I^2t
- Indicator options available

Applications:

- Protection of 700V or less DC drives, UPS, inverters, reduced voltage starters, etc.

**Contact technical services for application data.*



Ratings:

Volts : 700VAC
: 650VDC
Amps : 10 to1000A (AC)
: 10 to 800A (DC)
I.R. : 100kA I.R. AC
: 100kA I.R. DC
L/R : 10ms

Catalog Numbering System

	A	70	P	300	4	TI
Amp-Trap® Fuse	A					
Rated Volts - 700		70				
Style (Faster acting, lower I^2t than X)			P			
Amperes*				300		
Mounting Types*						
Ferrule					1	
Blades, bolt-in					4	
Hockey puck, bolt-in					28	
Integral Blown-Fuse Indicator						TI
Trigger Indicator (see pg. J5)						TA
Trigger Actuator (see pg. J5)						

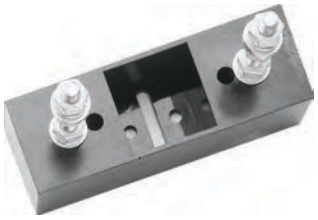
** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Approvals:

- UL recognized component UL File E60314
- AC: guide no. JFHR2 (10-1000A)
- DC: tested to UL standard 198L parameters (10-800A)

Single Pole Fuse Blocks for A70P Fuses

Fuse Ampere Rating	Catalog No.
10-30 (Type 1)	70316
31-60	P243C
61-100	P243C
101-200	P266A
201-400	P266A
401-600	P266F
601-800	1SC375



A70P Amp-Trap® Form 101

Catalog Numbers (amps)

Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.
A70P10-1	1	A70P80-4	3	A70P300-4	3
A70P10-4	2	A70P80-4TA	4	A70P350-4	3
A70P15-1	1	A70P80-4TI	3	A70P400-4	3
A70P15-4	2	A70P90-4	3	A70P400-4TA	4
A70P20-1	1	A70P100-4	3	A70P400-4TI	3
A70P25-1	1	A70P100-4TA	4	A70P450-4	3
A70P25-4	2	A70P125-4	3	A70P500-4	3
A70P30-1	1	A70P125-4TA	4	A70P600-4	3
A70P30-4	2	A70P150-4	3	A70P600-4TA	4
A70P35-4	3	A70P150-4TA	4	A70P600-4TI	3
A70P40-4	3	A70P150-4TI	3	A70P700-4	5
A70P40-4TA	4	A70P175-4	3	A70P700-4TI	5
A70P40-4TI	3	A70P200-4	3	A70P800-4	5
A70P50-4	3	A70P200-4TA	4	A70P800-4TI	5
A70P60-4	3	A70P200-4TI	3	A70P900-4	6
A70P60-4TA	4	A70P225-4	3	A70P1000-4	6
A70P60-4TI	3	A70P250-4	3		
A70P70-4	3	A70P250-4TA	4		
A70P70-4TI	3	A70P250-4TI	3		

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Dimensions

Outline Ref.	Mounting Type	Fig.	Dimensions - Inches (mm) A	B	C	D	E	F	G	H	J
A70P10 to 30	1	1	2.00 (50.8)	.56 (14.2)	- -	- -	- -	- -	- -	- -	- -
A70P10 to 30	4	2	2.88 (73.2)	.56 (14.2)	1.88 (47.8)	2.50 (63.5)	- -	.27 (6.9)	.41 (10.4)	- -	- -
A70P35 to 60	4, 4TA*, 4TI	3, 4*	4.38 (111)	1.00 (25.4)	2.88 (73.2)	3.69 (93.7)	3.56 (90.4)	.31 (7.9)	.75 (19.1)	.06 (1.5)	- -
A70P70 to 100	4, 4TA*, 4TI	3, 4*	4.38 (111)	1.22 (31.0)	2.88 (73.2)	3.69 (93.7)	3.56 (90.4)	.31 (7.9)	1.00 (25.4)	.19 (4.8)	- -
A70P125 to 200	4, 4TA*, 4TI	3, 4*	5.09 (129)	1.50 (38.1)	2.84 (72.1)	4.16 (106)	3.53 (89.7)	.41 (10.4)	1.00 (25.4)	.25 (6.4)	- -
A70P225 to 400	4, 4TA*, 4TI	3, 4*	5.09 (129)	2.00 (50.8)	2.84 (72.1)	4.16 (106)	3.53 (89.7)	.41 (10.4)	1.50 (38.1)	.24 (6.4)	- -
A70P450 to 600	4, 4TA*, 4TI	3, 4*	7.09 (180)	2.50 (63.5)	2.84 (72.1)	5.25 (133)	4.94 (125)	.53 (13.5)	2.00 (50.8)	.38 (9.7)	- -
A70P700 to 800	4, 4TI	5	6.81 (173)	2.88 (73.2)	3.31 (84.1)	5.31 (135)	- -	.63 (16.0)	2.00 (50.8)	.38 (9.7)	.31 (7.9)
A70P900 to 1000	4, 4TI	6	7.59 (193)	3.50 (88.9)	3.84 (97.5)	5.97 (152)	5.22 (133)	.63 (16.0)	2.75 (69.9)	.50 (12.7)	1.38 (35.1)

** Optional Trigger Actuator (TA)*

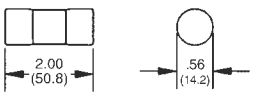


Figure 1

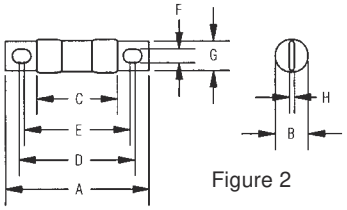


Figure 2

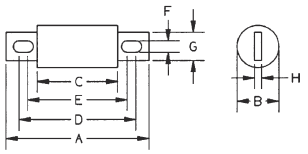


Figure 3

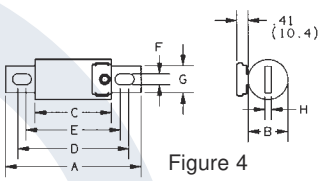


Figure 4

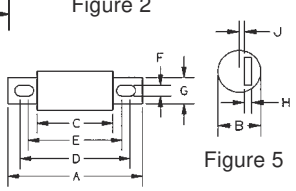


Figure 5

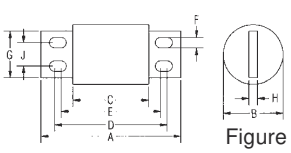


Figure 6

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

A70Q Amp-Trap® Form 101

A70Q Amp-Trap® Semiconductor Protection fuses were developed for inverter applications requiring extremely low I^2t. A70Q fuses provide the most responsive protection for applications not required to sustain heavy overloads. Typically used for replacement purposes.



Features/Benefits:

- Lowest I^2t of any fuse in this voltage rating for best overall protection
- 700V AC, 650V DC rating allows protection of greater variety of circuits
- Solid fill technology for extra reliability in performance

Highlights:

- Extremely fast acting
- Current limiting
- Lowest I^2t

Applications:

- Protection of inverters and other equipment requiring the best AC or DC protection in this voltage range

Ratings:

Volts : 700VAC
: 650VDC
Amps : 35 to 600A
I.R. : 100kA I.R. AC / DC
L/R : 10ms

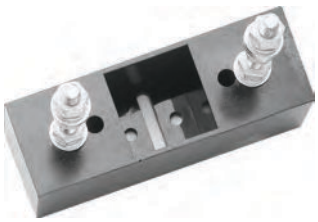
Catalog Numbering System

	A	70	Q	150	-	4
Amp-Trap® Fuse	A					
Rated Volts - 700		70				
Style			Q			
Amperes*				500		
Mounting Types Blades, bolt-in						4

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Single Pole Fuse Blocks for A70Q Fuses

Fuse Ampere Rating	Fuse Block Catalog No.
35-100	P243C
125-400	P266A
450-600	P266F



Approvals:

- UL recognized component UL File E60314
- AC: guide no. JFHR2
- DC: tested to UL standard 198L parameters (35-600A)

A70Q Amp-Trap® Form 101

Catalog Numbers (amps)

A70Q35-4	A70Q100-4	A70Q350-4
A70Q40-4	A70Q125-4	A70Q400-4
A70Q50-4	A70Q150-4	A70Q450-4
A70Q60-4	A70Q175-4	A70Q500-4
A70Q70-4	A70Q200-4	A70Q600-4
A70Q80-4	A70Q250-4	
A70Q90-4	A70Q300-4	

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Dimensions

Catalog No.	Mounting Type	Dimensions - Inches (mm)							
		A	B	C	D	E	F	G	H
A70Q35 to 60	4	4.37 (111)	1.22 (31.0)	1.96 (49.8)	3.69 (93.7)	2.91 (73.9)	.34 (8.6)	1.00 (25.4)	.19 (4.8)
A70Q70 to 100	4	4.37 (111)	1.22 (31.0)	1.96 (49.8)	3.69 (93.7)	2.91 (73.9)	.41 (10.4)	1.00 (25.4)	.19 (4.8)
A70Q125 to 200	4	5.09 (129)	1.50 (38.1)	1.96 (49.8)	4.16 (106)	2.91 (73.9)	.41 (10.4)	1.00 (25.4)	.25 (6.4)
A70Q250 to 400	4	5.09 (129)	2.00 (50.8)	1.96 (49.8)	4.00 (102)	2.94 (74.7)	.56 (14.2)	1.50 (38.1)	.25 (6.4)
A70Q450 to 600	4	7.09 (180)	2.50 (63.5)	1.96 (49.8)	5.72 (145)	3.25 (82.6)	.56 (14.2)	2.00 (50.8)	.38 (9.7)

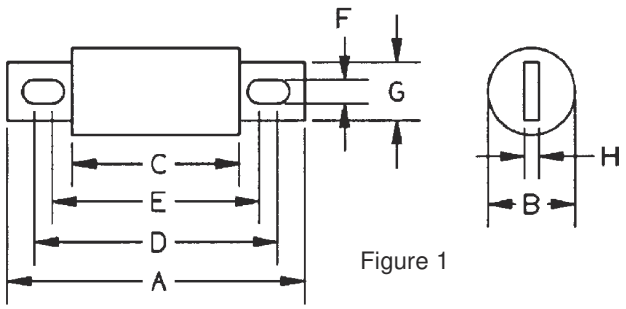


Figure 1

A100P Amp-Trap® Form 101

A100P Amp-Trap® Form 101 Semiconductor Protection fuses are rated 1000V, extending the range of protection for UPS systems, AC and DC drives, reduced voltage motor starters and similar applications where lower I^2t and superior reliability are needed. With ratings from 15 through 1000 amperes, a wide range of high voltage applications can be served.

Features/Benefits:

- Low I^2t minimizes damage to protected components on short circuit
- Controlled arc voltage reduces stress to circuit components during fuse clearing
- Wide range of ampere ratings

Highlights:

- Fast acting
- Current limiting
- Low I^2t
- Optional trigger indicator

Applications:

- Protection of UPS systems AC/DC drives, reduced voltage motor starters and other 1000V or less semiconductor devices

Catalog Numbering System

	A	100	P	80 -	4	TI
Amp-Trap® Fuse	A					
Rated Volts - 700		100				
Style			P			
Amperes*				80		
Mounting Type Blades, bolt-in					1 4	
Integral Blown-Fuse Trigger Indicator (see pg. J5)						TI

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Single Pole Fuse Blocks for A100P Fuses

Fuse Ampere Rating	Fuse Block Catalog No.
35-100	P266G
125-400	P266L





Ratings:

Volts : 1000VAC
: 750VDC
Amps : 15 to 1000A
I.R. : 100kA I.R.
L/R : 25ms

Approvals:

- UL recognized component File E60314
- AC: UL guide no. JFHR2 (35-600A)
- DC: self-certified

A100P Amp-Trap® Form 101

Catalog Numbers (amps)

Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.
A100P15-1	1	A100P100-4	2	A100P350-4TI	2
A100P20-1	1	A100P100-4TI	2	A100P400-4	2
A100P25-1	1	A100P125-4	2	A100P400-4TI	2
A100P30-1	1	A100P125-4TI	2	A100P500-4	3
A100P35-4	2	A100P150-4	2	A100P500-4TI	3
A100P40-4	2	A100P150-4TI	2	A100P600-4	3
A100P50-4	2	A100P200-4	2	A100P600-4TI	3
A100P50-4TI	2	A100P200-4TI	2	A100P650-4	4
A100P60-4	2	A100P225-4	2	A100P700-4	4
A100P60-4TI	2	A100P250-4	2	A100P800-4	4
A100P70-4TI	2	A100P300-4	2	A100P800-4TI	4
A100P80-4	2	A100P300-4TI	2	A100P1000-4	5
A100P80-4TI	2	A100P350-4	2		

** For ampere ratings and styles not listed, call Technical Services at 978-465-4853.*

Dimensions

Outline Ref.	Mounting Type	Fig.	Dimensions - Inches (mm)								
			A	B	C	D	E	F	G	H	J
A100P15 to 30	1	1	2.63	0.56	-	-	-	-	-	-	-
			(66.8)	(14.2)	-	-	-	-	-	-	-
A100P35 to 60	4, 4TI	2	5.00	1.00	3.50	4.31	4.19	0.31	0.75	0.13	-
			(127)	(25.4)	(173)	(109)	(106)	(7.9)	(19.1)	(3.3)	-
A100P65 to 100	4, 4TI	2	5.00	1.22	3.50	4.31	4.19	0.31	1.00	0.19	-
			(127)	(31.0)	(173)	(109)	(106)	(7.9)	(25.4)	(4.8)	-
A100P125 to 200	4, 4TI	2	5.72	1.50	3.47	4.78	4.16	0.41	1.00	0.25	-
			(145)	(38.1)	(88.1)	(121)	(106)	(10.4)	(25.4)	(6.4)	-
A100P225 to 400	4, 4TI	2	5.72	2.00	3.47	4.78	4.16	0.41	1.50	0.25	-
			(145)	(50.8)	(88.1)	(121)	(106)	(10.4)	(25.4)	(6.4)	-
A100P500 to 600	4, 4TI	3	7.72	2.50	3.47	5.88	5.56	0.53	2.00	0.38	-
			(196)	(63.5)	(88.1)	(149)	(141)	(13.5)	(50.8)	(9.7)	-
A100P650 to 800	4, 4TI	4	7.44	2.88	3.94	5.94	-	0.63	2.00	0.38	-
			(189)	(73.2)	(100)	(151)	-	(16.0)	(50.8)	(9.7)	-
A100P1000	4	5	8.22	3.50	4.47	6.59	5.84	0.63	2.75	0.50	1.38
			(209)	(88.9)	(114)	(167)	(148)	(16.0)	(69.9)	(12.7)	(35.1)

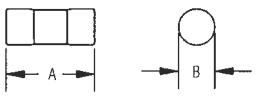


Figure 1

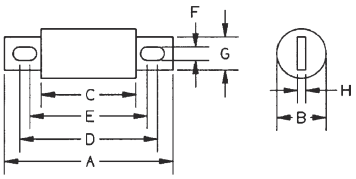


Figure 2

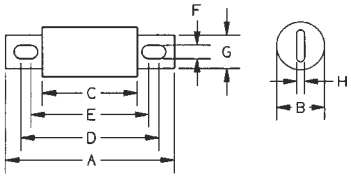


Figure 3

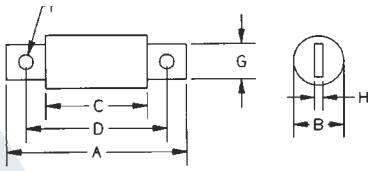


Figure 4

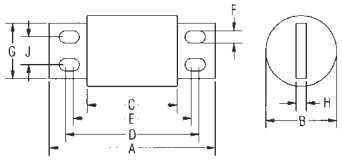


Figure 5

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

A120X Amp-Trap® Form 101

A120X Amp-Trap® Form 101 Semiconductor Protection fuses, rated 1/2A through 30A, 1200VAC are popular for use in traction drive auxiliary circuits and similar applications. A120X fuses are also suitable for use on 1000VDC auxiliary circuits with low time constants.

Features/Benefits:

- 1000V DC rated for wide range of circuits
- Compact size fits in where competitive sizes will not fit

Highlights:

- Fast acting
- Current limiting
- Low I^2t
- Compact size

Applications:

- Protection of traction drive auxiliary circuits, etc.



Ratings:

Volts : 1200VAC
: 1000VDC
Amps : 1/2 to 30A
I.R. : 100kA I.R. AC
: 100kA I.R. DC
L/R : 10ms

Catalog Numbering System

	A	120	X	25	-	1
Amp-Trap® Fuse	A					
Rated Volts - 1200		120				
Style (Fast acting, low I^2t)			X			
Amperes*				25		
Common Mounting Type* Ferrule						1

** For ampere ratings and types not listed, consult the factory.*

Single Pole Fuse Blocks for A120X Fuses

Ampere Rating	Catalog No.
1/2-30	P292

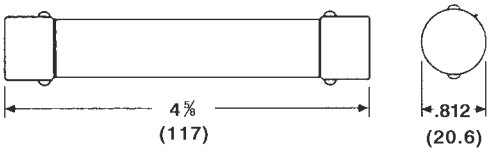
Catalog Numbers (amps)

A120X1/2-1	A120X6-1
A120X1-1	A120X10-1
A120X2-1	A120X15-1
A120X3-1	A120X20-1
A120X4-1	A120X25-1
A120X5-1	A120X30-1

Approvals:

- UL recognized component File E 60314

Dimensions - In (mm)



A150X Amp-Trap® Form 101

A150X Amp-Trap® Form 101 Semiconductor Protection fuses, rated up to 1000A, 1500VAC are suitable for traction drive and auxiliary circuits and for High Voltage Heavy duty rectifier applications. A150X fuses are suitable for use up to 1500VDC on circuits depending on time constant.

Features/Benefits:

- 1500V AC rated for wide range of applications
- Heavy duty links
- Rugged fiberglass body

Highlights:

- Fast acting
- Current limiting
- Low I^2t

Applications:

- Protection of traction drive and auxiliary circuits, etc.



Ratings:

Volts : 1500VAC
: 1000VDC
Amps : 1A to 1000A
I.R. : 100kA I.R. AC
: 100kA I.R. DC

Approvals:

- Self-certified

Catalog Numbers (amps)

Catalog No.	Dimen. Fig.	Catalog No.	Dimen. Fig.
A150X1-1	1	A150X90-4	2
A150X15-1	1	A150X100-4	2
A150X15-4	2	A150X125-4	2
A150X20-1	1	A150X150-4	2
A150X20-4	2	A150X175-4	2
A150X25-4	2	A150X200-4	2
A150X30-1	1	A150X250-4	2
A150X40-4	2	A150X300-4	2
A150X35-4	2	A150X400-4	2
A150X40-4	2	A150X450-4	2
A150X50-4	2	A150X500-4	2
A150X60-4	2	A150X600-4	2
A150X70-4	2	A150X800-4	2
A150X80-4	2	A150X1000-4	2

Dimensions

Outline Ref.	Mounting Type	Fig.	Dimensions - Inches (mm) A	B	C	D	E	F	G	H	J
A150X1 to 30	1	1									
A150X15 to 60	4	2	7.15 (182)	1.21 (31)	5.62 (143)	6.46 (164)	6.34 (161)	0.31 (8)	1.00 (25)	0.18 (3)	- -
A150X70 to 100	4	2	7.87 (127)	1.50 (31)	5.62 (173)	6.93 (176)	6.31 (160)	0.40 (10)	1.00 (25)	.025 (6)	- -
A150X125 to 300	4	2	7.87 (145)	2.00 (38)	5.62 (88)	6.93 (176)	6.31 (160)	0.40 (10)	1.50 (38)	0.25 (6)	- -
A150X400 to 600	4	2	9.75 (145)	2.50 (51)	6.62 (88)	8.31 (211)	8.06 (205)	0.56 (14)	2.00 (51)	0.25 (6)	- -
A150X800 to 1000	4	3	9.87 (251)	3.50 (89)	6.12 (155)	8.03 (204)	7.71 (196)	0.56 (14)	2.75 (70)	0.37 (9)	1.37 (35)

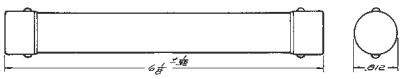


Figure 1

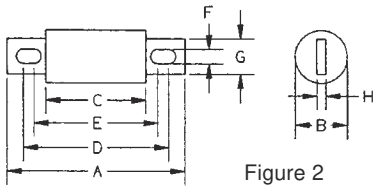


Figure 2

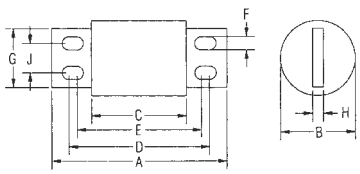


Figure 2

6,9 gRB-URB European Semiconductor Fuses

690V
gRB-URB FROM 12 TO 100A
Size: 17 x 49



Features/Benefits:

- Extremely high Interrupting rating
- Protection of power semiconductors as per IEC standard 269.4
- 690V rating as per IEC 33
- gR class [current rating 12 to 90A] as per VDE 636-23
  -Full range protection
  -Improved safety and protection
  -Allows selective coordination
- aR class [current rating 100A] according to VDE 636-23 and IEC 269.4
- Connections as per:
  -German Standard DIN 43653/00C
  -British Standard BS 88-4
- These fuses are UL recognized

c UL us

Applications Data

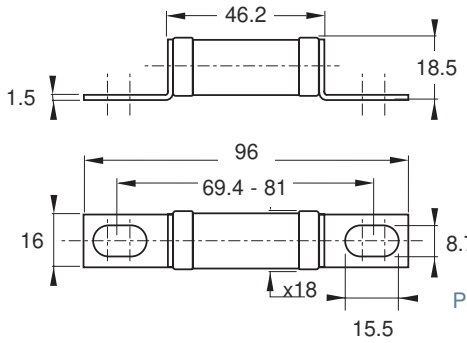
Voltage Rating UN(V)	Class	Current Rating I_N(A)	Melting I^2t @ 1 ms (A^2s)	Total Clearing I^2t @ Rated Voltage (A^2s)	Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating	Estimated Interrupting Rating
690	gRB	12	4.2	30	1.95	3.5	200 k A @ 690 V	300 k A @ 690 V
		16	9.6	65	2.2	4.0		
		20	17.1	110	3.0	5.5		
		25	26.8	170	4.4	8.0		
		32	52.5	330	5.0	9.0		
		35	69	430	5.2	9.5		
		40	96	610	5.8	10.5		
		45	130	820	6.3	11.5		
		50	154	970	7.2	13		
		55	210	1320	7.4	13.5		
		63	310	1950	8.0	14.5		
		75	520	3250	8.8	16		
		80	620	3900	9.4	17		
		90	840	5300	11	20		
690	URB	100	965	6150	13	23.5		

Minimum operating voltage for separate trip-indicator: 20 V

MERSEN

6,9 gRB-URB European Semiconductor Fuses

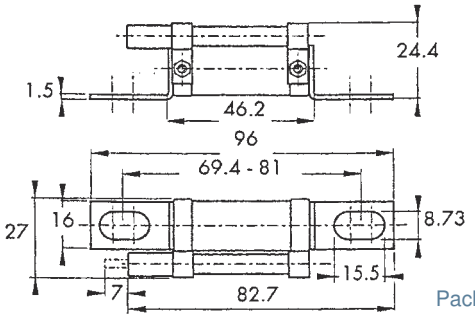
German Standard without Blown Fuse Indication



Weight: 40 g
Packaging: 10 pieces

Current Rating	Description	Catalog No.
12	6,9 gRB 17 DO8/12	M220972
16	6,9 gRB 17 DO8/16	N220973
20	6,9 gRB 17 DO8/20	P220974
25	6,9 gRB 17 DO8/25	Q22097a5
32	6,9 gRB 17 DO8/32	R220976
35	6,9 gRB 17 DO8/35	S220977
40	6,9 gRB 17 DO8/40	T220978
45	6,9 gRB 17 DO8/45	V220979
50	6,9 gRB 17 DO8/50	W220980
55	6,9 gRB 17 DO8/55	X220981
63	6,9 gRB 17 DO8/63	Y220982
75	6,9 gRB 17 DO8/75	Z220983
80	6,9 gRB 17 DO8/80	A220984
90	6,9 gRB 17 DO8/90	B220985
100	6,9 URB 17 DO8/100	C220986

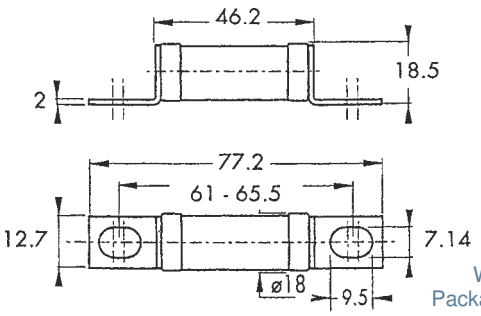
German Standard with Separate Blown Fuse Trip-Indicator DIN 43623/00C



Weight: 40 g
Packaging: 10 pieces

Current Rating	Description	Catalog No.
12	6,9 gRB 17 DO8P 12	X221004
16	6,9 gRB 17 DO8P 16	Y221005
20	6,9 gRB 17 DO8P 20	Z221006
25	6,9 gRB 17 DO8P 25	A221007
32	6,9 gRB 17 DO8P 32	B221008
35	6,9 gRB 17 DO8 P 35	C221009
40	6,9 gRB 17 DO8P 40	D221010
45	6,9 gRB 17 DO8P 45	E221011
50	6,9 gRB 17 DO8P 50	F221012
55	6,9 gRB 17 DO8P 55	G221013
63	6,9 gRB 17 DO8P 63	H221014
75	6,9 gRB 17 DO8P 75	J221015
80	6,9 gRB 17 DO8P 80	K221016
90	6,9 gRB 17 DO8P 90	L221017
100	6,9 URB 17 DO8P 100	M221018

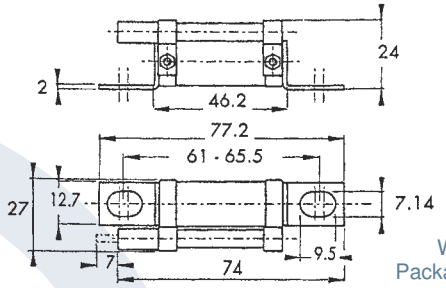
British Standard without Blown Fuse Indication



Weight: 37 g
Packaging: 10 pieces

Current Rating	Description	Catalog No.
12	6,9 gRB 17/12	W220957
16	6,9 gRB 17/16	X220958
20	6,9 gRB 17/20	Y220959
25	6,9 gRB 17/25	Z220960
32	6,9 gRB 17/32	A220961
35	6,9 gRB 17/35	B220962
40	6,9 gRB 17/40	C220963
45	6,9 gRB 17/45	D220964
50	6,9 gRB 17/50	E220965
55	6,9 gRB 17/55	F220966
63	6,9 gRB 17/63	G220967
75	6,9 gRB 17/75	H220968
80	6,9 gRB 17/80	J220969
90	6,9 gRB 17/90	K220970
100	6,9 URB 17/100	L220971

British Standard with Separate Blown Fuse Trip-Indicator BS 88-4

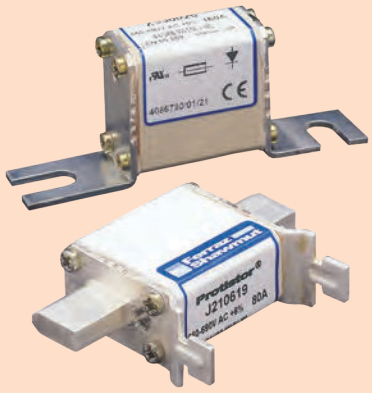


Weight: 37 g
Packaging: 10 pieces

Current Rating	Description	Catalog No.
12	6,9 gRB 17P12	D220987
16	6,9 gRB 17P16	E220988
20	6,9 gRB 17P20	F220989
25	6,9 gRB 17P25	G220990
32	6,9 gRB 17P32	H220991
35	6,9 gRB 17P35	J220992
40	6,9 gRB 17P40	K220993
45	6,9 gRB 17P45	L220994
50	6,9 gRB 17P50	M220995
55	6,9 gRB 17P55	N220996
63	6,9 gRB 17P63	P220997
75	6,9 gRB 17P75	Q220998
80	6,9 gRB 17P80	R220999
90	6,9 gRB 17P90	S221000
100	6,9 URB 17P100	T221001

6,9 gRB-URB DIN German Standard

German Standard
500 - 690V AC
gRB-URB FROM 20 TO 400A
Size: 000



Features/Benefits:

- Extremely high interrupting rating
- Protection of power semiconductors according to IEC 269.1 and EN 60269.4
- 500-690V [Rating 20 to 400A]
- gR class [gRB Ratings 20 to 125A] according to VDE 636-23
  -Full range protection
  -Improved safety and protection
  -Allows selective coordination
- aR class [current rating 80 to 400A] according to VDE 636-23 and IEC 269.4
- 3 models complying with DIN 43653-00C are:
  -With or without blown fuse indication
  -With trip indicator
- Model complying with DIN 43620 (00C)
  -Standard with or without blown fuse indication
  -With trip indicator

c UL us

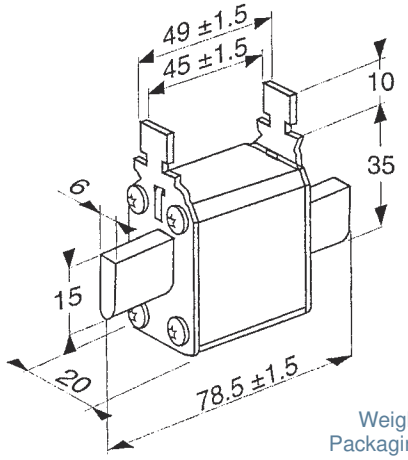
Applications Data

Voltage Rating U_N(V)	Class	Current Rating I_N(A)	Melting I^2t @ 1 ms (A^2s)	Total Clearing I^2t @ Rated Voltage (A^2s)	Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating	Estimated Interrupting Rating
690	gRB	20	12	80	3.8	7	200 k A @ 660 V	300 k A @ 660 V
		25	20	150	5.0	9		
		32	39	270	5.5	10		
		40	70	460	6.6	12		
		50	102	730	7.7	14		
		63	210	1500	8.8	16		
		80	475	2900	9.9	18		
		100	970	6000	11	20		
		125	1900	11800	11.6	21		
690	URB	80	390	2500	11.6	21		
		100	690	4200	12.7	23		
		125	1300	8900	14.3	26		
		160	2700	16000	17.0	31		
		200	5250	31500	19.8	36		
		250	9900	52000	24.8	45		
660		315	15500	82000	31.9	58	120 k A @ 500 V	
500		350	22400	110000	31.9	58		
		400	33200	160000	36.3	66		

Minimum operating voltage for blown fuse indicator: 20 V

6,9 gRB-URB DIN German Standard

German Standard Blade-Type DIN 43620**



Weight: 150 g
Packaging: 3 pieces

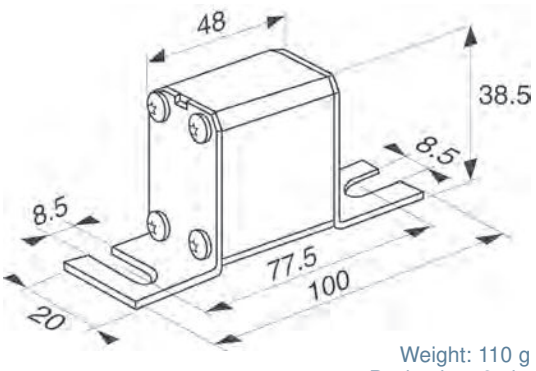
Microswitches
MS 4L 2-5 B6 + PRES Ref. F210156
MS 4L 2-5 B2 + PRES Ref. G210157

* Fuse Base: 41002-G

Size	Description	Cat. No.	CI/I_N
16	6,9 GRB 000 PV 016	Y210609	1
20	6,9 GRB 000 PV 020	Z210610	1
25	6,9 GRB 000 PV 025	A210611	1
32	6,9 GRB 000 PV 032	B210612	1
40	6,9 GRB 000 PV 040	C210613	1
50	6,9 GRB 000 PV 050	D210614	1
63	6,9 GRB 000 PV 063	E210615	1
80	6,9 GRB 000 PV 080	F210616	1
100	6,9 GRB 000 PV 100	G210617	1
125	6,9 GRB 000 PV 125	H210618	1
80	6,9 URD 000 PV 0080	Q320059	1
100	6,9 URD 000 PV 0100	V320063	1
125	6,9 URD 000 PV 0125	X320065	0,95
160	6,9 URD 000 PV 0160	B320069	0,85
200	6,9 URD 000 PV 0200	D320071	0,85
250	6,9 URD 000 PV 0250	H320075	0,8
315	6,9 URD 000 PV 0315	M320079	0,7
350	5 URB 000 PV 350	R210626	0,7
400	5 URB 000 PV 400	S210627	0,65

These fuses are not UL recognized.

German Standard without Blown Fuse Indicator



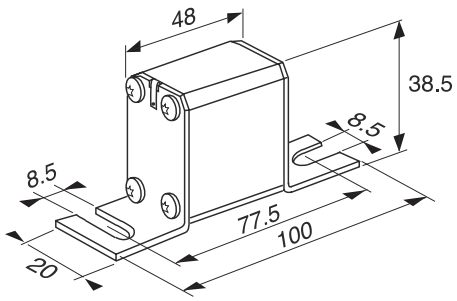
Weight: 110 g
Packaging: 6 pieces

* Fuse Base: SI 000 DIN 80
Ref. Number: C 220710

Size	Description	Cat. No.	CI/I_N
20	6,9 GRB 000 D08 / 020	D330030	1
25	6,9 GRB 000 D08 / 025	E330031	1
32	6,9 GRB 000 D08 / 032	F330032	1
40	6,9 GRB 000 D08 / 040	G330033	1
50	6,9 GRB 000 D08 / 050	H330034	1
63	6,9 GRB 000 D08 / 063	J330035	1
80	6,9 GRB 000 D08 / 080	A330073	1
100	6,9 GRB 000 D08 / 100	S330112	1
125	6,9 GRB 000 D08 / 125	T330113	0,9
80	6,9 URB 000 D08 / 080	K330036	1
100	6,9 URB 000 D08 / 100	L330037	1
125	6,9 URB 000 D08 / 120	M330038	0,9
160	6,9 URB 000 D08 / 160	N330039	0,85
200	6,9 URB 000 D08 / 200	P330040	0,85
250	6,9 URB 000 D08 / 250	Q330041	0,8
315	6,9 URB 000 D08 / 315	R330042	0,7
350	5 URB 000 D08 / 350	V330114	0,7
400	5 URB 000 D08 / 400	D330191	0,65

6,9 gRB-URB DIN German Standard

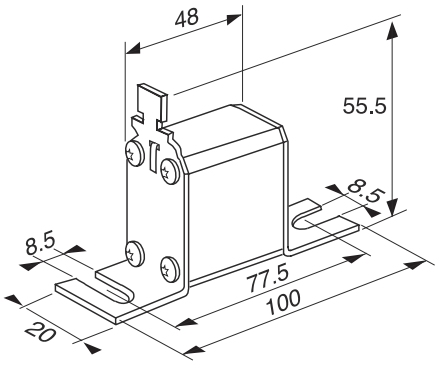
German Standard with Blown Fuse Indication



Current Rating	Description	Cat. No.	I/N Fuse Base*
20	6,9 gRB 000 DO8V/020	P330017	1
25	6,9 gRB 000 DO8V/025	Q330018	1
32	6,9 gRB 000 DO8V/032	R330019	1
40	6,9 gRB 000 DO8V/040	S330020	1
50	6,9 gRB 000 DO8V/050	T330021	1
63	6,9 gRB 000 DO8V/063	V330022	1
80	6,9 gRB 000 DO8V/080	G330102	1
100	6,9 gRB 000 DO8V/100	Q330110	1
125	6,9 gRB 000 DO8V/125	R330111	0,9
80	6,9 URB 000 DO8V/080	W330023	1
100	6,9 URB 000 DO8V/100	X330024	1
125	6,9 URB 000 DO8V/125	Y330025	0,95
160	6,9 URB 000 DO8V/160	Z330026	0,85
200	6,9 URB 000 DO8V/200	A330027	0,85
250	6,9 URB 000 DO8V/250	B330028	0,8
315	6,9 URB 000 DO8V/315	C330029	0,7
350	5 URB 000 DO8V/350	W330115	0,7
400	5 URB 000 DO8V/400	E330192	0,65

**Fuse Base: SI 000 DIN 80*
Ref. Number: C 220710

German Standard with Separate Blown Fuse Trip-Indicator



Current Rating	Description	Cat. No.	I/N Fuse Base*
20	6,9 gRB 000 DO8L/020	J330173	1
25	6,9 gRB 000 DO8L/025	K330174	1
32	6,9 gRB 000 DO8L/032	L330175	1
40	6,9 gRB 000 DO8L/040	M330176	1
50	6,9 gRB 000 DO8L/050	N330177	1
63	6,9 gRB 000 DO8L/063	P330178	1
80	6,9 gRB 000 DO8L/080	Q330179	1
100	6,9 gRB 000 DO8L/100	R330180	1
125	6,9 gRB 000 DO8L/125	S330181	0,9
80	6,9 URB 000 DO8L/080	T330182	1
100	6,9 URB 000 DO8L/100	V330183	1
125	6,9 URB 000 DO8L/125	W330184	0,9
160	6,9 URB 000 DO8L/160	X330185	0,85
200	6,9 URB 000 DO8L/200	Y330186	0,85
250	6,9 URB 000 DO8L/250	Z330187	0,8
315	6,9 URB 000 DO8L/315	A330188	0,7
350	5 URB 000 DO8L/350	B330189	0,7
400	5 URB 000 DO8L/400	F330193	0,65

Microswitch
MC 4L 2-5 B6 + PRES Ref. Number: F210156
MC 4L 2-5 B2 + PRES Ref. Number: G210157
**Fuse Base: SI 000 DIN 80 Ref. Number: C220710*

BS88 British Standard

Protistor® Fuses
500-690V AC
gRB/URB from 20 to 400A
Size: 000



D

Features/Benefits:

- Extremely high interrupting rating
- Protection of power semiconductors according to IEC 269.1 and EN 60269.4
- 500-690V (rating 20 to 400A)
- gR class (gRB Ratings 20 to 125A) according to VDE 636-23.
  -Full range protection
  -Improving safety and protection
  -Allows selective coordination
- aR class (URB ratings 75 to 400A) according to VDE 636-23 and IEC 269.4
- Two models according to BS 88-4 and EN 60 269.4 standards: Z3 drawing (74mm between axes) external open fuse with and without indicator

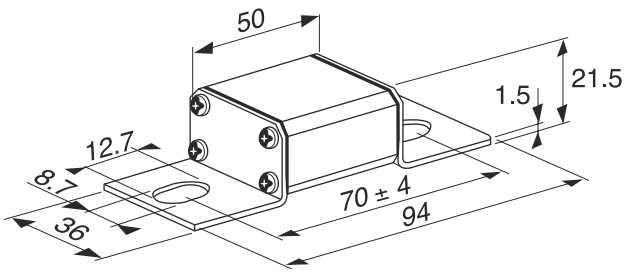
c UL us

Applications Data

Voltage Rating U_N(V)	Class	Current Rating I_N(A)	Melting I^2t @ 1 ms (A^2s)	Total Clearing I^2t @ UN I^2t_p (A^2s)	Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating	Estimated Interrupting Rating
690	gRB	20	12	80	3.8	7	200 k A @ 660 V	300 k A @ 660 V
		25	20	150	5.0	9		
		32	39	270	5.5	10		
		40	70	460	6.6	12		
		50	102	730	7.7	14		
		63	210	1500	8.8	16		
		80	475	2900	9.9	18		
		100	970	6000	11	20		
		125	1900	11800	11.6	21		
690	URB	75	350	2250	11.2	20.5		
		80	390	2500	11.6	21		
		100	690	4200	12.7	23		
		110	950	6800	13.5	24.5		
		125	1300	8900	14.3	26		
		160	2700	16000	17.0	31		
		200	5250	31500	19.8	36		
		250	9900	52000	24.8	45		
660		315	15500	82000	31.9	58	120 k A @ 500 V	
500		350	22400	110000	31.9	58		
		400		160000	36.3	66		

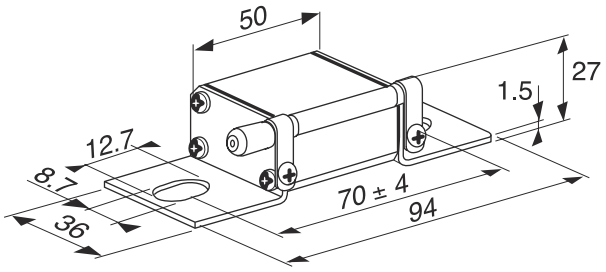
BS88 British Standard

British Standard without Open Fuse Indicator



Current Rating	Description	Cat. No.
20	6,9 gRB 000 BS88/020	T330044
25	6,9 gRB 000 BS88/025	V330045
32	6,9 gRB 000 BS88/032	W330046
40	6,9 gRB 000 BS88/040	X330047
50	6,9 gRB 000 BS88/050	Z330049
63	6,9 gRB 000 BS88/063	A330050
80	6,9 gRB 000 BS88/080	N330108
100	6,9 gRB 000 BS88/100	H330103
125	6,9 gRB 000 BS88/125	P330109
75	6,9 URB 000 BS88/075	B330051
80	6,9 URB 000 BS88/080	C330052
100	6,9 URB 000 BS88/100	D330053
110	6,9 URB 000 BS88/110	E330100
125	6,9 URB 000 BS88/125	E330054
150	6,9 URB 000 BS88/150	F330101
160	6,9 URB 000 BS88/160	F330055
200	6,9 URB 000 BS88/200	G330056
250	6,9 URB 000 BS88/250	H330057
315	6,9 URB 000 BS88/315	J330058
350	5 URB 000 BS88/350	X330116
400	5 URB 000 BS88/400	G330194

British Standard with External Open Fuse Trip-Indicator



The use of MC 6.3 GR 2-5N blown fuse remote sensing microswitch is possible.
Ref. Number: Y 310015 mounted on separate trip-indicator.
See Microswitch section page J10, J12.

Current Rating	Description	Cat. No.
20	6,9 gRB 000 BS88P/020	Y330117
25	6,9 gRB 000 BS88P/025	Z330118
32	6,9 gRB 000 BS88P/032	A330119
40	6,9 gRB 000 BS88P/040	B330120
50	6,9 gRB 000 BS88P/050	C330121
63	6,9 gRB 000 BS88P/063	D330122
80	6,9 gRB 000 BS88P/080	E330123
100	6,9 gRB 000 BS88P/100	F330124
125	6,9 gRB 000 BS88P/125	G330125
75	6,9 URB 000 BS88P/075	H330126
80	6,9 URB 000 BS88P/080	J330127
100	6,9 URB 000 BS88P/100	K330128
110	6,9 URB 000 BS88P/110	L330129
125	6,9 URB 000 BS88P/125	M330130
150	6,9 URB 000 BS88P/150	N330131
160	6,9 URB 000 BS88P/160	P330132
200	6,9 URB 000 BS88P/200	Q330133
250	6,9 URB 000 BS88P/250	R330134
315	6,9 URB 000 BS88P/315	S330135
350	5 URB 000 BS88P/350	T330136
400	5 URB 000 BS88P/400	H330195

Size 00 British Standard

Protistor® Fuses
690V
gRB-URB from 16 to 450A
Size: 00



D

Features/Benefits:

- Extremely high Interrupting rating
- Protection of power semiconductors according to IEC 269.1 and 4
- 690V
- gR class [gRB ratings 16 to 160 A] according to VDE 636-23
  -Full range protection
  -Improving safety and protection
  -Allows selective coordination
- aR class [URC and URD Ratings 16 to 450A] according to VDE 636-23 and IEC 269.4
- Connections according to:
  -DIN 43653/00C 80 and 110mm between axes
  -DIN 43620/00C solid blades
- Optional pin indicator for operating a microswitch

c UL us

Applications Data

Voltage Rating U_N(V)	Class	Current Rating I_N(A)	Melting I^2t @ 1 ms (A^2s)	Total Clearing I^2t @ UN I^2t_p (A^2s)	Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating	Estimated Interrupting Rating
690	gRB	16	8	61	2.7	5	200kA @ 690V	300kA @ 690V
		20	12	86	3.3	6		
		25	18	140	4.4	8		
		32	39	250	6.0	11		
		40	68	450	7.1	13		
		50	116	750	8.8	16		
		63	210	1400	9.9	18		
		80	525	3000	10.5	19		
		100	970	5400	10.7	19.5		
		125	1710	9600	13.2	24		
		160	4270	22400	13.7	25		
	URB	16	7	52	3.8	7		
		20	10	75	5.0	9		
		25	15	120	6.0	11		
		32	32	210	8.2	15		
		40	61	400	9.9	18		
		50	102	700	11.5	21		
		63	177	1200	12.6	23		
		80	390	2200	13.8	25		
		100	692	3900	15.4	28		
		125	1170	6600	18.1	33		
		160	2680	14 000	19.8	36		
		200	4690	24 000	23.1	42		
		250	8300	42 500	27.5	50		
		315	17 520	81 000	31.9	58		
		350•	25 450	118 000	33.0	60		
		400•	33 200	150 000	38.5	70		
600		450**	51 850	225 000	40.7	74	200kA @ 600V	300kA @ 600V

• Voltage rating: 690V with CC' at 1s - 450V with CC' at 10 s
***Voltage rating: 600V with CC' at 1s - 450V with CC' at 10 s*

Note: voltage rating of 350-400-450 A rated fuses is defined with a CC' curve at 1 second limited by the minimum breaking current.

Size 00 British Standard

German Standard According to DIN 43653/00C & DIN 80 & 110 - Catalog Numbers (amps)

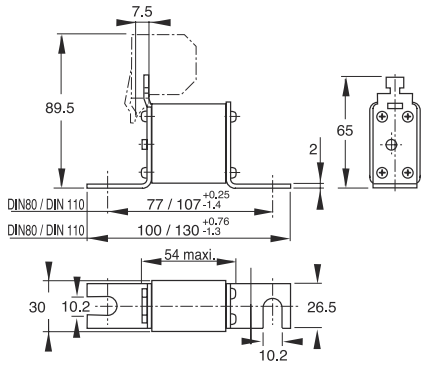
gRB DIN 80

Description	Cat. No.	I/N Fuse Base*
6,9 gRB 00 D08L 016	S330273	1
6,9 gRB 00 D08L 020	S330227	1
6,9 gRB 00 D08L 025	T330228	1
6,9 gRB 00 D08L 032	V330229	1
6,9 gRB 00 D08L 040	W330230	1
6,9 gRB 00 D08L 050	X330231	1
6,9 gRB 00 D08L 063	Y330232	1
6,9 gRB 00 D08L 080	Z330233	1
6,9 gRB 00 D08L 100	A330234	1
6,9 gRB 00 D08L 125	B330235	0.9
6,9 gRB 00 D08L 160	C330236	0.9

URB DIN 80

Description	Cat. No.	I/N Fuse Base*
6,9 URB 00 D08L 016	V330275	1
6,9 URB 00 D08L 020	T330274	1
6,9 URB 00 D08L 025	M330268	1
6,9 URB 00 D08L 032	N330269	1
6,9 URB 00 D08L 040	P330270	1
6,9 URB 00 D08L 050	Q330271	1
6,9 URB 00 D08L 063	R330272	1
6,9 URB 00 D08L 080	D330237	1
6,9 URB 00 D08L 100	E330238	1
6,9 URB 00 D08L 125	F330239	0.9
6,9 URB 00 D08L 160	G330240	0.85
6,9 URB 00 D08L 200	H330241	0.85
6,9 URB 00 D08L 250	J330242	0.80
6,9 URB 00 D08L 315	K330243	0.75
6,9 URB 00 D08L 350	L330244	0.75
6,9 URB 00 D08L 400	M330245	0.70
6 URB 00 D08L 450	N330246	0.65

German Standard According to DIN 43653/00C - DIN 80 & 110



Weight : 140 g(D08) - 190 g(D11)
Packaging : 3 pieces
Microswitches:

6.3 clips	MS 4L 2.5 B6 - Part #: L076646 or MC 4L 2.5 B6 + PRES - Part #: F210156
2.8 clips	MS 4L 2.5 B2 - Part #: G076642 or MC 4L 2.5 B2 + PRES - Part #: G210157

Fuse-base: SI 00 DIN 80 - Part #: Q098040

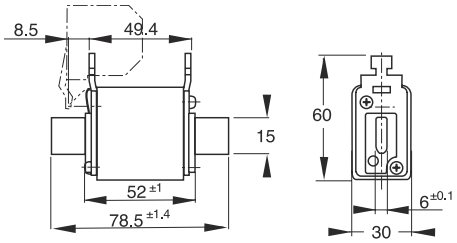
gRB DIN 110

Description	Cat. No.	I/N Fuse Base*
6,9 gRB 00 D11L 016	W330276	1
6,9 gRB 00 D11L 020	P330247	1
6,9 gRB 00 D11L 025	Q330248	1
6,9 gRB 00 D11L 032	R330249	1
6,9 gRB 00 D11L 040	S330250	1
6,9 gRB 00 D11L 050	T330251	1
6,9 gRB 00 D11L 063	V330252	1
6,9 gRB 00 D11L 080	W330253	1
6,9 gRB 00 D11L 100	X330254	1
6,9 gRB 00 D11L 125	Y330255	0.9
6,9 gRB 00 D11L 160	Z330256	0.9

URB DIN 110

Description	Cat. No.	I/N Fuse Base*
6,9 URB 00 D11L 80	A330257	1
6,9 URB 00 D11L 100	B330258	1
6,9 URB 00 D11L 125	C330259	0.9
6,9 URB 00 D11L 160	D330260	0.85
6,9 URB 00 D11L 200	E330261	0.85
6,9 URB 00 D11L 250	F330262	0.80
6,9 URB 00 D11L 315	G330263	0.75
6,9 URB 00 D11L 350	H330264	0.75
6,9 URB 00 D11L 400	J330265	0.70
6 URB 00 D11L 450	K330266	0.65

German Standard According to DIN 43620/00



Weight : 210 g
Packaging : 3 pieces
Microswitches:

6.3 clips	or MC 4L 2.5 B6 + PRES - Part #: F210156
2.8 clips	or MC 4L 2.5 B2 + PRES - Part #: G210157

Fuse-base: 41002-G

gRB DIN 43620

Description	Cat. No.	I/N Fuse Base*
6,9 gRB 00 PV/016	L330267	1
6,9 gRB 00 PV/020	W330207	1
6,9 gRB 00 PV/025	X330208	1
6,9 gRB 00 PV/032	Y330209	1
6,9 gRB 00 PV/040	Z330210	1
6,9 gRB 00 PV/050	A330211	1
6,9 gRB 00 PV/063	B330212	0.90
6,9 gRB 00 PV/080	C330213	0.90
6,9 gRB 00 PV/100	D330214	0.90
6,9 gRB 00 PV/125	E330215	0.85
6,9 gRB 00 PV/160	F330216	0.85

URD DIN 43620

6,9 URD 00 PV0080	Z320159	0.90
6,9 URD 00 PV0100	D320163	0.90
6,9 URD 00 PV0125	F320165	0.85
6,9 URD 00 PV0160	K320169	0.85
6,9 URD 00 PV0200	M320171	0.85
6,9 URD 00 PV0250	R320175	0.80
6,9 URD 00 PV0315	W320179	0.75

I/IN : Ratio RMS steady current / current rating for fuses in base.

URE/URGS/URZ British Standard

Protistor® Fuses
250V AC
URE/URGS/URZ from 5 up to 180A
Sizes: 10 X 28 - 17 X 27 mm



Features/Benefits:

- Extremely high interrupting rating
- Protection of power semiconductors according to IEC 269.1 and 4
- 250V according to IEC 33
- aR class (ratings from 5 to 32A) according to VDE 636-23 and IEC 269.4
- Model according to NF C 63210 and 63211 with built-in blown trip-indicator
- 17X27 are UL recognized

Ratings:

Volts : 250VAC
Amps : 5 to 180A
IR : 160kA I.R.

Applications Data

Voltage Rating U_N (V)	Size	Class	Current Rating I_N (A)	Melting I^2t @ 1 ms I^2t_p (A^2s)	Total Clearing I^2t @ UN I^2t_t (A^2s)		Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating
250 V	10x28	URE	5	1.3	10	11	0.6	1	160 kA @ 250 V
			6	1.8	13	15	0.7	1.2	
			10	2.4	18	20	1.2	2.1	
			12	4.3	28	33	1.6	2.8	
			15	6.7	41	48	2.0	3.5	
			20	15.0	85	100	2.2	4.0	
			25	27.0	135	160	2.6	4.7	
			32	53.0	240	280	3.0	5.4	
	17x27	URGS	7	1.3	8.5	9.8	0.56	1	
			10	4.5	21	23.8	0.84	1.5	
			12	5.9	27	31	1.1	2.0	
			16	11.2	50	59	1.7	3.0	
			20	15.6	80	100	2.2	3.9	
			25	30.0	130	160	2.7	4.8	
			30	45.0	195	235	3.2	5.6	
			35	63.0	270	330	3.7	6.5	
			50	180.0	790	940	4.9	8.8	
			60	250.0	1100	1310	5.8	10.4	
			75	380.0	1670	1990	7.2	13.6	
			80	480.0	2100	2530	7.25	13.7	
		URZ	100	730.0	3350	4060	6.5	11.5	
			125	850.0	5720	6920	6.7	12.3	
			150	1250.0	7930	9590	7.4	13.6	
			160	1730.0	9600	11700	8.8	15.6	
			180	2090.0	14500	17500	9.5	17	

Approvals

- UL Recognized Component (17x27mm)
- IEC 269.4, VDE 636.23 (5-32A)
- IEC 33 (250V)

URE/URGS/URZ British Standard

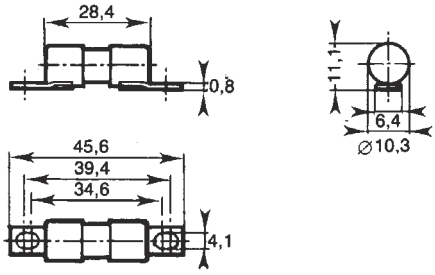
Catalog Numbers

Size	Description	Catalog No.
10x28 mm	2.5 URE 10/5	M082489
	2.5 URE 10/6	E097478
	2.5 URE 10/10	I082488
	2.5 URE 10/12	P097487
	2.5 URE 10/15	K082487
	2.5 URE 10/20	J082486
	2.5 URE 10/25	X097494
	2.5 URE 10/32	N081984

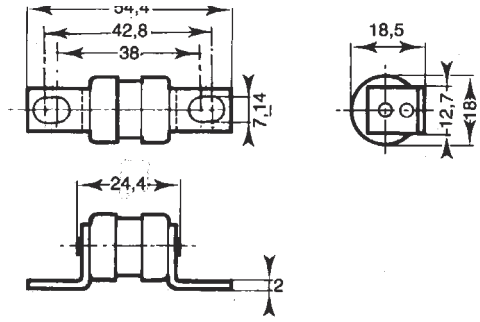
Size	Description	Catalog No.
17x27 mm	2.5 URGS 17/7	M076647
	2.5 URGS 17/10	N076648
	2.5 URGS 17/12	P076649
	2.5 URGS 17/16	Q076650
	2.5 URGS 17/20	L09507
	2.5 URGS 17/25	R076651
	2.5 URGS 17/30	S076652
	2.5 URGS 17/35	T076653
	2.5 URGS 17/50	V076654
	2.5 URGS 17/60	W076655
	2.5 URGS 17/75	X076656
	2.5 URGS 17/80	Z085559
	2.5 URGS 17/100	Y085558
	2.5 URGS 17/125	G097526
	2.5 URGS 17/150	W085556
	2.5 URGS 17/160	F097527
	2.5 URGS 17/180	N097532

Size	Description	Catalog No.
17x27 mm	2.5 URGS 17 P7	P097533
	2.5 URGS 17 P10	Q097434
	2.5 URGS 17 P12	S097536
	2.5 URGS 17 P16	X097540
	2.5 URGS 17 P20	B097540
	2.5 URGS 17 P25	D097546
	2.5 URGS 17 P30	E097547
	2.5 URGS 17 P35	F097548
	2.5 URGS 17 P50	J097551
	2.5 URGS 17 P60	H081082
	2.5 URGS 17 P75	K097552
	2.5 URGS 17 P80	L097553
	2.5 URZ 17 P100	P097556
	2.5 URZ 17 P125	Q097557
	2.5 URZ 17 P150	R097558
	2.5 URZ 17 P160	S097559
	2.5 URZ 17 P180	T097560

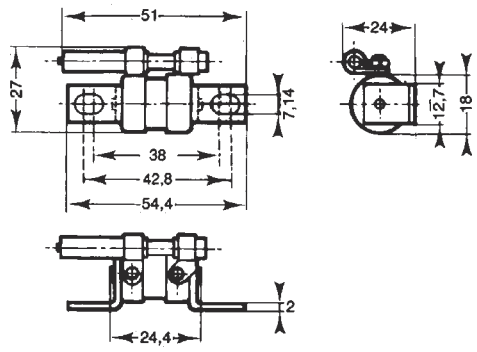
10x28 without Trip-Indicator (mm)



17x27 without Trip-Indicator (mm)



17x27 with Separated Trip-Indicator (mm)



Microswitch MC 6.3 GR 2.5N

URGG/URGH British Standard

Protistor® Fuses
250V
URGG/URGH from 50 to 1050A
SizeS: 36 X 27 - 2 X 36 x 27 mm



Features/Benefits:

- Extremely high-Interrupting rating fuses
- Protection of power semiconductors according to IEC 269.1 and 4
- aR class (ratings from 50 to 525A URGG - 300 to 1050A URGH) according to IEC 269.4
- Complies with BS 88-4
  - without indicator
  - with external trip-indicator

Ratings:

Volts : 250VAC
Amps : 50 to 1050A
IR : 100kA I.R

Applications Data

Voltage Rating U_N (V)	Size	Class	Current Rating I_N (A)	Melting I^2t @ 1 ms I^2t_p (A^2s)	Total Clearing I^2t @ UN I^2t_t (A^2s)	Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating
250 V	36x27	URGG	50	120	500	4.75	9.5	100 kA @ 250 V
			75	330	1380	6.3	12.6	
			100	745	3060	7.8	15.7	
			125	1340	5500	9.1	18.2	
			150	1930	7950	10.8	21.6	
			200	4020	16400	13.5	27.0	
			250	5350	30000	16.3	32.6	
			300	7290	49600	18.6	37.2	
			350	18000	74000	21	42.0	
			400	25100	128000	23.4	46.7	
			450	33500	170000	27.1	54.1	
			500	43000	219000	30.4	60.8	
			525	48200	245000	33.2	66.4	
	2x36x27	URGH	300	7700	31800	21.6	43.2	
			350	11500	48700	24.3	48.6	
			400	16000	65600	27	54.0	
			500	29100	120000	32.6	65.2	
			600	48200	198500	37.2	74.4	
			700	72000	276000	42.0	84.0	
			800	100000	512000	46.7	93.4	
			900	134000	680000	54.1	108.2	
			1000	172000	876000	60.8	121.6	
			1050	193000	980000	66.4	132.8	

Minimum operating voltage for all trip indicators = 20V

Approvals

- **IEC 269.4**
  - URGG (50-525A)
  - URGH (300-1050A)
- **BS 88-4**
  - URGG (50-525A)
  - URGH (300-1050A)

URGG/URGH British Standard

Size	Description	Catalog No.
36x27mm	2.5 URGG 36/50	J080945
	2.5 URGG 36/75	K080946
	2.5 URGG 36/100	L080947
	2.5 URGG 36/125	R082470
	2.5 URGG 36/150	Q082469
	2.5 URGG 36/200	P082468
	2.5 URGG 36/250	N082467
	2.5 URGG 36/300	M082466
	2.5 URGG 36/350	L082465
	2.5 URGG 36/400	G075538
	2.5 URGG 36/450	H075539
	2.5 URGG 36/500	J075540
	2.5 URGG 36/525	K075541

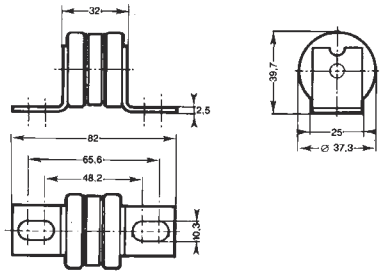
Size	Description	Catalog No.
36x27mm	2.5 URGG36T50	F080942
	2.5 URGG36T75	G080943
	2.5 URGG36T100	H080944
	2.5 URGG36T125	W082382
	2.5 URGG36T150	V080944
	2.5 URGG36T200	T082380
	2.5 URGG36T250	S082379
	2.5 URGG36T300	R082378
	2.5 URGG36T350	Q082377
	2.5 URGG36T400	L075542
	2.5 URGG36T450	M075542
	2.5 URGG36T500	N075544
	2.5 URGG36T525	P075545

Size	Description	Catalog No.
36x27mm	2.5 URGG36P50	C090939
	2.5 URGG36P75	D080940
	2.5 URGG36P100	E080941
	2.5 URGG36P125	Y081004
	2.5 URGG36P150	X081003
	2.5 URGG36P200	W081002
	2.5 URGG36P250	V081001
	2.5 URGG36P300	T081000
	2.5 URGG36P350	S080999
	2.5 URGG36P400	V075504
	2.5 URGG36P450	W07550
	2.5 URGG36P500	X075506
	2.5 URGG36P525	Y075507

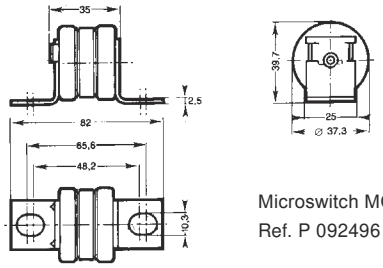
Size	Description	Catalog No.
2X36x27mm	2.5 URGH236/300	K082464
	2.5 URGH236/350	J082463
	2.5 URGH236/400	H082462
	2.5 URGH236/500	G082461
	2.5 URGH236/600	F082460
	2.5 URGH236/700	E082459
	2.5 URGH236/800	Q075546
	2.5 URGH236/900	R075547
	2.5 URGH236/1000	S075548
	2.5 URGH236/1050	T075549

Size	Description	Catalog No.
2X36x27mm	2.5 URGH236T300	P082376
	2.5 URGH236T350	N082375
	2.5 URGH236T400	M082374
	2.5 URGH236T500	L082373
	2.5 URGH236T600	K082372
	2.5 URGH236T700	J082371
	2.5 URGH236T800	V075550
	2.5 URGH236T900	R075501
	2.5 URGH236T1000	S075502
	2.5 URGH236T1050	T075503

36x27 - without Trip-Indicator (mm)

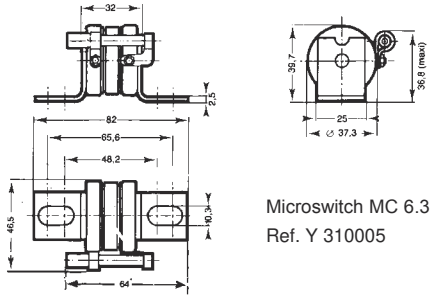


36x27 - with Built-in Trip-Indicator (mm)



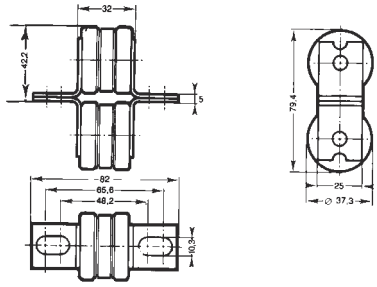
Microswitch MC 36 GR 2.5 N - Ref. P 092496

36x27 - with Separated Trip-Indicator (mm)

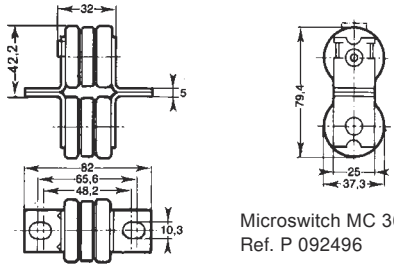


Microswitch MC 6.3 GR 2.5 N - Ref. Y 310005

2x36x27 - without Trip-Indicator (mm)



2x36x27 - with Built-in Trip-Indicator (mm)



Microswitch MC 36 GR 2.5 N - Ref. P 092496

URE/URS/URT British Standard

Protistor® Fuses
690V
URE/URS/URT from 5 to 160A
Sizes: 10 X 51 - 17 X 49 - 2 x 17 x49 mm



Features/Benefits:

- Extremely high Interrupting rating fuses
- Protection of power semiconductors according to IEC 269.1 and 4
- aR class (ratings from 5 to 160A) according to IEC 269.4
- Two models complying with BS 88-4
  - without indicator (17X49mm)
  - with external trip-indicator (2x17x49mm)

Applications Data

Voltage Rating U_N (V)	Size mm	Class	Current Rating I_N (A)	Melting I^2t @ 1 ms I^2t_p (A^2s)	Total Clearing I^2t @ UN I^2t_t (A^2s)		Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating
690 V	10x51	URE	5	1.3	10	15	1.05	2	200 kA @ 690 V
			6	1.3	13.5	20.5	1.3	2.5	
			10	3.3	25	35	2.2	4.1	
			12	5.5	40	58	2.3	4.3	
			15	9.7	70	100	2.4	4.4	
			20	19.4	120	200	3.1	5.8	
	17x49	URS	16	9.7	75	107	2.7	4.8	
			20	17.3	130	185	2.9	5.3	
			25	27	200	285	3.7	6.7	
			32	53	400	570	4.7	8.6	
			35	70	510	725	5.2	9.6	
			40	98	760	1080	5.7	10.5	
			45	130	900	1280	6.2	11.4	
			50	156	1000	1420	6.8	12.6	
			55	210	1380	1970	7.2	13.3	
			63	315	2000	2850	7.5	13.9	
			75	525	3350	4630	7.8	14.4	
			80	625	3900	5700	8.5	15.8	
	2x17x49	URT	65	210	1590	2270	9.5	17.4	
			75	310	2300	3280	10.9	20	
			85	430	3050	4350	11.9	21.9	
			90	525	3600	5130	12.4	22.8	
			110	850	5500	7840	13.8	26.5	
			140	1730	11000	15700	15.5	28.5	
			150	2090	13400	18500	15.6	28.7	
			160	2500	15600	22800	16.9	31.5	

Minimum operating voltage for all trip indicators = 20V

URE/URS/URT British Standard

Size	Description	Catalog No.
10x51mm	6,9 URE 10/5	D 082458
	6,9 URE 10/6	X 097057
	6,9 URE 10/10	C 082457
	6,9 URE 10/12	Z 079059
	6,9 URE 10/15	B 082456
	6,9 URE 10/20	A 082456

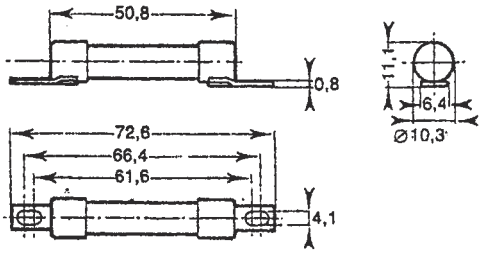
Size	Description	Catalog No.
17x49mm	6,9 URS 17/16	G 075883
	6,9 URS 17/20	H 075884
	6,9 URS 17/25	J 075885
	6,9 URS 17/32	K 075886
	6,9 URS 17/35	L 075887
	6,9 URS 17/40	M 075888
	6,9 URS 17/45	N 075889
	6,9 URS 17/50	P 075890
	6,9 URS 17/55	Q 075891
	6,9 URS 17/63	R 075892
	6,9 URS 17/75	S 075893
	6,9 URS 17/80	T 075894

Size	Description	Catalog No.
17x49mm	6,9 URS 17 P 16	V 075895
	6,9 URS 17 P 20	W 075896
	6,9 URS 17 P 25	X 075897
	6,9 URS 17 P 32	Y 075898
	6,9 URS 17 P 35	Z 075899
	6,9 URS 17 P 40	A 075900
	6,9 URS 17 P 45	B 075901
	6,9 URS 17 P 50	K 081084
	6,9 URS 17 P 55	C 075902
	6,9 URS 17 P 63	D 075903
	6,9 URS 17 P 75	E 075904
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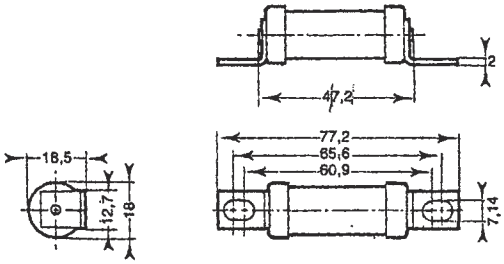
Size	Description	Catalog No.
2X17x49mm	6,9 URT 217/65	G 075906
	6,9 URT 217/75	F 099572
	6,9 URT 217/85	H 075907
	6,9 URT 217/90	A 099958
	6,9 URT 217/110	B 099959
	6,9 URT 217/140	J 075908
	6,9 URT 217/150	C 099960
	6,9 URT 217/160	K 075909

Size	Description	Catalog No.
2X17x49mm	6,9 URT 217 P 65	L 075910
	6,9 URT 217 P 75	M 075911
	6,9 URT 217 P 85	M 075912
	6,9 URT 217 P 90	P 075913
	6,9 URT 217 P 110	Q 075914
	6,9 URT 217 P 140	R 075915
	6,9 URT 217 P 150	S 075916
	6,9 URT 217 P 160	T 075917

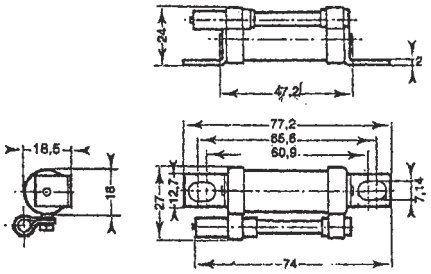
10x51 - without Trip-Indicator (mm)



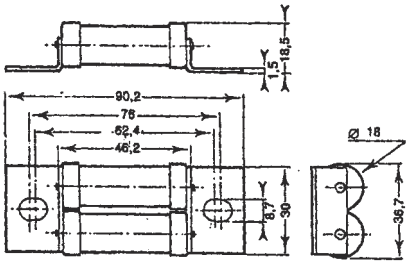
17x49 - without Trip-Indicator (mm)



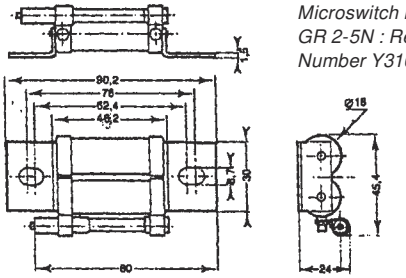
17x49 - with Separate Trip-Indicator (mm)



2x17x49 - without Trip-Indicator (mm)



2x17x49 - with Separate Trip-Indicator (mm)



Microswitch MC6,3 GR 2-5N : Reference Number Y310015

URR/URGL/URU/URGM British Standard

Protistor® fuses
690V
URR/URGL/URU/URGM from 75 to 800A
Sizes: 36 X 55 & 2 X 36 x 55 mm



Features/Benefits:

- Extremely high Interrupting rating fuses
- Protection of power semiconductors according to IEC 269.1 and 4
- aR class ratings from 75 to 800A according to IEC 269.4
- Complies with BS 88-4
  - without indicator
  - with external trip-indicator
  - with built in trip-indicator

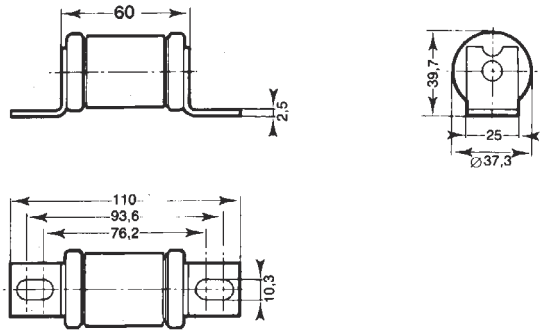
Applications Data

Voltage Rating U_N (V)	Size mm	Class	Current Rating I_N (A)	Melting I^2t @ 1 ms I^2t_p (A^2s)	Total Clearing I^2t @ UN I^2t_t (A^2s)		Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating
690 V	36x55	URR	75	350	1800	2000	9.7	19.5	200 kA @ 690 V
			110	1180	6000	6700	11.3	22.8	
			200	3900	18500	20500	21.8	41.4	
			250	8760	41000	46000	23.6	44.1	
		URGL	50	180	860	990	7.3	14.0	
			65	335	1600	1840	8.8	17.1	
			85	480	3450	4000	12.2	23.5	
			90	720	4100	4700	13.2	25.5	
			150	2880	12600	14500	18.9	35.3	
			180	5350	22500	25500	19.1	35.7	
			200	9510	40000	46000	17.7	33.1	
			250	21400	97000	110000	18.7	34.5	
			280	29100	125000	145000	20.3	38.0	
			315	38100	157000	180000	22.7	42.6	
			355	48200	190000	215000	25.9	48.5	
			400	72000	265000	305000	26.7	50.0	
	2x36x55	URU	200	4700	24000	27000	18.4	33.0	
			235	6920	34500	39000	21.0	37.6	
			400	21200	100000	110000	34.8	62.3	
			500	35000	164000	184000	47.2	88.2	
			630	97300	515000	575000	41.1	73.2	
		URGM	175	2880	13800	16000	24.7	47.6	
			300	13700	60000	68000	31.5	59.0	
			325	21400	90000	102000	30.0	54.0	
			355	25200	106000	120000	33.1	62.0	
			450	65600	300000	340000	34.6	63.8	
			500	85600	390000	440000	37.4	69.0	
			630	15200	630000	720000	45.4	85.2	
			710	193000	760000	860000	51.8	97.0	
			800	282000	1.06 106	1.22 106	53.4	100.0	

URR/URGL/URU/URGM British Standard

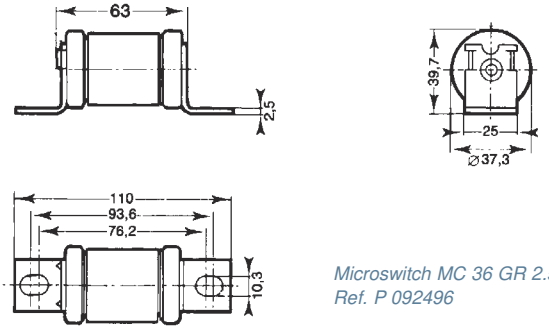
Size	Description	Catalog No.
36x55mm	6,9 URGL36/50	X097103
	6,9 URGL36/65	H097113
	6,9 URGL36/75	H097136
	6,9 URGL36/85	M097163
	6,9 URGL36/90	N097164
	6,9 URGL36/110	P097165
	6,9 URGL36/150	Q097167
	6,9 URGL36/180	S097168
	6,9 URR36/200	T097169
	6,9 URGL36/200	V097170
	6,9 URR36/250	W097171
	6,9 URGL36/280	A097175
	6,9 URGL36/315	B097176
	6,9 URGL36/355	C097177
	6,9 URGL36/400	D097178

36x55 - without Trip-Indicator (mm)



Size	Description	Catalog No.
36X55mm	6,9 URGL36T50	N097210
	6,9 URGL36T65	K097210
	6,9 URGL36T75	H099965
	6,9 URGL36T85	M097255
	6,9 URGL36T90	N097256
	6,9 URGL36T110	R099973
	6,9 URGL36T150	Z082178
	6,9 URGL36T180	P097257
	6,9 URR36T200	A085560
	6,9 URGL36T200	R097259
	6,9 URR36T250	W097263
	6,9 URGL36T250	X097266
	6,9 URGL36T280	Y097266
	6,9 URGL36T315	Z097266
	6,9 URGL36T355	A097267
	6,9 URGL36T400	C097269

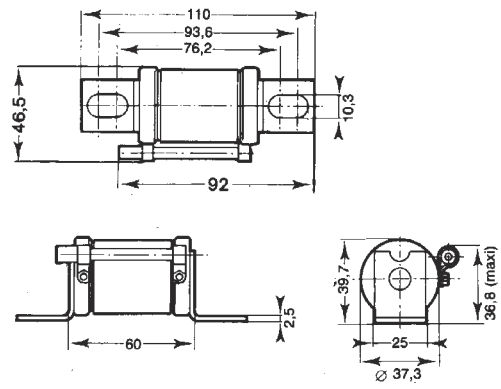
36x55 - with Built-in Trip-Indicator (mm)



Microswitch MC 36 GR 2.5 N - Ref. P 092496

Size	Description	Catalog No.
36X55mm	6,9 URGL36P90	H097182
	6,9 URR36P110	J097183
	6,9 URGL36P150	K097184
	6,9 URGL36P180	L097185
	6,9 URR36P200	M097186
	6,9 URGL36P200	N097187
	6,9 URR36P250	P097188
	6,9 URGL36P250	Q097189
	6,9 URGL36P280	R097190
	6,9 URGL36P315	V097193
	6,9 URGL36P355	Y097196
	6,9 URGL36P400	M097209

36x55 - with Separated Trip-Indicator (mm)

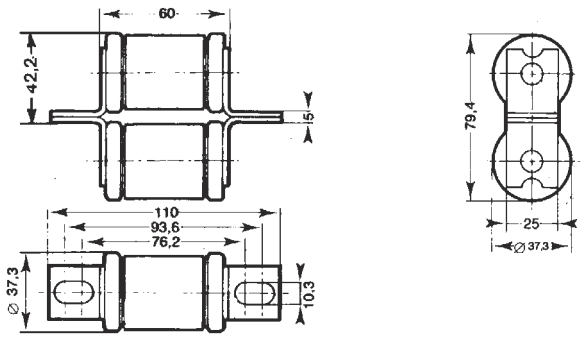


Microswitch MC 6.3 GR 2.5 N - Ref. Y 310015

URR/URGL/URU/URGM British Standard

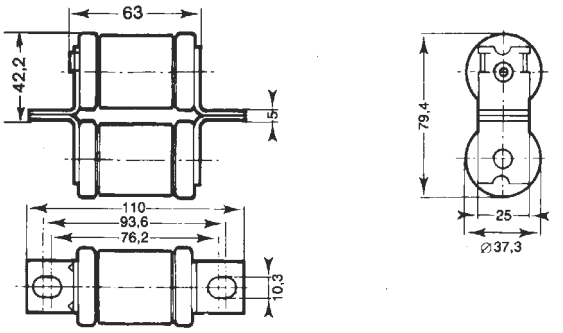
Size	Description	Catalog No.
2X36x55mm	6,9 URGM236/175	D097270
	6,9 URU236/200	F097272
	6,9 URU236/235	J097275
	6,9 URGM236/300	K097276
	6,9 URGM236/325	R097282
	6,9 URGM236/355	S097283
	6,9 URU236/400	T097284
	6,9 URGM236/450	Y097288
	6,9 URGM236/500	Z097289
	6,9 URU236/500	A097290
	6,9 URGM236/630	B097291
	6,9 URU236/630	R097351
	6,9 URGM236/710	S097352
	6,9 URGM236/800	Y097357

2x36x55 - without Trip-Indicator (mm)



Size	Description	Catalog No.
2X36x55mm	6,9 URGM236T175	F097456
	6,9 URU236T200	G097457
	6,9 URU236T235	A082179
	6,9 URGM236T300	S085553
	6,9 URGM236T325	J097463
	6,9 URGM236T355	N097463
	6,9 URU236T400	P097464
	6,9 URGM236T450	Q097465
	6,9 URGM236T500	R097466
	6,9 URU236T500	S097470
	6,9 URGM236T630	V097469
	6,9 URU236T630	W097470
	6,9 URGM236T710	C097476
	6,9 URGM236T800	D097477

2x36x55 - with Built-in Trip-Indicator (mm)



Microswitch MC 36 GR 2.5 N - Ref. P 092496

690/700 Volt PSC Square Body

Mersen 690/700V PSC fuse-links provide maximum flexibility in equipment design and ultimate protection for today's power conversion equipment. These square body fuse-links are available in four different body sizes, each size having seven worldwide acceptable mounting styles. The different mounting styles and body sizes along with a broad range of ampere ratings allow greatest flexibility in equipment design.

Mersen PSC fuses have been engineered to provide state-of-the-art protection for SCR's, diodes, thyristors, GTO's and IGBT devices. They have pure silver, die-cut elements embedded in solidified sand, which helps control arcing characteristics for low I^2t and high interrupting rating. All contact surfaces are silver plated and all hardware is non-magnetic.

All fuse links are equipped with a low voltage trip-indicator. This trip-indicator can operate a field mountable microswitch which is easily mounted directly onto the fuse even while in service.



Ratings:

Volts : 500-700 VAC
: DC - consult factory
Amps : 40-2500A
I.R. : 200kA I.R.

Features/Benefits:

- Choice of mounting styles gives wide choice for equipment design
- Broad range of ampere ratings in a given body size for design flexibility
- IEC 269-4 compliance for worldwide semiconductor applications

* For Microswitch information see page J7

Approvals:

- UL recognized component File E76491
- Sizes 30, 31 ,32, 33 tested to IEC 269.4

Highlights:

- Extremely fast-acting
- Current-limiting
- Very low I^2t
- Worldwide acceptability superior cycling ability

Applications:

- Protection of rectifiers, inverters, DC drives,
- UPS Systems, reduced voltage motor starters, and other equipment in globally accepted applications

Part Number Designation:

6,9 URD: European/IEC Mounting Style/Approval Tested @ 1.1 V_n

AO7O URD: North American Mounting Style/Approval Tested @ V_n

*V_n = rated voltage

N. American Reference Numbering System

A	070	URD	31	I	350

- A.C.
- Rated Volts (070=700V)
- Class
- Size: 30, 31, 32, 33
- Mounting Types: Straight-blade, short (KI); Straight-blade, long (LI); Flat-type, one hole (American) (TTI)
- Indicator
- Amp Rating

European Reference Numbering System

6.9	URD	31	I	350

- Rated Volts (6,9=690V)
- Class
- Size: 30, 31, 32, 33
- Mounting Types: DIN 80 (DO8A); DIN 110 (D11A); Flat-type, one hole (metric) (TTF); French Blade (EF)
- Indicator
- Amp Rating

690/700 Volt PSC Square Body

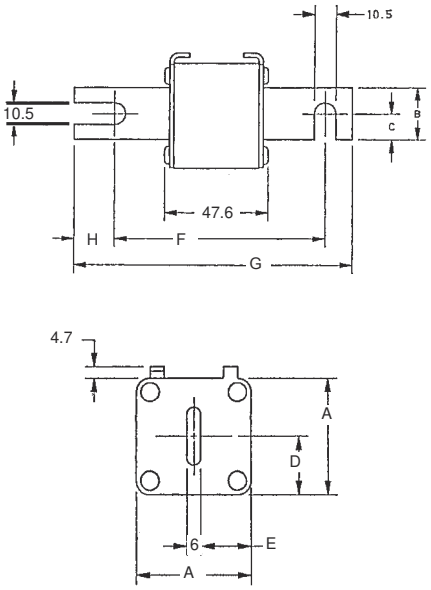
European Blade, Type DO8A

Body Size	Type	Dimensions - mm						
		A	B	C	D	E	F	G
30	D08	40	25	12.5	21	17	77	110
31		51	25	12.5	25	22.5	77	110
32		60	32	16	30	27	77	110
33		74.5	40	20	37.2	34.25	77	110

European Blade, Type D11A

Body Size	Type	Dimensions - mm						
		A	B	C	D	E	F	G
30	D11	40	25	12.5	21	17	101.6	134.6
31		51	25	12.5	25.5	22.5	101.6	134.6
32		60	32	16	30	27	101.6	134.6
33		74.5	40	20	37.2	34.25	101.6	134.6

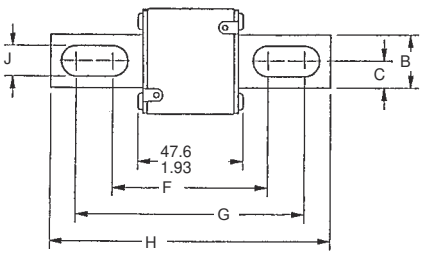
Outline Dimensions
Types D08A and D11A



North American Straight Blade, Type KI

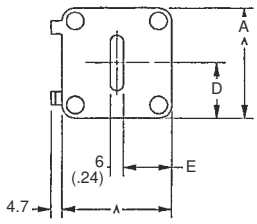
Body Size	Type	Dimensions - mm / in								
		A	B	C	D	E	F	G	H	J
30	KI	40	25	12.5	21	18	68	107	129	10.5
		(1.57)	(.98)	(.49)	(.83)	(.71)	(2.68)	(4.21)	(5.08)	(.41)
31		.51	25	12.5	25.5	22.5	67.6	107.1	128.8	14.3
32		60	32	16	30	27	74.2	109	134	14.6
		(2.36)	(1.26)	(.63)	(1.18)	(1.06)	2.92)	(4.29)	(5.28)	(.57)
33		74.5	40	20	37.2	34.2	75.4	107.6	134	15.9
		(2.93)	(1.57)	(.79)	(1.46)	(1.35	(2.97)	(4.24)	(5.28)	(.63)

Types KI and LI



North American Straight Blade, Type LI

Body Size	Type	Dimensions - mm /in								
		A	B	C	D	E	F	G	H	J
30	LI	40	25	12.5	21	18	87.6	126.6	148.6	10.5
		(1.57)	(.98)	(.49)	(.83)	(.71)	(3.45)	(4.98)	(5.85)	(.41)
31		51	25	12.5	25.5	22.5	91.6	122.4	148.6	14.6
		(2.01)	(.98)	(.49)	(1.00)	(.89)	(3.61)	(4.82)	(5.85)	(.57)
32		60	32	16	30	27	94.2	129	153	14.6
		(2.36)	(1.26)	(.63)	(1.18)	(1.06)	(3.71)	(5.08)	(6.02)	(.57)
33		74.5	40	20	37.2	34.2	94.4	126.6	153	15.9
		(2.93)	(1.57)	(.79)	(1.46)	(1.35)	(3.72)	(4.98)	(6.02)	(.63)



690/700 Volt PSC Square Body

North American Flat Single Hole, Type TTI

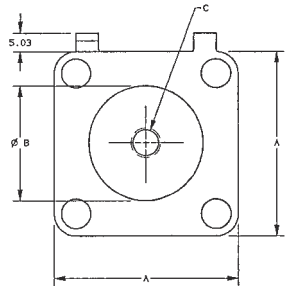
Body Size	Type	Dimensions - mm / in		
		A	B	C
30	TTI	1.57 (40)	1.00 (25)	5/16-18 x .35
31		2.00 (50.8)	1.19 (30.2)	5/16-18 x .35
32		2.37 (60.3)	1.50 (38.1)	3/8-16 x .35
33		2.94 (74.6)	1.81 (46)	1/2-13 x .35

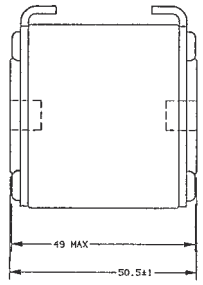
European Flat Single Hole, Type TTF

Body Size	Type	Dimensions - mm		
		A	B	C
30	TTF	40	26	M8 x 1.25 x 6 DP
31		51	30	M8 x 1.25 x 9 DP
32		60	38	M10 x 1.50 x 9 DP
33		74.5	46	M12 x 1.75 x 9 DP

Outline Dimensions

Types TTI and TTF

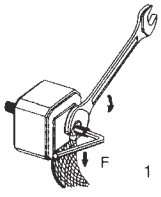


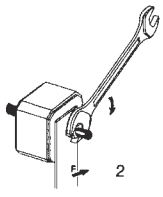


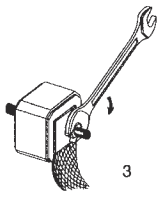
Standard Threaded Studs

Size	Ref. and Dimension Per Pair of Studs	Weight (g)	Max Stud Mounting Torque (Nm)	Max Nut Tightening Torque (Nm)*		
				Fig. 1	Fig. 2	Fig. 3
30 & 31	S 98 801 (HC M8 X 30 & M 8 X 35)	23	10	13.5	13.5	13.5
32	T 98 802 (HC M 10 X 30 & M 10 X 50)	40	15	26	26	26
33	V 98 803 (HC M 12 X 35 & M 12 X 50)	60		46	46	46
2X32	W 98 804 (HC M 10 X 50)	50		26	26	26
2X33	X 98 805 (HC M 12 X 50)	70		46	46	46

in.lbs = Nm/.113



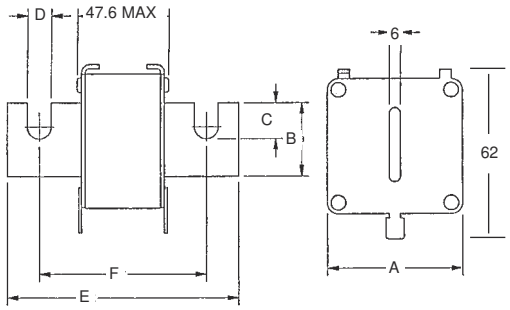




European French Blade, Type EF

Body Size	Type	Dimensions - mm					
		A	B	C	D	E	F
30	EF	40	18	11	9	100	76.6
31		50	25	16	10.5	110	86.5
32		59	32	21.2	13	13	90.8
33		74.5	40	19.5	13	13	91

Type EF



690/700 Volt PSC Square Body

690 Volt European/IEC Style Ratings and Application Data, D11A Mounting

Body Size	Amp Rating	Rated Voltage	Melting I^2t ($A^2s \times 10^3$)	Total I^2t @ 660VAC ($A^2s \times 10^3$)	** Watts Loss @ Rated Current (W)	Catalog No	New Description	Old Description
30	50	690	0.116	0.68	9	G301191	PC30UD69V50D1A	6,9URD30D11A0050
	63	690	0.2	1.09	14	Q300118	PC30UD69V63D1A	6,9URD30D11A0063
	80	690	0.33	1.75	19	R300119	PC30UD69V80D1A	6,9URD30D11A0080
	100	690	0.47	2.5	26	S300120	PC30UD69V100D1A	6,9URD30D11A0100
	125	690	0.85	4.5	30	T300121	PC30UD69V125D1A	6,9URD30D11A0125
	160	690	1.6	8.5	37	V300122	PC30UD69V160D1A	6,9URD30D11A0160
	200	690	3	15.5	42/43	W300123	PC30UD69V200D1A	6,9URD30D11A0200
	250	690	5.8	30	48/50	X300124	PC30UD69V250D1A	6,9URD30D11A0250
	315	690	12	62	53/55	Y300125	PC30UD69V315D1A	6,9URD30D11A0315
	350	690	15.5	80	57/60	Z300126	PC30UD69V350D1A	6,9URD30D11A0350
	400	690	23	120	60/65	A300127	PC30UD69V400D1A	6,9URD30D11A0400
	450	660	26	153	80/88	S300695	PC30UD69V450D1A	6,9URD30D11A0450
	500	660	41	245	80/88	Y301091	PC30UD69V500D1A	6,9URD30D11A0500
	550	660	52	305	80/90	Z301092	PC30UD69V550D1A	6,9URD30D11A0550
31	200	690	2.6	14	45	H300019	PC31UD69V200D1A	6,9URD31D11A0200
	250	690	4.7	25	52	J300020	PC31UD69V250D1A	6,9URD31D11A0250
	315	690	7.5	40	65	K300021	PC31UD69V315D1A	6,9URD31D11A0315
	350	690	10.5	55	67	P300048	PC31UD69V350D1A	6,9URD31D11A0350
	400	690	19	100	68	L300022	PC31UD69V400D1A	6,9URD31D11A0400
	450	690	26.5	140	70	M300023	PC31UD69V450D1A	6,9URD31D11A0450
	500	690	37	195	70/72	N300024	PC31UD69V500D1A	6,9URD31D11A0500
	550	690	52	280	70/75	P300025	PC31UD69V550D1A	6,9URD31D11A0550
	630	690	75	390	75/85	Q300026	PC31UD69V630D1A	6,9URD31D11A0630
	700	690	95	490	85/95	R300027	PC31UD69V700D1A	6,9URD31D11A0700
	800	660	140	815	105/120	H300709	PC31UD69V800D1A	6,9URD31D11A0800
32	400	690	15	80	72/75	P300186	PC32UD69V400D1A	6,9URD32D11A0400
	450	690	22	115	77/80	Q300187	PC32UD69V450D1A	6,9URD32D11A0450
	500	690	28	145	85/90	R300188	PC32UD69V500D1A	6,9URD32D11A0500
	550	690	37	195	90/95	S300189	PC32UD69V550D1A	6,9URD32D11A0550
	630	690	54	280	95/105	T300190	PC32UD69V630D1A	6,9URD32D11A0630
	700	690	76	400	100/110	V300191	PC32UD69V700D1A	6,9URD32D11A0700
	800	690	115	600	110/120	W300192	PC32UD69V800D1A	6,9URD32D11A0800
	900	660	170	900	110/125	X300193	PC32UD69V900D1A	6,9URD32D11A0900
	1000	660	240	1250	115/135	Y300194	PC32UD69V10CD1A	6,9URD32D11A1000
33	500	690	19	100	105	S300258	PC33UD69V500D1A	6,9URD33D11A0500
	550	690	27	140	105/110	T300259	PC33UD69V550D1A	6,9URD33D11A0550
	630	690	40	130	110/120	V300260	PC33UD69V630D1A	6,9URD33D11A0630
	700	690	55	300	115/125	W300261	PC33UD69V700D1A	6,9URD33D11A0700
	800	690	95	490	120/130	X300262	PC33UD69V800D1A	6,9URD33D11A0800
	900	690	135	700	120/135	Y300263	PC33UD69V900D1A	6,9URD33D11A0900
	1000	690	170	900	135/155	Z300264	PC33UD69V10CD1A	6,9URD33D11A1000
	1100	690	240	1260	135/160	A300265	PC33UD69V11CD1A	6,9URD33D11A1100
	1250	660	350	1850	150/180	B30026	PC33UD66V11CD1A	6,6URD33D11A1250
	1400	660	480	2500	160/200	C300267	PC33UD69V14CD1A	6,9URD33D11A1400
	1500	600	500		220	H301974	PC33UD60V15CD1A	6URD33D11A1500
	1600	600	555		210/240	Z301437	PC33UD60V16CD1A	6URD33D11A1600

*** Watts loss data is published for both blade and tapped style mounting configurations. When two watts loss values are shown this represents tapped/blade values respectively.*

690/700 Volt PSC Square Body

690 Volt European/IEC Style Ratings and Application Data, D08A Mounting

Body Size	Amp Rating	Rated Voltage	Melting I^2t ($A^2s \times 10^3$)	Total I^2t @ 660VAC ($A^2s \times 10^3$)	** Watts Loss @ Rated Current (W)	Catalog No	New Description	Old Description
30	50	690	0.116	0.68	9	F301926	PC30UD69V50A	6,9URD30D08A0050
	63	690	0.2	1.09	14	E300108	PC30UD69V63A	6,9URD30D08A0063
	80	690	0.33	1.75	19	F300109	PC30UD69V80A	6,9URD30D08A0080
	100	690	0.47	2.5	26	S300120	PC30UD69V100D1A	6,9URD30D11A0100
	125	690	0.85	4.5	30	H300111	PC30UD69V125A	6,9URD30D08A0125
	160	690	1.6	8.5	37	J300112	PC30UD69V160A	6,9URD30D08A0160
	200	690	3	15.5	42/43	K300113	PC30UD69V200A	6,9URD30D08A0200
	250	690	5.8	30	48/50	L300114	PC30UD69V250A	6,9URD30D08A0250
	315	690	12	62	53/55	M300115	PC30UD69V315A	6,9URD30D08A0315
	350	690	15.5	80	57/60	N300116	PC30UD69V350A	6,9URD30D08A0350
	400	690	23	120	60/65	P300117	PC30UD69V400A	6,9URD30D08A0400
	450	660	26	153	80/88	A300403	PC30UD69V450A	6,9URD30D08A0450
	500	660	41	245	80/88	B300404	PC30UD69V500A	6,9URD30D08A0500
	550	660	52	305	80/90	C300405	PC30UD69V550A	6,9URD30D08A0550
31	200	690	2.6	14	45	Y300010	PC31UD69V200A	6,9URD31D08A0200
	250	690	4.7	25	52	Z300011	PC31UD69V250A	6,9URD31D08A0250
	315	690	7.5	40	65	A300012	PC31UD69V315A	6,9URD31D08A0315
	350	690	10.5	55	67	Q300049	PC31UD69V350A	6,9URD31D08A0350
	400	690	19	100	68	B300013	PC31UD69V400A	6,9URD31D08A0400
	450	690	26.5	140	70	C300014	PC31UD69V450A	6,9URD31D08A0450
	500	690	37	195	70/72	D300015	PC31UD69V500A	6,9URD31D08A0500
	550	690	52	280	70/75	E300016	PC31UD69V550A	6,9URD31D08A0550
	630	690	75	390	75/85	F300017	PC31UD69V630A	6,9URD31D08A0630
	700	690	95	490	85/95	G300018	PC31UD69V700A	6,9URD31D08A0700
	800	660	140	815	105/120	D300406	PC31UD69V800A	6,9URD31D08A0800
32	400	690	15	80	72/75	E300177	PC32UD69V400A	6,9URD32D08A0400
	450	690	22	115	77/80	F300178	PC32UD69V450A	6,9URD32D08A0450
	500	690	28	145	85/90	G300179	PC32UD69V500A	6,9URD32D08A0500
	550	690	37	195	90/95	H300180	PC32UD69V550A	6,9URD32D08A0550
	630	690	54	280	95/105	J300181	PC32UD69V630A	6,9URD32D08A0630
	700	690	76	400	100/110	K300182	PC32UD69V700A	6,9URD32D08A0700
	800	690	115	600	110/120	L300183	PC32UD69V800A	6,9URD32D08A0800
	900	660	170	900	110/125	M300184	PC32UD69V900A	6,9URD32D08A0900
	1000	660	240	1250	115/135	N300185	PC32UD69V1000A	6,9URD32D08A1000
	1100	600	270	1620	140/165	W302101	PC32UD60V1100A	6URD32D08A1100
	1250	500	410	1940	150/180	G300409	PC32UD50V1250A	5,5URD32D08A1250
33	500	690	19	100	105	G300248	PC33UD69V500A	6,9URD33D08A0500
	550	690	27	140	105/110	H300249	PC33UD69V550A	6,9URD33D08A0550
	630	690	40	130	110/120	J300250	PC33UD69V630A	6,9URD33D08A0630
	700	690	55	300	115/125	K300251	PC33UD69V700A	6,9URD33D08A0700
	800	690	95	490	120/130	L300252	PC33UD69V800A	6,9URD33D08A0800
	900	690	135	700	120/135	M300253	PC33UD69V900A	6,9URD33D08A0900
	1000	690	170	900	135/155	N300254	PC33UD69V1000A	6,9URD33D08A1000
	1100	690	240	1260	135/160	P300255	PC33UD69V1100A	6,9URD33D08A1100
	1250	660	350	1850	150/180	Q300256	PC33UD69V1250A	6,9URD33D08A1250
	1400	660	480	2500	160/200	R300257	PC33UD69V1400A	6,9URD33D08A1400
	1500	600	500		220	M235071	PC33UD60V1500A	6URD33D08A1500
	1600	600	555		210/240	X301803	PC33UD60V1600A	6URD33D08A1600
	1800	600	720		225/260	E301971	PC33UD60V1800A	6URD33D08A1800

*** Watts loss data is published for both blade and tapped style mounting configurations. When two watts loss values are shown this represents tapped/blade values respectively.*

690/700 Volt PSC Square Body

690 Volt European/IEC Style Ratings and Application Data, EF Mounting

Body Size	Amp Rating	Rated Voltage	Melting I^2t ($A^2s \times 10^3$)	Total I^2t @ 660VAC ($A^2s \times 10^3$)	** Watts Loss @ Rated Current (W)	Catalog No	New Description	Old Description
30	50	690	0.116	0.68	9	R300372	PC30UD69V50EF	6,9URD30EF0050
	63	690	0.2	1.09	14	H300088	PC30UD69V63EF	6,9URD30EF0063
	80	690	0.33	1.75	19	J300089	PC30UD69V80EF	6,9URD30EF0080
	100	690	0.47	2.5	26	K300090	PC30UD69V100EF	6,9URD30EF0100
	125	690	0.85	4.5	30	L300091	PC30UD69V125EF	6,9URD30EF0125
	160	690	1.6	8.5	37	M300092	PC30UD69V160EF	6,9URD30EF0160
	200	690	3	15.5	42/43	N300093	PC30UD69V200EF	6,9URD30EF0200
	250	690	5.8	30	48/50	P300094	PC30UD69V250EF	6,9URD30EF0250
	315	690	12	62	53/55	Q300095	PC30UD69V315EF	6,9URD30EF0315
	350	690	15.5	80	57/60	R300096	PC30UD69V350EF	6,9URD30EF0350
	400	690	23	120	60/65	S300097	PC30UD69V400EF	6,9URD30EF0400
31	200	690	2.6	14	45	C300037	PC31UD69V200EF	6,9URD31EF0200
	250	690	4.7	25	52	D300038	PC31UD69V250EF	6,9URD31EF0250
	315	690	7.5	40	65	E300039	PC31UD69V315EF	6,9URD31EF0315
	350	690	10.5	55	67	N300047	PC31UD69V350EF	6,9URD31EF0350
	400	690	19	100	68	F300040	PC31UD69V400EF	6,9URD31EF0400
	450	690	26.5	140	70	G300041	PC31UD69V450EF	6,9URD31EF0450
	500	690	37	195	70/72	H300042	PC31UD69V500EF	6,9URD31EF0500
	550	690	52	280	70/75	J300043	PC31UD69V550EF	6,9URD31EF0550
	630	690	75	390	75/85	K300044	PC31UD69V630EF	6,9URD31EF0630
	700	690	95	490	85/95	L300045	PC31UD69V700EF	6,9URD31EF0700
32	400	690	15	80	72/75	V300168	PC32UD69V400EF	6,9URD32EF0400
	450	690	22	115	77/80	W300169	PC32UD69V450EF	6,9URD32EF0450
	500	690	28	145	85/90	X300170	PC32UD69V500EF	6,9URD32EF0500
	550	690	37	195	90/95	Y300171	PC32UD69V550EF	6,9URD32EF0550
	630	690	54	280	95/105	Z300172	PC32UD69V630EF	6,9URD32EF0630
	700	690	76	400	100/110	A300173	PC32UD69V700EF	6,9URD32EF0700
	800	690	115	600	110/120	B300174	PC32UD69V800EF	6,9URD32EF0800
	900	660	170	900	110/125	C300175	PC32UD69V900EF	6,9URD32EF0900
	1000	660	240	1250	115/135	D300176	PC32UD69V1000EF	6,9URD32EF1000
33	500	690	19	100	105	Z300218	PC33UD69V500EF	6,9URD33EF0500
	550	690	27	140	105/110	A300219	PC33UD69V550EF	6,9URD33EF0550
	630	690	40	130	110/120	B300220	PC33UD69V630EF	6,9URD33EF0630
	700	690	55	300	115/125	C300221	PC33UD69V700EF	6,9URD33EF0700
	800	690	95	490	120/130	D300222	PC33UD69V800EF	6,9URD33EF0800
	900	690	135	700	120/135	E300223	PC33UD69V900EF	6,9URD33EF0900
	1000	690	170	900	135/155	F300224	PC33UD69V1000EF	6,9URD33EF1000
	1100	690	240	1260	135/160	G300225	PC33UD69V1100EF	6,9URD33EF1100
	1250	660	350	1850	150/180	H300226	PC33UD69V1250EF	6,9URD33EF1250
	1400	660	480	2500	160/200	J300227	PC33UD69V1400EF	6,9URD33EF1400

** Watts loss data is published for both blade and tapped style mounting configurations. When two watts loss values are shown this represents tapped/blade values respectively.

690/700 Volt PSC Square Body

690 Volt European/IEC Style Ratings and Application Data, TTF Mounting

Body Size	Amp Rating	Rated Voltage	Melting I^2t ($A^2s \times 10^3$)	Total I^2t @ 660VAC ($A^2s \times 10^3$)	** Watts Loss @ Rated Current (W)	Catalog No	New Description	Old Description
30	50	690	0.116	0.68	9	S300373C	PC30UD69V50TF	6,9URD30TTF0050
	63	690	0.2	1.09	14	M300000C	PC30UD69V63TF	6,9URD30TTF0063
	80	690	0.33	1.75	19	S300051C	PC30UD69V80TF	6,9URD30TTF0080
	100	690	0.47	2.5	26	T300052C	PC30UD69V100TF	6,9URD30TTF0100
	125	690	0.85	4.5	30	V300053C	PC30UD69V125TF	6,9URD30TTF0125
	160	690	1.6	8.5	37	W300054C	PC30UD69V160TF	6,9URD30TTF0160
	200	690	3	15.5	42/43	X300055C	PC30UD69V200TF	6,9URD30TTF0200
	250	690	5.8	30	48/50	Y300056C	PC30UD69V250TF	6,9URD30TTF0250
	315	690	12	62	53/55	Z300057C	PC30UD69V315TF	6,9URD30TTF0315
	350	690	15.5	80	57/60	A300058C	PC30UD69V350TF	6,9URD30TTF0350
	400	690	23	120	60/65	B300059C	PC30UD69V400TF	6,9URD30TTF0400
	450	660	26	153	80/88	V300398C	PC30UD69V450TF	6,9URD30TTF0450
	500	660	41	245	80/88	W300399C	PC30UD69V500TF	6,9URD30TTF0500
	550	660	52	305	80/90	X300400C	PC30UD69V550TF	6,9URD30TTF0550
31	200	690	2.6	14	45	N300001C	PC31UD69V200TF	6,9URD31TTF0200
	250	690	4.7	25	52	P300002C	PC31UD69V250TF	6,9URD31TTF0250
	315	690	7.5	40	65	Q300003C	PC31UD69V315TF	6,9URD31TTF0315
	350	690	10.5	55	67	M300046C	PC31UD69V350TF	6,9URD31TTF0350
	400	690	19	100	68	R300004C	PC31UD69V400TF	6,9URD31TTF0400
	450	690	26.5	140	70	S300005C	PC31UD69V450TF	6,9URD31TTF0450
	500	690	37	195	70/72	T300006C	PC31UD69V500TF	6,9URD31TTF0500
	550	690	52	280	70/75	V300007C	PC31UD69V550TF	6,9URD31TTF0550
	630	690	75	390	75/85	W300008C	PC31UD69V630TF	6,9URD31TTF0630
	700	690	95	490	85/95	X300009C	PC31UD69V700TF	6,9URD31TTF0700
	800	660	140	815	105/120	Y300401C	PC31UD69V800TF	6,9URD31TTF0800
32	400	690	15	80	72/75	H300065C	PC32UD69V400TF	6,9URD32TTF0400
	450	690	22	115	77/80	J300066C	PC32UD69V450TF	6,9URD32TTF0450
	500	690	28	145	85/90	K300067C	PC32UD69V500TF	6,9URD32TTF0500
	550	690	37	195	90/95	L300068C	PC32UD69V550TF	6,9URD32TTF0550
	630	690	54	280	95/105	M300069C	PC32UD69V630TF	6,9URD32TTF0630
	700	690	76	400	100/110	N300070C	PC32UD69V700TF	6,9URD32TTF0700
	800	690	115	600	110/120	P300071C	PC32UD69V800TF	6,9URD32TTF0800
	900	660	170	900	110/125	Q300072C	PC32UD69V900TF	6,9URD32TTF0900
	1000	660	240	1250	115/135	S300074C	PC32UD69V1000TF	6,9URD32TTF1000
	1100	600	270	1620	140/165	M300759C	PC32UD60V1100TF	6URD32TTF1100
	1250	500	410	1940	150/180	P301060C	PC32UD55V1250TF	5,5URD32TTF1250
33	500	690	19	100	105	V300076C	PC33UD69V500TF	6,9URD33TTF0500
	550	690	27	140	105/110	W300077C	PC33UD69V550TF	6,9URD33TTF0550
	630	690	40	130	110/120	X300078C	PC33UD69V630TF	6,9URD33TTF0630
	700	690	55	300	115/125	Y300079C	PC33UD69V700TF	6,9URD33TTF0700
	800	690	95	490	120/130	Z300080C	PC33UD69V800TF	6,9URD33TTF0800
	900	690	135	700	120/135	A300081C	PC33UD69V900TF	6,9URD33TTF0900
	1000	690	170	900	135/155	B300082C	PC33UD69V1000TF	6,9URD33TTF1000
	1100	690	240	1260	135/160	C300083C	PC33UD69V1100TF	6,9URD33TTF1100
	1250	660	350	1850	150/180	D300084C	PC33UD69V1250TF	6,9URD33TTF1250
	1400	660	480	2500	160/200	E300085C	PC33UD69V1400TF	6,9URD33TTF1400
	1500	600	500		220	Y300585C	PC33UD60V1500TF	6URD33TTF1500
	1600	600	555		210/240	Z300586C	PC33UD60V1600TF	6URD33TTF1600
	1800	600	720		225/260	A300587C	PC33UD60V1800TF	6URD33TTF1800
	2000	550	950		250/290	B300588C	PC33UD55V2000TF	5,5URD33TTF2000
	2250	500	1250		280/330	K300757C	PC33UD50V2250TF	5URD33TTF2250
	2500	450	1870		280/330	L300758C	PC33UD45V2500TF	4,5URD33TTF2500

*** Watts loss data is published for both blade and tapped style mounting configurations. When two watts loss values are shown this represents tapped/blade values respectively.*

690/700 Volt PSC Square Body

700 Volt North American Style Ratings and Application Data, LI Mounting

Body Size	Amp Rating	Rated Voltage	Melting I^2t ($A^2s \times 10^3$)	Total I^2t @ 660VAC ($A^2s \times 10^3$)	** Watts Loss @ Rated Current (W)	Catalog No	New Description	Old Description
30	63	700	0.2	1.2	14	M300138	A070UD30LI63	A070URD30LI0063
	80	700	0.33	1.9	19	N300139	A070UD30LI080	A070URD30LI0080
	100	700	0.47	2.7	26	P300140	A070UD30LI100	A070URD30LI0100
	125	700	0.85	4.9	30	Q300141	A070UD30LI125	A070URD30LI0125
	160	700	1.6	9.2	37	R300142	A070UD30LI160	A070URD30LI0160
	200	700	3	16.7	42/43	S300143	A070UD30LI200	A070URD30LI0200
	250	700	5.8	32.4	48/50	T300144	A070UD30LI250	A070URD30LI0250
	315	700	12	67	53/55	V300145	A070UD30LI315	A070URD30LI0315
	350	700	15.5	86	57/60	W300146	A070UD30LI350	A070URD30LI0350
	400	700	23	130	60/65	X300147	A070UD30LI400	A070URD30LI0400
	450	700	26	165	80/88	K300527	A070UD30LI450	A070URD30LI0450
	500	700	41	264	80/88	L300528	A070UD30LI500	A070URD30LI0500
	550	700	52	330	80/90	M300529	A070UD30LI550	A070URD30LI0550
31	200	700	2.5	14.6	45	V300697	A070UD31LI200	A070URD31LI0200
	250	700	4.7	27	52	W300698	A070UD31LI250	A070URD31LI0250
	315	700	7.5	43	65	X300699	A070UD31LI315	A070URD31LI0315
	350	700	10.5	59	67	Y300700	A070UD31LI350	A070URD31LI0350
	400	700	19	110	68	Z300701	A070UD31LI400	A070URD31LI0400
	450	700	26.5	150	70	A300702	A070UD31LI450	A070URD31LI0450
	500	700	37	210	70/72	B300703	A070UD31LI500	A070URD31LI0500
	550	700	52	300	70/75	C300704	A070UD31LI550	A070URD31LI0550
	630	700	75	421	75/85	D300705	A070UD31LI630	A070URD31LI0630
	700	700	95	530	85/95	E300706	A070UD31LI700	A070URD31LI0700
	800	700	140	880	105/120	F300707	A070UD31LI800	A070URD31LI0800
32	400	700	15	86	72/75	J300204	A070UD32LI400	A070URD32LI0400
	450	700	22	124	77/80	K300205	A070UD32LI450	A070URD32LI0450
	500	700	28	157	85/90	L300206	A070UD32LI500	A070URD32LI0500
	550	700	37	211	90/95	M300207	A070UD32LI550	A070URD32LI0550
	630	700	54	302	95/105	N300208	A070UD32LI630	A070URD32LI0630
	700	700	76	432	100/110	P300209	A070UD32LI700	A070URD32LI0700
	800	700	115	648	110/120	Q300210	A070UD32LI800	A070URD32LI0800
	900	700	170	972	110/125	R300211	A070UD32LI900	A070URD32LI0900
	1000	700	240	1350	115/135	S300212	A070UD32LI1000	A070URD32LI1000
	1100	650	270	1620	140/165	B301071	A065UD32LI1100	A065URD32LI1100
	1250	600	410	2100	150/180	C301072	A060UD32LI1250	A060URD32LI1250
	1400	550	555	2600	160/190	D301073	A055UD32LI1400	A055URD32LI1400
	1600	550	870	4000	165/195	E301074	A055UD32LI1600	A055URD32LI1600
	1800	500	1050	4400	195/330	F301075	A050UD32LI1800	A050URD32LI1800
33	500	700	19	108	105	K300228	A070UD33LI500	A070URD33LI0500
	550	700	27	151	105/110	L300229	A070UD33LI550	A070URD33LI0550
	630	700	40	227	110/120	M300230	A070UD33LI630	A070URD33LI0630
	700	700	55	324	115/125	N300231	A070UD33LI700	A070URD33LI0700
	800	700	95	529	120/130	P300232	A070UD33LI800	A070URD33LI0800
	900	700	135	760	120/135	Q300233	A070UD33LI900	A070URD33LI0900
	1000	700	170	970	135/155	R300234	A070UD33LI1000	A070URD33LI1000
	1100	700	240	1360	135/160	S300235	A070UD33LI1100	A070URD33LI1100
	1250	700	350	2000	150/180	T300236	A070UD33LI1250	A070URD33LI1250
	1400	700	480	2700	160/200	V300237	A070UD33LI1400	A070URD33LI1400
	1600	650	555	3250	210/240	G301076	A065UD33LI1600	A065URD33LI1600
	1800	650	720	4330	225/260	H301077	A065UD33LI1800	A065URD33LI1800
	2000	600	950	5000	250/290	J301078	A060UD33LI2000	A060URD33LI2000
	2250	550	1250	5900	280/330	K301079	A055UD33LI2250	A055URD33LI2250
	2500	500	1870	7600	280/330	L301080	A050UD33LI2500	A050URD33LI2500

*** Watts loss data is published for both blade and tapped style mounting configurations. When two watts loss values are shown this represents tapped/blade values respectively.*

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

690/700 Volt PSC Square Body

700 Volt North American Style Ratings and Application Data, KI Mounting

Body Size	Amp Rating	Rated Voltage	Melting I^2t ($A^2s \times 10^3$)	Total I^2t @ 660VAC ($A^2s \times 10^3$)	** Watts Loss @ Rated Current (W)	Catalog No	New Description	Old Description
	63	700	0.2	11.2	14	B300128	A070UD30KI63	A070URD30KI0063
	80	700	0.33	1.9	19	C300129	A070UD30KI80	A070URD30KI0080
	100	700	0.47	2.7	26	D300130	A070UD30KI100	A070URD30KI0100
	125	700	0.85	4.9	30	E300131	A070UD30KI125	A070URD30KI0125
	160	700	1.6	9.2	37	F300132	A070UD30KI160	A070URD30KI0160
	200	700	3	16.7	42/43	G300133	A070UD30KI200	A070URD30KI0200
30	250	700	5.8	32.4	48/50	H300134	A070UD30KI250	A070URD30KI0250
	315	700	12	67	53/55	J300135	A070UD30KI315	A070URD30KI0315
	350	700	15.5	86	57/60	K300136	A070UD30KI350	A070URD30KI0350
	400	700	23	130	60/65	L300137	A070UD30KI400	A070URD30KI0400
	450	700	26	165	80/88	T301064	A070UD30KI450	A070URD30KI0450
	500	700	41	264	80/88	V301065	A070UD30KI500	A070URD30KI0500
	550	700	52	330	80/90	W301066	A070UD30KI550	A070URD30KI0550
	200	700	2.5	14.6	45	S300028	A070UD31KI200	A070URD31KI0200
	250	700	4.7	27	52	T300029	A070UD31KI250	A070URD31KI0250
	315	700	7.5	43	65	V300030	A070UD31KI315	A070URD31KI0315
	350	700	10.5	59	67	R300050	A070UD31KI350	A070URD31KI0350
	400	700	19	110	68	W300031	A070UD31KI400	A070URD31KI0400
31	450	700	26.5	150	70	X300032	A070UD31KI450	A070URD31KI0450
	500	700	37	210	70/72	Y300033	A070UD31KI500	A070URD31KI0500
	550	700	52	300	70/75	Z300034	A070UD31KI550	A070URD31KI0550
	630	700	75	421	75/85	A300035	A070UD31KI630	A070URD31KI0630
	700	700	95	530	85/95	B300036	A070UD31KI700	A070URD31KI0700
	800	700	140	880	105/120	A301070	A070UD31KI800	A070URD31KI0800
	400	700	15	86	72/75	Z300195	A070UD32KI400	A070URD32KI0400
	450	700	22	124	77/80	A300196	A070UD32KI450	A070URD32KI0450
	500	700	28	157	85/90	B300197	A070UD32KI500	A070URD32KI0500
	550	700	37	211	90/95	C300198	A070UD32KI550	A070URD32KI0550
32	630	700	54	302	85/105	D300199	A070UD32KI630	A070URD32KI0630
	700	700	76	432	100/110	E300200	A070UD32KI700	A070URD32KI0700
	800	700	115	648	110/120	F300201	A070UD32KI800	A070URD32KI0800
	900	700	170	972	110/125	G300202	A070UD32KI900	A070URD32KI0900
	1000	700	240	1350	115/135	H300203	A070UD32KI1000	A070URD32KI1000
	500	700	19	108	105	W300238	A070UD33KI500	A070URD33KI0500
	550	700	27	151	105/110	X300239	A070UD33KI550	A070URD33KI0550
	630	700	40	227	110/120	Y300240	A070UD33KI630	A070URD33KI0630
	700	700	55	324	115/125	Z300241	A070UD33KI700	A070URD33KI0700
	800	700	95	529	120/130	A300242	A070UD33KI800	A070URD33KI0800
33	900	700	135	760	120/135	B300243	A070UD33KI900	A070URD33KI0900
	1000	700	170	970	135/155	C300244	A070UD33KI1000	A070URD33KI1000
	1100	700	240	1360	135/160	D300245	A070UD33KI1100	A070URD33KI1100
	1250	700	350	2000	150/180	E300246	A070UD33KI1250	A070URD33KI1250
	1400	700	480	2700	160/200	F300247	A070UD33KI1400	A070URD33KI1400
	1600	650	555	3250	210/240	E302063	A065UD33KI1600	A065URD33KI1600

*** Watts loss data is published for both blade and tapped style mounting configurations. When two watts loss values are shown this represents tapped/blade values respectively.*

690/700 Volt PSC Square Body

700 Volt North American Style Ratings and Application Data,TTI Mounting

Body Size	Amp Rating	Rated Voltage	Melting I^2t ($A^2s \times 10^3$)	Total I^2t @ 660VAC ($A^2s \times 10^3$)	** Watts Loss @ Rated Current (W)	Catalog No	New Description	Old Description
30	63	700	0.2	1.2	14	A301967	A070UD30TTI63	A070URD30TTI0063
	80	700	0.33	1.9	19	V301962	A070UD30TTI80	A070URD30TTI0080
	100	700	0.47	2.7	26	W300744	A070UD30TTI100	A070URD30TTI0100
	125	700	0.85	4.9	30	G300708	A070UD30TTI125	A070URD30TTI0125
	160	700	1.6	9.2	37	N300576	A070UD30TTI160	A070URD30TTI0160
	200	700	3	16.7	42/43	P300577	A070UD30TTI200	A070URD30TTI0200
	250	700	5.8	32.4	48/50	Q300578	A070UD30TTI250	A070URD30TTI0250
	315	700	12	67	53/55	R300579	A070UD30TTI315	A070URD30TTI0315
	350	700	15.5	86	57/60	S300580	A070UD30TTI350	A070URD30TTI0350
	400	700	23	130	60/65	T300581	A070UD30TTI400	A070URD30TTI0400
	450	700	26	165	80/88	V300582	A070UD30TTI450	A070URD30TTI0450
	500	700	41	264	80/88	W300583	A070UD30TTI500	A070URD30TTI0500
	550	700	52	330	80/90	X300584	A070UD30TTI550	A070URD30TTI0550
31	200	700	2.5	14.6	45	A300472	A070UD31TTI200	A070URD31TTI0200
	250	700	4.7	27	52	B300473	A070UD31TTI250	A070URD31TTI0250
	315	700	7.5	43	65	C300474	A070UD31TTI315	A070URD31TTI0315
	350	700	10.5	59	67	D300475	A070UD31TTI350	A070URD31TTI0350
	400	700	19	110	68	E300476	A070UD31TTI400	A070URD31TTI0400
	450	700	26.5	150	70	F300477	A070UD31TTI450	A070URD31TTI0450
	500	700	37	210	70/72	G300478	A070UD31TTI500	A070URD31TTI0500
	550	700	52	300	70/75	H300479	A070UD31TTI550	A070URD31TTI0550
	630	700	75	421	75/85	J300480	A070UD31TTI630	A070URD31TTI0630
	700	700	95	530	85/95	K300481	A070UD31TTI700	A070URD31TTI0700
	800	700	140	880	105/120	L300482	A070UD31TTI800	A070URD31TTI0800
32	400	700	15	86	72/75	Q300463	A070UD32TTI400	A070URD32TTI0400
	450	700	22	124	77/80	N300461	A070UD32TTI450	A070URD32TTI0450
	500	700	28	157	85/90	P300462	A070UD32TTI500	A070URD32TTI0500
	550	700	37	211	90/95	R300464	A070UD32TTI550	A070URD32TTI0550
	630	700	54	302	95/105	S300465	A070UD32TTI630	A070URD32TTI0630
	700	700	76	432	100/110	T300466	A070UD32TTI700	A070URD32TTI0700
	800	700	115	648	110/120	V300467	A070UD32TTI800	A070URD32TTI0800
	900	700	170	972	110/125	W300468	A070UD32TTI900	A070URD32TTI0900
	1000	700	240	1350	115/135	X300469	A070UD32TTI1000	A070URD32TTI1000
	1100	650	270	1620	140/165	M301081	A065UD32TTI1100	A065URD32TTI1100
	1250	600	410	2100	150/180	N301082	A060UD32TTI1250	A060URD32TTI1250
	1400	550	555	2600	160/190	P301083	A055UD32TTI1400	A055URD32TTI1400
	1600	550	870	4000	165/195	Q301084	A055UD32TTI1600	A055URD32TTI1600
	1800	500	1050	4400	195/330	R301085	A050UD32TTI1800	A050URD32TTI1800
33	500	700	19	108	105	X300446	A070UD33TTI500	A070URD33TTI0500
	550	700	27	151	105/110	Y300447	A070UD33TTI550	A070URD33TTI0550
	630	700	40	227	110/120	Z300448	A070UD33TTI630	A070URD33TTI0630
	700	700	55	324	115/125	A300449	A070UD33TTI700	A070URD33TTI0700
	800	700	95	529	120/130	T300443	A070UD33TTI800	A070URD33TTI0800
	900	700	135	760	120/135	B300450	A070UD33TTI900	A070URD33TTI0900
	1000	700	170	970	135/155	C300451	A070UD33TTI1000	A070URD33TTI1000
	1100	700	240	1360	135/160	D300452	A070UD33TTI1100	A070URD33TTI1100
	1250	700	350	2000	150/180	E300453	A070UD33TTI1250	A070URD33TTI1250
	1400	700	480	2700	160/200	F300454	A070UD33TTI1400	A070URD33TTI1400
	1600	650	555	3250	210/240	S301086	A065UD33TTI1600	A065URD33TTI1600
	1800	650	720	4330	225/260	T301087	A065UD33TTI1800	A065URD33TTI1800
	2000	600	950	5000	250/290	V301088	A060UD33TTI2000	A060URD33TTI2000
	2250	550	1250	5900	280/330	W301089	A055UD33TTI2250	A055URD33TTI2250
	2500	500	1870	7600	280/330	Y300838	A050UD33TTI2500	A050URD33TTI2500

*** Watts loss data is published for both blade and tapped style mounting configurations. When two watts loss values are shown this represents tapped/blade values respectively.*

690/700 Volt PSC Square Body

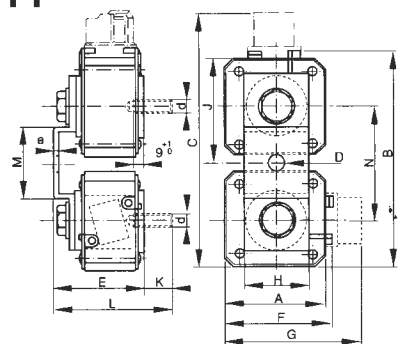
2x32, 2x33

Size	Catalog No	New Description	Old Description	Weight (g)
2 X 32	T300213A	PC232UD69V10CTF	6,9URD232TTF1000	1240
	V300214A	PC232UD69V13CTF	6,9URD232TTF1250	
	G300087A	PC232UD69V14CTF	6,9URD232TTF1400	
	W300215A	PC232UD69V16CTD	6,9URD232TDF1600	3300
	X300216A	PC232UD69V18CTD	6,9URD232TDF1800	
	Y300217A	PC232UD69V20CTD	6,9URD232TDF2000	
	D301993A	PC232UD55V22CTD	5,5URD232TDF2200	
2 X 33	D300268A	PC233UD69V13CTF	6,9URD233TTF1250	1900
	E300269A	PC233UD69V14CTF	6,9URD233TTF1400	
	F300270A	PC233UD69V16CTF	6,9URD233TTF1600	
	B300427A	PC36UD69V18CP11	6,9URD233PLAF1800	2000
	R302235A	PC36UD60V20CP11	6URD233PLAF2000	
	Q302234A	PC36UD60V22CP11	6URD233PLAF2200	
	P302233A	PC36UD60V25CP11	6URD233PLAF2500	
	N302232A	PC36UD60V28CP11	6URD233PLAF2800	
	L301977A	PC36UD55V30CP11	5,5URD233PLAF3000	
	M301978A	PC36UD55V32CP11	5,5URD233PLAF3200	
	N301979A	PC36UD50V36CP11	5URD233PLAF3600	
	P301980A	PC36UD50V40CP11	5URD233PLAF4000	
	Q301981A	PC36UD45V45CP11	4,5URD233PLAF4500	
	R301982A	PC36UD40V50CP11	4URD233PLAF5000	

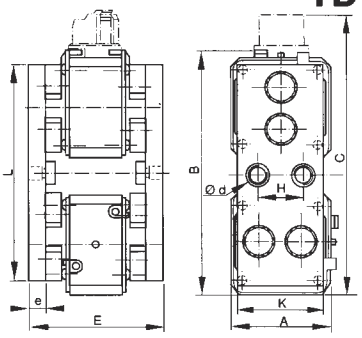
Dimensions (mm)

Size	A	B	C	D	E	F	G	H	J	K	d	e	L	M	N
2x32 TT	60	138,5	172	11	67,6	66,5	100	35	61	40	M 10	4	107,5	48	72
2x33 TT	74,5	167	200	13	67,6	81	114	50	80	40	M 12	4	107,5	54	86
2x32 TD	65,5	147	182	-	91,5	-	-	30	-	60	M 10	12	140	-	-
2x33 PLAF	75	171,5	207	-	55,5	-	115	40	-	71	M 10	15	81	-	-

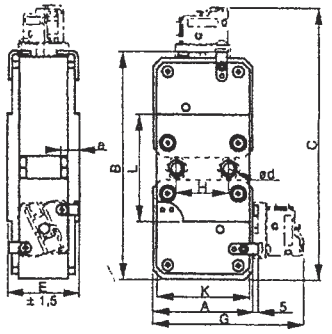
TT



TD



PLAF



Studs and microswitches supplied separately

1250/1300 Volt PSC Square Body

Mersen 1250/1300V PSC fuse-links provide maximum flexibility in equipment design and ultimate protection for today's power conversion equipment. These square body fuse-links are available in four different body sizes, each size having four worldwide acceptable mounting styles. The different mounting styles and body sizes along with a broad range of ampere ratings allow greatest flexibility in equipment design.

Mersen PSC fuses have been engineered to provide state-of-the-art protection for SCR's, diodes, thyristors, GTO's and IGBT devices. They have pure silver die-cut elements embedded in solidified sand which helps control arcing characteristics for low I^2t and high interrupting rating. All contact surfaces are silver plated and all hardware is non-magnetic.

All fuse links are equipped with a low voltage trip-indicator. This trip-indicator can operate a field mountable microswitch which is easily mounted directly onto the fuse even while in service.



Ratings:

Volts : 650-1300 VAC
Amps : AC - 50-1800A
I.R. : 100kA I.R. AC
DC : Consult Factory

Features/Benefits:

- Choice of mounting styles gives wide choice for equipment design
- Broad range of ampere ratings in a given body size for design flexibility
- IEC 269-4 compliance for fuses for worldwide semiconductor applications

*For Microswitch information see page J9

Approvals:

- UL recognized component File E76491
- Sizes 70,71,72,73 tested to IEC 269.4

Highlights:

- Extremely fast acting
- Current limiting
- Very low I^2t
- Superior cycling ability

Applications:

- Protection of rectifiers, inverters, DC drives, UPS Systems, reduced voltage motor starters, and other equipment in globally accepted applications

Part Number Designation:

12,5 URD: European/IEC Mounting Style/Approval Tested @ 1.1 V_n

A130 URD: North American Mounting Style/Approval Tested @ V_n

*V_n = rated voltage

N. American Reference Numbering System

A	130	URD	71	I	350

- A.C.
- Rated Volts (030=1300V)
- Class
- Size: 70, 71, 72, 73
- Mounting Types: Straight-blade LI; Straight-blade LLI; Flat-type, one hole (American) TTI
- Indicator
- Amp Rating

European Reference Numbering System

12.5	URD	71	I	350

- Rated Volts (12.5=1250V)
- Class
- Size: 70, 71, 72, 73
- Mounting Types: DIN 110 D11A; Flat-type, one hole (metric) TTF
- Indicator
- Amp Rating

1250/1300 Volt PSC Square Body

European Blade DIN 110, Type D11A

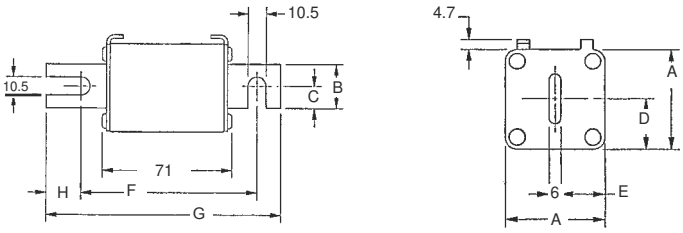
Body Size	Type	Dimensions - mm (in) A	B	C	D	E	F	G
70	D11	40 (1.57)	25 (.98)	12.5 (.49)	21 (.83)	17 (.67)	100.4 (3.95)	133.4 (5.25)
71		51 (2.01)	25 (.98)	12.5 (.49)	25.5 (1.00)	22.5 (.89)	100.4 (3.95)	133.4 (5.25)
72		60 (2.36)	32 (1.26)	16 (.63)	30 (1.18)	27 (1.06)	100.4 (3.95)	133.4 (5.25)
73		74.5 (2.93)	40 (1.57)	20 (.79)	37.2 (1.46)	34.25 (1.35)	100.4 (3.95)	133.4 (5.25)

North American Straight Blade, Types LI & LLI

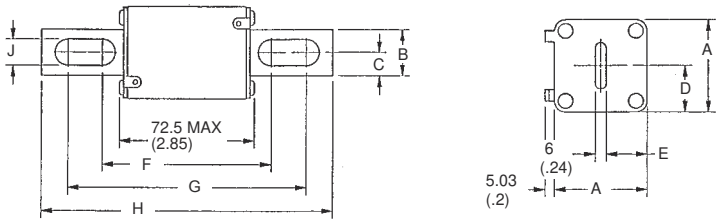
Body Size	Type	Dimensions - mm (in) A	B	C	D	E	F	G	H	J
70	LI	40	25	12.5	21	18	91.4	130.4	152.4	10.5
		(1.57)	(0.98)	(0.49)	(0.83)	(0.71)	(3.60)	(5.13)	(6.00)	(0.41)
71	LLI	51	25	12.5	25.5	22.5	91.4	130.4	152.4	14.6
		(2.01)	(0.98)	(0.49)	(1.00)	(0.89)	(3.60)	(5.13)	(6.00)	(0.57)
72	LI	60	32	16	30	27	97.6	132.4	157.4	14.6
		(2.36)	(1.26)	(0.63)	(1.18)	(1.06)	(3.84)	(5.2)	(6.20)	(0.57)
73		74.5	40	20	37.2	34.2	98.8	132.4	157.4	15.9
		(2.93)	(1.57)	(0.79)	(1.46)	(1.35)	(3.89)	(5.21)	(6.20)	(0.63)

Outline Dimensions

Type D11A



Types LI and LLI

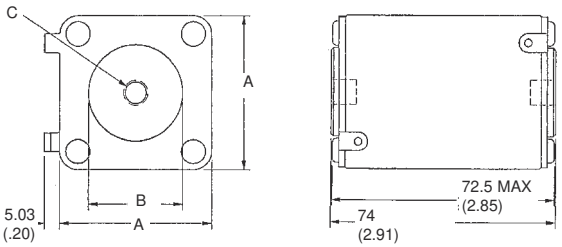


1250/1300 Volt PSC Square Body

1250/1300 Volt North American and European Flat Single Hole, Type TTI/TTF

Body Size	Type	Dimensions - mm/(In) A		B		Tapped Hole (N. A.) C (TTI)	Tapped Hole (EURO.) D (TTF)
70	TTI/TTF	40	(1.57)	25	(1.00)	5/16-18 X .23DP	M8 X 1.25 X 6 DP
71		50.8	(2.00)	30.2	(1.19)	5/16-18 X .36DP	M8 X 1.25 X 9 DP
72		60.3	(2.37)	38.1	(1.50)	3/8-16 X .36DP	M10 X 1.50 X 9 DP
73		74.6	(2.94)	46	(1.81)	M12 X 1.75 X DP	M12 X 1.75 X 9 DP

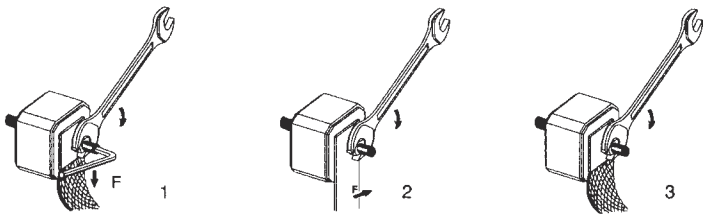
Types TTI and TTF



Standard Threaded Studs

Size	Ref. and Dimension Per Pair of Studs	Weight (g)	Max Stud Mounting Torque (Nm)	Max Nut Tightening Torque (Nm) Fig. 1	Fig. 2	Fig. 3
70 & 71	S 98 801 (HC M8 X 30 & M 8 X 35)	23	13	13.5	13.5	13.5
72	T 98 802 (HC M 10 X 30 & M 10 X 50)	40	15	26	26	26
73	V 98 803 (HC M 12 X 35 & M 12 X 50)	60		46	46	15
2X72	W 98 804 (HC M 10 X 50)	50		26	26	26
2X73	X 98 805 (HC M 12 X 50)	70		46	46	15

Packaging: 6 pairs



1250/1300 Volt PSC Square Body

1250 Volt European/IEC Style Ratings and Application Data, D11A Mounting

Body Size	Amp Rating	Rated Voltage	Melting I^2t ($A^2s \times 10^3$)	Total I^2t @ 660VAC ($A^2s \times 10^3$)	** Watts Loss @ Rated Current (W)	Catalog No	New Description	Old Description
70	50	1250	0.116	0.98	16	J301906	PC70UD13C50D1A	12,5URD70D11A0050
	63	1250	0.21	1.7	26	V300536	PC70UD13C63D1A	12,5URD70D11A0063
	80	1250	0.47	3.8	27	W300537	PC70UD13C80D1A	12,5URD70D11A0080
	100	1250	0.83	6.7	30	X300538	PC70UD13C100D1A	12,5URD70D11A0100
	125	1250	1.3	10.5	38	Y300539	PC70UD13C125D1A	12,5URD70D11A0125
	160	1250	2.5	21	45	Z300540	PC70UD13C160D1A	12,5URD70D11A0160
	200	1250	4.7	37.8	54/56	A300541	PC70UD13C200D1A	12,5URD70D11A0200
	250	1250	9.6	77	58/61	B300542	PC70UD13C250D1A	12,5URD70D11A0250
	280	1200	14	107	61	J300710	PC70UD12C280D1A	12URD70D11A0280
	315	1200	20	150	66	C300543	PC70UD12C315D1A	12URD70D11A0315
	350	1100	28	180	68/75	D300544	PC70UD11C350D1A	11URD70D11A0350
	400	1100	39	254	81	F300868	PC70UD11C400D1A	11URD70D11A0400
71	160	1250	2.6	21	46	D300751	PC71UD13C160D1A	12,5URD71D11A0160
	200	1250	4.7	38	54	E300545	PC71UD13C200D1A	12,5URD71D11A0200
	250	1250	8.9	71	61	F300546	PC71UD13C250D1A	12,5URD71D11A0250
	315	1250	16	130	73/76	G300547	PC71UD13C315D1A	12,5URD71D11A0315
	350	1250	22	180	76/80	H300548	PC71UD13C350D1A	12,5URD71D11A0350
	400	1250	38	310	76/80	J300549	PC71UD13C400D1A	12,5URD71D11A0400
	450	1250	47	380	87/95	K300550	PC71UD13C450D1A	12,5URD71D11A0450
	500	1100	68	440	90/100	L300551	PC71UD11C500D1A	11URD71D11A0500
	550	1100	84	540	98/112	M300552	PC71UD11C550D1A	11URD71D11A0550
	630	1000	125	810	105	N300553	PC71UD10C630D1A	10URD71D11A0630
72	280	1250	10	84	72	P300554	PC72UD13C280D1A	12,5URD72D11A0280
	315	1250	15	122	76	Q300555	PC72UD13C315D1A	12,5URD72D11A0315
	350	1250	21	170	77	R300556	PC72UD13C350D1A	12,5URD72D11A0350
	400	1250	32.5	270	80	S300557	PC72UD13C400D1A	12,5URD72D11A0400
	450	1250	44	360	87/89	T300558	PC72UD13C450D1A	12,5URD72D11A0450
	500	1250	57	460	94/98	V300559	PC72UD13C500D1A	12,5URD72D11A0500
	550	1250	68	550	110/120	W300560	PC72UD13C550D1A	12,5URD72D11A0550
	630	1100	105	850	113	X300561	PC72UD11C630D1A	11URD72D11A0630
	700	1000	145	910	122	Y300562	PC72UD10C700D1A	10URD72D11A0700
	800	1000	215	1400	125	Z300563	PC72UD10C800D1A	10URD72D11A0800
	900	1000	312	1800	130	H300870	PC72UD10C900D1A	10URD72D11A0900
73	315	1250	12	95	84	A300564	PC73UD13C315D1A	12,5URD73D11A0315
	350	1250	117	140	86	B300565	PC73UD13C350D1A	12,5URD73D11A0350
	400	1250	25	200	93	C300566	PC73UD13C400D1A	12,5URD73D11A0400
	450	1250	35.5	290	99/100	D300567	PC73UD13C450D1A	12,5URD73D11A0450
	500	1250	44	360	110/112	E300568	PC73UD13C500D1A	12,5URD73D11A0500
	550	1250	57	460	116/120	F300569	PC73UD13C550D1A	12,5URD73D11A0550
	630	1250	84	680	125/132	G300570	PC73UD13C630D1A	12,5URD73D11A0630
	700	1200	110	900	135	H300571	PC73UD12C700D1A	12URD73D11A0700
	800	1100	190	1530	136	J300572	PC73UD11C800D1A	11URD73D11A0800
	900	1000	250	1870	150	K300573	PC73UD10C900D1A	10URD73D11A0900
	1000	900	370	2130	152	L300574	PC73UD90V10CD1A	9URD73D11A1000
	1100	900	445	2470	168	M300575	PC73UD90V11CD1A	9URD73D11A1100

*** Watts loss data is published for both blade and tapped style mounting configurations. When two watts loss values are shown this represents tapped/blade values respectively.*

1250/1300 Volt PSC Square Body

1250 Volt European/IEC Style Ratings and Application Data, TTF Mounting

Body Size	Amp Rating	Rated Voltage	Melting I^2t ($A^2s \times 10^3$)	Total I^2t @ 660VAC ($A^2s \times 10^3$)	** Watts Loss @ Rated Current (W)	Catalog No	New Description	Old Description
70	50	1250	0.116	0.98	16	C301095	PC70UD13C50TF	12,5URD70TTF0050
	63	1250	0.21	1.7	26	M300483	PC70UD13C63TF	12,5URD70TTF0063
	80	1250	0.47	3.8	27	N300484	PC70UD13C80TF	12,5URD70TTF0080
	100	1250	0.83	6.7	30	P300485	PC70UD13C100TF	12,5URD70TTF0100
	125	1250	1.3	10.5	38	Q300486	PC70UD13C125TF	12,5URD70TTF0125
	160	1250	2.5	21	45	R300487	PC70UD13C160TF	12,5URD70TTF0160
	200	1250	4.7	37.8	54/56	S300488	PC70UD13C200TF	12,5URD70TTF0200
	250	1250	9.6	77	58/61	T300489	PC70UD13C250TF	12,5URD70TTF0250
	280	1200	14	107	64	N300714	PC70UD12C280TF	12URD70TTF0280
	315	1200	20	150	72	V300490	PC70UD12C315TF	12URD70TTF0315
	350	1100	28	180	68/75	W300491	PC70UD11C350TF	11URD70TTF0350
	400	1100	39	254	81	E300867	PC70UD11C400TF	11URD70TTF0400
71	160	1250	2.6	21	46	B300749	PC71UD13C160TF	12,5URD71TTF0160
	200	1250	4.7	38	54	Z300517	PC71UD13C200TF	12,5URD71TTF0200
	250	1250	8.9	71	61	A300518	PC71UD13C250TF	12,5URD71TTF0250
	315	1250	16	130	73/76	B300519	PC71UD13C315TF	12,5URD71TTF0315
	350	1250	22	180	76/80	C300520	PC71UD13C350TF	12,5URD71TTF0350
	400	1250	38	310	76/80	D300521	PC71UD13C400TF	12,5URD71TTF0400
	450	1250	47	380	87/95	E300522	PC71UD13C450TF	12,5URD71TTF0450
	500	1100	68	440	90/100	F300523	PC71UD11C500TF	11URD71TTF0500
	550	1100	84	540	98/112	G300524	PC71UD11C550TF	11URD71TTF0550
	630	1100	125	810	120	H300525	PC71UD11C630TF	11URD71TTF0630
72	280	1250	10	84	72	Y300493	PC72UD13C280TF	12,5URD72TTF0280
	315	1250	15	122	76	Z300494	PC72UD13C315TF	12,5URD72TTF0315
	350	1250	21	170	77	A300495	PC72UD13C350TF	12,5URD72TTF0350
	400	1250	32.5	270	80	B300496	PC72UD13C400TF	12,5URD72TTF0400
	450	1250	44	360	87/89	C300497	PC72UD13C450TF	12,5URD72TTF0450
	500	1250	57	460	94/98	D300498	PC72UD13C500TF	12,5URD72TTF0500
	550	1250	68	550	110/120	E300499	PC72UD13C550TF	12,5URD72TTF0550
	630	1250	105	850	125	F300500	PC72UD13C630TF	12,5URD72TTF0630
	700	1100	145	910	140	G300501	PC72UD11C700TF	11URD72TTF0700
	800	1100	215	1400	146	H300502	PC72UD11C800TF	11URD72TTF0800
	900	1000	312	1800	130	G300869	PC72UD10C900TF	10URD72TTF0900
	1000	850	-	-	136	T301294	PC72UD85V1000TF	8,5URD72TTF1000
73	315	1250	12	95	84	J300503	PC73UD13C315TF	12,5URD73TTF0315
	350	1250	17	140	86	K300504	PC73UD13C350TF	12,5URD73TTF0350
	400	1250	25	200	93	L300505	PC73UD13C400TF	12,5URD73TTF0400
	450	1250	35.5	290	99/100	M300506	PC73UD13C450TF	12,5URD73TTF0450
	500	1250	44	360	110/112	N300507	PC73UD13C500TF	12,5URD73TTF0500
	550	1250	57	460	116/120	P300508	PC73UD13C550TF	12,5URD73TTF0550
	630	1250	84	680	125/132	Q300509	PC73UD13C630TF	12,5URD73TTF0630
	700	1250	110	900	146	R300510	PC73UD13C700TF	12,5URD73TTF0700
	800	1250	190	1530	148	S300511	PC73UD13C800TF	12,5URD73TTF0800
	900	1200	250	1870	170	T300512	PC73UD12C900TF	12URD73TTF0900
	1000	1000	370	2130	174	V300513	PC73UD10C1000TF	10URD73TTF1000
	1100	950	445	2470	208	W300514	PC73UD95V11CTF	9,5URD73TTF1100
	1250	900	585	3050	186/200	T300696	PC73UD90V13CTF	9URD73TTF1250
	1400	850	755	3700	210/228	S300718	PC73UD85C14CTF	8,5URD73TTF1400
	1600	660	1430	5630	203	N304417		
	1800	600	2040	7600	206	C301302	PC73UD60V18CTF	6URD73TTF1800

*** Watts loss data is published for both blade and tapped style mounting configurations. When two watts loss values are shown this represents tapped/blade values respectively.*

1250/1300 Volt PSC Square Body

1300 Volt North American Style Ratings and Application Data, LI, LLI Mounting

Body Size	Amp Rating	Rated Voltage	Melting I^2t ($A^2s \times 10^3$)	Total I^2t @ 660VAC ($A^2s \times 10^3$)	** Watts Loss @ Rated Current (W)	Catalog No	New Description	Old Description
70	63	1300	0.21	1.8	26	W300652	A130UD70LI063	A130URD70LI0063
	80	1300	0.47	4	27	X300653	A130UD70LI080	A130URD70LI0080
	100	1300	0.83	7.2	30	Y300654	A130UD70LI100	A130URD70LI0100
	125	1300	1.3	11	38	Z300655	A130UD70LI125	A130URD70LI0125
	160	1300	2.5	22	45	A300656	A130UD70LI160	A130URD70LI0160
	200	1300	4.7	40	54/56	B300657	A130UD70LI200	A130URD70LI0200
	250	1300	9.6	82	58/61	C300658	A130UD70LI250	A130URD70LI0250
	315	1300	20	172	66/72	D300659	A130UD70LI315	A130URD70LI0315
	350	1200	28	205	68/75	E300660	A120UD70LI350	A120URD70LI0350
71	160	1300	2.6	22	46	E300752	A130UD71LLI160	A130URD71LLI0160
	200	1300	4.7	40	54	F300661	A130UD71LLI200	A130URD71LLI0200
	250	1300	8.9	76	61	G300662	A130UD71LLI250	A130URD71LLI0250
	280	1300	12	102	68/70	R300717	A130UD71LLI280	A130URD71LLI0280
	315	1300	16	138	73/76	H300663	A130UD71LLI315	A130URD71LLI0315
	350	1300	22	190	76/80	J300664	A130UD71LLI350	A130URD71LLI0350
	400	1300	38	330	76/80	K300665	A130UD71LLI400	A130URD71LLI0400
	450	1300	47	405	87/95	L300666	A130UD71LLI450	A130URD71LLI0450
	500	1200	68	500	90/100	M300667	A120UD71LLI500	A120URD71LLI0500
	550	1200	84	620	98/112	N300668	A120UD71LLI550	A120URD71LLI0550
	630	1100	125	930	105	P300669	A110UD71LLI630	A110URD71LLI0630
72	280	1300	10	90	72	Q300670	A130UD72LI280	A130URD72LI0280
	315	1300	15	130	76	R300671	A130UD72LI315	A130URD72LI0315
	350	1300	21	180	77	S300672	A130UD72LI350	A130URD72LI0350
	400	1300	32	285	80	T300673	A130UD72LI400	A130URD72LI0400
	450	1300	44	380	87/89	V300674	A130UD72LI450	A130URD72LI0450
	500	1300	57	500	94/98	W300675	A130UD72LI500	A130URD72LI0500
	550	1300	68	590	110/120	X300676	A130UD72LI550	A130URD72LI0550
	630	1200	105	920	113	Y300677	A120UD72LI630	A120URD72LI0630
	700	1100	145	1040	122	Z300678	A110UD72LI700	A110URD72LI0700
	800	1100	215	1590	125	A300679	A110UD72LI800	A110URD72LI0800
73	315	1300	12	102	84	B300680	A130UD73LI315	A130URD73LI0315
	350	1300	17	150	86	C300681	A130UD73LI350	A130URD73LI0350
	400	1300	25	220	93	D300682	A130UD73LI400	A130URD73LI0400
	450	1300	35	310	99/100	E300683	A130UD73LI450	A130URD73LI0450
	500	1300	44	390	110/112	F300684	A130UD73LI500	A130URD73LI0500
	550	1300	57	500	116/120	G300685	A130UD73LI550	A130URD73LI0550
	630	1300	84	730	125/132	H300686	A130UD73LI630	A130URD73LI0630
	700	1300	110	960	135/146	J300687	A130UD73LI700	A130URD73LI0700
	800	1200	190	1630	136	V301824	A130UD73LI800	A130URD73LI0800
	900	1100	250	2160	150	L300689	A110UD73LI900	A110URD73LI0900
	1000	1000	370	2430	152/174	M300690	A100UD73LI1000	A100URD73LI1000
	1100	1000	445	2580	168/208	N300691	A100UD73LI1100	A100URD73LI1100
	1250	1000	585	3480	186/200	J301193	A100UD73LI1250	A100URD73LI1250
	1400	900	755	3880	210/228	K301194	A090UD73LI1400	A090URD73LI1400
	1600	700	1430	5630	203	P300876	A070UD73LI1600	A070URD73LI1600
	1800	650	2040	7600	206	A301599	A065UD73LI1800	A065URD73LI1800

*** Watts loss data is published for both blade and tapped style mounting configurations. When two watts loss values are shown this represents tapped/blade values respectively.*

1250/1300 Volt PSC Square Body

1300 Volt North American Style Ratings and Application Data, TTI Mounting

Body Size	Amp Rating	Rated Voltage	Melting I^2t ($A^2s \times 10^3$)	Total I^2t @ 660VAC ($A^2s \times 10^3$)	** Watts Loss @ Rated Current (W)	Catalog No	New Description	Old Description
70	63	1300	0.21	1.8	26	Q301015	A130UD70TTI63	A130URD70TTI0063
	80	1300	0.47	4	27	R301016	A130UD70TTI80	A130URD70TTI0080
	100	1300	0.83	7.2	30	S301017	A130UD70TTI100	A130URD70TTI0100
	125	1300	1.3	11	38	T301018	A130UD70TTI125	A130URD70TTI0125
	160	1300	2.5	22	45	V301019	A130UD70TTI160	A130URD70TTI0160
	200	1300	4.7	40	54/56	W301020	A130UD70TTI200	A130URD70TTI0200
	250	1300	9.6	82	58/61	X301021	A130UD70TTI250	A130URD70TTI0250
	315	1300	20	172	66/72	Z301023	A130UD70TTI315	A130URD70TTI0315
	350	1200	28	205	68/75	A301024	A120UD70TTI350	A120URD70TTI0350
71	160	1300	2.6	22	46	B301025	A130UD71TTI160	A130URD71TTI0160
	200	1300	4.7	40	54	C301026	A130UD71TTI200	A130URD71TTI0200
	250	1300	8.9	76	61	D301027	A130UD71TTI250	A130URD71TTI0250
	280	1300	12	102	68/70	E301028	A130UD71TTI280	A130URD71TTI0280
	315	1300	16	138	73/76	F301029	A130UD71TTI315	A130URD71TTI0315
	350	1300	22	190	76/80	G301030	A130UD71TTI350	A130URD71TTI0350
	400	1300	38	330	76/80	H301031	A130UD71TTI400	A130URD71TTI0400
	450	1300	47	405	87/95	J301032	A130UD71TTI450	A130URD71TTI0450
	500	1200	68	500	90/100	K301033	A130UD71TTI500	A130URD71TTI0500
	550	1200	84	620	98/112	L301034	A120UD71TTI550	A120URD71TTI0550
	630	1200	125	930	120	M301035	A120UD71TTI630	A120URD71TTI0630
72	280	1300	10	90	72	N301036	A130UD72TTI280	A130URD72TTI0280
	315	1300	15	130	76	P301037	A130UD72TTI315	A130URD72TTI0315
	350	1300	21	180	77	Q301038	A130UD72TTI350	A130URD72TTI0350
	400	1300	32	285	80	R301039	A130UD72TTI400	A130URD72TTI0400
	450	1300	44	380	87/89	S301040	A130UD72TTI450	A130URD72TTI0450
	500	1300	57	500	94/98	T301041	A130UD72TTI500	A130URD72TTI0500
	550	1300	68	590	110/120	V301042	A130UD72TTI550	A130URD72TTI0550
	630	1300	105	920	125	W301043	A130UD72TTI630	A130URD72TTI0630
	700	1200	145	1040	140	X301044	A120UD72TTI700	A120URD72TTI0700
	800	1200	215	1590	146	Y301045	A120UD72TTI800	A120URD72TTI0800
73	315	1300	12	102	84	Z301046	A130UD73TTI315	A130URD73TTI0315
	350	1300	17	150	86	A301047	A130UD73TTI350	A130URD73TTI0350
	400	1300	25	220	93	B301048	A130UD73TTI400	A130URD73TTI0400
	450	1300	35	310	99/100	C301049	A130UD73TTI450	A130URD73TTI0450
	500	1300	44	390	110/112	D301050	A130UD73TTI500	A130URD73TTI0500
	550	1300	57	500	116/120	E301051	A130UD73TTI550	A130URD73TTI0550
	630	1300	84	730	125/132	F301052	A130UD73TTI630	A130URD73TTI0630
	700	1300	110	960	135/146	G301053	A130UD73TTI700	A130URD73TTI0700
	800	1300	190	1630	148	H301054	A130UD73TTI800	A130URD73TTI0800
	900	1300	250	2160	170	T1013903	A130UD73TTI900	A130URD73TTI0900
	1000	1000	370	2430	152/174	K301056	A110UD73TTI1000	A110URD73TTI1000
	1100	1000	445	2580	168/208	V302192	A110UD73TTI1100	A110URD73TTI1100
	1250	1000	585	3480	186/200	M301058	A100UD73TTI1250	A100URD73TTI1250
	1400	900	755	3880	210/228	N301059	A090UD73TTI1400	A090URD73TTI1400
	1600	700	1430	5630	203	Q300877	A070UD73TTI1600	A070URD73TTI1600
	1800	650	2040	7600	206	R300878	A065UD73TTI1800	A065URD73TTI1800

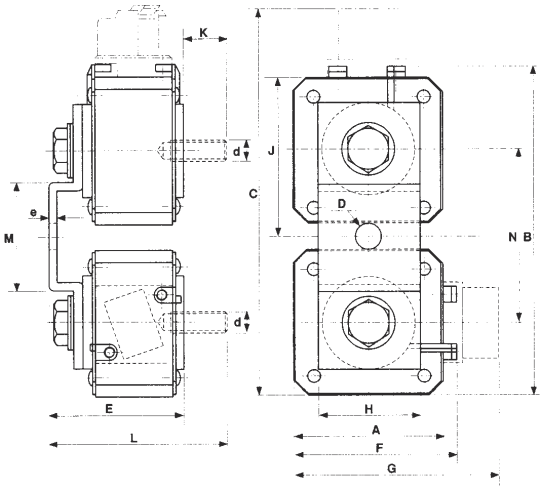
*** Watts loss data is published for both blade and tapped style mounting configurations. When two watts loss values are shown this represents tapped/blade values respectively.*

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

1250/1300 Volt PSC Square Body

1250/1300Volt, 2x72, 2x73 Semiconductor Protection Fuses

Size	Catalog No	New Description	Old Description	Weight (g)
73	H300640	PC73UD13C315PP4	12,5URD73PPAF0315	1250
	J300641	PC73UD13C350PP4	12,5URD73PPAF0350	
	K300642	PC73UD13C405PP4	12,5URD73PPAF0400	
	L300643	PC73UD13C450PP4	12,5URD73PPAF0450	
	M300644	PC73UD13C500PP4	12,5URD73PPAF0500	
	N300645	PC73UD13C550PP4	12,5URD73PPAF0550	
	P300646	PC73UD13C630PP4	12,5URD73PPAF0630	
	Q300647	PC73UD13C700PP4	12,5URD73PPAF0700	
	R300648	PC73UD13C800PP4	12,5URD73PPAF0800	
	S300649	PC73UD12C900PP4	12URD73PPAF0900	
	T300650	PC73UD10C10CPP4	10URD73PPAF1000	
	V300651	PC73UD95V11CPP4	9,5URD73PPAF1100	
	T300719	PC73UD90V13CPP4	9URD73PPAF1250	
	V300720	PC73UD85V14CPP4	8,5URD73PPAF1400	
2 X 72	W300721	PC272UD13C630TF	12,5URD272TTF0630	1750
	X300722	PC272UD13C700TF	12,5URD272TTF0700	
	Y300723	PC272UD13C800TF	12,5URD272TTF0800	
	Z300724	PC272UD13C900TF	12,5URD272TTF0900	
	A300725	PC272UD13C10CTF	12,5URD272TTF1000	
	B300726	PC272UD13C11CTF	12,5URD272TTF1100	
	M302231	PC272UD11C13CTF	11URD272TTF1250	
	D300728	PC272UD11C14CTF	11URD272TTF1400	1900
	L302230	PC272UD10C16CTF	10URD272TTF1600	
	E301994	PC272UD90V18CTF	9URD272TTF1800	
	F301995	PC272UD75V20CTF	7,5URD272TTF2000	
	G301996	PC272UD65V22CTF	6,5URD272TTF2200	
	H301997	PC272UD65V25CTF	6,5URD272TTF2500	
2 X 73	F300730	PC273UD13C800TF	12,5URD273TTF0800	2600
	G300731	PC273UD13C900TF	12,5URD273TTF0900	
	H300732	PC273UD13C10CTF	12,5URD273TTF1000	
	J300733	PC273UD13C11CTF	12,5URD273TTF1100	
	K300734	PC273UD13C13CTF	12,5URD273TTF1250	
	K302229	PC273UD11C14CTF	11URD273TTF1400	
	J302228	PC273UD11C16CTF	11URD273TTF1600	
	S302236	PC273UD11C18CTF	11URD273TTF1800	
	P300738	PC273UD10C20CTF	10URD273TTF2000	2800
	Q300739	PC273UD95V22CTF	9,5URD273TTF2200	
	M301909	PC76UD95V22CP11	9,5URD273PLAF2200	2700
	R300740	PC76UD90V25CP11	9URD273PLAF2500	
	S300741	PC76UD85V28CP11	8,5URD273PLAF2800	
	K301999	PC76UD60V30CP11	6URD273PLAF3000	
	M302001	PC76UD60V32CP11	6URD273PLAF3200	
	N302002	PC76UD55V36CP11	5,5URD273PLAF3600	



Microswitches and threaded studs supplied separately (see pages J8)

SIZE	A	B	C	D	E	F	G	H	J	K	d	e	L	M	N
2 X 72 TTF	60	138,5	172	11	91	65,5	100	35	66	39	M 10	4	131	48	72
2 X 73 TTF	74,5	167	200	13	91	79,6	114	50	80	39	M 12	4	131	54	86

Dimensions in / mm

URB/URD/URL French Cylindrical

Protistor® fuses
600V AC URD from 0.10 up to 0.80A**
500V AC URB/URD/URL from 1 up to 30A
Size: 10 x 38mm



D

Features/Benefits:

- Extremely high Interrupting rating
- Protection of power semiconductors according to IEC 269.1 and 4
- 500-600V AC
- aR class according to VDE 636-23 and IEC 269.4
- Without blown fuse indication according to NF C 63210 and 63211 - 0.10 up to 0.80A**
- With built in trip-indicator (1 up to 30A) Mersen Specialty*

Applications Data

Voltage Rating U_N(VAC)	Class	Current Rating I_N (A)	Melting I^2t @ 1 ms I^2t_P (A^2s)	Total Clearing I^2t @ UN I^2t_t (A^2s)	Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating
600 V without blown fuse indication	URD	100 mA		1.2 10 -3	0.23	0.4	200 kA @ 600 V
		125 mA		2.3 10 -3	0.25	0.44	
		160 mA		5.2 10 -3	0.28	0.48	
		200 mA		8 10 -3	0.34	0.58	
		250 mA		18 10 -3	0.35	0.60	
		315 mA		33 10 -3	0.42	0.73	
		400 mA		56 10 -3	0.46	0.80	
		500 mA		0.100	0.46	0.80	
		630 mA		0.18	0.52	0.90	
		800 mA		0.44	0.58	1	
500 V with trip-indicator	URD	1 A	0.49	1.3	0.4	0.7	50 kA @ 500 V
		1.25 A	0.13	1.7	0.52	0.91	
		1.6 A	0.31	2.2	0.58	1	
		2 A	0.65	3.1	0.63	1.1	
		2.5 A	1.65	5.9	0.63	1.1	
		3.15 A	2.80	9	0.86	1.5	
		4 A	5.30	16	1.1	1.8	
		5 A	12.7	36	1.1	1.8	
	URB	6 A	1.3	47	0.73	1.35	
		8 A	2.3	80	0.83	1.55	
		10 A	3.6	110	1	1.9	
		12 A	5.25	150	1.3	2.3	
		16 A	9.30	200	1.7	3.1	
		20 A	16	290	1.7	3.2	
	URL	25 A	37	580	2.9	4.25	
		30 A	58	900	3.5	5.1	

** minimum operating voltage for trip-indicator:20 V*
*** higher ratings 1 to 30 A see A070 gRB 30 T13*

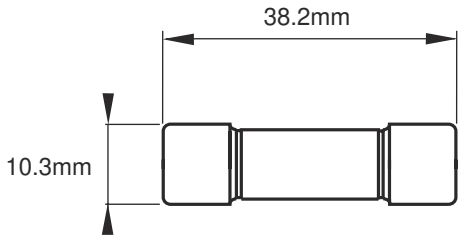
URB/URD/URL French Cylindrical

Catalog Numbers

Current Rating	Catalog No.	Ref. #
100 mA	A 060 URD 0.100 T13	H077632
125 mA	A 060 URD 0.125 T13	J077633
160 mA	A 060 URD 0.160 T13	K077634
200 mA	A 060 URD 0.200 T13	L077635
250 mA	A 060 URD 0.250 T13	M077636
315 mA	A 060 URD 0.315 T13	N077637
400 mA	A 060 URD 0.400 T13	P077638
500 mA	A 060 URD 0.500 T13*	Q077639
630 mA	A 060 URD 0.630 T13*	R077640
800 mA	A 060 URD 0.800 T13*	S077641

* UL Recognized

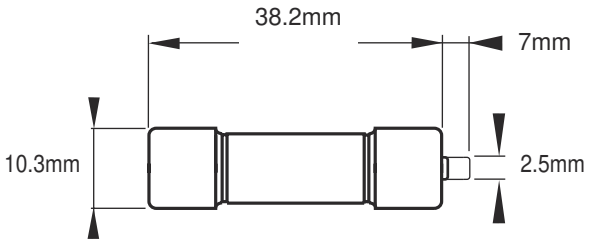
10.3x38 - Without blown fuse indicator



Catalog Numbers

Current Rating	Catalog No.	Ref. #
1A	A 050 URD 001 T13 I	P076925
1.25A	A 050 URD 001.2 T13 I	H076597
1.6A	A 050 URD 001.6 T13 I	G076596
2A	A 050 URD 002 T13 I	Q076926
2.5A	A 050 URD 002.5 T13 I	F076595
3.15A	A 050 URD 003 T13 I	R076927
4A	A 050 URD 004 T13 I	S076928
5A	A 050 URD 005 T13 I	T076929
6A	A 050 URB 006 T13 I	V076930
8A	A 050 URB 008 T13 I	W076931
10A	A 050 URB 010 T13 I	X076932
12A	A 050 URB 012 T13 I	Y076933
16A	A 050 URB 016 T13 I	Z076034
20A	A 050 URB 020 T13 I	A076935
25A	A 050 URL 025 T13 I	B076936
30A	A 050 URL 030 T13 I	C076937

10.3x38 - With blown fuse trip-indicator



URC/URD French Cylindrical

Protistor® fuses
690V AC
URC/URD from 6 up to 100A
Sizes: 14 x 51 & 22 X 58



Features/Benefits:

- Extremely high Interrupting rating
- Protection of power semiconductors according to IEC 269.1 and 4
- 690V AC
- aR class according to VDE 636-23 and IEC 269.4
- Two models according to NF C 63210 and 63211 with and without blown fuse built-in trip-indicator for sizes 14 x 51 and 22 x 58
- UL recognized (except 6A)*

Applications Data

Voltage Rating U_N (VAC)	Size mm	Class	Current Rating I_N (A)	Melting I^2t @ 1 ms I^2t_P (A^2s)	Total Clearing I^2t @ UN I^2t_t (A^2s)		Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating
690 V	14 x 51	URC	6	1.3	17.5*		1.1	2	100 kA @ 690 V
			8	2.4	27.5		1.6	2.8	
			10	4.3	40		2	3.5	
			12	5.4	60		2.45	4.4	
			16	13.2	100		2.7	4.8	
			20	27	160		2.9	5.2	
			25	53	275		3.2	5.8	
			32	98	500		3.9	7	
			40 (1)	130	700		6	10.7	
			50 (1)	280	1500		6.3	11.6	
	22 x 58	URD			7 IN < Ip < 30 IN Ip ≥ 30 IN				
			40 (2)	130	850	700	6	10.7	
			50 (2)	280	1850	1500	6.3	11.6	
		URD	25	22	125		5.2	10	
			32	49	275		5.7	11	
			40	88	480		6.8	13	
			50	155	800		7.8	14.9	
			63	350	1850		8.4	16	
			80	730	3800		9.4	17.8	
			100	1560	8000		10	19	

** Without trip-indicator I^2t : 15 A^2s.*
(1) No trip-indicator available for this model.
(2) Models available only with trip-indicator.
Minimum operating voltage for built-in trip-indicator:20 V.

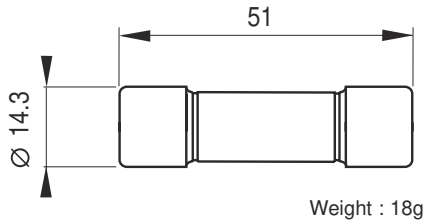
URC/URD French Cylindrical

Catalog Numbers

*All the fuses presented on this page are UL Recognized (except 6 A)**

Current Rating	Description	Catalog No,
6 A	6.900 CP URC 14.51/6*	K081475
8 A	6.900 CP URC 14.51/8	S093902
10 A	6.900 CP URC 14.51/10	T093903
12 A	6.900 CP URC 14.51/12	V093904
16 A	6.900 CP URC 14.51/16	W093905
20 A	6.900 CP URC 14.51/20	X093906
25 A	6.900 CP URC 14.51/25	Y093907
32 A	6.900 CP URC 14.51/32	Z093908
40 A	6.900 CP URC 14.51/40	A093909
50 A	6.900 CP URC 14.51/50	B093910

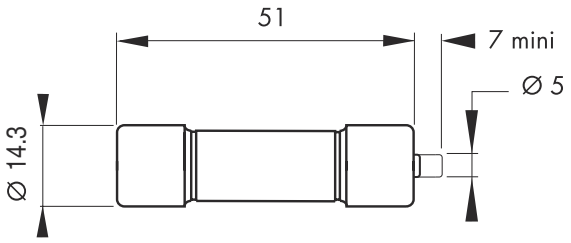
14x51 - Without blown fuse indication (mm)



Weight : 18g
Packaging : 10 pieces

Current Rating	Description	Catalog No,
6 A	6.921 CP URC 14.51/6*	G081518
8 A	6.921 CP URC 14.51/8	C093911
10 A	6.921 CP URC 14.51/10	D093912
12 A	6.921 CP URC 14.51/12	E093913
16 A	6.921 CP URC 14.51/16	F093914
20 A	6.921 CP URC 14.51/20	G093915
25 A	6.921 CP URC 14.51/25	H093916
32 A	6.921 CP URC 14.51/32	J093917
40 A	6.921 CP URD 14.51/40	T100136
50 A	6.921 CP URD 14.51/50	V100137

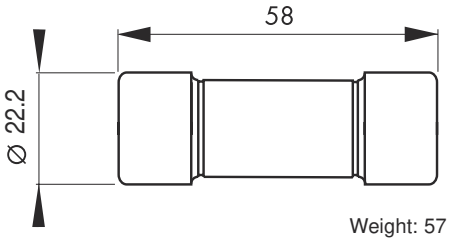
14x51 - With blown fuse trip-indicator (mm)



Weight : 18g
Packaging : 10 pieces

Current Rating	Description	Catalog No,
25 A	6.900 CP URD 22x58/25	B093956
32 A	6.900 CP URD 22x58/32	Z094828
40 A	6.900 CP URD 22x58/40	S094822
50 A	6.900 CP URD 22x58/50	W094779
63 A	6.900 CP URD 22x58/63	T094823
80 A	6.900 CP URD 22x58/80	A094829
100 A	6.900 CP URD 22x58/100	Y094827

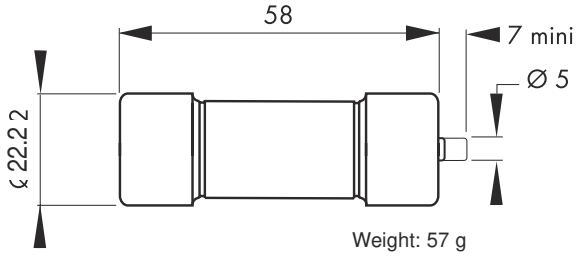
22x58 - Without blown fuse indication (mm)



Weight: 57 g
Packaging: 10 pieces

Current Rating	Description	Catalog No,
25 A	6.921 CP URD 22x58/ 25	H093801
32 A	6.921 CP URD 22x58/ 32	C093957
40 A	6.921 CP URD 22x58/ 40	J093802
50 A	6.921 CP URD 22x58/ 50	D093958
63 A	6.921 CP URD 22x58/ 63	K093803
80 A	6.921 CP URD 22x58/ 80	E093959
100 A	6.921 CP URD 22x58/100	F093960

22x58 - With blown fuse trip-indicator (mm)



Weight: 57 g
Packaging: 10 pieces

URGD French Cylindrical

Protistor® Fuses
600V - 690V AC
URGD from 63 up to 250A
Sizes: 27 X 60mm



Features/Benefits:

- Extremely high Interrupting rating
- Protection of power semiconductors according to IEC 269.1 and 4
- 600V-690V AC
- aR class according to VDE 636-23 and IEC 269.4
- Model according to NF C 63210 and 63211 with built-in blown fuse indication

Applications Data

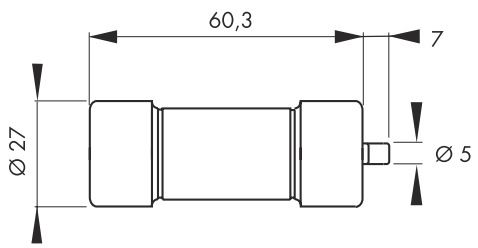
Voltage Rating U_N (VAC)	Class	Current Rating I_N (A)	Melting I^2t @ 1 ms I^2t_P (A^2s)	Total Clearing I^2t @ UN I^2t_t (A^2s)	Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating
690 V	URGD	63	405	1840	12	22	200 kA @ 600 V
		80	860	3750	13.5	24.6	
		100	1620	6800	15	27	
		125	3425	13600	16	29.5	
		160	6480	24600	17	32.5	
		200	13700	61500	18.5	35.7	
600 V		250	29600	107000	21	40	

Minimum operating voltage for trip-indicator: 20 V

Catalog Numbers

Type	Voltage	Current Rating	Description	Catalog No.
URGD	690V	63 A	6,921 CP URGD 27x60/ 63	A076820
		80 A	6,921 CP URGD 27x60/ 80	B076821
		100 A	6,921 CP URGD 27x60/100	C076822
		125 A	6,921 CP URGD 27x60/125	D076823
		160 A	6,921 CP URGD 27x60/160	E076824
		200 A	6,921 CP URGD 27x60/200	F076825
	600V	250 A	6,921 CP URGD 27x60/250	W076264

27x60 - With blown fuse trip-indicator (mm)



URB/URQ French Cylindrical

690V - 1000V AC
URB/URQ/URS from 32 up to 250A
Size: 27 X 60 mm



Features/Benefits:

- Extremely high interrupting rating
- Protection of power semiconductors according to IEC standard 269.1 and 4
- 690V-1000V AC
- aR class according to VDE 636-23 and IEC 269.4
- Model according to NF C 63210 and 63211 with built-in blown trip-indicator
- 690V URQ and 1000V URB are UL recognized

Applications Data

Voltage Rating U_N (VAC)	Class	Current Rating I_N (A)	Melting I^2t @ 1 ms I^2t_P (A^2s)	Total Clearing I^2t @ UN I^2t_t (A^2s)	Watts Loss 0.81 I_N	Watts Loss I_N	Tested Interrupting Rating
690 V	URQ	50	110	610	8.4	16	200 kA @ 690 V
		63	155	860	11.1	21	
		80	350	1880	12.6	24	
		100	625	3210	14.2	27	
		125	1400	6970	15.7	30	
		160	3150	15000	17.7	34	
		200	6580	30000	19.4	38	
		250	15570	63000	22.6	45	
	URS	125	2790	13000	14.5	25	
		160	5500	24000	17.5	30	
1000 V	URB	32	33	250	7.4	14.5	100 kA @ 1000 V
		40	60	450	8.7	17	
		50	110	840	9.7	19	
		63	200	1470	11.3	22	
		80	435	3300	12.3	24	
		100	975	6000	14	27	
		125	1910	12500	16	31	
		160	3890	26700	18	35	
		170	4710	36000	19	37	

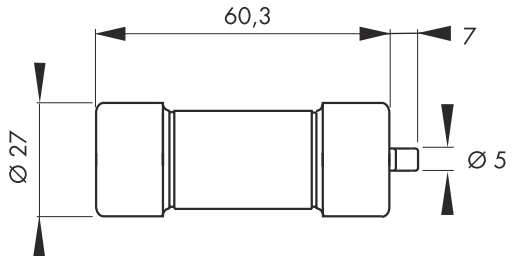
* Minimum operating voltage for trip-indicator: 20 V

URB/URQ French Cylindrical

Catalog Numbers

Type	Voltage	Current Rating	Description	Catalog No.
URQ	690 V	50A	6,921 CP URQ 27x60/ 50	N075958
		63 A	6,921 CP URQ 27x60/ 63	V076309
		80 A	6,921 CP URQ 27x60/ 80	W076310
		100 A	6,921 CP URQ 27x60/100	R078330
		125 A	6,921 CP URQ 27x60/125	S078331
		160 A	6,921 CP URQ 27x60/160	X076311
		200 A	6,921 CP URQ 27x60/200	T078332
		250 A	6,921 CP URQ 27x60/250	T076308
URB	1000 V	32 A	1021 CP URB 27x60/ 32	S081298
		40 A	1021 CP URB 27x60/ 40	R081297
		50 A	1021 CP URB 27x60/ 50	Q081296
		63 A	1021 CP URB 27x60/ 63	P081295
		80 A	1021 CP URB 27x60/ 80	N081294
		100 A	1021 CP URB 27x60/100	M081293
		125 A	1021 CP URB 27x60/125	L081292
		160 A	1021 CP URB 27x60/160	K081291
		170 A	1021 CP URB 27x60/170	Z080338

27x60 - With blown fuse trip-indicator (mm)



821cp gRB French Cylindrical

800V AC
gRB from 8 to 110A
SizeS: 27 X 60 mm



Features/Benefits:

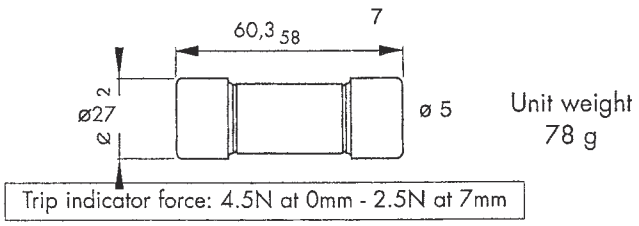
- Extremely high Interrupting rating
- Protection of power semiconductors complying with IEC standards 269-1 and 4
- 800V voltage rating according to IEC 33
- gR Class as per IEC 269-4
  - -Full range protection
  - -Improved safety and protection
  - -Allows selective coordination
- With built in trip indicator

Applications Data

Voltage Rating U_N (V)	Class	Current Rating I_N (A)	Melting I^2t @ 1 ms I^2t_p (A^2s)	Total Clearing I^2t @ UN I^2t_t (A^2s)	Watts Loss 0.8 I_N	Watts Loss I_N	Tested Interrupting Rating	Description	Catalog No
800	gRB	8	4.25	70	1.2	2.0	175 kA @ 700 V	821 CP GRB27.60 8	R221436
		10	8.0	100	1.3	2.3		821 CP GRB27.60 10	S221437
		12	17.0	180	1.4	2.5		821 CP GRB27.60 12	T221438
		16	26.5	250	1.9	3.5		821 CP GRB27.60 16	V221439
		20	38.5	350	2.4	4.0		821 CP GRB27.60 20	W221440
		25	73.0	600	2.8	5.0		821 CP GRB27.60 25	X221441
		32	130	1000	3.5	6.0		821 CP GRB27.60 32	Y221442
		40	195	1400	4.7	8.0		821 CP GRB27.60 40	Z221443
		50	430	2700	4.8	8.5	90 kA @ 800 V	821 CP GRB27.60 50	A221444
		63	965	5500	5.6	10		821 CP GRB27.60 63	B221445
		80	1890	11000	6.4	11.5		821 CP GRB27.60 80	C221446
		100	3480	19000	7.4	13		821 CP GRB27.60 100	D221447
		110	4670	27000	7.7	14		821 CP GRB27.60 110	E221448

* Minimum operating voltage for trip-indicator: 20 V

Dimensions



Medium Voltage Fuses & Accessories

Various types. Different configurations. Many ratings. One solution.



Your problem: On one hand you need current limiting protection for medium voltage transformers and distribution systems that supply industrial plants, shopping centers, hospitals, schools, office buildings and underground residential service. On the other, you need high short-circuit current protection to avoid damages to busway, motors, switches and other equipment.

Our solution: Current-limiting power fuses are widely used in these applications because they afford excellent over-current protection and noiseless operation, and because they can be used in confined spaces. The amount of damage in the faulted area and the mechanical stress and strain on busway, switches and other apparatus carrying the fault current is proportional to the square of the current and to the length of time the fault persists. By limiting the let through energy at the fault, properly applied current-limiting fuses assist in limiting or preventing short-circuit damage to busway, circuit breakers, switches, and other electrical components. Current-limiting power fuses are manufactured in ratings ranging from 1kV through 38 kV and in continuous current ratings from 0.5 amperes through 1200 amperes. Various designs are available for use with motors, transformers, capacitors, and circuit-protection equipment.

Want more information fast? For more technical or application-specific information, please call our Medium Voltage experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

E Medium Voltage Fuses and Accessories

Transformer Protection

- Amp-Trap® CS-3 and 9F60/9F62 Series E2
- Amp-Trap® & 9F62 Bolt-In Series ... E12
- Amp-Trap® CL-14 Series E16

Motor Protection

- Amp-Trap® & 9F60 Series E21
- Amp-Trap® Bolt-in Series E27
- Amp-Trap® DIN-style Series E30

Potential Transformer Protection

- Amp-Trap® & 9F60 Series PT Fuses E32

Capacitor Protection

- Amp-Trap® & 9F60 Series E36

Distribution Transformer Protection

- Sure Guard 9F59U Series ETP E44

IEC Standard Back-up Fuse Links

- IEC Standard Back-up Fuse-Links E48

Accessories

- Type EK 9F61 Series E53

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Transformer Protection

Amp-Trap® CS-3 Series and 9F60/9F62 Series

2.75kV, 5.5kV, 8.25kV, 15.5kV, 25.8kV and 38kV Ferrule Mounted Fuses

Mersen fuses for the protection of transformers and distribution lines deliver overload and short circuit protection. These current-limiting fuses will melt at current that can be as low as 1.7 times the fuse current ratings up to its maximum interrupting rating. These fuses are designed to withstand the transformer magnetizing inrush current. They have 2 (size C), 3 (size D) and 4 (size E) inch diameter barrels with ferrules and are mounted in spring reinforced clips.



Features/Benefits:

- Amp-Trap CS-3 and 9F62 series are UL listed for compatibility with UL listed equipment.
- Ferrule mounting for standard clips and interchangeability with other brands of fuses.
- Current-limiting for superior equipment protection.
- Non-venting for silent operation
- Metal embossed catalog number and manufacturing date for lasting identification.
- Outdoor usage for the 9F62 and 9F60 type EJO.
- Blown-fuse indicator to give positive identification of open fuse:
  - Amp-Trap: 2” Barrel 1 lb tripped force - 0.19 Inch
  - Amp-Trap: 3” Barrel 2 lb tripped force - 0.50 Inch
  - 9F60/9F62: 0.125 lb tripped force – 0.20 Inch
- Accessories - see page E53

Ratings

- See page E3 for listing

Highlights:

- E-Rated
- UL listed
- Outdoor use



Applications:

- Protection for 2.4kV to 34.5kV transformers or distribution systems.

Approvals:

- UL listed to standard File E143362

UL LISTED

Definitions:

General Purpose Current-Limiting Fuses (Per IEEE Std C37.40-2003):
A general purpose current-limiting fuse is one that is capable of interrupting all currents from its rated interrupting current down to the current that causes melting of the fusible element(s) in one hour or more.

E-Rating: E-Rated fuses are general purpose fuses that operate as follow (Per ANSI C37.46-2000):

- 100E or less – must melt in 300 seconds (5 mins.) at 200 to 240% of E (ampere) rating.
- Over 100E – must melt in 600 seconds (10 mins.) at 220 to 264% of E (ampere) rating.
- Example: A 100E fuse must melt in 300 seconds with an applied current of 200 to 240 amperes.

Power Distribution Fuses:
Defines fuses designed prior to the time where the ANSI standards defined the term “General Purpose” and do not meet all of the general purpose definition. These fuses are capable of interrupting all currents above 2.2 to 3 times the fuse’s rated current up to its maximum interrupting rating.

Transformer Protection

Amp-Trap® CS-3 Series and 9F60/9F62 Series

Ferrule Mounted Fuses

Amp-Trap CS-3 Series: (Indoors or outdoors in a weatherproof enclosure)

A055F: 5.5kV – AC: 5E to 450E – 63kA I.R. Sym
A825X: 8.25kV – AC: 10E to 200E – 50kA I.R. Sym
A155F: 15.5kV – AC: 5E to 200E – 50 kA I.R. Sym

9F62 Series Type EJO-1: (Indoors and outdoors)



9F62: 5.5kV – AC: 25A to 450A – 50kA IR Sym
9F62: 8.3kV – AC: 20A to 250A – 50 kA IR Sym
9F62: 15.5kV – AC: 20A to 200A – 50 kA IR Sym

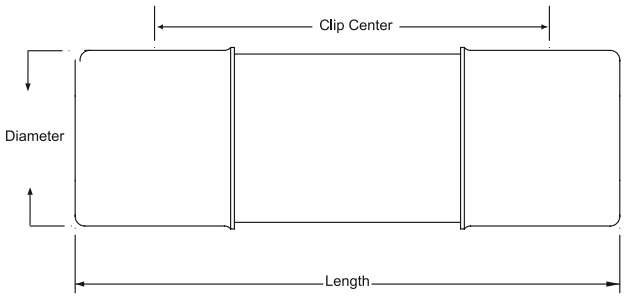
9F60 Series Type EJO-1: (Indoors and outdoors)

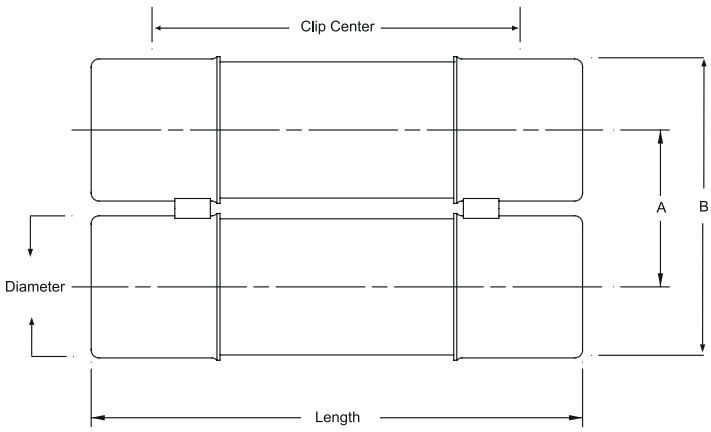


9F60: 2.75kV – AC: 1E to 200E – 50kA IR Sym
9F60: 5.5kV – AC: 0.5E to 200E – 50kA IR Sym
9F60: 8.25kV – AC: 0.5E to 200E – 50kA IR Sym
9F60: 15.5kV – AC: 0.5E to 100E – 50kA IR Sym
9F60: 25.8kV – AC: 0.5E to 100E – 25kA to 35kA IR Sym
9F60: 38kV – AC: 1E to 80E – 13kA to 26kA IR Sym

9F60 Series Type EJ-1: (Indoors or outdoors in a weatherproof enclosure)

9F60: 2.75kV – AC: 1E to 200E – 47kA to 52kA IR Sym
9F60: 5.5kV – AC: 0.5E to 25E – 63kA IR Sym
9F60: 15.5kV – AC: 2E to 175E – 31kA to 50kA IR Sym
9F60: 25.8kV – AC: 0.5E to 2E – 35kA IR Sym





9F series A = 3.31 inches (84mm)
9F series B = 6.16 inches (160mm)
Amp-Trap series A = 3.63 inches (92 mm)
Amp-Trap series B = 6.63 inches (169 mm)

Transformer Protection

Amp-Trap® CS-3 Series and 9F60/9F62 Series

2.75kV Ferrule mounted fuses:

2.75kV Power Distribution fuses – 9F60 series, E-Rated EJ-1

7" (178 mm) Clip Centers - Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60CCB001	1E	1	Yes	2 (50.8)	9.18 (233)	2.75 kV	47kA	9F61AAB201	N/A	9F61AAB205	N/A
9F60CCB002	2E										
9F60CCB003	3E										
9F60CCB005	5E										
9F60CCB007	7E										
9F60CCB010	10E										
9F60CCB015	15E	1	Yes	2 (50.8)	9.18 (233)	2.75 kV	52kA	9F61AAB201	N/A	9F61AAB205	N/A
9F60CCB020	20E										
9F60CCB025	25E										
9F60ECB030	30E	1	Yes	3 (76.2)	10.88 (276)	2.75 kV	52kA	9F61AAB301	N/A	9F61AAB305	N/A
9F60ECB040	40E										
9F60ECB050	50E										
9F60ECB065	65E										
9F60ECB080	80E										
9F60ECB100	100E										
9F60GCB125	125E	2	Yes	3 (76.2)	10.88 (276)	2.75 kV	52kA	9F61AAB401	N/A	9F61AAB405	N/A
9F60GCB150	150E										
9F60GCB200	200E										

2.75kV Power Distribution fuses – 9F60 series, E-Rated EJ-1

9" (229 mm) Clip Centers - Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60CEB001	1E	1	Yes	2 (50.8)	11.18 (284)	2.75 kV	52kA	9F61ACB201	N/A	9F61ACB205	N/A
9F60CEB002	2E										
9F60CEB003	3E										
9F60CEB005	5E										
9F60CEB007	7E										
9F60CEB010	10E										
9F60CEB015	15E										
9F60CEB020	20E										
9F60CEB025	25E										

2.75kV Power Distribution fuses – 9F60 Series, E-Rated EJO-1

12" (305 mm) Clip Centers - Suitable for use indoors or outdoors



Catalog No	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60DJB001	1E	1	Yes	2 (50.8)	14.18 (360)	2.75 kV	50kA	9F61AEG201	9F61CEF209	9F61AEG205	9F61CEF210
9F60DJB002	2E										
9F60DJB003	3E										
9F60DJB005	5E										
9F60DJB007	7E										
9F60DJB010	10E										
9F60DJB015	15E										
9F60DJB020	20E										
9F60DJB025	25E										
9F60FJB030	30E	1	Yes	3 (76.2)	15.88 (403)	2.75 kV	50kA	9F61AEB301	9F61CEF309	9F61AEB305	9F61CEF310
9F60FJB040	40E										
9F60FJB050	50E										
9F60FJB065	65E										
9F60FJB080	80E										
9F60FJB100	100E										
9F60HJB125	125E	2	Yes	3 (76.2)	15.88 (403)	2.75 kV	50kA	9F61AEB401	9F61CEF409	9F61AEB405	9F61CEF410
9F60HJB150	150E										
9F60HJB200	200E										

Transformer Protection

Amp-Trap® CS-3 Series and 9F60/9F62 Series

5.5kV Ferrule mounted fuses:

5.5kV Power Distribution fuses – 9F60 Series, E-Rated EJ-1

9" (229 mm) Clip Centers - Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60CED905	0.5E	1	Yes	2 (50.8)	11.18 (284)	5.5 kV	63kA	9F61ACB201	N/A	9F61ACB205	N/A
9F60CED001	1E										
9F60CED002	2E										
9F60CED003	3E										
9F60CED005	5E										
9F60CED007	7E										
9F60CED010	10E										
9F60CED015	15E										
9F60CED020	20E										
9F60CED025	25E										

5.5kV E-Rated Amp-Trap CS-3 Series – UL Listed

12" (305 mm) Clip Centers - Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
A055F1C0R0-5E	5E	1	Yes	2 (50.8)	14.18 (360)	5.5kV	63kA	9F61AEG201	N/A	9F61AEG205	N/A
A055F1C0R0-7E	7E										
A055F1C0R0-10E	10E										
A055F1C0R0-15E	15E										
A055F1C0R0-20E	20E										
A055F1C0R0-25E	25E										
A055F1C0R0-30E	30E										
A055F1C0R0-40E	40E										
A055F1C0R0-50E	50E										
A055F1C0R0-65E	65E										
A055F1D0R0-10E	10E	1	Yes	3 (76.2)	15.88 (403)	5.5kV	63kA	9F61AEB301	N/A	9F61AEB305	N/A
A055F1D0R0-15E	15E										
A055F1D0R0-20E	20E										
A055F1D0R0-25E	25E										
A055F1D0R0-30E	30E										
A055F1D0R0-40E	40E										
A055F1D0R0-50E	50E										
A055F1D0R0-65E	65E										
A055F1D0R0-80E	80E										
A055F1D0R0-100E	100E										
A055F1D0R0-125E	125E										
A055F1D0R0-150E	150E										
A055F1D0R0-175E	175E										
A055F1D0R0-200E	200E										
A055F2D0R0-250E	250E	2	Yes	3 (76.2)	15.88 (403)	5.5kV	63kA	–	N/A	–	N/A
A055F2D0R0-300E	300E										
A055F2D0R0-350E	350E										
A055F2D0R0-400E	400E										
A055F2D0R0-450E	450E										

Transformer Protection

Amp-Trap® CS-3 Series and 9F60/9F62 Series

5.5.kV General Purpose fuses – 9F62 Series, EJO-1 – UL Listed

12” (305 mm) Clip Centers - Suitable for use indoors or outdoors





Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F62HCB025	25A	1	Yes	2 (50.8)	14.18 (360)	5.5 kV	50kA	9F61AEG201	9F61CEF209	9F61AEG205	9F61CEF210
9F62HCB030	30A										
9F62HCB040	40A										
9F62HCB050	50A										
9F62HCB065	65A										
9F62DCB080	80A	1	Yes	3 (76.2)	15.88 (403)	5.5 kV	50kA	9F61AEB301	9F61CEF309	9F61AEB305	9F61CEF310
9F62DCB100	100A										
9F62DCB125	125A										
9F62DCB150	150A										
9F62DCB175	175A										
9F62DCB200	200A										
9F62FCB250	250A	2	Yes	3 (76.2)	15.88 (403)	5.5 kV	50kA	9F61AEB401	9F61CEF409	9F61AEB405	9F61CEF410
9F62FCB300	300A										
9F62FCB350	350A										
9F62FCB400	400A										
9F62FCB450	450A										

5.5kV Power Distribution fuses – 9F60 Series, E-Rated EJO-1

12” (305 mm) Clip Centers - Suitable for use indoors or outdoors



Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60DJD905	0.5E	1	Yes	2 (50.8)	14.18 (360)	5.5 kV	50kA	9F61AEG201	9F61CEF209	9F61AEG205	9F61CEF210
9F60DJD001	1E										
9F60DJD002	2E										
9F60DJD003	3E										
9F60DJD005	5E										
9F60DJD007	7E										
9F60DJD010	10E										
9F60DJD015	15E										
9F60DJD020	20E										
9F60DJD025	25E										
9F60FJD030	30E	1	Yes	3 (76.2)	15.88 (403)	5.5 kV	50kA	9F61AEB301	9F61CEF309	9F61AEB305	9F61CEF310
9F60FJD040	40E										
9F60FJD050	50E										
9F60FJD065	65E										
9F60FJD080	80E										
9F60FJD100	100E										
9F60HJD125	125E	2	Yes	3 (76.2)	15.88 (403)	5.5 kV	50kA	9F61AEB401	9F61CEF409	9F61AEB405	9F61CEF410
9F60HJD150	150E										
9F60HJD200	200E										

Transformer Protection

Amp-Trap® CS-3 Series and 9F60/9F62 Series

8.25kV / 8.3kV Ferrule mounted fuses:

8.25kV E-Rated Amp-Trap CS-3 Series

12” (305 mm) Clip Centers - Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
A825X10E-1	10E	1	Yes	3 (76.2)	15.88 (403)	8.25kV	50kA	9F61AEG301	N/A	9F61AEG305	N/A
A825X15E-1	15E										
A825X20E-1	20E										
A825X25E-1	25E										
A825X30E-1	30E										
A825X40E-1	40E										
A825X50E-1	50E										
A825X65E-1	65E										
A825X80E-1	80E										
A825X100E-1	100E										
A825X125E-1	125E	2	Yes	3 (76.2)	15.88 (403)	8.25kV	50kA	–	N/A	–	N/A
A825X150E-1	150E										
A825X200E-1	200E										

8.3kV General Purpose fuses – 9F62 Series, EJO-1 – UL Listed

12” (305 mm) Clip Centers - Suitable for use indoors or outdoors

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F62HCC020	20A	1	Yes	2 (50.8)	14.18 (360)	8.3 kV	50kA	9F61AEG201	9F61CEF209	9F61AEG205	9F61CEF210
9F62HCC025	25A										
9F62HCC030	30A										
9F62HCC040	40A										
9F62HCC050	50A										
9F62DCC065	65A	1	Yes	3 (76.2)	15.88 (403)	8.3 kV	50kA	9F61AEG301	9F61CEF309	9F61AEG305	9F61CEF310
9F62DCC080	80A										
9F62DCC100	100A										
9F62DCC125	125A										
9F62DCC150	150A										
9F62FCC175	175A	2	Yes	3 (76.2)	15.88 (403)	8.3 kV	50kA	9F61AEG401	9F61CEF409	9F61AEG405	9F61CEF410
9F62FCC200	200A										
9F62FCC250	250A										

8.25kV Power Distribution fuses – 9F60 Series, E-Rated EJO-1

12” (305 mm) Clip Centers - Suitable for use indoors or outdoors

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60DJE905	0.5E	1	Yes	2 (50.8)	14.18 (360)	8.25 kV	50kA	9F61AEG201	9F61CEF209	9F61AEG205	9F61CEF210
9F60DJE001	1E										
9F60DJE002	2E										
9F60DJE003	3E										
9F60DJE005	5E										
9F60DJE007	7E										
9F60DJE010	10E										
9F60DJE015	15E										
9F60FJE020	20E	1	Yes	3 (76.2)	15.88 (403)	8.25 kV	50kA	9F61AEG301	9F61CEF309	9F61AEG305	9F61CEF310
9F60FJE025	25E										
9F60FJE030	30E										
9F60FJE040	40E										
9F60FJE050	50E										
9F60FJE065	65E										
9F60FJE080	80E										
9F60FJE100	100E										
9F60HJE125	125E	2	Yes	3 (76.2)	15.88 (403)	8.25 kV	50kA	9F61AEG401	9F61CEF409	9F61AEG405	9F61CEF410
9F60HJE150	150E										
9F60HJE200	200E										

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Transformer Protection

Amp-Trap® CS-3 Series and 9F60/9F62 Series

15kV / 15.5kV Ferrule mounted fuses:

15.5kV Power Distribution fuses – 9F60 Series, E-Rated EJ-1

12" (305 mm) Clip Centers - Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60CJH002	2E	1	Yes	2 (50.8)	14.18 (360)	15.5 kV	50kA*	9F61AEG201	N/A	9F61AEG205	N/A
9F60CJH003	3E										
9F60CJH005	5E										
9F60CJH007	7E										
9F60CJH010	10E										

** These fuses were designed and originally tested at a higher maximum interrupting rating value. Consult factory for further information.*

15.0kV Power Distribution fuses – 9F60 Series, E-Rated EJ-1

14" (356 mm) Clip Centers - Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60KLH125	125E	2	Yes	4 (101.6)	19.12 (486)	15.0 kV	38kA	9F61AFG501 (13.8kV nominal - 95 kV BIL) 9F61AFJ501 (14.4kV nominal - 110kV BIL)	N/A		
9F60KLH150	150E										
9F60KLH175	175E										

15.5kV Power Distribution fuses – 9F60 Series, E-Rated EJO-1

15" (381 mm) Clip Centers - Suitable for use indoors or outdoors



Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60DMH905	0.5E	1	Yes	2 (50.8)	17.2 (437)	15.5 kV	50kA*	9F61AGG201 (13.8kV nominal - 95kV BIL) 9F61AGJ201 (14.4kV nominal - 110kV BIL)	9F61CGL209	9F61AGG205 (13.8kV nominal - 95kV BIL) 9F61AGJ205 (14.4kV nominal - 110kV BIL)	9F61CGL210
9F60DMH001	1E										
9F60DMH002	2E										
9F60DMH003	3E										
9F60DMH005	5E										
9F60DMH007	7E										
9F60DMH010	10E										
9F60FMH015	15E	1	Yes	3 (76.2)	18.88 (480)	15.5 kV	50kA	9F61AGG301 (13.8kV nominal - 95kV BIL) 9F61AGJ301 (14.4kV nominal - 110kV BIL)	9F61CGL309	9F61AGG305 (13.8kV nominal - 95kV BIL) 9F61AGJ305 (14.4kV nominal - 110kV BIL)	9F61CGL310
9F60FMH020	20E										
9F60FMH025	25E										
9F60FMH030	30E										
9F60FMH040	40E										
9F60FMH050	50E										
9F60HMH065	65E	2	Yes	3 (76.2)	18.88 (480)	15.5 kV	50kA	9F61AGG401 (13.8kV nominal - 95kV BIL) 9F61AGJ401 (14.4kV nominal - 110kV BIL)	9F61CGL409	9F61AGG405 (13.8kV nominal - 95kV BIL) 9F61AGJ405 (14.4kV nominal - 110kV BIL)	9F61CGL410
9F60HMH080	80E										
9F60HMH100	100E										

** These fuses were designed and originally tested at a higher maximum interrupting rating value. Consult factory for further information.*

Transformer Protection

Amp-Trap® CS-3 Series and 9F60/9F62 Series

15.5kV General Purpose fuses – 9F62 Series, EJO-1 – UL Listed
15" (381 mm) Clip Centers - Suitable for use indoors or outdoors

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F62HDD020	20A	1	Yes	2 (50.8)	17.2 (437)	15.5 kV	50kA	9F61AGG201 (13.8kV nominal - 95kV BIL) 9F61AGJ201 (14.4kV nominal - 110kV BIL)	9F61CGL209	9F61AGG205 (13.8kV nominal - 95kV BIL) 9F61AGJ205 (14.4kV nominal - 110kV BIL)	9F61CGL210
9F62HDD025	25A										
9F62HDD030	30A										
9F62DDD050	50A	1	Yes	3 (76.2)	18.88 (480)	15.5 kV	50kA	9F61AGG301 (13.8kV nominal - 95kV BIL) 9F61AGJ301 (14.4kV nominal - 110kV BIL)	9F61CGL309	9F61AGG305 (13.8kV nominal - 95kV BIL) 9F61AGJ305 (14.4kV nominal - 110kV BIL)	9F61CGL310
9F62DDD065	65A										
9F62DDD080	80A										
9F62DDD100	100A										
9F62FDD125	125A	2	Yes	3 (76.2)	18.88 (480)	15.5 kV	50kA	9F61AGG401 (13.8kV nominal - 95kV BIL) 9F61AGJ401 (14.4kV nominal - 110kV BIL)	9F61CGL409	9F61AGG405 (13.8kV nominal - 95kV BIL) 9F61AGJ405 (14.4kV nominal - 110kV BIL)	9F61CGL410
9F62FDD150	150A										
9F62FDD175	175A										
9F62FDD200	200A										

15.5kV E-Rated Amp-Trap CS-3 series – UL Listed
15" (381 mm) Clip Centers - Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
A155F1C0R0-5E	5E	1	Yes	2 (50.8)	17.03 (433)	15.5kV	50kA	9F61AGG201 (13.8kV nominal - 95kV BIL) 9F61AGJ201 (14.4kV nominal - 110kV BIL)	N/A	9F61AGG205 (13.8kV nominal - 95kV BIL) 9F61AGJ205 (14.4kV nominal - 110kV BIL)	N/A
A155F1C0R0-7E	7E										
A155F1C0R0-10E	10E										
A155F1C0R0-15E	15E										
A155F1C0R0-20E	20E										
A155F1C0R0-25E	25E										
A155F1C0R0-30E	30E										
A155F1D0R0-10E	10E	1	Yes	3 (76.2)	18.87 (479)	15.5kV	50kA	9F61AGG301 (13.8kV nominal - 95kV BIL) 9F61AGJ301 (14.4kV nominal - 110kV BIL)	N/A	9F61AGG305 (13.8kV nominal - 95kV BIL) 9F61AGJ305 (14.4kV nominal - 110kV BIL)	N/A
A155F1D0R0-15E	15E										
A155F1D0R0-20E	20E										
A155F1D0R0-25E	25E										
A155F1D0R0-30E	30E										
A155F1D0R0-40E	40E										
A155F1D0R0-50E	50E										
A155F2D0R0-65E	65E	2	Yes	3 (76.2)	18.87 (479)	15.5kV	50kA	–	N/A	–	N/A
A155F2D0R0-80E	80E										
A155F2D0R0-100E	100E										

15.5kV E-Rated Amp-Trap CS-3 series – UL Listed
18" (457 mm) Clip Centers - Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
A155F1D0R0-65E	65E	1	Yes	3 (76.2)	21.75 (552)	15.5kV	50kA	–	N/A	–	N/A
A155F1D0R0-80E	80E										
A155F1D0R0-100E	100E										
A155F2D0R0-125E	125E	2	Yes	3 (76.2)	21.75 (552)	15.5kV	50kA	–	N/A	–	N/A
A155F2D0R0-150E	150E										
A155F2D0R0-175E	175E										
A155F2D0R0-200E	200E										

Transformer Protection

Amp-Trap® CS-3 Series and 9F60/9F62 Series

25.8kV Ferrule mounted fuses:

25.8kV Power Distribution fuses – 9F60 Series, E-Rated EJ-1

15” (381 mm) Clip Centers - Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60CMJ905	0.5E										
9F60CMJ001	1E	1	Yes	2 (50.8)	17.20 (437)	25.8 kV	35kA*	–	N/A	–	N/A
9F60CMJ002	2E										

** These fuses were designed and originally tested at a higher maximum interrupting rating value. Consult factory for further information.*

25.8kV Power Distribution fuses – 9F60 Series, E-Rated EJO-1

21” (533 mm) Clip Centers - Suitable for use indoors or outdoors



Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60DNJ905	0.5E										
9F60DNJ001	1E										
9F60DNJ002	2E										
9F60DNJ003	3E	1	Yes	2 (50.8)	23.18 (589)	25.8 kV	35kA*	9F61AHM201	9F61CHM209	9F61AHM205	9F61CHM210
9F60DNJ005	5E										
9F60DNJ007	7E										
9F60DNJ010	10E										
9F60FNJ015	15E										
9F60FNJ020	20E										
9F60FNJ025	25E										
9F60FNJ030	30E	1	Yes	3 (76.2)	24.81 (630)	25.8 kV	25kA	9F61AHM301	9F61CHM309	9F61AHM305	9F61CHM310
9F60FNJ040	40E										
9F60FNJ050	50E										
9F60HNJ065	65E										
9F60HNJ080	80E	2	Yes	3 (76.2)	24.81 (630)	25.8 kV	25kA	9F61AHM401	9F61CHM409	9F61AHM405	9F61CHM410
9F60HNJ100	100E										

Transformer Protection

Amp-Trap® CS-3 Series and 9F60/9F62 Series

38kV Ferrule mounted fuses:

38kV Power Distribution fuses – 9F60 Series, E-Rated EJO-1

27” (686 mm) Clip Centers - Suitable for use indoors or outdoors



Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)	Fuse Disconnect Indoor (EK-3)	Fuse Disconnect Outdoor (EK0-3)
9F60FPK001	1E	1	Yes	3 (76.2)	30.81 (783)	38 kV	26kA*	–	9F61CJN309	–	9F61CJN310
9F60FPK002	2E										
9F60FPK003	3E										
9F60FPK005	5E										
9F60FPK007	7E										
9F60FPK010	10E										
9F60FPK015	15E	1	Yes	3 (76.2)	30.81 (783)	38 kV	13kA	–	9F61CJN309	–	9F61CJN310
9F60FPK020	20E										
9F60FPK025	25E										
9F60FPK030	30E										
9F60FPK040	40E										
9F60HPK050	50E	2	Yes	3 (76.2)	30.81 (783)	38 kV	13kA	–	9F61CJN409	–	9F61CJN410
9F60HPK065	65E										
9F60HPK080	80E										
9F60FPT001	1E	1	No	3 (76.2)	30.81 (783)	38 kV	26kA*	–	9F61CJN309	–	9F61CJN310
9F60FPT002	2E										
9F60FPT003	3E										
9F60FPT005	5E										
9F60FPT007	7E										
9F60FPT010	10E										
9F60FPT015	15E	1	No	3 (76.2)	30.81 (783)	38 kV	13kA	–	9F61CJN309	–	9F61CJN310
9F60FPT020	20E										
9F60FPT025	25E										
9F60FPT030	30E										
9F60FPT040	40E										
9F60HPT050	50E	2	No	3 (76.2)	30.81 (783)	38 kV	13kA	–	9F61CJN409	–	9F61CJN410
9F60HPT065	65E										
9F60HPT080	80E										

** These fuses were designed and originally tested at a higher maximum interrupting rating value. Consult factory for further information.*

Transformer Protection

Amp-Trap® and 9F62 Bolt-In Series

5.0kV, 5.5kV, 7.2kV, 8.25kV, and 15.5kV Bolt-In fuses:

Mersen fuses for the protection of transformers and distribution lines deliver overload and short circuit protection. These current-limiting fuses will melt at current that can be as low as 1.7 times the fuse current ratings up to its maximum interrupting rating. These fuses are designed to withstand the transformer magnetizing inrush current. They are single, double, triple or quadruple barrels 3 inch diameter (size D) with end mounts designed for bolting directly to equipment bus or terminal pads.

Features/Benefits:

- UL listed for compatibility with UL listed equipment.
- Bolt-In mounting for direct connection to bus or terminals.
- Current-limiting for superior equipment protection.
- Non-venting for silent operation
- Metal embossed catalog number and manufacturing date for lasting identification.
- Outdoor usage for the 9F62.
- Blown-fuse indicator to give positive identification of open fuse.
  - Amp trap: 2 lb tripped force - 0.50 Inch
  - 9F62: 0.125 lb tripped force – 0.20 Inch

Highlights:

- E-Rated
- UL listed
- Outdoor use

Applications:

- Protection for 5.5kV to 15.5kV transformers or distribution systems.

Definitions:

General Purpose Current-Limiting Fuses (Per IEEE Std C37.40-2003):
A general purpose current-limiting fuse is one that is capable of interrupting all currents from its rated interrupting current down to the current that causes melting of the fusible element(s) in one hour or more.

E-Rating: E-Rated fuses are general purpose fuses that operate as follows (Per ANSI C37.46-2000):

- 100E or less – must melt in 300 seconds (5 mins.) at 200 to 240% of E (ampere) rating.
- Over 100E – must melt in 600 seconds (10 mins.) at 220 to 264% of E (ampere) rating.
- Example: A 100E fuse must melt in 300 seconds with an applied current of 200 to 240 amperes.



Ratings:

Amp-Trap Bolt-in Series

A050B:
Volts : 5.0kV AC
Amps : 1200E
IR : 59kA Sym

A055B:
Volts : 5.5kV AC
Amps : 10 to 900E
IR : 59kA Sym

A072B:
Volts : 7.2kV AC
Amps : 250 to 400E
IR : 65kA Sym

A083B:
Volts : 8.25kV AC
Amps : 125 to 200E
IR : 50kA Sym

A155B:
Volts : 15.5kV AC
Amps : 200 to 300E
IR : 50kA Sym

9F62 Series Type EJO-1

9F62
Volts : 5.5kV AC
: 15.5V AC
Amps : 300 to 900A
IR : 50kA Sym

Approvals:

- UL Listed to standard File E143362

Transformer Protection

Amp-Trap® and 9F62 Bolt-In Series

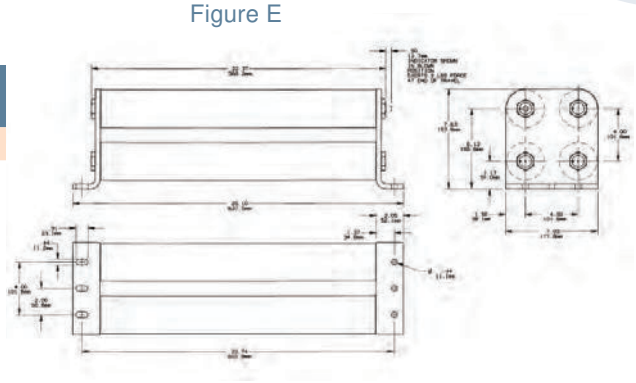
5.0kV / 5.5kV Bolt-In fuses:

5.0kV E-Rated Amp-Trap Bolt-In Series

Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure
A050B4D0R0-1200E	1200E	4	Yes	5.0kV	59kA	E

Figure E



5.5kV E-Rated Amp-Trap Bolt-In Series – UL Listed

Suitable for use indoors or in an enclosure only

Catalog Number	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure
A055B1DAR0-10E	10E	1	Yes	5.5kV	63kA	A
A055B1DAR0-15E	15E					
A055B1DAR0-20E	20E					
A055B1DAR0-25E	25E					
A055B1DAR0-30E	30E					
A055B1DAR0-40E	40E					
A055B1DAR0-50E	50E					
A055B1DAR0-65E	65E					
A055B1DAR0-80E	80E					
A055B1DAR0-100E	100E					
A055B1DAR0-125E	125E					
A055B1DAR0-150E	150E					
A055B1DAR0-175E	175E					
A055B1DAR0-200E	200E					
A055B2DAR0-250E	250E	2	Yes	5.5kV	63kA	B
A055B2DAR0-300E	300E					
A055B2DAR0-350E	350E					
A055B2DAR0-400E	400E					
A055B2DAR0-450E	450E					
A055B2D0R0-450E	450E	2	Yes	5.5kV	63kA	C
A055B2D0R0-500E	500E					
A055B2D0R0-600E	600E					
A055B3D0R0-750E	750E	3	Yes	5.5kV	63kA	D
A055B3D0R0-900E	900E					

Figure A

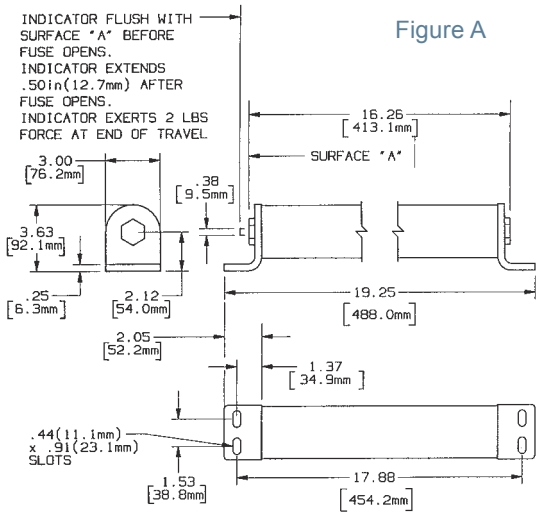
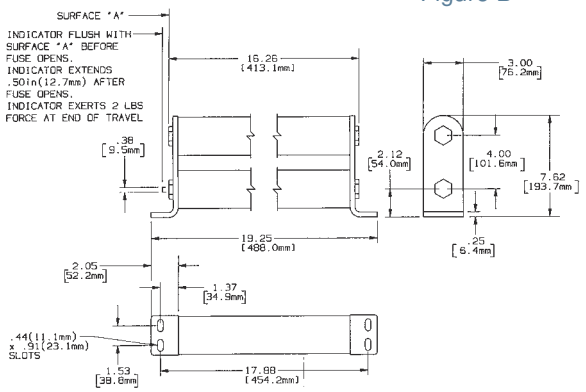


Figure B



E

Transformer Protection

Amp-Trap® and 9F62 Bolt-In Series

5.5kV General Purpose fuses – 9F62 Series, EJO-1 – UL Listed

Suitable for use indoors or outdoors

Catalog No.	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)
9F62KCB500	500A	4	Yes	5.5 kV	50kA	F	9F61AKB001	9F61CKF009
9F62KCB600	600A							
9F62KCB700	700A							
9F62KCB800	800A							
9F62KCB900	900A							

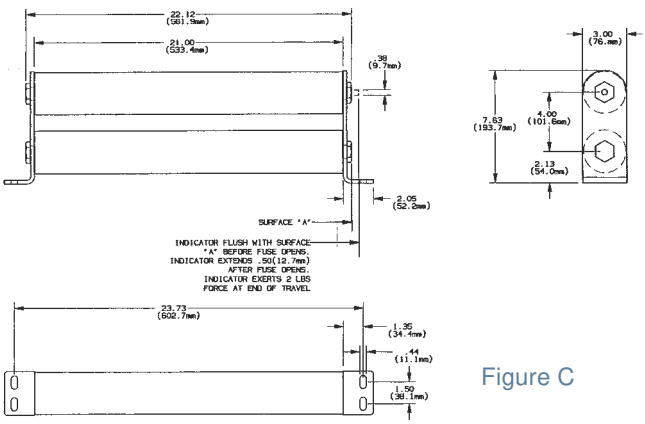


Figure C

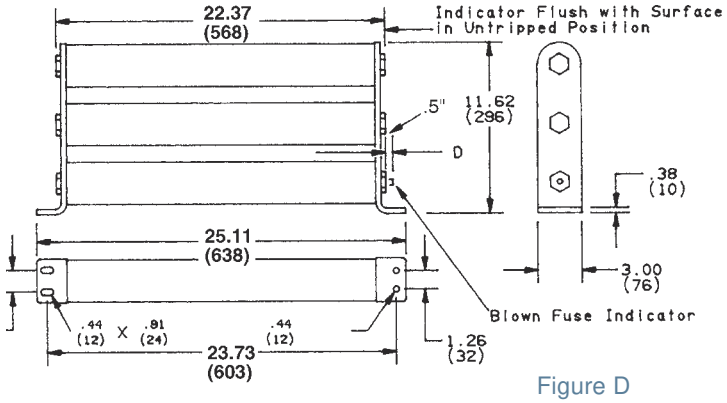


Figure D

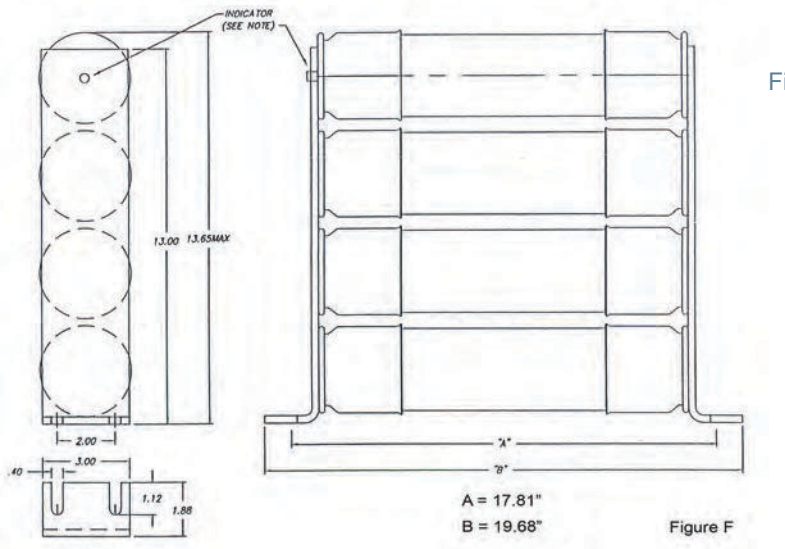


Figure F

Transformer Protection

Amp-Trap® and 9F62 Bolt-In Series

7.2kV / 8.25kV / 15.5kV Bolt-in fuses:

7.2kV E-Rated Amp-Trap Bolt-In Series

Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure
A072B2D0R0-250E	250E	2	Yes	7.9kV	65kA	G
A072B2D0R0-300E	300E					
A072B2D0R0-350E	350E					
A072B2D0R0-400E	400E					

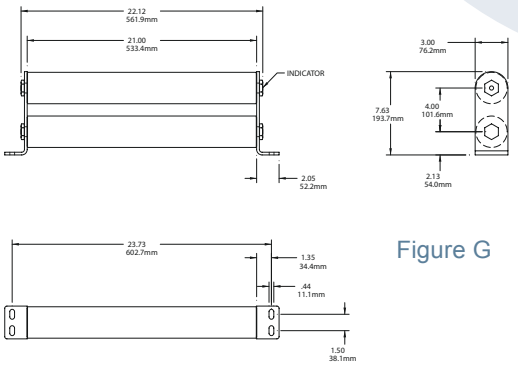


Figure G

8.25kV E-Rated Amp-Trap Bolt-In Series

Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure
A083B2DAR0-125E	125E	2	Yes	8.25kV	50kA	H
A083B2DAR0-150E	150E					
A083B2DAR0-175E	175E					
A083B2DAR0-200E	200E					

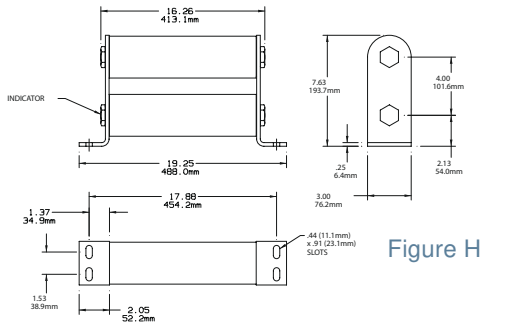


Figure H

15. 5kV E-Rated Amp-Trap Bolt-In Series

Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure
A155B2D0R0-200E	200E	2	Yes	15.5kV	50kA	J
A155B3D0R0-300E	300E	3	Yes	15.5kV	50kA	K

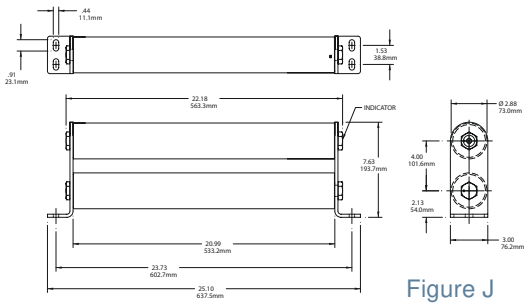


Figure J

15.5kV General Purpose fuses – 9F62 Series, EJO-1 – UL Listed

Suitable for use indoors or outdoors

Catalog No.	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure	Fuse Support Indoor (EK-1)	Fuse Support Outdoor (EK0-1)
9F62KED300	300A	4	Yes	15.5 kV	50kA	L	9F61AHG001	9F61CHL009

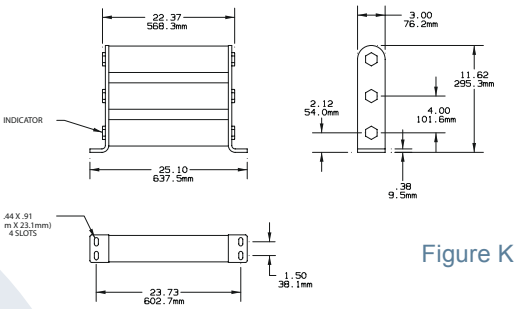


Figure K

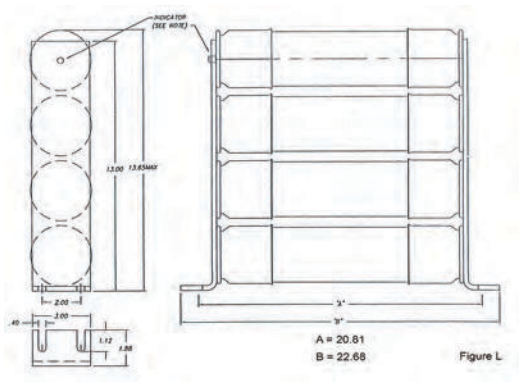


Figure L

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Transformer Protection

Amp-Trap® CL-14 Series

5.5kV, 8.25kV, and 15.5kV Clip-lock mounted fuses:

Mersen Amp-Trap fuses for the protection of transformers and distribution lines deliver overload and short circuit protection. These general purpose current-limiting fuses will melt at current that can be as low as 1.7 times the fuse current ratings up to its maximum interrupting rating. These fuses are designed to withstand the transformer magnetizing inrush current. They are single, double or triple barrels 3 inch diameter (size D) and mount in unique cam-locking clips for superior connections as well as easy installation and replacement.

Features/Benefits:

- UL listed for compatibility with UL listed equipment.
- Clip-lock mounting for reliable high integrity connection into circuit.
- Current-limiting for superior equipment protection.
- Non-venting for silent operation
- Metal embossed catalog number and manufacturing date for lasting identification.
- Blown-fuse indicator to give positive identification of open fuse.
  - 2 lb tripped force - 0.50 Inch

Highlights:

- E-Rated
- UL listed

Applications:

- Protection for 5.5kV to 15.5kV transformers or distribution systems.

Definitions:

General Purpose Current-Limiting Fuses (Per IEEE Std C37.40-2003):
A general purpose current-limiting fuse is one that is capable of interrupting all currents from its rated interrupting current down to the current that causes melting of the fusible element(s) in one hour or more.

E-Rating: E-Rated fuses are general purpose fuses that operate as follows (Per ANSI C37.46-2000):

- 100E or less – must melt in 300 seconds (5 mins.) at 200 to 240% of E (ampere) rating.
- Over 100E – must melt in 600 seconds (10 mins.) at 220 to 264% of E (ampere) rating.
- Example: A 100E fuse must melt in 300 seconds with an applied current of 200 to 240 amperes.



Ratings:

Amp-Trap CL-14 Series
(Indoor or outdoors in a weatherproof enclosure)

A055C
Volts : 5.5kV AC
Amps : 10 to 600E
IR : 63kA Sym

A083C:
Volts : 8.25kV AC
Amps : 60 to 200E
IR : 50kA Sym

A155C
Volts : 15.5kV AC
Amps : 10 to 300E
IR : 50kA Sym

Approvals:

- UL Listed to standard File E143362

UL LISTED

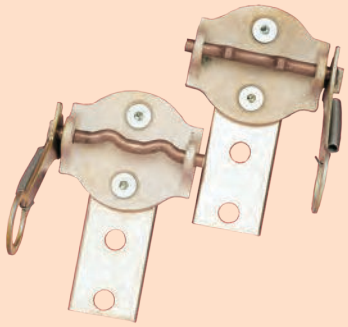
Transformer Protection

Amp-Trap® CL-14 Series

Clip-lock clips for CL-14 fuses:

228-700-520 (One pair of clips)

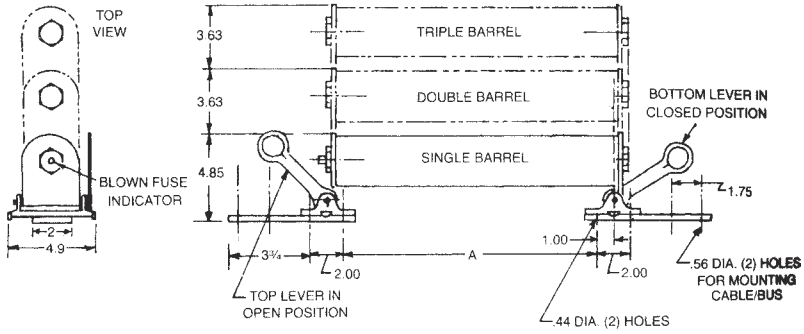
The clip lock design provides a reliable, high-pressure contact. Mersen CL-14 fuses have copper tabs which slide into position between the clip casting and cam. When the cam is locked by moving the pull ring, a high-pressure contact is made between the clip casting and fuse tab. Each clip includes two .44” diameter counter-sunk holes on 2” centers and two flat head socket screws (3/8-16 UNRC, recommended torque 200 pound-inches) for mounting the clip on standard NEMA insulators. Order catalog number 228-700-520 (for one pair of fuse clips, enough for one fuse).



Catalog Numbers, Dimensions

CL-14 Fuse Catalog No.	A Dimensions - Inches
A055C1DORO-(10E-150E)	13.25
A055C1DORO-(200E-400E)	19.25
A055C2DORO-(450E-600E)	19.25
A155C1DORO-(10E-50E)	16.25
A155C1DORO-(65E-100E)	19.25
A155C2DORO-(125E)	19.25
A155C3DORO-(150E-300E)	19.25

Mounting Details for Clip Lock Cat. No. 228-700-520



E

Transformer Protection

Amp-Trap® CL-14 Series

5.5kV / 8.25kV Clip-lock mounted fuses:

5.5kV E-Rated Amp-Trap CL-14 Series

15.25 (388mm) Clip Centers (dimension E). Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure	Dimensions Inches (mm) A	B	C	E
A055C1D0R0-10E	10E	1	Yes	5.5kV	63kA	A	16.81 (427)	16.12 (410)	0.5 (13) Tripped Force 2 lbs.	15.25 (388)
A055C1D0R0-15E	15E									
A055C1D0R0-20E	20E									
A055C1D0R0-25E	25E									
A055C1D0R0-30E	30E									
A055C1D0R0-40E	40E									
A055C1D0R0-50E	50E									
A055C1D0R0-65E	65E									
A055C1D0R0-80E	80E									
A055C1D0R0-100E	100E									
A055C1D0R0-125E	125E									
A055C1D0R0-150E	150E									

5.5kV E-Rated Amp-Trap CL-14 Series

21.25 (540mm) Clip Centers (dimension E). Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure	Dimensions Inches (mm) A	B	C	E
A055C1D0R0-200E	200E	1	Yes	5.5kV	63kA	A	22.81 (580)	22.12 (562)	0.5 (13) Tripped Force 2 lbs.	21.25 (540)
A055C1D0R0-250E	250E									
A055C1D0R0-300E	300E									
A055C1D0R0-400E	400E									
A055C2D0R0-450E	450E	2	Yes	5.5kV	63kA	B	22.81 (580)	22.12 (562)	0.5 (13) Tripped Force 2 lbs.	21.25 (540)
A055C2D0R0-500E	500E									
A055C2D0R0-600E	600E									

Figure A

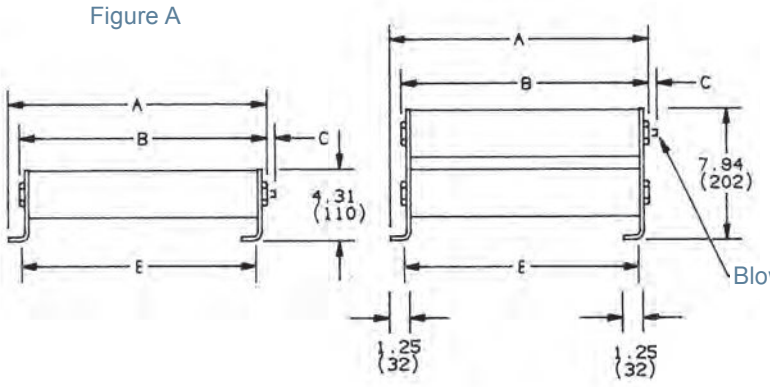


Figure B

Transformer Protection

Amp-Trap® CL-14 Series

8.25kV E-Rated Amp-Trap CL-14 Series

15.70 (399mm) and 15.39 (391mm) Clip Centers (dimension E). Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure	Dimensions Inches (mm) A	B	C	E
A083C1D0R0-60E	60E	1	Yes	8.25kV	50kA	A	16.95 (431)	16.26 (413)	0.5 (13) Tripped Force 2 lbs.	15.39 (391)
A083C2D0R0-200E	200E	2	Yes	8.25kV	50kA	B	16.95 (431)	16.26 (413)	0.5 (13) Tripped Force 2 lbs.	15.39 (391)

Figure A

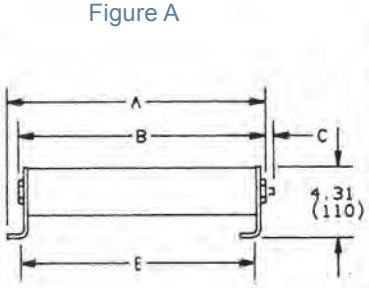
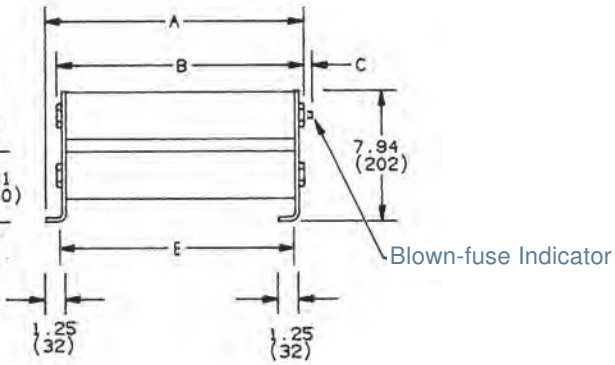


Figure B



E

Transformer Protection

Amp-Trap® CL-14 Series

15.5kV Clip-lock mounted fuses:

15.5kV E-Rated Amp-Trap CL-14 Series

18.25 (464mm) Clip Centers (dimension E). Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure	Dimensions Inches (mm) A	B	C	E
A155C1D0R0-10E	10E	1	Yes	15.5kV	50kA	A	19.81 (504)	19.12 (486)	0.5 (13) Tripped Force 2 lbs.	18.25 (464)
A155C1D0R0-15E	15E									
A155C1D0R0-20E	20E									
A155C1D0R0-25E	25E									
A155C1D0R0-30E	30E									
A155C1D0R0-40E	40E									
A155C1D0R0-50E	50E									

15.5kV E-Rated Amp-Trap CL-14 Series

21.25 (540mm) Clip Centers (dimension E). Suitable for use indoors or in an enclosure only

Catalog No.	Amp Rating	No. of Barrels	Indicating	Max Voltage	Max IR RMS Sym	Figure	Dimensions Inches (mm) A	B	C	E
A155C1D0R0-65E	65E	1	Yes	15.5kV	50kA	A	22.81 (580)	22.12 (562)	0.5 (13) Tripped Force 2 lbs.	21.25 (540)
A155C1D0R0-80E	80E									
A155C1D0R0-100E	100E									
A155C2D0R0-125E	125E	2	Yes	15.5kV	50kA	B	22.81 (580)	22.12 (562)	0.5 (13) Tripped Force 2 lbs.	21.25 (540)
A155C2D0R0-150E	150E									
A155C2D0R0-200E	200E									
A155C3D0R0-150E	150E	3	Yes	15.5kV	50kA	C	22.81 (580)	22.12 (562)	0.5 (13) Tripped Force 2 lbs.	21.25 (540)
A155C3D0R0-200E	200E									
A155C3D0R0-250E	250E									
A155C3D0R0-300E	300E									

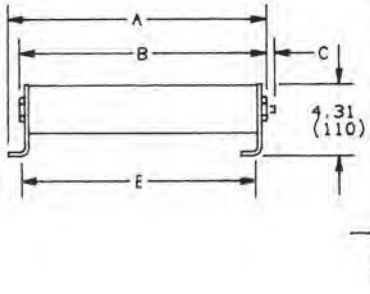


Figure A

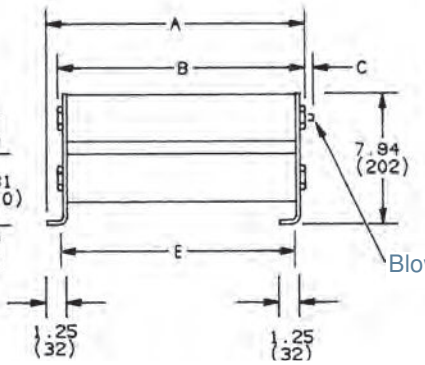


Figure B

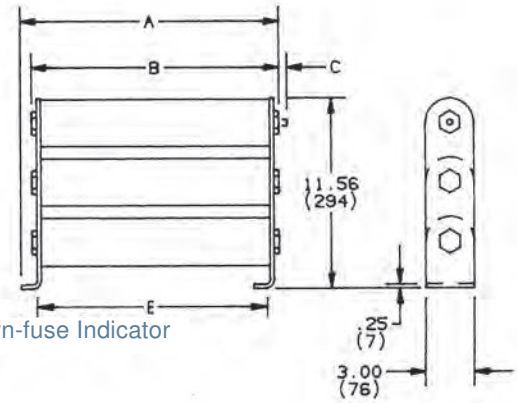


Figure C

Motor Protection
Amp-Trap® and 9F60 Series

2.4kV, 2.54kV, 4.8kV, 5.08kV and 7.2kV Ferrule mounted fuses:

Mersen R-Rated fuses are current-limiting, high interrupting rating fuses intended for the short circuit protection of medium voltage motors and motor controllers. R-Rated fuses are back-up fuses that have a minimum interrupting rating, and must be coordinated with overload relays in combination motor starters. The motor starter manufacturer generally specifies the R-Rated fuse size. These fuses come with a 3 (size D) or 4 (size E) inch diameter barrels with ferrules and are mounted in spring reinforced clips.

Features/Benefits:

- The Amp-Trap and 9F60 R-Rated fuses are UL Recognized.
- Ferrule mounting for standard clips and interchangeability with other brands of fuses.
- Current-limiting for superior equipment protection.
- Metal embossed catalog number and manufacturing date for lasting identification.
- Hookeye for non load-break isolation by hookstick
  - On the 4.8kV an optional hookeye mounted in the factory is available.
  - On all other 3" barrel if a hookeye is required, use the operating eye 9F61AAW612. (See page E58)
- Blown-fuse indicator to give positive identification of open fuse.
  - Amp trap: 3" Barrel 2 lb tripped force - 0.50 Inch
  - 9F60: 0.125 lb tripped force – 0.20 Inch

Highlights:

- R-Rated
- UL recognized

Applications:

- Short circuit protection of medium voltage motors and motor controllers.

Definitions:

R-Rating: R-Rated fuses are back-up fuses that operate as follows (Per ANSI C37.46-2000): An R-Rated fuse will melt in the range of 15 to 35 seconds at a value of current equal to 100 times the "R" rating.

Back-up Current-Limiting Fuses: A back-up current-limiting fuse is a fuse that can interrupt any current between its rated minimum interrupting current and its maximum interrupting current. Back-up fuses are not designed or intended to open under overload conditions.

Continuous Ampere Rating at 40°C: The continuous amp rating defines the thermal capability of the fuse per ANSI C37.46 and should not be the sole factor in fuse selection.



E

Ratings:

Amp-Trap
A240R
Volts : 2.4kV AC
Amps : 1 to 36R
IR : 65kA Sym
A480R
Volts : 4.8kV AC
Amps : 2 to 36R
IR : 50kA Sym
A072F
Volts : 7.2kV AC
Amps : 2 to 24R
IR : 50kA Sym

9F60 SERIES TYPE EJ-2
9F60
Volts : 2.54kV AC
: 5.08kV ac
Amps : 2 to 36R
IR : 50kA Sym

Approvals:

- Amp-Trap: UL File E93367
- 9F60: UL File E191980

Motor Protection
Amp-Trap® and 9F60 Series

2.4kV R-Rated Amp-Trap Series

7.5” (191 mm) Clip Centers – Barrel diameter size D (3”)

Catalog No.	Size	Continuous Amp rating at 40°C	Minimum Interrupting Rating RMS Amp	No of Barrels	Fig.	Indicating	Dimension L Inches (mm)	1 Phase interrupting rating	
								UL Component Recognition Max IR RMS Sym	Max Voltage Tested Max IR RMS Sym
A240R1R	1R	35	100	1	A	Yes	10.88 276)	65kA at 2.6kV	65kA at 2.6kV
A240R2R	2R	70	170						
A240R3R	3R	100	250						
A240R4R	4R	130	340						
A240R5R	5R	150	420						
A240R6R	6R	170	500						
A240R9R	9R	200	760						
A240R12R	12R	230	1000						
A240R18R	18R	390	1500	2	B				
A240R24R	24R	450	2000						
A240R36R	36R**	650	2900	3	C				

** Not recommended for use in fuse clips which grasp only one barrel.

2.4kV / 2.54kV Ferrule mounted fuses:

Indicator Flush with Surface

2 Lb. Force (Tripped)

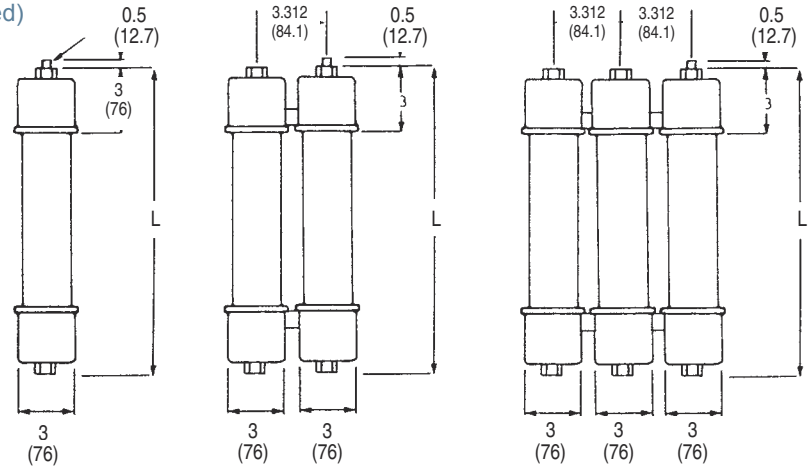


Figure A Figure B Figure C

Motor Protection

Amp-Trap® and 9F60 Series

2.4kV R-Rated 9F60 EJ-2 Series

7” (179 mm) Clip Centers – Barrel diameter size D (3”)

Catalog No.	Size	Continuous Amp rating at 40°C	Minimum Interrupting Rating RMS Amp	No of Barrels	Fig.	Indicating	Dimension L Inches (mm)	1 Phase interrupting rating	
								UL Component Recognition Max IR RMS Sym	Max Voltage Tested Max IR RMS Sym
9F60LCB502	2R	70	195	1	D	Yes	10.88 276)	50kA at 2.54kV	50kA at 2.54kV
9F60LCB503	3R	100	270						
9F60LCB504	4R	130	370						
9F60LCB506	6R	170	580						
9F60LCB509	9R	200	820						
9F60LCB512	12R	230	1150						
9F60MCB518	18R	390	1800	2	E				
9F60MCB524	24R	450	2400						
9F60LCL302	2R	70	195	1	D	No	10.88 (276)	50kA at 2.54kV	50kA at 2.54kV
9F60LCL303	3R	100	270						
9F60LCL304	4R	130	370						
9F60LCL306	6R	170	580						
9F60LCL309	9R	200	820						
9F60LCL312	12R	230	1150						
9F60MCL318	18R	390	1800	2	E				
9F60MCL324	24R	450	2400						

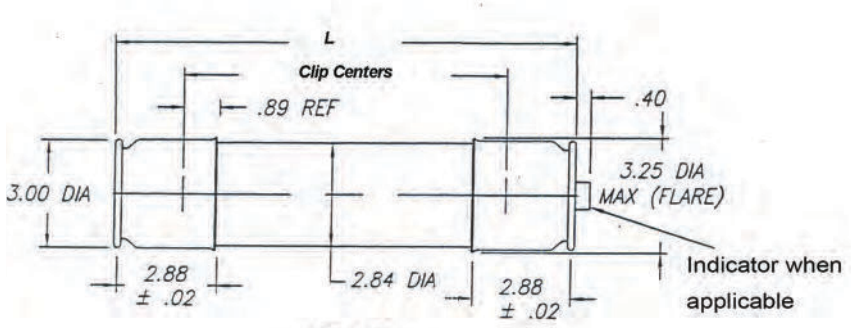


Fig. D

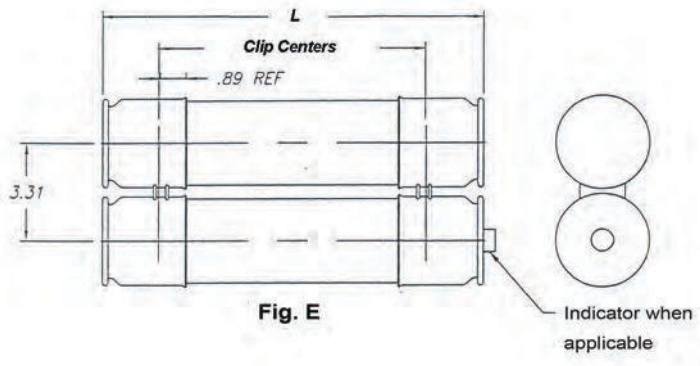


Fig. E

Motor Protection
Amp-Trap® and 9F60 Series

4.8kV / 5.08kV Ferrule Mounted Fuses:

4.8kV R-Rated Amp-Trap Series
12.5" (317 mm) Clip Centers – Barrel diameter size D (3")

Catalog No.	Size	Continuous Amp rating at 40°C	Minimum Interrupting Rating RMS Amp	No of Barrels	Fig.	Indicating	Dimension L Inches (mm)	1 Phase interrupting rating	
								UL Component Recognition Max IR RMS Sym	Max Voltage Tested Max IR RMS Sym
A480R2R-1	2R	70	190	1	A	Yes	15.88 (403)	64kA at 5.5kV	64kA at 5.5kV
A480R3R-1	3R	100	225						
A480R4R-1	4R	130	330						
A480R5R-1	5R	150	400						
A480R6R-1	6R	170	500						
A480R9R-1	9R	200	740						
A480R12R-1	12R	230	955						
A480R18R-1	18R	390	1440	2	B				
A480R24R-1	24R	450	1910						
A480R36R-1	36R**	650	2810	3	C				

4.8kV R-Rated Amp-Trap Series with Hookeye
12.75" (324 mm) Clip Centers – Barrel diameter size D (3")

Catalog No.	Size	Continuous Amp rating at 40°C	Minimum Interrupting Rating RMS Amp	No of Barrels	Fig.	Indicating	Dimension L Inches (mm)	1 Phase interrupting rating	
								UL Component Recognition Max IR RMS Sym	Max Voltage Tested Max IR RMS Sym
A480R2R-1HE	2R	70	190	1	A	Yes	16.13 (410)	50kA at 5.08kV	63kA at 5.5kV
A480R3R-1HE	3R	100	225						
A480R4R-1HE	4R	130	330						
A480R5R-1HE	5R	150	400						
A480R6R-1HE	6R	170	500						
A480R9R-1HE	9R	200	740						
A480R12R-1HE	12R	230	955						
A480R18R-1HE	18R	390	1440	2	B				
A480R24R-1HE	24R	450	1910						

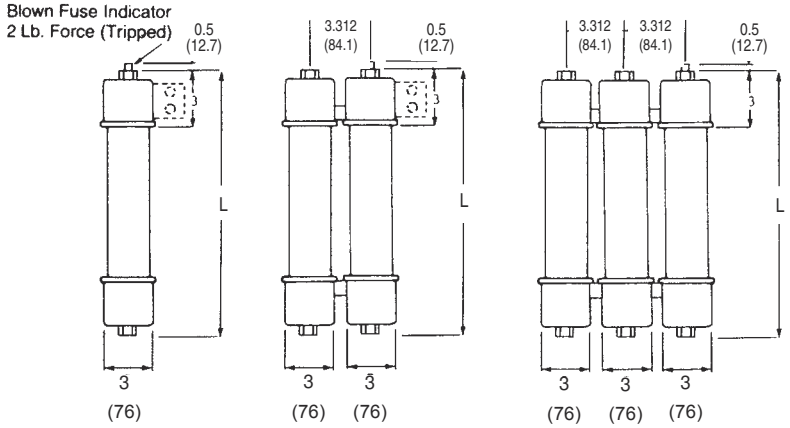
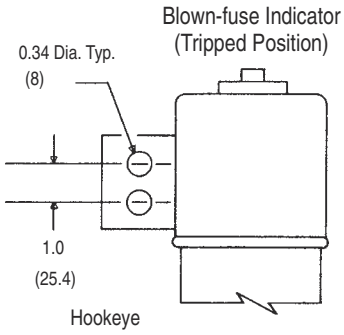


Figure A Figure B Figure C



Motor Protection
Amp-Trap® and 9F60 Series

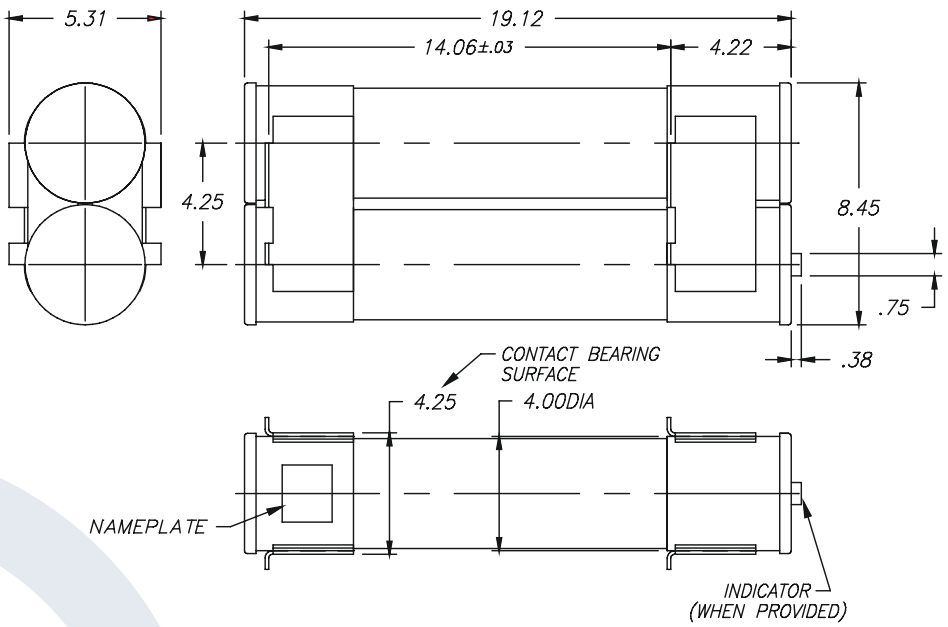
5.08kV R-Rated 9F60 EJ-2 Series
12" (305 mm) Clip Centers – Barrel diameter size D (3")

Catalog No.	Size	Continuous Amp rating at 40°C	Minimum Interrupting Rating RMS Amp	No of Barrels	Fig.	Indicating	Dimension L Inches (mm)	1 Phase interrupting rating	
								UL Component Recognition Max IR RMS Sym	Max Voltage Tested Max IR RMS Sym
9F60LJD502	2R	70	195	1	D*	Yes	15.97 (406)	50kA at 5.08kV	50kA at 5.08kV
9F60LJD503	3R	100	270						
9F60LJD504	4R	130	370						
9F60LJD506	6R	170	580						
9F60LJD509	9R	200	820						
9F60LJD512	12R	230	1150						
9F60MJD518	18R	390	1800	2	E*				
9F60MJD524	24R	450	2400						
9F60LJN302	2R	70	195	1	D*	No	15.97 (406)	50kA at 5.08kV	50kA at 5.08kV
9F60LJN303	3R	100	270						
9F60LJN304	4R	130	370						
9F60LJN306	6R	170	580						
9F60LJN309	9R	200	820						
9F60LJN312	12R	230	1150						
9F60MJN318	18R	390	1800	2	E*				
9F60MJN324	24R	450	2400						

* Figures D & E are on page E23

5.08kV R-Rated 9F60 EJ-2 Series
14" (356 mm) Clip Centers – Barrel diameter size E (4") – Use clip parts 9F61BNW452

Catalog No.	Size	Continuous Amp rating at 40°C	Minimum Interrupting Rating RMS Amp	Indicating	Dimension L Inches (mm)	1 Phase interrupting rating		No of Barrels	Fig.
						UL Component Recognition Max IR RMS Sym	Max Voltage Tested Max IR RMS Sym		
9F60NLD830	30R	550	3600	Yes	19.12 (486)	50kA at 5.08kV	50kA at 5.08kV	2	F
9F60NLD836	36R	650	4200						



Motor Protection
Amp-Trap® and 9F60 Series

7.2kV Ferrule Mounted Fuses:

7.2kV R-Rated Amp-Trap Series
12.5" (317 mm) Clip Centers – Barrel diameter size D (3")

Catalog No.	Size	Continuous Amp rating at 40°C	Minimum Interrupting Rating RMS Amp	No of Barrels	Fig.	Indicating	Dimension L Inches (mm)	1 Phase interrupting rating UL Component Recognition Max IR RMS Sym	Max Voltage Tested Max IR RMS Sym
A072F1D0R0-2R	2R	70	190						
A072F1D0R0-3R	3R	100	225						
A072F1D0R0-4R	4R	130	330						
A072F1D0R0-5R	5R	150	400	1	A				
A072F1D0R0-6R	6R	170	500			Yes	15.88 (403)	50kA at 7.2kV	50kA at 7.7kV
A072F1D0R0-9R	9R	200	740						
A072F1D0R0-12R	12R	230	955						
A072F2D0R0-18R	18R	390	1440	2	B				
A072F2D0R0-24R	24R	450	1910						

Indicator Flush with Surface
2 Lb. Force (Tripped)

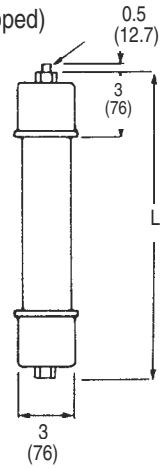


Figure A

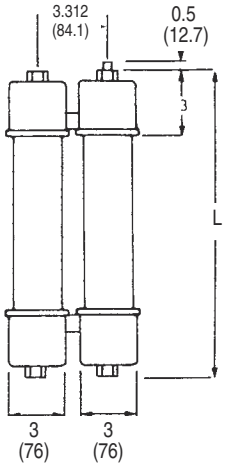


Figure B

Motor Protection

Amp-Trap® Bolt-In Series

5.08kV, 7.2kV and 15.5kV Bolt-In fuses:

Mersen R-Rated fuses are current-limiting, high interrupting rating fuses intended for the short circuit protection of medium voltage motors and motor controllers. R-Rated fuses are back-up fuses that have a minimum interrupting rating, and must be coordinated with overload relays in combination motor starters. The motor starter manufacturer generally specifies the R-Rated fuse size. These fuses are single, double, triple or quadruple barrels 3 inches diameter with end mounts designed for bolting directly to equipment bus or terminal pads.

Features/Benefits:

- The Amp-Trap Bolt-in series are UL Recognized.
- Bolt-in mounting for direct connection to bus or terminals.
- Current-limiting for superior equipment protection.
- Metal embossed catalog number and manufacturing date for lasting identification.
- Blown-fuse indicator to give positive identification of open fuse.

  Amp-Trap: 3” Barrel 2 lb tripped force - 0.50 Inch

Highlights:

- R-Rated
- UL recognized

Applications:

- Short circuit protection of medium voltage motors and motor controllers.

Definitions:

R-Rating: R-Rated fuses are back-up fuses that operate as follows (Per ANSI C37.46-2000): An R-Rated fuse will melt in the range of 15 to 35 seconds at a value of current equal to 100 times the “R” rating.

Back-up Current-Limiting Fuses: A back-up current-limiting fuse is a fuse that can interrupt any current between its rated minimum interrupting current and its maximum interrupting current. Back-up fuses are not designed or intended to open under overload conditions.

Continuous Ampere Rating at 40°C: The continuous amp rating defines the thermal capability of the fuse per ANSI C37.46 and should not be the sole factor in fuse selection.



E

Ratings:

Amp-Trap

A051B

Volts : 5.08kV AC
Amps : 2 to 38R
IR : 65kA Sym

A072B

Volts : 7.2kV AC
Amps : 2 to 24R
: 19R to 57X
IR : 50kA Sym
: 65kA Sym

A155B

Volts : 15.5kV AC
Amps : 9 to 38X
IR : 50kA Sym

Approvals:

- UL Recognized File E93367

Motor Protection

Amp-Trap® Bolt-In Series

5.08kV / 7.2kV Bolt-In fuses:

5.08kV R-Rated Amp-Trap Bolt-In Series

Catalog No.	Size	Continuous Amp rating at 40°C	Minimum Interrupting Rating RMS Amp	No of Barrels	Fig.	Indicating	1 Phase interrupting rating	
							UL Component Recognition Max IR RMS Sym	Max Voltage Tested Max IR RMS Sym
A051B1DAR0-2R	2R	70	190	1	A	Yes	65kA at 5.08kV	65kA at 5.5kV
A051B1DAR0-3R	3R	100	225					
A051B1DAR0-4R	4R	130	330					
A051B1DAR0-6R	6R	170	500					
A051B1DAR0-9R	9R	200	740					
A051B1DAR0-12R	12R	230	955					
A051B2DAR0-18R	18R	390	1440	2	B	Yes		
A051B2DAR0-24R	24R	450	1910					
A051B2DAR0-32R	32R	600	2500					
A051B2DAR0-38R	38R	700	3100					
A051B3DAR0-48X	48X	750	3600	3	C	Yes	50kA at 5.08kV	50kA at 5.2kV
A051B3DAR0-57X	57X	900	4500					

7.2kV R-Rated Amp-Trap Bolt-In Series

Catalog No.	Size	Continuous Amp rating at 40°C	Minimum Interrupting Rating RMS Amp	No of Barrels	Fig.	Indicating	1 Phase interrupting rating	
							UL Component Recognition Max IR RMS Sym	Max Voltage Tested Max IR RMS Sym
A072B1DAR0-2R	2R	70	190	1	A	Yes	50kA at 7.2kV	50kA at 7.7kV
A072B1DAR0-3R	3R	100	225					
A072B1DAR0-4R	4R	130	330					
A072B1DAR0-5R	5R	150	400					
A072B1DAR0-6R	6R	170	500					
A072B1DAR0-9R	9R	200	740					
A072B1DAR0-12R	12R	230	955					
A072B2DAR0-18R	18R	390	1440	2	B			
A072B2DAR0-24R	24R	450	1910					

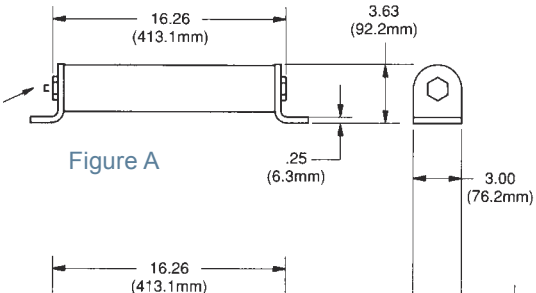
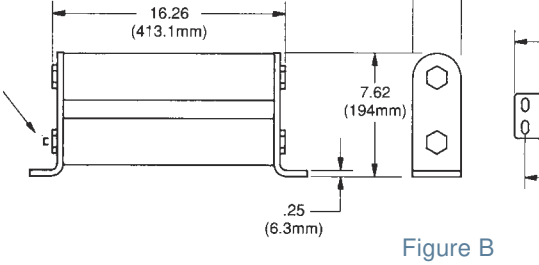


Figure A



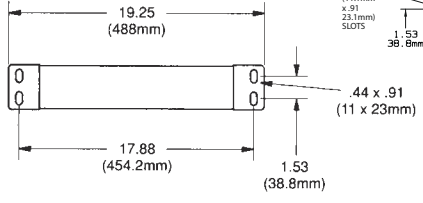


Figure B

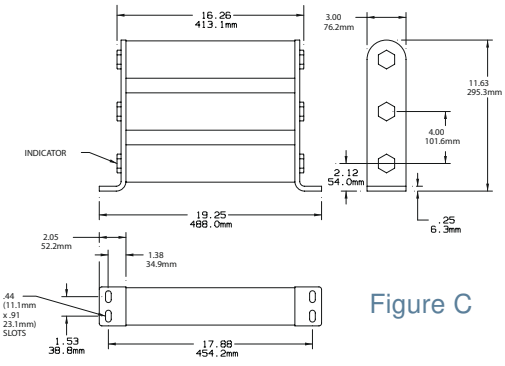


Figure C

Motor Protection

Amp-Trap® Bolt-In Series

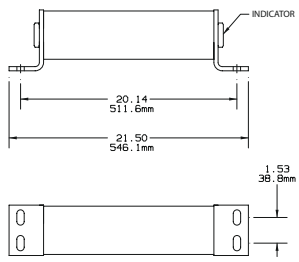
7.2kV / 15.5kV Bolt-In fuses:

7.2kV R-Rated Amp-Trap Bolt-In Series

Catalog No.	Size	Continuous Amp rating at 40°C	Minimum Interrupting Rating RMS Amp	Indicating	1 Phase interrupting rating		No of Barrels	Fig.
					UL Component Recognition Max IR RMS Sym	Max Voltage Tested Max IR RMS Sym		
A072B1D0R0-19R	19R	300	1560	Yes	65kA at 7.2kV	65kA at 7.5kV	1	D
A072B2D0R0-32R	32R	540	3070			65kA at 7.66kV	2	E
A072B2D0R0-38R	38R	600	3480					
A072B3DBR0-48X	48X	750	4360			65kA at 7.66kV	3	F
A072B3DBR0-57X	57X	900	5000			65kA at 7.2kV	3	F

15.5kV R-Rated Amp-Trap Bolt-In Series

Catalog No.	Size	Continuous Amp rating at 40°C	Minimum Interrupting Rating RMS Amp	Indicating	1 Phase interrupting rating		No of Barrels	Fig.
					UL Component Recognition Max IR RMS Sym	Max Voltage Tested Max IR RMS Sym		
A155B2D0R0-9R	9R	200	888	Yes	50 kA at 15.5kV	50 kA at 15.5kV	2	G
A155B2D0R0-12R	12R	230	1200					
A155B3D0R0-18X	18X	390	1900				3	H
A155B3D0R0-24X	24X	450	2633					
A155B4D0R0-32X	32X	600	3510				4	J
A155B4D0R0-38X	38X	700	4000					



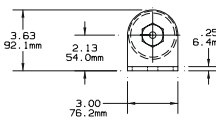


Figure D

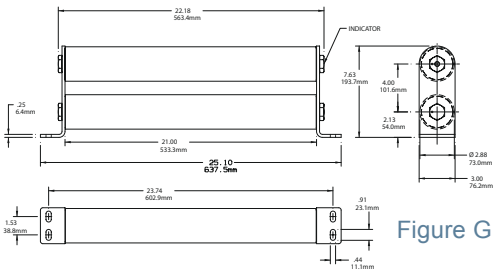
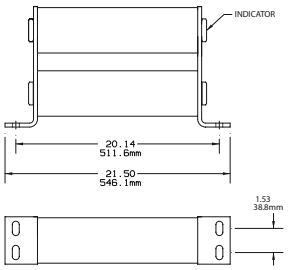


Figure G



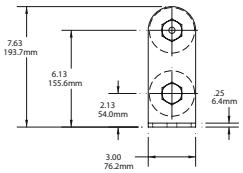


Figure E

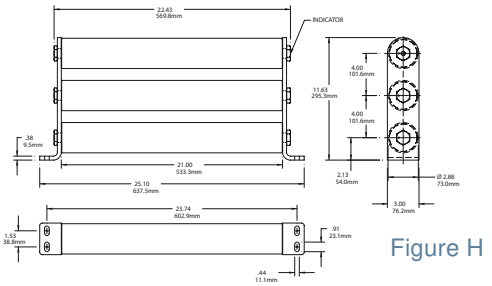


Figure H

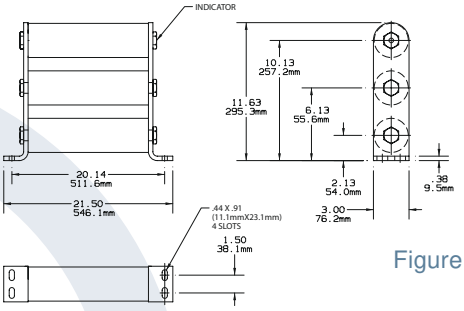


Figure F

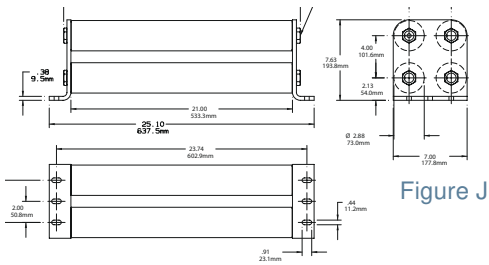


Figure J

Motor Protection

Amp-Trap® DIN-Style Fuses

R-Rated IEC DIN style MV fuses

Amp-Trap® R-Rated DIN style fuses are current-limiting, high interrupting rating fuses, intended for the short circuit protection of medium voltage motors and motor controllers. This product range offers North American R-Rated performance in the IEC 282-1 DIN mounting configuration of 442mm. R-Rated fuses are applied as back up fuses that have a minimum interrupting rating, and must be coordinated with overload relays in combination motor starters. Amp-Trap R-Rated, DIN type fuses are offered in voltage ratings of 3.3kV, 5.3kV and 7.2kV in ratings from 2R to 19R. All fuses within this product group are UL component recognized.

Features/Benefits:

- Clip mount DIN 45: R-Rated fuses with North American ANSI characteristics in a standard DIN 442mm size.
- Current-limiting for superior equipment protection
- Blown fuse indicator provides positive identification of open fuse. 4.5lb tripping force - 1.0" inch.

Highlights:

- R-Rated
- UL recognized

Applications:

- Short circuit protection of medium voltage motors and motor controllers.

Definitions:

R-Rating: R-Rated fuses are back-up fuses that operate as follows (Per ANSI C37.46-2000): An R-Rated fuse will melt in the range of 15 to 35 seconds at a value of current equal to 100 times the "R" rating.

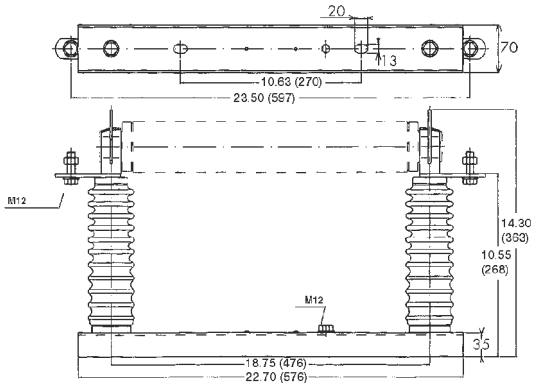
Back-up Current-Limiting Fuses: A back-up current-limiting fuse is a fuse that can interrupt any current between its rated minimum interrupting current and its maximum interrupting current. Back-up fuses are not designed or intended to open under overload conditions.

Continuous Ampere Rating at 40°C: The continuous amp rating defines the thermal capability of the fuse per ANSI C37.46 and should not be the sole factor in fuse selection.

Spring-Reinforced Clip
MR45 & Spring Ref.# L096472

Fuse-Holder: SI 24/442 Ref # K209425
In compliance with IEC 282-1, DIN standard 43625.

** Note: Ratings above 19R may be achieved by paralleling fuses. Please consult factory for details.*





Ratings:

A033D1
Volts : 3300V AC
Amps : 2 to 19R*
IR : 65kA Sym
A055D1
Volts : 5300V AC
Amps : 2 to 19R*
IR : 65kA Sym
A072D1
Volts : 7200V AC
Amps : 2 to19R*
IR : 65kA Sym

Approvals:

- UL recognized component File E93367

Motor Protection

Amp-Trap® DIN-Style Fuses

Fig.	Catalog Number	Size	Continuous Amp Rating 55°C**	Continuous Amp Rating 40°C**	Minimum Interrupting Rating RMS Rating	1 Phase Interrupting Rating Maximum Tested	
						RMS Asym	RMS Sym
3.3kv Max. DIN IEC Style 442 mm							
A	A033D1DSRO-2R	2R	63	70	190	100kA @ 3300V	65kA @ 3300V
A	A033D1DSRO-3R	3R	90	100	225		
A	A033D1DSRO-4R	4R	115	130	225		
A	A033D1DSRO-5R	5R	135	150	400		
A	A033D1DSRO-6R	6R	150	170	540		
A	A033D1DSRO-9R	9R	180	200	780		
A	A033D1DSRO-12R	12R	210	230	955		
A	A033D1DSRO-13R	13R*	230	260	1050		
A	A033D1DSRO-16R	16R*	270	300	1200		
A	A033D1DSRO-19R	19R*	280	310	1280		
5.5kV Max. DIN IEC Style 442 mm							
A	A055D1DSRO-2R	2R	63	70	190	100kA @ 5500V	65kA @ 5500V
A	A055D1DSRO-3R	3R	90	100	225		
A	A055D1DSRO-4R	4R	115	130	225		
A	A055D1DSRO-5R	5R	135	150	400		
A	A055D1DSRO-6R	6R	150	170	540		
A	A055D1DSRO-9R	9R	180	200	780		
A	A055D1DSRO-12R	12R	210	230	955		
A	A055D1DSRO-13R	13R*	230	260	1050		
A	A055D1DSRO-16R	16R*	270	300	1200		
A	A055D1DSRO-19R	19R*	280	310	1280		
7.2kV Max. DIN IEC Style 442 mm							
A	A072D1DSRO-2R	2R	63	70	190	100kA @ 7200V	65kA @ 7200V
A	A072D1DSRO-3R	3R	90	100	225		
A	A072D1DSRO-4R	4R	115	130	400		
A	A072D1DSRO-5R	5R	135	150	540		
A	A072D1DSRO-6R	6R	150	170	550		
A	A072D1DSRO-9R	9R	180	200	780		
A	A072D1DSRO-12R	12R	210	230	955		
A	A072D1DSRO-13R	13R*	230	260	1050		
A	A072D1DSRO-16R	16R*	270	300	1200		
A	A072D1DSRO-19R	19R*	280	310	1280		

** 13R, 16R and 19R are not standard ratings defined in ANSI C37.46.*

*** This rating defines the thermal capability of the fuse per ANSI 37.46 and should not be the sole factor in fuse selection.*

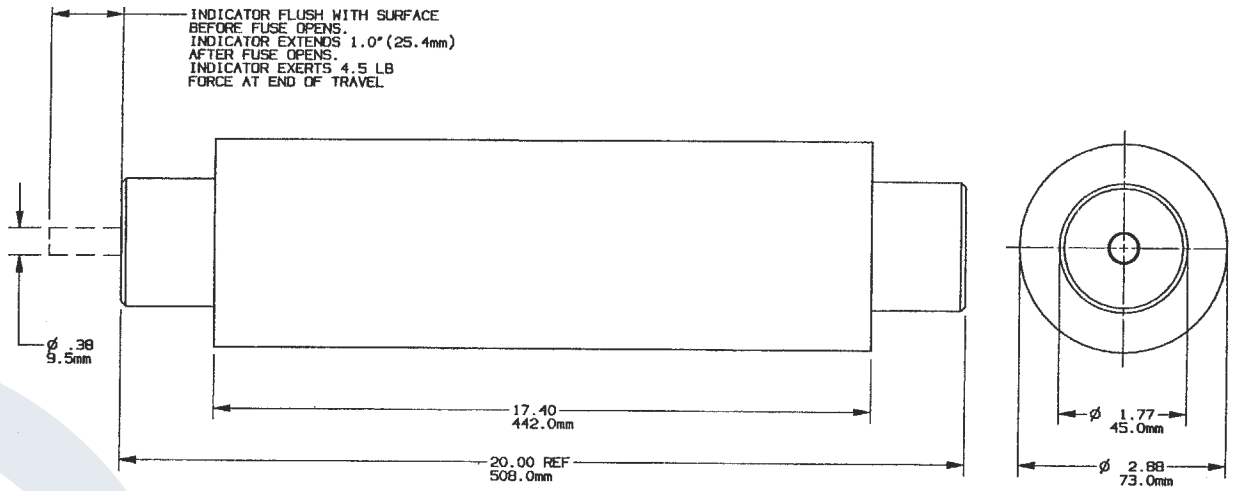


Figure A

Potential Transformer

Amp-Trap® and 9F60 Series PT Fuses

0.625kV – 2.4kV – 2.75kV – 4.8kV – 5.0kV – 5.5kV – 7.2kV – 8.25kV and 15.5kV ferrule mounted fuses:

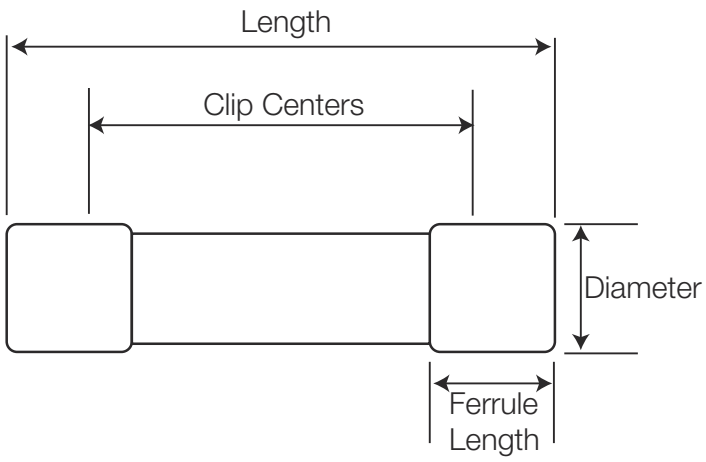
Mersen PT fuses are current-limiting fuses with high interrupting rating, used for the primary winding protection of potential transformer. They are small dimension ferrule type fuses and mount in standard clips. Current ratings are from 0.25A to 5A.

Features/Benefits:

- Ferrule mounting for standard clips and interchangeability with other brands of fuses.
- Current-limiting for superior equipment protection.
- Non-venting for silent operation.
- Metal embossed catalog number and manufacturing date for lasting identification.
- Blown-fuse indicator to give positive identification of open fuse fuse is available on the 9F60 series.

Applications:

- Primary protection for potential transformers (PT) or control power transformers (CPT).





Ratings:

Amp-Trap

A240T

Volts : 2.4kV AC
Amps : 0.05 to 5A
IR : 50kA Sym

A480T

Volts : 4.8kV AC
Amps : 0.05 to 5A
IR : 50kA Sym

A500T

Volts : 5.05kV AC
Amps : 0.25 to 5A
IR : 50kA Sym

A720T

Volts : 7.2kV AC
Amps : 0.5 to 3A
IR : 50kA Sym

9F60 Series EJ-1

9F60A

Volts : .625kV AC
Amps : 3 to 5A
IR : 100kA Sym

9F60B

Volts : 2.75kV AC
: 5.5kV AC
: 8.25kV AC
: 15.5kV AC
Amps : 0.5 to 3A
IR : 60kA Sym
: 80kA Sym
: 120kA Sym

Potential Transformer

Amp-Trap® and 9F60 Series PT Fuses

0.625kV / 2.4kV / 2.75kV Ferrule mounted fuses:

0.625kV Potential Transformer fuses – 9F60 Series, EJ-1

4.25" (108 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
9F60AAA003	3A	Yes	0.812 (20.6)	4.625 (117.5)	1.12 (28.4)	.625 kV	100kA	C08917P	–	–
9F60AAA005	5A									

2.4kV Potential Transformer fuses – Amp-Trap Series

4.00" (102 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
A240T1/2E	0.5A	No	0.812 (20.6)	4.625 (117.5)	0.625 (15.9)	2.4kV	50kA	C08917P	–	–
A240T1E	1A									
A240T2E	2A									
A240T5E	5A									

E

2.75kV Potential Transformer fuses – 9F60 Series, EJ-1

4.25" (108 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
9F60AAB001	1A	Yes	0.812 (20.6)	4.625 (117.5)	1.12 (28.4)	2.75kV	60kA	C08917P	–	–
9F60AAB002	2A									

2.75kV Potential Transformer fuses – 9F60 Series, EJ-1

6" (152 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
9F60BBB001	1A	Yes	1.625 (41.3)	7.375 (187)	1.31 (33.3)	2.75kV	60kA	9F61BWW460	9F61BNW450	–
9F60BBB002	2A									
9F60BBB003	3A									

2.75kV Potential Transformer fuses – 9F60 Series, EJ-1

8.12" (206 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
9F60BDB001	1A	Yes	1.625 (41.3)	9.5 (241)	1.31 (33.3)	2.75 kV	60kA	9F61BWW460	9F61BNW450	9F61ABB101
9F60BDB002	2A									
9F60BDB003	3A									

**Use two clips per fuse*

Potential Transformer

Amp-Trap® and 9F60 Series PT Fuses

4.8kV / 5kV / 5.4kV Ferrule Mounted Fuses:

4.8kV Potential Transformer fuses – Amp-Trap Series

5“ (127 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
A480T1/2E	0.5A	No	0.812 (20.6)	5.625 (143)	0.625 (15.9)	4.8kV	50kA	C08917P	–	–
A480T3/4E	0.75A									
A480T1E	1A									
A480T2E	2A									
A480T3E	3A									
A480T4E	4A									
A480T5E	5A									

5kV Potential Transformer fuses – Amp-Trap Series

5” (127 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
A500T1/4E-1	0.25A	No	1.00 (25.4)	5.625 (143)	0.563 (14.3)	5.0kV	50kA	–	–	–
A500T1/2E-1	0.5A									
A500T1E-1	1A									
A500T2E-1	2A									
A500T3E-1	3A									
A500T4E-1	4A									
A500T5E-1	5A									

5.5kV Potential Transformer fuses – 9F60 Series, EJ-1

6.00” (152 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
9F60BBD905	0.5A	Yes	1.625 (41.3)	7.375 (187)	1.31 (33.3)	5.5 kV	80kA	9F61BWW460	9F61BNW450	–
9F60BBD001	1A									
9F60BBD002	2A									
9F60BBD003	3A									
9F60BBN905	0.5A	No	1.625 (41.3)	7.375 (187)	1.31 (33.3)	5.5 kV	80kA	9F61BWW460	9F61BNW450	–
9F60BBN001	1A									
9F60BBN002	2A									
9F60BBN003	3A									

5.5kV Potential Transformer fuses – 9F60 Series, EJ-1

8.12” (206 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
9F60BDD905	0.5A	Yes	1.625 (41.3)	9.5 (241)	1.31 (33.3)	5.5 kV	80kA	9F61BWW460	9F61BNW450	9F61ABB101
9F60BDD001	1A									
9F60BDD002	2A									
9F60BDD003	3A									

*Use two clips per fuse

Potential Transformer

Amp-Trap® and 9F60 Series PT Fuses

7.2kV / 8.25kV / 15.5kV Ferrule mounted fuses:

7.2kV Potential Transformer fuses – Amp-Trap Series

8.88“ (227 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
A720T1/2E-1	0.5A	No	0.812 (20.6)	9.5 (241)	0.625 (15.9)	7.2kV	50kA	C08917P	–	–
A720T3/4-1	0.75A									
A720T1E-1	1A									
A720T2E-1	2A									
A720T3E-1	3A									

8.25kV Potential Transformer fuses – 9F60 Series, EJ-1

8.12” (206 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
9F60BDE905	0.5A	Yes	1.625 (41.3)	9.5 (241)	1.31 (33.3)	8.25 kV	80kA	9F61BWW460	9F61BNW450	9F61ABG101
9F60BDE001	1A									
9F60BDE002	2A									
9F60BDE003	3A									

15.5kV Potential Transformer fuses – 9F60 Series, EJ-1

11.5” (292 mm) Clip Centers

Catalog No.	Amp Rating	Indicating	Diameter Inches (mm)	Length Inches (mm)	Ferrule Length Inches (mm)	Max Voltage	Max IR RMS Sym	Spare Parts (Clips*)	Spare Parts (Live Parts)	Fuse Support Indoor (EK-1)
9F60BHH905	0.5A	Yes	1.625 (41.3)	12.875 (327)	1.31 (33.3)	15.5 kV	120kA	9F61BWW460	9F61BNW450	9F61ADG101 (13.8kV nominal - 95 kV BIL) 9F61ADJ101 (14.4kV nominal - 110kV BIL)
9F60BHH001	1A									
9F60BHH002	2A									
9F60BHH003	3A									

*Use two clips per fuse

Capacitor Protection

Amp-Trap® and 9F60 Series

Medium voltage capacitor fuses:

Mersen capacitor fuses are designed to ANSI C37-41. They are current-limiting operating without noise or discharge and are designed to be used indoors in a general purpose enclosure or outdoors in a weatherproof enclosure. These are non-disconnecting fuses requiring the use of a disconnect switch. These capacitor fuses provide both short circuit and overload protection and are intended to protect against capacitor case rupture or dielectric failure within the capacitor.

The various mounting configurations offer manufacturers a wide range of cost and space saving solutions and a large choice of equivalent products to users.

Features/Benefits:

- High interrupting capacity
- Current limitation
- Blown-fuse indication
- Direct mount
- Clip style mount
- Bus mount
- Non-venting for silent operation

Applications:

- Capacitor Protection
- Power Factor Correction Equipment
- Harmonic Filtering Equipment
- Induction Heating System
- High Power Drive
- Welders

Catalog Numbering System:

A 250 C 125 - 30

- **A** — AC Voltage
- **250** — Voltage Rating ÷ 10 (250 = 2.5kV)
- **C** — Capacitor Fuse
- **125** — Current Rating
- **30** — Mounting Configuration



Ratings:

A100C
Volts : 1000V AC Max.
Amps : 25 to 125 A
IR : 50 kA Sym

A150C
Volts : 1500V AC Max.
Amps : 25 to 200 A
IR : 40 kA Sym

A250C
Volts : 2500V AC Max.
Amps : 25 to 200 A
IR : 50 kA Sym

A300C
Volts : 3000V AC Max.
Amps : 50 to 175 A
IR : 50 kA Sym

A430C
Volts : 4300V AC Max.
Amps : 6 to 100 A
IR : 65 kA Sym

A550C
Volts : 5500V AC Max.
Amps : 6 to 75 A
IR : 65 kA Sym

9F60RJD
Volts : 5500V AC Max.
Amps : 25 to 80 A
IR : 50 kA Sym

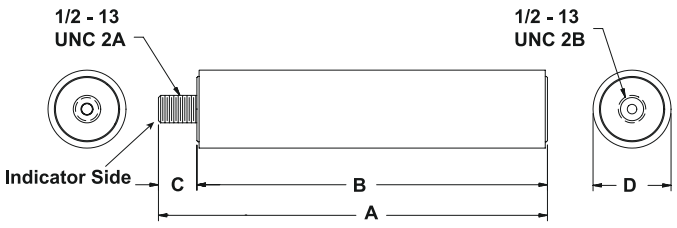
9F60RJF
Volts : 9520V AC Max.
Amps : 15 to 40A
IR : 50 kA Sym

Capacitor Protection

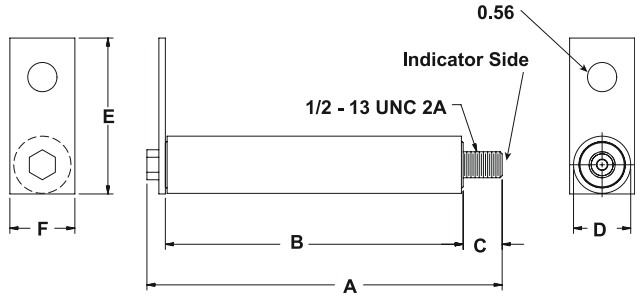
Amp-Trap® and 9F60 Series

1.0 kV - 1.5 kV Capacitor Fuses Amp-Trap Series

Catalog Number	Ampere Rating	Melting I^2t (kA^2s)	Maximum 1 Clearing I2t (kA^2s)	Maximum 1 Phase Interrupting Rating	Overall Length Inches (mm)	Tube Length Inches (mm)	Ind. Housing Inches (mm)	Body Dia Inches (mm)	Bracket Dimensions Inches (mm)	
1.5 kV Max Type 10 inner thread to screw					A	B	C	D	E	F
A150C25-10	25	4	12	40 kA @1500V RMS Sym	7.08 (179.8)	6.38 (162.1)	.70 (17.8)	1.42 (36.0)		
A150C50-10	50	16	50							
A150C60-10	60	25	70							
A150C75-10	75	35	110							
A150C90-10	90	50	150							
A150C100-10	100	65	200							
A150C110-10	110	80	250							
A150C120-10	120	100	310							
A150C125-10	125	125	330							
A150C130-10	130	125	330							
A150C135-10	135	130	350							
A150C140-10	140	130	350							
A150C150-10	150	150	390							
A150C160-10	160	185	480							
A150C165-10	165	185	480							
A150C175-10	175	225	600							
A150C200-10	200	300	800							
1.5 kV Max Type 20 screw to bolt (flat bracket)										
A150C25-20	25	3.2	6.5	40 kA @1500V RMS Sym	6.84 (173.6)	5.73 (145.5)	1.42 (36.0)	1.10 (27.9)	3.00 (76.2)	1.25 (31.8)
A150C50-20	50	13	27							
A150C60-20	60	18	38							
A150C75-20	75	30	60							
A150C90-20	90	35	72							
A150C100-20	100	52	105							
A150C110-20	110	58	120							
A150C120-20	120	73	150							
A150C125-20	125	82	165							
A150C130-20	130	90	190							
A150C135-20	135	90	190							
A150C140-20	140	105	220							
A150C150-20	150	120	240							
A150C160-20	160	185	480		7.48 (189.9)	6.37 (161.8)	.75 (19.1)	1.42 (36.0)	3.00 (76.2)	1.25 (31.8)
A150C165-20	165	185	480							
A150C175-20	175	225	600							
A150C200-20	200	300	800							



Type 10



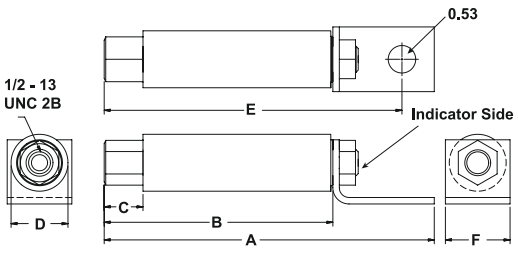
Type 20

Capacitor Protection

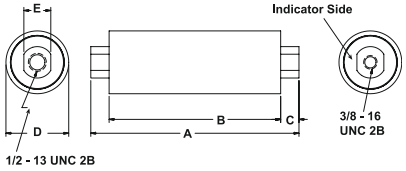
Amp-Trap® and 9F60 Series

1.0 kV - 1.5 kV Capacitor Fuses Amp-Trap Series

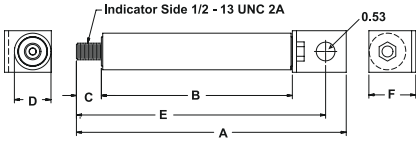
Catalog Number	Ampere Rating	Melting I^2t (kA^2s)	Maximum 1 Clearing I^2t (kA^2s)	Maximum 1 Phase Interrupting Rating	Overall Length Inches (mm)	Tube Length Inches (mm)	Ind. Housing Inches (mm)	Body Dia Inches (mm)	Bracket Dimensions Inches (mm)	
1.0 kV Max Type 30 external female to bolt (L bracket)					A	B	C	D	E	F
A100C25-30	25	4	10							
A100C50-30	50	16	40							
A100C60-30	60	25	60							
A100C75-30	75	35	95	50 kA @1000V	6.38 (162.1)	4.42 (112.3)	75 (19.1)	1.10 (27.9)	5.76 (146.2)	1.25 (31.8)
A100C90-30	90	50	130	RMS Sym						
A100C100-30	100	65	165							
A100C110-30	110	80	205							
A100C125-30	125	100	250							
1.5 kV Max Type 40 external female to external female										
A150C100-40	100	125	140							
A150C110-40	110	125	180							
A150C125-40	125	130	230							
A150C130-40	130	130	230	40 kA @1500V						
A150C140-40	140	150	285	RMS Sym	6.84 (173.6)	4.78 (121.4)	.51 (13.0)	1.75 (27.9)	.75 (19.1)	1.41 (35.8)
A150C150-40	150	185	315							
A150C160-40	160	185	360							
A150C175-40	175	225	410							
A150C200-40	200	300	560							
1.5 kV Max Type 50 screw to bolt (L bracket)										
A150C50-50	50	13	27							
A150C60-50	60	18	38							
A150C75-50	75	30	60							
A150C90-50	90	35	72							
A150C100-50	100	52	105							
A150C110-50	110	58	120	40 kA @1500V	8.11 (206.0)	5.74 (145.8)	.75 (19.1)	1.10 (27.9)	7.49 (190.2)	1.25 (31.8)
A150C120-50	120	73	150	RMS Sym						
A150C125-50	125	82	165							
A150C130-50	130	90	190							
A150C135-50	135	90	190							
A150C140-50	140	105	220							
A150C150-50	150	120	240							
A150C160-50	160	185	480							
A150C165-50	165	185	480		8.71 (221.1)	6.51 (165.2)	.70 (17.8)	1.42 (36.0)	8.08 (205.2)	
A150C175-50	175	225	600							
A150C200-50	200	300	800							



Type 30



Type 40



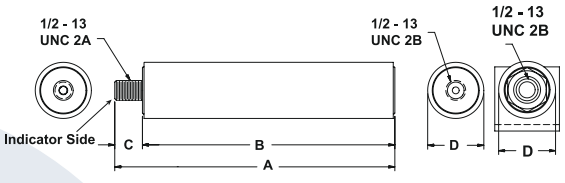
Type 50

Capacitor Protection

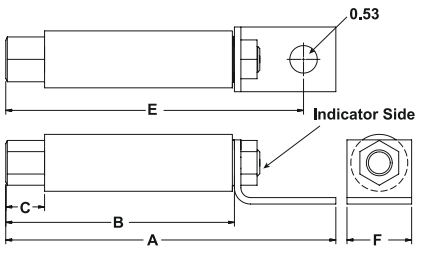
Amp-Trap® and 9F60 Series

2.5 kV Capacitor Fuses Amp-Trap Series

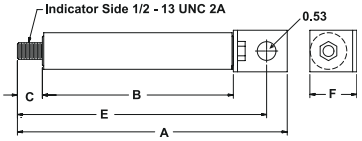
Catalog Number	Ampere Rating	Melting I^2t (kA^2s)	Maximum 1 Clearing I^2t (kA^2s)	Maximum 1 Phase Interrupting Rating	Overall Length Inches (mm) A	Tube Length Inches (mm) B	Ind. Housing Inches (mm) C	Body Dia Inches (mm) D	Bracket Dimensions Inches (mm) E	F
2.5 kV Max Type 10 inner thread to screw										
A250C25-10	25	3	9	50 kA @2500V RMS Sym	7.67 (194.8)	6.92 (175.8)	.75 (19.1)	1.42 (36.0)		
A250C50-10	50	12	35							
A250C65-10	65	18	60							
A250C75-10	75	25	85							
A250C80-10	80	25	85							
A250C100-10	100	45	150							
A250C110-10	110	60	190							
A250C125-10	125	75	240							
A250C135-10	135	115	395							
A250C150-10	150	130	460							
A200C165-10	165	150	350	40 kA @2000V RMS Sym	7.67 (194.8)	6.92 (175.8)	.75 (19.1)	1.42 (36.0)		
A200C175-10	175	165	440							
A200C200-10	200	225	500							
2.5 kV Max Type 30 external female to bolt (L bracket)										
A250C25-30	25	3	9	50 kA @2500V RMS Sym	9.41 (239.0)	6.66 (169.2)	.75 (19.1)	1.10 (27.9)	8.79 (223.2)	1.25 (31.8)
A250C50-30	50	12	35							
A250C65-30	65	18	60							
A250C75-30	75	25	85							
A250C80-30	80	25	85							
A250C100-30	100	45	150							
A250C110-30	110	60	190							
A250C125-30	125	75	240							
2.5 kV Max Type 50 screw to bolt (L bracket)										
A250C25-50	25	3	9	50 kA @2500V RMS Sym	9.11 (231.4)	6.74 (171.2)	.75 (19.1)	1.10 (27.9)	8.49 (215.6)	1.25 (31.8)
A250C50-50	50	12	35							
A250C65-50	65	18	60							
A250C75-50	75	25	85							
A250C80-50	80	25	85							
A250C100-50	100	45	150							
A250C110-50	110	60	190							
A250C125-50	125	75	240							
A250C135-50	135	115	395							
A250C150-50	150	130	460							
A200C165-50	165	150	350	40 kA @2000V RMS Sym	9.29 (236.0)	6.92 (175.8)	.75 (19.1)	1.42 (36.0)	8.67 (220.2)	1.25 (31.8)
A200C175-50	175	165	440							
A200C200-50	200	225	500							



Type 10



Type 30



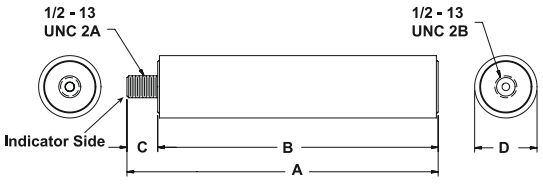
Type 50

Capacitor Protection

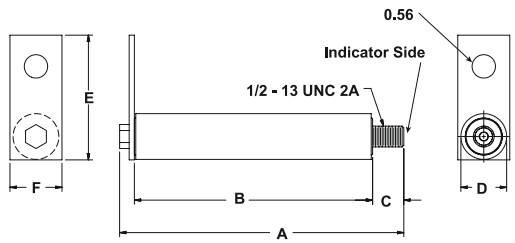
Amp-Trap® and 9F60 Series

3.0 kV Capacitor Fuses Amp-Trap Series

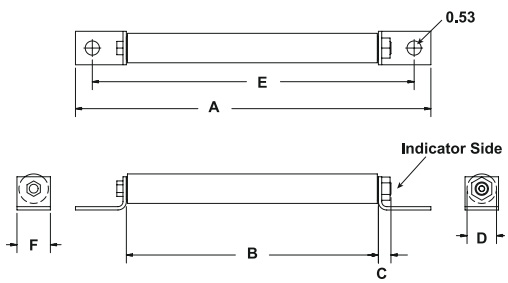
Catalog Number	Ampere Rating	Melting I^2t (kA^2s)	Maximum 1 Clearing I^2t (kA^2s)	Maximum 1 Phase Interrupting Rating	Overall Length Inches (mm)	Tube Length Inches (mm)	Ind. Housing Inches (mm)	Body Dia Inches (mm)	Bracket Dimensions Inches (mm)	
3.0 kV Max Type 10 inner thread to screw					A	B	C	D	E	F
A300C50-10	60	12	35							
A300C60-10	75	18	65							
A300C75-10	95	26	80							
A300C95-10	100	45	140		10.16 (258.1)	9.33 (237.0)	.75 (19.1)	1.10 (27.9)		
A300C100-10	115	45	140	50 kA @3000V						
A300C115-10	125	60	200	RMS Sym						
A300C125-10	130	75	260							
A300C130-10	150	75	260							
A300C150-10	175	105	350		10.16 (258.1)	9.33 (237.0)	.75 (19.1)	1.42 (36.0)		
A300C175-10		165	530							
3.0 kV Max Type 20 screw to bolt (flat bracket)										
A300C50-20	60	12	35							
A300C60-20	75	18	65							
A300C75-20	95	26	80							
A300C95-20	100	45	140		10.59 (269.1)	9.33 (237.0)	.75 (19.1)	1.10 (27.9)	3.00 (76.2)	1.25 (31.8)
A300C100-20	115	45	140	50 kA @3000V						
A300C115-20	125	60	200	RMS Sym						
A300C125-20	130	75	260							
A300C130-20	150	75	260							
A300C150-20	175	105	350		10.59 (269.0)	9.33 (237.0)	.75 (19.1)	1.42 (36.0)	3.00 (76.2)	1.25 (31.8)
A300C175-20		165	530							
3.0 kV Max Type 60 bolt (L bracket) to bolt (L bracket)										
A300C50-60	60	12	35							
A300C60-60	75	18	65							
A300C75-60	95	26	80							
A300C95-60	100	45	140							
A300C100-60	115	45	140	50 kA @3000V						
A300C115-60	125	60	200	RMS Sym						
A300C125-60	130	75	260							
A300C130-60	150	75	260		13.27 (337.1)	9.41 (239.0)	.47 (11.9)	1.42 (36.0)	12.02 (305.2)	1.25 (31.8)
A300C150-60	175	105	350							
A300C175-60		165	530							



Type 10



Type 20



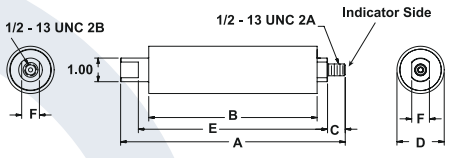
Type 60

Capacitor Protection

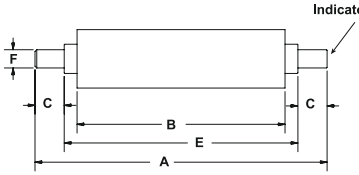
Amp-Trap® and 9F60 Series

4.3 kV Capacitor Fuses Amp-Trap Series

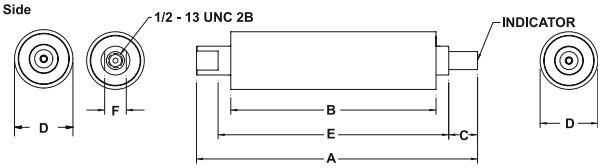
Catalog Number	Ampere Rating	Melting I^2t (kA^2s)	Maximum 1 Clearing I^2t (kA^2s)	Maximum 1 Phase Interrupting Rating	Overall Length Inches (mm)	Tube Length Inches (mm)	Ind. Housing Inches (mm)	Body Dia Inches (mm)	Bracket Dimensions Inches (mm)	
					A	B	C	D	E	F
4.3 kV Max Type 15 external female to bolt										
A430C6-15	6	0.4	2.49	65 kA @4300V RMS Sym	9.50 (241.3)	7.12 (180.8)	.75 (19.1)	2.00 (50.8)	8.00 (203.2)	.75 (19.1)
A430C8-15	8	0.73	4.31							
A430C10-15	10	1.14	6.38							
A430C12-15	12	1.6	8.64							
A430C18-15	18	3	15							
A430C20-15	20	4.5	22.1							
A430C25-15	25	6.5	31.2							
A430C30-15	30	7.7	36.2							
A430C35-15	35	9	41.4							
A430C45-15	45	12	54.6							
A430C50-15	50	15	68							
A430C65-15	65	29	84							
A430C75-15	75	36	100							
A430C80-15	80	42	120							
A430C90-15	90	58	160							
A430C100-15	100	66	180							
4.3 kV Max Type 70 tube to tube										
A430C6-70	6	0.4	2.49	65 kA @4300V RMS Sym	10.00 (254.0)	7.12 (180.8)	1.00 (25.4)	2.00 (50.8)	8.00 (203.2)	.63 (15.9)
A430C8-70	8	0.73	4.31							
A430C10-70	10	1.14	6.38							
A430C12-70	12	1.6	8.64							
A430C18-70	18	3	15							
A430C20-70	20	4.5	22.1							
A430C25-70	25	6.5	31.2							
A430C30-70	30	7.7	36.2							
A430C35-70	35	9	41.4							
A430C45-70	45	12	54.6							
A430C50-70	50	15	68							
A430C65-70	65	29	84							
A430C75-70	75	36	100							
A430C80-70	80	42	120							
A430C90-70	90	58	160							
A430C100-70	100	66	180							
4.35 kV Max Type 75 external female to tube										
A430C6-75	6	0.4	2.49	65 kA @ 4300V RMS Sym	9.75 (247.7)	7.12 (180.8)	1.00 (2.54)	2.00 (50.8)	8.00 (203.2)	0.63 (15.9)
A430C8-75	8	0.73	4.31							
A430C10-75	10	1.14	6.38							
A430C12-75	12	1.6	8.64							
A430C18-75	18	3	15							
A430C20-75	20	4.5	22.1							
A430C25-75	25	6.5	31.2							
A430C30-75	30	7.7	36.2							
A430C35-75	35	9	41.4							
A430C45-75	45	12	54.6							
A430C50-75	50	15	68							
A430C65-75	65	29	84							
A430C75-75	75	36	100							
A430C80-75	80	42	120							
A430C90-75	90	58	160							
A430C100-75	100	66	180							



Type 15



Type 70



Type 75

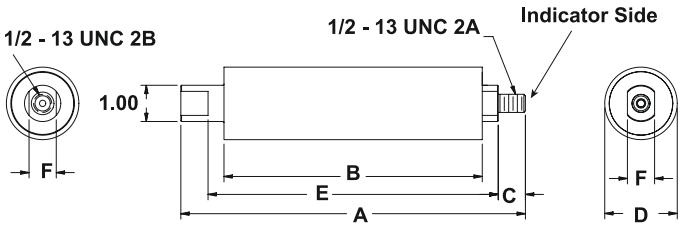
For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Capacitor Protection

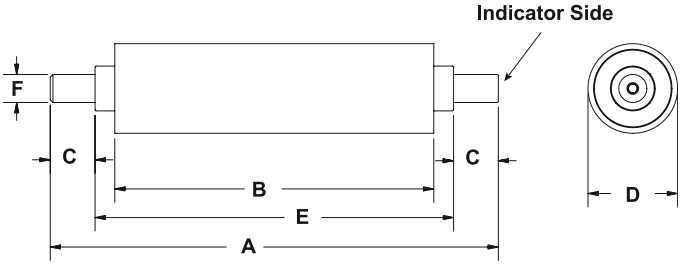
Amp-Trap® and 9F60 Series

5.5 kV Capacitor Fuses Amp-Trap Series

Catalog Number	Ampere Rating	Melting I^2t (kA^2s)	Maximum 1 Clearing I^2t (kA^2s)	Maximum 1 Phase Interrupting Rating	Overall Length Inches (mm) A	Tube Length Inches (mm) B	Ind. Housing Inches (mm) C	Body Dia Inches (mm) D	Bracket Dimensions Inches (mm) E	F
5.5 kV Max Type 15 external female to bolt										
A550C6-15	6	0.4	2.49	65 kA @ 5500V RMS Sym	9.50 (241.3)	7.12 (180.8)	.75 (19.1)	2.00 (50.8)	8.00 (203.2)	.75 (19.1)
A550C8-15	8	0.73	4.31							
A550C10-15	10	1.14	6.38							
A550C12-15	12	1.6	8.64							
A550C18-15	18	3	15							
A550C20-15	20	4.5	22.1							
A550C25-15	25	6.5	31.2							
A550C30-15	30	7.7	36.2							
A550C35-15	35	9	41.4							
A550C40-15	40	12	54.6							
A550C50-15	50	15	68	50 kA @ 5500V RMS Sym						
A550C65-15	65	35	156							
A550C75-15	75	43	186							
5.5 kV Max Type 70 tube to tube										
A550C6-70	6	0.4	2.49	65 kA @ 5500V RMS Sym	10.00 (254.0)	7.12 (180.8)	1.00 (25.4)	2.00 (50.8)	8.00 (203.2)	.63 (15.9)
A550C8-70	8	0.73	4.31							
A550C10-70	10	1.14	6.38							
A550C12-70	12	1.6	8.64							
A550C18-70	18	3	15							
A550C20-70	20	4.5	22.1							
A550C25-70	25	6.5	31.2							
A550C30-70	30	7.7	36.2							
A550C35-70	35	9	41.4							
A550C40-70	40	12	54.6							
A550C50-70	50	15	68	50 kA @ 5500V RMS Sym						
A550C65-70	65	35	156							
A550C75-70	75	43	186							



Type 15



Type 70

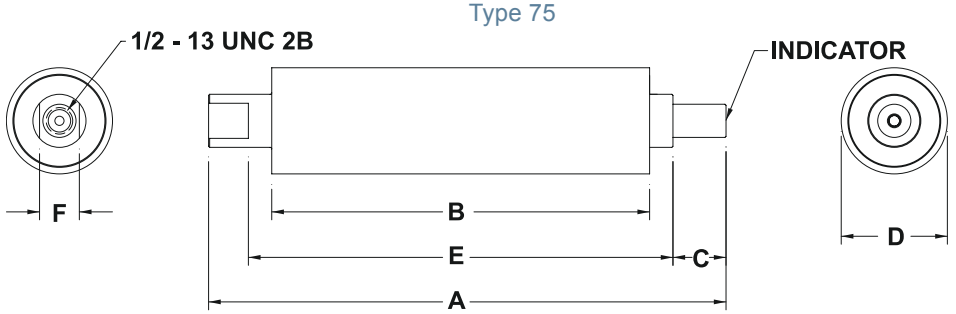
Capacitor Protection
Amp-Trap® and 9F60 Series

5.5kV / 9.52kV Capacitor Fuses Amp-Trap Series

5.5kV Capacitor Fuses - Amp-Trap Series

Catalog Number	Ampere Rating	Melting I^2t (kA^2s)	Maximum Clearing I^2t (kA^2s)	Maximum 1 Phase Interrupting Rating (kA)	Overall Length Inches (mm) A	Tube Length Inches (mm) B	Indicator Housing Inches (mm) C	Body Dia Inches (mm) D	Inches (mm) E	Inches (mm) F
5.5 kV Max Type 75 external female to tube										
A550C6-75	6	0.4	2.49	65 kA @ 5500V RMS Sym	9.75 (247.7)	7.12 (180.8)	1.00 (2.54)	2.00 (50.8)	8.00 (203.2)	0.63 (15.9)
A550C8-75	8	0.73	4.31							
A550C10-75	10	1.14	6.38							
A550C12-75	12	1.6	8.64							
A550C18-75	18	3	15							
A550C20-75	20	4.5	22.1							
A550C25-75	25	6.5	31.2							
A550C30-75	30	7.7	36.2							
A550C35-75	35	9	41.4							
A550C40-75	40	12	54.6							
A550C50-75	50	15	68							
A550C65-75	65	35	156	50 kA @ 5500V RMS Sym						
A550C75-75	75	43	186							

Type 75



5.5kV Capacitor fuses – 9F60 series, EJO-5

12” (305 mm) Clip Centers clip-in mounting* - Suitable for use indoors or outdoors

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym
9F60RJD025	25A	1	Yes	2.08 (20.8)	14.0 (356)	5.5 kV	50kA
9F60RJD040	40A						
9F60RJD080	80A						

9.52kV Capacitor fuses – 9F60 series, EJO-5

12” (305 mm) Clip Centers clip-in mounting* - Suitable for use indoors or outdoors

Catalog No.	Amp Rating	No. of Barrels	Indicating	Diameter Inches (mm)	Length Inches (mm)	Max Voltage	Max IR RMS Sym
9F60RJF015	15A	1	Yes	2.08 (20.8)	14.0 (356)	9.25 kV	50kA
9F60RJF025	25A						
9F60RJF040	40A						

**EJO-5 Capacitor fuses are typically mounted directly on the capacitor.*

Distribution Transformer Protection

Sure Guard 9F59U Series ETP Fuses

8.3kV / 15.5kV / 23.0kV ETP fuses

The Sure Guard ETP back-up current-limiting fuses are designed to protect distribution transformers and are used in series with another protective device (such as an expulsion fuse). This combination limits the high-fault current to a safe level, thus providing protection through the complete range. As its name implies, the “ETP” is for External Transformer Protection. For conventional transformers protected by expulsion-fuses cutouts, the ETP can be installed in series with the cutout. For self protected transformers, the ETP can be applied on the high-voltage bushing in series with the internal transformer expulsion fuse.



Features/Benefits:

- Various hardware options.
- Current-limiting for superior equipment protection.
- High fault current interrupting capability: I.R. Sym = 50kA at ETP voltage rating.

Highlights:

- Outdoor use

Applications:

- Overhead distribution systems

Ratings:

9F50UBC:
Volts : 8.3kV AC
9F50UBD:
Volts : 15.5kV AC
9F50UBE:
Volts : 23.0kV AC

Definitions:

Back-up Current-Limiting Fuses:

A back-up current-limiting fuse is a fuse that can interrupt any current between its rated minimum interrupting current and its maximum interrupting current. Back-up fuses are not designed or intended to open under overload conditions.

Hardware Options:

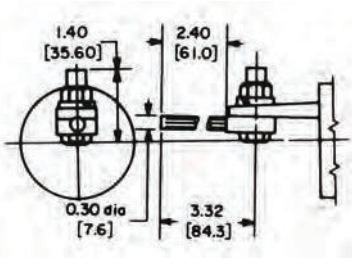


Fig. 1. Adapter only
9F59AAW007

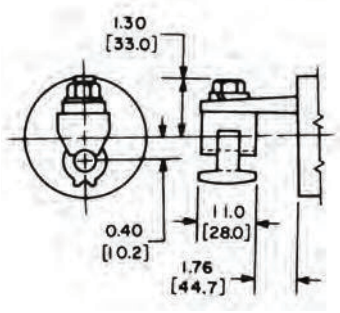


Fig. 2. Eyebolt only,
for 6-2/0 cable
9F59AAW008

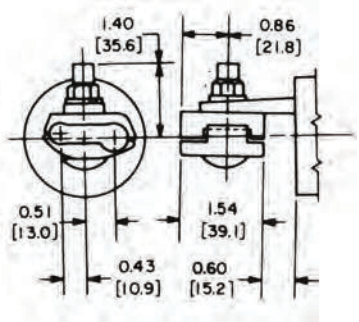


Fig. 3. Parallel groove only,
for 2/0 to 250MCM cable
9F59AAW009

Catalog No. Suitable for Parallel Application	
Catalog Number	Max kV
9F59UBC208	8.3
9F59UBC218	8.3
9F59UBC228	8.3
9F59UBC238	8.3
9F59UBC248	8.3
9F59UBC258	8.3
9F59UBC268	8.3
9F59UBC278	8.3
9F59UBC288	8.3
9F59UBD208	15.5
9F59UBD218	15.5
9F59UBD228	15.5
9F59UBD238	15.5
9F59UBD248	15.5
9F59UBD258	15.5
9F59UBD268	15.5
9F59UBD278	15.5
9F59UBD288	15.5

Distribution Transformer Protection

Sure Guard 9F59U Series ETP Fuses

Sure Guard rated 8.3kV

Catalog No.	ETP Rating	ETP Hardware	Minimum kV Class	Recommended Max. Expulsion	Max. Total I^2t	I.C. Amperes	Min. Melt Curve	Total Clear Curve	Let-through Curve
9F59UBC101	8.3, Spade & Stud	Without Hardware	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC111	8.3, Spade & Stud	(1) Adapter	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC121	8.3, Spade & Stud	(1) Eyebolt Terminal	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC131	8.3, Spade & Stud	(1) Parallel Groove	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC201	8.3, Spade & Spade	Without Hardware	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC211	8.3, Spade & Spade	(1) Adapter	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC221	8.3, Spade & Spade	(1) Eyebolt Terminal	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC231	8.3, Spade & Spade	(1) Parallel Groove	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC241	8.3, Spade & Spade	Adapter & eyebolt terminal	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC251	8.3, Spade & Spade	Adapter & parallel groove	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC261	8.3, Spade & Spade	Eyebolt terminal & parallel groove	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC271	8.3, Spade & Spade	(2) Eyebolt terminals	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC281	8.3, Spade & Spade	(2) Parallel groove	15	8T or 12K	16000	440	GES-8228A	GES-8229A	GET-6693A
9F59UBC102	8.3, Spade & Stud	Without Hardware	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC112	8.3, Spade & Stud	(1) Adapter	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC122	8.3, Spade & Stud	(1) Eyebolt Terminal	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC132	8.3, Spade & Stud	(1) Parallel Groove	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC202	8.3, Spade & Spade	Without Hardware	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC212	8.3, Spade & Spade	(1) Adapter	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC222	8.3, Spade & Spade	(1) Eyebolt Terminal	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC232	8.3, Spade & Spade	(1) Parallel Groove	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC242	8.3, Spade & Spade	Adapter & eyebolt terminal	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC252	8.3, Spade & Spade	Adapter & parallel groove	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC262	8.3, Spade & Spade	Eyebolt terminal & parallel groove	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC272	8.3, Spade & Spade	(2) Eyebolt terminals	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC282	8.3, Spade & Spade	(2) Parallel groove	15	15T or 25K	50000	450	GES-8228A	GES-8229A	GET-6693A
9F59UBC104	8.3, Spade & Stud	Without Hardware	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC114	8.3, Spade & Stud	(1) Adapter	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC124	8.3, Spade & Stud	(1) Eyebolt Terminal	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC134	8.3, Spade & Stud	(1) Parallel Groove	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC204	8.3, Spade & Spade	Without Hardware	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC214	8.3, Spade & Spade	(1) Adapter	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC224	8.3, Spade & Spade	(1) Eyebolt Terminal	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC234	8.3, Spade & Spade	(1) Parallel Groove	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC244	8.3, Spade & Spade	Adapter & eyebolt terminal	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC254	8.3, Spade & Spade	Adapter & parallel groove	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC264	8.3, Spade & Spade	Eyebolt terminal & parallel groove	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC274	8.3, Spade & Spade	(2) Eyebolt terminals	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC284	8.3, Spade & Spade	(2) Parallel groove	15	25T or 40K	140000	560	GES-8228A	GES-8229A	GET-6693A
9F59UBC208	8.3, Spade & Spade	Without Hardware	15	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBC218	8.3, Spade & Spade	(1) Adapter	15	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBC228	8.3, Spade & Spade	(1) Eyebolt Terminal	15	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBC238	8.3, Spade & Spade	(1) Parallel Groove	15	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBC248	8.3, Spade & Spade	Adapter & eyebolt terminal	15	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBC258	8.3, Spade & Spade	Adapter & parallel groove	15	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBC268	8.3, Spade & Spade	Eyebolt terminal & parallel groove	15	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBC278	8.3, Spade & Spade	(2) Eyebolt terminals	15	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBC288	8.3, Spade & Spade	(2) Parallel groove	15	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Distribution Transformer Protection

Sure Guard 9F59U Series ETP Fuses

Sure Guard rated 15.5kV

Catalog No.	ETP Rating	ETP Hardware	Min kV Class	Recommended Max. Expulsion	Max. Total I^2t	I.C. Amperes	Min. Melt Curve	Total Clear Curve	Let-through Curve
9F59UBD101	15.5, Spade & Stud	Without Hardware	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD111	15.5, Spade & Stud	(1) Adapter	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD121	15.5, Spade & Stud	(1) Eyebolt Terminal	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD131	15.5, Spade & Stud	(1) Parallel Groove	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD201	15.5, Spade & Spade	Without Hardware	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD211	15.5, Spade & Spade	(1) Adapter	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD221	15.5, Spade & Spade	(1) Eyebolt Terminal	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD231	15.5, Spade & Spade	(1) Parallel Groove	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD241	15.5, Spade & Spade	Adapter & eyebolt terminal	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD251	15.5, Spade & Spade	Adapter & parallel groove	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD261	15.5, Spade & Spade	Eyebolt terminal & parallel groove	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD271	15.5, Spade & Spade	(2) Eyebolt terminals	25	8T or 12K	16000	510	GES-8228A	GES-8229A	GET-6693A
9F59UBD102	15.5, Spade & Stud	Without Hardware	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD112	15.5, Spade & Stud	(1) Adapter	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD122	15.5, Spade & Stud	(1) Eyebolt Terminal	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD132	15.5, Spade & Stud	(1) Parallel Groove	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD202	15.5, Spade & Spade	Without Hardware	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD212	15.5, Spade & Spade	(1) Adapter	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD222	15.5, Spade & Spade	(1) Eyebolt Terminal	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD232	15.5, Spade & Spade	(1) Parallel Groove	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD242	15.5, Spade & Spade	Adapter & eyebolt terminal	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD252	15.5, Spade & Spade	Adapter & parallel groove	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD262	15.5, Spade & Spade	Eyebolt terminal & parallel groove	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD272	15.5, Spade & Spade	(2) Eyebolt terminals	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD282	15.5, Spade & Spade	(2) Parallel groove	25	15T or 25K	50000	480	GES-8228A	GES-8229A	GET-6693A
9F59UBD104	15.5, Spade & Stud	Without Hardware	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD114	15.5, Spade & Stud	(1) Adapter	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD124	15.5, Spade& Stud	(1) Eyebolt Terminal	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD134	15.5, Spade & Stud	(1) Parallel Groove	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD204	15.5, Spade & Spade	Without Hardware	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD214	15.5, Spade & Spade	(1) Adapter	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD224	15.5, Spade & Spade	(1) Eyebolt Terminal	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD234	15.5, Spade & Spade	(1) Parallel Groove	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD244	15.5, Spade & Spade	Adapter & eyebolt terminal	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD254	15.5, Spade & Spade	Adapter & parallel groove	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD264	15.5, Spade & Spade	Eyebolt terminal & parallel groove	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD274	15.5, Spade & Spade	(2) Eyebolt terminals	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD284	15.5, Spade & Spade	(2) Parallel groove	25	25T or 40K	140000	890	GES-8228A	GES-8229A	GET-6693A
9F59UBD208	15.5, Spade & Spade	Without Hardware	25	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBD218	15.5, Spade & Spade	(1) Adapter	25	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBD228	15.5, Spade & Spade	(1) Eyebolt Terminal	25	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBD238	15.5, Spade & Spade	(1) Parallel Groove	25	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBD248	15.5, Spade & Spade	Adapter & eyebolt terminal	25	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBD258	15.5, Spade & Spade	Adapter & parallel groove	25	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBD268	15.5, Spade & Spade	Eyebolt terminal & parallel groove	25	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBD278	15.5, Spade & Spade	(2) Eyebolt terminals	25	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A
9F59UBD288	15.5, Spade & Spade	(2) Parallel groove	25	50T or 80K	88000	1200	GES-8228A	GES-8229A	GET-6693A

Distribution Transformer Protection

Sure Guard 9F59U Series ETP Fuses

Sure Guard rated 23.0kV

Catalog No.	ETP Rating	ETP Hardware	kV Class	Recommended Max. Expulsion	Max. Total I^2t	Minimum I.C. Amperes	Min. Melt Curve	Total Clear Curve	Let-through Curve
9F59UBE101	23.0, Spade & Stud	Without Hardware	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE111	23.0, Spade & Stud	(1) Adapter	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE121	23.0, Spade & Stud	(1) Eyebolt Terminal	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE131	23.0, Spade & Stud	(1) Parallel Groove	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE201	23.0, Spade & Spade	Without Hardware	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE211	23.0, Spade & Spade	(1) Adapter	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE221	23.0, Spade & Spade	(1) Eyebolt Terminal	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE231	23.0, Spade & Spade	(1) Parallel Groove	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE241	23.0, Spade & Spade	Adapter & eyebolt terminal	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE251	23.0, Spade & Spade	Adapter & parallel groove	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE261	23.0, Spade & Spade	Eyebolt terminal & parallel groove	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE271	23.0, Spade & Spade	(2) Eyebolt terminals	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE281	23.0, Spade & Spade	(2) Parallel groove	35	8T or 12K	16000	280	GES-8228A	GES-8229A	GET-6693A
9F59UBE102	23.0, Spade & Stud	Without Hardware	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE112	23.0, Spade & Stud	(1) Adapter	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE122	23.0, Spade & Stud	(1) Eyebolt Terminal	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE132	23.0, Spade & Stud	(1) Parallel Groove	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE202	23.0, Spade & Spade	Without Hardware	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE212	23.0, Spade & Spade	(1) Adapter	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE222	23.0, Spade & Spade	(1) Eyebolt Terminal	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE232	23.0, Spade & Spade	(1) Parallel Groove	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE242	23.0, Spade & Spade	Adapter & eyebolt terminal	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE252	23.0, Spade & Spade	Adapter & parallel groove	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE262	23.0, Spade & Spade	Eyebolt terminal & parallel groove	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE272	23.0, Spade & Spade	(2) Eyebolt terminals	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A
9F59UBE282	23.0, Spade & Spade	(2) Parallel groove	35	15T or 25K	70000	460	GES-8228A	GES-8229A	GET-6693A

IEC Standard Back-Up Fuse-Links

3 / 7.2 kV – 6 / 12 kV – 10 / 17.5 kV – 10 / 24 kV – 20 / 36 kV Ferrule German DIN Standard

Beyond our line of ANSI / IEEE current-limiting fuses, Mersen offers a full line of medium voltage fuse links according to the IEC standards. Among them, the back-up current-limiting fuse-links designed according to IEC 60 282-1 and meeting DIN 43 625 fuse-link dimensions. These fuse-links' operating range is between their minimum interrupting rating (I3) and their maximum interrupting rating (I1). When necessary, we offer these fuses with a controlled power dissipation (CPD) feature. These type CPD fuse-links, prevent overheating of the fuse compartment when installed in conjunction with a load break switch.



Features/Benefits:

- Conform to IEC 60-282-1 which is identical to German standard VDE 0670T4
- Conform to DIN 43 625: High voltage fuse-links rated voltage 3.6 to 36kV (Fuse-link dimensions)
- Blown-fuse indicator: The strikers of the MV fuse-links mentioned here have an effective length of 27mm and are a "medium type." This classification results from the energy released by the striker during the first 20 mm of operating distance. The initial force is about 80N and the force at the end of the course (27mm) is 15N.

Highlights:

- Outdoor use
- High breaking capacity
- High current limitation

Applications:

- Protection of transformers and distribution systems.

Ratings:

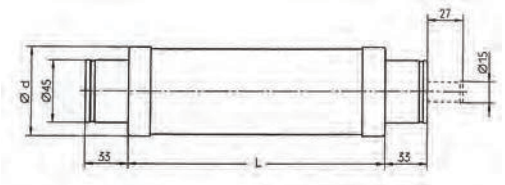
Size (L) 192:
Volts : 3/7.2kV AC
Amps : 2A to 200A
Size (L) 292:
Volts : 6/12kV AC
Amps : 1A to 200A
Size (L) 367:
Volts : 10/17.5kV AC
Amps : 6.3A to 100A
Size (L) 442:
Volts : 10/24kV AC
Amps : 1A to 200A
Size (L) 537:
Volts : 20/36kV AC
Amps : 2A to 63A
Size (L) 292:
Volts : 6/12kV AC
Amps : 1A to 200A with CPD
Size (L) 442:
Volts : 10/24kV AC
Amps : 1A to 125A with CPD

Definitions:

Back-up Fuse-links: Back-up fuse links have a rated minimum breaking capacity current above which the fuses are able to interrupt current. Back-up fuses are not designed to operate below their minimum breaking current (below I3). Their operating range is between their minimum interrupting rating (I3) and their maximum interrupting rating (I1). If protection is required for currents below I3, additional protection must be provided.

Rated Voltage Range: Medium voltage fuse links must operate at the voltage range for which they have been rated. When a current-limiting fuse clears a fault, the element melts and an arc is formed across the gap. The higher the fuse voltage rating, the higher the arc voltage will be and it will always be greater than the voltage rating of the fuse. Replacing a fuse in equipment with a fuse of a higher voltage rating can be destructive for the equipment. The rated voltage range provides the permissible voltage limits top and bottom the fuse can be used at.

Breaking Capacity I1: The breaking capacity is also referred to as the "rated maximum breaking current". This is the maximum current which can be interrupted by the fuse-link.



Definitions - Continued:

Minimum Breaking Capacity I3:

The minimum breaking current is referred to as the “rated minimum breaking current”. Back up fuses are not designed or intended to open below I3.

Control Power Dissipation:

Due to abnormal circumstances such as lightening strikes or atypical transformer inrush, some of the fuse elements can be damaged. The remaining elements will have to carry more current causing the fuse to dissipate significantly more heat. When these fuses are enclosed in a narrow fuse compartment that has limited thermal power acceptance, there is risk this may be exceeded. Type CPD fuse-links prevent such overheating. The CPD striker system releases the transformer switch before the permissible power acceptance of the fuse compartment is exceeded. The fuse should then be replaced.

Accessories:

Mersen offers clips, indoor and outdoor fuse supports along with signaling systems:

Fuse clips:

Size 45mm with connection lug: Cat # MR45R

Size 45mm without the connection lug: Cat # MR55R

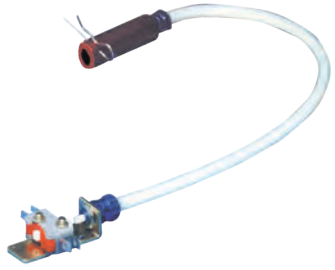
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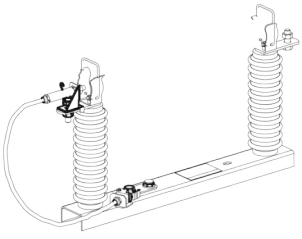
1 NO/NC Ref # E092855

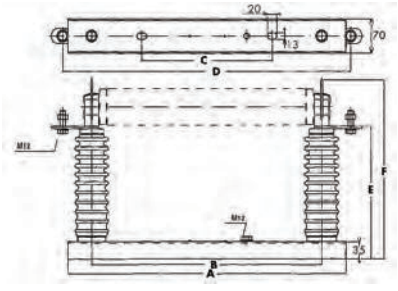
2 NO/NC Ref # F092856

Indoor and Outdoor Fuse Support:

	Catalog No.	Voltage (kV)	Size L (mm)	Dielectric Whithstand (phase to ground)		Dimensions					
				50 Hz - 1min kV RMS	1.2/50µs peak voltage	A	B	C	D	E	F
Indoor	SI72V192	7.2	192	20	60	400	226	322	347	175	270
	SI120V292	12	292	28	75	424	324	200	445	175	270
	SI175V292	17.5	292	38	95	424	324	200	445	220	315
	SI175/367	17.5	367	38	95	576	401	270	522	218	313
	SI240V442	24	442	50	125	576	476	270	597	270	365
	SI360V537	36	537	70	170	670	570	350	691	354	449
outdoor	SE120V292	12	292	28	75	424	324	200	445	261	356
	SE175V292	17.5	292	38	95	424	324	200	445	261	356
	SE175V367	17.5	367	38	95	576	401	270	521	263	358
	SE240V442	24	442	50	125	576	476	270	597	309	404
	SE360V537	36	537	70	170	670	570	350	691	381	476







IEC Standard Back-Up Fuse-Links

3 / 7.2 kV – 6 / 12 kV – 10 / 17.5 kV – 10 / 24 kV – 20 / 36 kV
Ferrule German DIN Standard

3 / 7.2 kV Rated Voltage Range – Back-up with Striker
Size: L = 192mm

Catalog No.	Ref #	I_N (A)	D (mm)	Maximum breaking current I1 (kA)	Minimum breaking current I3 (A)	Weight (kg)
45DB72V2P	N1000098	2	56	63	15	1.1
45DB72V4P	P1000099	4	56	63	20	1.1
45DB72V6,3PD	S209293	6.3	56	63	20	1.1
45DB72V10PD	T209294	10	56	63	35	1.1
45DB72V16PD	V209295	16	56	63	64	1.1
45DB72V20PD	W209296	20	56	63	80	1.1
45DB72V25PD	X209297	25	56	63	95	1.1
45DB72V32PD	Y209298	31.5	56	63	110	1.1
45DB72V40PD	Z209299	40	56	63	134	1.1
45DB72V50PD	A209300	50	56	63	190	1.1
45DB72V63P	B209301	63	65	63	220	1.4
45DB72V80P	C209302	80	65	63	300	1.4
45DB72V100P	D209303	100	65	63	350	1.4
45DB72V125PD	Q1000100	125	88	63	435	2.4
45DB72V160P	R1000101	160	88	63	500	2.4
45DB72V200P	S1000102	200	88	63	610	2.4

Indoor fuse support: SI72V192

6 / 12 kV Rated Voltage Range – Back-up with Striker
Size: L = 292mm

Catalog No.	Ref #	I_N (A)	D (mm)	Maximum breaking current I1 (kA)	Minimum breaking current I3 (A)	Weight (kg)
45DB120V1P	T1000103	1	56	63	14	1.7
45DB120V2P	V1000104	2	56	63	16	1.7
45DB120V4P	W1000105	4	56	63	22	1.7
45DB120V6,3P	F209305	6.3	56	63	30	1.7
45DB120V10P	G209306	10	56	63	42	1.7
45DB120V16P	H209307	16	56	63	54	1.7
45DB120V20P	J209308	20	56	63	73	1.7
45DB120V25P	K209309	25	56	63	93	1.7
45DB120V32P	L209310	31.5	56	63	105	1.7
45DB120V40P	M209311	40	56	63	125	1.7
45DB120V50P	N209312	50	56	63	160	1.7
45DB120V63P	P209313	63	56	63	230	1.7
45DB120V80P	Q209314	80	65	63	350	2.1
45DB120V100P	R209315	100	65	63	500	3.1
45DB120V125P	X1000106	125	88	63	480	3.7
45DB120V160P	Y1000107	160	88	63	560	3.7
45DB120V200P	Z1000108	200	88	63	610	3.7

Indoor fuse support: SI120V292 Outdoor fuse support: SE120V292

IEC Standard Back-Up Fuse-Links

10 / 17.5 kV Rated Voltage Range – Back-up with Striker Size: L = 367mm

Catalog No.	Ref #	I_N (A)	D (mm)	Maximum breaking current I1 (kA)	Minimum breaking current I3 (A)	Weight (kg)
45DB175V6,3P	V1000564	6.3	56	63	30	2.1
45DB175V10P	W1000565	10	56	63	43	2.1
45DB175V16P	X1000566	16	56	63	54	2.1
45DB175V20P	Y1000567	20	56	63	73	2.1
45DB175V25P	Z1000568	25	56	63	93	2.1
45DB175V32P	A1000569	31.5	56	63	105	2.1
45DB175V40P	B1000570	40	56	63	125	2.1
45DB175V50P	C1000571	50	56	63	205	2.1
45DB175V63P	D1000572	63	56	63	280	2.1
45DB175V80P	E1000573	80	65	63	350	2.6
45DB175V100P	F1000574	100	88	63	500	3.5

Indoor fuse support: SI175V367 Outdoor fuse support: SE175V367

10 / 24 kV Rated Voltage Range – Back-up with Striker Size: L = 442mm

Catalog No.	Ref #	I_N (A)	D (mm)	Maximum breaking current I1 (kA)	Minimum breaking current I3 (A)	Weight (kg)
45DB240V1P	A1000109	1	56	63	14	2.5
45DB240V2P	B1000110	2	56	63	16	2.5
45DB240V4P	C1000111	4	56	63	23	2.5
45DB240V6,3P	S209339	6.3	56	63	30	2.5
45DB240V10P	T209340	10	56	63	43	2.5
45DB240V16P	V209341	16	56	63	54	2.5
45DB240V20P	W209342	20	56	63	73	2.5
45DB240V25P	X209343	25	56	63	93	2.5
45DB240V32P	Y209344	31.5	56	63	105	2.5
45DB240V40P	Z209345	40	56	63	125	2.5
45DB240V50P	A209346	50	56	63	205	2.5
45DB240V63P	B209347	63	56	63	280	2.5
45DB240V80P	C209348	80	65	63	310	3.1
45DB240V100P	D209349	100	78	63	430	4.2
45DB240V125P	D1000112	125	88	40	760	5.9
45DB240V160P	E1000113	160	88	31.5	900	5.9
45DB240V200P	F1000114	200	88	31.5	1050	5.9

Indoor fuse support: SI240V442 Outdoor fuse support: SE240V442

20 / 36 kV Rated Voltage Range – Back-up with Striker Size: L = 537mm

Catalog No.	Ref #	I_N (A)	D (mm)	Maximum breaking current I1 (kA)	Minimum breaking current I3 (A)	Weight (kg)
45DB360V2P	G1000115	2	56	31.5	15	2.7
45DB360V4P	H1000116	4	56	31.5	20	2.7
45DB360V6,3PD	S209362	6.3	56	31.5	20	2.7
45DB360V10PD	T209363	10	56	31.5	33	2.7
45DB360V16PD	V209364	16	56	31.5	66	2.7
45DB360V20PD	W209365	20	56	31.5	95	2.7
45DB360V25PD	X209366	25	56	31.5	110	2.7
45DB360V32PD	Y209367	31.5	65	31.5	135	3.7
45DB360V40PD	Z209368	40	65	20	200	3.7
45DB360V50PD	J1000117	50	88	20	220	6.5
45DB360V63PD	K1000118	63	88	20	280	6.5

Indoor fuse support: SI360V537 Outdoor fuse support: SE360V537

IEC Standard Back-Up Fuse-Links

6 / 12 kV – 10 / 24 kV
Ferrule German DIN standard with Control Power Dissipation (CPD) striker system

6 / 12 kV Rated Voltage Range – Back-up with CPD Striker Size: L = 292mm

Catalog No.	Ref #	I_N (A)	D (mm)	Maximum breaking current I1 (kA)	Minimum breaking current I3 (A)	Weight (kg)
45DB120V1PT	L1000119	1	56	63	14	1.6
45DB120V2PT	M1000120	2	56	63	16	1.6
45DB120V4PT	N1000121	4	56	63	22	1.6
45DB120V6,3PT	P1000122	6.3	56	63	30	1.6
45DB120V10PT	Q1000123	10	56	63	42	1.6
45DB120V16PT	R1000124	16	56	63	54	1.6
45DB120V20PT	S1000125	20	56	63	73	1.6
45DB120V25PT	T1000126	25	56	63	93	1.6
45DB120V32PT	V1000127	31.5	56	63	105	1.6
45DB120V40PT	W1000128	40	56	63	125	1.6
45DB120V50PT	X1000129	50	56	63	160	1.6
45DB120V63PT	Y1000130	63	56	63	230	1.6
45DB120V80PT	Z1000131	80	65	63	350	2.1
45DB120V100PT	A1000132	100	65	63	500	2.1
45DB120V125PT	B1000133	125	88	63	480	3.7
45DB120V160PT	C1000134	160	88	63	560	3.7
45DB120V200PT	D1000135	200	88	63	610	3.7

Indoor fuse support: SI120V292 Outdoor fuse support: SE120V292

10 / 24 kV Rated Voltage Range – Back-up with CPD Striker Size: L = 442mm

Catalog No.	Ref #	I_N (A)	D (mm)	Maximum breaking current I1 (kA)	Minimum breaking current I3 (A)	Weight (kg)
45DB240V1PT	E1000136	1	56	63	14	2.3
45DB240V2PT	F1000137	2	56	63	16	2.3
45DB240V4PT	G1000138	4	56	63	23	2.3
45DB240V6,3PT	H1000139	6.3	56	63	30	2.3
45DB240V10PT	J1000140	10	56	63	43	2.3
45DB240V16PT	K1000141	16	56	63	54	2.3
45DB240V20PT	L1000142	20	56	63	73	2.3
45DB240V25PT	M1000143	25	56	63	93	2.3
45DB240V32PT	N1000144	31.5	56	63	105	2.3
45DB240V40PT	P1000145	40	56	63	125	2.3
45DB240V50PT	Q1000146	50	56	63	205	2.3
45DB240V63PT	R1000147	63	56	63	280	2.3
45DB240V80PT	S1000148	80	65	63	310	3.1
45DB240V100PT	T1000149	100	78	63	430	4.1
45DB240V125PT	V1000150	125	88	40	760	5.9

Indoor fuse support: SI240V442 Outdoor fuse support: SE240V442

Accessories Type EK 9F61 Series

Fuse supports, fuse disconnect switches and accessories from 2.4kV to 38kV

Fuse supports, non-disconnecting, are used primarily in potential transformer circuits, or where there is some other disconnecting or isolating device in series with the fuse in the circuit. Disconnecting switch devices have the additional feature of serving to isolate the equipment they protect. It should be noted that disconnecting switches are not load-breaking devices, therefore, the circuit must be open prior to the fuse disconnection. Select either a fuse support or a disconnecting switch for each fuse. Fuse supports and disconnecting switches include live parts for both ends. Both fuse supports and fuse disconnect switches can be mounted vertically or horizontally. The type EK are used for indoor installations while the type EKO are used outdoors.

Indoor:

Fuse supports: EK-1
Fuse disconnect switches: EK-3

Outdoor:

Fuse supports: EKO-1
Fuse disconnect switches: EKO-3

Fuse Size	Ferrule Diameter
B	1-9/16 inches
C	2 inches
D	3inches
DD	two-3 inch in parrallel
DDDD	four-3 inch in parrallel
EE	two-4 inch in parrallel

The letter suffix following the (-1) or the (-3) shows the fuse size.

When selecting a mounting for a current-limiting fuse, it is necessary that the clip centers and size agree with the fuse selected.

For further detailed information regarding these fuse supports and disconnecting switches such as storage, mounting and maintenance, please refer to INST-EK39196 available on our website at us-ferrazshawmut.mersen.com or ask your sales representative for a hard copy.

Fuse Support - EK-1 Indoor



EK-1B



EK-1C



EK-1D



EK-1DD



EK-1EE



EK-1DDDD

Refer to drawings for specific dimensions.

Accessories Type EK 9F61 Series

Fuse Support - EK-1 Indoor

Catalog No.	Max. kV	Ferrule Size/ Diam.	Clip Centers	Spare Parts (Live Parts)	Spare Parts (Clips)	Insulator Rating - Class/NEMA Nominal Sys. (kV)	Insulator Rating - BIL (kV)	Insulator Rating - Class/NEMA Tech Ref.
9F61ABB101	2.75/5.5	B/1.56"	8.12"	9F61BNW450	9F61BWW460	4.8	60	A-20
9F61ABG101	8.25	B/1.56"	8.12"	9F61BNW450	9F61BWW460	13.8	95	A-20
9F61ADG101	15.5	B/1.56"	11.5"	9F61BNW450	9F61BWW460	13.8	95	A-20
9F61ADJ101	15.5	B/1.56"	11.5"	9F61BNW450	9F61BWW460	14.4	110	A-20
9F61AAB201	2.75	C/2.00"	7"	9F61BNW451	9F61BWW457	4.8	60	A-20
9F61ACB201	5.5	C/2.00"	9"	9F61BNW451	9F61BWW457	4.8	60	A-20
9F61AEG201	15.5	C/2.00"	12"	9F61BNW451	9F61BWW457	13.8	95	A-20
9F61AGG201	15.5	C/2.00"	15"	9F61BNW451	9F61BWW457	13.8	95	A-20
9F61AGJ201	15.5	C/2.00"	15"	9F61BNW451	9F61BWW457	14.4	110	A-20
9F61AHM201	25.8	C/2.00"	21"	9F61BNW743	9F61BWW457	23	150	A-20
9F61AAB301	2.75	D/3.00"	7"	9F61BNW750	9F61BWW459	4.8	60	A-20
9F61AEB301	2.75/5.5	D/3.00"	12"	9F61BNW750	9F61BWW459	4.8	60	A-20
9F61AEG301	8.25	D/3.00"	12"	9F61BNW750	9F61BWW459	13.8	95	A-20
9F61AGG301	15.5	D/3.00"	15"	9F61BNW750	9F61BWW459	13.8	95	A-20
9F61AGJ301	15.5	D/3.00"	15"	9F61BNW750	9F61BWW459	14.4	110	A-20
9F61AHM301	25.8	D/3.00"	21"	9F61BNW744	9F61BWW459	23	150	A-20
9F61AAB401	2.75	DD/3.00"	7"	9F61BNW751	–	4.8	60	A-20
9F61AEB401	2.75/5.5	DD/3.00"	12"	9F61BNW751	–	4.8	60	A-20
9F61AEG401	8.25	DD/3.00"	12"	9F61BNW751	–	13.8	95	A-20
9F61AGG401	15.5	DD/3.00"	15"	9F61BNW751	–	13.8	95	A-20
9F61AGJ401	15.5	DD/3.00"	15"	9F61BNW751	–	14.4	110	A-20
9F61AHM401	25.8	DD/3.00"	21"	9F61AWW738	–	23	150	A-20
9F61AFB501	5.08	EE/4.00"	14.12"	9F61BNW452	–	4.8	60	A-20
9F61AFG501	15	EE/4.00"	14.12"	9F61BNW452	–	13.8	95	A-20
9F61AFJ501	15	EE/4.00"	14.12"	9F61BNW452	–	14.4	110	A-20
9F61AHG001		DDDD		For Bolted-end Fuses refer to drawings.				
9F61AHJ001		DDDD		For Bolted-end Fuses refer to drawings.				
9F61AKB001		DDDD		For Bolted-end Fuses refer to drawings.				

Accessories Type EK 9F61 Series

Disconnect Switch - EK-3 Indoor



EK-3C



EK-3D



EK-3DD

Catalog No.	Max. kV	Ferrule Size/ Diam.	Clip Centers	Spare Parts (Live Parts)	Spare Parts (Clips)	Insulator Rating - Nominal Sys. (kV)	Insulator Rating - BIL (kV)	Insulator Rating - Class/NEMA Tech Ref.
9F61AAB205	2.75	C/2.00"	7"	9F61BNW731	9F61BWW457	4.8	60	A-20
9F61ACB205	5.5	C/2.00"	9"	9F61BNW731	9F61BWW457	4.8	60	A-20
9F61AEG205	15.5	C/2.00"	12"	9F61BNW731	9F61BWW457	13.8	95	A-20
9F61AGG205	15.5	C/2.00"	15"	9F61BNW731	9F61BWW457	13.8	95	A-20
9F61AGJ205	15.5	C/2.00"	15"	9F61BNW731	9F61BWW457	14.4	110	A-20
9F61AHM205	25.8	C/2.00"	21"	9F61BNW746	9F61BWW457	23	150	A-20
9F61AAB305	2.75	D/3.00"	7"	9F61BNW732	9F61BWW459	4.8	60	A-20
9F61AEB305	2.75/5.5	D/3.00"	12"	9F61BNW732	9F61BWW459	4.8	60	A-20
9F61AEG305	8.25	D/3.00"	12"	9F61BNW732	9F61BWW459	13.8	95	A-20
9F61AGG305	15.5	D/3.00"	15"	9F61BNW732	9F61BWW459	13.8	95	A-20
9F61AGJ305	15.5	D/3.00"	15"	9F61BNW732	9F61BWW459	14.4	110	A-20
9F61AHM305	25.8	D/3.00"	21"	9F61BNW747	9F61BWW459	23	150	A-20
9F61AAB405	2.75	DD/3.00"	7"	9F61BNW461	–	4.8	60	A-20
9F61AEB405	2.75/5.5	DD/3.00"	12"	9F61BNW461	–	4.8	60	A-20
9F61AEG405	8.25	DD/3.00"	12"	9F61BNW461	–	13.8	95	A-20
9F61AGG405	15.5	DD/3.00"	15"	9F61BNW461	–	13.8	95	A-20
9F61AGJ405	15.5	DD/3.00"	15"	9F61BNW461	–	14.4	110	A-20
9F61AHM405	25.8	DD/3.00"	21"	9F61BNW748	–	23	150	A-20

Refer to drawings for specific dimensions.

Accessories Type EK 9F61 Series

Fuse Support - EKO-1 Outdoor



EKO-1C



EKO-1D



EKO-1DD



EKO-1DDDD

Catalog No.	Max. kV	Ferrule Size/Diam.	Clip Centers	Spare Parts (Live Parts)	Spare Parts (Clips)	Insulator Rating - Nominal Sys. (kV)	Insulator Rating - BIL (kV)	Insulator Rating - Class/NEMA Tech Ref.
9F61CEF209	2.75/5.5/8.25	C/2.00"	12"	9F61BNW743	9F61BWW457	7.5	95	202
9F61CGL209	15.5	C/2.00"	15"	9F61BNW743	9F61BWW457	15	110	205
9F61CHM209	25.8	C/2.00"	21"	9F61BNW743	9F61BWW457	23	150	208
9F61CEF309	2.75/5.5/8.25	D/3.00"	12"	9F61BNW744	9F61BWW459	7.5	95	202
9F61CGL309	15.5	D/3.00"	15"	9F61BNW744	9F61BWW459	15	110	205
9F61CHM309	25.8	D/3.00"	21"	9F61BNW744	9F61BWW459	23	150	208
9F61CJN309	38	D/3.00"	27"	9F61BNW744	9F61BWW459	34.5	200	210
9F61CEF409	2.75/5.5/8.25	DD/3.00"	12"	9F61AWW738	–	7.5	95	202
9F61CGL409	15.5	DD/3.00"	15"	9F61AWW738	–	15	110	205
9F61CHM409	25.8	DD/3.00"	21"	9F61AWW738	–	23	150	208
9F61CJN409	38	DD/3.00"	27"	9F61AWW738	–	34.5	200	210
9F61CHL009		DDDD	For Bolted-end Fuses refer to drawings.					
9F61CKF009		DDDD	For Bolted-end Fuses refer to drawings.					

Refer to drawings for specific dimensions.

Accessories Type EK 9F61 Series

Disconnect Switch - EKO-3 Outdoor



EKO-3C



EKO-3D Open Position



EKO-3DD

Catalog No.	Max. kV	Ferrule Size/Diam.	Clip Centers	Spare Parts (Live Parts)	Spare Parts (Clips)	Insulator Rating - Nominal Sys. (kV)	Insulator Rating - BIL (kV)	Insulator Rating - Class/NEMA Tech Ref.
9F61CEF210	2.75/5.5/8.25	C/2.00"	12"	9F61BNW746	9F61BWW457	7.5	95	202
9F61CGL210	15.5	C/2.00"	15"	9F61BNW746	9F61BWW457	15	110	205
9F61CGN210	15.5	C/2.00"	15"	9F61BNW746	9F61BWW457	34.5	200	210
9F61CHM210	25.8	C/2.00"	21"	9F61BNW746	9F61BWW457	23	150	208
9F61CEF310	2.75/5.5/8.25	D/3.00"	12"	9F61BNW747	9F61BWW459	7.5	95	202
9F61CGL310	15.5	D/3.00"	15"	9F61BNW747	9F61BWW459	15	110	205
9F61CHM310	25.8	D/3.00"	21"	9F61BNW747	9F61BWW459	23	150	208
9F61CJN310	38	D/3.00"	27"	9F61BNW747	9F61BWW459	34.5	200	210
9F61CEF410	2.75/5.5/8.25	DD/3.00"	12"	9F61BNW748	–	7.5	95	202
9F61CGL410	15.5	DD/3.00"	15"	9F61BNW748	–	15	110	205
9F61CHM410	25.8	DD/3.00"	21"	9F61BNW748	–	23	150	208
9F61CJN410	38	DD/3.00"	27"	9F61BNW748	–	34.5	200	210

Refer to drawings for specific dimensions.

Accessories Type EK 9F61 Series

Accessories and Spare Parts

Hinge Trunions and Operating Eyes for Use on Disconnecting Switches

Fuse Size	Hinge Trunion Model No.	Operating Eye Model No.
C	9F61BJW397	9F61BFW394
D	9F61BKW398	9F61AWW612
DD	9F61BLW399	9F61AWW612



EK-3C
9F61BFW394



EK-3D and DD
9F61AAW612



EKO-3C
9F61BJW397



EKO -3D
9F61BKW398



EKO-3DD
9F61BLW399

Accessories Type EK 9F61 Series

Fuse Size B (Ferrule Diameter 1.5625")

Fuse Supports & Disconnect Switches	Spare Live Parts(*)	Figure (Fig.)	Spare Fuse Clips(**)	Figure (Fig.)	Fuse size
9F61ABB101	9F61BNW450		9F61BWW460		B
9F61ABG101					B
9F61ADG101					B
9F61ADJ101					B

Fuse Size C (Ferrule Diameter 2")

Fuse Supports & Disconnect Switches	Spare Live Parts(*)	Figure (Fig.)	Spare Fuse Clips(**)	Figure (Fig.)	Fuse size
9F61AAB201	9F61BNW451		9F61BWW457		C
9F61ACB201					C
9F61AEG201					C
9F61AGG201					C
9F61AGJ201					C
9F61AAB205	9F61BNW731				C
9F61ACB205					C
9F61AEG205					C
9F61AGG205					C
9F61AGJ205					C
9F61AHM201	9F61BNW743				C
9F61CEF209					C
9F61CGL209					C
9F61CHM209					C
9F61AHM205	9F61BNW746				C
9F61CEF210					C
9F61CGL210					C
9F61CHM210					C

(*) Spare Live Parts: Order (1) Live Parts for each Fuse Support and Disconnecting Switch (includes live parts for both ends).
(**) Fuse Clips: Order (2) Fuse Clips for each Fuse Support and order (1) Fuse Clip for each Disconnecting Switch.

Accessories Type EK 9F61 Series

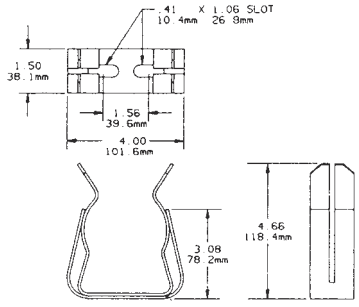
Fuse Size D (Ferrule Diameter 3")

Fuse Supports & Disconnect Switches	Spare Live Parts(*)	Figure (Fig.)	Spare Fuse Clips(**)	Figure (Fig.)	Fuse size
9F61AAB305	9F61BNW732		9F61BWW459		D
9F61AEB305					D
9F61AEG305					D
9F61AGG305					D
9F61AGJ305					D
9F61AHM301	9F61BNW744				D
9F61CEF309					D
9F61CGL309					D
9F61CHM309					D
9F61CJN309					D
9F61AHM305	9F61BNW747				D
9F61CEF310					D
9F61CGL310					D
9F61CHM310					D
9F61CJN310					D
9F61AAB301	9F61BNW750				D
9F61AEB301					D
9F61AEG301					D
9F61AGG301					D
9F61AGJ301					D

(*) Spare Live Parts: Order (1) Live Parts for each Fuse Support and Disconnecting Switch (includes live parts for both ends).
(**) Fuse Clips: Order (2) Fuse Clips for each Fuse Support and order (1) Fuse Clip for each Disconnecting Switch.

For the 3" ferrule diameter we also offer the Cat # 228-700-530 clips. These spring reinforced clips will accomodate one and two barrel 3-inch diameter medium voltage ferrule type fuses. The clip and reinforcing spring are intended to be bolted to a copper busbar through two .41" and 1.06" slots. A minimum copper-bus section of 1/4" x 1-1/2" is recommended for maximum ratings of 24R and 450E. The Cat # 228-700-530 is for one pair of clips, enough for one fuse.





Accessories Type EK 9F61 Series

Fuse Size DD (Ferrule Diameter two 3" in Parallel)

Fuse Supports & Disconnect Switches	Spare Live Parts(*)	Figure (Fig.)	Spare Fuse Clips(**)	Fuse size
9F61AHM401	9F61AWW738		N/A	DD
9F61CEF409				DD
9F61CGL409				DD
9F61CHM409				DD
9F61CJN409				DD
9F61AAB405	9F61BNW461			DD
9F61AEB405				DD
9F61AEG405				DD
9F61AGG405				DD
9F61AGJ405				DD
9F61AHM405	9F61BNW748			DD
9F61CEF410				DD
9F61CGL410				DD
9F61CHM410				DD
9F61CJN410				DD
9F61AAB401	9F61BNW751			DD
9F61AEB401				DD
9F61AEG401				DD
9F61AGG401				DD
9F61AGJ401				DD

Conversion Kit D to DD for use on Fuse Supports

Model No.	Figure (Fig.)	Used on live parts	Figure (Fig.)
9F61BNW402		9F61BNW751 (Indoor)	
		9F61AWW738 (Outdoor)	

Fuse Size EE (Ferrule Diameter Two 4" in Parallel)

Fuse Supports & Disconnect Switches	Spare Live Parts(*)	Figure (Fig.)	Spare Fuse Clips(**)	Fuse size
9F61AFB501	9F61BNW452		N/A	EE
9F61AFG501				EE
9F61AFJ501				EE

(*) Spare Live Parts: Order (1) Live Parts for each Fuse Support and Disconnecting Switch (includes live parts for both ends).
(**) Fuse Clips: Order (2) Fuse Clips for each Fuse Support and order (1) Fuse Clip for each Disconnecting Switch.

International Fuses

A world of circuit protection solutions — in your backyard



Your problem: For most of our customers, globalization isn't just a buzzword it's a reality with very tangible challenges for those in charge of purchasing, inventory, installations, repairs, and other operational duties. And that's true whether you're building, operating, or maintaining overseas manufacturing centers. Exporting equipment designed to be acceptable to overseas inspection authorities and electrical professionals. Or ensuring imported equipment is optimally installed and maintained.

Our solution: Mersen offers you the benefits of a truly global supplier. From the one-stop shopping advantages of our complete line of European and North American fuses, holders, and accessories. To our pursuit of other international technologies. To our definitive understanding of international circuit protection standards such as those of the IEC and CENELEC.

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F

International Fuses

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- gl-gG, aM F2
- D0 type (NEOZED) F7
- D type (DIAZED) F11
- NH Dimension / gl-gG, aM F15

Canadian Fuses

- Class C.....F20
- Class CA & CB, CN/CNS F22
- HRCII NIT/NS.....F23
- Class H NRN/NRS F24
- Class H CRN/CRS F25

FERRAZ SHAWMUT IS NOW MERSEN

MERSEN

gI-gG, aM Cylindrical Fuse-Links

Domestic and industrial cylindrical fuse-links

Mersen gI-gG and aM fuse-links cover a wide range of physical sizes and ampere ratings for 400, 500, and 690 volts AC. gI-gG and aM fuse-links are for industrial applications. Most ratings are available with an optional indicator. All industrial fuse-links have the option of a built-in striker. All cylindrical fuse-links have ceramic bodies and silver-plated ferrules.



gI-gG

Full Range Protection

- 4 physical sizes from 8 x 31mm to 22 x 58 mm
- 400, 500 and 690 Volt ratings - 0.5A through 125A
- Most ratings available with indicator
- Meet IEC, NFC and UNE standards
- Approved by Lloyds Register of Shipping and Bureau Veritas

gI-gG

Full Range Protection Fuse-links with Striker

- 2 sizes-14 x 51mm and 22 x 58mm
- 400, 500 and 690 Volt ratings - 4A through 125A
- All ratings include striker
- Meet IEC, NFC and UNE standards
- Approved by Lloyds Register of Shipping and Bureau Veritas

aM

Short Circuit Protection

- 4 physical sizes from 8 x 31mm to 22 x 58mm
- 400, 500 and 690 Volt ratings - 16A through 125A
- Most ratings available with indicator
- Meet IEC, NFC and UNE standards
- Approved by Lloyds Register of Shipping and Bureau Veritas

aM

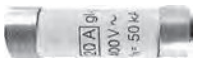
Short Circuit Protection Fuse-links with Striker

- 2 sizes - 14 x 51mm and 22 x 58mm
- 400, 500 and 690 Volt ratings - 2A through 125A
- All ratings include striker
- Meet IEC, NFC and UNE standards
- Approved by Lloyds Register of Shipping and Bureau Veritas

gI-gG Cylindrical Fuse-Links

Catalog Numbers, Ratings – gI-gG (Optional Blown-Fuse Indicator)

Size (mm x mm)	Rated In Current (A)	Rated Voltage	Catalog Number w/o Indicator	Catalog Number w Indicator	Interrupting Rating (A)	Standard Pack/Ctn
8x31	0.5	400V	15009-G		20,000	10/100
	1		15011-G			
	2		15013-G	15213-G		
	4		15019-G	15219-G		
	6		15023-G	15223-G		
	8		15027-G	15227-G		
	10		15031-G	15231-G		
	12		15033-G	15233-G		
	16		15035-G	15235-G		
	20		15037-G	15237-G		
	25		15039-G	15239-G		
10x38	0.5	500V	16009-G		120,000	10/100
	1		16011-G			
	2		16013-G	16213-G		
	4		16019-G	16219-G		
	6		16023-G	16223-G		
	8		16027-G	16227-G		
	12		16031-G	16231-G		
	16		16033-G	16233-G		
	20		16035-G	16235-G		
	25		16037-G	16237-G		
	32		16039-G	16239-G		
	0.5	400V	16043-G	16243-G		
14x51	1	690V	17011-G		80,000	10/50
	2		17013-G			
	4		17019-G			
	6		17023-G			
	8		17027-G			
	10		17031-G			
	12		17033-G			
	16		17035-G			
	20		17037-G			
	25		17039-G			
	32	500V	17043-G		120,000	
	40		17047-G			
	50	400V	17051-G			
22x58	2	690V	18013-G		80,000	10/50
	4		18019-G			
	6		18023-G			
	8		18027-G			
	10		18031-G			
	12		18033-G			
	16		18035-G			
	20		18037-G			
	25		18039-G			
	32		18043-G			
	40		18047-G			
	50		18051-G			
	63		18055-G			
	80		18059-G			
	100	500V	18063-G		120,000	
	125	400V	18065-G			



15037-G



16037-G



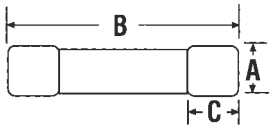
17039-G



18059-G

Dimensions (mm)

Fuse Size	A	B	C
8 x 31	8.5	31.5	6.3
10 x 38	10.3	38	10.5
14 x 51	14.3	51	13.8
22 x 58	22.2	58	16.2



gI-gG Cylindrical Fuse-Links

Catalog Numbers, Ratings – gI-gG with Striker

Size (mm x mm)	Rated In Current (A)	Rated Voltage	Catalog Number	Interrupting Rating (A)	Standard Pack/Ctn
14x51	2	500V	17413-G	120,000	10/50
	4		17419-G		
	6		17423-G		
	8		17427-G		
	10		17431-G		
	12		17433-G		
	16		17435-G		
	20		17437-G		
	25		17439-G		
	32		17443-G		
	40		17447-G		
	50	400V	17451-G		
22x58	4	690V	18419-G	80,000	10x50
	6		18423-G		
	8		18427-G		
	10		18431-G		
	12		18433-G		
	16		18435-G		
	20		18437-G		
	25		18439-G		
	32		18443-G		
	40		18447-G		
	50		18451-G		
	63	500V	18455-G		
	80	500V	18459-G	120,000	
	100	500V	18463-G		
	125	400V	18465-G		



17447-G



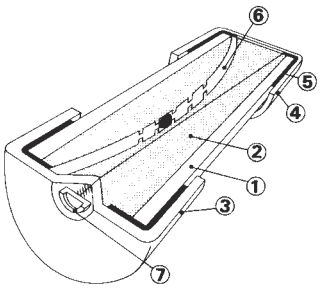
18447-G

Striker



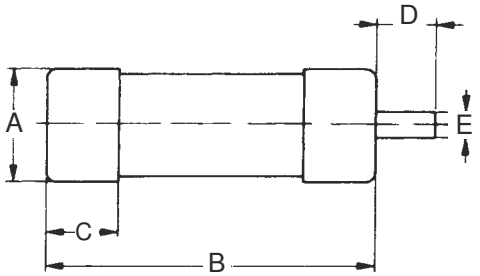
Fuse Construction

1 Ceramic body
2 Sand
3 Indicator contact
4 Lower contact
5 Contact ring
6 Melting element
7 Indicator



Dimensions (mm)

Fuse Size	A	B	C	D	E
14 x 51	14.3	51	13.8	7.5	3.8
22 x 58	22.2	58	16.2	7.5	3.8



aM Cylindrical Fuse-Links

Catalog Numbers, Ratings – aM (Optional Blown-Fuse Indicator)

Size (mm x mm)	Rated In Current (A)	Rated Voltage	Catalog Number w/o Indicator	Catalog Number w Indicator	Interrupting Rating (A)	Standard Pack/Ctn
8x31	1	400V	15511-G		20,000	10/100
	2		15513-G			
	4		15519-G			
	6		15523-G			
	8		15527-G			
	10		15531-G			
10x38	0.16	500V	16503-G		120,000	10/100
	0.25		16507-G			
	0.5		16509-G			
	1		16511-G	16711-G		
	2		16513-G	16713-G		
	4		16519-G	16719-G		
	6		16523-G	16723-G		
	8		16527-G	16727-G		
	10		16531-G	16731-G		
	12		16533-G	16733-G		
	16		16535-G	16735-G		
	20		16537-G	16737-G		
	25	400V	16539-G	16739-G		
	32		16543-G			
14x51	0.25	690V	17507-G		80,000	10/50
	0.5		17509-G			
	1		17511-G			
	2		17513-G			
	4		17519-G			
	6		17523-G			
	8		17527-G			
	10		17531-G			
	12		17533-G			
	16		17535-G			
	20		17537-G			
	25		17539-G			
	32	500V	17543-G		120,000	
	40		17547-G			
	45		17549-G			
	50	400V	17551-G			
22x58	4	690V	18519-G		80,000	10/50
	6		18523-G			
	8		18527-G			
	10		18531-G			
	12		18533-G			
	16		18535-G			
	20		18537-G			
	25		18539-G			
	32		18543-G			
	40		18547-G			
	50		18551-G			
	63		18055-G			
	80		18559-G			
	100	500V	18563-G		120,000	
	125	400V	18565-G			



15519-G



16535-G



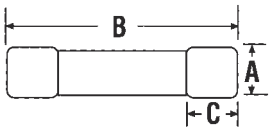
17535-G



18555-G

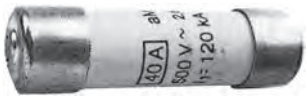
Dimensions (mm)

Fuse Size	A	B	C
8 x 31	8.5	31.5	6.3
10 x 38	10.3	38	10.5
14 x 51	14.3	51	13.8
22 x 58	22.2	58	16.2



Catalog Numbers, Ratings – aM with Striker

Size (mm x mm)	Rated In Current (A)	Rated Voltage	Catalog Number	Interrupting Rating (A)	Standard Pack/Ctn
14 X 51	1	500V	17911-G	120,000	10/50
	2		17913-G		
	4		17919-G		
	6		17923-G		
	8		17927-G		
	10		17931-G		
	12		17933-G		
	16		17935-G		
	20		17937-G		
	25		17939-G		
	32		17943-G		
	40		17947-G		
	45		17949-G		
	50	400V	17951-G		
22 X 58	4	690V	18919-G	80,000	10/50
	6		18923-G		
	8		18927-G		
	10		18931-G		
	12		18933-G		
	16		18935-G		
	20		18937-G		
	25		18939-G		
	32		18943-G		
	40		18947-G		
	50		18951-G		
	63		18955-G	120,000	
	80	500V	18959-G		
	100	400V	18963-G		
	125		18965-G		



17947-G



18951-G

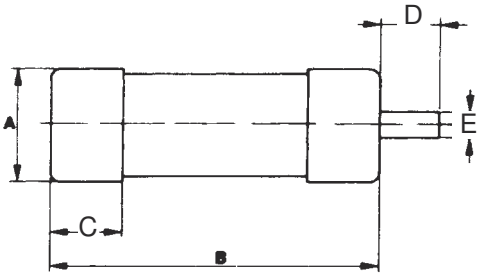
Striker



BEFORE *AFTER*

Dimensions (mm)

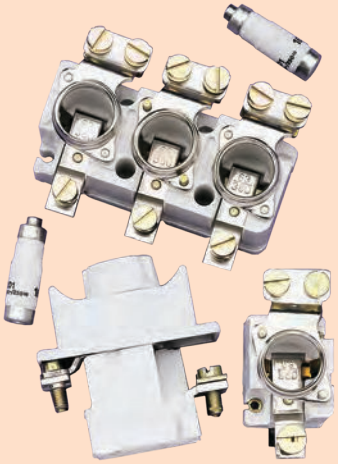
Fuse Size	A	B	C	D	E
14 x 51	14.3	51	13.8	7.5	3.8
22 x 58	22.2	58	16.2	7.5	3.8



DO Type (NEOZED)

400 Volt DO Type NEOZED fuse-links, screw caps and fuse bases

Mersen DO fuse-links, also called Neozed type, are 400 Volts AC rated with 100kA interrupting rating. They have 3 physical sizes, DO1, DO2, and DO3 and fit into special screw caps. All fuse-links have blown-fuse indicators which are visible through the screw cap when mounted. Screw caps fit onto single and three-pole bases which are screw or DIN rail mounted. All accessories such as covers and gauge rings are described.



F

DO Type NEOZED Fuses, 400VAC, 250VDC gG

Size	Rated Current	Catalog Number	Reference Number	Gauge Color	Standard Pack/Ctn.
DO1	2	1700.002-L	T214676	Pink	50
	4	1700.004-L	W200809	Brown	
	6	1700.006-L	B215695	Green	
	10	1700.010-L	W211090	Red	
	16	1700.016-L	R223023	Grey	
DO2	20	1701.020-L	B217742	Blue	50
	25	1701.025-L	W213160	Yellow	
	35	1701.035-L	R219826	Black	
	50	1701.050-L	D215191	White	
	63	1701.063-L	C201873	Copper	
DO3	80	1702.080-L	L216716	Silver	10
	100	1702.100-L	N212647	Red	



DO Type NEOZED Fuses, 400VAC, aM

DO2	20	1701.0205-L	H211607	Blue	10
	25	1701.0255-L	F212640	Yellow	
	35	1701.0355-L	J213655	Black	

Ratings:

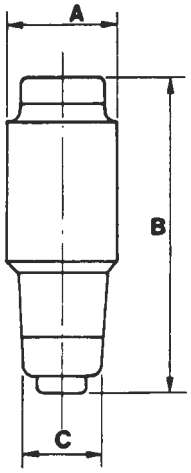
Volts : 400VAC
: 250VDC
Amps : 2 to 100A
I.R. : 100kA I.R.

Approvals:

- Meet IEC, VDE standards:
  IEC 269-3, 3A
  VDE 0636

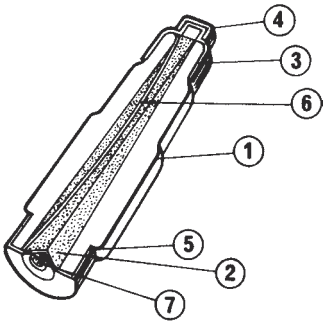
Dimensions (mm)

	DO1	DO2	DO3
A	11	15	24
B	36	36	43



Fuse Construction

1 Ceramic body
2 Sand
3 Upper contact
4 Contact top
5 Lower contact
6 Melting element
7 Indicator



DO Type (NEOZED)

DO NEOZED Screw Caps - Plastic, 400VAC

Size	Rated Current	Cap Thread	Catalog Number	Reference Number	Standard Pack/Ctn.
With Test Hole					
DO1	16	E14	1714.0002-L	E212501	20
DO2	63	E18	1715.0002-L	P211981	
With Sealable Hole and Testing Hole					
DO1	16	E14	11714.00022-L	R214536	20
DO2	63	E18	11715.00022-L	S214537	
Without Test Hole					
DO2	63	E18	1715-L	L206435	20



Screw Cap - Porcelain, 400VAC

With Test Hole					
DO1	16	E14	1710.0002-L	H201211	20
DO2	63	E18	1711.0002-L	T215044	
Without Test Hole					
DO3	100	M30 x 2	1712.0002-L	V215045	20

DO NEOZED Gauge Rings

Size	Rated Current	Catalog Number	Reference Number	Gauge Color	Standard Pack/Ctn.
DO1	2	1705.002-L	J216576	Pink	50
	4	1705.004-L	J219681	Brown	
	6	1705.006-L	P206438	Green	
	10	1705.010-L	M213014	Red	
DO2	2	1706.002-L*	K216577*	Pink	
	4	1706.004-L*	S222127*	Brown	
	6	1706.006-L*	R211983*	Green	
	10	1706.010-L*	H216069*	Red	
	16	1706.016-L*	Q218629*	Grey	
	20	1706.020-L	S200668	Blue	
	25	1706.025-L	R213524	Yellow	
	35	1706.035-L	J216070	Black	
	50	1706.050-L	R218630	White	
DO3	80	1707.080-L	T200669	Silver	25



** For use of D01 fuses in D02 bases*

D0 NEOZED Insulating covers

Single Pole for Ceramic Fuse Bases:

	Catalog Number	Reference Number	Standard Pack/Ctn.
D01/D02 With marking area	1718.7-L	V200670	50
D03 Without marking area	1728-L	V211986	20
D01/D02 Cover - cap	1721.03-L	X201730	
D01/D02 With marking area (3-pole)	1732.7-L	M216579	



DO Type (NEOZED)

D0 NEOZED Fuse Bases

Screw mounting without shock-proof protection cover, 400 VAC

Size	Rated Current	Pole	Max Cross Sect. mm²	Catalog Number	Reference Number	Standard Pack/Ctn.
D01	16	1	4	1720.1-L	Z216061	20
D02	63		25	1721.2-L	M214532	
D02	63			1721.4-L	F213008	
D03	100		50	1722.4-L	J213011	10
D01	16	3	4	1730.1-L	K200661	5
D02	63		25	1731.2-L	F216573	
D02	63			1731.4-L	K206365	



Snap-on fastening without shock-proof protection cover, 400 VAC

Size	Rated Current	Pole	Max Cross Sect. mm²	Catalog Number	Reference Number	Standard Pack/Ctn.
D01	16	1	4	1720.15-L	J200660	20
D02	63		25	1721.25-L	J218623	
D02	63			1721.45-L	W215552	
D03	100		50	1722.45-L	Q214535	10
D01	16	3	4	1730.15-L	B216063	5
D02	63		25	1731.252-L	Y217601	
D02	63			1731.452-L	M211979	



Snap-on fastening with shock-proof protection cover, 400 VAC

Size	Rated Current	Pole	Max Cross Sect. mm²	Catalog Number	Reference Number	Standard Pack/Ctn.
D01	16	1	4	1720.17-L	B211463	20
D01				1721.37-L	T215550	
D01		3		1730.172-L	219144	5
D02	63	1	25	1721.27-L	M200663	20
D02				1721.47-L	K218624	
D02		3		1731.272-L	E222874	5
D02				1731.472-L	K213518	
D03	100	1	50	1722.47-L	F216057	10



DO Type (NEOZED)

D0 NEOZED Accessories

Special Holding Spring

Size	Catalog Number	Reference Number	Standard Pack/Ctn.
D01 Fuse in D02 socket	1713-L	Z215049	50
D02 Fuse in D03 socket	1709-L	P214028	10



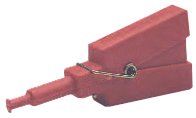
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Size	Catalog Number	Reference Number	Standard Pack/Ctn.
D02 fuse in D03 socket	1707-L	T211985	10



Gauge Ring Key

Size	Catalog Number	Reference Number	Standard Pack/Ctn.
Gauge rings D01, D02, D03	1708-L	J212505	10



Screw Cap Remover

Size	Catalog Number	Reference Number	Standard Pack/Ctn.
Plastic screw caps D01, D02	1716-L	X222936	1
	1716.333-L	F200726	1



D Type (DIAZED)

500 VOLT D type DIAZED fuse-links, screw caps and fuse bases

Mersen D fuse-links, also called Diazed type, are 500 Volts AC rated with 75kA interrupting rating. They have 4 physical sizes, DI, DII, DIII, and DIV and fit into special screw caps. All fuse-links have blown-fuse indicators which are visible through the screw cap. Screw caps fit onto single pole bases which are screw or DIN rail mounted. All accessories such as covers, adapter rings, and gauge rings are described.





Ratings:

Volts : 500VAC
I.R. : 75kA I.R. AC
gL-gG: : Performance characteristic

D Type DIAZED Fuse Bases, Snap-on

Size	Rated Current	Pole	Max Cross Sect. mm²	Catalog Number	Reference Number	Standard Pack/Ctn
Snap-on fastening, 500 VAC without shock-proof protection cover						
D II	25	1	6	685.1-L	K207055	15
D III	63	4	16	686.4-L	V215597	
Snap-on fastening, 500 VAC with shock-proof protection cover						
D II	25	1	6	685.11-L	D211511	10
D III	63	4	16	686.41-L	C216110	



D Type DIAZED Fuse Bases, Screw-in

Size	Rated Current	Pole	Max Cross Sect. mm²	Catalog Number	Reference Number	Standard Pack/Ctn
Screw in 500 VAC without shock-proof protection cover						
D II	25	1	6	81.1-L	K218670	15
D III	63	4	16	72.4-L	H212021	
Screw in 500 VAC with shock-proof protection cover						
D II	25	1	6	81.11-L	Z219189	10
D III	63	4	16	72.41-L	A212543	

Approvals:

- Meet IEC, VDE Standards: IEC 269-3, 3A VDE 0636
- Approved by Lloyds Register of Shipping and Bureau Veritas

D Type (DIAZED)

D Type DIAZED Fast Acting Fuses, 500VAC

Size	Rated Current	Catalog Number	Reference Number	Gauge Color	Standard Pack/Ctn.
NDZ	2	594.002-L	C222918	PINK	25
	4	594.004-L	L200708	BROWN	
	6	594.006-L	A201250	GREEN	
	10	594.01-L	L201766	RED	
	16	594.016-L	D207049	GRAY	
	20	594.02-L	B211509	BLUE	
	25	594.025-L	Y212541	YELLOW	
D II	2	597.002-L	E213559	PINK	
	4	597.004-L	D214064	BROWN	
	6	597.006-L	L214577	GREEN	
	10	597.01-L	S215089	RED	
	16	597.016-L	A216108	GRAY	
	20	597.02-L	J217128	BLUE	
	25	597.025-L	P217639	YELLOW	
D III	35	598.035-L	J218669	BLACK	
	50	598.05-L	J222165	WHITE	
	63	598.063-L	M200709	COPPER	

D Type DIAZED gG Fuses, 500VAC

Size	Rated Current	Catalog Number	Reference Number	Gauge Color	Standard Pack/Ctn.
NDZ	2	594.0027-L	W212539	PINK	25
	4	594.0047-L	G213055	BROWN	
	6	594.0067-L	C213557	GREEN	
	10	594.0107-L	B214062	RED	
	16	594.0167-L	J214575	GRAY	
	20	594.0207-L	Q215087	BLUE	
	25	594.0257-L	Q215593	YELLOW	
D II	2	597.0027-L	Z219718	PINK	
	4	597.0047-L	G222163	BROWN	
	6	597.0067-L	B222917	GREEN	
	10	597.0107-L	K200707	RED	
	16	597.0167-L	K201765	GRAY	
	20	597.0207-L	A211508	BLUE	
	25	597.0257-L	X212540	YELLOW	
D III	35	598.0357-L	C214063	BLACK	
	50	598.0507-L	K214576	WHITE	
	63	598.0637-L	R215088	COPPER	
D IV	80	595.0807-L	V216609	SILVER	10
	100	595.1007-L	M217637	RED	
D V	125	596.1257-L	V218150	YELLOW	
	160	596.1607-L	G218667	COPPER	
	200	596.2007-L	W219186	BLUE	

D Type (DIAZED)

D Type DIAZED Screw Caps

Size	Rated Current	Cap Thread	Catalog No.	Reference No.	Standard Pack/Ctn.
Porcelain with test hole					
D II	25	E 27	690.0002-L	E218619	20
D III	63	E 33	691.0002-L	B213004	
Porcelain without test hole					
NDZ	25	E 16	589-L	Z216613	50
D II	25	E 27	690-L	Z218108	20
D III	63	E 33	691-L	F211973	
D IV	100	R1 1/4	592-L	Y216060	10
Plastic with test hole					
D II	25	E 27	2071-L	L201720	20
D II	63	E 33	2072-L	E214019	





D Type DIAZED Gauge Pieces

Size	Rated Current	Gauge Color	Catalog No.	Reference No.	Standard Pack/Ctn.
NDZ	2	pink	1655.002-L	B212544	50
	4	brown	1655.004-L	M213060	
	6	green	1655.006-L	H213562	
	10	red	1655.010-L	G214067	
	16	gray	1655.016-L	P214580	



D Type DIAZED Screw Gauge Pieces

Size	Rated Current	Gauge Color	Catalog No.	Reference No.	Standard Pack/Ctn.
D II	2	pink	1657.002-L	A219190	25
	4	brown	1657.004-L	D219722	
	6	green	1657.006-L	L222167	
	10	red	1657.010-L	F222921	
	16	gray	1657.016-L	P200711	
	20	blue	1657.020-L	D201253	
	25	yellow	1657.025-L	P201769	
D III	35	black	1658.035-L	C207071	
	50	white	1658.050-L	E211512	
	63	copper	1658.063-L	J212022	



D Type DIAZED Gauge Rings

Size	Rated Current	Gauge Color	Catalog No.	Reference No.	Standard Pack/Ctn.
D II	2	pink	1652.002-L	W215092	50
	4	brown	1652.004-L	W215598	
	6	green	1652.006-L	D216111	
	10	red	1652.010-L	A216614	
	16	gray	1652.016-L	M217131	
	20	blue	1652.020-L	S217642	
	25	yellow	1652.025-L	A218155	
D III	2	pink	1653.002-L	M218672	
	4	brown	1653.004-L	E219723	
	6	green	1653.006-L	M222168	
	10	red	1653.010-L	G222922	
	16	gray	1653.016-L	Q200712	
	20	blue	1653.020-L	E201254	
	25	yellow	1653.025-L	Q201770	
	35	black	1653.035-L	L207079	
	50	white	1653.050-L	F211513	



For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

D Type (DIAZED) Accessories

D Type DIAZED Accessories

Key for D gauge pieces

Size	Catalog Number	Reference Number	Standard Pack/Ctn.
D II, D III	1657.993-L	E216112	10
D Cover			
Single pole			
D II (40mm width)	685.7-L*	H214068	30
D III (50mm width)	686.7-L*	X215093	
D II (45mm width)	685.709-L	Q214581	
D III (54mm width)	686.709-L	X215599	
**Standard version*			
D Touch protection rings			
Plastic			
D II	181.9-L	K222120	50
D III	182.9-L	A222870	
D Adapter fittings			
for D II fuses in D III bases			
D II / D III	581-L	C212545	50
D Locking caps			
D II Supply boards[1]	2071.8-L	B216615	10
D II Industry[2]	2071.81-L	N217132	
D III Supply boards[1]	2072.8-L	T217643	
D III Industry[2]	2072.81-L	B218156	









[1] black top, red screw pitch

[2] red top, black screw pitch

gI-gG, aM NH Dimension Knife-Blade Fuse-Links

NH Dimension Knife-Blade fuse-links, fuse bases, and accessories

Mersen NH Fuse-links, sizes 000, 00, 0, 1, 2, 3, 4 and 4a are rated 500 or 690 Volts AC with breaking capacities of 80kA or 120kA. All fuse-links include an indicator or striker and can accept a microswitch for remote signaling. They all have silver-plated knife blades and ceramic bodies. Accessories include 1, 2, 3 or 4-pole bases, barriers, shields, terminals, microswitch, etc.



gI-gG

Full Range Protection

- Sizes 000, 00, 0, 1, 2, 3, 4, 4a
- 500 and 690 Volt ratings - 2A through 800A
- All ratings include indicator
- All equipped for microswitch mounting

gI-gG

Full Range Protection Fuse-links with Striker

- Sizes 0, 1, 2, 3
- 500 and 690 Volt ratings - 32A through 630A
- All ratings include striker

aM

Short Circuit Protection

- • Sizes 000, 00, 0, 1, 2, 3
- • 400, 500 and 690 Volt ratings - 2A through 800A
- • All ratings include indicator
- • All equipped for microswitch mounting

aM

Short Circuit Protection Fuse-links with Striker

- Sizes 0, 1, 2, 3
- 500 and 690 Volt ratings - 2A through 630A
- All ratings include striker
- Certification
  DIN 57636
  VDE 60269
  NFC 63210, 63211
  IEC 269-1, 2, 2A
  UNE 21103
- Approved by Lloyds Register of Shipping and Bureau Veritas

Standards:

- DIN 57636
- NFC 63210-63211
- IEC 269-1-2-2A
- UNE 21103
- VDE 0636-2-1, 2-2
- DIN 43620

Approvals:

- Lloyd's Register of Shipping
  Bureau Veritas

gl-gG NH Dimension Knife-Blade Fuse-Links

Catalog Numbers, Ratings – gl-gG

Size	Rated Current (A)	Rated Voltage	Catalog Number	Interrupt Rating (A)	Std. Pack
000	2	690V	1C613	80,000	3
	4		1C619		3
	6		1C623		3
	10		1C631		3
	16		1C635		3
	20		1C637		3
	25		1C639		3
	32		1C643		3
	35		1C645		3
	40		1C647		3
	50		1C651		3
	63		1C655		3
	80		1C659		3
00	32	690V	1C743	80,000	3
	35		1C745		3
	40		1C747		3
	50		1C751		3
	63		1C755		3
	80		1C759		3
	100		1C763		3
	125		1C765		3
0	6	690V	1C023	80,000	3
	10		1C031		3
	16		1C035		3
	20		1C037		3
	25		1C039		3
	32		1C043		3
	35		1C045		3
	40		1C047		3
	50		1C051		3
	63		1C055		3
	80		1C059		3
	100		1C063		3
	125		1C065		3
	160		1C069		3
1	16	690V	1C135	80,000	3
	20		1C137		3
	25		1C139		3
	32		1C143		3
	35		1C145		3
	40		1C147		3
	50		1C151		3
	63		1C155		3
	80		1C159		3
	100		1C163		3
	125		1C165		3
	160		1C169		3
	200		1C171		3
	224	500V	1B173		3
	250		1B175		3



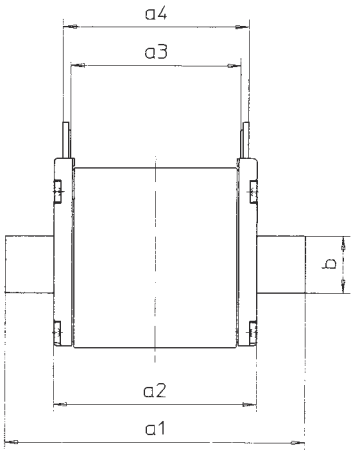
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gl-gG NH Dimension Knife-Blade Fuse-Links

Catalog Numbers, Ratings – gl-gG (cont.)

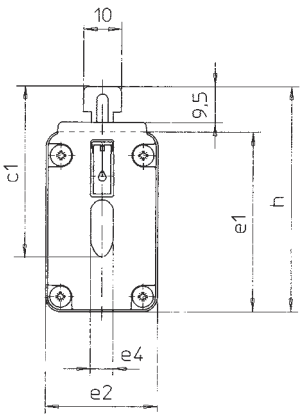
Size	Rated Current (A)	Rated Voltage	Catalog Number	Interrupt Rating (A)	Std. Pack
2	32	690V	1C243	80,000	3
	35		1C245		3
	40		1C247		3
	50		1C251		3
	63		1C255		3
	80		1C259		3
	100		1C263		3
	125		1C265		3
	160		1C269		3
	200		1C271		3
	224		1C273		3
	250		1C275		3
	300		1C277		3
	315		1C279		3
	355		1C281		3
3	250	690V	1C375	80,000	
	1				
	300		1C377		1
	315		1C379		1
	355		1C381		1
	400		1C383		1
	425		1C385		1
	500		1C387		1
4	400	690V	8004 400765-L	80,000	1
	500		8004 500765-L		1
	630		8004 630765-L		1
	800		8004 800765-L		1
4a	400	690V	8014 400765-L	80,000	1
	500		8014 500765-L		1
	640		8014 630765-L		1
	800		8014 800765-L		1





Dimensions (mm)

Size	Rated Current (A)	a1	a2	a3	a4	b	c1	e1	e2	e4	h
NH 690 V gG with voltage-conducting grip lug											
SIZE 000	2-35A	79	53,8	45	49	15	35,8	40	20	6	47,8
SIZE 00	40-100A	79	53,8	45	49	15	35,8	48	30	6	47,8
SIZE 1	16-160A	135	75	64	68	20	40	44	30	6	52
SIZE 1	200A	135	75	64	68	20	40	47	39	6	52
SIZE 2	35-100A	150	75	64	68	26	48	44	30	6	60
SIZE 2	125-315A	150	75	64	68	26	60	47	39	6	72
SIZE 3	250/300A	150	75	64	68	26	60	47	39	6	72
SIZE 3	315-425A	150	75	64	68	33	60	58	51	6	72
SIZE 3	500A	150	75	64	68	33	60	70	64	6	72
SIZE 4	400-800A	200	85	64	68	33	85	104	89	8	97
SIZE 4a	400-800A	200	85	86	90	33	85	104	89	6	97



aM NH Dimension Knife-Blade Fuse-Links

Catalog Numbers, Ratings – aM

Size	Rated Current (A)	Rated Voltage	Catalog Number	Interrupt Rating (A)	Std. Pack
000	2	690V	2C613	80,000	3
	4		2C619		3
	6		2C623		3
	10		2C631		3
	16		2C635		3
	20		2C637		3
	25		2C639		3
	32		2C643		3
	35		2C645		3
	40		2C647		3
	50		2C651		3
	63		2C655		3
00	50	690V	2C751	80,000	3
	63		2C755		3
	80		2C759		3
	100		2C763		3
	125		2C765		3
0	6	690V	2C023	80,000	3
	10		2C031		3
	16		2C035		3
	20		2C037		3
	25		2C039		3
	32		2C043		3
	35		2C045		3
	40		2C047		3
	50		2C051		3
	63		2C055		3
	80		2C059		3
	100		2C063		3
	125		2C065		3
	160		2C069		3
1	16	690V	2C135	80,000	3
	20		2C137		3
	25		2C139		3
	32		2C143		3
	35		2C145		3
	40		2C147		3
	50		2C151		3
	63		2C155		3
	80		2C159		3



Microswitch – Sizes 000 to 3

Catalog Number	Ref. Number	Std. Pkg.
MS4L2-5B6+PRES*	F210156	3
MS4L2-5B2+PRES**	G210157	3

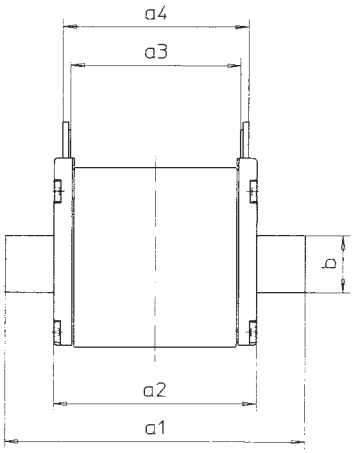
**6.3 mm clips. **2.8mm clips*

aM NH Dimension Knife-Blade Fuse-Links

Catalog Numbers, Ratings – aM

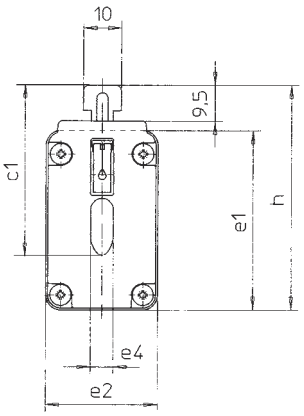
Size	Rated Current (A)	Rated Voltage	Catalog Number	Interrupt Rating (A)	Std. Pack
1	100		2C163	80,000	3
	125		2C165		3
	160		2C169		3
	200		2C171		3
	224		2C173		3
	250		2C175		3
2	35	690V	2C245	80,000	3
	40		2C247		3
	50		2C251		3
	63		2C255		3
	80		2C259		3
	100		2C263		3
	125		2C265		3
	160		2C269		3
	200		2C271		3
	224		2C273		3
	250		2C275		3
	315		2C279		3
	355		2C281		3
	400		2C283		3
	250	690V	2C375		1
3	300		2C377	80,000	1
	315		2C379		1
	355		2C381		1
	400		2C383		1
	425		2C385		1
	450		2C386		1
	500		2CC387		1
	630	500V	2B389	120,000	1
	800	400V	2A391		1





Dimensions (mm)

Size	Rated Current (A)	a1	a2	a3	a4	b	c1	e1	e2	e4	h
NH 690 V aM with voltage-conducting grip lug											
SIZE 000	2-35A	79	53,8	45	49	15	35,8	40	20	6	47,8
SIZE 00	40-100A	79	53,8	45	49	15	35,8	48	30	6	47,8
SIZE 1	16-160A	135	75	64	68	20	40	44	30	6	52
SIZE 1	200A	135	75	64	68	20	40	47	39	6	52
SIZE 2	35-100A	150	75	64	68	26	48	44	30	6	60
SIZE 2	125-315A	150	75	64	68	26	60	47	39	6	72
SIZE 3	250/300A	150	75	64	68	26	60	47	39	6	72
SIZE 3	315-425A	150	75	64	68	33	60	58	51	6	72
SIZE 3	500A	150	75	64	68	33	60	70	64	6	72



Class C Canadian Fuses

Class C fuses

Mersen Class C fuses have British standard (BS88) dimensions and are exact replacements for the British fuses and older HRCII-C fuses. Class C fuses are not dimensionally or electrically interchangeable with other North American fuses. They feature ceramic bodies and bolt-in mounting. They are for short-circuit protection only, in motor controllers, for example, where overload protection is provided by an overload relay.

* Ceramic version available upon request

Highlights:

- BS88 dimensions
- Fast-acting

Applications:

- Short circuit and back-up protection of motor controllers and components

Catalog Numbers (amps)

FES2	FES80	FESF250
FES4	FES100	FESF300
FES6	FES125	FESF350
FES10	FES150	FESF400
FES15	FES200	FESC250
FES20	FESC80	FESC300
FES25	FESC100	FESC350
FES30	FESC125	FESC400
FES40	FESC150	FESC450
FES50	FESC200	FESC500
FES60		FESC600



Ratings:

Volts : 600VAC
: 460VDC
: 450VDC
: 350VDC

Amps : 2 to 600A

I.R. : 200kA I.R. AC (2-600A)
: 40kA I.R. DC

460VDC:
FES (2-60A)
FESF (250-400A)
FESC (250-400A)

450VDC:
FESC (450-600A)

350VDC:
FES (80-100A)
FESC (80-200A)

Approvals:

- CSA Certified HRCII-MISC
  IEC 269-2-1

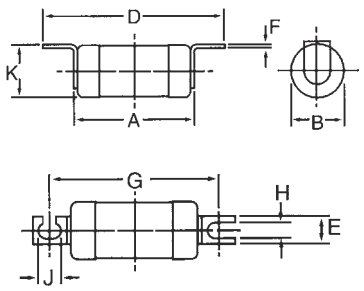
Class C Canadian Fuses

Class C Dimensions Inches (mm)

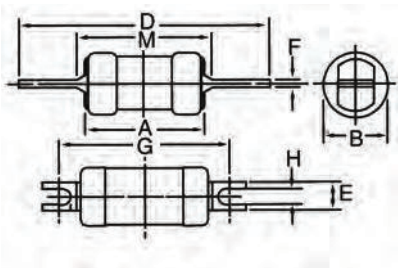
Catalog No.	A	B	D	E	F	G	H	K
FES 2-30	2.06 (52.3)	0.81 (20.6)	3.31 (84.1)	0.35 (8.9)	0.06 (1.6)	2.83 (71.9)	0.20 (5.2)	0.84 (21.3)
FES 40-60	2.19 (55.6)	1.06 (26.9)	3.44 (87.4)	0.50 (12.7)	0.06 (1.6)	2.77 (70.4)	0.20 (5.2)	1.07 (27.2)
FES 80-100	2.69 (68.3)	1.34 34.0	4.31 (109.5)	0.75 19.1	0.13 3.2	3.64 (92.5)	0.34 (8.7)	1.43 (36.3)
FES 125-200	2.69 (68.3)	1.58 (40.1)	4.31 (109.5)	0.75 (19.1)	0.13 (3.2)	3.64 (92.5)	0.34 (8.7)	1.69 (42.9)
FESC 80-100	2.44 (61.9)	1.34 (33.9)	5.31 (134.9)	0.75 (19.1)	0.13 (3.2)	4.28 (108.7)		
FESC 125-200	2.44 (61.9)	1.59 (40.3)	5.31 (134.9)	0.75 (19.1)	0.13 (3.2)	4.28 (108.7)		
FESF 250-400	3.00 (76.2)	2.00 (50.8)	5.38 (136.7)	1.00 (25.4)	0.25 (6.4)	4.25 (108.0)	0.41 (10.4)	
FESC 250-400	3.00 (76.2)	2.00 (50.8)	8.25 (209.6)	1.00 (25.4)	0.25 (6.4)	5.16 (131.0)		
FESC 450-600	3.00 (76.2)	2.88 (73.0)	8.25 (209.6)	1.00 (25.4)	0.38 (9.5)	5.06 (128.6)		

Class C Dimensions Inches (mm)

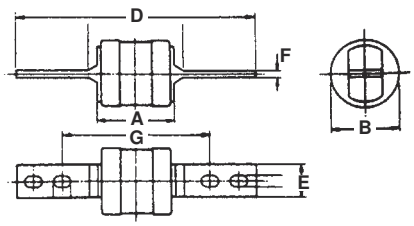
FES2-30
FES40-60
FES80-100
FES125-200



FESC80-100
FESC125-200
FESF250-400



FESC250-400
FESC450-600



Class CA & CB CN/CNS Canadian Fuses

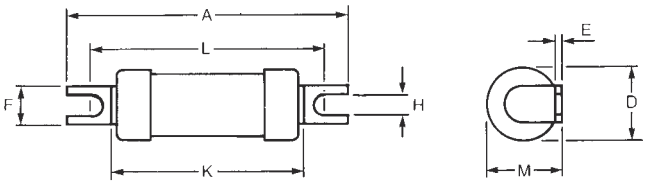
Class CA and CB fuses

Mersen Canadian Class CA and CB fuses are bolt-in type, interchangeable with older Canadian Form I/HRCI fuses for exact replacement. They are not interchangeable with other North American fuses. CA and CB fuses are full-range, current-limiting fuses with a high interrupting rating.



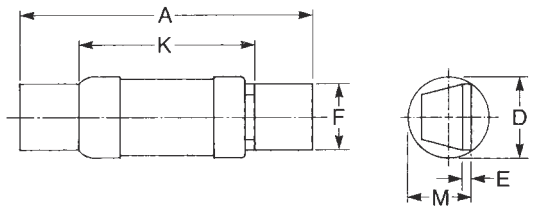
Class CA – Catalog Numbers & Dimensions

Ampere Rating	Catalog Number	Dimensions in mm							
		A	D	E	F	H	K	L	M
1	C1N	62	13.9	0.8	11.1	4.7	36.5	44.5	14.3
3	C3N								
6	C6N								
10	C10N								
15	C15N								
20	C20N								



Class CB – Catalog Numbers & Dimensions

Ampere Rating	Catalog Number	Dimensions in mm					
		A	D	E	F	K	M
1	CNS1	62	14.5	0.8	11.0	35.5	11.65
3	CNS3						
6	CNS6						
10	CMS10						
15	CNS15						
20	CNS20						
25	CNS25						
30	CNS30						



Call for technical information

Ratings:

Volts : 600VAC
Amps : 1 to 30A
I.R. : 200kA I.R.

Approvals:

- CSA Certified to Standard C22.2, No. 248.3

NIT & NS HRCII/Canadian Fuses

Canadian HRCII fuses

The Mersen Canadian NIT fuses series has offset contacts with British standard (BS88) dimensions. The NS series has diagonally offset contacts with British standard dimensions. Neither fuse is dimensionally interchangeable with other North American fuses. They are for short-circuit protection only, in motor controllers, for example, where overload protection is provided by an overload relay.

Highlights:

- BS88 dimensions

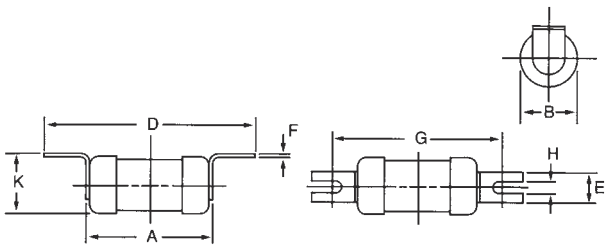
Applications:

- Motor circuits



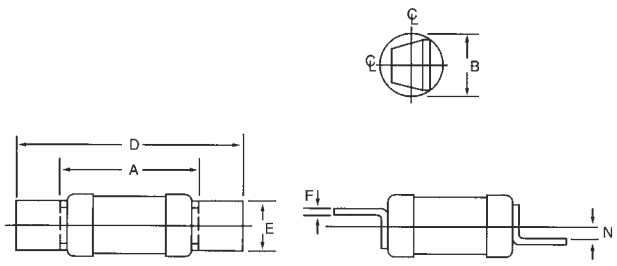
NIT – Catalog Numbers & Dimensions

Ampere Rating	Catalog Number	Dimensions in mm							
		A	B	D	E	F	G	H	K
2	NIT2	36.5	14.1	55.6	11.1	0.80	44.5	4.70	14.3
4	NIT4								
6	NIT6								
10	NIT10								
16	NIT16								
20	NIT20								



NS – Catalog Numbers & Dimensions

Ampere Rating	Catalog Number	Dimensions in mm					
		A	B	D	E	F	N
2	NS2	35.5	14.5	62.0	11.0	0.80	3.60
4	NS4						
6	NS6						
10	NS10						
16	NS16						
20	NS20						
25	NS25						
32	NS32						



Ratings:

NIT

Volts : 550VAC
: 250VDC

Amps : AC - 2 to 20A
: DC - 2 to 20A

I.R. : 80kA I.R. AC
: 40kA I.R. DC

NS

Volts : 440VAC
: 250VDC

Amps : AC - 2 to 32A
: DC - 2 to 32A

I.R. : 80kA I.R. AC
: 40kA I.R. DC

Approvals:

- HRCII-MISC
- IEC 269-2-1

F

Class H NRN/NRS/Canadian Fuses

NRN & NRS non-time delay fuses

Mersen NRN (250V) and NRS (600V) fuses are standard non-time delay fuses, with a 10kA short circuit rating. 250 Volt NRN15 through NRN60 fuses are certified as Type "P" fuses, satisfying the Canadian Electrical Code for low melting-point non-time delay fuses. Also qualifying for Type "P" are OTN15 through OTN60, which are Class K-5 fuses with a 50kA short circuit rating (found in the OT/OTS section of this catalog).

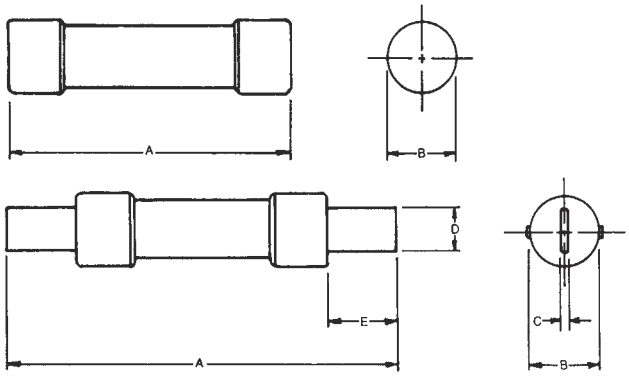


250V NRN Fuses – Dimensions

Ampere Rating	Dimensions - Inches (mm)				
	A	B	C	D	E
1-30	2.00 (50.8)	0.56 (14.2)			0.50 (12.7)
35-60	3.00 (76.2)	0.81 (20.6)			0.63 (16.0)
70-100	5.88 (149)	1.06 (26.9)	0.13 (3.18)	0.75 (19.1)	1.00 (25.4)
110-200	7.13 (181)	1.63 (41.4)	0.19 (4.76)	1.13 (28.7)	1.38 (35.1)
225-400	8.63 (219)	2.13 (54.1)	0.25 (6.35)	1.63 (41.4)	1.88 (47.8)
450-600	10.4 (264)	2.63 (66.8)	0.25 (6.35)	2.00 (50.8)	2.25 (57.2)

600V NRS Fuses – Dimensions

Ampere Rating	Dimensions - Inches (mm)				
	A	B	C	D	E
1-30	5.00 (127)	0.81 (20.6)			0.63 (16.0)
35-60	5.50 (139)	1.06 (26.9)			0.63 (16.0)
70-100	7.88 (200)	1.38 (35.1)	0.13 (3.18)	0.75 (19.1)	1.00 (25.4)
110-200	9.63 (244)	1.88 (47.8)	0.19 (4.76)	1.13 (28.7)	1.38 (35.1)
225-400	11.6 (295)	2.63 (66.8)	0.25 (6.35)	1.63 (41.4)	1.88 (47.8)
450-600	13.4 (340)	3.13 (79.5)	0.25 (6.35)	2.00 (50.8)	2.25 (57.2)



250V Fuse Ampere Ratings, Catalog Numbers

NRN1	NRN15*	NRN50*	NRN125	NRN350
NRN2	NRN20*	NRN60*	NRN150	NRN400
NRN3	NRN25*	NRN70	NRN175	NRN450
NRN4	NRN30*	NRN80	NRN200	NRN500
NRN5	NRN35*	NRN90	NRN250	NRN600
NRN6	NRN40*	NRN100	NRN250	
NRN10	NRN45*	NRN110	NRN300	

** CSA Type "P"*

600V Fuse Ampere Ratings, Catalog Numbers

NRS1	NRS15	NRS50	NRS125	NRS350
NRS2	NRS20	NRS60	NRS150	NRS400
NRS3	NRS25	NRS70	NRS175	NRS450
NRS4	NRS30	NRS80	NRS200	NRS500
NRS5	NRS35	NRS90	NRS250	NRS600
NRS6	NRS40	NRS100	NRS250	
NRS10	NRS45	NRS110	NRS300	

Class H CRN/CRS/Canadian Fuses

CRN & CRS time delay fuses

Mersen CRN and CRS fuses are standard fuses, Type “D”, with 10kA short circuit rating. Type “D” fuses satisfy the Canadian Electrical Code requirement for low melting-point fuses.



250V CRN Fuses – Dimensions

Ampere Rating	Dimensions - Inches (mm)				
	A	B	C	D	E
15-30	2.00 (50.8)	0.56 (14.2)			0.50 (12.7)
35-60	3.00 (76.2)	0.81 (20.6)			0.63 (16.0)
70-100	5.88 (149)	1.06 (26.9)	0.13 (3.18)	0.75 (19.1)	1.00 (25.4)
110-200	7.13 (181)	1.63 (41.4)	0.19 (4.76)	1.13 (28.7)	1.38 (35.1)
225-400	8.63 (219)	2.13 (54.1)	0.25 (6.35)	1.63 (41.4)	1.88 (47.8)
450-600	10.4 (264)	2.63 (66.8)	0.25 (6.35)	2.00 (50.8)	2.25 (57.2)

600V CRS Fuses – Dimensions

Ampere Rating	Dimensions - Inches (mm)				
	A	B	C	D	E
15-30	5.00 (127)	0.81 (20.6)			0.63 (16.0)
35-60	5.50 (139)	1.06 (26.9)			0.63 (16.0)
70-100	7.88 (200)	1.38 (35.1)	0.13 (3.18)	0.75 (19.1)	1.00 (25.4)
110-200	9.63 (244)	1.88 (47.8)	0.19 (4.76)	1.13 (28.7)	1.38 (35.1)
225-400	11.6 (295)	2.63 (66.8)	0.25 (6.35)	1.63 (41.4)	1.88 (47.8)
450-600	13.4 (340)	3.13 (79.5)	0.25 (6.35)	2.00 (50.8)	2.25 (57.2)

250V Fuse Ampere Ratings, Catalog Numbers*

CRN15	CRN60	CRN200
CRN17-1/2	CRN70	CRN225
CRN20	CRN80	CRN250
CRN25	CRN90	CRN300
CRN30	CRN100	CRN350
CRN35	CRN110	CRN400
CRN40	CRN125	CRN450
CRN45	CRN150	CRN500
CRN50	CRN175	CRN600

** For 1/10 - 12A ratings use Tri-onic TR-R.*

600V Fuse Ampere Ratings, Catalog Numbers**

CRS15	CRS60	CRS200
CRS17-1/2	CRS70	CRS225
CRS20	CRS80	CRS250
CRS25	CRS90	CRS300
CRS30	CRS100	CRS350
CRS35	CRS110	CRS400
CRS40	CRS125	CRS450
CRS45	CRS150	CRS500
CRS50	CRS175	CRS600

*** For 1/10 - 12 ratings use Tri-onic TRS-R.*

Ratings:

CRN

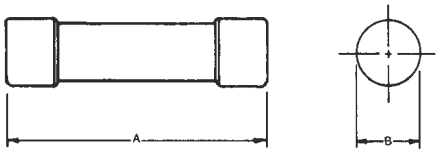
Volts : 250VAC
Amps : 15 to 600A
I.R. : 10kA I.R. AC

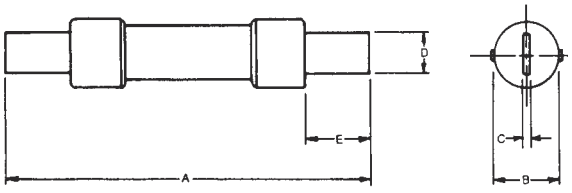
CRS

Volts : 600VAC
Amps : 15 to 600A
I.R. : 10kA I.R. AC

Approvals:

- CSA Certified Type “D”





Special Purpose

A world of circuit protection under one roof.



Your problem: Parallel cables from your main transformer. The welding station down in the machine shop. Need a fuse designed specifically to protect your solar power installation? Applications as varied and specialized as telecommunications systems, forklifts, and DC-powered equipment . . . If your plant is like most, it's full of highly specialized circuit protecting applications. Still, as specialized as the installations sometimes are, they have in common the need for a high performance, failsafe solution.

Our solution: No matter how specialized your application is, Mersen brings its broad expertise and numerous resources to bear on it. The result is a line of Special Purpose Fuses that unfailingly perform to application-specific requirements. Whether you're specifying our Helio Protection fuses, Cable Protectors, Welder Protectors, and Telecommunications fuses — or replacing our Form 600 fuses, or Forklift Truck fuses.

Want more information fast? For more technical or application-specific information, please call our special purpose products experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

G Special Purpose

- CP 600V Cable Protectors G2
- 2CL 250V Cable Protectors..... G10
- A60C Capacitor Fuses G11
- A4BX Welder Protectors..... G12
- A2Y & A6Y Form 600 Fuses..... G13
- Telecommunication Fuses..... G15
- Forklift Truck Fuses..... G18
- DC Rated Fuses..... G20
- Photovoltaic Fuses..... G38

FERRAZ SHAWMUT IS NOW MERSEN

MERSEN

CP 600V Cable Protectors

Cable Protectors

Mersen CP Cable Protectors are special purpose limiters which are crimped or bolted to cables or terminals to clear and isolate faults quickly, increasing the reliability of service entrance and distribution runs. CP Cable Protectors have a 200,000A interrupting rating, yet will carry low cable overloads which are handled by standard protective devices. Cable protectors are rated in terms of cable size and material (Al or Cu). Heavier duty CPH cable protectors are available on special order. Heat shrinkable (HS) tubing can be specified for field installation. TI blown fuse trigger indicators may be available upon request. Refer to the application information section for more information.



Features/Benefits:

- Fiberglass bodies for dimensional stability in harsh environments
- Catalog number stamped into terminal for permanent identification
- Crimp terminals for aluminum cable include oxide inhibitor
- Molded rubber boots or heat shrinkable tubing available for insulation and protection
- Current limiting device
- Permitted by National Electric Code

Ratings:

Sizes #2 to 1000kcmil aluminum or copper

Volts : 600VAC
IR : 200kA I.R. AC

Approvals:

- UL listed to File E305297

UL LISTED

Description			Catalog # for Cable Type	
Type	Termination	Cable Size	Copper	Aluminum
1	Cable to Cable	2	CP2C1	-
		1/0	CP1/0C1	-
		2/0	CP2/0C1	-
		4/0	CP4/0C1	CP4/0A1
		250kcmil	CP250C1	CP250A1
		350kcmil	CP350C1	CP350A1
		400kcmil	CP400C1	-
		500kcmil	CP500C1	CP500A1
		600kcmil	CP600C1	CP600A1
		750kcmil	CP750C1	CP750A1
		1000kcmil	CP1000C1	-
3	Cable to Offset Bus	2	CP2C3	-
		1/0	CP1/0C3	-
		2/0	CP2/0C3	-
		4/0	CP4/0C3	CP4/0A3
		250kcmil	CP250C3	CP250A3
		350kcmil	CP350C3	CP350A3
		400kcmil	CP400C3	-
		500kcmil	CP500C3	CP500A3
		600kcmil	CP600C3	CP600A3
		750kcmil	CP750C3	CP750A3
		1000kcmil	CP1000C3	-
5	Straight Bus to Offset Bus	2/0	CP2/0C5	CP2/0C5
		4/0	CP4/0C5	CP4/0C5
		250kcmil	CP250C5	CP250C5
		350kcmil	CP350C5	CP350C5
		500kcmil	CP500C5	CP500C5
		600kcmil	CP600C5	CP600C5
		750kcmil	CP750C5	CP750C5
6	Mole to Cable	4/0	CP4/0C6	CP4/0A6
		250kcmil	CP250C6	CP250A6
		350kcmil	CP350C6	CP350A6
		400kcmil	CP400C6	-
		500kcmil	CP500C6	CP500A6
		750kcmil	CP750C6	CP750A6
8	Mole to Offset Bus	4/0	CP4/0C8	CP4/0C8
		250kcmil	CP250C8	CP250C8
		350kcmil	CP350C8	CP350C8
		500kcmil	CP500C8	CP500C8
		750kcmil	CP750C8	CP750C8

Catalog Numbering System

CP 500 C 3 - TI

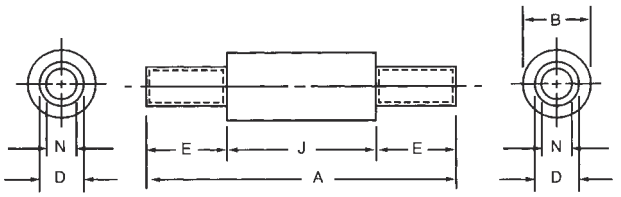
- Standard Duty / Heavy Duty: CP / CPH
- Conductor Size
- Cable Material: Copper C / Aluminum A
- Termination
- Heat Shrink HS / Trigger Indicator TI

**Please consult factory for special terminations.*

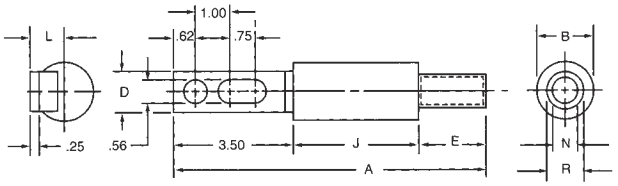
CP 600V Cable Protectors

Type C1 – Dimensions (Cable to Cable - Copper)

Catalog No.	Cable* Size	Dimensions - Inches (mm) A	B	D	E	J	N
CP2C1	#2	7.12 (180)	1.44 (37)	.42 (11)	1.75 (44)	3.62 (92)	.31 (7.9)
CP1/0C1	1/0	7.12 (180)	1.44 (37)	.52 (13)	1.75 (44)	3.62 (92)	.39 (9.9)
CP2/0C1	2/0	7.12 (180)	1.44 (37)	.56 (14)	1.75 (44)	3.62 (92)	.44 (11)
CP4/0C1	4/0	7.12 (180)	1.44 (37)	.68 (17)	1.75 (44)	3.62 (92)	.55 (14)
CP250C1	250kcmil	7.38 (188)	1.44 (37)	.75 (19)	1.88 (48)	3.62 (92)	.62 (16)
CP350C1	350kcmil	7.62 (194)	1.62 (41)	.88 (22)	2.00 (51)	3.62 (92)	.71 (18)
CP400C1	400kcmil	7.62 (194)	1.62 (41)	.94 (.24)	2.00 (51)	3.62 (92)	.75 (19)
CP500C1	500kcmil	9.38 (238)	1.88 (48)	1.05 (27)	2.88 (73)	3.62 (92)	.85 (22)
CP600C1	600kcml	9.51 (242)	2.50 (64)	1.07 (27)	2.88 (73)	3.75 (95)	.94 (24)
CP750C1	750kcmil	9.51 (242)	2.50 (64)	1.32 (34)	2.88 (73)	3.75 (95)	1.06 (27)
CP1000C1	1000kcmil	10.00 (254)	3.00 (76)	1.50 (38)	3.13 (79)	3.75 (95)	1.16 (29)



Type C1



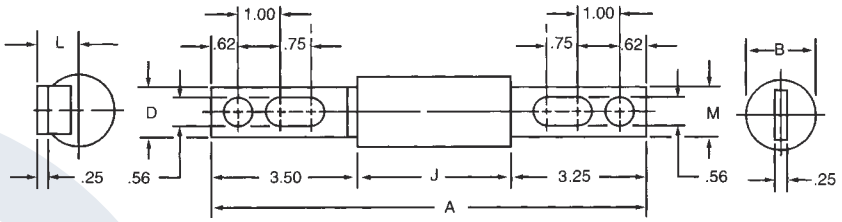
Type C3

Type C3 – Dimensions (Cable to Offset Bus- Copper)

Catalog No.	Cable* Size	Dimensions - Inches (mm) A	B	D	E	I	J	L	N	R
CP2C3	#2	8.87 (225)	1.44 (37)	1.12 (28)	1.75 (44)	3.50 (88.9)	3.62 (92)	.96 (24)	.31 (7.9)	.42 (11)
CP1/0C3	1/0	8.87 (225)	1.44 (37)	1.12 (28)	1.75 (44)	3.50 (88.9)	3.62 (92)	.96 (24)	.39 (9.9)	.52 (13)
CP2/0C3	2/0	8.87 (225)	1.44 (37)	1.12 (28)	1.75 (44)	3.50 (88.9)	3.62 (92)	.96 (24)	.44 (11)	.56 (14)
CP4/0C3	4/0	8.87 (225)	1.44 (37)	1.12 (28)	1.75 (44)	3.50 (88.9)	3.62 (92)	.96 (24)	.55 (14)	.68 (17)
CP250C3	250kcmil	9.00 (229)	1.44 (37)	1.12 (28)	1.88 (48)	3.50 (88.9)	3.62 (92)	.96 (24)	.62 (16)	.75 (19)
CP350C3	350kcmil	9.12 (232)	1.62 (41)	1.12 (28)	2.00 (51)	3.50 (88.9)	3.62 (92)	.96 (24)	.71 (18)	.88 (22)
CP400C3	400kcmil	9.12 (232)	1.62 (41)	1.12 (28)	2.00 (51)	3.50 (88.9)	3.62 (92)	.96 (24)	.75 (19)	.88 (22)
CP500C3	500kcmil	10 .00 (254)	1.88 (48)	1.62 (41)	2.88 (73)	3.50 (88.9)	3.62 (92)	1.19 (30)	.85 (22)	1.05 (27)
CP600C3	600kcmil	10 .13 (257)	2.50 (64)	2.00 (51)	2.88 (73)	3.50 (88.9)	3.75 (95)	1.31 (33)	.94 (24)	1.07 (27)
CP750C3	750kcmil	10.13 (257)	2.50 (64)	2.00 (51)	2.88 (73)	3.50 (88.9)	3.75 (95)	1.31 (33)	1.06 (27)	1.32 (34)
CP1000C3	1000kcmil	10.63 (270)	3.00 (76)	2.00 (51)	3.13 (79)	3.75 (95)	3.75 (95)	1.56 (40)	1.16 (29)	1.50 (38)

Type C5 – Dimensions (Straight Bus to Offset Bus - Copper)

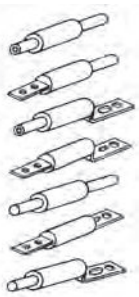
Catalog No.	Cable Size	Dimensions - Inches (mm) A	B	D	J	L	M
CP4/0C5	4/0	10.37 (263)	1.44 (37)	1.12 (28)	3.62 (92)	.96 (24)	1.12 (28)
CP250C5	250kcmil	10.37 (263)	1.44 (37)	1.12 (28)	3.62 (92)	.96 (24)	1.12 (28)
CP350C5	350kcmil	10.37 (263)	1.62 (41)	1.12 (28)	3.62 (92)	.96 (24)	1.12 (28)
CP400C5	400kcmil	10.37 (263)	1.62 (41)	1.12 (28)	3.62 (92)	.96 (24)	1.12 (28)
CP500C5	500kcmil	10.37 (263)	1.88 (48)	1.62 (41)	3.62 (92)	1.19 (30)	1.50 (38)
CP600C5	600kcmil	10.50 (267)	2.50 (64)	2.00 (51)	3.75 (95)	1.31 (33)	2.00 (51)
CP750C5	750kcmil	10.50 (267)	2.50 (64)	2.00 (51)	3.75 (95)	1.31 (33)	2.00 (51)



Type C5

Cable Type

TYPE 1 —Cable to cable
TYPE 2 —Bus to cable
TYPE 3 —Cable to offset bus
TYPE 5 —Bus to offset bus
TYPE 6 —Mole to cable
TYPE 7 —Bus to bus
TYPE 8 —Mole to offset bus

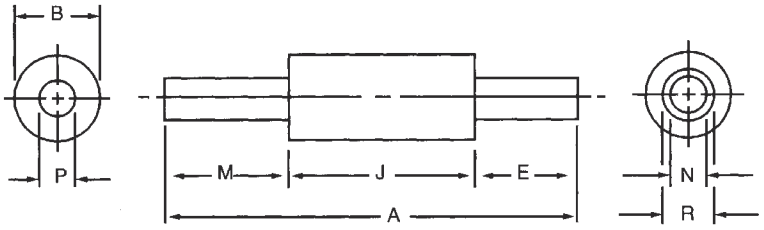


** kcmil = MCM*

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Type C6 – Dimensions (Mole to Cable - Copper)

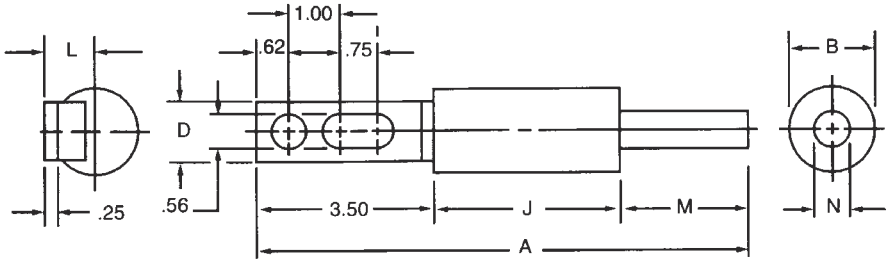
Catalog No.	Cable* Size	Dimensions - Inches (mm)							
		A	B	E	J	M	N	P	R
CP4/0C6	4/0	7.87 (200)	1.44 (37)	1.75 (44)	3.62 (92)	2.50 (64)	.55 (14)	.52 (13)	.68 (17)
CP250C6	250kcmil	8.00 (203)	1.44 (37)	1.88 (48)	3.62 (92)	2.50 (64)	.62 (16)	.58 (14)	.75 (19)
CP350C6	350kcmil	8.12 (206)	1.62 (41)	2.00 (51)	3.62 (92)	2.50 64)	.71 (18)	.68 (17)	.88 (22)
CP500C6	500kcmil	9 .38 (238)	1.88 (48)	2.88 (73)	3.62 (92)	2.88 (73)	.85 (22)	.81 (21)	1.05 (27)
CP750C6	750kcmil	9.51 (427)	2.50 (64)	2.88 (73)	3.75 (95)	2.88 (73)	1.06 (27)	1.00 (25)	1.32 (34)



Type C6

Type C8 – Dimensions (Mole to Offset Bus - Copper)

Catalog No.	Cable* Size	Dimensions - Inches (mm)						
		A	B	D	J	L	M	N
CP4/0C8	4/0	9.62 (244)	1.44 (37)	1.12 (28)	3.62 (92)	.96 (24)	2.50 (64)	.52 (14)
CP250C8	250kcmil	9.62 (244)	1.44 (37)	1.12 (28)	3.62 (92)	.96 (24)	2.50 (64)	.58 (13)
CP350C8	350kcmil	9.62 (244)	1.62 (41)	1.12 (28)	3.62 (92)	.96 (24)	2.50 (64)	.68 (17)
CP500C8	500kcmil	10.00 (254)	1.88 (48)	1.62 (41)	3.62 (92)	1.19 (30)	2.88 (73)	.81 (21)
CP750C8	750kcmil	10.13 (257)	2.50 (64)	2.00 (51)	3.75 (95)	1.31 (33)	2.88 (73)	1.00 (25)



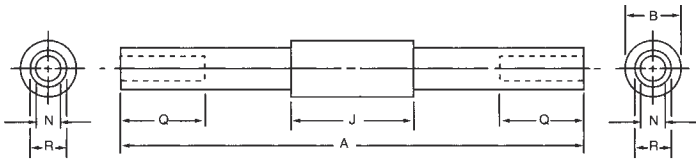
Type C8

** kcmil = MCM*

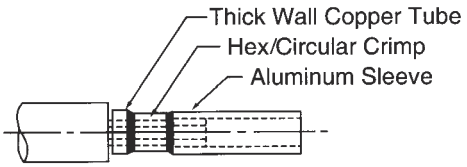
CP 600V Cable Protectors

Type A1 – Dimensions (Cable to Cable - Aluminum)

Catalog No.	Cable* Size	Dimensions - Inches (mm) A	B	J	N	Q	R
CP4/0A1	4/0	13.88 353)	1.44 (37)	3.62 (92)	.55 (14)	2.50 (64)	.85 (22)
CP250A1	250kcmil	13.88 (353)	1.44 (37)	3.62 (92)	.59 (15)	2.50 (64)	.94 (24)
CP350A1	350kcmil	13.88 (353)	1.62 (41)	3.62 (92)	.71 (18)	2.50 (64)	1.13 (29)
CP500A1	500kcmil	15.38 (391)	1.88 (48)	3.62 (92)	.85 (22)	2.88 (73)	1.33 (34)
CP750A1	750kcmil	15.50 (394)	2.50 (64)	3.75 (95)	1.06 (27)	2.88 (73)	1.62 (41)



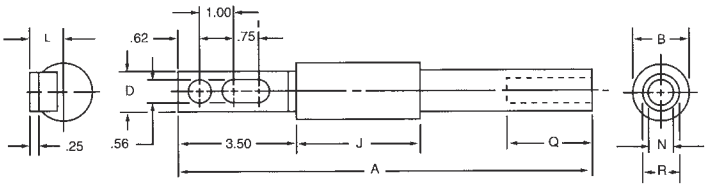
Type A1



Typical Terminal Assembly Details

Type A3 – Dimensions (Cable to Offset Bus - Aluminum)

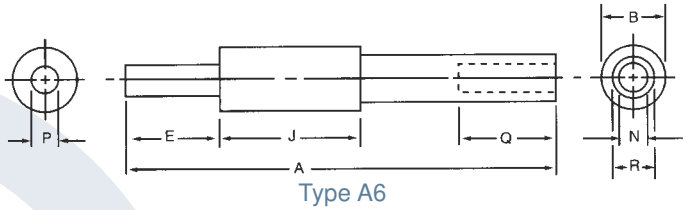
Catalog No.	Cable* Size	Dimensions - Inches (mm) A	B	D	J	L	N	Q	R
CP4/0A3	4/0	12.25(311)	1.44 (37)	1.12 (28)	3.62 (92)	.96 (24)	.55 (14)	2.50 (64)	.85 (22)
CP250A3	250kcmil	12.25 (311)	1.44 (37)	1.12 (28)	3.62 (92)	.96 (24)	.59 (15)	2.50 (64)	.94 (24)
CP350A3	350kcmil	12.25 (311)	1.62 (41)	1.12 (28)	3.62 (92)	.96 (24)	.71 (18)	2.50 (64)	1.13 (29)
CP500A3	500kcmil	13.00 (330)	1.88 (48)	1.62 (41)	3.62 (92)	1.19 (30)	.85 (22)	2.88 (73)	1.33 (34)
CP750A3	750kcmil	13.12 (333)	2.50 (64)	2.00 (51)	3.75 (95)	1.31 (33)	1.06 (27)	2.88 (73)	1.62 (41)



Type A3

Type A6 – Dimensions (Mole to Cable - Aluminum)

Catalog Number	Cable* Size	Dimensions - Inches (mm) A	B	E	J	N	P	Q	R
CP4/0A6	4/0	11.25 (286)	1.44 (37)	2.50 (64)	3.62 (92)	.55 (14)	.52 (13)	2.50 (64)	.85 (22)
CP250A6	250kcmil	11.25 (286)	1.44 (37)	2.50 (64)	3.62 (92)	.59 (15)	.58 (14)	2.50 (64)	.94 (24)
CP350A6	350kcmil	11.25 (286)	1.62 (41)	2.50 (64)	3.62 (92)	.71 (18)	.68 (17)	2.50 (64)	1.13 (29)
CP500A6	500kcmil	12.38 (314)	1.88 (48)	2.88 (73)	3.62 (92)	.85 (22)	.81 (21)	2.88 (73)	1.33 (34)
CP750A6	750kcmil	12.50 (318)	2.50 (64)	2.88 (73)	3.75 (95)	1.06 (27)	1.00 (25)	2.88 (73)	1.59 (41)



Type A6

Type 5 – Use Copper Cable Protectors Type C5

Type 8 – Use Copper Cable Protectors Type C8

** kcmil = MCM*

Note: Inside surface of sleeve ends is coated with oxide inhibitor and capped.

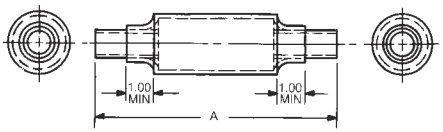
For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

CP 600V Cable Protectors

Copper Cable Protectors with Heat Shrinkable Tubing*

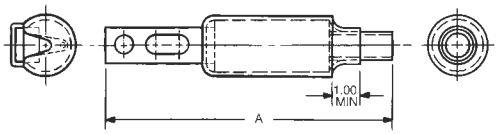
Type C1, Copper Cable – Dimensions

Cable Size	A		Catalog No. Cable Protector With Heat Shrinkable Tubing
	Inches	(mm)	
4/0	7.12	(180)	CP4/0C1-HS
250kcmil	7.38	(188)	CP250C1-HS
350kcmil	7.62	(194)	CP350C1-HS
500kcmil	9.38	(238)	CP500C1-HS
750kcmil	9.51	(242)	CP750C1-HS



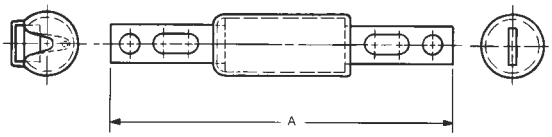
Type C3, Copper Cable – Dimensions

Cable Size	A		Catalog No. Cable Protector With Heat Shrinkable Tubing
	Inches	(mm)	
4/0	8.87	(225)	CP4/0C3-HS
250kcmil	9.00	(229)	CP250C3-HS
350kcmil	9.12	(232)	CP350C3-HS
500kcmil	10.00	(254)	CP500C3-HS
750kcmil	10.13	(257)	CP750C3-HS



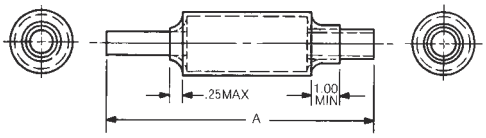
Type C5, Copper Cable – Dimensions

Cable Size	A		Catalog No. Cable Protector ith Heat Shrinkable Tubing
	Inches	(mm)	
4/0	10.37	(263)	CP4/0C5-HS
250kcmil	10.37	(263)	CP250C5-HS
350kcmil	10.37	(263)	CP350C5-HS
500kcmil	10.37	(263)	CP500C5-HS
750kcmil	10.50	(267)	CP750C5-HS



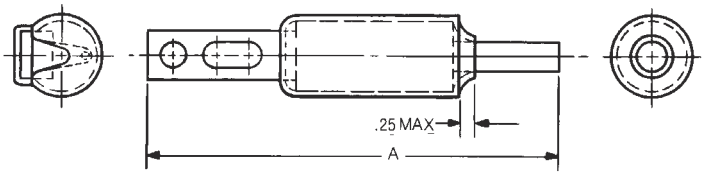
Type C6, Copper Cable – Dimensions

Cable Size	A		Catalog No. Cable Protector With Heat Shrinkable Tubing
	Inches	(mm)	
4/0	7.87	(200)	CP4/0C6-HS
250kcmil	8.00	(203)	CP250C6-HS
350kcmil	8.12	(206)	CP350C6-HS
500kcmil	9.38	(238)	CP500C6-HS
750kcmil	9.51	(242)	CP750C6-HS



Type C8, Copper Cable – Dimensions

Cable Size	A		Catalog No. Cable Protector With Heat Shrinkable Tubing
	Inches	(mm)	
4/0	9.62	(244)	CP4/0C8-HS
250kcmil	9.62	(244)	CP250C8-HS
350kcmil	9.62	(244)	CP350C8-HS
500kcmil	10.00	(254)	CP500C8-HS
750kcmil	10.13	(257)	CP750C8-HS



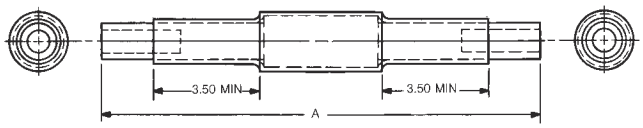
** Transparent heat shrinkable tubing is supplied separately with -HS Catalog No. Maximum curing conditions: 5 seconds at 450˚F.*

CP 600V Cable Protectors

Aluminum Cable Protectors with Heat Shrinkable Tubing*

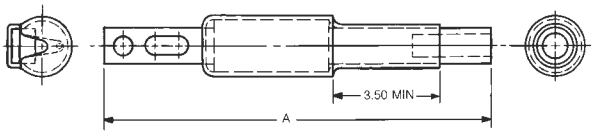
Type A1, Aluminum Cable – Dimensions

Cable Size	A Inches	A (mm)	Catalog No. Cable Protector With Heat Shrinkable Tubing
4/0	13.88	(353)	CP4/0A1-HS
250kcmil	13.88	(353)	CP250A1-HS
350kcmil	13.88	(353)	CP350A1-HS
500kcmil	15.38	(391)	CP500A1-HS
750kcmil	15.50	(394)	CP750A1-HS



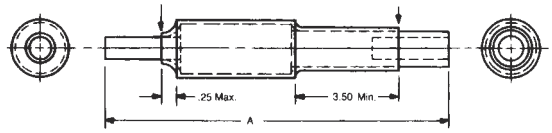
Type A3, Aluminum Cable – Dimensions

Cable Size	A Inches	A (mm)	Catalog No. Cable Protector With Heat Shrinkable Tubing
250kcmil	12.25	(311)	CP250A3-HS
350kcmil	12.25	(311)	CP350A3-HS
4/0	12.25	(311)	CP4/0A3-HS
500kcmil	13.00	(330)	CP500A3-HS
750kcmil	13.12	(333)	CP750A3-HS



Type A6, Aluminum Cable – Dimensions

Cable Size	A Inches	A (mm)	Catalog No. Cable Protector With Heat Shrinkable Tubing
4/0	11.25	(286)	CP4/0A6-HS
250kcmil	11.25	(286)	CP250A6-HS
350kcmil	11.25	(286)	CP350A6-HS
500kcmil	12.38	(314)	CP500A6-HS
750kcmil	12.50	(318)	CP750A6-HS



Type 5 – Use Copper Cable Protectors Type C5

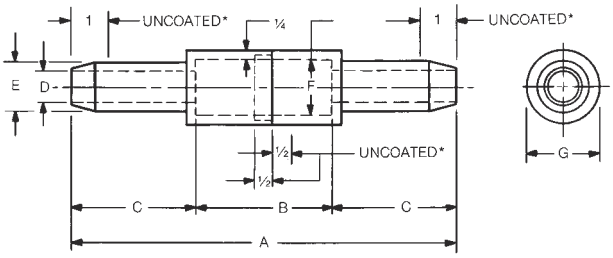
Type 8 – Use Copper Cable Protectors Type C8

* *Transparent heat shrinkable tubing is supplied separately with -HS Catalog Numbers. Maximum curing conditions: 5 seconds at 450˚F.*

Molded Rubber Insulating Sleeves**

For Type C1 Copper Cable Protectors – Dimensions

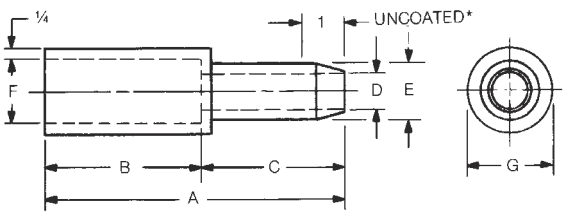
Catalog No.	Cable Size	Dimensions - Inches (mm) A	B	C	D	E	F	G
4/0CCR	4/0	10.44 (265)	3.69 (94)	3.38 (86)	.83 (21)	1.33 (33)	1.50 (38)	2.00 (51)
500CCR	500kcmil	14.19 (360)	3.69 (94)	5.25 (133)	1.31 (33)	1.81 (46)	1.94 (49)	2.44 (62)



INSULATING SLEEVE

For Type C3 Copper Cable Protectors – Dimensions

Catalog No.	Cable Size	Dimensions - Inches (mm) A	B	C	D	E	F	G
4/0CBR	4/0	7.06 (179)	3.69 (94)	3.38 (86)	.83 (21)	1.33 (33)	1.50 (38)	2.00 (51)
500CBR	500kcmil	8.94 (227)	3.69 (94)	5.25 (133)	1.31 (33)	1.81 (46)	1.94 (49)	2.44 (62)



INSULATING SLEEVE

** *Molded rubber insulating sleeves are ordered by their own catalog numbers, and not as suffixes to the cable protector catalog numbers. Neoprene coated except as noted.*

CP 600V Cable Protectors

Mersen Cable Protectors have standard commercial splicing sleeve dimensions. Any crimping tool suitable for standard splicing sleeves, can be used. Follow crimping tool manufacturers instructions. Some crimping tool examples are shown below. It is recommended to use at least 2 crimps.

Cable Protector Splicing Sleve Dimensions

Cable Size (MCM or kcmil)	Copper		Aluminum	
	ID	OD	ID	OD
#2	0.31 (7.87)	0.42 (10.69)	-	-
1/0	0.39 (9.91)	0.52 (13.21)	-	-
2/0	0.44 (11.18)	0.56 (14.22)	-	-
4/0	0.55 (13.97)	0.68 (17.27)	0.54 (13.8)	0.84 (21.5)
250	0.62 (15.75)	0.75 (19.05)	0.59 (15.1)	0.94 (23.7)
350	0.71 (18.03)	0.88 (22.35)	0.71 (18.0)	1.13 (28.7)
400	0.75 (19.05)	0.94 (23.88)	-	-
500	0.82 (20.83)	1.05 (26.67)	0.84 (21. 2)	1.31 (33.3)
600	0.94 (23.88)	1.07 (27.18)	0.92 (23.4)	1.44 (36.6)
750	1.06 (26.92)	1.32 (33.53)	1.03 (26.2)	1.59 (40.4)
1000	1.16 (29.46)	1.50 (38.1)	-	-

Panduit - Copper

Cable Size (MCM or kcmil)	CT-920, CT-920CH, CT-930, CT-930CH, CT-2920	
	Die	Die Color & Die No.
#2	CD-920-2	Brown P33
1/0	CD-920-1/0	Pink P42
2/0	CD-920-2/0	Black P45
4/0	CD-920-4/0	Purple P54
250	CD-920-250*	Yellow P62
350	CD-920-350	Red P71
400	CD-920-400	Blue P76
500	CD-920-500	Brown P87
600	CD-920-600	Green P94
750	CD-920-750	Black P106

** Copper Tap Connector Part Nos: HTCT250-8, HTCT250-2, HTCT250-250*
** Tap Connector Die Part No: CD-930H-250*

Panduit - Aluminum

Cable Size (MCM or kcmil)	CT-920, CT-920CH, CT-930, CT-930CH, CT-2920	
	Die	Die Color & Die No.
#2	CD-920-1/0	Pink P42
1/0	CD-920-3/0**	Tan P50 (Orange P50)
2/0	CD-920-4/0	Olive P54 (Purple 54)
4/0	CD-920-300	White P66
250	CD-920-350	Red P71
350	CD-920-500	Brown P87
400	CD-920-600	Green P94
500	CD-920-500A	Pink P99
600	CD-920-750	Black P106
750	-	-

*** Aluminum Tap Connector Part No: HTAP2-8-L (PANDUIT Die Color & Die No)*

Note: Crimp Tools CT 2940 and CT940H may be used with adapter CD-940-DA

CP 600V Cable Protectors

Thomas & Betts - Copper

Cable Size (MCM or kcmil)	13642M (13400) Hydraulic Head		TBM14 (14 TON) Head		TBM15 (15 TON) Head		Head	
	Die Cat No.	Die Code	Die Cat No.	Die Code	Die Cat No.	Die Code	Die Cat No.	Die Code
#2	11735	33	15528	33	15528	33	11402	33
1/0	11737	42	15508	42	15508	42	11334	42
2/0	11738	45	15526	45	15526	45	11405	45
4/0	11740	54	15511	54	15511	54H	11407	54H
250	11771	62	15510-CK	62	15510-CK	62	297-31669-7	62
350	11743	71H	15514-CK	71H	15514-CK	71H	11363	71
400	11744	76H	15512	76H	15512	76H	11410	76
500	11746-TB	87H	15506	87H	15506	87H	11423	87
600	11748	99H	15536-CK	94H	15536-CK	94H	11364	94
750	-	-	15515-CK	106H	15515-CK	106H	74506	106
1000			-	-	15603	125H	11416	125

Thomas & Betts - Aluminum

Cable Size (MCM or kcmil)	13642M (13400) Hydraulic Head		TBM14 Head		TBM15 Head		21940 (40 TON) Head	
	Die Cat No.	Die Code	Die Cat No.	Die Code	Die Cat No.	Die Code	Die Cat No.	Die Code
4/0	11742	66H	15534	66H	15534	66H	11409	66
250	11744	76H	15512	76H	15512	76H	11410	76
350	11747	94H	15536-CK	94H	15536-CK	94H	11364	94
400	-	-	-	-	-	-	-	-
500	11749	106H	15515-CK	106H	15515-CK	106H	74506	106
600	11751	112H	15504	115H	15609	112H	11426	112
750	-	-	-	-	15602	140H	11418	140

Burndy - Copper

Cable Size (MCM or kcmil)	Burndy Hypress and Die Set			
	Y35	Y39	Y750	Y46*
#2	U2CRT	U2CRT	U2CRT	U2CRT
1/0	U25RT	U25RT	U25RT	U25RT
2/0	U26RT	U26RT	U26RT	U26RT
4/0	U28RT	U28RT	U28RT	U28RT
250	U29RT	U29RT	U29RT	U29RT
350	U31RT	U31RT	U31RT	U31RT
400	U32RT	U32RT	U32RT	U32RT
500	-	U34RT	U34RT	U34RT
600	-	U36RT	U36RT	U36RT
750	-	U39RT	U39RT	U39RT
1000	-	-	-	P44RT**

* Requires PUADP-1 Adapter

** PUADP-1 Adapter not required

Note: Use Burndy Dies with Ilsco ILC-15H crimp tool by installing adapter part no ILD-PADP

Burndy - Aluminum

Cable Size (MCM or kcmil)	Burndy Hypress and Die Set	
	Y35	Y39
#2	-	-
1/0	-	-
2/0	U26ART	U26ART
4/0	U28ART	U28ART
250	U29ART	U29ART
350	U31ART	U31ART
400	U32ART	U32ART
500	-	U34ART
600	-	U36ART
750	-	U39ART-2
1000	-	-

* Requires PUADP-1 Adapter

** PUADP-1 Adapter not required

2CL 250V Cable Protectors

250V Cable Protectors

Mersen 2CL Cable Protectors are special purpose limiters which are crimped or bolted to cables or terminals to clear and isolate faults quickly, increasing the reliability of service entrance and distribution runs. They are 250VAC current limiting with a 200,000A interrupting rating, yet will carry low cable overloads which are handled by standard protective devices. These cable protectors are rated for both copper and aluminum cabling per their corresponding cable size.

Features/Benefits:

- Fiberglass bodies for dimensional stability in harsh environments
- Catalog number stamped into terminal for permanent identification
- 250VAC Rated
- Shorter in length, smaller dimensions than standard 600VAC rated cable limiters



Ratings:

Sizes 1 to 500 kcmil copper and aluminum

Volts : 250VAC
IR : 200kA I.R. AC

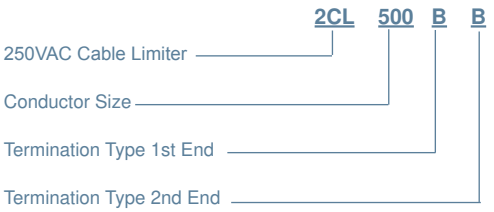
Approvals:

- Self Certified

Catalog Numbers

Type	Termination	Cable Size	Catalog No.
BB	Blade to Blade	1	2CL1BB
		2	2CL2BB
		3	2CL3BB
		4	2CL4BB
		1/0	2CL10BB
		2/0	2CL20BB
		3/0	2CL30BB
		4/0	2CL40BB
		250	2CL250BB
		350	2CL350BB
		500	2CL500BB
BF	Blade to Offset Bus	1	2CL1BF
		2	2CL2BF
		3	2CL3BF
		4	2CL4BF
		1/0	2CL10BF
		2/0	2CL20BF
		3/0	2CL30BF
		4/0	2CL40BF
		250	2CL250BF
		350	2CL350BF
		500	2CL500BF
CC	Cable to Cable	1/0	2CL10CC
		2/0	2CL20CC
		4/0	2CL40CC
		250	2CL250CC
		350	2CL350CC
		500	2CL500CC
CF	Cable to Offset Bus	1/0	2CL10CF
		2/0	2CL20CF
		4/0	2CL40CF
		250	2CL250CF
		350	2CL350CF
		500	2CL500CF

Catalog Numbering System



**Please consult factory for special terminations.*

A60C Low Voltage Capacitor Fuses

600V Low Voltage Capacitor Fuses

Mersen low voltage capacitor fuses provide advanced safety for power correction and harmonic filtering equipment. A capacitor fuse isolates a shorted capacitor before it can damage surrounding equipment or personnel. Typical capacitor failures occur when the internal dielectric can no longer withstand the applied voltage, resulting in a low impedance current path and generating excessive heat and pressure that can cause violent case rupture. Mersen low voltage capacitor fuses will isolate the shorted capacitor before case rupture occurs while routinely withstanding inrush current at startup.

Features/Benefits:

- High interrupting rating
- Current-limiting
- Capacitor inrush withstand capability
- Direct mount
- Optional blown fuse indication

Catalog Numbers (amps)

Without indicator	With indicator
A60C10-121	-
A60C15-121	-
A60C20-121	-
A60C25-121	A60C25-121TI
A60C30-121	-
A60C35-121	A60C35-121TI
A60C40-121	A60C40-121TI
A60C50-121	A60C50-121TI
A60C60-121	A60C60-121TI
-	A60C75-121TI
A60C80-121	A60C80-121TI
A60C100-121	A60C100-121TI
A60C125-121	A60C125-121TI
A60C150-121	A60C150-121TI
A60C175-121	A60C175-121TI
A60C200-121	A60C200-121TI
A60C225-121	A60C225-121TI
A60C250-121	A60C250-121TI
A60C300-121	A60C300-121TI

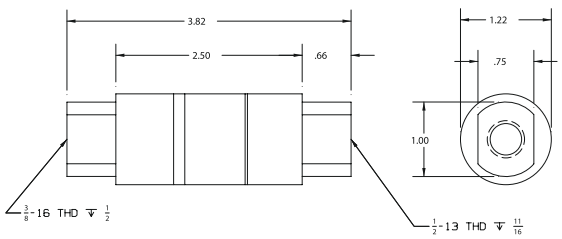
Ratings:

Volts : 600VAC
Amps : 10 to 300A
IR : 200kA I.R.

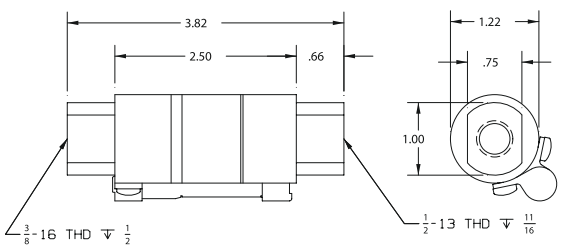
Approvals:

- UL Recognized Component File E60314
- Tested by UL to CSA standard C22.2 No. 248.1

Dimensions



A60C without Indicator



A60C with Indicator

A4BX Welder Protectors

Welder protectors

Mersen Welder Protectors are special purpose limiters used to provide isolation of faulted welding equipment and protection for the cable drop supplying the welder. Welder Protectors have a high thermal capacity and are less affected by high ambient temperatures and extended weld times than similar size Class J, K, or R fuses*. Welder Protectors should only be applied for isolation of short circuited welding circuits. Overload protection must be provided for by other means.

**Contact factory for Class L sizes and ratings.*



Ratings:

Volts : 600VAC
Amps : 100 to 600A
IR : 200kA I.R.

Approvals:

- Self Certified

Catalog Numbers (amps)

Class K Dimension	Class J Dimension
A4BX100-150	-
A4BX125-150	-
A4BX150-150	-
A4BX200-150	A4BX200-150J
A4BX225-150	A4BX225-150J
A4BX300-150	A4BX300-150J
A4BX400-150	A4BX400-150J
A4BX500-150	-
A4BX600-150	-

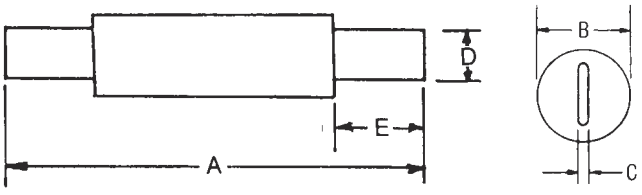
**For larger ratings consult factory.*

A4BX (amps) - 150; Class K Dimensions

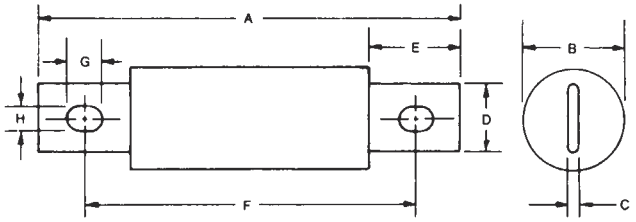
Ampere Rating	Inches							
	A	B	C	D	E	F	G	H
100	7-7/8	1	1/8	23/32	2-5/8	-	-	-
125-200	9-5/8	1-1/2	3/16	1-1/8	3-7/16	-	-	-
225-400	11-5/8	2	1/4	1-5/8	4-7/16	-	-	-
500-600	13-3/8	2-1/2	1/4	2	5-5/16	-	-	-

A4BX (amps) - 150J; Class J Dimensions

200	5-3/4	1-1/2	3/16	1-1/8	1-1/2	4-3/8	3/8	9/32
225-400	7-1/8	2	1/4	1-5/8	2-3/16	5-1/4	17/32	13/32



Class K



Class J

A2Y/A6Y Form 600

Form 600 fuses

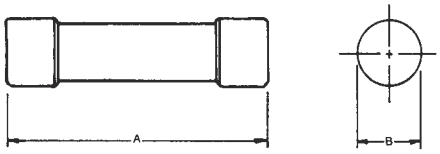
Mersen Form 600 fuses are the original current-limiting fuses, pre-dating all the standards. Their 500V DC rating (through 600A) is a useful feature for special fusing applications. Form 600 fuses provide a high degree of current limitation in AC and DC applications. Types 1 and 3 are dimensionally interchangeable with Class H and K fuses. Types 4 and 5 have unique rejection dimensions and are not interchangeable.

Catalog Numbers (amps)

250V		600V	
A2Y1-1	A2Y200-3	A6Y1-1	A6Y200-3
A2Y2-1	A2Y200-4	A6Y2-1	A6Y200-4
A2Y3-1	-	A6Y3-1	A6Y200-5
A2Y5-1	-	A6Y5-1	A6Y225-3
A2Y6-1	-	A6Y6-1	A6Y225-4
A2Y8-1	-	A6Y8-1	A6Y225-5
A2Y10-1	A2Y250-3	A6Y10-1	A6Y250-3
A2Y15-1	A2Y250-4	A6Y15-1	A6Y250-4
A2Y20-1	-	A6Y20-1	A6Y250-5
A2Y25-1	A2Y300-3	A6Y25-1	A6Y300-3
A2Y30-1	A2Y300-4	A6Y30-1	A6Y300-4
A2Y35-1	-	A6Y35-1	A6Y300-5
A2Y40-1	A2Y350-3	A6Y40-1	A6Y350-3
A2Y45-1	A2Y350-4	A6Y45-1	A6Y350-4
A2Y50-1	A2Y400-3	A6Y50-1	A6Y400-3
A2Y60-1	A2Y400-4	A6Y60-1	A6Y400-4
A2Y70-3	-	A6Y70-3	A6Y400-5
A2Y70-4	A2Y450-3	A6Y70-4	A6Y450-3
A2Y70-5	A2Y450-4	-	A6Y450-4
A2Y80-3	-	A6Y80-3	A6Y450-5
A2Y80-4	A2Y500-3	A6Y80-4	A6Y500-3
A2Y90-3	A2Y500-4	A6Y90-3	A6Y500-4
A2Y90-4	A2Y500-5	-	A6Y500-5
A2Y100-3	A2Y600-3	A6Y100-3	A6Y600-3
A2Y100-4	A2Y600-4	A6Y100-4	A6Y600-4
A2Y125-3	A2Y600-5	A6Y125-3	A6Y600-5
A2Y125-4	-	A6Y125-4	A6Y650-4
-	-	A6Y125-5	A6Y800-4
A2Y150-3	-	A6Y150-3	A6Y800-5
A2Y150-4	-	A6Y150-4	A6Y1000-4
-	-	A6Y150-5	A6Y1000-5
A2Y175-3	-	A6Y175-3	A6Y1200-4
A2Y175-4	-	A6Y175-4	A6Y1200-5
-		A6Y175-5	

Type 1, 1-60 Amperes Class K Dimensions

Ampere Rating	Inches A	Inches B
A2Y - 1-60A		
1-30	2	9/16
35-60	3	13/16
A6Y - 1-60A		
1-30	5	13/16
35-60	5-1/2	1-1/16





Ratings:

A2Y

Volts : 250VAC
: 500VDC
Amps : 1 to 600A
IR : 200kA I.R.AC
: 100kA I.R. DC

A6Y

Volts : 600VAC
: 500VDC
Amps : 1 to 8A (500VAC)
: 10 to 1200A (600VAC)
: 1 to 600A (500VDC)
IR : 200kA I.R. AC
: 100kA I.R. DC

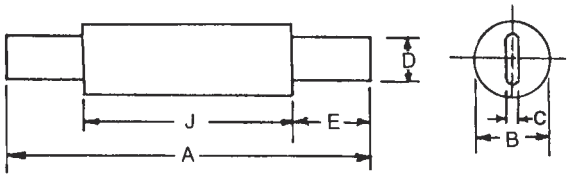
Approvals:

- UL Recognized Component File E60314
- DC Tested to UL248-1 (1-600A)

A2Y/A6Y Form 600

Type 3, 70-600 Amps, Class K Dimensions

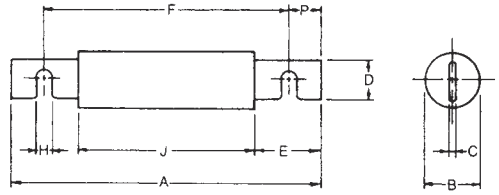
Ampere Rating	Inches					
	A	B	C	D	E	J
250 VAC/500 VDC - A2Y (Amp) - 3						
70-100	5-7/8	1	1/8	23/32	1-5/8	2-21/32
125-200	7-1/8	1-1/2	3/16	1-1/8	2-3/16	2-25/32
225-400	8-5/8	2	1/4	1-5/8	2-15/16	2-25/32
450-600	10-3/8	2-1/2	1/4	2	3-13/16	2-25/32
600 VAC/500 VDC - A6Y (Amp) - 3						
70-100	7-7/8	1	1/8	23/32	2-5/8	2-21/32
110-200	9-5/8	1-1/2	3/16	1-1/8	3-7/16	2-25/32
225-400	11-5/8	2	1/4	1-5/8	4-7/16	2-25/32
450-600	13-3/8	2-1/2	1/4	2	5-5/16	2-25/32



Type 3 70-600A

Type 4, 70-600 Amps – Dimensions

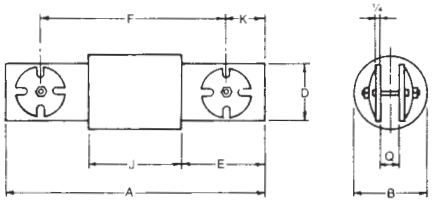
Ampere Rating	Inches								
	A	B	C	D	E	F	H	J	P
250 VAC/500 VDC - A2Y (Amp) - 4									
70-100	5-7/8	1	1/8	23/32	1-5/8	4-7/8	13/64	2-21/32	1/2
125-200	7-1/8	1-1/2	3/16	1-1/8	2-3/16	5-3/4	17/64	2-25/32	11/16
225-400	8-5/8	2	1/4	1-5/8	2-15/16	6-3/4	21/64	2-25/32	15/16
450-600	10-3/8	2-1/2	1/4	2	3-13/16	8-1/8	25/64	2-25/32	1-1/8
600 VAC/500 VDC - A6Y (Amp) - 4									
70-100	7-7/8	1	1/8	23/32	2-5/8	6-7/8	13/64	2-21/32	1/2
125-200	9-5/8	1-1/2	3/16	1-1/8	3-7/16	8-1/4	17/64	2-25/32	11/16
225-400	11-5/8	2	1/4	1-5/8	4-7/16	9-3/4	21/64	2-25/32	15/16
450-600	13-3/8	2-1/2	1/4	2	5-5/16	11-1/8	25/64	2-25/32	1-1/8



Type 4 70-600A

Type 4, 650-1200 Amps – Dimensions

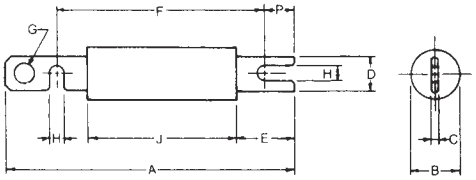
Ampere Rating	Inches							
	A	B	D	E	F	J	K	Q
600 VAC only - A6Y (Amp) - 4								
650-1200	10-1/2	3	2	3-3/8	7-7/8	3-3/4	1-5/16	5/8



Type 4 650-1200A

Type 5, 125-600 Amps – Dimensions

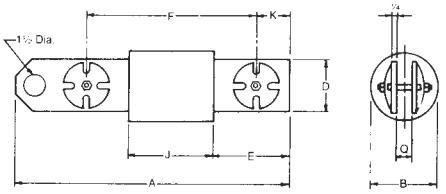
Ampere Rating	Inches									
	A	B	C	D	E	F	G	H	J	P
600 VAC/500 VDC - A6Y (Amp) - 5										
125-200	10-3/4	1-1/2	3/16	1-1/8	3-7/16	8-1/4	3/4	17/64	2-25/32	11/16
225-400	13-1/4	2	1/4	1-5/8	4-7/16	9-3/4	7/8	21/64	2-25/32	15/16
450-600	15-3/16	2-1/2	1/4	2	5-5/16	11-1/8	1	25/64	2-25/32	1



Type 5 125-600A

Type 5, 650-1200 Amps – Dimensions

Ampere Rating	Inches							
	A	B	D	E	F	J	K	Q
600 VAC only - A6Y (Amp) - 5								
650-1200	12-1/8	3	2	3-3/8	7-7/8	3-3/4	1-5/16	5/8



Type 5 650-1200A

TGL, TGN, TGS Telecommunications Fuses

Mersen Telecommunications fuses are specially designed for the protection of telecommunications equipment which includes telephone switching equipment, rectifiers, distribution switching panels, battery back-up modules, power supplies and switching sub-stations. Telecom fuses are available from 1 to 800 amperes rated at 170VDC with an interrupting rating of 100,000 amps. Telecom fuses have high current limiting capabilities to provide a better degree of circuit protection to traditional telecommunications equipment. These fuses consist of a blue and white label for easy identification of their DC voltage capability.



Features/Benefits:

- All fuses rated 170VDC, 100kA I.R.
- Extremely current limiting
- Blue & white labels for easy identification
- Various mounting configurations

Highlights:

- DC rated
- Highly current limiting
- Fast acting
- Rejection style

Applications:

- Distribution switching panels
- Battery back-up systems
- Power supplies
- Switching substations
- Telephone switching rectifiers

Ratings:

TGL
Volts : 170VDC
Amps : 70 to 800A
IR : 100kA I.R.

TGN
Volts : 170VDC
Amps : 1 to 600A
IR : 100kA I.R.

TGS
Volts : 170VDC
Amps : 1 to 70A
IR : 100kA I.R.

Telecom Fuse Cross Reference

Competitor Part No.	Mersen Part No.
TPL	TGL
TPN	TGN
TPS	TGS

Recommended Fuse Holders

Fuse	Ampere	1-Pole	3-Pole
TGL	70-250A	P243D	
	300-800A	P243G	
TGN	0-30	20306R	20308R
	31-60	20606R	20608R
	61-100	21036R	21038R
	101-200	22001R	22003R
	201-400	24001R	24003R
	401-600	2631R	2633R
TGS	0-70A	30656T	30658T

Approvals:

- UL recognized components File E60314

TGL, TGN, TGS Telecommunications Fuses

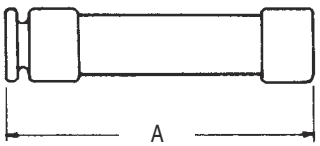
TGN

Catalog Numbers (amps)

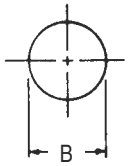
TGN1	TGN40	TGN175
TGN3	TGN45	TGN200
TGN5	TGN50	TGN225
TGN6	TGN60	TGN250
TGN10	TGN70	TGN300
TGN15	TGN80	TGN350
TGN20	TGN90	TGN400
TGN25	TGN100	TGN450
TGN30	TGN110	TGN500
TGN35	TGN150	TGN600

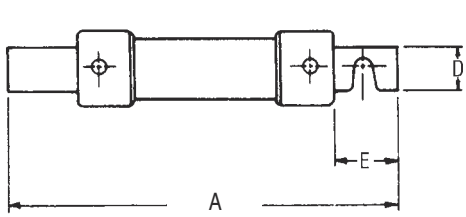
Dimensions - TGN

Ampere Rating	A		B		C		D		E	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
170 VDC TGN FUSES										
0-30	2	51	9/16	14						
31-60	3	76	13/16	21						
61-100	5-7/8	149	1-1/16	27	1/8	3	3/4	19	1	25
101-200	7-1/8	181	1-9/16	40	3/16	5	3/4	19	1-3/8	35
201-400	8-5/8	219	2-1/16	53	1/4	6	1-5/8	41	1-7/8	48
401-600	10-3/8	264	2-9/16	66	1/4	6	2	51	2-1/4	57

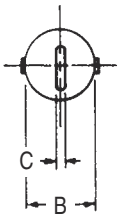


0-60A





61-600A



TGL

Catalog Numbers

Catalog No.	Ampere Rating	Catalog No.	Ampere Rating
TGL-BA	70A	TGL-BL	250A
TGL-BB	80A	TGL-CN	300A
TGL-BC	90A	TGL-CO	350A
TGL-BD	100A	TGL-CR	400A
TGL-BE	125A	TGL-CU	450A
TGL-BF	150A	TGL-CV	500A
TGL-BG	175A	TGL-CZ	600A
TGL-BH	200A	TGL-CZH	800A
TGL-BK	225A		

Dimensions - TGL

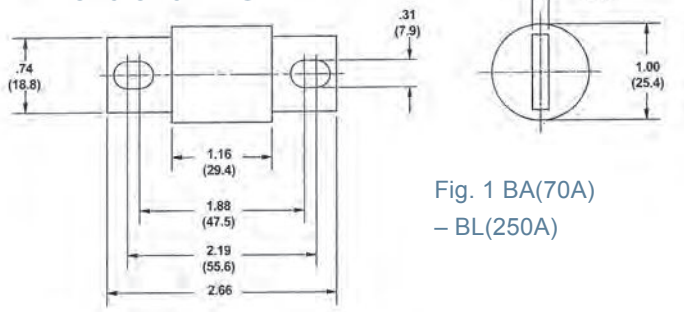


Fig. 1 BA(70A) – BL(250A)

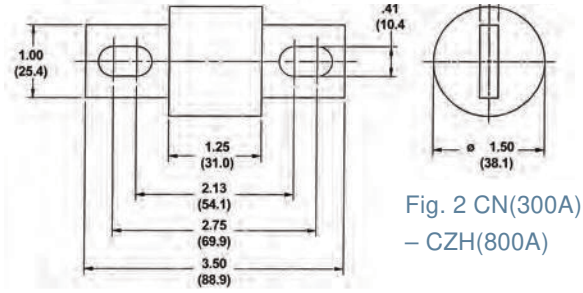


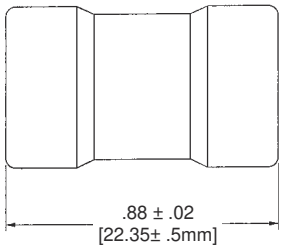
Fig. 2 CN(300A) – CZH(800A)

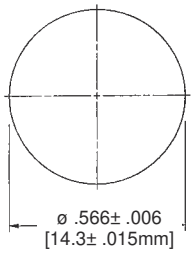
TGS

Catalog Numbers (amps)

TGS1	TGS20
TGS2	TGS25
TGS3	TGS30
TGS5	TGS40
TGS6	TGS50
TGS10	TGS60
TGS15	TGS70

Dimensions - TGS





GMS Telecommunications Fuses

GMS Series Alarm Indicating Telecommunications Fuses

Mersen GMS Series Alarm Indicating fuses are used in telecommunications equipment or other applications. A color coded flag indicates a circuit problem which caused the fuse to blow. Nineteen ampere ratings/colors fill every replacement need.

GMS: Alarm indicating telecommunications fuse



Features/Benefits:

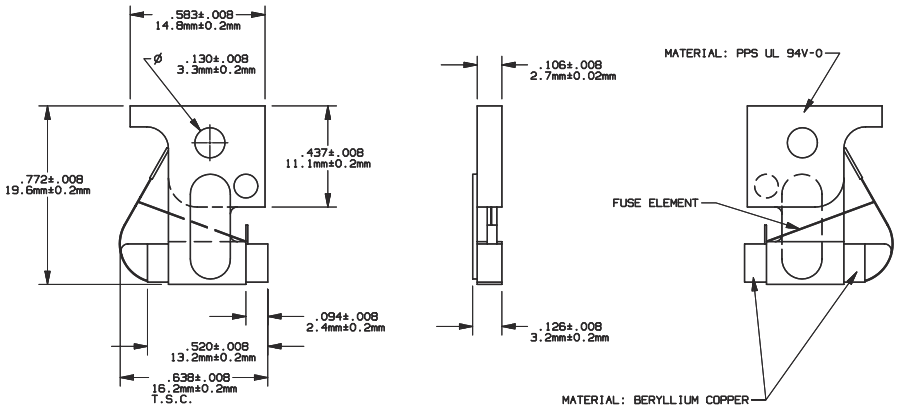
- Color coded
- Body material PPS UL 94V-0
- Rated 125V AC, 60V DC
- Carry 100% load - 10 minutes, min.
- Clear 150% load - 5 minutes, max.

Ratings:

Volts : 125VAC
: 60VDC
Amps : 180mA to 15A

Catalog Numbers (amps)

Catalog No.	Color Code	Catalog No.	Color Code
GMS18/100	Yellow	GMS2-1/2	White-Orange
GMS2/10	Black-Red	GMS3	Blue
GMS1/4	Violet	GMS3-1/2	White-Blue
GMS1/2	Red	GMS4	White-Brown
GMS65/100	Black	GMS5	Green
GMS3/4	Brown	GMS7-1/2	Black-White
GMS1	Gray	GMS10	Red-White
GMS1-1/3	White	GMS12	Yellow-Green
GMS1-1/2	White-Yellow	GMS15	Red-Blue
GMS2	Orange		



Forklift Truck Fuses

Mersen Forklift Truck and Battery Isolator fuses are specially designed for the heavy duty loads associated with DC battery powered equipment such as forklift trucks, hand trucks, motorized work platforms, and other DC battery operated systems. Rugged construction and stud mounted bolt-in design assure a long life in adverse conditions for these fuses. This expanded line of Forklift Truck Fuses can fulfill virtually all of your heavy duty circuit protection needs up to 125V AC or DC. The round body ACK, ACL and ALS fuses combine higher voltage ratings and more ampere ratings with higher interrupting ratings. The flat CNL and CNN style fuses have a lower voltage rating but are also AC and DC, more space saving and have visual “see-thru” indication to show when they have operated.

Features/Benefits:

- All fuses are AC and DC rated
- Expanded ampere ratings
- Time-delay and general purpose types
- Link is visible through window (CNL/CNN)

Highlights:

- AC/DC ratings
- Embossed catalog No’s.
- Stud mounted
- Time-delay - ACK
- General purpose - ACL,ALS

Applications:

- Forklift trucks
- Battery hand trucks
- Motorized work platforms
- Battery systems

Recommended Fuse Blocks for Forklift Truck Fuse Fuses

Fuse	Fuse Block
ACK(70-100)	P243C
ACL(70-120)	P243E
CNL	FTFH, FTFH-1
CNN	FTFH, FTFH-1



Ratings:

ACK:
Volts : 125VAC / DC
Amps : 1 to 400A
IR : 10kA I.R. AC / DC

ACL
Volts : 125VAC / DC
Amps : 30 to 120A
IR : 100kA I.R. AC
: 10kA I.R. DC

ALS
Volts : 125VAC / DC
Amps : 100 to 500A
IR : 10kA I.R. AC / DC

CNL
Volts : 80VAC / DC
Amps : 35 to 500A
IR : 2500kA I.R. AC / DC

CNN
Volts : 130 VAC
: 80VDC
Amps : 10 to 800A
IR : 2500kA I.R. AC / DC

Approvals:

- UL recognized components (All Products) File E60314

Forklift Truck Fuses

Catalog Numbers (amps)

ACK Fuse

ACK1	ACK20	ACK70	ACK160
ACK2	ACK25	ACK80	ACK175
ACK3	ACK30	ACK90	ACK200
ACK5	ACK35	ACK100	ACK225
ACK6	ACK40	ACK120	ACK250
ACK10	ACK50	ACK140	ACK300
ACK15	ACK60	ACK150	ACK400

ACL Fuse

ACL30	ACL70
ACL35	ACL80
ACL40	ACL90
ACL50	ACL100
ACL60	ACL120

ALS Fuse

ALS100	ALS300
ALS150	ALS350
ALS175	ALS400
ALS200	ALS450
ALS225	ALS500
ALS250	–

CNL/CNN:

CNN			CNL		
CNN10	–	CNN350	–	CNL130	CNL350
CNN35	CNN150	CNN400	CNL35	CNL150	CNL400
CNN40	CNN175	CNN500	CNL40	CNL175	CNL500
CNN50	CNN200	CNN600	CNL50	CNL200	CNL600
CNN60	CNN225	CNN225	CNL60	CNL225	CNL675
CNN80	CNN250	-	CNL80	CNL250	-
CNN90	CNN275	CNN700	–	CNL275	CNL750
CNN100	CNN300	-	CNL100	CNL300	-
CNN125	CNN325	CNN800	CNL125	CNL325	-

Dimensions

Catalog No.	Outline Figure	A In. (mm)	B In. (mm)	C In. (mm)	D In. (mm)	E In. (mm)	F In. (mm)	G In. (mm)
ACK 1-30	1	3.07 (77.9)	2.5 (63.5)	.56 (14.3)	.5 (12.7)	.28 (7.1)	.593 (15)	.03 (.8)
ACK 35-60	1	3.74 (95)	3 (76.2)	.81 (20.6)	.75 (19.1)	.34 (8.7)	.86 (21.8)	.047 (1.2)
ACK 70-100	1	4.46 (113.4)	3.5 (88.9)	1.06 (26.9)	1 (25.4)	.38 (9.5)	1.12 (28.5)	.06 (1.6)
ACK 120-200	1	4.72 (119.8)	3.75 (95.4)	1.06 (26.9)	1 (25.4)	.38 (9.5)	1.12 (28.5)	.06 (1.6)
ACK 225-400	1	4.71 (119.7)	3.75 (95.4)	1.06 (26.9)	1 (25.4)	.38 (9.5)	1.12 (28.5)	.06 (1.6)
ACL 30-60	1	3.07 (77.9)	2.5 (63.5)	.56 (14.3)	.5 (12.7)	.28 (7.1)	.593 (15)	.03 (.8)
ACL 70-120	1	3.49 (88.6)	2.75 (69.9)	.81 (20.6)	.75 (19.1)	.34 (8.7)	.86 (21.8)	.047 (1.2)
ALS 100-500	1	4.71 (119.7)	3.75 (95.4)	1.06 (26.9)	1 (25.4)	.38 (9.5)	1.12 (28.5)	.06 (1.6)
CNL/CNN	2	3.188 (80.9)	2.44 (61.9)	.89 (22.6)	.75 (19.0)	.34 (8.7)	—	—

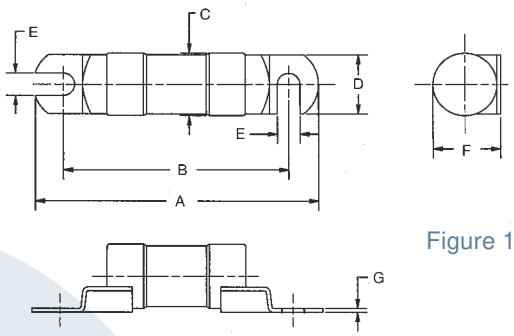


Figure 1

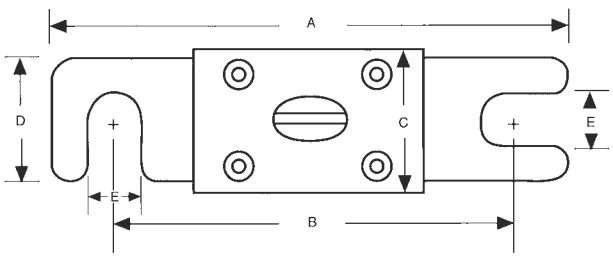


Figure 2

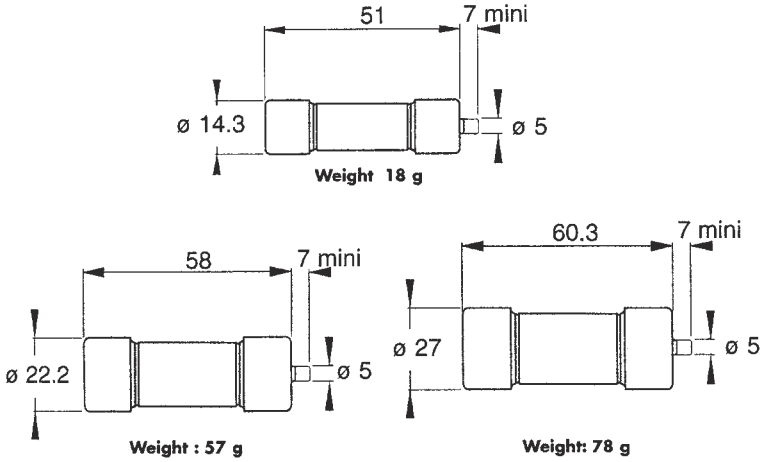
440V DC Ferrule Fuses

Sizes: 14x51, 22x58, 27x60

gLB from 2 to 160 A



Dimensions



Trip force: 4.5N (1lb) at 0 mm-2.5N (1/2lb) at 7 mm (1/4")

Ratings:

Volts : 440VDC
Amps : 2 to 160A
IR : 100kA I.R.
L/R : 30mSec

Catalog Numbers, Ratings

Size	Current Rating I_N(A)	Interrupting I_N(A)	Watts Loss 0.8 IN	Watts Loss IN	Catalog Number	Ref. No.
14x51	2	@ 440VDC 100 kA L/R = 30 ms	0.29	0.5	CC 4.421 CP gLB 14x51/2	E075720
	6		0.74	1.3	CC 4.421 CP gLB 14x51/6	Q094084
	8		1.1	1.8	CC 4.421 CP gLB 14x51/8	F075721
	10		1.1	1.9	CC 4.421 CP gLB 14x51/10	G075722
	12		1.2	2.0	CC 4.421 CP gLB 14x51/12	R094085
	16		1.2	2.1	CC 4.421 CP gLB 14x51/16	H075723
	20		1.4	2.5	CC 4.421 CP gLB 14x51/20	L221132
	25		1.6	2.8	CC 4.421 CP gLB 14x51/25	J075724
	32		2.4	4.2	CC 4.421 CP gLB 14x51/32	S098410
	40		2.9	5.0	CC 4.421 CP gLB 14x51/40	T098687
	50		3.3	5.7	CC 4.421 CP gLB 14x51/50	H076620
22x58	50	@ 440VDC 100 kA L/R = 30 ms	3.9	6.7	CC 4.421 CP gLB 22x58/50	L076968
	63		4.9	8.5	CC 4.421 CP gLB 22x58/63	M221133
	80		6.2	10.8	CC 4.421 CP gLB 22x58/80	J098563
	100		7.5	13.2	CC 4.421 CP gLB 22x58/100	K099507
27x60	125	@440VDC 100 kA L/R = 30 ms	12.6	22	CC 4.421 CP gLB 27x60/125	H098562
	160		13.8	24.2	CC 4.421 CP gLB 27x60/160	M075704

Blown fuse indicator minimum trip voltage: 20 V

660V DC Ferrule Fuses

Size: 27x60

Features/Benefits:

- Full range D.C. operation
- 27x60mm ceramic cylindrical body
- Blown-fuse indicator striker



Ratings:

Volts : 660VDC
Amps : 0.8 to 110A
IR : 50kA I.R.
L/R : 15mSec

Catalog Numbers, Ratings

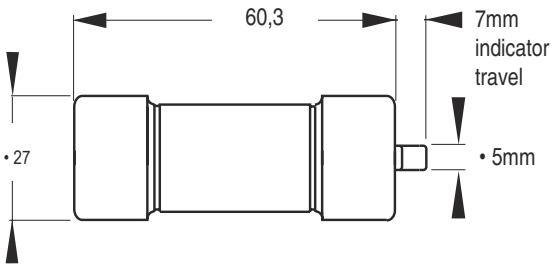
Size (Mm)	Current Rating I_N(A)	Interrupting Rating	Watts Loss 0.8 I_N	Watts Loss I_N	Catalog No.	Ref. No.
27 x 60	0.8	@ 660V DC 50kA L/R = 15ms	0.25	0.4	CC 6,621 CP gRB 27x60/0.8	H098585
	1		0.25	0.4	CC 6,621 CP gRB 27x60/1	J098586
	1.5		0.35	0.6	CC 6,621 CP gRB 27x60/1.5	K098587
	2		0.4	0.7	CC 6,621 CP gRB 27x60/2	P098591
	3.15		0.6	1	CC 6,621 CP gRB 27x60/3.15	Q098592
	4		0.6	1	CC 6,621 CP gRB 27x60/4	R098593
	5		0.7	1.1	CC 6,621 CP gRB 27x60/5	T098595
	6.3		0.8	1.3	CC 6,621 CP gRB 27x60/6.3	Z098600
	8		1.2	2	CC 6,621 CP gRB 27x60/8	L076301
	10		1.3	2.3	CC 6,621 CP gRB 27x60/10	M076302
	12		1.4	2.4	CC 6,621 CP gRB 27x60/12	L075703
	16		1.9	3.3	CC 6,621 CP gRB 27x60/16	N076303
	20		2.4	4.1	CC 6,621 CP gRB 27x60/20	C077006
	25		2.8	4.7	CC 6,621 CP gRB 27x60/25	M075635
	32		3.5	6	CC 6,621 CP gRB 27x60/32	P076304
	40		4.7	8	CC 6,621 CP gRB 27x60/40	Q076305
	50		4.8	8.3	CC 6,621 CP gRB 27x60/50	R076306
	63		5.6	9.6	CC 6,621 CP gRB 27x60/63	P079961
	80		6.4	11.2	CC 6,621 CP gRB 27x60/80	S079964
	100		7.4	12.9	CC 6,621 CP gRB 27x60/100	T099400
	110		7.7	13.7	CC 6,621 CP gRB 27x60/110	S076307

Blown fuse indicator minimum trip voltage: 20V

Approvals:

- UL recognized component File E76398

Dimensions



Indicator Trip Force: 4.5N (1lb) at 0mm-2.5N (1/2lb) at 7mm (1/4")

1000V DC Ferrule Fuses

Size: 20x127

Features/Benefits:

- Full range D.C. operation
- 20x127mm ceramic cylindrical body
- Blown-fuse indicator striker

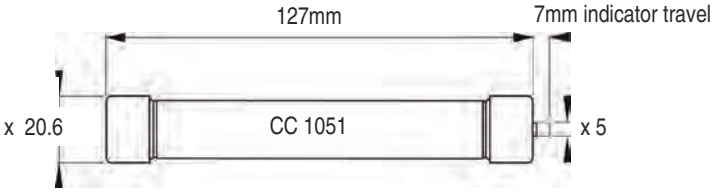


Catalog Numbers, Ratings

Size (Mm)	Current Rating I_N(A)	Interrupting Rating	Watts Loss 0.8 I_N	Watts Loss I_N	Catalog Number New	Catalog Number Old	Ref. No.
	6		2.0	3.5	CC 1051 CP gRB 20x127/6	D 100 gRB 006 VI	Z088020
	8		2.2	3.8	CC 1051 CP gRB 20x127/8	D 100 gRB 008 VI	T088774
	10		2.4	4.2	CC 1051 CP gRB 20x127/10	D 100 gRB 010 VI	A089493
	12		3.0	5.3	CC 1051 CP gRB 20x127/12	D 100 gRB 012 VI	B089494
27	16	@ 1000V DC	3.7	6.6	CC 1051 CP gRB 20x127/16	D 100 gRB 016 VI	C089495
x	20	100kA	4.4	7.7	CC 1051 CP gRB 20x127/20	D 100 gRB 020 VI	D089496
127	25	L/R = 20ms	5.1	9	CC 1051 CP gRB 20x127/25	D 100 gRB 025 VI	E089497
	32		6.0	10.5	CC 1051 CP gRB 20x127/32	D 100 gRB 032 VI	F089498
	40		7.3	13.2	CC 1051 CP gRC 20x127/40	D 100 gRB 040 VI	S086795
	50		8.5	15.5	CC 1051 CP gRC 20x127/50	D 100 gRB 050 VI	F086186
	63		9.6	17.4	CC 1051 CP gRC 20x127/63	D 100 gRB 063 VI	F083656

Blown fuse indicator minimum trip voltage: 50 V
•Use R.M.S. current less than 56 A when mounting in fuse holder.

Dimensions



Indicator Trip Force: 4.5N (1lb) at 0mm-2.5N (1/2lb) at 7mm (1/4")

Ratings:

Volts : 1000VDC
Amps : 6 to 63A
IR : 100kA I.R.
L/R : 20mSec

Max. AC Voltage
(50/60Hz)
1500V@100kA I.R.

Approvals:

- UL recognized component File E76491

1000V DC Ferrule Fuses

Size 36x127

gRB-gRC from 25 to 100 A



Features/Benefits:

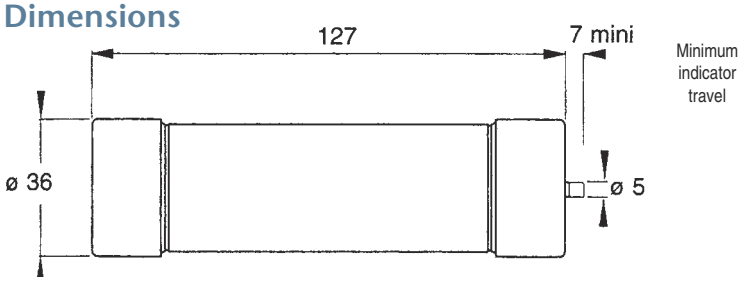
- Full range D.C. operation
- 36x127mm ceramic cylindrical body
- Blown-fuse indicator striker

Catalog Numbers, Ratings

Size (Mm)	Current Rating I_N(A)	Interrupting Rating	Watts Loss 0.8 I_N	Watts Loss I_N	Catalog Number New	Catalog Number Old	Ref. No.
36 x 127	25	@ 1000V DC 100kA L/R = 20ms	5.3	9.4	CC 1051 CP gRB 36x127/25	D 100 gRB 006 VI	H083980
	32		6.4	11.5	CC 1051 CP gRB 36x127/32	D 100 gRB 008 VI	R086495
	40		6.5	11.6	CC 1051 CP gRB 36x127/40	D 100 gRB 010 V I	G089499
						D 100 gRB 012 VI	
	50		8.7	15.4	CC 1051 CP gRB 36x127/50	D 100 gRB 016 VI	H089500
	63		10.5	18.8	CC 1051 CP gRC 36x127/63	D 100 gRB 020 VI	J089501
	80		11.9	21.5	CC 1051 CP gRC 36x127/80	D 100 gRB 025 VI	A083651
	100		13.2	24.1	CC 1051 CP gRC 36x127/100	D 100 gRB 032 VI	Z083650

Blown fuse indicator minimum trip voltage: 50 V

Dimensions



Trip force: 4.5N (1lb) at 0 mm - 2.5N (1/2) at 7 mm

Ratings:

Volts : 1000VDC
Amps : 25 to 100A
IR : 100kA I.R.
L/R : 20mSec

Max AC Voltage
(50/60Hz)
1500V @100k A I.R.

1500V DC Ferrule Fuses

Size: 20x127



Features/Benefits:

- Blown fuse indicator striker .8 to 5A
- 20x127mm ceramic cylindrical body
- Full range D.C. operation

Catalog Numbers, Ratings

Size (Mm)	Current Rating I_N(A)	Interrupting Rating	Watts Loss 0.8 I_N	Watts Loss I_N	Catalog Number New	Catalog Number Old	Ref. No.
	0.8		0.5	0.9	CC 1551 CP gRB 20x127/0.8	D 150 gRB 0.8 VI	E075743
	1		0.5	0.9	CC 1551 CP gRB 20x127/1	D 150 gRB 001 VI	F075744
	1.5	@ 1000V DC	0.8	1.4	CC 1551 CP gRB 20x127/1.5	D 150 gRB 01.5 VI	G075745
	2	100kA	0.9	1.6	CC 1551 CP gRB 20x127/2	D 150 gRB 002 VI	B088367
	3.15	L/R = 100ms	1.2	2.1	CC 1551 CP gRB 20x127/3.15	D 150 gRB 3.15 VI	H075746
	4		1.3	2.1	CC 1551 CP gRB 20x127/4	D 150 gRB 004 VI	J075747
	5		1.4	2.3	CC 1551 CP gRB 20x127/5	D 150 gRB 005 VI	C088368
	0.8		0.5	0.9	CC 1500 CP gRB 20x127/0.8	D 150 gRB 0.8 V	J081842
	1		0.5	0.9	CC 1500 CP gRB 20x127/1	D 150 gRB 001 V	R079894
20	1.5	@ 1500V DC	0.8	1.4	CC 1500 CP gRB 20x127/1.5	D 150 gRB 01.5 V	K081843
x	2	30kA	0.9	1.6	CC 1500 CP gRB 20x127/2	D 150 gRB 002 V	Y099243
127	3.15	L/R = 30ms	1.2	2.1	CC 1500 CP gRB 20x127/3.15	D 150 gRB 3.15 V	L081844
	4		1.3	2.1	CC 1500 CP gRB 20x127/4	D 150 gRB 004 V	Z099244
	5		1.4	2.3	CC 1500 CP gRB 20x127/5	D 150 gRB 005 V	A099245
	6		3.4	6.3	CC 1500 CP gRD 20x127/6	D 150 gRB 006 V	E082804
	8		3.3	6.0	CC 1500 CP gRD 20x127/8	D 150 gRB 008 V	Z080867
	10	@ 1500V DC	3.5	6.1	CC 1500 CP gRD 20x127/10	D 150 gRB 010 V	F081655
	12	30kA	3.9	6.8	CC 1500 CP gRD 20x12712	D 150 gRB 012 V	B080593
	16	L/R = 55ms	5	8.9	CC 1500 CP gRD 20x127/16	D 150 gRB 016 V	Q081457
	20		5.3	9.6	CC 1500 CP gRD 20x127/20	D 150 gRB 020 V	D082803
	25		6.6	12	CC 1500 CP gRD 20x127/25	D 150 gRB 025 V	A080431

Blown fuse indicator minimum trip voltage: 50 V

Ratings:

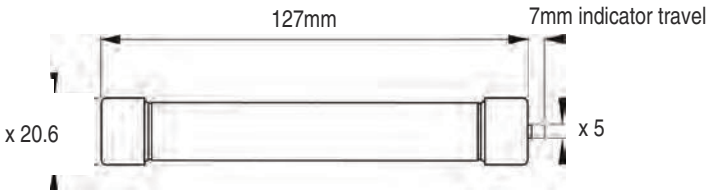
CC 1551 CP gRB

Volts : 1000VDC
Amps : 0.8 to 5A
IR : 100kA I.R. DC
L/R : 100mSec

CC 1500 CP gRB

Volts : 1500VDC
Amps : 0.8 to 25 Amps
IR : 30kA I.R. DC
L/R : 30mSec (.8 to 5A)
L/R : 55mSec (6 to 25A)
Max AC Voltage (50/60Hz)
2500@50k A.I.R.

Dimensions



Indicator Trip Force: 4.5N (1lb) at 0mm-2.5N (1/2lb) at 7mm (1/4")

1500V DC Ferrule Fuses

Size: 20x190



Features/Benefits:

- Blown-fuse indicator striker
  CC I59I CP gRC
- 20x190 ceramic cylindrical body
- Full range D.C. operation
- CC 1500, without indicator

Ratings:

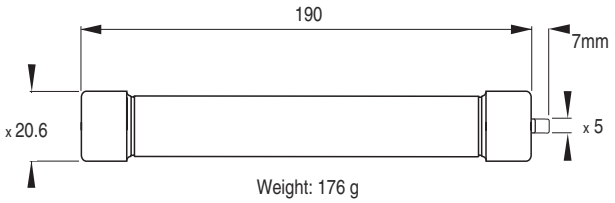
Volts : 1500VDC
Amps : 6 to 32A
IR : 60kA I.R. DC
L/R : 40mSec

Max AC Voltage (50/60 Hz)
3000V @ 50k A I.R.

Catalog Numbers, Ratings

Size	Current Rating I_N(A)	Interrupting I_N(A)	Watts Loss 0.8 I_N	Watts Loss I_N	Catalog Number	Ref. No.
20 x 190	6	@ 1500V DC 60kA L/R = 40ms	4.8	7.8	CC 1591 CP gRC 20x190/6	D083102
	8		5.3	8.8	CC 1591 CP gRC 20x190/8	V083738
	10		6.5	10.5	CC 1591 CP gRC 20x190/10	G087245
	12		7.0	11.5	CC 1591 CP gRC 20x190/12	Y080429
	16		8.0	13	CC 1591 CP gRC 20x190/16	N088378
	20		9.5	15	CC 1591 CP gRC 20x190/20	Q087345
	25		12	19.5	CC 1591 CP gRC 20x190/25	Z080430
	32		16	26	CC 1591 CP gRC 20x190/32	G085911
	6		4.8	7.8	CC 1500 CP gRC 20x190/6	Z089469
	8		5.3	8.8	CC 1500 CP gRC 20x190/8	A089470
	10		6.5	10.5	CC 1500 CP gRC 20x190/10	B089471
	12		7.0	11.5	CC 1500 CP gRC 20x190/12	C089472
	16		8.0	13	CC 1500 CP gRC 20x190/16	D089473
	20		9.5	15	CC 1500 CP gRC 20x190/20	E089474
	25		12	19.5	CC 1500 CP gRC 20x190/25	F089475
	32		16	26	CC 1500 CP gRC 20x190/32	G089476

Dimensions



Indicator Trip Force: 4.5N (1lb) at 0mm - 2.5N (1/2lb) at 7mm (1/4") - when so equipped*

1500V DC Ferrule Fuses

Size 36x190

gRC-gRD from 40 to 100 A



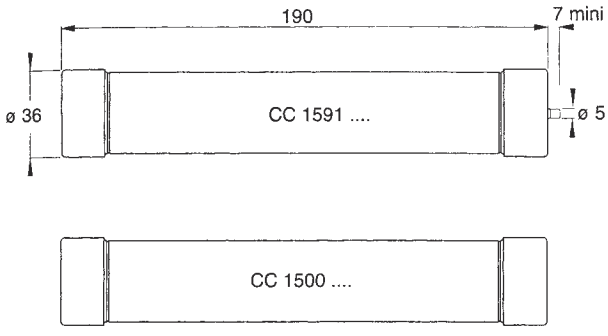
Features/Benefits:

- Full range D.C. operation
- 36x190mm ceramic cylindrical body
- CC 1591, with indicator
- CC 1500, without indicator

Catalog Numbers, Ratings

Size	Current Rating I_N(A)	Interrupting I_N(A)	Watts Loss 0.8 I_N	Watts Loss I_N	Catalog Number	Ref. No.
36 x 190	40	@ 1500 VDC 60kA L/R = 60 ms	14	26	CC 1591 CP gRC 36x190/40	M080419
	50		16.5	30	CC 1591 CP gRC 36x190/50	N080420
	63		20.6	38	CC 1591 CP gRC 36x190/63	P080421
	80		18	33	CC 1591 CP gRD 36x190/80	N221134
	100		23	42	CC 1591 CP gRD 36x190/100	Y220154
	40	@ 1500 VDC 60kA L/R = 30 ms	14	26	CC 1500 CP gRC 36x190/40	H089477
	50		16.5	30	CC 1500 CP gRC 36x190/50	J089478
	63		20.6	38	CC 1500 CP gRC 36x190/63	K089479
	80		18	33	CC 1500 CP gRD 36x190/80	Q078007
	100		23	42	CC 1500 CP gRD 36x190/100	K078025

Dimensions



Trip Force: 4.5N (1lb) at 0 mm-2.5N (1/2lb) at 7mm (1/4") when so equipped

Rating:

Volts : 1500VDC
Amps : 40 to 100A
IR : 60kA I.R. DC

Max AC Voltage (50/60 Hz) 3000V @ 50k A I.R.
CC1591 : L/R=60mSec
CC1500 : L/R=30mSec

4000V DC Ferrule Fuses

Size 36x400

gRC from 0.8 to 20 A



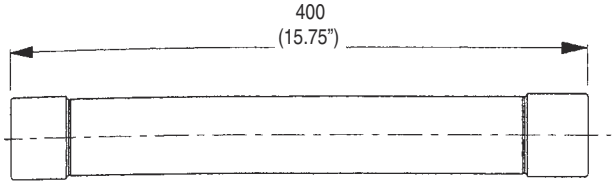
Features/Benefits:

- Full range D.C. operation
- 36x400mm ceramic cylindrical body

Catalog Numbers, Ratings

Size	Current Rating I_N(A)	Interrupting I_N(A)	Watts Loss 0.8 I_N	Watts Loss I_N	Catalog Number	Ref. No.
	.08		1.5	2.5	CC 4000 CP gRC 36x400/0.8	Z220293
	1		1.6	2.7	CC 4000 CP gRC 36x400/1	R221137
	1.5		2.4	14.1	CC 4000 CP gRC 36x400/1.5	S221138
	2		3.0	5.0	CC 4000 CP gRC 36x400/2	Z089423
	3.15		3.9	6.4	CC 4000 CP gRC 36x400/3.15	T221139
36	4	@ 4000 V DC	6.0	10	CC 4000 CP gRC 36x400/4	A089424
x	5	30kA	9.6	16	CC 4000 CP gRC 36x400/5	Y098461
400	6	L/R = 20 ms	11	19	CC 4000 CP gRC 36x400/6	E099847
	8		12	22	CC 4000 CP gRC 36x400/8	V221140
	10		13	23	CC 4000 CP gRC 36x400/10	G098469
	12		15	26	CC 4000 CP gRC 36x400/12	C098396
	16		15	27	CC 4000 CP gRC 36x400/16	Z083052
	20		18.6	33	CC 4000 CP gRC 36x400/20	F099848

Dimensions



Ratings:

Volts : 4000VDC
Amps : .8 to 20A
IR : 30kA I.R. DC
L/R : 20mSec

4000VAC @ 50kA I.R.

750V DC Square Body Fuses

Size: 120



Features/Benefits:

- Blown-fuse indicator
- Square ceramic body
- Full range D.C. operation
- Bladed and tapped versions standard

Catalog Numbers, Ratings

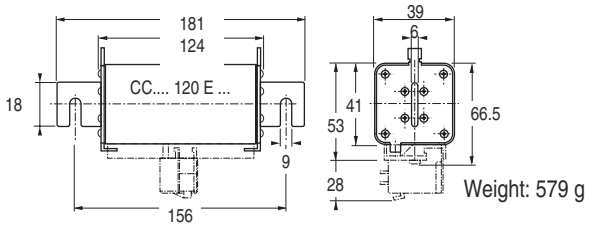
Size	Current Rating I_N(A)	Interrupting I_N(A)	Maximum I^2t @900V=L/R 40ms		Watts Loss		Catalog Number	Ref. No.
			Ip=101$_N$	Ip=501$_N$	0.8 I_N	I_N		
120	50	@ 750V= 100kA L/R = 100ms	4.4	8.1	4.4	8.1	CC 7,5 gRC 120 EF 0050	Y084776
	63		5.7	10.4	5.7	10.4	CC 7,5 gRC 120 EF 0063	R085207
	80		7.3	13.4	7.3	13.4	CC 7,5 gRC 120 EF 0080	Q085206
	100		9.1	16.7	9.1	16.7	CC 7,5 gRC 120 EF 0100	P085205
	125		11.5	21	11.5	21	CC 7,5 gRC 120 EF 0125	R086242
	160		15	27	15	27	CC 7,5 gRC 120 EF 0160	N085204
	50	@ 900 V= 100kA L/R = 40ms	4.4	8.1	4.4	8.1	CC 7,5 gRC 120 TTF 0050	B220824
	63		5.7	10.4	5.7	10.4	CC 7,5 gRC 120 TTF 0063	Q082400
	80		7.3	13.4	7.3	13.4	CC 7,5 gRC 120 TTF 0080	Z090435
	100		9.1	16.7	9.1	16.7	CC 7,5 gRC 120 TTF 0100	R082401
	125		11.5	21	11.5	21	CC 7,5 gRC 120 TTF 0125	P085251
	160		15	27	15	27	CC 7,5 gRC 120 TTF 0160	R085253

Microswitch: MC 3E 1-5N Ref. Number: D310020
Contact factory for holder

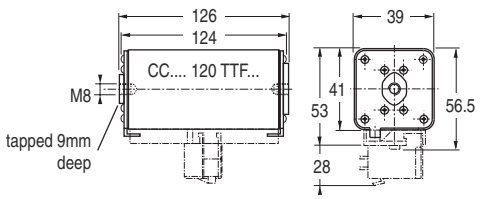
Ratings:

Volts : 750VDC
: 900VDC
Amps : 50 to 160A
IR : 100kA I.R. DC
L/R : 100mSec (750)
L/R : 40mSec (900)

Dimensions



Weight: 579 g



Weight: 574 g

750V DC Square Body Fuses

Size: 121

Features/Benefits:

- Blown-fuse indicator
- Square ceramic body
- Full range D.C. operation
- Bladed and tapped versions standard



Ratings:

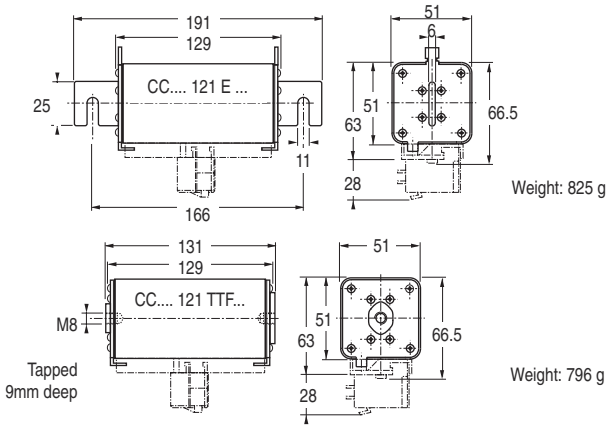
Volts : 750VDC
: 900VDC
Amps : 200 & 250A
IR : 100kA I.R.
L/R : 100mSec (750V)
L/R : 40mSec (900V)

Catalog Numbers, Ratings

Size	Current Rating I_N(A)	Interrupting I_N(A)	Maximum I^2t @900V=L/R 40ms		Watts Loss		Catalog Number	Ref. No.
			Ip=101$_N$	Ip=501$_N$	0.8 I_N	I_N		
121	200	@ 750V DC	755000	150000	20.5	37.5	CC 7,5 gRC 121 EF 0200	A086710
	250	100kA L/R = 100ms	1250000	250000	25.5	46.7	CC 7,5 gRC 121 EF 0250	M085203
	200	@900V DC	755000	150000	20.5	37.5	CC 7,5 gRC 121 TTF 0200	N085250
	250	100kAL/R = 40ms	1250000	250000	25.5	46.7	CC 7,5 gRC 121 TTF 0250	Q085252

Microswitch: MC 3E 1-5N Ref. Number: D310020
Contact factory for holder

Dimensions



750V DC Square Body Fuses

Size: 122



Features/Benefits:

- Blown-fuse indicator
- Square ceramic body
- Full range D.C. operation
- Bladed and tapped versions standard

Catalog Numbers, Ratings

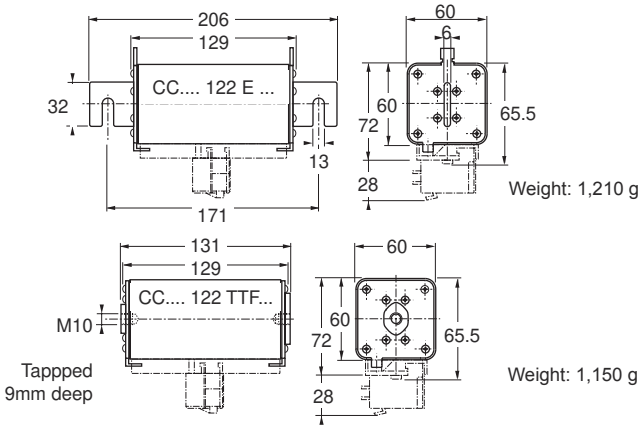
Size	Current Rating I_N(A)	Interrupting I_N(A)	Maximum I^2t @900V=L/R 40ms		Watts Loss		Catalog Number	Ref. No.
			Ip=101$_N$	Ip=501$_N$	0.8 I_N	I_N		
122	250	@ 750V= 100kA L/R = 100ms	$1.25x10^6$	250,000	25.5	46.7	CC 7,5 gRC 122 EF 0250	A087331
	315		$2x10^6$	400,000	31.5	58	CC 7,5 gRC 122 EF 0315	B087332
	350		$2.5x10^6$	500,000	35	64.5	CC 7,5 gRC 122 EF 0350	W221141
	400		$3.1x10^6$	600,000	40.5	74.5	CC 7,5 gRC 122 EF 0400	L089388
	450		$4x10^6$	800,000	49	90	CC 7,5 gRD 122 EF 0450	P220951
	500		$6.2x10^{6*}$	$1.25x10^{6*}$	52	95	CC 7,5 gRD 122 EF 0500	Q220952
	250		$1.25 x10^6$	250,000	25.5	46.7	CC 7,5 gRC 122 TTF 0250	B090437
	315		$2x10^6$	400,000	31.5	58	CC 7,5 gRC 122 TTF 0315	M085249
	350		$2.5x10^6$	500,000	35	64.5	CC 7,5 gRC 122 TTF 0350	G220898
	400		$3.1x10^6$	600,000	40.5	74.5	CC 7,5 gRC 122 TTF 0400	C090438
	450		$4x10^{6*}$	800,000	49	90	CC 7,5 gRD 122 TTF 0450	R220953
	500		$6.2x10^{6*}$	$1.25x10^{6*}$	52	95	CC 7,5 gRD 122 TTF 050	S220954

**MAX. I^2t @ 800V=, L/R=40ms*
Microswitch: MC 3E 1-5N Ref. Number: D310020
Contact factory for holder

Ratings:

Volts : 750VDC
: 900VDC
Amps : 250 to 500A
IR : 100kA I.R. DC
L/R : 100mSec (750V)
L/R : 40mSec (900V)

Dimensions



660-750V DC Square Body Fuses

Size: 123



Features/Benefits:

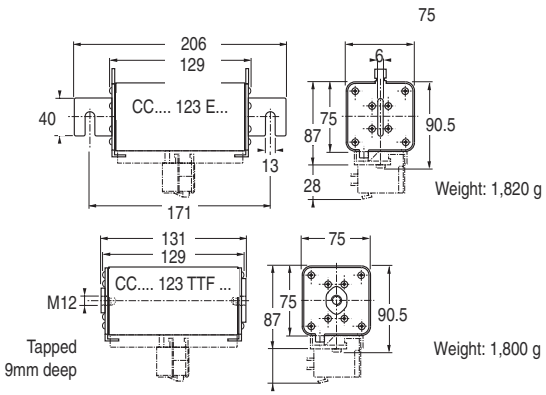
- Blown-fuse indicator
- Square ceramic body
- Full range D.C. operation
- Bladed and tapped versions standard

Catalog Numbers, Ratings

Size	Current Rating I_N(A)	Interrupting I_N(A)	Maximum I^2t @900V=L/R 40ms		Watts Loss		Catalog Number	Ref. No.
			Ip=101$_N$	Ip=501$_N$	0.8 I_N	I_N		
123	500	@750VDC 100kA L/R=100ms	5x10^6	1x10^6	51	93.5	CC 7,5 gRC 123 EF 0500	M089389
	500	@900VDC 100kA L/R = 40ms	5x10^6	1x10^6	51	93.5	CC 7,5 gRC 123 TTF 0500	D090439
			maximum I^2t (A^2s) @800V = L/R 40ms					
	630	@750VDC 100kA L/R=50ms	7.5x10^6	1.5x10^6	74		CC 7,5 gRB 123 EF 0630	B098556
	700		10x10^6	2x10^6	82		CC 7,5 gRB 123 EF 0700	Q078191
	750		10x10^6	2x10^6	82		CC 7,5 gRD 123 EF 0750	F220943
	630		7.5x10^6	1.5x10^6	74		CC 7,5 gRB 123 TTF 0630	C098557
	700		10x10^6	2x10^6	82		CC 7,5 gRB 123 TTF 0700	F090441
	750		10x10^6	2x10^6	82		CC 7,5 gRD 123 TTF 0750	H220945
			maximum I^2t (A^2s) @660V = L/R 30ms					
	800	@660VDC 100kA L/R=50ms	12.15x10^6	2.6x10^6	90		CC 6.6 gRB 123 EF 0800	G220944
	800		12.15x10^6	2.6x10^6	90		CC 6.6 gRB 123 TTF 0800	J220946

Contact factory for holder

Dimensions



Ratings:

CC 7.5gRC

Volts : 750VDC
: 900VDC
Amps : 500A
IR : 100kA I.R. DC
L/R : 100mSec (750V)
L/R : 40mSec (900V)

CC 7.5gRB, gRD

Volts : 750VDC
Amps : 630 to 750A
IR : 100kA I.R. DC
L/R : 50mSec

CC 6.6gRB

Volts : 660VDC
Amps : 800A
IR : 100kA I.R. DC
L/R : 50mSec

Rated Current (A)	Max. Operating Current (A)
630	550
700	600
750	600
800	650

750V DC Square Body/Special Purpose

Size 2x122

gRC - gRD from 500 to 900 A



Catalog Numbers, Ratings

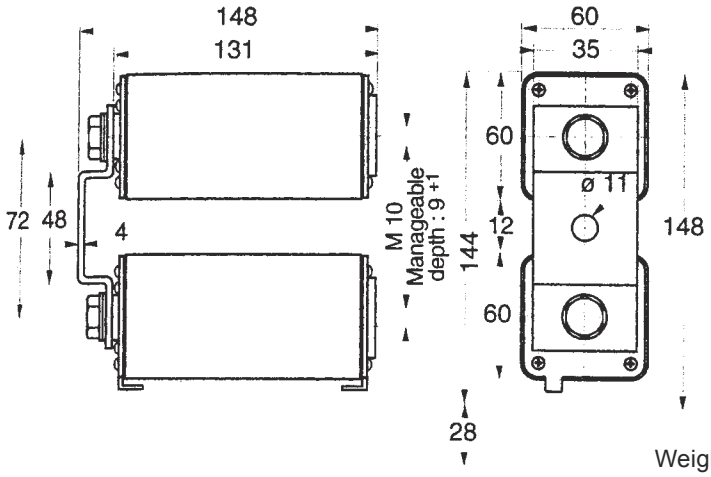
Size	Current Rating I_N(A)	Interrupting I_N(A)	Maximum I^2t @900V=L/R 40ms		Watts Loss		Catalog Number	Ref. No.
			Ip=101$_N$	Ip=501$_N$	0.8 I_N	I_N		
2 x 122	500	@ 900V DC 100kA L/R = 40ms	5x10^6	1x10^6	51	94	CC 7,5 gRC 2122 TTF 0500	Q090473
	630		8x10^6	1.6x10^6	63	116	CC 7,5 gRC 2122 TTF 0630	R090474
	800		12.4x10^6	2.4x10^6	81	149	CC 7,5 gRC 2122 TTF 0800	S090475
	900		16x10^6	3.2x10^6	98	180	CC 7,5 gRD 2122 TTF 0900	T220955
			maximum I^2t (A^2s) @800V = L/R 40ms					
			$I_{p=10\ I_N}$	$I_{p=50\ I_N}$				
	1000	@750VDC 100kA L/R=50ms	25x10^6	4.8x10^6	104		CC 7,5 gRD 2122 TTF 1000	V220956

Microswitch: MC 3E 1-5N Ref. Number: D310020

Ratings:

Volts : 900VDC
: 750VDC
Amps : 500 to 1000A
IR : 100kA I.R.
L/R : 40mSec (900V)
L/R : 100mSec (750V)

Dimensions



Weight: 2,825g

660-750V DC Square Body/Special Purpose

Size 2x123

gRC - gRB, gRD, gRC - gRD from 1000 to 1600A

Catalog Numbers, Ratings

Size	Current Rating I_N(A)	Interrupting I_N(A)	Maximum I^2t @900V=L/R 40ms Ip=101$_N$	Ip=501$_N$	Watts Loss 0.8 I_N	I_N	Catalog Number	Ref. No.
2 x 123	1000	@750VDC 100kA L/R=100ms @900VDC 100kA L/R = 40ms	20x10^6	4x10^6	102	87	CC 7,5 gRC 2123 TTF 1000	Z090481
			maximum I^2t (A^2s) @800V = L/R 40ms $I_{p=10\,I_N}$	$I_{p=50\,I_N}$				
	1250	@750VDC 100kA L/R=50ms	30x10^6	6x10^6	148		CC 7,5 gRB 2123 TTF 1250	D098558
	1400		40x10^6	8x10^6	164		CC 7,5 gRB 2123 TTF 1400	B090483
	1500		40x10^6	8x10^6	164		CC 7,5 gRB 2123 TTF 1500	K220947
			maximum I^2t (A^2s) @660V = L/R 30ms $I_{p=10\,I_N}$	$I_{p=50\,I_N}$				
	1600	@660VDC 100kA L/R=50ms	48.6x10^6	10x10^6	90		CC 6.6 gRB 2123 TTF 1600	L220948

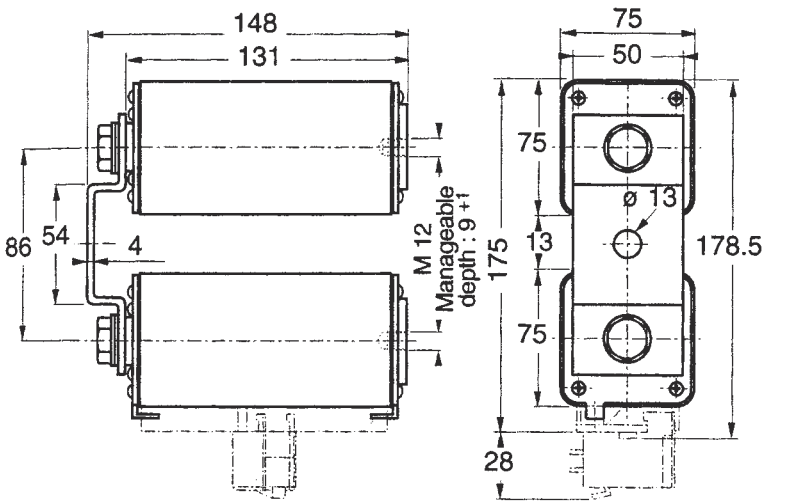
Microswitch: MC 3E 1-5N Ref. Number: D310020



Ratings:

Volts : 900VDC
: 750VDC
: 660VDC
Amps : 1000 to 1600A
IR : 100kA I.R.
L/R : 40mSec (900V, 1000A)
L/R : 50mSec (125 to 1500A)
L/R : 100mSec (750V, 1000A)

Dimensions



Weight: 3,600 g

Rated Current (A)	Max. Operating Current (A)
1250	1100
1400	1200
1500	1200
1600	1300

1200V DC Square Body

Size 72

SRG from 160 to 420 A

Catalog Numbers, Ratings

Size	Current Rating I_N(A)	Interrupting I_N(A)	Maximum I^2t @1000V=		Watts Loss		Catalog Number	Ref. No.
			L/R=15ms	L/R=45ms	0.8 I_N	I_N		
72	160	@ 900V DC 100kA L/R = 40ms	12000	20000	41	77.5	CC 12 SRG 72 QF 0160	K079428
	200		21000	36000	48	88	CC 12 SRG 72 QF 0200	L079429
	250		45500	78500	57	96	CC 12 SRG 72 QF 0250	M079430
	315		90000	154000	60	110	CC 12 SRG 72 QF 0315	N079431
	400		182000	314000	66	129	CC 12 SRG 72 QF 0400	P079432
	420		220000	380000	67	131	CC 12 SRG 72 QF 0420	Q079433

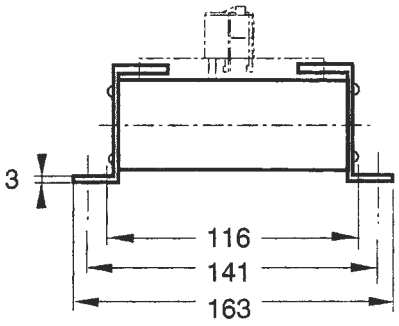
Microswitch: MC 3E 1-5N Ref. Number: D310020

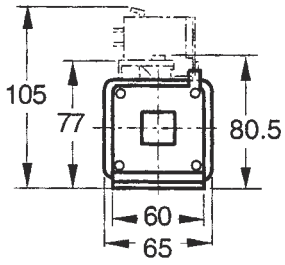


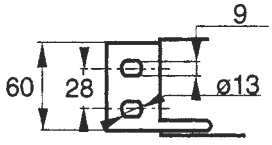
Ratings:

Volts : 1200VDC
Amps : 160 to 420A
IR : 100kA I.R.
L/R : 15mSec

Dimensions







weight : 1,151 g

2000V DC Square Body

Size 120

SRC from 20 to 215 A



Catalog Numbers, Ratings

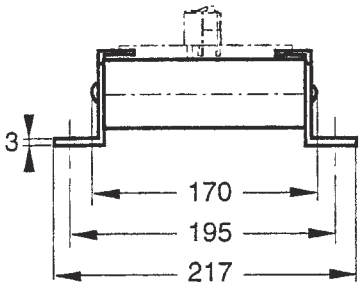
Size	Current Rating I_N(A)	Interrupting I_N(A)	Maximum I^2t @1000V=		Watts Loss		Catalog Number	Ref. No.
			L/R=15ms	L/R=45ms	0.8 I_N	I_N		
120	20	@ 2000VDC = 100kA L/R = 15ms	180	310	8	16	CC 20 SRC 120 QF 0020	J079450
	25		180	310	12.5	25	CC 20 SRC 120 QF 0025	K079451
	32		350	610	14.5	29.5	CC 20 SRC 120 QF 0032	L079452
	40		580	1000	17.5	36	CC 20 SRC 120 QF 0040	M079453
	50		1030	1800	20.5	42	CC 20 SRC 120 QF 0050	N079454
	63		1600	2800	26	53.5	CC 20 SRC 120 QF 0063	P079455
	80		3100	5400	30	61.5	CC 20 SRC 120 QF 0080	Q079456
	100		5800	10000	35	70.5	CC 20 SRC 120 QF 0100	R079457
	125		9200	16000	43	87.5	CC 20 SRC 120 QF 0125	S079458
	160		19200	33200	49	99	CC 20 SRC 120 QF 0160	T079459
	200		45000	78500	49.5	101	CC 20 SRC 120 QF 0200	V079460
	215		55000	95000	52	106	CC 20 SRC 120 QF 0215	W079461

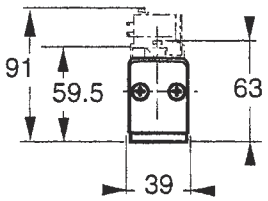
Microswitch: MCR 3E 1-5N BS Ref. Number: D310023

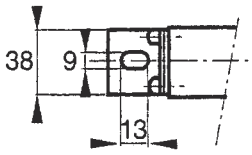
Ratings:

Volts : 2000VDC
Amps : 20 to 215A
IR : 100kA I.R.
L/R : 15mSec

Dimensions







Weight : 745 g

2000V DC Square Body

Size 122

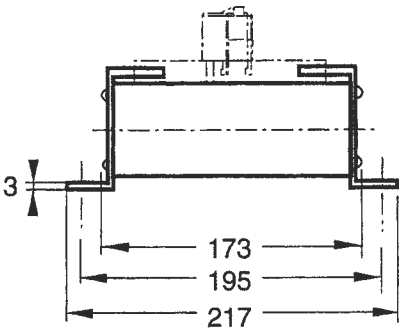
SRD from 160 to 400 A

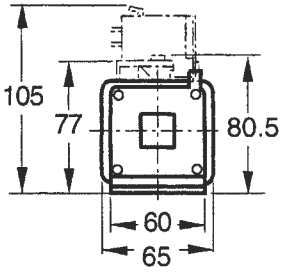
Catalog Numbers, Ratings

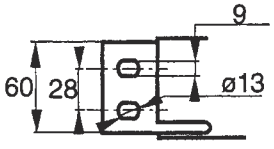
Size	Current Rating I_N(A)	Interrupting I_N(A)	Maximum I^2t @100V=		Watts Loss		Catalog Number	Ref. No.
			L/R=15ms	L/R=45ms	0.8 I_N	I_N		
122	160	@ 1800VDC	15000	25000	52.5	100	CC 20 SRD 122 QF 0160	D076639
	200	100kA	26000	44000	61.5	118	CC 20 SRD 122 QF 0200	X079462
	250	L/R = 30ms	50000	87000	69	131	CC 20 SRD 122 QF 0250	Y079463
	315	@ 2000VDC	117000	200000	74	150	CC 20 SRD 122 QF 0315	Z079464
	400	100kA L/R = 15ms	219000	380000	87	175	CC 20 SRD 122 QF 0400	A079465

Microswitch: MCR 3E 1-5N BS Ref. Number: D310023

Dimensions







Weight : 1,539 g



Ratings:

Volts : 1800VDC
: 2000VDC
Amps : 160 to 400A
IR : 100kA I.R.
L/R : 30mSec (1800V)
L/R : 15mSec (2000V)

3500-4000V DC Square Body

Size 600

gRB - grD from 6 to 125 A



Catalog Numbers, Ratings

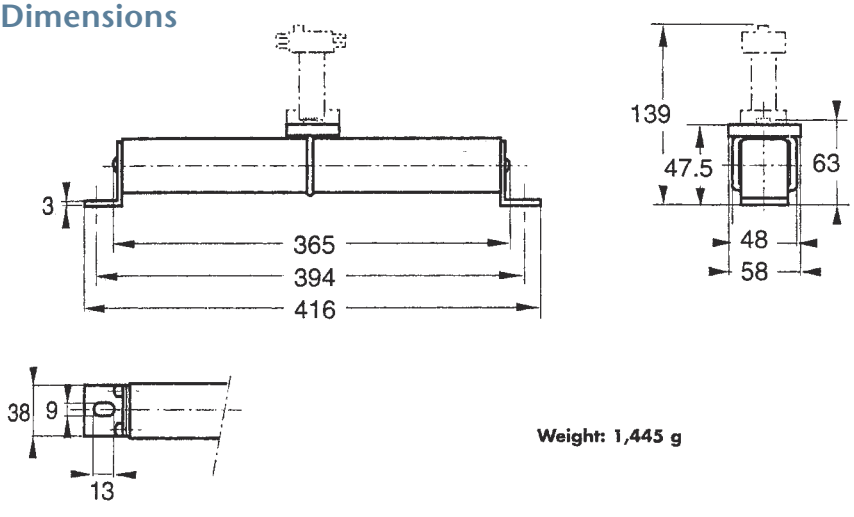
Size	Current Rating I_N(A)	Interrupting I_N(A)	Watts Loss 0.8 I_N	Watts Loss I_N	Catalog Number	Ref. No.
600	6	@ 3500 V DC 30kA L/R = 30 ms	5.3	9.5	CC 35 gRB 600 QF 0006	S083736
	8		7	12.7	CC 35 gRB 600 QF 0008	R083735
	10		10.2	18.5	CC 35 gRB 600 QF 0010	N089390
	12		11	20	CC 35 gRB 600 QF 0012	V082220
	16		13.1	24	CC 35 gRB 600 QF 0016	P089391
	20		14	25.4	CC 35 gRB 600 QF 0020	Q089392
	25		18	32.5	CC 35 gRB 600 QF 0025	R089393
	32	@ 4000 V DC 30kA L/R = 30 ms	25.5	46	CC 40 gRB 600 QF 0032	A086963
	40		35	63	CC 40 gRB 600 QF 0040	B086964
	50		29	52	CC 40 gRB 600 QF 0050	C086965
	63		42	76.5	CC 40 gRB 600 QF 0063	D086966
	80		51	92	CC 40 gRB 600 QF 0080	E086967
	80	@ 4000 V DC 30kA L/R = 30 ms	3.9	67	CC 40 gRD 600 QF 0080	B075763
	100		50.5	88	CC 40 gRD 600 QF 0100	C075764
	125		63	110	CC 40 gRD 600 QF 0125	D075765

Microswitch: 2R 3E 1-5N BS Ref. Number: J310025

Ratings:

Volts : 3500VDC
: 4000VDC
Amps : 6 to 125A
IR : 30kA I.R.
L/R : 30mSec

Dimensions



Weight: 1,445 g

HP6M 600V DC Photovoltaic Fuses

About the HP6M Fuse

Mersen's HP6M photovoltaic (PV) fuse series was engineered and designed specifically for the protection of photovoltaic systems. Its enhanced fuse construction makes it ideal for continuous temperature and current cycling withstand adding to system longevity. The 600VDC rated HP6M, designed for low minimum breaking capacity capabilities of 1.35 times the fuse rated current value, allows for safe circuit interruption under typical low fault current conditions produced by PV arrays. Protect your off-grid or grid tied PV system from unexpected ground faults and line faults using Mersen's Helio Protection fuse line.

Features/Benefits:

- Low fault current interrupting capability
- Durable construction for enhanced system longevity
- Temperature cycle withstand capability
- Guaranteed operation at temperature extremes
- Industries first UL Listed Solution
- Globally accepted

Applications:

- All photovoltaic applications
- PV string/array level protection
- Combiner box applications
- In-line PV module protection
- Inverters
- Battery charge controllers



Ratings:

Volts : 600VDC
Amps : 1 to 30A
IR : 10kA I.R. DC
MBC : 1.35 x In

Photovoltaic Fuse, gPV

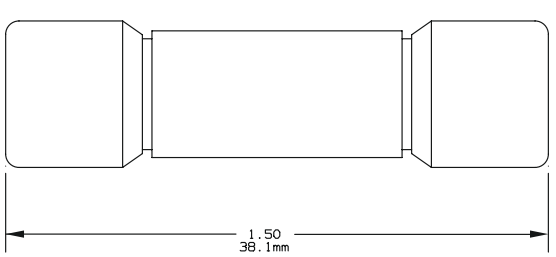
Catalog Numbers (amps)

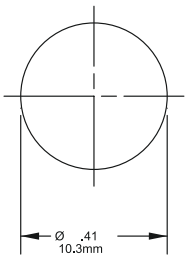
HP6M1	HP6M8
HP6M2	HP6M10
HP6M3	HP6M12
HP6M4	HP6M15
HP6M5	HP6M20
HP6M6	HP6M25
HP6M7	HP6M30

Catalog Numbers - Fuse Holder

UltraSafe™ Non-Indicating	UltraSafe™ Indicating
US101HEL	US101IHEL

Dimensions





Approvals:

- UL Listed to Standard UL2579 File E333668
- CSA Component Certified C22.2
- IEC 60269-6 Approved

HelioProtection

UL LISTED

CE RoHS 2002/95/EC

MERSEN

HP10M 1000V DC Photovoltaic Fuses

Engineered to protect photovoltaic applications

Mersen's HP10M photovoltaic (PV) fuse series was engineered and designed specifically for the protection of photovoltaic systems. Its enhanced fuse construction makes it ideal for continuous temperature and current cycling withstand adding to system longevity. The 1000VDC rated HP10M, designed for low minimum breaking capacity capabilities of 1.35 times the fuse rated current value, allows for safe circuit interruption under typical low fault current conditions produced by PV arrays. Protect your off-grid or grid tied PV system from unexpected ground faults and line faults using Mersen's Helio Protection fuse line.



Features/Benefits:

- Low fault current interrupting capability
- Durable construction for enhanced system longevity
- Temperature cycle withstand capability
- Guaranteed operation at temperature extremes
- Industries first UL Listed Solution
- Globally accepted

Applications:

- All photovoltaic applications
- PV string/array level protection
- Combiner box applications
- In-line PV module protection
- Inverters
- Battery charge controllers

Ratings:

Volts : 1000VDC
Amps : 1 to 20A
IR : 10kA I.R. DC
MBC : 1.35 x In

Photovoltaic Fuse, gPV

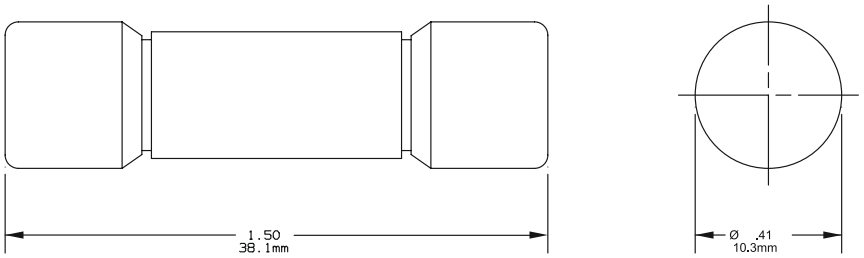
Catalog Numbers (amps)

HP10M1	HP10M7
HP10M2	HP10M8
HP10M3	HP10M10
HP10M4	HP10M12
HP10M5	HP10M15
HP10M6	HP10M20

Catalog Numbers - Fuse Holder

UltraSafe™ Non-Indicating	UltraSafe™ Indicating
US101HEL	US101IHEL

Dimensions



Approvals:

- UL Listed to Standard UL2579 File E333668
- CSA Component Certified C22.2
- IEC 60269-6 Approved

HP6J 600V DC Photovoltaic Fuses

About the HP6J Fuse

Mersen's HP6J photovoltaic (PV) fuse series was engineered and designed specifically for the protection of photovoltaic systems. Its enhanced fuse construction makes it ideal for continuous temperature and current cycling withstand adding to system longevity. The 600VDC rated HP6J designed for low minimum breaking capacity capabilities of 1.35 times the fuse rated current value allows for safe circuit interruption under typical low fault current conditions produced by PV arrays. Protect your off-grid or grid tied PV system from unexpected ground faults and line faults using Mersen's Helio Protection fuse line.

Features/Benefits:

- Smallest footprint in the industry
- Low fault current interrupting capability
- Durable construction for enhanced system longevity
- Temperature cycle withstand capability
- Guaranteed operation at temperature extremes
- Industries first UL Listed Solution
- Globally accepted

Applications:

- Re-combiner (sub-combiner, array combiner, master combiner) applications
- Inverter DC input protection
- Battery charge controllers



Ratings:

Volts : 600VDC
Amps : 70 to 400A
IR : 10kA I.R. DC
MBC : 1.35 x In

Photovoltaic Fuse, gPV

Catalog Numbers (amps)

HP6J70	HP6J175
HP6J80	HP6J200
HP6J90	HP6J225
HP6J100	HP6J250
HP6J110	HP6J300
HP6J125	HP6J350
HP6J150	HP6J400

Catalog Numbers - Fuse Holder

Ampere Rating	Wire Terminal		Clip Configuration	Catalog Number
	Input	Output		
100	Stud	Stud	In-line Clip	61016J
200	Stud	Stud	Side Clip	62011J
400	Stud	Stud	In-line Clip	64011J

These fuse holders are suitable for use on circuits capable of delivering a maximum fault current of 10kA. The wire connectors for these fuse holders will be supplied in the end-use.

Approvals:

- UL Listed to Standard UL2579 File E333668
- CSA Component Certified C22.2

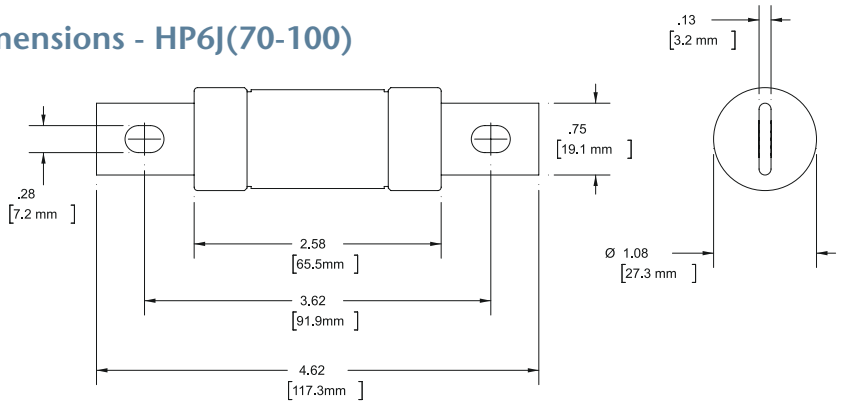
HelioProtection

UL LISTED

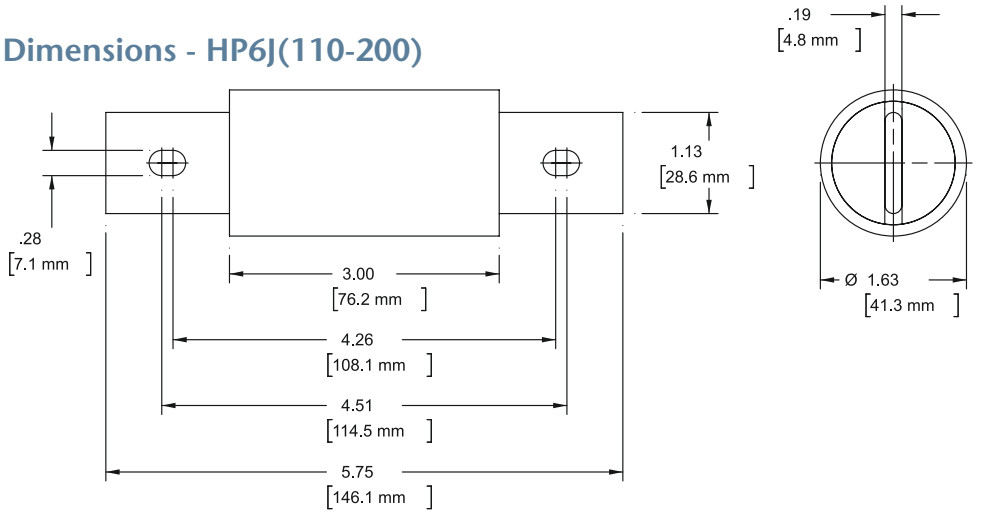
CE RoHS 2002/95/EC

HP6J 600V DC Photovoltaic Fuses

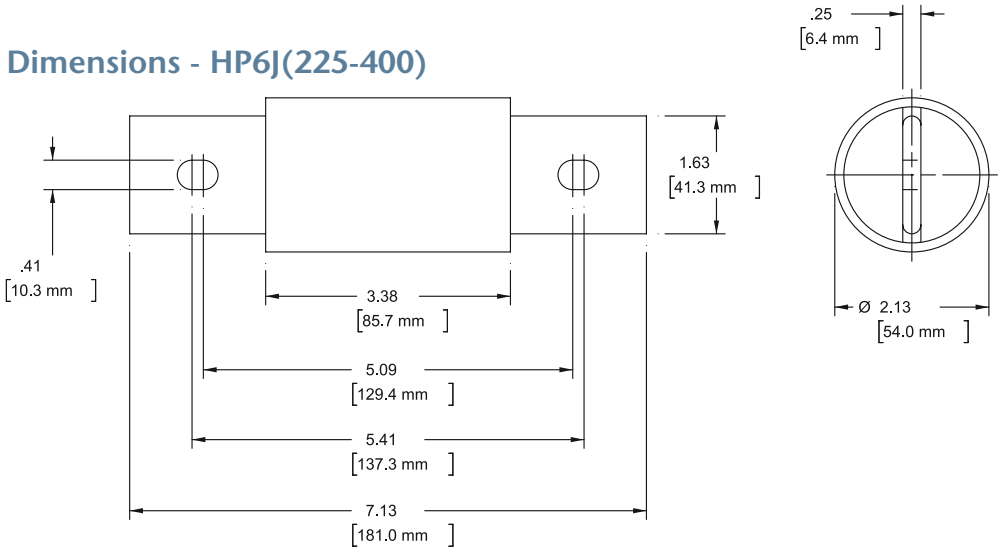
Dimensions - HP6J(70-100)



Dimensions - HP6J(110-200)



Dimensions - HP6J(225-400)



Fuse Blocks & Holders

"Finger-safe" IEC, Traditional, Panel Mount... You name the block, we've got it in stock.



Your problem: You need a range of standard fuse blocks to meet industrial requirements. You need DIN-rail mounting fuse holders that save space and conform with today's "Finger-safe" IEC standards. You need panel-mount fuse holders, blocks that safely handle stress on conductors, accessories to make pulling fuses safer.

Our solution: Mersen's extensive line of fuses is matched by our line of fuseblocks. Need a durable Class H, K, or R block? We've got configurations that accept nearly all 250 and 600V power fuses. How about Class CC or Class J IEC-style holders? Turn to our popular UltraSafe™ models for the small footprints, blown-fuse indicators, and finger-safe changeouts you want. The same goes for traditional Class J blocks, space-saving "SJ" blocks, 600V Class CC and midget dimension holders, and a dozen other fuse holder solutions.

Want more information fast? For more technical or application-specific information, please call our Fuse Block experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

H Fuse Blocks & Holders

- UltraSafe™ USCC & USM H2
- UltraSafe™ USFM H4
- UltraSafe™ US3J & US6J..... H6
- UltraSafe™ US14 & US22 ..... H8
- Open Style Class J & SJ Series..... H12
- Open Style Midget & Class CC H16
- Open Style Class H, K & R H18
- Open Style Class T H25
- Open Style Class G..... H30
- Open Style Miniature..... H32
- In-Line Fuse Holders / FEB, FEC, FEX, FEY Series - Midget/Class CC..... H33
- Panel Mount Fuse Holders / GPM Series..... H37
- Semiconductor Fuse Blocks / P243/P266/P292 ..... H44
- Modular Semiconductor Fuse Blocks / 1SC/1MSC..... H45
- Semiconductor Fuse Holders / 703, U705, U710 Series..... H46
- Ferrule Fuse Holders / PS20x127.. H48
- Fuse Bases / NH Dimension H50
- Dead Front Fuse Covers / DFC Series..... H55
- Fuse Block Accessories / DFC3M, DFC3LP & DRM H57
- Ferrule Fuse Clips / PC Board Mount Fuse Clips H58

FERRAZ SHAWMUT IS NOW MERSEN

MERSEN

USCC & USM UltraSafe™ Fuseholders

UltraSafe modular fuse holders for midget and class CC fuses

Mersen UltraSafe Modular Fuse Holders introduce a new level of safety for Class CC (USCC) and Midget 1-1/2" x 13/32" (USM) AC and DC-rated fuses up to 30 amperes. UltraSafe holders qualify as "Finger-safe" under IEC and DIN standards to an IP20 grade of protection, including fuse changing (with the flick of a finger). UltraSafe holders are available in 1, 2, 3 or 4 poles, with or without visual blown-fuse indicators in each pole. Multi-pole units can also be field assembled by ordering pin-tie handles.

UltraSafe holders save up to 15% mounting space and any combination can be snapped onto 35mm DIN-rail for extra savings in panel building time. UltraSafe holders with Class CC fuses chosen for Type "2" No Damage protection give one of the safest protection packages in the industry. UltraSafe body material is tough and durable polyamide, with exceptional insulating properties.



Highlights:

- IP20 Finger-Safe (touch safe)
- Optional visual blown fuse Indicator lights
- DIN-rail mounting
- Compact footprint
- Quick, tool-free, easy fuse change outs

Applications:

- All circuits up to 600 volts for motors, control circuits, transformers, etc…
- DC circuits up to 1000VDC including photovoltaic applications
- Non-load disconnect

Recommended Fuse Usage:

- USM use with:
  ATQ, ATM*, A6Y-2B, A25Z-2, TRM, OTM, A13X-2, A60Q-2, DCT*, HP6M, HP10M
- USCC use with:
  ATDR, ATMR*, ATQR

* Recommended for DC applications

Ratings:

USM (Midget 10x38mm Fuses)

Volts : 800VAC Maximum
: 1000VAC Maximum
Amps : 30A Maximum
SCCR : 100kA

USCC (Class CC Fuses)

Volts : 600VAC / DC Maximum
Amps : 30A Maximum
SCCR : 200kA

Min. voltage to operate indicator light: 90VAC, 115VDC [Less than 0.7 mA leakage current at 600V]

Approvals:

USM (Midget 10x38mm Fuses)

- UL Recognized Component, guide IZLT2, File E52283
- CSA Certified C22.2, class 6225 File 32169 (750VAC, 30A)
- IEC Compliant (690VAC, 32A)

USCC (Class CC Fuses)

- UL Listed, guide IZLT, File E52283
- CSA Certified C22.2, class 6225 File 32169 (600VAC, 30A)

USCC & USM UltraSafe™ Fuseholders

Catalog Numbers and Descriptions:

Catalog No. W/O Indicator	Catalog No. w/ Indicator	Description	Fuse Type	Voltage Rating AC	Voltage Rating DC	Ampere Rating	No. of Poles	Certifications
USCC1	USCC1I	1-Pole Class CC UltraSafe Fuse Holder	Class CC	600V	600V	30A	1	UL Listed CSA Certified
USCC2	USCC2I	2-Pole Class CC UltraSafe Fuse Holder					2	
USCC3	USCC3I	3-Pole Class CC UltraSafe Fuse Holder					3	
USCC4	USCC4I	4-Pole Class CC UltraSafe Fuse Holder					4	
USCC3N	USCC3IN	3-Pole + N Class CC UltraSafe Fuse Holder					4	
Special Indicator Versions	USCC1I-AC120	USCC1I with 120VAC indicator		120	-		1	
	USCC1I-AC300	USCC1I with 300VAC indicator		300	-		1	
	USCC1I-DC24	USCC1I with 24VDC indicator		-	24		1	
USM1	USM1I	1-Pole Midget UltraSafe Fuse Holder	Midget (10 x 38mm) (1-1/2" x 13/32")	800V*	1000V*	30A	1	UL Recognized CSA Certified IEC Certified
USM2	USM2I	2-Pole Midget UltraSafe Fuse Holder					2	
USM3	USM3I	3-Pole Midget UltraSafe Fuse Holder					3	
USM4	USM4I	4-Pole Midget UltraSafe Fuse Holder					4	
USM3N	USM3IN	3-Pole + N Midget UltraSafe Fuse Holder					4	
Special Indicator Versions	USM1I-AC120	USM1I with 120VAC indicator		120	-		1	
	USM1I-DC24	USM1I with 24VDC indicator		-	24		1	
	USM1I-DC1000	USM1I with 1000VDC indicator		-	1000		1	

* Catalog Numbers with Indicators are rated 600VAC / 600VDC unless otherwise noted.

Accessories Catalog No.	Description
USN	1-Pole with Intergral Neutral Link
USPTH	Pin-tie Accessory for 12-Poles
US12PJMP	12-pole Jumper Bar
TBB1A	1-Phase Input Power Terminal
TBB1C	1-Phase Input Power Terminal Right Angle



USPTH Pin-Tie Accessory



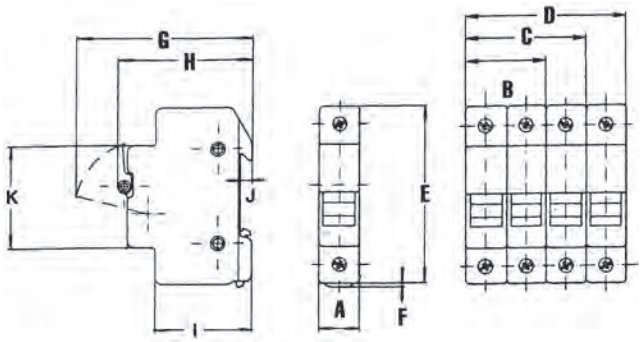
USM1 with USPTH Pin-Ties

Additional Specifications:

Terminal screws: Phillips/slot head
Suggested screw torque: 14.75 in-lbs.
Connector type: Pressure plate
Wire range: #6 to #14 (solid/stranded Cu)
Load-break disconnect: No

Dimensions

Dimension	mm	In	Dimension	mm	In
A	17.5	0.69	G	78.0	3.07
B	35.0	1.38	H	59.0	2.32
C	52.5	2.07	I	42.5	1.67
D	70.0	2.76	J	5.0	0.20
E	78.0	3.07	K	45.0	1.77
F	2.5	0.10			



For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

USFM UltraSafe™ Fuse Modules

UltraSafe 3-pole fuse modules for midget and class CC fuses

Mersen UltraSafe™ Fuse Modules have a unique, compact design suited for use with 45mm wide IEC contactors. These modules also offer other features not found on other Class CC and midget UltraSafe fuse holders such as an auxiliary contact option. When the auxiliary is wired to an adjacent contactor the load is dropped out by the contactor immediately once someone tries to open the fuse extractor handle. Additionally, the fuse module features padlock capabilities, compact busbars for line side terminations, and tool free removal from DIN-rail. Yet the fuse modules still incorporate well known UltraSafe features such as IP20 protection, easy operating fuse extraction handles and an open fuse visual indication option.



Highlights:

- Dedicated 3-pole fuse module
- Finger-safe
- Compact footprint with 45mm width
- Auxiliary contact option (1NO/1NC)
- Ability to padlock in OPEN position with 1/4” shank diameter
- DIN-rail mount with tool free removal
- Quick, easy fuse change
- Optional indicator lights

Applications:

- Primarily for motor circuits to replace circuit breakers for higher SCCR ratings
- Other circuits up to 600 volts for control circuits, transformers, etc.
- Non-load disconnect
- Padlock compliance

Recommended Fuse Usage:

- USM use with:
  ATQ, ATM*, A6Y-2B, A25Z-2, TRM, OTM, A13X-2, A60Q-2, DCT*
- USCC use with:
  ATDR, ATMR*, ATQR

* Recommended for DC applications

Ratings:

USFMCC (Class CC Fuses)

Volts : 600VAC / DC :
Amps : 30A Maximum
SCCR : 200kA

USFM10 (Midget 10x38mm Fuses)

Volts : 600VAC / DC
Amps : 30A Maximum
SCCR : 100kA

Min. voltage to operate indicator light: 90VAC, 115VDC [Less than 0.7 mA leakage current at 600V]

Approvals:

USFMCC (Class CC Fuses)

- UL Listed, guide IZLT, File E52283
- CSA Certified C22.2, class 6225 01, File 32169

USFM10 (Midget 10x38mm Fuses)

- UL Recognized Component, guide IZLT2, File E52283
- CSA Certified C22.2, Class 6225 01, File 32169
- IEC Certified 60269-1, 60947-3 (690VAC, 32A, 120kA)

USFM UltraSafe™ Fuse Modules

Catalog Numbers and Descriptions:

For use with Class CC Fuses

Catalog No.	Description
USFMCC	3 pole fuse module
USFMCCI	3 pole fuse module with indicators
USFMCCM	3 pole fuse module with microswitch style auxiliary contact
USFMCCMI	3 pole fuse module with microswitch style auxiliary contact and indicators



USFMAC11

For use with Midget and 10x38mm UL and IEC Fuses

Catalog No.	Description
USFM10	3 pole fuse module
USFM10I	3 pole fuse module with indicators
USFM10M	3 pole fuse module with microswitch style auxiliary contact
USFM10MI	3 pole fuse module with microswitch style auxiliary contact and indicators



USFMBB2

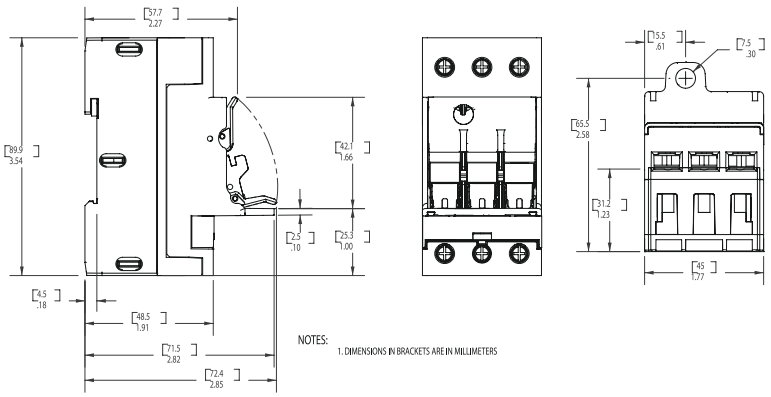
Accessories

Catalog No.	Description
USFMAC11	1NO (late make)/NC (early break) auxiliary contact
USFMBB2	Busbar to connect 2 modules together
USFMBB3	Busbar to connect 3 modules together
USFMBB4	Busbar to connect 4 modules together
USFMBB5	Busbar to connect 5 modules together
USFMBBC1	Busbar connector terminal



USFMBBC1

Dimensions



Additional specifications:

Terminal screws: Pozidriv#2
Suggested screw torque: 13 Lbs-in (1.5 N-m)
Connector type: Pressure plate
Wire range: #10 to #16 AWG (1-4 mm2)
75ºC solid/stranded Cu only

Load-break disconnect: No (when auxiliary contact is installed in fuse module and properly wired to adjacent IEC contactor the load will be dropped out prior to disconnection between fuse and clip inside holder upon operation of the fuse extractor handle).

US3J & US6J UltraSafe™ Class J Fuse Holders

UltraSafe™ modular fuse holders for class J fuses

Mersen UltraSafe Modular 600 Volt Fuse Holders for Class J fuses introduce a new level of safety and ease for installing or replacing Class J fuses. UltraSafe holders qualify as “finger-safe” to an IP20 grade of protection under IEC standards. The US3J accommodates 30A Class J or 22 x 58 mm French Ferrule* fuses. The US6J is for 60A Class J fuses. UltraSafe holders are available in compact 1, 2, or 3 pole units, with or without blown-fuse indicators in each pole. Multi-pole units can also be made up in the field by using the multiple-pole Assembly Kits. All units have provisions for locking in the open position for safety during fuse changeouts or equipment servicing. US3J and US6J holders can be snap-mounted to 35 mm DIN-rail and they have a unique latch which will stay open to allow re-positioning of the holder in the future. UltraSafe body material is tough and durable polyamide.

**Holder not UL listed when installed with French Ferrule fuses.*



Ratings:

Volts : 600VAC/DC
Amps : US3J - 30A Maximum
: US6J - 60A Maximum
SCCR : 200kA

Min. voltage to operate indicator light: 90VAC, 115VDC [Less than 0.7 mA leakage current at 600V]

Highlights

- Finger-safe IP20 protection
- Optional indicator lights
- DIN-rail mount
- Compact footprint
- Quick, easy fuse change

Applications:

- 600 volt motors, transformers, lighting, heating, control circuits, general loads
- Non-load disconnect

Recommended Fuse Usage:

US3J, US6J use with AJT, A4J, HSJ

Approvals:

- UL Listed, guide IZLT File E52283
- CSA Certified C22.2, class 6225 01, File 32169
- IEC certified 60269-1, 60947-3

US3J & US6J UltraSafe™ Class J Fuse Holders

Catalog Numbers

Catalog No. W/O Indicator	Catalog No. W/ Indicator	Description	Fuse Type	Voltage Rating		Ampere Rating	No. of Poles	Certifications
				AC	DC			
US3J1	US3J1I	1-Pole 30A Class J UltraSafe Fuse Holder	Class J	600V	600V	30A	1	UL Listed CSA Approved IEC Certified
US3J2	US3J2I	2-Pole 30A Class J UltraSafe Fuse Holder					2	
US3J3	US3J3I	3-Pole 30A Class J UltraSafe Fuse Holder					3	
US6J1	US6J1I	1-Pole 60A Class J UltraSafe Fuse Holder				60A	1	
US6J2	US6J2I	2-Pole 60A Class J UltraSafe Fuse Holder					2	
US6J3	US6J3I	3-Pole 60A Class J UltraSafe Fuse Holder					3	

Catalog Numbers – Accessories

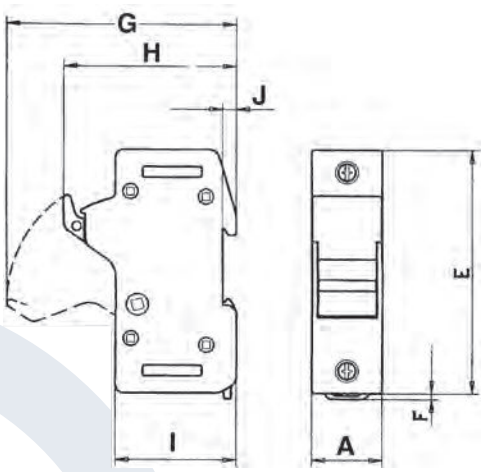
Accessories Catalog No.	Description
US3JN	1-Pole Neutral 30A Class J UltraSafe Fuse Holder
US3JPAK	Pin Tie Assembly Kit, 6-Poles, for use with US3J
US6JN	1-Pole Neutral 60A Class J UltraSafe Fuse Holder
US6JPAK	Pin Tie Assembly Kit, 6-Poles, for use with US6J

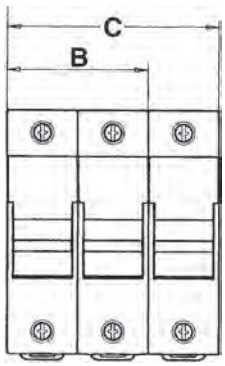
Additional specifications:

Terminal screws: Phillips/slot head
Suggested screw torque: 30A - 35 in-lbs. 60A - 45 in-lbs.
Connector type: Pressure plate
Wire range: #2 to #14 (solid/stranded Cu)
Load-break disconnect: No

Dimensions

Dimension	US3J		US6J	
	mm	In	mm	In
A	32.5	1.28	40	1.57
B	65	2.56	80	3.15
C	97.5	3.84	120	4.72
E	114	4.49	122	4.80
F	3	0.12	3	0.12
G	106	4.17	115	4.53
H	80	3.15	89	3.50
I	56	2.20	62	2.44
J	6.5	0.26	6.5	0.26





US14 & US22

750 Volt UltraSafe™ Fuse Holders

UltraSafe modular fuse holders for 14 x 51 and 22 x 58mm fuses

Mersen UltraSafe™ modular 750 volt Fuse Holders offer the highest levels of safety and features for 14 x 51 mm and 22 x 58 mm fuses. Like all UltraSafe holders, they qualify as “finger-safe” to an IP20 grade of protection under IEC standards, including fuse changing (with the flick of a finger). The US14 and US22 ranges are available in 1, 2 or 3 pole units, with or without blown-fuse indicator lights in each pole.

These holders come standard with a mechanical indicator that shows fuse presence. If a striker fuse is used, this mechanical indicator will also indicate a blown fuse. Microswitches can be supplied with the holders (or ordered separately for field installation) to allow remote communication. These holders also feature padlocking capabilities, DIN-rail mounting with our unique latching system to allow re-positioning, and the capability to be joined as multiple poles in the field.



Ratings:

Volts : 750VAC/DC
Amps : 50A (14 x 51 mm)
: 125A (22 x 58 mm)
SCCR : 200kA

Highlights:

- Finger-safe
- Optional indicator lights
- Optional microswitches
- DIN-rail mount
- Compact footprint
- Quick, easy fuse change

Applications:

- All circuits up to 750 volts using semiconductor fuses for protection of small inverters, UPS systems, motor drives, etc.
- No-load disconnect
- IP20 requirements

Recommended Fuse Usage:

- US14 use with 14 x 51mm: A70QS, A70P, URC, URD
- US22 use with 22 x 58 mm: A70QS, URD

Approvals:

- All UltraSafe fuse holders meet the requirements of UL4248
- UL Recognized Component guide IZLT2, File E52283
- CSA Certified C22.2, class 6225, File 32169
- IEC Compliant (60269-1, 60947-3)

US14 & US22

750 Volt UltraSafe™ Fuse Holders

Catalog Numbers and Descriptions - For use with 14 x 51 mm Fuses up to 50A

Catalog No.	Description
US141	1 Pole
US142	2 Pole
US143	3 Pole
US141I	1 Pole with Indicator
US142I	2 Pole with Indicators
US143I	3 Pole with Indicators
US141M	1 Pole with Microswitch
US142M	2 Pole with Microswitch
US143M	3 Pole with Microswitch
US143M2	3 Pole with 2 Microswitches
US141MI	1 Pole with Microswitch & Indicator
US142MI	2 Pole with Microswitch & Indicators
US143MI	3 Pole with Microswitch & Indicators
US143M2I	3 Pole with 2 Microswitches & Indicators
US141N	1 Pole - Neutral
US14PAK	Accessory - Multi-pole Assembly Kit
US14S1P	Accessory - 1 Pole Microswitch
US14S3P	Accessory - 3 Pole Microswitch
US14S3P2	Accessory - 3 Pole, 2 Microswitches

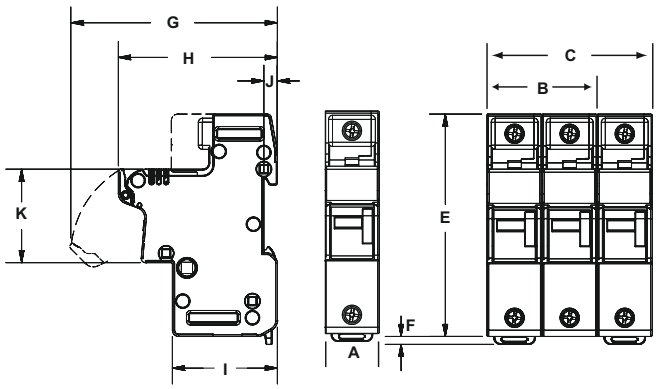
Catalog Numbers and Descriptions - For use with 22 x 58 mm Fuses up to 125A

Catalog No.	Description
US221	1 Pole
US222	2 Pole
US223	3 Pole
US221I	1 Pole with Indicator
US222I	2 Pole with Indicators
US223I	3 Pole with Indicators
US221M	1 Pole with Microswitch
US222M	2 Pole with Microswitch
US223M	3 Pole with Microswitch
US223M2	3 Pole with 2 Microswitches
US221MI	1 Pole with Microswitch & Indicator
US222MI	2 Pole with Microswitch & Indicators
US223MI	3 Pole with Microswitch & Indicators
US223M2I	3 Pole with 2 Microswitches & Indicators
US22N	1 Pole - Neutral
US22PAK	Accessory - Multi-pole Assembly Kit
US22S1P	Accessory - 1 Pole Microswitch
US22S3P	Accessory - 3 Pole Microswitch
US22S3P2	Accessory - 3 Pole, 2 Microswitches

H

Dimensions

Dimension	US14		US22	
	mm	In	mm	In
A	26.5	1.04	35.0	1.38
B	53.0	2.09	70.0	2.76
C	79.5	3.13	105.0	4.13
E	107.0	4.21	124.0	4.88
F	3.80	0.15	3.80	0.15
G	94.0	3.70	103.0	4.06
H	76.5	3.01	76.5	3.01
I	50.5	1.98	50.5	1.98
J	6.50	0.26	6.5	0.26
K	45.0	1.77	45.0	1.77



Additional Specifications:

Terminal screws: Phillips/slot head

Suggested screw torque: 50A - 35 lbs.-in. 125A - 45 lbs.-in.

Connector type: Pressure Plate

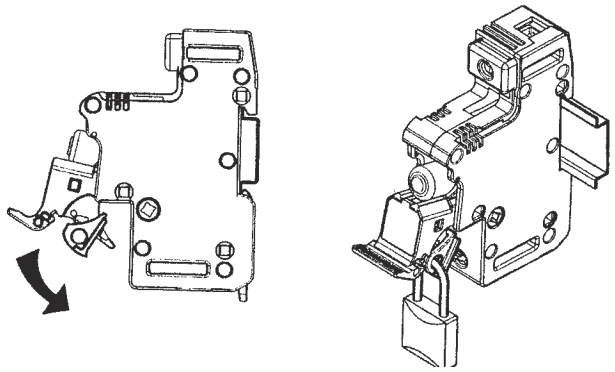
Wire range: US14 #2 to #14 (solid/stranded Cu), US22 1/0 to #14 (solid/stranded Cu)

Load-break disconnect: No

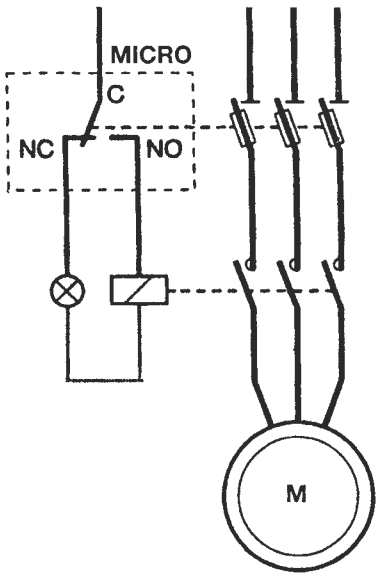
US14 & US22

750 Volt UltraSafe™ Fuse Holders

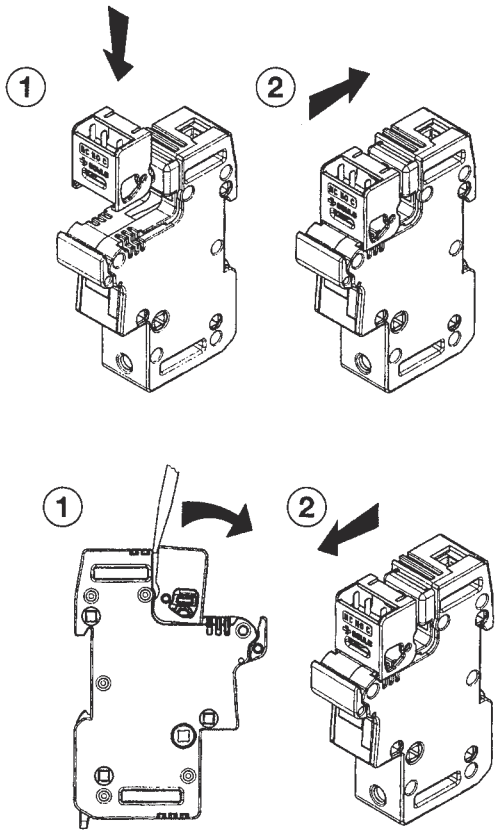
Lock installation



Microswitch mounting instructions(*)



Assembly



Auxilliary microswitch characteristics

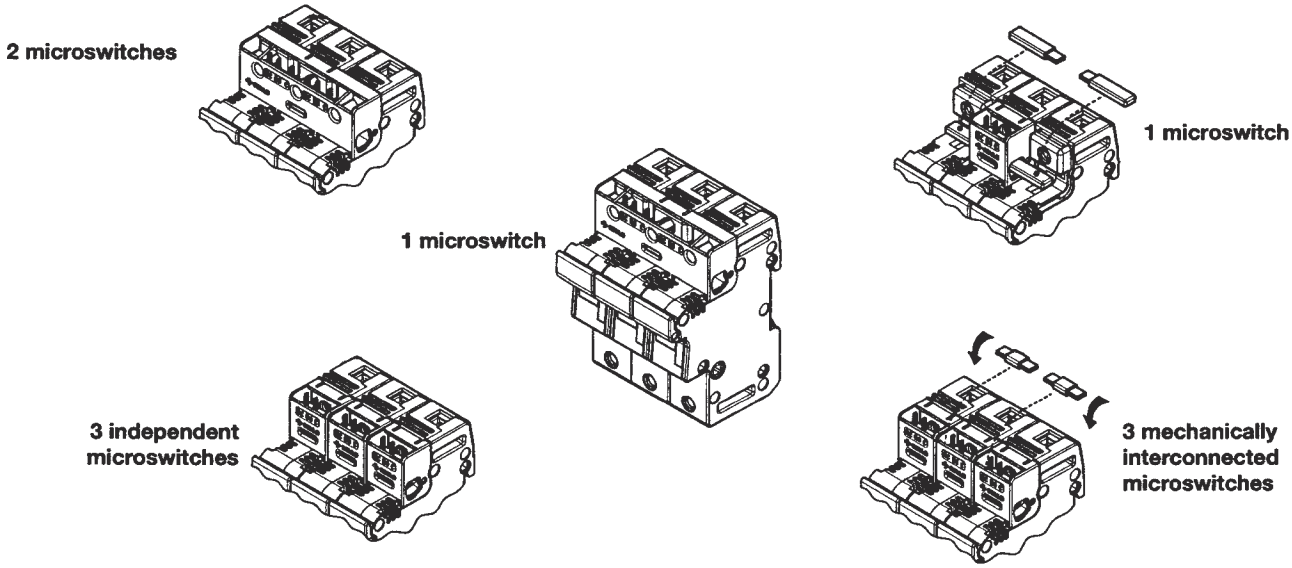
(*) Microswitch functions

Blown fuse:	Fuse holder containing fuse with striker sends message when fuse blown	Nominal current and interrupting rating(1) at 250V	6A 3A 0,3A 0,1A	AC12 AC13 AC14 DC12/13/14
Prebreaking:	When fuse holder opens	Nominal current and interrupting rating(1) at 12 V and 24 V	6A 5A 2A 0,6A	DC12/DC13 AC13 AC14/DC13 DC14
Presence:	Sends message or not depending on fuse presence	(1) According IEC947-5 Standard		

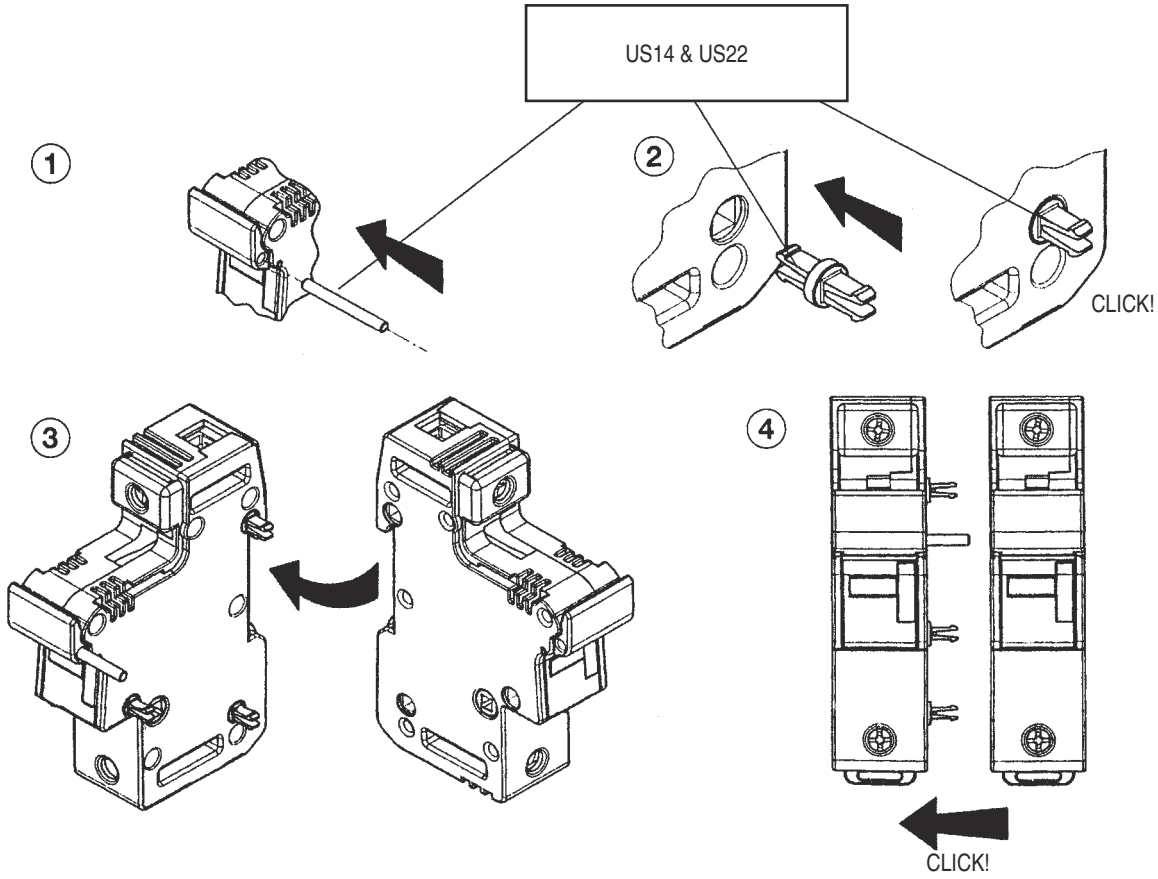
US14 & US22

750 Volt UltraSafe™ Fuse Holders

Microswitch options



Fuse holder assembly



CLASS J 600 Volt Fuse Blocks

Mersen Class J fuse blocks accommodate all Class J fuses.

A choice of screw, pressure plate, box and special order stud connectors fit a wide range of stranded or solid copper or aluminum conductors. Insulators are either molded glass-filled polycarbonate (GFPC) or phenolic with verified dielectric strength in excess of 2500V. 30A, 60A and the new 100A SJ fuse blocks feature a unique adder block configuration which can be snapped onto 1-, 2-, or 3-pole blocks to form multi-pole segmented blocks of as many poles as desired. All fuse clips are made of high conductivity tin-plated copper, with a choice of spring-reinforced or non-spring reinforced clips. Space saving options are now available in the 30A and 100A configurations which are noted in the product selection tables.



Recommended Fuse Usage:

- Class J Blocks (600V) use with AJT, A4J, HSJ

Clip & Connector Types:

30A & 60A Clips	Connectors	Connectors	Connectors	Connectors
Spring Reinforced 	Non-spring Reinforced 30A & 60A Box 	Spring Reinforced 30A & 60A Box 	Spring Reinforced 100A Box 	Spring Reinforced 400A Box Side Clip 
Non-spring Reinforced 	Non-spring Reinforced 30A Screw 	Spring Reinforced 30A Screw 	Spring Reinforced 100A Box Side Clip 	Spring Reinforced 400A Box In-line Clip 
	Non-spring Reinforced 30A Pressure Plate 	Spring Reinforced 30A Pressure Plate 	Spring Reinforced 200A Box Side Clip 	Spring Reinforced 600A Box In-line Clip 

Ratings:

Volts : 600VAC / DC
Amps : 30A, 60A, 100A,
: 200A, 400A, 600A
SCCR: : 200kA

Approvals:

- All class J fuse blocks meet the requirements of UL4248 (formerly UL512)
- UL listed Guide IZLT, File E52283
- CSA certified class 6225, File 32169

CLASS J 600 Volt Fuse Blocks

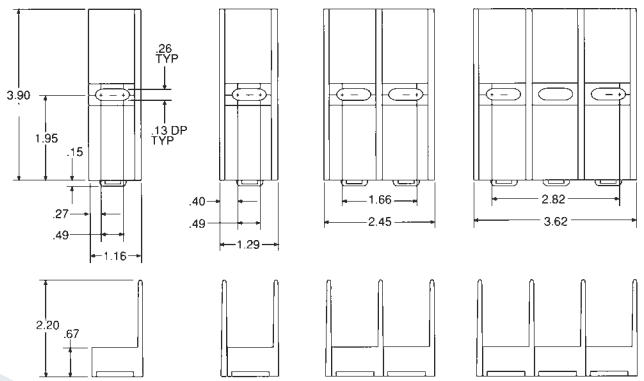
600 Volt, 30 & 60 Ampere Class J Fuse Blocks

Ampere Rating	Poles	Connectors		Catalog Number		Connector Torque In - lb
		Types	Wire Range	Non-Spring Reinforced	Spring Reinforced	
30 GFPC Insulator	ADDER	BOX	Al/Cu #2-14	60300J	60305SJ	35
	1			60301J	60306SJ	
	2			60302J	60307SJ	
	3			60303J	60308SJ	
	ADDER	SCREW	Cu* #4-14	60310J	60315SJ	20
	1			60311J	60316SJ	
	2			60312J	60317SJ	
	3			60313J	60318SJ	
	ADDER	PRESSURE PLATE	Cu* #4-14	60320J	60325SJ	20
	1			60321J	60326SJ	
	2			60322J	60327SJ	
	3			60323J	60328SJ	
	ADDER	BOX	Cu* #4-14	-	60355SJ	35
	1			-	60356SJ	
	2			-	60357SJ	
	3			-	60358SJ	
60 GFPC Insulator	ADDER	BOX	Al/Cu #2-14	60600J	60605J	45
	1			60601J	60606J	
	2			60602J	60607J	
	3			60603J	60608J	
	ADDER	BOX	Cu* #4-14	-	60655J	45
	1			-	60656J	
	2			-	60657J	
	3			-	60658J	

***Note**: To convert 30A "SJ" adder pole to single pole use end barrier cat # U09372. To convert 30A or 60A standard J adder pole to single use pole use end barrier cat # U09617. Recommended mounting screws for all 30A and 60A fuse blocks: 1/4" (0.250" dia).*

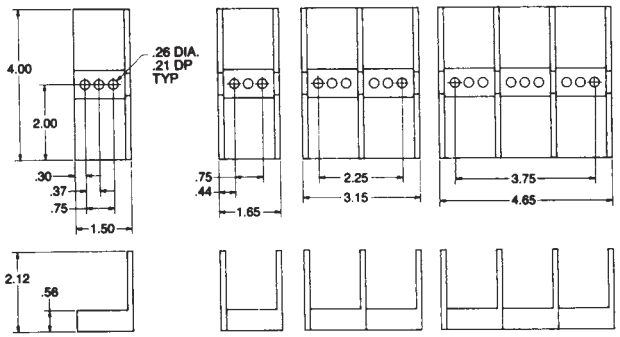
**Fuses have copper box connectors and clips and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM "no aluminum" specifications.*

Dimensions for 30A Space Saving "SJ" Style Fuse Blocks



Adder 1-Pole 2-Pole 3-Pole

Dimensions for 30A and 60A Standard Class J Style Fuse Blocks



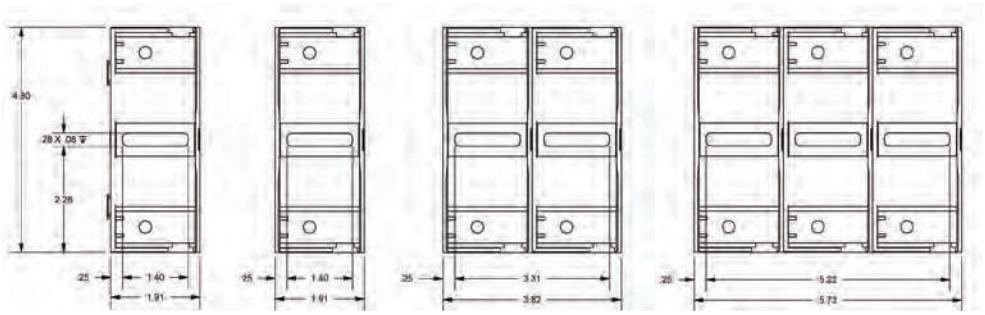
Adder 1-Pole 2-Pole 3-Pole

CLASS J 600 Volt Fuse Blocks

600 Volt, 200, 400 & 600 Ampere Class J Fuse Blocks

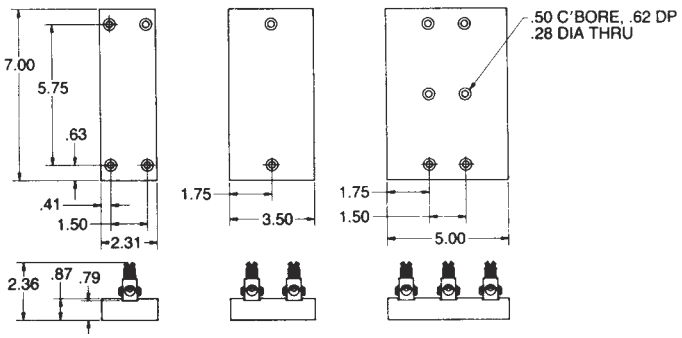
Ampere Rating	Poles	Connectors		Catalog Number	Connector Torque In - lb
		Type	Wire Range	Spring Reinforced	
100 GFCP Insulator	Adder			61005SJ	
	1	Box	Al/Cu	61006SJ	100 (Al)
	2	Side Clip	2/0-#6	61007SJ	60 (Cu)
	3			61008SJ	
	1	Box	Al/Cu 2/0-#6	61036J	120
	2			61037J	
	3			61038J	
	1	Box	Cu* 2/0-#12	61006J	50
	2			61007J	
	3			61008J	

Dimensions for 100A Space Saving "SJ" Style Fuse Blocks



Adder 1-Pole 2-Pole 3-Pole

Dimensions for 100A Standard Class J Style Fuse Blocks



1-Pole 2-Pole 3-Pole

CLASS J 600 Volt Fuse Blocks

600 Volt, 200, 400 & 600 Ampere Class J Fuse Blocks

Ampere Rating	Poles	Connector Type	Connector Wire Range	Catalog No. Spring Reinforced	Fig.	Connector Torque In - lb
200 Phenolic Insulator	1	Box	Al/Cu	62001J	1	375
	3	Side-Clip	350kcmil-#6	62003J	2	
	1	Box	Cu**	62051J	1	275
	3	Side-Clip	350kcmil-#6	62053J	2	
400 Phenolic Insulator	1	Box*	AL/Cu	64001J	3	375
	3	Side-Clip	1000-250kcmil	64003J	4	
	1	Box	AL/Cu	64031J	5	275
	3	In-Line Clip	(2) 350kcmil-#4	64033J	6	
	1	Box*	Cu**	64051J	3	375
	3	Side-Clip	1000-250kcmil	64053J	4	
	1	Box	Cu**	64061J	5	275
	3	In-Line Clip	(2) 350kcmil-#6	64063J	6	
600 Phenolic Insulator	1	Box	Al/Cu	6631J	7	500
	3	In-Line Clip	(2) 500kcmil-#4	6633J	8	
	1	Box	Cu**	6661J	7	375
	3	In-Line Clip	(2) 500kcmil-#4	6663J	8	

* Not UL Listed or CSA Certified

** Fuse blocks have copper box connectors and clips and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM "no aluminum" specifications.

Recommended mounting screws:
All 200A, 400A & 600A - 5/16" (.313" dia.)

H

Dimensions

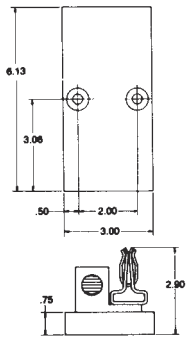


Figure 1

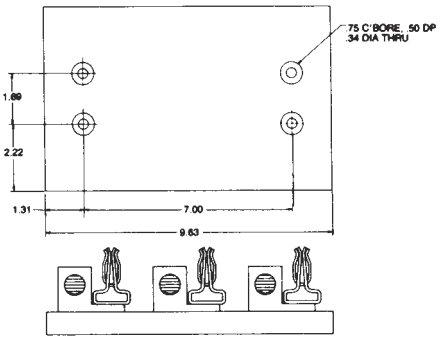


Figure 2

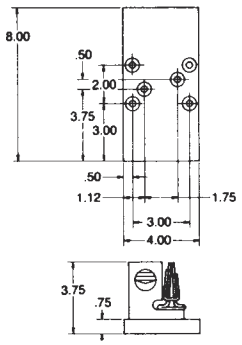


Figure 3

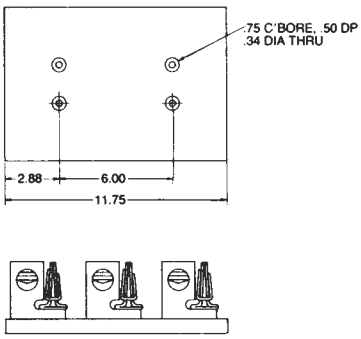


Figure 4

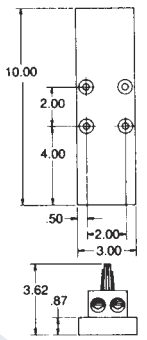


Figure 5

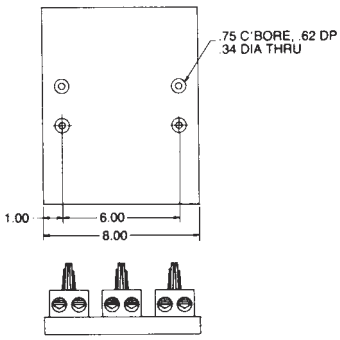


Figure 6

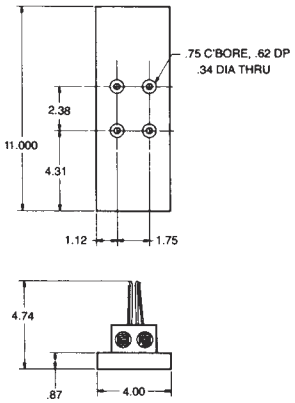


Figure 7

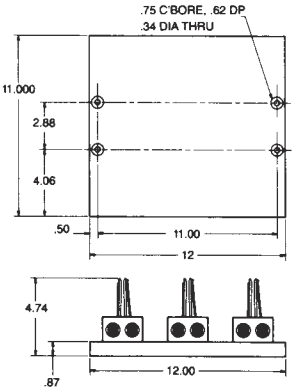


Figure 8

MIDGET & CLASS CC
600 Volt Fuse Blocks

600 Volt midget and Class CC fuse blocks

Mersen midget fuse blocks accommodate all 30 ampere 1-1/2" x 13/32" midget fuses. Class CC fuse blocks accommodate all 30 ampere Class CC fuses. A choice of box, screw, or pressure-plate connectors fit a wide range of stranded or solid copper wire. Insulators are glass-filled polycarbonate (GFPC) with verified dielectric strength in excess of 2500V. Fuse blocks feature a unique adder block which can be snapped onto 1-, 2- or 3-pole blocks to form multi-pole segmented blocks of as many poles as desired. All fuse clips are made of high conductivity tin-plated copper alloy.

Recommended Fuse Usage:

Midget Fuse Block use with ATQ, ATM, A6Y-2B, A25Z-2, TRM, OTM, A15QS-2, GFN, GGU, A60Q-2, DCT

Class CC Fuse Block use with ATDR, ATMR, ATQR

Clip & Connector Types

30A MIDGET/CC			
COPPER BOX CONNECTOR	SCREW WITH DOUBLE QUICK-CONNECTS	PRESSURE PLATE WITH DOUBLE QUICK-CONNECTS	PRESSURE PLATE WITH DOUBLE QUICK- CONNECTS (CLASS CC REJECTION END)
			



Ratings:

Midget Block

Volts : 600VAC / DC
Amps : 30A Maximum
SCCR : 100kA (depending on fuse I.R.)
: 10kA (when using quick connect terminal)

Class CC Block

Volts : 600VAC / DC
Amps : 30A Maximum
SCCR : 200kA
: 10kA (when using quick connect terminal)

Temperature/flammability GFPC insulators rated 125°C, 94V-0 flammability.

Approvals:

All fuse blocks meet the requirements of UL 4248

Midget Block

- UL recognized component guide IZLT2, File E52283
- CSA certified class 6225, File 32169

Class CC Block

- UL listed, guide IZLT, File E52283
- CSA certified class 6225, File 32169

MIDGET & CLASS CC
600 Volt Fuse Blocks

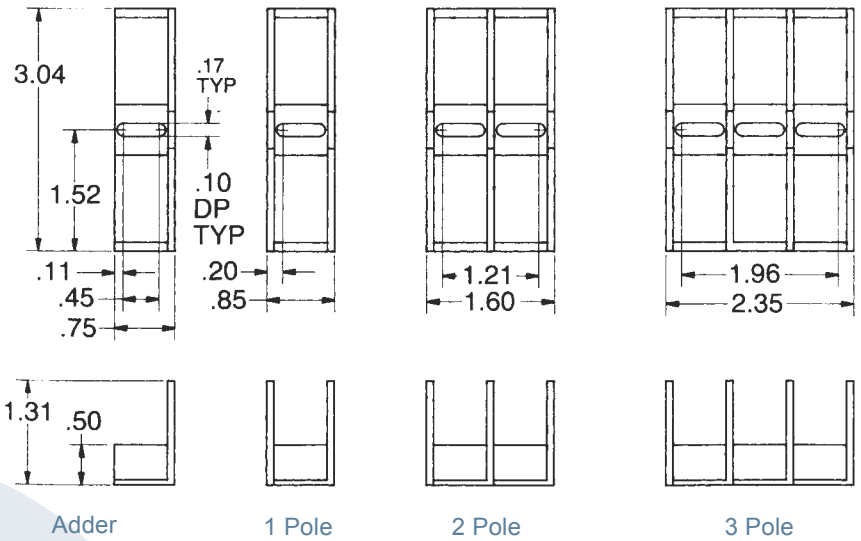
600 Volt, 30A Midget and Class CC Fuse Blocks

Connector			Catalog No.				Torque
Type	Wire Range	Poles*	Midget	Listing	Class CC	Listing	In - lb
Screw w/ double quick connects at both ends	Cu #10-14	ADDER 1 2 3 4	30310 30311 30312 30313 30314	UL Rec. & CSA	30310R 30311R 30312R 30313R 30314R	UL & CSA	20
Pressure plate (sems) w/ double quick connects at both ends	Cu #10-14	ADDER 1 2 3 4	30320 30321 30322 30323 30324	UL Rec. & CSA	30320R 30321R 30322R 30323R 30324R	UL & CSA	20
Copper box	Cu #6-14	ADDER 1 2 3 4	30350 30351 30352 30353 30354	UL Rec. & CSA	30350R 30351R 30352R 30353R 30354R	UL & CSA	35

Note: To convert Midget or Class CC adder pole to single pole, use end barrier #U09301.
* Available in any number of poles. Replace last digit in Catalog Number with number of poles needed.
Example: 303112 is a 12-pole screw/double QC connector Midget Fuse Block. Total width of N poles = (N x .76) + .08 inches. 12 poles = (12 x .76") + .08" = 9.20".

Recommended mounting screws for all Midget and Class CC fuse blocks: #8 (.164" dia.)

Dimensions



CLASS H, K & R
250 & 600 Volt Fuse Blocks

250 & 600V Class H, K & R Fuse Blocks

Mersen Class H, K and R fuse blocks accommodate all Class H, K and R 250 and 600V power fuses. A choice of screw, pressure plate, box and special order stud connectors fit a wide range of stranded or solid copper or aluminum wire. Insulators are either molded glass-filled polycarbonate (GFPC) or phenolic with verified dielectric strength in excess of 2500V. 30, 60 and 100A fuse blocks feature a unique adder block which can be snapped onto 1-, 2- or 3-pole blocks to form multi-pole segmented blocks of as many poles as desired. All fuse clips are made of high conductivity tin-plated copper, with a choice of spring reinforced or non-spring reinforced clips in 30A and 60A. Clips 100A and above are spring reinforced.

Recommended Fuse Usage:

Class R Blocks (250V) use with A2D-R, A2K-R, TR-R
Class R Blocks (600V) use with A6D-R, A6K-R, TRS-R
Class H & K Blocks (250V) use with OT, RF, A2Y types 1 & 3 OTN, CRN, NRN
Class H & K Blocks (600V) use with OTS, RFS, A6Y types 1 & 3 CRS, NRS

Clip & Connector Types

30A & 60A Clips	Connectors	Connectors
Spring Reinforced Class R 	Non-Spring Reinforced 30A & 60A Box 	Spring Reinforced 30A & 60A Box 
Class H & K 	Non-Spring 30A Screw 	Spring 30A Screw (R) 
Non-Spring Reinforced 	Non-Spring 30A Pressure Plate 	Spring 30A Screw 
		Spring Reinforced 30A Pressure Plate 

Connectors		
Spring Reinforced 100A Box 	Spring Reinforced 400A Box In-Line Clip 	
Spring 200A Box Side Clip 	Spring 400A Box Side Clip 	



Ratings:

Volts : 250VAC / DC
: 600VAC /DC
Amps : 30A, 60A, 100A, 200A, 400A, 600A
SCCR: : 10kA with class H fuses
: 50kA with class K fuses
: 200kA with class R fuses

Approvals:

- All fuse blocks meet the requirements of UL 4248
- UL listed, guide IZLT, File E52283
- UL recognized component guide IZLT2, file E52283
- CSA certified class 6225, File 32169

CLASS H, K & R 250 & 600 Volt Fuse Blocks

250 Volt, 30 & 60 Ampere Class H, K and R Fuse Blocks

Ampere Rating	Poles	Connector Type	Connector Wire Range	Catalog No. Class H & K Non-Spring Reinforced	Catalog No. Class H K Spring einforced	Catalog No. Class R Spring Reinforced	Fig.	Connector Torque In - lb
30 GFPC Insulator	ADDER	BOX	Al/Cu #2-14	20300	20305	20305R	1	35
	1			20301*	20306*	20306R*	2	
	2			20302	20307	20307R	3	
	3			20303	20308	20308R	4	
	ADDER	SCREW	Cu #10-14	20310	20315	20315R	1	20
	1			20311*	20316*	20316R*	2	
	2			20312	20317	20317R	3	
	3			20313	20318	20318R	4	
	ADDER	PRESSURE PLATE	Cu #10-14	20320	20325	20325R	1	20
	1			20321*	20326*	20326R*	2	
	2			20322	20327	20327R	3	
	3			20323	20328	20328R	4	
	ADDER	BOX	Cu** #4-14	-	20355	20355R	1	35
	1			-	20356*	20356R*	2	
	2			-	20357	20357R	3	
	3			-	20358	20358R	4	
60 GFPC Insulator	ADDER	BOX	Al/Cu #2-14	20600	20605	20605R	5	45
	1			20601	20606	20606R	6	
	2			20602	20607	20607R	7	
	3			20603	20608	20608R	8	
	ADDER	BOX	Cu** #4-14	-	20655	20655R	5	45
	1			-	20656	20656R	6	
	2			-	20657	20657R	7	
	3			-	20658	20658R	8	

Note: To convert 30A adder pole to single pole, use end barrier #U09322. To convert 60A adder pole to single pole, use end barrier #U09365.
* 1-pole, 30A block does not accept adder pole.
** Fuse blocks have copper box connectors and clips and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM "no aluminum" specifications.

Recommended mounting screws for all 30A and 60A fuse blocks: #10 (.190" dia.)

Dimensions

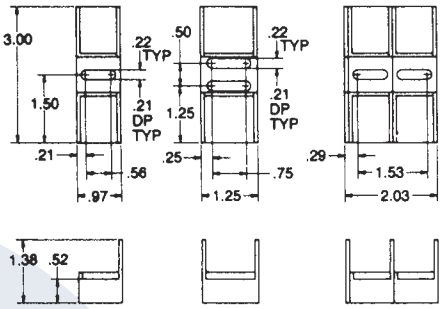


Figure 1

Figure 2

Figure 3

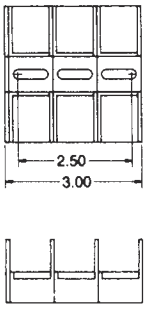


Figure 4

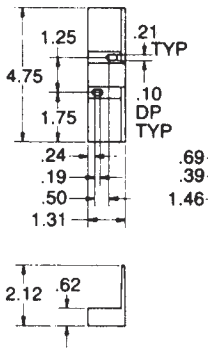


Figure 5

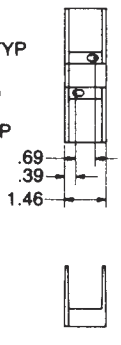


Figure 6

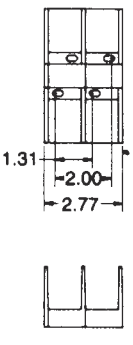


Figure 7

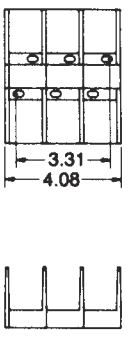


Figure 8

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

CLASS H, K & R 250 & 600 Volt Fuse Blocks

250 Volt, 100 & 200 Ampere Class H, K and R Fuse Blocks

Ampere Rating	Poles	Connector		Catalog No.		Fig.	Connector Torque In - lb
		Type	Wire Range	Class H & K Spring Reinforced	Class R Spring Reinforced		
100 GFPC Insulator	ADDER	Box	Al/Cu 2/0-#6	21035	21035R	1	120
	1			21036	21036R	2	
	2			21037	21037R	3	
	3			21038	21038R	4	
	ADDER	Box	Cu* 2/0-#12	21005	21005R	1	50
	1			21006	21006R	2	
	2			21007	21007R	3	
	3			21008	21008R	4	
200 Phenolic Insulator	1	Box Side-Clip	AL/Cu 350kcmil-#6	22001	22001R	5	375
	3			22003	22003R	6	
	1	Box Side-Clip	Cu* 350kcmil-#6	22051	22051R	5	275
	3			22053	22053R	6	

Note: To convert 100A adder pole to single pole, use end barrier #U09363.
*Fuse blocks have copper box connectors and clips and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM "no aluminum" specifications.

Recommended mounting screws:
- All 100A-1/4" (.250" dia.)
- 200A, 1-pole - #10 (.190" dia.)
- 200A, 3-pole - 5/16" (.313" dia.)

Dimensions

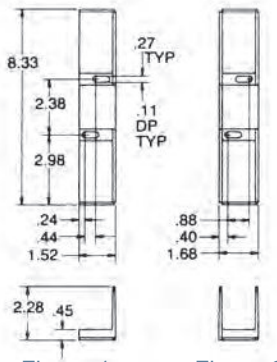


Figure 1

Figure 2

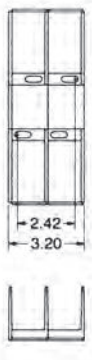


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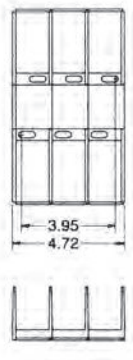


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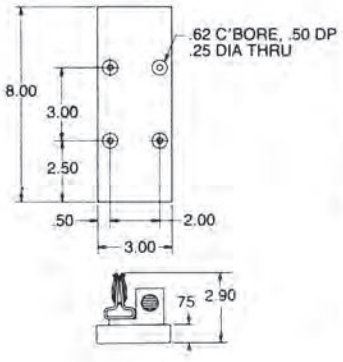
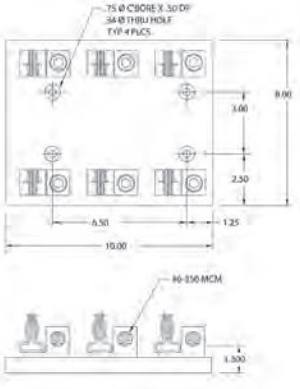


Figure 5


Figure 6

CLASS H, K & R 250 & 600 Volt Fuse Blocks

250 Volt, 400 & 600 Ampere Class H, K and R Fuse Blocks

Ampere Rating	Poles	Connector Type	Connector Wire Range	Catalog No. Class H & K Spring Reinforced	Catalog No. Class R Spring Reinforced	Fig.	Connector Torque In - lb
400 Phenolic Insulator	1	Box*	Al/Cu	24001	24001R	1	375
	3	Side-Clip	1000-250kcmil	24003	24003R	2	
	1	Box*	Cu**	24051	24051R	1	375
	3	Side-Clip	1000-250kcmil	24053	24053R	2	
	1	Box	Al/Cu	24031	24031R	3	275
	3	In-Line Clip	(2) 350kcmil-#4	24033	24033R	4	
	1	Box	Al/Cu	24061	24061R	3	275
	3	In-Line Clip	(2) 350kcmil-#6	24033	24033R	4	
600 Phenolic Insulator	1	Box	Al/Cu	2631	2631R	5	500
	3	In-Line Clip	(2) 500kcmil-#4	2633	2633R	6	
	1	Box	Cu**	2661	2661R	5	375
	3	In-Line Clip	(2) 500kcmil-#4	2663	2663R	6	

*Not UL Listed or CSA Certified

**Fuse blocks have copper box connectors and clips and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM “no aluminum” specifications.

Recommended mounting screws for all 400A and 600A fuse blocks: 5/16 (.313” dia.)

Dimensions

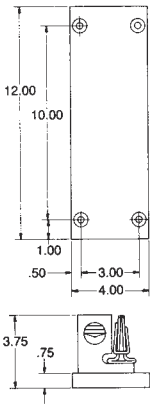


Figure 1

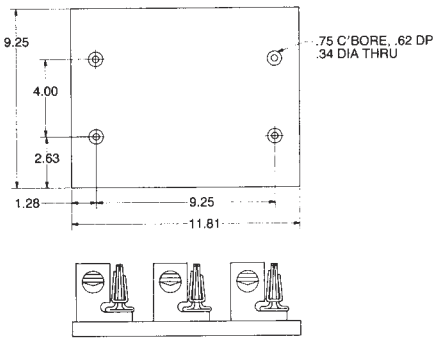


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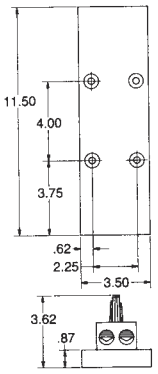


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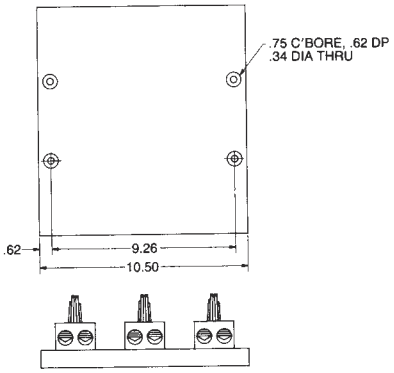


Figure 4

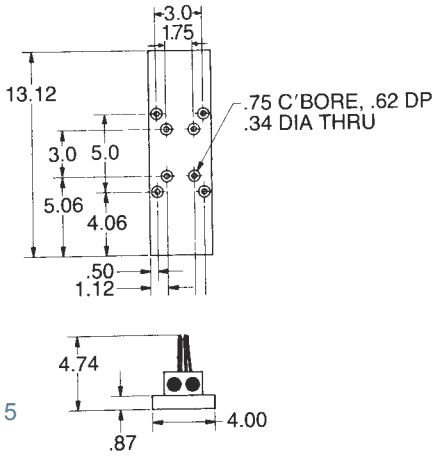


Figure 5

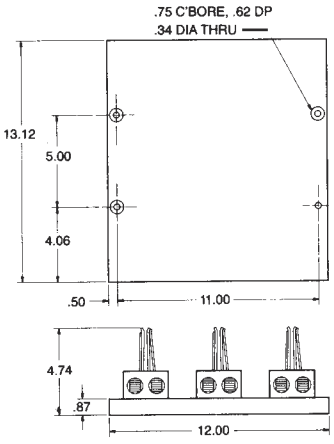


Figure 6

CLASS H, K & R 250 & 600 Volt Fuse Blocks

600 Volt, 30 & 60 Ampere Class H, K and R Fuse Blocks

Ampere Rating	Poles	Connector		Catalog No.			Fig.	Connector Torque In - lb
		Type	Wire Range	Class H & K Non-Spring Reinforced	Class H & K Spring Reinforced	Class R Spring Reinforced		
30 GFPC Insulator	ADDER			60300	60305	60305R	1	
	1	Box	Al/Cu	60301	60306	60306R	2	35
	2		#2-14	60302	60307	60307R	3	
	3			60303	60308	60308R	4	
	ADDER			60310	60315	60315R	1	
	1	Screw	Cu	60311	60316	60316R	2	20
	2		#10-14	60312	60317	60317R	3	
	3			60313	60318	60318R	4	
	ADDER			60320	60325	60325R	1	
	1	Pressure	Cu	60321	60326	60326R	2	20
	2	Plate	#10-14	60322	60327	60327R	3	
	3			60323	60328	60328R	4	
	ADDER			-	60355	60355R	1	
	1	Box	Cu*	-	60356	60356R	2	35
	2		#4-14	-	60357	60357R	3	
	3			-	60358	60358R	4	
60 GFPC Insulator	ADDER			60600	60605	60605R	1	
	1	Box	Al/Cu	60601	60606	60606R	2	45
	2		#2-14	60602	60607	60607R	3	
	3			60603	60608	60608R	4	
	ADDER			-	60655	60655R	1	
	1	Box	Cu*	-	60656	60656R	2	45
	2		#4-14	-	60657	60657R	3	
	3			-	60658	60658R	4	

Note: To convert 30A or 60A adder pole to single pole, use end barrier #U09361.
* Fuse blocks have copper box connectors and clips and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM “no aluminum” specifications.

Recommended mounting screws for all 30A and 60A fuse blocks: 1/4” (.250” dia.)

Dimensions

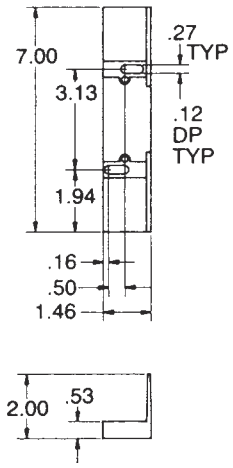


Figure 1

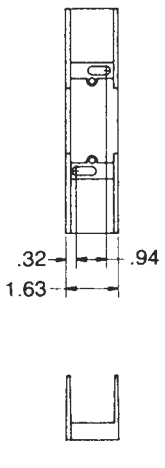


Figure 2

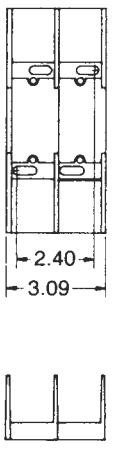


Figure 3

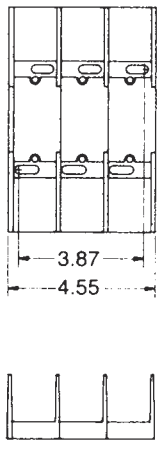


Figure 4

CLASS H, K & R 250 & 600 Volt Fuse Blocks

600 Volt, 100 & 200 Ampere Class H, K and R Fuse Blocks

Ampere Rating	Poles	Connector Type	Connector Wire Range	Catalog No. Class H & K Spring Reinforced	Catalog No. Class R Spring Reinforced	Fig.	Connector Torque In - lb
100 Insulator	ADDER	Box	Al/Cu 2/0-#6	61035	61035R	1	120
	1			61036	61036R	2	
	3			61038	61038R	3	
	ADDER	Box	Cu* 2/0-#12	61005	61005R	1	50
	1			61006	61006R	2	
	3			61008	61008R	3	
200 Insulator	1	Box Side-Clip	Al/Cu 350kcmil-#6	62001	62001R	4	375
	3			62003	62003R	5	
	1	Box Side-Clip	Cu* 350kcmil-#6	62051	62051R	4	275
	3			62053	62053R	5	

* Fuse blocks have copper box connectors and clips and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM "no aluminum" specifications.

Recommended mounting screws:

All 100A-1/4" (.250" dia.)
200A, 1-pole - #10 (.190" dia.)
200A, 3-pole - 5/16" (.313" dia.)

Dimensions

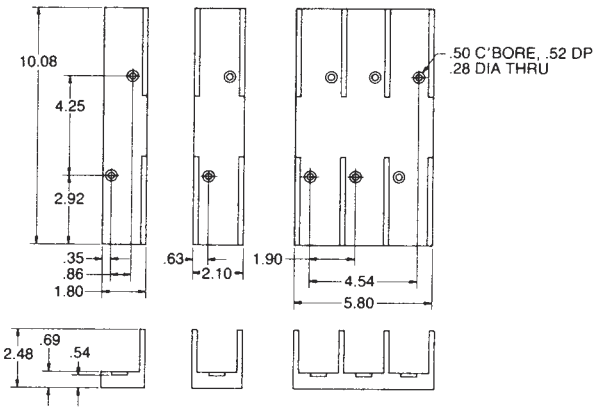


Figure 1

Figure 2

Figure 3

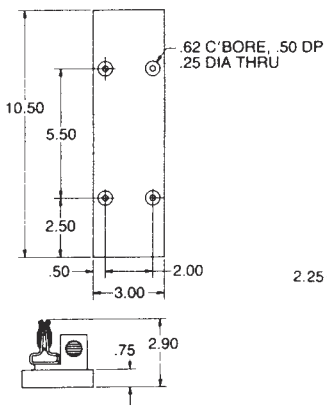


Figure 4

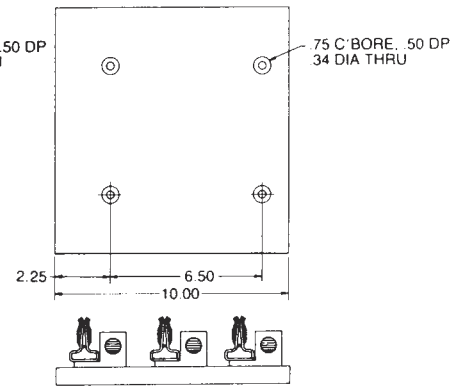


Figure 5

CLASS H, K & R 250 & 600 Volt Fuse Blocks

600 Volt, 400 & 600 Ampere Class H, K and R Fuse Blocks

Ampere Rating	Poles	Connector Type	Connector Wire Range	Catalog No. Class H & K Spring Reinforced	Catalog No. Class R Spring Reinforced	Fig.	Connector Torque In - lb
400 Phenolic Insulator	1	Box*	Al/Cu	64001	64001R	1	375
	3	Side-Clip	1000-250kcmil	64003	64003R	2	
	1	Box*	Cu**	64051	64051R	1	375
	3	Side-Clip	1000-250kcmil	64053	64053R	2	
	1	Box	AL/Cu	64031	64031R	3	275
	3	In-Line Clip	(2) 350kcmil-#4	64033	64033R	4	
	1	Box	Cu**	64061	64061R	3	275
	3	In-Line Clip	(2) 350kcmil-#6	64063	64063R	4	
600 Phenolic Insulator	1	Box	Al/Cu	6631	6631R	5	500
	3	In-Line Clip	(2) 500kcmil-#4	6633	6633R	6	
	1	Box	Cu**	6661	6661R	5	375
	3	In-Line Clip	(2) 500kcmil-#4	6663	6663R	6	

*Not UL Listed or CSA Certified

**Fuse blocks have copper box connectors and clips and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM "no aluminum" specifications.

Recommended mounting screws for all 400A and 600A fuse blocks: 5/16 (.313" dia.)

Dimensions

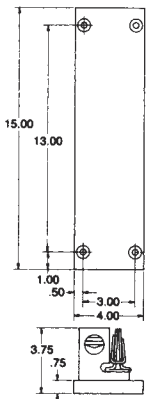


Figure 1

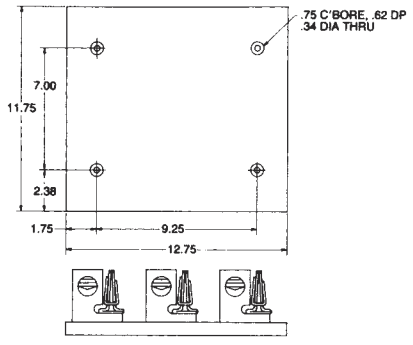


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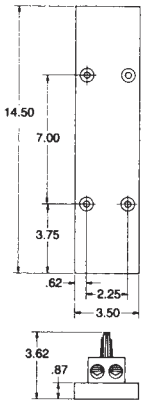


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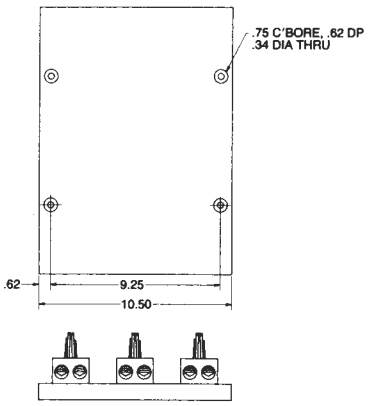


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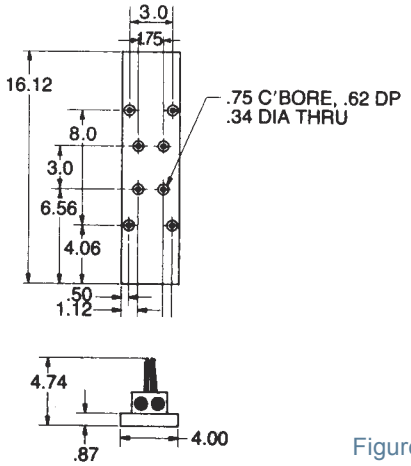


Figure 5

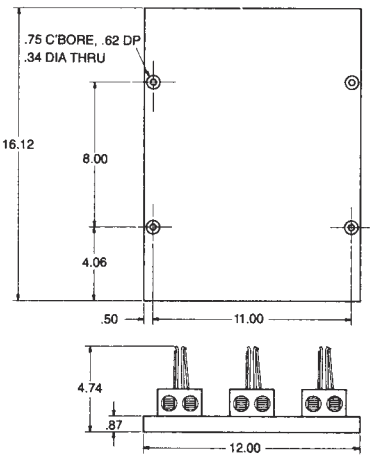


Figure 6

CLASS T 300 & 600 Volt Fuse Blocks

300 & 600V Class T Fuse Blocks

Mersen Class T fuse blocks accommodate Class T fuses up to 600A. Insulators are either durable, glass-filled polycarbonate (GFPC) or phenolic with verified dielectric strength in excess of 2500V. Mersen is the only manufacturer to offer Class T blocks with copper connectors.



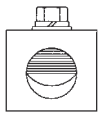
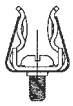
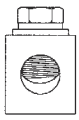
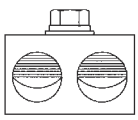
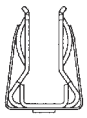
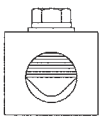
Features/Benefits:

- Unique integral DIN-rail adapters for 600V, 30 & 60A blocks
- Full barrier design (30 & 60A) increases pole to pole safety
- Unique adder-block design (30 & 60A) for design flexibility
- Spring reinforcing standard for all 30 & 60A clips
- Features high conductivity copper alloy fuse clips
- Cool running high amperage (100 - 600A) connectors
- Copper connectors available 30 - 600A

Recommended Fuse Usage:

Class T Blocks (300V) use with A3T
Class T Blocks (600V) use with A6T

Clip & Connector Types

Spring Reinforced 30A & 60A Clips	Connectors for Spring Reinforced 30A & 60A Clips	Connectors	Connectors
300V - 30A 600V - 30A 	30A - 60A Box 	100A Box Side Clip 	400A Box 
300V - 60A 	30A - 60A Screw 	100A Box 	600A Box 
600V - 60A 	30A - 60A Pressure Plate 	200A Box 	

Ratings:

Volts : 300VAC / DC
: 600VAC / DC
Amps : 30A, 60A, 100A, 200A, 400A, 600A
SCCR: : 200kA

Approvals:

- All fuse blocks meet the requirements of UL 4248
- UL listed, guide IZLT, File E52283
- UL recognized component guide IZLT2, file E52283
- CSA certified class 6225, File 32169

CLASS T 300 & 600 Volt Fuse Blocks

300 Volt, 30 & 60 Ampere Class T Fuse Blocks

Ampere Rating	Poles	Connector Type	Connector Wire Range	Catalog No. Spring Reinforced	Fig.	Connector Torque In - lb
	ADDER			30305T	1	
	1		Al/Cu	30306T	2	
	2	Box	#2-14	30307T	3	35
	3			30308T	4	
	4			30309T	5	
	ADDER			30315T	1	
	1		Cu	30316T	2	
	2	Screw	#10-14	30317T	3	20
	3			30318T	4	
	4			30319T	5	
	ADDER			30325T	1	
30	1	Pressure	Cu	30326T	2	
GFPC	2	Plate	#10-14	30327T	3	20
Insulator	3			30328T	4	
	4			30329T	5	
	ADDER			30355T	1	
	1		Cu*	30356T	2	
	2	Box	#4-14	30357T	3	35
	3			30358T	4	
	4			30359T	5	
	ADDER			30615T**	1	
	1		Cu	30616T**	2	
	2	Screw	#10-14	30617T**	3	20
	3			30618T**	4	
	4			30619T**	5	
60	ADDER			30605T	1	
GFPC	1		Al/Cu	30606T	2	
Insulator	2	Box	#2-14	30607T	3	45
	3			30608T	4	
	4			30609T	5	
	ADDER			30655T	1	
	1		Cu*	30656T	2	
	2	Box	#4-14	30657T	3	45
	3			30658T	4	
	4			30659T	5	

*Fuse blocks have copper box connectors and clips and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM “no aluminum” specifications.
** UL Component Recognized

Recommended base mounting screws: #10 (.190” dia.)

Dimensions

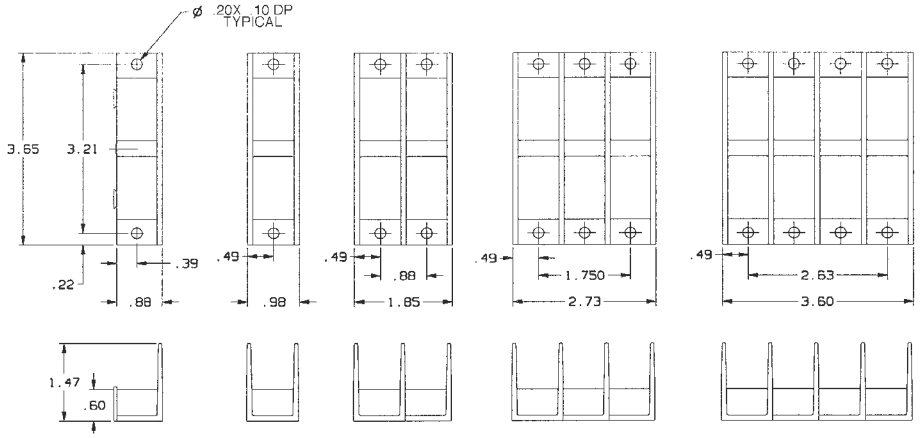


Figure 1 Figure 2 Figure 3 Figure 4 Figure 5

CLASS T 300 & 600 Volt Fuse Blocks

300 Volt, 100, 200, 400 & 600 Ampere Class T Fuse Blocks

Ampere Rating	Poles	Connector		Catalog No.	Fig.	Connector Torque In - lb	
		Type	Wire Range	Spring Reinforced		Connector	Fuse Bolt
100 Phenolic Insulator	1	Box	Cu*	31001T	1	50	72
	2		2/0-#12	31002T	2		
	3			31003T	3		
200 Phenolic Insulator	1	Box	Al/Cu	32031T	4	275	132
	3		350 kcmil-#6	32033T	5		
	1	Box	Cu*	32051T	4	275	132
	3		350 kcmil-#6	32053T	5		
400 Phenolic Insulator	1	Box	Al/Cu	34031T	6	600	228
	3		600 kcmil-#2	34033T	7		
	1	Box	Cu*	34051T	6	375	228
	3		600 kcmil-#2	34053T	7		
600 Phenolic Insulator	1	Box	Al/Cu	36031T	8	600	360
			(2) 600 kcmil-#2				
	1	Box	Cu*	36051T	8	375	360
			(2) 600 kcmil-#2				

† Note: Height includes nominal fuse blade thickness
Recommended base mounting screws:
100A & 200A, #10 (.190" dia.)
400A & 600A, 1/4" (.250" dia.)

Note: * Fuse blocks have copper box connectors and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM "no aluminum" specifications.

Dimensions

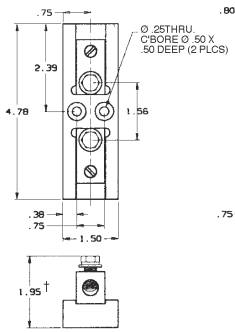


Figure 1

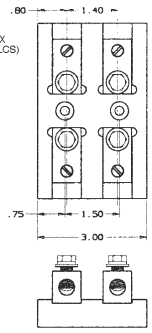


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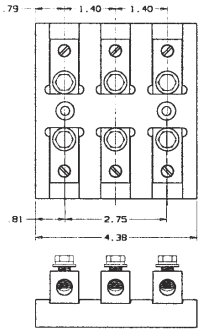


Figure 3

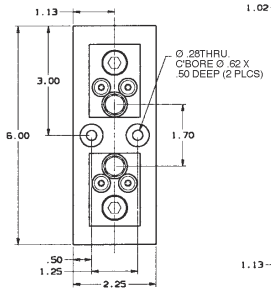


Figure 4

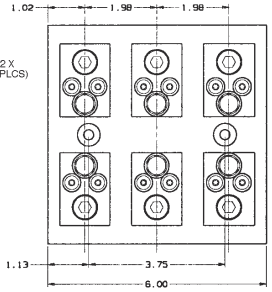


Figure 5

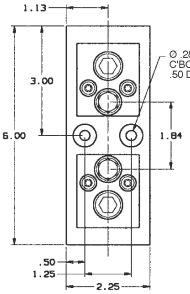


Figure 6

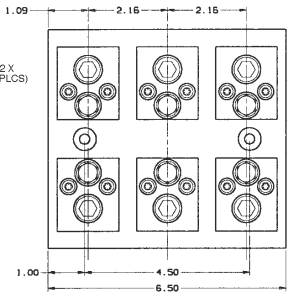


Figure 7

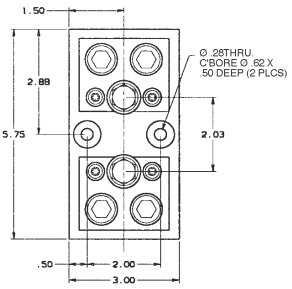


Figure 8

CLASS T 300 & 600 Volt Fuse Blocks

600 Volt, 30 & 60 Ampere Class T Fuse Blocks

Ampere Rating	Poles	Connector Type	Connector Wire Range	Catalog No. Spring Reinforced	Fig.	Connector Torque In - lb
30 GFPC Insulator	ADDER			60305T	1	
	1	Box	Al/Cu	60306T	2	
	2		#2-14	60307T	3	35
	3			60308T	4	
	ADDER			60315T	1	
	1	Screw	Cu	60316T	2	
	2		#10-14	60317T	3	20
	3			60318T	4	
	ADDER			60325T	1	
	1	Pressure	Cu	60326T	2	
	2	Plate	#10-14	60327T	3	20
	3			60328T	4	
	ADDER			60355T	1	
	1	Box	Cu*	60356T	2	
	2		#4-14	60357T	3	35
	3			60358T	4	
60 GFPC Insulator	ADDER			60615T**	5	
	1	Screw	Cu	60616T**	6	
	2		#10-14	60617T**	7	20
	3			60618T**	8	
	ADDER			60605T	5	
	1	Box	Al/Cu	60606T	6	
	2		#2-14	60607T	7	45
	3			60608T	8	
	ADDER			60655T	5	
	1	Box	Cu*	60656T	6	
	2		#4-14	60657T	7	45
	3			60658T	8	

*Fuse blocks have copper box connectors and clips and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM "no aluminum" specifications.
** UL Component Recognized

Recommended mounting screws:
30A, #10 (.190" dia.)
60A, 1/4 " (.250" dia.)

Dimensions

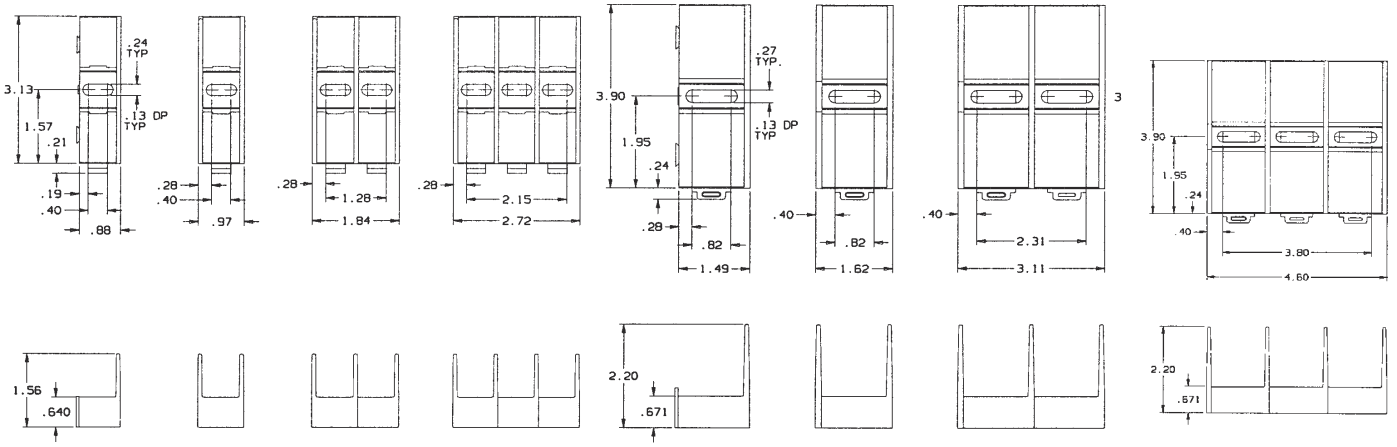


Figure 1 Figure 2 Figure 3 Figure 4 Figure 5 Figure 6 Figure 7 Figure 8

CLASS T 300 & 600 Volt Fuse Blocks

600 Volt, 100, 200, 400 & 600 Ampere Class T Fuse Blocks

Ampere Rating	Poles	Connector Type	Connector Wire Range	Catalog No. Spring Reinforced	Fig.	Torque (In - Lbs) Connector	Torque (In - Lbs) Fuse Bolt
100 Phenolic Insulator	1 2 3	BOX	Al/Cu 2/0-#6	61031T 61032T 61033T	1 2 3	120	72
	1 2 3	BOX	Cu* 2/0-#12	61051T 61052T 61053T	1 2 3	50	72
200 Phenolic Insulator	1 3	BOX	Al/Cu 350 kcmil-#6	62031T 62033T	4 5	275	132
	1 3	BOX	Cu* 350 kcmil-#6	62051T 62053T	4 5	275	132
400 Phenolic Insulator	1	BOX	Al/Cu 600 kcmil-#2	64031T	6	600	228
	1	BOX	Cu* 600 kcmil-#2	64051T	6	375	228
600 Phenolic Insulator	1	BOX	Al/Cu (2) 600 kcmil-#2	66031T	7	600	360
	1	BOX	Cu* (2) 600 kcmil-#2	66051T	7	375	360

Note: Fuse blocks have copper box connectors and are for copper wires only. These are specifically designed with the same coefficient of expansion as copper wire for improved heat cycling and meet or exceed OEM "no aluminum" specifications.

Recommended base mounting screws:
100A & 200A, #10 (.190" dia.)
400A & 600A, 1/4 " (.250" dia.)

Dimensions

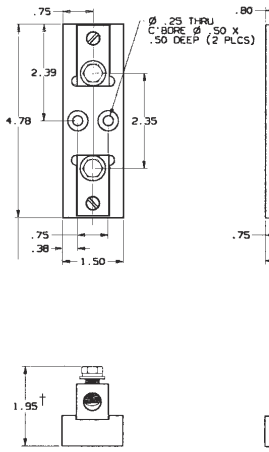


Figure 1

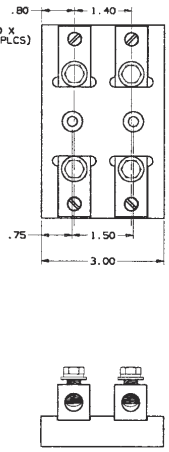


Figure 2

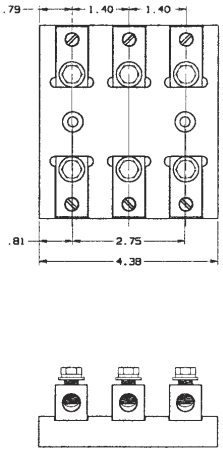


Figure 3

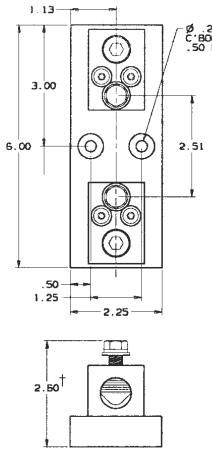


Figure 4

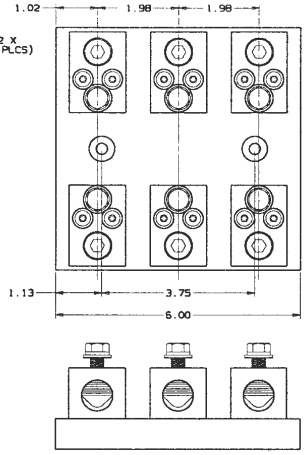


Figure 5

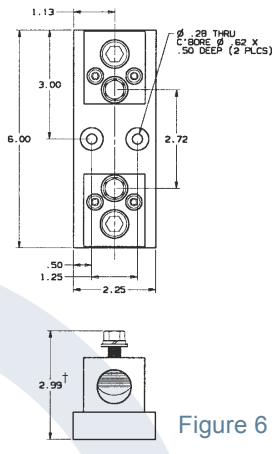


Figure 6

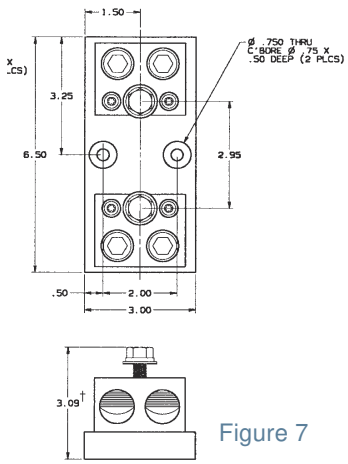


Figure 7

† Note: Height includes nominal fuse blade thickness

CLASS G 480 & 600 Volt Fuse Blocks

480 & 600V Class G Fuse Blocks

Mersen Class G fuse blocks accommodate all 15, 20, 30 and 60 ampere Class G fuses. A choice of box, screw or pressure-plate connectors fit a wide range of stranded or solid copper wire. Insulators are glass-filled polycarbonate (GFPC) with verified dielectric strength in excess of 2500V. Fuse blocks feature a unique adder block which can be snapped onto 1-, 2-, or 3-pole blocks to form multi-pole segmented blocks of as many poles as desired. All fuse clips are made of high conductivity tin-plated copper alloy.



Features/Benefits:

- Unique integral DIN-rail adapters for 15, 20 & 30A blocks
- Unique adder-block design (all ampere ratings) for design flexibility
- Spring reinforcing standard for 60A clips
- Features high conductivity copper alloy fuse clips

Recommended Fuse Usage:

Class G Blocks use with AG

Clip & Connector Types

15, 20, 30, 60A	15, 20, 30A	15, 20, 30A
COPPER BOX CONNECTOR OR ALUMINUM BOX CONNECTOR 	SCREW WITH DOUBLE QUICK-CONNECTS 	PRESSURE PLATE WITH DOUBLE-QUICK CONNECTS 

Ratings:

Volts : 600VAC (15, 20A)
: 480VAC (30, 60A)
Amps : 15A, 20A, 30A, 60A
SCCR: : 100kA
: 10kA (when using quick connects)

Temperature/Flammability:
GFPC insulators rated 125^{0}C RTI, 94V-0 flammability

Approvals:

All fuse blocks meet the requirements of UL 4248

- UL Listed guide IZLT, File E52283
- CSA Certified class 6225, File 32169

CLASS G 480 & 600 Volt Fuse Blocks

600 Volt, 15 & 20 Ampere; 480 Volt 30 & 60 Ampere Class G Fuse Blocks

Ampere Rating	Poles	Connector Type	Connector Wire Range	Catalog No.	Fig.	Torque (In - Lbs)
15 GFPC Insulator	ADDER	Screw w Double		40110G	1	
	1	Quick Connects at	Cu	40111G	2	20
	2	Both Ends	#10-14	40112G	3	
	3			40113G	4	
	ADDER	Pressure Plate		40120G	1	
	1	(SEMS) w Double	Cu	40121G	2	20
	2	Quick Connects at	#10-14	40122G	3	
	3	Both Ends		40123G	4	
20 GFPC Insulator	ADDER	Screw w Double		40210G	1	
	1	Quick Connects at	Cu	40211G	2	20
	2	Both Ends	#10-14	40212G	3	
	3			40213G	4	
	ADDER	Pressure Plate		40220G	1	
	1	(SEMS) w Double	Cu	40221G	2	20
	2	Quick Connects at	#10-14	40222G	3	
	3	Both Ends		40223G	4	
30 GFPC Insulator	ADDER	Screw w Double		40310G	1	
	1	Quick Connects at	Cu	40311G	2	20
	2	Both Ends	#10-14	40312G	3	
	3			40313G	4	
	ADDER	Pressure Plate		40320G	1	
	1	(SEMS) w Double	Cu	40321G	2	20
	2	Quick Connects at	#10-14	40322G	3	
	3	Both Ends		40323G	4	
	ADDER			40350G	1	
	1	Copper	Cu	40351G	2	35
	2	Box	#6-14	40352G	3	
	3			40353G	4	
60 GFPC Insulator	ADDER			40605G	5	
	1	Aluminum	Al/Cu	40606G	6	45
	2	Box	#2-14	40607G	7	
	3			40608G	8	
	ADDER			40655G	5	
	1	Copper	Cu	40656G	6	45
	2	Box	#4-14	40657G	7	
	3			40658G	8	

Dimensions

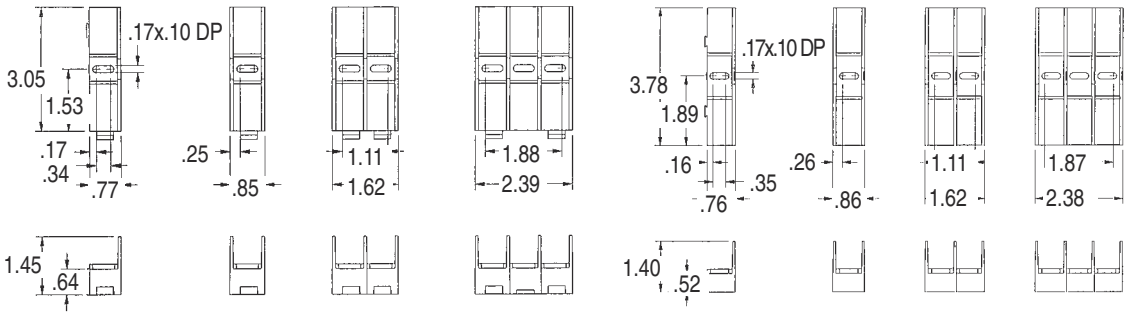


Figure 1 Figure 2 Figure 3 Figure 4 Figure 5 Figure 6 Figure 7 Figure 8

Miniature Fuse Blocks

5X20QC1 & 6X32QC1 Single Pole Fuse Blocks

The 5X20QC1 single pole fuse blocks are for for 5mm x 20mm fuses featuring tin-plated clips, a polyester insultator and 3/16" quick-connect terminals. The 6X32QC1 single pole fuse blocks are for 1/4" x 1-1/4" fuses and have tin-plated phosphor bronze clips, a phenolic insulator and 1/4" quick-connect terminals.



Features/Benefits:

5X20QC1

Single Pole Fuse Block
for 5mm x 20mm fuses

- Tin plated clips
- Polyester insulator
- 3/16" quick-connect terminals
- Rated 15A, 250V
- UL recognized

6X32QC1

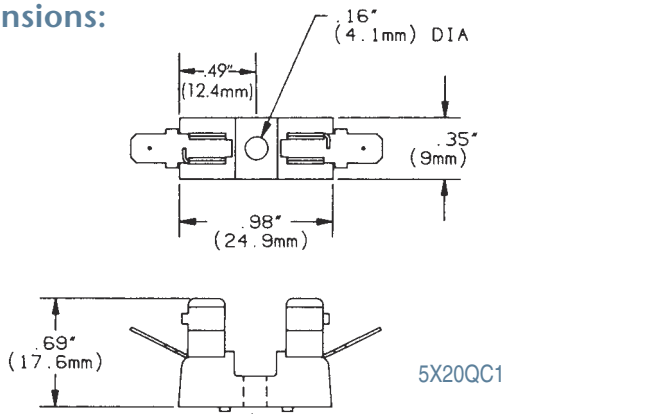
Single Pole Fuse Block for
1/4" x 1-1/4" fuses

- Tin plated phosphor bronze clips
- Phenolic insulator
- 1/4" quick-connect terminals
- Rated 30A, 250V - UL Recognized

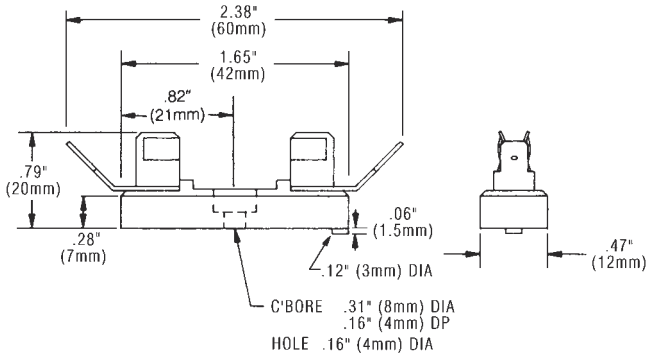
Recommended Fuse Usage:

5X20QC1 use with GGM, GGA, GSA, GSB, GDG
6X32QC1 use with GSA, GDL, GGC, GAB

Dimensions:



5X20QC1



6X32QC1

Ratings:

5X20QC1:

Volts: 250V
Amps : 15A

6X32QC1:

Volts: 250V
Amps : 30A

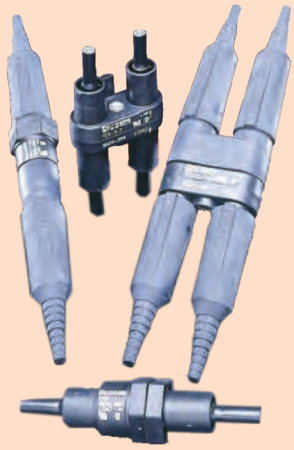
Approvals:

- UL Recognized

FEB,FEC,FEX,FEY

600 Volt In-Line Fuse Holders

Mersen's complete line of single and dual pole in-line fuse holders accommodate either 1-1/2" x 13/32" (10x38mm) midget or Class CC fuses. The fuse holders are designed for quick installation. Securing nuts or screws are captive thus speeding installation by reducing the need to locate and assemble loose components in the field. Three internal O-rings per pole seal the fuse holder providing a water-resistant compartment for the fuse. The captive O-rings are colored (blue for single pole and red for dual pole) for quick detection. Optional cone shaped insulator boots can be slipped on to provide a watertight seal (breakaway versions come with boots standard). Both single and dual pole versions have an optional breakaway feature which safely disconnects the load in case of a pole knockdown. Fuses remain safely encapsulated within the watertight fuse holder on the load side. Once the pole has been reinstalled the fuse holder can be easily reconnected.



Applications:

- Street lighting
- Parking lot lighting
- Traffic signaling
- Sports lighting
- Boats and marinas
- Humid/corrosive environments

Highlights:

- Breakaway version quickly disconnects line side during pole knockdown in compliance with state and federal highway commission standards
- 3 O-rings per pole for water tight applications
- Colored O-rings for quick detection
- Single and dual poles
- Accepts midget or Class CC fuses
- Wide assortment of terminal variations
- High heat, impact resistant insulator
- Captive nut or screw for quick installations
- Polarized dual pole provides simultaneous disconnection
- Permanently installed neutral versions quickly identified by white nuts
- Tulip fuse clip for improved contact and low losses
- Environmentally friendly-no lead solder used
- Highly visible catalog number even with insulation boots installed
- Wire gauge size identified on insulation boots for quick, accurate trimming
- Time delay for motor starting and transformer inrush

Recommended Fuse Usage:

FEB and FEX holders use with:

Midget (1-1/2" x 13/32", 10 x 38mm): ATQ, ATM, TRM, OTM, GGU, GFN, A13X-2, A25Z-2, A60Q-2, A6Y-2B

FEC and FEY holders use with:

Class CC: ATDR, ATMR, ATQR

Ratings:

Volts: : 600VAC / DC
Amps : 30A Maximum
SCCR : 200kA (Class CC Fuses)
: 100kA (Midget Fuses)

Temperature Rating 155° C

Approvals:

- UL Listed Class CC Guide IZLT, File E52283
- UL Recognized Component Midget Guide IZLT2, File E52283
- CSA Certified Class CC and Midget Class 6225, File 32169

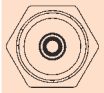
FEB,FEC,FEX,FEY 600 Volt In-Line Fuse Holders

Catalog Numbering System

Family	Load Terminal		Line Terminal		Option
FEB-	1	1	1	1	-BA

Nomenclature Legend

Family	Description
FEB	Single pole midget
FEC	Single pole Class CC
FEX	Dual Pole midget
FEY	Dual pole Class CC
FEBN	Single pole neutral

Load or Line Terminal Type							Option Description
Terminal End View	Terminal	Type	Wire	No. Per	Solid	Stranded	
	11	Cu Crimp	#8-#12 #12-#14	1 2	Yes Yes	Yes Yes	BA (breakaway version equipped with breakaway stud,breakaway boot, and insulating boots for both line and load sides)
	21	Cu Crimp	#10 #6 #4	2 1 1	Yes Yes Yes	Yes Yes No	
	31	Cu Crimp	#10 #4	2 1	Yes No	Yes Yes	
	41	Cu Crimp	#6 #2	2 1	Yes No	Yes Yes	
	81	Cu single Set Screw	#2–#12	1	Yes	Yes	
	91	Cu Double Set Screw	#2–#12	1 each	Yes	Yes	
	82	Al single Set Screw	#2–#12	1	Yes	Yes	
	92	Al double Set Screw	#2–#12	1 each	Yes	Yes	
	S	Cu Stud	N/A	1	N/A	N/A	

Notes:

1. Non-breakaway units do not include insulator boots. These optional cone shaped boots are available to provide a watertight installation. The insulator boots are designed to form a watertight seal over conductors, but due to varying wire insulation sizes it is suggested that tape wrap be utilized for best results.

FSB1 = Single conductor boot (used to cover all crimp type & single set screw terminals)

FSB2 = Double conductor boot (used to cover all double set screw (Y-type) terminals)

Insulator boot trimming instructions: Locate wire gage size to be utilized marking on the boot and cut just beneath it.

2. Tightening torque for single and double set screw terminations: 35 lbs.-in.
3. Tightening torque for dual pole fastening screw: 10-15 lbs.-in.
4. FEBN versions have a permanently mounted dummy fuse for neutral applications.

FEB,FEC,FEX,FEY 600 Volt In-Line Fuse Holders

Mersen In-Line Fuse Holder Family - Typical Combination Chart

Midget 10x38mm	Midget 10x38mm Breakaway	Class CC	Class CC Breakaway	Midget 10x38mm Dual Pole	Midget 10x38mm Dual Pole Breakaway	Class CC Dual Pole	Class CC Dual Pole Breakaway
FEB-11-11	FEB-11-11-BA	FEC-11-11	FEC-11-11-BA	FEX-11-11	FEX-11-11-BA	FEY-11-11	FEY-11-11-BA
FEB-11-21	FEB-11-21-BA	FEC-11-21	FEC-11-21-BA	FEX-11-21	FEX-11-21-BA	FEY-11-21	FEY-11-21-BA
FEB-11-31				FEX-11-31		FEY-11-31	
FEB-11-41	FEB-11-41-BA			FEX-11-41	FEX-11-41-BA	FEY-11-41	
	FEB-11-81-BA						
FEB-11-82	FEB-11-82-BA						
FEB-11-91	FEB-11-91-BA	FEC-11-91	FEC-11-91-BA				FEY-11-91-BA
FEB-11-92	FEB-11-92-BA						
FEB-11-S							
FEB-21-11							
FEB-21-21	FEB-21-21-BA	FEC-21-21	FEC-21-21-BA	FEX-21-21	FEX-21-21-BA	FEY-21-21	FEY-21-21-BA
FEB-21-91	FEB-21-91-BA						
FEB-31-31	FEB-31-31-BA						
FEB-41-41	FEB-41-41-BA						
FEB-81-81	FEB-81-81-BA	FEC-81-81	FEC-81-81-BA	FEX-81-81			FEY-81-81-BA
FEB-81-91	FEB-81-91-BA			FEX-81-91	FEX-81-91-BA	FEY-81-91	
FEB-81-S							
FEB-82-82	FEB-82-82-BA						
FEB-82-92	FEB-82-92-BA						
	FEB-91-91-BA				FEX-81-91-BA		
FEBN-11-11	FEBN-11-11-BA						
FEBN-11-91	FEBN-11-91-BA						
FEBN-81-81	FEBN-81-81-BA						
FEB-SS							
					FEX-81-91-BA		

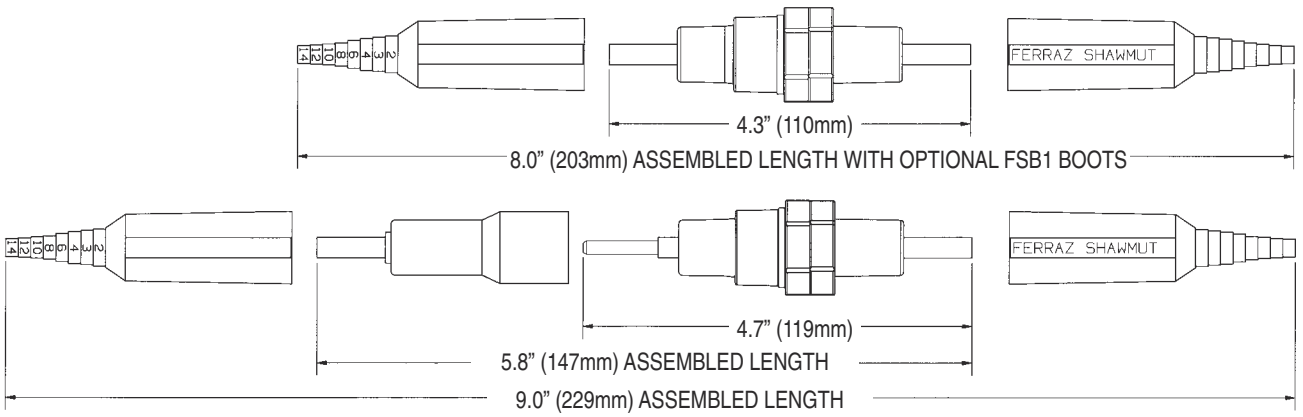
Note: Consult factory for other configurations.

Crimping Tools Reference Chart, the following crimping tools (or equivalent) are recommended:

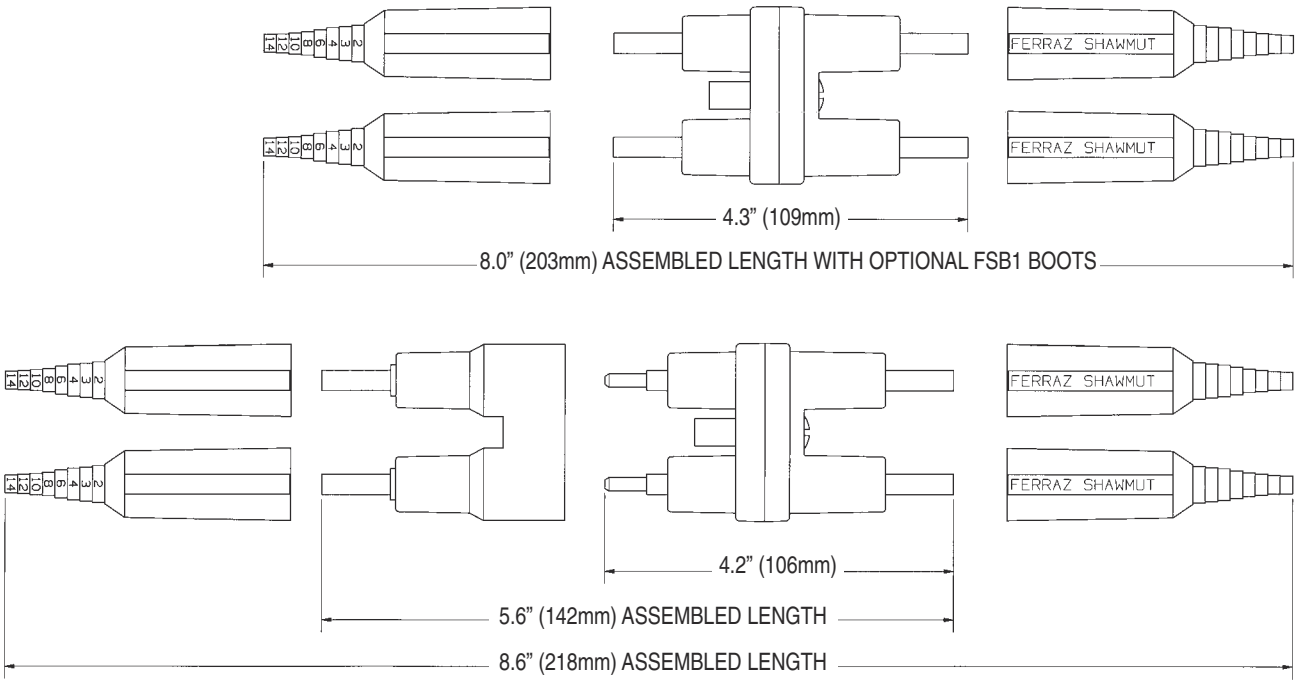
Terminal Type	FCI-Burndy	T&B
1	Y8MRB-1	WT-111M
2	Y2MR	TBM2/TBM5 BLUE DIE, WT-115-A DIE O
3	Y2MR	TBM2/TBM5 GREY DIE, WT-115-A DIE E
4	Y2MR	TBM2/TBM5 BROWN DIE, WT-115-A DIE F

FEB,FEC,FEX,FEY 600 Volt In-Line Fuse Holders

FEB and FEC, Non-Breakaway and Breakaway Assembly Drawings



FEX and FEY, Non-Breakaway and Breakaway Assembly Drawings



GPM SERIES Panel Mount Fuse Holders

Mersen GPM panel mount fuse holders are in sizes to accommodate Class CC and midget (1-1/2" x 13/32") fuses. All 30A holders have glass-filled thermoplastic insulators for extra dependability and trouble-free installation. Patented design allows same body to accept screw or bayonet knob. Flange design allows front or rear mounting.



Catalog Numbers & Descriptions

Catalog No.	Fig.	Cap Type	Amps	Volts	Fuse Type	Terminal Type
GPM-S	1	Screw Knob	30	600	1-1/2" x 13/32"	1/4" Quick-connect/ Solder
GPM-S90	2	Screw Knob	30	600	1-1/2" x 13/32"	1/4" Quick-connect/ Solder, Right Angle
GPM-SRR	1	Screw Knob	30	600	Class CC	1/4" Quick-connect/ Solder
GPM-SRR90	2	Screw Knob	30	600	Class CC	1/4" Quick-connect/ Solder, Right Angle
GPM-B	1	1/4 Turn Bayonet Knob	30	600	1-1/2" x 13/32"	1/4" Quick-connect/ Solder
GPM-B90	2	1/4 Turn Bayonet Knob	30	600	1-1/2" x 13/32"	1/4" Quick-connect/ Solder, Right Angle
GPM-BRR	1	1/4 Turn Bayonet Knob	30	600	Class CC	1/4" Quick-connect/ Solder
GPM-BRR90	2	1/4 Turn Bayonet Knob	30	600	Class CC	1/4" Quick-connect/ Solder, Right Angle
GPM-WT	1	Water-tight Screw Knob	30	600	1-1/2" x 13/32"	1/4" Quick-connect/ Solder
GPM-WT90	2	Water-tight Screw Knob	30	600	1-1/2" x 13/32"	1/4" Quick-connect/ Solder, Right Angle
GPM-WTR	1	Water-tight Screw Knob	30	600	Class CC	1/4" Quick-connect/ Solder
GPM-WTR90	2	Water-tight Screw Knob	30	600	Class CC	1/4" Quick-connect/ Solder, Right Angle

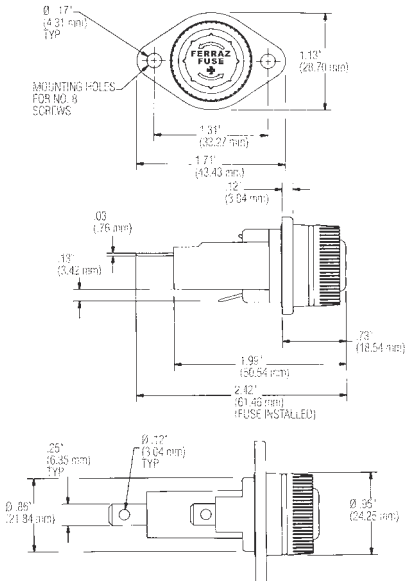


Figure 1

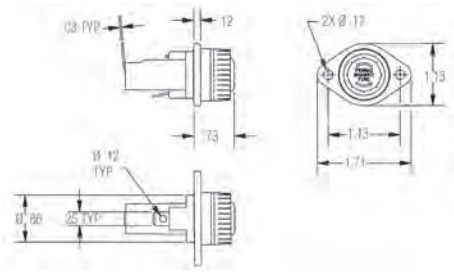


Figure 2

Ratings:

Volts : 600VAC / DC
Amps : 30A Maximum
SCCR : 200kA (Class CC Fuses)
: 100kA (Midget Fuses)

Approvals:

- UL Recognized, guide IZLT2, File E52283
- CSA Certified - C22.2, class 6225, File 32169

Recommended Fuse Usage:

GPM Fuse Holders will accommodate these Mersen fuses:
GPM-SRR, GPM-BRR, GPM-WTR: ATQR, ATDR, ATMR,
GPM-SRR90, GPM-BRR90, GPM-WTR90: ATQR, ATDR, ATMR,
GPM-S, GPM-B, GPM-WT: ATQ, ATM, TRM, OTM, GGU, A13X-2, A25Z-2, A60Q-2, A6Y-2B,
GPM-S90, GPM-B90, GPM-WT90: ATQ, ATM, TRM, OTM, GGU, A13X-2, A25Z-2, A60Q-2, A6Y-2B

GPM SERIES Panel Mount Fuse Holders

Mersen GPM panel mount fuse holders will accommodate 1” x 1-1/4” 3AG fuses and 5mm x 20mm fuses; most are approved by U.L. and CSA. Cap and body material is bakelite or polycarbonate and function as a screw-in or bayonet style closure. Finger-grip or screwdriver slots are available. All holders are rated for up to 250 volts with amp ratings ranging from 3A to 15A.

Catalog No.	Cap Type	Volts	Amps	Fuse Size	Terminal Type	Approvals
GPM-A	Finger-grip/Screw-in	250	10	5mm x 20mm	Solder	UR/CSA
GPM-A1	Finger-grip/Screw-in	250	10	5mm x 20mm	Solder	
GPM-A2	Finger-grip/Screw-in	250	10	5mm x 20mm	Solder	UR/CSA
GPM-A3	Finger-grip/Screw-in	250	3	5mm x 20mm	Solder	UR/CSA
GPM-A4	Finger-grip/Screw-in	250	6.3	5mm x 20mm	Solder, right angle	
GPM-A5	Screwdriver Slot	250	10	5mm x 20mm	Solder	
GPM-A6	Screwdriver Slot	250	6.3	5mm x 20mm	Solder, right angle	UR/CSA
GPM-A8	Screwdriver Slot	250	10	5mm x 20mm	Solder, right angle	UR/CSA
GPM-A9	Screwdriver Slot	250	6.3	5mm x 20mm	Solder, right angle	UR/CSA
GPM-A10	Screwdriver Slot	250	6.3	5mm x 20mm	3/16”Solder/QC	UR/CSA
GPM-A11	Screwdriver Slot	250	10	5mm x 20mm	Solder, right angle	UR/CSA

Recommended Fuse Usage:

GPM-A: GGM, GGA, GSB, GSC, GDG, GSD, GSF

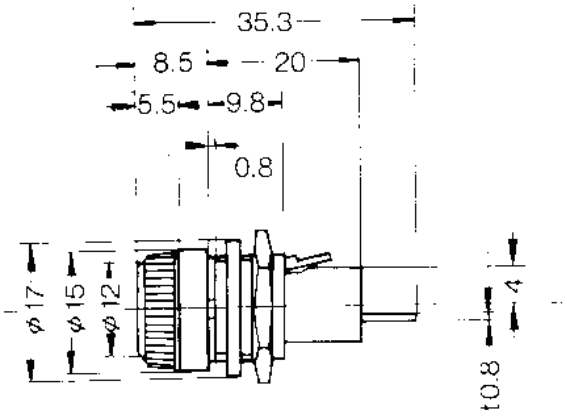
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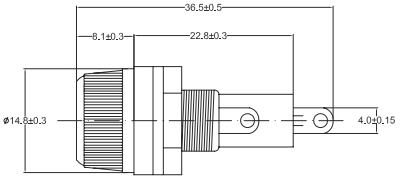
GPM-A

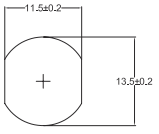


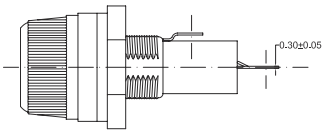
GPM-A1







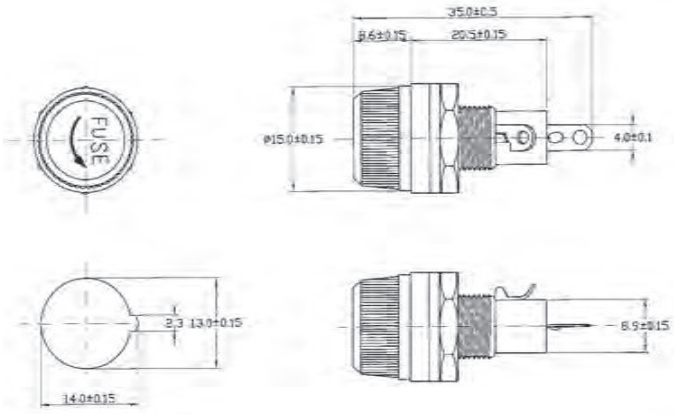




GPM SERIES Panel Mount Fuse Holders

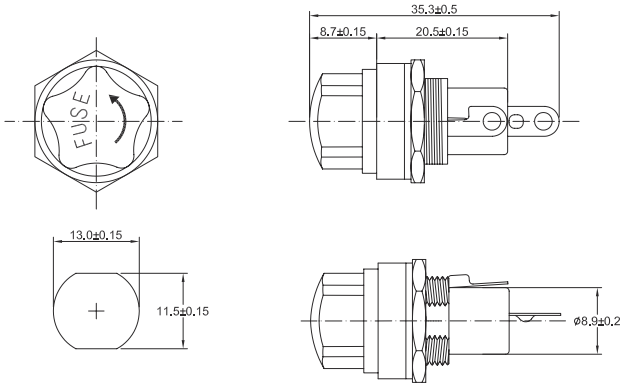


GPM-A2



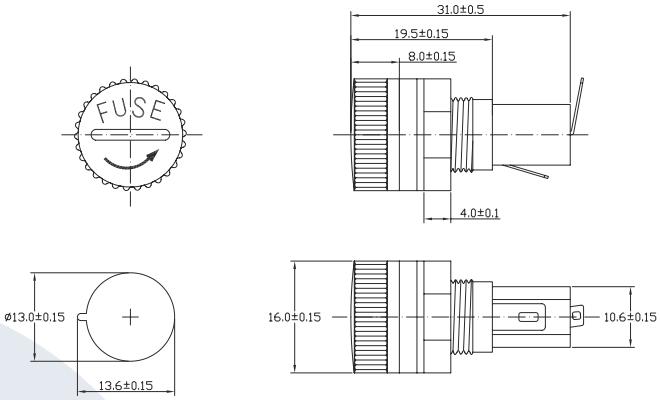


GPM-A3



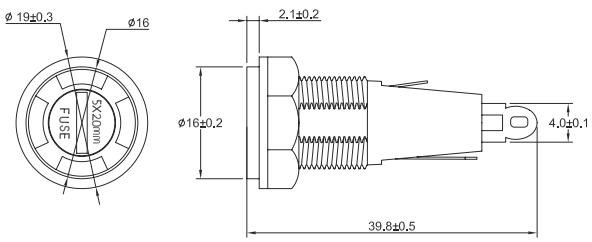


GPM-A4





GPM-A5

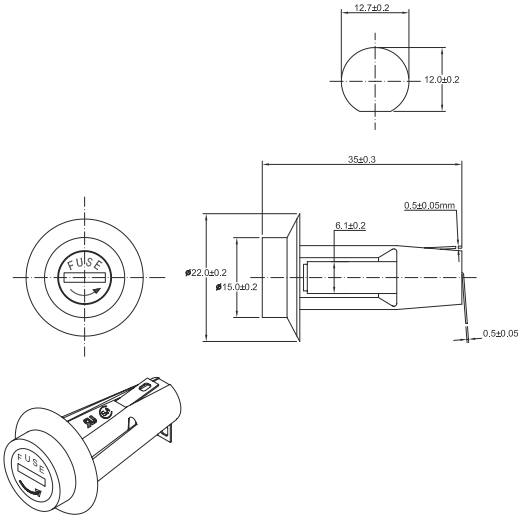


H

GPM SERIES Panel Mount Fuse Holders

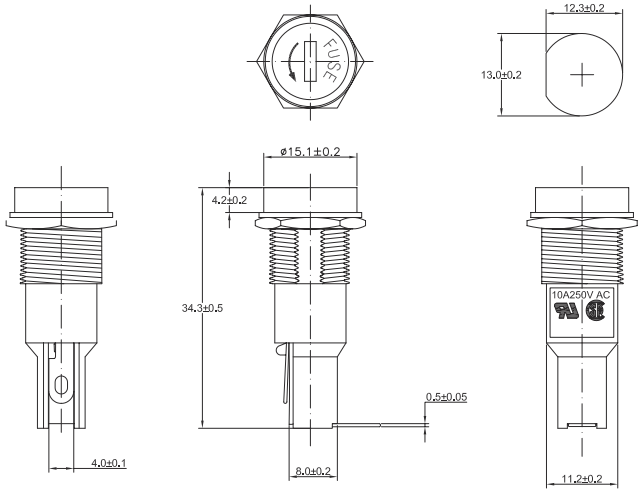


GPM-A6



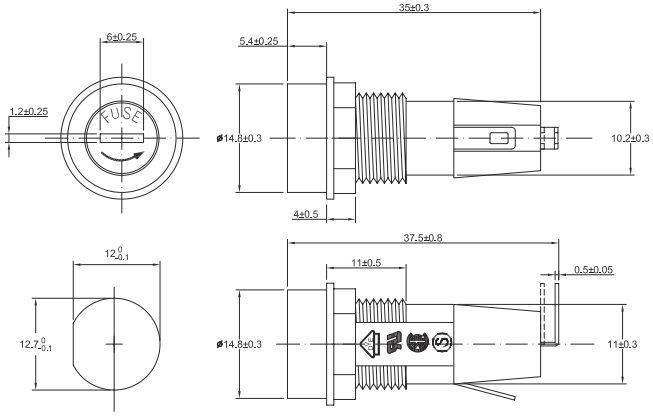


GPM-A8



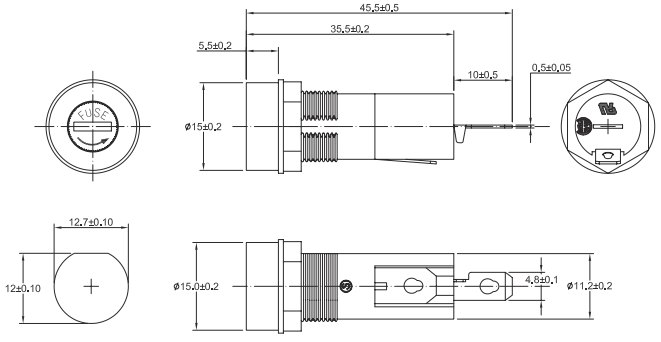


GPM-A9





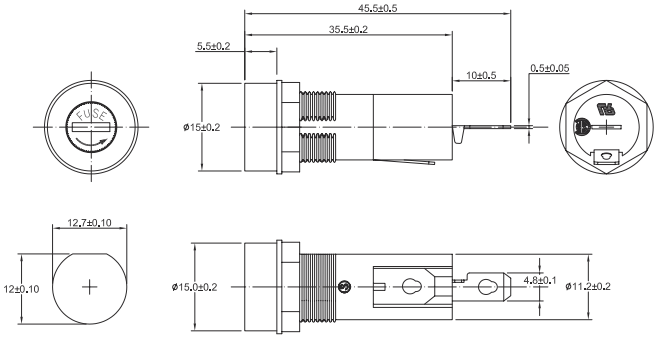
GPM-A10



GPM SERIES Panel Mount Fuse Holders



GPM-A11



Catalog No.	Cap Type	Volts	Amps	Fuse Size	Terminal Type	Approvals
GPM-G	Finger-grip/Screw-in	250	15	3AG	3/16" Solder/QC	UR/CSA
GPM-G1	Finger-grip/Screw-in	250	10	3AG	3/16" Solder/QC	UR/CSA
GPM-G2	Finger-grip/Screw-in	250	10	3AG	Solder	
GPM-G3	Screwdriver Slot	250	10	3AG	Solder	UR/CSA
GPM-G5	Finger-grip/Bayonet	250	10	3AG	1/4" Solder/QC	UR/CSA
GPM-G6	Finger-grip/Bayonet	250	10	3AG	Solder	UR/CSA
GPM-G7	Screwdriver Slot	250	15	3AG	3/16" Solder/QC	UR/CSA
GPM-G8	Finger-grip/Screw-in	250	15	3AG	Quick-connect	

H

Recommended Fuse Usage:

GPM-G: GGC, GDL, GSA, GAB

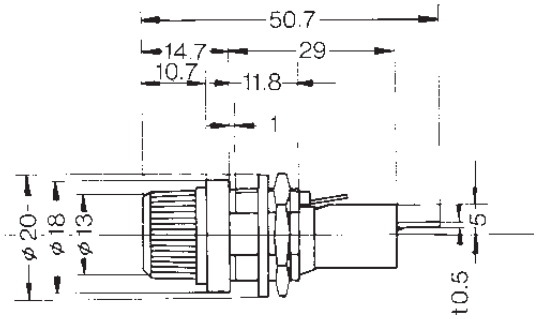
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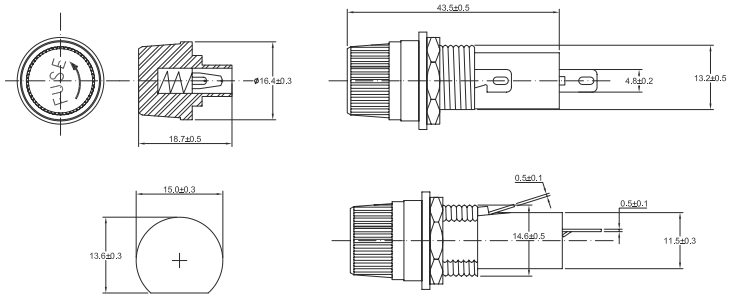


GPM-G



GPM-G1

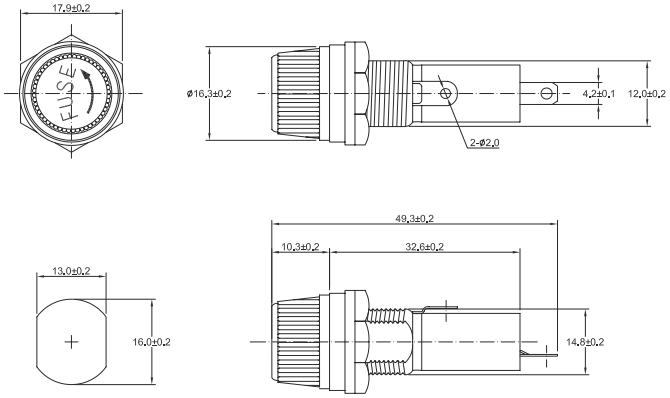




GPM SERIES Panel Mount Fuse Holders

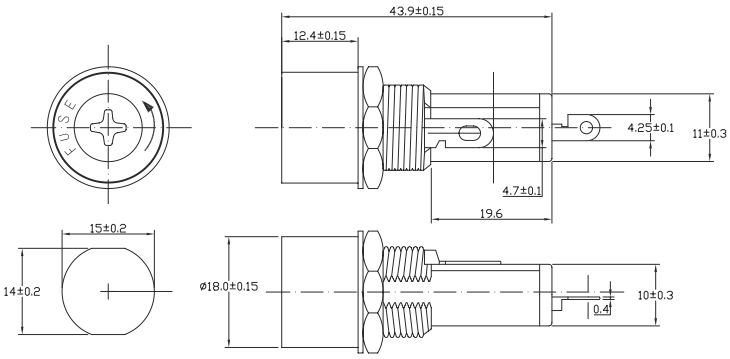


GPM-G2



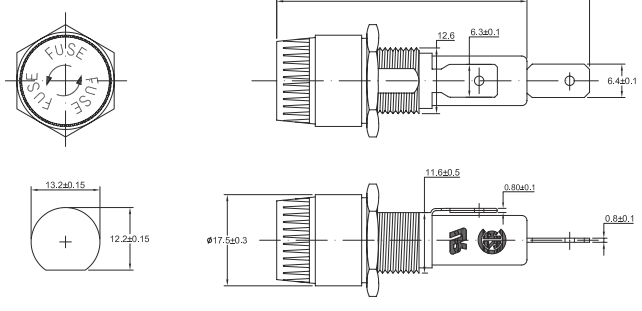


GPM-G3



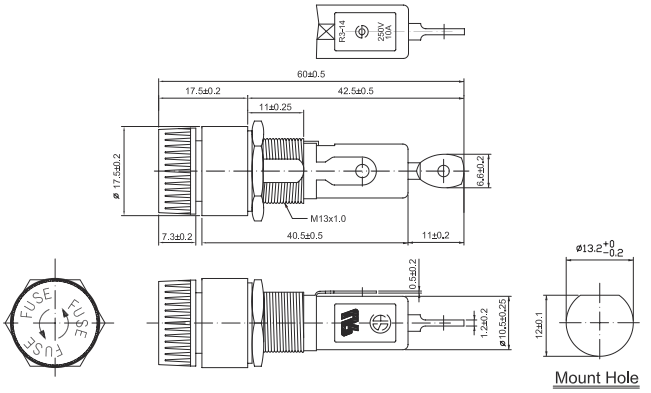


GPM-G5





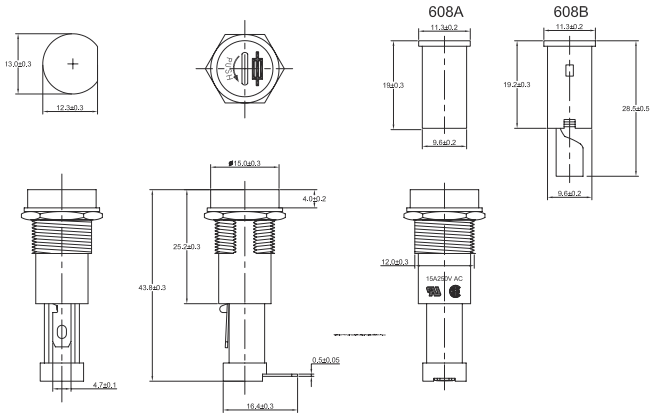
GPM-G6



GPM SERIES Panel Mount Fuse Holders

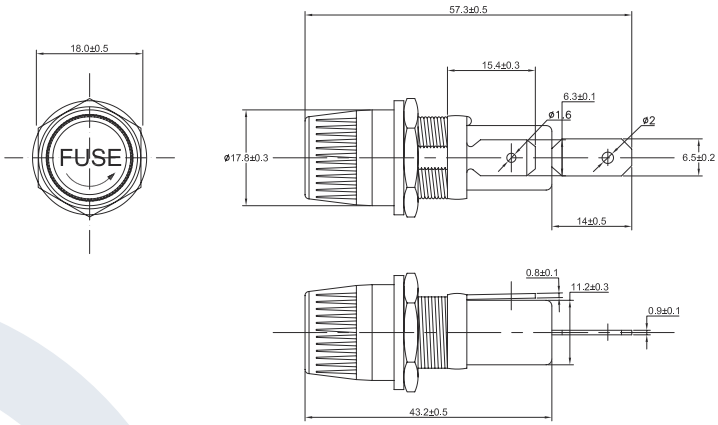


GPM-G7





GPM-G8



P243/P266/P292 Fuse Blocks

Fuse Blocks for Semiconductor Fuses

Mersen P243 and P266 series fuse blocks for Form 101 fuses are glass-filled polycarbonate or laminated phenolic insulator blocks with studs to accommodate bolt-in fuses. The P292 series has a laminated phenolic insulator base with fuse clips. All studs, clips and mounting hardware are tin or zinc plated.



Dimensions

For Use with	Amps	Catalog No.	Fig.	Dimensions - Inches A	B	C	D	E	F	Stud Size	Torque (in lbs)
A13X, A15QS	70-450	P243D	2	4.40	1.50	2.79	2.20	2.06	1.17	1/4-20	36
A13X, A15QS	500-600	P243G	2	4.40	1.50	2.79	2.20	2.44	0.98	5/16-18	84
A25X, A25Z, A30QS	35-60	P243G	2	4.40	1.50	2.79	2.20	2.44	0.98	5/16-18	84
A25X, A25Z, A30QS	70-200	P243	1	4.50	1.50	2.50	2.25	2.38	1.06	1/4-20	36
A25X, A25Z, A30QS	225-600	P243G	2	4.40	1.50	2.79	2.20	2.44	0.98	5/16-18	84
A50P	35-60	P243G	2	4.40	1.50	2.79	2.20	2.44	0.98	5/16-18	84
A50P, A50QS	70-200	P243E	2	4.40	1.50	2.79	2.20	2.88	0.76	1/4-20	36
A50P, A50QS	225-600	P266C	1	6.00	2.00	3.00	3.00	3.28	1.36	3/8-16	144
A60X, A60Z, A70QS-4	35-200	P243C	2	4.40	1.50	2.79	2.20	3.62	0.39	1/4-20	36
A60X, A60Z, A70QS-4	225-600	P266A	1	6.00	2.00	3.00	3.00	4.06	0.97	3/8-16	144
A70P, A70Q, A70QS-4	35-100	P243C	2	4.40	1.50	2.79	2.20	3.62	0.39	1/4-20	36
A70QS-4K	125-200	P266A	1	6.00	2.00	3.00	3.00	4.06	0.97	3/8-16	144
A70P, A70Q	125-400	P266A	1	6.00	2.00	3.00	3.00	4.06	0.97	3/8-16	144
A70P, A70Q, A70QS-4K	450-600	P266F	1	8.00	2.50	3.00	4.00	5.09	1.45	3/8-16	144
A100P	35-100	P266G	1	6.00	2.00	2.50	3.00	4.25	0.88	1/4-20	36
A100P	125-400	P266L	1	6.00	2.00	3.00	3.00	4.66	0.67	3/8-16	144
A120X	1-30	P292	3	-	-	-	-	-	-	-	-
A30QS	700-800	FH25F4	1	6.00	2.00	3.00	3.00	2.66	1.67	3/8-16	144
A50QS	700-800	FH50F4	1	8.00	2.50	3.00	4.00	4.21	1.84	1/2-13	360
A50QS	900-1000	FH50F5	1	8.00	2.50	3.00	4.50	4.97	1.50	1/2-13	360
A70QS-4K	450-600	FH70F3	1	8.00	2.50	3.00	4.00	5.09	1.91	1/2-13	360

Note: FH Blocks are 1" thick.

* Not UL or CSA Certified

Ratings:

Amps : 1 to 1000A

Clip Type : 1200VAC or less

Stud Type : 1000VAC or less

Approvals:

- UL Recognized Component guide IZLT2 File E52283
- CSA Certified C22.2, class 6225, File 32169

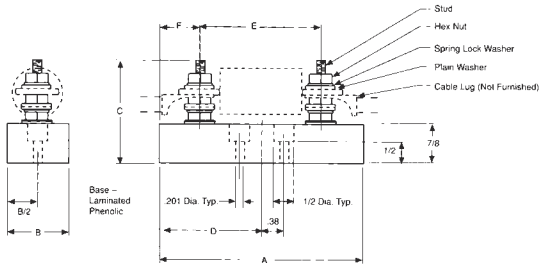


Figure 1

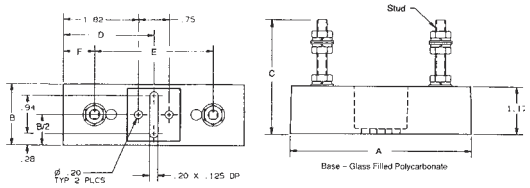


Figure 2

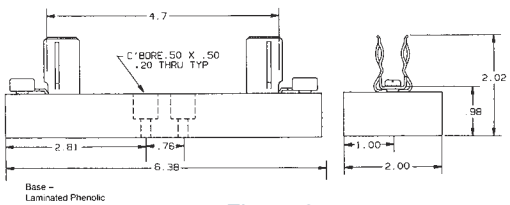


Figure 3

1SC/1MSC
Modular Semiconductor Fuse Blocks

Mersen 1SC and 1MSC semiconductor fuse blocks feature modular mounting that offers greater flexibility in adjusting to various fuse lengths. Both stud type and integral box connector versions are offered to allow for user preference of wire terminations. The integeral box connector versions also provide for greater heat dissipation. All modular blocks are sold in pairs but need to be ordered as two items to suit one fuse. Mounting hardware is supplied with the blocks.

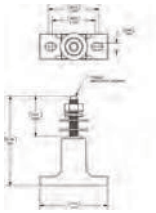


Figure 1

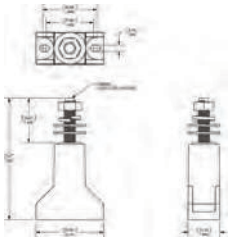


Figure 2

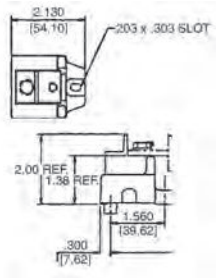


Figure 3

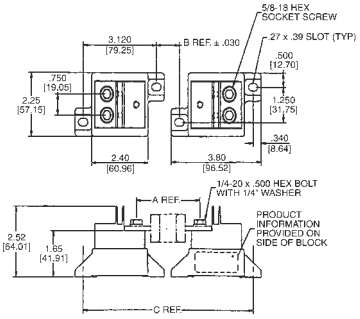


Figure 4

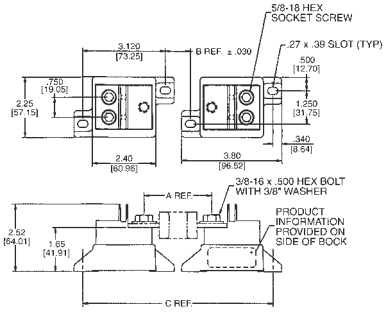


Figure 5

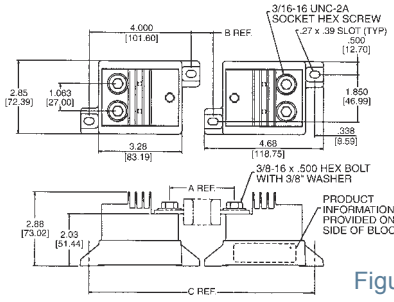
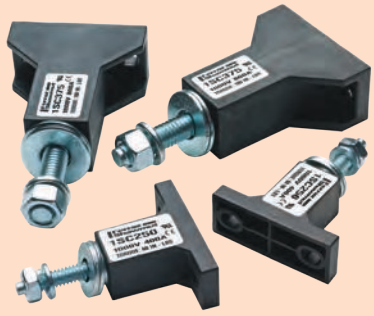


Figure 6



Ratings:

1SC

Volts : 1000V
Amps : 800A Maximum
SCCR : 200kA

1MSC

Volts : 600V
Amps : 600A Maximum
SCCR : 200kA

Approvals:

- UL Recognized Component
  File for 1SC: E52283
  File for 1MSC: E35113

Dimensions

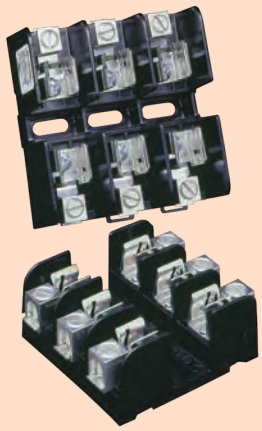
Catalog No.	Voltage Rating	Ampere Rating	UR	Connector		Hardware		Tightning Tourque (lb.-in.)		Fig.
				Type	Wire Range	Bolt	Washer	Fuse	Cable	
1SC250	1,000	400	Yes	1/4" Stud	—	—	—	61	61	1
1SC375	1,000	800	Yes	3/8" Stud	—	—	—	192	192	2
1MSC101	600	100	Yes	Al Box	Al/Cu 2/0 - #6	1/4"	0.655"	120	120	3
1MSC102	600	400	Yes	Al Box	Al/Cu (2) 250kcmil - #6	1/4"	0.655"	275	275	4
1MSC103	600	400	Yes	Al Box	Al/Cu (2) 250kcmil - #6	3/8"	0.900"	275	275	5
1MSC104	600	600	Yes	Al Box	Al/Cu (2) 250kcmil - #6	3/8"	0.900"	375	375	6
1SCM8	1,000	400	Yes	M8 Stud	—	—	—	60	60	1
1SCM10	1,000	800	Yes	M10 Stud	—	—	—	190	190	2

*Consult Factory

703,U705,U710
Semiconductor Fuse Holders

750V Semiconductor Fuse Holders

Mersen semiconductor fuse holders feature open face styles. Each version is rated 750 volts and accommodates 14 x 51 mm or 22 x 58 mm fuses. 703, U705 and U710 holders feature Mersen's unique adder-block design which can be snapped onto 1-, 2-, or 3-pole blocks to form multi-pole segmented blocks of as many poles as desired. A choice of box, screw or pressure plate connectors is offered to fit a wide range of standard or solid copper wire. All versions have verified dielectric strengths in excess of 2500V. A patented built-in DIN-rail adapter on the U710 blocks adds further design versatiltiy. All fuse clips are made of high conductivity tin-plated copper with spring reinforced clips.



Highlights:

- Thermoplastic bases
- DIN-rail (U710) or Screw Mount
- Adder block design

Applications:

- All circuits up to 750 volts using semiconductor fuses for protection of small inverters, UPS systems, motor drives, etc.

Recommended Fuse Usage:

703 use with 14x51mm A70QS, A70P, URD
U705 use with 14x51mm A70QS, A70P, URD
U710 use with 22x58mm A70QS, URD, up to 100A

Ratings:

Volts : 750V
Amps : 30A (703)
: 50A (U7050)
: 100A (U7100)
SCCR : 200kA dependent on fuse I.R.

Approvals:

- UL Recognized component guide IZLT2, File E52283
- CSA Certified class 6225, File 32169

703,U705,U710 Semiconductor Fuse Holders

750 Volt Fuse Holders for 14 x 51mm & 22 x 58 mm Fuses

Catalog No.	Fuse Size	Ampacity Rating	Poles	Connector Type	Connector Wire Range	Figure	Connector Torque (In-Lb)
U70505	14 x 51	50	Adder	Box	Al/Cu #2-14	1	35
U70506			1			2	
U70507			2			3	
U70508			3			4	
70315	14 x 51	30	Adder	Screw	Cu #10-14	1	20
70316			1			2	
70317			2			3	
70318			3			4	
70325	14 x 51	30	Adder	Pressure Plate	Cu #10-14	1	20
70326			1			2	
70327			2			3	
70328			3			4	
70355	14 x 51	30	Adder	Box	Cu* #4-14	1	35
70356			1			2	
70357			2			3	
70358			3			4	
U71005	22 x 58	100	Adder	Box	A1/Cu #2-14	5	35
U71006			1			6	
U71007			2			7	
U71008			3			8	

*Copper box connectors and clips-for copper wires only.

Note: To convert 30A adder pole to single pole, use end barrier #U09322 100A adder pole to single pole, use end barrier #U09372.

Recommended mounting screws; #10 (.190"dia)

Dimensions

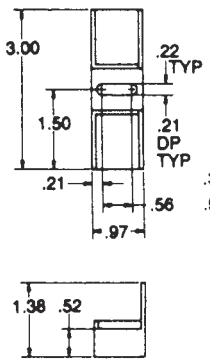


Figure 1

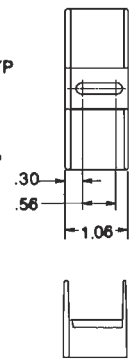


Figure 2

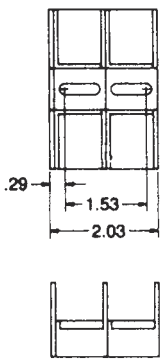


Figure 3

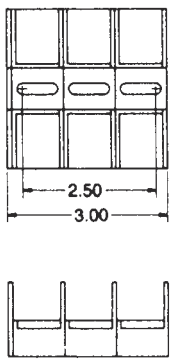


Figure 4

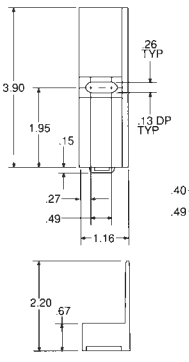


Figure 5

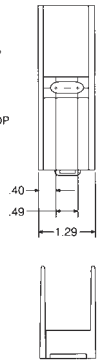


Figure 6

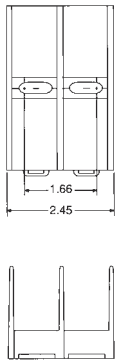


Figure 7

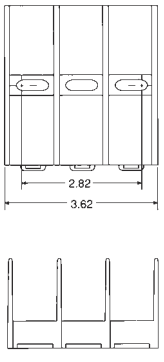


Figure 8

PS 20x127 Ferrule Fuse Holders and No-Load Disconnectors

Highlights:

- Solid assembly offers good thermal and mechanical withstand rating
- Fuse mounting in holders or no-load disconnectors with or without open fuse indicating microswitches
- Phenolic resin models for basic applications, fiber-glass polyester for applications in corrosive atmospheres or applications for traction
- Voltage = 1,500 V and 2,500 V



Ratings:

Volts : 1,500V
: 2,500V
SCCR : 42kA AC
: 55kA DC

Approvals:

- UL Recognized component
  File E113357

Dielectric withstand tests

	R.M.S. voltage 1 mn 50/60 Hz	Impulse voltage 1.2/50 s (IEC 694 et CEI 60)
Between close phases and phase and ground	6kV(1) - 10 kV(2)	12 kV(1) - 20 kV(2)
Between phases and microswitch	12 kV	

Connecting with 16mm² max. width, 5mm max. thick terminal

(1) Basic model
Max. temperature (°C)/ Relative humidity (%): 20 °C/95% - 40°C/80% - 50°C/50%
(2) Salt spray-proof model
Moist tropical and equatorial climate or corrosive atmosphere.

Dimensions

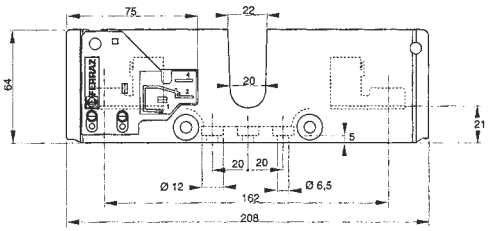
Description	Insulation voltage rating Ui AC 50/60 Hz or DC	Fuse current rating I_N(A)	Maximum operating current of fuse (A)					Advised copper wire size mm²	Fire and fumes class NF F 16-101 and 102 and UL
			1000 V gLB	=1000 V gRC	=1000 V gRB	=1500 V gRB	=1500 V gRD		
PSI 20X127	1500 V without terminal covers	50		50	No Operating Limit			10	basic model 12-F1 UL 94 V1
PSI 20X127 PRE	2500 V with terminal covers and only salt spray-proof model	63	80	56				16	salt spray-proof model I1 - F1 UL 94 VO
PSII 20X127 PRE		80	90					25	
PSIII 20X127 PRE		100	100					35	
PSIV 20X127 PRE		125						50	

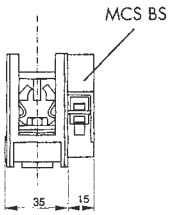
Connecting with 50 mm² max. cable with copper terminals or with a 15 x 8 max. rigid or flexible bar.

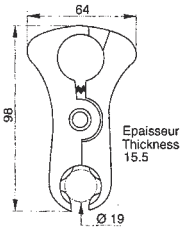
PS 20x127

Ferrule Fuse Holders and No-Load Disconnectors

Fuse Holders and Accessories



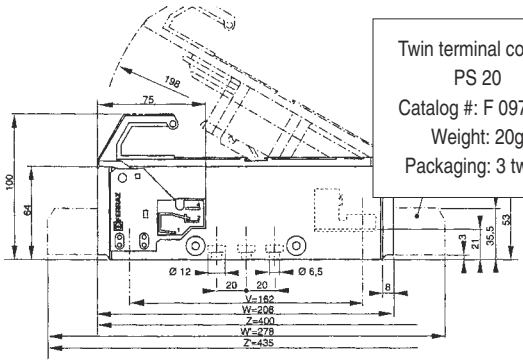




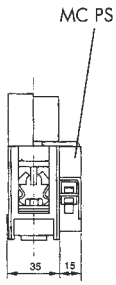
Description	Catalog No.	Weight (g)	Packaging
PSI 20x127	X 097310	260	3 pieces
PSI 20x127 + MCS BS	X 220130	290	2 pieces

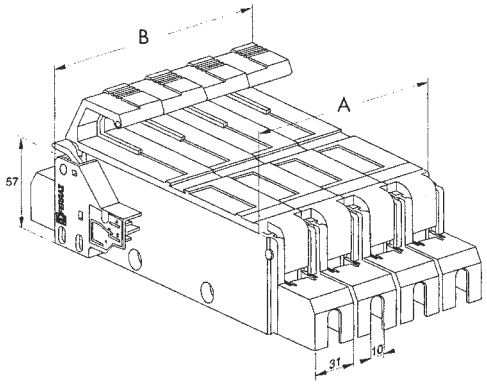
PMCP 20+22
Catalog #: K 100036
Weight: 40g
Packaging: 1

Fuse non-load Disconnectors and Accessories



Twin terminal covers
PS 20
Catalog #: F 097226
Weight: 20g
Packaging: 3 twins





V: Connecting distance between centers
W: Clip for rail mounting in two positions
W': With terminal cover length
Y: Space factor with a 90° fuse carrier position

Z: Without terminal cover, space factor with a 180° fuse carrier position
Z': With terminal cover, space factor with 180° fuse carrier position

Description (basic model)	Catalog No.
PSI 20x127 PRE	F 097203
PSII 20x127 PRE	G 097227
PSIII 20x127 PRE	H 097228
PSIV 20x127 PRE	J 097229
PSI 20 x 127 PRE+MC PS	H 097205
PSII 20 x 127 PRE+MC PS	D 097293
PSIII 20 x 127 PRE+MC PS	E 097294
PSIV 20 x 127 PRE+MC PS	F 097295

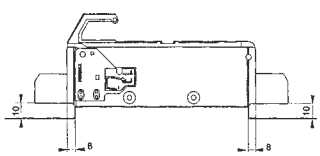
Description (salt spray-proof model)	Ref. No.
PSI 20x127 PRE BS	G 097204
PSII 20x127 PRE BS	L 097231
PSIII 20x127 PRE BS	T 097261
PSIV 20x127 PRE BS	C 097292
PSI 20 x 127 PRE BS+MC PS	J 097206
PSII 20 x 127 PRE BS+MC PS	G 097296
PSIII 20 x 127 PRE BS+MC PS	H 097297
PSIV 20 x 127 PRE BS+MC PS	J 097298

No. of Poles	A	B
1	35	50
2	69	84
3	103	118
4	137	152

Preisolating and blown fuse indicating microswitch features	
Microswitch rated current	Non-inductive circuit interrupting rating
3A - 50 Hz	3A - 50 Hz
3A - DC	3A - DC

Reliable minimum operating voltage/current:
10V - 10mA
Connecting with 6.35 mm lug

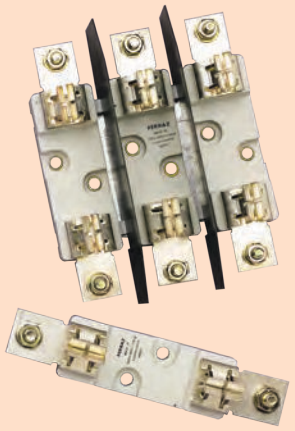
Distances when mounting on a conductive board @ Ui = 2500 VAC



NH DIMENSION Fuse Bases

690V Ceramic fuse bases for NH fuse-links

- Ceramic insulating bases
- Silver plated contacts
- High spring contact pressure
- Screw mounting



Single-Pole Fuse Bases

Size	Rated Current (A)	Catalog No.
00-E	160	40002-G
00-EB	160	40003-G
0-E	160	40004-G
0-P	160	40006-G
1-P	250	40008-G
2-P	400	40010-G
3-P	630	40012-G
4-P	1250	40014-G



40002-G



40006-G

Three-Pole Fuse Bases

Size	Rated Current (A)	Catalog No.
00-E	160	40502-G
00-EB	160	40503-G
0-E	160	40504-G
1-P	250	40508-G
2-P	400	40510-G
3-P	630	40512-G

Notes: Size 1 fuse base will accept size 0 fuses.
Size 2 fuse base will accept size 1 fuses.
Size 3 fuse base will accept size 1 & 2 fuses.
Size 4 has a special nut to assure contact pressure.
Types E and EP have square contacts
Types P and PP have pincer contacts
Type EB has pressure-plate cable connection.



40510-G

Ratings:

Volts : 690V AC
Amps : 160-1250A

Approvals:

Designed to meet standards:

- IEC 60269-2-1
- DIN, VDE 0636-21 & 201
- DIN 43621

Insulating Barriers for Ceramic NH Fuse Bases

Size	Rated Current (A)	Catalog No.
00	100	45102-G
0	160	45104-G
1-2	400	45110-G
3	630	45112-G

00	100	45202-G
0	160	45204-G
1-2	400	45210-G
3	630	45212-G
4	1250	45214-G



Friction Fit
45110-G



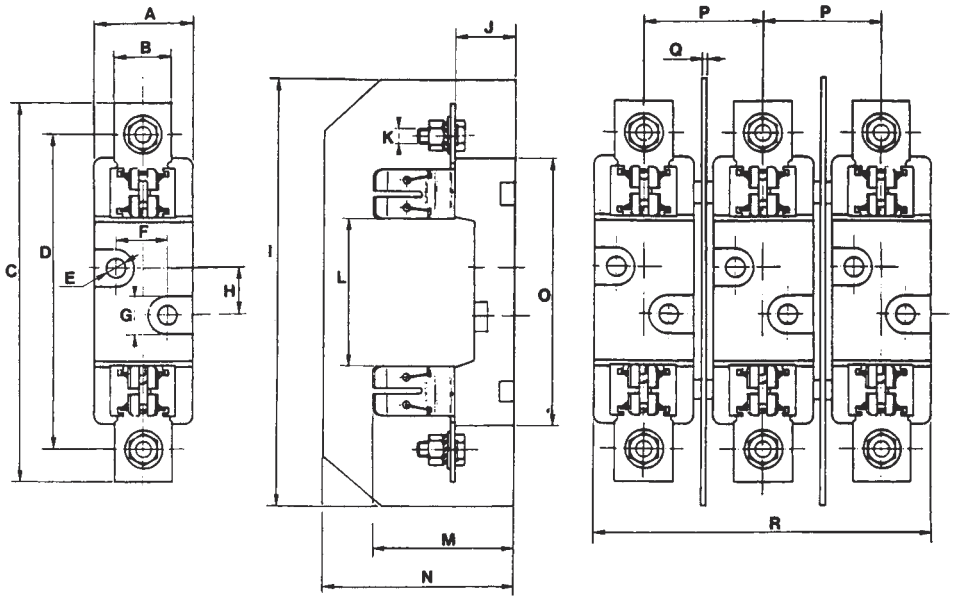
Tab Fastened
45212-G

NH DIMENSION Fuse Bases

Dimensions of Ceramic Fuse Bases for NH Fuse-Links

	00-E, EB	0-E	0-P	1-P	2-P	3-P	4-P
A	33	32	32	55	55	55	80
B	20	20	25	32	35	40	45
C	118.5	269	166	210	227	241	312
D	100	151	150	175	200	210	262
E*	8	8.5	8.5	11	11	11	11
F	-	-	-	30	30	30	45
G	14.5	14	14	22	22	22	-
H	25	25	25	25	25	25	30
I	145	185	185	250	250	250	-
J	21.5	29	29	35	35	35	45
K	8	8	8	10	10	12	16
L	55	72	74	84	84	84	111
M	52.5	60	60	71	89	103	145
N	80	85	85	100	100	127	-
O	84	120	120	148	148	148	192
P	34	47	47	62	69	82	-
Q	1	2	2	2	2	2	-
R	101	126	126	177	190	213	-

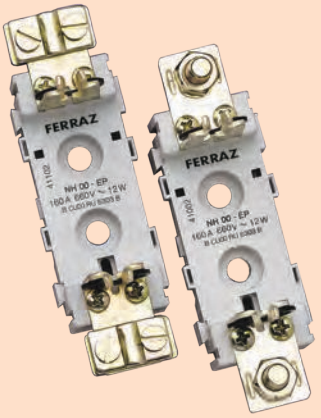
* 8mm for all multiple pole bases; dimensions in chart for single pole bases.



NH DIMENSION Fuse Bases

690V POLYESTER fuse bases for NH fuse-links

- Polyester insulating bases
- Silver plated contacts
- High pressure spring contacts
- Screw or rail mount



Type 00-EP* – Fuse Bases for NH-00 Fuse-Links

Poles	Catalog No.			
	Screw Connector		Pressure Plate Connector	
	Screw Mt.	Rail Mt.	Screw Mt.	Rail Mt.
1	41002-G	42002-G	41102-G	42102-G
2	41012-G	42012-G	41112-G	42112-G
3	41016-G	42016-G	41114-G	42114-G
4	41019-G	42019-G	41119-G	42119-G

* EP bases have square contacts.



41002-G



41014-G

Connection Detail



Screw



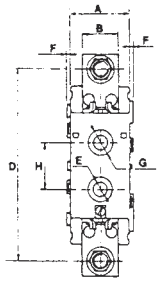
Clamp

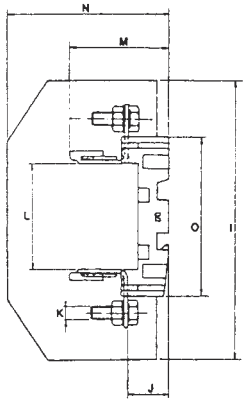
Ratings:

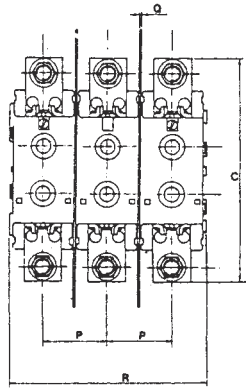
Volts : 690VAC
Amps : 160 to 1250A

Dimensions

	00-EP
A	32
B	20
C	117
D	100
E	8
F	2
G	14
H	25
I	145
J	21.5
K	8
L	56
M	52
N	85
0	84
P	34
Q	1
R	104







Approvals:

Designed to meet standards:

- IEC 60269-2-1
- DIN, VDE 0636-21 & 201
- DIN 43620

NH DIMENSION Fuse Bases

Type 0-EP* – Fuse Bases for NH-0 Fuse-Links

Poles	Catalog No. Mounting Style	
	Screw	DIN-Rail
1	41202-G	42202-G
2	41212-G	42212-G
3	41214-G	42214-G
4	41219-G	42219-G

* EP bases have square contacts. PP bases have pincer contacts.


42202-G


41412-G


41514-G

Type 0-PP – Fuse Bases for NH-0 Fuse-Links

1	41302-G	42302-G
2	41312-G	42312-G
3	41314-G	42314-G
4	41319-G	42319-G

Type 2-PP – Fuse Bases for NH-2 Fuse-Links

1	41502-G	42502-G
2	41512-G	42512-G
3	41514-G	42514-G
4	41519-G	42519-G

Type 1-PP – Fuse Bases for NH-1 Fuse-Links

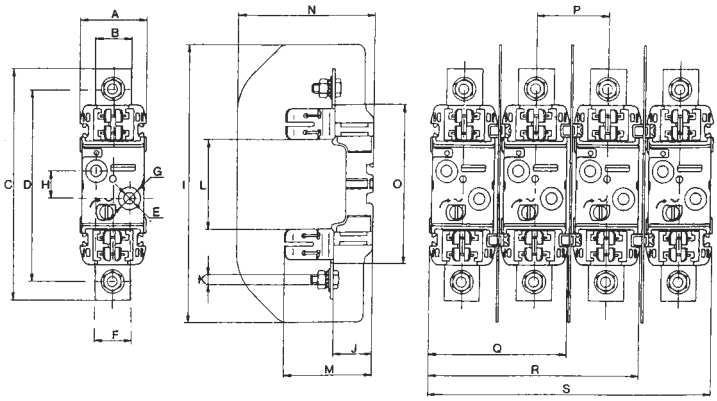
1	41402-G	42402-G
2	41412-G	42412-G
3	41414-G	42414-G
4	41419-G	42419-G

Type 3-PP – Fuse Bases for NH-3 Fuse-Links

1	41602-G	42602-G
2	41612-G	42612-G
3	41614-G	42614-G
4	41619-G	42619-G

Dimensions of Polyester Fuse Bases for NH Fuse-Links

	0-EP	O-PP	1-PP	2-PP	3-PP
A	46	46	60	60	60
B	20	25	32	35	40
C	168	168	209	225	241
D	150.5	150.5	176	201	210
E	7.5	7.5	10.5	10.5	10.5
F	-	-	30	30	30
G	14.5	14.5	20.5	20.5	20.5
H	25	25	25	25	25
I	185	185	250	250	270
J	29	29	35	35	35
K	M8	M8	M10	M10	M12
L	74	75	81	81	81
M	59	61	71	89	103
N	95	95	122.5	122.5	142.5
O	122	122	146	146	146
P	48.5	48.5	65.5	65.5	81.5
Q	94	94	125.5	125.5	141.5
R	142	142	191	191	223
S	190	190	256.5	256.5	304.5



For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

NH DIMENSION Fuse Bases

Insulating Barriers for Polyester NH Fuse Bases

Size	Rated Current (A)	Catalog No.	Standard Pack
00	100	44502-G	2
0	160	44504-G	2
1-2	400	44510-G	2
3	630	44512-G	2



44502-G



44510-G

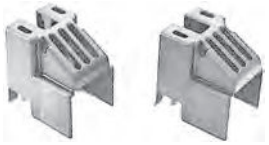
*Not for use with 41016-G and 42016-G. Use 84392-G.

Separators

0	160	44604-G	2
1-2	400	44610-G	2
3	630	44612-G	2
3	630	44512-G	2



44610-G



44702-G

Fuse Shields

00	100	44802-G	3
0	160	44804-G	3
1-2	400	44810-G	3
3	630	44512-G	2

44802-G

Terminal Shields

00	100	44702-G	6
0	160	44704-G	6
1-2	400	44710-G	6

One Cable – Terminal for NH Bases

Base Size	Cable Size (mm)		Catalog Number	Standard Pack
	Max.	Min.		
00	50	6	45421-G	60
00-0	95	10	45423-G	50
1	150	16	45425-G	30
2-3	240	50	45427-G	15



45425-G

Two Cable – Terminal for NH Bases

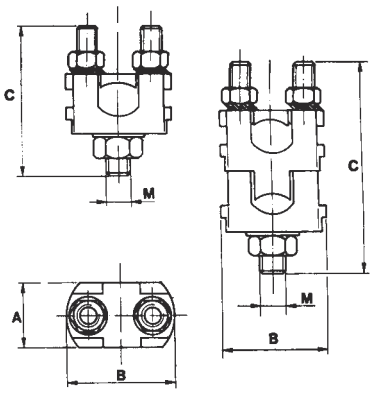
Base Size	Cable 1 (Size mm)		Cable 2 (Size mm)		Catalog Number	Standard Pack
	Max.	Min.	Max.	Min.		
00	50	6	50	6	45431-G	60
00-0	95	10	95	10	45433-G	30
1	150	25	150	16	45435-G	20
2-3	240	95	240	50	45437-G	5



45435-G

Dimensions of Terminals

Catalog No.	A	B	C	M
45421-G	18	26	34	6
45423-G	24	35	52	8
45425-G	26	41	58	10
45427-G	36	53	68	12
45431-G	18	26	39	6
45433-G	24	35	82	8
45435-G	26	41	84	10
45437-G	36	53	98	12



DFC SERIES Dead-Front Fuse Covers

Mersen DFC dead-front fuse covers snap on to individual fuses installed in fuse blocks, covering exposed live clips and terminals and reducing accidental contact by personnel. They are sized to fit Class G, H, J, K, R, CC or midget fuses for increased safety and (optional) open-fuse indication. All DFC dead-front fuse covers are reusable when a fuse is replaced – simply detach from the open fuse and re-attach to the new replacement fuse. On indicator models an orange indicator light will illuminate to indicate an open fuse. DFC fuse cover ends can be easily cut to accommodate existing wiring, safety switches or special installations. A blank label is provided with each DFC to write in circuit or fuse information.



Features/Benefits:

- Innovative design provides dead-front electrical safety to personnel
- Optional orange indicator light shows open fuse
- Many sizes to fit virtually all popular fuses/fuse blocks
- Reusable with no changes or additional cost
- Labels provided for write-in identification
- Thermoplastic flammability rating of UL 94-V2
- Low leakage current <0.6 mA at 600V

Ratings:

Non-Indicating

Volts : 0 to 600VAC / DC

Amps : Fits fuses rated 0 to 200A

Indicating

Volts : 90 to 600VAC
: 115 to 600VDC

Amps : Fits fuses rated 0 to 200A

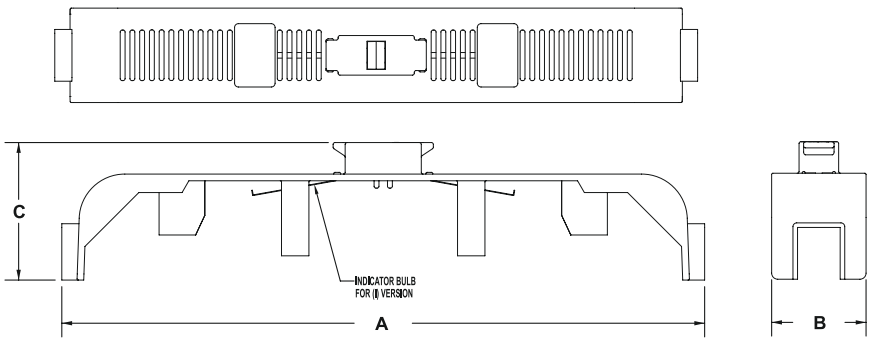
Approvals:

- UL Listed (All except midget size) guide JDVS, File E90426
- UL Recognized Component (midget) guide JDVS2, File E90426
- CSA Certified class 6228, File 70159

Catalog Numbers & Dimensions

Catalog Numbers		Fuses Accomodated			Dimensions (inches)		
Non-indicating	indicating	Amps	Volts	Class	A	B	C
DFC-1	DFC-1I	0-30	600	J	4.68	1.36	1.97
DFC-2	DFC-2I	0-30	600	R, K, H	7.45	1.35	1.80
DFC-3	DFC-3I	65-100	600	J	7.57	1.30	2.20
DFC-4	DFC-4I	65-100	250	R, K, H	8.73	1.40	2.02
DFC-5	DFC-5I	35-60	600	R, K, H	7.46	1.35	2.00
DFC-6	DFC-6I	35-60	600	J	4.64	1.40	2.17
DFC-7	DFC-7I	0-30	600	Midget, CC, G	3.71	0.69	1.37
DFC-8	DFC-8I	65-100	600	R, K, H	10.55	1.55	2.26
DFC-9	DFC-9I	0-30	250	R, K, H	3.71	0.85	1.55
DFC-10	DFC-10I	0-30	600	SJ	4.56	1.06	2.02
DFC-11	DFC-11I	65-100	600	SJ	5.52	1.7	2.04
DFC-12	DFC-12I	200	600	J	6.63	3.03	2.86

WARNING: To avoid electrical shock, TURN POWER OFF before installing, removing or servicing.



DFC SERIES Dead-Front Fuse Covers

Fuses and Fuse Blocks for use with DFC

Fuse	Fuse Block	DFC	Fuse	Fuse Block	DFC
AG(0-30)	40xxxG	-7I, -7	A6K(35-60)R	606xxR	-5I, -5
AJT(1-30)	603xxJ	-1I, -1	A6K(70-100)R	610xxR	-8I, -8
AJT(1-30)	603xxSJ	10I, -10	A6Y(0-30)-2B	303xx	-7I, -7
AJT(35-60)	606xxJ	-6I, -6	A60Q(0-30)-2	303xx	-7I, -7
AJT(70-100)	610xxJ	-3I, -3	A60X(0-30)-1	603xx	-1I, -1
AJT(70-100)	6100xxSJ	-11I, -11	A70P(10-30)-1	203xx	-9I, -9
AJT(110-200)	620xxJ	-12I, -12	GFN(0-30)	303xx	-7I, -7
ATDR(0-30)	303xxR	-7I, -7	GGU(0-30)	303xx	-7I, -7
ATM(0-30)	303xx	-7I, -7	HSJ(15-30)	603xxSJ	-10I, -10
ATMR(0-30)	303xxR	-7I, -7	HSJ(70-100)	6100xxSJ	-11I, -11
ATQ(0-30)	303xx	-7I, -7	HSJ(110-200)	620xxJ	-12I, -12
ATQR(0-30)	303xxR	-7I, -7	OT(0-30)	203xx	-9I, -9
A13X(1-30)-2	303xx	-7I, -7	OT(35-60)	206xx	
A2D(0-30)R	203xxR	-9I, -9	OT(65-100)	210xx	-4I, -4
A2D(35-60)R	206xxR		OTM(0-30)	303xx	-7I, -7
A2D(65-100)R	210xxR	-4I, -4	OTS(0-30)	603xx	-2I, -2
A2K(0-30)R	203xxR	-9I, -9	OTS(35-60)	606xx	-5I, -5
A2K(35-60)R	206xxR		OTS(65-100)	610xx	-8I, -8
A2K(70-100)R	210xxR	-4I, -4	RF(0-30)	203xx	-9I, -9
A2Y(0-30)	203xx	-9I, -9	RF(35-60)	206xx	
A2Y(35-60)	206xx		RF(65-100)	210xx	-4I, -4
A2Y(70-100)	210xx	-4I, -4	RFS(0-30)	603xx	-2I, -2
A25X(1-30)-1	203xx	-9I, -9	RFS(35-60)	606xx	-5I, -5
A25Z(1-30)-2	303xx	-7I, -7	RFS(65-100)	610xx	-8I, -8
A4J(1-30)	603xxJ	-1I, -1	TR(0-30)R	203xx	-9I, -9
A4J(1-30)	603xxSJ	-10I, -10	TR(35-60)R	206xx	
A4J(35-60)	606xxJ	-6I, -6	TR(70-100)R	210xx	-4I, -4
A4J(70-100)	610xxJ	-3I, -3	TRM(0-30)	303xx	-7I, -7
A4J(70-100)	6100xxSJ	-11I, -11	TRS(0-30)R	603xxR	-2I, -2
A4J(110-200)	620xxJ	-12I, -12	TRS(35-60)R	606xxR	-5I, -5
A50P(10-30)	203xx	-9I, -9	TRS(65-100)R	610xxR	-8I, -8
A6D(0-30)R	603xxR	-2I, -2	TRS(35-60)RDC	606xxR	-5I, -5
A6D(35-60)R	606xxR	-5I, -5	TRS(70-100)RDC	610xxR	-8I, -8
A6D(70-100)R	610xxR	-8I, -8			
A6K(0-30)R	603xxR	-2I, -2			

Note: DFC Covers fit single pole blocks and each pole of multi-pole blocks. Consult factory for data sheets of DFC trim instructions for safety switches.

WARNING: To avoid electrical shock, TURN POWER OFF before installing, removing or servicing.

Power Distribution Blocks

A powerful way to manage your power distribution challenges.



Your problem: You're facing the enormously complex wiring requirements of an automated manufacturing facility. Or the compatibility problems of a commercial complex retrofit. Or the need for seamless electrical service in a hospital annex that's anything but seamless. Where can you turn to solve your power distribution problems?

Our solution: Well beyond circuit protection solutions. Mersen offers you an arsenal of circuit management products. One of which is our line of polycarbonate 600V / 90 to 1520A Power Distribution Blocks. Safe and convenient, durable and easy to install, they're the simple way to split primary power circuits into secondary circuits — or provide fixed-junction tap-off points. Either way, our full range of sizes accommodate any gauge aluminum or copper conductor. Exclusive adder poles snap onto the 1, 2, or 3-pole blocks for maximum pole flexibility . . . and safety covers are available.

Want more information fast? For more technical or application-specific information, please call our Power Distribution Block experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

I Power Distribution Blocks

- Finger-Safe / FSPDB Series I2
- Open Style 62000-69000 .....I4
- 62000-63000 Mini Series I5
- 66000-67000 Intermediate Series.....I6
- 68000-69000 Large Series.....I8

FERRAZ SHAWMUT IS NOW MERSEN

MERSEN

DFC3M/DFC3LP/DRM
Fuse Block Accessories

DFC3M safety puller protects personnel, covers live parts

The DFC3M safety puller is intended to hold and safely enclose 1-1/2” x 13/32” midget or Class CC fuses for insertion or removal from fuse clips, making fuse installation easy and safe without the use of a standard fuse puller. The DFC3M is made of clear polycarbonate, so the fuse can be identified when installed in a 303 series fuse block.



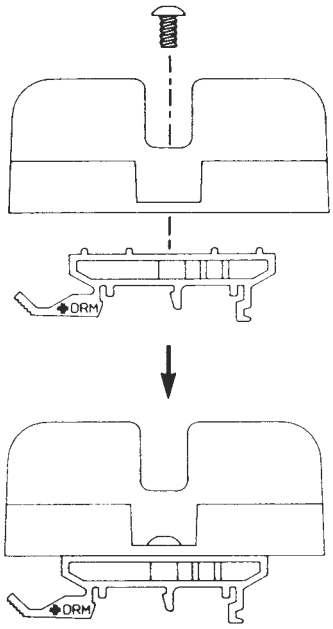
DFC3LP safety puller holds fuse, protects personnel, and saves space

The DFC3LP holds and safely encloses 1-1/2” x 13/32” midget or class CC fuse, similar to the DFC3M, but with a lower profile in height so it takes less room where space is restricted. The DFC3LP is made of clear polycarbonate so the fuse can be seen after installation in a fuse block such as the Mersen 303 series.



DRM adapts 303 series midget and class CC fuse blocks to DIN-rail

The DIN-rail adapter, DRM, provides quick mounting for all Mersen 303 series midget and class CC fuse blocks to all symmetrical 35mm DIN or asymmetrical 32mm “G” rail. A DRM adapter is attached to each pole with the screw provided. The DRM is molded of black polycarbonate and is mounted or dismounted from the rail simply by depressing the finger pull.



FUSE CLIPS

For Ferrule Fuses/PC Board Mount

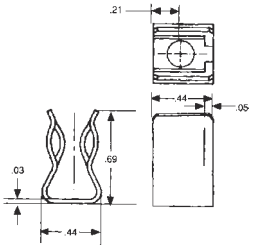
30A & 60A Ferrule - Fuse Clips



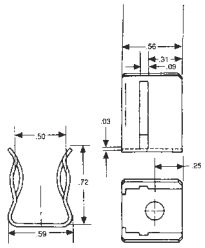
Fuse Clips for 30 & 60 Ampere Ferrule-type Fuses

Cat. No.	For Fuse Rating/Size			Mounting Details	
	Volts	Amps (max)	Ferrule Dia.	Hole Size	Screw Size
C08915P	600	30	13/32"	.72 dia.	#8
C08919P	600	30	13/32"	.196 dia.	#10
C08916P	250	30	9/16"	.172 dia.	#8
C08917P	250	60	13/16"	.22 X .30"	#10
	600	30	13/16"	.22 X .30"	#10
C08918P	600	60	1-1/16"	.22 X .30"	#10

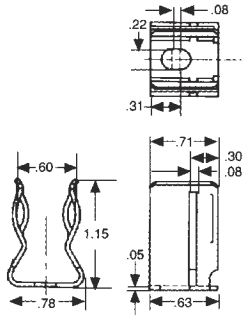
All clips are UL recognized: guide IZLT2, file E52283
All clips are tin-plated copper alloy, non-spring reinforced.



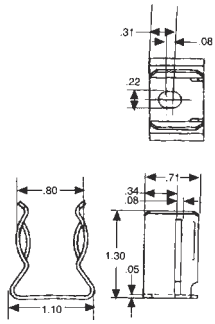
CO8915P
CO8919P



CO8916P



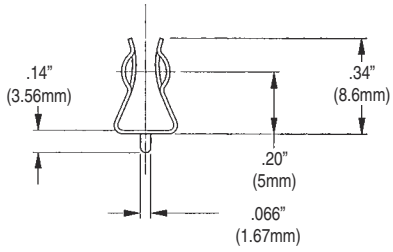
CO8917P

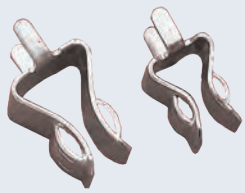


CO8918P

SDC5 PC BOARD clips

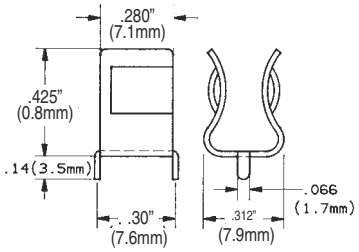
- PC board mount fuse clip
- For 5mm diameter fuses
- Tin plated hard brass





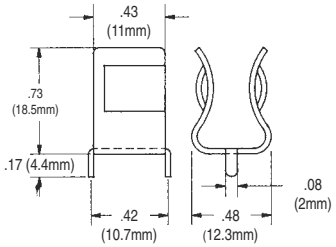
SDC6 PC BOARD clips

- PC board mount fuse clip
- For 1/4" diameter fuses
- Tin plated hard brass



SDC7 PC BOARD clips

- PC board mount fuse clip
- For 13/32" diameter fuses
- Tin plated hard brass



FSPDB Finger-Safe Power Distribution Blocks

Safety evolving

Mersen FSPDBs introduce a new level of safety and ease for installing power distribution blocks. An IP20 level of finger-safe protection is achieved using FSPDBs, eliminating the need for special covers or custom Plexiglas sheets to protect your panels. FSPDBs (sizes 1 to 4) simply snap onto 35mm DIN rail to provide the quickest installation. Modular design also allows for multi pole applications by use of assembly pins. FSPDBs provide a safe, convenient way of splicing cables, splitting primary power into a variety of secondary circuits or providing a fixed junction tap-off point.

Features/Benefits:

- **Finger-safe protection**
  Fully insulated block ensures touch safe isolation of live parts. Recessed termination screws and wire openings provide IP20 grade protection and qualify as “finger-safe” per IEC 529.
- **Compact modularity**
  Single or multiple pole configurations in the most compact footprint. Allows users to build smaller or higher density panels.
- **Snap on DIN-rail mounting**
  Sizes 1 to 4 feature integral DIN rail adaptors allowing for quick and easy installations on 35mm DIN rail yielding lower installed costs.
- **Captive termination screws**
  Unique channel design ensures captive metric wire termination screws. Screws can never be lost.
- **Available accessories**
  For multi-pole panel mounting, simply snap in pins for rigid fit. Cap plugs provide the ability to maintain touch safety on unused openings. Circuit identification markers simply snap into blocks to ID circuits. End anchors provide rigid end stops.
- **Multiple wire ratings**
  Provide users more versatility by offering capability of using multiple conductors in #2 and 2/0 openings.
- **AC & DC ratings**
  FSPDB1, 2, and 3 have been evaluated for use at 1000V (AC or DC) provided they are installed on DIN-rails only and with barriers between poles of opposite polarity of sufficient size to maintain required spacings.



Ratings:

Volts : 600V
Amps: : 175 to 840A
SCCR : 100kA with proper fuse.

Contact Technical Services for instruction sheet and/or DC Ratings.

Approvals:

- UL Recognized Component Guide XCFR2, File E73571
- CSA Certified: Class 6228, File 69363

FSPDB Finger-Safe Power Distribution Blocks

Catalog Numbers

Catalog Number		Ampere Rating (Based on NEC Table 310-16 for 75° C Cu wire only)	Line			Load			
			Wire Range			Wire Range			
Aluminum (Connector rated for 90° C Cu/AL wire)	Copper (Connector rated for 75° C Cu wire only)		AWG/	mm2	Openings	AWG/ kcmil	mm2	Openings Per Pole	Short Circuit Current Rating
FSPDB1A	FSPDB1C	175	2/0-#14	70-2.5	1	2/0-#14	70-2.5	1	100kA•
FSPDB2A	FSPDB2C	175	2/0-#14	70-2.5	1	#2-#14	35-2.5	4	100kA•
FSPDB3A	FSPDB3C	310	350-#6 2/0-#14	185-16 70-2.5	1	#8-#14	8-2.5	8	100kA•
FSPDB4A	FSPDB4C	335	400-#6	185-16	1	400-#6	185-16	1	100kA•
FSPDB5A	FSPDB5C	840	600-#4	300-25	2	600-#4	300-25	2	100kA•

•Contact Mersen Technical Services at technicalservices.nby@mersen.com for fuse type and maximum ampere required.

Multiple Wire Ratings (Same Size & Type Wires Only)			
2/0 Openings		#2 Openings	
(2) #4 AWG	(2) #10 AWG	(2) #6 AWG	(2-4) #12 AWG
(2) #6 AWG	(2) #12 AWG	(2) #8 AWG	(2-4) #14 AWG
(2) #8 AWG	(2) #14 AWG	(2-4) #10 AWG	

Dimensions

Dimension	FSPDB1A FSPDB1C Figure 1		FSPDB2A FSPDB2C Figure 1		FSPDB3A FSPDB3C Figure 2		FSPDB4A FSPDB4C Figure 1		FSPDB5A FSPDB5C Figure 2	
	mm	in	mm	in	mm	in	mm	in	mm	in
A	25.4	1.00	28.4	1.12	46.9	1.85	39	1.54	72	2.84
B	43.3	1.70	57.8	2.28	64.3	2.53	108	4.25	91	3.58
C	49.5	1.95	56.0	2.21	64.3	2.53	80	3.15	80	3.15
D	45.1	1.78	51.6	2.03	59.8	2.36	75.5	2.97	-	-
E	39.4	1.55	39.4	1.55	51.5	2.03	50.1	1.97	50.1	1.97
F	72.6	2.86	87.7	3.45	100.8	3.97	145.5	5.73	145	5.71
G	59.6	2.35	74.6	2.94	82.4	3.24	120.6	4.75	127.5	5.02
H	5.3	0.21	5.1	0.20	6.5	0.26	7	0.28	3	0.12
I	-	-	-	-	31.5	1.24	-	-	52	2.04
J	5.3	0.21	6.4	0.25	6.5	0.26	6.5	0.26	6.5	0.26
K	10	0.40	11.7	0.46	8.9	0.35	16	0.63	8.5	0.34

Accessories

Catalog No.	Description
FSPIN1	Accessory pin to form multiple pole block
FSCIM1	Circuit identification marker for 2/0 & #2 max. conductors (Qty of 100)
FSCIM2	Circuit identification marker for 350, 400 & 600 kcmil max. conductors (Qty of 100)
FSCAP1	Cap plug for spare 2/0 openings
FSCAP2	Cap plug for spare 350 kcmil openings
FSCP3	Cap plug for spare 600 kcmil opening
FSEA	Pair of end anchors

Figure 1

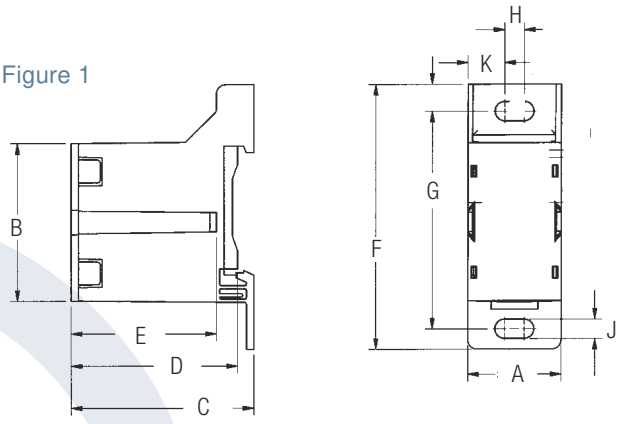
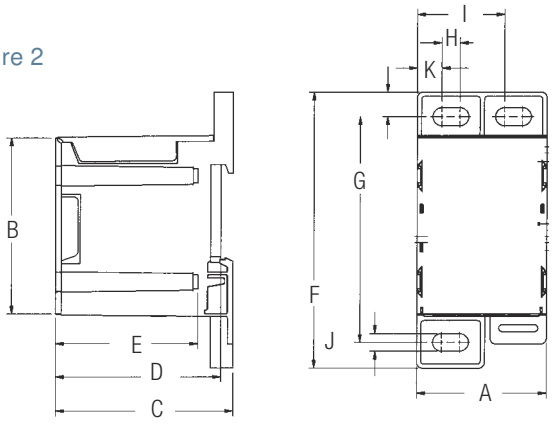


Figure 2



For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Open Style PDBs 62000-69000

Versatile Power Distribution Blocks for cable terminations

Mersen Power Distribution Blocks afford a safe, convenient way of splicing cables, splitting primary power into a variety of secondary circuits or providing a fixed junction tap-off point. Power block options include single or dual primary connections with up to 30 secondary connections.

Features/Benefits:

- **Adder Poles**
  All series have optional adder poles which snap onto the 1, 2 or 3- pole blocks and lock together to form as many poles as required. Adder poles with a variety of terminations can be combined to match special wire size combinations.
- **Wire Connectors**
  Standard aluminum box connectors accommodate aluminum or copper wire, 1 conductor per opening. Standard copper box connections are for copper wire only, 1 conductor per opening. Connectors are all 1 piece and tin plated.
- **Insulators**
  Insulators are virtually unbreakable, glass-filled polycarbonate on all series. “See-through” safety covers are available, which give greater safety and provide service entrance ratings for large and intermediate series blocks.

Highlights:

- **Mini** - 62000 and 63000 Series
- **Intermediate** - 66000 and 67000 Series
- **Large** - 68000 and 69000 Series

Applications:

- Box, stud and quick-connect terminations for copper and/or aluminum cables



Ratings:

Volts : 600V
Amps : 90 to 2660A
SCCR : 100kA with proper fuse.

Contact technical services for sizing table.

Approvals:

- Most sizes are UL Recognized Component -Guide XCFR2, File E73571
- Most sizes are CSA Certified:
  - Series 62, 63, 66, 68 - Class 6228, File 69363
  - Series 67, 69 - Class 3211, File 15469

Mini 62000-63000 Series

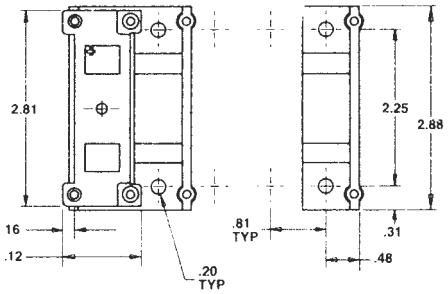
Catalog Numbers

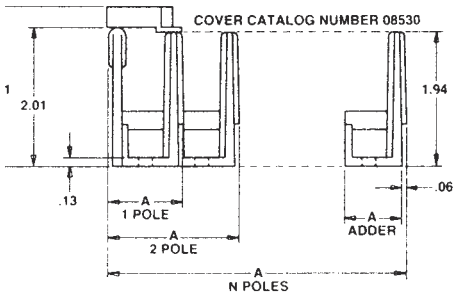
Ampere rating based on NEC Table 310-16 for 75ºC copper wire.

Primary		Secondary		Ampere Rating (A)		Aluminum				Copper				Short Circuit Current Rating
Wire Range AWG/kcmiL or Stud Size	Openings or Studs per Pole	Wire Range AWG/kcmiL or Stud Size	Openings or Studs per Pole			Adder	1-Pole	2-Pole	3-Pole	Adder	1-Pole	2-Pole	3-Pole	
Box to Box														
#4-14	1	#4-14	1	90	85	63100	63101	63102	63103	62100	62101	62102	62103	100kA•
			4			63160	63161	63162	63163	62160	62161	62162	62163	100kA•
2/0-#14	1	2/0-#14	1	185	175	63150	63151	63152	63153	62150	62151	62152	62153	100kA•
		#2-14	2			63190	63191	63192	63193	62190	62191	62192	62193	100kA•
		#4-14	4			63130	63131	63132	63133	62130	62131	62132	62133	100kA•
Box to Stud														
2/0-#14	1	1/4-20 x 5/8	1	185	175	63140	63141	63142	63143	62140	62141	62142	62143	100kA•
		1/4-20 x 1/2	1							62170	62171	62172	62173	100kA•
		Tapped hole												
Stud to Stud														
1/4-20 x 5/8	1	1/4-20 x 5/8	1	240	240	-	-	-	-	62200	62201	62202	62203	100kA•
Box to Quick Connect														
#4-14	1	1/4 x .032QC	4	90	95	-	-	-	-	62210†	62211†	62212†	62213†	-

**Studs are furnished with nuts and washers. Recommended stud torque: (1/4-20) - 72 in. lbs.* *†Quick connector, not CSA Certified.*
Note: Blocks for 5, 6 and 10 poles are also available. To order, simply modify the Adder catalog number. Example: 63100 becomes 63106 for 6 poles.
•Short circuit current rating with correctly sized fuse 100kA except adder block. Contact Mersen technical services for fuse type and maximum ampere required.
#Connectors are rated for 90º C wire.

Dimensions





Number of Poles	Dimension A (In.)
Adder	.812
1	1.09
2	1.90
3	2.71
N	(.812 x N) + .273

Example for 10 poles:
A= (.812 x 10) + .273 = 8.39

Safety Cover - Catalog number 08530

Polycarbonate safety covers provide dead-front protection to 62000 and 63000 series power distribution blocks. One cover is needed for each pole (1-pole block requires 1 cover, 3-pole requires 3 covers, etc.) Each cover has a test probe hole in the center for circuit checking and each is marked with the reminder “REPLACE AFTER SERVICING EQUIPMENT”. To order, simply determine the total number of poles to be protected and specify the same number of 08530 safety covers. Mounting screws are supplied with cover. Recommended mounting screws for all 62000-63000 series: #10 (.190” diameter).

End Barrier - Catalog number U09311

Polycarbonate end barriers snap on to PDB Adder blocks to form 1-pole blocks. Use one barrier per block.

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Intermediate 66000-67000 Series

Catalog Numbers

Ampere rating based on NEC Table 310-16 for 75ºC copper wire.

Primary		Secondary		Ampere Rating (A)	Aluminum				Copper				Short Circuit Current Rating
Wire Range AWG/kcmiL or Stud Size	Openings or Studs per Pole	Wire Range AWG/kcmiL or Stud Size	Openings or Studs per Pole		Adder	1-Pole	2-Pole	3-Pole	Adder	1-Pole	2-Pole	3-Pole	
Box to Box													
2/0-#14	1	2/0-#14	1	175	67050	67051	67052	67053	66050	66051	66052	66053	100kA•
		#2-14	4		67570	67571	67572	67573	66570	66571	66572	66573	100kA•
		#2-14	6		67560	67561	67562	67563	66560	66561	66562	66563	100kA•
		#2-14	8		67580	67581	67582	67583	66580	66581	66582	66583	100kA•
		#6-14	10		67590	67591	67592	67593	66590	66591	66592	66593	100kA•
		#10-14*	12		67110	67111	67112	67113	66110	66111	66112	66113	100kA•
350-#6	1	350-#6	1	310	67000	67001	67002	67003	66000	66001	66002	66003	100kA•
		2/0-#14	2		67010	67011	67012	67013	66010	66011	66012	66013	100kA•
		#2-14	4		67670	67671	67672	67673	66670	66671	66672	66673	100kA•
		#2-14	6		67660	67661	67662	67663	66660	66661	66662	66663	100kA•
		#2-14	8		67630	67631	67632	67633	66630	66631	66632	66633	100kA•
		#6-14	10		67650	67651	67652	67653	66650	66651	66652	66653	100kA•
		#10-14*	15		67620	67621	67622	67623	66620	66621	66622	66623	100kA•
500-#4	1	500-#4	1	380	67400	67401	67402	67403	66400	66401	66402	66403	100kA•
		4/0-#6	2		67420	67421	67422	67423	-	-	-	-	100kA•
		4/0-#10	2		-	-	-	-	66420	66421	66422	66423	100kA•
		2/0-#14	4		67410	67411	67412	67413	66410	66411	66412	66413	100kA•
		#2-14	6		67460	67461	67462	67463	66460	66461	66462	66463	100kA•
		#2-14	8		67430	67431	67432	67433	66430	66431	66432	66433	100kA•
		#6-14	10		67480	67481	67482	67483	66480	66481	66482	66483	100kA•
		#10-14*	18		67490	67491	67492	67493	66490	66491	66492	66493	100kA•
		#350-#6 &	1										100kA•
		#2-14	3		67450	67451	67452	67453	66450	66451	66452	66453	100kA•
#2/0-#14	2	#2/0-#14	2	350	67020	67021	67022	67023	66020	66021	66022	66023	100kA•
		#2-14	6		67510	67511	67512	67513	66510	66511	66512	66513	100kA•
		#2-14	8		67610	67611	67612	67613	66610	66611	66612	66613	100kA•
		#6-14	10		67530	67531	67532	67533	66530	66531	66532	66533	100kA•
		#10-14*	15		67550	67551	67552	67553	66550	66551	66552	66553	100kA•
4/0-#10	2	4/0-#10	2	460	-	-	-	-	66520	66521	66522	66523	100kA•
4/0-#6	2	4/0-#6	2	460	67520	67521	67522	67523	-	-	-	-	100kA•
		#2-14	6	460	67540	67541	67542	67543	66540	66541	66542	66543	100kA•
Box to Stud													
350-36	1	3/8-16 x 1	1	310	67250	67251	67252	67253	66250	66251	66252	66253	
500-#4	1	3/8-16 x 1-1/16	1	380	67220	67221	67222	67223	66220	66221	66222	66223	
		1/4-20 x 1-1/16	2	380	67240	67241	67242	67243	66240	66241	66242	66243	
Stud to Stud													
1/4-20 x 1-5/16	1	1/4-20 x 1-5/16	1	155	-	-	-	-	66270	66271	66272	66273	
1/4-20 x 1-5/16	1	1/4-20 x 1-5/16	1	155	-	-	-	-	66210	66211	66212	66213	
		3/8-16 x 1-5/16	1	155	-	-	-	-	66200	66201	66202	66203	
3/8-16 x 1-1/8	1	3/8-16 x 1-1/8	1	400	-	-	-	-	66260	66261	66262	66263	
		1/4-20 x 1-1/8	2	400	-	-	-	-	66230	66231	66232	66233	

**Copper wire only*

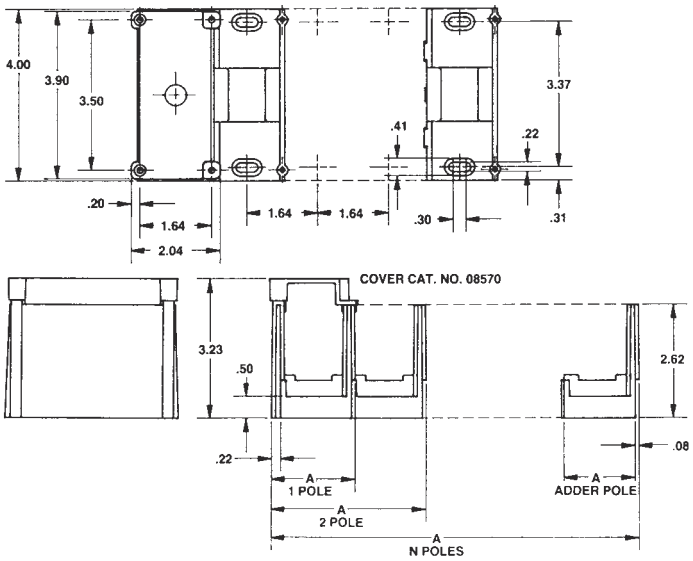
Stud type connectors are furnished with nuts and washers. Recommended stud torque: (1/4-20) - 72 in.-lbs; (3/8-16) - 228 in.-lbs.

•Short circuit current rating with correctly sized fuse 100kA except adder block. Contact Mersen technical services for fuse type and maximum ampere required.

 # Aluminum connectors are rated for 90º C Cu/AL wire, copper connectors are rated for 75º C Cu wire.

Intermediate 66000-67000 Series

Dimensions



Number of Poles	Dimension A (Inches)
Adder	1.64
1	1.94
2	3.57
3	5.20
N	(1.635 x N) + .3

Example for 10 poles:
A= (1.635 x 10) + .30 = 16.65 inches

Safety Cover - Catalog No. 08570

Polycarbonate safety covers provide dead-front protection for 66000 and 67000 series power distribution blocks. One cover is needed for each pole (1-pole block requires 1 cover, 3-pole requires 3 covers, etc.) Each cover has a test probe hole in the center for circuit checking and each is marked with the reminder "REPLACE AFTER SERVICING EQUIPMENT." Mounting screws are supplied with cover. To order, simply determine the total number of poles to be protected and specify the same number of 08570 safety covers. Recommended mounting screws for all 66000-67000 series: #10 (.190 diameter).

End Barrier - Catalog No. U09705

Polycarbonate end barriers snap on to PDB Adder blocks to form 1-pole blocks. Use one barrier per block.

Properties of Materials Used in Power Distribution Blocks

Property	Units	ASTM Test	Glass Filled Polycarbonate
Specific Gravity		D792	1.21
IZOD	ft-lb/in	D256	4-6
Flexural Strength	psi	D790	13,200
Flexural Modulus	psi	D790	325,000
Tensile Strength	psi	D638	9,000
Compressive Strength	psi	D695	12,500
Water Absorption	24 hrs-%	D570	.15
Hardness	Rockwell	D785	M-85
Dielectric Stength			
• 60Hz, 25°C, s/t	vpm	D149	425
• 60Hz, 25°C, s/s	vpm	D149	425
Dielectric constant			
• 60Hz-dry		D150	3.01
• 1Hz-dry		D150	2.96
Volume resistivity	ohm-cm	D257	$>10^{16}$
Heat deflecting (°F@264 psi)	°F	D648	270
Flammability (UL 94)			94 V-O

Note: Above data represents approximate values and are for reference only.

Large 68000-69000 Series

Catalog Numbers - 68000 and 69000 Series

Ampere rating based on NEC Table 310-16 for 75ºC copper wire.

Primary		Secondary		Ampere Rating (A)	Aluminum				Copper				Short Circuit Current Rating
Wire Range AWG/kcmiL or Stud Size Box to Box	Openings or Studs per Pole	Wire Range AWG/kcmiL or Stud Size	Openings or Studs per Pole		Adder	1-Pole	2-Pole	3-Pole	Adder	1-Pole	2-Pole	3-Pole	
		2/0-#14	6		69170	69171	69172	69173	68170	68171	68172	68173	100kA•
350-#6	1	#4-14	12	310	69150	69151	69152	69153	68150	68151	68152	68153	100kA•
		#10-14*	20		69630**	69631**	69632**	69633**	68630**	68631**	68632**	68633**	
		500-#4	1		69050	69051	69052	69053	68050	68051	68052	68053	100kA•
		350-#6	2		69060	69061	69062	69063	68060	68061	68062	68063	100kA•
		4/0-#6	4		69510**	69511**	69512**	69513**	-	-	-	-	
500-#4	1	4/0-#10	4	380	-	-	-	-	68510**	68511**	68512**	68513**	
		2/0-#14	6		69070	69071	69072	69073	68070	68071	68072	68073	100kA•
		#4-14	12		69080	69081	69082	69083	68080	68081	68082	68083	100kA•
600-#2	1	600-#2	1	420	69640	69641	69642	69643	68640	68641	68642	68643	100kA•
		1000-250	1		69000	69001	69002	69003	68000	68001	68002	68003	100kA•
		500-#4	2		69010	69011	69012	69013	68010	68011	68012	68013	100kA•
		350-#6	2		69020	69021	69022	69023	68020	68021	68022	68023	100kA•
		4/0-#6	4		69300**	69301**	69302**	69303**	-	-	-	-	
1000-250	1	4/0-#10	4	545	-	-	-	-	68300**	68301**	68302**	68303**	
		2/0-#14	6		69030	69031	69032	69033	68030	68031	68032	68033	100kA•
		#2-14	10		69530**	69531**	69532**	69533**	68530**	68531**	68532**	68533**	
		#4-14	12		69040	69041	69042	69043	68040	68041	68042	68043	100kA•
#4-14	2	#4-14	12	170	69180	69181	69182	69183	68180	68181	68182	68183	100kA•
2/0-#14	2	#4-14	12	350	69160	69161	69162	69163	68160	68161	68162	68163	100kA•
		#10-14*	20		69600	69601	69602	69603	68600	68601	68602	68603	100kA•
		350-#6	2		69120	69121	69122	69123	68120	68121	68122	68123	100kA•
		4/0-#6	4		69320**	69321**	69322**	69323**	-	-	-	-	
350-#6	2	4/0-#10	4	620	-	-	-	-	68320**	68321**	68322**	68383**	
		2/0-#14	6		69130	69131	69132	69133	68130	68131	68132	68133	100kA•
		#4-14	12		69140	69141	69142	69143	68140	68141	68142	68143	100kA•
		500-#4	2		69090	69091	69092	69093	68090	68091	68092	68093	100kA•
		4/0-#6	4		69310	69311	69312	69313	-	-	-	-	
500-#4	2	4/0-#10	4	760	-	-	-	-	68310	68311	68312	68313	100kA•
		2/0-#14	6		69100	69101	69102	69103	68100	68101	68102	68103	100kA•
		#4-14	12		69110	69111	69112	69113	68110	68111	68112	68113	100kA•
600-#2	2	600-#2	2	840	69650	69651	69652	69653	-	-	-	-	
		#14-4 & 3/0-#10	4		69540	69541	69542	69543	68540**	68541**	68542**	68543**	
1000-250	2	500-#4	4	1090	-	69561**†	-	-	-	68561**†	-	-	
600-#2	3	600-#2	3	1260	-	69331**†	-	-	-	-	-	-	
		#6-14	30		-	69191**†	-	-	-	68191**†	-	-	
500-#4	4	#6-14 &	22	1520									
		2/0-#14	4		-	69521**†	-	-	-	68521**†	-	-	
600-#2	4	600-#2	4	1680	-	69341**†	-	-	-	-	-	-	
500-#4	3	4/0-#10	6	1140	-	-	-	-	-	800011**†	-	-	
500-#4	7	500-#4	7	2660	-	-	-	-	-	800061***	-	-	
500-#4	3	2/0-#14	8	1140	-	900061**†	-	-	-	-	-	-	
500-#4	4	500-#4	4	1520	-	900071**†	-	-	-	800031**†	-	-	
500-#4	4	2/0-#12	6	1050	-	900121†	-	-	-	800121**†	-	-	

*Copper wire only
**Not UL Recognized or CSA Certified
***These pole blocks are triple width (7.81")
†These 1 pole blocks are double width (5.31")
•Short Circuit current rating with correctly sized fuse 100kA except adder block. Contact Mersen technical services for fuse type and maximum ampere required.
Aluminum connectors are rated for 90º C Cu/AL wire, copper connectors are rated for 75º C Cu wire.

Large 68000-69000 Series

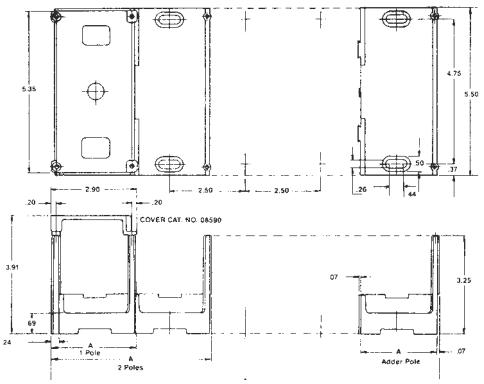
Catalog Numbers - 68000 and 69000 Series (Continued)

Ampere rating based on NEC Table 310-16 for 75ºC copper wire.

Primary		Secondary		Ampere Rating (A)	Aluminum				Copper			
Wire Range AWG/kcmiL or Stud Size	Openings or Studs per Pole	Wire Range AWG/kcmiL or Stud Size	Openings or Studs per Pole		Adder	1-Pole	2-Pole	3-Pole	Adder	1-Pole	2-Pole	3-Pole
Box to Stud												
500-#4	1	3/8-16 x 1	1	Cu 380	69210	69211	69212	69213	68210	68211	68212	68213
			2	Al 310	69270	69271	69272	69273	68270	68271	68272	68273
500-#4	2	3/8-16 x 1	2	Cu 380 Al 310	-	69221	69222	69223	-	-	-	-
1000-250	1	1/2-13 x 1-3/16	1	Cu 545	69280	69281	69282	69283	68280	68281	68282	68283
		3/8-16 x 1	2	Al 445	69240	69241	69242	69243	68240	68241	68242	68243
1/2-13 x 1	1	2/0-#14	4	545	69260	69261	69262	69263	-	-	-	-
		#4-14	12	545	69290	69291	69292	69293	-	-	-	-
		2/0-#14	4	1000	-	-	-	-	68260	68261	68262	68263
		#4-14	12	1000	-	-	-	-	68290	68291	68292	68293
500-#4	4	3/8-16 x 1	4	1520	-	900091†	-	-	-	-	-	-
Stud to Stud												
1/2-13 x 1-3/8	1	1/2-13 x 1-3/8	1	400	-	-	-	-	68220**	68221**	68222**	68223**

**Stud type connectors are furnished with nuts and washers. Recommended stud torque: (3/8-16) - 228 in.-lbs; (1/2-13) - 496 in.-lbs.*
***Not UL Recognized or CSA Certified* *† These 1 pole blocks are double width (5.31")*
 # Aluminum connectors are rated for 90º C Cu/AL wire, copper connectors are rated for 75º C Cu wire.

Dimensions – 68000 and 69000 Series Power Distribution Blocks



Number of Poles	Dimension A (Inches)
Adder	2.50
1	2.81
2	5.31
3	7.81
N	(2.50 x N) + .31

Example for 10 poles:
A= (2.50 x 10) + .31 = 25.31 inches

Safety Cover - Catalog No. 08590

Polycarbonate safety covers provide dead-front protection to 68000 and 69000 series power distribution blocks. One cover is needed for each pole (1-pole block requires 1 cover, 3-pole requires 3 covers, etc.) Each cover has a test probe hole in the center for circuit checking and each is marked with the reminder “REPLACE AFTER SERVICING EQUIPMENT”. Mounting screws are supplied with cover. To order, simply determine the total number of poles to be protected and specify the same number of 08590 safety covers. Recommended mounting screws for all 68000-69000 series: 1/4” (.250 dia.). For double wide blocks use 08592W safety cover.



08590 cover and 69092 PDB with 2-08590 covers installed

End Barrier - Catalog No. U09911

Polycarbonate end barriers snap on to PDB Adder blocks to form 1-pole blocks. Use one barrier per block.

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Circuit Protection Accessories

You maintain the circuit. We'll maintain an inventory of accessories to help.



Your problem: The little things that make your job easier add up. Maybe it's having the right fuse puller, so your people don't put themselves at risk by "improvising" during fuse changeouts. Or maybe you're an OEM designer or specifying engineer, and that circuit protection problem you've been wrestling with would disappear if fuses came with a special gadget that . . .

Our solution: Look no further than Mersen's line of Circuit Protection Accessories. Cabinets, box covers, reducers, pullers, blown-fuse indicators, add-on switches . . . they're all here. In stock. Under one roof. And ready to meet your circuit protection system maintenance needs — or help you solve specialized design problems.

Want more information fast? For more technical or application-specific information, please call our Circuit Protection Accessories experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

J Circuit Protection Accessories

- Box Covers.....J2
- Fuse Reducers.....J3
- Fuse Pullers, Clip Clamps.....J4
- Trigger® Indicator.....J5
- Shawmut Trigger®.....J5
- Trigger® Actuator J5
- Blown Fuse Indicators.....J6
- Add-on Switches J6
- IL Indicator.....J6
- PSC Microswitches J7
- Protistor® Microswitches.....J10
- Point of Sale Displays J12

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Box Covers

Mersen box covers fit all standard size boxes with a variety of plug fuse, switch and receptacle combinations. They provide easy access to local protection and control of 125V motors and other equipment. Long life corrosion-protected steel bases.

Catalog Numbers

Catalog No.	Box Cover Features	To Mount On:
COU	Edison-Base Fuse Holder	2-1/4" Handy Box
COW	Edison-Base Fuse Holder	2-3/4" Switch Box
COX	Edison-Base Fuse Holder	4" Octagon Box
COY	Edison-Base Fuse Holder	4" Square Box
CRU	Edison-Base Fuse Holder and Grounding Receptacle	2-1/4" Handy Box
CRW	Edison-Base Fuse Holder and Grounding Receptacle	2-3/4" Switch Box
CRX	Edison-Base Fuse Holder and Grounding Receptacle	4" Octagon Box
CRY	Edison-Base Fuse Holder and Grounding Receptacle	4" Square Box
CSU	Edison-Base Fuse Holder and Single Pole Switch	2-1/4" Handy Box
CSW	Edison-Base Fuse Holder and Single Pole Switch	2-3/4" Switch Box
CSX	Edison-Base Fuse Holder and Single Pole Switch	4" Octagon Box
CSY	Edison-Base Fuse Holder and Single Pole Switch	4" Square Box
COY-B	2 Edison-Base Fuse Holders	4" Square Box
CSY-L	Edison-Base Fuse Holder and Single Pole Switch and Pilot Light	4" Square Box
CSY-RL	Edison-Base Fuse Holder Single Pole Switch and Pilot Light	4" Square Box
CCY	Edison-Base Fuse Holders and 2 Single Pole Switches	4" Square Box
CKA	2 Edison-Base Fuse Holders & 250V Grounding Receptacle	4-11/16" Square Box
CTY	2 Edison-Base Fuse Holders and one 2-Pole Switch	4" Square Box

Rating:

Volts : 125V (AC)
Amps : 15A

Approvals:

- UL listed

UL LISTED

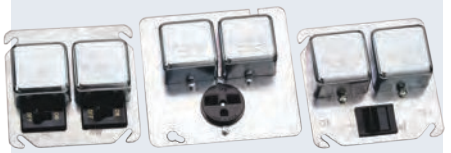

COU COW COX


COY CRU CRW


CRX CRY CSU


CSW CSX CSY


COY-B CSY-L CSY-RL


CCY CKA CTY

Fuse Reducers

Mersen fuse reducers allow the use of lower rated fuses in existing equipment having clips with higher ampere ratings. The use of closer rated time-delay fuses can improve circuit protection. For example, renewable or one-time fuses feeding a motor can be replaced with fuses sized closer to the motor nameplate current. Non-rejection reducers will allow Class H, K or R fuses to fit Class H or K clips. Rejection-type reducers will allow only Class R fuses to fit Class R clips or only Class J fuses to fit Class J clips. Class J fuse reducers are not for bolt on applications.

Catalog Numbers

Catalog Number			
Class H & K (Non-rejection)	Class R (Rejection)	Class J (Rejection)	Description
250V			
632	R632	-	Allows 30A fuse to fit 60A clips
132	R132	-	Allows 30A fuse to fit 100A clips
162	R162	-	Allows 60A fuse to fit 100A clips
262	R262	-	Allows 60A fuse to fit 200A clips
212	R212	-	Allows 100A fuse to fit 200A clips
412	R412	-	Allows 100A fuse to fit 400A clip
422	R422	-	Allows 200A fuse to fit 400A clips
612	R612	-	Allows 100A fuse to fit 600A clips
622	R622	-	Allows 200A fuse to fit 600A clips
642*	R642*	-	Allows 400A fuse to fit 600A clips
600V			
636	R636	J636	Allows 30A fuse to fit 60A clips
162	R162	J136	Allows 30A fuse to fit 100A clips
166	R166	J166	Allows 60A fuse to fit 100A clips
-	-	J236	Allows 30A fuse to fit 200A clips
266	R266	J266	Allows 60A fuse to fit 200A clips
212	R212	J216	Allows 100A fuse to fit 200A clips
412	R412	J416	Allows 100A fuse to fit 400A clips
422	R422	J426	Allows 200A fuse to fit 400A clips
612	R612	J616	Allows 100A fuse to fit 600A clips
622	R622	J626	Allows 200A fuse to fit 600A clips
642*	R642*	J646	Allows 400A fuse to fit 600A clips

**Not a pair; rejection end piece only.*



Ratings:

Volts : for 250 and 600V Class H, K and R fuses
: for 600 Volt Class J fuses

Amps : 30 to 600A

Tested to 200,000A

Approvals:

- UL Listed Guide No. IZZR
- CSA Certified

Fuse Pullers/Clip Clamps

Plastic Fuse Pullers

Mersen plastic fuse pullers are fully insulated, made of high-dielectric, reinforced plastic with notched handles to provide a safe grip. Stronger and more durable than fiber pullers, they are permanently marked with the recommended fuse ampere range. Yellow color for safety.



Catalog Numbers

Catalog No.	Description		Use with Fuses		
	Size	Length (in)	Ampere	Volts	Diameter (in)
34-001G	small	5	0-30	32-250	9/32-1/2
34-002G	pocket	7-1/2	0-100	250 600	-
34-003G	large	11-3/4	31-600 31-400	250 600	-

Plastic Fuse Clamps

Mersen fuse clip clamps are used to clamp fuse clips together onto a fuse ferrule or blade. An easy twist of the cap tightens the jaws against the clip, preventing heating by reducing resistance at the point where fuse and clip make contact. This helps prevent loss of spring tension due to annealing from overheating.



Catalog Numbers

Catalog No.	Use with Fuse Clips			Weight (ounces)
	Type	Ampere	Volts	
32-001G	Ferrule	30	250	2
32-002G	Ferrule	60	250	
32-002G	Ferrule	30	600	
32-003G	Ferrule	60	600	
32-004G	knife blade	100	250 or 600	2
32-005G		200		2
32-006G*		400		8
32-007G		600		8

** Wide jaws permit clamping split clips.*

Nylon Fuse Pullers

Mersen nylon fuse pullers are fully insulated, made of high-dielectric, high impact nylon with no-slip handles and protective finger stops for greater safety when inserting fuses. Yellow color for safety.



Catalog Numbers

Catalog No.	Description		Use with Fuses	
	Size	Length (in)	Ampere	Volts
34-015G	small	5	0-30	250
34-016G	medium	7-1/4	0-100 0-60	250 600

Blown Fuse Indicators

Trigger® Indicator

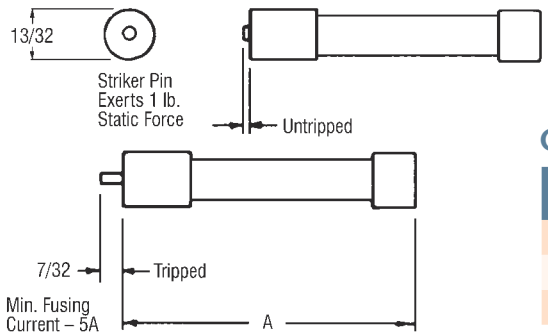
The Trigger Indicator (catalog number suffix TI) is available on many blade type fuses, primarily Form 101 semiconductor fuses and some Class L fuses. The TI allows blown fuses to be identified visually, eliminating the need for resistance or continuity testing.



Shawmut Trigger®

The Shawmut Trigger Indicator is a field-mountable blown-fuse indicator which is wired in parallel with the fuse to be monitored. The striker pin exerts a static force of one pound and may be used to actuate a switch. It is available in 130 volt (TI-130), 600 volt (TI-600), and 1500 volt (TI-1500) ratings. The TI-600 Trigger is a UL Listed accessory. The Shawmut Trigger is not a fuse and should only be used in parallel with fuses rated 70A or higher. To mount the Trigger, use two midget fuse clips (for 13/32" diameter fuses) found in the Fuse Clip section.





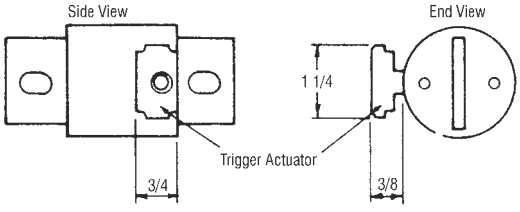
Catalog Numbers

Cat No.	Volts	Length A-In.
TI-130	0-130	2
TI-600	0-600	2
TI-1500	0-1500	3-1/2

Trigger® Actuator

The Trigger Actuator (catalog number suffix TA) has two functions and is an option available on many Amp-Trap® fuses. First, it provides visual indication of an open fuse and second, it provides a mount for an Add-On-Switch (AOS-) which can indicate a blown fuse via a signal light or initiate appropriate control action. The Trigger Actuator has no measurable I^2t or arc voltage effect on fuses rated 65A or higher. It will add 2 to 5 amperes of long term rating and requires a minimum circuit voltage of 5 to 10 volts to activate.





Blown Fuse Indicators

Add-On Switch

Add-On-Switches contain one single-pole double-throw contact rated 4 amperes resistive and 1 ampere inductive at 250V AC maximum. Two versions of the Add-On-Switch are available. Catalog number AOS-S has screw terminals. Catalog number AOS-Q accommodates push-on connectors.



IL Indicator

The “IL” indicator, developed from proven designs, provides a blown fuse indication system which does not sacrifice the excellent I^2t characteristics of Mersen fuses. Its low voltage design requires just 0.9 volts to activate the indicator, thus insuring reliable fuse performance under all conditions. The red pop up button is located in the center of the fuse body for ease of visibility and optimum voltage isolation. Interference with busbar and cable connection is significantly less than other designs. The addition of the “IL” indicator provides blown fuse indication on virtually all Mersen fuses. Optional auxiliary microswitches for remote signaling are also available for use with the “IL” indicator.



Features/Benefits:

- Visual indication or remote signaling
- Optional auxiliary microswitches
- Same size for all fuses
- Retains optimum performance
- Operation at all times above 0.9 volts

Highlights:

- Low voltage design
- Center location
- Rugged construction
- Proven reliability
- AC or DC

For blown fuse indication on general purpose fuses, please consult factory.

Approvals:

- UL Recognized

Microswitches & Studs

Features/Benefits:

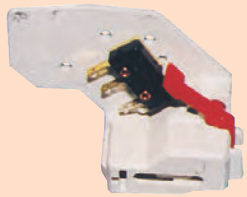
- Microswitch systems adapted to the following fuses:
  - PSC sizes 30, 31, 32, 33 / 70, 71, 72, 73
  - Blade-type PSC (PA) sizes 0-1, 2-3 / 70, 71, 72, 73
  - PSC sizes 000 / 00

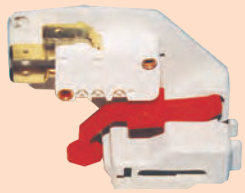
- Highly resistant studs offering optimized connection, excellent electrical contact and high mechanical withstand for stud-style fuses.











Applications Data

Description	AC Volt ***	Positive Operating Volt/ Current	Rated Current	Nature of Current	Interrupting Rating						AC Voltage Withstand Test	Impulse Voltage Test UIMP 1.2/50	FIRE Class UL 94
					Non-Inductive Circuit			Inductive Circuit					
					30V	110V	250V	30V	110V	250V			
MS 3V 1-5	1000 V	20 V	10 A	50/60 Hz	10A	10A	10A	10A	10A	10A	8,5 kV*	14 kV**	H.B.
MS 7V 1-5	1500 V	50 mA	10 A	DC	8A	0,4A	.2A	4A	.2A	.1A	12 kV*	20 kV**	H.B.
MS 3V 1-5 BS	1000 V	10 V	3 A	50/60 Hz	3A	3A	3A	2A	1A	1A	8,5 kV*	14 kV **	H.B.
MS 7V 1-9 BS	1000 V	10 V	3 A	50/60 Hz	3A	3A	3A	2A	1A	1A	8,5 kV*	14 kV **	H.B.
MS 7V 1-5 BS	1500 V	50 mA	3 A	DC	3A	0,5A	0,25A	3A	0,2A	0,1A	12 kV*	20 kV**	H.B.
MS 7V 1-9 BS	1500V	10 mA	3 A	DC	3A	0,5A	0,25A	3A	0,2A	0,1A	12 kV*	20 kV**	H.B.
MS 3V 1-5 ET	1000V	10 V	3 A	50/60 Hz	3A	3A	3A	2A	1A	1A	8.5 kV*	14 kV**	H.B.
MS 7V 1-5 ET	1500V	10 mA	3 A	DC	3A	0.5A	-	2A	0.2A	-	12 kV*	20 kV**	H.B.
MS PA 2-5	1500 V	20 V	10 A	50/60 Hz	10A	10A	10A	10A	10A	10A	9 kV*	13 kV**	VO
MS PA 2-5 B2	1500 V	20 V	5 A	50 Hz	4A	4A	5A	-	5A	5A	12 kV*	16 kV**	VO
MS 4L 2-5 B2	1000 V	100 mA	5 A	DC	-	-	-	-	2A	0,4A	8 kV*	13 kV**	VO
MS 4L 2-5 B6	1000 V	20 V 50 mA	10 A	50/60 Hz DC	10A 8A	10A 0,4A	10A 0,2A	10A 4A	10A 0,2A	10A 0,1A	8 kV*	10 kV**	VO
MC 6,3 GR 2-5N	1000 V	20 V 100 mA	5 A	50/60 Hz DC	- 4A	5A 0.4A	3A -	- 3A	3A 0.4A	2A -	3.5 kV*	-	H.B.
MC 36 GR 2-5	1000 V	20 V 100 mA	5 A	50/60 Hz DC	- 4A	5A 0.4A	5A -	- 2A	5A 0.4A	5A -	7.5 kV*	-	H.B.

* *Between power circuit and microswitch terminals as per IEC 60 and 694 and NFC 64010 (50/60 Hz 1 min. duration in dry air)*

** *Between power circuit and microswitch terminals Uimp: impulse voltage as per IEC 947-1*

*** *Between power circuit and microswitch terminals*

EACH MICROSWITCH WEIGHS LESS THAN 100 g, THEREFORE NO FUME AND SMOKE GRADE IS REQUIRED BY NF F 16-102 STANDARD

MS 3V Fuse Sizes: 30 - 33

Fuse Size	Description	Ref. No.	Indication Style	Weight (g)
30, 31 32, 33	MS 3V 1-5 (fig.1)	X310014	Standard NO-NC	34
	MS 3V 1-5 BS (3)	X310013	Low Level NO-NC	34
	MS 3V 1-9 BS (4)	T310011	Low Level NO-NC	44
	MS 3V 1-5 ET (fig.3)	R310009	Low Level NO-NC	34

(3) Same as fig. 1
(4) Same dimensions as fig. 1 but with 2 microswitches side by side
(9) Watertightness class

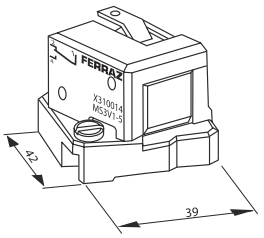


Fig. 1

MS 7V1 Fuse Sizes: 70 - 73

Fuse Size	Description	Ref. No.	Indication Style	Weight (g)
70, 71 72,73	MS 7V 1-5 (fig.4)	J310002	Standard NO-NC	45
	MS 7V 1-5 BS (7)	K310003	Low level NO-NC	45
	MS 7V 1-9 BS (8)	P310007	Double pole NO-NC low level	55
	MS 7V 1-5 ET (fig.5)	S310010	Low level NO-NC	55

(7) Same as fig. 4
(8) Same dimensions as fig. 4 but with 2 microswitches side by side
(9) Watertightness class
Attention: Microswitch systems exclusively designed for Mersen PSC fuses are fitted with a patented trip-indicator, saving the use of an EDV.

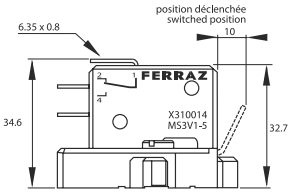


Fig. 2

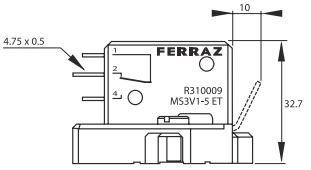


Fig. 3

MS PA Fuse Sizes: 0 - 70

Fuse Size	Description	Ref. No.	Indication Style	Weight (g)
1,2,3	MS PA 2-5	H210158	OF Standard (fig 7)	32.5
71,72,73	MS PA 2-5B2	C210360	OF Terminal 2.8OF	27
70	MS PA 2-5	T210398	Standard (fig 7)	31

Exclusive "MS PA" indication systems are automatically resettable

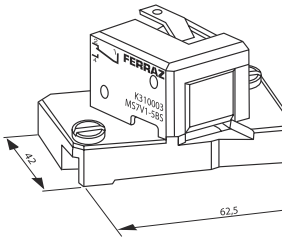


Fig. 4

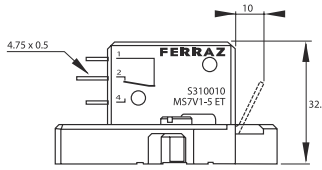


Fig. 5

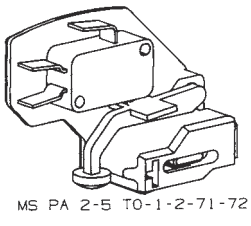


Fig. 7

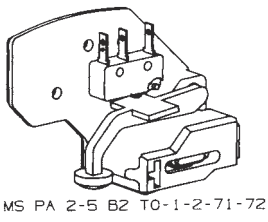
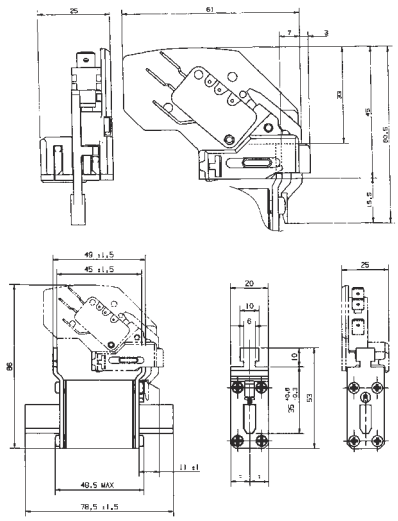


Fig. 8

MS Indication System for 000 & 00 Fuses as per DIN 43653 and DIN 43620 Terminals

Automatically resettable, these microswitch systems indicate fuse presence (PRES) and proper mounting. In case of improper mounting or fuse melting, terminals 1-4 closed.

Catalog Number	Reference No.	Weight (g)
MS 4L 2-5 B6 + PRES (fig. 1) (1)	F210156C	30
MS 4L 2-5 B2 + PRES (fig. 2) (2)	G210157C	26



(1) 6.3mm Clips
(2) 2.8mm Clips

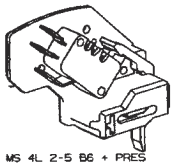


Fig. 1

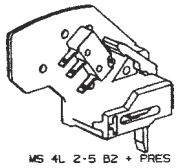
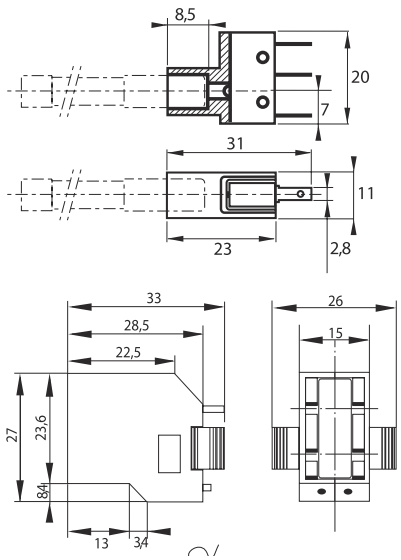


Fig. 2

MC Indication System for BS 88-4 Blown Fuse Trip-Indicator

Catalog Number	Reference No.	Weight (g)
MC 6,3 GR 2-5 N with external trip-indicator	Y 310015	10

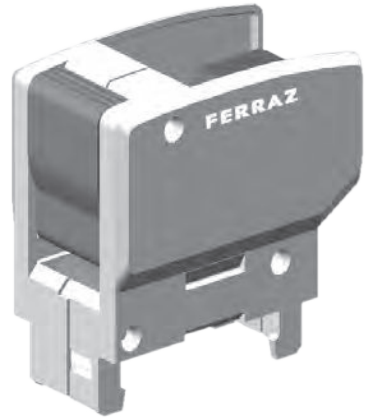
Catalog Number	Reference No.	Weight (g)
MC 36 GR 2-5 for British standard fuses with internal indicator 27 and 36	P092496	10



Protistor® Fuse Microswitches

Microswitch systems for round and square-body fuses (not for PSC fuses)

The Protistor fuse microswitch is a remote signaling system designed to fit on round and square body Protistor fuses (not for PSC fuses) that are equipped with microswitch support. It indicates fuse status and has a manual reset feature.



Features/Benefits:

- Remote signaling systems for fitting on Mersen fuses equipped with microswitch support
- Indication of fuse status
- Manual reset
- Standard and low current models with different insulation ratings
- Watertight types for use in corrosive atmospheres

Characteristics

Type	Catalog Number	AC or DC Insulation Voltage Rating Ui (V)	AC Voltage Withstand Test (.)	Impulse Voltage Test Uimp 1,2/50 hs (..)	Positive Operating Min. Voltage / Min. Current	Current Rating	Current	Non-indicating Circuit			Indicating Circuit L/R=25ms		
								30V	110V	250V	30V	100V	250V
Standard	MC3E 1-5N	1250V	15 kV	20 kV	20 V 50 mA	5A	50/60 Hz	10 A	10 A	7 A			6 A
	MCR3E 1-5N	2200V	20 kV	30 kV			DC	5 A	0.5 A		1.6 A	0.3A	
Low Level	MC3E 1-5NBS	1250V	15 kV		10 V 10 mA	3A	50/60 Hz	3 A	3 A	3 A	2 A	1 A	1 A
	MC3E 1-9NBS	1250V	15 kV	20 kV									
	MCR3E 1-5NBS	2200V	20 kV (1)										
	MCR3E 1-9NBS	2200V	23 kV (2)	30 kV			DC	3 A	0.5 A	0.25 A	3 A	0.2 A	0.1 A
	MC2R3E 1-5BS	6000V	24 kV (1)										
	MC2R3E 1-9NBS	6000V	26 kV (2)	40 kV									
Watertight IP 50	MC3E 1-5NET	1250V	32 kV (3)	16 kV	10 V 10 mA	3A	50 Hz		3 A	3 A		1 A	1 A
	MCR3E 1-5NET	2200V	11 kV	30 kV			DC		0.5A			0.2 A	
	MC2R3E 1-5NET	6000V	20 kV (1)	40 kV									

Catalog numbering system: MC3E 1-5 single pole microswitch - MC3E 1-9 double pole microswitch - MCR, MC2R reinforced insulation microswitch

** Between power circuit and microswitch terminals as per IEC 60 and 694 and NFC 64010 (50/60 Hz 1 min. duration in dry air)*

*** Between power circuit and microswitch terminals Uimp: impulse voltage according to IEC 947-1*

****Between power circuit and microswitch terminals*

EACH MICROSWITCH WEIGHS LESS THAN 100g, THEREFORE NO FUME AND SMOKE GRADE IS REQUIRED BY NF F16-102 STANDARD

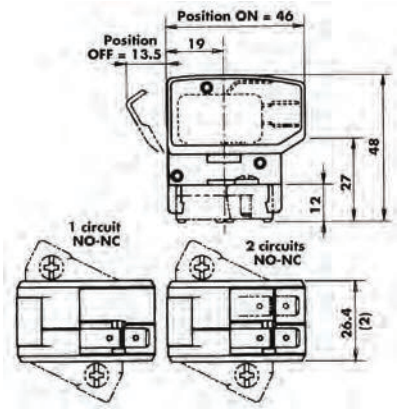
(1) for short body fuses (sizes 30 - 31 - 32 - 33 - 70 - 71 - 72 - 73 - 83 - 84) Except PSC

(2) for sizes 100 - 91 - 92 - 93 - 94 - 123 - 124 fuses and longer

(3) for sizes 171 - 172 - 173 - 174 fuses and longer

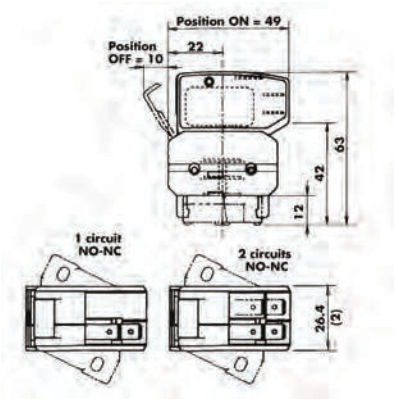
Protistor® Fuse Microswitches

Remote Signaling with 1250 V AC/DC Insulation Voltage



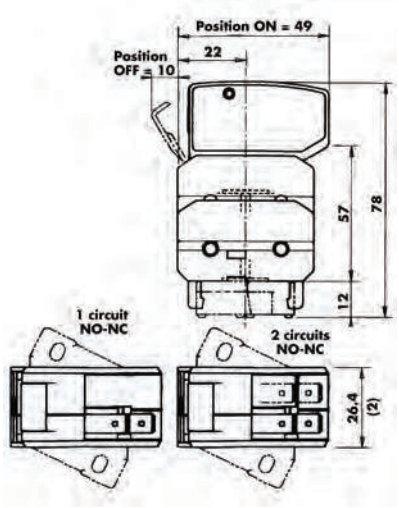
Quantity of NO-NC separated circuits	Contact	Catalog Number	Ref. Number	Weight (g)	Pack. (1)
1	standard	MC3E 1-5N	D310020	39.5	3
1	low level	MC3E 1-5NBS	E310021	39.5	3
2	low level	MC3E 1-9NBS	F310022	45.7	3
1	watertight	MC3E 1-5NET	L310027	40.2	3

Remote Signaling with Insulation Voltage up to 2200 V AC/DC



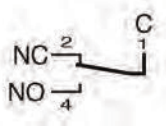
Quantity of NO-NC separated circuits	Contact	Catalog Number	Ref. Number	Weight (g)	Pack. (1)
1	standard	MCR3E 1-5N	G310023	51.7	1
1	low level	MC3RE 1-5NBS	P310030	51.7	1
2	low level	MCR3E 1-9NBS	H310024	58.0	1
1	watertight	MCR3E 1-5NET	Q310031	52.5	1

Remote Signaling with Insulation Voltage up to 6000 V AC/DC

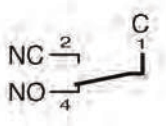


Quantity of NO-NC separated circuits	Contact	Catalog Number	Ref. Number	Weight (g)	Pack. (1)
1	low level	MC2R3E 1-5NBS	J310025	64.0	1
1	watertight	MC2R3E 1-5NET	N310029	64.8	1
2	low level	MC2R3E 1-9NBS	K310026	70.3	1

Electrical diagram of each microswitch circuit



Non-blown fuse
Microswitch ON



Blown fuse
Microswitch OFF

All of these signaling systems are resettable and fitted with silver-plated 3-terminal microswitch C, NO and NC. The C terminal is on the top and connection is made via 6.35 mm clips except for watertight models whose clips are 4.8 mm wide

NOTE (2): The 26.4 dimension is the same with 1 or 2 separated circuits NO-NC.
Tests with sine vibrations carried out at ambient with scanning of the three main holder axes.
Spectrum: 1st segment (2 to 16 Hz) constant trip x = 5 mm peak.
2nd segment (16 to 250 Hz) constant acceleration y + 5 g peak

Exponential scanning speed: 1 octave per minute.
Duration: 2 hours per axis.

Point of Sale Displays

FS-POP Free-Standing Floor Display

Mersen's point of sale display brings best selling fuses within easy reach while promoting a self service environment. This unit not only acts as a silent efficient salesperson, but also as an eyecatching reminder to buy. The FS-POP consists of: metal gondola frame, slatwall, appealing header sign with cross reference guide, adjustable bins in practical sizes including, (12) standard, (6) wide and (6) large and bin labels for trouble-free identification. Instructions for assembly are included with each display.



Standard Bins (White): 5.11 (l) x 5.51 (w) x 3.81 (h) inches.
Wide Bins (White): 5.11 (l) x 11.42 (w) x 3.81 (h) inches.
Large Bins (Orange): 10.83 (l) x 11.0 (w) x 6.70 (h) inches.
*FS-POP is shipped unassembled with instructions included to minimize risk of products being damaged during shipment.

MFD / MFD300

The miniature fuse display, MFD, is a compact and organized solution to hold only the most popular glass fuses available. Order with or without fuses. The display can hold up to 300 fuses and is made from clear plastic which contains individual slots for supporting standard glass fuse packages. It is wall mountable. Included with the MFD is a paper insert with company logo and cross reference list. Order the MFD fully stocked with catalog number MFD300.

GSMR

The Midget and Class CC fuse rack holds 400 fuses and is an automatic feeding system for standard 10 packs of midget and Class CC fuses. It is peg board and slatwall mountable.

GSGFD

The GSGFD glass fuse display rack gives high visibility to fuses at the point of purchase. The GSGFD consists of a sturdy metal display rack with wall mounting hardware, 48 slots (each holds 12 standard 5-pack boxes for a possible display total of 576 boxes or 2,880 glass fuses), an attractive header sign, and a laminated glass fuse cross reference guide for quick and easy selection. The dimensions are 12.5 (w) x 29.5 (h) x 4 (d) inches.

GSFC / GSFC-M

The Spare Fuse Cabinet provides dedicated storage space for spare fuses. It is made of heavy duty all-welded steel construction with primed and painted gray finish offering a good appearance and easy maintenance. A positive latching handle with cylinder lock and two keys will prevent unauthorized access. It comes in two sizes: the GSFC is 24 (w) x 36 (h) x 12 (d) inches (6 cubic feet) or the GSFC-M is 18 (w) x 24 (h) x 13 (d) inches (3.25 cubic feet).

Disconnect Switches

The safest way to switch power on and off in your industrial control panels.



Your problem: You need a range of disconnect switches for your industrial control requirements ranging from "Service Entrance Rated" to motor isolation. You need DIN-rail and direct mountable disconnect switches that conform to today's "finger-safe" IEC standards. You need a range of handles, shafts and accessories to select from.

Our solution: Mersen offers an extensive line of compact UL98 fusible and non-fusible disconnect switches ranging from 30 to 1200A. We also offer a full range of compact UL508 disconnect switches ranging from 16 to 125A. In addition, you can find handle, shaft and accessory options that you require for all of your applications.

Want more information fast? For more technical or application-specific information, please call our Disconnect Switch experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

K Disconnect Switches

- UL508 Non-Fused Load Break Switches, FSLBS..... K2
- UL98 Non-Fused Load Break Switches, FSSC, SX, SXDC, SC..... K5
- UL98 Fusible Disconnect Switches, FB Series K18
- Enclosed Disconnect Switches K31
- Fusible Shunt Trip (Engineered) Switches K37

FERRAZ SHAWMUT IS NOW MERSEN

MERSEN

Load Break Disconnect Switches FSLBS

UL 508 Non-Fused Load Break Switches

The FSLBS Load Break Switch is a newly designed industrial-grade switch capable of making or breaking loads up to 600V. It is suitable as a motor disconnect. Extremely compact and robust, these switches have a variety of mounting options including DIN-rail, base, or door-mounting. A wide assortment of handles, shafts and accessories are available to accommodate any installation requirement. Both the toggle and rotary styles have a built-in pad-lockable hasp and the integrated box terminals are finger-safe to IP-20. Utilizing a patented, innovative design, the FSLBS can be actuated from the front or either side.

Highlights:

- Terminals rated for 2 wires!
- Front or side operation
- Padlockable
- Compact
- Robust
- DIN-rail, base, or door- mounting
- Choice of handles and shafts
- Side-mount auxiliary contacts and additional poles
- Double-break, silver-plated contacts

Applications:

- On/Off switching and disconnect applications in circuits up to 600V, 80A on the load side of branch circuit protection fusing.
- Motor controller, suitable as motor disconnect
- Motor isolator
- General purpose



Ratings:

Volts : 600VAC
Amps : 16, 25, 40, 63, and 80A

Suitable as motor disconnect up to 40hp

Approvals:

- UL 508 listed E196672
- CSA 22.2 #14
- IEC 60947-3

Load Break Disconnect Switches FSLBS

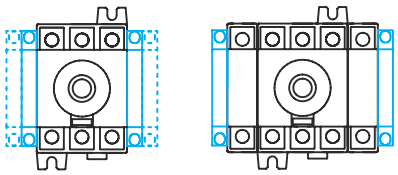
Catalog Numbers - FSLBS

	Ampere Rating				16A	25A	40A	63A	80A
Select a Switch	Toggle				FSLBST16	FSLBST25	FSLBST40	FSLBST63	FSLBST80
	Rotary				FSLBS16	FSLBS25	FSLBS40	FSLBS63	FSLBS80
Select a Handle & Shaft	Direct Operation Handle 	No Shaft Required			FSHD	FSHD	FSHD	FSHD	FSHD
	Thru-door	Select a Handle 	NEMA 1, 3R, 12	Black	FSH00BR**	FSH00BR**	FSH00BR**	FSH0BR**	FSH0BR**
			NEMA 1, 3R, 12, 4, 4X	Black	FSH00BR4**	FSH00BR4**	FSH00BR4**	FSH0BR4**	FSH0BR4**
			NEMA 1, 3R, 12	Red	FSH00RR**	FSH00RR**	FSH00RR**	FSH0RR**	FSH0RR**
			NEMA 1, 3R, 12, 4, 4X	Red	FSH00RR4**	FSH00RR4**	FSH00RR4**	FSH0RR4**	FSH0RR4**
		Select a Shaft 	150mm/5.9"		FS150	FS150	FS150	FS150	FS150
			200mm/7.9"		FS200	FS200	FS200	FS200	FS200
			320mm/12.6"		FS320	FS320	FS320	FS320	FS320
Select Accessories		Auxiliary Contacts 		NO/NC	FSACNONC	FSACNONC	FSACNONC	FSACNONC	FSACNONC
				NO/NO	FSACNONO	FSACNONO	FSACNONO	FSACNONO	FSACNONO
		4th Pole* 			FS4P16	FS4P25	FS4P40	FS4P63	FS4P80
		Neutral Pole* (not switched) 			FSNP40	FSNP40	FSNP40	FSNP80	FSNP80
		Ground Pole* (not switched) 			FSGP40	FSGP40	FSGP40	FSGP80	FSGP80
		Terminal Shrouds 			FSTS40	FSTS40	FSTS40	FSTS80	FSTS80
		Door Mounting Kit 			FSDMK	FSDMK	FSDMK	FSDMK	FSDMK

**Consult factory for availability*
***Either FSH00xxx or FSH0xxx can be used.*

Pre-Break Auxiliary Contacts

Mount directly to the side of the switch. The top contact is pre-break, the bottom contact makes with the switch. Up to four devices can be added, in any combination (maximum of two additional poles).



Door Mounting Kit

Allows mounting of the switch to a door or side panel. Utilizing the switch's side actuation provides access to the terminal screws, enabling the wiring to be completed after installation.



Padlocking Capabilities

Switch: With the switch in the 'Off' position, a hasp can be deployed that will lock the switch in this position.

Handle: The white lever in the center of the handle can be rotated out to reveal openings for up to 3 padlocks.



Load Break Disconnect Switches FSLBS

UL and CSA Characteristics - FSLBS

Technical Characteristics	16A	25A	40A	63A	80A
Short circuit current rating at 600 VAC	10kA/65kA	10kA/65kA	10kA/65kA	65kA/50kA	65kA/50kA
Fuse type	J/J	J/J	J/J	J	J
Maximum fuse rating (A)	60/30	60/30	60/30	60/100	60/100
Maximum Horsepower Rating / Max. motor FLA 3 φ					
208 VAC	3 / 11A	7.5 / 24A	7.5 / 24A	15 / 46A	15 / 46A
220 - 240 VAC	5 / 15A	7.5 / 22A	7.5 / 22A	20 / 54A	20 / 54A
440 - 480 VAC	10 / 14A	15 / 17A	20 / 27A	40 / 52A	40 / 52A
600 VAC	10 / 11A	20 / 22A	25 / 27A	40 / 41A	40 / 41A
Connection					
Solid (AWG)	#14 - #10	#14 - #10	#14 - #10	#14 - #10	#14 - #10
	2x #12	2x #12	2x #12	2x #12	2x #12
Stranded (AWG)	#14 - #4	#14 - #4	#14 - #4	#14 - #1	#14 - #1
	2x (#14 - #12)	2x (#14 - #12)	2x (#14 - #12)	2x (#10 - #6)	2x (#10 - #6)
Torque	26.5 lb-in/3 Nm	26.5 lb-in/3 Nm	26.5 lb-in/3 Nm	31.1 lb-in/3.5 Nm	31.1 lb-in/3.5 Nm
Auxiliary Contacts					
Electrical characteristics	A300	A300	A300	A300	A300

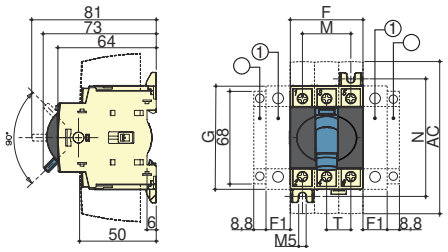
FSLBS Dimensions (Inch/mm)

Rating	AC	F	F1	G	J	M	N	T
16, 25, 40A	4.33 / 110	1.77 / 45	0.59 / 15	2.68 / 68	0.59 / 15	1.18 / 30	2.95 / 75	0.59 / 15
63, 80A	4.33 / 110	2.07 / 52.5	0.69 / 17.5	3.00 / 76	0.69 / 17.5	1.38 / 35	3.35 / 85	0.69 / 17.5

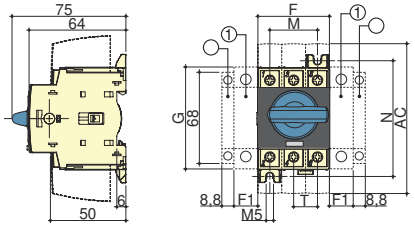
1. Additional Pole - maximum of two, one each side
2. Auxilliary Contact - maximum of four, two each side

E. Minimum is 1.18"/30mm, maximum is 14.6" /372mm
D. Minimum is 1.18"/30mm, maximum is 9.25" /235mm

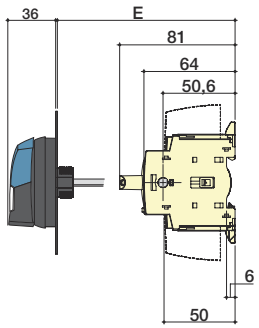
16A to 40A Direct operation "Toggle"



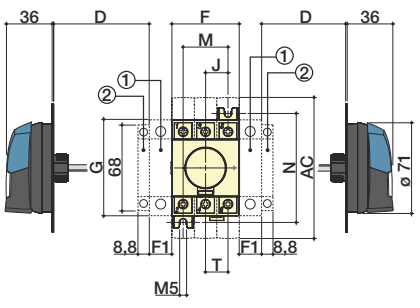
63A and 80A Direct operation "Rotary"



External front operation



External side operation



Non-Fused Load Break Switches FSSC, SX, SXDC, SC

UL 98 Non-Fused Load Break Switches

Mersen disconnect switches are extremely durable, manually operated, non-fused disconnect switches. These heavy-duty switches are designed with the most up-to-date disconnect switch technology available. Designed to suit the UL98 or UL489 standard, the switch gives you a product that “makes and breaks” power circuits on load. The switches are tested and approved for use in demanding applications, such as “Service Entrance”. Up to 400A, the switches are available with visible blade contacts. A wide array of handles are available to meet OSHA padlocking requirements, NEMA configurations, defeater options and NFPA 79 requirements.

Features/Benefits

- UL 98 Service entrance rated
- Front or side operated switches
- Padlockable
- Compact
- Robust
- DIN-rail, panel or door mounting
- Lockable, defeatable external handles
- Side-mounted auxiliary contacts and additional poles available
- The SXDC switches are rated 600VDC UL and 1000VDC IEC

Highlights:

- Visible blade contacts up to 400 A
- Line side shrouding supplied with switch
- Defeatable pistol handles automatically re-latch when panel door is closed - no tool necessary to reset latch
- External or direct operation handles
- Flange operation (for use with side operated switches)
- Double-break, silver-plated contacts
- SX series has flexible terminal shields that allow for tighter wire bending

Applications:

- Service entrance or main panel disconnects up to 600VAC, 1200A
- “Make and break” power circuit applications on load
- NFPA 79 solutions
- Photovoltaic



Ratings:

Volts : 600VAC / DC
: UL and 1000VDC IEC

Amps : 30A, 60A, 100A, 200A, 400A, 600A, 800A, 1000A and 1200A

SCCR : Up to 200kA with fuses

Suitable as motor disconnect up to 200hp

Approvals:

- All switches meet the requirements of UL and CSA
- UL listed guide WHTY, File E191605 for UL 98 (ratings from 30 A to 1200 A)
- CSA 22.2 # 4, class 4652-04, File 703166 (ratings from 30 A to 1200 A)
- IEC 947-3 CE mark (other IEC ratings up to 5,000A available on request, please consult us)

Non-Fused Load Break Switches FSSC

Catalog Numbers (amps) - FSSC

Compact, UL98

Select a Switch			**Ampere Rating**			**30**	**60**	**100**
			FSSC Non-fused Load Break Switch			FSSC30	FSSC60	FSSC100
Select a Handle & Shaft	Direct Operation Handle	No Shaft Required	**Handle for Direct Front Operation**					
	Thru-door	Select a Handle	Black			FSHD3	FSHD3	FSHD3
			Handle for External Front and Side Operation					
			NEMA Type	IEC	Color			
			1, 3R, 12	IP54	Black	FSH0BR	FSH0BR	FSH0BR
			1, 3R, 12	IP54	Red/Yellow	FSH0RR	FSH0RR	FSH0RR
			1, 3R, 12,4, 4X	IP65	Black	FSH0BR4	FSH0BR4	FSH0BR4
			1, 3R, 12,4, 4X	IP65	Red/Yellow	FSH0RR4	FSH0RR4	FSH0RR4
		Select a Shaft	150mm/5.9"			FS150	FS150	FS150
			200mm/7.9"			FS200	FS200	FS200
			320mm/12.6"			FS320	FS320	FS320
Select Accessories			**Accessories**					
			Fourth Pole*			FSSC4P30	FSSC4P60	FSSC4P100
			Neutral Pole (Unswitched)*			FSSCNP	FSSCNP	FSSCNP
			Ground Pole (Unswitched)*			FSSCGP	FSSCGP	FSSCGP
			3-pole Terminal Shroud (line and load sides)			FSSCTS	FSSCTS	FSSCTS
			1-pole Terminal Shroud (line and load sides)			FSSCTS1	FSSCTS1	FSSCTS1
			Auxiliary Contacts, NO and NC			FSACNONC	FSACNONC	FSACNONC
			Auxiliary Contacts, both NO			FSACNONO	FSACNONO	FSACNONO

**Consult factory for availlability.*

UL and CSA Characteristics

Technical characteristics		30A	60A	100A
Short circuit rating at 480 VAC		100kA	100kA	100kA
Short circuit rating at 600 VAC		100kA	100kA	25kA
Fuse type		J	J	J
Max. fuse rating (A)		30	60	100
Max. horsepower rating / Max. motor FLA 3 ph				
220-240 VAC		10 / 28	20 / 54	20 / 54
440-480 VAC		20 / 27	40 / 52	50 / 65
600 VAC		25 / 27	50 / 52	50 / 52
Max. horsepower rating / Max. motor FLA single phase				
120 VAC		5 / 56	5 / 56	5 / 56
240 VAC		10 / 50	10 / 50	10 / 50
480 VAC		25 / 55	25 / 55	25 / 55
Connection				
Solid	1 wire	#12 - #10	#12 - #10	#12 - #10
Stranded	1 wire	#12 - 2/0	#12 - 2/0	#12 - 2/0
Auxiliary Contacts				
Electrical characteristic		A300	A300	A300

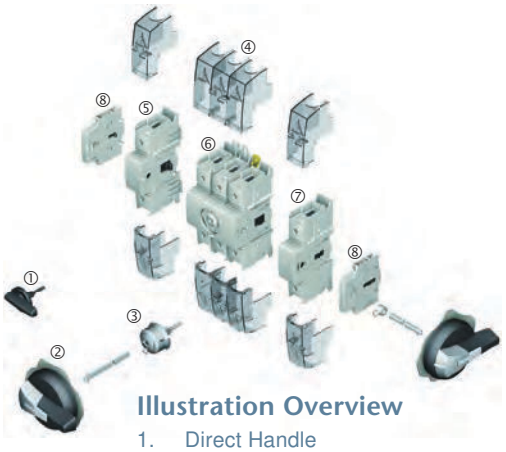


Illustration Overview

1. Direct Handle
2. Door-interlocked External Handle
3. Shaft for External Operation(includes collar)
4. Terminal Shrouds
5. Switched 4th Pole
6. Switch body
7. Unswitched Neutral or Ground Pole
8. NO/NC Auxiliary Contacts

Non-Fused Load Break Switches SX

Front Operated Range 100A to 400A - SX

High HP Rating!

Select a switch



Select a switch

Ampere Rating	Catalog Numbers 100	200	400
3-Pole	SX1003	SX2003	SX4003
4-Pole	SX1004	SX2004	SX4004

S type pistol handle for external front and side operation



Select a handle

NEMA Type	IEC	Color	Catalog Numbers		
1, 3R, 12	IP54	Black	HSPBL	HSPBL	HSPBL
1, 3R, 12	IP54	Red / Yellow	HSPRL	HSPRL	HSPRL
1, 3R, 12, 4, 4X	IP65	Black	HSPB4L	HSPB4L	HSPB4L
1, 3R, 12, 4, 4X	IP65	Red / Yellow	HSPR4L	HSPR4L	HSPR4L



Select a shaft

Shaft Length (in/mm)	Catalog Numbers		
7.9 / 200	SS200-10	SS200-10	SS200-10
12.6 / 320	SS320-10	SS320-10	SS320-10
15.7 / 400	SS400-10	SS400-10	SS400-10
19.7 / 500	SS500-10*	SS500-10*	SS500-10*

**Not UL*

Pistol handle for direct front operation



	Color	Catalog Numbers		
Direct Handle for SX	Black	SXHD	SXHD	SXHD

Options for front & side operation



	Catalog Numbers		
Terminal lugs for 3-pole (set of 6)	TL200X6	TL200X6	TL400X6
Terminal lugs for 4-pole (set of 8)	TL200X8	TL200X8	TL400X8
1 Auxiliary Contact NO+NC	SXAUX	SXAUX	SXAUX
2 Auxiliary Contact NO+NC	SXAUX2	SXAUX2	SXAUX2
Top Terminal Screen 3-pole	SXTS2T3	SXTS2T3	SXTS4T3
Bottom Terminal Screen 3-pole	SXTS2B3	SXTS2B3	SXTS4B3
Top OR Bottom Terminal Screen 4-pole	SXTS2TB4	SXTS2TB4	SXTS4TB4

Please contact factory for visible blades and/or flange operation.

Note: Do not mount in a vertical position with window on top. Any other orientation is okay.

Non-Fused Load Break Switches SXDC

Front Operated Range 100A to 400A - SXDC

UL listed 600VDC load-break!

Select a switch



Select a switch

Ampere Rating	Catalog Numbers 100	200	400
3-Pole	SXDC1003	SXDC2003	SXDC4003
4-Pole	SXDC1004	SXDC2004	SXDC4004

S type pistol handle for external front and side operation



Select a handle

NEMA Type	IEC	Color	Catalog Numbers		
1, 3R, 12	IP54	Black	HSPBL	HSPBL	HSPBL
1, 3R, 12	IP54	Red / Yellow	HSPRL	HSPRL	HSPRL
1, 3R, 12, 4, 4X	IP65	Black	HSPB4L	HSPB4L	HSPB4L
1, 3R, 12, 4, 4X	IP65	Red / Yellow	HSPR4L	HSPR4L	HSPR4L



Select a shaft

Shaft Length (in/mm)	Catalog Numbers		
7.9 / 200	SS200-10	SS200-10	SS200-10
12.6 / 320	SS320-10	SS320-10	SS320-10
15.7 / 400	SS400-10	SS400-10	SS400-10
19.7 / 500	SS500-10*	SS500-10*	SS500-10*

**Not UL*

Pistol handle for direct front operation



	Color	Catalog Numbers		
Direct Handle for SX	Black	SXHD	SXHD	SXHD

Options for front & side operation



	Catalog Numbers		
Terminal lugs (set of 2)	TL200X2	TL200X2	TL400X2
Jumper bars (set of 2, for 3-pole)	SX2J	SX2J	SX4J*
Jumper bars (set of 3, for 4-pole)	SX2J4	SX2J4	SX4J4*
1 Auxiliary Contact NO+NC	SXAUX	SXAUX	SXAUX
2 Auxiliary Contact NO+NC	SXAUX2	SXAUX2	SXAUX2
Top Terminal Screen 3-pole	SXTS2T3	SXTS2T3	SXTS4T3
Bottom Terminal Screen 3-pole	SXTS2B3	SXTS2B3	SXTS4B3
Top & Bottom Terminal Screen 4-pole	SXTS2TB4	SXTS2TB4	SXTS4TB4

**If the application requires a heavy loading of the switch, doubling of the jumper bars may be necessary.*

Note: Do not mount in a vertical position with window on top. Any other orientation is okay.

Non-Fused Load Break Switches SC

Front Operated Range from 600 to 1200A - SC



Select a switch

Ampere Rating	Catalog Numbers			
	600	800	1000	1200
3-pole	SC600	SC800	SC1000	SC1200
4-pole	SC6004	SC8004	SC10004	SC12004

S type pistol handle for front external operation



Select a handle

Recommended for easier switching

NEMA Type	IEC	Color	Catalog Numbers			
1, 3R, 12, 4, 4X	IP65	Black	HSTB4	HSTB4	HSTB4	HSTB4
1, 3R, 12, 4, 4X	IP65	Red / Yellow	HSTR4	HSTR4	HSTR4	HSTR4

Note: Handle is defeatable and is padlockable in the "OFF" position



Select a handle

Recommended for tighter spacing

NEMA Type	IEC	Color	Catalog Numbers			
1, 3R, 12	IP54	Black	HSPBEL	HSPBEL	HSPBEL	HSPBEL
1, 3R, 12	IP54	Red / Yellow	HSPREL	HSPREL	HSPREL	HSPREL
1, 3R, 12, 4, 4X	IP65	Black	HSPB4EL	HSPB4EL	HSPB4EL	HSPB4EL
1, 3R, 12, 4, 4X	IP65	Red / Yellow	HSPR4EL	HSPR4EL	HSPR4EL	HSPR4EL

Note: Handle is defeatable and is padlockable in the "OFF" position



Select a shaft

Shaft Length (in/mm)	Catalog Numbers			
7.9 / 200	SS200-15	SS200-15	SS200-15	SS200-15
12.6 / 320	SS320-15	SS320-15	SS320-15	SS320-15
15.7 / 400	SS400-15	SS400-15	SS400-15	SS400-15

Note: The small shaft protruding from the switch is 15mm x 15mm. The shaft for the handle is 12 x 12mm. A coupler is included and adapts from 12mm to 15mm.

Pistol handle for direct front operation



Select a handle

Color	Catalog Numbers			
Black	HADB5	HADB5	HADB5	HADB5

Note: Handle is defeatable and is padlockable in the "OFF" position

Options for front & side operation







Select a handle

Terminal Lugs Kit	Catalog Numbers			
Six lugs per kit - for 3-pole switches	TL600	TL800[4]	TL1200	TL1200
Eight lugs per kit - for 4-pole switches	TL6004	TL8004[4]	TL12004	TL12004
Terminal Screen[1]				
3-pole (for line or load side)	TS600SC	TS1200SC	TS1200SC	TS1200SC
4-pole (for line or load side)	TS6004SC	TS12004S	TS12004SC	TS12004SC
Auxiliary Contacts				
Auxiliary Contacts Holder[2]	ACHSC	ACHSC	ACHSC	ACHSC
1 N / O, 10A, 600VAC snap-on contact block, A600-Q600, pre-break, late make	AC3	AC3	AC3	AC3
1 N / C, 10A, 600VAC snap-on contact block, A600-Q600, pre-break, late make	AC4	AC4	AC4	AC4
Padlocking facility for external operation[3]	SWL01	SWL01	SWL01	SWL01

(1) Line side Terminal Screen supplied as standard with switch.
(2) ACHSC accommodates up to 4 auxiliary contacts.
(3) Allows to padlock the switch when door of the enclosure is open.
(4) TL1200 or TL12004 also fit if 4 holes are required.

Non-Fused Load Break Switches SX

Technical Characteristics for Front and Side Operation - SX

Catalog Numbers - UL, cUL and CSA

Catalog Numbers	SX1002 / SX1003 / SX1004	SX2002 / SX2003 / SX2004	SX4002 / SX4003 / SX4004
Ampere Rating	**100**	**200**	**400**
Operating voltage	600	600	600
Max Horsepower Rating / Max Motor FLA Current Three-Phase			
208 V	25 / 78.5	50 / 150	100 / 286
240 V	30 / 80	79 /192	125 / 312
480 V	75 / 96	150 / 180	250 / 302
600 V	100 / 99	200 / 192	350 / 336
DC 125 V	10 / 76(1)	15 / 55(1)	20 / 148(1)
DC 250 V	15 / 55(2)	15 / 55(2)	50 / 173 (2)
Short circuit rating with fuses (SCCR) kA	200	200	200
Branch circuit fuse type	J	J	J
Max fuse rating (A)	100	200	400
Dimension 3-Pole (front operated switches)			
H (in)	6.3	6.3	10.2
W (in)	7.1	7.1	9.05
D (in)	3.72	3.72	4.92
Shaft Size Square (front operated switches)			
in	0.4 x 0.4	0.4 x 0.4	0.4 x 0.4
mm	10 x 10	10 x 10	10 x 10
3-pole switch operating torque (front operation) (lb in)	88	88	130
Terminal lugs kit (# lugs per kit)	Optional (6)	Optional (6)	Optional (6)
Wire range AWG (# wire holes per lug)	300 kcmil-#6 (1)	300 kcmil-#6 (1)	250 kcmil-1/0 (2)
Wire tightening torque (lb in)	275 max	275 max	375 max

(1) 2-pole in series. (2) 3-pole in series.

Catalog Numbers - IEC 947-3

Catalog Numbers		SX1002 / SX1003 / SX1004	SX2002 / SX2003 / SX2004	SX4002 / SX4003 / SX4004
Ampere Rating	**A**	**100**	**200**	**400**
Rated Insulation voltage Ui (V)	V	1000	1000	1000
Rated impulse voltage (Uimp)	kV	12	12	12
Operation Current Ie (A)				
400 V AC	AC-22A	100	200	400
	AC-23A	100	200	400
690 V AC	AC-22A	100	200	400
	AC-23A	100	200	315
Motor Power (kW)				
400 V AC	AC-23A	51	100	220
500 V AC	AC-23A	63	140	220
690	AC-23A	90	185	295
Max.peak let through current (gG)	kA peak	17.6	32	40
Connection				
Minimum Cu cable section	mm^2	25	50	185
Minimum Cu bubar section	mm^2	-	-	-

Non-Fused Load Break Switches SXDC

Technical Characteristics - SXDC

Catalog Numbers - UL, cUL and CSA

UL, cUL, and CSA	Catalog Numbers		
	SXDC1002, SXDC1003, SXDC1004	SXDC2002, SXDC2003, SXDC2004	SXDC4002, SXDC4003, SXDC4004
Ampere Rating	**100**	**200**	**400**
Operating Voltage - 3P in series	600V DC	600V DC	600V DC
Prospective short-circuit current (rms) with fuses	20kA	20kA	20kA
Type of Fuse	A70P100	A70P200	LDC
Fuse Rating	100	200	400
Dimensions 3-pole			
Height (without shrouds) (in)	6.3	6.3	10.2
Width (in)	7.1	7.1	9.05
Depth (in)	3.7	3.7	4.9
Shaft size (mm)	10 x 10	10 x 10	10 x 10
3-pole switch operating torque (front operation) (lb in)	88	88	130
Terminal lugs kit (# lugs per kit)	Optional (6)	Optional (6)	Optional (6)
Wire range AWG (# wire holes per lug)	300 kcmil-#6 (1)	300 kcmil-#6 (1)	250 kcmil-1/0 (2)
Wire tightening torque (lb in)	275 max	275 max	375 max
Auxiliary Contacts	A300	A300	A300

Catalog Numbers - IEC 60947-3, DC-22B

IEC 60947-3, DC-22B	Catalog Numbers		
	SXDC1002, SXDC1003, SXDC1004	SXDC2002, SXDC2003, SXDC2004	SXDC4002, SXDC4003, SXDC4004
Ampere Rating	**160**	**250**	**400**
Operating Voltage - 3P in series	750V DC	750V DC	750V DC
Operating Voltage - 4P in series	1,000V DC	1,000V DC	1,000V DC

Non-Fused Load Break Switches SC

Technical Characteristics for Front and Side Operation - SC

Catalog Numbers - UL, cUL and CSA

Catalog Numbers	SC600 / SC6004	SC800 / SC8004	SC1000 / SC10004	SC1200 / SC12004
Ampere Rating (A)	**600**	**800**	**1000**	**1200**
Operating voltage (V)	600	600	600	600
Max Horsepower Rating / Max Motor FLA Current Three-Phase				
208 V	150 / 415	200 / 554	200 / 554	200 / 554
240 V	200 / 480	200 / 602	200 / 602	200 / 602
480 V	400 / 447	500 / 590	500 / 590	500 / 590
600 V	350 / 336	500 / 472	500 / 472	500 / 472
DC 125 V	20 / 148(1)	-	-	-
DC 250 V	50 / 173(2)	-	-	-
Short circuit rating with fuses (SCCR) (kA)	200	100	100	100
Branch circuit fuse type	J	J	J	J
Max fuse rating (A)	600	800	1000	1200
Dimension 3-Pole (front operated switches)				
H (in)	12.60	13	13	13
W (in)	11.02	14.64	14.64	14.64
D (in)	5.51	5.51	5.51	5.51
Shaft Size Square (front operated switches)				
in.	0.59 x 0.59	0.59 x 0.59	0.59 x 0.59	0.59 x 0.59
mm	15 x 15	15 x 15	15 x 15	15 x 15
3-pole switch operating torque (front operation) (lb in)	320	320	320	320
Terminal lugs kit (# lugs per kit)	optional (6)	optional (6)	optional (12)	optional (12)
Wire range AWG (# wire holes per lug)	600 kcmil-#2 (2)	600 kcmil-#2 (3)	600 kcmil-#2 (4)	600 kcmil-#2 (4)
Wire tightening torque (lb in)	375	375	375	375

(1) 2-pole in series. (2) 3-pole in series.

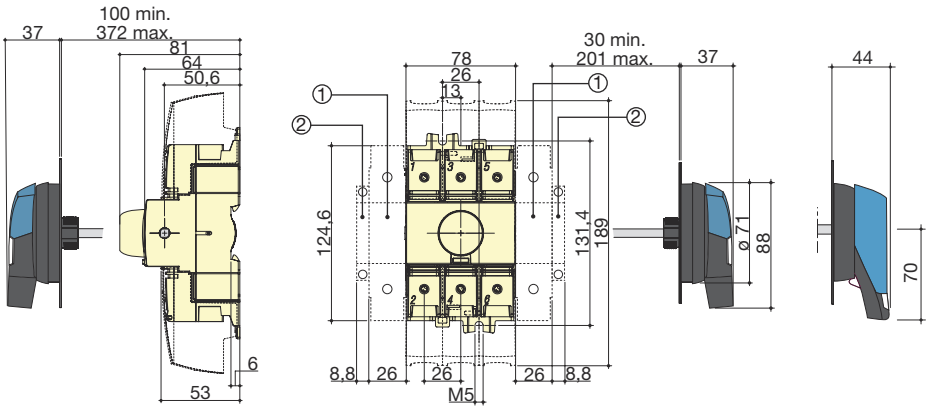
Catalog Numbers - IEC 947-3

Catalog Numbers		SC600 / SC6004	SC800 / SC8004	SC1000 / SC10004	SC1200 / SC12004
Ampere Rating	**A**	**600**	**800**	**1000**	**1200**
Rated Insulation voltage Ui	V	1000	1000	1000	1000
Rated impulse voltage (Uimp)	kV	12	12	12	12
Operation current Ie (A)					
400 V AC	AC-22A	630	800	1000	1200
	AC-23A	630	800	1000	1000
690 V AC	AC-22A	500	630	630	630
	AC-23A	200	400	400	400
Motor Power (kW)					
400 V AC	AC-23A	355	450	560	560
500 V AC	AC-23A	450	560	560	560
690 V AC	AC-23A	185	400	400	400
Max. peak let through current (gG)	kA peak	48	75	75	75
Connection					
Minimum Cu cable section	mm^2	2 x 150	2 x 185	2 x 240	-
Minimum CU busbar section	mm^2	2 x 30 x 5	2 x 40 x 5	2 x 50 x 5	2 x 60 x 5

Non-Fused Load Break Switches FSSC, SX, SXDC

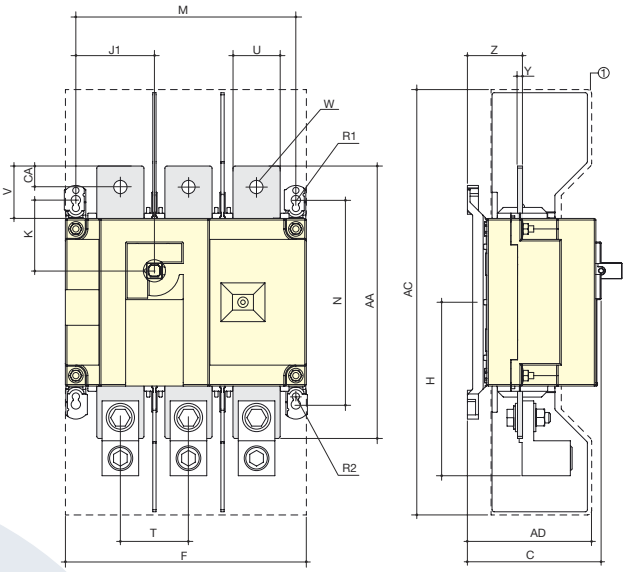
Dimensions (in/mm) for Front and Side Operation

FSSC 30 to 100A



SX and SXDC 100 to 400A

Ampere Rating (A)	Overall dimen.	Terminal shrouds		Switch body						Switch mounting					Connection terminal							
	C	AC	AD	F 3p.	F 4p.	H	J1 3p.	J1 4p.	K	M 3p.	M 4p.	N	R1	R2	T	U	V	W	Y	Z	AA	CA
100 - 200	3.72 in	10.1	3.05	7.09	9.06	4.22	2.17	4.13	1.8	6.3	8.27	5.31	0.35	0.27	1.97	0.98	1.18	0.43	0.14	1.35	6.3	0.6
100 - 200	94.6 mm	256	77.5	180	230	107	55	105	45.6	160	210	135	9	7	50	25	30	11	3.5	34.4	160	15
400	4.92 in	16	4.51	9.05	11.4	6.53	2.95	5.31	2.65	8.26	10.6	7.6	0.35	0.27	2.56	1.77	1.97	0.43	0.2	2.08	10.2	0.8
400	128 mm	406	115	230	290	166	75	135	67.5	210	270	195	9	7	65	45	50	13	5	53	260	20



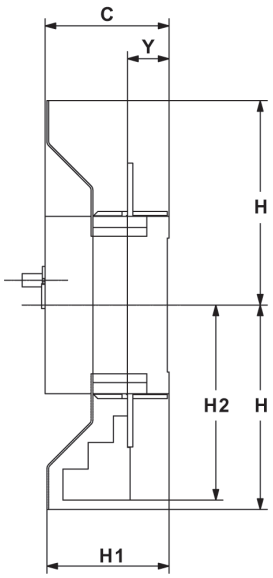
Direct Front Operation *External Front Operation*

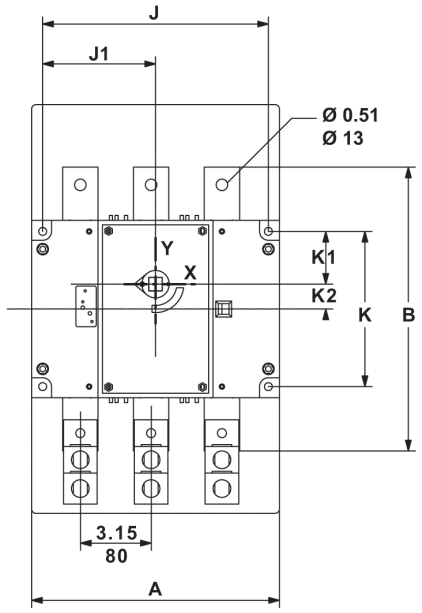
Non-Fused Load Break Switches SC

Dimensions (in/mm) for Front Operation - SC

600 A

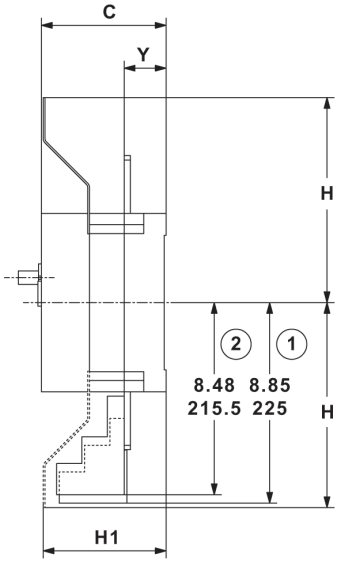
SC600
SC6004

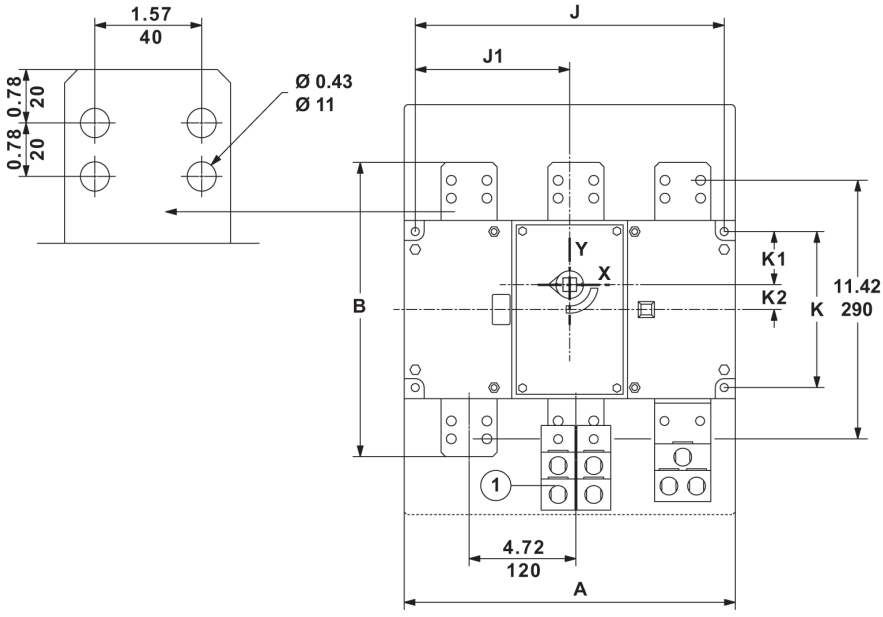




800-1000-1200 A

SC800
SC8004
SC1000
SC10004
SC1200
SC12004





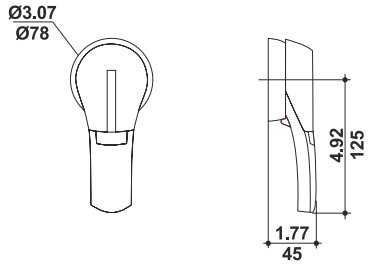
Ampere Rating	No. of Poles	A		B		C		H		H1		H2		J		J1		K		K1		K2		Y	
		In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm
400 A	3 P	11.02	280	12.60	320	5.51	140	9.05	230	5.43	138	8.66	220	10.04	255	5	127.5	6.88	175	2.34	59.5	1.10	28	1.85	47
600 A	4 P	14.17	360	12.60	320	5.51	140	9.05	230	5.43	138	8.66	220	13.19	335	6.59	167.5	6.88	175	2.34	59.5	1.10	28	1.85	47
800 A - 1000 A	3 P	14.64	372	13	330	5.51	140	9.05	230	5.43	138	-	-	13.66	347	6.83	173.5	6.88	175	2.34	59.5	1.10	28	1.85	47
1200 A	4 P	19.37	492	13	330	5.51	140	9.05	230	5.43	138	-	-	18.38	467	9.19	233.5	6.88	175	2.34	59.5	1.10	28	1.85	47

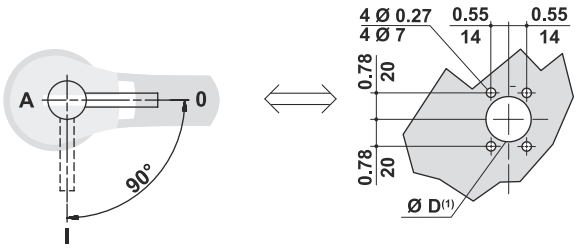
Non-Fused Load Break Switches FSSC, SX, SXDC, SC

Dimensions (in/mm) for External Front Operation Handles

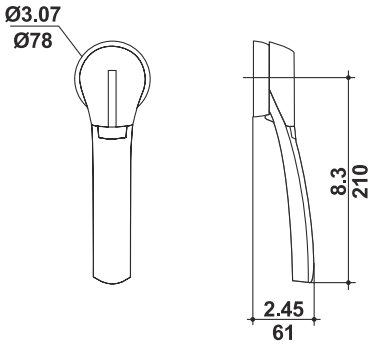
S type pistol handle

HSPBL
HSPRL
HSPB4L
HSPR4L

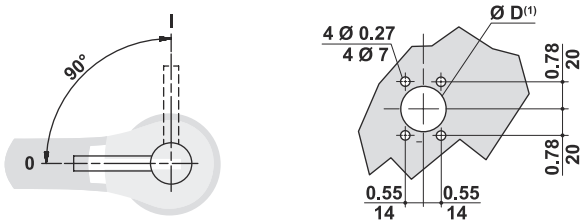




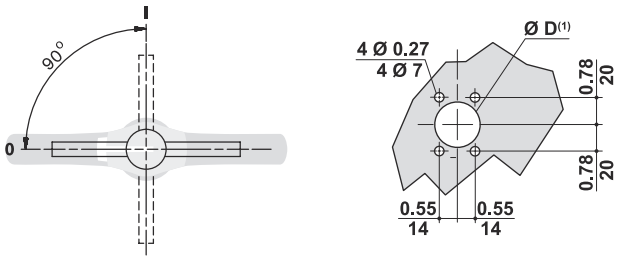
HSPBEL
HSPREL
HSPB4EL
HSPR4EL



Side operation

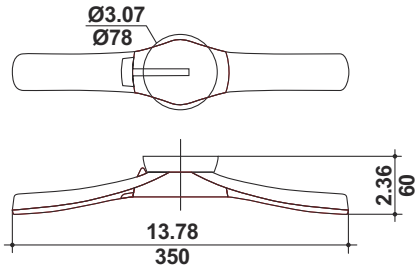


Front operation



S type pistol double handle

HSTB4
HSTR4

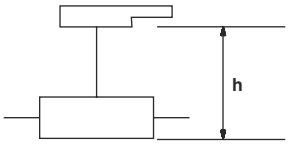


(1) *Conventional fixing (from rear): D = 1.22 to 1.45 in / 31 to 37 mm.*
Fast fixing (external, door closed): D = 1.45 in / 37 mm, fast fixing is acheived with special clips that avoid drilling for fixation of the handle on the door. Clips are included.

K

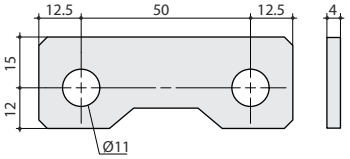
Dimensions (in/mm) from Backplate to Door Distance with Shaft Extension - FSSC, SX, SC

Minimum distance (in / mm)

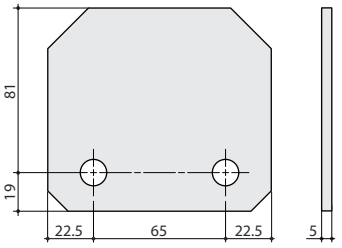


H & C Minimum Dimension	All HSP Handles	
	In	mm
FSSC	6	153
SX 100-200A	6	152
SX 400A	8	203
SC 600-1200 A	8.70	221

Jumper Bars - SXDC



100A and 200A #SX2J



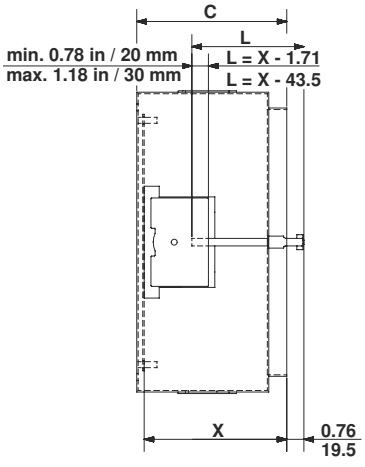
400A and 200A #SX4J

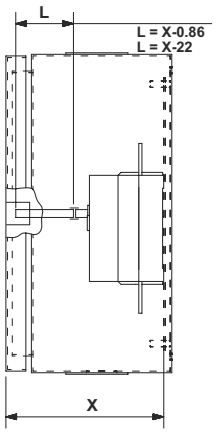
Note: Large size is for heat dissipation.

SX4003
SX4004
SXDC4003
SXDC4004

SC600
SC6004
SC800
SC8004

SC1000
SC10004
SC1200
SC12004



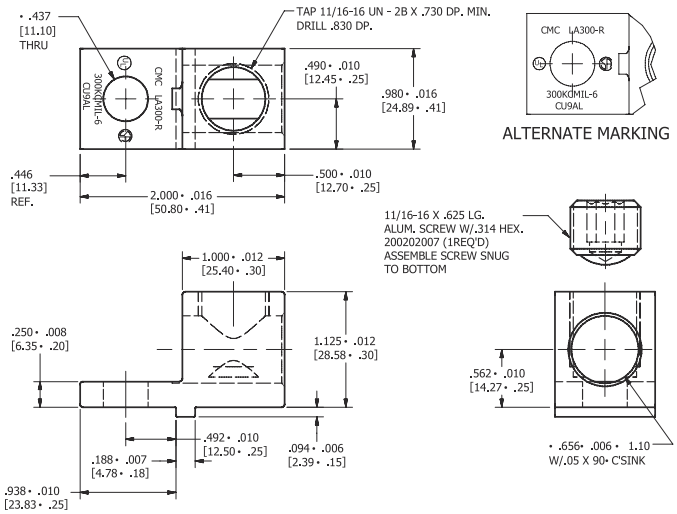


Non-Fused Load Break Switches SX, SXDC, SC

Dimensions (in/mm) for Terminal Lugs

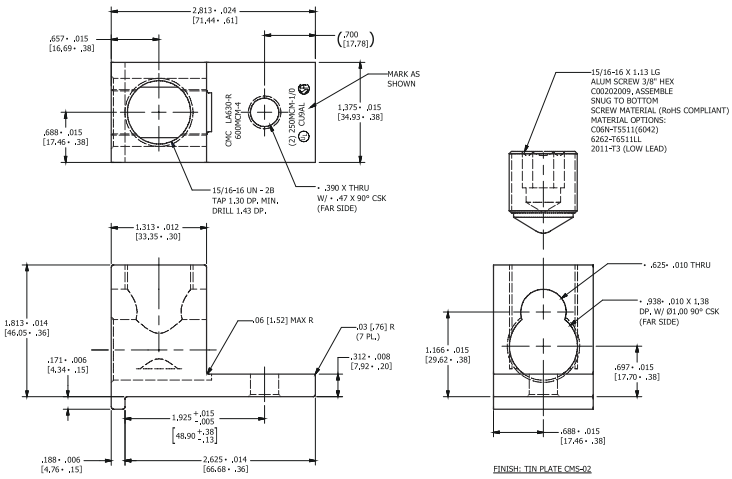
For use with SX series switches

TL200X



1 wire 300kcmil / 0 - #6

TL400X

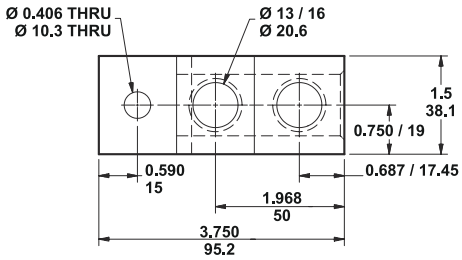


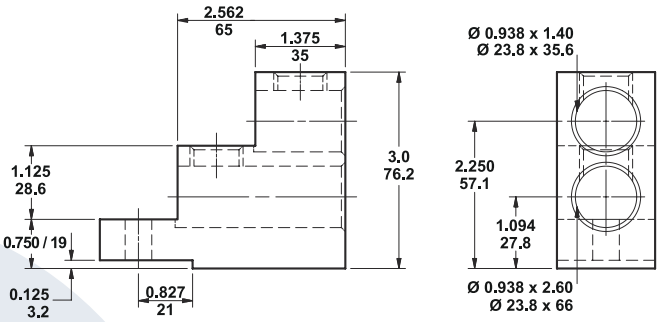
2 wire 250kcmil - 1/0

TL600 and TL1200

TL600: For use with SC 600 (1 lug per terminal)

TL1200: For use with SC 800, 1000 & 1200 (2 lugs per terminal)

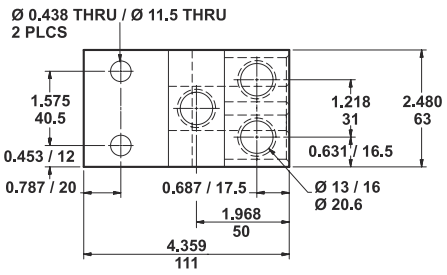


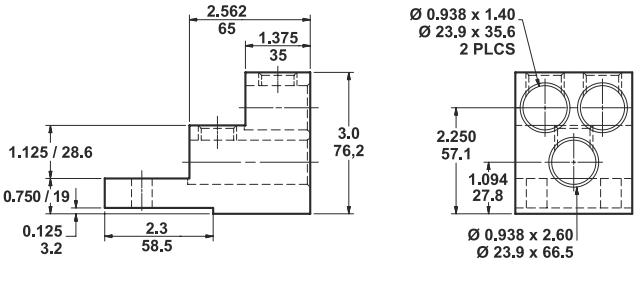


2 wires 600 MCM-2

TL 800

For use with SC 800





3 wires 600 MCM-2

Fusible Disconnect Switches FB Series

UL 98 Fusible Disconnect Switches

Mersen FB Series disconnect switches are extremely durable, manually operated, fusible disconnect switches. They employ double break contacts per pole that ensure complete isolation of the fuse when the switch is in the OFF position. With safety in mind, all fusible disconnect switches are supplied with fuse covers and line side shrouding as a standard feature. These switches provide the ultimate in short circuit protection when used with Mersen's Class CC, J or L fuses.These heavy-duty switches are designed with the most up-to-date disconnect fuse and switch technology available. Designed to meet the UL98 or UL489 standard, the fusible disconnect switch gives you the product that "makes and breaks" power circuits under load. They have been tested and approved for use in the most demanding applications, such as "Service Entrance." The optional TEST function (up to 400 A) enables testing of the control circuit auxiliaries without switching the main contacts. This function provides a simple alternative to a separately wired push button. A wide array of handles are available to meet OSHA padlocking requirements, NEMA configurations, defeater options and NFPA 79 requirements.



Ratings:

Volts : 600VAC, 250VDC
Amps : 30, 60, 100, 200, 400, 600, and 800A
SCCR : Up to 200kA with Class CC, J, or L Fuses

Highlights:

- Double break contact per pole up to 800 A
- Touch safe covers protect fuse terminals
- Service entrance rated
- Compact footprints
- Front and side operated switches with snap-on auxiliary contact feature
- 14AWG power taps on both line and load sides for control power transformers or surge protection
- External or direct operation handles
- Defeatable pistol handles automatically re-latch when panel door is closed - no tool necessary to reset latch
- Test positions available up to 400A
- Padlocking feature as standard on modular switchgear boxes
- Modular switch configurations, special executions on request (5-pole, mix ratings…)
- Padlockable handle
- Flange-mounted actuators

Applications:

- Service entrance or main panel disconnects up to 600 VAC, 800 A
- "Make and break" power circuit applications on load
- Fusible isolation switches
- NFPA 79 solutions

Recommended fuse usage:

- FBCC — use with ATDR*, ATMR, ATQR
- FBJ — use with AJT, A4J, HSJ
- FBL — use with A4BQ, A4BY, A4BT

** Recommended for DC application*

Approvals:

- All Fusible Disconnect Switch switches meet UL & CSA requirements
- UL listed guide WHTY, File E191605 for UL 98 (ratings from 30 A to 800 A)
- UL listed guide WJAZ, File E258428 for UL489 (for 30 A CDT)
- CSA 22.2 # 4, class 4652-04, File703166 (ratings from 30 A to 800 A)
- CSA 22.2 # 5, class 4652-06, File 703166 (for 30 A CDT)
- IEC 947-3 CE mark

Fusible Disconnect Switches FB Series

Front and Side Operated Range from 30 to 60A



Select a switch

	Catalog Numbers			
Ampere Rating	**30**	**30**	**30**	**60**
2-Pole			FBJ302X	FBJ602X
3-Pole	FBCC30CDT	FBJ30CDT	FBJ303X	FBJ603X
4-Pole	FBCC30SNCDT	FBJ30SNCDT	FBJ304X	FBJ604X
Fuse class	CC	J	J	J

Selector handle for external front operation



Select a handle

NEMA Type	IEC	Test Function	Color	Catalog Numbers			
1, 3R, 12	IP54	No	Black	HSPB	HSPB	HSPBL	HSPBL
1, 3R, 12	IP54	No	Red / Yellow	HSPR	HSPR	HSPRL	HSPRL
1, 3R, 12, 4, 4X	IP65	No	Black	HSPB4	HSPB4	HSPB4L	HSPB4L
1, 3R, 12, 4, 4X	IP65	No	Red / Yellow	HSPR4	HSPR4	HSPR4L	HSPR4L
1, 3R, 12, 4, 4X	IP65	Yes	Black	HSPB4T	HSPB4T	HSPB4LT	HSPB4LT
1, 3R, 12, 4, 4X	IP65	Yes	Red / Yellow	HSPR4T	HSPR4T	HSPR4LT	HSPR4LT

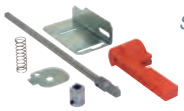
Note: handle is defeatable, and is padlockable in the "OFF" position.



Select a shaft

Shaft Length (in/mm)	Catalog Numbers			
7.9 / 200	SS200-5	SS200-5	SS200-10	SS200-10
12.6 / 320	SS320-5	SS320-5	SS320-10	SS320-10
15.7 / 400	SS400-5	SS400-5	SS400-10	SS400-10
19.7 / 500	-	-	SS500-10	SS500-10

NFPA 79 Front Operation Kit



Select a kit

	Catalog Numbers			
NFPA 79 Front Operation Kit	HADB6	HADB6	NFPA791	NFPA791

Note: allows to operate & padlock the switch when door of enclosure is open. For full information on NFPA79 requirements and on our solution, please consult P42 of this Advisor Catalog.

Options for external front and side operation







	Catalog Numbers			
Terminal Lugs Kit (for 2, 3 and 4 pole switches)	integral	integral	integral	integral
Terminal Shrouds (for 2, 3 and 4 pole switches)	integral	integral	integral	integral
Shorting Links Kit (3 links per Kit)	CCNL30	JNL30	JNL30	SL60
Direct Front Operation Handle	HADB1	HADB2		
Auxiliary contact				
Auxiliary contact block holder	ACHCD	ACHCD	-	-
1 N / O, 10A, 600VAC snap-on contact block, A600-Q600(1)	AC3	AC3	AC3	AC3
1 N / C, 10A, 600VAC snap-on contact block, A600-Q600(1)	AC4	AC4	AC4	AC4
1 NO + NC side mount contact block, A600-N600(2)	-	AC5	AC5	AC5
2 NO + NC side mount contact blocks, A600-N600(2)	-	AC6	AC6	AC6

(1) Compact Design Fusible Disconnect Switch accommodates up to 4 auxiliary contacts for FBCC30CDT and FBCC30SNCDT and up to 2 auxiliary contacts for FBJ30CDT and FBJ30SNCDT on the switch.
(2) Two auxiliary contact blocks maximum can be side mounted.
Note : For class T fuse adaptors, please consult us.

Fusible Disconnect Switches FB Series

Front and side operated range from 100 to 800A



Select a switch

Ampere Rating	Catalog Numbers 100	200	400	600	800
2-Pole	FBJ1002X	FBJ2002X	-	-	-
3-Pole	FBJ1003X	FBJ2003X	FBJ400U	FBJ600U	FBL800U
4-Pole	FBJ1004X	FBJ2004X	FBJ4004U	FBJ6004U	FBL8004U
Fuse class	J	J	J	J	L

S type pistol handle for external front and side operation



Select a handle

NEMA Type	IEC	Test Function	Color	Catalog Numbers				
1, 3R, 12	IP54	No	Black	HSPBL	HSPBL	HSPBL	HSPBEL	HSPBEL
1, 3R, 12	IP54	No	Red / Yellow	HSPRL	HSPRL	HSPRL	HSPREL	HSPREL
1, 3R, 12, 4, 4X	IP65	No	Black	HSPB4L	HSPB4L	HSPB4L	HSPB4EL	HSPB4EL
1, 3R, 12, 4, 4X	IP65	No	Red / Yellow	HSPR4L	HSPR4L	HSPR4L	HSPR4EL	HSPR4EL
1, 3R, 12, 4, 4X	IP65	Yes	Black	HSPB4LT	HSPB4LT	HSPB4LT	HSTB4†	HSTB4†
1, 3R, 12, 4, 4X	IP65	Yes	Red / Yellow	HSPR4LT	HSPR4LT	HSPR4LT	HSTR4†	HSTR4†

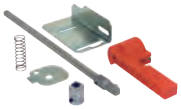
Note: Handle is defeatable, and is padlockable in the "OFF" position. † T-bar type handle. No test function.



Select a shaft

Shaft Length (inches / mm)	Catalog Numbers				
7.9 / 200	SS200-10	SS200-10	SS200-10	SS200-12	SS200-12
12.6 / 320	SS320-10	SS320-10	SS320-10	SS320-12	SS320-12
15.7 / 400	SS400-10	SS400-10	SS400-10	SS400-12	SS400-12
19.7 / 500	SS500-10	SS500-10	SS500-10	SS500-12	SS500-12

NFPA 79 Front Operation Kit



Select a kit

	Catalog Numbers				
NFPA 79 Front Operation Kit	NFPA791	NFPA791	NFPA791	NFPA792	NFPA792

Note: allows to operate & padlock the switch when door of enclosure is open. For full information on NFPA79 requirements and on our solution, please consult P42 of this Advisor Catalog.

Options for external front and side operation







	Catalog Numbers				
Pistol Handle for Direct Front Operation	-	-	-	HADBSU	HADBSU
Terminal Lugs Kit					
4 lugs per kit - for 2 pole switches	Intergral	TL200X4	-	-	-
6 lugs per kit - for 3 pole switches	Intergral	TL200X6	TL400	TL600	TL600
8 lugs per kit - for 4 pole switches	Intergral	TL200X8	TL4004	TL6004	TL6004
Terminal shrouds kit(1)					
2-pole (for line or load side)	Intergral	TS2002FBX	-	-	-
3-pole (for line or load side	Intergral	TS2003FBX	TS400FB(2)	TS800U	TS800U
4-pole (for line or load side)	Intergral	TS2004FBX	TS4004FB(2)	TS8004U	TS8004U
Shorting links kit (3 links per kit)	SL100	SL200	SL400	SL800	SL800
Auxiliary contacts					
1 N/O, 10A, 600 VAC snap-on-contact block, A600-Q600	AC3	AC3	AC3	AC3	AC3
1 N/C, 10A, 600 VAC snap-on-contact block, A600-Q600	AC4	AC4	AC4	AC4	AC4
1 NO+NC side mount contact block, A600-N600(3)	AC5	AC5	AC5	AC5	AC5
2 NO+NC side mount contact blocks, A600-N600(3)	AC6	AC6	AC6	AC6	AC6

(1) Line side shrouding supplied as standard with switch.
(2) As a replacement part for line or load side (two terminal screens supplied as standard with switch).
(3) Two auxiliary contact blocks maximum can be side mounted.
Note: for class T fuse adaptors, please consult Mersen.

Fusible Disconnect Switches FB Series

Flange Operated Range from 30 to 400A



Select a switch

Ampere Rating	Catalog Numbers 30	60	100	200	400
2-Pole	FBJ302X	FBJ602X	FBJ1002X	FBJ2002X	-
3-Pole	FBJ3003X	FBJ603X	FBJ1003X	FBJ2003X	FBJ400U
4-Pole	FBJ3004X	FBJ604X	FBJ1004X	FBJ2004X	FBJ4004U
Fuse class	J	J	J	J	J

Cable flange operated handle (square D type - class 9422)



Select a handle

NEMA Type	IEC	Catalog Numbers				
1, 3R, 12, 4, 4X	IP54	HAF-OP1(1)	HAF-OP1(1)	HAF-OP1(1)	HAF-OP1(1)	HAF-OP1(1)
4, 4X	IP65	HAF-OP2(2)	HAF-OP2(2)	HAF-OP2(2)	HAF-OP2(2)	HAF-OP2(2)

Note: Handle is defeatable, and padlockable in the "OFF" position.



Mechanism

Mechanism	HAF-MECHX	HAF-MECHX	HAF-MECHX	HAF-MECHX	HAF-MECHX
Cable Length (inches / mm)					
36 / 914.4	HAFC36	HAFC36	HAFC36	HAFC36	HAFC36
60 / 1,524	HAFC60	HAFC60	HAFC60	HAFC60	HAFC60
120 / 3,048	HAFC120	HAFC120	HAFC120	HAFC120	HAFC12



Select a cable

Note: Cable flange operation is for enclosure depth from 5.75"/145mm to 36"/990mm, depending on the cable length.

Rod flange operated handle (square D type - class 9422)



Select a handle

NEMA Type	IEC	Catalog Numbers				
1, 3, 3R, 4, 12	IP54	HAF-OP1(1)	HAF-OP1(1)	HAF-OP1(1)	HAF-OP1(1)	HAF-OP1(1)
4, 4X	IP65	HAF-OP2(2)	HAF-OP2(2)	HAF-OP2(2)	HAF-OP2(2)	HAF-OP2(2)

Note: handle is defeatable, and padlockable in the "OFF" position.



Select a rod

Rod Length (inches / mm)						
23.6 / 500		HAFRX	HAFRX	HAFRX	HAFRX	HAFRX

Note: Rod kit is for enclosure depth from 8 / 203 to 24.12 / 613 For smaller depth, please consult us.

Pistol handle for direct side operation (not NFPA 79)



Select a handle

Color	Catalog Numbers				
Black	HADB4	HADB4	HADB4	HADB4	HADB4

Note: Handle is padlockable in the "OFF" position.

Options for flange & direct operation handle from 30 to 400 A







Terminal lugs kit	Catalog Numbers				
6 lugs per kit - for 2 pole fuse switches	Intergral	Intergral	Intergral	TL200X4	TL400
6 lugs per kit - for 3 pole fuse switches	Intergral	Intergral	Intergral	TL200X6	TL400
8 lugs per kit - for 4 pole fuse switches	Intergral	Intergral	Intergral	TL200X8	TL4004
Terminal shrouds kit(4)					
2-pole (for line or load side)	Intergral	Intergral	Intergral	TS2002FBX	-
3-pole (for line or load side)	Intergral	Intergral	Intergral	TS2003FBX	TS400FB(5)
4-pole terminal shrouds kit(4) (for line or load side)	Intergral	Intergral	Intergral	TS2004FBX	TS4004FB(5)
Shorting links kit (3 links per kit - for 3 pole fuse switches)	JNL30	SL60	SL100	SL200	SL400
Auxiliary contacts(3)					
1 NO+NC side mount contact block, A600 - N600	AC5	AC5	AC5	AC5	AC5
2 NO+NC side mount contact blocks, A600 - N600	AC6	AC6	AC6	AC6	AC6

(1) All external metal parts are sheet steel. (2) All external metal parts are either stainless steel or a chrome-plated non-ferrous die casting.
(3) Two auxiliary contact blocks maximum can be side mounted. (4) Line side Shrouding supplied as standard with switch.
(5) As a replacement part (two terminal screens supplied as standard with switch). Note: for class T fuse adaptors, please consult us.

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Fusible Disconnect Switches FB Series

Technical Characteristics for Front and Side Operation

Catalog Numbers - UL, cUL and CSA

Catalog Numbers	FBCC30CDT / FBCC30SNCDT	FBJ30CDT / FBJ30SNCDT	FBJ302X / FBJ303X / FBJ304X
Ampere Rating (A)	**30**	**30**	**30**
Fuse type	CC	J	J
Operating voltage (V)	600	600	600
Max Horsepower Rating / Max Motor FLA Current Three-Phase			
208 V	5 / 17.5	5 / 17.5	5 / 17.5
240 V	7.5 / 22	7.5 / 22	7.5 / 22
480 V	15 / 21	15 / 21	15 / 21
600 V	20 / 22	20 / 22	20 / 22
DC 125 V - 2-pole in series	3 / 25	3 / 25	3 / 25
DC 250 V - 3-pole in series	5 / 20	5 / 20	5 / 20
Max Horsepower Rating / Max Motor FLA Current Single-Phase			
240 V AC	-	-	3 / 17
480 V AC	-	-	7.5 / 21
Short Circuit Rating			
Short circuit rating with fuses (SCCR) (kA)	100	100	200
Branch circuit fuse type	CC	J	J
Max fuse rating (A)	30	30	30
Dimension 3-pole			
H (in)	4.56	4.56	5.35
W (in)	3.78	4.13	5.88
D (in)	3.28	3.89	4.84
Shaft size square			
in	0.2 x 0.2	0.2 x 0.2	0.4 x 0.4
mm	5 x 5	5 x 5	10 x 10
3-pole switch operating torque (front operation) (lb in)	21	21	88
Terminal lugs kit (# of lugs per kit)	Integral	Integral	Integral
Wire range AWG (# of wire holes per lug)	#10-#14 (1)	#10-#14 (1)	#6-#10 (1)
Wire tightening torque	27	27	58

Fusible Disconnect Switches FB Series

Technical Characteristics for Front and Side Operation

Catalog Numbers - UL, cUL and CSA

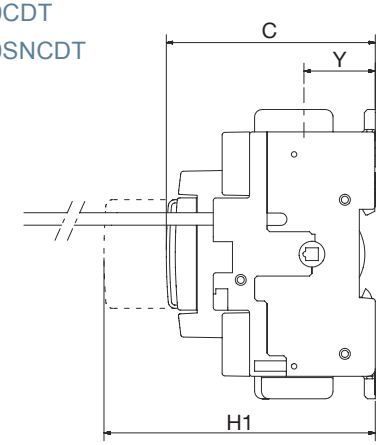
Catalog Numbers	FBJ602X FBJ603X FBJ604X	FBJ1002X FBJ1003X FBJ1004X	FBJ2002X FBJ2003X FBJ2004X	FBJ400U FBJ4004U	FBJ600U FBJ6004U	FBL800U FBL8004U
Ampere Rating (A)	**60**	**100**	**200**	**400**	**600**	**800**
Fuse type	J	J	J	J	J	L
Operating voltage (V)	600	600	600	600	600	600
Max Horsepower Rating / Max Motor FLA Current Three-Phase						
208 V	15 / 48.5	25 / 78.5	50 / 150	100 / 286	-	-
240 V	15 / 42	30 / 80	60 / 154	125 / 312	200 / 480	200 / 480
480 V	30 / 40	60 / 77	125 / 156	250 / 302	400 / 477	500 / 590
600 V	50 / 52	75 / 77	150 / 144	350 / 336	500 / 472	500 / 472
DC 125 V - 2-pole in series	3 / 25	7.5 / 58	-	20 / 148	-	-
DC 250 V - 3-pole in series	10 / 38	20 / 38	-	50 / 173	-	-
Max Horsepower Rating / Max Motor FLA Current Single-Phase						
240 V AC	10 / 50	10 / 50	-	-	-	-
480 V AC	10 / 26	10 / 26	-	-	-	-
Short Circuit Rating						
Short circuit rating with fuses (SCCR) (kA)	100	200	200	200	200	200
Branch circuit fuse type	J	J	J	J	J	L
Max fuse rating (A)	60	100	200	400	600	800
Dimension 3 pole (front operated switches)						
H (in)	5.35	7.32	7.72	14.31	11.86	11.86
W (in)	5.88	5.88	7.68	11.93	14.31	14.31
D (in)	4.84	4.84	5.12	5.56	11.42	11.42
Shaft size square (front operated switches)						
in	0.4 x 0.4	0.4 x 0.4	0.4 x 0.4	0.4 x 0.4	4.7 x 4.7	4.7 x 4.7
mm	10 x 10	10 x 10	10 x 10	10 x 10	12 x 12	12 x 12
3-pole switch operating torque (front operation) (lb-in)	88	88	106	132	350	350
Terminal lugs kit (# lugs per kit)	Integral	Integral	Optional (6)	Optional (6)	Optional (6)	Optional (6)
Wire range AWG (# of wire holes per lug)	#6-#10 (1)	#1-#12 (1)	300kcmil - #6 (1)	600kcmil-#2 (1)	600kcmil-#2 (2)	600kcmil-#2 (2)
Wire tightening torque (lb-in)	120	200	275 max	375	375	375

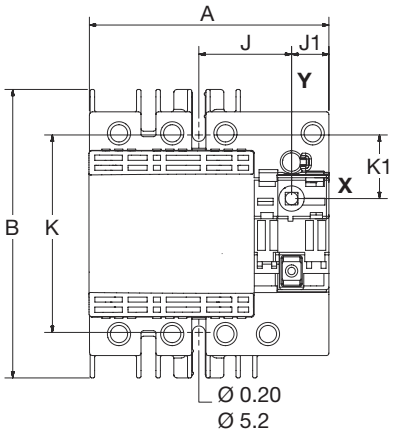
Fusible Disconnect Switches FB Series

Dimensions (in/mm) for Front and Side Operation

Fusible Disconnect Switch CD 30 A CC

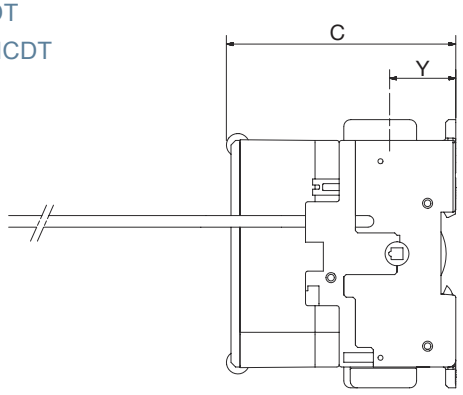
FBCC30CDT
FBCC30SNCDT

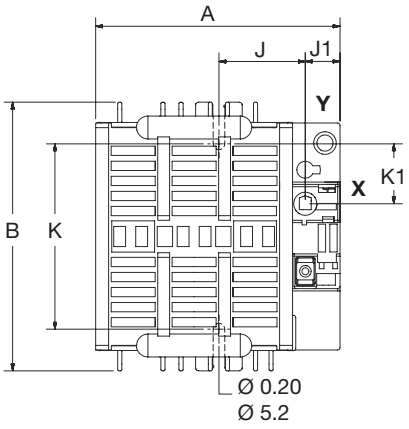




Fusible Disconnect Switch CD 30 A J

FBJ30CDT
FBJ30SNCDT





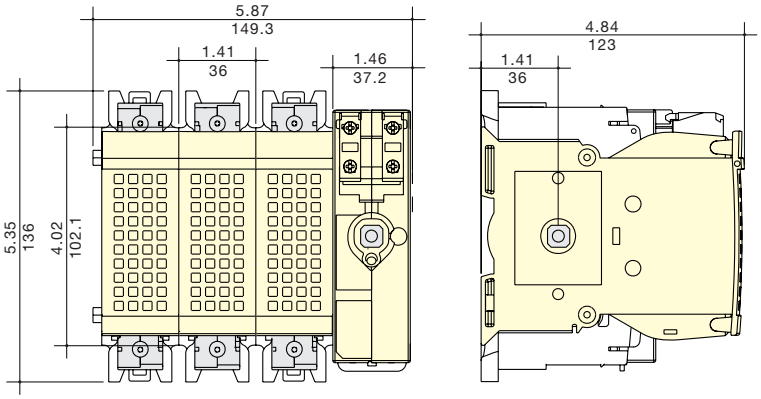
Ampere Rating	Number of Poles	A		B		C		H1		H3		J		J1		K		K1		Y	
		In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm
30 A CC CD type	3 P	3.78	96	4.56	116	3.28	83.5	5.19	132	-	-	1.47	37.5	0.59	15	3.3	84	1	25.5	1.12	28.5
30 A J CD type	3 P	4.13	105	4.56	116	3.89	99	-	-	-	-	1.47	37.5	0.59	15	3.30	84	1	25.5	1.12	28.5

Fusible Disconnect Switches FB Series

Dimensions (in/mm)

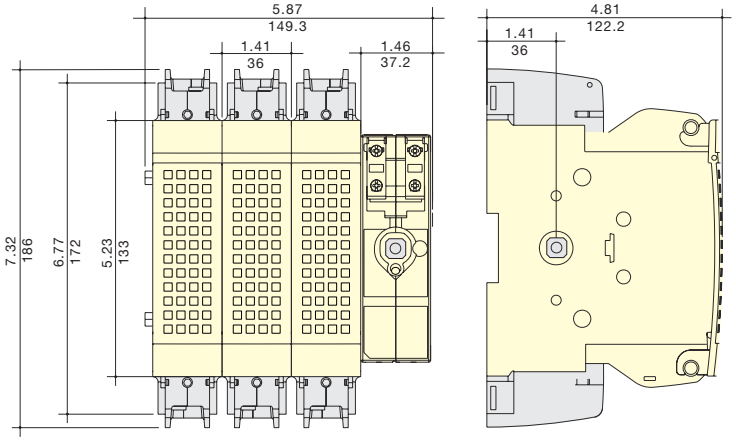
Fusible Disconnect Switch 30A and 60A

FBJ303X*
FBJ603X*



Fusible Disconnect Switch 100A

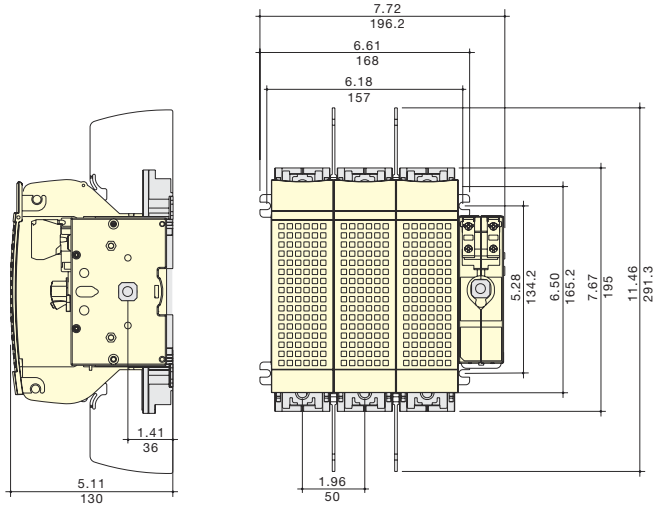
FBJ103X*



Note: For 4-pole or 2-Pole versions, add or subtract 1.41" / 36mm.

Fusible Disconnect Switch 200A

FBJ203X**



**Note: For 4-pole or 2-Pole versions, add or subtract 1.96" / 50mm.

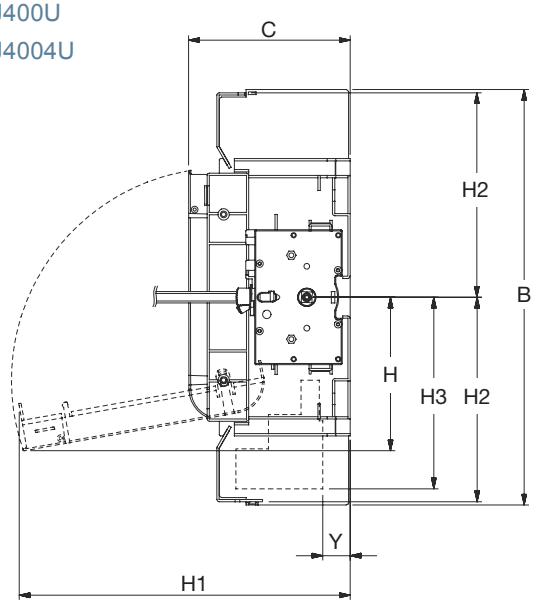
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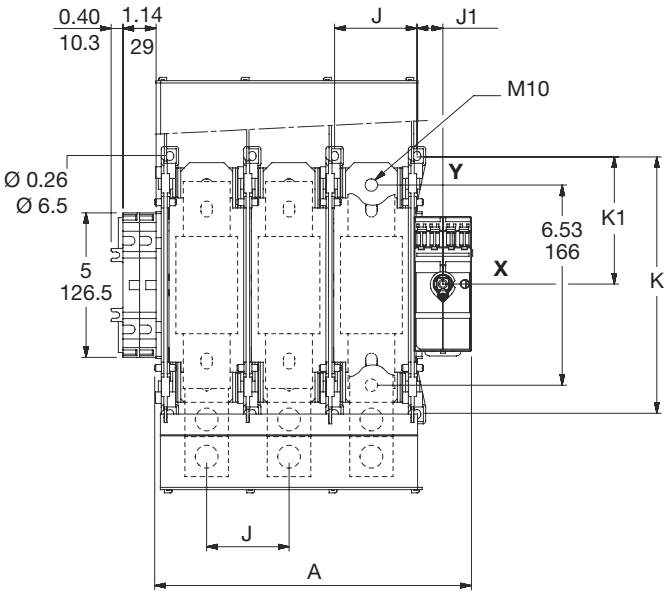
Fusible Disconnect Switches FB Series

Dimensions (in/mm) for Front and Side Operation

Fusible Disconnect Switch 400A

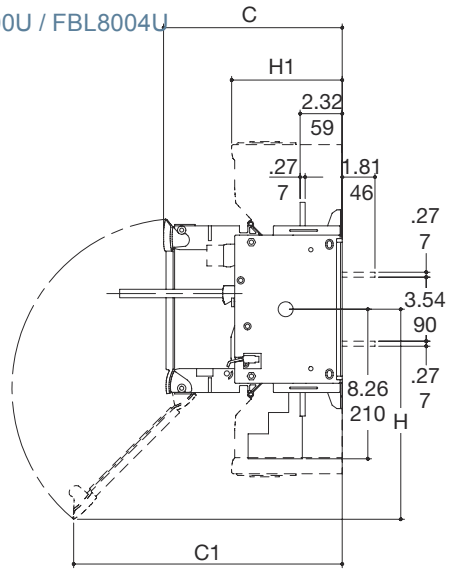
FBJ400U
FBJ4004U

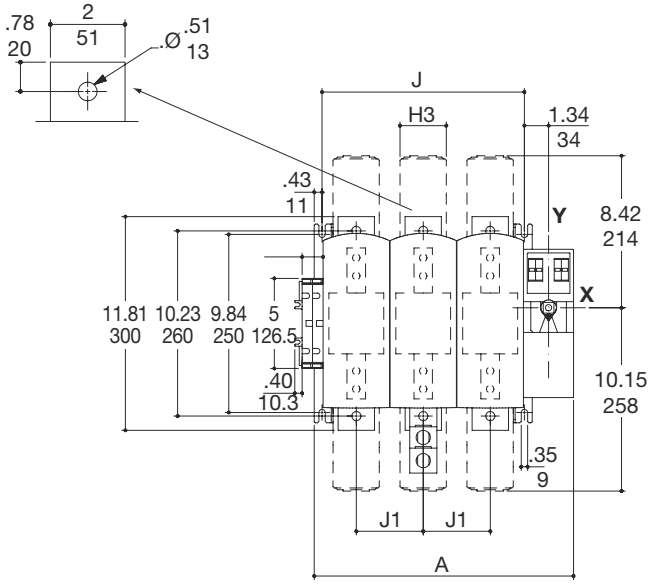




Fusible Disconnect Switch 600A - 800A

FBJ600U / FBJ6004U
FBL800U / FBL8004U





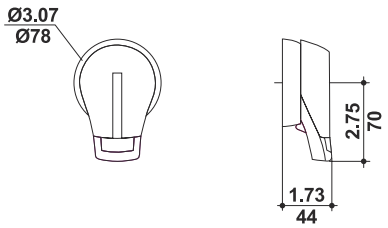
Ampere Rating	No of Poles	A		B		C		C1		H		H1		H2		H3		J		J1		K		K1		Y	
		In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm
400 A	3 P	10.8	276	14.31	363.5	5.56	141.5	-	-	5.28	134.5	11.41	290	7.04	179	6.59	167.5	2.84	72	0.88	22.5	8.83	224	4.41	112	1.06	27
	4 P	13.7	348	14.31	363.5	5.56	141.5	-	-	5.28	134.5	11.41	290	7.04	179	6.59	167.5	2.84	72	0.88	22.5	8.83	224	4.41	112	1.06	27
600 A, 800 A	3 P	14.33	364	-	-	9.84	250	14.72	374	11.69	297	6.10	155	-	-	2.56	65	11.18	284	3.70	94	-	-	-	-	-	-
	4 P	18.03	458	-	-	9.84	250	14.72	374	11.69	297	6.10	155	-	-	2.56	65	14.88	378	3.70	94	-	-	-	-	-	-

Fusible Disconnect Switches FB Series

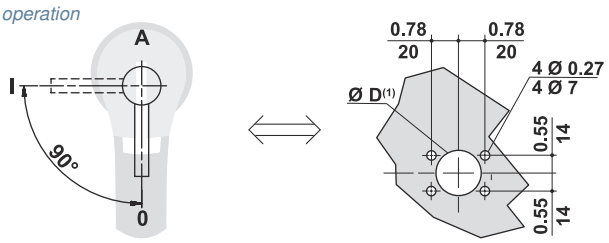
Dimensions (in/mm) for External Front Operation Handles

S type pistol handle

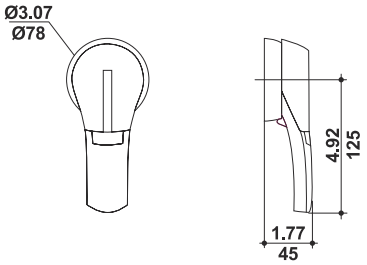
HSPB
HSPR
HSPB4
HSPR4

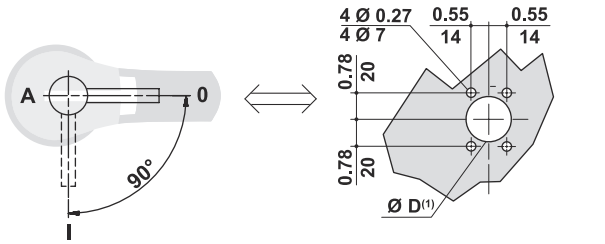


Front operation

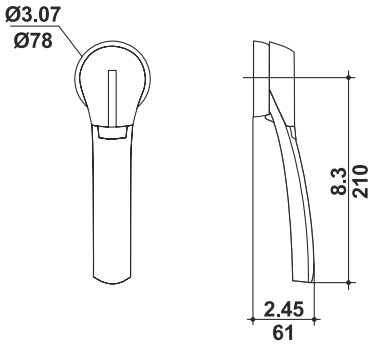


HSPBL
HSPRL
HSPB4L
HSPR4L

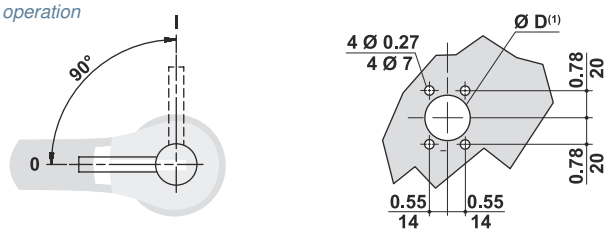




HSPBEL
HSPREL
HSPB4EL
HSPR4EL



Side operation

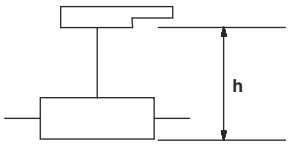


K

Fusible Disconnect Switches FB Series

Dimensions (in/mm) from Backplate to Door Distance with Shaft Extension

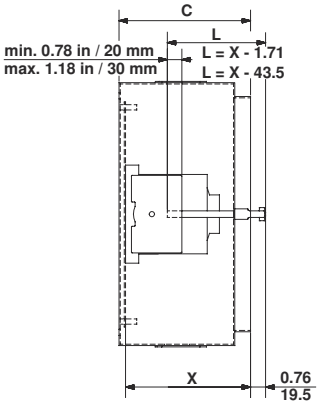
Minimum distance (in / mm)



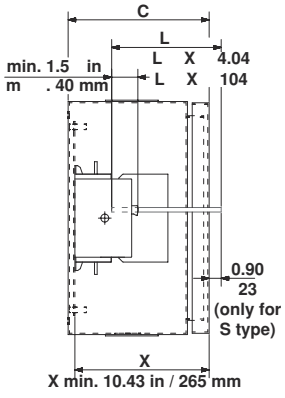
H & C Minimum Dimension	All HSP Handles	
	In	mm
Fusible Disconnect Switch CD 30 A CC	5.31	135
Fusible Disconnect Switch CD 30 A J	5.98	152
Fusible Disconnect Switch 30 A J - 60 A J	6	153
Fusible Disconnect Switch 100 A J	6	153
Fusible Disconnect Switch 200 A J	8	203.5
Fusible Disconnect Switch 400 A J	12	305
Fusible Disconnect Switch 600 A J - 800 A L	12	305

S type pistol handle

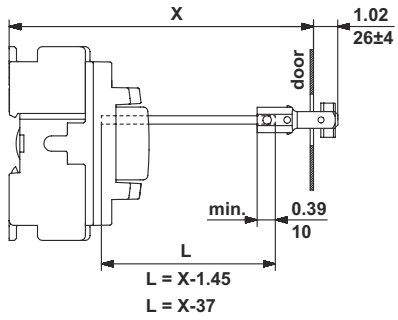
FBJ400U
FBJ4004U



FBJ600U FBJ6004U
FBL800U FBL8004U



FBCC30CDT FBCC30SNCDT
FBJ30CDT FBJ30SNCDT

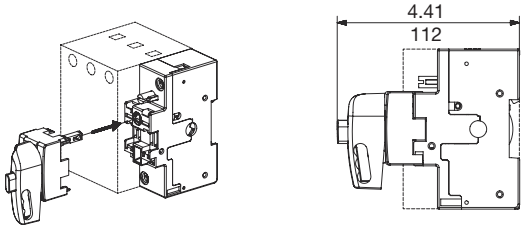


Fusible Disconnect Switches FB Series

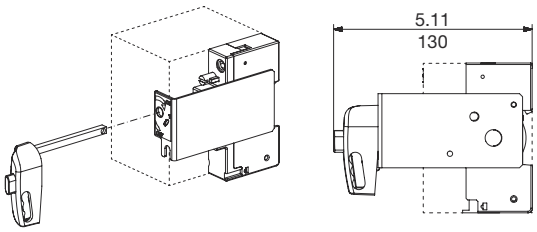
Dimensions (in / mm) for Direct Front Operation Handles

Direct pistol handle

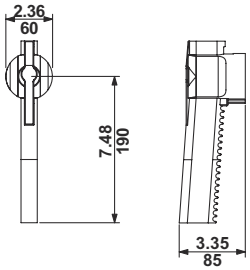
HADB1



HADB2



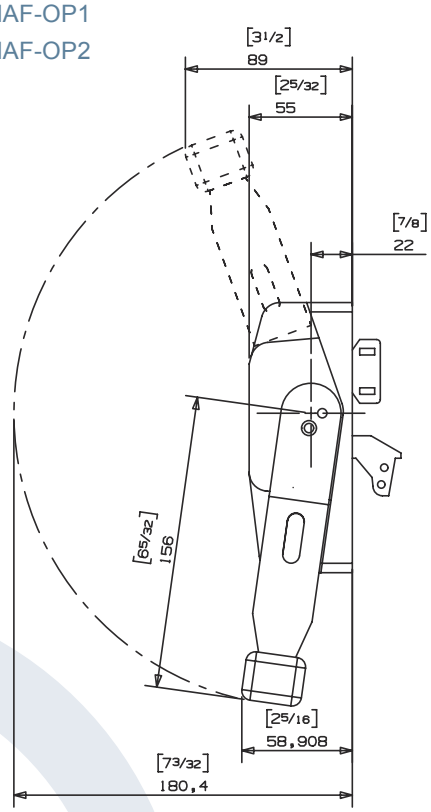
HADB5U

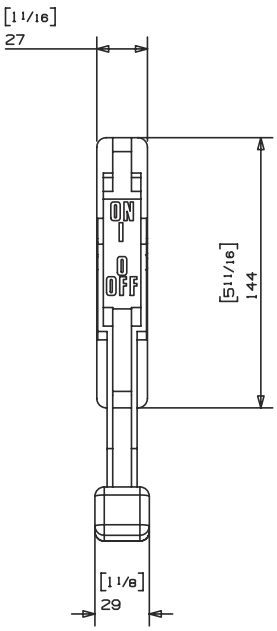


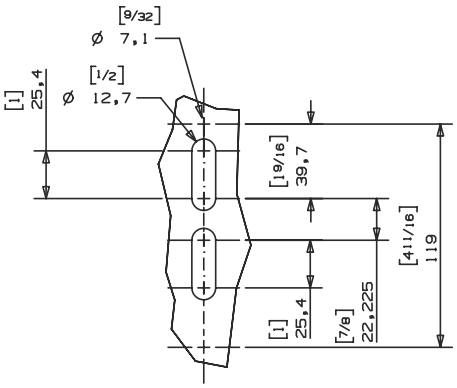
Dimensions (in / mm) for Flange Operation Handles

Square D type flange handle - class 9422 (A1 & A2)

HAF-OP1
HAF-OP2





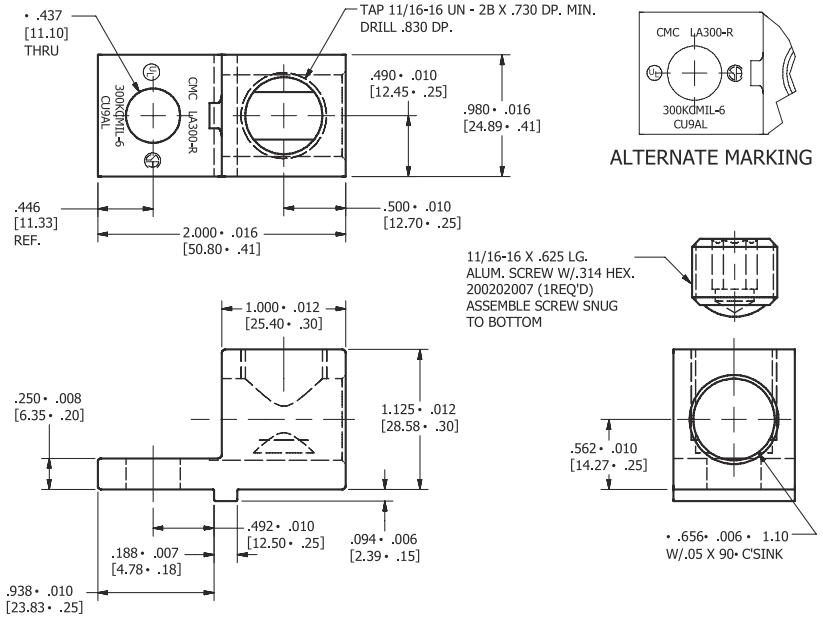


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Dimensions (in / mm) for Terminal Lugs

TL200X

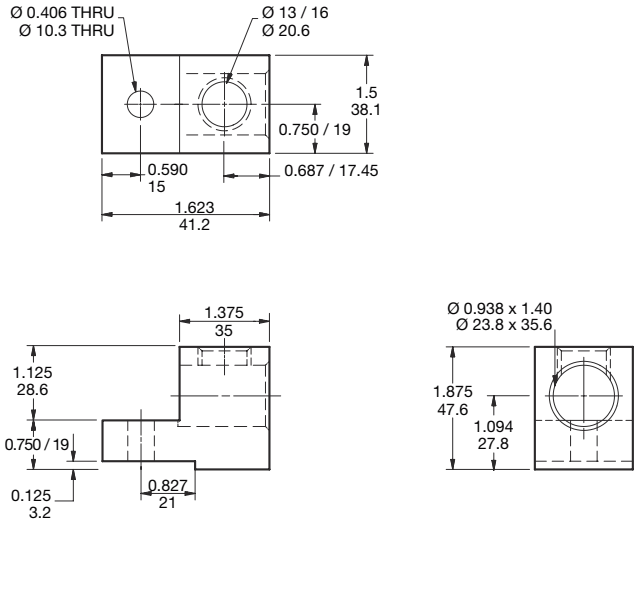
For use with FBJ 200xX



1 wire 300kcmil - #6

TL400

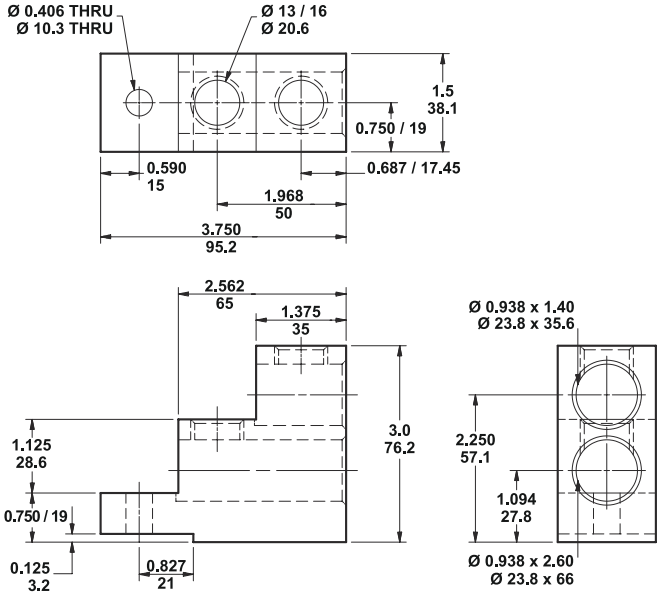
For use with FBJ400



1 wire 600 MCM-2

TL600

For use with FBJ600U and FBL800U



2 wire 600 MCM-2

Note: for FBJ400, please use HM bolts 10 x 30 mm class 6.8.

Enclosed Disconnect Switches

Mersen enclosed disconnect switches are designed to meet customer's requirements for compact and durable individual disconnecting means. Both fusible and non-fusible versions are available in a variety of enclosures types resulting in one of the largest available ranges in the industry. The enclosed disconnect switch range offers safety, ease of installation, space savings and operational convenience to end-users.

Mersen features NEMA style, Type 4X non-metallic and stainless steel enclosures that are extremely durable and provide the ultimate protection for harsh environments and conditions. These rugged enclosure types are often used in areas where "wash down" applications are required.

Highlights:

- Suitable for use as motor disconnect
- Meets OSHA lockout/tagout requirements
- NEMA rated enclosures
- Knockouts provided
- Easy screw mounting
- Selector or pistol handles in black or red/yellow
- Clear ON/OFF indication

Applications:

- Load break switching
- Separate disconnect means within sight of all motor loads to comply with NEC® Article 430
- Circuit isolation
- Service entrance ratings available
- Food processing
- Conveyor systems
- Harsh industrial environments



Ratings:

Fusible

Volts : 600VAC
Amps : 30 to 800A

Non-Fusible

Volts : 600VAC
Amps : 16 to 1200A

Volts : 600VDC
Amps : 100 to 400A

Approvals:

- UL 508A
- UL 508
- UL 98
- CSA
- IEC versions available

Enclosed Disconnect Switches

Part Numbering Guideline (example)

ED	FS	30	3	R	S	0	-
Enclosure Type	Switch Type	Amp Rating	Number of Poles	Color of handle: R = Red/yellow B = Black	Type of handle: S = Selector P = Pistol	Auxiliary contacts: See chart below	Other options

Pre-break, Pre-mounted Auxiliary Contacts

Switch Style		Catalog Suffix			
		0	1	2	3
Non-fusible, UL508	FSLBS 16-80A	None	-	-	1 NO + NC
Non-fusible, UL98	Fusible Disconnect Switch 30-1200A	None	1 NO	1 NC	1 NO + NC
Fusible, UL98	Fusible Disconnect Switch 30 – 800A	None	1 NO	1 NC	1 NO + NC

Other Options

Please consult factory for availability and suffix for any other options including:

- Neutral blocks (N)
- Terminal Shrouds are integral or standard with many of our switches. If terminal shrouds are necessary, add a “T” to the end of the part number.
- Special Request
  - Pilot Lights
  - Pushbuttons
  - 2 or 3 position selector switches

All enclosed switches are provided with a standard integral ground lug

Box type	Switch type	Ground lug wire size
NEMA/UL	16 – 60A	(2) #4 – #14
NEMA/UL	80 – 125A	(2) 1/0 – #14
NEMA/UL	200 – 400A	(2) 600kcmil – #2
NEMA/UL	600A & above	Consult Factory

Note: EDFS 40A, 60A & 80A use grounding stud

Enclosure Application Information

Enclosure Type		Intended Use and Description
NEMA	1	Indoor use primarily to provide a degree of protection against contact with the enclosed equipment and against a limited amount of falling dirt.
NEMA	3R	Intended for outdoor use primarily to provide a degree of protection against rain, sleet, and damage from external ice formation.
NEMA	12	Intended for indoor use primarily to provide a degree of protection against circulating dust, falling dirt, and dripping non-corrosive liquids.
NEMA	4	Intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, hose-directed water, and damage from external ice formation.
NEMA	4X	Intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, wind blown dust and rain, splashing water, hose-directed water, and damage from ice formation.
IEC	IP65	Total protection against dust and protected against water jets from any hosed direction.

Enclosed Disconnect Switches

NEMA ENCLOSURE 3 Pole, 600V 30-1200A, Non-fused		1	3R	12	4	4X Stainless	4X Non-Metallic
	Ampere Rating (A)	Catalog Numbers					
	30	Special compact polycarbonate enclosures					EJFS303RS0
	60	Special compact polycarbonate enclosures					EJFS603RS0
	16	EAFS163RS0	EFFS163RS0	ECFS163RS0	EHFS163RS0	EBFS163RS0	EDFS163RS0
	20	EAFS203RS0	EFFS203RS0	ECFS203RS0	EHFS203RS0	EBFS203RS0	EDFS203RS0
UL 508	25	EAFS253RS0	EFFS253RS0	ECFS253RS0	EHFS253RS0	EBFS253RS0	EDFS253RS0
	30	EAFS303RS0	EFFS303RS0	ECFS303RS0	EHFS303RS0	EBFS303RS0	EDFS303RS0
	40	EAFS403RS0	EFFS403RS0	ECFS403RS0	EHFS403RS0	EBFS403RS0	EDFS403RS0
	60	EAFS603RP0	EFFS603RP0	ECFS603RP0	EHFS603RP0	EBFS603RP0	EDFS603RP0
	80	EAFS803RP0	EFFS803RP0	ECFS803RP0	EHFS803RP0	EBFS803RP0	EGFS803RP0
	30	EAFC303RP0	EFFC303RP0	ECFC303RP0	EHFC303RP0	EBFC303RP0	EGFC303RP0
	60	EAFC603RP0	EFFC603RP0	ECFC603RP0	EHFC603RP0	EBFC603RP0	EGFC603RP0
	100	EAFC1003RP0	EFFC1003RP0	ECFC1003RP0	EHFC1003RP0	EBFC1003RP0	EGFC1003RP0
	200	EAFC2003RP0	EFFC2003RP0	ECFC2003RP0	EHFC2003RP0	EBFC2003RP0	EGFC2003RP0
UL 98	400	EAFC4003RP0	EFFC4003RP0	ECFC4003RP0	EHFC4003RP0	EBFC4003RP0	EGFC4003RP0
	600	EASC6003RP0	EFSC6003RP0	ECSC6003RP0	EHSC6003RP0	EBSC6003RP0	EGSC6003RP0
	800	EASC8003RP0	EFSC8003RP0	ECSC8003RP0	EHSC8003RP0	EBSC8003RP0	EGSC8003RP0
	1000	EASC10003RP0	EFSC10003RP0	ECSC10003RP0	EHSC10003RP0	EBSC10003RP0	EGSC10003RP0
	1200	EASC12003RP0	EFSC12003RP0	ECSC12003RP0	EHSC12003RP0	EBSC12003RP0	EGSC12003RP0

NEMA ENCLOSURE 3 Pole, 600V 30-800A, Fused			1	3R	12	4	4X Stainless	4X Non-Metallic
	Ampere Rating (A)	Fuse Type	Catalog Numbers					
	30, compact	CC	EAFBCC303RP0	EFFBCC303RP0	ECFBCC303RP0	EHFBCC303RP0	EBFBCC303RP0	EGFBCC303RP0
	30, compact	J	EAFBJC303RP0	EFFBJC303RP0	ECFBJC303RP0	EHFBJC303RP0	EBFBJC303RP0	EGFBJC303RP0
	30	J	EAFBX303RP0	EFFBX303RP0	ECFBX303RP0	EHFBX303RP0	EBFBX303RP0	EGFBX303RP0
	60	J	EAFBX603RP0	EFFBX603RP0	ECFBX603RP0	EHFBX603RP0	EBFBX603RP0	EGFBX603RP0
UL 98	100	J	EAFBX1003RP0	EFFBX1003RP0	ECFBX1003RP0	EHFBX1003RP0	EBFBX1003RP0	EGFBX1003RP0
	200	J	EAFBX2003RP0	EFFBX2003RP0	ECFBX2003RP0	EHFBX2003RP0	EBFBX2003RP0	EGFBX2003RP0
	400	J	EAFBJ4003RP0	EFFBJ4003RP0	ECFBJ4003RP0	EHFBJ4003RP0	EBFBJ4003RP0	EGFBJ4003RP0
	600	J	EAFBJ6003RP0	EFFBJ6003RP0	ECFBJ6003RP0	EHFBJ6003RP0	EBFBJ6003RP0	EGFBJ6003RP0
	800	L	EAFBL8003RP0	EFFBL8003RP0	ECFBL8003RP0	EHFBL8003RP0	EBFBL8003RP0	EGFBL8003RP0

Notes: Each of the above enclosed switches are listed having a red/yellow handle. Simply replace the "RS" or "RP" with a "BS" or "BP" to receive with a black selector or black pistol handle. The non-metallic enclosures are comprised of "ED" polycarbonate and "EG" polyester fiberglass.

Enclosed Disconnect Switches

Switch Rating	Enclosure Type	H height (in)	W width (in)	D depth (in)	MH mounting height (in)	MW mounting width (in)	Shipping Weight (lbs)	Figure No.
16–40A (FSLBS) UL508	1	8	8	6	5	7	10	2
	3R	8	8	6	9	3	11	1
	12	8	6	6	8.75	4	7	1
	4	5.91	5.91	4.72	5.2	3.35	7	2
	4X Stainless	5.91	5.91	4.72	5.2	3.35	7	2
	4X Non-Metallic	7	5	5	6.18	4.21	2	2
60A (FSLBS) UL508	1	8	8	6	5	7	10	2
	3R	8	8	6	9	3	10	1
	12	8	6	6	8.75	4	7	1
	4	7.87	5.91	4.72	7.17	3.35	7	2
	4X Stainless	7.87	5.91	4.72	7.17	3.35	7	2
	4X Non-Metallic	7	5	5	6.18	4.21	4	2
80A (FSLBS) UL508	1	10	8	6	7	7	10.6	2
	3R	10	8	6	11	3	11.1	1
	12	10	8	6	10.75	6	12.3	1
	4	9.84	7.87	5.91	9.13	5.31	9.8	2
	4X Stainless	9.84	7.87	5.91	9.13	5.31	9.8	2
	4X Non-Metallic	11.3	9.31	5.43	10.75	6	6	1
100A (FSSC) UL98	1	10	8	6	7	7	10.6	2
	3R	10	8	6	11	3	11.1	1
	12	10	8	6	10.75	6	12.3	1
	4	10	8	6	10.75	6	11.8	1
	4X Stainless	9.84	7.87	5.91	9.13	5.31	9.8	2
	4X Non-Metallic	11.31	9.31	5.43	10.75	6.02	7.6	1

Dimensions (in / mm)

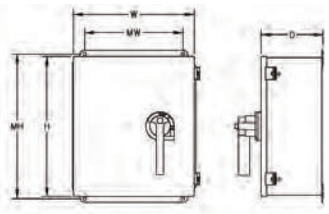


Figure 1

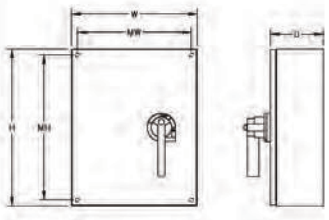


Figure 2

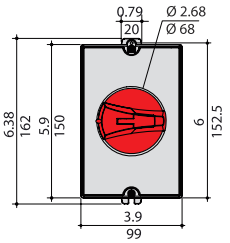


Figure 3

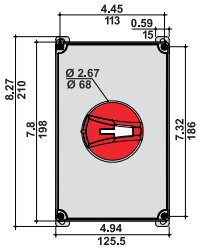


Figure 4

Enclosed Disconnect Switches

Switch Rating	Enclosure Type	H height (in)	W width (in)	D depth (in)	MH mounting height (in)	MW mounting width (in)	Shipping Weight (lbs)	Figure No.
125A (LBSR) UL508	1	10	8	6	7	7	10.6	2
	3R	10	8	6	11	3	11.1	1
	12	10	8	6	10.75	6	12.4	1
	4	10	8	6	10.75	6	11.9	1
	4X Stainless	9.84	7.87	5.91	9.13	5.31	9.8	2
	4X Non-Metallic	11.31	9.31	5.43	10.75	6.02	7.6	1
30A (FSSC) UL98	1	8	8	6	5	5	9.3	2
	3R	8	8	6	9	3	10.2	1
	12	7.87	5.91	4.72	5.2	3.35	7.6	1
	4	7.87	5.91	4.72	5.2	3.35	7.6	1
	4X Stainless	9.844	7.87	5.91	9.13	5.31	10.1	2
	4X Non-Metallic	9.3	7.31	4.96	8.74	4.01	6.2	1
60A (FSSC) UL98	1	12	12	6	9	11	16	2
	3R	12	10	6	13	3	17.6	1
	12	12	12	6	12.75	10	21.6	1
	4	12	12	6	12.75	10	21.9	1
	4X Stainless	11.81	9.84	5.91	11.1	7.28	17.4	2
	4X Non-Metallic	13.3	11.29	7.1	12.75	8.01	12.9	1
100A (SX) UL98	1	12	12	6	9	11	16	2
	3R	12	10	6	13	3	17.6	1
	12	12	12	6	12.75	10	21.6	1
	4	12	12	6	12.75	10	21.9	1
	4X Stainless	12	10	6	12.75	8	18.6	1
	4X Non-Metallic	13.3	11.29	7.1	12.75	8.01	12.9	1
200A (SX) UL98	1	30	20	8.62	27.5	15	68.6	2
	3R	30	14	8	31	13	88.6	1
	12	30	20	8	28.5	18.5	70.1	2
	4	30	20	8	28.5	18.5	70.1	2
	4X Stainless	30	20	10	28.5	18.5	71	1
	4X Non-Metallic	32.87	25	11.81	34.72	22.91	59.3	1

Note: Dimensions are subject to change! Please consult factory for verification.

Enclosed Disconnect Switches

Switch Rating	Enclosure Type	H height (in)	W width (in)	D depth (in)	MH mounting height (in)	MW mounting width (in)	Shipping Weight (lbs)	Figure No.
30A (FBCC Compact) UL489	1	8	8	6	5	7	9.4	2
	3R	8	8	6	9	3	10.3	1
	12	9.84	7.87	5.91	9.13	5.31	10.8	1
	4	9.84	7.87	5.91	9.13	5.31	10.8	1
	4X Stainless	9.84	7.87	5.91	9.13	5.31	11.3	2
	4X Non-Metallic	11.31	9.31	6.93	10.75	6.02	9.7	1
30A (FBJ Compact) UL489	1	12	12	8	9	11	18.3	2
	3R	12	12	10	13	3	23.2	1
	12	12	10	8	12.75	8	14.4	1
	4	13.78	11.81	7.87	13.07	9.25	22.4	2
	4X Stainless	13.78	11.81	7.87	13.07	9.25	24.3	2
	4X Non-Metallic	11.31	9.31	6.93	10.75	6.02	9.7	1
30A (FBX) UL98	1	12	12	8	9	11	18.3	2
	3R	12	12	10	13	5	23.2	1
	12	12	10	8	12.75	8	21.9	1
	4	13.78	11.81	7.87	13.07	9.25	22.4	2
	4X Stainless	13.78	11.81	7.87	13.07	9.25	24.3	2
	4X Non-Metallic	15.32	13.3	8.19	14.75	10	17.1	1
60A (FBX) UL98	1	12	12	8	9	11	18.2	2
	3R	12	12	10	13	5	23.1	1
	12	12	10	8	12.75	8	14.6	1
	4	13.78	11.81	7.87	13.07	9.25	24.2	2
	4X Stainless	13.78	11.81	7.87	13.07	9.25	24.2	2
	4X Non-Metallic	15.32	13.3	8.19	14.75	10	17.5	1
100A (FBX) UL98	1	20	16	8.62	17.88	11	35.2	2
	3R	18	18	10	19	13	41.3	1
	12	20	16	8	21.24	10	35.2	1
	4	20	16	8	18.5	14.5	39	2
	4X Stainless	20	16	8	18.5	14.5	38.1	2
	4X Non-Metallic	19.31	17.31	9.58	18.74	12	25.6	1
200A (FBX) UL98	1	24	20	8.62	21.96	12.76	56.6	2
	3R	24	24	10	25	13	61.2	1
	12	24	20	8	25.24	14	51	1
	4	24	20	8	22.5	18.5	49.5	2
	4X Stainless	24	20	8	22.5	18.5	50.5	2
	4X Non-Metallic	28.94	21	10.63	30.79	18.97	46.3	1

Note: Dimensions are subject to change! Please consult factory for verification.

Fusible Shunt Trip

Mersen's engineered switches offer modular industrial control panels featuring a fusible shunt trip to allow for remote disconnection. An array of available options allows for maximum functionality to be built into a single compact panel.
Panels built for elevator applications feature control transformers (fusing both primary and secondary sides), a fire safety interface relay with a fire alarm voltage monitoring relay and mechanically interlocked auxiliary contacts. Use of Mersen's Amp-Trap 2000® AJT Class J fuses permits easy selectivity coordination, while providing the panel and its components with superior current limitation and the ability to withstand high fault conditions. AJT fuses provide added system reliability since no maintenance or periodic testing is required as with other electromechanical overcurrent devices.



Features/Benefits:

- Fused switch – provides high current limitation and short circuit withstand
- Padlockable handle – allows panel to be locked with switch in the off position ensuring load side power isolation during servicing
- Shunt trip – allows for remote tripping of the main line power prior to the application of water in elevator
- Sprinkler system applications

Highlights:

- 3-Pole fused switch
- 120 VAC Shunt Trip
- Class J fuse block (fuses not included)
- Ground lug as per NEC
- Control power brought to terminals
- Modular components
- NEMA 1 Industrial enclosure standard

Applications:

- Elevators
- Building emergency systems
- Data processing rooms
- Miscellaneous fusible shunt trip applications

Optional Features:

- Industrial control circuit transformer
- Primary (208, 240, 480 or 600 VAC)
- Fire safety relay for control interface (3PDT Relay, choice of Coil Voltage: 120 VAC, 24 VDC or 24VAC)
- Oil-tight key switch to test 2 position selector switch.
- Oil-tight power enabled power light (choice of colors: red, green, white or yellow)
- Isolated neutral lug – 100%. Oversized 200% for excessive Non-Linear loads.
- Auxiliary and alarm contacts are both Form C contacts. The auxiliary contacts change state when the switch is in the on position. Alarm contacts change state when the switch is in the tripped position. The alarm contact is located in place of the second auxiliary contact.
- NEMA 12, 3R, 4 or 4X enclosure available.

Ratings:

Volts : 600VAC
Amps : 30A, 60A, 100A, 200A & 400A

Approvals:

- UL 1087 molded-case switch
- UL 50
- NEMA 1, 12, 3R, 4, 4X
- UL 512
- UL / cUL listed control panel

Recommended Fuse Usage:

- ES Series - Use with AJT, A4J, HSJ

Fusible Shunt Trip

An example of an Engineered Switch Catalog number is listed below with the ordering process detail.

ES2T20R1KRN2A2

Select fusible shunt trip switch:

Ampere Rating (A)	Catalog Number
30	ES3
60	ES6
100	ES1
200	ES2
400	ES4

Fusible Shunt Trip Switch Maximum Horsepower Ratings based on Motor Load

	Ampere Rating (A)	30			60			100			200			400		
	FLA %	150	175	225	150	175	225	150	175	225	150	175	225	150	175	225
VOLTAGE	208 VAC 3 (I)	5	5	3	10	10	10	20	15	15	40	40	30	75	75	60
	240 VAC 3 (I)	5	5	5	10	10	10	20	20	15	50	40	30	125	75	75
	480 VAC 3 (I)	10	10	10	30	25	20	50	40	30	100	75	75	250	150	150
	600 VAC 2 (I)	15	15	10	30	30	25	60	50	40	125	100	100	250	200	200

150...Light duty maximum allowable motor horsepower based on Class J fuses

175...General duty maximum allowable motor horsepower based on Class J fuses

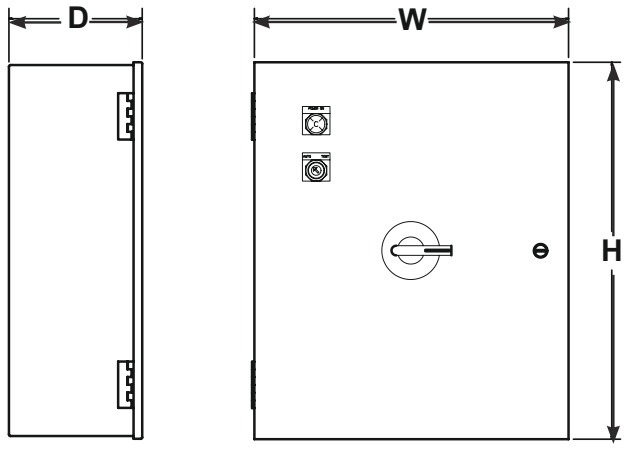
225...Heavy duty maximum allowable motor horsepower based on Class J fuses

Horsepower values in the above table are intended for estimating the size of the switch only. For light duty applications size switch for a minimum of 1.5 times the motor's full load amps. Medium or general duty applications size for a minimum of 1.75 times the full load amps of the motor. For heavy duty applications use a maximum of 2.25 times the full load amps of the motor.

Select options:

Option No.	Description	Catalog No.
	Control Transformer	
1 (Req'd)	208VAC to 120VAC	T20
	240VAC to 120VAC	T24
	480VAC to 120VAC	T48
	600VAC to 120VAC	T60
2 (Req'd)	**Fire Safety Relay 3PDT with Voltage Monitoring**	
	120VAC coil	R1
	24VDC coil	R2
	24VAC coil	R3
3	**Keyswitch**	
	Key to test switch, 120V, with legend plate	K
4	**Pilot light - power enabled**	
	Red	R
	Green	G
	White	W
5	**Isolated Neutral Lug**	
	30-60A	N1
	100A (for 200% oversize use N2)	N1
	200A (for 200% oversize use N4)	N2
	400A (for 200% oversize use two N4)	N4
6 (Req'd)	**Mechanical Interlocked Auxiliary Contacts**	
	1 Form C auxiliary contact	A
	2 Form C auxiliary contacts	B
	1 Form C auxiliary contact and 1 Form C auxiliary alarm contact	C
	Same as C plus handle-activated microswitch	D
7	**Enclosure Options**	
	NEMA 1 standard	-
	NEMA 12	2
	NEMA 3R	3
	NEMA 4	4
	NEMA 4X	X

Note: Options must be selected in above order for part number to be valid.

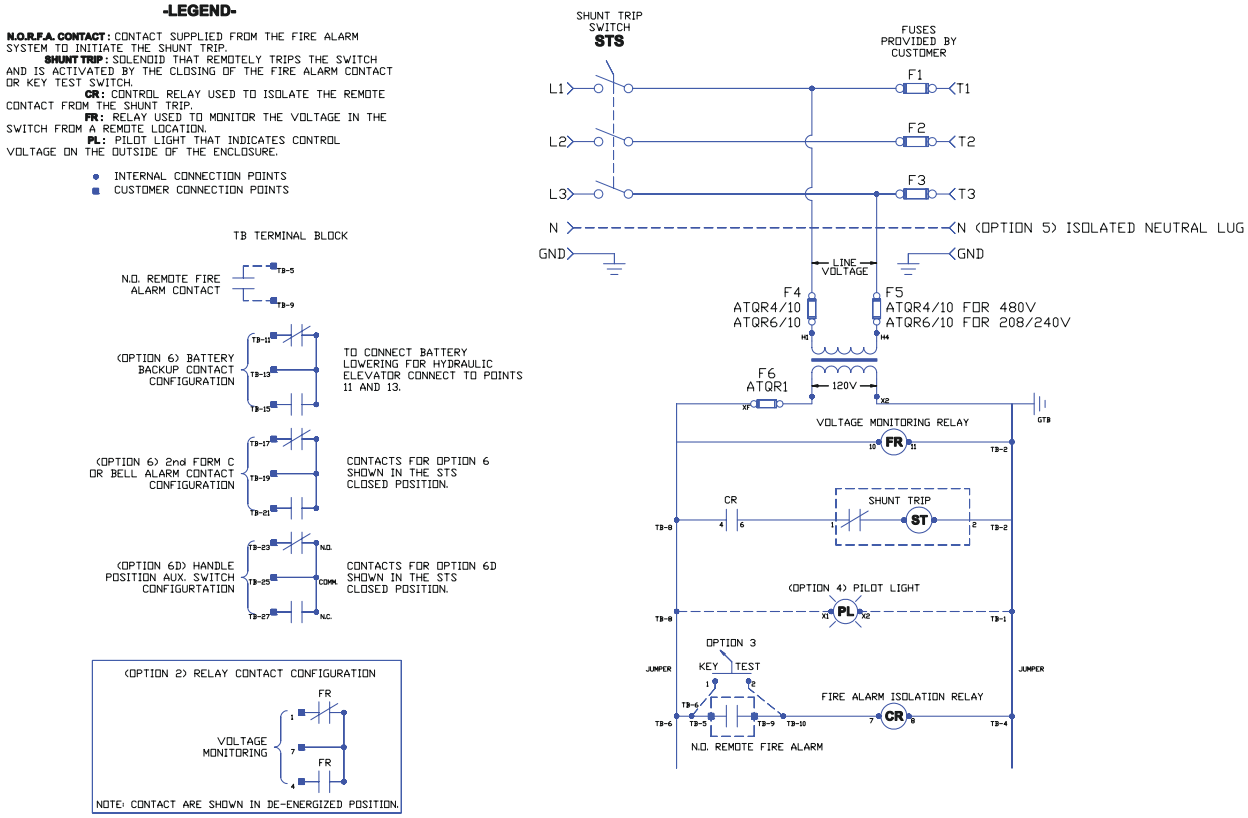


Fusible Shunt Trip Switch Dimensions and Optional Neutral Lug Sizes

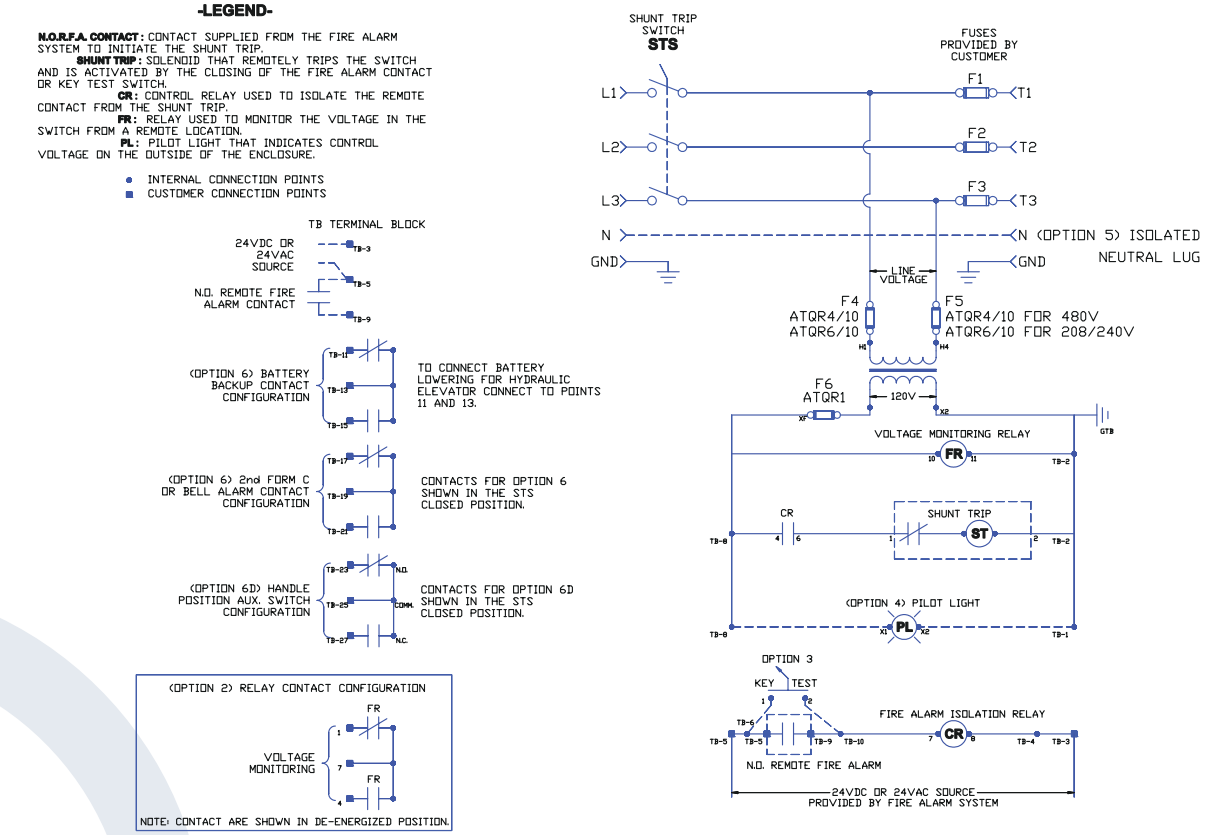
Ampere Rating (A)	30	60	100	200	400
Voltage	H x W x D	H x W x D	H x W x D	H x W x D	H x W x D
208 VAC 3 (I)	24 x 20 x 8	24 x 20 x 8	24 x 20 x 8	30 x 24 x 8	36 x 30 x 8
240 VAC 3 (I)	24 x 20 x 8	24 x 20 x 8	24 x 20 x 8	30 x 24 x 8	36 x 30 x 8
480 VAC 3 (I)	24 x 20 x 8	24 x 20 x 8	24 x 20 x 8	30 x 24 x 8	36 x 30 x 8
600 VAC 3 (I)	24 x 20 x 8	24 x 20 x 8	24 x 20 x 8	30 x 24 x 8	36 x 30 x 8
Neutral Lug Size	350 - #6	350 - #6	350 - #6	500 - #4	600 - #2

Fusible Shunt Trip

Fusible Shunt Trip Switch 120 VAC Fire Safety Control Interface



Fusible Shunt Trip Switch 24 VDC Fire Safety Control Interface



High Power Switches

Expertly engineered for reliable performance



Your problem: High power switches are critical to your operation. Not only do they help protect your people from injury, they help protect your equipment and processes and minimize the risk of costly downtime and repairs. You need high power switches that are reliable, enduring and that thrive in harsh environments.

Our solution: Mersen offers a wide range of DC and AC high power switches that are rigorously engineered and designed to handle high current/low voltage and high voltage/low current applications. And when you need more than just a switch, Mersen's world-class engineering team is ready to provide custom engineering and fabrication to build the high power switch system or assembly you need, exactly the way you need it.

Want more information fast? For more technical or application-specific information, please call our High Power Switch experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

L High Power Switches

- Berg HA Range 1500V DC LV Disconnect Switch L2
- Berg HUVS Range 3.6kV MV Changeover Disconnect Switch..... L3
- Berg HAS Range 12kV MV Disconnect Switch L4
- Berg HAS Range 24kV MV Disconnect Switch L5
- Berg HAS Range 36kV MV Disconnect Switch L6
- Fouilleret NORD 1500VDC Disconnect Switch L7
- Soule PBD 2000V DC Disconnect Switch L9
- Hundt & Weber HSE-HSD Electrolytic Cell Disconnect Switch L11
- CBC Modular Bar Contactors..... L12
- CEX Field Excitation Contactors L13
- Colomix 71 ..... L14
- Systems Capability..... L15

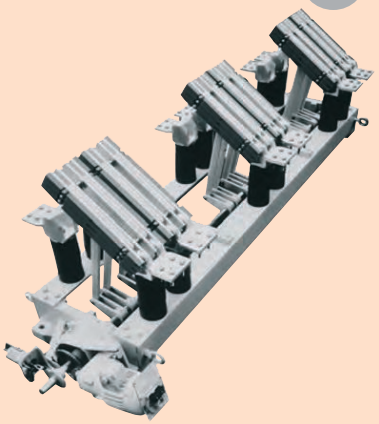
FERRAZ SHAWMUT IS NOW MERSEN

MERSEN

HA Range 1500V DC LV Disconnect Switch

Berg 1500V DC Disconnect Switch

Our HA switch style is a high quality, extremely robust product. This safety device is simple, transparent to the network, and reliable over time in all environments.
It is a safety device with a visible blade opening and is used for maintenance of major electrical installations. The switch may also be customized to customer requirements regarding number of poles and poles spacing.



Features/Benefits:

- Large air isolation and creepage distance
- Self-cleaning blade contacts
- Positive opening and visible break
- Rugged anti-torsion construction
- Large customization with: manual, motor & pneumatic drives; auxiliary switches; solenoid interlocks
- Adaptable mounting dimensions

Highlights:

- No-load operation
- Indoor type – vertical mounting only
- Mechanical endurance: ≤ 1kA = 25,000 cycles; >1kA = 50,000 cycles (open/close)
- 130° C maximum temperature without damage to the switch
- Electrical contact through silver plated electrolytic copper blades with pressed on hard silver contact rivets and silver plated copper alloy castings
- Supporting insulators made of cast epoxy resin (UL94-V1 flammability classification)

Applications:

- Battery disconnect
- Grounding switch
- Motor isolation
- 3rd rail sectionalization for Transit use

Ratings:

Amps : 100A to 3750A

Approvals:

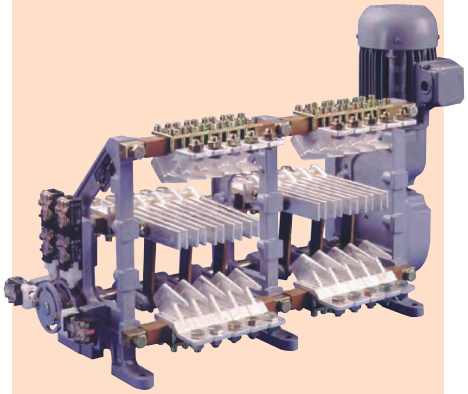
- Designed according to IEC 62271

Please contact our application team at technicalservices.nby@mersen.com or 978-465-4853 for suitable solutions to your requirements.

HUVS Range 3.6kV MV Changeover Disconnect

BERG 3.6 kV AC / DC MV Changeover Switch

The changeover disconnect's unique design transfers power from one single source to two or three loads in one switch body using one shaft, eliminating the need for costly and non-safe interlocks systems. It is a safety device with a visible blade opening and is used for maintenance of major electrical installations. The electrical contact is made with silver contacts, which provide strong mechanical endurance up to 50,000-cycles.



Features/Benefits:

- Positions 1-2 (1-0-2 on request)
- Large isolation air and creepage distance
- Self-cleaning blade contacts
- Positive opening and visible break
- Rugged anti-torsion construction
- Large customization with: manual, motor & pneumatic drives; auxiliary switches; solenoid interlocks

Ratings:

Amps : 400A to 6300A

Highlights:

- No-load operation
- Indoor type – vertical mounting only
- Mechanical endurance: ≤ 1kA = 25,000 cycles; >1kA = 50,000 cycles (open/close)
- 130° C maximum temperature without damage to the switch
- Electrical contact through silver plated electrolytic copper blades with pressed on hard silver contact rivets and silver plated copper alloy castings
- Supporting insulators made of cast epoxy resin (UL94-V1 flammability classification)

Applications:

- Battery disconnect
- Grounding switch
- Transfers power between furnaces

Rated power frequency withstand voltage, 1 min, 50 Hz	
Phase to earth and between poles (kV)	10
Across the isolating distance (kV)	12
Rated lightning impulse withstand voltage (BIL)	
Phase to earth and between poles (kV)	40
Across the isolating distance (kV)	46

Approvals:

- Designed according to IEC 62271

Electrical Characteristics:

Rated continuous current (A) - AC	400	630	1000	1600	2000	3150	4000	6300
Rated continuous current (A) - DC	400	630	1250	1900	2400	3750	5300	7500
Rated short-time withstand current (rms) 1 sec (kA)	26	26	40	52	63	71	71	81
Rated peak withstand current, 50 Hz (kA)	65	65	100	130	160	177	177	214

HAS Range 12kV MV Disconnect Switch

The BERG 12 kV AC Disconnect Switch is a robust product

This safety device is simple and transparent to the network, and reliable over time in all environments. Our specially designed pressure systems require low to no maintenance. It is a safety device with a visible blade opening and is used for maintenance of major electrical installations. The electrical contact is made with silver contacts, which provide strong mechanical endurance up to 50,000-cycles.



Features/Benefits:

- Large air isolation and creepage distance
- Self-cleaning blade contacts
- Positive opening and visible break
- Rugged anti-torsion construction
- Large customization with: manual, motor & pneumatic drives; auxiliary switches; solenoid interlocks
- Adaptable mounting dimensions

Highlights:

- No-load operation
- Indoor type – vertical mounting only
- Mechanical endurance: ≤ 1kA = 25,000 cycles; >1kA = 50,000 cycles (open/close)
- 130° C maximum temperature without damage to the switch
- Electrical contact through silver plated electrolytic copper blades with pressed on hard silver contact rivets and silver plated copper alloy castings
- Supporting insulators made of cast epoxy resin (UL94-V1 flammability classification)

Applications:

- Generator isolation
- Transformer isolation
- Grounding switch
- Tie switch
- Medium Voltage drive
- Furnace applications

Rated power frequency withstand voltage, 1 min, 50 Hz	
Phase to earth and between poles (kV)	28
Across the isolating distance (kV)	32
Rated lightning impulse withstand voltage (BIL)	
Phase to earth and between poles (kV)	75
Across the isolating distance (kV)	85

Approvals:

- Designed according to IEC 62271

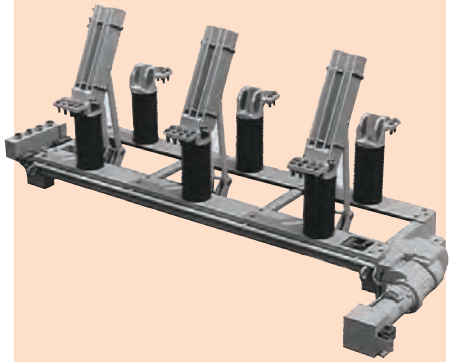
Electrical Characteristics:

Ampere Rating (A) - AC	400	630	1000	1600	2000	3150	4000	6300	8000	12000
Rated short-time withstand current (rms) 1 sec (kA)	20	20	40	52	63	71	71	81	110	121
Rated peak withstand current, 50 Hz (kA)	50	50	100	130	160	177	177	214	275	300

HAS Range 24kV MV Disconnect Switch

BERG 24 kV AC MV Disconnect Switch

This is a high quality, extremely robust AC disconnect switch. This safety device is simple, transparent to the network, and reliable over time in all environments. Our specially designed pressure systems require low to no maintenance. It is a safety device with a visible blade opening and is used for maintenance of major electrical installations. The electrical contact is made with silver contacts, which provide strong mechanical endurance up to 50,000-cycles.



Features/Benefits:

- Large air isolation and creepage distance
- Self-cleaning blade contacts
- Positive opening and visible break
- Rugged anti-torsion construction
- Large customization with: manual, motor & pneumatic drives; auxiliary switches; solenoid interlocks
- Adaptable mounting dimensions

Highlights:

- No-load operation
- Indoor type – vertical mounting only
- Mechanical endurance: ≤ 1kA = 25,000 cycles; >1kA = 50,000 cycles (open/close)
- 130° C maximum temperature without damage to the switch
- Electrical contact through silver plated electrolytic copper blades with pressed on hard silver contact rivets and silver plated copper alloy castings
- Supporting insulators made of cast epoxy resin (UL94-V1 flammability classification)

Applications:

- Generator isolation
- Transformer isolation
- Grounding switch
- Tie switch
- Medium Voltage drives
- Furnace applications

Rated power frequency withstand voltage, 1 min, 50 Hz	
Phase to earth and between poles (kV)	50
Across the isolating distance (kV)	60
Rated lightning impulse withstand voltage (BIL)	
Phase to earth and between poles (kV)	125
Across the isolating distance (kV)	145

Approvals:

- Designed according to IEC 62271

Electrical Characteristics:

Rated continuous current (A) - AC	400	630	1000	1600	2000	3150	4000	6300	8000	12000
Rated short-time withstand current (rms) 1 sec (kA)	26	26	30	37	58	64	64	77	100	110
Rated peak withstand current, 50 Hz (kA)	65	65	75	91	144	159	159	193	250	275

HAS Range 36kV MV Disconnect Switch

BERG 36 kV AC Disconnect Switch

The HAS Range Low Voltage Disconnect Switch is a high quality, extremely robust product. This safety device is simple, transparent to the network, and reliable over time in all environments. Our specially designed pressure systems require low to no maintenance. It is a safety device with a visible blade opening and is used for maintenance of major electrical installations. The electrical contact is made with silver contacts, which provide strong mechanical endurance up to 50,000-cycles.



Features/Benefits:

- Large air isolation and creepage distance
- Self-cleaning blade contacts
- Positive opening and visible break
- Rugged anti-torsion construction
- Large customization with: manual, motor & pneumatic drives; auxiliary switches; solenoid interlocks
- Adaptable mounting dimensions

Highlights:

- No-load operation
- Indoor type – vertical mounting only
- Mechanical endurance: ≤ 1kA = 25,000 cycles; >1kA = 50,000 cycles (open/close)
- 130° C maximum temperature without damage to the switch
- Electrical contact through silver plated electrolytic copper blades with pressed on hard silver contact rivets and silver plated copper alloy castings
- Supporting insulators made of cast epoxy resin (UL94-V1 flammability classification)

Applications:

- Generator isolation
- Transformer isolation
- Grounding switch
- Tie switch
- Medium Voltage drives
- Furnace applications

Rated power frequency withstand voltage,1 min, 50 Hz	
Phase to earth and between poles (kV)	70
Across the isolating distance (kV)	80
Rated lightning impulse withstand voltage (BIL)	
Phase to earth and between poles (kV)	170
Across the isolating distance (kV)	195

Approvals:

- Designed according to IEC 62271

Electrical Characteristics:

Rated continuous current (A) - AC	400	630	1000	1600	2000	3150	4000	6300	8000	12000
Rated short-time withstand current (rms) 1 sec (kA)	26	26	30	37	58	64	64	77	100	110
Rated peak withstand current, 50 Hz (kA)	65	65	75	91	144	159	159	193	250	275

NORD DC Disconnect Switch 1500VDC

Fouilleret NORD DC Disconnect Switch

The NORD is a high quality, extremely robust product. This safety device is simple, transparent to the network, and reliable over time in all environments. The NORD is a deformable switch, which moves with the expansion and retraction of the busbar system, eliminating the need for flexible shunt connections. Its individual spring system helps to distribute the current throughout the switch, and provides a very low and constant voltage drop. The NORD DC Disconnect Switch is mainly used with copper busbar systems. The NORD switch is bolted directly to the busbar with bolted copper connections for easy installation. The electrical contact is made with silver contacts, which provide strong mechanical endurance up to 50,000-cycles.



Features/Benefits:

- Visible break by direct seeing of the mobile silver-plated copper contacts
- Mechanically independent mobile contact arms with high-pressure springs
- Electrical contact with silver to silver contact
- Insulation with Fiberglass reinforced polyester insulators
- Operation mechanism of bichromate galvanized steel by a toggle closed system
- Disconnects are self-supporting. Busbar support must be sized to withstand the disconnect's additional weight
- Upon request, choice of input and output terminals in aluminium or silver-plated copper
- Upon request, two-poles or change-over design by side association of two disconnects

Ratings:

Amps : 14kA to 140kA

Highlights:

- Accepts busbar dilatations thanks to built-in deformability (flexible shunts are not necessary)
- Low and constant voltage drop
- Self-cleaning effect on contact
- High short-circuit current withstand
- Large insulation and creepage distances
- Easy connections to:
  - Aluminum busbar by welding
  - Copper busbar by bolting
- Large customization possible with:
  - Actuators (motor, pneumatic, manual)
  - Auxiliaries (limit switches, locks, control boxes)
  - Adaptation to the connecting busbar.

Applications:

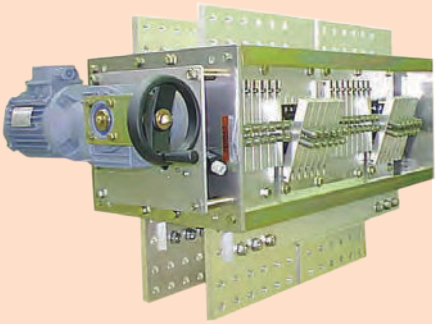
- Output rectifier isolation
- Large power supply disconnect

Approvals:

- Designed according to IEC 60947-3 / IEC 60077-1 (NFF 16101 / 16102)

Fouilleret NORD DC Disconnect Switch 1500VDC

Main Technical Characteristics



Electrical Data:

- Temperature rise at nominal current (with 40°C max. Ambient temperature) less than : 65°C
- Typical temperature rise at nominal current (with 40°C max.) : 15°C above busbar
- Typical voltage drop at nominal current : 30 mV
- Peak short-circuit current withstand (upon circuit configuration)
  - In one pole configuration : 10 x (Nominal current)
  - In two poles configuration : 5 x (nominal current)
- Dielectric withstand strength
  - Between live parts in open position : 10 kV - 50 Hz - 1 min
  - Between live parts and earth : 10 kV - 50 Hz - 1 min
  - Between auxiliary contacts and earth : 2.5 kV - 50 Hz - 1 min
  - Between motor and earth : 2 kV - 50 Hz - 1 min
- SCR leakage current breaking capacity (upon request) : 1 A - 100 V DC
- Power breaking capacity up to 100 kA - 100 V DC - L/R < 20 msec : Upon request

Mechanical Data:

- Mechanical endurance (with respect to maintenance instructions) : 20,000 cycles
- Typical duration of opening or closing operation:
  - With motor operation : 3 to 12 seconds
  - With pneumatic operation : Less than 1 second
- Ponctual temperature withstand without equipment damage : 140°C

Soule PBD 2000V DC Disconnect Switch

Soule PBD DC Disconnect Switch

The PBD DC Disconnect Switch is a high quality, extremely robust product. This safety device is simple, transparent to the network, and reliable over time in all environments. Our PBD is a deformable switch, which will move with the expansion and retraction of the busbar system eliminating the need for flexible shunt connections. The PBD is mainly used with and welded directly onto aluminum busbar systems. The electrical contact is made with silver contacts, which give it a strong mechanical endurance with very good electrical data.



Features/Benefits:

- Visible break
- Aluminum welded connections
- Absorbs dimensional variations due to expansion (flexible shunts are not necessary)
- Low and constant voltage drop
- Supported by busbar (no frame required)
- Possibility of covering up totally one side of the disconnect (for protection & isolation)
- Easy connections by welding to high section aluminium busbar
- Large customization possible with:
- Actuators (motor, pneumatic, manual)
- Auxiliaries (limit switches, locks, control boxes)
- Adaptation to the connecting busbar

Highlights:

- Accepts busbar dilatations thanks to built-in deformability (flexible shunts are not necessary)
- All contacts are fitted with solid silver, high temperature brazed (special process)
- Mechanically independent mobile contact arms with high-pressure springs
- Electrical contact with solid pure silver, point to point, contact tips.
- Operation mechanism by a toggle closed system
- Upon request, two poles or change-over design by side association of two disconnects

Applications:

- Output rectifier isolation
- Large power supply disconnect

Ratings:

Volts : 2000V DC
Amps : 20kA to 140kA

Approvals:

- Designed according to IEC 60947-3 / IEC 60077-1

Soule PBD 2000V DC Disconnect Switch

Main Technical Characteristics

Electrical Data:

- Temperature rise at nominal current (with 40°C max. Ambient temperature) less than : 65°C
- Voltage drop at nominal current less than : 60 mV
- Peak short-circuit current withstand (upon circuit configuration) : 8 x (Nominal current)
- Dielectric withstand strength:
  - Between live parts in open position : 10 kV - 50 Hz - 1 min
  - Between live parts and earth : 10 kV - 50 Hz - 1 min
  - Between auxiliary contacts and earth : 2.5 kV - 50 Hz - 1 min
  - Between motor (AC) and earth : 2 kV - 50 Hz - 1 min



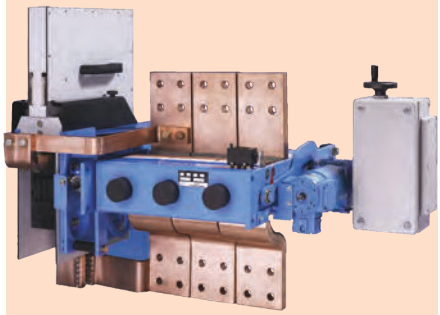
Mechanical Data:

- Built-in deformability (longitudinally (dL) / transversally (dT) / axially (dA)) : 20 / 20 / 20 mm (higher values available upon request)
- Mechanical endurance (with respect to maintenance instructions).
- Higher endurance upon : 1000 Cycles
- Typical duration of opening or closing operation:
  - With motor operation : Less than 20 seconds
  - With pneumatic operation : Less than 1 second
- Ponctual contact temperature on live parts withstand without equipment damage : 140°C

HSE-HSD Electrolytic Cell Disconnect Switch

Hundt & Weber DC Disconnect Switch

The HSE/HSD Electrolytic Cell Disconnect Switch allows for installation in any position directly into the busduct system without further fixation. One side of the switch is equipped with flexible connectors, thus no further expansion joints are needed. The other side has solid busbar. The design of the switch (ball bearings supporting main switching shaft) and the slight travel of the contacts while switching, require minimal operating force. Thus easy manual operation is possible, or operation by means of a direct acting motor operator with little power consumption. The high current isolators, HSE/ HSD, consist of a system with one or more integrated, encapsulated contact modules. One module is normally rated for a current of 6,000A. If higher ratings are required, adequate numbers of contact modules are connected in parallel and operated with a common mechanism. The principal elements of the switch are standardized, encapsulated contacts, which consist of two connector plates, a high-elastic bellow, and the contacts. These contacts are made of silver alloy with very good electrical data.



Ratings:

Amps : 6kA to 60kA

Features/Benefits:

- Complete encapsulated main contacts
- High mechanical strength
- Corrosion proofed
- Little operation torque
- Position insensitive
- Positive opening
- Low contact resistance
- Low voltage drop
- Low contact heating
- Extreme high electrical and mechanical durability
- Safe operation, even under extreme ambient temperature
- Auxiliaries (limit switches, locks, control boxes)
- Adaptation to the connecting busbar

Highlights:

- Accepts busbar dilatations thanks to built-in deformability (flexible shunts are not necessary)
- Very compact switch
- Electrical contacts are encapsulated, protecting them from corrosive atmosphere like chlorine or salt
- Easy connections to bolted copper busbar
- Large customization possible with:
  - Actuators (motor, pneumatic, manual)
  - Auxiliaries (limit switches, locks, control boxes)

Applications:

- Output rectifier isolation
- Cell isolation for electrolytic process
- Large power supply disconnect

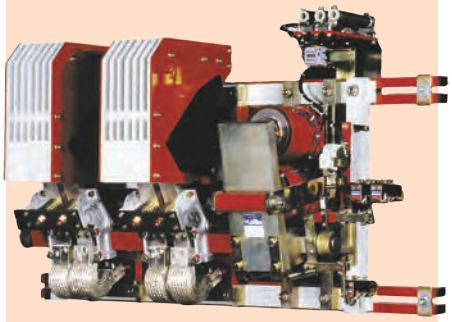
Approvals:

- Designed according to VDE 0110 Gr. C/IEC 60947

CBC Modular Bar Contactors

Elec CBC Bar Contactor: 80 – 6200A

The CBC Bar Contactor is ideal for use in DC applications including; lifting magnets, lifts, electroplating, the iron and steel industry for traction (rolling stock), motor controls, and hoisting equipment, and other applications in harsh conditions. Thanks to its modular constitution, the CBC Bar Contactor from 80 to 6200A can meet most of the requirements that block contactors, although easy to mount, can not.



Features/Benefits:

- Mechanical latching with single or double electrical release (does not change the total dimensions of the contactor).
- Self-protective device for the release coil(s).
- Metallic support for Kirk Key-type lock (lock not supplied).
- Horizontal or back-to-back mechanical locking.
- Poles of different calibers and supplied with different currents.
- Poles without magnetic blowout.
- Reinforced insulation.
- Double insulation for specific applications.
- Tropical treatment n° 2

Highlights:

- 1 to 4 single main poles (2 poles for calibers 4000 and 5000) with copper contact (silver pad contact on request or for specific applications).
- Arc-blowout coil operates only during opening.
- Closing electromagnet mounted on the right side of the poles (on request, it can be mounted on the left), solid iron magnetic circuit with 2 coils.
  - Control circuit supplied from an AC source via a rectifier and power-saved coils (device mounted and cabled on the contactor).
  - Control circuit supplied from a DC source with power saved coils (device mounted and cabled on the contactor

Applications:

- Electrochemistry - galvanoplasty (reversing polarities), electroplating, etc.
- Lifting magnets and lifts
- Hosting equipment such as cranes or overhead cranes
- Motor control, rolling mills accessories, “Blooming Mills,” mining industry
- Motor controls in foundry industry

Ratings:

Volts : 500V to 1500V
Amps : 1250 to 8000A

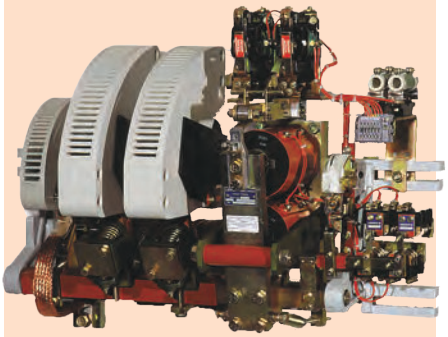
Approvals:

- Designed according to VDE 0110 Gr. C/IEC 60947

CEX Field Excitation Contactors

Elec CEX Field Excitation Contactor: 80 – 5000A

The CEX Field Excitation Contactor is used to switch on and cut off the excitation circuit of a machine, inserting a discharge resistor at the terminals of the inductor at the time of the break. The CEX Field Excitation Contactor is for the excitation and de-excitation of power inductors up to 900MW and more. The CEX Contactors are made up of 1, 2 or 3 magnetic arc-blow-out poles and of one opening pole called a “rupturing pole.” On opening, the rupturing pole closes before the main poles open.



Features/Benefits:

- Bar contactor is adaptable to customer needs regarding options for high mechanical strength and number of operations
- Electrical or mechanical latching
- Variety of auxiliary contacts

Highlights:

- 1, 2 or 3 magnetic arc-blow-out contactor poles:
  - silver alloy contacts for caliber 80 to 5000 A.
  - copper contacts (on request).
- One magnetic arc-blow-out dosing pole without mechanical overlapping with the contactor poles.
- One mechanical latching with single or double electrical release.
- Magnetic circuit for over-excited coil supplied with DC current:
  - Closing: economy resistor for caliber 80 to 200A, delivered separately.
  - Opening: one NO contact connected in series with the coil opening at the same time as the contactor.

Applications:

- Power generator excitation systems

Ratings:

Volts : 110 to 2000 VDC
Amps : 80 to 6200A

Approvals:

- Designed according to VDE 0110 Gr. C/IEC 60947

Colomix 71

Elec Colomix 71 for the replacement of old asbestos arc chutes.

No one needs to explain how harmful asbestos is. For years people working in all types of industries were exposed to it. Electrotechnology was no exception: asbestos cement was widely used for its excellent thermal and mechanical characteristics. With Colomix 71, we developed a material that presents no hazard to human health, is easy to work with, has excellent mechanical strength and can be machined to any shape. Colomix 71 has the thermal and insulating properties to withstand extremely high temperature densities and dissipate electric arcs. In fact, replacing asbestos blow-out cages with Colomix 71 leads to better performance. Colomix 71 is a mineral insulator for electrical and thermal applications consisting of 59% hydrated aluminum silicate, 38% wollastonite (calcium silicate) and 3% glass fiber. It has excellent mechanical strength at high temperatures (600°C). “S” grade is recommended for electrical applications. Finished parts of that grade are impregnated with high temperature resin.



Features/Benefits:

Colomix 71 is a patented product that is designed to aid in the replacement of cement-asbestos blow-out cages equipping contactors created by an older generation of manufacturers. With Colomix 71, you can create an indentical match of your existing blow-cages, while maintaining the equipment’s genuine technical characteristics. This innovative material allows you to replace existing blow-cages, without launching a long and expensive R&D study. With Colomix 71 there is no need to change the whole breaking system (circuit breaker, switch, etc.) — only the old blow-out cages with their asbestos shell need to be replaced. The Colomix 71 offers an easy solution to maintenance and asbestos compliance.

Highlights:

This new generation of blow-out cages is 100% compatible with existing contactors. It does not downgrade the contactors in any way, ensuring their perennity. In addition, breaking capacities are notably improved due to a reduction in breaking times.

Colomix 71 is available in three forms:

- 1000x1000 mm sheets in its standard version (930x830 mm available only on request)
- Parts to be machined per customers’ drawings, sample or specification
- Molded parts

Applications:

- Replacement of all old asbestos arc chambers and arc chutes

Systems Capability

When you need more than just a switch, our world-class engineering team is ready to provide custom engineering and fabrication to build the High Power Switch system or assembly you need, exactly the way you need it. We can design and build an enclosure for our high power switch products that meets your specific requirements — either in a metallic or polyester fiberglass enclosure, wall mounted or floor mounted, and with controls, if needed. Our team of design engineers are bold problem-solvers and enjoy meeting your High Power Switch challenges head on with innovative engineering and creative solutions. Our engineers incorporate design and construction features that ensure each switch performs reliably, whether it's a rectifier output switch operated once a year or a change-over switch system in an enclosed panel actuated dozens of times a day.

Features/Benefits:

- Customized enclosure to fit your specification
- Customize controls as per your requirements
- Positive opening and visible break
- Rugged anti-torsion construction
- Large customization with: manual, motor & pneumatic drives; auxiliary switches; solenoid interlocks
- Adaptable mounting dimensions

Highlights:

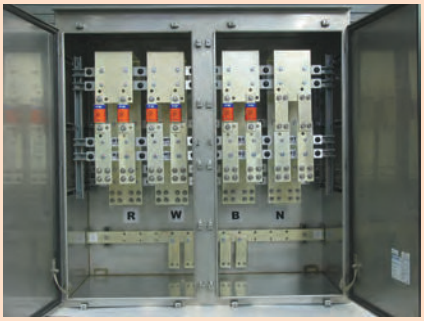
- Metal or fiberglass
- Local or remote controls
- Viewing windows
- Floor, wall or pole mount

Approvals:

- Designed as per UL, CSA, ANSI/IEEE Standards

Please contact our application team at technicalservices.nby@mersen.com or 978-465-4853 for suitable solutions to your requirements.

Applications:



- Fuse Cabinet (above)
- Street Lighting Control (below)



- Power Distribution Changeover Switch (below)



- Enclosed Medium Voltage Disconnect (below)



Thermal Management

Innovative air & liquid cooled heatsinks and cooling systems



Your problem: You need to protect critical semiconductor and power electronic systems from heat generated during high power applications.

Our solution: Mersen offers innovative thermal management solutions. We deliver patented cooling technology that absorbs and dissipates heat from critical components. Our innovative Fabfin® product was the first "glueless technology" for high performance, high ratio heatsink solutions. Our pioneering products can be found in a wide range of applications and industries including, industrial controls, motor drives, power controls, transportation, communication, medical, solar power and wind power.

Want more information fast? Take advantage of R-Tools® - our free 3D Thermal Modeling software on our website, click Resources & select R-tools. For quotes or questions on heatsinks and cooling systems, email us at sales.mis@mersen.com or contact applications support at 905-795-0077 x258 or x340. You may also visit our website at **us-ferrazshawmut.mersen.com** and click "Products > Product Data >Thermal Management."

M Thermal Management

Air Cooled

- FabFin® Heatsink.....M2
- Hollowfin® Heatsink.....M9
- Mixed Metals Heatsink.....M10
- Integrated Modules.....M11
- Copper Heatsink.....M12
- Dual Base Plate Heatsink.....M13
- Extrusion Heatsink.....M14
- Heatpipes.....M15
- Embedded Heatpipes.....M16

Liquid Cooled

- Aquasink® Heatsink.....M17
- Aquamax® (Copper) Heatsink.....M19
- Aquasurf® Heatsink.....M20
- Aquamax® (Aluminum) Heatsink....M21

Cooling

- Press-Pack Coolers.....M22
- Cooling Systems.....M23
- Product Materials & Tolerances.....M24
- R-Tools® 3D Heatsink Modeling.....M26

FERRAZ SHAWMUT IS NOW MERSEN

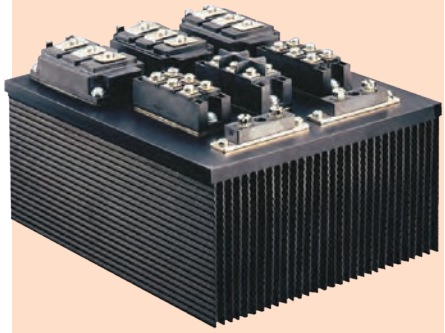
MERSEN

Air Cooled Fabfin® Heatsink

The first patented "glueless technology" air cooled

Fabfin is a fabricated air cooled heatsink with a height-to-fin spacing ratio greater than an extruded section. Fabfin can be supplied essentially of any size where a multitude of aluminum fins of varying heights and thickness are attached by a swaging process to an aluminum base plate of variable thickness, length and width, on four standard fin spacings. These standard spacings are designated as an FF (8.51 mm), DF (6.86 mm), AF (5.49 mm), or MF (3.43 mm) series. Typical alloy is 6063 for both fins and base plate. Finishes are numerous. No glue is used in the process.

Performance can be modeled within R-Tools.



Features/Benefits:

- Fabricated
- Multiple fins joined to baseplate by swaging process
- Metal to metal construction. Al/Al Cu/Al Cu/Cu
- Immensely rugged
- No epoxy/glue used in fabrication process
- No thermal barrier at fin to baseplate join
- Fin height to spacing ratio much greater than extruded section
- -40°C to + 350°C storage and operating range
- Capable of withstanding extensive vibration
- Tongue and groove construction
- Baseplates can be welded together with fins attached

Performance:

- Typically 15% lower thermal impedance than a glued solution
- Can be modeled on R-Tools

Highlights:

- Essentially any width, length or height
- Any fin height to spacing ratio up to 46:1
- Anodize finish
- Chromate finish: Hexavalent + Trivalent
- Electroless nickel finish
- Selective use of copper fins

Applications:

- Communications
- Industrial controls
- Medical, Military
- Motor drives
- Power controls
- Solar energy
- Transportation
- Wind energy

Air Cooled Fabfin® Heatsink

What you need to know about Fabfin Heatsinks

Welcome to the amazing potential of Fabfin. The design engineer can now leap beyond the limitations of low ratio one piece aluminum extrusions and the thermal barriers of epoxy assemblies by using Fabfin — the high ratio, high performance, immensely rugged, thermal barrier-free aluminum heatsink assembly. Within a broad mechanical envelope lies unlimited possibilities to address your most challenging thermal applications.

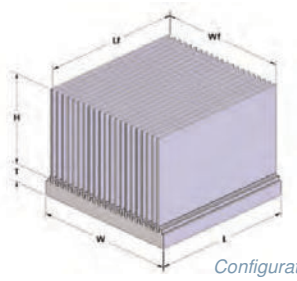
All configurations

- L = Length of baseplate
- L*f* = Length of fin
- W = Width of baseplate
- W*f* = Width over fins
- T = Thickness of baseplate
- T*f* = Thickness of flange

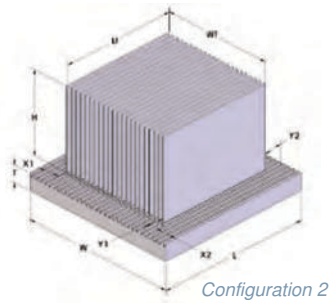
- Baseplate thickness:
  9 mm Min
  64 mm Max

- Non-tooled fin height within each family will be provided by shearing the next taller fin. If quantities dictate we will tool a new fin.

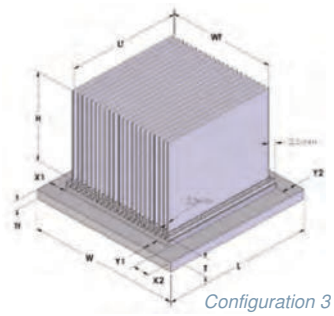
- Max fin height 118 mm except MF which is 49 mm tall. MF equivalent fins can be achieved by selecting the Hollowfin® on 6.86 mm centers.



Configuration 1



Configuration 2



Configuration 3

Note: Configurable aluminum air cooled assemblies. Four series organized on baseplate slot spacing. Highly flexible width, length and fin arrangement.

Copper options available.

Configuration 1

(without mounting flanges: all slots filled)

- L = L*f* =1250
- W = [W*f* + (2 x shoulder)] = Wmax (see Fig. 1 Table 2)
- Number of fins = Width indicator (N) corresponding to W (see formulas in Table 3)
- Shoulder Width ≥ 2.5 mm for MF, 3.5 mm ≥ AF, DF and FF

Configuration 2

(with mounting flanges; exposed fin slots)

- L = (L*f* + Y1 + Y2) =1250
- If flanges Y1 and Y2 = 0, then L*f* = L
- X1 may equal X2 but both must be specified
- W = (W*f* + X1 + X2) = Wmax (see Fig. 1 Table 2)
- Flanges X1 and X2 must be ≥ 2.5 mm for MF, ≥ 3.5 mm for AF, DF and FF
- Y1 may equal Y2 but both must be specified
- Number of fins = Width indicator (N) corresponding to W*f* (see formulas in Table 3)

Configuration 3

(with mounting flanges; machined surfaces)

- L = [L*f* + Y1 + Y2 + (2 x 2.5)] =1250
- If flanges Y1 and Y2 = 0, then L*f* = L
- X1 may equal X2 but both must be specified
- W = [W*f* + X1 + X2 + (2 x shoulder)] = Wmax (see Fig. 1 Table 2)
- Flanges X1 and X2 must be specified beyond 2.5 shoulder for MF and 3.5 mm for AF, DF and FF
- Y1 may equal Y2 but both must be specified
- Number of fins = Width indicator (N) corresponding to W*f* (see formulas in Table 3)
- T*f* must be = T – 3.3 in order to remove the fin slots

Air Cooled Fabfin® Heatsink Configurator

9-easy steps to configure a Fabfin

The following represents a sample configuration of Figure 3, page 6

STEP 1: Select a series

Select a series for a fin pitch.

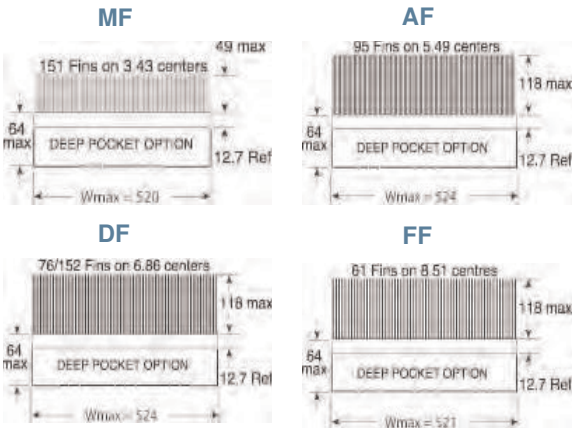
Table 1: Fin Pitch

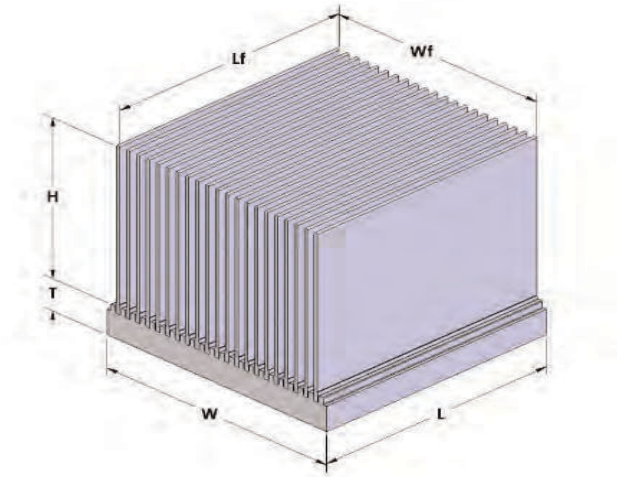
Series	Fin Pitch (CC) (Center to Center)
MF	3.43 mm
AF	5.49 mm
DF	6.86 mm
FF	8.51 mm

Table 1 (above) and Fig. 1 (below) show the four standard Fabfin series based on Fin Pitch (CC). Variables within each series include length, width and thickness of baseplate as well as height and thickness of fins.

Part Number Example: FF

Fig 1





Configuration 1

Fig. 2

STEP 2: Select a configuration

All Fabfin baseplates can be configured with or without a mounting flange. To define the configuration see detailed diagrams on page 3. If configuration 2 or 3 are selected please specify the x and y coordinates for the mounting flange area.

Configuration 1

* fully populated, full length fins and without mounting flanges- all slots filled

Configuration 2

* unmachined exposed flange(s)

Configuration 3

* machined exposed flange(s)

Part Number:

Configuration 1 = no digit required

Configuration 2 = 2

Configuration 3 = 3

**(if configurator 2 or 3 is selected the digit/code appears at the very end of the product number)*

Part Number Example: FF

Air Cooled Fabfin® Heatsink Configurator

STEP 3: Select a total length

Select the total length in mm *(this is user defined)
eg. L = L*f* = 300 mm

Part Number Example: FF300

STEP 4: Select a baseplate thickness

(refer to Table 2)

All Fabfin heatsinks are available with standard 12.7 mm baseplate thickness but many other thicknesses are tooled. The baseplate thickness is typically governed by the mechanical, thermal and cost requirements of the application. Custom baseplate thicknesses can be provided within the range of 9 mm to 64 mm by cutting new extrusion dies or gang slotting of the baseplate. New tooling is coming on-line continuously and we may be able to supply your special needs at no additional cost.

Part Number Example: FF300T13

Table 2 (a-d) Baseplate Thickness

Table 2a - MF Baseplate Options

Thickness Reference	Thickness T (mm)	Maximum Width Wmax(mm)
T13	12.7	Up to 305 mm
T00	to be specified	

Table 2b - AF Baseplate Options

Thickness Reference	Thickness T (mm)	Maximum Width Wmax(mm)
T10	9.9	Up to 222 mm
T13	12.7	Up to 524 mm
T15	14.9	Up to 524 mm
T19	19.0	Up to 343 mm
T00	to be specified	

Table 2c - DF Baseplate Options

Thickness Reference	Thickness T (mm)	Maximum Width Wmax(mm)
T10	9.5	Up to 310 mm
T13	12.7	Up to 524 mm
T14	14.2	Up to 337 mm
T15	15.3	Up to 524 mm
T17	17.3	Up to 324 mm
T18	18.3	Up to 400 mm
T00	to be specified	

Table 2d - FF Baseplate Options

Thickness Reference	Thickness T (mm)	Maximum Width Wmax(mm)
T13	12.7	Up to 520 mm
T00	to be specified	

Air Cooled Fabfin® Heatsink Configurator

STEP 5: Select a baseplate material

Choose one of the following materials: A = Aluminum
C = Copper

Part Number Example: FF300T13A

STEP 6: Determine width indicator (N)

To convert baseplate width to width indicator, select desired baseplate total width (W). To determine Width Indicator (N) use the formula at the bottom of each series table. (refer to Table 3)

i.e. If W = 260 mm

$$N = \frac{260 - 9.4}{-8.51}$$

= 29.4 *(round up to the nearest integer)

N = 30

Refer to Table 3 for standard tooled baseplate widths (W).

Alternatively go to the Fabfin configurator section on the website for a complete listing of all widths and fin counts.

Mersen will manufacture this heatsink by machining the next wider standard baseplate. (refer to Table 3d)

Fin count

Configuration 1: Number of fins = Width indicator (N)
Configuration 2,3: Substitute Wf into the formula at the bottom of each series in Table 3 to obtain fin count.

Wider widths are frequently supplied by welding Fabfin assemblies together. The swaged fin to baseplate joint is unaffected by the elevated welding temperatures.

Part Number Example: FF300T13A30

Fig. 3 Sample Heatsink

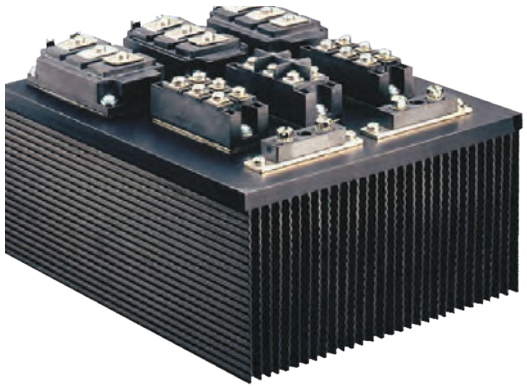


Table 3 (a-d) Width Indicator

Table 3a - Standard Tooled Baseplates

Width (mm) W	Width Indicator N	Width Fin to Fin (mm) Wf
127	36	121.4
202	58	196.8
237	68	231.1
264	76	258.6
302	87	296.3

Table 3b - AF Standard Tooled Baseplates

Width (mm) W	Width Indicator N	Width Fin to Fin (mm) Wf
223	40	215.4
234	42	226.4
300	54	292.3
343	62	336.2
349	63	341.7
404	73	396.6
525	95	517.4

Table 3c - DF Standard Tooled Baseplates

Width (mm) W	Width Indicator N	Width Fin to Fin (mm) Wf
257	37	249.4
298	43	290.5
310	45	304.2
325	47	318.0
339	49	331.7
401	58	393.4
524	76	516.9

Table 3d - FF Standard Tooled Baseplates

Width (mm) W	Width Indicator N	Width Fin to Fin (mm) Wf
121	14	113.0
190	22	181.1
274	32	266.2
308	36	300.3
393	46	385.4
521	61	513.0

Air Cooled Fabfin® Heatsink Configurator

STEP 7: Select fin

To select fin material, style and height, please refer to Fig. 4 and Table 4 for standard heights and fin height ratios for each series.

Non-standard fin height within each family will be provided by shearing the next taller fin.

The exact fin height in millimeters should substitute the 000 in the Fin Reference in Table 4. If quantities dictate we will tool a new fin.

AC = Aluminum Corrugated
AS = Aluminum Serrated
AH = Aluminum Hollow
CF = Copper Flat
AF = Aluminum Flat

Part Number Example:
FF300T13A30AC118

STEP 8: Select a finish

Choose from the following finishes:
C = RoHS compliant tri-valent clear chrome
B = Black Anodize
A = Clear Anodize
D = Degrease only

Part Number Example:
FF300T13A30AC118B

STEP 9: (Optional)

Choose legs if desired:
Yes = L
No = no digit required

Part Number Example:
FF300T13A30AC118B

Fig.4a

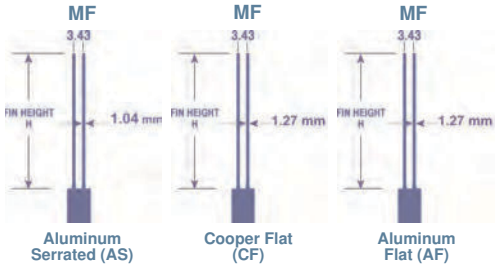


Fig.4b

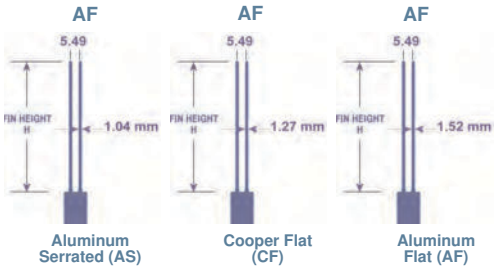


Fig.4c

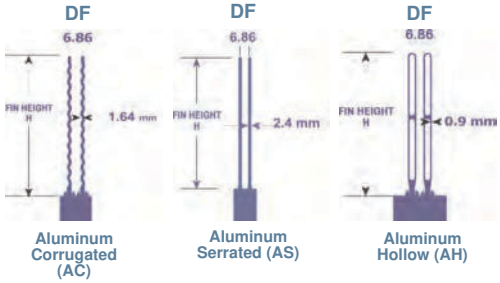
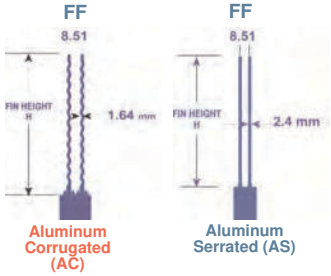


Fig.4d



*Note: Take this part number and enter into R-Tools to simulate thermal performance using your selected interface materials and semi-conductors. * (refer to Fig. 3 on page 6 for picture of this configured part FF300T13A30AC118B)*

Table 4 (a-d) Fin Styles

Table 4a - MKMF Fin Options

Fin Reference	Fin Style	Fin Height H (mm)	Ratio H to Space
AS035	Serrated	35	15:1
AS049	Serrated	49	20:1
AS000	Serrated	to be specified	
AF000	Flat	to be specified	
CF000	Flat	to be specified	

Table 4b - AF Fin Options

Fin Reference	Fin Style	Fin Height H (mm)	Ratio H to Space
AS037	Serrated	36.5	8:1
AS051	Serrated	50.5	11:1
AS091	Serrated	90.5	20:1
AS120	Serrated	119.5	27:1
AS000	Serrated	to be specified	
AF000	Flat	to be specified	
CF000	Flat	to be specified	

Table 4c - DF Fin Options

Fin Reference	Fin Style	Fin Height H (mm)	Ratio H to Space
AC071	Corrugated	71.4	13:1
AS071	Serrated	71.4	16:1
AC119	Corrugated	119.4	22:1
AS119	Serrated	119.4	26:1
AH060	Hollow	59.5	24:1
AH063	Hollow	63	25:1
AH085	Hollow	85	34:1
AH102	Hollow	101.8	40:1
AH119	Hollow	119.4	46:1
AC000	Corrugated	to be specified	
AS000	Serrated	to be specified	
AH000	Hollow	to be specified	

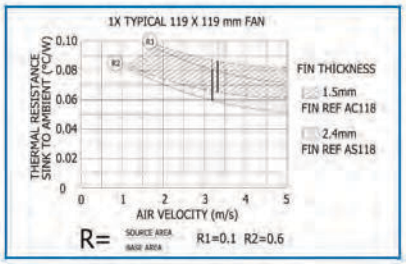
Table 4d - FF Fin Options

Fin Reference	Fin Style	Fin Height H (mm)	Ratio H to Space
AC070	Corrugated	70	10:1
AS070	Serrated	70	11:1
AC118	Corrugated	118	17:1
AS118	Serrated	118	27:1
AC000	Corrugated	to be specified	
AS000	Serrated	to be specified	

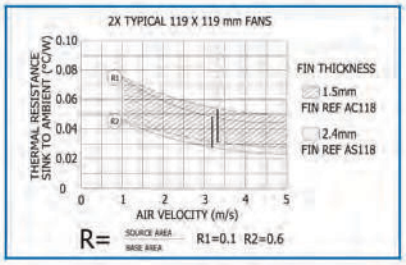
Air Cooled Fabfin® Standards

The range of standard Fabfin® forced convection cooled heatsinks (FFC series) was developed to incorporate standard 119mm square axial fans. The fin spacing of 8.51 mm was selected to provide a 20:1 ratio, the practical heat transfer limit for cooling Power Semiconductors in typical ambient conditions. The standard FFC series will accept 1, 2, 3 or 4 fans. Available in many finishes. The serrated fin thickness of 2.4mm provides near optimum performance when using industry standard axial fans. If some level of performance de-rating is acceptable (approximately 20%) then we recommend that corrugated fins be used. These have a thickness of 1.5 mm and are designated by ordering the 'AC' part numbers. The use of corrugated fins provides a weight savings of approximately 15% and will increase surface area by 7% compared with a straight fin of the same height. The push/pull (PP) option is common for applications where fan redundancy is important. We recommend the use of ball bearing fan(s), specifically for the "pull" end, in order to maximize the fan life due to the elevated operating temperatures. The additional weight of the fan can be offset by using the corrugated fins, if applicable. The adjacent graphs provide a performance guide for heat generating devices ranging in size from point source to 60% coverage.

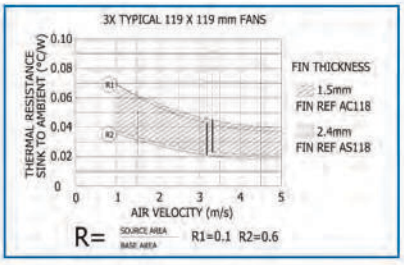


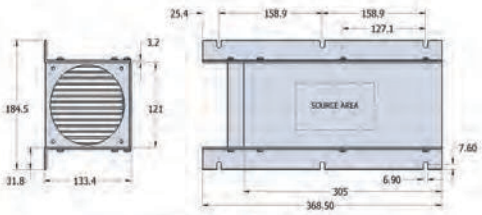






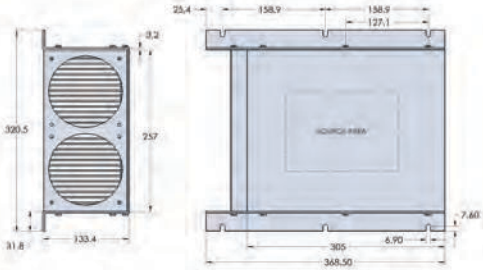






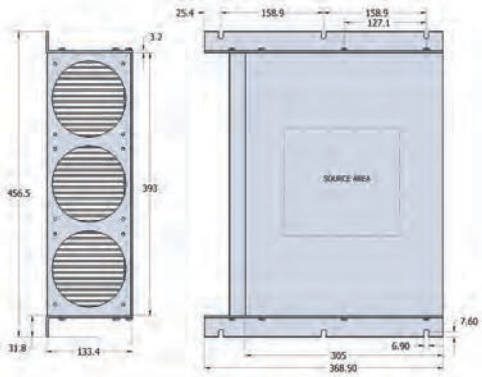
TECHNICAL DATA

MODAL #	FFC305T13A14AS118B		FFC305T13A14AC118B	
FIN STYLE	SERRATED		CORRUGATED	
WT WITHOUT FAN	5.4	kg	4.7	kg
BASE AREA	36,774	mm²	36,774	mm²
TOTAL CSA	5,091	mm²	4,242	mm²
TOTAL PERIMETER	3,883	mm	3,749	mm



TECHNICAL DATA

MODAL #	FFC305T13A30AS118B		FFC305T13A30AC118B	
FIN STYLE	SERRATED		CORRUGATED	
WT WITHOUT FAN	10.4	kg	8.8	kg
BASE AREA	79,387	mm²	79,387	mm²
TOTAL CSA	10,889	mm²	8,981	mm²
TOTAL PERIMETER	7,800	mm	7,929	mm



TECHNICAL DATA

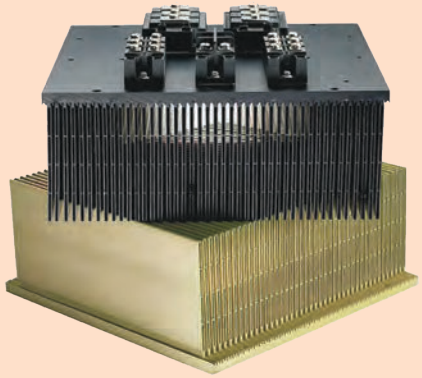
MODAL #	FFC305T13A46AS118B		FFC305T13A46AC118B	
FIN STYLE	SERRATED		CORRUGATED	
WT WITHOUT FAN	15.5	kg	13.2	kg
BASE AREA	119,865	mm²	119,865	mm²
TOTAL CSA	16,574	mm²	13,766	mm²
TOTAL PERIMETER	11,991	mm	12,578	mm

Air Cooled - Hollowfin® Heatsink

The high fin density of the MF series with taller fins

The Hollowfin air cooled heatsink is characterized by the shape of its fins which when mounted on the DF (6.86 mm) base plate effectively duplicates the high fin density MF (3.43 mm) series, but with taller fins. A height to space ratio equivalent to 46:1 occurs when the fin height is 118 mm. The Hollowfin is an ideal candidate to be attached to a copper base plate to maximize performance. No glue is used in the process.

Performance can be modeled within R-Tools.



Features/Benefits:

- All that apply to Fabfin®
- 46 :1 fin height to spacing ratio at fin height of 118mm
- Highest performance all aluminum heatsink on the market
- No epoxy/glue used in fabrication process

Highlights:

- Copper baseplate/Aluminum fins available

Applications:

- Communications
- Industrial controls
- Medical
- Military
- Motor drives
- Power controls
- Solar energy
- Transportation
- Wind energy

Performance:

- Can be modeled on R-Tools

Air Cooled Mixed Metals Heatsinks

Enhances heat spreading for high heat flux applications

Combination Fabfin® air cooled heatsinks are available with copper baseplates for concentrated heat sources and aluminum baseplates with copper fins for large area heat sources. Optimization is possible by mixing both aluminum and copper fins.

The heatsink was developed to enhance heat spreading for those semi-conductors developing high heat flux and limited allowable temperature rise. The combination heatsink is offered on MF and AF fin spacing as a standard configurable assembly. However, we do supply copper baseplates with DF (6.86 mm) spacing using a Hollowfin which effectively provides MF fin spacing with fins up to 118 mm high. No glue is used in the process.

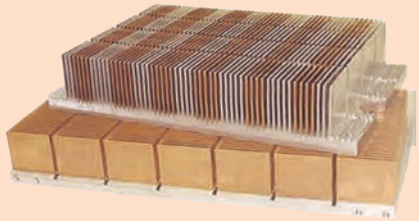
Contact the Applications Department for Modeling Assistance at 905-795-0077 x258 or x340.

Features/Benefits:

- All that apply to Fabfin®
- Increased performance with use of copper
- Selective use of copper and aluminum fins
- Copper baseplate and aluminum fins
- Aluminum baseplate with Cu or Al/Cu fins
- Can also apply to dual baseplate

Highlights:

- Essentially any width, length or height



Performance:

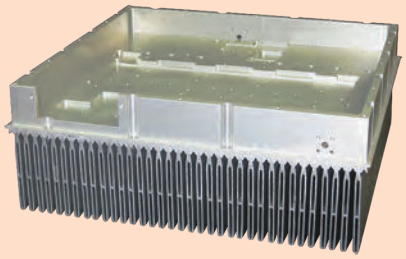
- Typically 15 - 25% lower thermal impedance than a glued solution
- Can be modeled on R-Tools with assistance of our Application Department

Air Cooled Integrated Heatsink Modules

A consolidated approach for maximum cooling

Typically power modules and amplifiers are attached to an air cooled heatsink with a multitude of screws together with some form of TIM. The high thermal barrier at the interface can be eliminated by swaging a multitude of fins into a thick base plate and then machining the module features and requirements into the base plate.

Performance can be modeled within R-Tools.



Features/Benefits:

- All that apply to Fabfin®
- Thick baseplate is hogged out
- Detailed internal machining

Highlights:

- Eliminates interface between power supply and heatsink

Applications:

- Microwave
- Military

Performance:

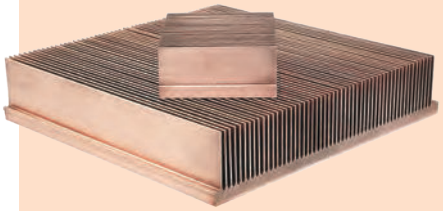
- Can be modeled on R-Tools

Air Cooled Copper Heatsinks

Maximum forced air cooling performance

An all copper Fabfin® heatsink provides maximum forced air cooling performance. The fabrication process is the same as that for an aluminum Fabfin heatsink and is offered on MF and AF fin spacing (3.43 mm and 5.49 mm respectively). While copper provides outstanding performance, the overall cost is high. Other fin spacing can be provided when fins are silver soldered into slots. No glue is used in the process.

Performance can be modeled within R-Tools.



Features/Benefits:

- All that apply to Fabfin®
- Swaged or soldered
- Fins can be taller than 118mm
- Spacing is variable
- Fin thickness is variable
- No epoxy/glue used in fabrication process

Highlights:

- Highest air cooled performance

Applications:

- Anywhere maximum performance is required but where weight is not an issue

Performance:

- Can be modeled on R-Tools

Air Cooled Dual Base Plate Heatsinks

Superb fin efficiency with a no-glue process

Dual base plate air cooled heatsinks (patented) increase fin efficiency with all aluminum or copper/aluminum assemblies. Mixed metal fin arrangements as well as dissimilar baseplates are available. Standard fin height, thickness and spacing are available but few mechanical constraints limit height, width, spacing or thickness of assembly. No glue is used in the process.

Performance can be modeled within R-Tools.

Features/Benefits:

- All that apply to Fabfin®
- Increased performance
- Mixed metals can be used

Highlights:

- Increased fin efficiency by splitting the thermal load



Performance:

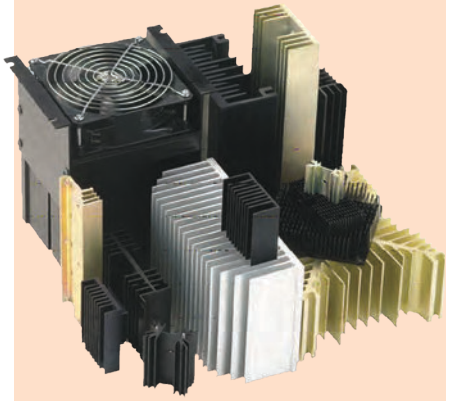
- Increased fin efficiency by up to 30%
- Can be modeled on R-Tools

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Air Cooled Aluminum Extrusion Heatsinks

Aluminum extrusion air cooled heatsinks are the mainstay for cooling medium power semiconductors. Many shapes are available to fit diverse applications. Thousands of shapes exist in the marketplace. If you do not find your needs amid our existing offerings, we will tool a new shape to meet your needs with minimum order quantities.

Performance can be modeled within R-Tools.



Features/Benefits:

- Lowest cost

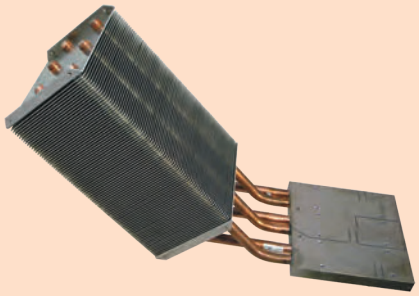
Air Cooled Heatpipes

Spreading heat to large area cooling banks via heat pipes

High heat losses from Press-Pack and IGBT power devices can be spread to large area cooling banks via heatpipes. Typical construction employs copper heatpipes and aluminum or copper “Evaporator” and “Condenser” sections.
If electrical insulation is required ceramic insulators can be built into the heatpipes. Working fluids are chosen to suit the application.

Full specifications can be found on our website.

Contact the Applications Department for Modeling Assistance at 905-795-0077 x258 or x340.



Features/Benefits:

- Increased surface area of cooling fins
- Moves thermal load to high performance air cooled bank
- Will transfer high thermal loads
- Copper tube heatpipes
- Working fluid options
- Copper or aluminum evaporator
- Copper or aluminum condenser

Performance:

- Heat transfer performance between air and liquid cooled
- Contact factory applications department

Highlights:

- Allows for maximum heat flux

Applications:

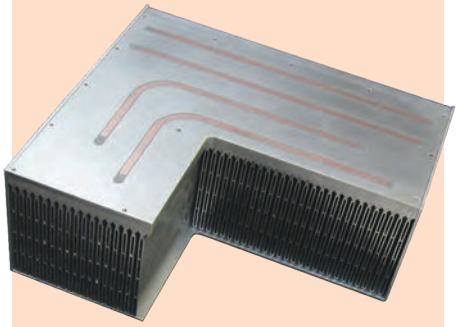
- Those applications where typical air cooled solutions cannot meet demand and liquid cooling is unacceptable

Air Cooled Embedded Heatpipes

The “hot spot” heat evaporator

Typical applications combine the high performance of Fabfin® and the heat spreading of heatpipes. High heat flux in concentrated areas can be spread across a heatsink by placing the hot spot over one end of the heatpipe which becomes the “evaporator” and the heat is transferred to the cooler part of the heatsink where it condenses releasing the heat to the heatsink.

Contact the Applications Department for Modeling Assistance at 905-795-0077 x258 or x340.



Features/Benefits:

- Spreads thermal load
- Surface embedded copper heatpipes
- Integrated with Fabfin heatsinks
- Epoxy interface

Highlights:

- No dimensional constraints

Applications:

- High flux heat sources

Performance:

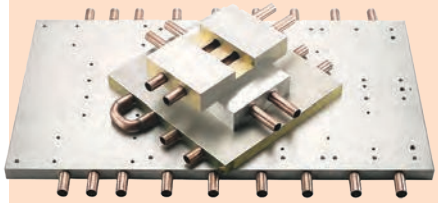
- Contact factory applications department

Liquid Cooled Aquasink® Heatsinks

Robust construction for reliable performance.

The Aquasink liquid cooled heatsink employs an aluminum body and copper tubes. These tubes are embedded in the aluminum body using a mandreling process that expands the copper tube into intimate contact with the aluminum body creating a very robust construction. A smear of specialty grease at the interface of copper and aluminum prevents the possibility of dissimilar metal corrosion. Heat transfer is equal from both mounting surfaces.

Performance can be modeled within R-Tools.



Features/Benefits::

- Aluminum body, straight copper tubes
- Tubes expanded into intimate contact with aluminum body
- Specialty grease prevents corrosion
- Heat transfer equal from both mounting surfaces
- Very rugged

Highlights:

- Practically no physical limitations

Performance:

- Can be modeled on R-Tools

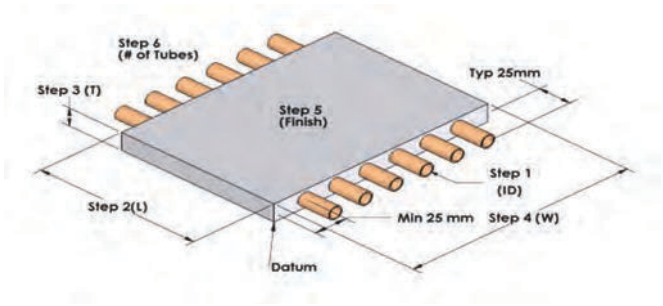
Liquid Cooled Aquasink® Heatsink Configurator

About Aquasink heatsinks

The Aquasink heatsink has been developed to provide the design engineer with a rugged, low cost, high performance heatsink. This Aluminum/ Copper liquid cooled cold plate is suitable for high power, isolated base semiconductors and other heat sensitive components. Aquasink's unique copper tube mandreling technology provides intimate long term contact of the tube with the aluminum cold plate. It is impossible to loosen Aquasink's copper tubes. The integrity of an Aquasink tube is never compromised by flycutting, guaranteeing that an Aquasink will survive the most rigorous of pressure tests.

Embedding process

The embedding process employed to manufacture Aquasink allows you to mount electronic components on both sides of the cooling plate with equal thermal efficiency.



** Please refer to the numbered steps illustrated in this diagram. Step numbers to the right correspond to the steps above.*

Base materials

The heat collecting semi-conductor mounting surface is fabricated from extruded 6063 aluminum alloy. Commercial grade ASTM B-75 copper tubes of a size to suit given applications are embedded within the aluminum plate by a proprietary mechanical process that provides an industry unique metal to metal bond between the aluminum and copper. This process is free of heat impeding glue or epoxy at the copper/ aluminum interface. The copper tube location can be specified for practically any dimension from the datum point.

** Tube location and thermal modeling can be performed on R-Tools.*

7 EASY STEPS TO CONFIGURE AQUASINK

STEP 1: Select tube diameter

Select tube nominal internal diameter (ID):
AA = 1/4" (6.35 mm)
AB = 3/8" (9.53 mm)
AC = 1/2" (12.7 mm)
AD = 5/6" (7.9 mm)
Part Number Example: AC

STEP 2: Select baseplate length

Select length (L) specified in mm (user defined):
eg. L = 250 mm
Maximum allowable length is 813 mm
Part Number Example: AC250

STEP 3: Select baseplate thickness

Select baseplate thickness (T) minimum 2x ID:
TA = 12.7 mm
TB = 19.1 mm
TC = 25.4 mm
TD = 15.9 mm
Part Number Example: AC250TC

STEP 4: Select baseplate width

Select baseplate width (W) specified in mm (user defined): eg. W = 230 mm
Maximum allowable width is 610 mm
Part Number Example: AC250TC230

STEP 5: Select a finish

Choose from the following finishes:
D = Degrease Only
Part Number Example: AC250TC230D

STEP 6/7: Number of tubes/select configuration

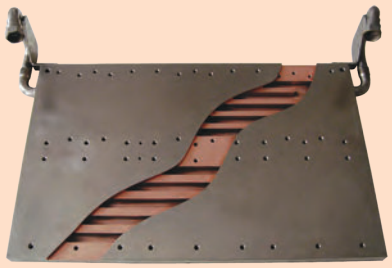
Select number of Tubes (user defined): eg. 6 tubes
Select tube configuration A,B,C,D,E or F
(visit website configuration details): eg. A
Part Number Example: AC250TC230D6A

Liquid Cooled Aquamax® Copper Heatsinks

Superb thermal performance in copper

Aquamax® copper provides additional performance over aluminum using the same proprietary channeling techniques as aluminum. The vacuum brazed, flux free joint ensures leak and corrosion free construction. Typical external finish is RoHS compliant electroless nickel.

Contact the Applications Department for Modeling Assistance at 905-795-0077 x258 or x340.



Features/Benefits:

- Vacuum brazed copper construction
- Flux free
- Leak free
- Highest thermal performance
- Very rugged

Highlights:

- Custom channels
- Optimized channel design
- No physical constraints

Applications:

- Any high power semiconductor application

Performance:

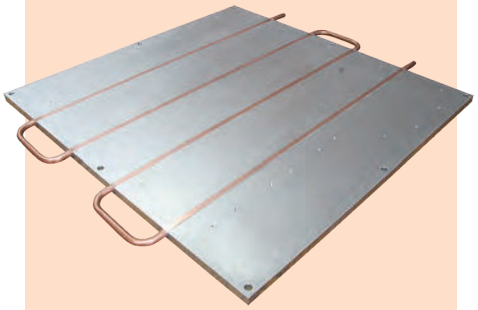
- Contact factory applications department

Liquid Cooled Aquasurf® Heatsinks

The lowest thermal resistance available

Copper tubes are embedded in the surface of an aluminum plate to provide the lowest thermal resistance between the semiconductor mounting surface and the cooling liquid. Tubes can be bent into complex arrays to ensure the copper surface is directly under the semiconductor chips.

Contact the Applications Department for Modeling Assistance at 905-795-0077 x258 or x340.



Features/Benefits:

- Aluminum body, copper tubes
- Copper tubes embedded in aluminum surface
- Copper tubes can be embedded both sides
- Copper tubes can be custom formed to suit application
- Epoxy interface between copper and aluminum
- Lowest cost

Highlights:

- Custom tube layout
- Exposed copper tubes minimizes thermal interface with semiconductors
- Parallel tube design option equalizes junction temperatures

Applications:

- Any high power semiconductor application

Performance:

- Contact factory applications department

Liquid Cooled Aquamax® Aluminum Heatsinks

Maximum thermal performance in aluminum

Aquamax provides maximum thermal performance in aluminum by employing proprietary channeling techniques to optimize coolant velocity at low head loss while providing uniform temperature across the mounting surface. Precision machining techniques used at the vacuum braze, flux free, interface ensure leak and corrosion free construction. Typical external finish is RoHS compliant trivalent chrome.

Contact the Applications Department for Modeling Assistance at 905-795-0077 x258 or x340.



Features/Benefits:

- Vacuum brazed aluminum construction
- Flux free
- Leak free
- Low weight
- High thermal performance
- Very rugged

Highlights:

- Custom channels
- Optimized channel design
- No physical constraints

Applications:

- Any high power semiconductor application

Performance:

- Contact factory applications department

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Press Pack Coolers

For demanding, high performance applications

Patented technology provides the highest performance vacuum brazed, flux free Press Pack Coolers in both aluminum and copper construction.

Full specifications can be found on our website.



Features/Benefits:

- Vacuum brazed construction
- Aluminum or copper
- Flux free
- Leak free
- Mixed metal adaptors
- Highest thermal performance

Highlights:

- Unique design
- Cools all sizes of press pack semiconductors

Applications:

- Any size press pack semiconductor

Performance:

- Contact factory applications department

Cooling Systems

The ultimate integrated cooling solution

To cool the hot fluid exiting a liquid cooled heatsink so that it may be recirculated requires a liquid-to-air heat exchanger working in conjunction with pumps and associated systems.

Full specifications can be found on our website.



Features/Benefits:

- Cools recirculating liquids
- Air cooled radiators
- Copper or aluminum tubes
- Copper or aluminum fins
- Control apparatus

Highlights:

- Compliments liquid cooled heatsinks

Applications:

- Any liquid cooled recirculating system

Performance:

- Contact factory applications department

Product Materials & Tolerances

GENERAL MATERIALS

Baseplates: Aluminum - 6063-T5, 6061-T6
Copper - C11000

Fins: Aluminum - 6063-T5, 6061-T6, 1100-H14
Copper - C11000

Legs and Fan Bracket: Aluminum 6063-T5

Tolerances:

Places	Value
X	± 0.5 mm
XX	± 0.25 mm
XXX	± 0.13 mm

Drilled Hole Diameter: ± .13mm

Note: Tighter tolerances can be supplied if required at some additional cost. Dimensions are in mm unless otherwise stated. Dual measurement convention mm (inches).

FABFIN® (All fin spacings)

Cut to Length: < 305 mm ± 0.5
> 305 mm ± 1.0

Cut to Width: ± 0.5 mm

Angularity: Saw Cut ± 1/4°
Extrusion ± 1°
Machined ± 1/4°

Flatness (max.): Machined flycut 0.03/25 mm

Surface Roughness (max.): 1.6 rms or better

Overall Height: ± 0.75 mm Fin height "H" ≤ 100mm
± 1.00 mm Fin height "H" > 100mm

Baseplate Thickness: ± 0.75 mm

AQUAMAX® (Copper or Aluminum)

Contact the factory for complete details at 905-795-0077

AQUASINK® and AQUASURF®

Copper Tubes: Commercial ASTM B-75

Inlet/Outlet Adapters: Brass/Copper

Length (L) parallel to tubes:
≤ 305 mm ± 0.5 mm Aquasink-Max 813
> 305 mm ± 1.0 mm
No limit - Aquasurf

Width (W) transverse to tubes:
Up to 610 mm ± 0.5 mm - Aquasink
No limit - Aquasurf

Angularity: ± 1/4°

Flatness (max.): Machined (flycut) 0.03/25 mm
Unmachined 0.1/25 mm

Surface Roughness (max.): 1.6 rms or better

Locations of tubes from datum point: ± 1.0 mm

Nominal ID	6.35 (1/4)	7.93 (5/16)	9.53 (3/8)
OD*	8.07 ± 0.025	9.60 ± 0.025	11.50 ± 0.024

**after mandrel expansion process - Aquasink*

Finish-Copper Tubes: Natural

Leak Testing: To 120 psi for 5 min.; other specs contact factory.

EXTRUSION

The aluminum extrusions supplied by Mersen comply with the standard commercial tolerances established by "The Aluminum Association Inc.", which roughly translate into the following "rules of thumb" when applied to heatsink sections.

Cutting to Length: ≤610mm ± 0.5mm
>610mm ≤ 1220mm ± 1.27mm
>1220mm ± 1.57mm

Flatness (max. deviation): 0.1mm/25mm of width up to 250mm
0.2mm/25mm of width over 250 mm

Roughness/Die Lines: Depth of defect <0.1mm

Angularity: ± 1°

MACHINED PARTS

Flatness (max. deviation): 0.03/25mm of width

Roughness: 1.6 rms or better

Angularity: ± 0.25°

Edge to Datum: ±0.25mm

Feature to Feature: ±0.13mm

Product Materials & Tolerances

GENERAL FINISH TYPE

Meets the requirements of:

Black Anodize:	MIL-A-8625, Type II, Class 2, Black
Clear Anodize:	MIL-A-8625, Type II, Class 1, Clear
Gold Chromate:	MIL-DTL-5541, Type I, Class 3, Gold
Trivalent Chromate:	MIL-DTL-5541, Type II, Class 3, Clear
Electroless Nickel:	ASTM-B-733
Tin Plated Copper:	Lead Free
Tin Plated Solderable Tabs:	Lead Free
Wash:	Degrease Only

AQUASINK®/AQUASURF® - Degrease only

AQUAMAX® - COPPER - Electroless Nickel; degrease

AQUAMAX - ALUMINUM - Trivalent Chromate

SURFACE FINISH FOR FABFIN ANODIZING

The entire family of Fabfin aluminum heatsinks can be anodized without worry of an inconsistent finish. Anodizing, by its nature, requires that hundreds of amperes of DC current be conducted through the entire heatsink body. Any resistance present in the interface (between the fin and the baseplate) would cause the fins to appear “off black” or “grey” once the processing is complete. This is yet another test of the interface between the fin and the baseplate which shows superior performance over alternative assembly techniques. Clip marks which show as white marks in a black anodize finish occur where the electrical contact(s) is/are made. Clip marks can be eliminated by inserting titanium screws into threaded holes in the heatsink to form the required electrical path. This process results in additional cost.

SURFACE “FINISH FREE”

“Finish Free” areas can be provided if required for electrical conductivity.

FABFIN®

OPERATING RANGE

The swaging process which the entire family of Fabfin heatsinks incorporates, allows all assemblies to successfully pass the harshest environmental and physical tests. Storage and operating temperatures of -40°C to +350°C demonstrate that Fabfin heatsinks are unmatched by other less robust methods of construction.

VIBRATION

Fabfin’s durability of design has been independently tested, without failure, to the following parameters. All three axis tested, swept sine wave vibration resonance search from 5-200 Hz with a sweep rate of 0.5 oct./min., Input acceleration amplitude of 0.5 g, A one hour dwell at each resonant frequency, and a twelve hour durability sweep from 5-200 Hz with 0.3 g input.

WELDING

Welding baseplates together (after the addition of fins) to increase overall width beyond 521 mm is common practice since the fin to baseplate join is unaffected by the welding process. If your finish selection is black anodize, please note that a shade of black variance exists along the weld joints.

TEMPERATURE CYCLING

To determine the reliability of the metal displacement swaging process both the FF & MF series Fabfin assemblies were tested by an independent third party laboratory. The results showed that extensive temperature cycling, from -40°C to +120°C, and one time heating to +350°C, had no adverse effect on the performance of the heatsink.

FIN PULL TESTS

A fin pull test was completed, following the temperature cycling period, on a 50 mm length of fin perpendicular to the baseplate, exceeded 900 kgs (18kg/mm) and occurred without failure of the fin to baseplate interface.

MF & AF FABFIN

Specify blind holes wherever possible in the mounting surface. It should be recognized that some streaking may occur at the plugged holes and as such cosmetic requirements must be specified at time of RFQ.

DF & FF FABFIN

Specify that through holes are acceptable in the mounting surface to eliminate the need to plug holes when finishing. It should be recognized that deburring between the fins may leave minor scratches near the through holes and as such cosmetic requirements must be specified at time of RFQ.

RoHS 2002/95/EC

R-Tools® 3D Heatsink Modeling

Powerful thermal modeling software

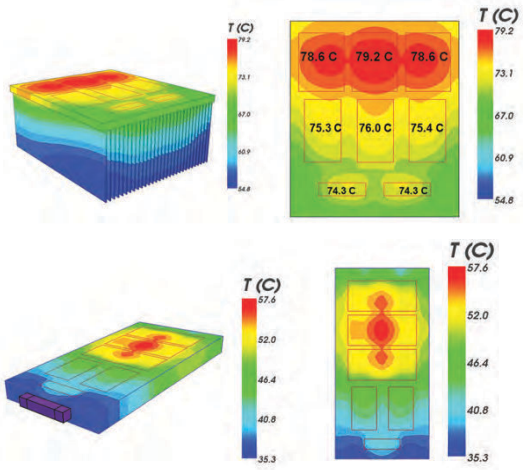
Mersen makes it easy and convenient to quickly and accurately model various heatsink configurations using the R-Tools online thermal modeling software program. R-Tools is completely interactive. It uses analytically based design tools allowing you to perform the thermal design of the heatsink concurrent with the optimization of the electrical and manufacturing elements prior to any prototype builds and testing. This invaluable resource reduces your design time and increases the reliability in your finished product.



Features/Benefits:

- Completely interactive on-line thermal design tool for heatsinks.
- Quick and accurate heatsink solutions.
- Analytical models for conduction heat transfer in the solid elements.
- Natural and forced convection heat transfer models in the cooling airflow.
- Reduction in design time and better reliability in the finished product.
- User-friendly approach introduces users to R- Tools.
- Colorful and clear graphics.
- Design tips and notes.
- Step by step approach.
- Liquid and air-cooled heatsinks.
- Graphical source layout.
- Parts library for semi-conductors, thermal interfaces, and fans.
- Fin optimizer solves for optimum heatsink configurations.
- Thermal design output details heatsink performance.
- Heatsink thermal map shows temperature profile of the heatsink baseplate.
- Hydraulic performance chart displays heatsink vs. fan performance curves.

Visit R-Tools under Resources at www.us-ferrazshawmut.mersen.com.



Need more support?

Mersen is a company that is easy to do business with. Our leading engineers will work with you to develop tailored solutions for removing damaging heat from your electronic systems.

Email:
sales.mis@mersen.com

Manufacturing:
905-795-0077

Applications support:
905-795-0077 x258 or x340

R-Tools® 3D Heatsink Modeling

Powerful 3D thermal modeling software

Heatsinks are used with semi-conductor devices to provide more surface area for heat dissipation. Power electronic designers require quick and accurate heat sink solutions. With the advent of the internet, and realizing the potential of providing interactive design capability on the Web, Mersen offers R-Tools; a completely interactive on-line thermal design tool for heatsinks. The R-Tools mathematical engine is located on a web server at us.ferrazshawmut.com/thermal/r-tools_front.cfm. R-Tools simulation can be run on an Internet browser, which is capable of utilizing Java Applets. R-Tools thermal modeling is based on a set of analytical models for conduction heat transfer in the solid elements coupled with natural and forced convection heat transfer models in the cooling airflow. The conduction heat transfer model in the baseplate of the heatsink is based on the steady state solution of the Laplace equation for general rectangular geometry. The solution is based on a general three-dimensional Fourier series solution, which satisfies the conduction equation in the base plate. For the forced convection air-cooled fins, an analytical model is used to predict the average heat transfer rate. The model used is a composite solution based on the limiting cases of fully developed and developing flow between parallel plates. Because the R-Tools is analytically based, the solution is achieved within a few seconds, a very short time compared to the several hours required for a full CFD simulation.

R-Tools provides an analytical method for quickly and accurately testing various heat sink configurations. The use of analytically based design tools allows the user to perform the thermal design of the heatsink concurrent with the optimization of the electrical and manufacturing elements prior to any prototype or testing. This approach results in a reduction in design time and better reliability in the finished product.

Free on-line registration

Users may register for R-Tools by visiting our website Selecting Resources > R-Tools. On the first screen of R-Tools, a menu on the left-hand side of the screen lists selections and options available for users such as: Simulation Menu button allows the user to start a new simulation.

User Option Menu gives the user two options for using R-Tools:

i) Step by step option is the default option for all new users. This user-friendly approach introduces users to the R-Tools concept of designing heatsinks on-line. Colorful and clear sketches are used to describe the basic dimensions and parameters of the heatsink design. When the user points the cursor in any text box, design tips and notes are displayed in green color at the bottom of the screen.

ii) For advanced users the Compact Pages option reduces the design screens down to four screens, which reduces the design and browsing time.

File Menu allow users to copy, rename and delete existing simulations.

On simulation screens, the left-hand side menu list the steps of navigating R-Tools through the designing of Mersen
heatsinks. Users have two options to navigate through R-Tools screens as follows:

a) Navigate step by step through any R-Tools screen by clicking the “Next” button on the bottom of each screen.

b) Display the desired R-Tools screen by clicking on the screen name on the left-hand side menu.

On the Web:

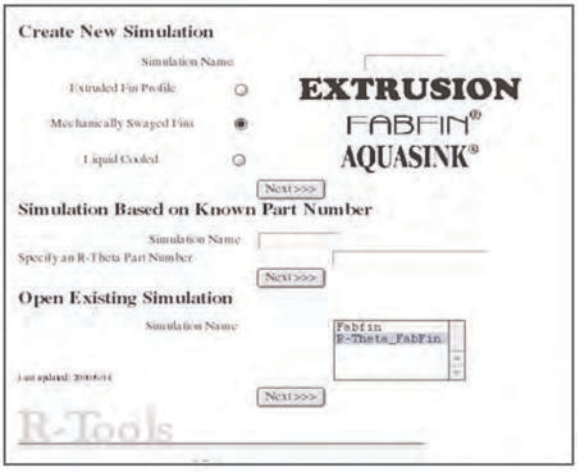
Visit R-Tools under Resources on our website.

R-Tools® 10 Easy Steps

STEP 1: Starting simulation

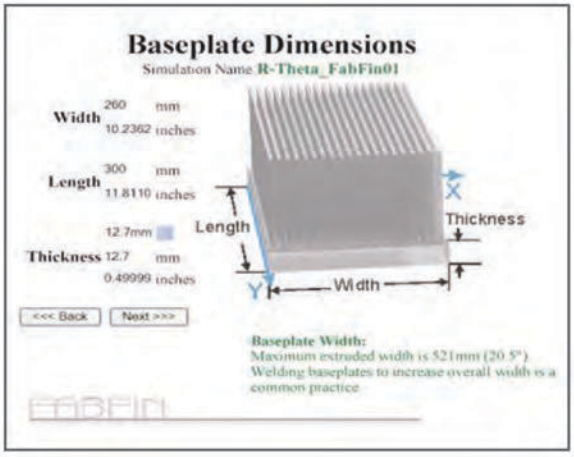
To start a simulation on R-Tools, there are three options:

- "Create New Simulation" by typing a simulation name and selecting the product which is suitable for the applications: Examples: Extrusion, Fabfin, Aquasink.
- "Simulation Based on Known Part Number" by typing in a simulation name and the appropriate Mersen part number to generate a new simulation: Example: FF300T13A30AC118B.
- "Open Existing Simulation" by selecting the name of the simulation from the drop down list of your previously created simulations. Note: Click the next button to go to the next screen, baseplate dimensions.



STEP 2: Baseplate dimensions

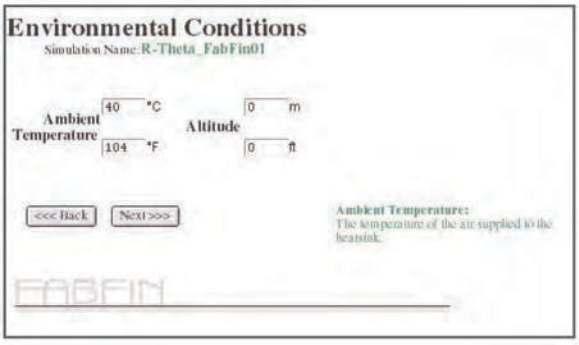
- The sketch on the right hand side of the screen demonstrates the three dimensions of the baseplate.
- Enter the dimensions by typing in the value (mm or inches) in the corresponding text box.
- The user can select a standard thickness or customized one by typing the value in the text box.
- The green design on the bottom right side of the screen will inform the user about Mersen manufacturing capabilities.



STEP 3: Environmental conditions

- "Ambient Temperature" is the temperature of the air cooling the heatsink. "Ambient Temperature" can be entered in ºC or ºF.
- "Altitude" of the application can effect the cooling capacity of the heatsink because it can change density of the cooling air.

Note: The name of the simulation will always appear on the top of the screen.



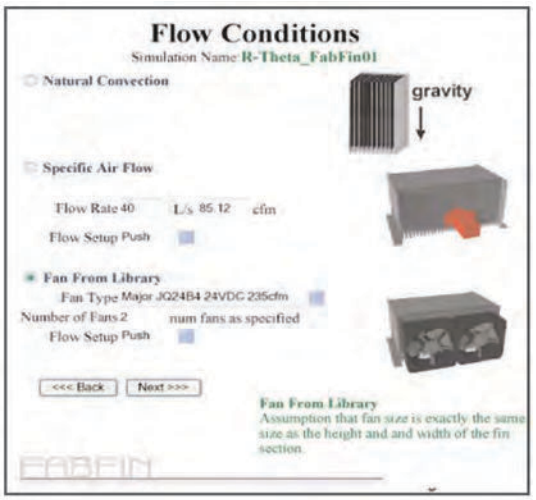
R-Tools® 10 Easy Steps

STEP 4: Flow conditions

The heatsink can be cooled using one of the heat transfer modes:

- "Natural Convection" mode where air moves through the heatsink due to the buoyancy effects.
- Forced convection mode which has two input options in R-Tools.
  1. "Specific Air Flow": The user has to enter the appropriate volumetric flow rate of the air cooling the heatsink, or
  2. "Fan From Library": The user can select a fan from the drop down list.
- For forced convection the user can select the flow direction:
  1. Push, or
  2. Impinging, or
  3. Push/Pull.

Note: By-pass air is not modeled in R-Tools. All air flow data entered is assumed to be presented to the face of the heatsink.

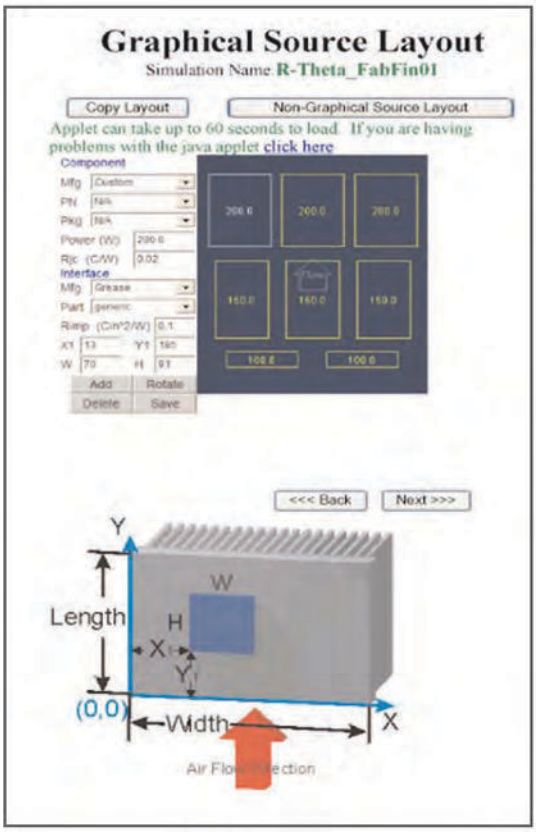


STEP 5: Graphical source layout

A sketch of the main dimensions of the heatsink and the locations of the heat source is shown at the bottom of the screen. To add a heat source on the baseplate of the heatsink, click "Add" button.

R-Tools allows two options for specifying the heat source: i.e. component:

1. Customize the specifications of the device by entering the dimensions, power dissipation and the thermal resistance, Rjc of the device in the corresponding text boxes on the screen.
2. Select an industry standard semiconductor from the drop-down list.
   - Users can change the dimensions (W, H) and the location (X1, Y1) of any source on the heatsink graphically or by typing the values in the corresponding text box.
   - To rotate the source on the heatsink, click "Rotate" button.
   - To delete a source, click on the "Delete" button.



STEP 6: Thermal interface material

Users can enter the thermal impedance, Rimp, of the interface material by:

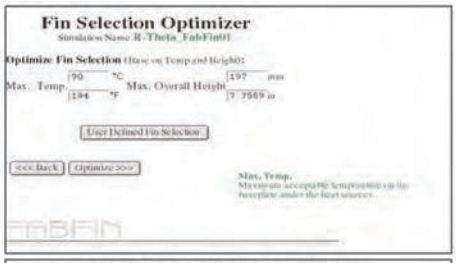
- Typing its value in the textbox, or
- Selecting the manufacturer and the part number of the interface from the drop down lists.

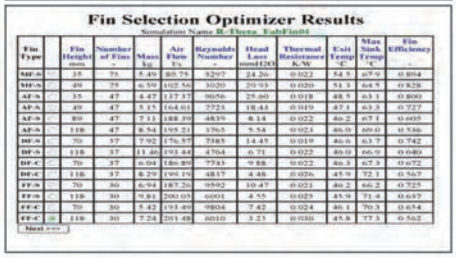
STEP 7: Save

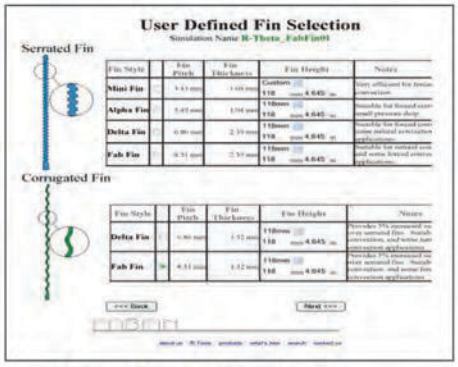
At this point, you must click "SAVE" before advancing to the "Next" screen!

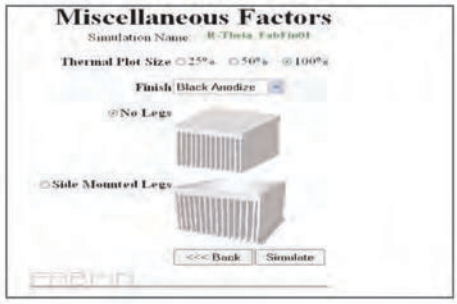
STEP 8: Fin selection and optimizer

Users can select from the two following options:









1. Fin optimizer: the user must enter

a) Thermal constraints i.e. Maximum Temperature allowed on the heatsink.

b) Physical constraints i.e. Maximum Height allowed for the heatsink.

- The fin optimizer will solve all fin configurations, which will meet the thermal performance i.e. maximum allowed temperature, and will list all the available selections in the “Fin Optimizer Results” table.
- Click on any header of the “Fin Optimizer Results” table to sort the table according to the header name ie: the user can sort the table by the mass of the heatsink by clicking on the “Mass” header.
- When selecting any configuration from the table a green design note will describe the main specification of the selected fin.

2. User defined fin selection:

For users familiar with the Mersen Fabfin® heatsink configuration, “User Defined Fin Selection” allows users to select the exact Mersen standard fin design as follows:

- MF is the recommended fin design for forced convection applications with maximum height of 49 mm.
- AF is recommended for forced convection applications, which require low pressure drop i.e. low noise levels.
- DF has three fin designs satisfying different application objectives as follows:
  - i) Serrated Fin: for high power dissipation.
  - ii) Corrugated Fin: for weight sensitive applications.
  - iii) Hollowfin: for high power dissipation applications. Hollowfin with the advantage of lower pressure drop performance and lower weight.
- FF is a suitable selection for natural convection heat transfer. FF can be used for relatively low power dissipation forced convection applications. FF has two fin designs as follows:
  - i) Serrated Fin: provides mechanical integrity.
  - ii) Corrugated Fin: larger surface area to provide better cooling for natural convection.

Note: Fin height can be customized by the user with certain limitations for each group: MF: minimum of 25 mm and maximum of 49 mm; AF, DC, FF: minimum of 25 mm and maximum of 118 mm. Hollowfin is recommended as an alternative to a MF fin when a fin height higher than 49 mm is needed to dissipate more heat.

STEP 9: Miscellaneous factors:

On this page users can define the following:

i) “Thermal Plot Size” in the final simulation i.e. for large heatsinks it is better to reduce the display to 50% or 25% of the original size so that the display will appear inside the web page.

ii) Specify the “Finish” of the final product which can be one of the following:

- Degreased;
- Black anodized (recommended for natural convection;)
- Clear anodized;
- RoHS compliant clear tri-valent chrome.

iii) Mounting option where the user can select to attach legs for the heatsink for mounting.

Click “Simulate” for the full thermal simulation for Mersen heatsink.

R-Tools® 10 Easy Steps

STEP 10: R-Tools simulation-design output summary

The summary contains three main sections

A) Numerical results summary (contains three sections)

1. Heatsink Design Details Section: The physical dimensions of the heatsink such as weight, fin height, fin spacing, baseplate thickness, fin material, baseplate material etc. It also generates a Mersen part number.

2. Thermal Design Detail Section: A full list of the heat sources is displayed. For each source the the following information is displayed:

- W & L: foot print of the heat source i.e. device;
- Power: heat dissipation;
- Tsavg: average temperature of the baseplate under the device;
- Tcase: average case temperature;
- Tjunction: average junction temperature;
- Fin Efficiency;
- Thermal Resistances associated with each device.

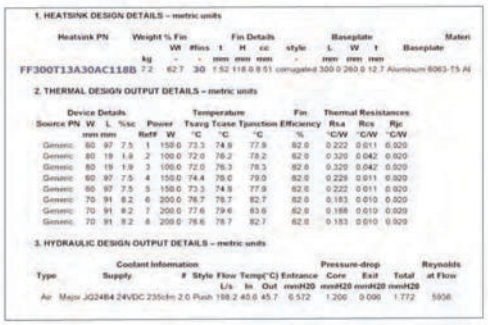
3. Hydraulic Design Details Section**:** This section displays three main sub-sections:

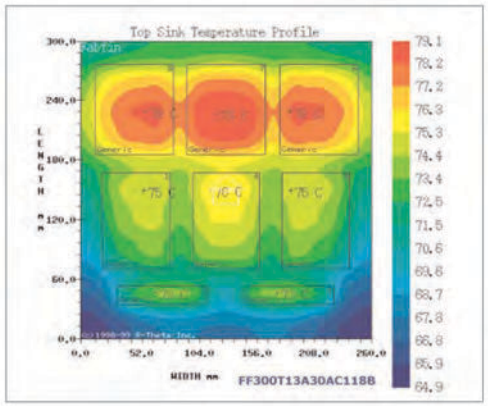
a) Coolant Information (if applicable):

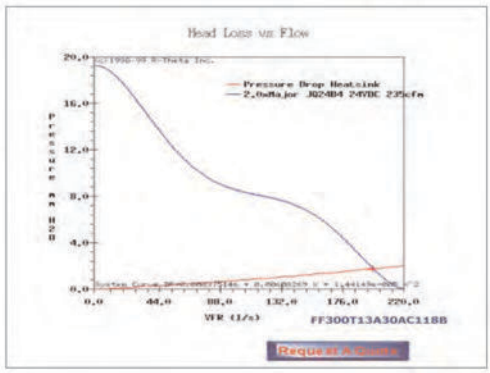
- Coolant type air, water, Water/Glycol mix etc.;
- Supply: shows the fan name, number of fans used in the application and cooling style;
- Inlet and the outlet coolant temperatures (air or liquid);

b) Pressure drop through the entrance, the heatsink core, and exit section. The sum of the pressure drop through the three sections is displayed under total header.

c) Reynolds number, which is a measure of the turbulence level in the fluid flow.







B) Heatsink thermal map:

This shows a temperature profile of the heatsink baseplate. Hot spots on the heatsink baseplate are identified by the red color in the thermal map. The maximum temperature under each device is printed on the thermal map in the square which identifies the location of each device.

C) Hydraulic performance chart (fan should be selected):

This displays heatsink performance curve vs. fan performance hydraulic curve. Displaying the performance point of the system helps designers to determine the noise level and fan efficiency. A second degree equation which represents the heatsink performance curve can help designers include the designed heatsink in CFD models.

Surge Protection

Fail-safe overvoltage protection in a full range of options



Your problem: Power-related problems cost U.S. companies more than $80 billion dollars a year. Most transients originate from within a facility and nearly 80% of today's overvoltage problems are caused by equipment and power disturbances within the plant. These inner-facility transients are caused, for example, by light load panels switching on and off, motors starting and stopping, and close conductor proximity. Less than 20% of the transient problems originate outside the facility due to lightning strikes, utility grid switching, switching capacitor banks, and electrical accidents.

Our solution: You need fail-safe surge suppression, and the reliability and cost savings of Mersen's Surge-Trap® Surge Protection Devices with patented TPMOV® Technology inside. Surge-Trap SPDs provide a compact, space saving solution. Plus, unlike other SPDs on the market, they do not require additional overcurrent protection, thus offering reduced installation costs.

Want more information fast? For more technical or application-specific information, please call our overvoltage protection experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

N Surge Protection

- Surge-Trap® Modular SPD N2
- Surge-Trap® Pluggable SPD N4
- Surge-Trap® Type 1 T2 Series N6
- Surge-Trap® Type 1 XR Series..... N8
- Surge-Trap® Type 1 XP Series N10
- Surge-Trap® Type 1 XT Series N12
- TPMOV® Technology N14
- VSP MOV Fuses N16
- Surge Switch N18

FERRAZ SHAWMUT IS NOW MERSEN

MERSEN

Surge-Trap® Modular SPD

DIN-rail Style SPD

Surge-Trap® Modular Surge Protective Device (SPD) is a no-fuse, fail-safe surge suppressor featuring Mersen's patented TPMOV® technology inside. The modular SPD is UL 1449 Third Edition approved. It is DIN-rail mountable featuring a fail-safe self-protected design, visual indicator and a small footprint. A remote indicator option provides status to critical control circuitry. The Surge-Trap Modular SPD has a high short circuit rating and a thermally protected MOV, which eliminates the need for additional overcurrent protection devices.



Features/Benefits

- Easy installation or retrofit
- DIN-rail mountable
- Fail-safe, self-protected design
- Remote indicator (optional)
- Visual indicator
- IP20 finger-safe design
- Small footprint
- No additional overcurrent protection devices required

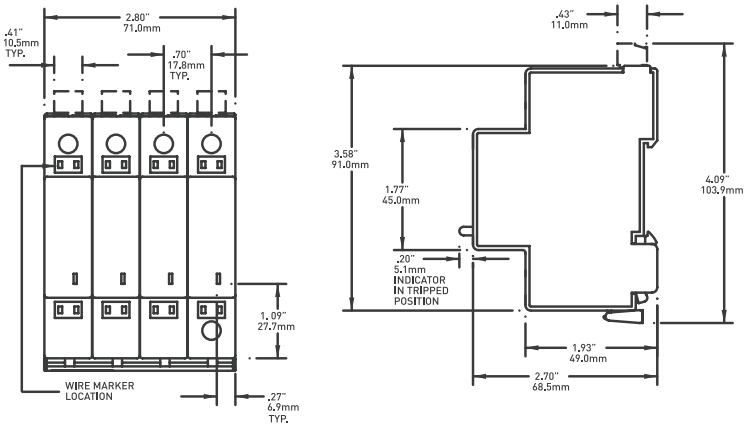
Applications:

- AC/DC distribution
- Power supplies
- Industrial automation
- Telecommunications
- Motor controls and starter systems
- Programmable logic controller (PLC) applications
- Power transfer equipment
- HVAC applications
- AC drives
- UPS systems
- Security systems
- IT/Data centers
- Medical equipment

Ratings:

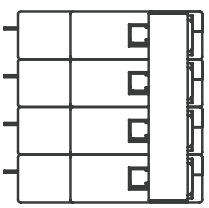
Volts : 120V to 600V
: 600V to 1000V (PV only)
SCCR : 200kA
Operating & storage temp
: -25°C to +60°C
Wiring range:
: #6 to #14AWG
Nominal discharge current
: 20kA

Dimensions



Poles	A
1 Pole	17.8 mm
2 Pole	35.5 mm
3 Pole	53.3 mm
4 Pole	71.0 mm

*** Wire Size: 6-14 AWG*
*** Torque: 15 lbs-in*
*** Use 35mm DIN-rail*



Approvals:

- UL 1449 Third Edition Approved, File E210793
- Type 4 UL Recognized Component (Tested to UL Type 2 SPD)
- IEC 61643-1
- RoHS Compliant
- ANSI/IEEE C62.41
- CE

Surge-Trap® Modular SPD

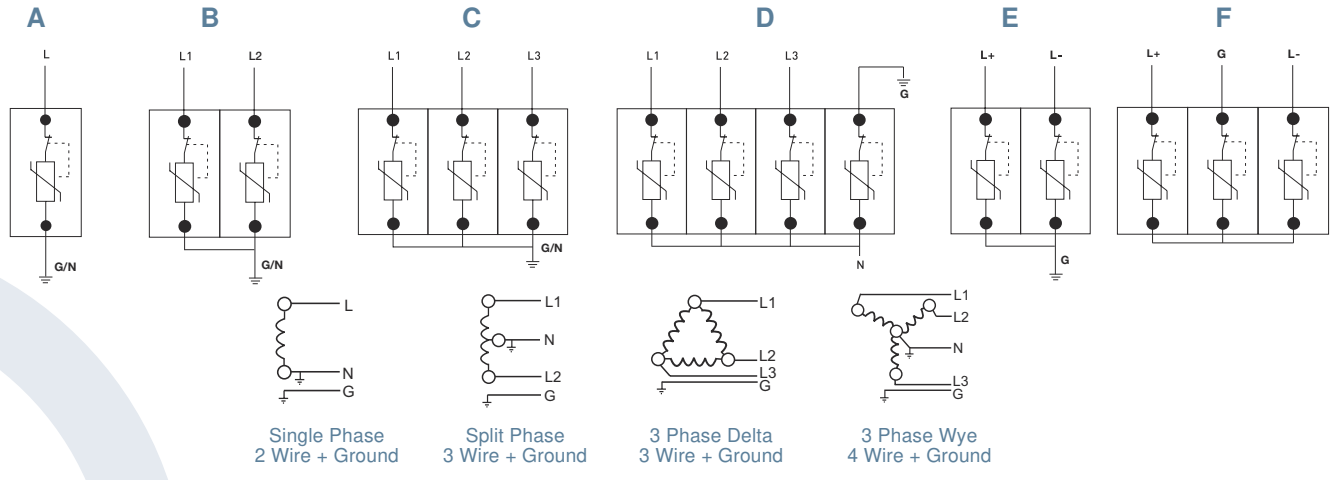
Product Type	Voltage	System Type	Mode	Auxiliary Microswitch
ST	480	3PY	G	M
ST- Modular	120	1P - Single Phase	Blank - Includes N-G Mode	Blank - No Microswitch
	120/208	SP - Split Phase	G - Does Not Provide N-G Mode	M - Microswitch Included
	120/240	3PD - 3 Phase Delta		
	240			
	277	3PY - 3 Phase Wye		
	347	PV - Photovoltaic		
	480			
	240/480			
	277/480			
	347/600			
	600			
	1000	Indicates PV only		

Catalog Numbers

Catalog No.	Nominal Voltage (VAC)	MCOV L-G	No. of Poles	System Type	Nominal Discharge Current ** (In, kA)	Max. Discharge Current (Imax, 8/20µs, kA)	SCCR (kA)	Freq (Hz)	Voltage Protection Rating (VPR)				No. of Wires	Circuit Connection Wiring Diagrams
									L-N	L-G	N-G	L-L		
ST1201PGM	120	180	1	1P	20	50	200	50/60	500	-	-	-	2	A
ST2301PGM	240	270	1	1P	20	50	200	50/60	800	-	-	-	2	A
ST2771PGM	277	320	1	1P	20	50	200	50/60	900	-	-	-	2	A
ST2083PYM	120/208	360	4	3PY	20	50	200	50/60	500	900	500	900	5	D
ST2083PYGM	120/208	180	3	3PY	20	50	200	50/60	500	-		900	4	C
ST240SPGM	120/240	180	2	SP	20	50	200	50/60	500	-		900	3	B
ST480SPGM	240/480	270	2	SP	20	50	200	50/60	800	-	-	1500	3	B
ST2403PDGM	240D	270	3	3PD	20	50	200	50/60	-	800	-	1500	4	C
ST4803PYM	277/480	500	4	3PY	20	50	200	50/60	1000	1500	500	1800	5	D
ST4803PYGM	277/480	320	3	3PY	20	50	200	50/60	900	-	-	1800	4	C
ST4803PDGM	480D	550	3	3D	20	50	200	50/60	-	1500	-	3000	4	C
ST6003PYM	347/600	690	4	3PY	20	50	200	50/60	1500	2500	800	2500	5	D
ST6003PYGM	347/600	420	3	3PY	20	50	200	50/60	1200	-	-	2000	4	C

Catalog No. PV	Nominal Operating DC Voltage (V)	Ucpv*	Nominal Discharge Current (In,8/20, kA)	Imax Discharge Current (Imax, 8/20µs, kA)	Voltage Protection Level (Up @ In, kV)	Iscwpv** (kA)	L/R	Replacement Plug Part No	No. of Poles	Wiring Diagrams
ST600PVM	600	720	10	40	<2.4	10	<= 1mS	-	2	E
ST1000PVM	1000	1200	10	40	<4.0	10	<= 1mS	-	3	F

** Ucpv: Maximum continuous operating DC voltage. **Values based upon SPD type 2 testing*



For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Surge-Trap® Pluggable SPD

DIN-rail Style SPD

Surge-Trap® Pluggable Surge Protective Device (SPD) is a no-fuse, fail-safe surge suppressor featuring Mersen's patented TPMOV® technology inside. The pluggable SPD is UL 1449 Third Edition approved. It is DIN-rail mountable featuring a fail-safe self-protected design, visual indicator and a small footprint. A remote indicator option provides status to critical control circuits. The Surge-Trap Pluggable SPD has a high short circuit rating and a thermally protected MOV, which eliminates the need for additional overcurrent protection devices.



Features/Benefits:

- Easy installation or retrofit
- DIN-rail mountable
- Fail-safe, self-protected design
- Remote indicator
- Visual indicator
- IP20 finger-safe design
- Small footprint
- No additional overcurrent protection devices required
- Easy to replace modules
- Two-year warranty

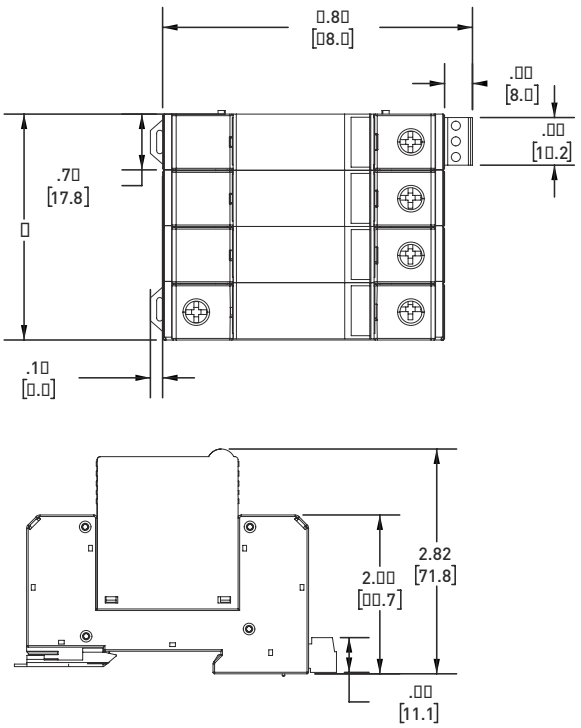
Applications:

- AC/DC distribution
- Power supplies
- Industrial automation
- Telecommunications
- Motor controls and starter systems
- Programmable logic controller (PLC)
- Power transfer equipment
- Photovoltaic systems
- HVAC applications
- AC drives
- UPS systems
- Security systems
- IT/Data centers
- Medical equipment

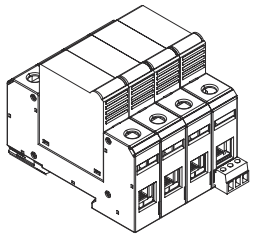
Ratings

Volts : 120V to 600V
: 600V to 1000V (PV only)
SCCR : 200kA
Operating & storage temp
: -25°C to +60°C
Wiring range:
: #6 to #14AWG
Nominal discharge current
: 20kA

Dimensions



Poles	A
1 Pole	18.03 mm
2 Pole	36.06 mm
3 Pole	54.10 mm
4 Pole	72.13 mm



Approvals:

- UL 1449 Third Edition Approved, File E210793
- Type 4 UL Recognized Component (Tested to UL Type 2 SPD)
- IEC 61643-1
- RoHS Compliant
- ANSI/IEEE C62.41
- CE

Surge-Trap® Pluggable SPD

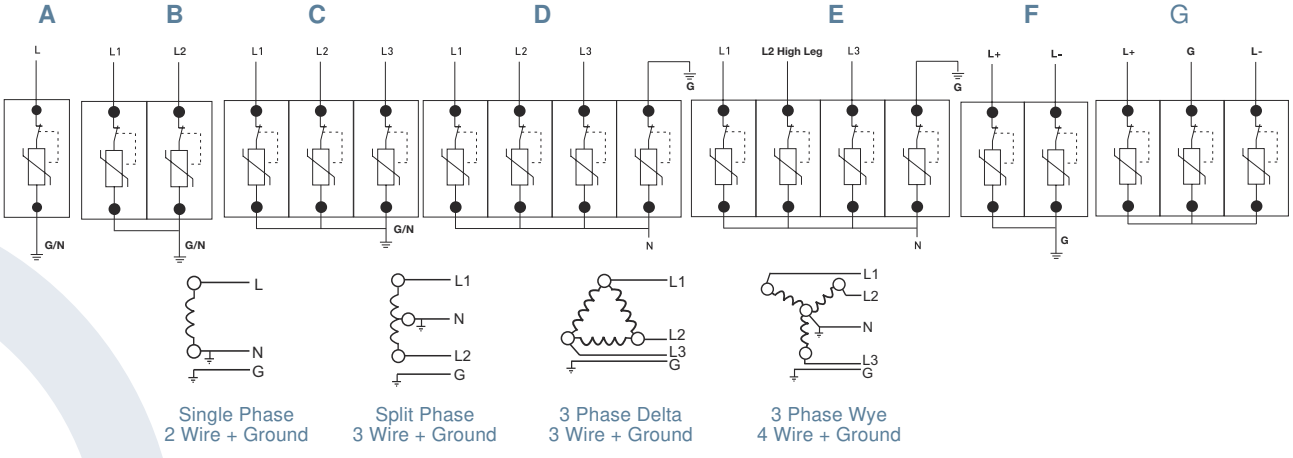
Product Type	Voltage	System Type	Mode	Auxiliary Microswitch
STP	480	3PY	G	M
STP - Pluggable	120	1P - Single Phase	Blank - Includes N-G Mode	
	120/208	SP - Split Phase	G - Does Not Provide N-G Mode	M - Microswitch Included
	120/240	3PD - 3 Phase Delta		
	240	3PH - 3 Phase Highleg		
	277	3PY - 3 Phase Wye		
	347	PV - Photovoltaic		
	480			
	240/480			
	277/480			
	347/600			
	600			
	1000	Indicates PV only		

Catalog Numbers

Catalog No.	Nominal Voltage (VAC)	MCOV L-G	No. of Poles	System Type	Nominal Discharge Current ** (In, kA)	Max. Discharge Current (Imax, 8/20µs, kA)	SCCR (kA)	Freq (Hz)	Replace-ment Plug Part No	Voltage Protection Rating (VPR)				No. of Wires	Circuit Connection Wiring Diagrams
										L-N	L-G	N-G	L-L		
STP1201PGM	120	180	1	1P	20	50	200	50/60	SP180U	600				2	A
STP2083PYM	120/208	360	4	3PY	20	50	200	50/60	SP180U	600	1200	600	1200	5	D
STP2083PYGM	120/208	180	3	3PY	20	50	200	50/60	SP180U	600			1200	4	C
STP2301PGM	240	275	1	1P	20	50	200	50/60	SP275U	900				2	A
STP2403PDGM	240D	275	3	3PD	20	50	200	50/60	SP275U		900		1800	4	C
STP2403PHM	120/240	*	4	3PH	20	50	200	50/60	SP180U, SP275U	600	1200	600	1200	5	E
STP240SPGM	120/240	180	2	SP	20	50	200	50/60	SP180U	600			1200	3	B
STP2771PGM	277	320	1	1P	20	50	200	50/60	SP320U	1000				2	A
STP3471PGM	347	420	1	1P	10	50	200	50/60	SP420U	1500				2	A
STP4803PDGM	480D	550	3	3PD	10	50	200	50/60	SP550U		1800		3000	4	C
STP4803PHM	240/480	*	4	3PH	10	50	200	50/60	SP275U, SP550U, SP180U	900	1500	600	1800	5	E
STP4803PYM	277/480	500	4	3PY	20	50	200	50/60	SP320U, SP180U	1000	1500	600	1800	5	D
STP4803PYGM	277/480	320	3	3PY	20	50	200	50/60	SP320U	1000			1800	4	C
STP480SPGM	240/480	275	2	SP	20	50	200	50/60	SP275U	900			1800	3	B
STP6003PYM	347/600	695	4	3PY	10	50	200	50/60	SP420U, SP275U	1500	2000	900	2500	5	D
STP6003PYGM	347/600	420	3	3PY	10	50	200	50/60	SP420U	1500			2500	4	C

Catalog No. PV	Nominal Operating DC Voltage (V)	Ucpv*	Nominal Discharge Current (In,8/20, kA)	Imax Discharge Current (Imax, 8/20µs, kA)	Voltage Protection Level (Up @ In, kV)	Iscwpv** (kA)	L/R	Replacement Plug Part No	No. of Poles	Wiring Diagrams
STP600PVM	600	720	10	40	<4.0	10	<= 1mS	SP670PV	2	F
STP600YPVM	600	720	20	40	<4.0	10	<= 1mS	SP350PV	3	G
STP1000YPVM	1000	1200	10	40	<4.0	10	<= 1mS	SP560PV	3	G
STP1200YPVM	1200	1440	10	40	<4.0	10	<= 1mS	SP560PV	3	G

** Ucpv: Maximum continuous operating DC voltage. **Values based upon SPD type 2 testing*



For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Surge-Trap® Type 1 SPD

UL TYPE 1 SPD for Indoor Applications

The Surge-Trap® Type 1 SPD meets requirements for UL 1449 Third Edition and is ideal for indoor applications. It provides a two-year warranty and offers an economical replacement for the former surge arrestor category. The Surge-Trap Type 1 SPD features TPMOV® technology inside making it a “no-fuse” surge suppressor that doesn’t require the use of additional overcurrent protection. It can be installed upstream or downstream of the main disconnect.



Features/Benefits:

- Compact design
- Panel mount
- No additional overcurrent protection devices required
- 200kA Short circuit current rating (SCCR)
- UL 1449 Third Edition Type 1 listed
- For indoor, NEMA 2, applications
- Status LEDs
- Two-year warranty

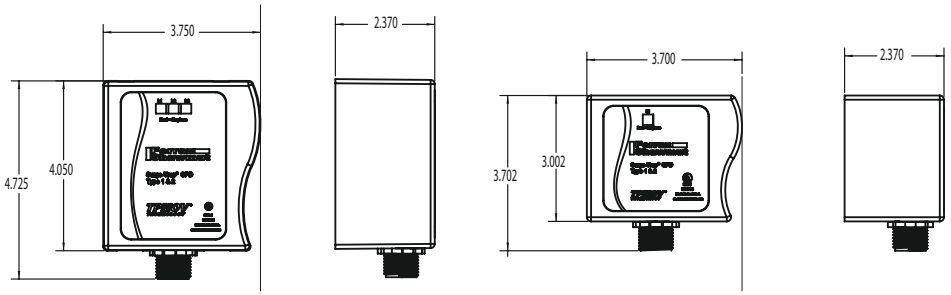
Applications:

- AC distribution
- Power supplies
- Industrial
- Commercial
- Telecommunications
- Residential
- IT / Data centers

Ratings:

Volts : 120V to 600V
SCCR : 200kA
Operating & storage temp : -25°C to +60°C
Wiring size : 16” #12 AWG integral leads
Enclosure : NEMA 2x
Nominal discharge current : 20kA

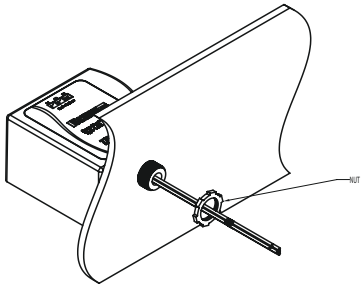
Dimensions



Three Phase

Single / Split Phase

Installation Diagram



Approvals:

- UL 1449 Third Edition Approved, File E210793
- Type 1 Listed for United States
- Type 2 Listed for Canada
- RoHS Compliant
- ANSI/IEEE C62.41
- CE

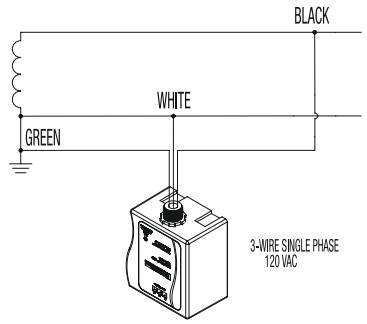
Surge-Trap® Type 1 SPD

Catalog Numbers

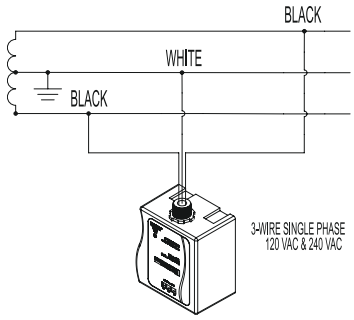
Catalog No.	Nominal Voltage (VAC)	System Type	Freq (Hz)	MCOV (L-G)	Nominal Discharge Current (In, kA)	Voltage Protection Rating (VPR)				UL Listing Type	Circuit Connection Wiring Diagrams
						L-N	L-G	N-G	L-L		
STT21201PG	120	1	50/60	180	20	700	1200	600	-	USL - Type 1	A
STT2240SPG	120/240	1S	50/60	180	20	700	-	-	1200	USL - Type 1	B
STT22083PYG	120/208	3Y	50/60	180	20	700	-	-	1200	USL - Type 1	D
STT24803PYG	277/480	3Y	50/60	320	10	1200	-	-	2000	USL - Type 1	D
STT26003PYG	347/600	3Y	50/60	420	10	1500	-	-	2500	USL - Type 1	D
STT22403PDG	240	3D	50/60	270	20	-	1000	-	1800	USL - Type 1	C
STT24803PDG	480	3D	50/60	550	10	-	1800	-	3000	USL - Type 1	C

Single/Split Phase

A

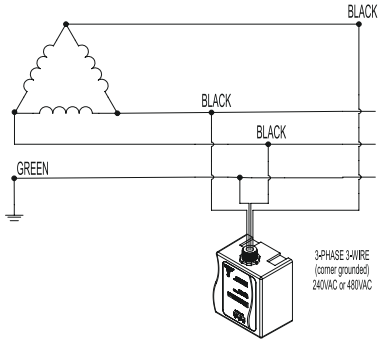


B

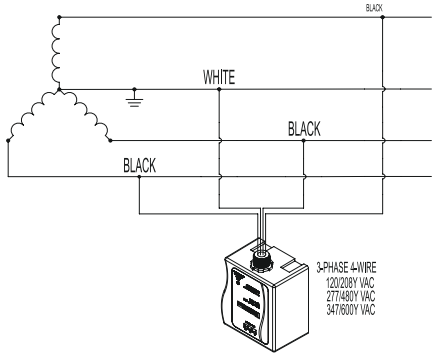


Three Phase Delta & Wye

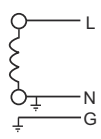
C



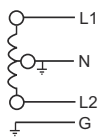
D



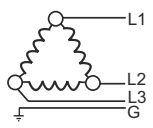
Note: Must be installed on a solidly grounded system.



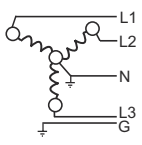
Single Phase
2 Wire + Ground



Split Phase
3 Wire + Ground



3 Phase Delta
3 Wire + Ground



3 Phase Wye
4 Wire

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Surge-Trap® Type 1 XR Series SPD

The Surge-Trap® Type 1 XR Series meets requirements for UL1449 Third Edition and is ideal for the replacement of obsolete surge arrestors. The XR Series SPD feature TPMOV® technology inside making them the safest product available. With a small, compact design and line or load installation flexibility the XR series is the perfect fit from service entrance all the way down to a specific control panel.



Features/Highlights:

- UL 1449 Third Edition Listed,Type 1 SPD
- Can be installed line-side or load-side of main disconnect
- 20kA Nominal discharge current
- 200kA SCCR (most models)
- UL 96A Lightning Protection Master Label compliant (20kA, In)
- Large block 50kA Thermally Protected MOVs
- Pre-wired with 3' (1m) of #10 AWG conductor
- Standard NEMA 4X polycarbonate enclosure
- Tri-mount installation kit Included (pipe nipple, bracket, DIN-rail)
- Two-year warranty

Applications:

- AC Distribution
- Power supplies
- Drive Protection
- Fire Alarms
- Control Panels
- Telecommunications
- Residential
- IT / Data centers

Mounting:

- STD 3/4" -14 nipple
- DIN-rail mount
- Bracket mount (flat surface)

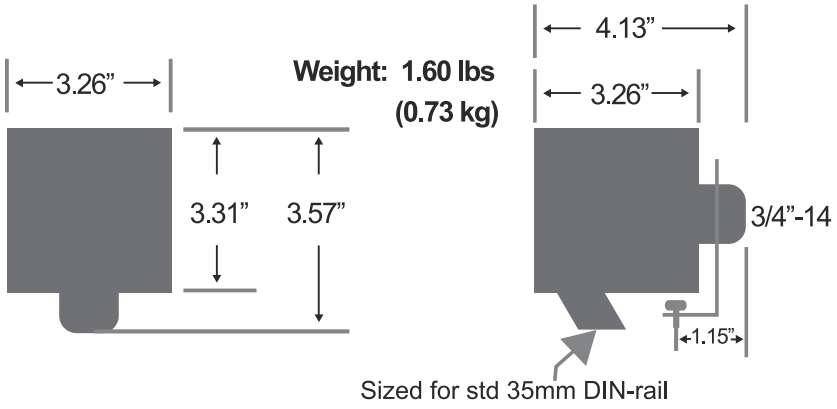
Green=Go Visual Diagnostic Monitoring

- Green LED = A-OK, Out = replace
- Visible from multiple sides & angles for better viewing
- Every MOV is monitored as opposed to 'power is present'

Ratings:

Surge : 50kA per phase
Volts : 120V to 600V
SCCR : 200kA (most models)
Nominal discharge current : 20kA rating 8x20µs pulse
Operating & storage temp : -25°C to +60°C
Enclosure : NEMA 4X

Dimensions & Weight



Approvals:

- UL 1449 Third Edition File VZCA.E210793
- IEC 61643
- CE
- ANSI/IEEE C62.41
- Burn-In tested prior to shipment
- UL 96A lighting protection master label

Surge-Trap® Type 1 XR Series SPD

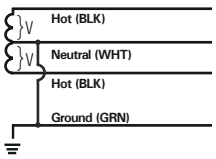
Catalog - Ordering System

STXR Series	System Voltage	System Config	Surge Rating	Options
STXR	120V	1P = One Pole, Single Phase	50	Blank
	127V	2P = Two Pole, Split Phase		N = Neutral to Ground Protection on 50kA units
	220V	3Y = Three Pole Wye		D = Dry Contacts and Audible Alarm
	240V	3D = Three Pole Delta		F = Neutral and Ground modes reversed
	277V	3H = Three Pole Hi-Leg		P = LED and / or Diagnostics
	347V			R = Removes all Diagnostics
	480V			M = Provides TPMOV microswiches for use
	600V			8 = Replace 10AWG with 8AWG leads
Example STXR4803DS50D				
STXR	480V	3D	50	D

* Please call factory for specific product performance data.

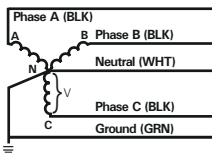
Wiring Diagrams

Figure 1



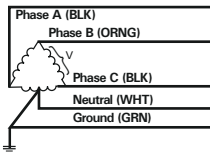
SPLIT
2 Hots, 1 Neu, 1 Grnd

Figure 2



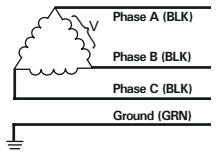
WYE
3 Hots, 1 Neu, 1 Grnd

Figure 3



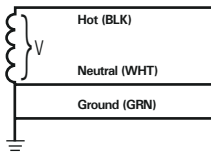
HI-LEG DELTA (B High)
3 Hots, (B HIGH),
1 Neu, 1 Grnd

Figure 4



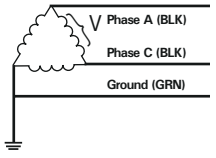
DELTA & HRG WYE
3 Hots, 1 Grnd

Figure 5



SINGLE POLE
1 Hot, 1 Neu, 1 Grnd

Figure 6

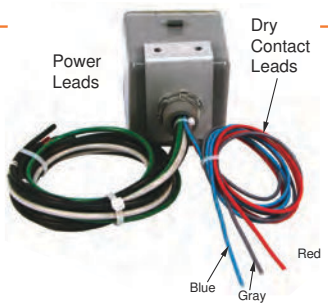


CORNER GROUND
DELTA (B grounded)
2 Hots, 1 Grnd

Optional Form C Dry Contact and Audible Alarm

Form C Dry Contact
Three (3) #18 wires exit the pipe nipple
Gray is common, blue is normally open, Red is normally closed.
- Normally open: Use gray & blue
- Normally closed: Use gray & red

Audible Alarm
Alarm sounds when any protection is lost (If diagnostic LED extinguishes (i.e. problem), alarm will sound)



Catalog No.	System Voltage & Config.	UL 1449 Third Edition (Sept 2009) Voltage Protection Rating VPR 3000A				In	SCCR	MCOV
		L-N	L-L	N-G*	L-G*			
STXR120V1P50	120V	600		600*	1000*	20kA	200kA	150
STXR120V2P50	120V/240V	600	1000	600*	1000*	20kA	200kA	150
STXR120V3Y50	208Y/120V	600	1000	600*	1000*	20kA	200kA	150
STXR127V1P50	127V	700		600*	1200*	20kA	100kA	180
STXR127V2P50	127/254V	700	1200	600*	1200*	20kA	100kA	180
STXR127V3Y50	220Y/127V	700	1200	600*	1200*	20kA	100kA	180
STXR220V1P50	220V-1 pole	1200		1000*	1800*	20kA	200kA	320
STXR220V3Y50	380Y/220V	1200	2000	1000*	1800*	20kA	200kA	320
STXR240V3H50	120/240V - Hi-Leg Delta	600/1200	1000/1500	600	1000/1500	20kA	200kA	150/320
STXR240V1P50	240V-1 pole	1200		1000	1800	20kA	200kA	320
STXR240V3D50	240V Delta -		1500		1200	20kA	200kA	321
STXR277V1P50	277V	1200		1000*	1800*	20kA	200kA	320
STXR277V2P50	240/480V	1200	2000	1000*	1800*	20kA	200kA	320
STXR277V3Y50	480Y/277V	1200	2000	1000*	1800*	20kA	200kA	320
STXR347V3Y50	600Y/347Y	1500	2500	1200*	2500*	20kA	200kA	420
STXR480V1P50	480V-1 pole	1800				10kA	200kA	550
STXR480V3D50	480V Delta - 3 Pole		3000		1800	10kA	200kA	550
STXR480V3H50	240/480V -Hi-Leg Delta	1200/1800	2500			10kA	200kA	320/550
STXR600V3D50	600V Delta - 3 Pole		2500		2500	20kA	200kA	690

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Surge-Trap® Type 1 XP Series SPD

The Surge-Trap® Type 1 XP Series offers advanced performance over other products. The XP meets requirements for UL1449 Third Edition and has been designed to be as compact as possible while offering advanced protection. The XP features TPMOV® technology inside making it the safest product available. Installation can be done on the line or load side of a panel. The XP is the perfect fit from service entrance all the way down to an important machine specific control panel.



Features/Highlights:

- UL 1449 Third Edition Listed, Type 1 SPD (Sept. 2009)
- Can be installed line-side or load-side of main disconnect
- 20kA Nominal discharge current
- 200kA SCCRs (most models)
- UL 96A Lightning Protection Master Label compliant (@20kA In)
- Pre-wired with 3' (1m) of #10 AWG conductor
- Voltage specific design – highly configurable
- All MOV suppression elements monitored
- NEMA 4X enclosure
- Ten-year warranty
- Phase-loss monitoring (toggles LED and dry contacts)

Applications:

- AC Distribution
- Power supplies
- Drive Protection
- Fire Alarms
- Control Panels
- Telecommunications
- Residential
- IT / Data centers

Ratings:

Surge : 100kA

Phase	L-N	L-G	N-G
	50kA	50kA	50kA

Volts : 120 - 600

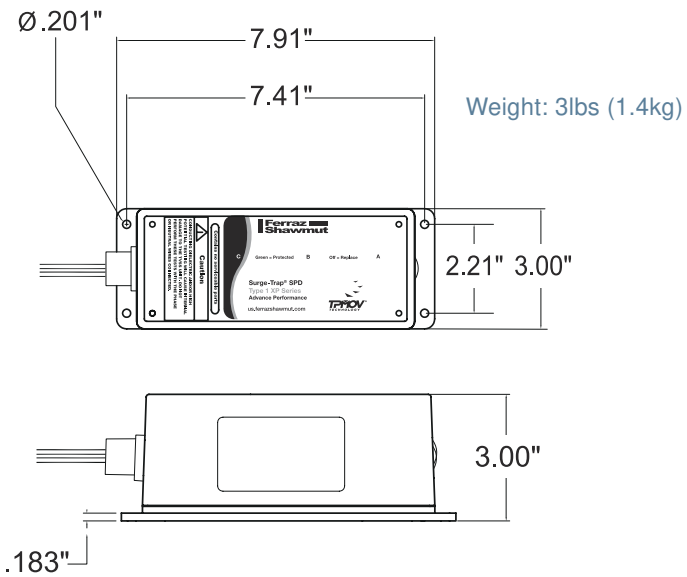
SCCR : 200kA (most models)

Nominal discharge current
: 20kA (most models)

Operating & storage temp
: -25°C to +60°C

Enclosure
: NEMA 4x

Dimensions and Weight



Approvals:

- UL 1449 Third Edition, (cUL Type 2 optional)
- UL File VZCA.E210793
- RoHS Compliant
- IEC 61643, CE
- Burn-In tested prior to shipment
- UL 96A lighting protection master label

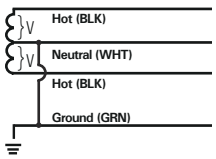
Surge-Trap® Type 1 XP Series SPD

Catalog - Ordering System

STXP	System Voltage	S	Surge Rating	Enclosure	Options
	Common System Configurations				Blank
	01 = 240/120V Split Phase - 1Φ 3W+Grnd (Fig 1)				A = Audible Alarms & Dry Contacts
	02 = 208Y/120V Wye - 3Φ 4W+Grnd (Fig 2)				E = Remote Indicator (on 6ft cable)
	03 = 240/120V High Leg Delta (B High) (Fig 3)				L = Deletes L-N protection
	04 = 480Y/277V Wye - 3Φ 4W+Grnd (Fig 2)				G = Deletes L-G protection
	05 = 480V Delta - 3Φ 3W+Grnd (Fig 4) & HRG Wye				N = Deletes N-G protection
	08 = 600Y/347V Wye -3Φ 4W+Grnd (Fig 2)				R = Alternate lead length
	Other System Configurations Available				
	06 = 240V Delta - 3Φ 3W+Grnd (Fig 4)				
	07 = 380Y/220V Wye - 3Φ 4W+Grnd (Fig 2)				
	09 = 600V Delta - 3Φ 3W+Grnd (Fig 4) & HRG Wye				
	11 = 120V Single Phase (Fig 5)				
STXP	12 = 240V Single Phase (Fig 5) - Not split phase	S	100	4X	
	13 = 127V Single Phase (Fig 5)				
	14 = 300V Single Phase (Fig 5)				
	15 = 254/127V Split Phase - 1Φ 3W+Grnd (Fig 1)				
	16 = 277V Single Phase (Fig 5)				
	17 = 480V Single Phase (1 Hot, 1 Neu, 1 Grnd) (Fig 5)				
	18 = 480/277 2-Pole, (480/240V Split Phase) (Fig 1)				
	21 = 220Y/127V Wye - 3Φ 4W Grnd (Fig 2)				
	41 = 520Y/300V Wye- 3Φ 4W+Grnd (Fig 2)				
	42 = 415Y/240V Wye-3Φ 4W+Grnd (Fig 2)				
	43 = 400Y/230V Wye - 3Φ 4W+Grnd (Fig 2)				
	44 = 440Y/250V Wye - 3Φ 4W+Grnd (Fig 2)				
	51 = 480V B Corner Grnd Delta, 3Φ 3W+Grnd (Fig 6)				
	61 = 240V B Corner Grnd Delta, 3Φ 3W+Grnd (Fig 6)				
	91 = 600V B Corner Grnd Delta, 3Φ 3W+Grnd (Fig 6)				
Example	***STXP05S1004XE***				
STXP	05	S	100	4X	E

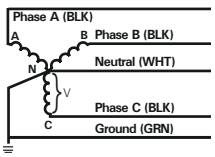
Wiring Diagrams

Figure 1



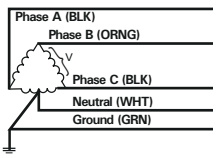
SPLIT
2 Hots, 1 Neu, 1 Grnd

Figure 2



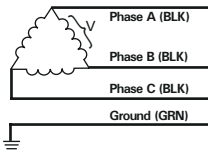
WYE
3 Hots, 1 Neu, 1 Grnd

Figure 3



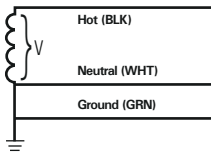
HI-LEG DELTA (B High)
3 Hots, (B HIGH),
1 Neu, 1 Grnd

Figure 4



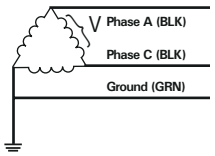
DELTA & HRG WYE
3 Hots, 1 Grnd

Figure 5



SINGLE POLE
1 Hot, 1 Neu, 1 Grnd

Figure 6



CORNER GROUND
DELTA (B grounded)
2 Hots, 1 Grnd

Performance Data

Common North American Systems			UL 1449 THIRD Edition (Sept 2009) Test Data Voltage Protection Ratings (VPR - 3kA)							
			L-N	L-G	N-G	L-L	Type	In	SCCR	MCOV
01	=	240/120V Split Phase	600	700	500	1000	Type 1	20kA	100kA	150
02	=	208Y/120V 3Ø Wye	600	700	500	1000	Type 1	20kA	200kA	150
03	=	240Y/120V B High Leg Delta	600/1200	700/1200	500	1000	Type 1	20kA	200kA	150 / 320
04	=	480Y/277V 3Ø Wye	1200	1200	1000	1800	Type 1	20kA	200kA	320
05	=	480V 3Ø Delta	-	1800	-	1800	Type 1	10kA	200kA	552
08	=	600Y/347V 3Ø Wye	1500	1500	1500	2500	Type 1	10kA	200kA	420

Available Accessories*

FMKITC = Flush mount kit.
RM = Remote monitor
**Consult factory for details.*

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

Surge-Trap® Type 1 XT Series SPD

The Surge-Trap® Type 1 XT Series offers Advanced Technology. It utilizes large block 50kA Thermally Protected MOV's. With line or load side installation flexibility, this unit is a great fit from the service entrance all the way down to each distribution and/or branch panel.



Features/Highlights:

- UL 1449 Third Edition Listed (Sept 2009)
- Type 1 SPD – All UL required OCP & safety coordination included inside
- Can be installed line-side or load-side of main disconnect
- 20kA Nominal discharge current
- 200kA SCCR (most models)
- UL 96A Lightning Protection Master Label compliant (@20kA In)
- NEMA 4X polycarbonate enclosure – UL 746C(f1) & UL 94-5VA
- TPMOV® Technology Inside
- All MOV suppression elements monitored
- Filtering - AC sinewave tracking filter with EMI/RFI filtering up to -50dB from 10khz to 100mhz
- Phase-loss monitoring (toggles LED and dry contacts)
- Ten-year Warranty

Applications:

- Service Entrance
- AC Distribution
- Power supplies
- Drive Protection
- Large Control Panels
- Telecommunications
- IT / Data centers

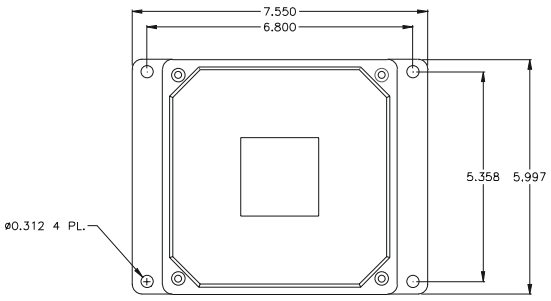
Ratings:

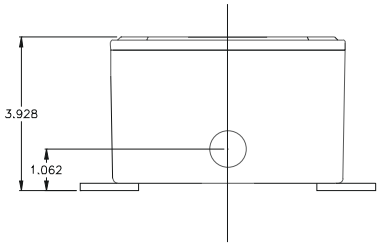
Surge : 100kA per phase
: 200kA per phase
Volts : 120V to 600V
SCCR : 200kA SCCR (most models)
Nominal discharge current : 20kA (most models)
Operating & storage temp : -25°C to +60°C
Enclosure : NEMA 4x

Approvals:

- UL 1449 Third Edition, cUL, UL 1283 R/C
- UL File: VZCA.E210793
- RoHS Compliant
- IEC 61643, CE
- Burn-In tested prior to shipment
- UL 96A lighting protection master label

Dimensions and Weight





Weight: 5lbs (2.3kg)

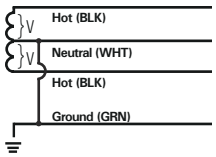
Surge-Trap® Type 1 XT Series SPD

Catalog Numbers - Ordering System

STXT	System Voltage	S	Surge Rating	Enclosure	Options
	Common System Configurations				Blank
	01 = 240/120V Split Phase - 1Φ 3W+Grnd (Fig 1)		100		A = Audible Alarms & Dry Contacts
	02 = 208Y/120V Wye - 3Φ 4W+Grnd (Fig 2)		200		E = Remote Indicator (6ft cable)
	03 = 240/120V High Leg Delta (B High) (Fig 3)		200		L = Deletes L-N protection
	04 = 480Y/277V Wye - 3Φ 4W+Grnd (Fig 2)		200		G = Deletes L-G protection
	05 = 480V Delta - 3Φ 3W+Grnd (Fig 4) & HRG Wye		200		N = Deletes N-G protection
	08 = 600Y/347V Wye -3Φ 4W+Grnd (Fig 2)		200		R = Alternate lead length
	Other System Configurations Available				
	06 = 240V Delta - 3Φ 3W+Grnd (Fig 4)				
	07 = 380Y/220V Wye - 3Φ 4W+Grnd (Fig 2)				
	09 = 600V Delta - 3Φ 3W+Grnd (Fig 4) & HRG Wye				
	11 = 120V Single Phase (Fig 5)				
STXT	12 = 240V Single Phase (Fig 5) - Not split phase	S		4X	
	13 = 127V Single Phase (Fig 5)				
	14 = 300V Single Phase (Fig 5)				
	15 = 254/127V Split Phase - 1Φ 3W+Grnd (Fig 1)				
	16 = 277V Single Phase (Fig 5)				
	17 = 480V Single Phase (1 Hot, 1 Neu, 1 Grnd) (Fig 5)				
	18 = 480/277 2-Pole, (480/240V Split Phase) (Fig 1)				
	21 = 220Y/127V Wye - 3Φ 4W Grnd (Fig 2)				
	41 = 520Y/300V Wye- 3Φ 4W+Grnd (Fig 2)				
	42 = 415Y/240V Wye-3Φ 4W+Grnd (Fig 2)				
	43 = 400Y/230V Wye - 3Φ 4W+Grnd (Fig 2)				
	44 = 440Y/250V Wye - 3Φ 4W+Grnd (Fig 2)				
	51 = 480V B Corner Grnd Delta, 3Φ 3W+Grnd (Fig 6)				
	61 = 240V B Corner Grnd Delta, 3Φ 3W+Grnd (Fig 6)				
	91 = 600V B Corner Grnd Delta, 3Φ 3W+Grnd (Fig 6)				
Example	***STXT04S2004XA***				
STXP	4	S	200	4X	A

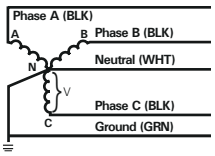
Wiring Diagrams

Figure 1



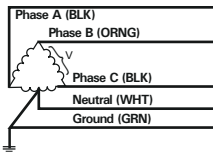
SPLIT
2 Hots, 1 Neu, 1 Grnd

Figure 2



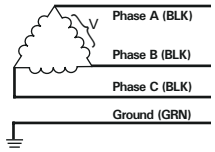
WYE
3 Hots, 1 Neu, 1 Grnd

Figure 3



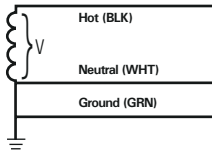
HI-LEG DELTA (B High)
3 Hots, (B HIGH),
1 Neu, 1 Grnd

Figure 4



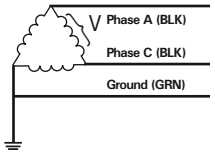
DELTA & HRG WYE
3 Hots, 1 Grnd

Figure 5



SINGLE POLE
1 Hot, 1 Neu, 1 Grnd

Figure 6



CORNER GROUND
DELTA (B grounded)
2 Hots, 1 Grnd

Performance Data

Common North American Systems			UL 1449 THIRD Edition (Sept 2009) Test Data Voltage Protection Ratings (VPR - 3kA)							
			L-N	L-G	N-G	L-L	Type	In	SCCR	MCOV
01	=	240/120V Split Phase	700	700	600	1000	Type 1	20kA	100kA	150
02	=	208Y/120V 3Ø Wye	700	700	600	1000	Type 1	20kA	200kA	150
03	=	240Y/120V B High Leg Delta	700/1200	700/1200	600	1000/2000	Type 1	20kA	200kA	150 / 320
04	=	480Y/277V 3Ø Wye	1200	1200	1200	2000	Type 1	20kA	200kA	320
05	=	480V 3Ø Delta	-	1800	-	2000	Type 1	10kA	200kA	550
08	=	600Y/347V 3Ø Wye	1500	1500	1500	2500	Type 1	10kA	200kA	420

Available Accessories*

FMKITC = Flush mount kit.
RM = Remote monitor
**Consult factory for details.*

For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

TPMOV® Technology

Thermally protected MOV (TPMOV) technology

Mersen's patented TPMOV® technology eliminates common failure modes that occur in the field with standard metal oxide varistors. Internally the TPMOV is comprised of a voltage clamping device and a disconnecting apparatus that monitors the status of the metal oxide disk making the TPMOV a fail-safe device. In the event of an overvoltage breakdown the metal oxide disk is securely disconnected from the system power by an arc shield. Upon failure the TPMOV is also equipped with a visual pin indicator as well as a normally open micro-switch providing remote indication, if applicable.

The TPMOV is rated for 50kA - 8/20µs peak surge current and is available for maximum continuous operating voltages (MCOV) from 150V to 550VAC. No additional fusing or overcurrent protective device is required when using the TPMOV as compared to most MOV's on the market today.

The TPMOV footings are similar to that of equivalent voltage ratings of traditional 25 to 40mm MOV's. The TPMOV can be utilized on existing systems that utilize traditional MOV's without costly board redesigns. See dimensional drawings on the following page.



Ratings:

Volts : 150V - 550V AC
SCCR : 200kA
Nominal discharge current
: 20kA 8/20µs
Operating & storage temp
: -25°C to +60°C

Features/Benefits:

- High energy capacity
- Consistent footprint with 25–40mm MOV's
- Built-in visual/remote indication
- Wave solderable
- No additional overcurrent protection device (fuses) required

Applications:

- Surge protective devices and systems
- AC / DC distribution systems
- High voltage power supplies
- Telecommunications equipment
- Motor control systems
- Computer related products
- PLC applications
- Power transfer switches

Approvals:

- UL 1449 Third Edition Approved, File E210793
- Type 4 UL Recognized Component
- CE
- RoHS Compliant

Catalog - Ordering System

Select the MCOV and add it to the prefix of the Part Number to obtain the appropriate Catalog Number

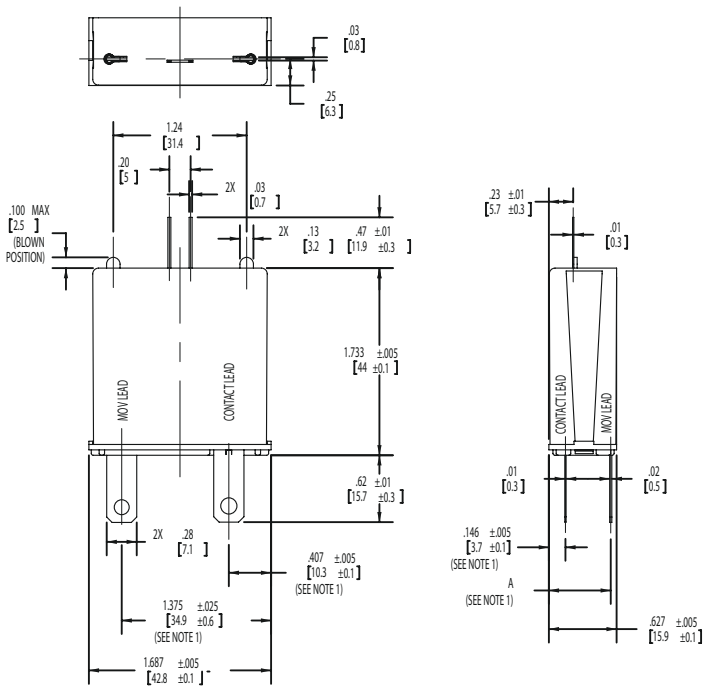
MCOVs (xxx)	Part No	Description (TPMOV with…)	Pkg Qty	Operating Temperature
150	TPMOV	Tabs & Microswitch with Long Leads	10	-25 ºC to 60 ºC
180	xxxTPMOV-HV	Tabs & Heavy Duty Microswitch with Long Leads	10	-25 ºC to 60 ºC
270	xxxTPMOVS	Microswitch with Short Leads, no visual indicator	10	-25 ºC to 60 ºC
320	xxxTPMOVSL	Microswitch with Short Leads, no visual indicator	500	-25 ºC to 60 ºC
420	xxxTPMOVS-HV	Tabs & Heavy Duty Microswitch with Short Leads	10	-25 ºC to 60 ºC
510	xxxTPMOVSL-HV	Tabs & Heavy Duty Microswitch with Short Leads	500	-25 ºC to 60 ºC
550	xxxTPMOVST	Tabs & Microswitch with Short Leads	10	-25 ºC to 60 ºC
	xxxTPMOVSLT	Tabs & Microswitch with Short Leads	500	-25 ºC to 60 ºC

TPMOV® Technology

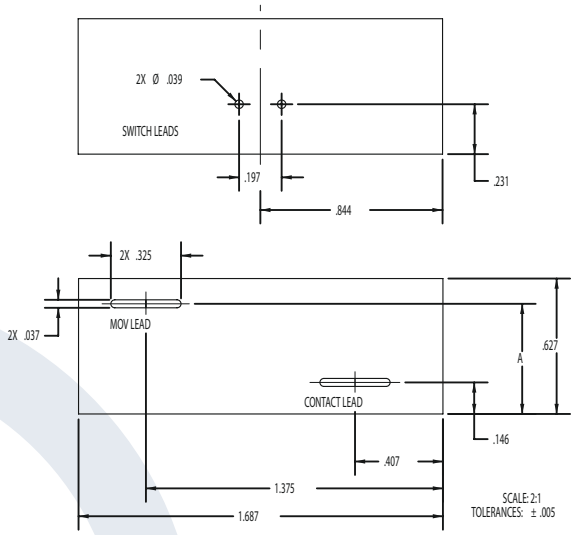
Product Performance Data

Cat. No. Prefix	Maximum Continuous Operation Voltage (VAC)	Voltage Protection Rating (VPR) (Vpk)	Nominal Discharge Current (kA)	SCCR (A)
*150TPMOV	180	700	20	200,000
*180TPMOV	180	800	20	200,000
*270TPMOV	270	800	20	200,000
*320TPMOV	320	1000	20	200,000
*420TPMOV	420	1500	20	200,000
*510TPMOV	510	1500	20	200,000
*550TPMOV	550	1500	20	200,000

Dimensional Drawing of TPMOV



Board Layout Dimensions



For the most current product performance data visit us-ferrazshawmut.mersen.com and use catalog search.

VSP MOV Protector Fuse

Surge Suppression Fuses

Mersen surge suppression fuses are specially designed to address the protection of SPD systems. Our surge suppression fuses have been specially designed to withstand 8x20 µSec surge pulses without opening, allowing the SPD system to react to the surge. All surge suppression fuses have a 8x20 µSec surge rating, not a continuous current rating. Under AC short circuit conditions these surge suppression fuses are very current limiting.

Features/Benefits:

- VSP fuses rated 600VAC, 200kA I.R.
- Surge ratings of 5-100kA 8 x 20 µSec capacity
- Various mounting configurations ferrules, blade, bolt-in, pc board mount

Applications:

- Protection of surge protection devices (SPD)
- Coordination with other protection devices



Ratings

Volts : 600V AC

Surge Rating

: 5-100kA 8x20 µSec
600 VAC

I.R. : 200kA I.R. AC

Catalog Numbers

Catalog No. (Connection Suffix)	Voltage Rating (AC)	8x20 µSEC Surge Rating	Melting I^2t (A2S)	Clearing I^2t (A2S)	I_{PEAK} @ 100kA 60 Hz (A)
VSP5-2,-R,-H,-S	600V	5,000	341	936	3,652
VSP10-2,-R,-H,-S	600V	10,000	1,541	3,744	5,794
VSP15-2,-R,-H,-S	600V	15,000	3,072	8,424	7,591
VSP20-2,-R,-H,-S	600V	20,000	4,992	14,400	9,194
VSP30, -2	600V	30,000	12,507	33,696	12,044
VSP40, -2	600V	40,000	19,543	59,904	14,588
VSP50, -2	600V	50,000	32,020	93,600	16,925
VSP60, -2	600V	60,000	42,808	134,784	19,110
VSP70, -2	600V	70,000	61,152	183,456	21,176
VSP80, -2	600V	80,000	79,872	239,616	23,146
VSP90, -2	600V	90,000	99,000	303,264	25,034
VSP100, -2	480V	100,000	121,500	374,400	26,854
VSP100-XL	600V	100,000	121,500	374,400	26,854

Approvals

- UL Recognized Component File E60314, Vol.3 Special Purpose MOV Protector

Recommended Fuse Blocks for VSP Fuses

VSP(5-20)-2

Number of Poles	Screw with Double Quick Connects	Pressure Plate with Double Quick Connects	Copper Box Connector
ADDER	30310	30320	30350
1	30311	30321	30351
2	30312	30322	30352
3	30313	30323	30353

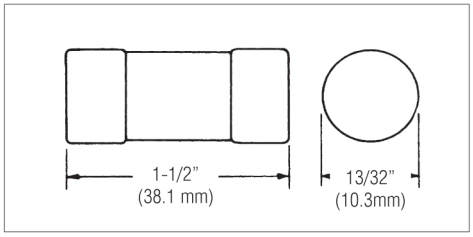
VSP(30-100)-2

Number of Poles	Catalog Number		
ADDER	60305J	60315J	60325J
1	60306J	60316J	60326J
2	60307J	60317J	60327J
3	60308J	60318J	60328J

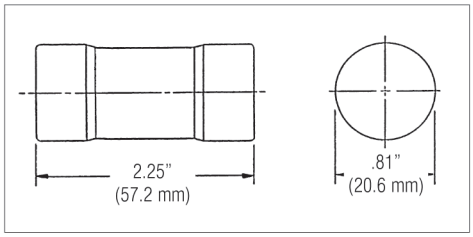
VSP MOV Protector Fuse

VSP (5-20)-2,R,H,S

-2

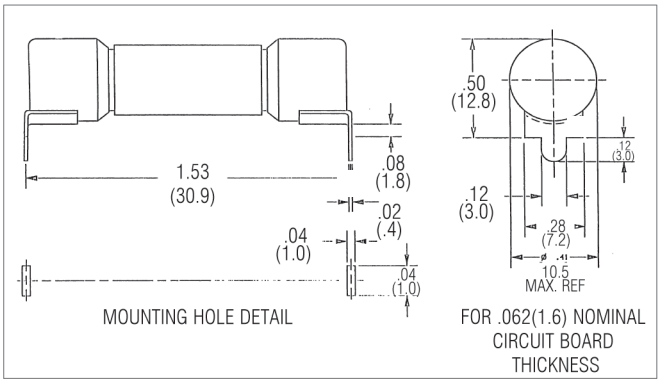


VSP (30-100)-2

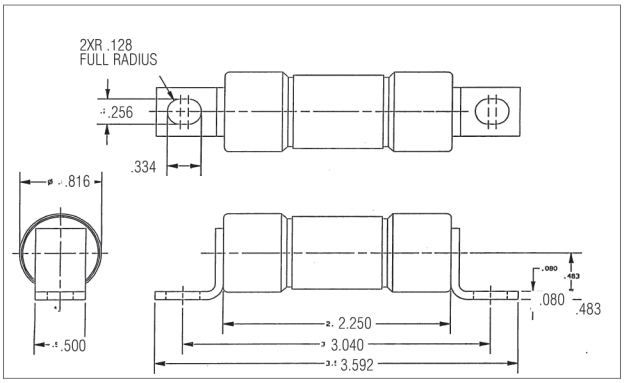


PC BOARD MOUNTING

-R

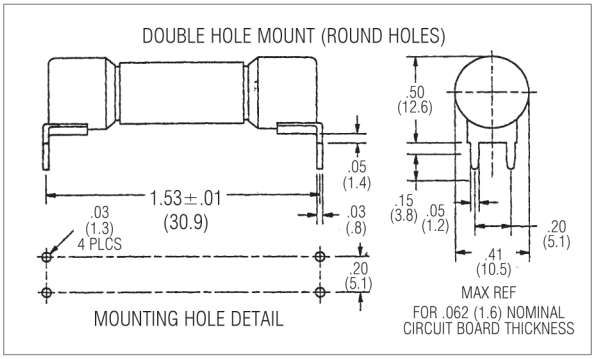


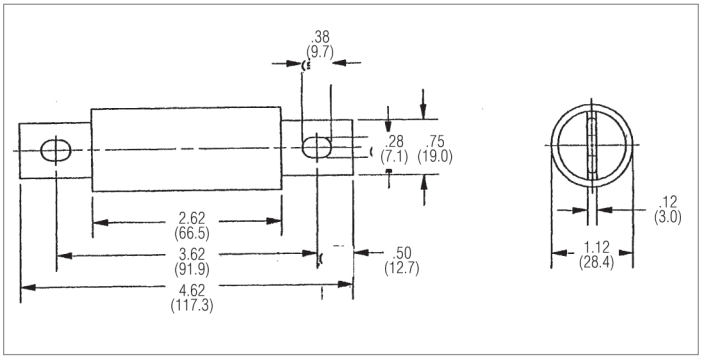
VSP30-100



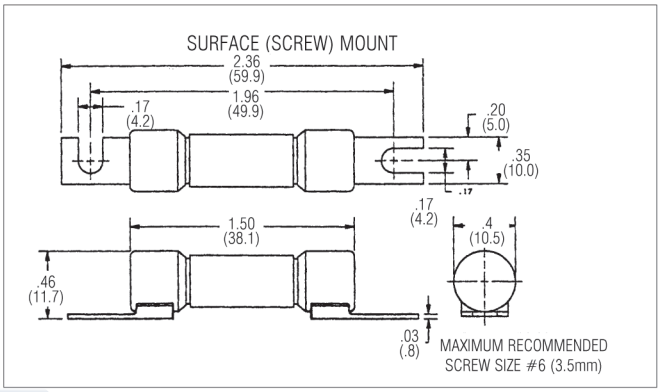
VSP100-XL

-H





-S



N

Surge Switch

Disconnect Switch

The Surge Switch is an extremely compact, high performance, manually operated, non-fused switch. It is specifically designed to withstand the high surge current of 200kA with an 8x20 µs waveform seen in today's transient voltage surge protection device (SPD) applications. Mersen's Surge Switch utilizes a unique contact design that actually clamp contacts tighter during a surge.



Features/Benefits:

- Only surge rated switch available today
- Compact footprint
- Extremely reliable
- Defeatable pistol handles automatically relatch when panel door is closed, no tool necessary to reset latch
- Direct mount handle option

Applications:

- Surge protective device (SPD) panels up to 600VAC, 200kA 8x20 µs waveform

Ratings:

Volts : 600V AC
Amps : 600A
Surge Rating
: 200kA 8x20 µs wave form

Catalog Numbers

Catalog No.	Description
SS200	3-pole, surge switch, 200kA 8x20 µs
SS200-4	4-pole, surge switch, 200kA 8x20 µs
HADSS200	Direct mount black handle
HGPB	External black handle, NEMA 1,3R, 12 (IEC IP 54), defeatable
HGPR	External red handle, NEMA 1,3R,12 (IEC IP 54), defeatable
HGPB4	External black handle, NEMA 1,3R,124,4X (IEC IP 65), defeatable
HGPR4	External red handle, NEMA 1,3R,12,4,4X (IEC IP 65), defeatable
SG200-10	Shaft, 7.9 in (200 mm)
SG320-10	Shaft, 12.6 in (320 mm)
SG400-10	Shaft, 15.7 in (400 mm)
TS200SS	Terminal Shield, 3-pole
TS2004SS	Terminal Shield, 4-pole

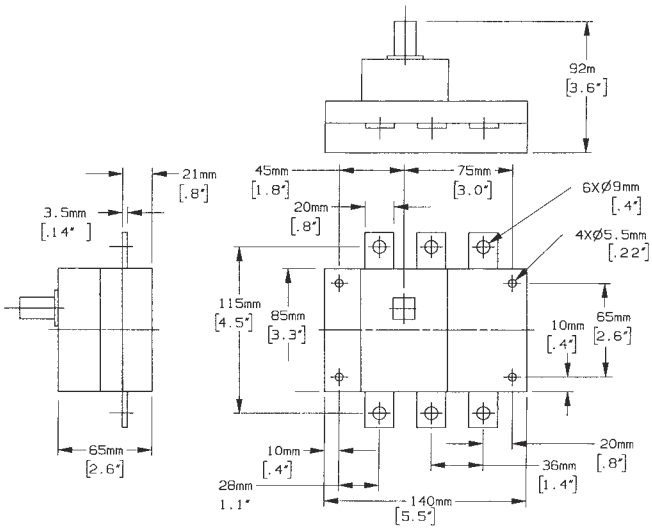
Approvals:

- UL Listed Guide NRNT, File E224922

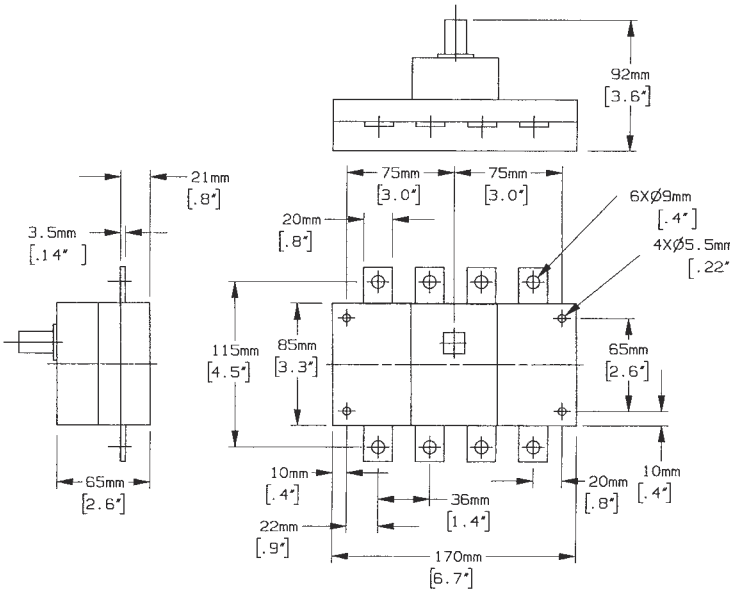
Surge Switch

Dimensions (dual dimensions: in/mm)

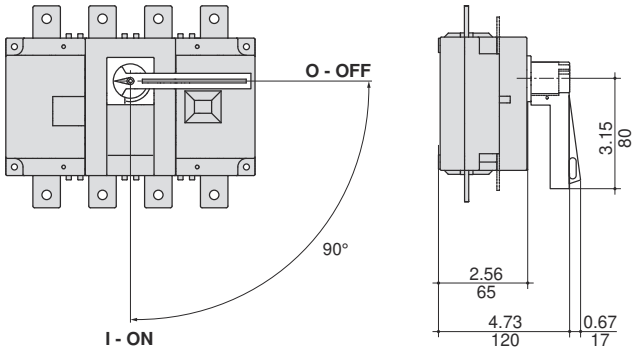
SS200



SS200-4

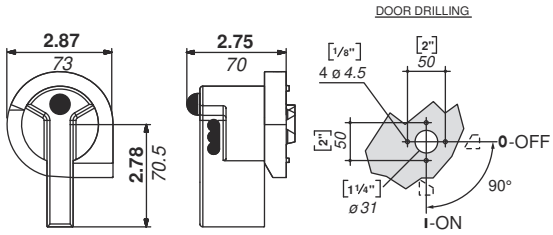


HADSS200



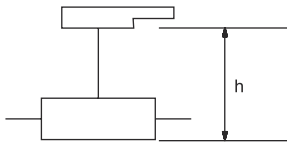
PISTOL HANDLE TYPE G

HGPB
HGPR
HGPB4
HGPR4



PISTOL HANDLE TYPE G

SS200/SS200-4



Shaft Length		h Minimum	Dimension	h Maximum	Dimension
in	mm	in	mm	in	mm
7.9	200	4.88	124	9.29	236
12.6	320	4.88	124	14.01	356
15.7	400	4.88	124	17.16	436

N

Resources & Tools

Strapped for time? Try some of these time-saving resources to enhance your electrical safety initiatives.



Your problem: Thanks to downsizing, restructuring, and other cost-saving initiatives, your facility is running lean and mean. You have to do much more with a lot less. And, you have to figure out how to do it safely and effectively.

Our solution: Our goal is to offer the right solution for the right application or business challenge. Need a quick, effective tool that will help you find the best heatsink to fit your space? Try our R-Tools® 3D Heatsink Thermal Modeling. Need to specify the right fuse fast? Explore our Select-A-Fuse® Software. Want a sure fire way to 5S your fuse maintenance program and reduce your inventory by 25% or more, then explore our innovative Fuse Control™ program. We have these and many other timesaving resources.

Want more information fast? If you want more in depth information on these resources & tools, visit our website at **us-ferrazshawmut.mersen.com**, or call Technical Service Support at 978-465-4853.

O Resources & Tools

- Arc Flash Info Center O2
- Electrical Services O3
- Electrical Safety Seminars O4
- Fuse Control™ Program O5
- High Power Test Lab O6
- Protection Intelligence Quotient (PIQ) Quizzes O7
- R-Tools® 3D Heatsink Modeling O8
- Select-A-Fuse® Software O9
- Power Electronics Solutions O10
- Solar Power Solutions O11
- Wind Power Solutions O12
- Technical Services Support O13

FERRAZ SHAWMUT IS NOW MERSEN

MERSEN

Arc Flash Info Center™



Learning about arc flash makes you an even more valued resource.

Arc flash is a daily threat to your customers. It can blind, burn, or even kill in an instant, and there's no one, sure protection. But there is an excellent defense: knowledge. The more you know about how arc flash occurs, the better you can help your customers stay safe, protect their equipment, and comply with OSHA requirements.

A lot has been written about arc flash—a simple Internet search alone finds more than 3 million references. But you don't need to search website after website for the accurate, up-to-date information you need to protect your workers. Just visit the Arc Flash Info Center.™

Developed by Mersen, the Arc Flash Info Center is your online guide to understanding arc flash requirements and improving plant safety. From a startling look at an arc blast to explanations of current-limitation and hazard analysis to an interactive Arc Flash calculator, it gives you an up-close view of this vital topic.

We've been heavily involved in arc flash research and testing for many years, amassing a valuable base of information that's available to you—free. You'll learn how arc flash protection is the sum of many factors: routine electrical safety analysis, staff training, appropriate circuit protection devices, and the right personal protective equipment (PPE). Considering how your customers' safety can go up in a flash, that's valuable information to share. Find out more about arc flash and the products that can mitigate it by visit the Arc Flash Info Center.

Here's what you'll discover on the Arc Flash Info Center:

Arc Flash Hazard Background
- The causes
- Arc Flash hazard
- Test lab examples
- Regulations

Hazard Analysis
- Why hazard analysis?
- Nine steps of Arc Flash hazard analysis

Reducing Arc Energies with Fuses
- Using current-limiting fuses
- Understanding current-limiting fuses
- Recommended fuses for Arc Flash mitigation
- Arc Flash calculator

Getting Help
- Technical services
- Training
- More information
  - Books & standards
  - Articles & white papers
  - Literature
  - References
- Helpful links

FAQs

What's New
- News releases
- Events

ArcFlash™ INFO CENTER

us-ferrazshawmut.mersen.com/arcflash

MERSEN

Electrical Services



Mersen has built a reputation for providing innovative electrical protection products that meet NEC, UL, CSA, IEC, ANSI/IEEE, CE, NFPA, and other critical safety standards. In fact, many of our respected field engineers serve on leading electrical safety codes and standards committees.

Today, Mersen brings its highly regarded electrical protection expertise to you through our new suite of Electrical Services. Discover why more Safety Managers, Facility Engineers and Maintenance Supervisors turn to Mersen to help them put electrical safety to work for their companies. We offer:

Electrical Safety Project Management
Mersen can coordinate some or all of the electrical safety requirements for a facility. This may include initial assessment through program development, implementation or training. Or you may choose this service on a project basis for assistance with arc flash analysis, integrating the latest NFPA 70E requirements, development of Request for Quote (RFQ) packages for Arc Flash studies, and more.

Arc Flash Hazard Analysis
Turn to our experienced team of electrical safety engineers to analyze your electrical system's exposure to arc flash and other electrical hazards in accordance with NFPA 70E and OSHA. A standard analysis includes: arc flash, shock and other hazards assessment, arc flash incident energy calculations, arc flash protection boundary calculations, determining hazard risk categories, required PPE, and recommended warning labels for electrical equipment.

One-Line Drawings
The foundation of a strong electrical safety program is built upon one-line electrical drawings that are current and accurately represent the facility's electrical system with all of the electrical components, power sources, and electrical equipment located and clearly identified.

Short Circuit Analysis & Coordination Studies
Mersen's seasoned electrical safety experts are available to provide analysis of short circuit current faults, identify electrical equipment deficiencies and inappropriately sized components, conduct circuit protection coordination studies, and pin-point potential short circuit current rating (SCCR) issues.

Field Inspection and Data Collection Supervision
Electrical engineers are available to perform field inspections in order to help ensure your facility is compliant with today's electrical codes. Our team is also on hand to supervise data collection and input to ensure the accuracy of arc flash calculations.

Hazard Labeling
After we complete your arc flash energy calculations, Mersen helps you satisfy the NEC 110.16 code and NFPA 70E standards requiring Arc Flash Warning Labels on all equipment that could be energized while being worked on.

Electrical Safety Program Audit
Mersen is available to provide an objective review of your facility's electrical hazards and safety manual for NFPA 70E and OSHA compliance in a confidential audit process.

Product Analysis & High Power Testing
Turn to Mersen to help with forensic analysis of electrical products. We can help identify fault levels, durations, temperatures and target the reason why the products operated.

Need More Information?
For additional information, please contact us:
Email: electricalservices.nby@mersen.com
Call: 978-462-6662

Electrical Services Seminars & Training

The standard electrical training programs we can bring your facility.

Introduction to Arc Flash Hazards – This is a 2, 4, or 6-hour seminar ranging from an overview to a thorough session. The objective is to present an overview of 70E and to explain selected OSHA and 70E requirements relevant to arc-flash and fusible protection. This seminar also discusses real world examples.

Arc Flash Safety for Equipment Installers – This 6-hour seminar presents an overview of 70E requirements relevant to arc flash for individuals that will be working within their customers' facilities. The NFPA Electrical Program Safety Book is discussed in reference to different facility safety programs. This gives a basic understanding of arc flash hazards and the value of safety programs. Relevant laws, codes and standards are discussed.

General Electrical Safety for Shock, Arc Flash, and Arc Blast – This 6-hour seminar combines arc flash safety with shock hazard safety for a full understanding of electrical safety. It begins with laws, codes, and standards, then progresses to a detailed explanation of the hazards, and ends with PPE and test equipment.

Complete Arc Flash Safety – This is a two or three day seminar. It introduces OSHA, key national standards, and standards development organizations. The seminar gives understanding of electrical hazards, proper work practices, and related grounding considerations. It also reviews how PPE and ground fault items can increase safety.

2008 National Electrical Code Over-Current Protection Updates – This 4-hour seminar reviews the most important code changes pertaining to overcurrent and overvoltage protection. These topics include Short Circuit Current Ratings (SCCR), interaction with UL 508A, safety labeling requirements, surge suppressors, selective coordination requirements, and other changes affecting overcurrent ratings of equipment.



Short Circuit Current Rating (SCCR) calculations for Panel Builders – This 4-hour program explains to panel builders the whys of SCCR requirements. It includes examples of calculating SCCR in accordance with UL 508A and typical solutions to upgrading panel SCCR ratings.

Use of Power Distribution Fuses for 600 Volts and Below – This 4-hour seminar is intended to teach the fundamentals of selecting fuses for power distribution applications including motors and transformers 600 volts and less. It covers normal applications, UL fuse types, and gives an appreciation of the strengths and limitations of fuses.

Basics of Selective Coordination – This 4-hour program explains the National Electrical Code requirements for selective coordination. It gives the student a conceptual understanding of selective coordination. It reviews some examples using time current curves with circuit breakers and fuses for NEC compliance.

Customized Electrical Training Services – Combinations of standard courses can be customized for your individual facility, equipment, and procedures. Some of the more common requests are below:

Industrial Electricity: Basics and Troubleshooting – 3 days
National Electrical Code Basics – 3 days
Grounding and Bonding – 2 days
Hazardous Locations – 3 days
Industrial High voltage Safety – 2 days

Need More Information?
For additional information, please contact us:
Email: electricalservices.nby@mersen.com
Call: 978-462-6662

Fuse Control™ Program

Mersen's Fuse Control™ program is a powerful combination of circuit protection products and services designed to help you get control of your facility's inventory, operating costs, code compliance and workplace safety.

Developed by Mersen and refined through extensive field research, Fuse Control is a simple program that packs a lot of power. It will give you the edge you need to mitigate arc flash hazards, achieve code compliance, reduce inventory by 25% or more — and offer the highest grade overcurrent protection available. Get Fuse Control and enjoy these five benefits:

- Improved workplace safety
- Easier electrical code compliance
- Reduced downtime associated with electrical failures
- Streamline inventory - as much as 25% or more
- Run Leaner and decrease operating costs

How can one program deliver such benefits? It's easy! Let the fuses do the work. The key lies in consolidating your current inventory and installed overcurrent protective devices into one fuse line - Mersen's innovative current-limiting, arc flash mitigating, Amp-Trap 2000® fuse family.



Order Fuse Control and receive a FREE Fuse Inventory Audit & Analysis

Take action today to get control of your inventory, contact a Mersen Sales Representative to initiate your Fuse Control program today. The initial storeroom audit and database analysis is very simple and will take up little of your time or resources. Also, did we mention it is free!

Ask your Sales Representative about the Mersen Fuse Control program today.

Implementing Fuse Control in Three Easy Steps

Storeroom Audit and Database Analysis

↓

Consolidation Report & Plan

↓

Implementation

Free Resources

- **Fuse Control Guide** - us.ferrazshawmut.com/oem/resources/literature/FuseControlGuide-Rev1.pdf
- **Inventory Template in MS Excel** - us.ferrazshawmut.com/about-you/fusecontrol.cfm
- **Bin Labels Template in MS Word** - us.ferrazshawmut.com/about-you/fusecontrol.cfm

Need More Information?

For additional information, please contact us:

Email: info.nby@mersen.com

Call: 978-462-6662

High Power Test Lab

Our focus on efficiency makes the Mersen test facilities extremely productive and affordable for all your testing needs. Our customers turn to us to avoid the inconveniences of long lead-times for test dates, and to gain the advantages of rapid setup and change over times (e.g., circuit-switching in five minutes vs. one hr.) allowing us to provide you more “shots” per day. We appreciate that our customers expect flexibility, and we make every effort to accommodate their unique testing requirements.

Mersen offers our customers global test capabilities for testing products in North America (Newburyport, MA) or in Europe (Saint Bonnet, France). Our labs are ready and able to meet all your test requirements from UL or CSA approval testing in North America to IEC testing in Europe.

This is why innovative and successful companies who manufacture equipment like AC and DC drives, soft starters, UPS’s, lighting controls, circuit breakers, MCC, industrial controls, cables, surge suppression devices and many other electrical products select Mersen and our global test capabilities as their partner when it comes to critical design and approval testing. They value our on-site engineering trouble-shooting expertise and consultation services.

Our facilities in North America and Europe have the capability to test from the smallest components to large complete systems such as motor control centers and power distribution panel boards. Our lab provides precise graphical representation of even the lowest levels of current, voltage and time.

To keep you and ourselves competitive, we are continually reviewing and updating our data acquisition technologies, lab design, and test procedures. Turn to the Mersen high power test labs for expert, effective, accurate, and affordable high power electrical testing.

To schedule test time, contact us at:



Mersen Newburyport Laboratory
Phone: 978-465-4834
Fax: 978-462-7934
Email: craig.mckenzie@mersen.com

Mersen Lyon Laboratory
Phone: +33 (0) 4 72 22 66 31
Fax: +33 (0) 4 72 22 66 12
Email: christophe.turbidi@mersen.com

When a test date has been arranged, the client will be sent an Engineering Test Agreement which must be filled out and returned prior to the test date. This agreement verifies the test date, and sets forth contract conditions for the client and the lab. Liability and responsibility are explained in the test agreement.

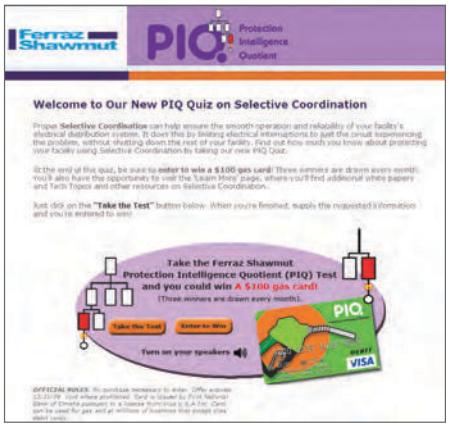
Requirements
- Client Purchase Order
- All witnesses to test must conform to Test Lab Visitor’s Safety Policy
- Clients must read and sign Visitor’s Safety Policy
- Test Lab recommends that the client have an engineer present during actual testing to ensure compliance to any special requirements

Testing
- Summary sheet of test lab charges is available on request and will be sent with the Engineering Test Agreement
- Testing is normally run in accordance with recognized standards such as UL, CSA, MSHA, and IEC.
- All testing is treated with the strictest confidential awareness

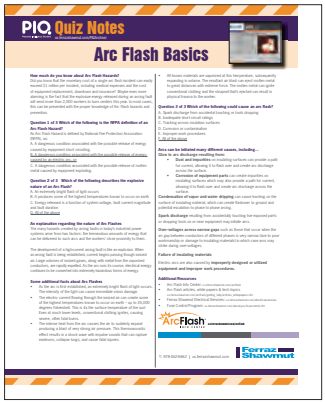
PIQ Quiz

Come see what's new with PIQ

Every quarter, Mersen features a new opportunity to test your knowledge of electrical protection and a new chance to win a prize. What are we offering today? Visit the PIQ Quiz at: **us-ferrazshawmut.mersen.com/PIQ**



At the conclusion of every quiz, you are invited to enter your name into the contest and you can check out the "Learn More" page where you'll find a host of additional resources on the featured quiz topic - white papers, articles, calculators, brochures and more! You can also download our new handy one page summary of the quiz - the PIQ Quiz Notes.



There's more! Discover the PIQ Quiz Archive...

Explore earlier quizzes from our PIQ Archive, click the "Resources" tab on our website, select "PIQ Quiz" and click "PIQ Archives." Explore earlier topics such as:



- Arc Flash hazard protection
- Overvoltage protection
- Solar power circuit protection
- Selective coordination

Mersen makes it easy to learn more because we understand that your customers don't just trust you; they rely on you. So trust Mersen to give you the products and the knowledge to be a real protection pro!

Read what our PIQ fans have to say...

The PIQ Quiz participants are engineers, electricians, design and specifying engineers, plant managers, distributors, consultants, and students. Like you, they are dedicated to electrical protection. They like the quizzes -and we bet you'll like them too. Here's what they've had to say:

- The quiz was very user friendly. The demonstrations made them more memorable.
- Great, informative graphics. My first thought on the first question was 'surge,' but picked 'sag' instead. The explanation that followed was very good.
- This is a simple and good test to check and update our knowledge about protection systems.
- The test was good information for anyone, but especially people in sales.
- I enjoyed listening to the explanations as to how things come about. The test is an interesting and self-challenging device, useful to keep a person up-to-date, and knowledgeable of Arc Flash and it's causes.
- Excellent. I'm the OSHA trained rep in our area. Very good basic safety slides.
- I hope you continue providing tests like these. They are an excellent source of knowledge in this relatively new field (solar power).
- Although the info did not pertain to our application, I always enjoy the information presented in the PIQ.
- It's the second PIQ quiz that I've taken, and I have found it to be most informative. Thanks for sharing this valuable information with us.
- The PIQ was a great surprise in my email. I enjoyed the challenge of the topic and questions.
- It was great to win a prize and learn some very useful information in the process. The quiz was very user friendly. The demonstrations made them more memorable.

Find out how much you know. Visit: **us-ferrazshawmut.mersen.com/PIQ**

R-Tools® 3D Heatsink Modeling

Powerful Thermal Modeling Software

Mersen makes it easy and convenient to quickly and accurately model various heatsink configurations using the R-Tools online thermal modeling software program. R-Tools is completely interactive. It uses analytically based design tools allowing you to perform the thermal design of the heatsink concurrent with the optimization of the electrical and manufacturing elements prior to any prototype builds and testing. This invaluable resource reduces your design time and increases the reliability in your finished product.

The benefits of R-Tools

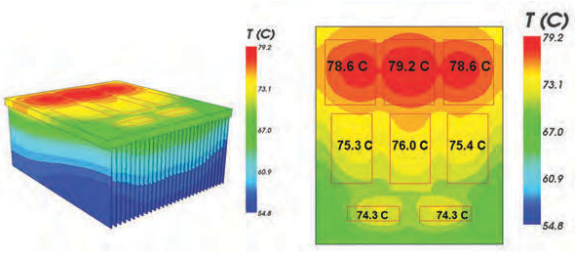
- Convenient online thermal modeling tool
- Online and accessible 24/7
- Quickly and accurately model heatsinks
- 3-D numerical model

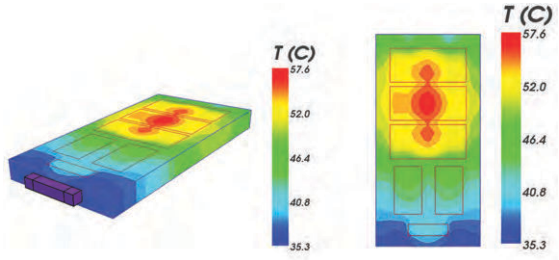
But don't take our word for it, explore R-Tools today and experience the benefits.

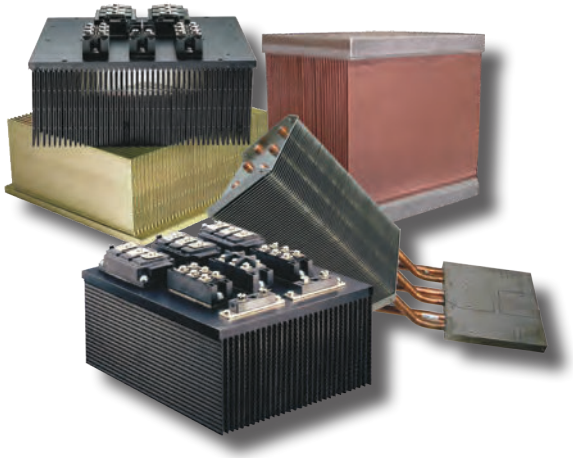
On the Web:

us-ferrazshawmut.mersen.com

Click "Resources" and "R-Tools"







Need More Support?

Mersen is a company that is easy to do business with. Our leading engineers will work with you to develop tailored solutions for removing damaging heat from your electronic systems. Our ongoing commitment to critical research in thermal management, means you'll benefit from new products and processes that meet the operating requirements of high heat flux power semiconductor modules. Using a combination of in-house modeling techniques and third-party labs for design verification, Mersen is committed to being your number one resource for cooling solutions.

Email:

sales.mis@mersen.com

Manufacturing:

905-795-0077

Applications Support:

905-795-0077 x258 or x340

Select-A-Fuse® Software



The industry's first point-and-click, Windows®-based fuse selection software, Select-A-Fuse is fast, easy and accurate. With Select-A-Fuse, you can quickly and accurately choose the right overcurrent protection for low- and medium-voltage motors, power and control transformers, and general loads.

With Version 4.1, you can do even more. Because in addition to product specs, melting time and peak let-thru curves, and the ability to check fuse coordination, our enhanced Select-A-Fuse software package features:

- An Arc Flash calculator you can use to calculate incident heat energies for Mersen's Amp-Trap 2000® current-limiting fuses
- Data and selection routines for our low- and medium-voltage capacitor fuses, High-Speed J fuses and FSPDB finger-safe power distribution blocks
- A cross-reference list with more than 18,000 entries

Select-A-Fuse will save you time and effort, and best of all, it's free. Visit the web address below to get your copy today.

Version 4.1 Select-A-Fuse System requirements:

- Pentium® PC with Windows 95, 98, NT, ME, XP or 2000 operating system
- 16MB minimum RAM
- 2MB free hard disk space

Download your free copy today at:
us.ferrazshawmut.com/resources/download.cfm?f=1

Coming Soon - SAF Online
Select-A-Fuse software is currently being updated and re-engineered for the web. We're updating all the content and will have a brand new, completely web-based version in 2011!

Look for Our New Web-based Program in 2011

Power Electronics Solutions



You can count on Mersen as a single-source supplier of electrical and thermal protection products for Power Electronics. By combining our extensive product line with the knowledge of our application experts, we have the unique ability to evaluate your needs and deliver the right solution.

A global manufacturing company with a century of experience, Mersen has remained strong and viable by consistently focusing on our day-to-day mission — ensuring the integrity of the equipment our devices protect and the safety of the people working around them.

Our zealous commitment to critical research in electrical safety has enabled us to turn industry knowledge into products and services customers can rely on. We consistently go the extra mile by helping our customers increase their effectiveness, simplify applications and enhance productivity.

For unbeatable technical support teams, design assistance in the earliest stages of an application through to final development, and a customer and sales service team that is easy to do business with, turn to Mersen.

Product Overview:

- Semiconductor fuses & fuse holders
- High speed fuses & fuse holders
- Control fuses & fuse holders
- Air and liquid cooled heatsinks
- Disconnect switches
- Surge protective devices
- Power distribution blocks
- High power switches
- Medium voltage fuses

Serving Companies that Manufacture:

- Drives
- Induction heating
- Inverters
- Motor controllers
- Rectifiers
- UPS
- Welding equipment

The Benefits of Mersen:

- Product breadth
- Technical knowledge
- Design assistance from day one
- Global manufacturing
- Innovative, problem solving products like Fabin® heatsinks, TPMOV® Technology, and the industry's first finger-safe UltraSafe™ fuse holders
- Easy to do business with!

Additional Resources

Download Select-A-Fuse® for Power Electronics, Ver. 4.2 - With Select-A-Fuse PE, it's easy to pick the right fuse for power electronics applications. There's no need to sift through product data or perform tedious calculations. Just enter load current and other variables and in seconds, this software responds with viable solutions. Download at: **us.ferrazshawmut.com/resources/download.cfm?f=2**

Find your local sales representative:

Click "Where to Buy" at **us-ferrazshawmut.mersen.com**

Call: 978-462-6662
Email: info.nby@mersen.com

Solar Power Solutions

HelioProtection

Circuit Protection Solutions for solar power generation and distribution systems.

Drawing on a century of experience - and an ongoing commitment to critical research in electrical safety in both traditional and emerging markets - we provide solar power designers, engineering specifiers, solar power installers and solar power equipment manufacturers with innovative circuit protection products and unbeatable technical support.

Generating electricity from solar energy is an extremely reliable process – as long as it's properly protected! Mersen offers a trusted range of circuit protection solutions that will help protect your solar power investment. Any installation, whether it's a stand-alone solar array with a back-up generator set or a grid-connected system, is vulnerable to fault currents or lightning.

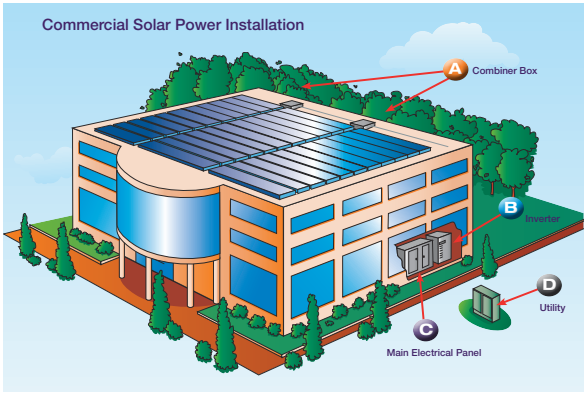
Today, fuses and surge protective devices are the most effective ways of protecting the wiring and electrical equipment in a Photovoltaic (PV) system. Fuses protect the cables between strings of modules from overcurrent damage. The faulty circuits are isolated allowing the system to continue generating power. But that protection must be designed, dimensioned, tested and adapted to the specific features of solar applications.

At Mersen, we offer a dedicated range of protection components specially designed for solar power generation and distribution including, fuses, fuse holders, wire management solutions, disconnect switches, and surge protective devices. For solar power circuit protection solutions you can rely on, contact Mersen.

Need More Information?

Here's how to learn more about Mersen solar power circuit protection products:

Call: 978-462-6662
Email: info.nby@mersen.com
Web: us-ferrazshawmut.mersen.com



Circuit Protection Components for Solar Power

A Combiner Box
600VDC fuse solutions
1000VDC fuse solutions
UltraSafe™ class CC & midget fuse holders
Finger-Safe Power Distribution Block
Surge-Trap® surge protective devices
DC-rated disconnect switches

B Inverter
700VDC semiconductor fuses
1000VDC semiconductor fuses
Square body semiconductor fuses
Surge-Trap® surge protective devices
Modular fuse holders
AC/DC-rated disconnect switches

C Main Electrical Panel
600VAC class J fuses
600VAC class CC fuses
UltraSafe™ class J fuse holders
AC-rated fused Disconnect Switches
Surge-Trap® surge protective devices

D Utility
Medium voltage E-Rated fuses
Cable limiters

Download Mersen's solar power solutions brochure at:
us-ferrazshawmut.mersen.com
Click Resources > Literature.

Wind Power Circuit Protection

Mersen brings its knowledge, innovation and technical expertise to the wind power industry, with a complete line of problem-solving products.

A wide range of circuit protection solutions are available for the Nacelle, Utility and Tower Base, including Finger-safe Power Distribution Blocks (FSPDB) Time-delay Class J Fuses (AJT), E-Rated Medium Voltage Current-limiting Power Fuses and more.

Download Mersen's wind power solutions brochure at us-ferrazshawmut.mersen.com > Resources > Literature.

To learn more about how Mersen products can protect people and equipment:

Call: 978-462-6662
Email: info.nby@mersen.com
Web: us-ferrazshawmut.mersen.com



Turbine Component			Mersen Electrical Protection			
			Fuses	Holders	Surge Protection	Other
Nacelle	1	Control Cabinet	AJT Class CC	UltraSafe™ Disconnect Switch	Surge-Trap® SPD	FSPDB
	2	Rotor	Medium Voltage NH - G Class L	Associated Holders	Surge-Trap® SPD	
	3	Stator	Medium Voltage NH - G Class L	Associated Holders	Surge-Trap® SPD	
	4	HUB	AJT Class CC	UltraSafe™	Surge-Trap® SPD	
	5	Obstruction Lighting	AJT Class CC	UltraSafe™	Surge-Trap® SPD	
	6	Anemometer	Class CC Midget	UltraSafe™	Surge-Trap® SPD	
Base	7	Heading	NH Class L	NH Holders or NH Switch	Surge-Trap® SPD	
	8	Control Cabinet (230V)	AJT Class CC	UltraSafe™ Disconnect Switch	Surge-Trap® SPD	FSPDB
	9	Control Cabinet (24V/ 48V)	Midget	UltraSafe™		
	10	Inverter for Rotor Power Supply	PSC Form101 NH - g	NH Holder	Surge-Trap® SPD	Cable Protector
	11	Transformer & Utility Lines	Medium Voltage			High Voltage Switch
Both	12	Inverter & Generators	Medium Voltage	Disconnect Switch		High Voltage Switch Heatsinks

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Circuit Protection Technical Services Support



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Unable to locate the product you need?
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Phone: 905-795-0077 x340 or x258
U.S.A: (800) 388-5428

Application Information

Need to know how? You've turned to the right place...literally.



Your problem: Whether your objective is optimum protection of motor control equipment, power or control transformers, cable wiring, or lighting and heating circuits — you need fast, accurate information to do the job right. Problem is, not all electrical pros have the same familiarity with circuit protection theories and practices.

Our solution: Every application has its unique challenges. But you'll find the path to a basic understanding of applied circuit protection principles in our Applications section. Be it a glossary of relevant electrical terms. An introduction to fuse construction. Guidance on reading and applying Peak Let-thru curves. Or a look at the most common applications.

Want more information fast? For more technical or application-specific information, please call our Applications/Engineering experts, at 978-462-6662; 416-252-9371 in Canada; or visit our website at **us-ferrazshawmut.mersen.com.**

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Definitions

Ampacity
The current a conductor can carry continuously without exceeding its temperature rating. Ampacity is a function of cable size, insulation type and the conditions of use.

Ampere Rating
The continuous current carrying capability of a fuse under defined laboratory conditions. The ampere rating is marked on each fuse. Class L fuses and E rated fuses may be loaded to 100% of their ampere rating. For all other fuses, continuous load current should not exceed 80% of fuse ampere rating.

Available Fault Current
The maximum short circuit current that can flow in an unprotected circuit.

Bolt-in Fuse
A fuse which is intended to be bolted directly to bus bars, contact pads or fuse blocks.

Contacts
The external live parts of the fuse which provide continuity between the fuse and the balance of the circuit. Also referred to as ferrules, blades or terminals.

Coordination
The use of overcurrent protective devices which will isolate only that portion of an electrical system which has been overloaded or faulted. See Selectivity.

Current-Limiting Fuse
A fuse which will limit both the magnitude and duration of current flow under short circuit conditions.

Current-Limiting Range
The available fault currents a fuse will clear in less than 1/2 cycle, thus limiting the actual magnitude of current flow.

Dual Element Fuse
Often confused with time delay, dual element is a term describing fuse element construction. A fuse having two current responsive elements in series.

Element
A calibrated conductor inside a fuse which melts when subjected to excessive current. The element is enclosed by the fuse body and may be surrounded by an arc-quenching medium such as silica sand. The element is sometimes referred to as a link.

Fault
An accidental condition in which a current path becomes available which by-passes the connected load.

Fault Current
The amount of current flowing in a faulted circuit.

Fuse
An overcurrent protective device containing a calibrated current carrying member which melts and opens a circuit under specified overcurrent conditions.

I^2t (Ampere Squared Seconds)
A measure of the thermal energy associated with current flow. I^2t is equal to $(I_{RMS})^2 \times t$, where t is the duration of current flow in seconds.

Clearing I^2t is the total I^2t passed by a fuse as the fuse clears a fault, with t being equal to the time elapsed from the initiation of the fault to the instant the fault has been cleared.

Melting I^2t is the minimum I^2t required to melt the fuse element.

Interrupting Rating (Abbreviated I.R.)
The maximum current a fuse can safely interrupt. Some special purpose fuses may also have a “Minimum Interrupting Rating”. This defines the minimum current that a fuse can safely interrupt.

Kiloamperes (Abbreviated kA)
1,000 amperes.

Limiter or Back-up Fuse
A special purpose fuse which is intended to provide short circuit protection only.

Overcurrent
Any current in excess of conductor ampacity or equipment continuous current rating.

Overload
The operation of conductors or equipment at a current level that will cause damage if allowed to persist.

Definitions

Peak Let-Thru Current (Ip)
The maximum instantaneous current passed by a current- limiting fuse when clearing a fault current of specified magnitude.

Rejection Fuse Block
A fuse block which will only accept fuses of a specific UL class. Rejection is a safety feature intended to prevent the insertion of a fuse with an inadequate voltage or interrupting rating.

Rejection Fuse
A current-limiting fuse with high interrupting rating and with unique dimensions or mounting provisions.

Renewable Fuse
A fuse which can be restored for service by the replacement of its element.

Renewable Element or Link
The field-replaceable element of a renewable fuse. Also referred to as a renewable link.

Selectivity
A main fuse and a branch fuse are said to be selective if the branch fuse will clear all overcurrent conditions before the main fuse opens. Selectivity is desirable because it limits outage to that portion of the circuit which has been overloaded or faulted. Also called selective coordination.

Semiconductor Fuse
An extremely fast acting fuse intended for the protection of power semiconductors. Sometimes referred to as a rectifier or ultra fast fuse.

Short Circuit
Excessive current flow caused by insulation breakdown or wiring error.

Threshold Current
The minimum available fault current at which a fuse is current limiting.

Time Delay Fuse
A fuse which will carry an overcurrent of a specified magnitude for a minimum specified time without opening. The specified current and time requirements are defined in the UL/CSA/NOM 248 fuse standards.

Voltage Rating
The maximum voltage at which a fuse is designed to operate. Voltage ratings are assumed to be for AC unless specifically labeled as DC.

Fuse Descriptions

High Voltage (over 34,500V)

Expulsion-Type power fuses are available for nominal voltages of 46, 69, 115, 138 and 161kV in current ratings up to 400 amperes. ANSI (American National Standards Institute) Standards are followed.

Medium Voltage (601-34,500V)

Current-Limiting or Expulsion-Type Power Fuses

are general purpose fuses available for nominal voltages of 2.4, 2.75, 4.16, 5.5, 7.2, 8.25, 14.4, 15.5, 23 and 34.5kV in current ratings up to 720 amperes. ANSI and UL Standards are followed.

Current-Limiting Motor Starter Fuses

are available for nominal voltages of 2.4, 4.8 and 7.2kV in current ratings up to 36R (650A). These are special purpose R-Rated fuses for motor short circuit protection only (back-up fuses) and are not full-range power fuses. ANSI and UL Standards are followed.

PT Fuses

Potential transformers require current limiting fuses or equivalent on the primary connection side. Standard PT primary voltages range from 2.4kV to 36kV. Since the power requirement is low (for relays, metering, etc.) fuses of the proper voltage are applied in the 1/2 to 5 ampere range. Several voltage ratings are available, physical sizes vary among manufacturers.

Low Voltages (600V or less)

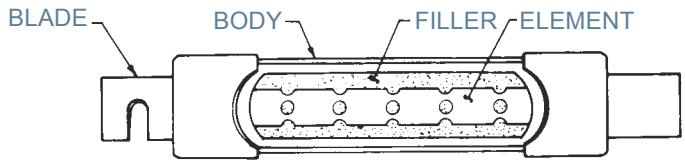
Many types of low voltage fuses are classified and identified for use in 125, 250, 300, 480, or 600V circuits. UL/CSA/NOM standards are followed. Common types are briefly summarized below:

Summary of Low Voltage Fuses

Fuse Type	Voltage	Ampere Rating	Interrupting Rating – kA	Mersen Part #	UL
Class CC	600VAC	0-30	200	ATDR, ATQR, ATMR	248-4
	300VDC	0-30	100	ATDR, ATQR	
	600VDC	0-30	100	ATMR	
Class G	480/600VAC	0-20/21-60	100	AG	248-5
Class H (Renewable)	250/600VAC	0-600	10	RF/RFS	248-7
Class H (Non-Renew)	250/600VAC	0-600	10	NRN, CRN/NRS, CRS	248-6
Class J	600VAC	0-600	200	AJT, HSJ, A4J	248-8
	300VDC	0-30	100	A4J, HSJ(1-10)	
	500VDC	0-600	100	AJT, HSJ(15-600)	
Class K-5	250/600VAC	0-600	50	OT, OTN/OTS	248-9
Class L	600VAC	601-6000	200	A4BQ, A4BY, A4BT	248-10
	500VDC	601-3000	100	A4BQ	
Class RK1	250/600VAC	0-600	200	A2D, A2K/A6D, A6K	248-12
	600VAC	70-600	200	HSRK	
	250VDC	0-600	100	A2D	
	600VDC	0-600	100	A6D	
Class RK5	250/600VAC	0-600	200	TR/TRS	248-12
	300/600VDC	0-30/35-400	20	TRS-RDC	
Class T	300/600VAC	0-1200/0-800	200	A3T/A6T	248-15
	160/300VDC	0-1200	50/100	A3T/A6T	
Semiconductor	130-4000VAC	0-2000	Up to 300	See Section D	248-13
Glass/Electronic	32-350VAC	0-30	Up to 10	See Section C	248-14
Midget	125/250VAC	0-30	0.2-10	TRM, OTM, GFN	248-14
	500/600VAC	0-30	10,100	ATQ, ATM, SBS	
Plug	125VAC	0-30	10	See Section G	248-11
Cable Protector	250VAC	1-500kcmil Cu or Al	200	2CL	248-1
	600VAC	#2-1000kcmil Cu or Al	200	CP, CPH	
Capacitor	600-5500VAC	25-300	Up to 200	A100C-A550C	Other
Welder	600VAC	100-600	200	A4BX	Other

Fuse Construction And Operation

The typical fuse consists of an element which is surrounded by a filler and enclosed by the fuse body. The element is welded or soldered to the fuse contacts (blades or ferrules).



The element is a calibrated conductor. Its configuration, its mass, and the materials employed are selected to achieve the desired electrical and thermal characteristics. The element provides the current path through the fuse. It generates heat at a rate that is dependent upon its resistance and the load current.

The heat generated by the element is absorbed by the filler and passed through the fuse body to the surrounding air. A filler such as quartz sand provides effective heat transfer and allows for the small element cross-section typical in modern fuses. The effective heat transfer allows the fuse to carry harmless overloads. The small element cross section melts quickly under short circuit conditions. The filler also aids fuse performance by absorbing arc energy when the fuse clears an overload or short circuit.

When a sustained overload occurs, the element will generate heat at a faster rate than the heat can be passed to the filler. If the overload persists, the element will reach its melting point and open. Increasing the applied current will heat the element faster and cause the fuse to open sooner. Thus fuses have an inverse time current characteristic, i.e. the greater the overcurrent the less time required for the fuse to open the circuit.

This characteristic is desirable because it parallels the characteristics of conductors, motors, transformers and other electrical apparatus. These components can carry low level overloads for relatively long times without damage. However, under high current conditions damage can occur quickly. Because of its inverse time current characteristic, a properly applied fuse can provide effective protection over a broad current range, from low level overloads to high level short circuits.

How To Read A Time-Current Curve

A time-current characteristic curve, for any specified fuse, is displayed as a continuous line representing the average melting time in seconds for a range of overcurrent conditions. The melting time is considered nominal unless noted otherwise. Several curves are traditionally shown on one sheet to represent a family of fuses. The family shown here is the Time Delay Class J AJT Amp-trap 2000 fuse.

Information can be accessed from these curves in several ways:

- If a fuse has been selected, the designer can use the curve for that fuse to check its opening time versus a given overcurrent. Example: Using the 30 ampere fuse curve, what is the fuse opening time in seconds at a current of 160 amperes? At the bottom of the sheet (Current in Amperes) find 160 amperes (Pt. A) and follow that line straight up to the point where it intersects the 30A curve (Pt. B). Then follow that line to the left edge (Time in Seconds) and read 10 seconds. (Pt. C). This tells us that the AJT30 will open in 10 seconds on a current of 160 amperes.

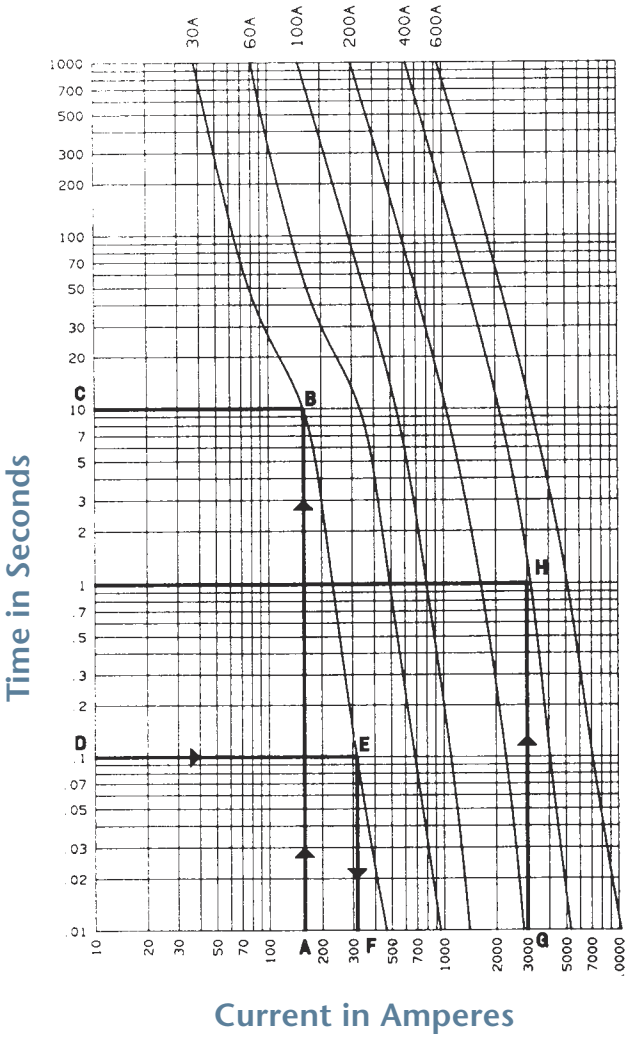
- Likewise, for the same fuse we might want to know what current will open the fuse in 0.1 second. On the vertical axis (Time in Seconds) find 0.1 second (Pt. D) and follow that line to the right until it intersects the 30A curve (Pt. E). Then follow that line straight down to the horizontal axis (Current in Amperes) and read 320 amperes (Pt. F). This shows that the AJT30 requires an overcurrent of 320 amperes to open in 0.1 second.

- The curves can be used in other ways by the designer. For example, if a family has been chosen (i.e. Time Delay Class J AJT) and an opening time of approximately 1 second is required at 3000 amperes, what fuse in the family best meets this need? Find the 3000 ampere line on the horizontal axis (Pt. G) and follow it up to the 1 second line (Pt. H). The nearest curve to the right is the AJT400. If the point is not near a curve shown, other intermediate curves are available from the factory.

Sometimes the fuse family or type has not been chosen, so a design requirement can be presented to several family characteristic curves. One fuse type will emerge as a good choice. Voltage rating, interrupting rating, physical size, time delay, etc. are all considerations in the final choice.

AJT Time Delay / Class J

Melting Time -Current Data
1-600 Amperes, 600 Volts AC



Low Voltage Fuses For Motor Protection

Code Requirements

The NEC or CEC requires that motor branch circuits be protected against overloads and short circuits. Overload protection may be provided by fuses, overload relays or motor thermal protectors. Short circuit protection may be provided by fuses or circuit breakers.

Overload Protection

The NEC or CEC allows fuses to be used as the sole means of overload protection for motor branch circuits. This approach is often practical with small single phase motors. If the fuse is the sole means of protection, the fuse ampere rating must not exceed the values shown in Table 1.

Most integral horsepower 3 phase motors are controlled by a motor starter which includes an overload relay. Since the overload relay provides overload protection for the motor branch circuit, the fuses may be sized for short circuit protection.

Short Circuit Protection

The motor branch circuit fuses may be sized as large as shown in Table 2 when an overload relay or motor thermal protector is included in the branch circuit. Time delay fuse ratings may be increased to 225% and non-time delay fuse ratings to 400% (300% if over 600 amperes) if the ratings shown in Table 2 will not carry motor starting current.

Some manufacturers' motor starters may not be adequately protected by the maximum fuse sizing shown in Table 2. If this is the case, the starter manufacturer is required by UL 508 to label the starter with a maximum permissible fuse size. If so labeled, this maximum value is not be exceeded.

Where the percentages shown in Table 2 do not correspond to standard fuse ratings the next larger fuse rating may be used. Standard fuse ratings in amperes:

15	20	25	30	35	40	45	50
60	70	80	90	100	110	125	150
175	200	225	250	300	350	400	450
500	600	700	800	1000	1200	1600	2000
2500	3000	4000	5000	6000			

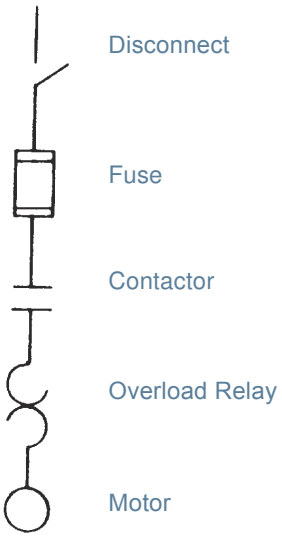
Fuse Selection Guidelines

What fuse type and ampere rating is best for a given application? The answer depends upon the application and objective to be met. Here are some suggestions.

Which Fuse Class?

UL Classes RK5, RK1, and J are the most popular. The Class RK5 (Tri-onic®) is the least expensive. The Class RK1 (Amp-trap®) is used where a higher degree of current limitation is required for improved component protection or system coordination. The RK5 and RK1 are dimensionally interchangeable.

The Class J time delay fuse (AJT) provides advantages over the RK5 and RK1 fuses. Class J fuses provide a higher degree of current limitation than the RK's. This reduced fault current will reduce arc faults in cases of an arc flash incident.



Motor Branch Circuit

Table 1- Maximum Fuse Rating for Overload Protection

Motor Service Factor or Marked Temperature Rise	Fuse Rating as %* Motor Full Load
Service factor of 1.15 or greater	125
Marked temperature rise not Exceeding 40°C	125
All Others	115

* These percentages are not to be exceeded.

Table 2- Maximum Fuse Rating for Short Circuit Protection

Type of Motor	Fuse Rating as %* Motor Full Load* Fuse Type	
	Non-Time Delay	Time Delay
All Single-phase AC motors	300	175
AC polyphase motors other than wound-rotor:		
Squirrel Cage		
Other than Design E	300	175
Design E	300	175
Synchronous	300	175
Wound rotor	150	150
Direct-current (constant voltage)	150	150

* The non-time delay ratings apply to all class CC fuses.

Low Voltage Fuses For Motor Protection

The Class J fuse is also about half the physical size of the RK5 and RK1 reducing panel space and saving money.

Time Delay vs. Non-Time Delay

Time delay fuses are the most useful fuses for motor branch circuit application. A time delay fuse can be sized closer to motor full load current, providing a degree of overload protection, better short circuit protection, and possible use of a smaller disconnect switch.

What Ampere Rating?

The selection of fuse ampere rating is a matter of experience and personal preference. Some prefer to size time delay fuses at 125% of motor full load amperes. This sizing will provide a degree of overload protection for motors with a service factor of 1.15. Sizing fuses at 125% of motor nameplate amperes in some applications may result in nuisance fuse openings. Time delay fuses sized at 125% may open at motor locked rotor current before some NEMA Class 20 overload relays operate. Nuisance fuse openings may result if Class RK1 or Class J fuses are sized at 125% of motor full load current. These fuses are more current limiting than the RK5 and have less short time current carrying capability.

Sizing time delay fuses between 125% and 150% of motor full load current provides advantages. The fuse will coordinate with NEMA Class 20 overload relays. Nuisance fuse opening will virtually be eliminated and effective short circuit protection will be maintained.

Protecting IEC Style Motor Starters

The new IEC European style motor starters and contactors are popular but they present different problems in protection. These devices represent substantial savings in space and cost but they have a lower withstand capability than their NEMA counterparts.

In order to achieve the same level of protection for IEC style devices that we expect for NEMA devices, the AJT Class J Time Delay fuse is the best choice, sized at 1.25 to 1.50 times motor full load amperes. Also, the AJT has the advantage of being half the size of RK5 and RK1 fuses and thereby fits the trim IEC package.

Single Phase Motor Fuse Selection UL Classes RK1, RK5, J & CC

Motor HP	Full Load Current	Recommended Ampere Rating Motor Acceleration Times								
		Minimum	Typical	Heavy Load	Minimum	Typical	Heavy Load	Minimum	Typical	Heavy Load
115V		RK5 and RK1 TR/A2D			J-AJT			CC-ATDR		
1/6	4.4	5 6/10	6 1/4	8	5 6/10	6 1/4	8	12	15	17 1/2
1/4	5.8	7	8	12	8	8	12	12	17 1/2	20
1/3	7.2	9	12	15	9	12	15	17 1/2	25	25
1/2	9.8	12	15	17	12	15	17 1/2	20	30	
3/4	13.8	17 1/2	20	25	17 1/2	20	25	30	-	-
1	16	20	25	30	20	25	30	-	-	-
1 1/2	20	25	30	35	25	30	35	-	-	-
2	24	30	35	40	30	35	40	-	-	-
3	34	45	50	60	45	50	60	-	-	-
5	56	70	80	100	70	80	100	-	-	-
7 1/2	80	100	125	150	100	125	150	-	-	-
10	100	125	150	175	125	150	175	-	-	-
230V		RK5 and RK1 TR/A2D			J-AJT			CC-ATDR		
1/6	2.2	2 8/10	3 1/2	4	3	3 1/2	4	5	7	10
1/4	2.9	3 1/2	4 1/2	5 6/10	3 1/2	4 1/2	5 6/10	6	9	10
1/3	3.6	4 1/2	5 6/10	7	4 1/2	5 6/10	7	8	12	15
1/2	4.9	6 1/4	7	9	6 1/4	7	9	12	15	17 1/2
3/4	6.9	9	12	15	9	12	15	15	20	25
1	8	10	12	15	10	12	15	20	25	30
1 1/2	10	12	15	17 1/2	12	15	17 1/2	20	30	-
2	12	15	17 1/2	25	15	17 1/2	25	25	-	-
3	17	20	25	30	20	25	30	-	-	-
5	28	35	40	50	35	40	50	-	-	-
7 1/2	40	50	60	70	50	60	70	-	-	-
10	50	60	80	90	60	80	90	-	-	-

Minimum - This sizing is recommended if motor acceleration times do not exceed 2 seconds. Minimum sizing with RK1, RK5, and Class J fuses will provide overload relay back up protection but may not coordinate with some NEMA Class 20 overload relays. Minimum sizing is generally not heavy enough for motors with code letter G or higher.

Typical - Suggested for most applications. Will coordinate with NEMA Class 20 overload relays. Suitable for motor acceleration times up to 5 seconds.

Heavy Load - Maximum fuse size in accordance with Table 2. If this fuse size is not sufficient to start the load, RK1, RK5, and J time delay fuse size may be increased to a maximum of 225% of full load amperes. Class CC fuses may be increased to 400% of full load amperes. The Heavy Load column should be used for Design E and high efficiency Design B motor fuse sizing.

Low Voltage Fuses For Motor Protection

Three Phase Motor Fuse Selection UL Classes RK5, RK1, J & CC

Motor HP	Full Load Current	Recommended Ampere Rating Motor Acceleration Times								
		Minimum	Typical	Heavy Load	Minimum	Typical	Heavy Load	Minimum	Typical	Heavy Load
208V		RK5 and RK1 TR/A2D			J-AJT			CC-ATDR		
1/2	2.4	3	3 1/2	4 1/2	3	3 1/2	4 1/2	5	8	10
3/4	3.5	4 1/2	5	6 1/4	4 1/2	5	6 1/4	8	10	15
1	4.6	5 6/10	7	9	6	7	9	10	15	17 1/2
1 1/2	6.6	8	10	12	8	10	12	15	20	25
2	7.5	9	12	15	9	12	15	17 1/2	25	30
3	10.6	15	15	20	15	15	20	25	30	-
5	16.8	20	25	30	20	25	30	-	-	-
7 1/2	24.2	30	35	45	30	35	45	-	-	-
10	30.8	40	50	60	40	50	60	-	-	-
15	46.2	60	70	90	60	70	90	-	-	-
20	60	75	90	110	80	90	110	-	-	-
25	75	90	110	150	90	110	150	-	-	-
30	88	110	150	175	110	150	175	-	-	-
40	114	150	175	200	150	175	200	-	-	-
50	143	175	225	300	175	225	300	-	-	-
60	169	200	250	300	200	250	300	-	-	-
75	211	250	350	400	250	350	400	-	-	-
100	273	350	400	500	350	400	500	-	-	-
125	343	450	500	600	450	500	600	-	-	-
150	396	500	600	-	500	600	-	-	-	-
230V		RK5 and RK1 TR/A2D			J-AJT			CC-ATDR		
1/2	2.2	2 8/10	3 1/2	4	3	3 1/2	4	5	7	10
3/4	3.2	4	5	6	4	5	6	8	10	12
1	4.2	5	6 1/4	8	5	6 1/4	8	10	12	15
1 1/2	6	8	9	12	8	9	12	15	17 1/2	20
2	6.8	8	10	12	8	10	12	15	20	25
3	9.6	12	15	17 1/2	12	15	17 1/2	20	30	-
5	15.2	20	25	30	20	25	30	-	-	-
7 1/2	22	30	35	40	30	35	40	-	-	-
10	28	35	40	50	35	40	50	-	-	-
15	42	50	60	80	50	60	80	-	-	-
20	54	70	80	100	70	80	100	-	-	-
25	68	80	100	125	80	100	125	-	-	-
30	80	100	125	150	100	125	150	-	-	-
40	104	125	150	200	125	150	200	-	-	-
50	130	175	200	250	175	200	250	-	-	-
60	154	200	225	300	200	225	300	-	-	-
75	192	250	300	350	250	300	350	-	-	-
100	248	300	350	450	300	350	450	-	-	-
125	312	400	450	600	400	450	600	-	-	-
150	360	450	500	600	450	500	600	-	-	-
200	480	600	-	-	600	-	-	-	-	-

Minimum - This sizing is recommended if motor acceleration times do not exceed 2 seconds. Minimum sizing with RK1, RK5, and Class J fuses will provide overload relay back up protection but may not coordinate with some NEMA Class 20 overload relays. Minimum sizing is generally not heavy enough for motors with code letter G or higher.
Typical - Suggested for most applications. Will coordinate with NEMA Class 20 overload relays. Suitable for motor acceleration times up to 5 seconds.
Heavy Load - Maximum fuse size in accordance with Table 2. If this fuse size is not sufficient to start the load, RK1, RK5, and J time delay fuse size may be increased to a maximum of 225% of full load amperes. Class CC fuses may be increased to 400% of full load amperes. The Heavy Load column should be used for Design E and high efficiency Design B motor fuse sizing.

Low Voltage Fuses For Motor Protection

Three Phase Motor Fuse Selection UL Classes RK5, RK1, J & CC

Motor HP	Full Load Current	Recommended Ampere Rating Motor Acceleration Times								
		Minimum	Typical	Heavy Load	Minimum	Typical	Heavy Load	Minimum	Typical	Heavy Load
380V		RK5 and RK1 TRS / A6D			J-AJT			CC-ATDR		
1/2	1.3	1 6/10	2	2 1/2	1 6/10	2	2 8/10	3	4	6
3/4	1.7	2 1/4	2 8/10	3	2 1/2	2 8/10	3 1/2	4	5 6/10	6 1/4
1	2.2	2 8/10	3 1/2	4 1/2	3	3 1/2	4	5	8	10
1 1/2	3.6	4 1/2	5 6/10	7	4 1/2	5 6/10	7	8	12	15
2	4.1	5	6	8	5	6	8	9	12	15
3	5.8	7	8	12	8	8	12	12	17 1/2	20
5	9.2	12	15	17 1/2	12	15	17 1/2	20	30	-
7 1/2	13.3	15	20	25	17 1/2	20	25	30	-	-
10	17	20	25	30	20	25	30	-	-	-
15	25	30	35	45	30	35	45	-	-	-
20	33	40	50	60	40	50	60	-	-	-
25	41	50	60	75	50	60	80	-	-	-
30	48	60	70	90	60	80	90	-	-	-
40	68	80	100	125	80	100	125	-	-	-
50	79	100	125	150	100	125	150	-	-	-
60	93	110	150	175	110	150	175	-	-	-
75	116	150	175	225	150	175	225	-	-	-
100	150	175	225	300	175	225	300	-	-	-
125	189	250	300	350	250	300	350	-	-	-
150	218	300	350	400	300	350	400	-	-	-
200	291	350	450	600	350	450	600	-	-	-

Minimum - This sizing is recommended if motor acceleration times do not exceed 2 seconds. Minimum sizing with RK1, RK5, and Class J fuses will provide overload relay back up protection but may not coordinate with some NEMA Class 20 overload relays. Minimum sizing is generally not heavy enough for motors with code letter G or higher.
Typical - Suggested for most applications. Will coordinate with NEMA Class 20 overload relays. Suitable for motor acceleration times up to 5 seconds.
Heavy Load - Maximum fuse size in accordance with Table 2. If this fuse size is not sufficient to start the load, RK1, RK5, and J time delay fuse size may be increased to a maximum of 225% of full load amperes. Class CC fuses may be increased to 400% of full load amperes. The Heavy Load column should be used for Design E and high efficiency Design B motor fuse sizing.

Low Voltage Fuses For Motor Protection

Three Phase Motor Fuse Selection UL Classes RK5, RK1, J, CC and L

Motor HP	Full Load Current	Recommended Ampere Rating Motor Acceleration Times								
		Minimum	Typical	Heavy Load	Minimum	Typical	Heavy Load	Minimum	Typical	Heavy Load
460V		RK5 and RK1 TRS / A6D			J-AJT			CC-ATDR		
1/2	1.1	1 4/10	1 6/10	2	1 1/2	1 6/10	2	3	3 1/2	6
3/4	1.6	2	2 1/4	2 8/10	2	2 1/4	2 8/10	3 1/2	5	6 1/4
1	2.1	2 1/2	3 2/10	4	2 1/2	3 2/10	4	5	6 1/4	8
1 1/2	3	3 1/2	4 1/2	5 6/10	3 1/2	4 1/2	5 6/10	6	9	12
2	3.4	4	5	6	4	5	6	8	10	15
3	4.8	5 6/10	7	9	6	7	9	12	15	17 1/2
5	7.6	10	12	15	10	12	15	17 1/2	25	30
7 1/2	11	15	17 1/2	20	15	17 1/2	20	25	30	-
10	14	17 1/2	20	25	17 1/2	20	25	30	-	-
15	21	25	30	40	25	30	40	-	-	-
20	27	35	40	50	35	40	50	-	-	-
25	34	45	50	60	40	50	60	-	-	-
30	40	50	60	70	50	60	70	-	-	-
40	52	70	80	100	70	80	100	-	-	-
50	65	80	100	125	80	100	125	-	-	-
60	77	100	125	150	100	125	150	-	-	-
75	96	125	150	175	125	150	175	-	-	-
100	124	175	200	225	175	200	225	-	-	-
125	156	200	225	300	200	225	300	-	-	-
150	180	225	250	350	225	250	350	-	-	-
200	240	300	350	450	300	350	450	-	-	-
250	302	400	450	600	400	450	600	-	-	-
300	361	450	600	-	450	600	-	-	-	-
Motor HP	Full Load Current	Class L A4BT								
300	360	-	601	800						
400	477	-	800	1200						
500	590	-	1000	1600						

Minimum - This sizing is recommended if motor acceleration times do not exceed 2 seconds. Minimum sizing with RK1, RK5, and Class J fuses will provide overload relay back up protection but may not coordinate with some NEMA Class 20 overload relays. Minimum sizing is generally not heavy enough for motors with code letter G or higher.
Typical - Suggested for most applications. Will coordinate with NEMA Class 20 overload relays. Suitable for motor acceleration times up to 5 seconds.
Heavy Load - Maximum fuse size in accordance with Table 2. If this fuse size is not sufficient to start the load, RK1, RK5, and J time delay fuse size may be increased to a maximum of 225% of full load amperes. Class CC fuses may be increased to 400% of full load amperes. The Heavy Load column should be used for Design E and high efficiency Design B motor fuse sizing.

Low Voltage Fuses For Motor Protection

Three Phase Motor Fuse Selection UL Classes RK5, RK1, J, CC and L

Motor HP	Full Load Current	Recommended Ampere Rating Motor Acceleration Times								
		Minimum	Typical	Heavy Load	Minimum	Typical	Heavy Load	Minimum	Typical	Heavy Load
575V		RK5 and RK1 TRS / A6D			J-AJT			CC-ATDR		
1/2	0.9	1 1/8	1 4/10	1 6/10	1 1/4	1 1/2	1 6/10	2 1/2	2 8/10	3 1/2
3/4	1.3	1 6/10	2	2 1/2	1 6/10	2	2 8/10	3	4	6
1	1.7	2 1/4	2 1/2	3	2 1/4	2 8/10	3 1/2	4	5 6/10	6 1/4
1 1/2	2.4	3	3 1/2	4 1/2	3	3 1/2	4 1/2	5	8	10
2	2.7	3 2/10	4	5	3 2/10	4	5	6	8	10
3	3.9	5	6	7	5	6	7	9	12	15
5	6.1	8	9	12	8	10	12	15	17 1/2	20
7 1/2	9	12	15	17 1/2	12	15	17 1/2	20	30	-
10	11	15	17 1/2	20	15	17 1/2	20	25	30	-
15	17	20	25	30	20	25	30	-	-	-
20	22	30	35	40	30	35	40	-	-	-
25	27	35	40	50	35	40	50	-	-	-
30	32	40	50	60	40	50	60	-	-	-
40	41	50	60	75	50	60	80	-	-	-
50	52	70	80	100	70	80	100	-	-	-
60	62	75	90	110	80	90	110	-	-	-
75	77	100	125	150	100	125	150	-	-	-
100	99	125	150	175	125	150	175	-	-	-
125	125	175	200	225	175	200	225	-	-	-
150	144	175	225	300	175	225	300	-	-	-
200	192	250	300	350	250	300	350	-	-	-
250	240	300	350	500	300	350	500	-	-	-
300	289	350	450	600	350	450	600	-	-	-
Motor HP	Full Load Current	Class L A4BT								
400	382	--	800	1100						
500	472	--	1000	1400						

Minimum - This sizing is recommended if motor acceleration times do not exceed 2 seconds. Minimum sizing with RK1, RK5, and Class J fuses will provide overload relay back up protection but may not coordinate with some NEMA Class 20 overload relays. Minimum sizing is generally not heavy enough for motors with code letter G or higher.
Typical - Suggested for most applications. Will coordinate with NEMA Class 20 overload relays. Suitable for motor acceleration times up to 5 seconds.
Heavy Load - Maximum fuse size in accordance with Table 2. If this fuse size is not sufficient to start the load, RK1, RK5, and J time delay fuse size may be increased to a maximum of 225% of full load amperes. Class CC fuses may be increased to 400% of full load amperes. The Heavy Load column should be used for Design E and high efficiency Design B motor fuse sizing.

Medium Voltage Motor Protection

Fuse Application Guidelines

The guidelines for applying R-Rated fuses are significantly different from those applying to low voltage motor fuses. This is because R-Rated fuses are back-up fuses which are intended to provide short circuit protection only for medium voltage starters and motors.

An R-Rated fuse is not designed to protect itself or other circuit components against long term overloads. This is why these fuses are given an R rating, and not an ampere rating. An R-Rated fuse will safely interrupt any current between its minimum interrupting rating and its maximum interrupting rating. The minimum interrupting rating is verified during UL tests for UL component recognition.

R-Rated fuses must be applied in combination with an overload relay and a contactor. The time current characteristics of the fuse and overload relay should be matched so that the contactor interrupts currents below the fuse's minimum interrupting rating while the fuse interrupts fault currents, thus easing duty on the contactor and extending the interrupting ability of the controller.

A medium voltage starter is usually engineered for a specific motor and application. For this reason the starter manufacturer selects the proper fuse R rating and provides the fuses as part of the starter package. Unless the user has good reason, no deviation should be made from the R rating recommended by the starter manufacturer. If the user has an existing starter which is to be applied to a new or different motor, the application should be reviewed with the starter manufacturer. Recalibration of the overload relay(s) or fuses of a different R rating may be required.

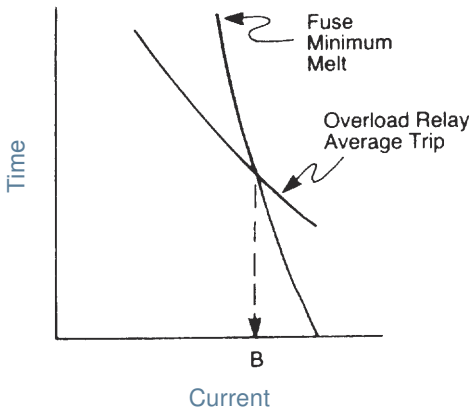
Properly sized R-Rated fuses should provide a service life approaching that of the contactor. If fuse openings are experienced with no faults present, the fuses, overload relay or both may be improperly sized. The table in this section is offered as a guideline and shows the maximum motor full load current appropriate for a given R rating. In addition to this table it is advisable to compare the fuse minimum melt time-current curve and the nominal time-current characteristic curve for the overload relay. These curves should intersect at (B) no less than 120% of motor locked rotor current (see figure). This will assure that the contactor will open before the fuse during locked rotor conditions.

The 10 or 3 Second Start

The 10 or 3 second start listed in the table is a start during which the motor accelerates from standstill to rated speed in 10 (or 3) seconds or less. For reduced voltage starting, motor starting current should not exceed 75% of the fuse minimum melt current for the required motor acceleration time.

Consult the factory for application assistance for ratings above 36R.

Fuse/Overload Relay Crossover Point



Where B ≥ 1.2 x locked rotor amperes

Motor Full Load Currents for R-Rated Fuses*

Fuse R Rating	Max. Motor Full-Load Current For Full Voltage Start - Amperes	
	10 sec. start	3 sec. start
2R	28	32
3R	40	45
4R	55	65
5R	65	75
6R	80	95
9R	125	140
12R	165	190
18R	250	280
24R	330	360
36R	500	550

*Note: Always round up to the next larger R rating.

Transformer Protection

This section summarizes transformer overcurrent protection as required by the National Electrical Code (NEC) and Canadian Electric Code.

Transformers - Primary 600 Volts or Less

If secondary fuse protection is not provided, primary fuses are to be selected according to Table 1. If both primary and secondary fuses are used, they are to be selected according to Table 2.

Table 1- Primary Fuse Only

Transformer Primary Amperes	Maximum Primary Fuse % Rating
9 or more	125*
2 to less than 9	167
less than 2	300

Table 2- Primary & Secondary Fuses

Transformer Secondary Amperes	Maximum Primary Fuse % Rating	
	Primary Fuse	Secondary Fuse
9 or more	250	125*
less than 9	250	167

* If 125% does not correspond to a standard ampere rating, the next higher standard rating shall be permitted.

Transformer Magnetizing Inrush Currents

When voltage is switched on to energize a transformer, the transformer core normally saturates. This results in a large inrush current which is greatest during the first half cycle (approximately .01 second) and becomes progressively less severe over the next several cycles (approximately 1 second) until the transformer reaches its normal magnetizing current.

To accommodate this inrush current, fuses are often selected which have time-current withstand values of at least 12 times transformer primary rated current for .1 second and 25 timess for .01 second. Recommended primary fuses for popular, low-voltage 3-phase transformers are shown on the next page. Some small dry-type transformers may have substantially greater inrush currents. For these applications, the fuse may have to be selected to withstand 45 times transformer primary rated current for .01 second.

Secondary Fuses

Selecting fuses for the secondary is simple once rated secondary current is known. Fuses are sized at 125% of secondary FLA or the next higher rating; or at maximum 167% of secondary FLA, see Table 2 for rules. The preferred sizing is 125% of rated secondary current Isec or next higher fuse rating. To determine Isec, first determine transformer rating (VA or kVA), secondary voltage (Vsec) and use formulas below.

1. Single Phase : $Isec = \frac{\text{Transformer VA}}{\text{Vsec}}$

or $\frac{\text{Transformer kVA x 1000}}{\text{Vsec}}$

2. Three Phase : $Isec = \frac{\text{Transformer VA}}{1.73 \times \text{Vsec}}$

or $\frac{\text{Transformer kVA x 1000}}{1.73 \times \text{Vsec}}$

When Isec is determined, multiply it by 1.25 and choose that fuse rating or next higher rating. [Isec x 1.25 = Fuse Rating]

Transformers - Primary Over 600 Volts

If in unsupervised locations, fuses are to be selected according to Table 3. Where the required fuse rating does not correspond to a standard ampere rating, the next higher standard rating shall be permitted. In supervised locations,fuses are to be selected according to Table 4.

Table 3- Unsupervised Locations

Transformer Secondary Amperes	Maximum % Rating		
	Primary Fuse	Secondary Fuse	
		Over 600V	600V or Less
6 or less	300*	250*	125*
More than 6 & not more then 10	300*	225*	125*

Table 4- Supervised Locations

Transformer Rated % Impedance	Maximum % Rating		
	Primary Fuse	Secondary Fuse	
		Over 600V	600V or Less
All	250*	-	-
6 or less	300	250	250
More than 6 & not more then 10	300	225	250

* Where fuse sizes do not correspond to a standard ampere rating, the next higher standard rating shall be permitted.

Primary Fuses For 3-Phase LV Transformers

Recommended Primary Fuses for 240 Volt, Three Phase Transformers

Transformer Rating kVA	240 Volt Primary					
	Primary Full Load Amps	Primary Fuse Rating				
		TR-R	A2D-R*	A4BT*	A4BY*	A4BQ*
3	7.2	9	15	-	-	-
5	12	15	25	-	-	-
7-1/2	18	25	40	-	-	-
9	22	30	45	-	-	-
15	36	45	60	-	-	-
30	72	90	150	-	-	-
45	108	150	225	-	-	-
75	180	225	400	-	-	-
100	241	300	450	-	-	-
112-1/2	271	350	500	-	-	-
150	361	450	600	-	-	-
225	541	600	-	800	900	1200
300	722	-	-	1200	1200	1600
500	1203	-	-	1800	2000	2500
750	1804	-	-	-	3000	4000
1000	2406	-	-	-	5000	5000
1500	3608	-	-	-	6000	-

Recommended Primary Fuses for 480 & 600 Volt, Three Phase Transformers

Transformer Rating kVA	480 Volt Primary						600 Volt Primary					
	Primary Full Load Amps	Primary Fuse Rating					Primary Full Load Amps	Primary Fuse Rating				
		TRS-R	AJT* or A6D-R*	A4BT*	A4BY*	A4BQ*		TRS-R	AJT* or A6D-R*	A4BT*	A4BY*	A4BQ*
3	3.6	4-1/2	6	-	-	-	2.9	4	5	-	-	-
5	6.0	8	12	-	-	-	4.8	6	10	-	-	-
7-1/2	9.0	12	15	-	-	-	7.2	9	15	-	-	-
9	11	15	25	-	-	-	9.0	12	17-1/2	-	-	-
15	18	25	35	-	-	-	14	20	25	-	-	-
30	36	45	60	-	-	-	29	35	45	-	-	-
45	54	70	100	-	-	-	43	60	80	-	-	-
75	90	125	175	-	-	-	72	90	150	-	-	-
100	120	150	225	-	-	-	96	125	200	-	-	-
112-1/2	135	175	300	-	-	-	108	150	225	-	-	-
150	180	225	400	-	-	-	144	200	300	-	-	-
225	271	350	500	-	-	-	217	300	450	-	-	-
300	361	450	600	-	-	-	289	350	500	-	-	-
500	601	-	-	1000	1000	1200	481	600	-	700	900	1000
750	902	-	-	1400	1600	2000	722	-	-	1200	1400	1600
1000	1203	-	-	1800	2000	2500	962	-	-	1600	1800	2000
1500	1804	-	-	-	3000	4000	1443	-	-	2000	2500	3000
2000	2406	-	-	-	4000	5000	1925	-	-	-	4000	4000
2500	3007	-	-	-	5000	6000	2406	-	-	-	5000	5000

*When using these fuses, the secondary of the transformer must be fused to comply with the Code.

Secondary Fuses for LV Transformers

TRANS-FORMER RATING (kVA)	SECONDARY FULL LOAD AMPS AT RATED VOLTAGE (VAC) 3-PHASE				SECONDARY FUSE RATING FOR 120V				SECONDARY FUSE RATING FOR 240V				SECONDARY FUSE RATING FOR 480V				SECONDARY FUSE RATING FOR 600V			
	120	240	480	600	*A2D-R, AJT, or *TR-R	A4BQ	A4BY	A4BT	*A2D-R, AJT, or *TR-R	A4BQ	A4BY	A4BT	*A6D-R, AJT, or *TRS-R	A4BQ	A4BY	A4BT	*A6D-R, AJT, or *TRS-R	A4BQ	A4BY	A4BT
3	14	7	4	3	20	-	-	-	9	-	-	-	5	-	-	-	4	-	-	-
5	24	12	6	5	30	-	-	-	15	-	-	-	8	-	-	-	6	-	-	-
7.5	36	18	9	7	45	-	-	-	25	-	-	-	12	-	-	-	9	-	-	-
9	43	22	11	9	50	-	-	-	30	-	-	-	15	-	-	-	12	-	-	-
15	72	36	18	14	90	-	-	-	45	-	-	-	25	-	-	-	20	-	-	-
30	145	72	36	29	200	-	-	-	90	-	-	-	45	-	-	-	35	-	-	-
45	217	108	54	43	300	-	-	-	150	-	-	-	70	-	-	-	60	-	-	-
75	361	181	90	72	450	-	-	-	225	-	-	-	125	-	-	-	90	-	-	-
100	482	241	120	96	600	-	-	-	300	-	-	-	150	-	-	-	125	-	-	-
112.5	542	271	135	108	-	700	700	700	350	-	-	-	175	-	-	-	150	-	-	-
150	723	361	181	145	-	900	900	900	450	-	-	-	250	-	-	-	200	-	-	-
225	1084	542	271	217	-	1350	1350	1400	-	700	700	700	350	-	-	-	300	-	-	-
300	1445	723	361	289	-	1800	1800	2000	-	900	900	900	450	-	-	-	400	-	-	-
500	2408	1204	602	482	-	3000	3000		-	1500	1500	1500	-	750	750	750	600	-	-	-
750	3613	1806	903	723	-	4500	4500		-	2200	2200		-	1000	1000	1000	-	900	900	900
1000	4817	2408	1204	963	-	6000	6000		-	3000	3000		-	1500	1500	1500	-	1200	1200	1200
1500	7225	3613	1806	1445	-	-	-	-	-	4500	4500		-	2500	2500	-	-	2000	2000	2000
2000	9634	4817	2408	1927	-	-	-	-	-	6000	6000		-	3000	3000	-	-	2500	2500	-
2500	12042	6021	3011	2408	-	-	-	-	-	-	-	-	-	4000	4000	-	-	3000	3000	-
3000	14451	7225	3613	2890									-	5000	5000		-	3500	3500	-
3750	18064	9032	4516	3613									-	6000	6000		-	5000	5000	-
5000	24085	12042	6021	4817									-	-			-	6000	6000	-

*Use A2D(Amp)R, A6D(Amp)R, TR(Amp)R, or TRS(Amp)R.

Primary Fuses For MV 3-Phase Power Transformers

3 Phase 2400 Volt Typical Primary Fuse Sizing Chart									
Transformer Rating kVA[2]	Full Load Amperes	2 " Ferrule mounting			3 " Ferrule mounting (single and double)			Bolt on	Clip Lock
		9F60 EJ "C"	9F60 EJO "C"	A055F	9F60 EJ "D"	9F60 EJO "D"	A055F	A055B	A055C
9	2.2	9F60CCB005 *	9F60DJB005	A055F1C0R0-5E	-	-	-	-	-
15	3.6	9F60CCB010 *	9F60DJB010	A055F1C0R0-7E	-	-	-	-	-
30	7.2	9F60CCB020 *	9F60DJB020	A055F1C0R0-10E	-	-	A055F1D0R0-10E	A055B1DAR0-10E	A055C1D0R0-10E
45	11	9F60CCB025 *	9F60DJB025	A055F1C0R0-15E	-	-	A055F1D0R0-15E	A055B1DAR0-15E	A055C1D0R0-15E
75	18	-	-	A055F1C0R0-25E	9F60ECB030	9F60FJB030	A055F1D0R0-25E	A055B1DAR0-25E	A055C1D0R0-25E
112.5	27	-	-	A055F1C0R0-40E	9F60ECB050	9F60FJB050	A055F1D0R0-40E	A055B1DAR0-40E	A055C1D0R0-40E
150	36	-	-	A055F1C0R0-50E	9F60ECB065	9F60FJB065	A055F1D0R0-50E	A055B1DAR0-50E	A055C1D0R0-50E
225	54	-	-	-	9F60ECB100	9F60FJB100	A055F1D0R0-80E	A055B1DAR0-80E	A055C1D0R0-80E
300	72	-	-	-	9F60GCB125	9F60HJB125	A055F1D0R0-100E	A055B1DAR0-100E	A055C1D0R0-100E
500	120	-	-	-	9F60GCB200	9F60HJB200	A055F1D0R0-200E	A055B1DAR0-200E	A055C1D0R0-200E
750	181	-	-	-	-	-	A055F2D0R0-250E	A055B2DAR0-250E	A055C1D0R0-250E
1000	241	-	-	-	-	-	A055F2D0R0-400E	A055B2DAR0-400E	A055C1D0R0-400E
1500	361	-	-	-	-	-	-	A055B2D0R0-500E	A055C2D0R0-500E
2000	482	-	-	-	-	-	-	A055B2D0R0-600E	A055C2D0R0-600E

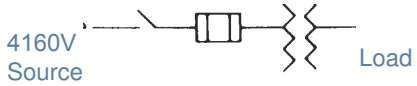
Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
EJO fuses can be used outdoors without an enclosure [2] the self cooled rating of the transformer * use CEB in place of CCB for 9" clip center fuses

3 Phase 4160 Volt Typical Primary Fuse Sizing Chart										
Transformer Rating kVA[2]	Full Load Amperes	2 " Ferrule mounting				3 " Ferrule mounting (single and double)			Bolt on		Clip Lock
		9F60 EJ "C"	9F60 EJO "C"	9F62 EJO "C"	A055F	9F60 EJO "D"	9F62 EJO "D"	A055F	9F62 EJO "DDDD"	A055B	A055C
9	1.3	9F60CED005	9F60DJD005	-	A055F1C0R0-5E	-	-	-	-	-	-
15	2.1	9F60CED007	9F60DJD007	-	A055F1C0R0-5E	-	-	-	-	-	-
30	4.2	9F60CED015	9F60DJD015	-	A055F1C0R0-7E	-	-	A055F1D0R0-10E	-	A055B1DAR0-10E	A055C1D0R0-10E
45	6.3	9F60CED015	9F60DJD015	-	A055F1C0R0-10E	-	-	A055F1D0R0-10E	-	A055B1DAR0-10E	A055C1D0R0-10E
75	10	9F60CED025	9F60DJD025	9F62HCB025	A055F1C0R0-15E	-	-	A055F1D0R0-15E	-	A055B1DAR0-15E	A055C1D0R0-15E
112.5	16	-	-	9F62HCB030	A055F1C0R0-20E	9F60FJD040	-	A055F1D0R0-20E	-	A055B1DAR0-20E	A055C1D0R0-20E
150	21	-	-	9F62HCB040	A055F1C0R0-30E	9F60FJD040	-	A055F1D0R0-30E	-	A055B1DAR0-30E	A055C1D0R0-30E
225	31	-	-	9F62HCB050	A055F1C0R0-40E	9F60FJD065	-	A055F1D0R0-40E	-	A055B1DAR0-40E	A055C1D0R0-40E
300	42	-	-	-	A055F1C0R0-65E	9F60FJD080	9F62DCB080	A055F1D0R0-65E	-	A055B1DAR0-65E	A055C1D0R0-65E
500	69	-	-	-	-	9F60FJD100	9F62DCB100	A055F1D0R0-100E	-	A055B1DAR0-100E	A055C1D0R0-100E
750	104	-	-	-	-	9F60HJD150	9F62DCB150	A055F1D0R0-150E	-	A055B1DAR0-150E	A055C1D0R0-150E
1000	139	-	-	-	-	9F60HJD200	9F62DCB200	A055F1D0R0-200E	-	A055B1DAR0-200E	A055C1D0R0-200E
1500	208	-	-	-	-	-	9F62FCB300	A055F2D0R0-300E	-	A055B2DAR0-300E	A055C1D0R0-300E
2000	278	-	-	-	-	-	9F62FCB350	A055F2D0R0-400E	-	A055B2DAR0-400E	A055C1D0R0-400E
2500	347	-	-	-	-	-	-	-	9F62KCB500	A055B2D0R0-500E	A055C2D0R0-500E
3000	417	-	-	-	-	-	-	-	9F62KCB600	A055B2D0R0-600E	A055C2D0R0-600E
3750	520	-	-	-	-	-	-	-	9F62KCB700	A055B3D0R0-750E	-
4000	556	-	-	-	-	-	-	-	9F62KCB700	A055B3D0R0-750E	-
4500	625	-	-	-	-	-	-	-	9F62KCB800	A055B3D0R0-900E	-
5000	695	-	-	-	-	-	-	-	9F62KCB900	A055B3D0R0-900E	-

Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
EJO fuses can be used outdoors without an enclosure [2] the self cooled rating of the transformer

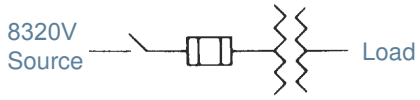
Examples:

1. A new installation has a 300kVA transformer with 4160V primary. It is not fully loaded. What is the typical primary fuse recommended?



A 65 rating (Mersen A055F1DORO-65E or equivalent) is correct. Lower ratings may open when transformer is energized.

2. What is the normal fuse size recommended for a 1500kVA transformer with 12,470V primary?



For this application use a 100E rating A155F2DORO-100E or equivalent which will allow normal overload operations of transformer up to 133% of rating.

Primary Fuses For MV 3-Phase Power Transformers

3 Phase 4800 Volt Typical Primary Fuse Sizing Chart											
Transformer Rating kVA[2]	Full Load Amperes	2 " Ferrule mounting				3 " Ferrule mounting (single and double)			Bolt on		Clip Lock
		9F60 EJ "C"	9F60 EJO "C"	9F62 EJO "C"	A055F	9F60 EJO "D"	9F62 EJO "D"	A055F	9F62 EJO "DDDD"	A055B	A055C
9	1.1	9F60CED005	9F60DJD005	-	-	-	-	-	-	-	-
15	1.8	9F60CED005	9F60DJD005	-	A055F1C0R0-5E	-	-	-	-	-	-
30	3.6	9F60CED010	9F60DJD010	-	A055F1C0R0-7E	-	-	-	-	-	-
45	5.4	9F60CED015	9F60DJD015	-	A055F1C0R0-10E	-	-	A055F1D0R0-10E	-	A055B1DAR0-10E	A055C1D0R0-10E
75	9.0	9F60CED020	9F60DJD020	9F62HCB025	A055F1C0R0-15E	-	-	A055F1D0R0-15E	-	A055B1DAR0-15E	A055C1D0R0-15E
112.5	14	9F60CED030	9F60DJD030	9F62HCB030	A055F1C0R0-20E	-	-	A055F1D0R0-20E	-	A055B1DAR0-20E	A055C1D0R0-20E
150	18	-	-	9F62HCB040	A055F1C0R0-25E	9F60FJD040	-	A055F1D0R0-25E	-	A055B1DAR0-25E	A055C1D0R0-25E
225	27	-	-	9F62HCB050	A055F1C0R0-40E	9F60FJD065	-	A055F1D0R0-40E	-	A055B1DAR0-40E	A055C1D0R0-40E
300	36	-	-	9F62HCB065	A055F1C0R0-50E	9F60FJD065	-	A055F1D0R0-50E	-	A055B1DAR0-50E	A055C1D0R0-50E
500	60	-	-	-	-	9F60FJD100	9F62DCB080	A055F1D0R0-80E	-	A055B1DAR0-80E	A055C1D0R0-80E
750	90	-	-	-	-	9F60HJD125	9F62DCB125	A055F1D0R0-125E	-	A055B1DAR0-125E	A055C1D0R0-125E
1000	120	-	-	-	-	9F60HJD150	9F62DCB150	A055F1D0R0-200E	-	A055B1DAR0-200E	A055C1D0R0-200E
1500	181	-	-	-	-	-	9F62FCB250	A055F2D0R0-250E	-	A055B2DAR0-250E	A055C1D0R0-250E
2000	241	-	-	-	-	-	9F62FCB350	A055F2D0R0-300E	-	A055B2DAR0-400E	A055C1D0R0-400E
2500	301	-	-	-	-	-	9F62FCB400	A055F2D0R0-400E	-	A055B2DAR0-400E	A055C1D0R0-400E
3000	361	-	-	-	-	-	-	-	9F62KCB500	A055B2D0R0-500E	A055C2D0R0-500E
3750	421	-	-	-	-	-	-	-	9F62KCB600	A055B2D0R0-600E	A055C2D0R0-600E
4000	482	-	-	-	-	-	-	-	9F62KCB700	A055B2D0R0-600E	A055C2D0R0-600E
4500	542	-	-	-	-	-	-	-	9F62KCB700	A055B3D0R0-750E	-
5000	602	-	-	-	-	-	-	-	9F62KCB800	A055B3D0R0-900E	-
5500	662	-	-	-	-	-	-	-	9F62KCB900	A055B3D0R0-900E	-
6000	723	-	-	-	-	-	-	-	9F62KCB900	A055B3D0R0-900E	-

Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
EJO fuses can be used outdoors without an enclosure [2] the self cooled rating of the transformer

3 Phase 6900 Volt Typical Primary Fuse Sizing Chart							
Transformer Rating kVA[2]	Full Load Amperes	2 " Ferrule mounting		3 " Ferrule mounting (single and double)			Bolt on
		9F60 EJO "C"	9F62 EJO "C"	9F60 EJO "D"	9F62 EJO "D"	A825X	A072B
9	0.75	9F60DJE003	-	-	-	-	-
15	1.3	9F60DJE005	-	-	-	-	-
30	2.5	9F60DJE010	-	-	-	-	-
45	3.8	9F60DJE010	-	-	-	-	-
75	6.3	-	9H62HCC020	9F60FJE020	-	A825X10-1	-
112.5	9.4	-	9H62HCC020	9F60FJE025	-	A825X15-1	-
150	13	-	9H62HCC025	9F60FJE040	-	A825X20-1	-
225	19	-	9H62HCC040	9F60FJE050	-	A825X25-1	-
300	25	-	9H62HCC040	9F60FJE065	-	A825X40-1	-
500	42	-	-	9F60FJE100	9F62DCC065	A825X65-1	-
750	63	-	-	9F60HJE125	9F62DCC080	A825X80-1	-
1000	84	-	-	9F60HJE150	9F62DCC150	A825X125-1	-
1500	126	-	-	-	9F62FCC200	A825X200-1	-
2000	168	-	-	-	9F62FCC250	-	A072B2D0R0-250E
2500	209	-	-	-	-	-	A072B2D0R0-300E
3000	251	-	-	-	-	-	A072B2D0R0-350E
3500	293	-	-	-	-	-	A072B2D0R0-400E

Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
EJO fuses can be used outdoors without an enclosure [2] the self cooled rating of the transformer

Maximum Fuse Size

The Code allows primary fuses to be sized at 250% of transformer primary current rating or next standard fuse rating. Sizing this large may not provide adequate protection. Maximum fuse size should be determined by making sure the fuse total clearing curve does not exceed transformer damage curve. The transformer manufacturer should be consulted to determine transformer overload and short circuit withstand capability.

Primary Fuses For MV 3-Phase Power Transformers

3 Phase 7200 Volt Typical Primary Fuse Sizing Chart							
Transformer Rating kVA[2]	Full Load Amperes	2 " Ferrule mounting		3 " Ferrule mounting (single and double)			Bolt on
		9F60 EJO "C"	9F62 EJO "C"	9F60 EJO "D"	9F62 EJO "D"	A825X	A072B
9	0.72	9F60DJE003	-	-	-	-	-
15	1.2	9F60DJE005	-	-	-	-	-
30	2.4	9F60DJE010	-	-	-	-	-
45	3.6	9F60DJE010	-	-	-	-	-
75	6.0	-	-	9F60FJE020	-	-	-
112.5	9.0	-	9F62HCC020	9F60FJE025	-	-	-
150	12	-	9F62HCC020	9F60FJE040	-	A825X20-1	-
225	18	-	9F62HCC040	9F60FJE050	-	A825X25-1	-
300	24	-	9F62HCC040	9F60FJE065	-	A825X40-1	-
500	40	-	9F62HCC050	9F60FJE100	-	A825X65-1	-
750	60	-	-	9F60HJE125	9F62DCC080	A825X80-1	-
1000	80	-	-	9F60HJE150	9F62DCC125	A825X125-1	-
1500	120	-	-	9F60HJE200	9F62FCC200	A825X200-1	-
2000	161	-	-	-	9F62FCC200	A825X200-1	-
2500	201	-	-	-	9F62FCC250	-	A072B2D0R0-250E
3000	241	-	-	-	-	-	A072B2D0R0-300E
3500	281	-	-	-	-	-	A072B2D0R0-350E
4000	321	-	-	-	-	-	A072B2D0R0-400E

Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
EJO fuses can be used outdoors without an enclosure
[2] the self cooled rating of the transformer

3 Phase 12,000 Volt Typical Primary Fuse Sizing Chart											
Transformer Rating kVA[2]	Full Load Amperes	2 " Ferrule mounting				3 " Ferrule mounting (single and double)			Bolt on		Clip Lock
		9F60 EJ "C"	9F60 EJO "C"	9F62 EJO "C"	A155F	9F60 EJO "D"	9F62 EJO "D"	A155F	9F62 EJO "DDDD"	A155B	A155C
9	0.43	9F60CJH002	9F60DMH002	-	-	-	-	-	-	-	-
15	0.72	9F60CJH003	9F60DMH003	-	-	-	-	-	-	-	-
30	1.4	9F60CJH005	9F60DMH005	-	-	-	-	-	-	-	-
45	2.2	9F60CJH007	9F60DMH007	-	A155F1C0R0-5E	-	-	-	-	-	-
75	3.6	9F60CJH010	9F60DMH010	-	A155F1C0R0-7E	-	-	-	-	-	-
112.5	5.4	-	-	9F62HDD020	A155F1C0R0-10E	9F60FMH020	-	A155F1D0R0-10E	-	-	A155C1D0R0-10E
150	11	-	-	9F62HDD020	A155F1C0R0-10E	9F60FMH025	-	A155F1D0R0-10E	-	-	A155C1D0R0-10E
225	11	-	-	9F62HDD020	A155F1C0R0-15E	9F60FMH030	-	A155F1D0R0-15E	-	-	A155C1D0R0-15E
300	14	-	-	9F62HDD025	A155F1C0R0-20E	9F60FMH040	-	A155F1D0R0-20E	-	-	A155C1D0R0-20E
500	24	-	-	-	-	9F60HMH065	-	A155F1D0R0-40E	-	-	A155C1D0R0-40E
750	36	-	-	-	-	9F60HMH100	9F62DDD065	A155F1D0R0-50E	-	-	A155C1D0R0-50E
1000	48	-	-	-	-	9F60HMH100	9F62DDD065	A155F1D0R0-65E *	-	-	A155C2D0R0-65E
1500	72	-	-	-	-	-	9F62DDD100	A155F1D0R0-100E *	-	-	A155C2D0R0-100E
2000	96	-	-	-	-	-	9F62FDD150	A155F2D0R0-150E	-	-	A155C3D0R0-150E
2500	120	-	-	-	-	-	9F62FDD175	A155F2D0R0-175E	-	A155B2D0R0-200E	A155C3D0R0-200E
3000	144	-	-	-	-	-	9F62FDD200	A155F2D0R0-200E	-	A155B2D0R0-200E	A155C3D0R0-200E
3500	169	-	-	-	-	-	-	-	-	A155B3D0R0-300E	A155C3D0R0-250E
4000	193	-	-	-	-	-	-	-	-	A155B3D0R0-300E	A155C3D0R0-250E
4500	217	-	-	-	-	-	-	-	9F62KED300	A155B3D0R0-300E	A155C3D0R0-300E
5000	241	-	-	-	-	-	-	-	9F62KED300	A155B3D0R0-300E	A155C3D0R0-300E

Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
EJO fuses can be used outdoors without an enclosure
[2] the self cooled rating of the transformer
* use F2 in place of F1 for double barrel fuses

Primary Fuses For MV 3-Phase Power Transformers

3 Phase 12,470 Volt Typical Primary Fuse Sizing Chart											
Transformer Rating kVA[2]	Full Load Amperes	2 " Ferrule mounting				3 " Ferrule mounting (single and double)			Bolt on		Clip Lock
		9F60 EJ "C"	9F60 EJO "C"	9F62 EJO "C"	A155F	9F60 EJO "D"	9F62 EJO "D"	A155F	9F62 EJO "DDDD"	A155B	A155C
30	1.4	9F60CJH005	9F60DMH005	-	-	-	-	-	-	-	-
45	2.1	9F60CJH007	9F60DMH007	-	A155F1C0R0-5E	-	-	-	-	-	-
75	3.5	9F60CJH010	9F60DMH010	-	A155F1C0R0-7E	-	-	-	-	-	-
112.5	5.2	-	-	9F62HDD020	A155F1C0R0-10E	9F60FMH020	-	A155F1D0R0-10E	-	-	A155C1D0R0-10E
150	7.0	-	-	9F62HDD020	A155F1C0R0-10E	9F60FMH020	-	A155F1D0R0-10E	-	-	A155C1D0R0-10E
225	10	-	-	9F62HDD020	A155F1C0R0-15E	9F60FMH025	-	A155F1D0R0-15E	-	-	A155C1D0R0-15E
300	14	-	-	9F62HDD025	A155F1C0R0-20E	9F60FMH040	-	A155F1D0R0-20E	-	-	A155C1D0R0-20E
500	23	-	-	9F62HDD030	A155F1C0R0-30E	9F60FMH050	-	A155F1D0R0-30E	-	-	A155C1D0R0-30E
750	35	-	-	-	-	9F60HMH065	9F62DDD065	A155F1D0R0-50E	-	-	A155C1D0R0-50E
1000	46	-	-	-	-	9F60HMH080	9F62DDD065	A155F1D0R0-65E*	-	-	A155C1D0R0-65E
1500	70	-	-	-	-	-	9F62DDD100	A155F1D0R0-100E*	-	-	A155C1D0R0-100E
2000	93	-	-	-	-	-	9F62FDD125	A155F2D0R0-125E	-	-	A155C2D0R0-125E
2500	116	-	-	-	-	-	9F62FDD150	A155F2D0R0-150E	-	A155B2D0R0-200E	A155C3D0R0-200E
3000	139	-	-	-	-	-	9F62FDD175	A155F2D0R0-175E	-	A155B2D0R0-200E	A155C3D0R0-200E
3500	162	-	-	-	-	-	9F62FDD200	A155F2D0R0-200E	-	A155B2D0R0-200E	A155C3D0R0-200E
4000	185	-	-	-	-	-	-	-	-	A155B2D0R0-300E	A155C3D0R0-250E
4500	209	-	-	-	-	-	-	-	-	A155B2D0R0-300E	A155C3D0R0-250E
5000	232	-	-	-	-	-	-	-	9F62KED300	A155B2D0R0-300E	A155C3D0R0-300E
5500	255	-	-	-	-	-	-	-	9F62KED300	A155B2D0R0-300E	A155C3D0R0-300E

Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
EJO fuses can be used outdoors without an enclosure
[2] the self cooled rating of the transformer
* use F2 in place of F1 for double barrel fuses

3 Phase 13,200 Volt Typical Primary Fuse Sizing Chart											
Transformer Rating kVA[2]	Full Load Amperes	2 " Ferrule mounting				3 " Ferrule mounting (single and double)			Bolt on		Clip Lock
		9F60 EJ "C"	9F60 EJO "C"	9F62 EJO "C"	A155F	9F60 EJO "D"	9F62 EJO "D"	A155F	9F62 EJO "DDDD"	A155B	A155C
9	0.4	9F60CJH002	9F60DMH002	-	-	-	-	-	-	-	-
15	0.7	9F60CJH003	9F60DMH003	-	-	-	-	-	-	-	-
30	1.3	9F60CJH005	9F60DMH005	-	-	-	-	-	-	-	-
45	2.0	9F60CJH007	9F60DMH007	-	A155F1C0R0-5E	-	-	-	-	-	-
75	3.3	9F60CJH010	9F60DMH010	-	A155F1C0R0-7E	-	-	-	-	-	-
112.5	4.9	-	-	-	A155F1C0R0-10E	9F60FMH015	-	A155F1D0R0-10E	-	-	A155C1D0R0-10E
150	6.6	-	-	-	A155F1C0R0-10E	9F60FMH020	-	A155F1D0R0-10E	-	-	A155C1D0R0-10E
225	10	-	-	9F62HDD020	A155F1C0R0-15E	9F60FMH030	-	A155F1D0R0-15E	-	-	A155C1D0R0-15E
300	13	-	-	9F62HDD025	A155F1C0R0-20E	9F60FMH040	-	A155F1D0R0-20E	-	-	A155C1D0R0-20E
500	22	-	-	9F62HDD030	A155F1C0R0-30E	9F60HMH065	-	A155F1D0R0-30E	-	-	A155C1D0R0-30E
750	33	-	-	-	-	9F60HMH080	9F62DDD050	A155F1D0R0-50E	-	-	A155C1D0R0-50E
1000	44	-	-	-	-	9F60HMH100	9F62DDD065	A155F1D0R0-65E*	-	-	A155C1D0R0-65E
1500	66	-	-	-	-	-	9F62DDD100	A155F1D0R0-100E*	-	-	A155C1D0R0-100E
2000	88	-	-	-	-	-	9F62FDD125	A155F2D0R0-125E	-	-	A155C2D0R0-125E
2500	109	-	-	-	-	-	9F62FDD150	A155F2D0R0-150E	-	-	A155C3D0R0-150E
3000	131	-	-	-	-	-	9F62FDD175	A155F2D0R0-200E	-	A155B2D0R0-200E	A155C3D0R0-200E
3500	153	-	-	-	-	-	9F62FDD200	A155F2D0R0-200E	-	A155B2D0R0-200E	A155C3D0R0-200E
4000	175	-	-	-	-	-	-	-		A155B2D0R0-200E	A155C3D0R0-250E
4500	197	-	-	-	-	-	-	-		A155B2D0R0-300E	A155C3D0R0-250E
5000	219	-	-	-	-	-	-	-	9F62KED300	A155B2D0R0-300E	A155C3D0R0-300E
5500	241								9C62KED300	A155B2D0R0-300E	A155C3D0R0-300E

Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
EJO fuses can be used outdoors without an enclosure
[2] the self cooled rating of the transformer
* use F2 in place of F1 for double barrel fuses

Primary Fuses For MV 3-Phase Power Transformers

3 Phase 13,800 Volt Typical Primary Fuse Sizing Chart											
Transformer	Full Load	2 " Ferrule mounting				3 " Ferrule mounting (single and double)			Bolt on		Clip Lock
Rating kVA[2]	Amperes	9F60 EJ "C"	9F60 EJO "C"	9F62 EJO "C"	A155F	9F60 EJO "D"	9F62 EJO "D"	A155F	9F62 EJO "DDDD"	A155B	A155C
30	1	9F60CJH005	9F60DMH005	-	-	-	-	-	-	-	-
45	2	9F60CJH007	9F60DMH007	-	A155F1C0R0-5E	-	-	-	-	-	-
75	3	9F60CJH010	9F60DMH010	-	A155F1C0R0-7E	-	-	-	-	-	-
112.5	5	-	-	-	A155F1C0R0-10E	9F60FMH015	-	A155F1D0R0-10E	-	-	A155C1D0R0-10E
150	6	-	-	-	A155F1C0R0-10E	9F60FMH020	-	A155F1D0R0-10E	-	-	A155C1D0R0-10E
225	9	-	-	9F62HDD020	A155F1C0R0-15E	9F60FMH030	-	A155F1D0R0-15E	-	-	A155C1D0R0-15E
300	13	-	-	9F62HDD025	A155F1C0R0-20E	9F60FMH030	-	A155F1D0R0-20E	-	-	A155C1D0R0-20E
500	21	-	-	9F62HDD030	A155F1C0R0-30E	9F60FMH040	-	A155F1D0R0-30E	-	-	A155C1D0R0-30E
750	31	-	-	-	-	9F60HMH065	9F62DDD050	A155F1D0R0-50E	-	-	A155C1D0R0-50E
1000	42	-	-	-	-	9F60HMH080	9F62DDD065	A155F1D0R0-65E*	-	-	A155C1D0R0-65E
1500	63	-	-	-	-	9F60HMH100	9F62DDD100	A155F1D0R0-100E*	-	-	A155C1D0R0-100E
2000	84	-	-	-	-	-	9F62FDD125	A155F2D0R0-125E	-	-	A155C2D0R0-125E
2500	105	-	-	-	-	-	9F62FDD150	A155F2D0R0-150E	-	-	A155C3D0R0-150E
3000	126	-	-	-	-	-	9F62FDD200	A155F2D0R0-200E	-	A155B2D0R0-200E	A155C3D0R0-200E
3500	147	-	-	-	-	-	9F62FDD200	A155F2D0R0-200E	-	A155B2D0R0-200E	A155C3D0R0-200E
4000	168	-	-	-	-	-	-	-	-	A155B2D0R0-300E	A155C3D0R0-250E
4500	188	-	-	-	-	-	-	-	-	A155B2D0R0-300E	A155C3D0R0-250E
5000	209	-	-	-	-	-	-	-	-	A155B2D0R0-300E	A155C3D0R0-300E
5500	230	-	-	-	-	-	-	-	9F62KED300	A155B2D0R0-300E	A155C3D0R0-300E
6000	251	-	-	-	-	-	-	-	9F62KED300	A155B2D0R0-300E	A155C3D0R0-300E

Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
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[2] the self cooled rating of the transformer
* use F2 in place of F1 for double barrel fuses

3 Phase 14,400 Volt Typical Primary Fuse Sizing Chart											
Transformer	Full Load	2 " Ferrule mounting				3 " Ferrule mounting (single and double)			Bolt on		Clip Lock
Rating kVA[2]	Amperes	9F60 EJ "C"	9F60 EJO "C"	9F62 EJO "C"	A155F	9F60 EJO "D"	9F62 EJO "D"	A155F	9F62 EJO "DDDD"	A155B	A155C
9	0.4	9F60DMH002	9F60CJH002	-	-	-	-	-	-	-	-
15	0.6	9F60DMH003	9F60CJH003	-	-	-	-	-	-	-	-
30	1.2	9F60DMH005	9F60CJH005	-	-	-	-	-	-	-	-
45	1.8	9F60DMH007	9F60CJH007	-	A155F1C0R0-5E	-	-	-	-	-	-
75	3.0	9F60DMH010	9F60CJH010	-	A155F1C0R0-7E	-	-	-	-	-	-
112.5	5	-	-	-	A155F1C0R0-10E	9F60FMH015	-	A155F1D0R0-10E	-	-	A155C1D0R0-10E
150	6	-	-	-	A155F1C0R0-10E	9F60FMH020	-	A155F1D0R0-10E	-	-	A155C1D0R0-10E
225	9	-	-	9F62HDD020	A155F1C0R0-15E	9F60FMH030	-	A155F1D0R0-15E	-	-	A155C1D0R0-15E
300	12	-	-	9F62HDD020	A155F1C0R0-20E	9F60FMH040	-	A155F1D0R0-20E	-	-	A155C1D0R0-20E
500	20	-	-	9F62HDD030	A155F1C0R0-30E	9F60FMH050	-	A155F1D0R0-30E	-	-	A155C1D0R0-30E
750	30	-	-	-	-	9F60FMH080	9F62DDD050	A155F1D0R0-40E	-	-	A155C1D0R0-50E
1000	40	-	-	-	-	9F60FMH100	9F62DDD065	A155F1D0R0-65E*	-	-	A155C1D0R0-65E
1500	60	-	-	-	-	-	9F62DDD080	A155F1D0R0-80E*	-	-	A155C1D0R0-100E
2000	80	-	-	-	-	-	9F62FDD125	A155F2D0R0-125E	-	-	A155C2D0R0-125E
2500	100	-	-	-	-	-	9F62FDD150	A155F2D0R0-150E	-	-	A155C3D0R0-150E
3000	120	-	-	-	-	-	9F62FDD175	A155F2D0R0-175E	-	A155B2D0R0-200E	A155C3D0R0-200E
3500	140	-	-	-	-	-	9F62FDD200	A155F2D0R0-200E	-	A155B2D0R0-200E	A155C3D0R0-200E
4000	161	-	-	-	-	-	-	-	-	A155B2D0R0-200E	A155C3D0R0-250E
4500	181	-	-	-	-	-	-	-	-	A155B2D0R0-300E	A155C3D0R0-250E
5000	201	-	-	-	-	-	-	-	-	A155B2D0R0-300E	A155C3D0R0-300E
5500	221	-	-	-	-	-	-	-	9F62KED300	A155B2D0R0-300E	A155C3D0R0-300E
6000	241	-	-	-	-	-	-	-	9F62KED300	A155B2D0R0-300E	A155C3D0R0-300E

Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
EJO fuses can be used outdoors without an enclosure
[2] the self cooled rating of the transformer
* use F2 in place of F1 for double barrel fuses

Primary Fuses For MV 3-Phase Power Transformers

3 Phase 22,000 Volt Typical Primary Fuse Sizing Chart			
Transformer Rating kVA[2]	Full Load Amperes	2 " Ferrule mounting 9F60 EJO "C"	3 " Ferrule mounting (single and double) 9F60 EJO "D"
30	0.79	9F60DNJ003	-
45	1.18	9F60DNJ004	-
75	1.97	9F60DNJ005	-
112.5	2.95	9F60DNJ006	-
150	3.93	9F60DNJ010	-
225	5.9	-	9F60FNJ020
300	7.84	-	9F60FNJ020
500	13.1	-	9F60FNJ030
750	19.7	-	9F60FNJ050
1000	26.2	-	9F60HNJ065
1500	39.4	-	9F60HNJ080
2000	52.4	-	9F60HNJ100

Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
EJO fuses can be used outdoors without an enclosure
[2] the self cooled rating of the transformer

3 Phase 33.,000 Volt Typical Primary Fuse Sizing Chart			
Transformer Rating kVA[2]	Full Load Amperes	3 " Ferrule mounting (single and double)	
		9F60 EJO "D" with indicator	9F60 EJO "D" without indicator
45	0.79	9F60FPK002	9F60FPT002
75	1.31	9F60FPK005	9F60FPT005
112.5	1.98	9F60FPK005	9F60FPT005
150	2.62	9F60FPK007	9F60FPT007
225	3.96	9F60FPK010	9F60FPT010
300	5.26	9F60FPK015	9F60FPT015
500	8.71	9F60FPK025	9F60FPT025
750	13.1	9F60FPK030	9F60FPT030
1000	17.5	9F60FPK040	9F60FPT040
1500	26.2	9F60HPK065	9F60HPT065
2000	35	9F60HPK065	9F60HPT065
2500	43.7	9F60HPK080	9F60HPT080

Fuses will carry transformer magnetizing inrush current of 25 times full load amperes for .01 second and 12 times full load current for .1 second
EJO fuses can be used outdoors without an enclosure
[2] the self cooled rating of the transformer

Primary Fuses For LV Control Transformers

Control circuit transformers used as part of a motor control circuit are to be protected as outlined in Tables 1 & 2 (p. P14) with one important exception. Primary fuses may be sized up to 500% of transformer rated primary current if the rated primary current is less than 2 amperes.

When a control circuit transformer is energized, the typical magnetizing inrush will be 25-40 times rated primary full load current (FLA) for the first 1/2 cycle and dissipates to rated current in a few cycles. Fuses must be sized so they do not open during this inrush. We recommend that fuses be selected to withstand 40 x FLA for .01 sec. and to stay within the NEC guidelines specified above.

For example: 300VA Transformer, 600 V primary.

$$I_{pri} = \frac{\text{Transformer VA}}{\text{Primary V}} = \frac{300}{600} = 1/2A = FLA$$

The fuse time-current curve must lie to the right of the point 40 x (1/2A) = 20A @ .01 sec.

Secondary fuses are still sized at 125% of the secondary FLA.

Recommended Primary Fuses for Single Phase Control Transformers

Trans	600 Volt Primary						480 Volt Primary					
VA	FLA	ATQR	ATMR	A6D-R+	AJT+	TRS-R	FLA	ATQR	ATMR	A6D-R+	AJT+	TRS-R
25	.042	1/10	2/10	2/10	-	1/10	.052	1/10	1/4	1/4	-	1/10
50	.083	1/4	3/10*	4/10	-	2/10	.104	1/4	1/2*	1/2	-	2/10
75	.125	1/4	1/2*	6/10	-	2/10	.156	3/10	3/4*	6/10	-	2/10
100	.167	3/10	3/4*	8/10	-	3/10	.208	4/10	1	1	1	3/10
130	.22	4/10	1	1	1	4/10	.27	1/2	1	1	1-1/2	4/10
150	.25	1/2	1*	1-1/4	1	4/10	.313	1/2	1-1/2	1-4/10	1-1/2	4/10
200	.33	1/2	1-1/2	1-6/10	1-1/2	6/10	.417	6/10	2	2	2	6/10
250	.42	6/10	2	2	2	6/10	.52	8/10	2	2-1/2	2-1/2	6/10
300	.50	1	2	2-1/2	2	8/10	.62	1-1/2	3	3	3	8/10
350	.583	1-1/4	2	2-8/10	2	1	.73	1-1/2	3-1/2	3-1/2	3-1/2	1
500	.833	1-1/2	4	4	4	1-1/4	1.04	2	5	4	4	1-4/10
750	1.25	2-1/2	6	4	4	1-6/10	I.56	3*	7	5	5	2
1000	1.67	3	8	5	5	2-1/4	2.08	4+	-	5+	5+	3
1500	2.5	5+	-	6+	6+	4	3.125	7+	-	6-1/4+	6-1/4+	4
2000	3.33	8+	-	8+	8+	5	4.17	10+	-	7+	7+	5
3000	5.00	12+	-	12+	12+*	8	6.25	15+*	-	15+*	15+	8
5000	8.33	20+*	-	20+*	20+**	12+	10.4	-	-	25+*	25+*	15+
7500	12.5	30+*	-	30+*	30+**	17-1/2+	15.6	-	-	35+**	35+**	20+
10000	16.7	-	-	40+*	40+**	25+	20.8	-	-	50+**	50+**	30+
		240 Volt Primary					120 Volt Primary					
25	.104	2/10	1/2	1/2	-	2/10	.21	4/10	1	1	1	3/10
50	.21	4/10	1	1	1	3/10	.42	6/10	2	2	2	6/10
75	.31	1/2	1-1/2	1-4/10	1-1/2	4/10	.6	1	3	3	3	8/10
100	.42	6/10	2	2	2	6/10	.83	1-1/2	4	4	4	1
130	.54	1	2-1/2	2-1/2	2-1/2	8/10	1.08	2-1/2	5	4	4	1-6/10
150	.625	1	3	3	3	8/10	1.25	2-1/2	6	4	4	1-6/10
200	.83	1-1/2	4	3-1/2	3-1/2	1	1.67	3*	8	5	5	2-1/4
250	1.04	2	5	4	4	1-4/10	2.08	4+	-	5+	5+	2-8/10
300	1.25	2-1/2	6	4	4	1-6/10	2.5	5+	-	6+	6+	3-2/10
350	1.46	3*	7	5	5	2	2.92	7+	-	6+	6+	4
500	2.08	4+	-	5+	5+	2-8/10	4.17	10+	-	10+	6	5-6/10
750	3.13	7+	-	6-1/4+	6-1/4+	4	6.25	15+*	-	15+**	15+	8
1000	4.2	10+	-	7	7	5-6/10	8.33	20+*	-	20+**	20+*	12+
1500	6.25	15+		15+	15+	8	12.5	30+*	-	30+	30+	15
2000	8.3	20+*	-	20+**	20+**	12	16.7	-	-	40+**	40+	25+
3000	12.5	30+*	-	30+**	30+**	15	25	-	-	60+**	60+*	35+
5000	20.8	-	-	50+**	50+*	25	41.7	-	-	100+**	100+**	60+
7500	31.3	-	-	70+**	70+**	40+	62.5	-	-	150+**	150+**	90+
10000	41.7	-	-	100+**	100+**	60+	83.3	-	-	200+**	200+**	125+

The above fuses will withstand 40 x FLA for .01 second except where noted.
+ Secondary fusing required.
* Fuse will withstand 30 x FLA for .01 second.
** Fuse will withstand 35 x FLA for .01 second.

Surge-Trap® SPD Application Information

What is the Surge-Trap SPD?

The Surge-Trap is a branded surge protection device (SPD) that utilizes Mersen's patented thermally protected metal oxide varistor (TPMOV®) technology. This technology eliminates the need for fuses to be installed in series with the Surge-Trap SPD, which saves money and panel space. Surge-Trap SPD is typically installed in industrial control panels to protect sensitive electrical equipment from harmful voltage transients. Nearly 80% of all transients are caused by equipment or power disturbances within a facility.

What Types of Ratings Do SPDs Have?

Do SPDs have a current rating? This is a trick question! They do not have a continuous current rating however they do have other important current-based ratings. They are required to have a short circuit current rating (SCCR), which is the maximum rms current at a specified voltage the SPD can withstand.

The nominal discharge current (In) is new to UL 1449 Third Edition (effective 9/29/09). This is the peak value of the current (20kA maximum) through the SPD (8/20µs waveform) where the SPD remains functional after 15 surges.

There are two main voltage ratings for an SPD, the first is maximum continuous operating voltage (MCOV) which is the maximum rms voltage that may be applied to the SPD per each connected mode.

Voltage protection rating (VPR) is determined as the nearest high value (from a list of preferred values) to the measured limiting voltage determined during the transient-voltage surge suppression test using the combination wave generator at a setting of 6kV, 3kA.

How Do I Select The Correct SPD?

When selecting an SPD you must make sure that the available fault current is less than or equal to the SCCR of the SPD. The nominal discharge current should be as high as possible because an SPD with a higher In will be able to handle more surges (at lower currents) then one with a lower In.

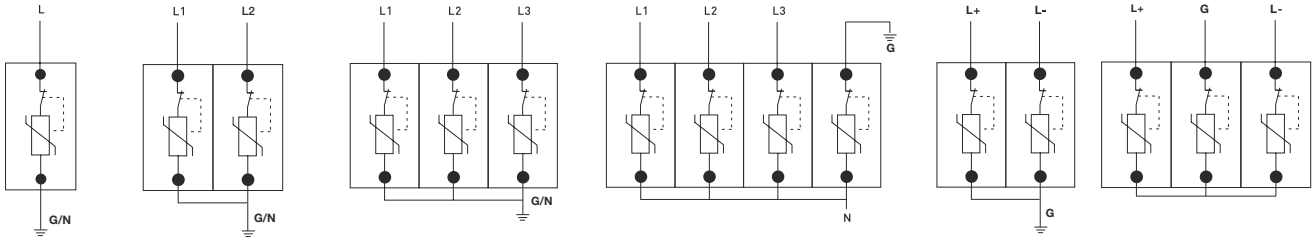
Mersen makes it easy to select the correct Surge-Trap SPD. All you need to know is the system voltage, configuration and short circuit current. All Surge-Trap SPDs have a 100kA SCCR (without fuses), which you need to make sure is not exceeded. From the selection chart, find your voltage configuration and preferred protections modes. There is no need to worry about the nominal discharge current as all Surge-Trap SPDs are rated at the UL maximum 20kA.



Surge-Trap® SPD Application Information

How Is an SPD Installed and How Does It Work?

A Surge-Trap SPD is always installed in parallel with the load. When the circuit has the normal operating voltage the Surge-Trap SPD will not be conducting current. Once the system experiences an overvoltage the Surge-Trap SPD will “turn on” and begin to conduct the extra voltage to ground, allowing the load to continue running at the correct voltage. This operation is similar to a pressure relief valve in a steam system.





Single Phase
2 Wire + Ground

Split Phase
3 Wire + Ground

3 Phase Delta
3 Wire + Ground

3 Phase Wye
4 Wire + Ground

How Do I Retro Fit an Existing Panel?

Providing there is adequate space, retro fitting an existing panel with a Surge-Trap SPD is easy. Typical industrial control panels will have a main disconnect that feeds a power distribution block (PDB) and then on to the individual loads. The Surge-Trap SPD mounts on standard 35mm DIN-rail typically found inside the panel. It should be installed as close as possible to the PDB and connected with #6-#14 AWG, the wire should not exceed 20” in length. It is important to make sure the wires are not twisted together nor have any loops, as this will result in higher let-thru voltages.

Surge-Trap® SPD Application Information

Q1: What is SPD?

A: SPD is an abbreviation for “Surge Protective Device.” A SPD is a device that attenuates (reduces in magnitude) random, high energy, short duration electrical power anomalies caused by utilities, atmospheric phenomena, or inductive loads. Such anomalies occur in the form of voltage and current spikes with duration of less than half an AC cycle. These high-energy power spikes can damage sensitive electronic equipment, such as computers, instrumentation, and process controllers.

Q2: How do surge suppressors work?

A: Surge Suppressors are designed to divert high-energy power away from a load by providing a lower impedance path to common point earth ground. Surge suppressors used most often for panel board protection have metal oxide varistors (MOVs) connected in parallel.

Q3: What types of components make up a surge suppressor?

A: The device most commonly used in an AC surge suppressor is an MOV comprised of solid-state zinc oxide with multiple junctions. MOVs provide low impedance when conducting, and are packaged for specific voltages and current handling capacities. Other devices (more typically found in DC applications) include single junction diodes and gas tubes that ionize at preset voltages.

Q4: Where are surge suppressors installed?

A: AC surge suppressors are typically installed in these three areas:

- At a utility service entrance for protection of an entire facility.
- In distribution panel boards and switchboards for protection of sensitive downstream loads;
- Connected to a wall outlet for individual protection of a specific piece of equipment, such as a computer or solid-state controller.

Q5: What is surge current capacity?

A: Surge current capacity, as defined by NEMA standards, is the maximum level of current a surge suppressor can withstand for a single transient event. This level is used to indicate the protection capacity of a surge suppressor.

Q6: What is clamping voltage?

A: Clamping voltage, also known as suppressed voltage rating (SVR), is the voltage a surge suppressor permits to pass to the attached load during a transient event. Clamping voltage is a performance measurement of a surge suppressor’s ability to attenuate a transient. This performance value is confirmed by Underwriters Laboratories (UL) during tests conducted while evaluating a surge suppressor for listing.

Q7: What features should be considered when selecting a surge suppressor?

A: Two important areas to consider during the selection of a surge suppressor are performance and safety, and include the following criteria:

Performance: 1) surge current capacity; and 2) Short circuit rating.

Make sure your surge device is not fuse limited. Many manufactures need fusing in front of the device to pass UL testing conditions.

Q8: What is important when specifying a SPD?

A: When specifying SPD, submit a clear, concise specification detailing the required performance and design features. A minimum specification should include:

- UL surge rating
- Suppression rating
- Short circuit rating
- Peak surge current per mode (L-N, L-G, and N-G)
- Voltage and configuration of electrical service

Q9: What is the difference between UL 1449 Listed and UL 1449 Component Recognized?

A: UL 1449 Component Recognized products are required to pass the same performance tests as UL 1449 Listed products. The main difference is the listed devices are packaged differently, meaning they are tested and listed in stand-alone enclosures.

Q: What key changes were made in the UL 1449 3rd Edition?

A: The UL 1449 3rd Edition includes all of the 2nd Edition changes plus the addition of more rigorous safety testing requirements. The major differences include (1) change in terminology from Transient Voltage Surge Suppressors to Surge Protective Devices, (2) the UL 3rd Edition is now an American National Standard (ANSI), (3) addition of nominal discharge current ratings and markings (4) duty cycle test at nominal discharge current, and (5) measured limiting voltage now performed at 6kV / 3kA.

Q10: What are C62.41 and C62.45?

A: C62.41 and C62.45 are IEEE standards used to describe the characteristics of a transient and how a surge suppressor is tested to evaluate performance.

C62.41 defines a transient and describes the transient environment at three separate facility locations. These locations are a service entrance (Category C-the most severe), a distribution panel board or switchboard (Category B), and a wall outlet (Category A). C62.41 is also a reference document that specifying engineers refer to for application information for defining a transient environment in a particular facility location. C62.45 describes in detail how a surge suppressor performance test is to be conducted.

Q11. How is the Surge-Trap SPD more cost efficient than other SPD options?

A: The Surge-Trap SPD is a no-fuse surge suppressor.

1. It does not need coordinated fusing or have the expense of the fuses, fuse holder, additional wiring and in meeting the UL or IEC requirements/standards.
2. Surge-Trap's compact design helps save valuable space in the cabinet.
3. Offers modular and pluggable din-rail style with IP20 grade finger-safe protection.
4. Complies with latest UL 1449 Third Edition and IEC 61643-1 Standards.

Surge-Trap® SPD Glossary & Definitions

The following definitions apply specifically to surge protective devices (SPD). They are provided for further clarification of the performance specifications in the data sheets.

Crest Value (peak): The maximum value that a wave, surge, or impulse attains. It is generally associated with the front of a wave.

Clamping Voltage: The peak voltage across the surge protective device (SPD) measured under the conditions of a specified surge current and waveform. Peak voltage and peak current are not necessarily coincident in time.

Impulse: A wave (surge) of unidirectional polarity. In testing, the rise time and duration of the impulse are specified, e.g., an 8/20µs impulse, a 10/350µs impulse.

Maximum Continuous Operating Voltage (MCOV): The maximum rms value of the power frequency voltage that may be applied continuously between the terminals of the surge protective device.

Nominal System Voltage: A nominal value assigned to designate a system of a given voltage class, e.g., 120/240 Volt single phase. Note: see ANSI C84.1-1989

Operating Duty Cycle: One or more operations per unit of time as specified.

Pulse Life: The number of surges of a specified voltage and current amplitude and waveform that may be applied to a SPD without causing a change of more than 10 percent in the clamping voltage. The time interval between surges must be specified.

Maximum Single Impulse Current: The maximum amplitude of current which may be applied for a single 8/20µs impulse without causing device failure.

Power Dissipation: The power dissipated by a protective device while connected to an AC line of the rated voltage and frequency while no over voltage condition or surge exists. Steady state power dissipation.

Response Time: The time domain response of a surge protective device to the front of a voltage waveform depends on the rate-of-rise of the incident wave, the impedance of the surge source and connecting wiring, the effects of protective device reactance, and the response behavior of conducting mechanisms within active suppression elements. In other words, response to the front of a wave can be affected more by the test circuit conditions, including lead inductance, than by the response time of the active suppression element.

Surge: A transient wave of current, potential, or power in an electric circuit.

Surge Let-Through: The voltage seen by the protected load, includes the SPD clamp voltage plus the voltage drop in the connecting wires. The part of the surge impulse that passes through the protective device.

Surge Protective Device (SPD): A device for limiting the surge voltage on equipment by discharging or diverting surge current. A SPD should be able to repeatedly perform these functions as specified.

Turn-On Time: The time required for a device to make the transition from an “OFF” state to an “ON” state.

Turn-Off Time: The time required for a device to make the transition from an “ON” state to an “OFF” state.

Voltage-Current (V-I) Characteristics: The relationship between the suppressed voltage and the magnitude of the surge current which induces this voltage.

Semiconductor Protection

Solid state devices have progressed through several generations of sophistication since their introduction in the 1940s. Fuse designs have changed to match solid state protection demands.

The protection task looks simple- choose a fuse of correct voltage and ampere rating which will protect a solid state device (diode, silicon-controlled rectifier, triac, etc.) through a wide range of overcurrents, yet carry normal rated loads without deterioration through a long life.

Solid state power devices operate at high current densities. Cooling is a prime consideration. The fuse should be cooled with the solid state device. Cycling conditions must be considered. The ability of solid state devices to switch high currents at high speed subjects fuses to thermal and mechanical stresses. Proper fuse selection is mandatory for long-term reliability.

Solid state devices have relatively short thermal time constants. An overcurrent which may not harm an electromechanical device can cause catastrophic failure of a solid state device.

Many solid state devices have an overcurrent withstand rating which is termed "I^2t for fusing". These values are found in most power semiconductor application handbooks.

Fuses intended for solid state device protection are rated in terms of total clearing I^2t. Fuses and devices are matched so that the total clearing I^2t of the fuse is less than the withstand I^2t for the device.

The published fuse total clearing I^2t values are derived from short-circuit test oscillograms of the fuse under controlled conditions. The end application can vary significantly from the tested conditions. The specifier must take these differences into account since they will affect fuse clearing I^2t.

For application guidelines, request the Mersen publication titled Power Semiconductor Fuse Application Guide, and the software program titled Select a Fuse for Power Electronics.

DC Circuit Protection

AC applications are more common than DC. This is why fuses are generally designed, tested and rated for AC. Fuses rated for AC are also capable of DC circuit interruption. The key question is how much DC voltage interrupting capability does an AC rated fuse have? There is no safe rule of thumb that will convert AC voltage rating to a DC voltage rating. Testing is required to determine the DC voltage rating of a fuse. This section covers AC fuses that have been tested for DC applications. Mersen is a leader in DC protection, offering a line of DC fuses. Contact Technical Services for further information.

DC Circuit Parameters

The degree of difficulty of interrupting a DC circuit is a function of the voltage, current and circuit time constant. The higher the voltage and time constant, the more difficult the interruption is for the fuse.

Time constant is defined as **t = L/R** where:

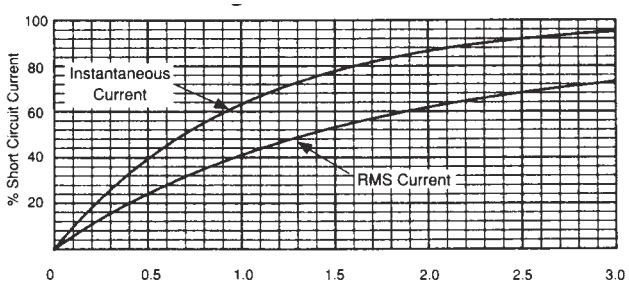
t is time constant in seconds
L is inductance in henrys
R is resistance in ohms

If rated voltage is applied, 63% of rated current will be reached in one time constant.

DC Short Circuit

Graph A shows the relationship of current as a function of time during a DC short circuit.

Graph A- Current as a Function of Time During a DC Short Circuit



Time Constants (n)

Instantaneous Current (I inst) = Isc [I - e^{-n}]

RMS Current (I rms) = $Isc\sqrt{\frac{1 + 2e^{-n}}{n} - \frac{e^{-2n}}{2n} - \frac{1.5}{n}}$

Where Isc = short circuit current, n = number of time constants

Example

Given: Voltage = 600VDC
Circuit Resistance (R) = 0.1 ohm
Circuit Inductance (L) = 1.0 x 10-3 henry

Isc = 600 Volts = 6000 Amperes
0.1 ohm

t (time constant) = L/R = $\frac{1.0 \times 10\text{-}3 \text{ henry}}{0.1 \text{ ohm}}$ = .01 second

In the example, if a short circuit occurs, the instantaneous current will rise to .63 x 6000 = 3780 amperes in .01 second (one time constant). In .05 second (5 time constants) the short-circuit current will reach its ultimate value of 6000 amperes.

DC Circuit Protection

Typical Time Constants

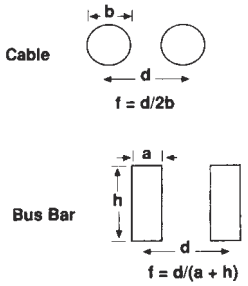
The time constant of a circuit is a function of the resistance and inductance of the components in the circuit. Here are typical time constants associated with the different DC voltage sources:

Less than 10 milliseconds	Battery supply of capacitor bank
Less than 25 milliseconds	Bridge circuit
10 to 40 milliseconds	Armature circuit of DC motor
1 second*	Field winding of DC motor

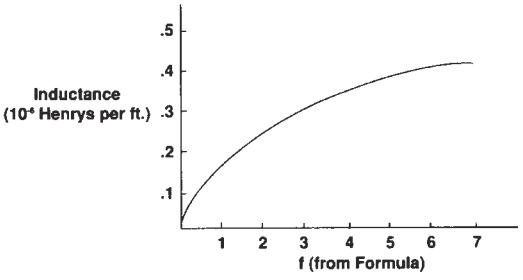
* Where time constants exceed 100 milliseconds, we do not recommend the use of fuses. A fuse can be used to interrupt short circuits in these cases, but only under conditions where the inductance (load) is effectively by-passed.

Maximum parallel conductor inductance can be assumed to be less than .5 x 10–6 henry per foot of conductor. Graph B approximates conductor inductance based on conductor size and spacing.

Conductor End Views



Graph B- Conductor Inductance



Third Party Approval Listing

Underwriters Laboratories and the Mine Safety and Health Administration (MSHA) are third party organizations which test and list or approve fuses for DC application, respectively.

Two UL standards exist for the DC rating of fuses. UL 248, entitled Low Voltage Fuses which provides for both AC and DC rating of UL class fuses in accordance with the Code. The previous standard UL 198L has been absorbed into UL 248. UL 198M, entitled Mine-Duty Fuses addresses the DC rating of Class R and Class K fuses intended for the short circuit protection of trailing cables in mines. UL198M is equivalent to the requirements of MSHA, which are administered by the United States Department of Labor. The MSHA requirements for approval of DC rated fuses are specified in the Code of Federal Regulations, Title 30, Part 28.

Table 1 shows the voltage ratings and time constants associated with these standards.

Mersen fuses which have been tested and rated for DC by third party certification agencies are shown in Table 2 and Table 3. The Mersen Applications Engineering Department should be contacted for assistance with applications not served by these products.

Table 1- DC Parameters of UL and MSHA Standards

Standard	Voltage	Time Constant	Test Current
UL248	Up to 600V DC	.01 second	10kA or higher
MSHA & UL198M	300 or 600V DC	.016 second	10kA or higher
		.008 second	1kA to 9.99kA
		.006 second	100A to 999A
		.002 second	Less than 100A

Table 2- DC Rating of General Purpose Mersen Fuses

Fuse Family	Fuse Ampere Rating	DC Voltage Rating	DC Interrupting Rating	Listing Or Approval
A2D-R	15-600	250	100kA	UL248-1
A3T	1-1200	160	50kA	UL248-1
A4BQ	601-2000	500	100kA	UL248-1
A6D-R	0-600	600	100kA	UL248-1
A6T	1-800	300	100kA	UL248-1
AJT	0-600	500	100kA	UL248-1
ATDR	1/4-30	300	100kA	UL248-1
ATM	1/10-30	600	100kA	UL248-1
ATMR	1/10-30	600	100kA	UL248-1
HSJ	15-600	500	100kA	UL248-1
TRS-R	0-12	600	20kA	UL248-1
TRS-R	15-60	300	20kA	UL248-1
TRS-R	70-600	600	100kA	UL248-1
TRS-RDC	35-400	600	20kA	MSHA

Table 3-DC Voltage Ratings of Component Recognized Mersen Fuses*

Fuse Family	Fuse Ampere Rating	DC Voltage	DC Interrupting
A15QS	20-4000	150	50kA
A2Y	1-600	500	100kA
A30QS	35-4500	300	100kA
A50P	10-800	450	79kA
A50QS	0-1200	500	100kA
A5Y TYPE 11	3-50	500	100kA
A60Q	5-40	600	100kA
A6Y	1-600	500	100kA
A70P TYPE 4	10-700	650	100kA
A70P TYPE 4	1200-2000	550	100kA
A70Q	35-600	650	100kA
A7OQS	35-800	700	100kA
ACK	1-400	125	10kA
ACL	30-120	125	10kA
ALS	100-500	125	10kA
CNL	35-750	80	2.5kA
CNN	10-800	80	2.5kA
DCT	5-30	1000	50kA
FSM	0.41-15	1000	20kA
PCF	1-30	500	100kA
PCS	5-40	600	100kA
TGL	70-800	170	100kA
TGN	1-600	170	100kA
TGS	1-70	170	100kA

*UL Recognized Components complying with UL248 DC requirements.

Temperature De-Rating

Ampere ratings for fuses are based on specific test conditions. External factors which influence the ampere rating of a fuse are terminal connections, air flow across the fuse, and ambient temperature.

The following formulas should be used when de-rating a fuse's ampere rating for use at an increased ambient temperature of up to 80°C.

80°C Maximum ambient temperature for installations.

Temperature De-Rating for Low Voltage Fuses

A4J; A2D; A6D; A2K; A6K; TR; TRS

$$I_{new} = I_{rated} \sqrt{\frac{125 - T_A}{100}}$$

I_{new} = New Ampere Rating
I_{rated} = Nameplate Current Rating
T_A = Ambient Temperature in °C

FORM 101; A2Y; A6Y; A3T; A6T; DCT; ATM; ATMR; ATDR; ATQR; AJT; HSJ; A4BQ; A4BY; A4BT

$$I_{new} = I_{rated} \sqrt{\frac{150 - T_A}{125}}$$

I_{new} = New Ampere Rating
I_{rated} = Nameplate Current Rating
T_A = Ambient Temperature in °C

OT; OTS; TRM

$$I_{new} = I_{rated} \sqrt{\frac{110 - T_A}{8}}$$

I_{new} = New Ampere Rating
I_{rated} = Nameplate Current Rating
T_A = Ambient Temperature in °C

Temperature De-Rating

80°C Maximum ambient temperature for installations.

Temperature De-Rating for UltraSafe™ Fuse Holders

USM; USCC; US3J; US6J; US14; US22

Multiple Poles

Number of Poles	Coefficient
1 - 2 - 3	1
4 - 5 - 6	0.8
7 - 8 - 9	0.7
>10	0.6

Temperature De-Rating

Temperature	Coefficient
20°C	1
30°C	0.95
40°C	0.9
50°C	0.8

Temperature De-Rating for Medium Voltage Fuses

A055F1C0R0-5E thru 65E; A055C1C0R0-450E,500E,600E; A055F2D0R0-400E,450E; A055B3D0R0-750E,900E; A155C1D0R0-80E,100E; A155C2D0R0-125E; A155C3D0R0-150E,300E; A155F1C0R0-5E thru 30E; A155F1D0R0-100E; A155F2D0R0-150E,175E,200E; A480R12R thru 36R; A072B1DAR0-2R thru 12R; A072B2DAR0-18R,24R; A072F1D0R0-2R thru 12R; A072F2DAR0-18R,24R; 9F60; 9F62

$$I_{new} = I_{rated} \sqrt{\frac{140 - T_A}{100}}$$

I_{new} = New Ampere Rating
I_{rated} = Nameplate Current Rating
T_A = Ambient Temperature in °C

A240R2R thru 36R; A480R2R thru 9R; A055C1D0R0-10E thru 400E; A055C3D0R0-500E,600E; A055F1D0R0-10E thru 200E; A055F2D0R0-250E,300E,350E; A155C1D0R0-10E thru 65E; A155F1D0R0-10E thru 80E; A155F2D0R0-65E,80E,100E,125E

$$I_{new} = I_{rated} \sqrt{\frac{115 - T_A}{75}}$$

I_{new} = New Ampere Rating
I_{rated} = Nameplate Current Rating
T_A = Ambient Temperature in °C

Let-Thru Current and I^2t

Current limitation is one of the important benefits provided by modern fuses. Current-limiting fuses are capable of isolating a faulted circuit before the fault current has sufficient time to reach its maximum value. This current-limiting action provides several benefits:

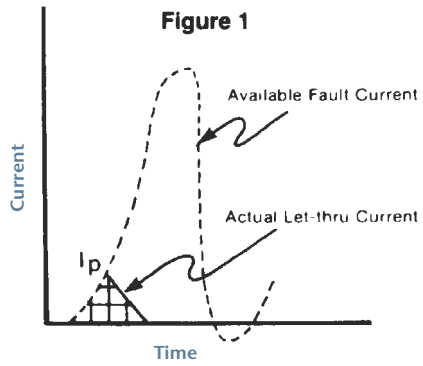
- It limits thermal and mechanical stresses created by the fault currents.
- It reduces the magnitude and duration of the system voltage drop caused by fault currents.
- Current-limiting fuses can be precisely and easily coordinated under even short circuit conditions to minimize unnecessary service interruption.

Peak let-thru current (Ip) and I^2t are two measures of the degree of current limitation provided by a fuse. Maximum allowable Ip and I^2t values are specified in UL standards for all UL listed current-limiting fuses, and are available on all semiconductor fuses.

Let-Thru Current

Let-thru current is that current passed by a fuse while the fuse is interrupting a fault within the fuse's current-limiting range. Figure 1 illustrates this. Let-thru current is expressed as a peak instantaneous value (Ip).

Figure 1



Ip

Ip data is generally presented in the form of a graph. Let's review the key information provided by a peak let-thru graph. Figure 2 shows the important components.

(1) The X-axis is labeled "Available Fault Current" in RMS symmetrical amperes.

(2) The Y-axis is labeled as "Instantaneous Peak Let-Thru Current" in amperes.

(3) The line labeled "Maximum Peak Current Circuit Can Produce" gives the worst case peak current possible with no fuse in the circuit.

(4) The fuse characteristic line is a plot of the peak let-thru currents which are passed by a given fuse at various available fault currents.

Figure 2

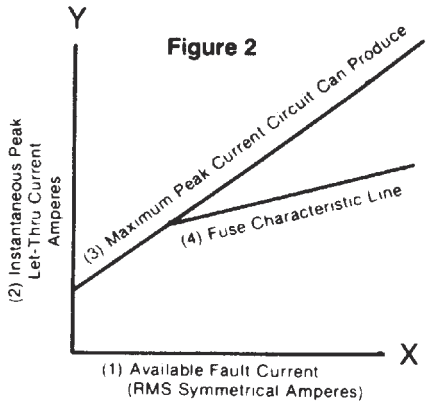
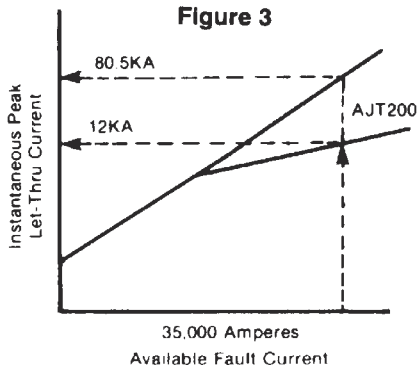


Figure 3 illustrates the use of the peak let-thru current graph. Assume that a 200 ampere Class J fuse (#AJT200) is to be applied where the available fault current is 35,000 amperes RMS. The graph shows that with 35,000 amperes RMS available, the peak available current is 80,500 amperes (35,000 x 2.3) and that the fuse will limit the peak let-thru current to 12,000 amperes.

Figure 3



Why is the peak available current 2.3 times greater than the RMS available current? In theory, the peak available fault current can be anywhere from 1.414 x (RMS available) to 2.828 x (RMS available) in a circuit where the impedance is all reactance with no resistance. In reality all circuits include some resistance and the 2.3 multiplier has been chosen as a practical limit.

Let-Thru Current and I^2t

Ip versus I^2t

Ip has a rather limited application usefulness. Two fuses can have the same Ip but different total clearing times.
See Figure 4.

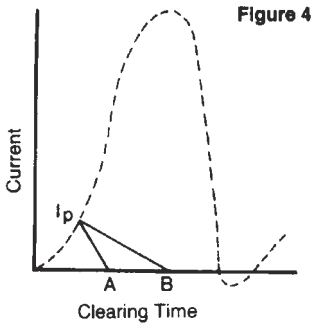


Figure 4

The fuse that clears in time A will provide better component protection than will the fuse that clears in time B.

Fuse clearing I^2t takes into account Ip and total clearing time. Fuse clearing I^2t values are derived from oscillograms of fuses tested within their current-limiting range and are calculated as follows:

The "t" in the equation is the total clearing time for the fuse. To be proper, I^2t should be written as $(I_{RMS})^2t$. It is generally understood that the "I" in I^2t is really I_{RMS}, and the RMS is dropped for the sake of brevity.

$$I^2t = \int_0^t I^2 dt$$

Note, from Figure 4, since clearing time "B" is approximately twice clearing time "A", the resultant I^2t for that fuse will be at least twice the I^2t for the fuse with clearing time "A" and its level of protection will be correspondingly lower.

The I^2t passed by a given fuse is dependent upon the characteristics of the fuse and also upon the applied voltage. The I^2t passed by a given fuse will decrease as the application voltage decreases. Unless stated otherwise, published I^2t values are based on AC testing. The I^2t passed by a fuse in a DC application may be higher or lower than in an AC application. The voltage, available fault current and time constant of the DC circuit are the determining factors.

Fuse I^2t value can be used to determine the level of protection provided to circuit components under fault current conditions. Manufacturers of diodes, thyristors, triacs, and cable publish I^2t withstand ratings for their products. The fuse chosen to protect these products should have a clearing I^2t that is lower than the withstand I^2t of the device being protected.

Fuse Let-Thru Tables

Apparent RMS Symmetrical Let-Thru Current

Although the current-limiting characteristics of current-limiting fuses are represented in Peak Let-Thru charts, an increasingly easy to use method of presenting this data uses Peak Let-Thru tables. The tables are based on Peak Let-Thru charts and reflect fuse tests at 15% power factor at rated voltage with prospective fault currents as high as 200,000 amperes. At each prospective fault current, let-thru data is given in two forms for an individual fuse - I_{rms} and Ip. Where Irms is the "Apparent RMS Symmetrical Current" and Ip is the maximum peak instantaneous current passed by the fuse, the Ip let-thru current is 2.3 times Irms. This relationship exists between peak current and RMS available current under worst-case test conditions (i.e. closing angle of 0° at 15% power factor).

Let-thru tables are easier to read than let-thru charts. Presenting let-thru data in table versus chart format reduces the possibility of misreading the information and saves time. These tables are also helpful when comparing the current-limiting capability of various fuses.

Fuse Let-Thru Current Tables

Table 1- Class L, A4BQ Fuses at 600 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes																					
	601		800		1000		1200		1600		2000		2500		3000		4000		5000		6000	
	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip
10,000	7.4	17	8.7	20	10	23	10	23	10	23	10	23	10	23	10	23	10	23	10	23	10	23
15,000	8.3	19	10	23	12	27	13	30	15	35	15	35	15	35	15	35	15	35	15	35	15	35
20,000	9.1	21	11	25	13	29	14	33	17	39	20	46	20	46	20	46	20	46	20	46	20	46
25,000	9.8	23	12	27	13	31	15	35	18	42	22	50	25	58	25	58	25	58	25	58	25	58
30,000	10	24	13	29	14	33	16	37	20	45	23	53	29	66	30	69	30	69	30	69	30	69
35,000	11	25	13	30	15	35	17	39	20	47	24	56	30	69	35	81	35	81	35	81	35	81
40,000	12	27	14	32	16	37	18	41	21	49	25	58	31	72	36	83	40	92	40	92	40	92
50,000	13	29	15	34	17	40	19	44	23	53	27	63	34	78	39	89	48	111	50	115	50	115
60,000	13	30	16	36	18	42	20	47	25	57	29	67	36	83	41	94	51	118	60	138	60	138
80,000	14	33	17	40	20	46	23	52	27	62	32	73	40	91	45	104	57	130	67	153	77	176
100,000	16	36	19	43	22	50	24	56	29	67	34	79	43	98	49	112	61	140	72	165	83	190
150,000	18	41	21	49	25	57	28	64	33	77	39	90	49	112	56	128	70	160	82	189	94	217
200,000	20	45	24	54	27	63	31	71	37	84	43	100	53	123	61	141	77	176	90	208	104	239

Table 2 - Class L, A4BY Fuses at 600 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes															
	601		800		1000		1200		1600		2000		2500		3000		4000	
	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip
15,000	11	24	13	29	15	35	15	35	15	35	15	35	15	35	15	35	15	35
20,000	12	26	14	32	16	37	19	43	20	46	20	46	20	46	20	46	20	46
25,000	13	29	15	34	18	40	20	46	24	55	25	58	25	58	25	58	25	58
30,000	13	30	16	36	19	43	21	49	25	58	29	67	30	69	30	69	30	69
35,000	14	32	17	38	20	45	23	52	27	61	30	70	33	76	35	81	35	81
40,000	15	34	17	40	21	47	24	54	28	64	32	73	35	79	37	86	40	92
50,000	16	36	19	43	22	51	25	58	30	68	34	78	37	86	41	95	50	115
60,000	17	38	20	45	24	54	27	62	31	72	37	84	40	91	44	100	53	121
80,000	18	42	22	50	26	59	29	67	35	80	40	92	44	100	48	110	58	133
100,000	20	45	24	54	28	64	32	73	38	87	43	99	47	108	52	119	62	143
150,000	23	52	27	62	32	73	37	84	43	99	49	113	54	123	59	137	73	167
200,000	25	56	29	67	35	80	40	91	48	110	54	123	59	136	65	150	79	181

Table 3 - Class L, A4BT Fuses at 600 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes									
	800		1000		1200		1600		2000	
	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip	Irms	Ip
15,000	14	33	15	35	15	35	15	35	15	35
20,000	16	36	18	41	20	46	20	46	20	46
25,000	17	39	19	45	22	50	25	58	25	58
30,000	18	41	21	48	23	54	28	63	30	69
35,000	19	43	22	50	25	56	29	67	34	79
40,000	20	45	23	52	26	59	30	70	35	81
50,000	21	49	25	56	28	63	33	75	38	87
60,000	23	52	26	60	29	67	35	80	40	93
80,000	25	57	29	66	32	74	38	88	44	102
100,000	27	62	31	71	35	80	41	95	48	110
150,000	31	70	35	81	40	92	47	109	55	126
200,000	34	78	39	89	44	101	52	120	60	139

Fuse Let-Thru Current Tables

Apparent RMS Symmetrical Let-Thru Current

Table 4 - Class RK1, A6K Fuses at 600 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes											
	30		60		100		200		400		600	
	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip
5,000	.63	1.4	1.4	3.2	2.0	4.6	3.2	7.4	4.6	11	5.0	11.5
10,000	.80	1.8	1.7	3.9	2.6	6.0	4.0	9.2	5.8	13	7.5	17
15,000	.91	2.1	2.0	4.6	2.9	6.7	4.6	11	6.7	15	8.6	20
20,000	1.0	2.3	2.2	5.1	3.2	7.4	5.0	12	7.4	17	9.5	22
25,000	1.1	2.5	2.4	5.5	3.5	8.1	5.4	12	7.9	18	10	23
30,000	1.2	2.6	2.5	5.8	3.7	8.5	5.8	13	8.4	19	11	25
35,000	1.2	2.8	2.6	6.0	3.9	9.0	6.1	14	8.9	20	11	26
40,000	1.3	2.9	2.8	6.4	4.1	9.4	6.3	14	9.3	21	12	27
50,000	1.4	3.1	3.0	6.9	4.4	10	6.8	16	10	23	13	30
60,000	1.4	3.3	3.2	7.4	4.7	11	7.3	17	11	24	14	32
80,000	1.6	3.7	3.5	8.1	5.1	12	8.0	18	12	27	15	35
100,000	1.7	3.9	3.7	8.5	5.5	13	8.6	20	13	29	16	37
150,000	2.0	4.5	4.4	9.9	6.3	14	9.9	23	14	33	19	43
200,000	2.2	4.9	4.7	11	7.0	16	11	25	16	37	20	47

Table 5 - Class RK1, A6D Fuses at 600 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes											
	30		60		100		200		400		600	
	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip
5,000	.80	1.8	1.5	3.5	2.0	4.6	3.5	8.0	5.0	12	-	-
10,000	1.0	2.3	1.9	4.4	2.5	5.8	4.4	10.1	7.1	16.4	10	23
15,000	1.2	2.7	2.2	4.9	2.9	6.6	5.0	11.6	8.2	18.8	12	27
20,000	1.3	2.9	2.4	5.4	3.1	7.1	5.5	12	9.0	20.7	13	29
25,000	1.4	3.2	2.6	5.9	3.4	7.8	6.0	13.8	9.7	22.3	14	32
30,000	1.5	3.4	2.7	6.2	3.6	8.3	6.3	14.6	10.3	23.6	15	33
35,000	1.5	3.5	2.9	6.6	3.8	8.7	6.7	15.4	10.8	24.9	15	35
40,000	1.6	3.7	3.0	6.9	4.0	9.1	7.0	16.5	11.3	26	16	37
50,000	1.7	4.0	3.2	7.4	4.3	9.8	7.5	16.5	12.2	28	17	40
60,000	1.8	4.2	3.4	7.8	4.5	11	8.0	17	13	30	18	42
80,000	2.0	4.7	3.8	8.6	5.0	12	8.8	20.3	13	33	20	46
100,000	2.2	5.0	4.1	9.3	5.4	12	9.5	20	14	35	22	50
150,000	2.5	5.8	4.6	11	6.1	14	10.9	25	16	40	25	57
200,000	2.8	6.3	5.1	12	6.8	16	11	25	19	45	27	63

Table 6 - Class J, A4J Fuses at 600 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes											
	30		60		100		200		400		600	
	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip
5,000	.85	2.0	1.4	3.2	2.0	4.6	3.1	7.2	4.5	10	5.0	12
10,000	1.1	2.5	1.8	4.4	2.8	6.4	3.6	8.2	5.7	13	8.7	20
15,000	1.2	2.8	2.0	4.6	2.9	6.6	4.1	9.4	6.5	15	9.9	23
20,000	1.4	3.1	2.4	5.1	3.2	7.3	4.5	10	7.1	16	11	25
25,000	1.5	3.4	2.4	5.5	3.8	8.7	5.3	12	7.7	18	12	27
30,000	1.6	3.6	2.5	5.8	4.0	9.2	5.5	13	8.2	19	13	29
35,000	1.6	3.7	2.7	6.2	4.2	9.7	5.9	14	8.6	20	13	30
40,000	1.7	3.9	2.8	6.4	4.5	10	6.0	14	9.0	21	14	32
50,000	1.8	4.2	3.0	6.9	4.7	11	6.1	14	9.7	22	15	34
60,000	2.0	4.5	3.2	7.4	5.0	11	6.5	15	10	23	16	36
80,000	2.2	4.9	3.5	8.1	5.5	12	7.1	16	11	25	17	40
100,000	2.3	5.3	3.8	9.5	6.0	14	7.7	18	12	28	19	43
150,000	2.7	6.1	4.7	10.9	6.8	16	8.8	20	14	32	21	49
200,000	2.9	6.7	4.8	11	7.5	17	9.7	22	15	35	24	54

Fuse Let-Thru Current Tables

Apparent RMS Symmetrical Let-Thru Current

Table 7 - Class J, AJT Fuses at 600 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes											
	30		60		100		200		400		600	
	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip
5,000	.79	1.8	1.2	2.8	1.8	4.0	3.1	7.0	4.8	11	5.0	12
10,000	1.0	2.3	1.6	3.6	2.2	5.1	3.8	8.8	6.0	14	8.3	19
15,000	1.2	2.6	1.8	4.1	2.5	5.8	4.4	10	6.9	16	9.5	22
20,000	1.3	2.9	2.0	4.5	2.8	6.4	4.8	11	7.6	18	11	24
25,000	1.4	3.1	2.1	4.8	3.0	6.9	5.2	12	8.2	19	11	26
30,000	1.4	3.3	2.2	5.1	3.2	7.4	5.5	13	8.7	20	12	28
35,000	1.5	3.5	2.4	5.4	3.4	7.7	5.8	13	9.1	21	13	29
40,000	1.6	3.7	2.5	5.6	3.5	8.1	6.1	14	9.6	22	13	30
50,000	1.7	3.9	2.7	6.1	3.8	8.7	6.6	15	10.3	24	14	33
60,000	1.8	4.2	2.8	6.4	4.0	9.2	7.0	16	11	25	15	35
80,000	2.0	4.6	3.1	7.1	4.4	10	7.7	18	12	28	17	38
100,000	2.2	4.9	3.3	7.6	4.8	11	8.3	19	13	30	18	41
150,000	2.5	5.7	3.8	8.7	5.4	12	9.5	22	15	34	21	47
200,000	2.7	6.2	4.2	9.7	6.0	14	10.4	24	16	37	23	59

Table 8 - Class T, A6T Fuses at 600 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes													
	30		60		100		200		400		600		800	
	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip
5,000	.62	1.4	1.2	2.8	1.6	3.8	2.6	6.0	4.2	9.7	5.0	12	5.0	12
10,000	.78	1.8	1.5	3.5	2.1	4.8	3.3	7.5	5.3	12	8.2	19	10	22
15,000	.89	2.1	1.7	4.0	2.4	5.4	3.7	8.6	6.1	14	9.4	22	11	26
20,000	.98	2.3	1.9	4.4	2.6	6.0	4.1	9.5	6.7	15	10	24	12	28
25,000	1.1	2.4	2.0	4.8	2.8	6.5	4.4	10	7.2	17	11	26	13	31
30,000	1.1	2.6	2.2	5.0	3.0	6.9	4.7	11	7.7	18	12	27	14	32
35,000	1.2	2.7	2.3	5.3	3.1	7.2	5.0	11	8.1	19	12	29	15	34
40,000	1.2	2.9	2.4	5.6	3.3	7.5	5.2	12	8.5	19	13	30	16	36
50,000	1.3	3.1	2.6	6.0	3.5	8.1	5.6	13	9.1	21	14	32	17	38
60,000	1.4	3.3	2.8	6.4	3.8	8.6	5.9	14	9.7	22	15	34	18	41
80,000	1.6	3.6	3.0	7.0	4.1	9.5	6.5	15	11	25	16	38	20	45
100,000	1.7	3.9	3.2	7.5	4.5	10	7.0	16	11	26	18	40	21	48
150,000	1.9	4.4	3.8	8.6	5.1	12	8.1	19	13	30	20	46	24	55
200,000	2.1	4.9	4.1	9.5	5.6	13	8.9	20	14	33	22	51	27	61

Table 9 - Class T, A3T Fuses at 300 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes															
	30		60		100		200		400		600		800		1200	
	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip
5,000	.53	1.2	.95	2.2	1.4	3.1	2.0	4.6	3.0	6.9	4.5	10	5.0	12	5.0	12
10,000	.66	1.5	1.2	2.8	1.7	3.9	2.5	5.8	3.8	8.7	5.6	13	7.2	16	9.3	21
15,000	.76	1.7	1.4	3.2	2.0	4.5	2.9	6.6	4.4	10	6.4	15	8.2	19	11	24
20,000	.83	1.9	1.5	3.5	2.1	4.8	3.1	7.1	4.8	11	7.0	16	9.0	21	12	27
25,000	.90	2.1	1.6	3.7	2.3	5.3	3.4	7.8	5.2	12	7.6	17	9.7	22	13	29
30,000	.96	2.2	1.7	3.9	2.5	5.6	3.6	8.3	5.5	13	8.1	19	10	24	13	31
35,000	1.0	2.3	1.8	4.1	2.6	6.0	3.8	8.7	5.8	13	8.5	20	11	25	14	32
40,000	1.1	2.4	1.9	4.4	2.7	6.2	4.0	9.2	6.0	14	8.9	20	11	26	15	34
50,000	1.1	2.6	2.1	4.7	2.9	6.7	4.3	9.9	6.5	15	9.6	22	12	28	16	37
60,000	1.2	2.8	2.2	5.1	3.1	7.1	4.5	10	6.9	16	10	23	13	30	17	39
80,000	1.3	3.1	2.4	5.5	3.4	7.8	5.0	12	7.6	17	11	26	14	33	19	43
100,000	1.4	3.3	2.6	6.0	3.7	8.4	5.4	12	8.2	19	12	28	15	35	20	46
150,000	1.6	3.7	3.0	6.8	4.2	9.7	6.1	14	9.4	22	14	32	18	41	23	53
200,000	1.8	4.1	3.3	7.5	4.6	11	6.8	16	10	24	15	35	19	45	25	58

Fuse Let-Thru Current Tables

Apparent RMS Symmetrical Let-Thru Current

Table 10- Class RK1, A2K Fuses at 250 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes											
	30		60		100		200		400		600	
	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip
5,000	.61	1.4	1.4	3.2	1.7	4.0	2.9	6.7	4.4	10	5.0	12
10,000	.77	1.8	1.7	4.0	2.2	5.0	3.7	8.5	5.5	13	7.4	17
15,000	.88	2.0	2.0	4.6	2.5	5.8	4.2	9.7	6.3	14	8.5	19
20,000	.97	2.2	2.2	5.0	2.8	6.3	4.6	11	6.9	16	9.3	21
25,000	1.1	2.4	2.4	5.4	3.0	6.8	5.0	12	7.4	17	10	23
30,000	1.1	2.6	2.5	5.8	3.2	7.3	5.3	12	7.9	18	11	25
35,000	1.2	2.7	2.6	6.0	3.3	7.7	5.6	13	8.3	19	11	26
40,000	1.2	2.8	2.8	6.3	3.5	8.0	5.9	13	8.7	20	12	27
50,000	1.3	3.0	3.0	6.8	3.8	8.6	6.3	14	9.4	22	13	29
60,000	1.4	3.2	3.2	7.2	4.0	9.2	6.7	15	10	23	13	31
80,000	1.5	3.5	3.5	8.0	4.4	10	7.4	17	11	25	15	34
100,000	1.7	3.8	3.7	8.6	4.7	11	7.9	18	12	27	16	37
150,000	1.9	4.4	4.3	9.8	5.4	12	9.1	21	14	31	18	42
200,000	2.1	4.8	4.7	11	6.0	14	10	23	15	34	20	46

Table 11 - Class RK1, A2D Fuses at 250 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes											
	30		60		100		200		400		600	
	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip
5,000	.77	1.8	1.4	3.2	2.0	4.6	3.2	7.3	5.0	12	5.0	12
10,000	.97	2.2	1.8	4.0	2.5	5.8	4.0	9.2	6.4	15	8.0	18
15,000	1.1	2.6	2.0	4.6	2.9	6.6	4.6	11	7.3	17	9.2	21
20,000	1.2	2.8	2.2	5.1	3.2	7.3	5.0	12	8.1	19	10	23
25,000	1.3	3.0	2.4	5.5	3.4	7.9	5.4	12	8.7	20	11	25
30,000	1.4	3.2	2.5	5.8	3.6	8.3	5.8	13	9.2	21	12	27
35,000	1.5	3.4	2.7	6.1	3.8	8.8	6.1	14	9.7	22	12	28
40,000	1.5	3.5	2.8	5.7	4.0	9.2	6.4	15	10	23	13	29
50,000	1.7	3.8	3.0	6.9	4.3	9.9	6.8	16	11	25	14	32
60,000	1.8	4.0	3.2	7.3	4.6	11	7.3	17	12	27	15	34
80,000	1.9	4.5	3.5	8.1	5.0	12	8.0	18	13	29	16	37
100,000	2.1	4.8	3.8	8.7	5.4	12	8.6	20	14	32	17	40
150,000	2.4	5.5	4.3	9.9	6.2	14	9.9	23	16	36	20	46
200,000	2.6	6.0	4.8	11	6.8	16	11	25	17	40	22	50

Table 12 - Class RK5, TRS Fuses at 600 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes											
	30		60		100		200		400		600	
	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip
5,000	1.7	3.9	3.2	7.4	3.4	7.8	5.0	12	-	-	-	-
10,000	2.1	4.8	4.0	9.2	4.2	9.7	6.2	14	10	23	10	23
15,000	2.4	5.5	4.6	11	4.8	11	7.1	16	12	27	15	35
20,000	2.7	6.2	5.1	12	5.3	12	7.8	18	13	30	18	42
25,000	2.9	6.7	5.5	13	5.7	13	8.4	19	14	32	20	45
30,000	3.1	7.1	5.8	13	6.1	14	8.9	20	15	35	21	48
35,000	3.3	7.6	6.1	14	6.4	15	9.4	22	16	36	22	50
40,000	3.4	7.8	6.4	15	6.7	15	9.8	23	17	38	23	53
50,000	3.7	8.5	6.9	16	7.2	17	11	24	18	41	25	57
60,000	3.9	9.0	7.3	17	7.7	18	11	26	19	43	26	60
80,000	4.3	9.9	8.1	19	8.5	20	12	29	21	48	29	66
100,000	4.6	11	8.7	20	9.1	21	13	31	22	52	31	72
150,000	5.3	12	9.9	23	10	24	15	35	26	59	36	82
200,000	5.8	13	11	25	12	26	17	39	28	65	39	90

Fuse Let-Thru Current Tables

Apparent RMS Symmetrical Let-Thru Current

Table 13 - Class RK5, TR Fuses at 250 Volts AC, 15% Power Factor

Prospective Short Circuit Rms. Sym Amperes	Fuse Let-Thru Current In Kilo-Amperes By Fuse Rating In Amperes											
	30		60		100		200		400		600	
	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip	irms	Ip
5,000	1.4	3.2	3.0	6.9	3.2	7.4	5.0	12	-	-	-	-
10,000	1.8	4.1	3.8	8.7	4.1	9.4	6.6	15	10	23	10	23
15,000	2.1	4.8	4.4	10	4.7	11	7.6	17	13	29	15	35
20,000	2.3	5.3	4.8	11	5.1	12	8.4	19	14	32	19	44
25,000	2.5	5.6	5.2	12	5.5	13	9.0	21	15	34	21	48
30,000	2.6	6.0	5.5	13	5.9	14	9.6	22	16	37	22	50
35,000	2.7	6.2	5.8	13	6.2	14	10	23	17	38	23	53
40,000	2.9	6.7	6.1	14	6.5	15	11	24	18	40	24	56
50,000	3.1	7.1	6.5	15	7.0	16	11	26	19	43	26	60
60,000	3.3	7.6	7.0	16	7.4	17	12	27	20	46	28	63
80,000	3.6	8.3	7.7	18	8.1	19	13	31	22	51	30	70
100,000	3.9	9.0	8.3	19	8.8	20	14	33	24	55	33	75
150,000	4.4	10	9.4	22	10	23	16	38	27	62	38	86
200,000	4.9	11	11	24	11	26	18	41	30	69	41	95

Bus Duct Short-Circuit Protection

Bus duct listed to the UL 857 standard is labeled with a “short-circuit current rating”. To earn this rating the bus duct must be capable of surviving its “short-circuit current rating” for 3 full cycles (60 Hz basis).

The following table shows the potential short-circuit current ratings for both feeder and plug-in bus duct. Also shown are the peak instantaneous currents the bus duct must be capable of withstanding to earn a given “short-circuit current rating”.

Current-limiting fuses may be used to protect bus duct from fault currents that exceed the bus duct “short-circuit current rating”. The fuse will provide short-circuit protection if fuse peak let-thru current does not exceed the bus duct peak instantaneous withstand current. In addition, the fuse total clearing curve must fall to the left of the bus duct short-circuit current rating at the 3 cycle (.05 sec.) point. The fuse ampere ratings shown in this table satisfy both of these requirements.

Example:

In a 480V circuit with 100,000A available short-circuit current, what maximum size fuse can be used to protect feeder bus duct which has a 42,000 short-circuit rating?

Answer:

From the table, a Mersen 1600A Class L fuse A4BQ1600 will protect this bus duct up to 100,000 amperes.

Feeder & Plug-In Fuse Bus Duct		Maximum Mersen Fuse for Short Circuit Protection*		
Short Circuit Current Rating in Amperes	Peak Instantaneous Withstand Current in Amperes	50,000A	100,000A	200,000A
5000	8500	60A	60A	30A
7500	13,000	100A	100A	100A
10,000	17,000	200A	100A	100A
14,000	28,000	400A	400A	200A
22,000	48,000	800A	600A	400A
25,000	55,000	1000A	600A	600A
30,000	66,000	1200A	800A	600A
35,000	76,000	1600A	1000A	800A
42,000	92,000	2500A	1600A	1000A
50,000	110,000	3000A	2000A	1200A
65,000	142,000	4000A	3000A	2500A
75,000	160,000	5000A	4000A	3000A
85,000	180,000	5000A	5000A	4000A
100,000	220,000	6000A	6000A	5000A
125,000	270,000	6000A	6000A	6000A
150,000	330,000	6000A	6000A	6000A

* 30A to 600A fuses – Class J (time delay AJT)
Class RK1 (A2K/A6K or time delay A2D/A6D)
800 to 6000A fuses – Class L (A4BQ)

Capacitor Protection

The primary responsibility of a capacitor fuse is to isolate a shorted capacitor before the capacitor can damage surrounding equipment or personnel. Typical capacitor failure occurs when the dielectric in the capacitor is no longer able to withstand the applied voltage. A low impedance current path results. The excessive heat generated builds pressure and can cause violent case rupture. A fuse will isolate the shorted capacitor before case rupture occurs.

Fuse Placement

The Code requires that an overcurrent device be placed in each ungrounded conductor of each capacitor bank (see Figure 1). The Code further requires that the rating or setting of the over-current device be as low as practicable. A separate overcurrent device is not required if the capacitor is connected on the load side of a motor-running overcurrent device.

Fusing per the Code provides reasonable protection if the capacitors are the metallized film self-healing type. If not, each capacitor should be individually fused as shown in Figure 2.

Fusing each individual capacitor is especially important in large banks of parallel capacitors. Should one capacitor fail, the parallel capacitors will discharge into the faulted capacitor and violent case rupture of the faulted capacitor can result. Individual capacitor fusing eliminates this problem.

If the capacitors are to be placed in banks comprised of both series and parallel combinations, the capacitor manufacturer must be consulted for fuse placement recommendations. The opening of improperly placed fuses can cause overvoltage and result in damage to other capacitors in the network.

Ampere Rating

How much overcurrent can a capacitor withstand? What effects do neighboring capacitors have on the inrush of a given capacitor? These and other questions influence fuse selection. Circuit analysis can be very complex. It is best to consult the capacitor manufacturer for specific recommendations.

For applications 600V or less in lieu of specific fusing recommendations from the capacitor manufacturer, we suggest a Mersen A60C Type 121 or an A6Y Type 2SG fuse sized at 165% to 200% of the capacitor's current rating (contact factory for technical data). If these fuses are not dimensionally acceptable, then a non-time delay Class J or Class RK1 fuse could be used and sized at 185% to 220% of the capacitor's current rating.

For applications over 600V to 5.5kV, we suggest Amp-Trap A100C to A550C capacitor fuses. These medium voltage fuses are available in a variety of voltage ratings and mounting configurations. Refer to pages E36 for specific data. Medium voltage capacitor fuses are sized at 165% to 200% of the capacitor current rating.

Capacitor fuses are selected for their ability to provide short circuit protection and to ride through capacitor inrush current. Inrush current is affected by the closing angle, capacitance, resistance and inductance of the circuit, and varies from one application to another. Inrush lasts for less than 1/4 cycle and is typically less than 25 timess the capacitor's current rating.

Steady state capacitor current is proportional to the applied voltage and frequency. Since voltage and frequency are fixed in power factor correction applications, the capacitor is not expected to be subjected to an overload. Therefore, capacitor fuses are not selected to provide overload protectors for the capacitor.

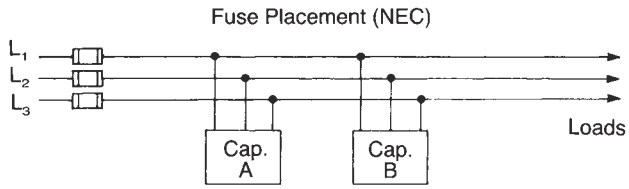


Figure 1

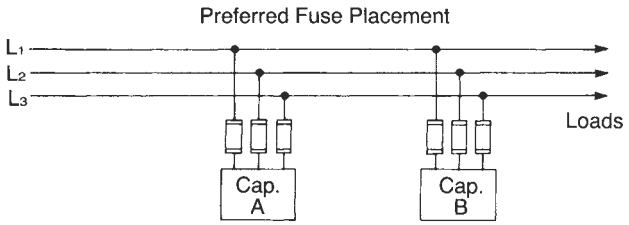


Figure 2

Capacitor Protection

kVAR vs. AMPS

The capacitor's current rating can be derived from its kVAR rating by using the following formula:

$$\frac{\text{kVAR} \times 1000}{\text{volts}} = \text{amps}$$

1 kVAR = 1000VA (Reactive)

Example#1: What fuse would you recommend for a three phase capacitor rated 100kVAR at 480 volts?

$$\frac{100{,}000 \text{ volt-amps}}{480 \text{ volts}} = 208 \text{ amps}$$

To determine line current, we must divide the 208 amps, which is the three phase current by $\sqrt{3}$

$$\frac{208}{\sqrt{3}} = 120 \text{ amps}$$

If an A6OC Type 121 fuse is to be used, size the fuse at 165% to 200% of line current.

120 amps x 1.65 = 198 amps
120 amps x 2.00 = 240 amps

Suggestions: A60C200-121 or A60C200-121TI

If a Class J or a Class RK1 is to be used, size the fuse at 185% to 220% of line current.

120 amps x 1.85 = 222 amps
120 amps x 2.20 = 264 amps

Suggestions: A4J225 or A6K225R

Example#2: What fuse would you recommend for a three phase capacitor rated 2400kV, 100kVAR?

$$\text{Calculate Capacitor Current} = \frac{100{,}000 \text{ volt-amps}}{\sqrt{3} \times 2400\text{V}} = 24\text{A}$$

fuse size 24 x 1.65 = 39A
24 x 2.00 = 48A

We suggest a 40 or 50 amp fuse rated at least 2400V A250C50-XX, where XX is the type of mounting needed.

Cable Protection

Using Cable Protectors

Cable Protectors are special purpose limiters which are used to protect service entrance and distribution cable runs. The National Electrical Code (NEC) does not require using cable protectors.

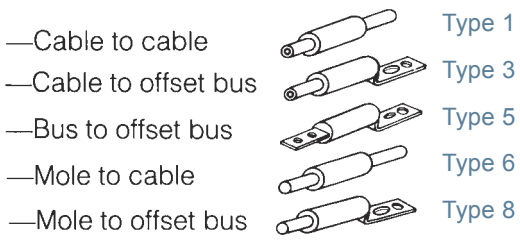
When unprotected cables are paralleled, a singe conductor faulting to ground can result in damage to and eventual loss of all parallel conductors. The resultant cost of cable replacement, loss of service, and down time can be significant. This cost can be minimized by the use of Cable Protectors.

When each phase consists of three or more parallel conductors, Cable Protectors are installed at each end of each conductor. Should one cable fault, the Cable Protectors at each end of the faulted cable will open and isolate the faulted cable. The unfaulted cables will maintain service.

Terminations

In addition to improving system reliability, Cable Protectors provide a means of terminating cable, thus eliminating the need for cable lugs. Cable Protectors are available with the following configurations:

Aluminum and copper cable require different terminations. Cable Protectors intended for copper cable must not be used with aluminum cable. Cable Protectors intended for aluminum cable include an oxide inhibitor.



Placement of Cable Protectors

In single phase applications where a single transformer supplies the service and there are only one or two conductors per phase, a single Cable Protector per cable may be used. The Cable Protector should be located at the supply end of the cable. In all other applications, Cable Protectors should be placed at both ends of each cable. This allows a faulted cable to be isolated from the source end and from a back feed at its load end. Isolation of a faulted cable is only possible if there are 3 or more parallel cables per phase.

Cable Protector Ampacity

Cable Protectors are not ampere rated. They are not intended to provide overload protection for the cable. Cable Protectors are designed to open in case of a short circuit or after a cable has faulted. Thus total system reliability is maximized. For these reasons Cable Protectors are rated in terms of the cable material (aluminum or copper) and the cable size (250kcmil, 500kcmil, etc.)

Selecting a Cable Protector

The following questions must be answered to choose the correct Cable Protector:

- Is the cable copper or aluminum?
- What is the cable size?
- What termination type is desired?
- Is the Cable Protector to be insulated or protected with a heat-shrink sleeve or a rubber boot?

Once these questions have been answered, the Cable Protector catalog number can be chosen from the listings.

Small Cable Sizes

Class J fuses may be used for cable sizes smaller than 4/0. Since Class J blades are drilled for bolting, they may be attached directly to bus. Cables must be prepared by installing lugs before bolting to the fuse. Cable-to-bus or cable-to-cable terminations are possible. The following ampere ratings are recommended, or each cable size.

Cable - Size Awg CU or AL	Class J Fuse Catalog No.
#4	A4J125
#3	A4J150
#2	A4J175
#1	A4J200
1/0	A4J250
2/0	A4J300
3/0	A4J400

Welder Protection

General

Articles 630-12 and 630-32 of the National Electrical Code requires that electric welders and their supply conductors have overcurrent protection. The Code further requires that each welder have a nameplate which provides information necessary for the selection of the appropriate supply conductors and overcurrent protection devices.

While either circuit breakers or fuses may be used for overcurrent protection, the typically high available fault currents and the need for overall system selective coordination favor the use of current-limiting fuses.

Supply Conductor Protection

For AC transformer, DC rectifier and motor-generator arc welders the supply conductors should be fused at not more than 200% of the conductor ampere rating. For resistance welders the Code allows fusing at up to 300% of conductor ampere rating. In both applications a time delay RK5 fuse such as the Tri-onic® is generally recommended.

Welder Protection

To comply with the Code, AC transformer, DC rectifier and motor-generator arc welders should be fused at not more than 200% of their primary current rating (shown on welder nameplate). Resistance welders should be fused at not more than 300% of their primary current rating. As with supply conductors, RK5 time delay fuses such as the Tri-onic® are recommended. It should be noted that the Code states that a separate overcurrent device is not required for the welder if the supply conductors are protected by an overcurrent device which will satisfy the welder overcurrent protection requirements.

Special Applications

UL class fuses sized according to the Code may not be suitable in some welding applications. High ambient temperatures, high cycle rates and high available fault currents may require the use of Mersen Welder Protectors.

Welder Protectors (A4BX Type 150 or Type 150J) are special purpose limiters which have been designed specifically for welding applications to protect equipment in case of short circuits. They have twice the thermal rating of UL Class fuses yet provide a low clearing I^2t . This combination minimizes fuse fatigue and allows effective coordination with upstream devices. Welder Protectors may be sized closer to welder primary ampere rating than UL Class fuses, hence may allow the use of smaller disconnect switches.

Welder Protectors are intended for short circuit protection and are not intended for overload protection. They should never be used as the only protective device on any welder application. Thermal overload protection must be provided in the welder by some other device.

Motor Starter General Information

Typical Construction Of a Motor Starter



Disconnect Switch
UL 98 - UL489
CSA – C22.2 # 4
CSA – C22.2 # 5

SIRCO
Non-Fusible
Disconnect Switch
range

FUSERBLOC
Fusible Disconnect Switch
range

Fuses

Contactor

Overload relay

UL 508 Manual Motor Controller
"Suitable as Motor Disconnect"
CSA – C22.2 # 14

FSLBS Non-Fusible
Disconnect Switch range

Motor

Essential parts of a motor branch circuit required by the National Electrical Code:

- Disconnect means
- Branch-circuit short-circuit protective device
- Motor-controller
- Motor overload protective devices

Disconnect means

The Disconnect means can be a Manual Disconnect Switch according to UL 98.

A manual Motor Controller (according to UL 508) additionally marked "Suitable as Motor Disconnect" is only permitted as a disconnecting means where installed between the final branch-circuit short-circuit and ground-fault protective device and the motor (NEC 2008 Article 430.109).

Branch-circuit short-circuit protective device

The short-circuit protective device can be either a Fuse or an Inverse-time Circuit-breaker.

Motor-controller

Any switch or device that is normally used to start and stop a motor according to the National Electrical Code article 430.82.

Motor overload protective devices

The National Electrical Code permits fuses to be used as the sole means of overload protection for motor branch circuits. This approach is often practical only with small single phase motors. Most integral horsepower 3 phase motors are controlled by a motor starter which includes an overload relay. Since the overload relay provides overload protection for the motor branch circuit, the fuses may be sized for short-circuit protection.

Product Features
of Non-Fusible & Fusible Disconnect Switches

Door Interlock in On Position



The handles allow opening the door in the OFF position only. In the ON position the door can not be opened.

This interlocking can be by-passed by authorized personnel (defeater option on handle) for maintenance, testing or commissioning.

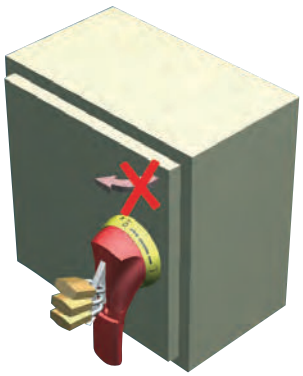
Defeater



The defeat function allows qualified personnel to by-pass the door interlock when the switch is in the ON position by means of a tool.

This exclusive design is also available in a NEMA 4 and 4X rating.

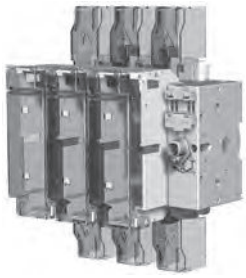
Padlocking



Handles can be padlocked in the OFF position with up to 3 padlocks. Meets OSHA requirement for lockout / tagout.

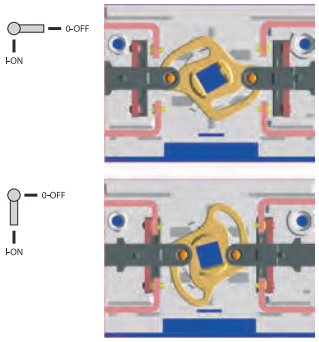
For safety reasons, the door can not be opened when the handle is padlocked.

Touch Safe



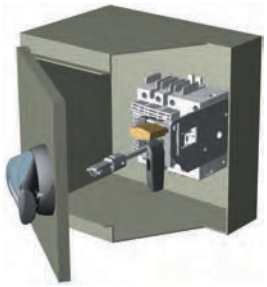
Our design reduces or eliminates the danger of accidental contact with live, energized parts. All products are supplied standard with line side shrouding.

Positive Opening Operation



The positive opening operation feature of our switches means that all the main contacts are ensured to be in the open position when the handle is in the "OFF" position.

New NFPA 79 Requirements and Solutions



As defined in the NFPA 79 Standard section 5.3.3.1 and 6.2.3.2, our disconnecting devices fully comply with all of the following requirements:

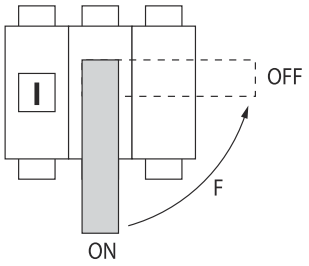
1. Isolate the electrical equipment from the supply circuit and have one off (open) and one on (closed) position only.
2. Have an external operating means (e.g., handle).
3. Be provided with a permanent means permitting it to be locked in the off (open) position only (e.g., by padlocks) independent of the door position. When so locked, remote as well as local closing shall be prevented.
4. Be operable, by qualified persons, independent of the door position without the use of accessory tools or devices.

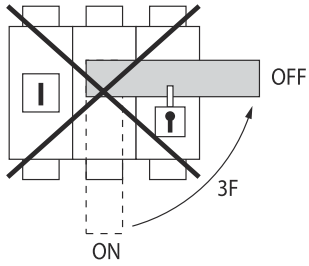
However the closing of the disconnecting means while door is open is not permitted unless an interlock is operated by deliberate action.

Flange and side operation:
Our side operated switches used with flange handles meet the requirements of the NFPA 79 without any additional parts being added.

Product Features
of Non-Fusible & Fusible Disconnect Switches

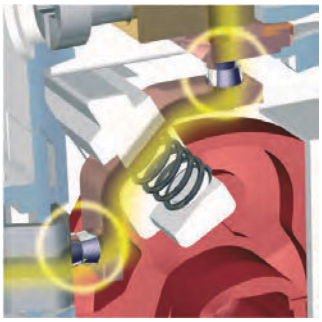
Welded Contact Protection





Positive opening operation safeguards users in case of welded contacts due to an overload or short-circuit. The handle can not reach the “OFF” position unless the contacts are truly open. According to the IEC 947-3 standard if the contacts are welded due to an overload or short-circuit, the switch will not reach the “OFF” position and can not be padlocked in this position as long as operating force applied to the operating mechanism is less than a force three times the standard operating force. Thus, this unusual operation alerts the user that a problem has occurred.

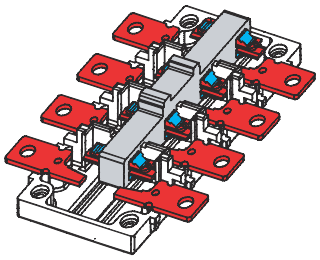
Contact Principle



Up to 400A

All switches use silver tipped contacts technology providing the following advantages:

- best solution for harsh environments (humidity, sulphide, chloride…),
- high on-load break characteristics,
- longer mechanical and electrical life,
- maintenance free switches without grease.



Above 400A

Our switches use a self-cleaning moving contact technology allowing high short-circuit withstand.

Clear Position Indicator

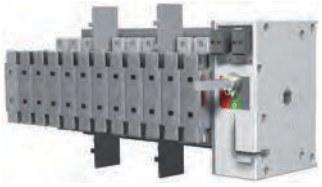


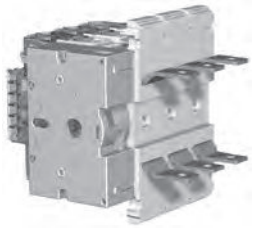
All switches and handles have clear “ON” and “OFF” designations.

Fast Make and Break Contacts

All the Non-Fusible and Fusible Disconnect switches’ contacts work independently of the speed and force of the operator providing better electrical characteristics (making capacities on short-circuits, highly inductive load operation possibilities).

Tailor-Made Solutions

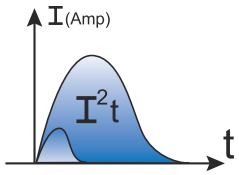




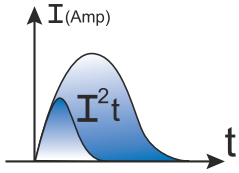
- Multipolar switches (examples: 12-pole 160A switch; 18-pole 30A switch…).
- Rear connections (top or/and bottom).
- Mixed pole (example: 3-pole 200A + 2-pole 30A switch…). Please consult us.

Product Features of Fusible Disconnect Switches

Exceptional 200kA short-circuit protection with fuses



Fuse



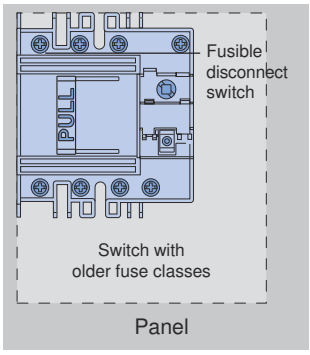
Circuit breaker

The Fused Switch line with class CC, J or L fuses provides exceptional high level of short-circuit protection, up to 200kA.

The CC and J fuses are more current limiting than older classes of fuses or circuit breakers. In other words, fuses have higher breaking capacities than most of the circuit breakers. Moreover discrimination (selectivity) and coordination are easily achieved with fuses.

The fuse solution brings the following advantages: high performance, reliability, safety, savings and ease of use.

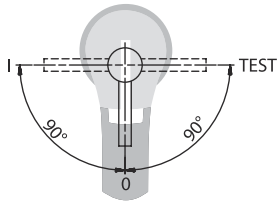
Panel space saving



This proven switch technology has the fuses incorporated on the top of the switch mechanism to reduce the footprint of the product and save you valuable real estate in your panel.

The space saving can be as much as 50% from the switches designed with use of older fuse classes.

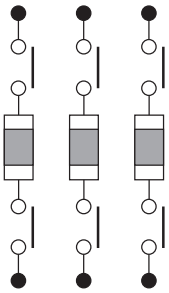
Fast and safe commissioning



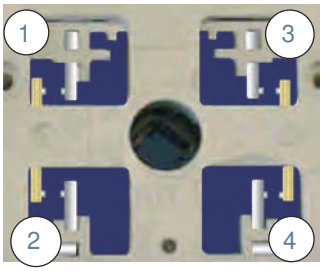
The TEST feature enables the testing of the control circuit auxiliaries without switching the main contacts or removing the fuses.

This function provides a serious technical and commercial alternative to a separately wired push button.

Practical safeguard



Arc broken into 4



Double break

The modern designed mechanism of our Fusible Disconnect Switches disconnects both sides of the fuses using two double breaking contacts per pole. This ensures the complete isolation of the fuses in the “OFF” position and allows the switch to be fed from either top or bottom side.

This feature allows the switch to operate on highly inductive loads.

Touch safe





Our design reduces or eliminates the danger of accidental contact with live, energized parts.

All switches are supplied standard with fuse cover and line side shrouding.

Correction Factors
For Non-Fusible & Fusible Disconnect Switches

Correction factors due to ambient air temperature

Method: Ithu ≤ Ith x Kt
ta: ambient temperature
Ith: thermal switch current
Kt: correction factor due to ambient temperature ta
Ithu: maximum thermal current after correction

Non-Fusible Disconnect Switches

	T (° C)		
Ith	40°C < ta ≤ 50°C	50°C < ta ≤ 60°C	60°C < ta ≤ 70°C
V30 A	1	0.8	0.7
V60 A	1	1	1
V100 A	1	1	1
V200 A	1	1	0.9
V400 A	1	0.9	0.8
400 A	1	1	1
600 A	1	1	0.9
800 A	1	1	1
1000 A	1	1	0.9
1200 A	1	0.9	0.8

Fusible Disconnect Switches

	T (° C)		
Ith	40°C < ta ≤ 50°C	50°C < ta ≤ 60°C	60°C < ta ≤ 70°C
30 A CC CD type	0.9	0.8	0.7
30A J CD type	0.9	0.8	0.7
30 A CC	1	1	1
30 A J	1	1	1
60 A J	1	1	1
100 A J	1	1	1
200 A J	1	1	1
400 A J	0.9	0.8	0.7
600 A J	1	1	1
800 A L	1	1	1

Correction factors due to frequency

Method: Ithu ≤ Ith x Kf
f: rated operating frequency
Ith: thermal switch current
Kf: correction factor due to operating frequency F
Ithu: maximum thermal current after correction

Non-Fusible Disconnect Switches

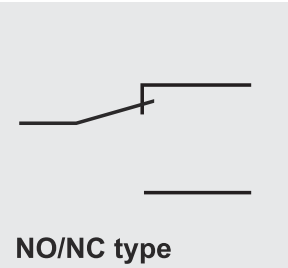
	f (Hz)		
Ith	100 Hz < f ≤ 2000 Hz	2000 Hz < f ≤ 6000 Hz	6000 Hz < f ≤ 10000 Hz
V30 A	1	0.7	0.6
V60 A	1	1	1
V100 A	1	1	1
V200 A	1	1	1
V400 A	0.9	0.8	0.7
400 A	1	1	1
600 A	1	0.9	0.8
800 A	1	1	0.9
1000 A	1	0.9	0.8
1200 A	1	0.7	0.6

Fusible Disconnect Switches

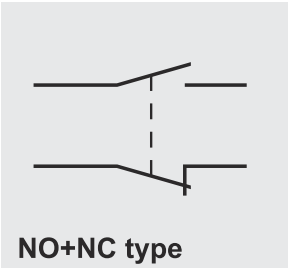
	f (Hz)		
Ith	100 Hz < f ≤ 2000 Hz	2000 Hz < f ≤ 6000 Hz	6000 Hz < f ≤ 10000 Hz
30 A CC CD type	0.8	0.7	0.6
30 A J CD type	0.8	0.7	0.6
30 A CC	1	1	1
30 A J	1	1	1
60 A J	1	1	1
100 A J	1	1	1
200 A J	1	0.9	0.8
400 A J	0.8	0.7	0.6
600 A J	1	1	1
800 A L	1	1	1

Auxiliary Contacts

Auxiliary Contact Wiring Diagrams



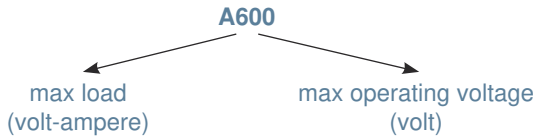
NO/NC type



NO+NC type

Auxiliary contact rating codes (according to UL508 standard item 139)

Designation



These codes concern the auxiliary contacts and give the maximum load they can make or break. The numerical suffix designates the maximum voltage design values, which are to be 600, 300 and 150 volts for suffixes 600, 300 and 150 respectively. The table below gives some typical rating codes:

Example

A contactor used at 600VAC - 60 Hz has the following specifications:

Average consumption: - inrush 60 Hz: 1200VA
- sealed 60 Hz: 120VA

Thus a C600 rated auxiliary device is the minimum rating required.

Contact Rating Code Designation	Max Operating Voltage (V)	Network Type	Making Max Load (VA)	Breaking Max Load (VA)
A600	600	AC	7200	720
B600	600	AC	3600	360
C600	600	AC	1800	180
D300	300	AC	432	72
E150	150	AC	216	36
N600	600	DC	275	275
P600	600	DC	138	138
Q600	600	DC	69	69
R300	300	DC	28	28

Note: A600 and N600 are the highest categories and may be used to cover all cases.

NEMA Ratings & IP Cross-Reference

This table provides a guide for converting from NEMA Enclosure Type Numbers to IP Ratings. The NEMA Types meet or exceed the test requirements for the associated European Classifications; for this reason the table should not be used to convert “from IP Rating to NEMA” and the “NEMA to IP Rating” should be verified by test.

NEMA Type	Intended Use and Description	NEMA Ratings and IP Cross-Reference
1	Indoor use primarily to provide a degree of protection against contact with the enclosed equipment and against a limited amount of falling dirt.	NEMA 1 meets or exceeds IP10
2	Indoor use to provide a degree of protection against a limited amount of falling water and dirt.	NEMA 2 meets or exceeds IP11
3	Intended for outdoor use primarily to provide a degree of protection against rain, sleet, windblown dust, and damage from external ice formation.	NEMA 3 meets or exceeds IP54
3R	Intended for outdoor use primarily to provide a degree of protection against rain, sleet, and damage from external ice formation.	NEMA 3R meets or exceeds IP14
3S	Intended for outdoor use primarily to provide a degree of protection against rain, sleet, windblown dust, and to provide for operation of external mechanisms when ice laden.	NEMA 3S meets or exceeds IP54
4	Intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, hose-directed water, and damage from external ice formation.	NEMA 4 meets or exceeds IP56
4X	Intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, hose-directed water, and damage from ice formation.	NEMA 4X meets or exceeds IP56
6	Intended for indoor or outdoor use primarily to provide a degree of protection against hose-directed water, the entry of water during occasional temporary submersion at a limited depth, and damage from external ice formation.	NEMA 6 meets or exceeds IP67
6P	Intended for indoor or outdoor use primarily to provide a degree of protection against hose-directed water, the entry of water during prolonged submersion at a limited depth, and damage from external ice formation.	NEMA 6P meets or exceeds IP67
12	Intended for indoor use primarily to provide a degree of protection against circulating dust, falling dirt, and dripping non-corrosive liquids.	NEMA 12 meets or exceeds IP52
12K	Type 12 with knockouts.	NEMA 12K meets or exceeds IP52

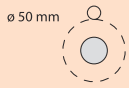
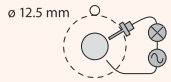
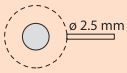
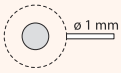
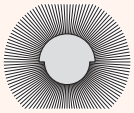
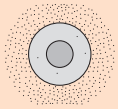
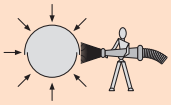
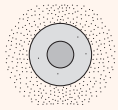
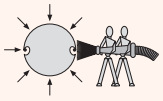
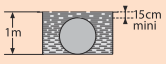
Wire Size Cross Reference

AWG	mm2
14	2.1
12	3.3
10	5.3
8	8.4
6	13.3
4	21.2
3	26.7
2	33.6
1	42.4
1/0	53.5
2/0	67.4
3/0	85.0
4/0	107.2

kcmil/mcm	mm2
250	127
300	152
350	177
400	203
500	253
600	304
700	355
750	380
800	405
900	456
1000	507
1250	633
1500	760
1750	887
2000	1014

Degrees of Protection
(IP Codes According to IEC 60529 Standard)

The degrees of protection are defined by two numbers and sometimes by an additional letter.
For example: IP 55 or IP xx B (x indicates: any value).
The numbers and additional letters are defined below:

First Number Protection Against Solid Body Penetration			Second Number Protection Against Liquid Penetration			Additional Letter[2]	Degree of Protection
IP	Tests		IP	Tests			Brief Description
0		No protection	0		No protection		
1		Protected against solid bodies greater than 50 mm	1		Protected against water drops falling vertically (condensation)	A	Protected against access with back of hand
2[1]		Protected against solid bodies greater than 12 mm	2		Protected against water drops falling up to 15° from the vertical	B	Protected against access with finger
3		Protected against solid bodies greater than 2.5 mm	3		Protected against water showers up to 60° from the vertical	C	Protected against access with tool
4		Protected against solid bodies greater than 1 mm	4		Protected against water splashes from any direction	D	Protected against access with wire
5		Protected against dust (excluding damaging deposits)	5		Protected against water jets from any hosed direction		
6		Total protection against dust	6		Protected against water splashes comparable to heavy seas		
			7		Protected against total immersion		

Note:

(1) This is established by 2 tests:

- non penetration of a sphere with the diameter of 12.5 mm
- non accessibility of a test probe with a diameter of 12 mm.

(2) This additional letter only defines the access to dangerous components

Example: A device has an aperture allowing access with a finger. This will not be classified as IP 2x.However, if the components which are accessible with a finger are not dangerous (electric shock, burns, etc.), the device will be classified as xx B.

IEC 947-1 & IEC 947-3 Standards

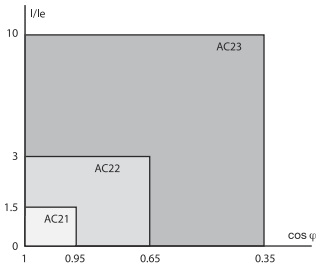
Selecting Switches According to IEC 947 -3 Standard

Utilization category		Use	Application
AC	DC		
AC20	DC20	No-load making and breaking	Disconnector (device without on-load making and breaking capacity
AC21	DC21	Resistive including moderate overloads	Switches at installation head or for resistive circuits (heating, lighting, except discharge lamps, etc.)
AC22	DC22	Inductive and resistive mixed loads including moderate overloads	Switches in secondary circuits or reactive circuits (capacitor banks, discharge lamps, shunt motors, etc.)
AC23	DC23	Loads made of motor or other highly inductive loads	Switches feeding one or several motors or inductive circuits (electric carriers, brake magnet, series motor, etc.)

Breaking and Making Capacities

Unlike circuit breakers, where these criteria indicate tripping or short-circuit making characteristics and perhaps requiring device replacement, switch making and breaking capacities correspond to utilization category maximum performance values. In these uses, the switch must still maintain its characteristics, in particular its resistance to leakage current and temperature rise.

	Making		Breaking		N° of operating cycles
	I/Ie	cos ϕ	I/Ie	cos ϕ	
AC 21	1.5	0.95	1.5	0.95	5
AC 22	3	0.65	3	0.65	5
AC 23 I ≤ 100 A	10	0.45	8	0.45	5
AC 23 Ie > 100 A	10	0.35	8	0.35	3
		L/R (ms)		L/R (ms)	
DC 21	1.5	1	1.5	1	5
DC 22	4	2.5	4	2.5	5
DC 23	4	15	4	15	5



Making and breaking capacities.

Short Circuit Characteristics

- Short-time withstand current (Icw): allowable rms current for 1 second.
- Short circuit making capacity (Icm): peak current value which the device can withstand when closed on a short-circuit.
- Conditional short circuit current: the rms current the switch can withstand when associated with a protection device limiting both the current and short circuit duration.
- Dynamic withstand: peak current the device can withstand in a closed position.

The characteristic established by this standard is the short-time withstand current (Icw) from which minimal dynamic withstand is deduced. This essential withstand value corresponds to what the switch can stand without welding.

Electrical and Mechanical Endurance

This standard establishes the minimum number of electrical (full load) and mechanical (no-load) operating cycles that must be performed by devices. These characteristics also specify the device's theoretical lifespan during which it must maintain its characteristics, particularly resistance to leakage current and temperature rise.
This performance is linked to the device's use and rating. According to anticipated use, two additional application categories are offered:

- Category A: frequent operations (in close proximity to the load),
- Category B: infrequent operations (at installation head or wiring system).

Ie (A)	≤ 100	≤ 315	≤ 630	≤ 2500	> 2500
N° cycles/hour	120	120	60	20	10
N° of operations in cat. A					
without current	8500	7000	4000	2500	1500
with current	1500	1000	1000	500	500
Total	10000	8000	5000	3000	2000
N° of operations in cat. B					
without current	1700	1400	800	500	300
with current	300	200	200	100	100
Total	2000	1600	1000	600	400

Definitions

Conventional thermal current (Ith): Value of the current the disconnect switch can withstand with pole in closed position, in free air for an eight hour duty, without the temperature rise of its various parts exceeding the limits specified by the standards.
Rated insulation voltage (Ui): Voltage value which designates the unit and to which dielectric tests, clearance and creepage distances are referred.
Rated impulse withstand voltage (Uimp): Peak value of an impulse voltage of prescribed form and polarity which the equipment is capable of withstanding without failure under specified conditions of test and to which the values of the clearances are referred.
Rated operating current (Ie): Current value determined by endurance tests (both mechanical and electrical) and by making and breaking capacity tests.

Elevator Switch

Why do we offer our Fusible Shunt Trip Switch?

For a few different reasons:

- NFPA 13, 8.14.5
- NFPA 72 6.15.4.4
- ANSI/ASME A17.1
- NEC 620.91



We offer our fusible shunt trip switch as an all-in-one solution to meet the many different code requirements with the protection and safety in elevator shafts. According to NFPA 13, 8.14.5 sprinkler protection is required at the top and bottom of elevator shafts. With that being said, NFPA 13 requires the installation of sprinklers in the elevator machine room. Once a sprinkler system has been introduced to either the elevator shaft or elevator machine room, you are now installing these per the State-Adopted Elevator Code ANSI/ASME A17.1.

To summarize ASME A17.1, Safety Code for Elevators and Escalators, Rule 102.2 (c) (3), requires the shutdown of power to the elevator prior to the application of water in the elevator machine room and or hoistway.

The shutdown of power is accomplished by a shunt trip device in the elevator circuit. This reduces the risk of any potential electrical shock once the water is released into the system. This will also reduce the risk of any elevator car slippage once the cables and hoist system become saturated from the release of water. In addition to turning off the power, 2002 NFPA 72 6.15.4.4 (Fire Alarm Code) requires:

“Control circuits to shut down elevator power shall be monitored for the presence of operating voltage. Loss of voltage to the control circuit for the disconnecting means shall cause a supervisory signal to be indicated at the control unit and required remote annunciation.”

This is achieved with our Fire Monitoring Relay, (FR Relay) that is standard in our Fusible Shunt Trip Device.

In the event of a power loss at which point a back up power supply is introduced to the system, you are now required to meet NEC Article 620.91 paragraph (C) emergency or standby power system. This is accomplished with a set of mechanical interlock auxiliary contacts which comes standard as 1-N/O and 1-N/C contact with our units. This prevents the elevator from descending down and injuring any workers that could be working in the elevator shaft. This also allows the elevator to move to the next convenient location and open the doors to let any passengers out in the event of an emergency.

Selectivity Between
240, 480, or 600V Main and Branch Fuses

Definition

Coordination is defined as properly localizing a fault condition to restrict outages to the equipment affected, accomplished by choice of selective fault protective devices.

Coordination (selectivity, discrimination) is desirable and often times mandatory. A lack of coordination can represent a hazard to people and equipment. When designing for coordination, fuses provide distinct advantages over other types of overcurrent protective devices.

To coordinate a circuit breaker protected system, it is generally necessary to intentionally delay the short circuit response of upstream breakers. Though coordination may be achieved, short circuit protection is compromised. The speed and consistency of response of fuses allows coordination without compromising component protection.

The terms coordination and selectivity are often used interchangeably. The term coordination should be used to describe a system as defined above, while two fuses are said to be selective if the downstream fuse opens while the upstream fuse remains operable under ALL conditions of overcurrent. The term “discrimination” is synonymous with selectivity and is the preferred international term for this definition.

The word ALL is key. Fuse selectivity cannot be assured by comparing fuse time current curves alone. These curves stop at .01 second. Fuse performance under high fault conditions must also be evaluated. Fuse I^2t is the best tool for assuring coordination under high fault current conditions. If the total clearing I^2t of the downstream fuse is less than the melting I^2t of the main upstream fuse, the fuses will be selective under high fault conditions.

To simplify presenting weighty I^2t data, selectivity information can simply be found in selectivity ratio tables.

The ratios found in the following tables are conservative and are appropriate for all overcurrents up to 200,000 amperes RMS. In some cases smaller ratios than shown may be used. Consult your Mersen representative for specific recommendations.

Fuse Selectivity Ratios - 600 and 480 Volt Applications Up to 200,000 RMS Symmetrical Amperes

Branch Fuse	Ratio (For Fuses Rated 61 – 600a) Main Fuse								
	A4BQ	A4BY	A4BT	TRS	A6K	A6D	A4J	AJT	A6T
A4BQ	2:1	2:1	2:1	-	-	-	-	-	-
A4BY	-	2.5:1	2:1	-	-	-	-	-	-
A4BT	2.5:1	2.5:1	2:1	-	-	-	-	-	-
TRS	4:1	4:1	3:1	2:1	4:1	4:1	4:1	3:1	4.5:1
A6K	2:1	2:1	1.5:1	1.5:1	2:1	2:1	3:1	2:1	3.5:1
A6D	2:1	2:1	1.5:1	1.5:1	2:1	2:1	3:1	2:1	3.5:1
A4J	2:1	2:1	1.5:1	1.5:1	2:1	2:1	2:1	2:1	3:1
AJT	2:1**	2:1**	2:1	1.5:1	2:1	2:1	2.5:1	2:1	3.5:1
A6T	3:1	2.5:1	2:1	1.5:1	2:1	2:1	2:1	2:1	2.5:1

Fuse Selectivity Ratios - 240 Volt Applications Up to 200,000 RMS Symmetrical Amperes

Branch Fuse	Ratio (For Fuses Rated 61 – 600a) Main Fuse								
	A4BQ	A4BY	A4BT	TR	A2K	A2D	A4J	AJT	A3T
A4BQ	2:1	2:1	2:1	-	-	-	-	-	-
A4BY	-	2.5:1	2:1	-	-	-	-	-	-
A4BT	2.5:1	2.5:1	2:1	-	-	-	-	-	-
TR	4:1	4:1	4:1	1.5:1	4:1	3:1	4:1	3:1	5:1
A2K	2:1	2:1	1.5:1	1.5:1	2:1	1.5:1	2:1	1.5:1	3:1
A2D	2.5:1	2.5:1	2:1	1.5:1	2:1	1:5:1	2:1	2:1	3:1
A4J	2:1	2:1	1.5:1	1.5:1	2:1	1.5:1	2:1	2:1	3:1
AJT	2:1	2:1	2:1	1.5:1	2.5:1	2:1	2.5:1	2:1	3:1
A3T	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	2:1

**Exception: For AJT450-600 use 2:1 on 480V only, 2.25:1 on 600V.

Short Circuit Calculations Quick Three Phase

Short circuit current levels must be known before fuses or other equipment can be correctly applied. For fuses, unlike circuit breakers, there are four levels of interest. These are 10,000, 50,000, 100,000 and 200,000 RMS symmetrical amperes.

Rigorous determination of short circuit currents requires accurate reactance and resistance data for each power component from the utility generating station down to the point of the fault. It is time-consuming for a plant engineer to collect all this information and yet he is the one most affected by short circuit hazards.

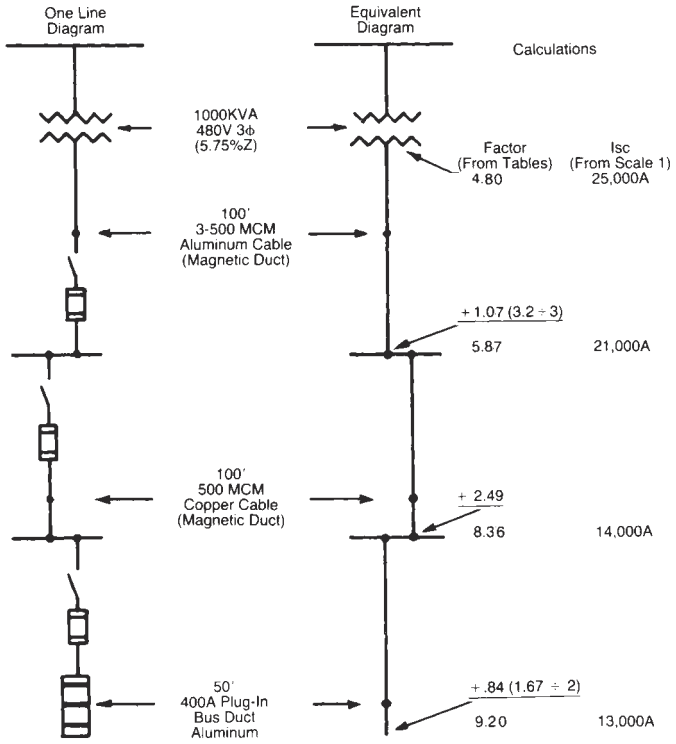
There have been several approaches to “easy” short circuit calculations which have been cumbersome to be of practical use. The method described here is not new but it is the simplest of all approaches.

Example 1:
What is the potential short circuit current at various points in a 480V, 3-phase system fed by a 1000kVA, 5.75%Z transformer? (Assume primary short circuit power to be 500MVA.)

In summary, each basic component of the industrial electrical distribution system is pre-assigned a single factor based on the impedance it adds to the system. For instance, a 1000kVA, 480 volt, 5.75%Z transformer has a factor of 4.80 obtained from Table A. This factor corresponds with 25,000 RMS short circuit amperes (directly read on Scale 1, pg 55). Note: Factors change proportionally with transformer impedance. If this transformer were 5.00%Z, the factor would be 5.00/5.75 x 4.80 = 4.17.

Cable and bus factors are based on 100 foot lengths. Shorter or longer lengths have proportionately smaller or larger factors (i.e. 50’ length = 1/2 factor; 200’ length = 2 x factor). Basic component factors are listed on following pages in tables A through D.

To find the short circuit current at any point in the system, simply add the factors as they appear in the system from service entrance to fault point and read the available current on Scale 1.



Example 2:
If the primary short circuit power were 50MVA (instead of 500MVA) in this same system, what would Isc be at the transformer? At the end of the bus duct run?

Answer:
From the Primary MVA correction factor table A1, the factor for 50MVA (at 480V) is 1.74. The new factor at the transformer is then 4.80 + 1.74 = 6.54 and Isc is reduced to 18,000A (Scale 1). The new factor at the bus duct is 9.21 + 1.74 = 10.95 Isc = 11,000A (Scale 1).

Short Circuit Calculations Quick Three Phase

Component factor tables- transformers

The transformer factors are based on available primary short circuit power of 500MVA and listed in Table A. For systems with other than 500MVA primary short circuit power, add the appropriate correction factors from Table A1 to the transformer factor found in Table A.

A- Three Phase Transformer Factors

Transformer		Factor 3 Phase Voltage			
kVA	%Z	208	240	480	600
75	1.60	9.00	10.00	20.00	24.00
100	1.70	7.00	8.00	16.00	20.00
112.5	2.00	7.40	8.50	17.00	21.00
150	2.00	5.40	6.00	12.00	15.00
225	2.00	3.70	4.00	8.00	10.00
300	2.00	2.70	3.00	6.00	7.50
500	2.50	2.15	2.25	4.50	5.60
750	5.75	2.78	3.25	6.50	8.00
1000	5.75	2.24	2.40	4.80	6.00
1500	5.75	1.48	1.60	3.20	4.00
2000	5.75	NA	1.20	2.40	3.00
2500	5.75	NA	.95	1.91	2.40

Notes: 208 volt 3φ transformer factors are calculated for 50% motor load. 240, 480 and 600 volt 3φ transformer factors are calculated for 100% motor load. A phase-to-phase fault is .866 times the calculated 3-phase value.

A1- Transformer Correction Factors

Primary MVA	Factor 3 Phase Voltage			
	208	240	480	600
15	2.82	3.24	6.43	8.05
25	1.65	1.90	3.78	4.73
50	.78	.90	1.74	2.24
100	.34	.40	.80	1.00
150	.20	.23	.46	.58
250	.08	.10	.20	.25
Infinite	-.08	-.10	-.20	-.25

A2- Factor for Second Three Phase Transformer in System

1. Determine system factor at the second transformer primary.

Example:

Isc @ 480V = 40,000A. Factor is 3.00 (from Scale 1).

2. Adjust factor in proportion to voltage ratio of second transformer.

Example:

For 208V, factor changes to (208 ÷ 480) x 3.00 = 1.30

3. Add factor for second 3φ transformer.

Example:

Factor for 100kVA, 208V, 1.70%Z transformer is 7.00.

Total Factor = 7.00 + 1.30 = 8.30

(Isc = 14,500A)

3ϕ to 3ϕ

480V 40,000A — 208V 14,500A

100kVA

A3- Factors for Single Phase Transformer in Three Phase System

Transformer connections must be known before factor can be determined. See Figures A and B (bottom right).

1. Determine system factor at 1ϕ transformer primary, with 480V pri., 120/240V sec. (Figure A)

Example:

Isc @480V = 40,000A, 3ϕ. Factor is 3.00 (from Scale 1).

$$1\phi \text{ factor} = \frac{3\phi \text{ factor}}{.866} = \frac{3.00}{.866} = 3.46$$

2. Adjust factor in proportion to voltage ratio of 480/240V transformer.

Example:

For 240V, 1ϕ factor is (240 ÷ 480) 3.46 = 1.73

3. Add factor for 1ϕ transformer with Figure A connection.

Example:

Factor for 100kVA, 120/240V, 3%Z transformer is:

a. 120V--total factor = 6.22 + 1.73 = 7.95
   (Isc = 15,000A)

b. 240V--total factor = 8.64 + 1.73 = 10.37
   (Isc = 11,600A)

A3- Single Phase Transformer Factors

Transformer		Factor 1 Phase Voltage		
		120V	240V	120V
kVA	%Z	FIG. A	FIG. A	FIG. B
15	2.5	34.6	48.0	24.0
25	2.5	20.7	28.8	14.4
37.5	2.8	16.6	23.0	11.5
50	3.0	12.5	17.3	8.65
75	3.0	8.28	11.5	5.75
100	3.0	6.22	8.64	4.32
150	2.5	3.46	4.80	2.40
167	2.5	3.10	4.31	2.16
225	2.5	2.30	3.20	1.60
300	3.0	2.07	2.88	1.44
500	4.5	1.86	2.59	1.30

Note: Factor varies with %Z.
Example: 50kVA, 240V secondary with a 1.5%Z has a factor of (1.5%Z ÷ 3.0%Z) x 17.3 = 8.65

3ϕ to 1ϕ

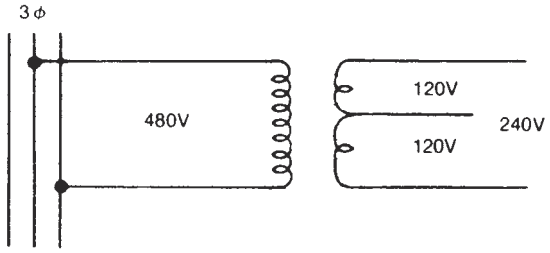


Fig. A

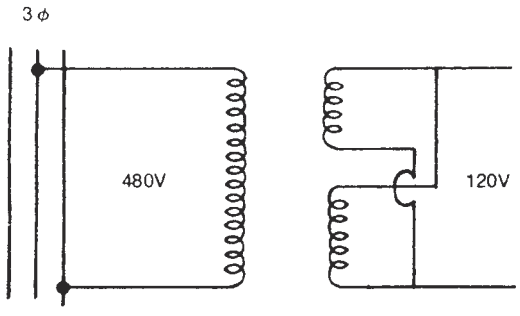


Fig. B

Component Factor Tables - Cables in Duct

B/B1- Copper Cables in Duct (Per 100')

Cable Size	B–Magnetic Duct 3 Phase Voltage				B1–Non-Magnetic Duct 3 Phase Voltage			
	208	240	480	600	208	240	480	600
#8	79.00	68.00	34.00	27.00	78.00	67.60	33.80	27.10
6	50.00	43.00	22.00	17.50	47.90	41.50	20.70	16.60
4	32.00	28.00	14.00	11.15	30.70	26.70	13.30	10.70
2	21.00	18.00	9.00	7.23	19.90	17.20	8.61	6.89
1	17.50	15.00	7.40	5.91	16.20	14.00	7.07	5.60
1/0	14.00	12.20	6.10	4.85	13.20	11.40	5.70	4.57
2/0	11.80	10.20	5.10	4.05	10.60	9.21	4.60	3.68
3/0	9.80	8.50	4.27	3.43	8.87	7.59	3.85	3.08
4/0	8.40	7.30	3.67	2.94	7.57	6.55	3.28	2.62
250kcmil	7.70	6.70	3.37	2.70	6.86	5.95	2.97	2.38
300	7.00	6.10	3.04	2.44	5.75	4.98	2.49	1.98
350	6.60	5.70	2.85	2.28	5.36	4.64	2.32	1.86
400	6.20	5.40	2.70	2.16	5.09	4.41	2.20	1.75
500	5.80	5.00	2.49	2.00	4.66	4.04	2.02	1.62
600	5.50	4.80	2.40	1.91	4.29	3.72	1.86	1.49
750	5.20	4.50	2.26	1.80	4.05	3.51	1.76	1.41

C/C1- Aluminum Cables in Duct (Per 100')

Cable Size	C–Magnetic Duct 3 Phase Voltage				C1–Non-Magnetic Duct 3 Phase Voltage			
	208	240	480	600	208	240	480	600
#8	129.00	112.00	56.00	45.00	129.75	112.45	56.20	45.00
6	83.00	72.00	36.00	29.00	80.00	69.10	34.60	27.70
4	53.00	46.00	23.00	18.50	51.10	44.20	22.10	17.70
2	35.00	30.00	15.00	12.00	33.00	25.70	14.30	11.40
1	28.00	24.00	12.00	9.50	26.30	22.80	11.40	9.12
1/0	21.50	18.50	9.70	7.70	21.20	18.40	9.20	7.36
2/0	18.50	16.00	8.00	6.40	17.00	14.70	7.34	5.87
3/0	15.00	13.00	6.50	5.20	13.80	12.00	6.02	4.79
4/0	12.50	11.00	5.50	4.40	11.50	9.95	4.98	3.99
250kcmil	11.10	9.60	4.80	3.85	10.10	8.72	4.36	3.49
300	9.90	8.60	4.30	3.42	8.13	7.04	3.52	2.81
350	8.60	7.40	3.70	3.00	7.49	6.50	3.07	2.45
400	8.30	7.20	3.60	2.90	6.87	5.95	2.98	2.38
500	7.40	6.40	3.20	2.60	6.12	5.31	2.66	2.13
600	7.20	6.20	3.10	2.44	5.30	4.59	2.29	1.83
750	6.50	5.60	2.80	2.22	4.85	4.20	2.10	1.69

Note: For parallel runs divide factor by number of conductors per phase.
Example: If factor for a single 500kcmil conductor is 2.49 then the factor for a run having 3-500kcmil per phase is 2.49 ÷ 3 = .83 (Example from Table B, 480 volts)

Short Circuit Calculations Quick Three Phase

Component Factor Tables - Bus Duct

$$I_{sc} = \frac{120{,}000}{\text{Total Factor}}$$

D- Factors for Feeder* Bus Duct (Per 100')

Duct Ampere Rating	Factor 3 Phase Voltage							
	Copper				Aluminum			
	208	240	480	600	208	240	480	600
600	2.85	2.48	1.24	.99	2.54	2.19	1.10	.88
800	1.61	1.40	.70	.56	2.54	2.19	1.10	.88
1000	1.61	1.40	.70	.56	1.90	1.65	.82	.66
1200	1.21	1.06	.53	.42	1.60	1.36	.66	.54
1350	1.17	1.01	.51	.40	1.32	1.14	.57	.46
1600	1.03	.89	.45	.36	1.19	1.03	.52	.41
2000	.90	.78	.39	.31	.90	.77	.39	.31
2500	.63	.54	.27	.22	.70	.60	.30	.24
3000	.51	.44	.22	.18	.60	.52	.26	.21
4000	.37	.32	.16	.13	.43	.38	.19	.15
5000	.30	.26	.13	.10	--	--	--	--

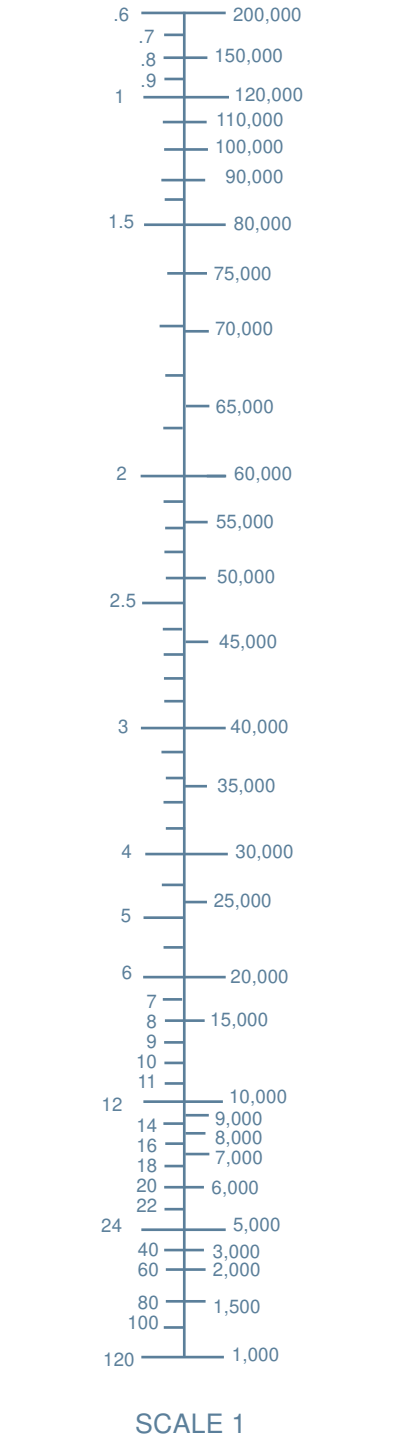
* These factors may be used with feeder duct manufactured by I-T-E, GE, Square D and Westinghouse.

D1- Factors for Plug-In** Bus Duct (Per 100')

Duct Ampere Rating	Factor 3 Phase Voltage							
	Copper				Aluminum			
	208	240	480	600	208	240	480	600
400	2.53	2.18	1.09	.89	3.88	3.34	1.67	1.36
600	2.53	2.18	1.09	.89	2.41	2.07	1.04	.84
800	1.87	1.61	.81	.66	2.41	2.07	1.04	.84
1000	1.87	1.61	.81	.66	1.69	1.45	.73	.59
1200	1.47	1.26	.63	.51	1.43	1.22	.61	.50
1350	1.26	1.08	.54	.44	1.30	1.12	.56	.45
1600	.91	.78	.39	.32	1.09	.94	.47	.38
2000	.79	.68	.34	.28	.89	.77	.38	.31
2500	.61	.52	.26	.21	.66	.57	.28	.23
3000	.48	.42	.21	.17	.59	.51	.25	.21
4000	.43	.37	.18	.15	.46	.40	.20	.16
5000	.38	.33	.16	.13	.35	.30	.15	.12

** These factors may be used with plug-in duct manufactured by GE, Square D and Westinghouse.

Short Circuit Current



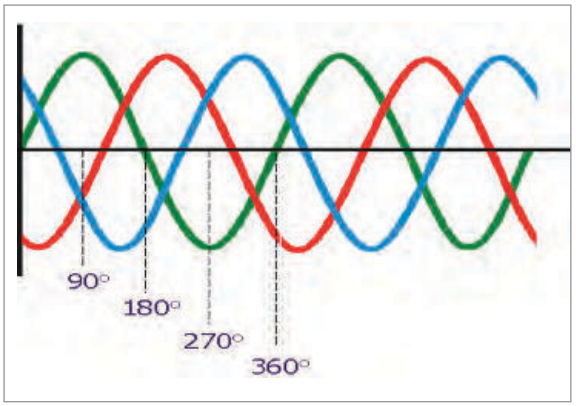
SCALE 1

P

Short Circuit Calculations Quick Three Phase

How Many Fuses Will Open On a Short Circuit?

In a three phase system typically only two fuses will open on a line-to-line short circuit. Since all three line currents are offset from each other (see chart to the right), each fuse will see the full fault at different times. Therefore the fuses will open at different times, once the first two fuses open, the circuit is disconnected and the third one typically never sees the full fault current. The third line can only conduct current directly to ground.



How many fuses will open on an overload?
Similar to a short circuit typically two fuses will open on an overload. Typically, one fuse opening will not be adequate to disconnect all three phases so the two remaining phases will conduct the overcurrent until one of them opens. At this point, the last fuse will only be able to conduct current directly to ground so it most likely will not open.

Is it ok to replace only the open fuses?
It is always recommended to replace all three fuses. In both short circuit and overload conditions the third fuse might not open but there is no way to tell how much of the element may have melted due to the overcurrent. Not replacing the third fuse can lead to issues in the future such as nuisance openings which can result in costly downtime.

Is there a life expectancy on my fuse?
A fuse does not have a “mean time between failures” because theoretically a fuse only needs to be replaced once it opens on an overcurrent. Fuses are 100% tested before leaving the factory to ensure that they will perform as intended. In the real world, factors such as temperature and humidity can cause a fuse to need replacement. Mersen suggests using ten years as a guideline for replacing both fuses installed and in inventory.



Fuses are 100% tested before leaving the factory to ensure they will perform as intended.

Properties of Materials*

Fuse Blocks, Fuse Holders, Power Distribution Blocks, Fuses & Accessories

Property	Units	Astm Test	Phenolic	Glass Filled Polycarbonate	Polyamide	Polyethelene Terphthalate	Polysulfone Copolymer	Polyphtalamide	Nylon
Specific Gravity	-	D792	1.4	1.21	1.36	1.67	1.52	1.71	1.16
IZOD	ft-lb/in	D256	0.29	4-6	3.2	1.7	1.8	1.5	0.63
Flexural Strength	psi	D790	11,000	13,200	38,000	29,000	26,900	37,300	18,500
Flexural Modulus	psi	D790	1.1 x 106	325,000	1.25 x 106	1.5 x 106	1.4 x 106	1.9 x 106	4.3 x 105
Tensile Strength	psi	D638	7,000	9,000	25,000	20,000	17,600	26,000	12,000
Compressive Strength	psi	D695	28,800	12,500	34,000	29,000	-	-	-
Water Absorption	24 hrs %	D570	0.45	0.15	1.3	0.05	0.1	0.18	1.5
Hardness	Rockwell	D785	M-110	M-85	R-105	R-120	-	-	-
Dielectric Strength									
60 hertz, 25ºC, s/t	vpm	-	300	425	435	460	500	460	432
60 hertz, 25ºC, s/s	vpm	-	250	425	-	355	-	-	-
Dielectric Constant									
60 hertz–dry	-	D150	5.96	3.01	-	3.8	-	-	-
1 Mhertz–dry	-	D150	4.9	2.96	3.6	3.7	3.8	4.9	3.6
Volume Resistivity	ohm-cm	D257	50 x 106	>1016	1016	>1015	>1016	3 x 1016	>1016
Heat Deflection	ºF	D648	320	270	410	435	330	523	167
(ºF @ 264 psi)									
Flammability (UL 94)	-	-	94 V-0	94 V-0	94 V-0	94 V-0	94 V-0	94 V-0	94 V-0
Relative Thermal Index (RTI)									
(UL746B)									
Electrical	ºC	-	150	125	150	155	150	140	140
Mechanical without impact	ºC	-	150	125	140	155	150	130	110

*Note: Above data represents approximate values and are for reference only.

Product Types & Families						
61XXXX	PDB	USM	GPM	SHR	AOS	FSPDB
62XXXX	DRM	USCC	FEB		EI	
64XXXX	DFC	US3J	FEX			
22XXXX	603XXX	US6J	IL			
24XXXX	203XXX	US14	TPMOV			
26XX	206XXX	US22	Surge Trap			
P266	303XXX	CC	1SC			
P243	306XXX	MSC				
1MSC	P243X	NH				
PS2OX127	703XX					
FHXXX	U705XX					
	U710XX					
	21XXXX					
	61XXXSJ					

Application Information

Comparative Data of Stranded Copper and Aluminum Cables

Size Awg Kcmil	Area Circular Mils	Square Millimeters
30	100.5	0.051
28	159.8	0.081
26	254.1	0.123
24	404.0	0.205
22	642.4	0.326
20	1022	0.518
18	1620	0.823
16	2580	1.31
14	4110	2.08
12	6530	3.31
10	10380	5.26
8	16510	8.37
6	26240	13.3
4	41740	21.2
3	52620	26.7
2	66360	33.6
1	83690	42.4
1/0	105600	53.5
2/0	133100	67.4
3/0	167800	85.0
4/0	211600	107
250	-	127
300	-	152
350	-	177
400	-	203
500	-	253
600	-	304
700	-	355
750	-	380
800	-	405
900	-	456
1000	-	507
1250	-	634
1500	-	760
1750	-	887
2000	-	1014

Recommended Tightening Torque for Bolt-On and Stud Mounted Fuses

English Sizes

Thread Size	Tightening Torque ft-lbs	in-lbs
1/4-20	4	50
5/16-18	7.5	90
3/8-16	13	160
3/8-24	15	180
1/2-13	30	360
1/2-20	31	375

Metric Sizes

Thread Size	Tightening Torque newton-meters	in-lbs
M6	6	53
M8	13	115
M10	26	230
M12	45	398
M16	84	740

Small Ampere Rating Equivalents

Fraction	Decimal	Milliamps
1/100	0.0100	10
1/64	0.0156	15
1/32	0.03125	32
4/100	0.0400	40
5/100(1/20)	0.0500	50
1/16	0.0625	63
8/100	0.0800	80
1/10	0.10	100
1/8	0.1250	125
15/100	0.150	150
16/100	0.160	160
175/1000	0.1750	175
3/16	0.1875	188
2/10	0.20000	200
1/4	0.2500	250
3/10	0.3000	300
315/1000	0.3150	315
3/8	0.3750	375
4/10	0.4000	400
1/2	0.5000	500
6/10	0.6000	600
630/1000	0.6300	630
7/10	0.7000	700
3/4	0.7500	750
8/10	0.8000	800
9/10	0.9000	900
1	1.000	1000

Application Information

Short Circuit Rating (SCCR)

The National Electric Code (2008) defines Short-Circuit Current Rating (article 100) as “the prospective symmetrical fault current at a normal voltage to which an apparatus or system is able to be connected without sustaining damage exceeding defined acceptance criteria.” SCCR is important to provide for safety of people and equipment during short-circuit conditions.

Article 409.110 (3) states that industrial control panels shall be marked with “short-circuit current rating of the industrial control panel based on one of the following: (a) short-circuit current rating of a listed and labeled assembly (b) short-circuit current rating established utilizing an approved method.” The fine print note refers to UL 508A, supplement SB as an example of an approved method. 430.8 require motor controllers to be marked with an SCCR.

Supplement SB in UL 508A uses a four step process to determine what a short circuit current rating for a panel should be. This process identifies the components with the lowest individual SCCR in the circuit. If there is no feeder over-current protective device (OCPD) this component is the weakest link and would determine the overall SCCR of the panel. Typically the feeder circuit will have an OCPD and we must consider its current-limiting effects on the circuit.

The feeder OCPD may limit fault currents enough so that the weakest link components are protected and the panel can have a higher overall SCCR. For more information please contact Mersen Technical Services at 978-462-6662 or technicalservices.nby@mersen.com.

11 Reasons For Using Current-Limiting Fuses:

Arc Flash Reduction

Current limiting fuses, when applied within their current limiting range, reduce personnel exposure to incident arc flash energy. Non fused systems may need extensive re-engineering to reduce arc flash hazards, and improve personnel safety.

Safety

Overcurrent protective devices which operate are often reset without first investigating to find the cause of opening. Electromechanical devices which have opened high level faults may not have the reserve capacity to open a 2nd or 3rd fault safely. When a fuse opens it is replaced with a new fuse, thus protection is not degraded by previous faults.

Reliability

No moving parts to wear or become contaminated by dust, oil or corrosion.

Long Life

The speed of response of a fuse will not change or slow down as the fuse ages. In other words, the fuse’s ability to provide protection is not adversely affected by the passage of time.

Minimal Maintenance

Fuses do not require periodic recalibration as do electromechanical overcurrent protective devices.

Component Protection

The current limiting action of a fuse minimizes or eliminates component damage.

North American Standards

Tri-national Standards specify fuse performance and maximum allowable fuse Ip and I^2t let-thru values.

Selectivity

Fuses may be easily coordinated to provide selectivity under both overload and short circuit conditions.

High Interrupting Rating

You don’t pay a premium for high interrupting capacity. Most low voltage current limiting fuses have a 200,000 ampere interrupting rating.

Cost Effective

Fuses are generally the most cost effective means of providing overcurrent protection. This is especially true where high fault currents exist or where small components need protection.

Extended Protection

Devices with low interrupting ratings are often rendered obsolete by service upgrades or increases in available fault current. Non-fused systems may need expensive system upgrades to maintain system safety.

Application Information

Three Clues for Detecting When is a Fuse Too Old for Storeroom Inventory?

Storeroom managers often have the responsibility for identifying obsolete inventory. There are advantages to having the right inventory for needs, without the clutter of fuses that should never be used. Obsolete fuses can mask stock-out of important spare fuses resulting in needless emergencies. Sometimes, an electrician will mistakenly use an obsolete fuse and create a dangerous safety condition.

What conditions would make a fuse obsolete? There is functional obsolescence, concealed damage obsolescence, and age obsolescence. Any of these conditions justify discarding a fuse. The electrical safety experts at Mersen offer the following three clues for determining when a fuse should be removed from storeroom inventory:

1. Functional Obsolescence

Functional obsolescence occurs when the fuse can't protect the equipment due to changes in the electrical system, or when the end-use equipment needing this particular fuse has been abandoned. Either way, the fuse will not help in restoring the equipment to service. If it's accidently used by an electrician, it could create a hazardous situation.

An example of a functionally obsolete fuse is a One-Time with a safety rating of only 10kA IR. When the fuse was originally purchased, it could have had an adequate safety rating. Now the electrical system has changed and requires a safety rating of more than 10kA. If the fuse is installed without adequate IR as required by OSHA, it could explode or cause personal injury.

2. Concealed Damage

Obsolescence can be caused by concealed damaged. An electrician normally only checks for fuse continuity to determine its suitability for continued service. But other concealed damage can occur in storage. The biggest threat to fuses in storage is moisture.

Once fuses absorb too much moisture, they lose their interrupting (safety) capacity. Even if they are dried out after the exposure, they are permanently damaged. In normal use they generate enough heat to keep themselves safe from absorbing moisture, but not in storage. The absorption of moisture permanently changes the structure of the filler packing around the fuse link and consequently decreases the safety capacity.

A common check for water damage is to check for wrinkling on the fuse's paper label. If the paper label is wrinkled, it indicates excessive moisture during storage. Also, any water stains on the fuse body or corrosion on the ends can indicate moisture damage.

Other concealed damage can occur when a fuse is used and returned to the storeroom. Any fuse that show scratches on the blades or ferrules was probably inserted into fuse clips and returned to inventory.

3. Fuses Over 10 Years Old

When fuses are more than 10 years old, the history of these fuses is uncertain. More than likely, they were exposed to moisture or damaging conditions sometime during the 10 years of storage. This would make them unsafe and unreliable for maintenance. Most manufacturers mark a date code on their fuses.

Summary

If storeroom fuses exhibit functional obsolescence, signs of moisture damage, or are more than 10 years old, they should be replaced. For a free fuse audit and inventory analysis, visit call 978-462-6662.

Application Information

Class 1 Division 2 Locations

List of Mersen products that meet the description of “non-indicating, filled, current-limiting” as referenced in Section 501.115(B) (3) of the 2008 National Electrical Code, allowing them to be used in standard enclosures.

Cat. No.	U.L. Class	U.L. Standard	Guide	File
A2D(1/10- 7)R*	RK1	248-12	JDDZ	E2137
A2K(1- 600)R	RK1	248-12	JDDZ	E2137
A3T(1- 1200)	T	248-15	JDDZ	E2137
A4BT(601- 6000)*	L	248-10	JDDZ	E2137
A4BQ(601- 6000)*	L	248-10	JDDZ	E2137
A4BY(601- 6000)	L	248-10	JDDZ	E2137
A4J(1- 600)	J	248-8	JDDZ	E2137
A6D(1/10- 7)R*	RK1	248-12	JDDZ	E2137
A6K(1- 600)R	RK1	248-12	JDDZ	E2137
A6T(1- 800)	T	248-15	JDDZ	E2137
AG(3- 60)*	G	248-5	JDDZ	E2137
AJT(1- 7)*	J	248-8	JDDZ	E2137
ATDR(1/4- 30)*	CC	248-4	JDDZ	E2137
ATMR(2-1/2 - 30)	CC	248-4	JDDZ	E2137
ATQR(2- 30)*	CC	248-4	JDDZ	E2137
HSJ(1- 600)	J	248-8	JDDZ	E2137
HSRK(70- 600)R	RK1	248-12	JDDZ	E2137
TR(1/10- 600)R* +	RK5	248-12	JDDZ	E2137
TRS(1/10- 600)R* +	RK5	248-12	JDDZ	E2137

**A Time Delay Fuse*

+ Blue Label Fuses Only

Since all of the above fuses meet the “non-indicating, filled, current-limiting” specifications, they are suitable for use in standard enclosures for Class 1 Division 2 applications.

Application Information

AMP-TRAP® 2000

Suggested Fuse Specifications

1.0 General

The electrical contractor shall furnish and install a complete set of fuses for all fusible equipment on the job as specified by the electrical drawings. Final tests and inspections shall be made prior to energizing the equipment. This shall include tightening all electrical connections and inspecting all ground conductors. Fuses shall be as follows:

2.0 Mains, Feeders and Branch Circuits

A. Circuits 601 to 6000 amperes shall be protected by current-limiting Mersen Amp-Trap 2000® Class L time-delay A4BQ fuses. Fuses shall be time-delay and shall hold 500% of rated current for a minimum of 4 seconds, clear 20 times rated current in .01 second or less and be UL Listed and CSA Certified with an interrupting rating of 200,000 amperes rms symmetrical.

B. Circuits 600 amperes or less shall be protected by current-limiting Mersen Amp-Trap 2000® Class RK1 time-delay A2D (250V) or A6D (600V) or Class J time-delay AJT fuses. Fuses shall hold 500% of rated current for a minimum of 10 seconds (30A, 250V Class RK1 case size shall be a minimum of 8 seconds) and shall be UL Listed and CSA Certified with an interrupting rating of 200,000 amperes rms symmetrical.

C. Motor Protection

All individual motor circuits shall be protected by Mersen Amp-Trap 2000® Class RK1, Class J or Class L time-delay fuses as follows:

Circuits up to 480A:	Class RK1 - A2D (250V) or A6D(600V) Class J - AJT
Circuits over 480A:	Class L - A4BQ

Fuse sizes for motor protection shall be chosen from tables published by Mersen for the appropriate motor rating. Heavy load and maximum fuse ratings are also shown for applications where typical ratings are not sufficient for the starting current of the motor.

D. Motor Controllers

Motor controllers shall be protected from short circuits by Mersen Amp-Trap 2000® time-delay fuses. For Type 2 protection of motor controllers, fuses shall be chosen in accordance with motor control manufacturers' published recommendations, based on Type 2 test results. The fuses shall be Class RK1 A2D (250V) or A6D (600V) or Class J AJT or Class CC ATDR (600V).

E. Circuit breakers and circuit breaker panels shall be protected by Mersen Amp-Trap 2000® fuses Class RK1 (A2D or A6D), Class J (AJT) or Class L (A4BQ) chosen in accordance with tested UL Series-connected combinations published in the current yellow UL Recognized Component Director.

F. Supplementary lighting and control circuits in the connected combinations shown up to 600VAC and 24 amps shall be protected by Mersen Amp-Trap 2000® Class CC time-delay ATQR or ATDR fuses, sized according to the fixture manufacturers recommendations.

3.0 Spares

Spare fuses amounting to 10% (minimum three) of each type and rating shall be supplied by the electrical contractor. These shall be turned over to the owner upon project completion. Fuses shall be contained and cataloged within the appropriate number of spare fuse cabinets (no less than one). Spare fuse cabinets shall be equipped with a key lock handle, be dedicated for storage of spare fuses and shall be GSFC, as supplied by Mersen.

4.0 Execution

A. Fuses shall not be installed until equipment is to be energized. All fuses shall be of the same manufacturer to assure selective coordination.

B. As-installed drawings shall be submitted to the engineer after completion of the job.

C. All fusible equipment rated 600 amperes or less shall be equipped with fuse clips to accept Class RK1 or Class J fuses as noted in the specifications.

5.0 Substitution

Fuse sizes and types indicated on drawings are based on Mersen Amp-Trap 2000® fuse current-limiting performance and selectivity ratios. Alternative submittals to furnish materials other than those specified, shall be submitted to the engineer in writing two weeks prior to bid date, along with a short circuit and selective coordination study.

MERSEN

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Mersen USA
374 Merrimac Street
Newburyport, MA 01950
U.S.A.
T : 978 462 6662
F : 978 462 0181

Mersen FRANCE
1, rue Jean Noel
F-69100 Villeurbanne
France
T : +33 (0)4 72 22 66 11
F : +33 (0)4 72 22 67 13

Mersen TORONTO
88 Horner Avenue
Toronto, Ontario
Canada M8Z 5Y3
T : 416 252 9371
F : 416 252 6572

Mersen MISSISSAUGA
6220 Kestrel Roas
Mississauga, Ontario,
Canada L5T 1Y9
T : 905 795 0077
F : 905 795 2508

us-ferrazshawmut.mersen.com