

Energy Storage System Solution



Powering Business Worldwide



Energizing a world that demands more.

We deliver:

- **Electrical solutions** that use less energy, improve power reliability and make the places we live and work safer and more comfortable
- **Hydraulic and electrical solutions** that enable machines to deliver more productivity without wasting power
- **Aerospace solutions** that make aircraft lighter, safer and less costly to operate, and help airports operate more efficiently
- **Vehicle drivetrain and powertrain solutions** that deliver more power to cars, trucks and buses, while reducing fuel consumption and emissions

Discover today's Eaton.



Powering Business Worldwide

Energy Storage System Solution

Product Description

70Vdc

EVH Series	9
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150Vdc

BS88 Series	13
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500Vdc

BS88 Series	22
FWH-C Series	30

800Vdc

170M17xx Series	34
CBX000S Series	36

1000Vdc

170M18xx Series	38
CBX01S Series	40
PV-ANH Series	42

1500Vdc

ESS2 Series	43
ESS3 Series	48

1500Vdc

ESS5 Series	50
CBMG Series	52

PV15M Series	54
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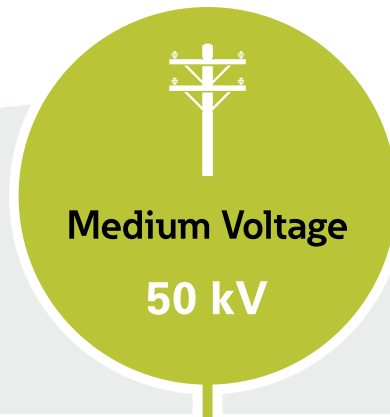
690Vac ~ 1250Vac

690Vac: DIN43653, Size 1/2/3	62
690Vac: Flush end, Size 4	65
1000Vac: DIN43653, Size 1/2/3	67
1000Vac: Flush end, Size 4	69
1250Vac: DIN43653, Size 1/2/3	71
1250Vac: Flush end, Size 4	73

Bussmann has more products for ESS application, and will continue to develop new products to meet customer's requirement. For detail, please contact local sales.

This catalog is intended to present product data and provide technical information that will help the end user with design application. Eaton reserves the right, without notice, to change design or construction or any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this catalog. Once a product has been selected, it should be tested by the user in all possible applications. Further, Eaton takes no responsibility for errors or omissions contained in this catalog, or for misapplication of any Eaton product. Extensive product information is available in the Eaton product data sheets available on line at Eaton.com/bussmannseries.

Where battery storage systems fit in the electrical grid network

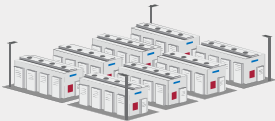


Different types of battery storage systems



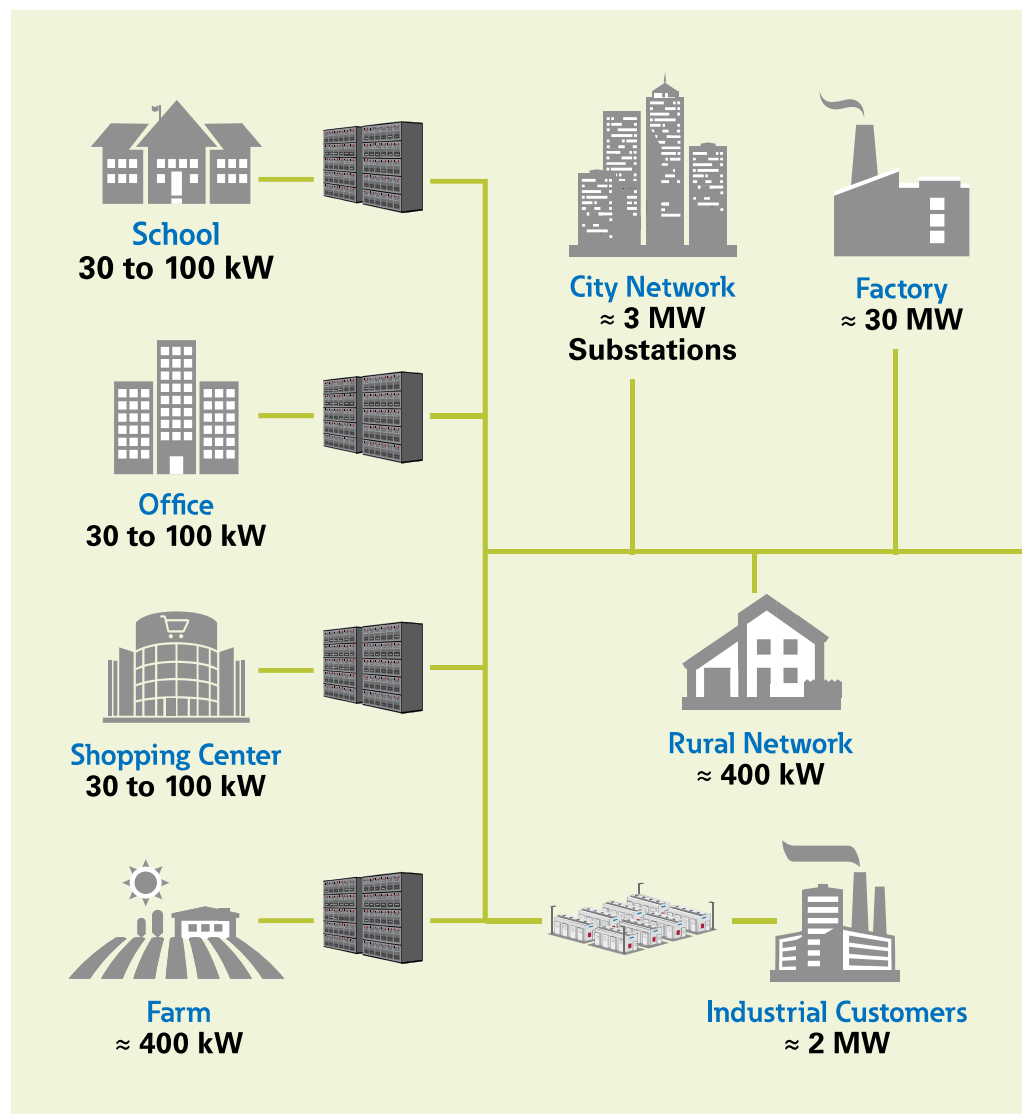
Medium scale battery storage containers

Schools
Offices
Shopping Centres
Farming

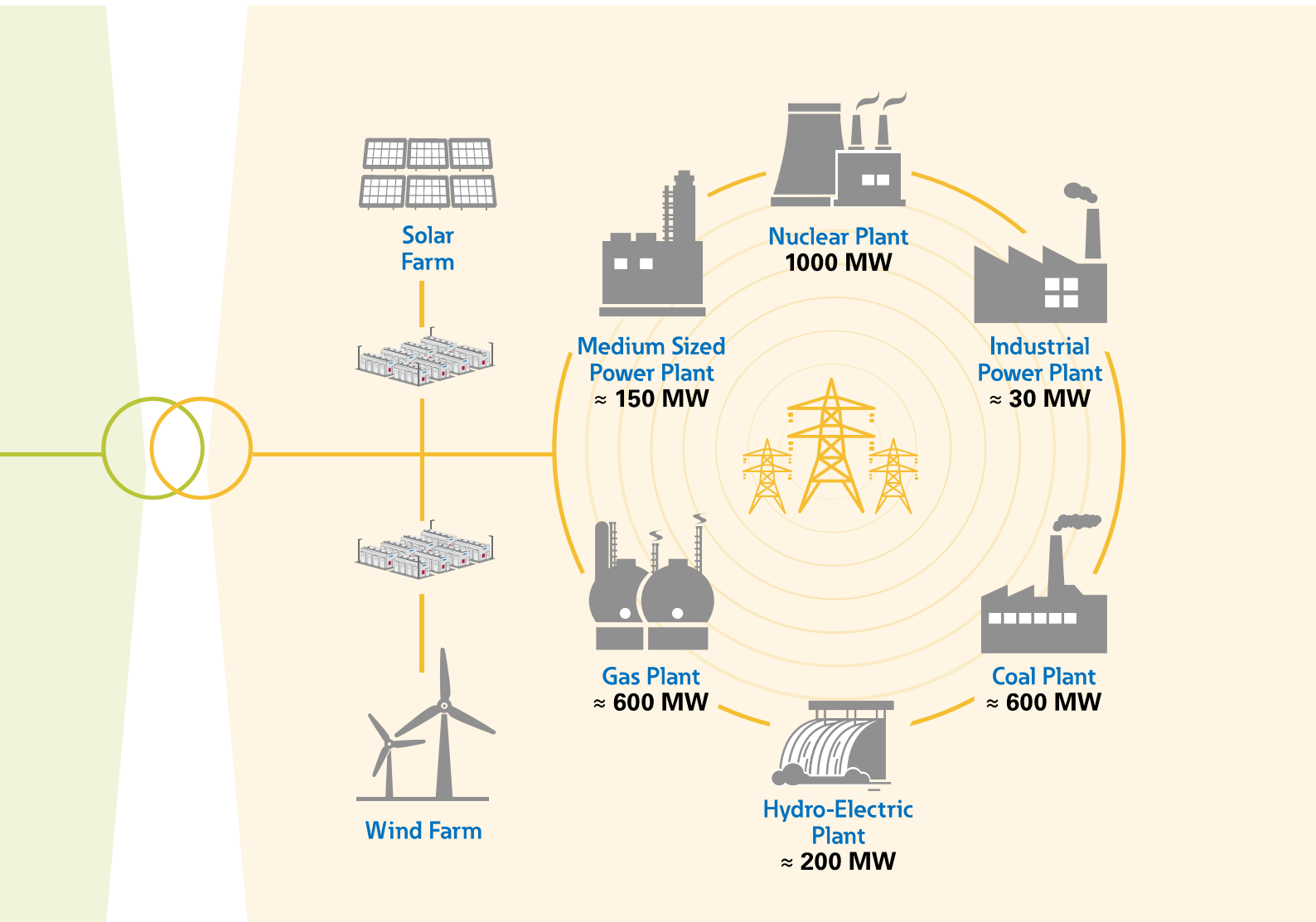
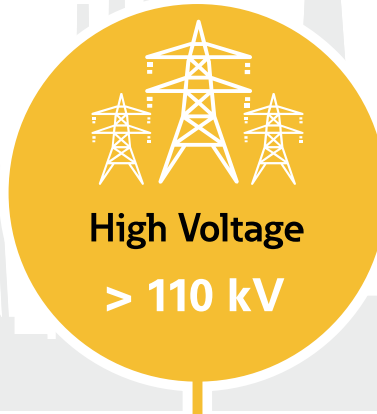


Utility large scale battery storage containers

Solar Farm
Wind Farm
Industrial Customers



- Distribution Grid -



- Transmission Grid -

Introduction

Power demand is forever increasing. Traditional energy generation has been supported, in the last decade, by the growth of renewable energy technology such as solar, wind and tidal. The need to store the energy generated, by both traditional and renewable methods, is becoming necessary to make sure power is continually provided where and when required.

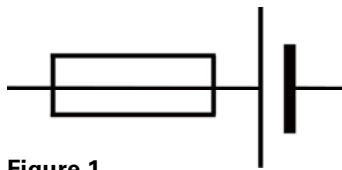
Battery storage systems provide a number of advantages of being modular, easily deployable in proximity to power generation applications and even retro fitted to existing systems.

IEC 60269-7 Battery storage fuse links standard

The protection requirements within battery Storage systems are quite different when compared to typical grid connected AC systems. In battery systems the protective devices are required to operate in DC systems which may have high faults currents and a number of lower over current situations. For this reason, Eaton has conducted extensive research and development of its Eaton's Bussmann series fuse links that are specifically designed and tested to safely protect battery storage systems with high DC voltages and low fault currents.

The International Electrotechnical Commission (IEC) has recognised the protection of Battery Storage systems is different to standard electrical installations. This is reflected in the proposed standard IEC 60269-7 which will define specific characteristics that a fuse link is required to meet for protecting Battery Storage Systems, with the inclusion utilisation classes gBat and aBat. The two classes reflect the configurations where full range or partial range protection is required. The proposed standard also reflects the battery storage systems may have high fault currents. Eaton's range of Bussmann series battery storage fuse links has been specifically designed to meet this proposed standard.

Contact our team of Field Application team for further information order.xian@eaton.com



To identify fuse links to the proposed standard the combination of the symbols for fuse-link and a single cell are used to indicate a fuse-link is suitable for protecting batteries, particularly in storage systems, see Figure 1.

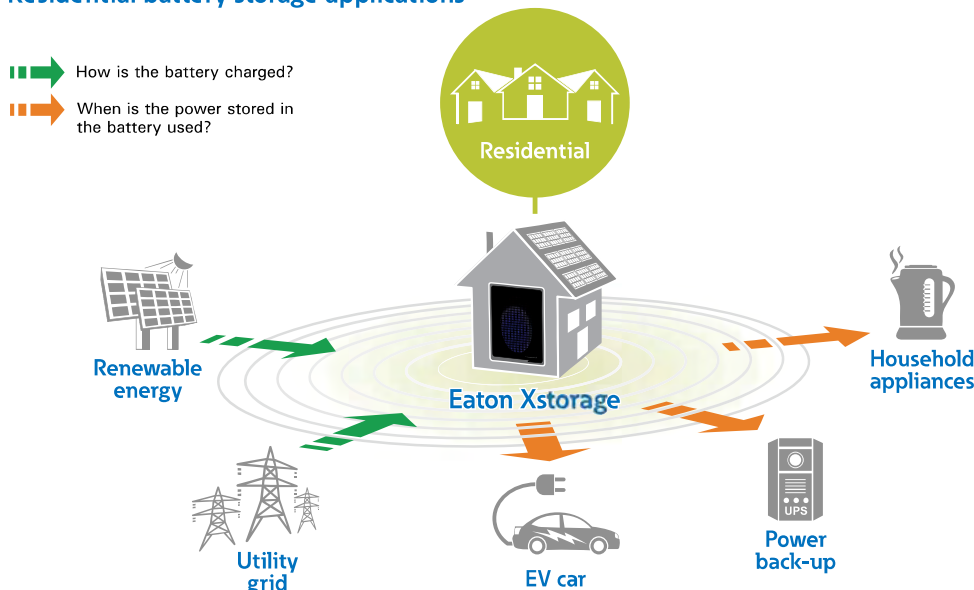
Figure 1

Battery storage system applications

Battery storage systems have become one of the most common form of electrical energy storage that converts electrical energy from the grid, solar and wind farms into a stored form for later use in residential homes, commercial buildings industrial sites,

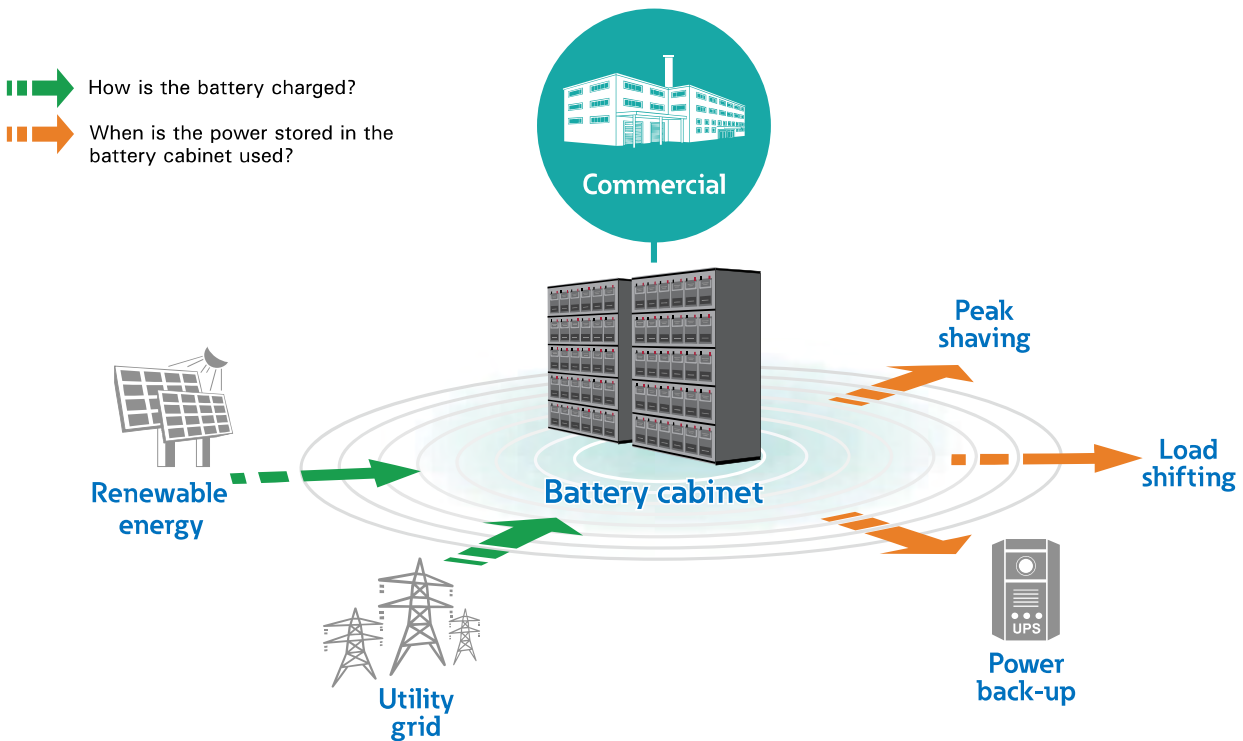
Eaton's Bussmann series has a vast array of fuse links able to support your applications. **Contact our team of Field Application team for further information bulehighspeedtechnical@eaton.com**

Residential battery storage applications

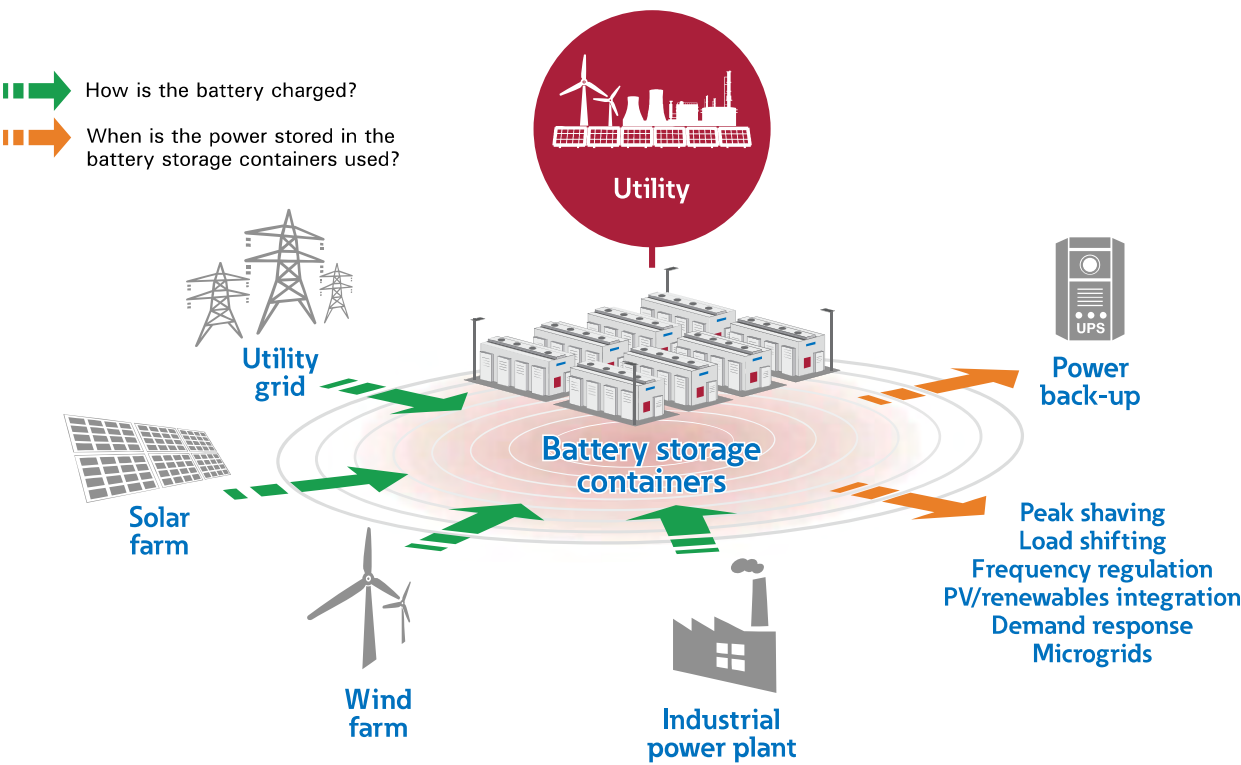


Battery storage system applications

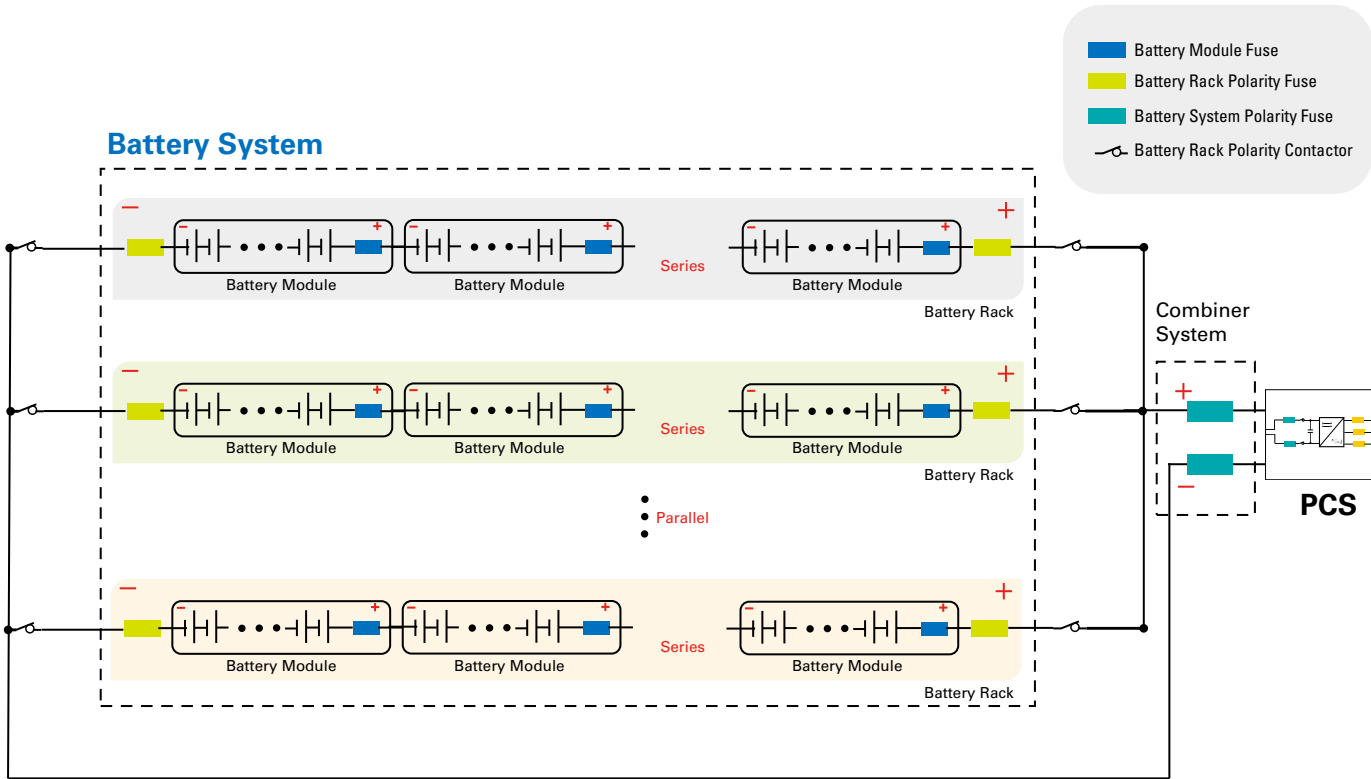
Commercial scale battery storage applications



Utility scale battery storage applications

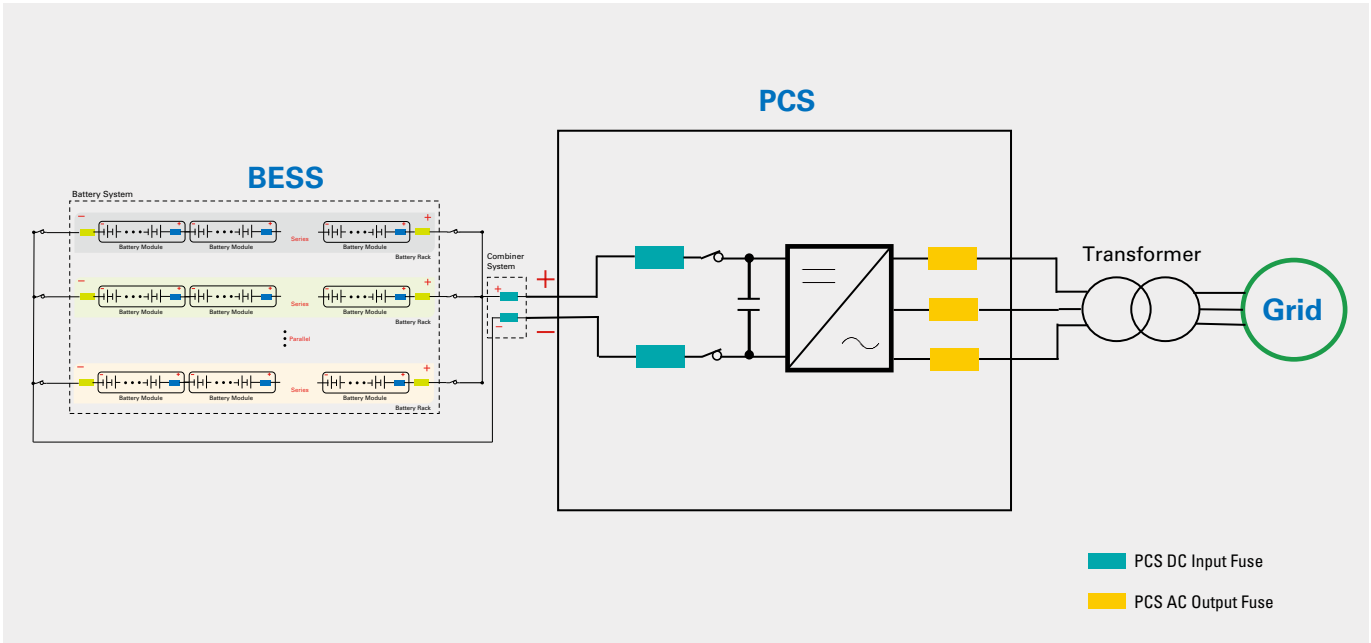


BESS Fuse Solution



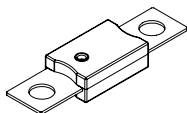
(Reference only, should be designed by the system provideis.)

PCS Fuse Solution

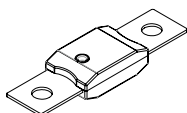


(Reference only, should be designed by the system provideis.)

EVH Series



EVH-XXX(-M6)



EVH-XXX-A6

Description

- DC low voltage circuit protection fuse with compact size

Typical applications

- High current protection for battery, other similar DC circuit application

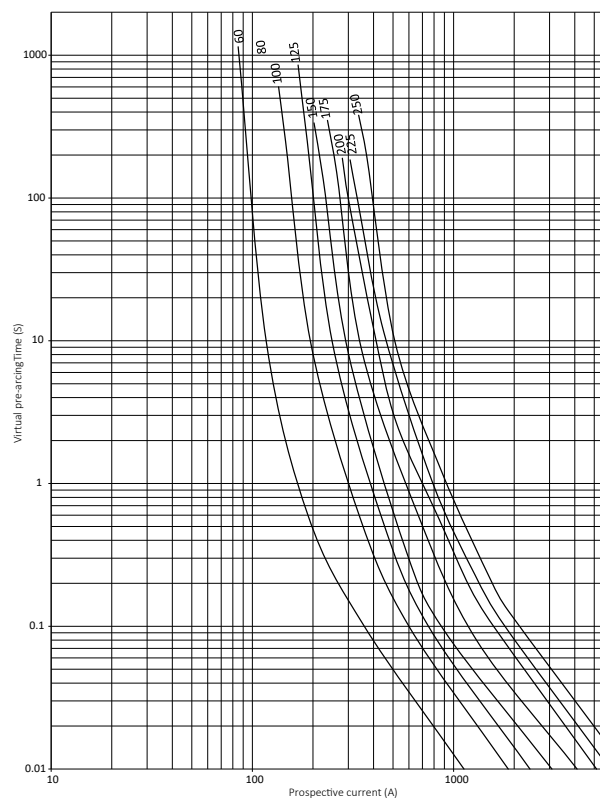
Standards / Agency information

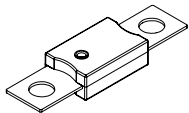
- ISO20934-2019(Type SF51)
- RoHS and ELV Compliant
- UL Recognized (EVHXXX&EVH-XXX-M6)

Technical Data Sheet

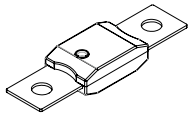
Size	29.2*19mm
Voltage rating	70Vdc
Current Ratings	See table
Breaking Capacity	6KA TC = 2 ± 0.5ms

Material No.	Voltage Rating (V)	Current Rating (A)	Pre-arcing I ² t (A ² s)	Total I ² t (A ² s)	Voltage Drop 1.0xI _n (mv)	Color Band
EVH-60(-A6/M6)	70Vdc	60	7,000	8,400	110	
EVH-80(-A6/M6)		80	19,000	22,800	110	
EVH-100(-A6/M6)		100	25,000	30,000	110	
EVH-125(-A6/M6)		125	57,000	68,400	110	
EVH-150(-A6/M6)		150	95,000	114,000	110	
EVH-175(-A6/M6)		175	169,000	202,800	110	
EVH-200(-A6/M6)		200	230,000	276,000	110	
EVH-225(-A6/M6)		225	264,000	316,800	110	
EVH-250(-A6/M6)		250	359,000	430,800	110	





EVH-XXX(-M6)

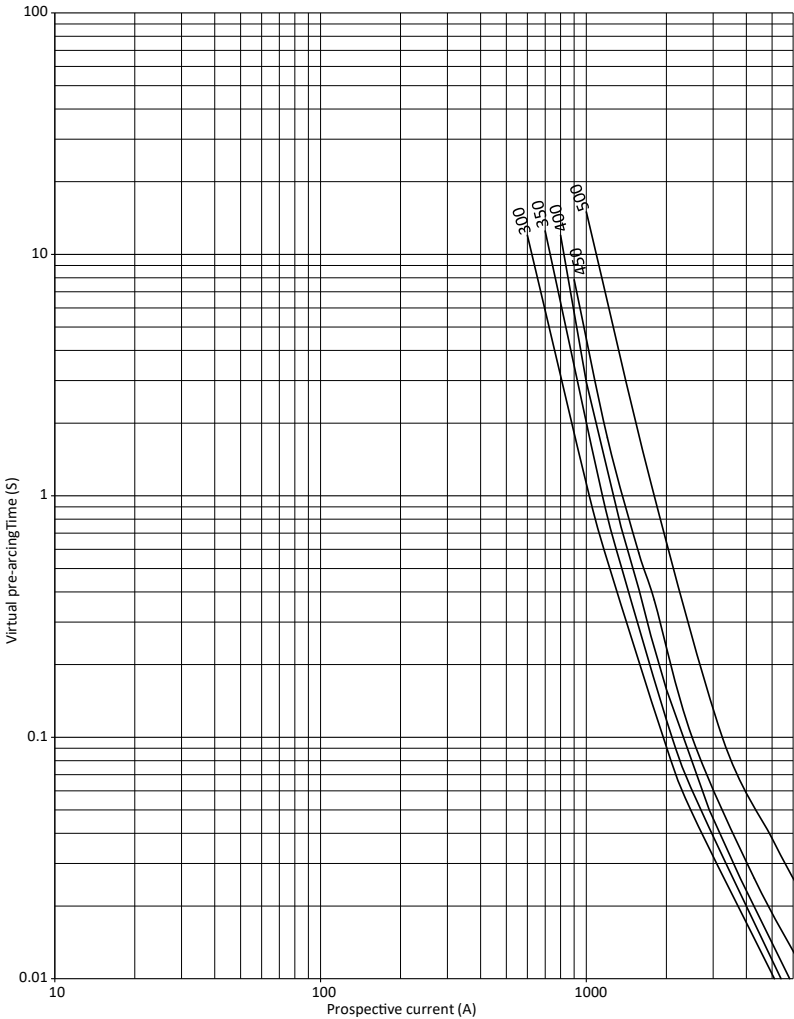


EVH-XXX-A6

Technical Data Sheet

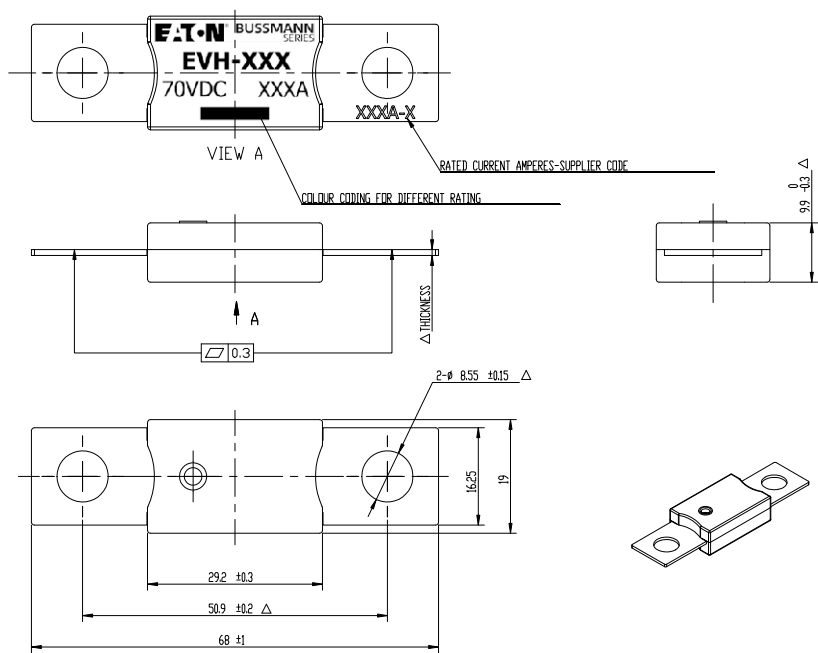
Size	29.2*19mm
Voltage rating	70Vdc
Current Ratings	See table
Breaking Capacity	6KA TC=2±0.5ms

Material No.	Voltage Rating (V)	Current Rating (A)	Pre-arcing I²t (A²s)	Total I²t (A²s)	Voltage Drop 0.75×In (mv)	Color Band
EVH-300(-A6/M6)	70Vdc	300	331,000	397,200	80	
EVH-350(-A6/M6)		350	762,000	914,400	80	
EVH-400(-A6/M6)		400	278,000	333,600	80	
EVH-450(-A6/M6)		450	469,000	562,800	80	
EVH-500(-A6/M6)		500	762,000	914,400	80	



EVH-XXX

Dimensions(mm):



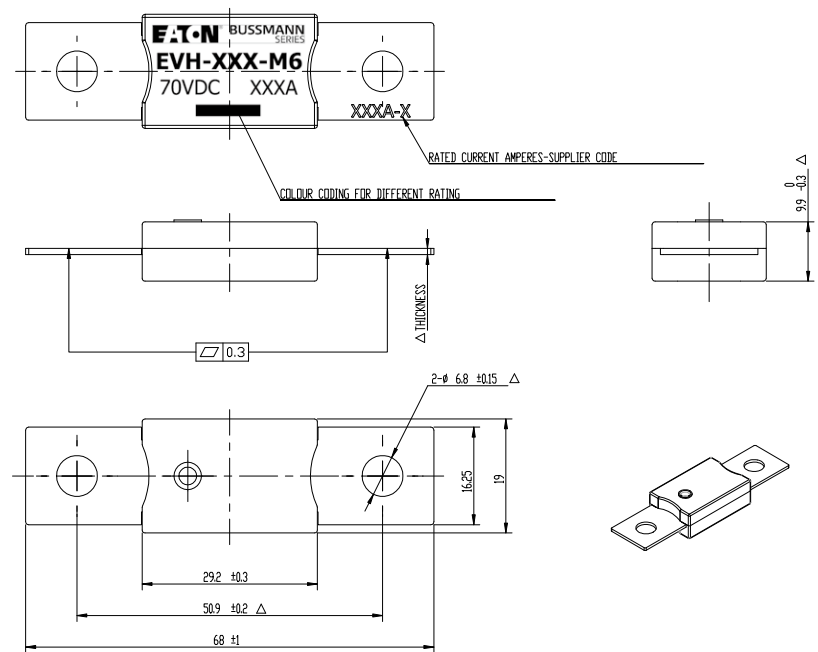
Notes

1. The fuse terminal should be mounted by manual, mounting torque $6\text{Nm} \pm 1\text{Nm}$, pneumatic or electric screwdriver is not allowed.
2. Flange locking bolt or nut should not be stacked on the terminal directly.

Rated current	Thickness (mm)
60A	0.95~1.3
80A	0.95~1.3
100A	0.95~1.3
125A	0.95~1.3
150A	0.95~1.3
175A	0.95~1.3
200A	0.95~1.3
225A	0.95~1.3
250A	0.95~1.3
300A	0.95~1.3
350A	0.95~1.3
400A	0.97~1.03
450A	0.97~1.03
500A	0.97~1.03

EVH-XXX-M6

Dimensions(mm):



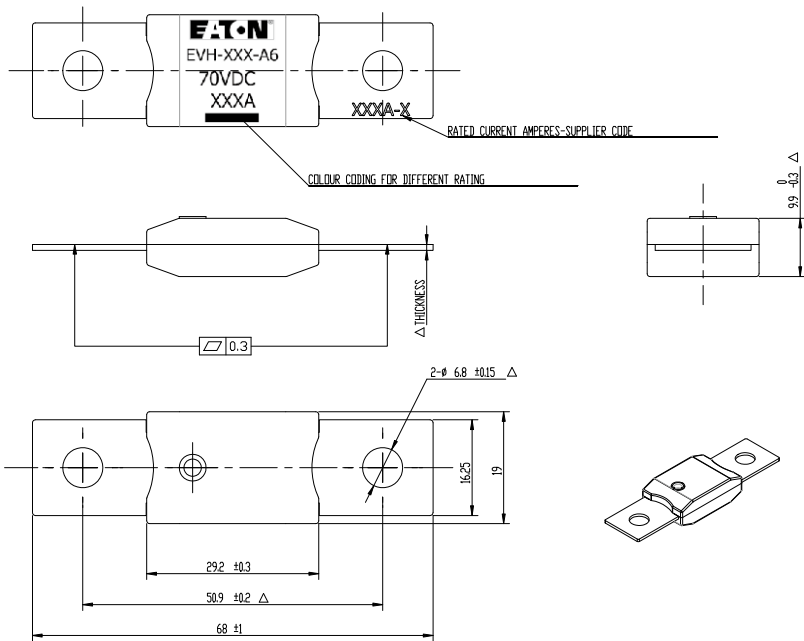
Notes

1. The fuse terminal should be mounted by manual, mounting torque $6\text{Nm} \pm 1\text{Nm}$, pneumatic or electric screwdriver is not allowed.
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200A	0.95~1.3
225A	0.95~1.3
250A	0.95~1.3
300A	0.95~1.3
350A	0.95~1.3
400A	0.97~1.03
450A	0.97~1.03
500A	0.97~1.03

EVH-XXX-A6

Dimensions(mm):



Rated current	Thickness (mm)
60A	0.95~1.3
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100A	0.95~1.3
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150A	0.95~1.3
175A	0.95~1.3
200A	0.95~1.3
225A	0.95~1.3
250A	0.95~1.3
300A	0.95~1.3
350A	0.95~1.3
400A	0.97~1.03
450A	0.97~1.03
500A	0.97~1.03

Notes

1. The fuse terminal should be mounted by manual, mounting torque 6Nm ± 1Nm, pneumatic or electric screwdriver is not allowed.
2. Flange locking bolt or nut should not be stacked on the terminal directly.

BS88 Series (LCT, LET, LMT, LMMT)



Description

BS88 style high speed fuse links.

Technical data

- Rated voltage LCT, LMT, LMMT:
 - 240V a.c./150V d.c. (IEC)
 - 250V a.c./150V d.c. (UL)
- Rated voltage LET
 - 280V a.c./150V d.c. (UL 25-160 A)
 - 250V a.c./150V d.c. (UL 180 A)
- Rated current
 - LCT: 6-20 A
 - LET: 25- 180 A
 - LMT: 160- 450 A
 - LMMT: 400-900A
- Breaking capacity LCT, LET
 - 200 kA RMS Sym
 - 50 kA DC at 125V d.c.
- Breaking capacity LMT, LMMT
 - 200 kA RMS Sym., 40 kAat 150V d.c. (IEC)
 - 200 kA RMS Sym., 50 kAat 150V d.c. (UL)
- Operating class: aR

Agency information

- CE
- Designed and tested to BS88 part 4
- IEC 60269 Part 4
- UL recognised
- All the fuse links have been tested at 318 V a.c., consult fusetechn@eaton.com for specific UL recognition status

Features and benefits

- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through (I^2t)

Typical applications

- DC common bus
- AC and DC drives
- Power converters/rectifiers
- Reduced voltage starters

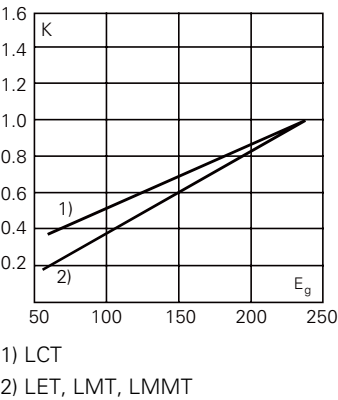
Catalogue numbers

6LCT	25LET	160LMT	400LMMT
10LCT	32LET	200LMT	500LMMT
12LCT	35LET	250LMT	630LMMT
16LCT	50LET	315LMT	710LMMT
20LCT	63LET	355LMT	800LMMT
	80LET	400LMT	900LMMT
	100LET	450LMT	
	125LET		
	160LET		
	180LET		

Electrical characteristics

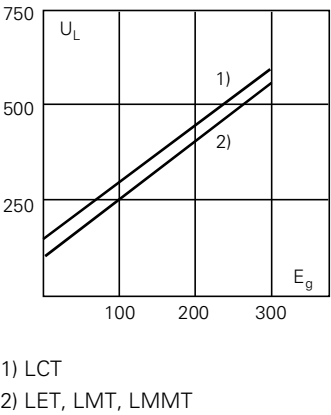
Total clearing I²t

The total clearing I²t at rated voltage and at a power factor of 15 percent are given in the electrical characteristics. For other voltages, the clearing I²t is found by multiplying by correction factor, K, given as a function of applied working voltage, E_g, (RMS).



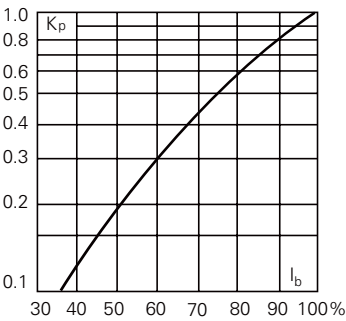
Arc voltage

This curve gives the peak arc voltage, U_L, which may appear across the fuse during its operation as a function of the applied working voltage, E_g, (RMS) at a power factor of 15 percent.



Watts losses

Watts loss at rated current is given in the electrical characteristics. The curve allows the calculation of the watts losses at load currents lower than the rated current. The correction factor, K_p, is given as a function of the RMS load current, I_b, in percent of the rated current.



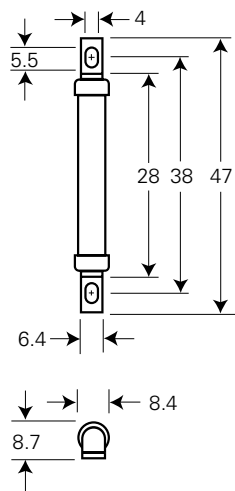
Technical data

Catalogue numbers	Rated voltage V a.c. / V d.c.	Rated current RMS-Amps	I ² t (A ² Sec)		
			Pre-arc	Clearing at 240 V	Watts loss**
6LCT	IEC: 240 V a.c./150 V d.c.	6	2	9	1
10LCT	UL: 250 V a.c./150 V d.c.	10	3.8	22	2.5
12LCT		12	7	32	2.5
16LCT		16	20	100	2.5
20LCT		20	25	160	4
25LET		25	18	250	4
32LET	UL: 280 V a.c./150 V d.c.	32	32	450	5
35LET		35	50	600	5
50LET		50	100	1400	7
63LET		63	180	2200	9
80LET		80	300	3800	10
100LET		100	600	7500	10
125LET		125	600	7500	16
160LET		160	1100	16,000	20
180LET		180	1600	29,000	21
160LMT	IEC: 240 V a.c./150 V d.c.	160	1100	16,000	17
200LMT	UL: 250 V a.c./150 V d.c.	200	1500	20,000	28
250LMT		250	3200	40,000	28
315LMT		315	6000	75,000	35
355LMT		355	8000	100,000	35
400LMT		400	14,000	160,000	40
450LMT	IEC: 240 V a.c./150 V d.c.	450	18,000	220,000	42
400LMMT		400	6000	80,000	60
500LMMT		500	14,000	170,000	64
630LMMT		630	24,000	300,000	75
710LMMT		710	32,000	460,000	77
800LMMT		800	52,000	600,000	82
900LMMT		900	75,000	800,000	97

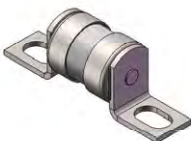
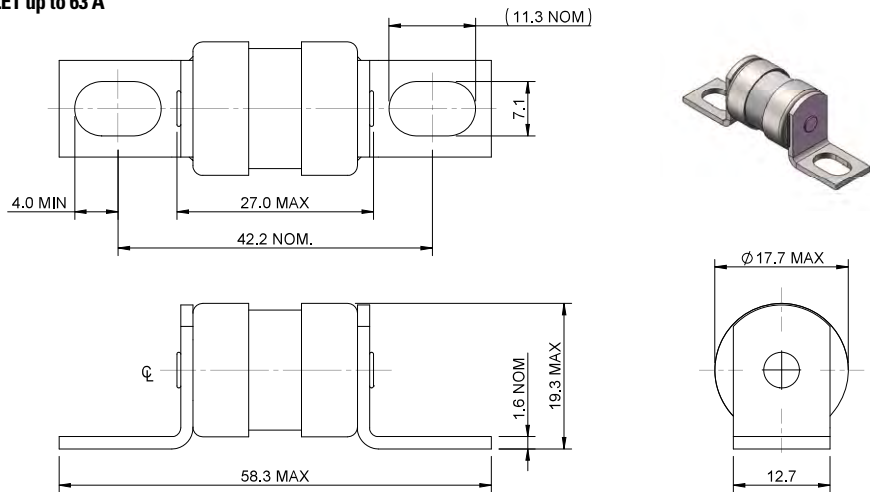
**Watts loss provided at rated current

Dimensions - mm

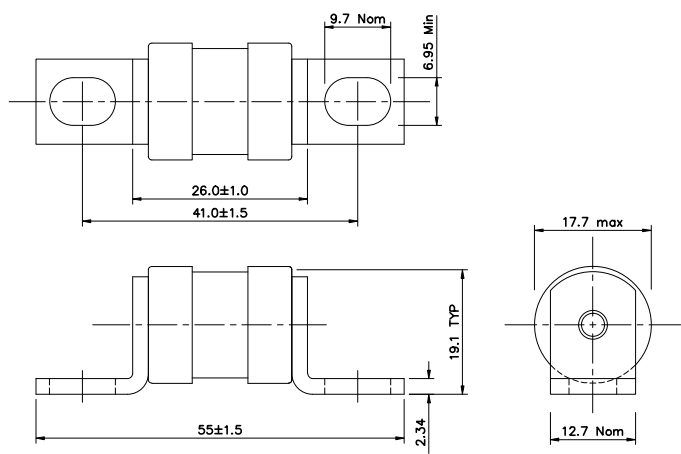
LCT



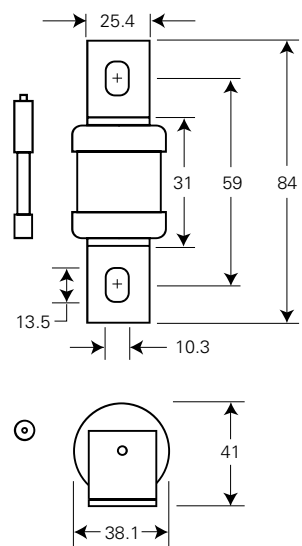
LET up to 63 A



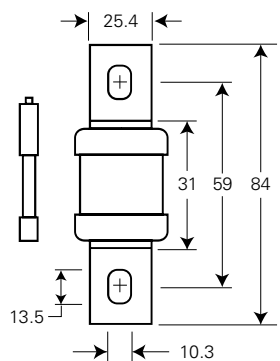
LET 80A and over



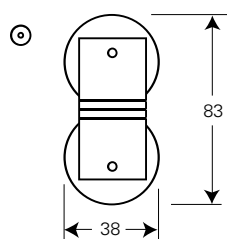
LMT



LMMT

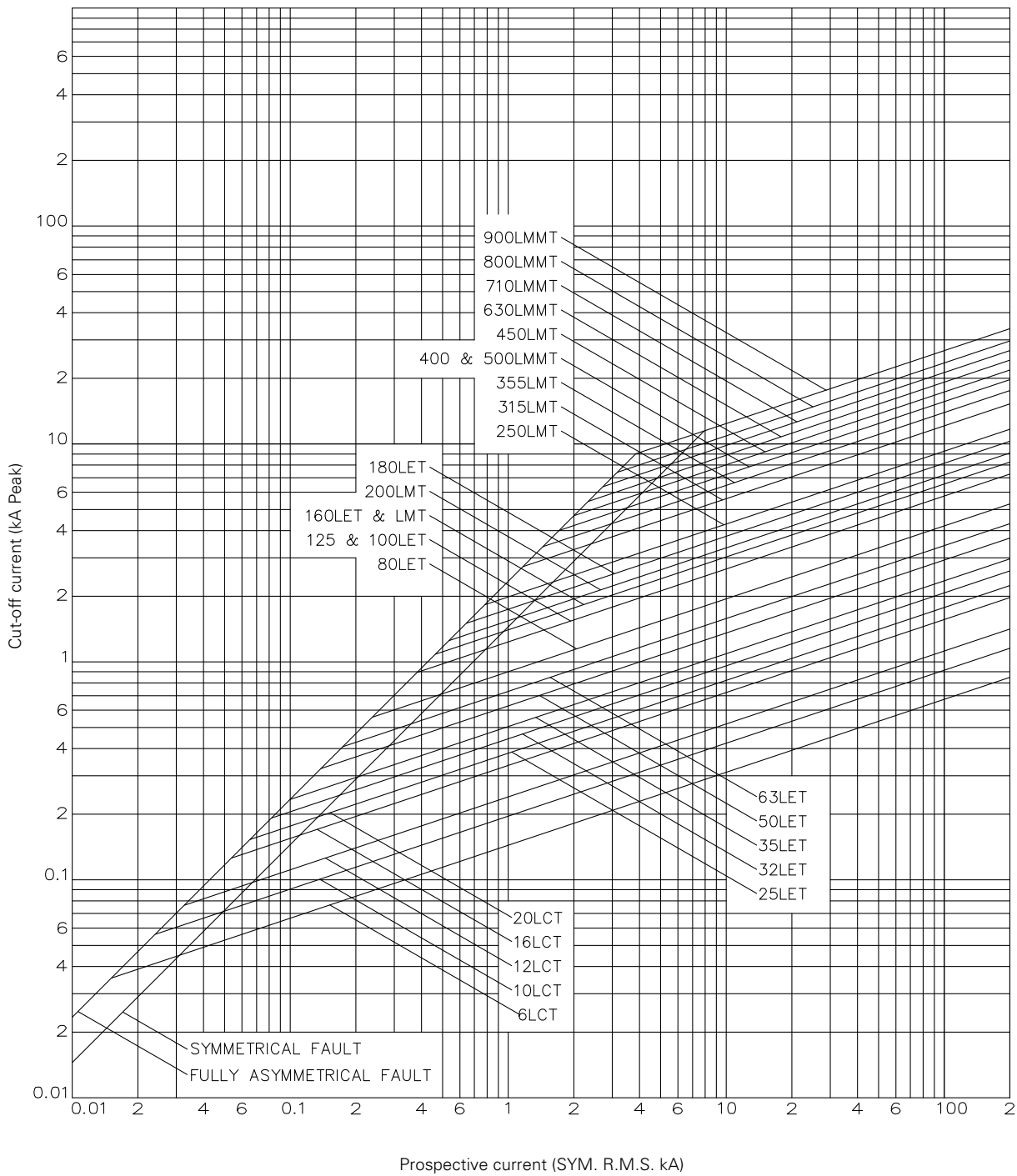


Indicator (optional)

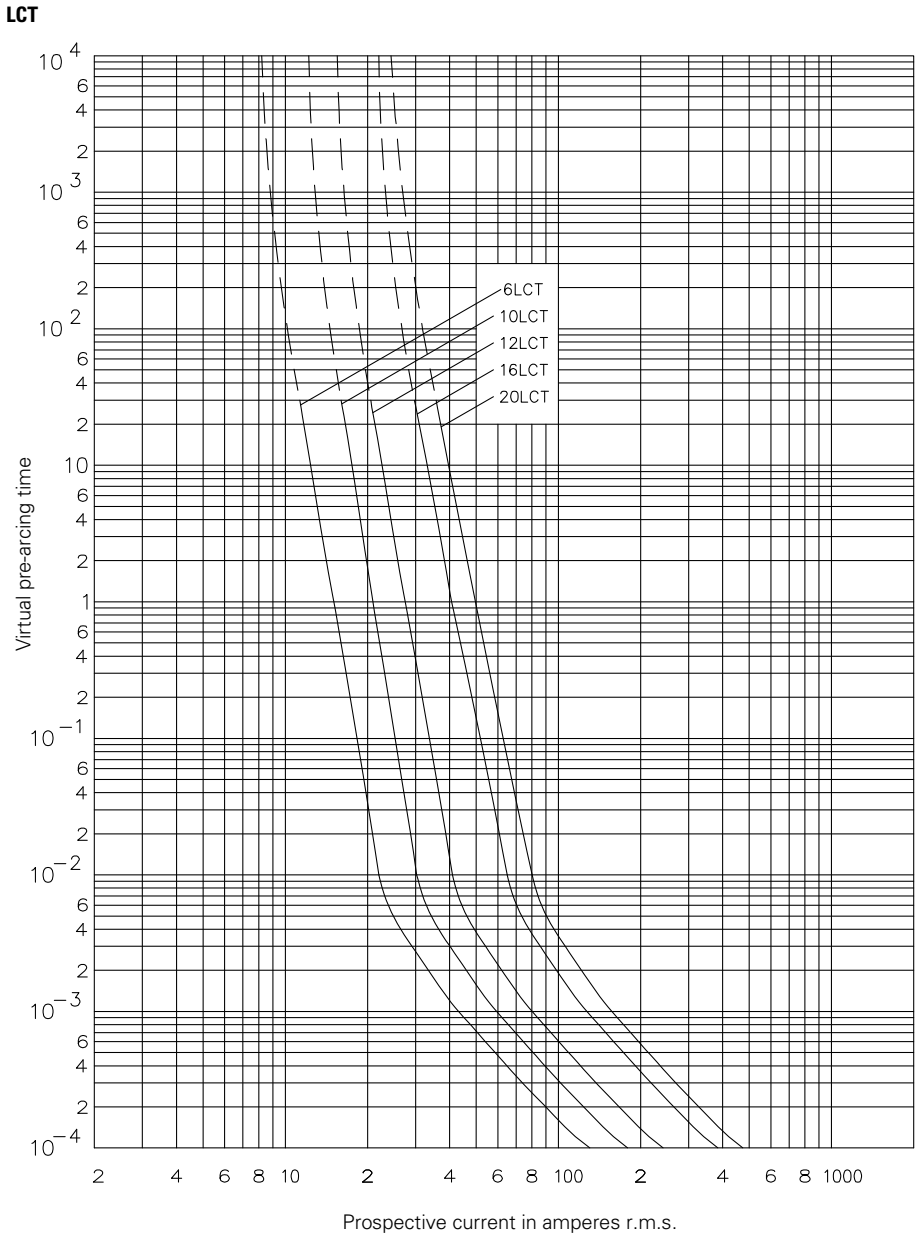


Indicator (optional)

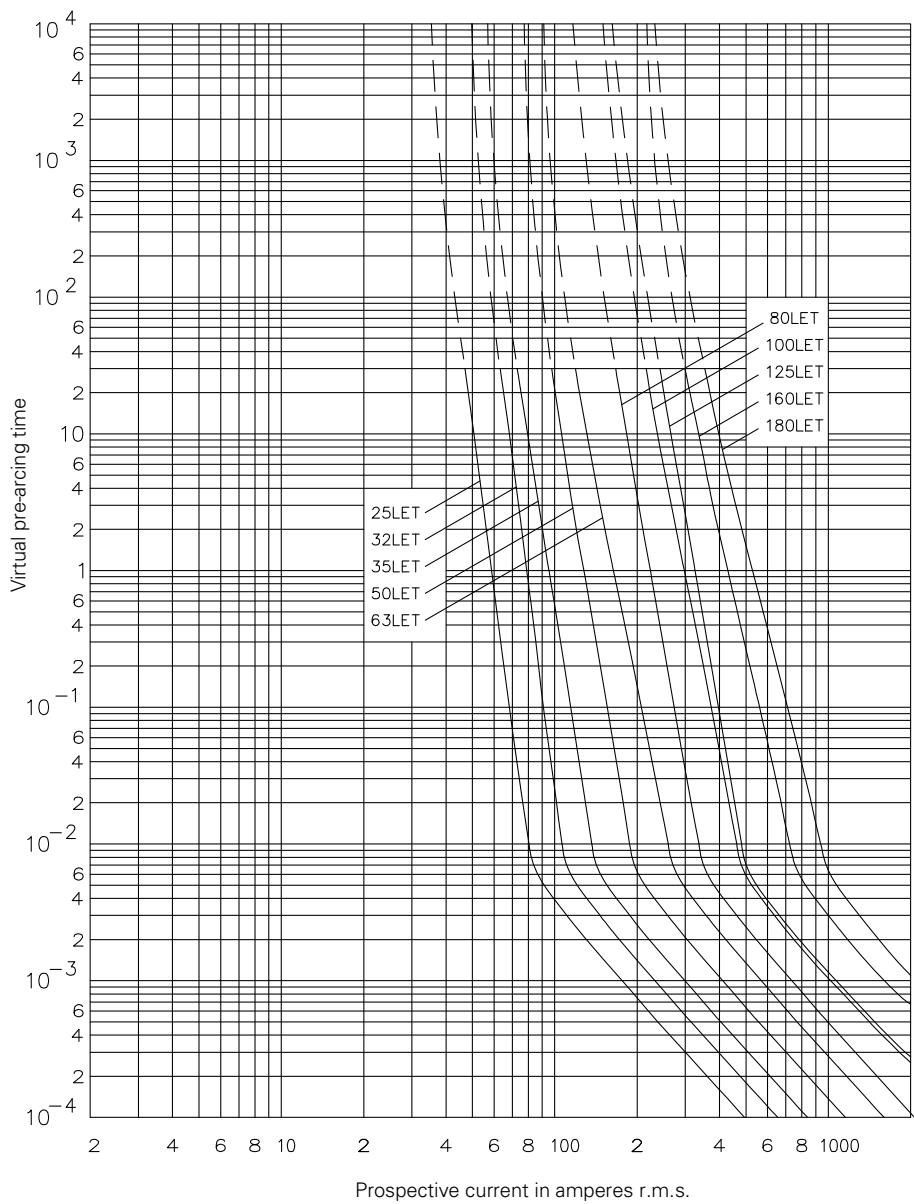
Cut-off curves

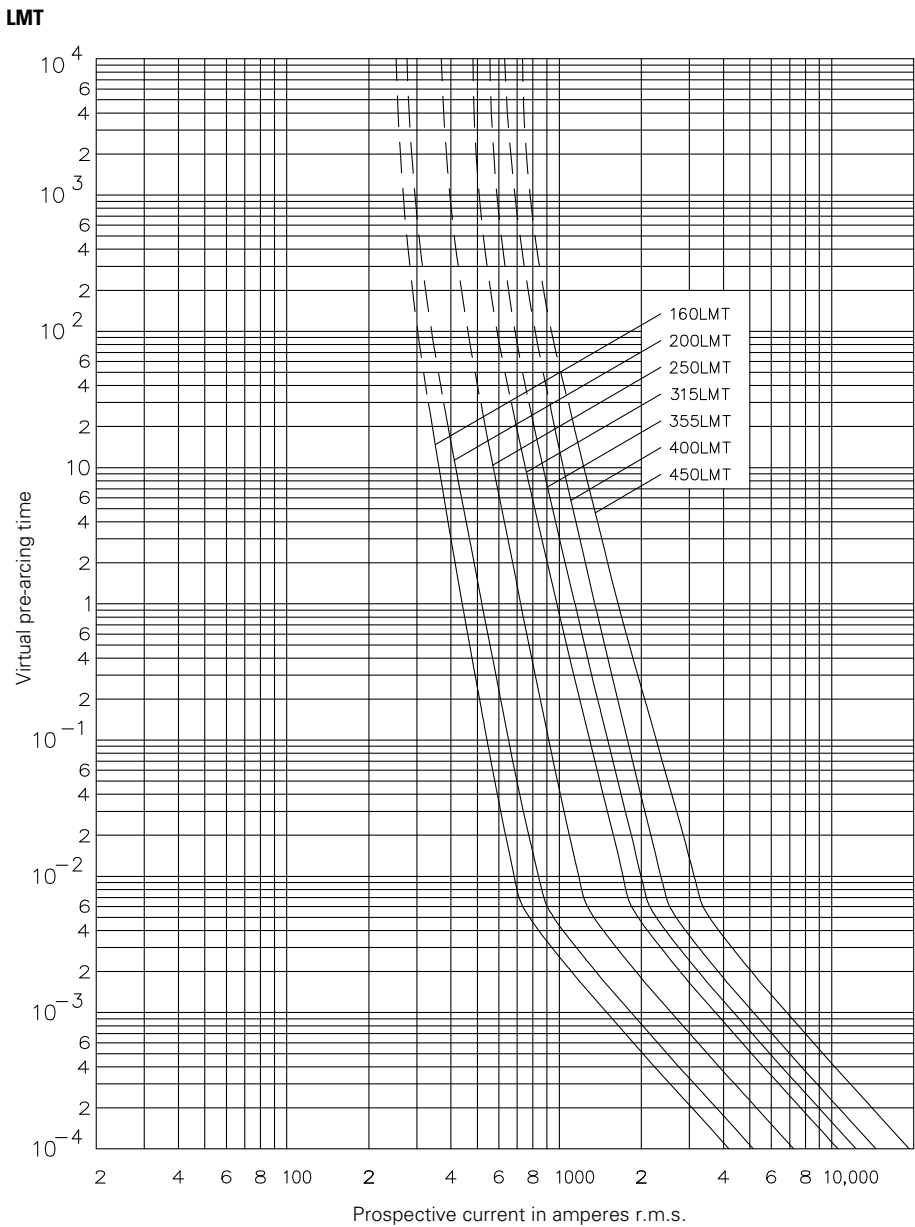


Time-current curve - nominal melt

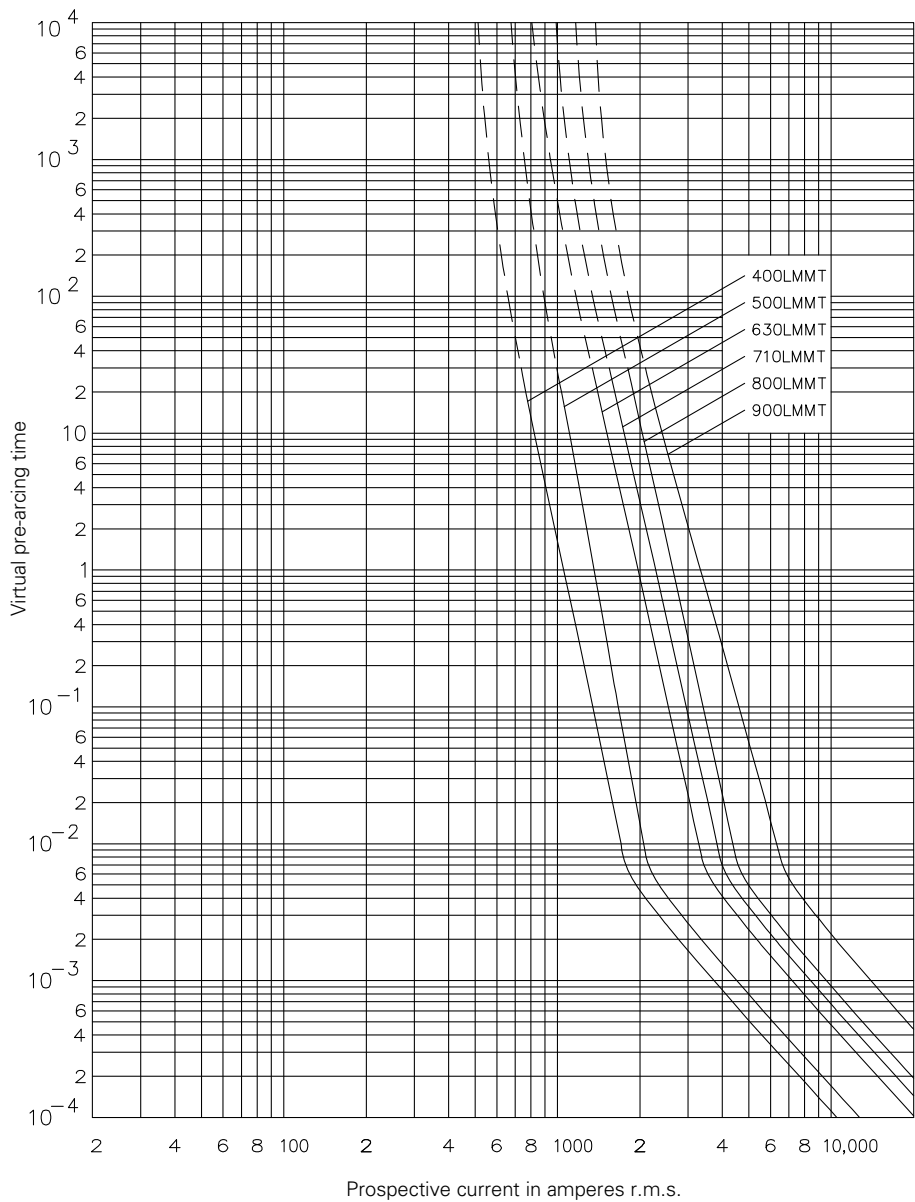


LET





LMMT



BS88 Series (CT, ET, FE, EET, FEE, FM, FMM, MT, MMT)



Description

BS88 style high speed fuse links.

Technical data

- Rated current
 - 6 - 710 A
- Operating class: aR
- Breaking capacity

Agency information

- CE
- Designed and tested to BS88 part 4
- IEC 60269 Part 4
- Consult fusetech@eaton.com for specific UL recognition status
- CCC for ET, FE, EET, FEE, FM and FMM

Features and benefits

- Excellent cycling capability and DC performance
- Low arc voltage and low energy let-through (I^2t)
- Low watts loss

Typical applications

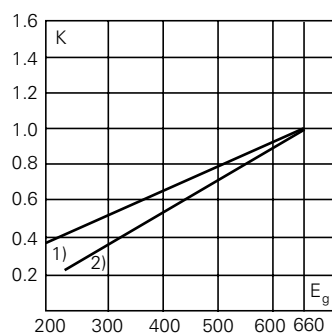
- DC common bus
- DC drives
- Power converters/rectifiers
- Reduced voltage starters

Catalogue numbers	IEC		UL	
	RMS Sym	DC at rated voltage	RMS Sym	DC at rated voltage
CT	90 kA	40 kA at 500Vd.c.	200 kA	50 kA at 500V d.c.
ET	200 kA	50 kA at 500Vd.c.	200 kA	50 kA at 500V d.c.
FE	200 kA	50 kA at 500Vd.c.	200 kA	50 kA at 500V d.c.
EET	200 kA	50 kA at 500Vd.c.	200 kA	50 kA at 500V d.c.
FEE	200 kA	50 kA at 500Vd.c.	200 kA	50 kA at 500V d.c.
FM	200 kA	40 kA at 450Vd.c.	200 kA	50 kA at 500V d.c.
FMM	200 kA	40 kA at 450Vd.c.	200 kA	-
MT	200 kA	40 kA at 350Vd.c.	200 kA	-
MMT	200 kA	40 kA at 350Vd.c.	200 kA	-

Electrical characteristics

Total clearing I^2t

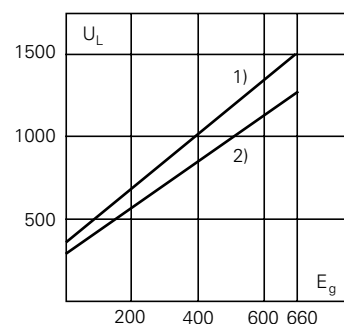
The total clearing I^2t at rated voltage and at a power factor of 15 percent are given in the electrical characteristics. For other voltages, the clearing I^2t is found by multiplying by correction factor, K, given as a function of applied working voltage, E_g , (RMS).



- 1) CT, ET, EET, FE, FEE, MT, MMT
2) FM, FMM

Arc voltage

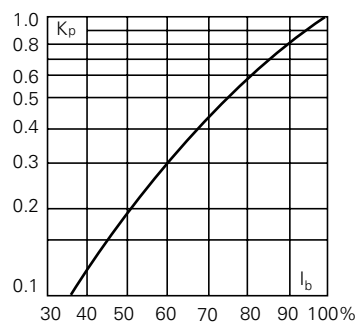
This curve gives the peak arc voltage, U_L , which may appear across the fuse during its operation as a function of the applied working voltage, E_g , (RMS) at a power factor of 15 percent.



- 1) CT
2) ET, FE, EET, FEE, FM, FMM

Watts losses

Watts loss at rated current is given in the electrical characteristics. The curve allows the calculation of the watts losses at load currents lower than the rated current. The correction factor, K_p , is given as a function of the RMS load current, I_b , in percent of the rated current.



Technical data - CT, ET, FE, EET, FEE

Catalogue numbers	Rated voltage V a.c. / V d.c.	Rated current RMS-Amps	I²t (A² Sec)			
			Pre-arc	Clearing at 415 V	Clearing at 660 V	Watts loss**
6CT	690 V a.c. / 500 V d.c. (IEC)	6	1.8	8.5	12	2
10CT	700 V a.c. / 500 V d.c. (UL)	10	7	30	48	3
12CT		12	10	40	65	3
16CT		16	16	66	110	7
20CT		20	32	150	220	7
25ET		690 V a.c. / 500 V d.c. (IEC)	25	25	150	250
32ET	700 V a.c. / 500 V d.c. (UL)	32	32	190	350	11
35ET		35	52	310	500	11
40ET		40	103	600	900	9
45ET		45	103	680	1100	11
56ET		56	135	950	1500	14
63ET		63	171	1200	2000	16
80ET		80	360	2500	4000	18
35FE	690 V a.c. / 500 V d.c. (IEC)	35	33	130	200	9
40FE	700 V a.c. / 500 V d.c. (UL)	40	52	180	300	9
45FE		45	76	270	450	11
50FE		50	103	380	600	11
63FE		63	135	480	750	18.5
71FE		71	210	600	950	17
80FE		80	250	900	1500	20
90FE		90	360	1300	2100	20
100FE		100	470	1800	2800	23
90EET		690 V a.c. / 500 V d.c. (IEC)	90	490	3000	4500
110EET	700 V a.c. / 500 V d.c. (UL)	110	600	4000	6500	27
140EET		140	1050	7000	12,000	35
160EET		160	1500	10,000	17,000	39
100FEE	690 V a.c. / 500 V d.c. (IEC)	100	400	1600	2400	24
120FEE	700 V a.c. / 500 V d.c. (UL)	120	540	1900	3100	32
140FEE		140	850	2500	3800	36
160FEE		160	1000	3700	5700	46
180FEE		180	1400	5300	8400	46
200FEE		200	1900	7100	11,400	52

**Watts loss provided at rated current

Technical data - FM, FMM, MT and MMT

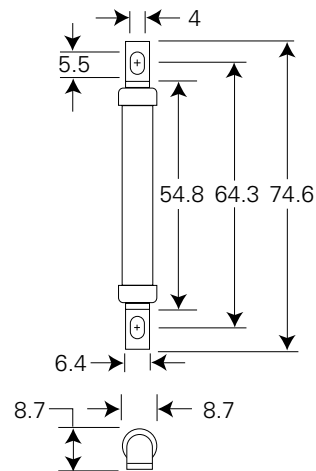
Catalogue numbers	Rated voltage V a.c. / V d.c.	Rated current RMS-Amps	I ² t (A ² Sec)			
			Pre-arc	Clearing at 415 V	Clearing at 660 V	Watts loss**
180FM	690 V a.c. / 450 V d.c. (IEC)	180	1400	7500	13,500	40
200FM	700 V a.c. / 500 V d.c. (UL)	200	2600	10,500	18,500	40
225FM		225	3700	14,500	26,500	44
250FM		250	5200	20,500	37,500	48
280FM		280	7000	30,500	55,000	48
315FM		315	10,000	40,000	77,000	55
350FM		350	15,000	60,000	105,000	55
400FMM	690 V a.c. / 450 V d.c. (IEC)	400	10,000	40,000	72,500	85
450FMM	700 V a.c. (UL)	450	15,000	60,000	105,000	90
500FMM		500	20,000	82,000	150,000	100
550FMM		550	30,000	120,000	215,000	100
630FMM		630	45,000	180,000	310,000	100
700FMM		700	60,000	245,000	420,000	120
160MT	690 V a.c. / 350 V d.c. (IEC)	160	2400	15,000	25,000	26
180MT	700 V a.c. (UL)	180	3800	25,000	38,000	26
200MT		200	6000	40,000	58,000	27
250MT		250	11,500	80,000	110,000	32
280MT		280	16,500	100,000	150,000	35
315MT		315	19,000	125,000	180,000	42
355MT		355	22,000	160,000	200,000	51
180MMT	690 V a.c. / 350 V d.c. (IEC)	180	1650	12,000	18,000	42
200MMT	700 V a.c. (UL)	200	2200	16,000	23,000	42
225MMT		225	3700	26,000	40,000	42
280MMT		280	6600	47,000	70,000	47
315MMT		315	8600	62,000	91,000	51
355MMT		355	13,500	97,000	140,000	54
400MMT		400	21,000	150,000	220,000	60
450MMT		450	30,000	220,000	320,000	57
500MMT		500	42,000	300,000	450,000	64
560MMT		560	60,000	430,000	640,000	64
630MMT		630	68,500	500,000	720,000	86
710MMT		710	78,000	600,000	850,000	105

**Watts loss provided at rated current

BS88 (CT, ET, FE, EET, FEE, FM, FMM, MT, MMT)

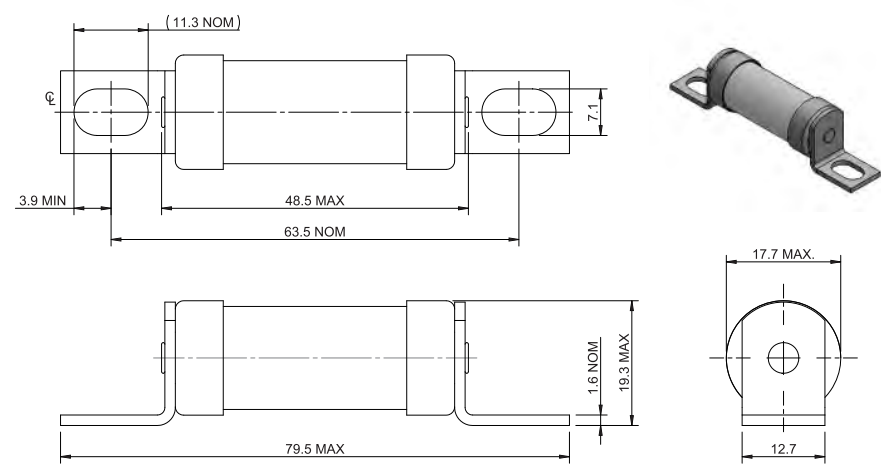
Dimensions (mm):

CT



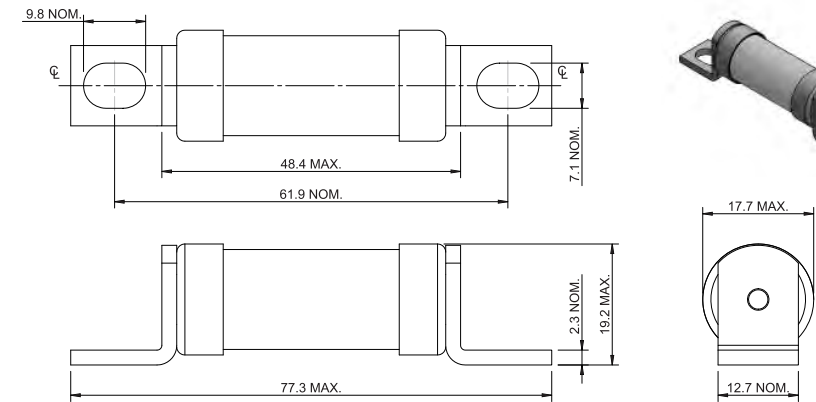
Indicator (optional)

ET, FE up to 63 A



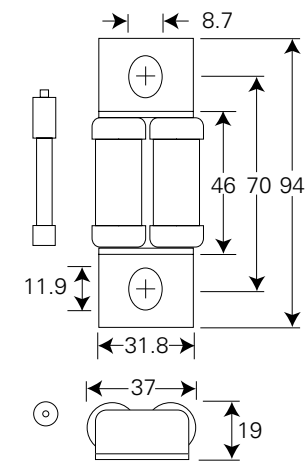
Indicator (optional)

ET, FE greater than 63 A



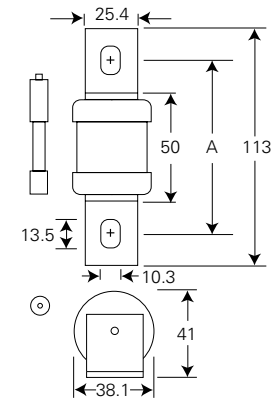
Indicator (optional)

EET, FEE



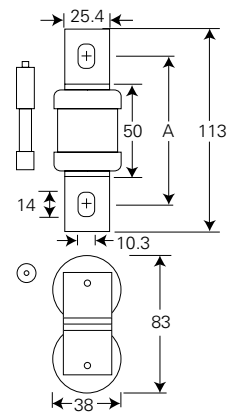
Indicator (optional)

FM, MT



Indicator (optional)

FMM, MMT



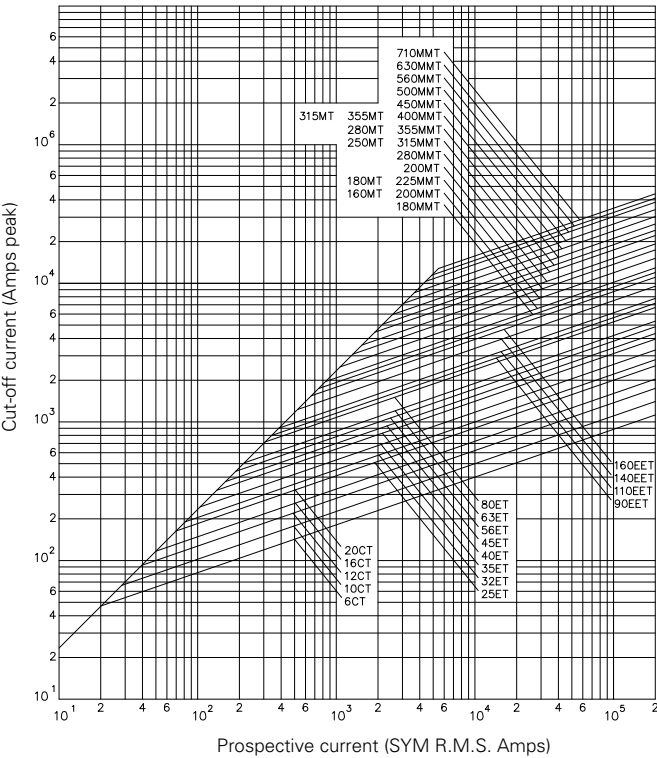
Indicator (optional)

Type	'A' Dimensions
FM	80-85
FMM	80-85
MT	85
MMT	85

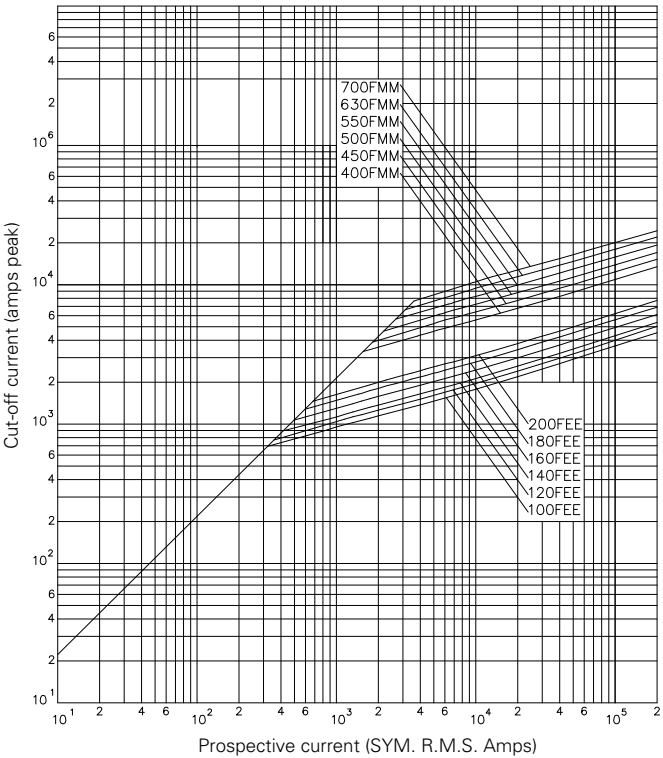
Dimension in mm
1 mm = 0.0394" 1" = 25.4 mm

Cut-off curves

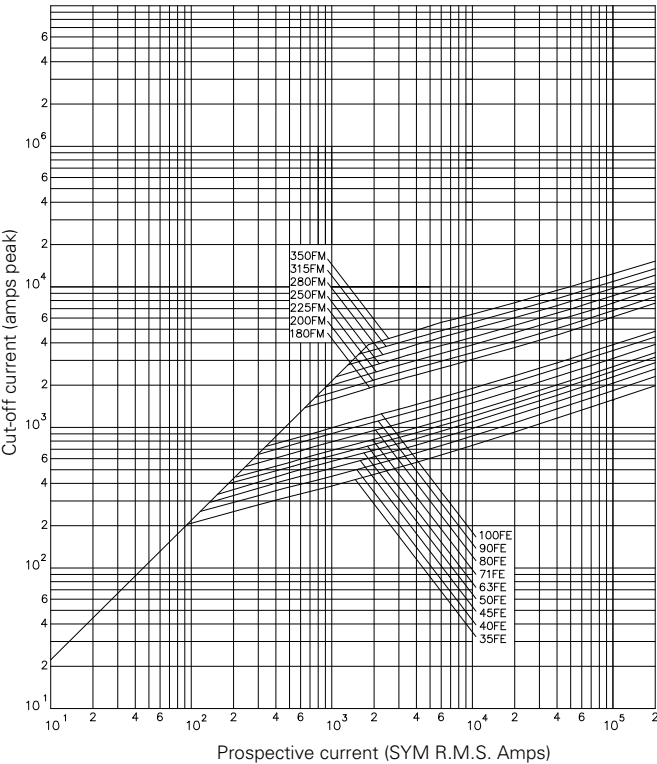
CT, ET, EET, MT and MMT



FEE and FMM

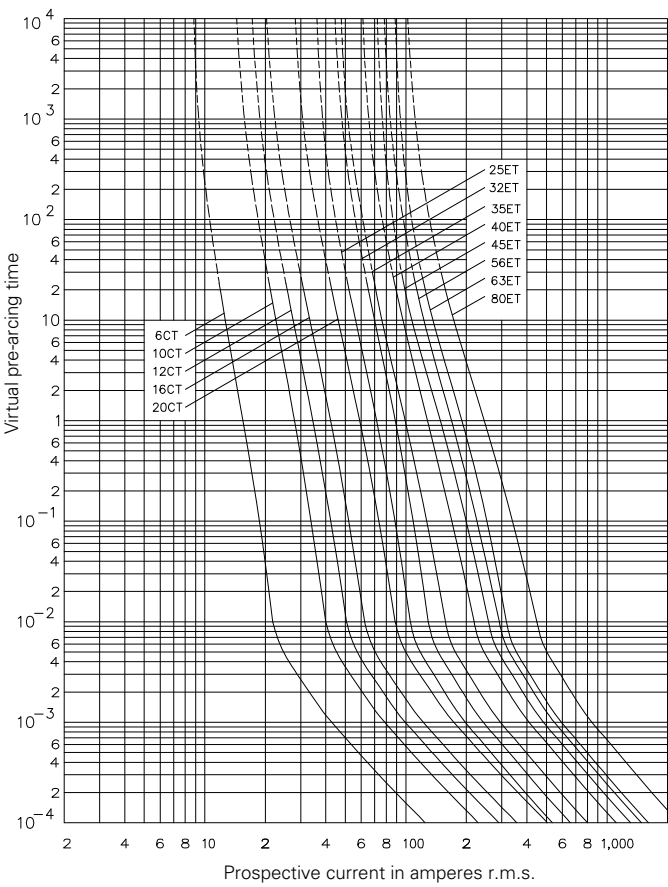


FE, FM

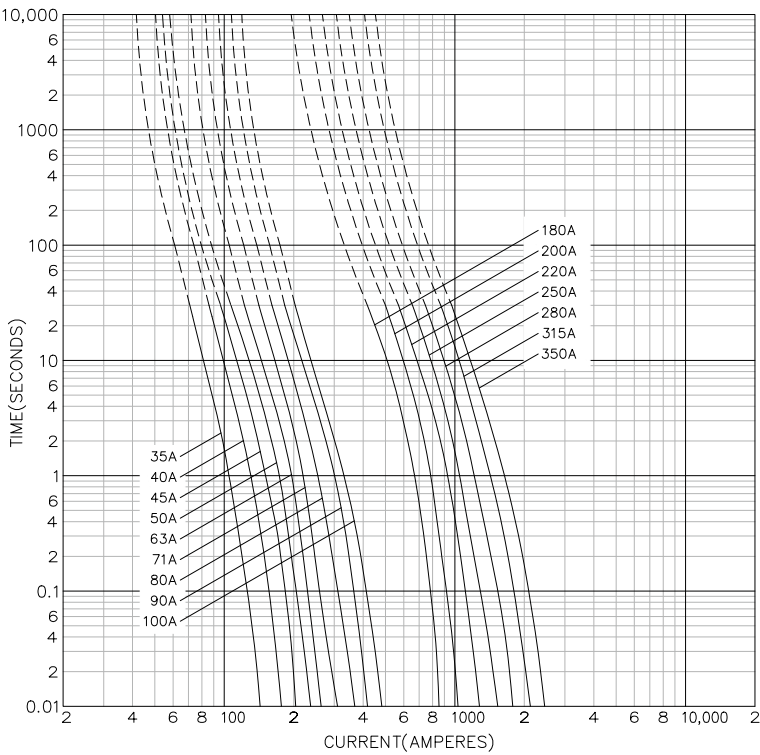


Time-current curves

CT, ET

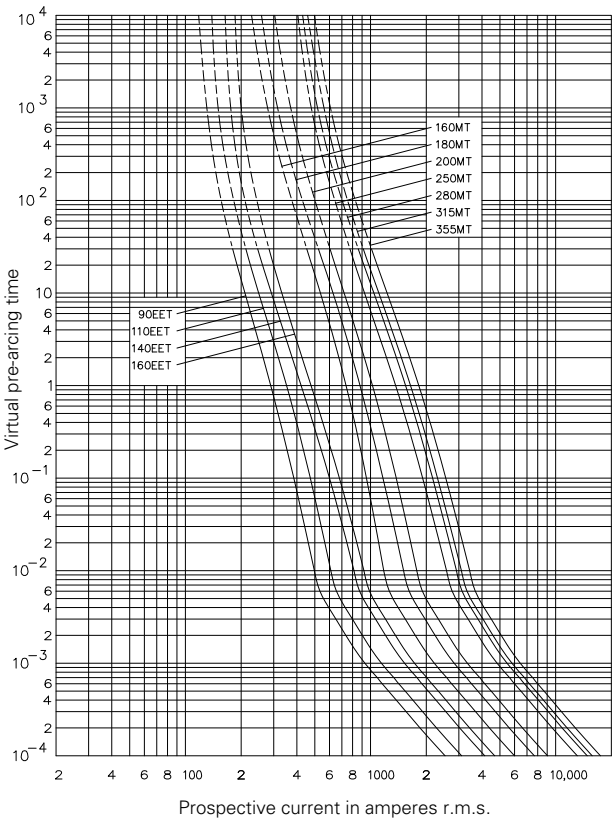


FE, FM

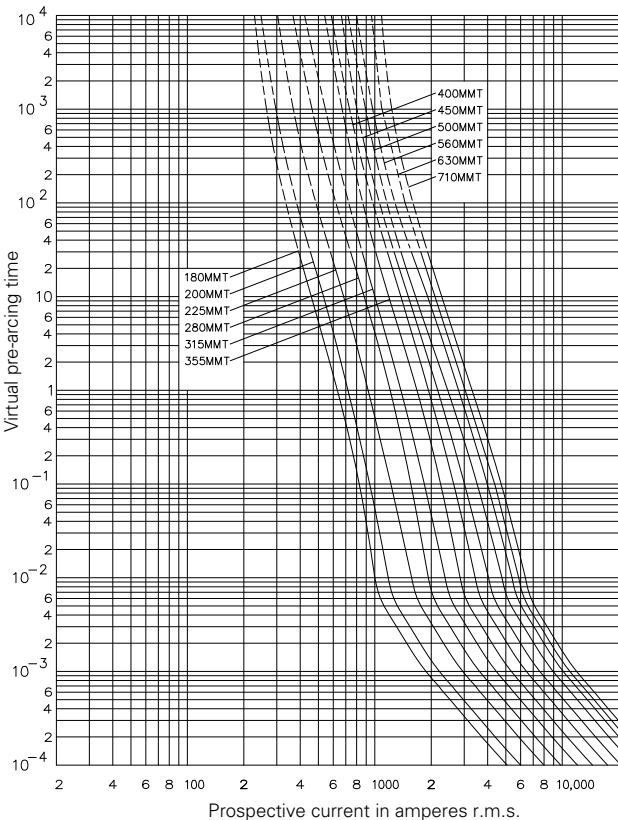


Time-current curve - nominal melt

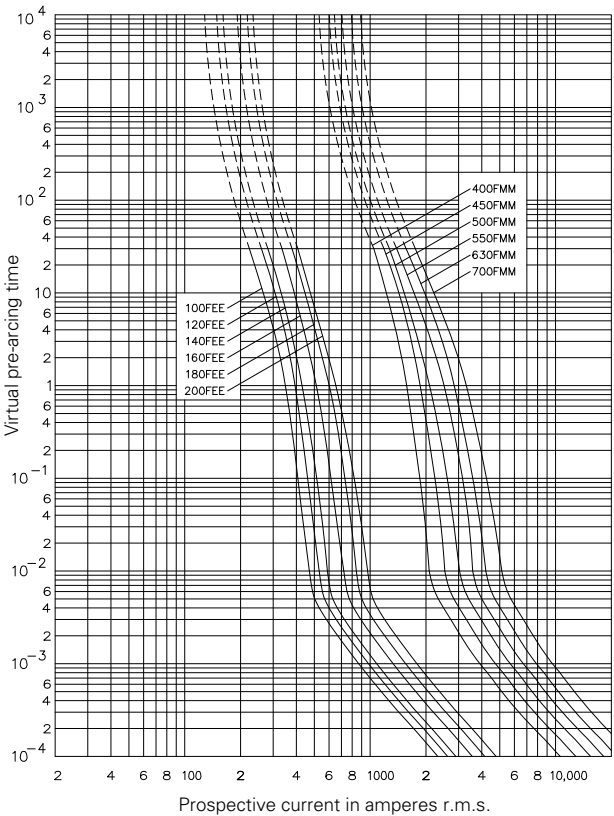
EET, MT



MMT



FEE, FMM



FWH-C Series

Description

- Bolted tags high speed fuse links

Standards / Agency information

- CCC & UL (AC 200kA)
- UL (DC 50kA)

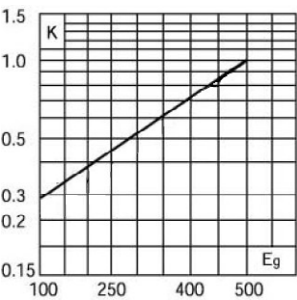
Typical applications

- DC common bus
- Power converters/rectifiers
- Reduced voltage starters

Electrical Characteristics

Total Clearing I²t

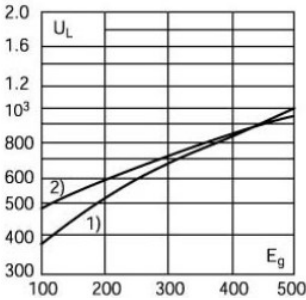
The total clearing I²t at rated voltage and at power factor of 15% are given in the electrical characteristics. For other voltages, the clearing I²t is found by multiplying by correction factor, K, given as a function of applied working voltage, Eg, (rms).



35—800A

Arc Voltage

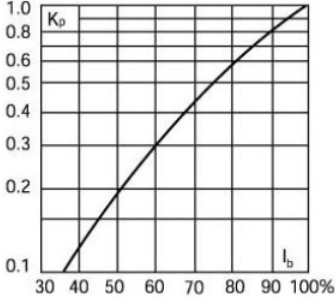
This curve gives the peak arc voltage, UL, which may appear across the fuse during its operation as a function of the applied working voltage, Eg, (rms) at a power factor of 15%



1) 35-200A
2) 225-800A

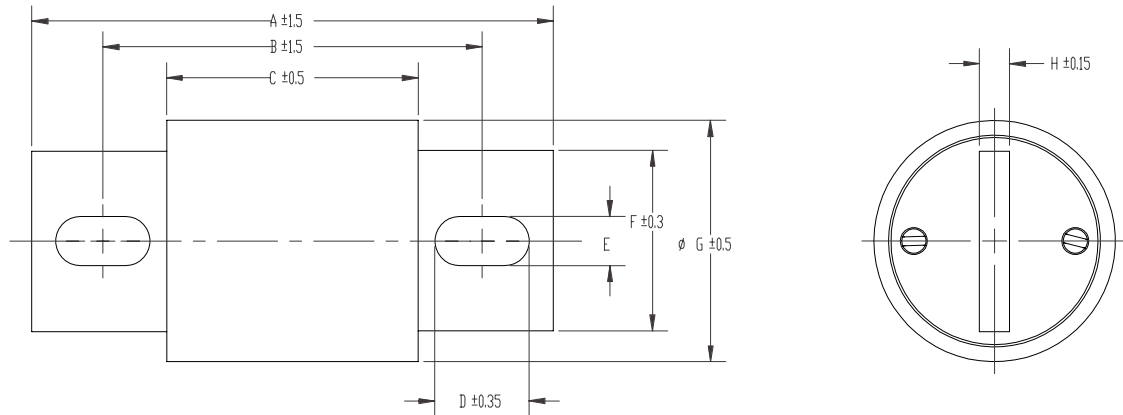
Power Losses

Watts loss at rated current is given in the electrical characteristics. The curve allows the calculation of the power losses at load currents lower than the rated current. The correction factor, Kp, is given as a function of the RMS load current, Ib, in % of the rated current.



FWH-C

Dimensions(mm):



P/N	A	B	C	D	E	F	G	H
FWH-35C-60C	81.01	61.16	40.31	13.13	8.69	15.8	20.52	3.18
FWH-70C-100C	92.23	72.27	53.01	13.16	8.76	19.05	25.4	3.18
FWH-125C-200C	92.23	71.17	53.01	11.86	8.79	25.4	30.94	4.78
FWH-225C-400C	110.31	78.28	53.01	19.07	10.34	25.4	38.1	6.35
FWH-450C-600C	109.91	79.93	53.01	19.86	10.36	37.97	50.8	6.35
FWH-700C-800C	160.41	106.7	53.01	33.02	13.46	50.8	63.5	9.53

1mm=0.0394in 1in=25.4mm

ESS Solution

500VDC Series

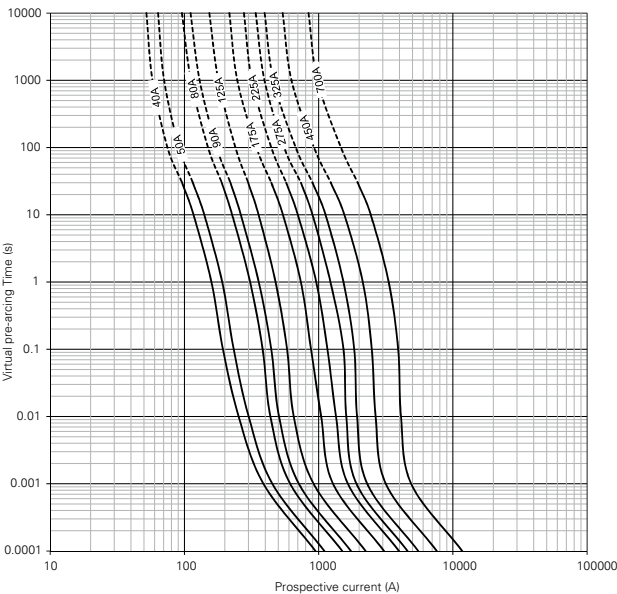
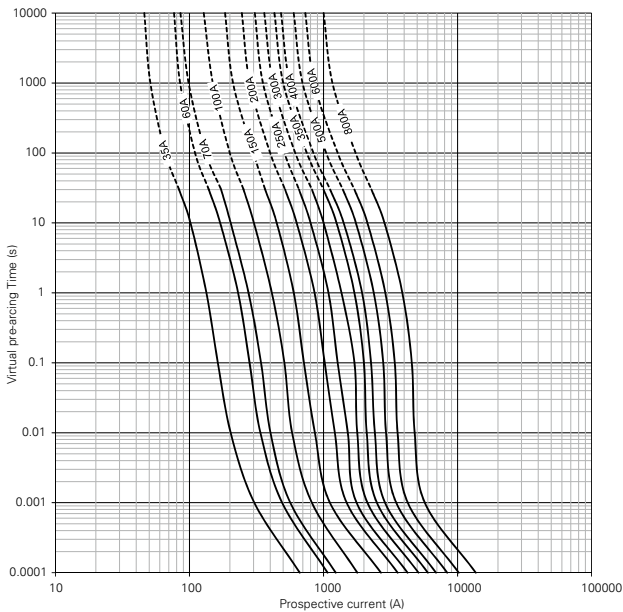
FWH 35-800A

P/N	Electrical aracteristics			Order Information	
	Type	Current (A)	I _{at} (A² Sec)	Watts Loss	
FWH-35C	FWH 500V	35	34	150	8
FWH-40C		40	76	320	7.5
FWH-50C		50	135	670	7.5
FWH-60C		60	210	900	9.9
FWH-70C		70	210	900	10.6
FWH-80C		80	305	1400	12.7
FWH-90C		90	360	1600	15
FWH-100C		100	475	2000	17
FWH-125C		125	800	3500	25
FWH-150C		150	1100	4600	30
FWH-175C		175	1450	6200	35
FWH-200C		200	1900	8500	40
FWH-225C		225	4600	23300	39
FWH-250C		250	6300	32200	41
FWH-275C		275	7900	40300	46
FWH-300C		300	9800	49800	51
FWH-325C		325	13700	63800	53
FWH-350C		350	14500	72900	58
FWH-400C		400	19200	96700	65
FWH-450C		450	24700	127000	74
FWH-500C		500	29200	149000	84
FWH-600C		600	41300	206000	108
FWH-700C		700	55000	298000	120
FWH-800C		800	76200	409000	129

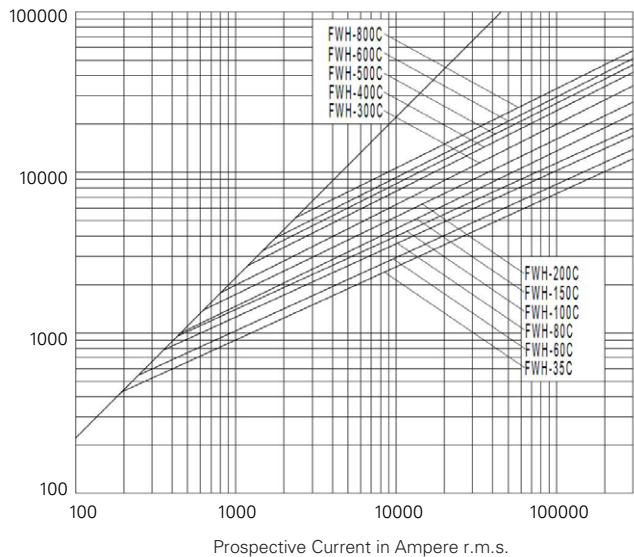
1kg=2.2lbs 1lb=0.45kg

- Breaking Capacity 200kA for AC(both CCC & UL Certified)
- Breaking Capacity 50kA for DC.(UL Certified)
- Watts loss provided at rated current.

Time-Current Curve



Peak Let-Through Curve



170M17xx Series



Description

- Bolted tags high speed fuse

Standards / Agency information

- UL DC Recognized, 800 Vdc L/R 1 ms max

Typical applications

- Protection to IGBT modules
- Optimization for use in IGBT inverter circuits

Specifications:

Description: High speed fuse links for the protection of IGBT modules, optimized for use in IGBT inverter circuits with DC-link voltages up to 750Vdc. Low inductance $\leq 15\text{nH}$.

Ratings:

Volts: 690Vac / 750Vdc - Tested at 863Vdc according to IEC 60269-4.

700Vac / 800Vdc - Tested at 800Vdc according to UL 248-1

Amps: 25 - 630A

IR: 200kA RMS Sym / 50kA dc(1ms to)

Operating Class: aR

Agency Information: UL DC recognized, 800Vdc LR 1mS. min.

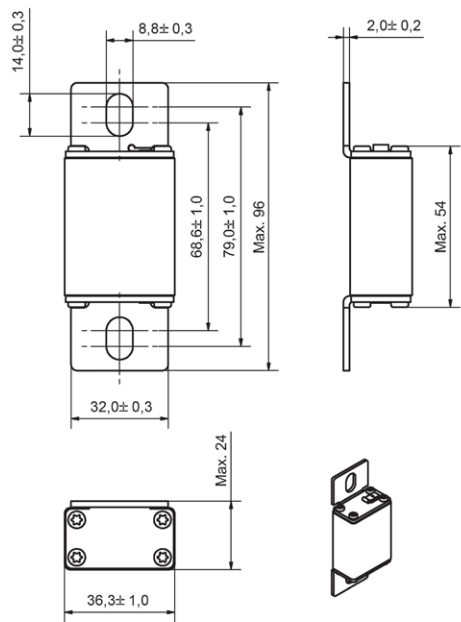
Catalogue Numbers:

Fuse Size	Cat. Number				Electrical Characteristics		
	-FU/70	-FN/70	Rated Voltage (V)	Rated Current RMS-Amp	I ² t (A ² Sec)		Watt Loss (W)
					Pre arc	Clearing at 690V	
000	170M1750	170M1730	690	25	25	135	12
	170M1751	170M1731		32	45	240	13
	170M1752	170M1732		40	75	395	14
	170M1753	170M1733		50	135	695	16
	170M1754	170M1734		63	260	1350	17
	170M1755	170M1735		80	460	2350	20
	170M1756	170M1736		100	795	4000	25
	170M1757	170M1737		125	1300	6800	29
	170M1758	170M1738		160	2550	13500	34
	170M1759	170M1739		200	4350	22000	40
	170M1760	170M1740		250	7400	37500	48
	170M1761	170M1741		315	12500	65000	60
	170M1762	170M1742		350	17000	88000	65
230	170M1770	170M1785	690	100	380	1950	35
	170M1771	170M1786		125	645	3300	42
	170M1772	170M1787		160	1350	7000	47
	170M1773	170M1788		200	2550	13500	54
	170M1774	170M1789		250	4950	25000	62
	170M1775	170M1790		315	9350	47500	72
	170M1776	170M1791		350	12000	61000	78
	170M1777	170M1792		400	18500	94500	80
	170M1778	170M1793		450	27000	140000	85
	170M1779	170M1794		500	37500	190000	90
	170M1780	170M1795		550	48500	245000	95
	170M1781	170M1796		630	69500	355000	105

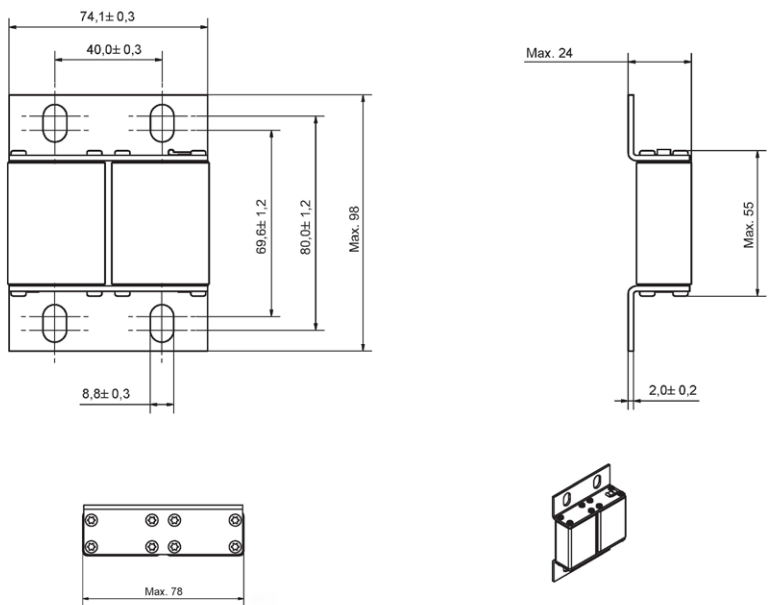
170Mxx

Dimensions (mm):

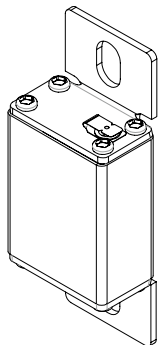
Size 000



Size 230



CBX000S Series



Description

- The battery storage fuses are specifically designed to protect and isolate battery strings and converters system at DC side.

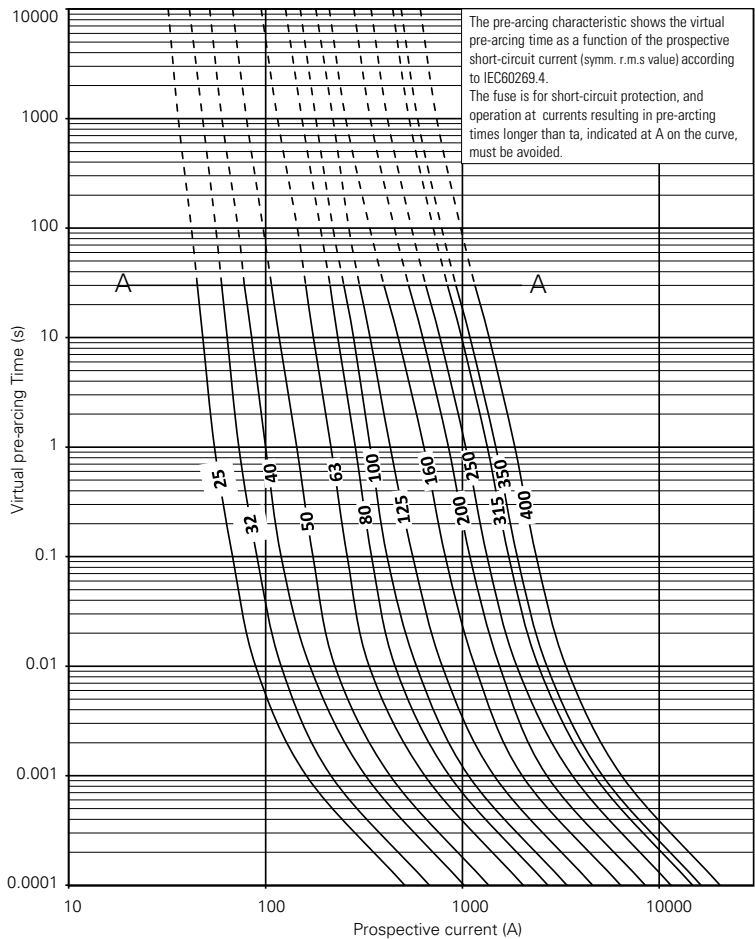
Standards / Agency information

- IEC60269-4/GB135394

Typical applications

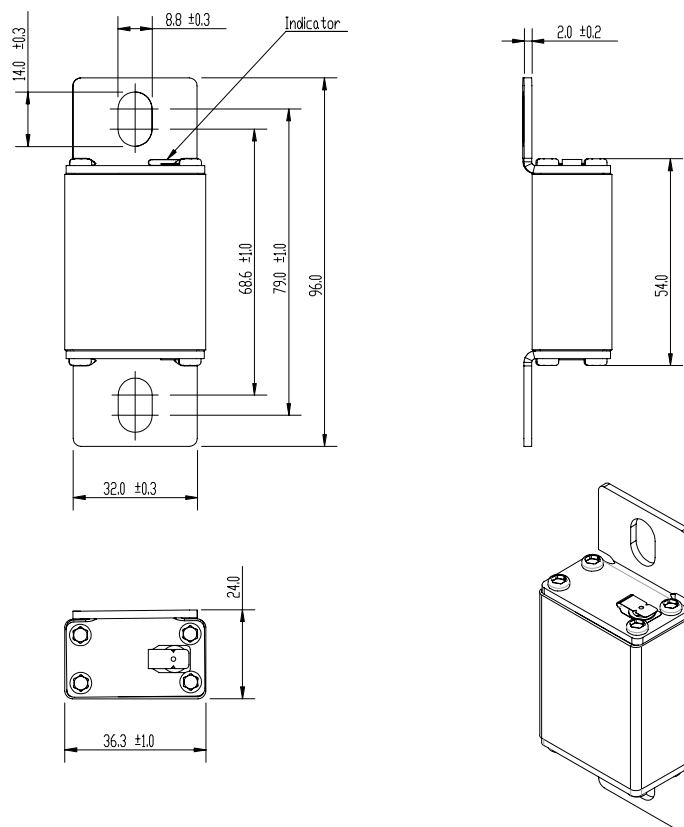
- Battery strings and converters system at DC side

Material No.		Voltage Rating (V)	Current Rating (A)	Pre-arcing I^2t (A ² s)	Total I^2t (A ² s)	Power Loss at I_n (W)	Power Loss at $0.8 \times I_n$ (W)
Visual Indicator	Type T Indicator for microswitch						
25CBX000S-800	25CBX000S-800-IN	800Vdc	25	30	80	10	6
32CBX000S-800	32CBX000S-800-IN		32	50	140	12	7
40CBX000S-800	40CBX000S-800-IN		40	100	310	13	7
50CBX000S-800	50CBX000S-800-IN		50	180	550	15	8
63CBX000S-800	63CBX000S-800-IN		63	420	1,250	16	9
80CBX000S-800	80CBX000S-800-IN		80	740	2,220	20	11
100CBX000S-800	100CBX000S-800-IN		100	1,150	3,460	25	14
125CBX000S-800	125CBX000S-800-IN		125	2,100	6,310	28	16
160CBX000S-800	160CBX000S-800-IN		160	4,060	12,170	34	18
200CBX000S-800	200CBX000S-800-IN		200	7,210	21,640	39	22
250CBX000S-800	250CBX000S-800-IN		250	13,150	39,440	45	25
315CBX000S-800	315CBX000S-800-IN		315	21,840	65,510	56	31
350CBX000S-800	350CBX000S-800-IN		350	26,590	79,770	63	34
400CBX000S-800	400CBX000S-800-IN		400	41,550	124,640	68	37



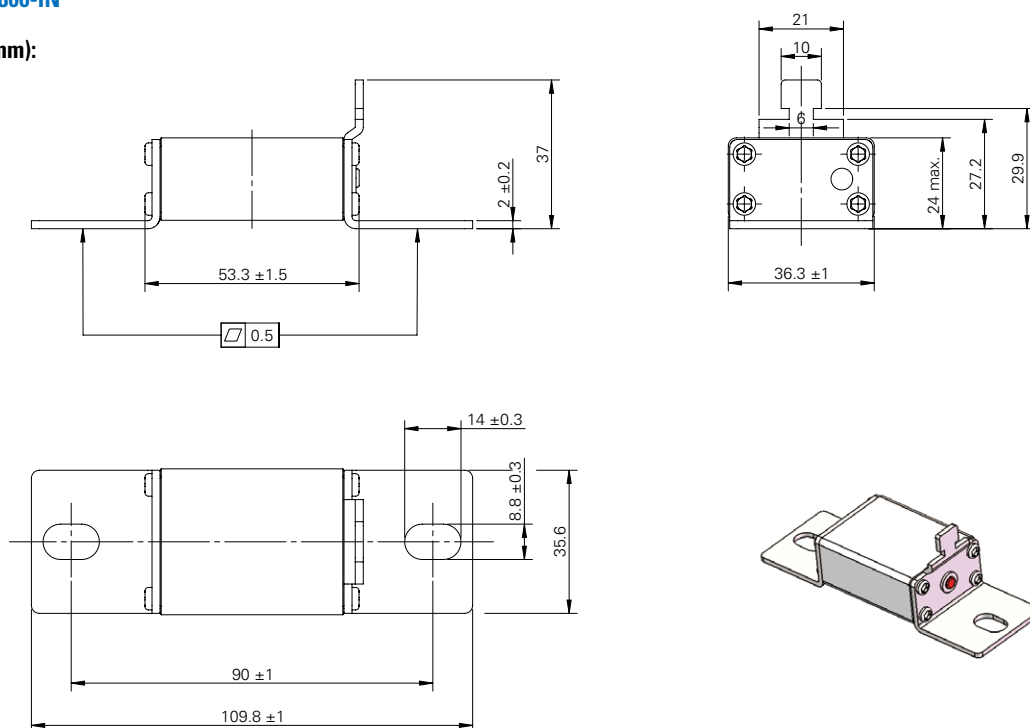
XXxcbX000S-800

Dimensions (mm):



XXxcbX000S-800-IN

Dimensions (mm):



170M18xx Series



Description

- Bolted tags high speed fuse

Standards / Agency information

- UL DC Recognized, 1000 Vdc L/R 1 ms max

Typical applications

- Protection to IGBT modules
- Optimization for use in IGBT inverter circuits

Specifications:

Description: High speed fuse links for the protection of IGBT modules, optimized for use in IGBT inverter circuits with DC-link voltages up to 1000Vdc. Low inductance $\leq 20\text{nH}$.

Ratings:

Volts: 1000Vac / 1000Vdc - Tested at 1150Vdc according to IEC 60269-4.

1000Vac / 1000Vdc - Tested at 1000Vdc according to UL 248-1

Amps: 25 - 5000A

IR: 100kA RMS Sym / 50kA dc(1ms tc)

Operating Class: aR

Agency Information: UL DC recognized, 1000Vdc LR 1mS. min.

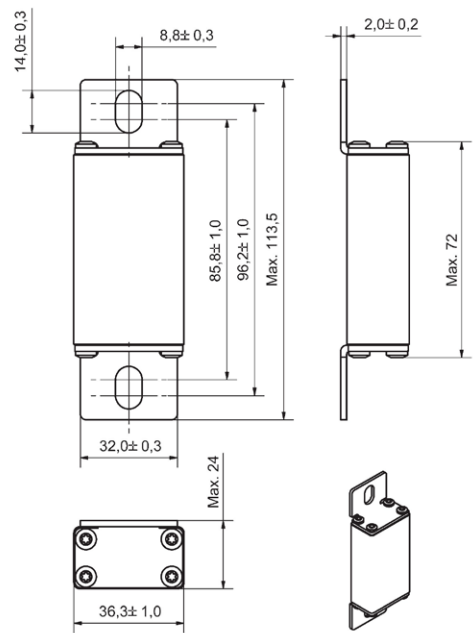
Catalogue Numbers:

Fuse Size	Cat. Number				Electrical Characteristics		
	-FU/90	-FN/90	Rated Voltage (V)	Rated Current RMS-Amp	I ² t (A ² Sec)		Watt Loss (W)
					Pre-arc	Clearing at 1000V	
000	170M1802	170M1842	1000	25	19	95	14
	170M1803	170M1843		32	34	170	17
	170M1804	170M1844		40	61	300	20
	170M1805	170M1845		50	135	675	21
	170M1806	170M1846		63	245	1200	22
	170M1807	170M1847		80	505	2500	27
	170M1808	170M1848		100	1050	5150	32
	170M1809	170M1849		125	1900	9500	34
	170M1810	170M1850		160	4050	20000	37
	170M1811	170M1851		200	8500	42000	43
	170M1812	170M1852		225	12000	59000	45
	170M1813	170M1853		250	16000	79500	48
230	170M1824	170M1860	1000	100	600	3050	38
	170M1825	170M1861		125	1200	6050	42
	170M1826	170M1862		160	2550	13000	48
	170M1827	170M1863		200	4650	23000	55
	170M1828	170M1864		250	9300	45500	62
	170M1829	170M1865		315	18500	91500	68
	170M1830	170M1866		350	24500	125000	75
	170M1831	170M1867		400	37500	185000	80
	170M1832	170M1868		450	52000	260000	85
	170M1833	170M1869		500	69500	340000	90

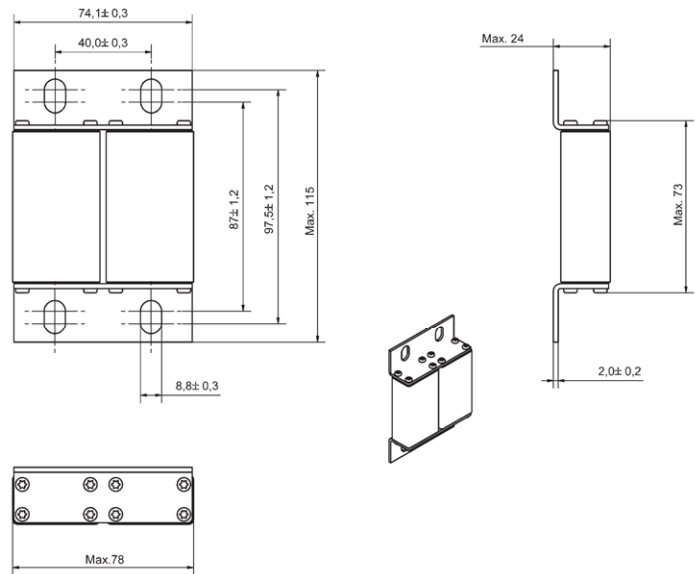
170M18xx

Dimensions (mm):

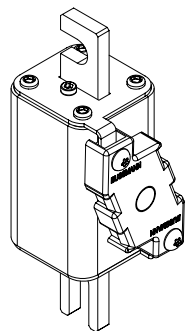
Size 000



Size 230



CBX01S Series



Description

These fuse links are capable of interrupting extremely high fault currents provided by battery storage system.

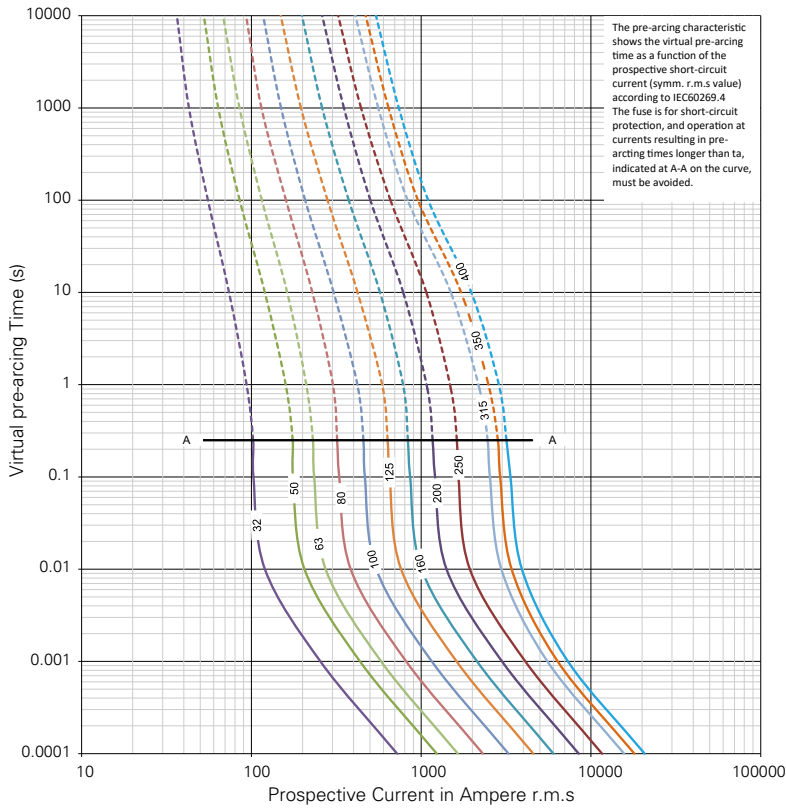
Standards / Agency information

- UL248
- UL Recognized

Typical applications

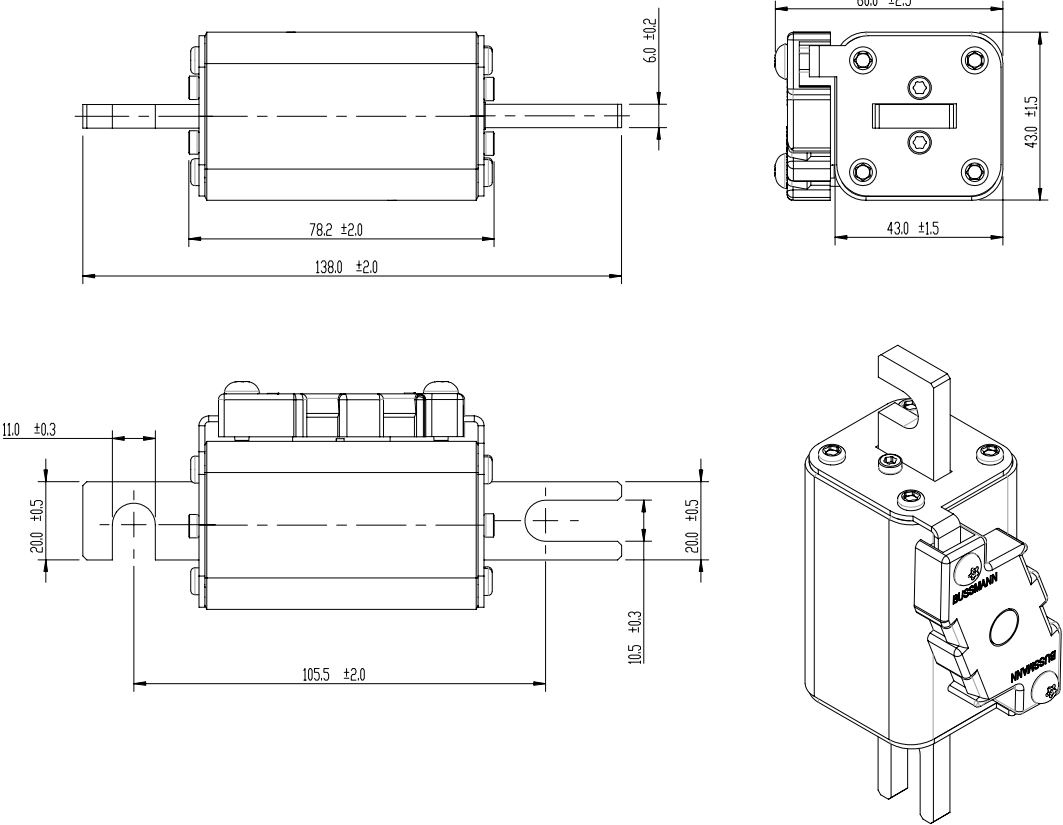
- Battery storage system

Material No.		Voltage Rating (V)	Current Rating (A)	Pre-arcing I ² t (A ² s)	Total I ² t (A ² s)	Power Loss at I _n (W)	Power Loss at 0.8xI _n (W)	Power Loss at 0.5xI _n (W)
Without indicator	Type k indicator for microswitch							
32CBX01S-1000N	32CBX01S-1000	1000Vdc	32	100	200	18	10	4
50CBX01S-1000N	50CBX01S-1000		50	200	500	25	14	6
63CBX01S-1000N	63CBX01S-1000		63	300	800	30	17	8
80CBX01S-1000N	80CBX01S-1000		80	600	2,000	34	18	8
100CBX01S-1000N	100CBX01S-1000		100	1,200	3,400	37	20	9
125CBX01S-1000N	125CBX01S-1000		125	2,400	6,000	41	23	10
160CBX01S-1000N	160CBX01S-1000		160	4,200	11,000	50	28	13
200CBX01S-1000N	200CBX01S-1000		200	8,500	23,000	54	30	14
250CBX01S-1000N	250CBX01S-1000		250	16,700	43,000	60	33	15
315CBX01S-1000N	315CBX01S-1000		315	30,900	80,000	64	35	16
350CBX01S-1000N	350CBX01S-1000		350	33,700	87,000	67	37	17
400CBX01S-1000N	400CBX01S-1000		400	64,500	161,000	72	40	18
Proven at 1000Vdc, ≥ 10 ms time constant, IR=50kA								



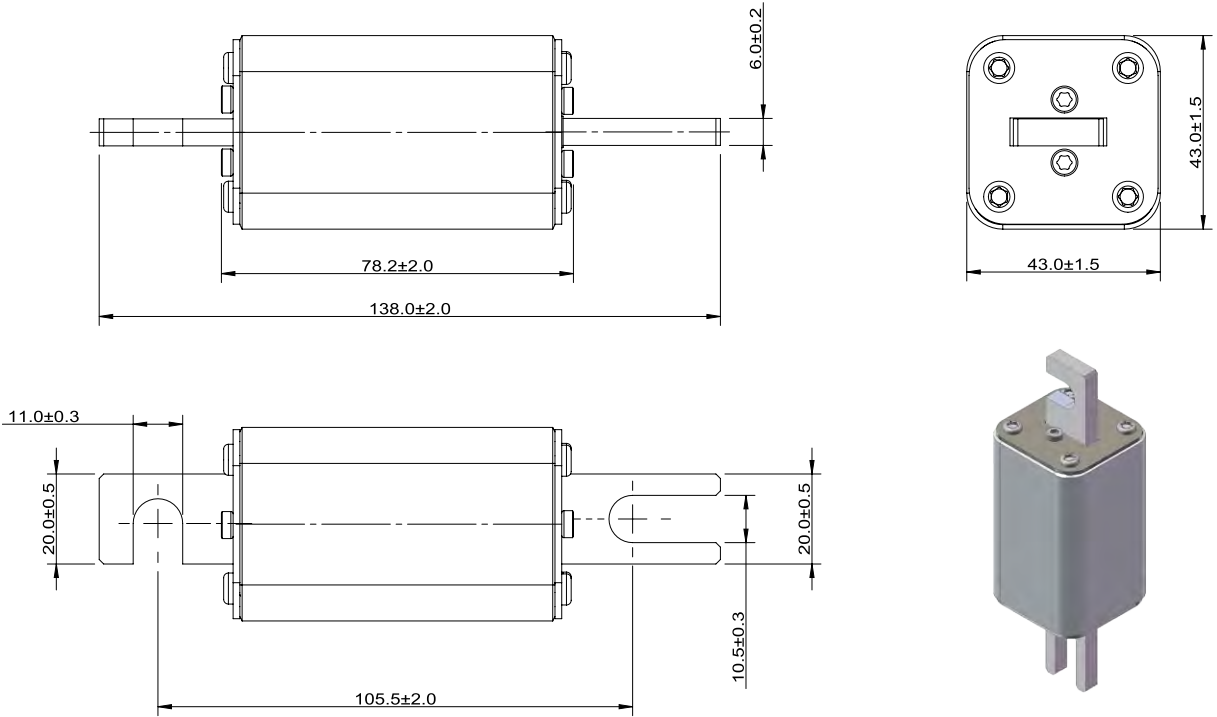
XXXCBX01S-1000

Dimensions (mm):



XXXCBX01S-1000N

Dimensions (mm):



PV-ANH Series



Description

- A range of 1000Vdc NH size photovoltaic fuse

Standards / Agency information

- UL Listed, Guide JFGA, File E335324, Photovoltaic to UL 248-19, IEC 60269-6 gPV, CSA Class 1422-30, File 53787 (32-160 A), UL Listed, IEC gPV, CSA, CCC Pending, RoHS compliant

Features

- Compact size saves panel space and extends design flexibility
- Bolt-on versions have common hole centers for standardizing busbar designs across 63-400 amp range
- Low power loss for greater efficiency and lower operating temperature
- Dual indication feature and optional microswitches make system monitoring easier

Typical applications

- Recombiner boxes
- Inverters

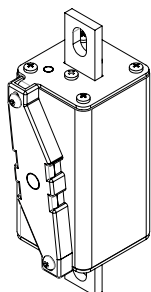
Blade without bolt-holes

Part number	Fuse size	Current rating (amps)	Energy integrals I ² t (A ² S)		Watts loss	
			Pre-arcing	Total at 1000V	0.8 I _n	I _n
PV-32ANH1	NH1	32	80	720	4	8
PV-40ANH1		40	185	1670	5	9
PV-50ANH1		50	400	3600	6	11
PV-63ANH1		63	470	4300	6	12
PV-80ANH1		80	640	5760	8	15
PV-100ANH1		100	1300	11,700	8	16
PV-125ANH1		125	2600	23,400	9	17
PV-160ANH1		160	5200	46,800	14	27
PV-200ANH1	NH2	200	10,200	82,000	13	25
PV-250ANH2		250	17,000	136,000	19	38
PV-300ANH3	NH3	300	32,000	260,000	24	40
PV-315ANH3		315	32,000	260,000	26	44
PV-350ANH3		350	44,500	370,000	27	45
PV-355ANH3		355	44,500	370,000	28	46
PV-400ANH3		400	67,500	550,000	30	50

Blade with bolt-holes

Part number with bolt holes	Fuse size	Current rating (amps)	Energy integrals I ² t (A ² S)		Watts loss	
			Pre-arcing	Total at 1000V	0.8 I _n	I _n
PV-63ANH1-B	NH1	63	470	4300	6	12
PV-80ANH1-B		80	640	5760	8	15
PV-100ANH1-B		100	1300	11,700	8	16
PV-125ANH1-B		125	2600	23,400	9	17
PV-160ANH1-B		160	5200	46,800	14	27
PV-200ANH1-B		200	10,200	82,000	13	25
PV-250ANH2-B	NH2	250	17,000	136,000	19	38
PV-315ANH3-B		315	32,000	260,000	26	44
PV-355ANH3-B	NH3	355	38,000	310,000	29	48
PV-400ANH3-B		400	61,000	490,000	32	50

ESS2 Series



Description

- The battery storage fuses

Standards / Agency information

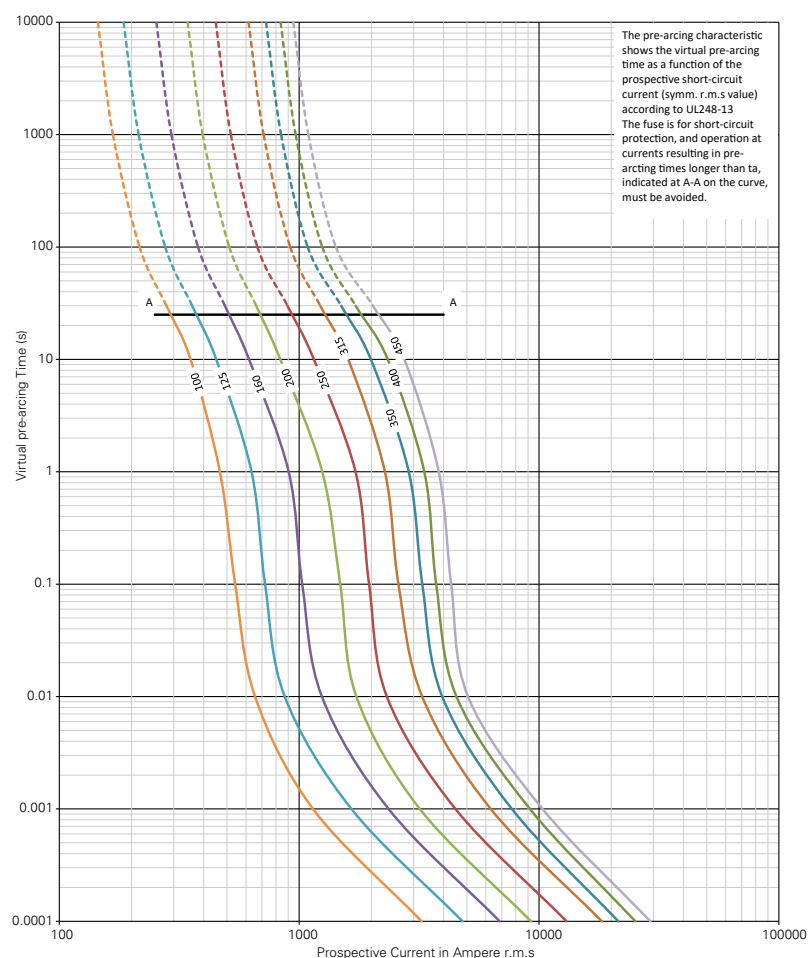
- UL (ESS2)
- UL and TUV (ESS3, ESS5)

Typical applications

- Coordinated with battery module fuses to save the safe of the battery modules and electricity continuity.

Material No.		Current Rating (A)	Pre-arcing I^2t (A ² s)	Total I^2t (A ² s)	Power Loss at I_n (W)	Power Loss at $0.8 \times I_n$ (W)	Power Loss at $0.5 \times I_n$ (W)
Type k indicator for microswitch P/N1	Without indicator P/N2						
ESS2X-100	ESS2X-100-NI	100	1,000	4,200	50	29	13
ESS2X-125	ESS2X-125-NI	125	3,000	8,300	60	33	15
ESS2X-160	ESS2X-160-NI	160	5,300	17,000	74	40	18
ESS2X-200	ESS2X-200-NI	200	10,000	31,000	87	47	21
ESS2X-250	ESS2X-250-NI	250	19,000	57,000	94	50	23
ESS2X-315	ESS2X-315-NI	315	38,000	113,000	113	61	28
ESS2X-350	ESS2X-350-NI	350	53,000	159,000	117	63	29
ESS2X-400	ESS2X-400-NI	400	79,000	236,000	129	70	31
ESS2X-450	ESS2X-450-NI	450	111,000	334,000	137	74	33

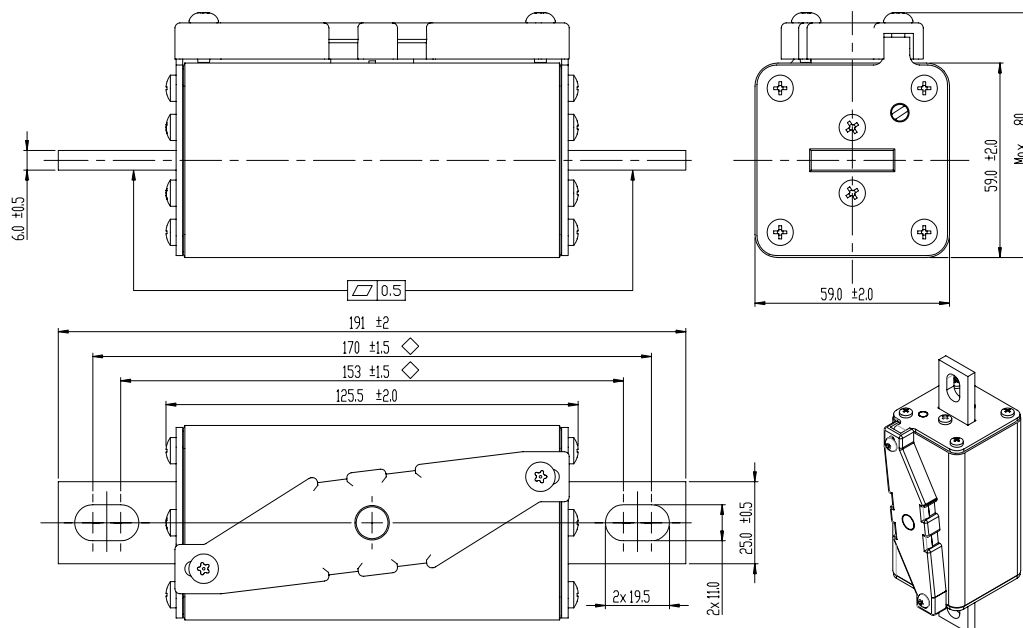
Note: X can be H,B,J and L for various terminal tags.



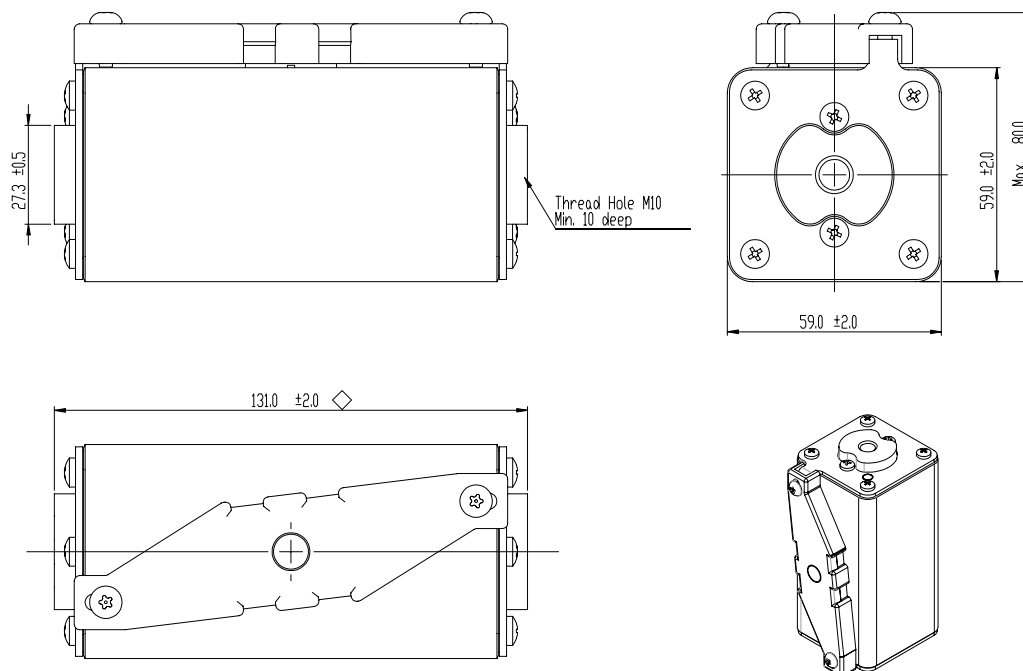
1500VDC Series

ESS2H-XXX

Dimensions (mm):

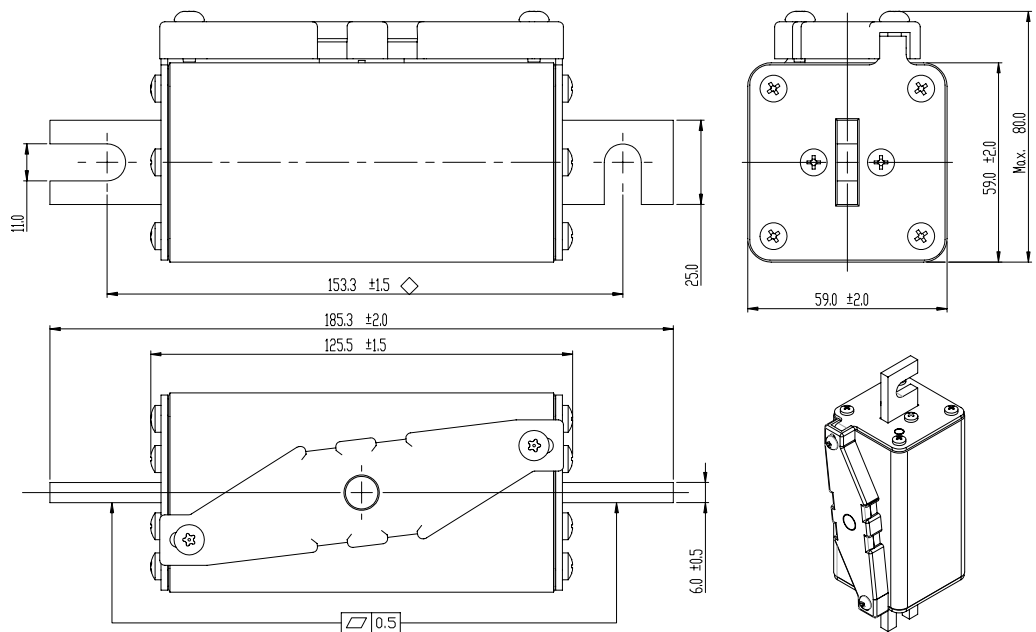
**ESS2B-XXX**

Dimensions (mm):



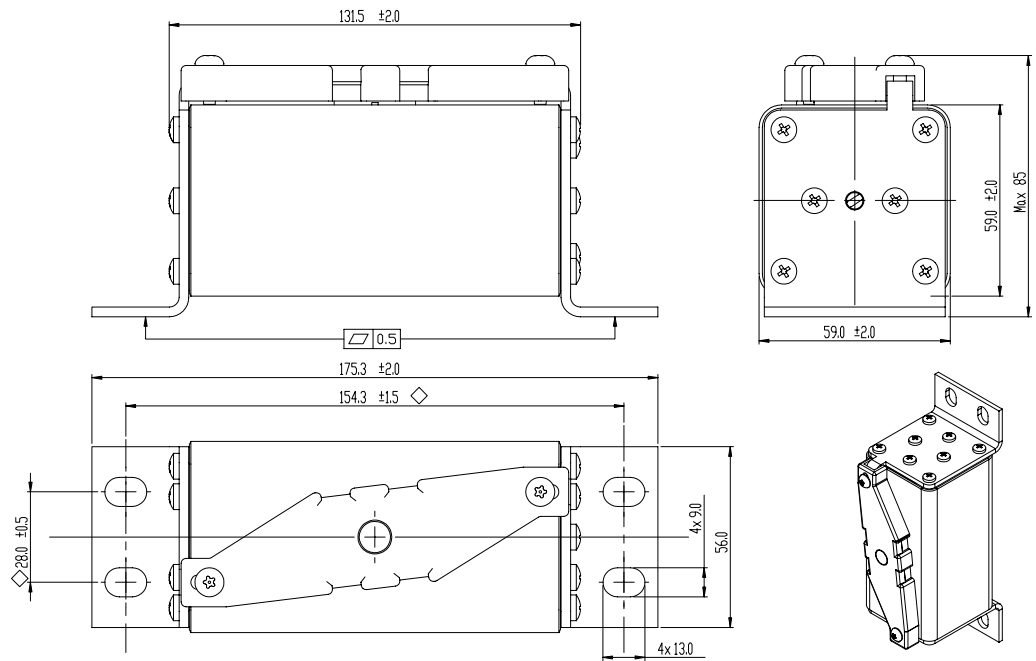
ESS2J-XXX

Dimensions (mm):



ESS2L-XXX

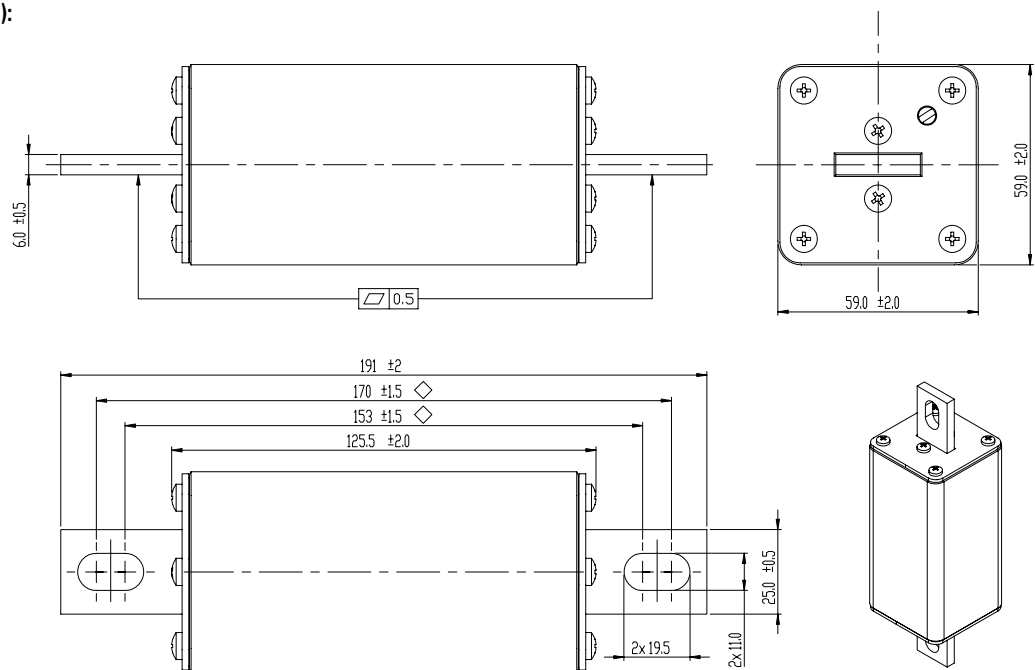
Dimensions (mm):



ESS Solution
1500VDC Series

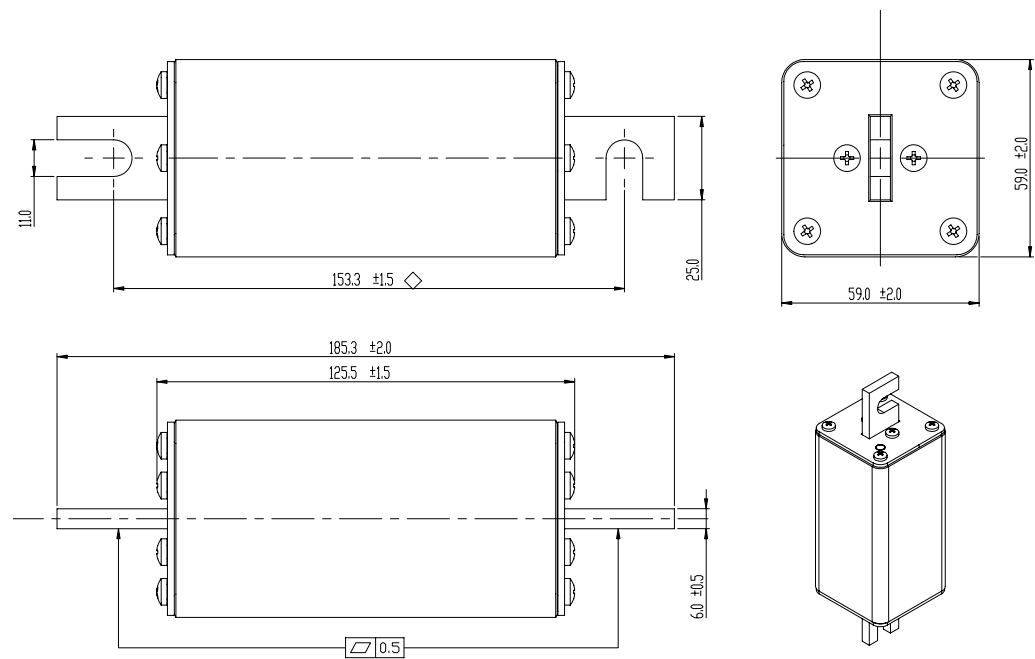
ESS2H-XXX-NI

Dimensions (mm):



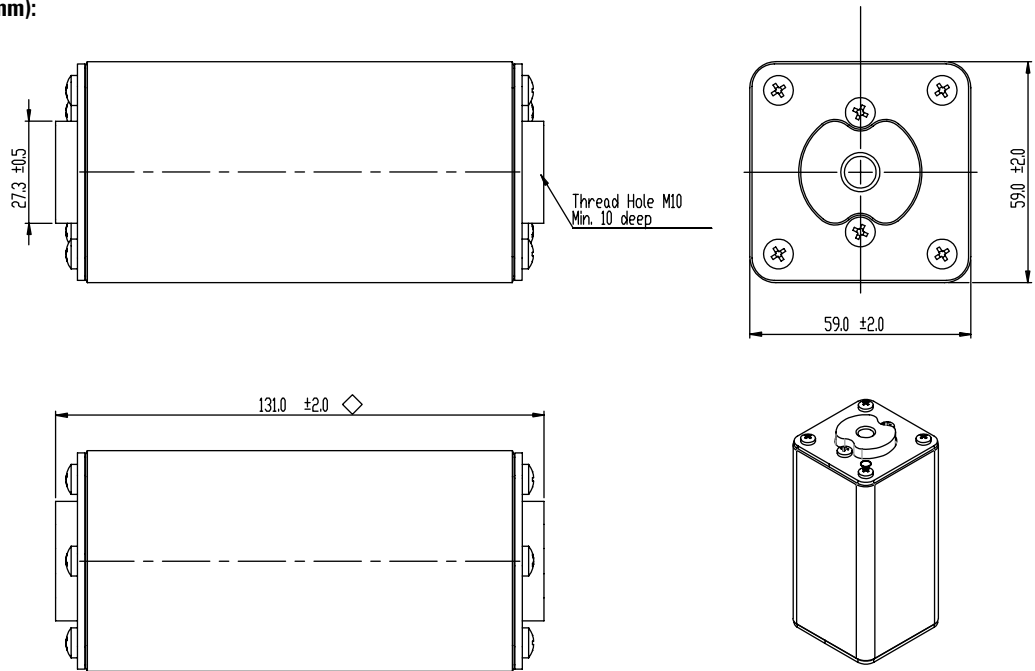
ESS2J-XXX-NI

Dimensions (mm):



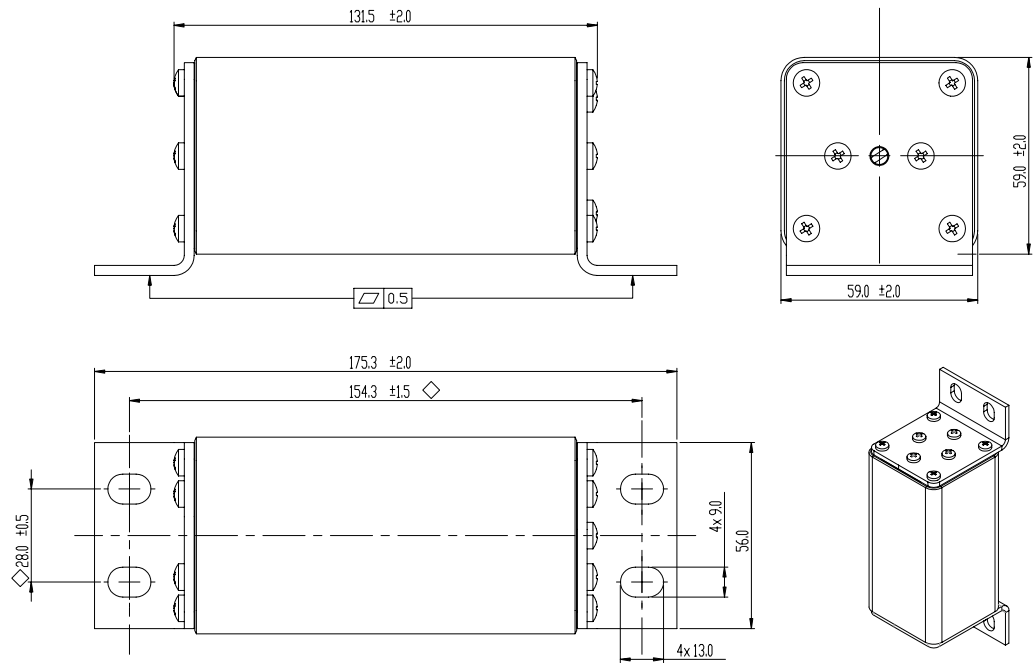
ESS2B-XXX-NI

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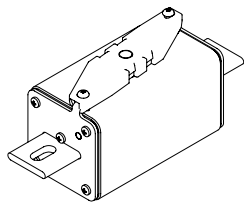


ESS2L-XXX-NI

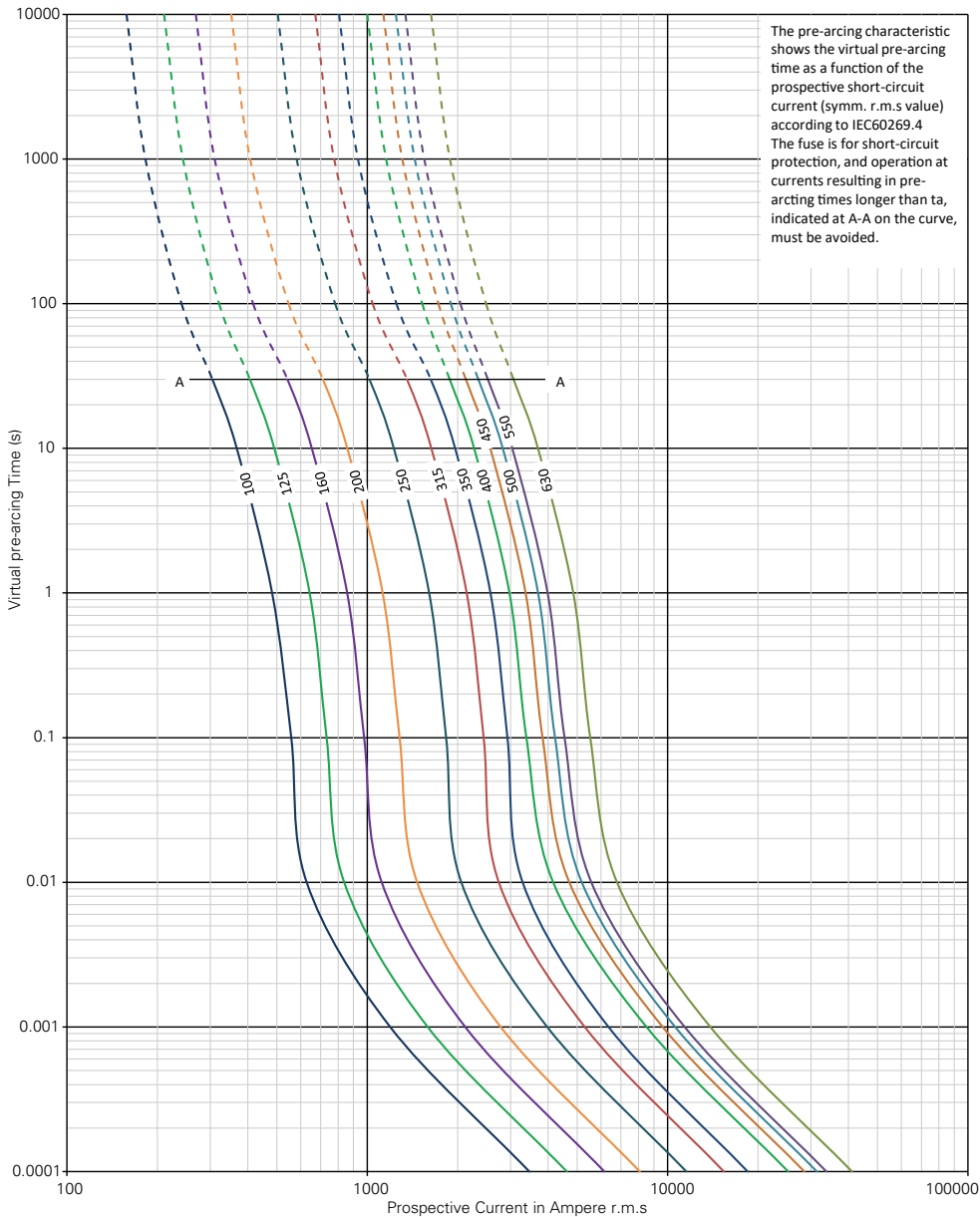
Dimensions (mm):



ESS3 Series

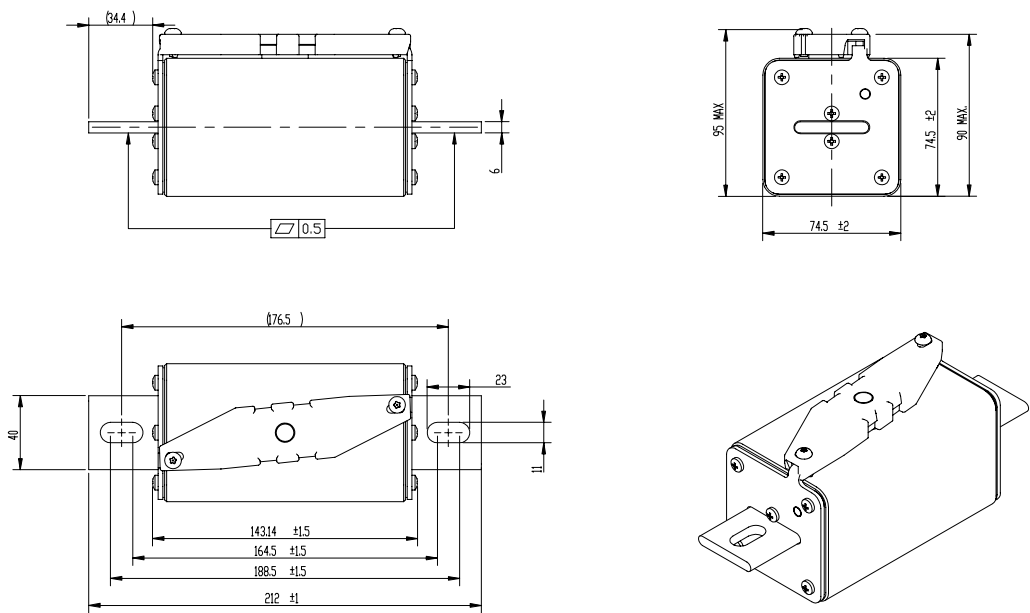


Material No.		Current Rating (A)	Pre-arcing I^2t (A ² s)	Total I^2t (A ² s)	Power Loss at I_n (W)	Power Loss at $0.8 \times I_n$ (W)	Power Loss at $0.5 \times I_n$ (W)
Type k indicator for microswitch P/N1	Without indicator P/N2						
ESS3-100	ESS3-100-NI	100	1,200	6,100	45	24	11
ESS3-125	ESS3-125-NI	125	2,200	10,900	55	30	13
ESS3-160	ESS3-160-NI	160	3,900	19,300	70	38	17
ESS3-200	ESS3-200-NI	200	6,600	33,200	85	46	21
ESS3-250	ESS3-250-NI	250	13,600	67,800	90	49	22
ESS3-315	ESS3-315-NI	315	24,100	120,600	115	62	28
ESS3-350	ESS3-350-NI	350	34,700	173,600	118	64	29
ESS3-400	ESS3-400-NI	400	60,000	299,000	120	67	30
ESS3-450	ESS3-450-NI	450	78,000	367,000	140	74	33
ESS3-500	ESS3-500-NI	500	96,000	444,000	150	82	37
ESS3-550	ESS3-550-NI	550	112,000	502,000	170	94	43
ESS3-630	ESS3-630-NI	630	172,000	775,000	190	100	45



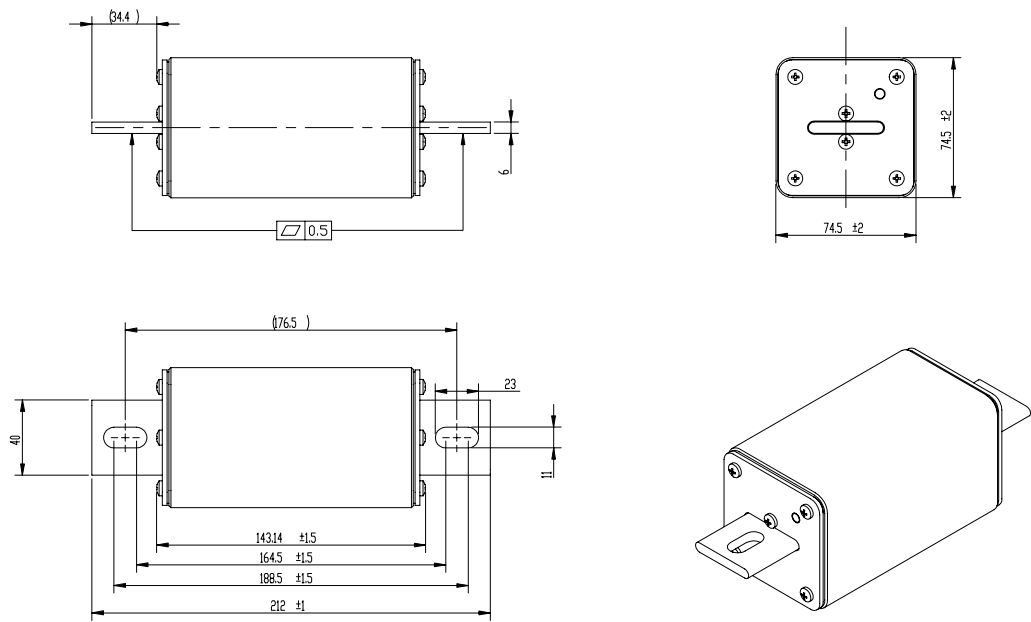
ESS3-XXX

Dimensions (mm):

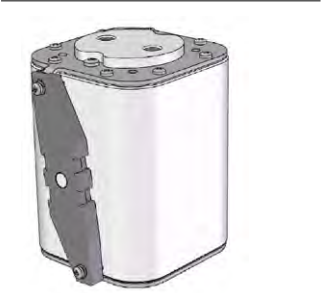


ESS3-XXX-NI

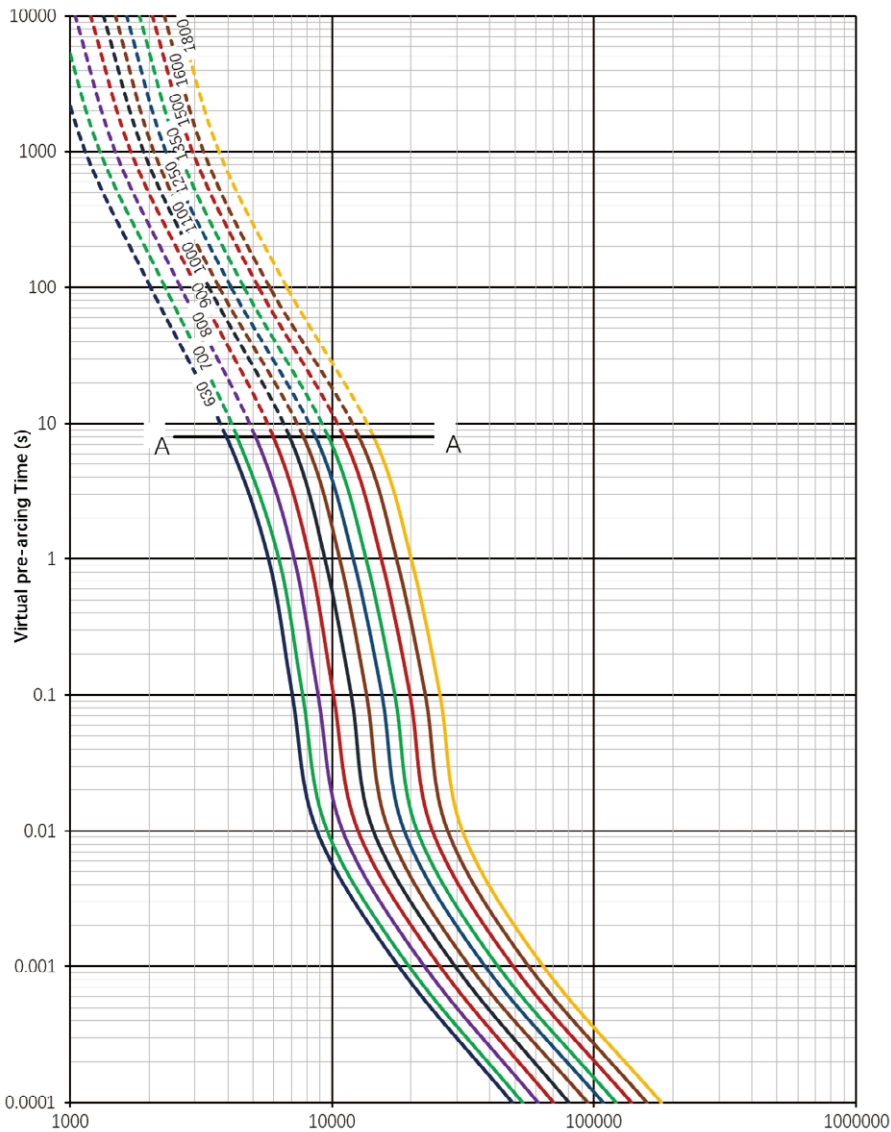
Dimensions (mm):



ESS5 Series

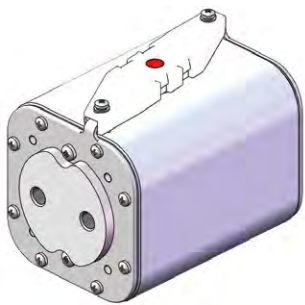
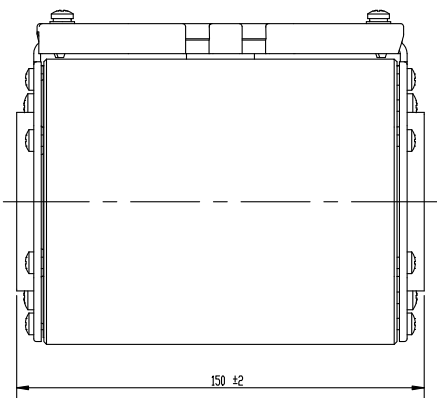
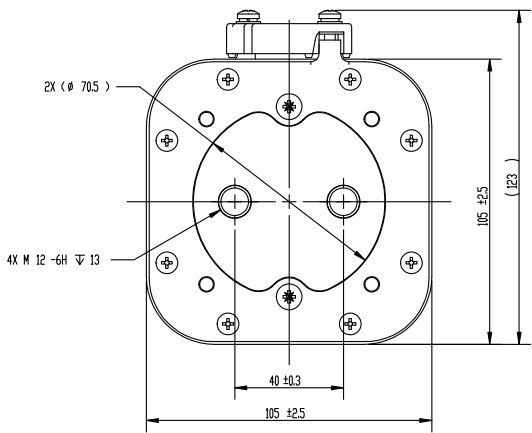


P/N	Current Rating (A)	Pre-arcing I^2t (A ² s)	Total I^2t (A ² s)	Power Loss at I_n (W)	Power Loss at $0.8 \times I_n$ (W)	Power Loss at $0.5 \times I_n$ (W)
ESS5-630	630	169,000	1,098,000	183	99	45
ESS5-700	700	200,000	1,434,000	192	104	47
ESS5-800	800	320,000	2,081,000	202	109	49
ESS5-900	900	467,000	3,035,000	212	115	52
ESS5-1000	1000	658,000	4,280,000	233	126	57
ESS5-1100	1100	804,000	5,228,000	241	130	59
ESS5-1250	1250	1,140,000	7,410,000	262	142	64
ESS5-1350	1350	1,430,000	9,290,000	273	147	67
ESS5-1500	1500	1,870,000	12,140,000	286	155	70
ESS5-1600	1600	2,450,000	15,910,000	284	154	69
ESS5-1800	1800	3,170,000	20,570,000	315	170	77



ESS5-xxx

Dimensions (mm):



CBMG Series



Description

The fuses are excellent DC performance, they could be well designed for solar inverter system, ESS PCSS and similar DC application

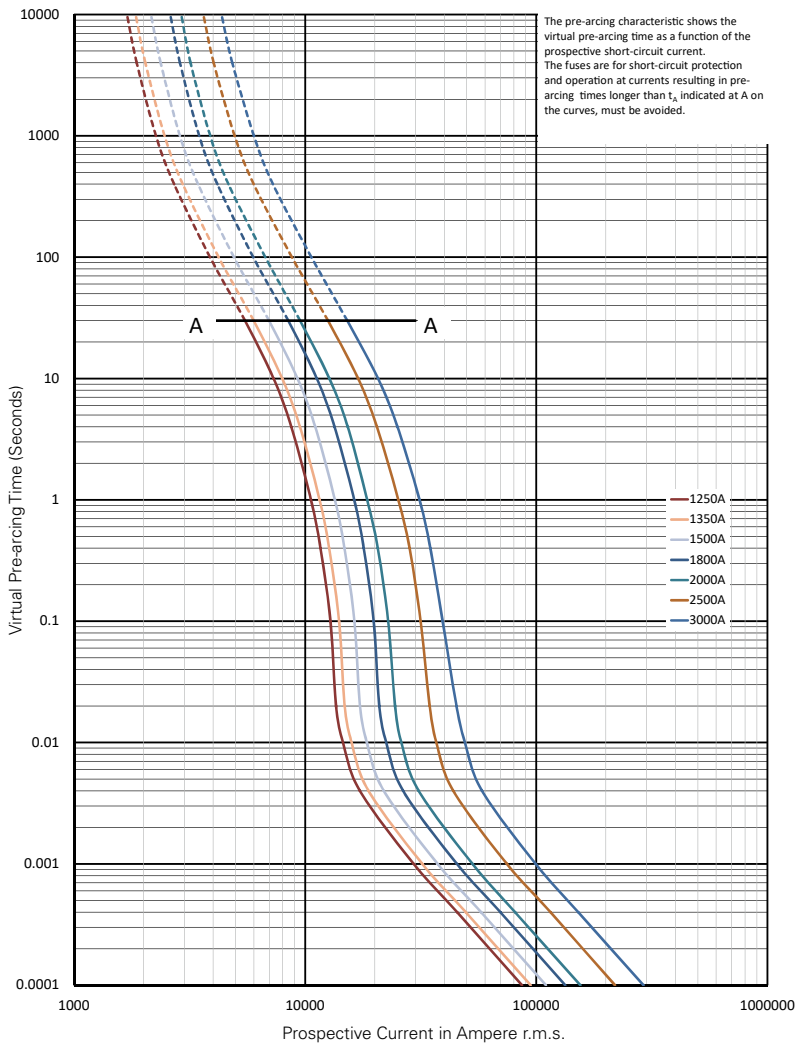
Typical applications

- Solar inverter system
- ESS converters

Standards / Agency information

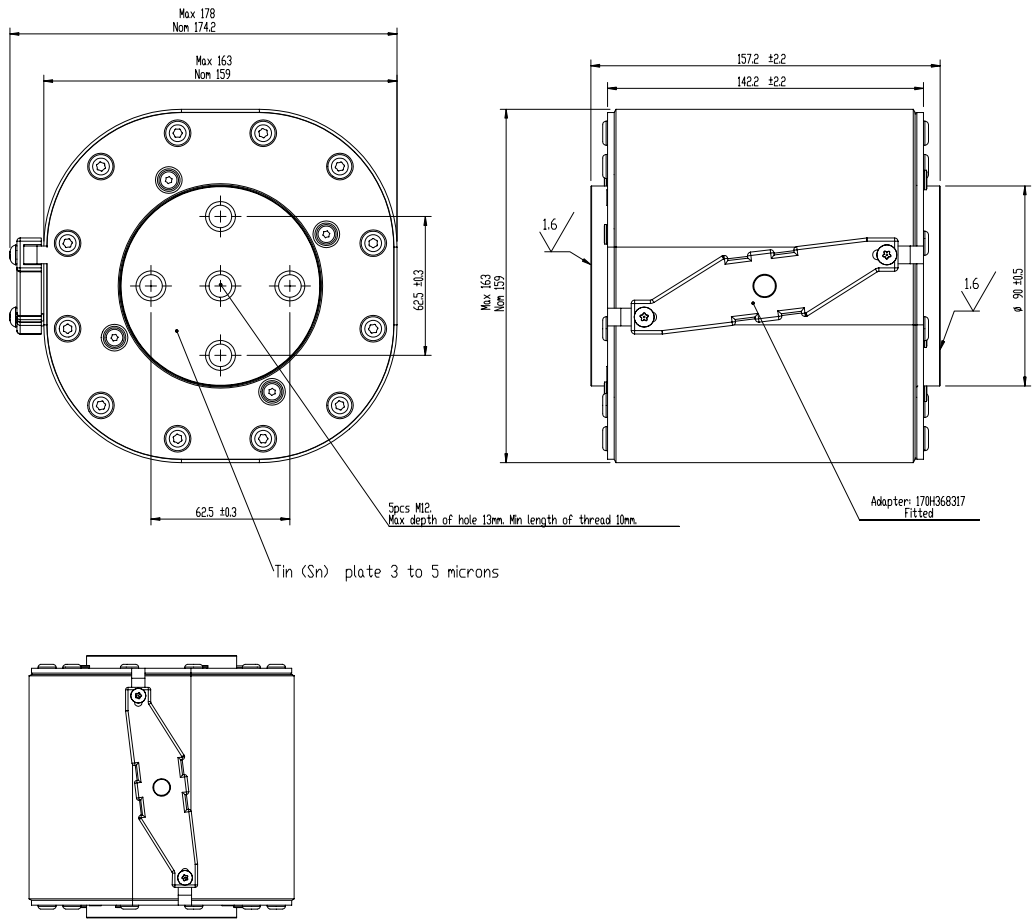
- UL248-13

Part Number	Rated Voltage V dc	Rated current RMS-value (A)	Pre-arcing Integral (from cold) (A²s)	Max. operating I²t at Max. operating voltage (A²s)	Losses at rated current (W)	Rated Breaking Capacity
CBMG-1250	1500	1250	695000	2400000	340	100KA(UL, L/R≤15ms) 250KA(Test, L/R≤4ms)
CBMG-1350	1500	1350	825000	2800000	365	
CBMG-1500	1500	1500	1100000	3650000	390	
CBMG-1800	1500	1800	1650000	5000000	460	
CBMG-2000	1500	2000	2300000	7000000	480	
CBMG-2500	1500	2500	4650000	14000000	530	
CBMG-3000	1500	3000	8100000	24300000	585	

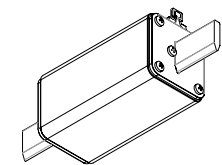


CBMG

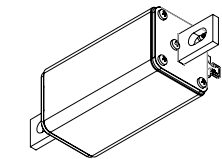
Dimensions (mm):



PV15M Series



PV15M-XXX



PV15M-XXX-H

Description

The battery storage fuses are specifically designed to protect and isolate battery strings and converters system at DC side.

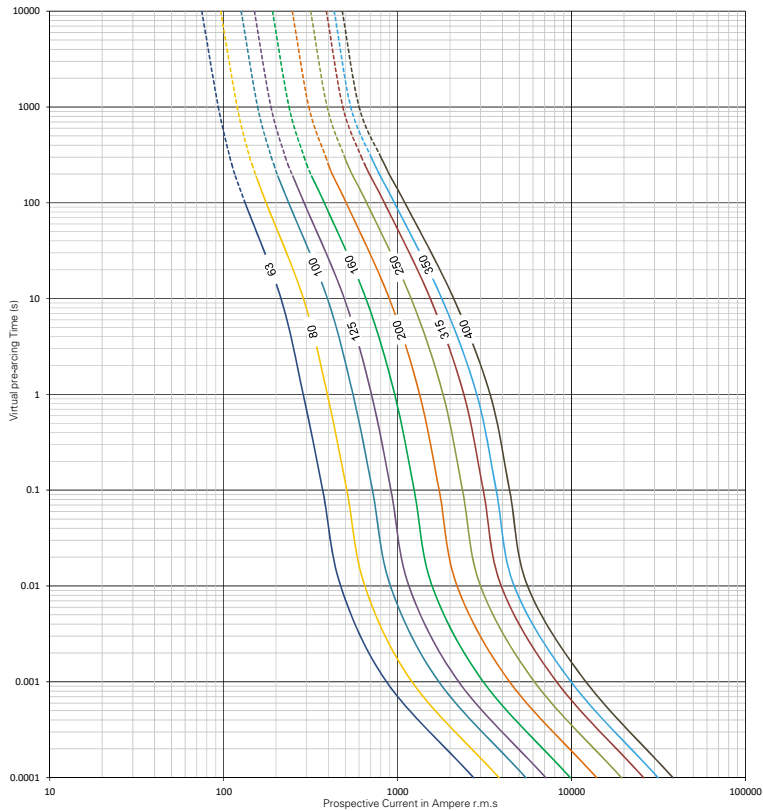
Standards / Agency information

- UL (PV15M-XXX) UL248-19
- TUV (PV15MT-XXX) IEC60269-6

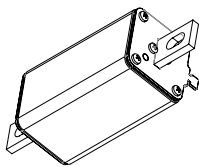
Feature

- These fuse links are capable of interrupting both low over currents and high short circuit currents.
- The fuses are excellent DC performance
- Typical applications
- PV strings and arrays
- Solar inverter system
- EV DC fast chargers and similar DC application

Material No.		Voltage Rating (V)	Current Rating (A)	Pre-arcing I ² _t (A ² s)	Total I ² _t (A ² s)	Power Loss at I _n (W)	Power Loss at 0.8xI _n (W)	Power Loss at 0.5xI _n (W)
Material No. for bladed terminal tags	Material No. for slotted terminal tags							
PV15M-63	PV15M-63-H	1500Vdc	63	700	2,000	27	15	7
PV15M-80	PV15M-80-H		80	1,500	4,000	31	17	8
PV15M-100	PV15M-100-H		100	3,000	8,000	35	19	9
PV15M-125	PV15M-125-H		125	5,000	14,000	43	24	11
PV15M-160	PV15M-160-H		160	9,700	28,000	53	29	13
PV15M-200	PV15M-200-H		200	19,400	58,000	59	33	15
PV15M-250	PV15M-250-H		250	37,400	112,000	68	38	17
PV15M-315	PV15M-315-H		315	67,300	202,000	83	46	21
PV15M-350	PV15M-350-H		350	98,600	296,000	86	47	22
PV15M-400	PV15M-400-H		400	146,100	438,200	95	52	24
Proven at 1500Vdc, 1~3ms time constant, IR=50kA								

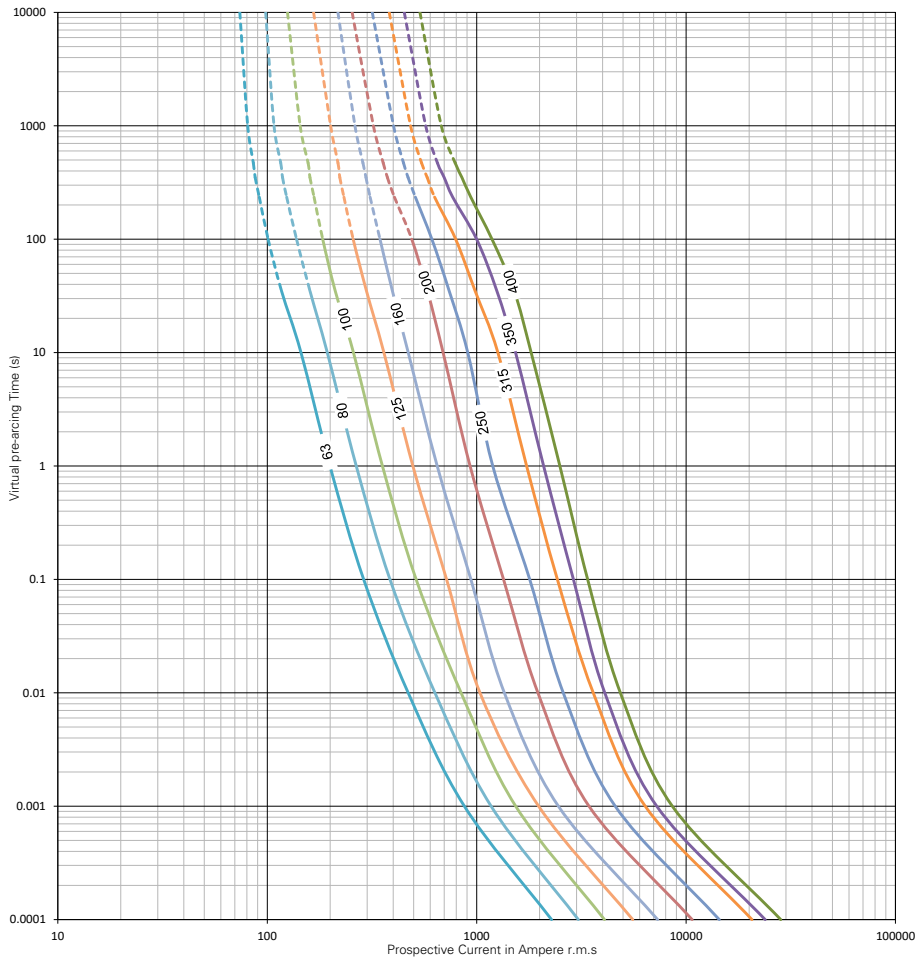


PV15M Series

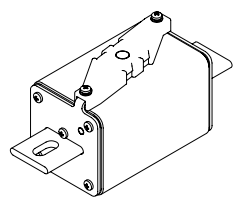


PV15MT-XXX-HX (63A-400A)

Material No.	Voltage Rating (V)	Current Rating (A)	Pre-arcing I ² t (A ² s)	Total I ² t (A ² s)	Power Loss at I _n (W)	Power Loss at 0.8xI _n (W)	Power Loss at 0.5xI _n (W)
PV15MT-63-HX	1500Vdc	63	500	1,800	35	20	9
PV15MT-80-HX		80	800	3,000	41	23	10
PV15MT-100-HX		100	1,500	6,000	51	28	13
PV15MT-125-HX		125	2,900	11,000	62	34	16
PV15MT-160-HX		160	5,200	19,000	72	40	18
PV15MT-200-HX		200	11,200	41,000	81	45	20
PV15MT-250-HX		250	20,300	74,000	89	49	22
PV15MT-315-HX		315	41,700	152,000	101	56	25
PV15MT-350-HX		350	55,900	201,000	108	59	27
PV15MT-400-HX		400	81,900	295,000	125	69	31
Proven at 1500Vdc, 1~3ms time constant, IR=50kA							

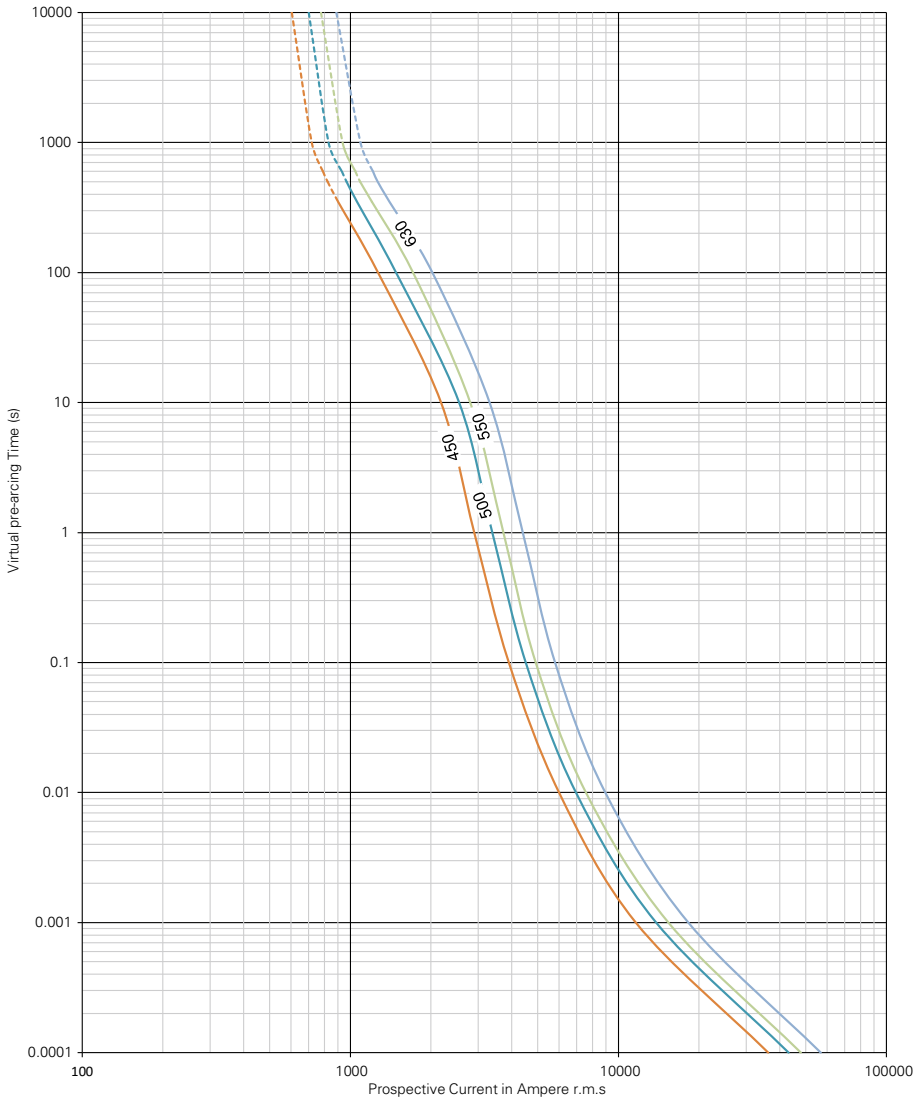


PV15M Series

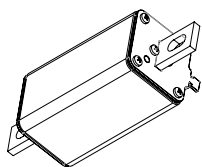


PV15MT-XXX-HX (450A-630A)

Material No.	Voltage Rating (V)	Current Rating (A)	Pre-arcing I²t (A²s)	Total I²t (A²s)	Power Loss at I _n (W)	Power Loss at 0.8xI _n (W)	Power Loss at 0.5xI _n (W)
PV15MT-450-HX	1500Vdc	450	94,700	284,000	137	76	34
PV15MT-500-HX		500	134,400	403,000	150	83	38
PV15MT-550-HX		550	165,900	498,000	170	93	42
PV15MT-630-HX		630	247,800	793,000	210	115	52
Proven at 1500Vdc, 1~3ms time constant, IR=150kA							



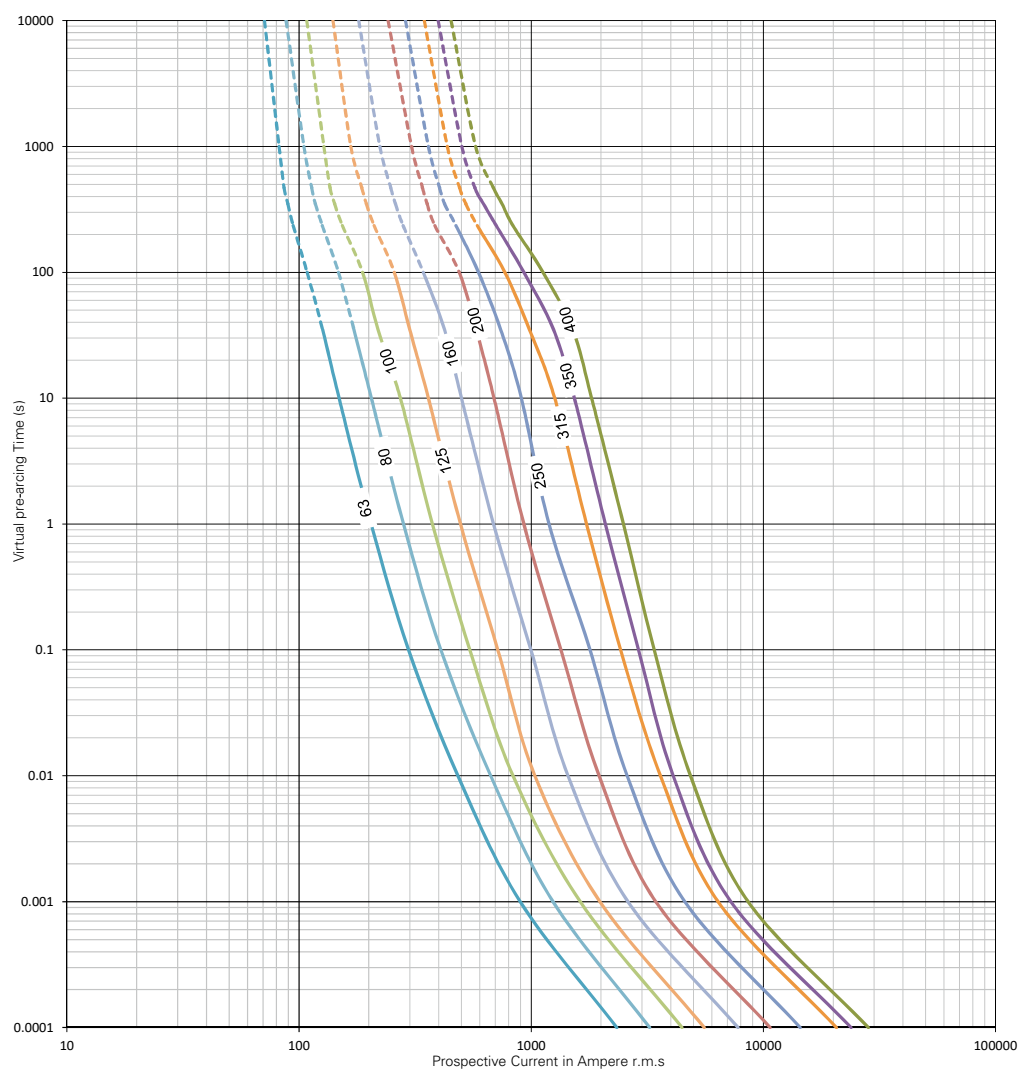
PV15M Series



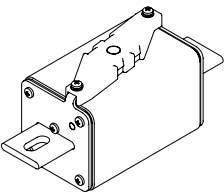
PV15M-XXX-HX(63A-400A)

Material No.	Voltage Rating (V)	Current Rating (A)	Pre-arcing I^2t (A ² s)	Total I^2t (A ² s)	Power Loss at I_n (W)	Power Loss at $0.8 \times I_n$ (W)	Power Loss at $0.5 \times I_n$ (W)
PV15M-63-HX	1500Vdc	63	500	1,800	35	20	9
PV15M-80-HX		80	900	4,000	41	23	10
PV15M-100-HX		100	1,700	6,000	51	28	13
PV15M-125-HX		125	2,900	11,000	62	34	16
PV15M-160-HX		160	5,900	22,000	72	40	18
PV15M-200-HX		200	11,200	41,000	81	45	20
PV15M-250-HX		250	20,300	74,000	89	49	22
PV15M-315-HX		315	41,700	152,000	101	56	25
PV15M-350-HX		350	55,900	201,000	108	59	27
PV15M-400-HX		400	81,900	295,000	125	69	31

Proven at 1500Vdc, 1~3ms time constant, IR=50kA

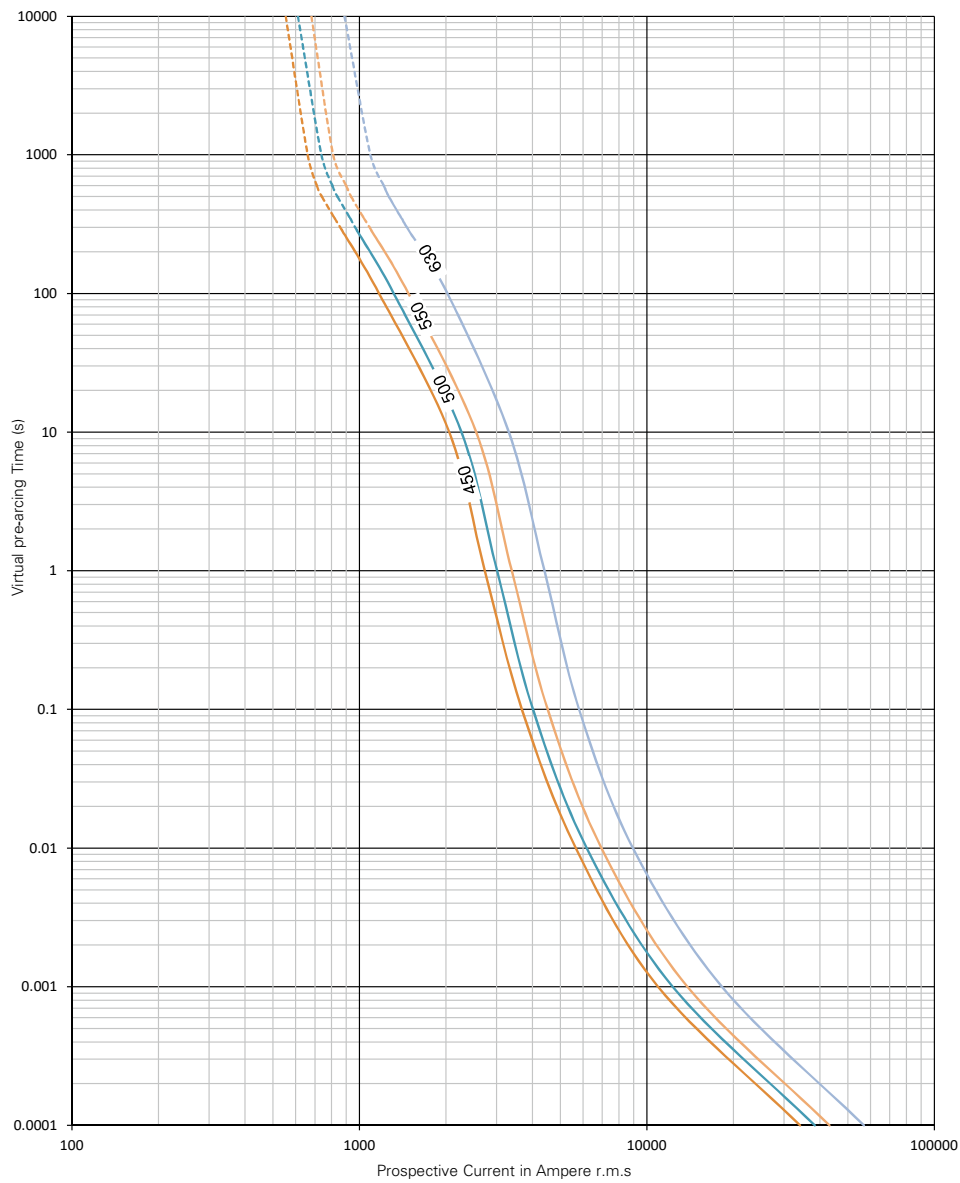


PV15M Series

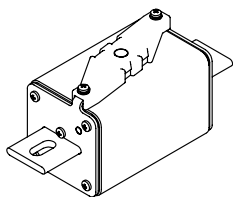


PV15M-XXX-HX(450A-630A)

Material No.	Voltage Rating (V)	Current Rating (A)	Pre-arcing I²t (A²s)	Total I²t (A²s)	Power Loss at I _n (W)	Power Loss at 0.8xI _n (W)	Power Loss at 0.5xI _n (W)
PV15M-450-HX	1500Vdc	450	83,900	252,000	156	86	39
PV15M-500-HX		500	106,200	319,000	180	99	45
PV15M-550-HX		550	134,400	403,000	204	112	51
PV15M-630-HX		630	247,800	793,000	211	116	53
PV15M-XXX-HX, EBSG15UX-XXX, EBPV15UX-XXX 1500Vdc, 100uH, IR=150kA							

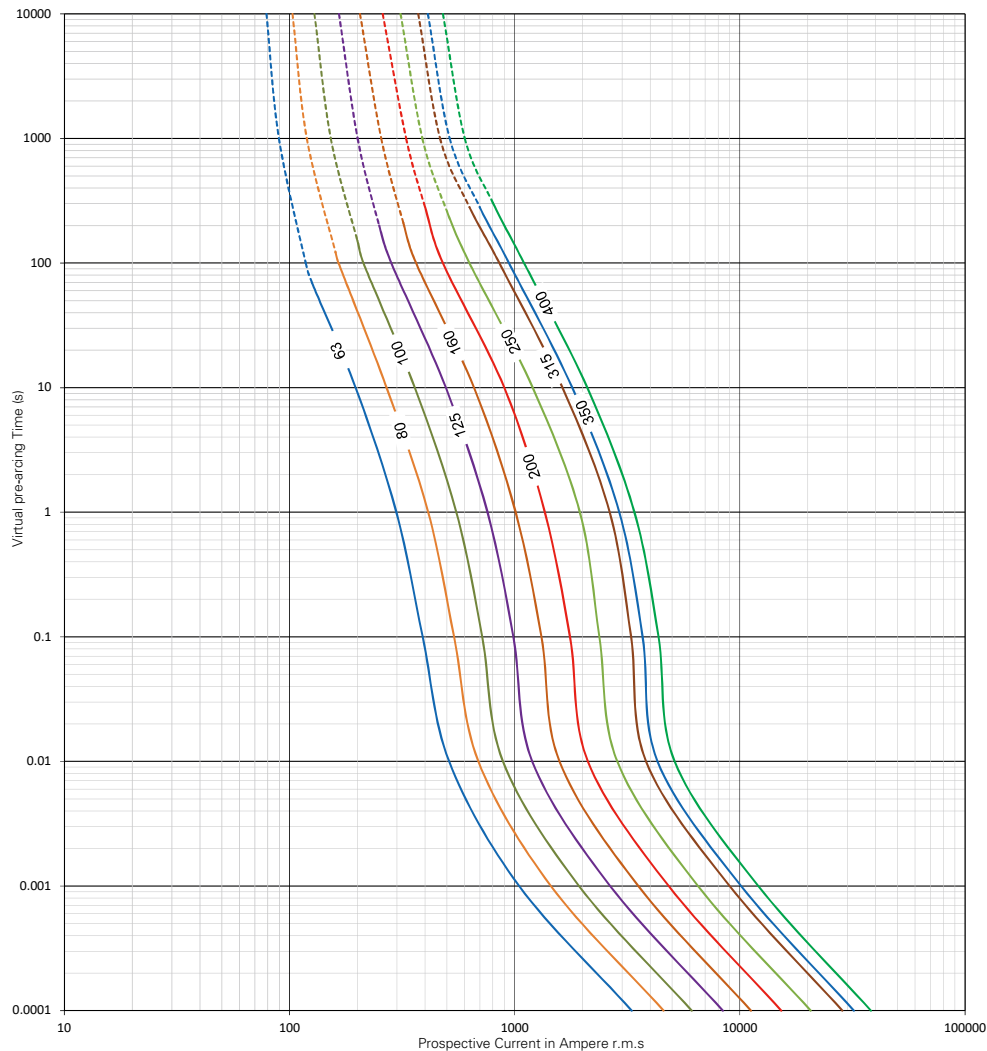


PV15M Series



PV15MT-XXX-H(63A-400A)

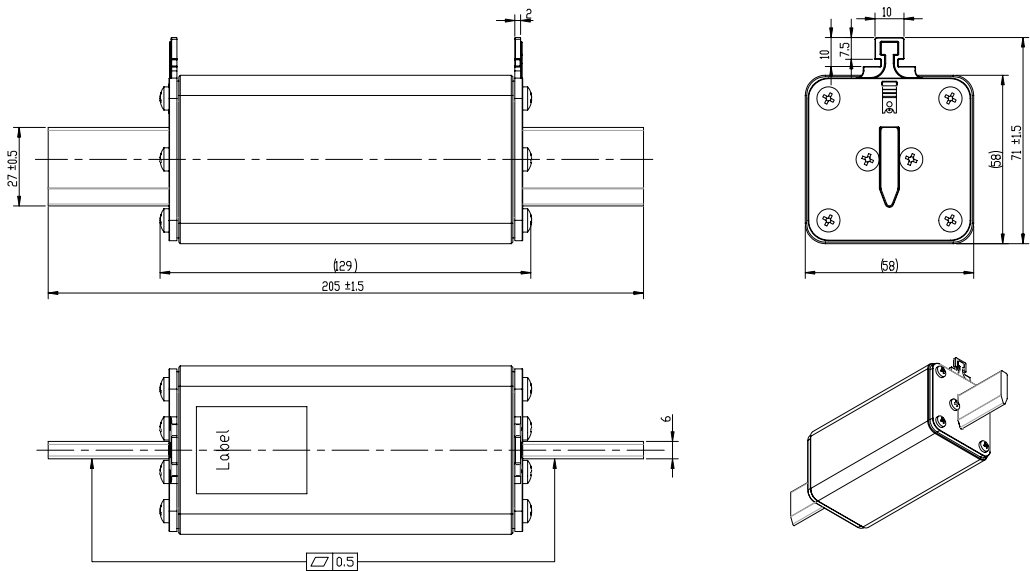
Material No.	Voltage Rating (V)	Current Rating (A)	Pre-arcing I ² t (A ² s)	Total I ² t (A ² s)	Power Loss at I _n (W)	Power Loss at 0.8xI _n (W)	Power Loss at 0.5xI _n (W)
PV15MT-63-H	1500Vdc	63	1,100	3,000	22	12	5
PV15MT-80-H		80	2,100	5,000	26	14	7
PV15MT-105-H		100	3,700	10,000	31	17	8
PV15MT-125-H		125	7,100	20,000	37	20	9
PV15MT-160-H		160	12,500	36,000	46	25	12
PV15MT-200-H		200	23,300	70,000	54	30	14
PV15MT-250-H		250	42,500	128,000	64	35	16
PV15MT-315-H		315	81,300	244,000	74	41	18
PV15MT-350-H		350	102,900	309,000	82	45	21
PV15MT-400-H		400	145,800	437,400	90	50	23
Proven at 1500Vdc, 1~3ms time constant, IR=50kA							



ESS Solution
1500VDC Series

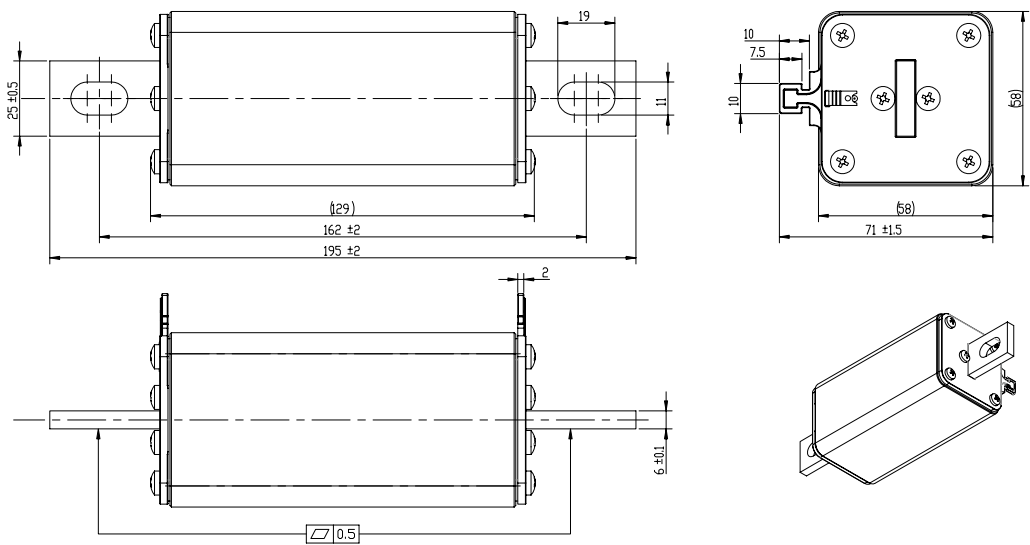
PV15M(T)-XXX: 63A-400A

Dimensions (mm):



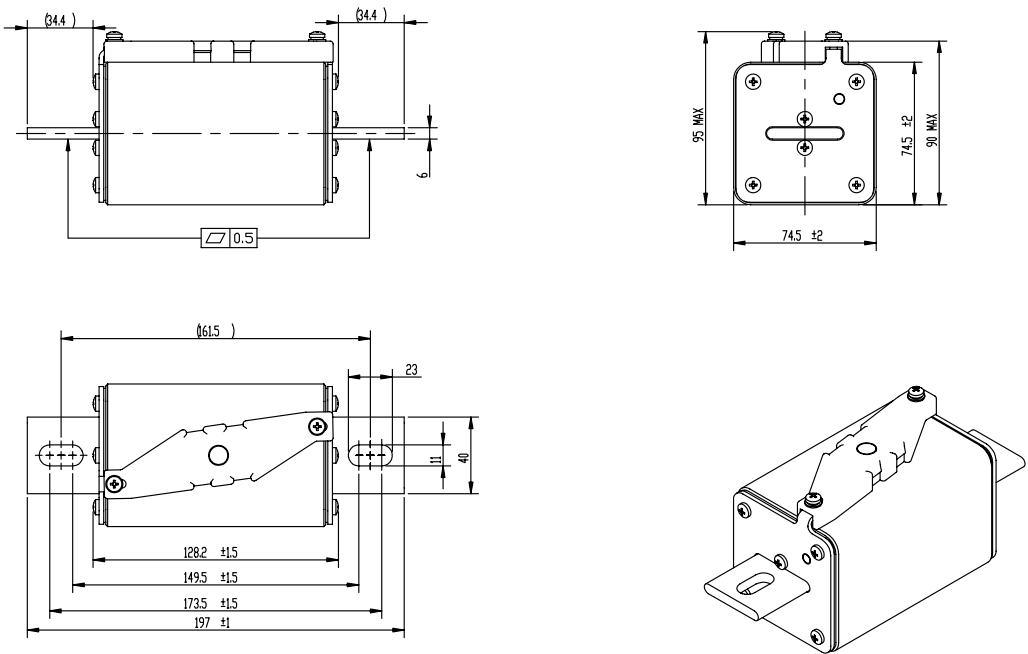
PV15M(T)-XXX-H: 63A-400A

Dimensions (mm):



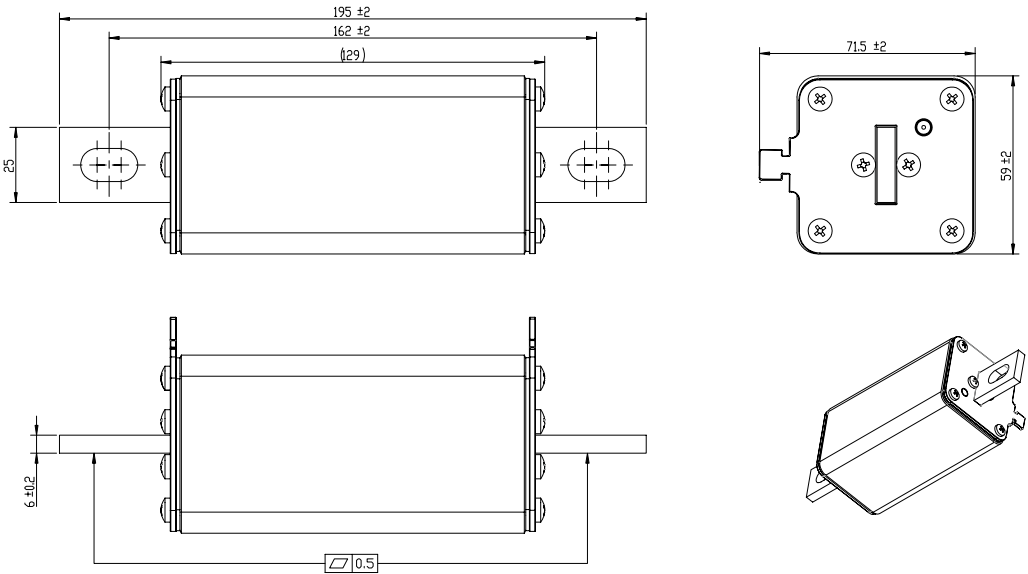
PV15M(T)-XXX(-HX): 450A-630A

Dimensions (mm):



PV15M(T)-XXX-HX: 63A-400A

Dimensions (mm):



690Vac DIN 43653 Size 1/2/3



Description

Square body DIN 43653 bolted tags high speed fuse

Standards / Agency information

- Designed and tested to IEC 60269 Part 4
- UL Recognized, JFHR2*, E125085
- CSA Class 53787, File 1422-30*
- CCC except where noted
- CE

Typical applications

- DC common bus
- DC drives
- Power converters/rectifiers
- Reduced voltage starters

DIN 43 653

690V - 700V (IEC/UL)/ 40 - 2000A

Specifications

Description: Square body DIN 43 653 stud mount high speed fuse links, for the protection of DC common bus, DC drives, power converters/rectifiers and reduced voltage starters.

Ratings:

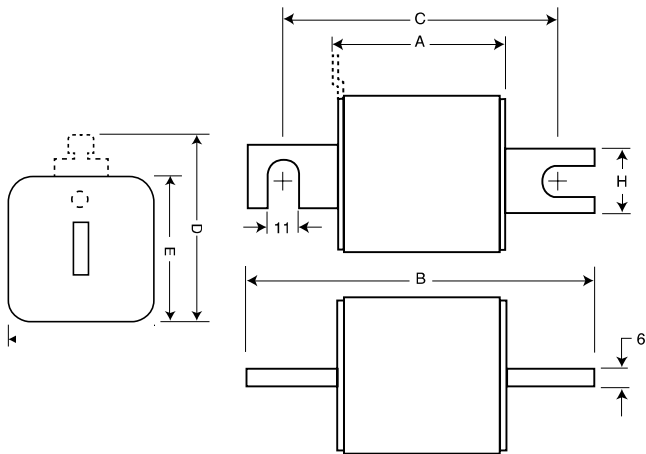
Volts: 690Vac (IEC) / 700Vac (UL)

Amps: 40-2000A

IR: 200kA RMS Sym.

Operating Class: aR

Dimensions (mm):



Type -/80, -TN/80, -/110, -TN/110.

Size	A	B	B**	C	C**	D***	E	H
1*	50	104	134	78	108	58	45	22
1	50	108	138	78	108	66	53	25
2	50	108	138	78	108	75	61	25
3	51	109	139	78	108	90	76	30

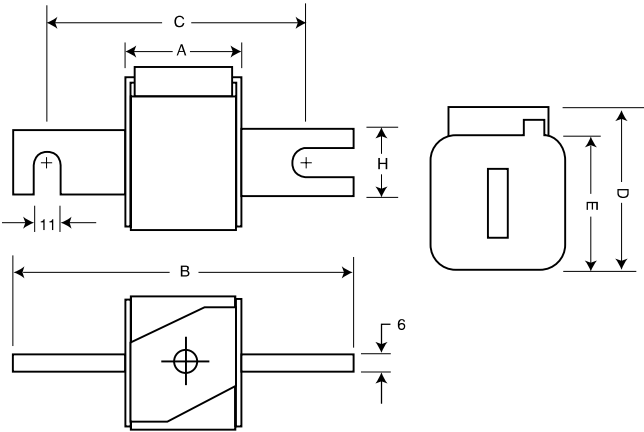
**Valid for fuses type -/110, -TN/110.

***Valid for Microswitch.

1mm = 0.0394" / 1"= 25.4mm

DIN 43 653
690V - 700V (IEC/UL)/ 40 - 2000A

Dimensions (mm):



Type -KN/80, -KN/110.

Size	A	B	B**	C	C**	D	E	H
1*	50	104	134	78	108	59	45	22
1	50	108	138	78	108	69	53	25
2	50	108	138	78	108	77	61	25
3	51	109	139	78	108	92	76	30

**Valid for fuse type -KN/110.
1mm = 0.0394"/1"= 25.4mm

ESS Solution

690Vac ~ 1250Vac Series

DIN 43 653

690V - 700V (IEC/UL)/ 40 - 2000A

Catalogue Numbers:

Catalogue Number						Fuse Size	Electrical Characteristics				
-80 Visual Indicator	-TN/80 Type T Indicator for Micro	-KN/80 Type K Indicator for Micro	-/110 Visual Indicator	-TN/110 Type T Indicator for Micro	-KN/110 Type K Indicator for Micro		Rated Current RMS-Amps	I ² t (A ² Sec)		Watt Loss	
								Pre-arc	Clearing at 660V		
170M3008	170M3058	170M3108	170M3158	170M3208	170M3258	1*	40	40	270	9	
170M3009	170M3059	170M3109	170M3159	170M3209	170M3259		50	77	515	11	
170M3010	170M3060	170M3110	170M3160	170M3210	170M3260		63	115	770	14	
170M3011	170M3061	170M3111	170M3161	170M3211	170M3261		80	185	1250	18	
170M3012	170M3062	170M3112	170M3162	170M3212	170M3262		100	360	2450	21	
170M3013	170M3063	170M3113	170M3163	170M3213	170M3263		125	550	3700	26	
170M3014	170M3064	170M3114	170M3164	170M3214	170M3264		160	1100	7500	30	
170M3015	170M3065	170M3115	170M3165	170M3215	170M3265		200	2200	15000	35	
170M3016	170M3066	170M3116	170M3166	170M3216	170M3266		250	4200	28500	40	
170M3017	170M3067	170M3117	170M3167	170M3217	170M3267		315	7000	46500	50	
170M3018	170M3068	170M3118	170M3168	170M3218	170M3268		350	10000	68500	55	
170M3019	170M3069	170M3119	170M3169	170M3219	170M3269		400	15000	105000	60	
170M3020	170M3070	170M3120	170M3170	170M3220	170M3270		450	21000	140000	65	
170M3021	170M3071	170M3121	170M3171	170M3221	170M3271		500	27000	180000	70	
170M3022	170M3072	170M3122	170M3172	170M3222	170M3272		550	34000	230000	75	
170M3023	170M3073	170M3123	170M3173	170M3223	170M3273		630	48500	325000	80	
170M4008	170M4058	170M4108	170M4158	170M4208	170M4258	1	200	1650	11500	45	
170M4009	170M4059	170M4109	170M4159	170M4209	170M4259		250	3100	21000	55	
170M4010	170M4060	170M4110	170M4160	170M4210	170M4260		315	6200	42000	58	
170M4011	170M4061	170M4111	170M4161	170M4211	170M4261		350	8500	59000	60	
170M4012	170M4062	170M4112	170M4162	170M4212	170M4262		400	13500	91500	65	
170M4013	170M4063	170M4113	170M4163	170M4213	170M4263		450	17000	120000	70	
170M4014	170M4064	170M4114	170M4164	170M4214	170M4264		500	25000	170000	72	
170M4015	170M4065	170M4115	170M4165	170M4215	170M4265		550	34000	230000	75	
170M4016	170M4066	170M4116	170M4166	170M4216	170M4266		630	52000	350000	80	
170M4017	170M4067	170M4117	170M4167	170M4217	170M4267		700	69500	465000	85	
170M4018	170M4068	170M4118	170M4168	170M4218	170M4268		800	105000	725000	95	
170M4019	170M4069	170M4119	170M4169	170M4219	170M4269		††900	155000	††850000	100	
170M5008	170M5058	170M5108	170M5158	170M5208	170M5258	2	400	11000	74000	65	
170M5009	170M5059	170M5109	170M5159	170M5209	170M5259		450	15500	105000	70	
170M5010	170M5060	170M5110	170M5160	170M5210	170M5260		500	21500	145000	75	
170M5011	170M5061	170M5111	170M5161	170M5211	170M5261		550	28000	190000	80	
170M5012	170M5062	170M5112	170M5162	170M5212	170M5262		630	41000	275000	90	
170M5013	170M5063	170M5113	170M5163	170M5213	170M5263		700	60500	405000	95	
170M5014	170M5064	170M5114	170M5164	170M5214	170M5264		800	86000	575000	105	
170M5015	170M5065	170M5115	170M5165	170M5215	170M5265		900	125000	840000	110	
170M5016	170M5066	170M5116	170M5166	170M5216	170M5266		1000	180000	1250000	115	
170M5017	170M5067	170M5117	170M5167	170M5217	170M5267		†1100	245000	1600000	120	
170M5018	170M5068	170M5118	170M5168	170M5218	170M5268		†1250	365000	2400000	130	
170M6008	170M6058	170M6108	170M6158	170M6208	170M6258	3	500	14000	95000	95	
170M6009	170M6059	170M6109	170M6159	170M6209	170M6259		550	19500	135000	100	
170M6010	170M6060	170M6110	170M6160	170M6210	170M6260		630	31000	210000	105	
170M6011	170M6061	170M6111	170M6161	170M6211	170M6261		700	44500	300000	110	
170M6012	170M6062	170M6112	170M6162	170M6212	170M6262		800	69500	465000	115	
170M6013	170M6063	170M6113	170M6163	170M6213	170M6263		900	100000	670000	120	
170M6014	170M6064	170M6114	170M6164	170M6214	170M6264		1000	140000	945000	125	
170M6015	170M6065	170M6115	170M6165	170M6215	170M6265		1100	190000	1300000	130	
170M6016	170M6066	170M6116	170M6166	170M6216	170M6266		1250	290000	1950000	140	
170M6017	170M6067	170M6117	170M6167	170M6217	170M6267		1400	370000	2450000	155	
170M6018	170M6068	170M6118	170M6168	170M6218	170M6268		1500	460000	3100000	160	
170M6019	170M6069	170M6119	170M6169	170M6219	170M6269		1600	580000	3900000	160	
170M6020	170M6070	170M6120	170M6170	170M6220	170M6270		†1800	880000	†5250000	165	
170M6021	170M6071	170M6121	170M6171	170M6221	170M6271		††2000	1150000	††6350000	175	

† Rated voltage (IEC) 660V.

††Rated voltage (IEC) 550V.

Data Sheets: 170K6314 (Size 1*), 170K6316 (Size 1), 170K6318 (Size 2), 170K6320 (Size 3)

690Vac flush end size4



Description

Square body, flush-end contact, high speed fuse

Standards / Agency information

- Designed and tested to IEC 60269 Part 4
- UL Recognized, JFHR2, E125085
- CE

Typical applications

- power rectifiers

Flush End Contact - Size 4

690V : 1000- 4000A

Specifications

Description: High speed square body fuse links, for the protection of the power rectifier section of the equipment.

Ratings:

Volts: 690Vac

Amps: 1000-4000A

IR: 200kA RMS Sym.

Operating Class: aR

Catalogue Numbers:

Fuse Size	Catalogue Number				Electrical Characteristics				
	B/65 Visual Indicator	-BKN/65 Type K Indicator	-G/65 Visual Indicator	-GKN/65 Type K Indicator	Rated Voltage (V)	Rated Current RMS-Amp	I ² t (A ² Sec)		Watt Loss (W)
							Pre-arc	Clearing at 660V	
4	170M7058	170M7078	170M7098	170M7118	690	1000	76000	505000	175
	170M7059	170M7079	170M7099	170M7119		1250	145000	965000	195
	170M7060	170M7080	170M7100	170M7120		1400	205000	1400000	205
	170M7061	170M7081	170M7101	170M7121		1600	305000	2050000	220
	170M7062	170M7082	170M7102	170M7122		2000	600000	3950000	245
	170M7063	170M7083	170M7103	170M7123		2500	1200000	7800000	275
	170M7064	170M7084	170M7104	170M7124		3000	2000000	13500000	305
	170M7065	170M7085	170M7105	170M7125		3500	3250000	22000000	325
	170M7066	170M7086	170M7106	170M7126	600	4000	4700000	28000000+	355

+ Clearing at 600V

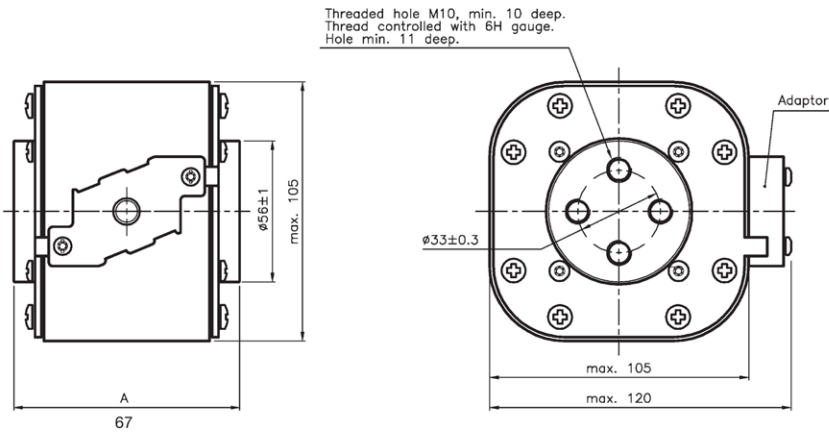
Data Sheet: 170K6328

ESS Solution

690Vac ~ 1250Vac Series

Type -BKN/65-GKN/65

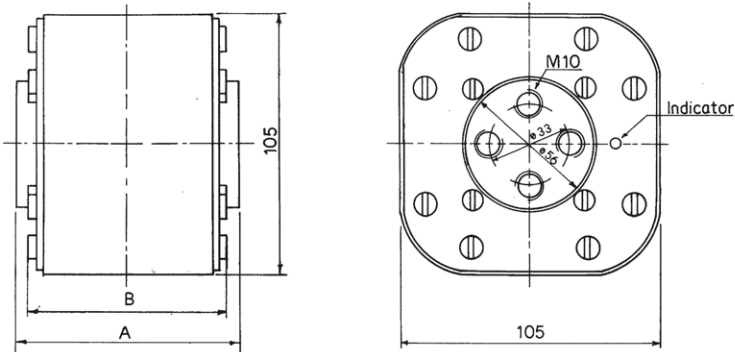
Dimensions (mm):



	PCD	Thread
GKN/65	$\phi 38.1$	UNC 1/2" - 13
BKN/65	$\phi 33$	M-10

Type -B/65 , -G/65

Dimensions (mm):



	PCD	Thread
G/65	$\phi 38,1$	UNC 1/2" - 13
B/65	$\phi 33$	M-10

1000Vac DIN 43653 Size 1/2/3



Description

Square body DIN 43653 bolted tags high speed fuse

Standards / Agency information

- Designed and tested to IEC 60269 Part 4
- UL Recognized, JFHR2, E125085 (only sizes 2 and 3)
- CCC (only size 3, 315-1100 A)
- CE

Typical applications

- DC common bus
- DC drives
- Power converters/rectifiers
- Reduced voltage starters

DIN 43 653

1000V (IEC) / 50-1400A

Specifications

Description: Square body DIN 43 653 stud mount high speed fuse links, for the protection of DC common bus, DC drives, power converters/rectifiers and reduced voltage starters.

Ratings:

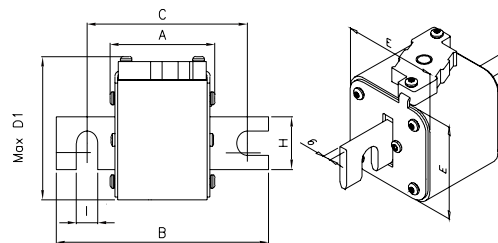
Volts: 1000Vac

Amps: 50-1400A

IR: 125kA RMS Sym.

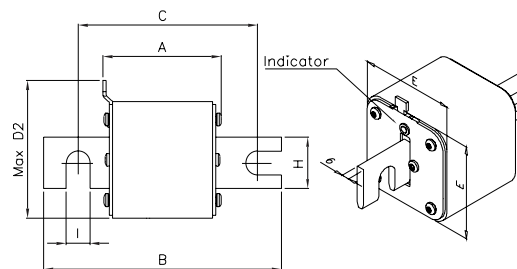
Operating Class: aR

Dimensions (mm):



Type-KN/110

Size	A	B	C	Max D1	E	G	H	I
1*KN/110	80	138	108	61	43	6	22	11
1KN/110	80	138	108	69	51	6	25	11
2KN/110	80	138	108	77	59	6	25	11
3KN/110	81	138	108	92	74	6	30	11



Type-TN/110

Size	A	B	C	Max D1	E	G	H	I
1*TN/110	80	138	108	61	43	6	22	11
1TN/110	80	138	108	69	51	6	25	11
2TN/110	80	138	108	75	59	6	25	11
3TN/110	81	139	108	90	74	6	30	11

1mm = 0.0394" / 1" = 25.4mm

ESS Solution

690Vac ~ 1250Vac Series

Catalogue Numbers:

Catalogue Number		Fuse Size	Electrical Characteristics				
-KN/110 Type K Indicator for Micro	-TN/110 Type T Indicator for Micro		Rated Voltage	Rated Current RMS Amps	I ² t (A ² Sec)		Watt Loss
					Pre-arc	Clearing at Rated Voltage	
170M3965	170M3981	1*	1000	50	135	815	20
170M3966	170M3982		1000	63	215	1300	25
170M3967	170M3983		1000	80	460	2750	30
170M3968	170M3984		1000	100	860	5100	35
170M3969	170M3985		1000	125	1450	8600	40
170M3970	170M3986		1000	160	2850	17500	45
170M3971	170M3987		1000	200	4950	29500	48
170M3972	170M3988		1000	250	9550	57000	50
170M3973	170M3989		1000	315	21500	130000	60
170M3974	170M3990		1000	350	29000	175000	65
170M3975	170M3991		1000	400	42000	250000	70
170M4965	170M4980	1	1000	160	2200	13500	40
170M4966	170M4981		1000	200	4150	24500	45
170M4967	170M4982		1000	250	7750	46000	52
170M4968	170M4983		1000	315	16500	98500	60
170M4969	170M4984		1000	350	21500	130000	65
170M4970	170M4985		1000	400	31000	185000	70
170M4971	170M4986		1000	450	44500	265000	80
170M4972	170M4987		1000	500	63000	375000	85
170M4973	170M4988		1000	550	84500	500000	90
170M4974	170M4989		1000	630	125000	755000	98
170M5966	170M5981	2	1000	250	6750	40000	65
170M5967	170M5982		1000	315	13500	81500	75
170M5968	170M5983		1000	350	16500	99000	80
170M5969	170M5984		1000	400	26000	155000	85
170M5970	170M5985		1000	450	35500	210000	90
170M5971	170M5986		1000	500	49500	295000	95
170M5972	170M5987		1000	550	66000	390000	100
170M5973	170M5988		1000	630	93500	555000	110
170M5974	170M5989		1000	700	130000	770000	115
170M5975	170M5990		1000	800	195000	1200000	125
170M8614	170M8629	3	1000	315	9200	54500	90
170M8615	170M8630		1000	350	13000	77500	95
170M8616	170M8631		1000	400	19000	115000	105
170M8617	170M8632		1000	450	27000	160000	107
170M8618	170M8633		1000	500	37500	225000	110
170M8619	170M8634		1000	550	52000	310000	115
170M8620	170M8635		1000	630	82500	490000	120
170M8621	170M8636		1000	700	115000	700000	125
170M8622	170M8637		1000	800	170000	1050000	135
170M8623	170M8638		1000	900	250000	1500000	145
170M8624	170M8639		1000	1000	340000	2050000	150
170M8625	170M8640		1000	1100	460000	2750000	155
170M8626	170M8641		1000	1250	575000	3400000	175
170M8627	170M8642		900	1400	795000	4200000	185

. Watts loss provided at rated current.

Data Sheets: 170K8564 (Size 1*), 170K8566 (Size 1), 170K8568 (Size 2), 170K8570 (Size 3)

1000Vac flush end size4



Description

Square body, flush-end contact, high speed fuse

Standards / Agency information

- Designed and tested to IEC 60269 Part 4
- UL Recognized, JFHR2, E125085
- CE

Typical applications

- power rectifiers

Flush End Contact - Size 4

1000V (IEC) : 1000 - 3200A

Specifications

Description: High speed square body fuse links, for the protection of the power rectifier section of the equipment.

Ratings:

Volts: 1000Vac

Amps: 1000-3200A

IR: 125kA RMS Sym.

Operating Class: aR

Catalogue Numbers:

Fuse Size	Catalogue Number		Electrical Characteristics				
	-BKN/95 Type K Indicator	-SBKN/90 Type K Indicator	Rated Voltage (V)	Rated Current RMS-Amp	I ² t (A ² Sec)		Watt Loss (W)
					Pre-arc	Clearing at 1000V	
4		170M7542	1000	1000	180000	1100000	195
		170M7031		1100	250000	1500000	200
	170M7636	170M7548		1500	600000	3600000	250
	170M7639	170M7034		1700	850000	5000000	260
	170M7661	170M7053		1800	1000000	5950000	265
	170M7963	170M7544		2000	1450000	8600000	270
	170M7090	170M7035		2200	2000000	12000000	280
	170M7640	170M7036		2500	3000000	18000000	295
	170M7658	170M7037		2700	3700000	22000000	310
	170M7962	170M7156		3000	4700000	28000000	380

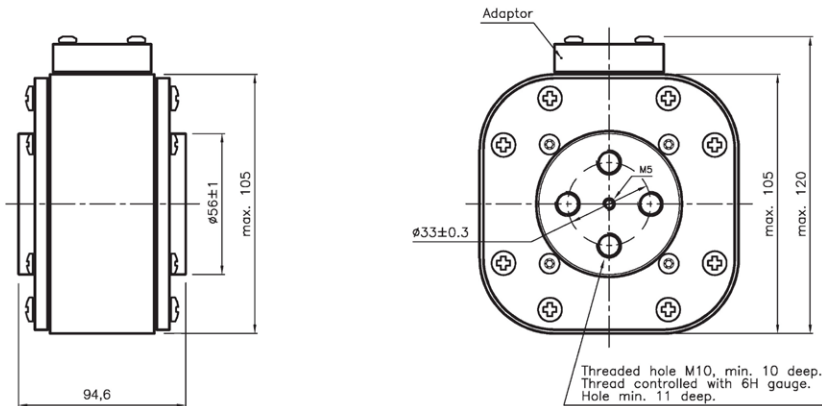
ESS Solution

690Vac ~ 1250Vac Series

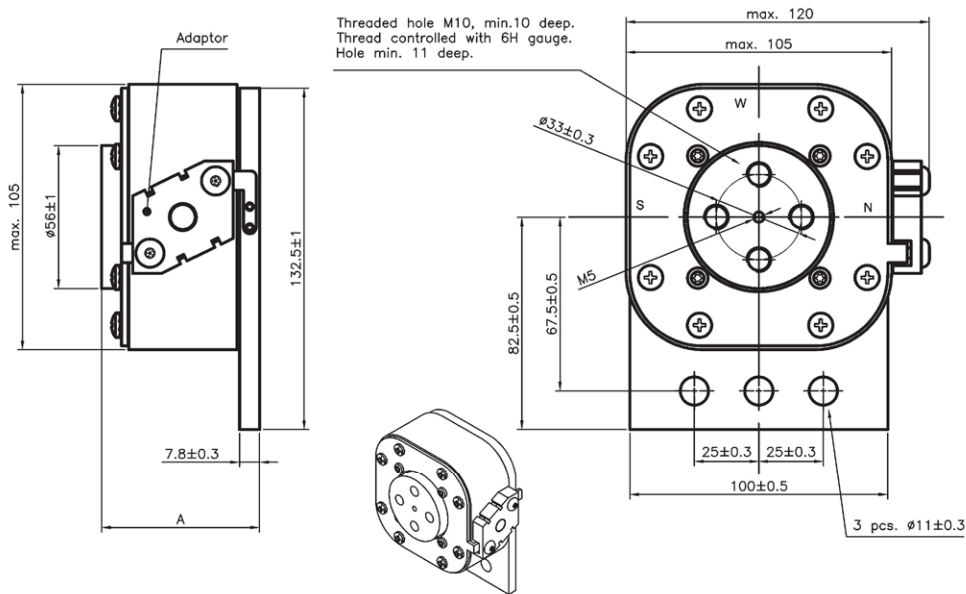
Flush End Contact - Size 4
1000V (IEC) : 1000 - 3200A

Dimensions (mm):

Type 4BKN/95



Type 4SBKN/95



1250Vac DIN 43653 Size 1/2/3



Description

Square body DIN 43653 bolted tags high speed fuse

Standards / Agency information

- Designed and tested to IEC 60269 Part 4
- UL Recognized, JFHR2*, E125085
- CSA Class 53787, File 1422-30*
- CE

Typical applications

- DC common bus
- DC drives
- Power converters/rectifiers
- Reduced voltage starters

DIN 43 653

1250V - 1300V (IEC/UL) / 50-1400A

Specifications

Description: Square body DIN 43 653 stud mount high speed fuse links, for the protection of DC common bus, DC drives, power converters/rectifiers and reduced voltage starters.

Ratings:

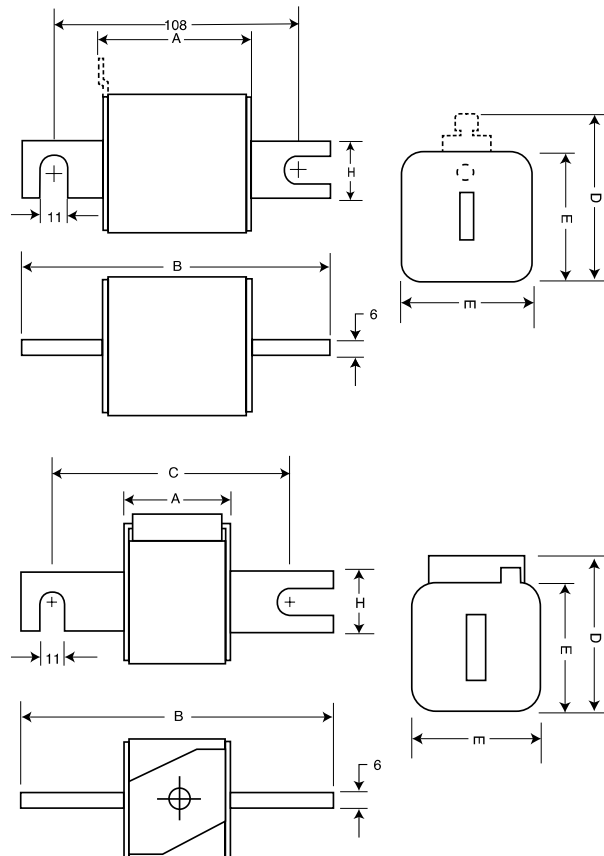
Volts: 1250Vac (IEC) / 1300Vac (UL)

Amps: 50-1400A

IR:100kA RMS Sym.

Operating Class: aR

Dimensions (mm):



Type -/110, -TN/110

Size	A	B	D**	E	H
1*	80	138	58	45	20
1	80	138	66	53	25
2	80	138	75	61	25
3	81	139	90	76	30

**clip on Microswitch.

1mm = 0.0394" / 1" = 25.4mm

Type -KN/110

Size	A	B	D	E	H
1*	80	138	60	45	20
1	80	138	69	53	25
2	80	138	77	61	25
3	81	139	92	76	30

1mm = 0.0394" / 1" = 25.4mm

ESS Solution

690Vac ~ 1250Vac Series

DIN 43 653

1250V - 1300V (IEC/UL) / 50-1400A

Catalogue Numbers:

Catalogue Number			Fuse Size	Electrical Characteristics				
-110 Visual Indicator	-TN/110 Type T Indicator for Micro	-KN/110 Type K Indicator for Micro		Rated Current RMS-Amps	I²t (A² Sec)			Watt Loss
					Pre-arc	Clearing at 1000V	Clearing at 1250V	
170M3138	170M3188	170M3238	1*	50	135	815	1100	15
170M3139	170M3189	170M3239		63	215	1300	1750	20
170M3140	170M3190	170M3240		80	420	2500	3350	25
170M3141	170M3191	170M3241		100	750	4450	5950	30
170M3142	170M3192	170M3242		125	1450	9000	11500	35
170M3143	170M3193	170M3243		160	2600	16000	21000	40
170M3144	170M3194	170M3244		200	5150	31000	41000	45
170M3145	170M3195	170M3245		250	9200	54500	73000	55
170M3146	170M3196	170M3246		315	18500	115000	150000	60
170M3147	170M3197	170M3247		350	27000	165000	220000	65
170M3148	170M3198	170M3248		400	53000	265000	335000	70
170M4138	170M4188	170M4238	1	160	1900	11500	15500	45
170M4139	170M4189	170M4239		200	3800	22500	30000	50
170M4140	170M4190	170M4240		250	7750	46000	61500	60
170M4141	170M4191	170M4241		315	15000	90000	120000	65
170M4142	170M4192	170M4242		350	20000	125000	165000	70
170M4143	170M4193	170M4243		400	29500	175000	235000	75
170M4144	170M4194	170M4244		450	42000	250000	335000	80
170M4145	170M4195	170M4245		500	69500	340000	435000	85
170M4146	170M4196	170M4246		550	95000	465000	590000	95
170M4147	170M4197	170M4247		†630	130000	660000		100
170M5138	170M5188	170M5238		2	250	6500	38500	51500
170M5139	170M5189	170M5239	280		9350	55500	74500	70
170M5140	170M5190	170M5240	315		13000	77500	105000	75
170M5141	170M5191	170M5241	350		16500	97500	135000	80
170M5142	170M5192	170M5242	400		23000	140000	180000	85
170M5143	170M5193	170M5243	450		34000	205000	270000	90
170M5144	170M5194	170M5244	500		48000	285000	380000	95
170M5145	170M5195	170M5245	550		62000	370000	495000	100
170M5146	170M5196	170M5246	630		115000	575000	730000	110
170M5147	170M5197	170M5247	700		160000	795000	1050000	115
170M5148	170M5198	170M5248	800		245000	1200000	1550000	120
170M5149	170M5199	170M5249	†900		360000	1750000		125
170M5150	170M5200	1 70M5250	†1000		480000	2350000		135
170M6138	170M6188	170M6238	3	315	9500	58000	77500	85
170M6139	170M6189	170M6239		350	13500	81500	110000	90
170M6140	170M6190	170M6240		400	19500	120000	160000	95
170M6141	170M6191	170M6241		450	31000	185000	245000	100
170M6142	170M6192	170M6242		500	39000	235000	310000	105
170M6143	170M6193	170M6243		550	55000	325000	435000	110
170M6144	170M6194	170M6244		630	83500	495000	665000	115
170M6145	170M6195	170M6245		700	115000	705000	940000	120
170M6146	170M6196	170M6246		800	205000	995000	1300000	125
170M6147	170M6197	170M6247		900	305000	1500000	1900000	130
170M6148	170M6198	170M6248		1000	450000	2150000	2750000	135
170M6149	170M6199	170M6249		1100	575000	2800000	3600000	140
170M6150	170M6200	170M6250		†1250	810000	3950000		145
170M6151	170M6201	170M6251		†1400	1250000	6000000		150

†Rated voltage (IEC) 1100V.

·Watts loss provided at rated current.

Data Sheets: 170K6630 (Size 1"). 170K6632 (Size 1), 170K664 (Size 2), 170K6636 (Size 3)

1250Vac flush end size4



Description

Square body, flush-end contact, high speed fuse

Standards / Agency information

- Designed and tested to IEC 60269 Part 4
- UL Recognized, JFHR2, E125085
- CE

Typical applications

- power rectifiers

Flush End Contact - Size 4

1250V (IEC) / 1400 - 2500A

Specifications

Description: High speed square body fuse links, for the protection of the power rectifier section of the equipment.

Ratings:

Volts: 1250Vac .

Amps: 1400-2500A

IR: 125kA RMS Sym.

Operating Class: aR

Catalogue Numbers:

Fuse Size	Catalogue Number		Electrical Characteristics				
	-BKN/105 Type K Indicator	-SBKN/105 Type K Indicator	Rated Voltage (V)	Rated Current RMS-Amp	I ² t (A ² Sec)		Watt Loss (W)
					Pre-arc	Clearing at 1250V	
4	170M7217	170M7512	1250	1400	800000	5000000	195
	170M7597	170M7510		1500	1000000	6200000	200
	170M7676	170M7511		1700	1400000	8700000	220
	170M7532	170M7976		1800	1700000	11000000	225
	170M7633	170M7513		2000	2300000	14500000	235
	170M7592	170M7546		2200	3100000	19500000	245
	170M7107	170M7516		2400	4000000	25000000	255
	170M7595	170M7978		2500	4500000	28000000	260

Data Sheet: 170K6640, 170K6642

ESS Solution

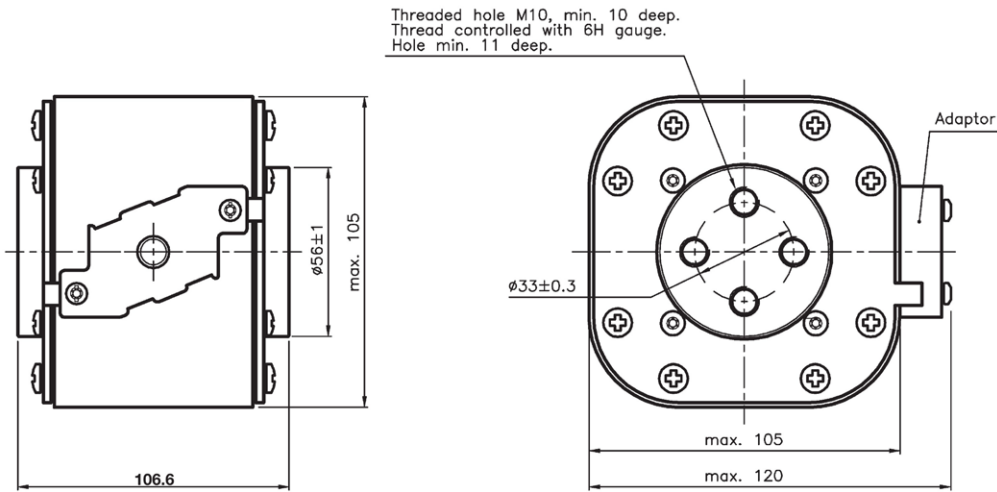
690Vac ~ 1250Vac Series

Flush End Contact - Size 4

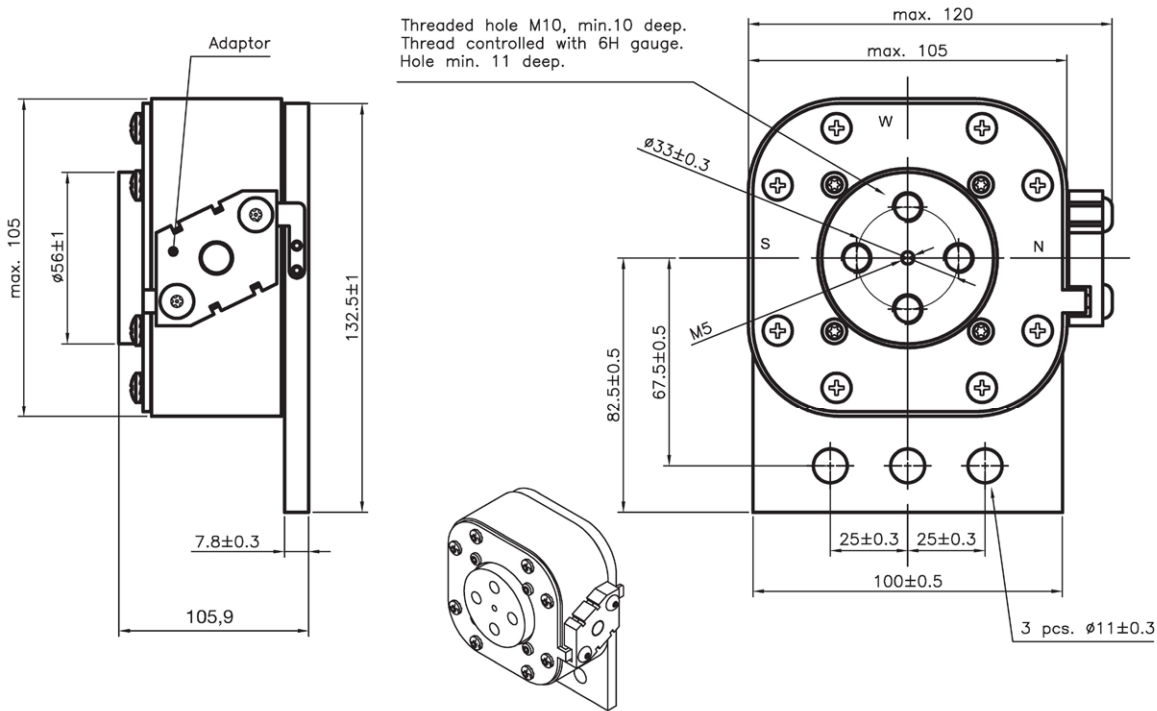
1250V (IEC) / 1400 - 2500A

Dimensions (mm):

Type 4BKN/105



Type 4SBKN/105



[illegible]

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Eaton entered the Asia-Pacific market during the 1970s, and has grown significantly since then. Eaton moved its Asia-Pacific headquarters from Hong Kong to Shanghai in 2004. Today, Eaton has nearly 17,000 employees and 34 manufacturing facilities in the Asia-Pacific region.

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