

## British BS 88 Fuses



### Introduction

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#### British BS 88 Fuse Ranges

| Amps  | Vac | Vdc |
|-------|-----|-----|
| 6-900 | 240 | 150 |
| 6-710 | 690 | 500 |

### General Information

Designed and tested to:

- BS 88: Part 4
- IEC 269: Part 4
- UL Recognized

Cooper Bussmann offers the industry's widest range of British style semiconductor fuses and accessories.

Cooper Bussmann British style products use innovative arc quenching techniques and high grade materials to provide:

- Minimal energy let-through ( $I^2t$ )
- Excellent DC performance
- Good surge withstand profile

British style fuses are typically found in equipment manufactured in the United Kingdom or British Commonwealth countries. However, North American manufacturers have begun to specify British style fuses — particularly in UPS applications at 240V or less — to take advantage of their size, performance and cost benefits.

### Voltage Rating

All Cooper Bussmann British style fuses are tested to IEC 269: Part 4. This standard requires a test voltage which is 5% higher than the rated voltage. In North America, fuses are required to clear only their rated voltage.

### Accessories

Trip-indicator fuses are available for use in parallel with the main fuse. Indicator fuses can be attached to the associated fuselink, or mounted separately in panel-mounted fuseclips. In addition, a push-on adapter and microswitch attachment are available, to provide remote indication. Fuse blocks are also available for most applications.

## British BS 88 — 240V: 6-900A

### LCT, LET, LMT, LMMT

#### Specifications

**Description:** BS 88 style stud-mount fuses.

**Dimensions:** See dimensions illustrations.

#### Ratings:

Volts: — 240Vac/150Vdc

Amps: — 6-900A

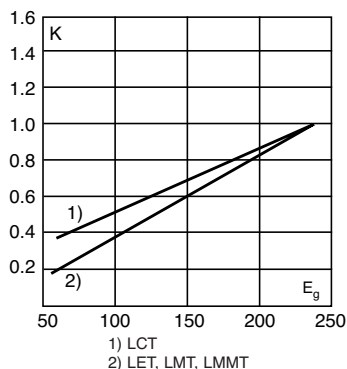
IR: — 200kA RMS Sym.

**Agency Information:** CE, Designed and tested to: BS 88 Part 4, IEC 269 Part 4, UL Recognized. All fuses above have been tested at 318Vac. Consult Cooper Bussmann for specific UL Recognition status.

### Electrical Characteristics

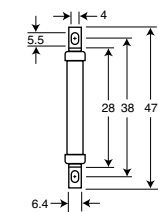
#### Total Clearing $I^2t$

The total clearing  $I^2t$  at rated voltage and at power factor of 15% 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).



#### Dimensions (mm)

Fig. 1: LCT



1mm = 0.0394" / 1" = 25.4mm

Fig. 2: LET

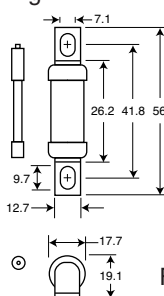
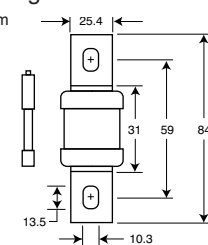
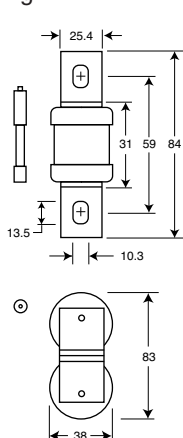


Fig. 3: LMT



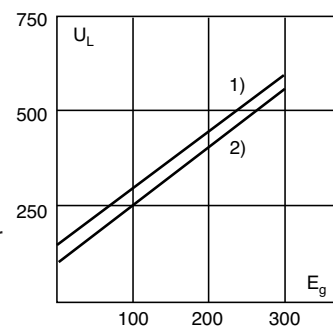
Indicator (Optional)

Fig. 4: LMMT



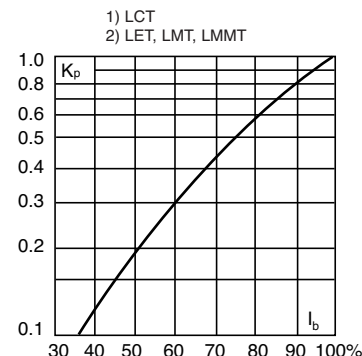
### Arc Voltage

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%.



### 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,  $K_p$ , is given as a function of the RMS load current,  $I_b$ , in % of the rated current.



### Catalog Numbers

| Catalog Numbers | Type | Rated Current RMS-Amps | $Pt$ (A <sup>2</sup> Sec) |                  |                  | Watts Loss |
|-----------------|------|------------------------|---------------------------|------------------|------------------|------------|
|                 |      |                        | Pre-arc                   | Clearing at 120V | Clearing at 240V |            |
| 6LCT            | LCT  | 6                      | 2                         | 6                | 9                | 1.0        |
| 10LCT           |      | 10                     | 3.8                       | 12               | 22               | 2.5        |
| 12LCT           |      | 12                     | 7                         | 22               | 32               | 2.5        |
| 16LCT           |      | 16                     | 20                        | 50               | 100              | 2.5        |
| 20LCT           |      | 20                     | 25                        | 80               | 160              | 4.0        |
| 25LET           | LET  | 25                     | 18                        | 120              | 250              | 4.0        |
| 32LET           |      | 32                     | 32                        | 200              | 450              | 5.0        |
| 35LET           |      | 35                     | 50                        | 320              | 600              | 5.0        |
| 50LET           |      | 50                     | 100                       | 500              | 1400             | 7.0        |
| 63LET           |      | 63                     | 180                       | 1100             | 2200             | 9.0        |
| 80LET           |      | 80                     | 300                       | 1900             | 3800             | 10.0       |
| 100LET          |      | 100                    | 600                       | 3800             | 7500             | 10.0       |
| 125LET          |      | 125                    | 600                       | 3800             | 7500             | 16.0       |
| 160LET          |      | 160                    | 1100                      | 7000             | 16000            | 20.0       |
| 180LETa         |      | 180                    | 1600                      | 12000            | 29000            | 21.0       |
| 160LMT          | LMT  | 160                    | 1100                      | 7000             | 16000            | 17.0       |
| 200LMT          |      | 200                    | 1500                      | 10000            | 20000            | 28.0       |
| 250LMT          |      | 250                    | 3200                      | 20000            | 40000            | 28.0       |
| 315LMT          |      | 315                    | 6000                      | 35000            | 75000            | 35.0       |
| 355LMT          |      | 355                    | 8000                      | 50000            | 100000           | 35.0       |
| 400LMT          |      | 400                    | 14000                     | 70000            | 160000           | 40.0       |
| 450LMT          |      | 450                    | 18000                     | 100000           | 220000           | 42.0       |
| 400LMMT         | LMMT | 400                    | 6000                      | 35000            | 80000            | 60.0       |
| 500LMMT         |      | 500                    | 14000                     | 80000            | 170000           | 64.0       |
| 630LMMT         |      | 630                    | 24000                     | 150000           | 300000           | 75.0       |
| 710LMMT         |      | 710                    | 32000                     | 200000           | 460000           | 77.0       |
| 800LMMT         |      | 800                    | 52000                     | 300000           | 600000           | 82.0       |
| 900LMMT         |      | 900                    | 75000                     | 400000           | 800000           | 97.0       |

• Watts loss provided at rated current.

• Note: 7LET, 10LET, 12LET and 16LET are available for replacement purposes on existing equipment.

• See accessories on page 195.

### Features and Benefits

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

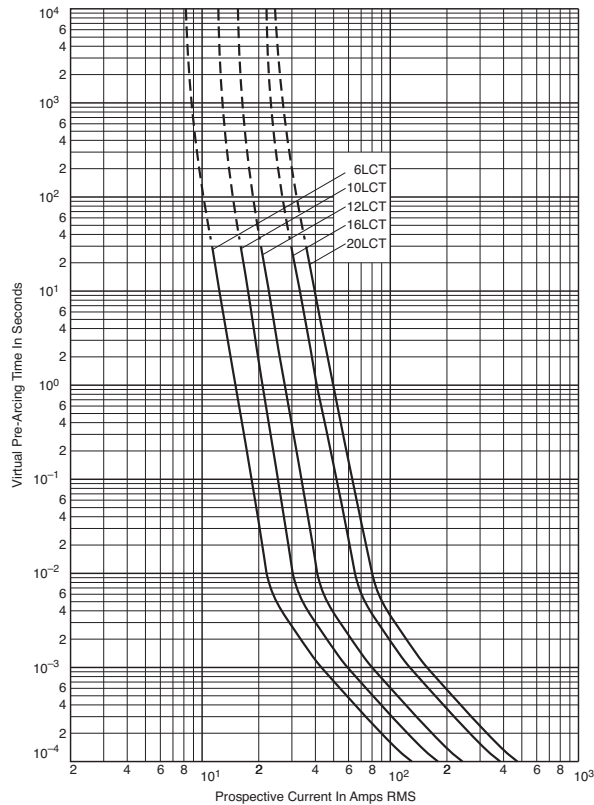
### Typical Applications

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

## British BS 88 — 240V: 6-900A

### LCT 6-20A: 240V

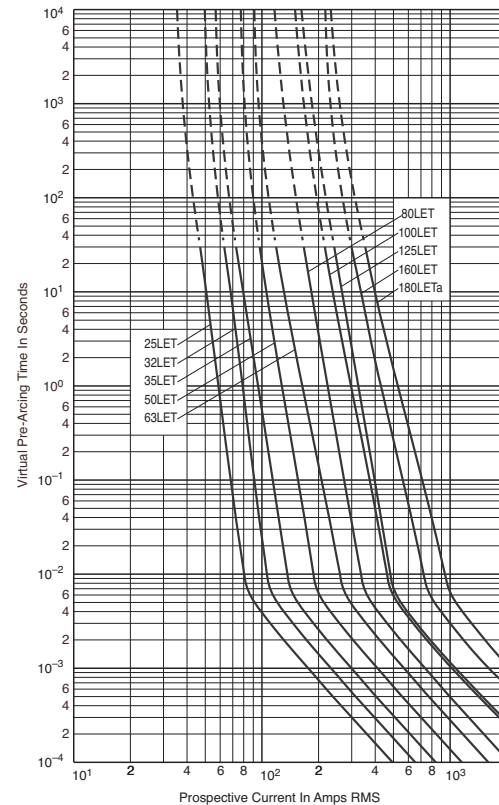
Time-Current Curve



Data Sheet: 35785296

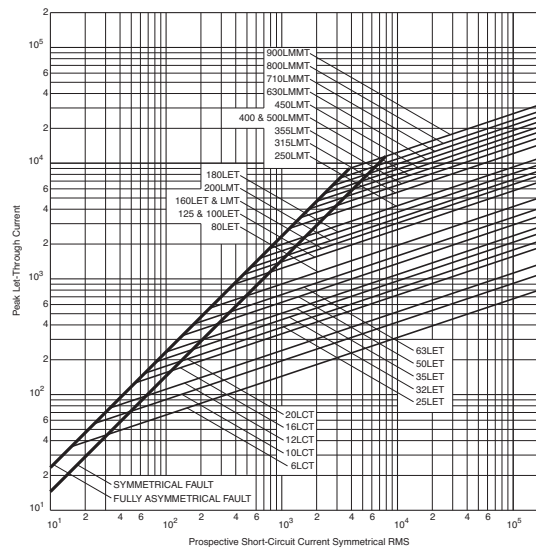
### LET 25-180A: 240V

Time-Current Curve



Data Sheet: 35785293

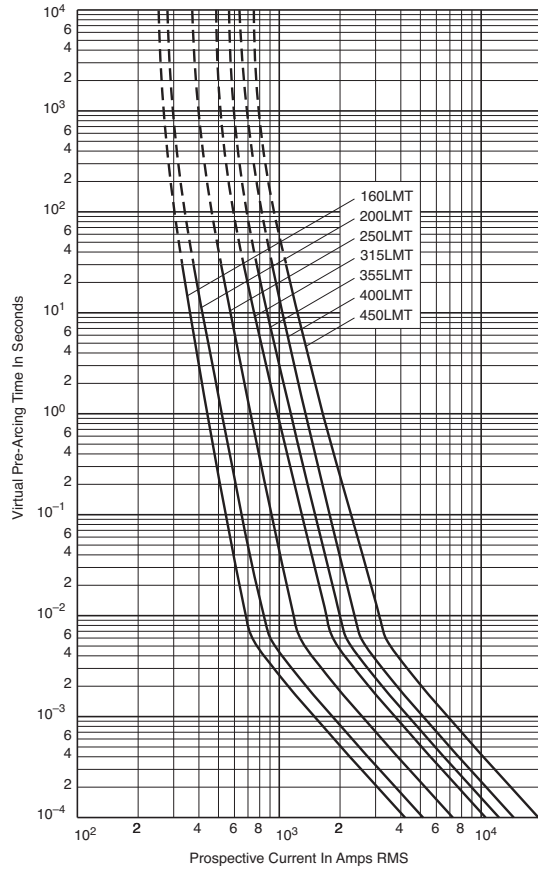
### Peak Let-Through Curve



## British BS 88 — 240V: 6-900A

### LMT 160-450A: 240V

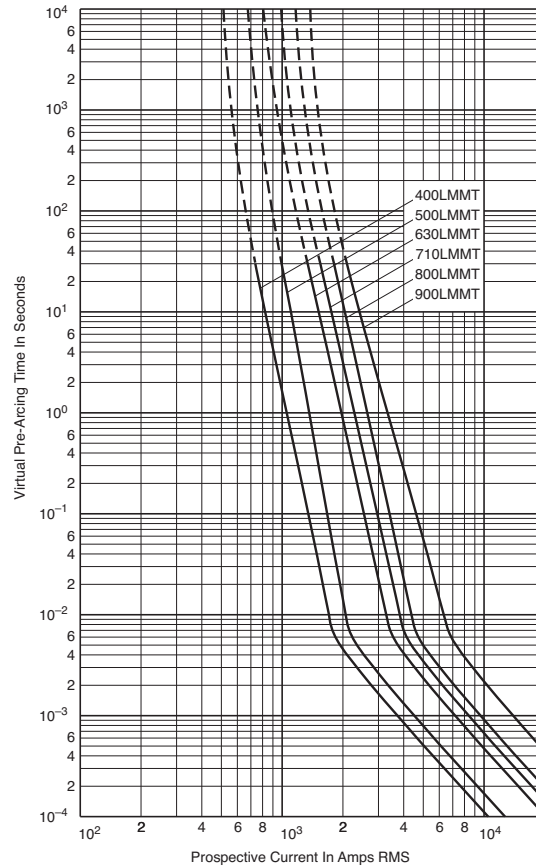
Time-Current Curve



Data Sheet: 35785294

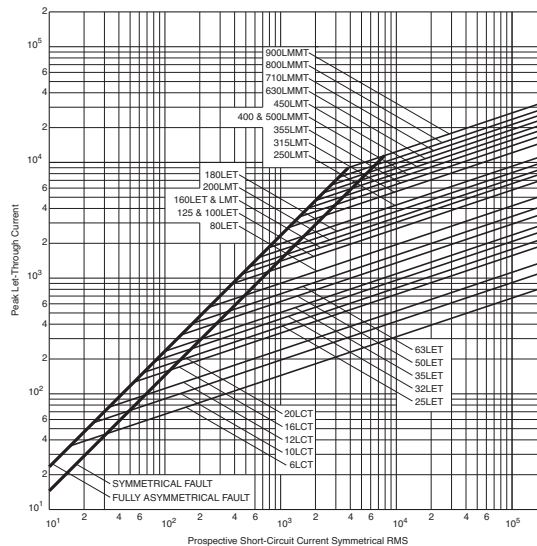
### LMMT 400-900A: 240V

Time-Current Curve



Data Sheet: 35785295

### Peak Let-Through Curve



## British BS 88 — 690V: 6-710A

### CT, ET, FE, EET, FEE, FM, FMM, MT, MMT

#### Specifications

**Description:** BS 88 style stud-mount fuses.

**Dimensions:** See dimensions illustrations.

#### Ratings:

Volts: — 690Vac/500Vdc

Amps: — 6-710A

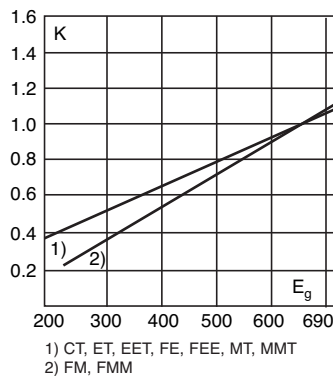
IR: — 200kA RMS Sym.

**Agency Information:** CE, Designed and tested to: BS 88 Part 4, IEC 269 Part 4, UL Recognized. MT and MMT — 350Vdc (IEC) rating. Consult Cooper Bussmann for UL Recognition status.

#### Electrical Characteristics

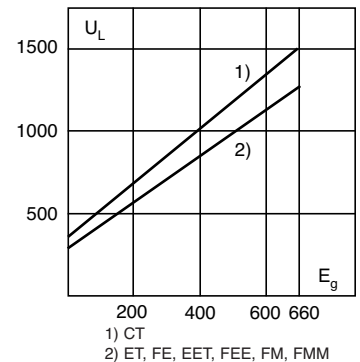
##### Total Clearing $I^2t$

The total clearing  $I^2t$  at rated voltage and at power factor of 15% 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).



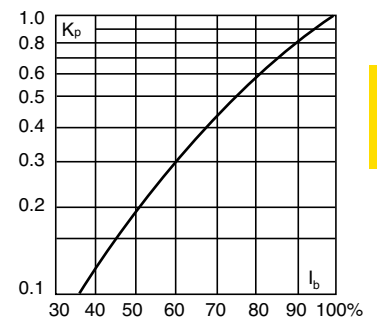
#### Arc Voltage

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%.



#### 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,  $K_p$ , is given as a function of the RMS load current,  $I_b$ , in % of the rated current.



#### Features and Benefits

- Excellent cycling capability
- Excellent 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

#### Dimensions (mm)

Fig. 1: CT

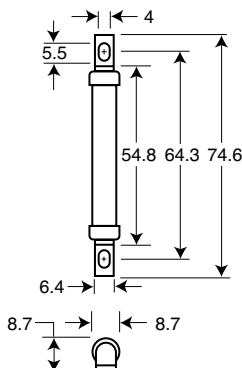


Fig. 2: ET, FE

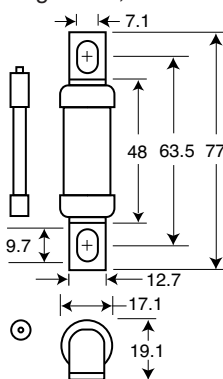


Fig. 3: EET, FEE

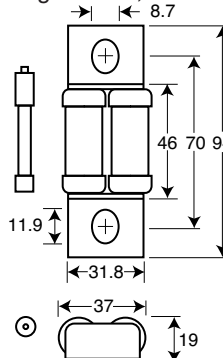


Fig. 4: FM, MT

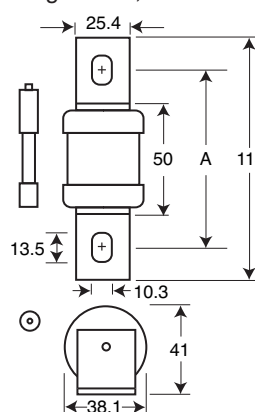
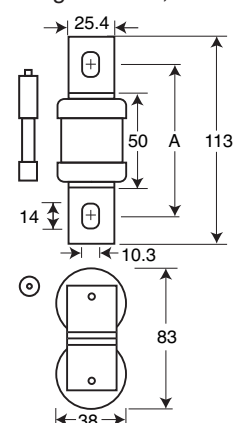


Fig. 5: FMM, MMT



Figs. 4 & 5 "A" Dimensions

| Type | "A"     |
|------|---------|
| FM   | 80-85mm |
| FMM  | 80-85mm |
| MT   | 85mm    |
| MMT  | 85mm    |

1mm = 0.0394" / 1" = 25.4mm

## British BS 88 — 690V: 6-710A

### Catalog Numbers

| Catalog Numbers | Type | Electrical Characteristics |         |                                 |                  | Watts Loss |
|-----------------|------|----------------------------|---------|---------------------------------|------------------|------------|
|                 |      | Rated Current RMS-Amps     | Pre-arc | Pt (A² Sec)<br>Clearing at 415V | Clearing at 660V |            |
| 6CT             | CT   | 6                          | 1.8     | 8.5                             | 12               | 2          |
| 10CT            |      | 10                         | 7       | 30                              | 48               | 3          |
| 12CT            |      | 12                         | 10      | 40                              | 65               | 3          |
| 16CT            |      | 16                         | 16      | 66                              | 110              | 7          |
| 20CT            |      | 20                         | 32      | 150                             | 220              | 7          |
| 25ET            | ET   | 25                         | 25      | 150                             | 250              | 7          |
| 32ET            |      | 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            | FE   | 35                         | 33      | 130                             | 200              | 9          |
| 40FE            |      | 40                         | 52      | 180                             | 300              | 9          |
| 45FE            |      | 45                         | 76      | 270                             | 450              | 11         |
| 50FE            |      | 50                         | 103     | 380                             | 600              | 11         |
| 63FE            |      | 63                         | 135     | 480                             | 750              | 12         |
| 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           | EET  | 90                         | 490     | 3000                            | 4500             | 19         |
| 110EET          |      | 110                        | 600     | 4000                            | 6500             | 27         |
| 140EET          |      | 140                        | 1050    | 7000                            | 12000            | 35         |
| 160EET          |      | 160                        | 1500    | 10000                           | 17000            | 39         |
| 100FEE          | FEE  | 100                        | 400     | 1600                            | 2400             | 24         |
| 120FEE          |      | 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                            | 11400            | 52         |
| 180FM           | FM   | 180                        | 1400    | 7500                            | 13500            | 40         |
| 200FM           |      | 200                        | 2600    | 10500                           | 18500            | 40         |
| 225FM           |      | 225                        | 3700    | 14500                           | 26500            | 44         |
| 250FM           |      | 250                        | 5200    | 20500                           | 37500            | 48         |
| 280FM           |      | 280                        | 7000    | 30500                           | 55000            | 48         |
| 315FM           |      | 315                        | 10000   | 40000                           | 77000            | 55         |
| 350FM           |      | 350                        | 15000   | 60000                           | 105000           | 55         |
| 400FMM          | FMM  | 400                        | 10000   | 40000                           | 72500            | 85         |
| 450FMM          |      | 450                        | 15000   | 60000                           | 105000           | 90         |
| 500FMM          |      | 500                        | 20000   | 82000                           | 150000           | 100        |
| 550FMM          |      | 550                        | 30000   | 120000                          | 215000           | 100        |
| 630FMM          |      | 630                        | 45000   | 180000                          | 310000           | 100        |
| 700FMM          |      | 700                        | 60000   | 245000                          | 420000           | 120        |
| 160MT           | MT   | 160                        | 2400    | 15000                           | 25000            | 26         |
| 180MT           |      | 180                        | 3800    | 25000                           | 38000            | 26         |
| 200MT           |      | 200                        | 6000    | 40000                           | 58000            | 27         |
| 250MT           |      | 250                        | 11500   | 80000                           | 110000           | 32         |
| 280MT           |      | 280                        | 16500   | 100000                          | 150000           | 35         |
| 315MT           |      | 315                        | 19000   | 125000                          | 180000           | 42         |
| 355MT           |      | 355                        | 22000   | 160000                          | 200000           | 51         |
| 180MMT          | MMT  | 180                        | 1650    | 12000                           | 18000            | 42         |
| 200MMT          |      | 200                        | 2200    | 16000                           | 23000            | 42         |
| 225MMT          |      | 225                        | 3700    | 26000                           | 40000            | 42         |
| 280MMT          |      | 280                        | 6600    | 47000                           | 70000            | 47         |
| 315MMT          |      | 315                        | 8600    | 62000                           | 91000            | 51         |
| 355MMT          |      | 355                        | 13500   | 97000                           | 140000           | 54         |
| 400MMT          |      | 400                        | 21000   | 150000                          | 220000           | 60         |
| 450MMT          |      | 450                        | 30000   | 220000                          | 320000           | 57         |
| 500MMT          |      | 500                        | 42000   | 300000                          | 450000           | 64         |
| 560MMT          |      | 560                        | 60000   | 430000                          | 640000           | 64         |
| 630MMT          |      | 630                        | 68500   | 500000                          | 720000           | 86         |
| 710MMT          |      | 710                        | 78000   | 600000                          | 850000           | 105        |

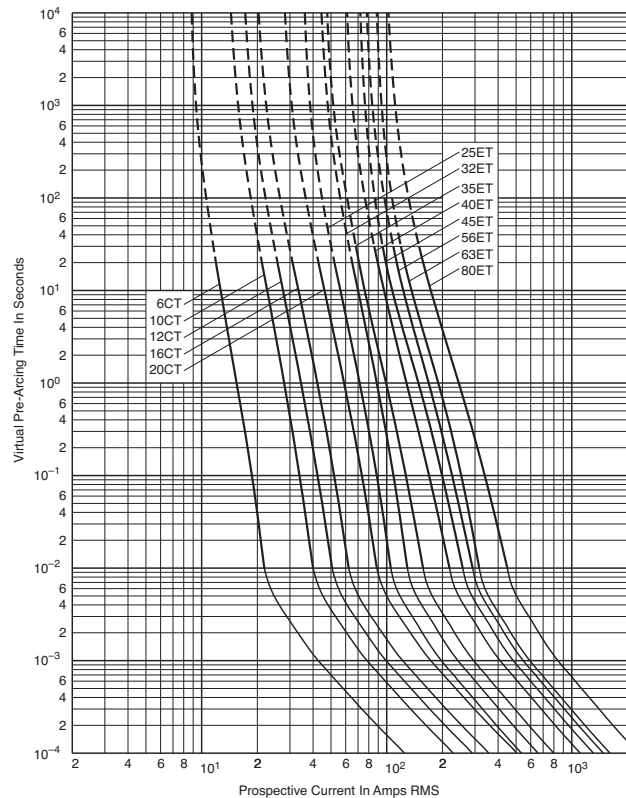
• Watts loss provided at rated current.

• Note: FC, 8ET, 12ET, 15ET, 20ET, 65EET and 75EET are available for replacement purposes on existing equipment.

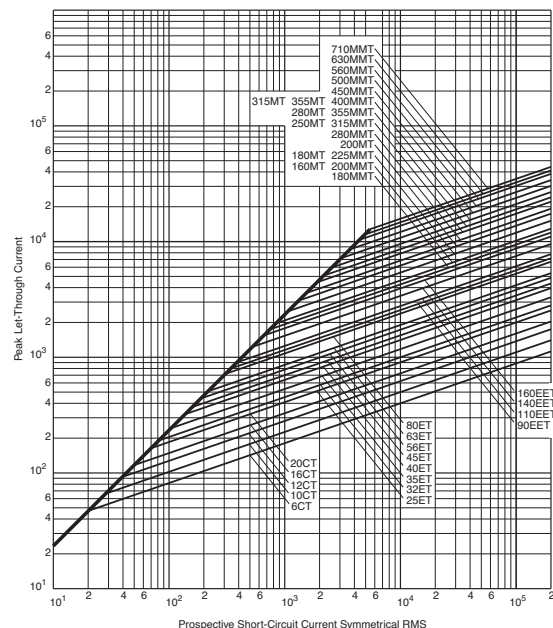
• See accessories on page 195.

### CT 6-20, ET 25-80A: 690V

#### Time-Current Curve



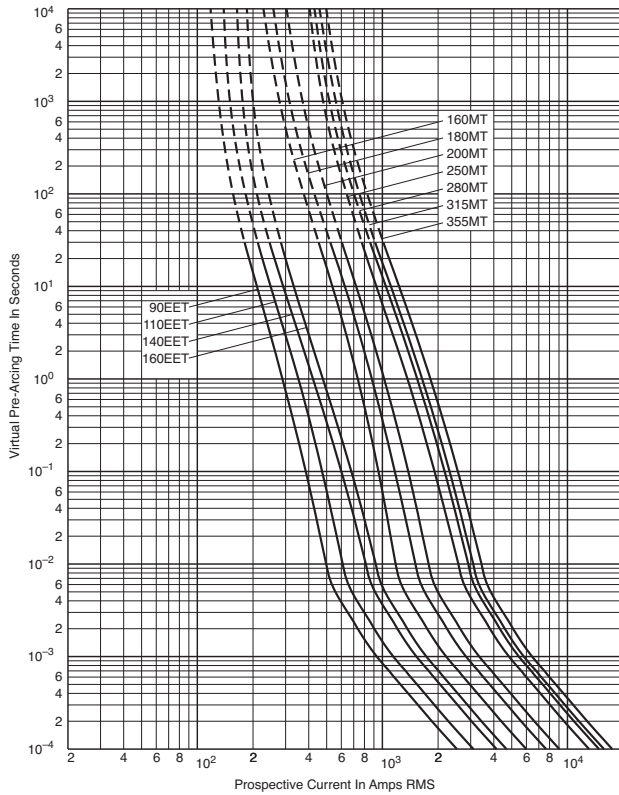
#### Peak Let-Through Curve



## British BS 88 — 690V: 6-710A

### EET 90-160A, MT 160-355A: 690V

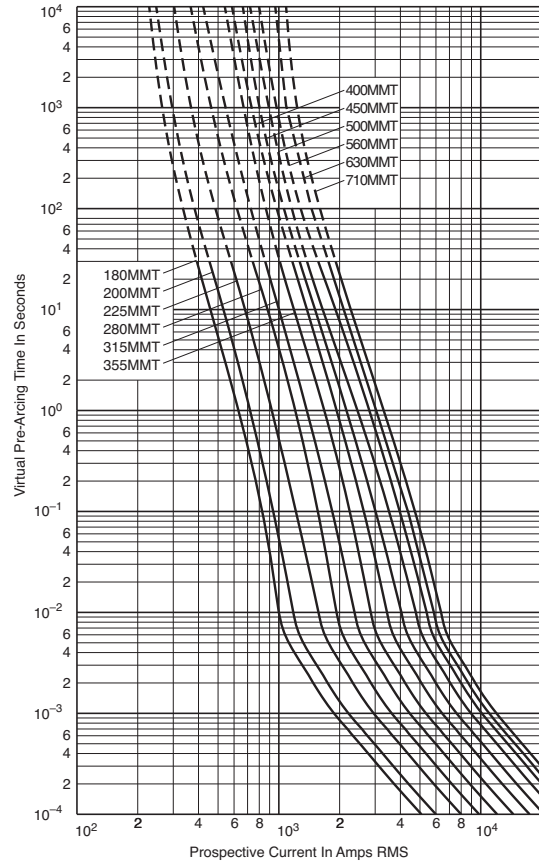
Time-Current Curve



Data Sheet: 35785313

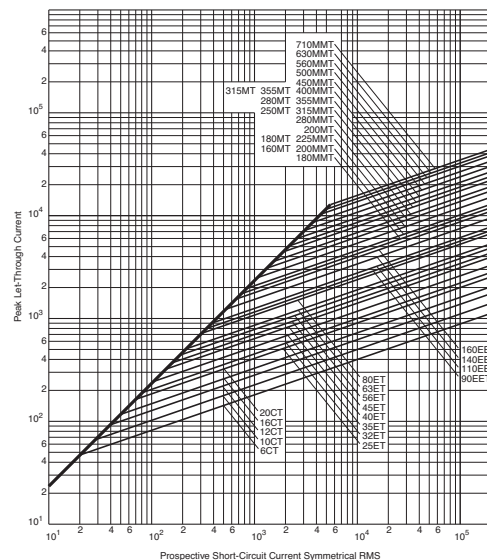
### MMT 180-710A: 690V

Time-Current Curve



Data Sheet: 35785311

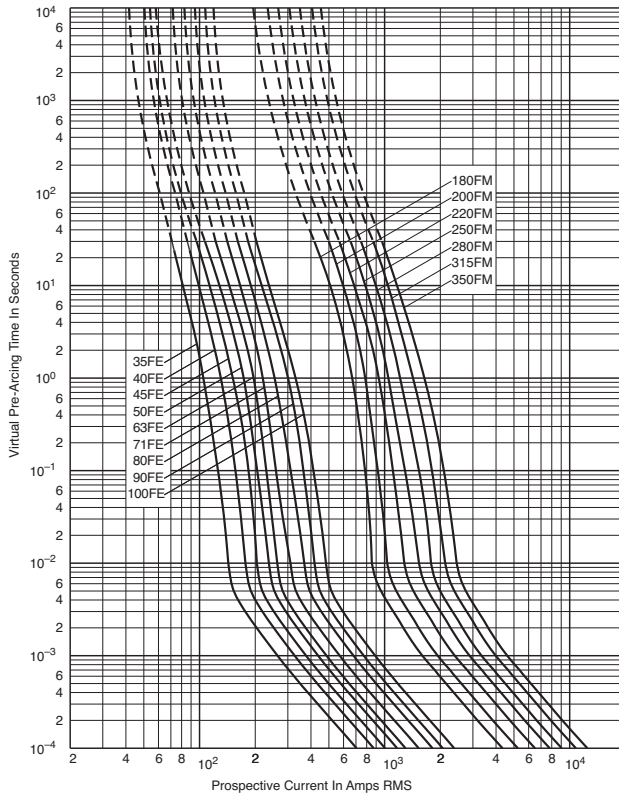
Peak Let-Through Curve



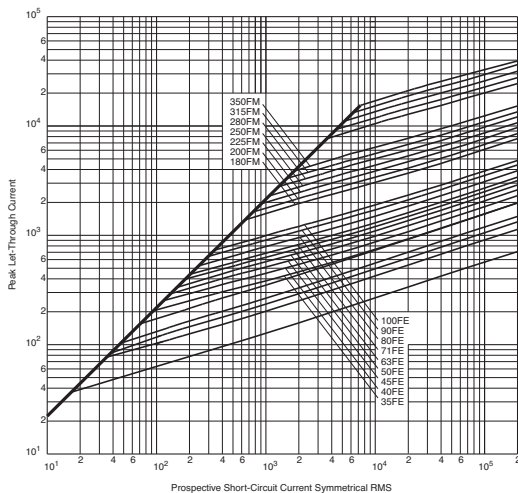
## British BS 88 — 690V: 6-710A

### FE 35-100A & FM 180-350A: 690V

Time-Current Curve



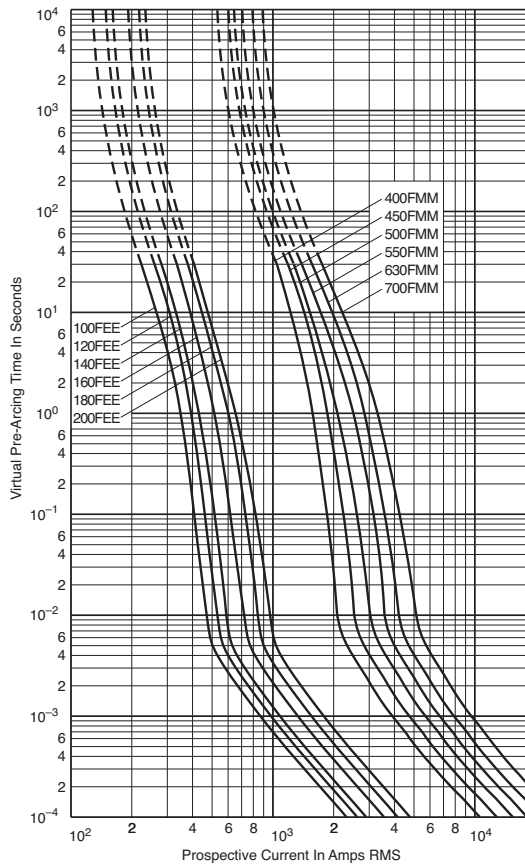
Peak Let-Through Curve



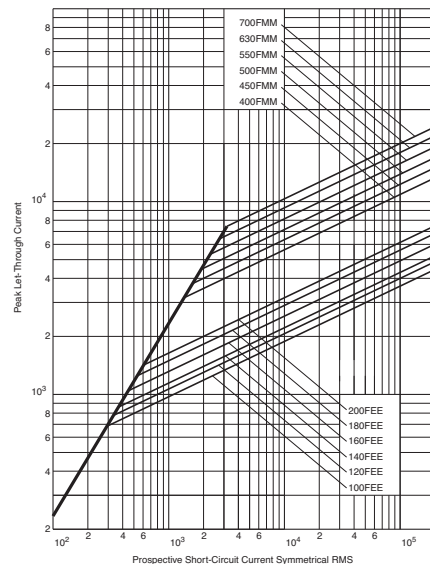
Data Sheet: 35785314

### FEE 100-200A & FMM 400-700A: 690V

Time-Current Curve



Peak Let-Through Curve



Data Sheet: 35785292

## British BS 88 Fuse Accessories

### Indicator System

#### Trip-Indicators

Trip-indicators are available for use in parallel with the main fuse. They can either be attached to the associated fuse or mounted separately in panel mounted fuse clips, reference CL1. A push-on adapter and microswitch attachment is available for use with the trip indicator to give the facility of remote indication, reference MAI.

Fuse ratings of 20A and below cannot usually accommodate a trip-indicator.

When a trip-indicator is to be attached to the main fuse an accessory pack comprising a pair of mounting clips and an appropriate trip indicator would be required. The clips are snapped onto the fuse end caps and the indicator is pressed into clips as shown.

#### Electrical Specifications

| Type                                     | TI500   | TI700   |
|------------------------------------------|---------|---------|
| Maximum RMS Voltage                      | 500     | 700     |
| Maximum Peak Voltage                     | 700     | 1000    |
| Maximum DC Voltage                       | 130     | 350     |
| Cold Resistance (ohms)                   | 0.3     | 0.45    |
| Maximum permissible steady-state current | 1.5A    | 1.5A    |
| Interrupting Capacity (RMS Symm.)        | 100,000 | 100,000 |
| Pre-Arcing I <sup>2</sup> t              | 23      | 23      |

#### Fuse Indicator Kits

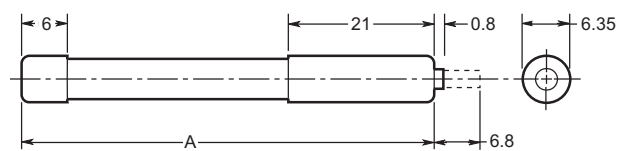
| Kit. Ref. | Details        | RMS Volts | For use with Fuse Ref. |
|-----------|----------------|-----------|------------------------|
| EC-250    | Fuse Mount     | 250       | LET                    |
| MC250     | Indicator Kits | 250       | LMT & LMMT             |
| EC-600    | (Includes one  | 660       | FE, FEE & ET           |
| MC600     | indicator      | 660       | FM & FMM               |
| MC700     | and two clips) | 700       | MT & MMT               |

#### CL1 Panel Mount Clips

CL1 Panel mount fuse clips are available for mounting a trip-indicator when mounting directly on the fuse is impractical. Order part number CL1.

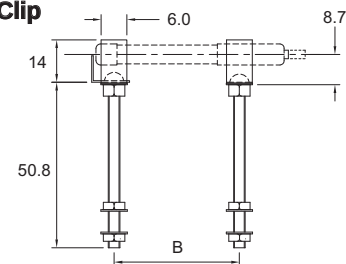


#### Trip-Indicator Dimensions - mm



| Ref.   | Dim. "A" (mm) | RMS Volts |
|--------|---------------|-----------|
| TI250  | 37.6          | 250       |
| TI500  | 47.5          | 500       |
| TI600  | 55.7          | 600       |
| TI700  | 61.8          | 700       |
| TI1100 | 98.4          | 1100      |
| TI1500 | 120.6         | 1500      |
| TI2000 | 147.5         | 2000      |
| TI2500 | 198.3         | 2500      |

#### CL1 Panel Mount Clip Dimensions - mm



### Microswitch Adapter – MAI

We offer a microswitch, complete with adapter for securing the indicator. The microswitch is provided with double pole, single throw contacts, having both a normally open and a normally closed position. A special material has been employed in the construction of the adapter to provide reliable operation in the range of temperatures associated with standard operating conditions and during fuse operation.

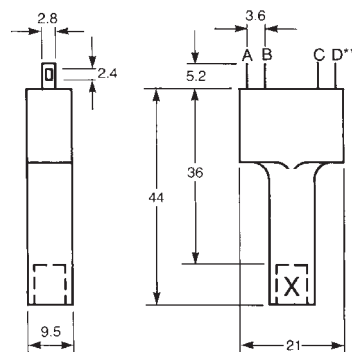
#### Microswitch and Adapter Type MAI

|                                                                                                        |                  |
|--------------------------------------------------------------------------------------------------------|------------------|
| <b>Current Rating:</b><br>AC 50/60Hz resistive load @ 250V RMS<br>AC 50/60Hz resistive load @ 127V RMS | 4A<br>6A         |
| DC, resistive load @ 110Vdc<br>DC, resistive load @ 30Vdc                                              | 0.7A DC<br>2A DC |
| <b>Maximum Working Voltage:</b><br>Contact-to-contact (RMS)<br>Contact-to-contact (RMS)                | 1000V<br>1500V   |
| <b>Maximum DC Volts:</b>                                                                               | 110V DC          |

#### Terminal Arrangement



#### Dimensions in mm



\*\*A=D=N/O contacts  
B=C=N/C contacts