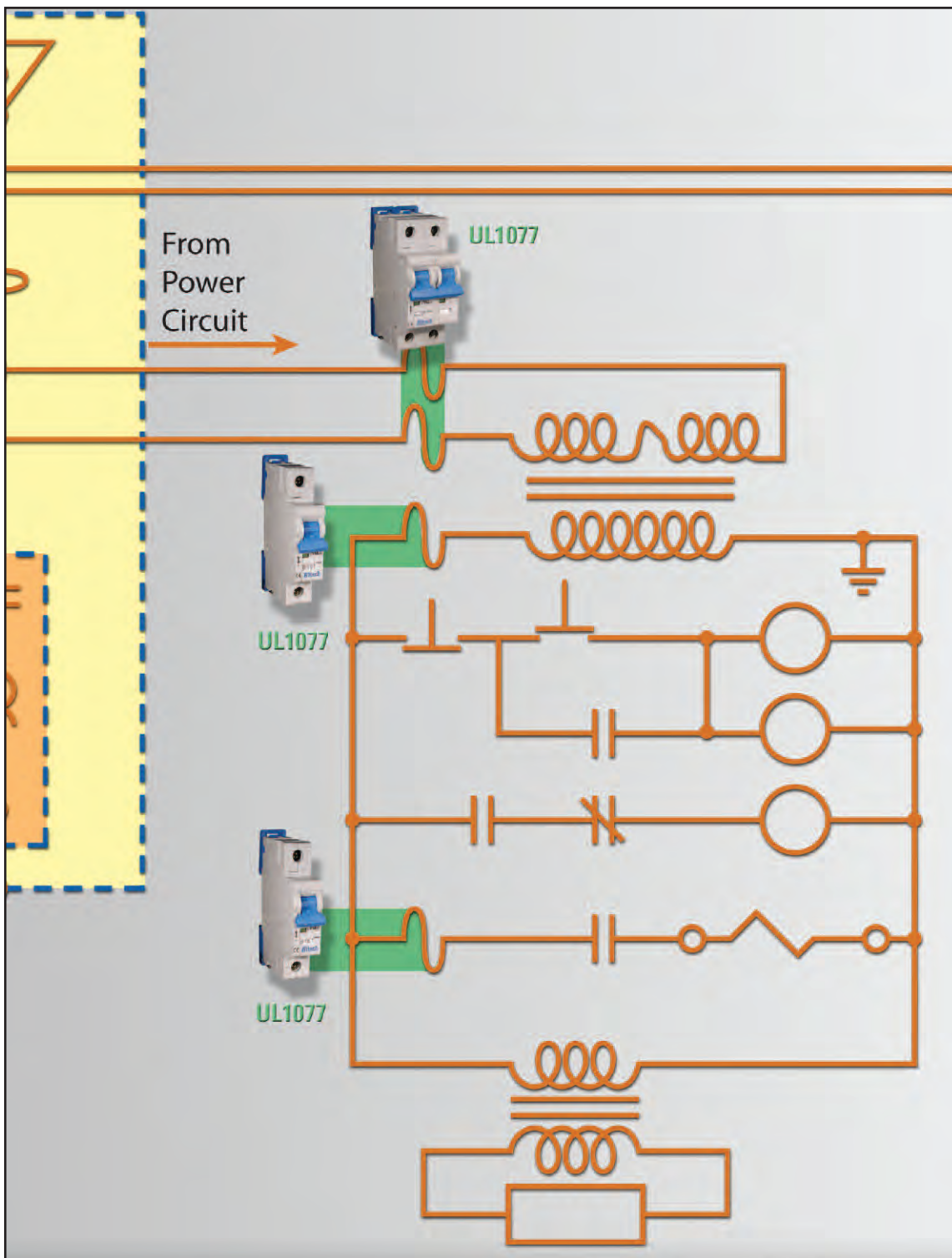


## Typical UL1077 Application

### Control Circuit of a UL508A Panel



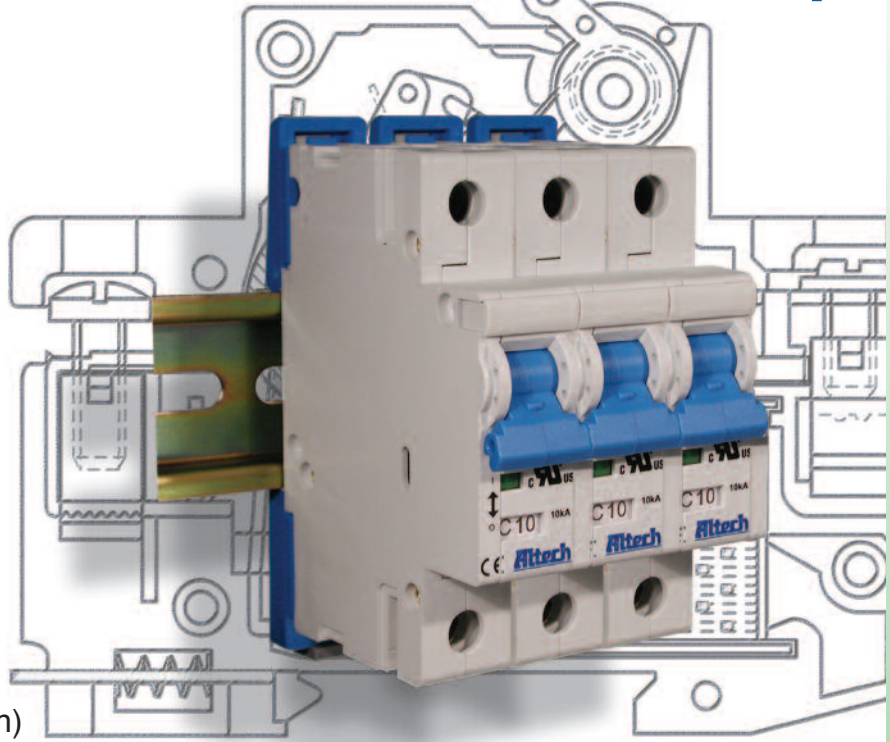
**Disclaimer:** This is an example application. Installation should be done by a qualified electrician under the guidance of UL/NEC® specifications..

# R-Series



## UL1077 Recognized Supplementary Protector

- DIN Rail Mounted
- 17.5mm width per pole
- Thermal Magnetic
- 480Y/277V AC, 50/60Hz
- 10kA Short Circuit Withstand Capacity
- Positive Trip indicator (Green - off/tripped, Red - on)
- Applications (on the load side of Branch Circuit Protection) include: Sensitive Electronics, Power Supplies, Appliance circuits, etc.



<b>Voltage Rating</b>	480Y/277VAC
<b>Short Circuit Withstand Rating (UL - Ratings)</b>	0.5-6A (RC): 10kA with no back-up fuse 8-63A (RC): 10kA with UL-listed Class J back-up fuse; 5kA with no back-up fuse
<b>Interrupting Capacity (IEC/EN60898/60947-2)</b>	0.5-63A (RC): 10kA
<b>Calibration Temperature</b>	30°C (86°F)
<b>Operating Temperature</b>	-25° to 60°C (-13° to 140°F)
<b>Storage Temperature</b>	-25° to 75°C (-13° to 167°F)
<b>Terminal Size Acceptability and Torque</b>	14-3 AWG: 17.5 lb-in. (2.0 Nm) 18-16 AWG: 25 lb-in. (2.8 Nm)
<b>Terminal Protection Degree</b>	IP20
<b>Vibration Resistance</b>	3g (18-50Hz)

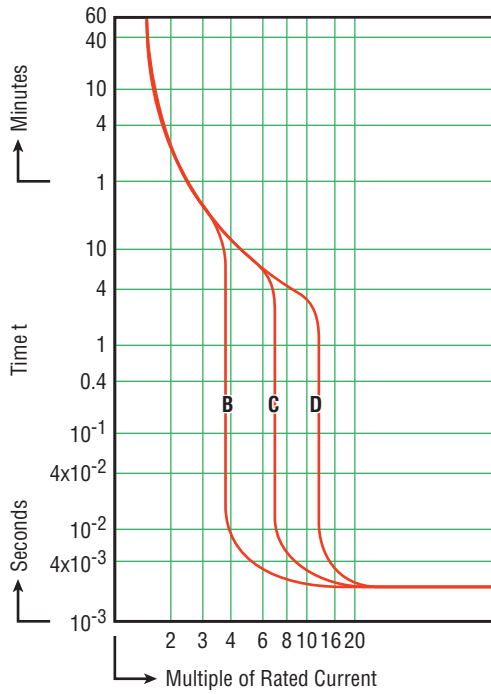
### SHORT CIRCUIT WITHSTAND RATINGS FOR R-SERIES SUPPLEMENTARY PROTECTOR

Trip Curve	Amp Range	Backup Protection	
		UL-Listed Class J Fuse up to 10kA	No Backup Fuse Required up to:
All	0.5 - 6A	4xRC*	10kA
All	8 - 63A	4xRC*	5kA

\*up to nearest rated current

DC voltage rating: 48 VDC (self-certified).

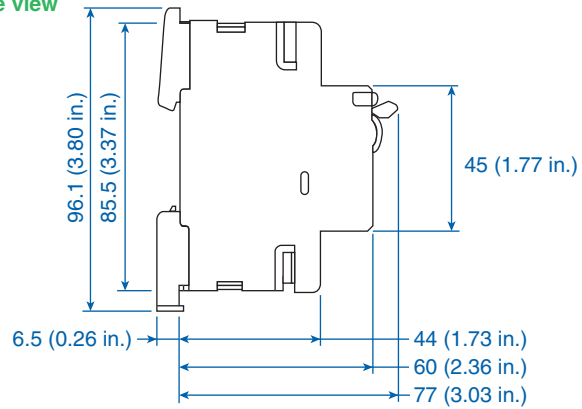
Altech UL1077



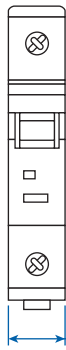
## Time versus Current Trip Curve

For the exact trip curve, please refer to page 16.

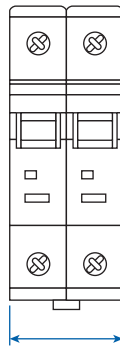
Dimensions in mm side view



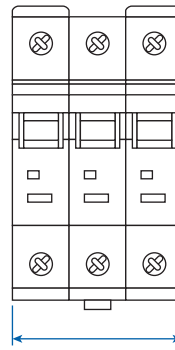
1 POLE



2 POLE



3 POLE



Trip-Characteristics*				Applications					
Characteristic Trip Boundaries				Lighting Wiring Protection Control Circuits	Business Equipment Appliances	Control Transformers	Power Supplies	General Electronics	Reactive Load
Thermal Trip		Magnetic Trip							
Must not Trip>100ms	Must Trip <1hr	Must not Trip>100ms	Must Trip at 100ms						
B-Characteristics									
1.13xRC	1.45xRC	3xRC	5xRC						
C-Characteristics									
1.13xRC	1.45xRC	5xRC	10xRC						
D-Characteristics									
1.13xRC	1.45xRC	10xRC	20xRC						

\*The value of each characteristic is shown vertically beneath its corresponding heading.



### Warning!

This information should only be used as a selection guide. The use of a Miniature Circuit Breaker/Supplementary Protector in an application with a certain Trip-Characteristic always requires prototype testing! It is the responsibility of the circuit design engineer to select the appropriate Miniature Circuit Breaker/Supplementary Protector for his specific application.

# B-Trip Characteristic



E301611

**Application Examples:**

Business equipment, wiring protection, lighting, appliances, control circuits and some electronic applications. Relatively long thermal trip delay but low magnetic trip point.



**One Pole**

Rated Current	Type/ Cat. No.
0.5A	1BU05R
1.0A	1BU1R
2.0A	1BU2R
3.0A	1BU3R
4.0A	1BU4R
5.0A	1BU5R
6.0A	1BU6R
8.0A	1BU8R
10A	1BU10R
12A	1BU12R
13A	1BU13R
15A	1BU15R
16A	1BU16R
20A	1BU20R
25A	1BU25R
30A	1BU30R
32A	1BU32R
40A	1BU40R
50A	1BU50R
60A	1BU60R
63A	1BU63R

Standard Pack: 12

Weight:  
0.5A - 63A: 1.6kg (3.54 lb.)



**Two Pole**

Rated Current	Type/ Cat. No.
0.5A	2BU05R
1.0A	2BU1R
2.0A	2BU2R
3.0A	2BU3R
4.0A	2BU4R
5.0A	2BU5R
6.0A	2BU6R
8.0A	2BU8R
10A	2BU10R
12A	2BU12R
13A	2BU13R
15A	2BU15R
16A	2BU16R
20A	2BU20R
25A	2BU25R
30A	2BU30R
32A	2BU32R
40A	2BU40R
50A	2BU50R
60A	2BU60R
63A	2BU63R

Standard Pack: 6

Weight:  
0.5A - 63A: 1.6kg (3.54 lb.)



**Three Pole**

Rated Current	Type/ Cat. No.
0.5A	3BU05R
1.0A	3BU1R
2.0A	3BU2R
3.0A	3BU3R
4.0A	3BU4R
5.0A	3BU5R
6.0A	3BU6R
8.0A	3BU8R
10A	3BU10R
12A	3BU12R
13A	3BU13R
15A	3BU15R
16A	3BU16R
20A	3BU20R
25A	3BU25R
30A	3BU30R
32A	3BU32R
40A	3BU40R
50A	3BU50R
60A	3BU60R
63A	3BU63R

Standard Pack: 4

Weight:  
0.5A - 63A: 1.66kg (3.67 lb.)



**Four Pole**  
Please contact  
Altech.

Non-standard current ratings available. Minimum quantities may apply. Please contact Altech for further details.

## C-Trip Characteristic



**Application Examples:**  
Lighting, wiring protection, appliances, business equipment, and control circuit applications. Relatively long thermal trip delay and medium magnetic trip point.



**One Pole**

Rated Current	Type/ Cat. No.
0.5A	1CU05R
1.0A	1CU1R
2.0A	1CU2R
3.0A	1CU3R
4.0A	1CU4R
5.0A	1CU5R
6.0A	1CU6R
8.0A	1CU8R
10A	1CU10R
12A	1CU12R
13A	1CU13R
15A	1CU15R
16A	1CU16R
20A	1CU20R
25A	1CU25R
30A	1CU30R
32A	1CU32R
40A	1CU40R
50A	1CU50R
60A	1CU60R
63A	1CU63R

Standard Pack: 12

Weight:  
0.5A - 63A: 1.6kg (3.54 lb.)



**Two Pole**

Rated Current	Type/ Cat. No.
0.5A	2CU05R
1.0A	2CU1R
2.0A	2CU2R
3.0A	2CU3R
4.0A	2CU4R
5.0A	2CU5R
6.0A	2CU6R
8.0A	2CU8R
10A	2CU10R
12A	2CU12R
13A	2CU13R
15A	2CU15R
16A	2CU16R
20A	2CU20R
25A	2CU25R
30A	2CU30R
32A	2CU32R
40A	2CU40R
50A	2CU50R
60A	2CU60R
63A	2CU63R

Standard Pack: 6

Weight:  
0.5A - 63A: 1.6kg (3.54 lb.)



**Three Pole**

Rated Current	Type/ Cat. No.
0.5A	3CU05R
1.0A	3CU1R
2.0A	3CU2R
3.0A	3CU3R
4.0A	3CU4R
5.0A	3CU5R
6.0A	3CU6R
8.0A	3CU8R
10A	3CU10R
12A	3CU12R
13A	3CU13R
15A	3CU15R
16A	3CU16R
20A	3CU20R
25A	3CU25R
30A	3CU30R
32A	3CU32R
40A	3CU40R
50A	3CU50R
60A	3CU60R
63A	3CU63R

Standard Pack: 4

Weight:  
0.5A - 63A: 1.66kg (3.67 lb.)



**Four Pole  
Please contact  
Altech.**

Non-standard current ratings available. Minimum quantities may apply. Please contact Altech for further details.



# D-Trip Characteristic

**Application Examples:**  
Control transformers, power supplies and reactive loads. Relatively long thermal trip delay and very high magnetic trip point.



**One Pole**

Rated Current	Type/ Cat. No.
0.5A	1DU05R
1.0A	1DU1R
2.0A	1DU2R
3.0A	1DU3R
4.0A	1DU4R
5.0A	1DU5R
6.0A	1DU6R
8.0A	1DU8R
10A	1DU10R
12A	1DU12R
13A	1DU13R
15A	1DU15R
16A	1DU16R
20A	1DU20R
25A	1DU25R
30A	1DU30R
32A	1DU32R
40A	1DU40R
50A	1DU50R
60A	1DU60R
63A	1DU63R

Standard Pack: 12

Weight:  
0.5A - 63A: 1.6kg (3.54 lb.)



**Two Pole**

Rated Current	Type/ Cat. No.
0.5A	2DU05R
1.0A	2DU1R
2.0A	2DU2R
3.0A	2DU3R
4.0A	2DU4R
5.0A	2DU5R
6.0A	2DU6R
8.0A	2DU8R
10A	2DU10R
12A	2DU12R
13A	2DU13R
15A	2DU15R
16A	2DU16R
20A	2DU20R
25A	2DU25R
30A	2DU30R
32A	2DU32R
40A	2DU40R
50A	2DU50R
60A	2DU60R
63A	2DU63R

Standard Pack: 6

Weight:  
0.5A - 63A: 1.6kg (3.54 lb.)



**Three Pole**

Rated Current	Type/ Cat. No.
0.5A	3DU05R
1.0A	3DU1R
2.0A	3DU2R
3.0A	3DU3R
4.0A	3DU4R
5.0A	3DU5R
6.0A	3DU6R
8.0A	3DU8R
10A	3DU10R
12A	3DU12R
13A	3DU13R
15A	3DU15R
16A	3DU16R
20A	3DU20R
25A	3DU25R
30A	3DU30R
32A	3DU32R
40A	3DU40R
50A	3DU50R
60A	3DU60R
63A	3DU63R

Standard Pack: 4

Weight:  
0.5A - 63A: 1.66kg (3.67 lb.)

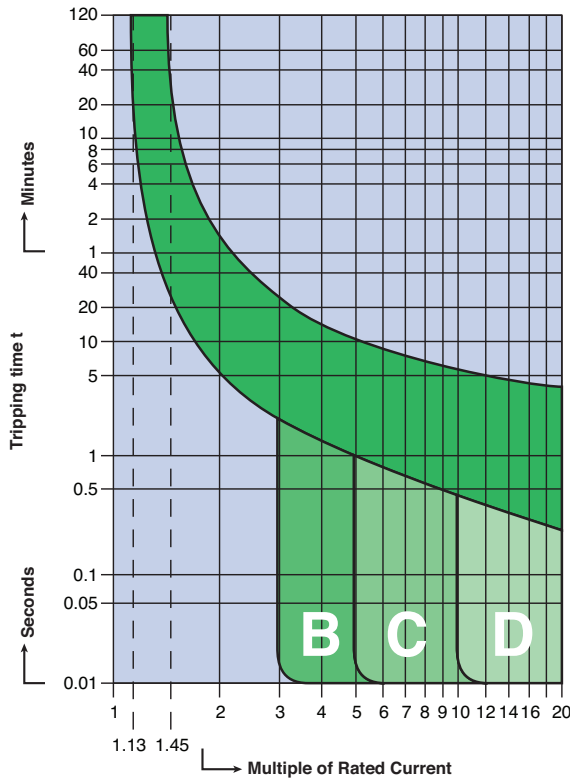


**Four Pole**  
Please contact  
Altech.

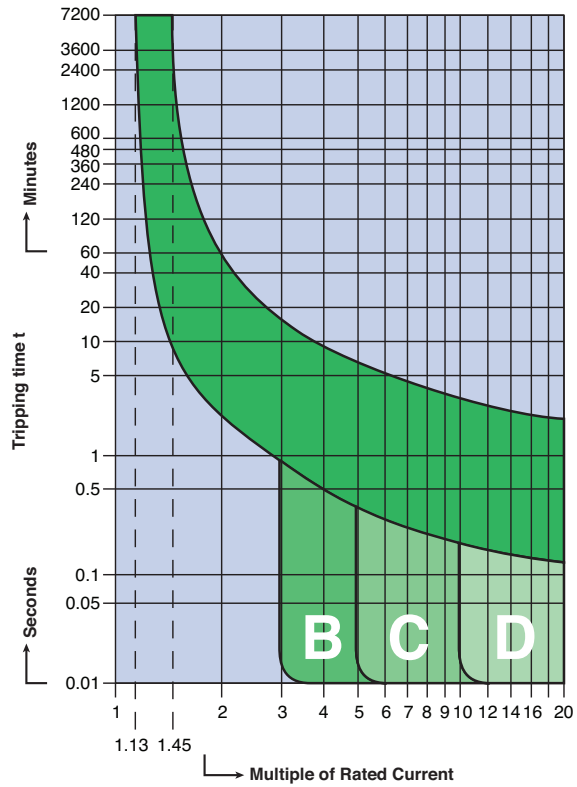
Non-standard current ratings available. Minimum quantities may apply. Please contact Altech for further details.

## R-Series Trip Curves

**B, C and D Trip  
Less than 10A**



**B, C and D Trip  
10A and higher**



## Temperature and Power Loss Specifications

Rated current of MCB	Internal Impedances & Power Loss					MCB Temperature Compensation									
	Internal impedance	Power loss on CB	Maximum allowable impedance of breakdown loop (0.2/0.4s)			Effective rated current allowing for ambient temperature.									
	Z (m Ω)	P (W)	Z <sub>s</sub> (Ω)			I <sub>cor</sub> (A)									
I <sub>n</sub> (A)	Char. B,C,D	Char. B,C,D	Char.B	Char.C	Char.D	Ambient Temperature									
						-20°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C	60°C	
0.50	6600	1.7	42.0	51.1	28.8	0.61	0.59	0.57	0.55	0.53	0.50	0.47	0.44	0.42	
1.00	1650	1.7	46.0	25.6	14.4	1.21	1.18	1.14	1.10	1.05	1.00	0.93	0.88	0.83	
2.00	370	1.5	23.0	12.8	7.2	2.42	2.36	2.28	2.20	2.10	2.00	1.86	1.76	1.67	
3.00	210	1.9	15.3	8.5	4.8	3.63	3.54	3.42	3.30	3.15	3.00	2.79	2.64	2.50	
4.00	126	2.0	11.5	6.4	3.6	4.84	4.72	4.56	4.40	4.20	4.00	3.72	3.52	3.33	
6.00	51	1.8	7.7	4.3	2.4	7.30	7.10	6.80	6.60	6.30	6.00	5.60	5.30	5.00	
8.00	21	1.3	5.8	3.2	1.8	9.70	9.40	9.10	8.80	8.40	8.00	7.40	7.00	6.70	
10.00	14.8	1.5	4.6	2.6	1.4	12.1	11.8	11.40	11.00	10.50	10.00	9.30	8.80	8.30	
13.00	11.3	1.9	3.5	2.0	1.1	15.7	15.3	14.80	14.30	13.70	13.00	12.10	11.50	10.80	
16.00	7.5	1.9	2.9	1.6	0.9	19.4	18.9	18.20	17.60	16.80	16.00	14.90	14.10	13.30	
20.00	6.3	2.5	2.3	1.3	0.7	24.2	23.60	22.80	22.00	21.00	20.00	18.60	17.60	16.70	
25.00	4.4	2.8	1.8	1.0	0.6	30.3	29.50	28.50	27.50	26.30	25.00	23.30	22.00	20.80	
32.00	3.1	3.2	1.4	0.8	0.4	38.7	37.80	36.50	35.20	33.60	32.00	29.80	28.20	26.70	
40.00	2.5	4.0	1.2	0.6	0.4	48.4	47.20	45.60	44.00	42.00	40.00	37.20	35.20	33.30	
50.00	2.2	5.5	0.9	0.5	0.3	60.5	59.0	57.00	55.00	52.50	50.00	46.50	44.10	41.70	
63.00	1.6	6.4	0.7	0.4	0.2	76.2	74.30	71.80	69.30	66.20	63.00	58.60	55.50	52.50	

## Accessories

### R-Series Supplementary Protector



E301611



Accessories can be factory or field mounted on R-Series supplementary protectors for enhanced control and monitoring capabilities. Field mounting kits include all necessary parts and instructions. Accessories can be gang mounted on a single controller (the Auxiliary Switch in the outside position). The mounting arrangement links the internal latch-pins for the tripping mechanisms, ensuring simultaneous trips. Handles are linked to simplify manual resetting.

#### Neutral Pole (63A/480Y/277 VAC)

Description	Type/ Cat. No.	Cable Max	Cable Min	Torque Max	Torque Min
Neutral	ALTN2	25mm <sup>2</sup> AWG 3	2.5mm <sup>2</sup> AWG 12	2Nm 17.5 lb-in	1.5Nm 12 lb-in

Standard Pack: 10

Weight: 1.25kg (2.77 lb.)

#### Shunt Trip and Undervoltage Trip



Shunt Trip



Undervoltage Trip

Description	Shunt Trip Type/Cat. No.	Operational Voltage	Rated Coil Current	Undervoltage Trip* Type/Cat. No.
<b>AC Coil:</b>				
12V AC	FA12ACR	8.4 - 13.2V	6A	UV12ACR
24V AC	FA24ACR	16.8 - 26.4V	2.8A	UV24ACR
48V AC	FA48ACR	33.6 - 52.8V	0.8A	UV48ACR
60V AC	FA60ACR	42 - 66V	~0.7A	UV60ACR
110V AC	FA110ACR	77 - 121V	0.5A	UV110ACR
120V AC	FA120ACR	84 - 132V	~0.5A	UV120ACR
230V AC	FA230ACR	161 - 253V	0.6A	UV230ACR
277V AC	FA277ACR	194 - 305V	~0.5A	UV277ACR
400V AC	FA400ACR	280 - 440V	0.5A	UV400ACR
<b>DC Coil:</b>				
12V DC	FA12DCR	8.4 - 13.2V	~6A	UV12DCR
24V DC	FA24DCR	16.8 - 26.4V	3A	UV24DCR
48V DC	FA48DCR	33.6 - 52.8V	2A	UV48DCR
110V DC	FA110DCR	77 - 121V	0.6A	UV110DCR

\* Reset-Hold Voltage = 0.85 x V<sub>E</sub>; Drop-Out Voltage = 0.2 x V<sub>E</sub>

Standard Pack: 10

Weight: 1.1kg (2.43 lb.)

Terminal Size - min/max

2.5 mm<sup>2</sup> (12 AWG) / 25mm<sup>2</sup> (3 AWG)

Terminal Torque - min/max

1.5 Nm (12 lb. in.) / 2 Nm (17.5 lb. in.)

#### Auxiliary Contact (4A/230 VAC)



Description	Type/ Cat. No.	Cable Max	Cable Min	Torque Max	Torque Min
1 x CO	H1COR				
2 x CO	H2COR	2.5mm <sup>2</sup> AWG 12	0.5mm <sup>2</sup> AWG 20	0.5Nm 4 lb-in	0.33Nm 3 lb-in
1 x CO, 1 Signal & Test Button	HSTCOR				

Standard Pack: 15

Weight: H1COR: 0.5kg (1.32 lb.); H2COR, HSTCOR: 0.72kg (1.59 lb.)

#### Lock-out Adapter

(uses small suitcase lock)



Description	Type/ Cat. No.
Yellow	EASS2

Standard Pack: 10

Weight: 50g (1.76 oz.)

Altech UL1077



# TR11 Series



up to 12 Amps

## UL1077 Recognized Supplementary Protector/ Circuit Breaker for Equipment

### Applications:

Protection of Control Transformers, UPS, Power strips, Solenoids etc., against damage due to overload conditions.



Current Rating	0.5 - 16.0A
Rated Voltage	240V AC, 50/60Hz, 32V DC / 24V DC (VDE)
Initial insulation resistance	> 100 M ohms. (As per EN 60934)
Dielectric strength	1.5 KV for One minute. (As per EN 60934) 6 I <sub>n</sub> ~ up to 9.0A
Overload Switching Capacity	4 I <sub>n</sub> - up to 12.0A (As per EN 60934) 60A Max. ~ from 10.0A to 12.0A 60A Max. - from 10.0A to 12.0A
Maximum Breaking Capacity	8x I <sub>n</sub> for <6.0A 60A MAX. for ≥ 6.0A
Power Loss	1 - 2 Watts
Operating Temperature	Maximum 60°C Ambient
Operational Life at 2xI <sub>n</sub>	1000 Cycles
Limited short circuit current	1000 Amps PC 1
Terminals	0.25" Quick connect
Applicable Standards	EN 60934, CSA 22.2 No. 235, UL-1077
Approvals	up to 16.0 A  upto 12.0A
Accessories	Dust Cover, DC-TR11 C (see page 20)

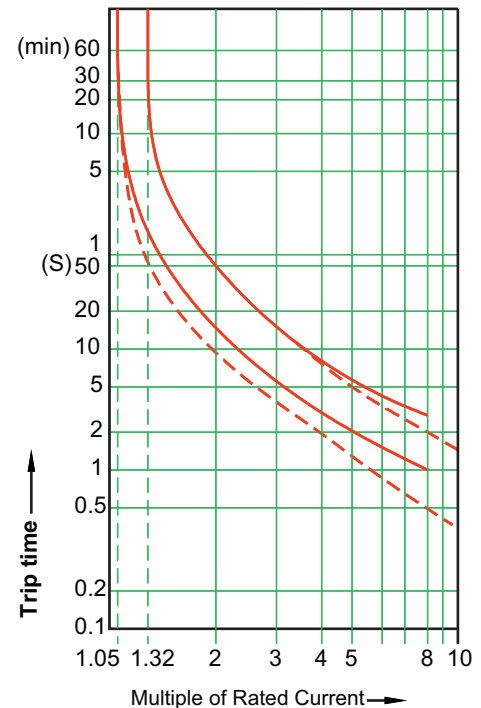
### Time Current Characteristics:

The standard characteristic is valid for ambient temperatures of +23°C. If the device is to be used in an ambient temperature other than +23°C, allowances must be made when selecting the current rating according to the following guidelines:

Ambient temp. °C	-20	-5	0	+10	+20	+30	+40	+50	+60
Correction Factor	0.8	0.88	0.9	0.96	1	1.05	1.12	1.2	1.3

Example :  
 Normal Continuous Current : 1.8A  
 Ambient Temperature : 40°C  
 Correction Factor : 1.12  
 Recommended Current Rating : 1.8 x 1.12 = 2.016  
 Select the nearest : 2.0A

## Operating Characteristic



— Rated current < 6 A  
- - - Rated current ≥ 6 A  
 Ambient Temperature 23°C

# TR-11 Characteristics & Mounting Options

**Application Examples:**

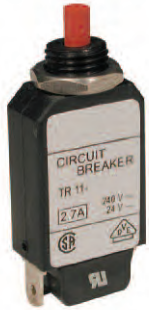
Protection of Control Transformers, UPS, Power strips, Solenoids etc., against damage due to overcurrent conditions.



E209569



up to 12 Amps



**Central Mounting**

Standard Pack: 10

Weight: 0.27kg (0.6 lb.)

Rated Current	Type/Cat. No.
0.5A	TR-11CX630.5A
0.9A	TR-11CX630.9A
1.0A	TR-11CX631A
1.2A	TR-11CX631.2A
1.5A	TR-11CX631.5A
1.8A	TR-11CX631.8A
2.0A	TR-11CX632A
2.2A	TR-11CX632.2A
2.5A	TR-11CX632.5A
2.7A	TR-11CX632.7A
3A	TR-11CX633A
3.3A	TR-11CX633.3A
4A	TR-11CX634A
5A	TR-11CX635A
6A	TR-11CX636A
6.5A	TR-11CY636.5A
7A	TR-11CY637A
8A	TR-11CY638A
9A	TR-11CY639A
10A	TR-11CY6310A
12A	TR-11CY6312A
15A	TR-11CY6315A
16A	TR-11CY6316A



**Wing Clips\***

Standard Pack: 10

Weight: 0.27kg (0.6 lb.)

Rated Current	Type/Cat. No.
0.5A	TR-11WX630.5A
0.9A	TR-11WX630.9A
1.0A	TR-11WX631A
1.2A	TR-11WX631.2A
1.5A	TR-11WX631.5A
1.8A	TR-11WX631.8A
2.0A	TR-11WX632A
2.2A	TR-11WX632.2A
2.5A	TR-11WX632.5A
2.7A	TR-11WX632.7A
3A	TR-11WX633A
3.3A	TR-11WX633.3A
4A	TR-11WX634A
5A	TR-11WX635A
6A	TR-11WX636A
6.5A	TR-11WY636.5A
7A	TR-11WY637A
8A	TR-11WY638A
9A	TR-11WY639A
10A	TR-11WY6310A
12A	TR-11WY6312A
15A	TR-11WY6315A
16A	TR-11WY6316A



**Snap Fitting\***

Standard Pack: 10

Weight: 0.27kg (0.6 lb.)

Rated Current	Type/Cat. No.
0.5A	TR-11SX630.5A
0.9A	TR-11SX630.9A
1.0A	TR-11SX631A
1.2A	TR-11SX631.2A
1.5A	TR-11SX631.5A
1.8A	TR-11SX631.8A
2.0A	TR-11SX632A
2.2A	TR-11SX632.2A
2.5A	TR-11SX632.5A
2.7A	TR-11SX632.7A
3A	TR-11SX633A
3.3A	TR-11SX633.3A
4A	TR-11SX634A
5A	TR-11SX635A
6A	TR-11SX636A
6.5A	TR-11SY636.5A
7A	TR-11SY637A
8A	TR-11SY638A
9A	TR-11SY639A
10A	TR-11SY6310A
12A	TR-11SY6312A
15A	TR-11SY6315A
16A	TR-11SY6316A



**Integral Mounting\***

Standard Pack: 10

Weight: 0.27kg (0.6 lb.)

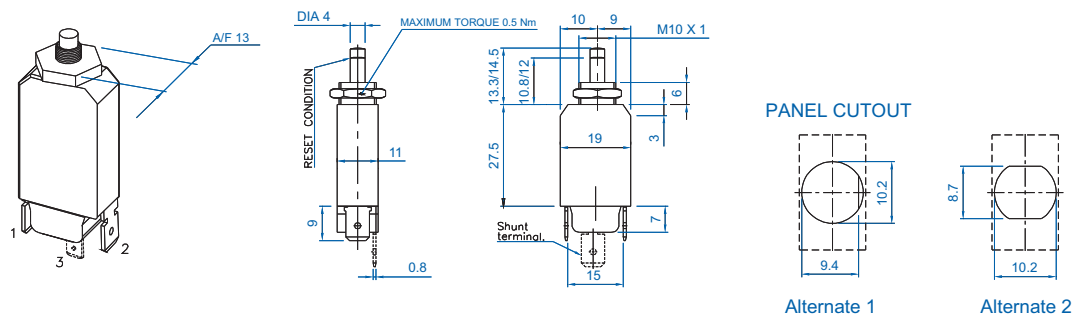
Rated Current	Type/Cat. No.
0.5A	TR-11BX630.5A
0.9A	TR-11BX630.9A
1.0A	TR-11BX631A
1.2A	TR-11BX631.2A
1.5A	TR-11BX631.5A
1.8A	TR-11BX631.8A
2.0A	TR-11BX632A
2.2A	TR-11BX632.2A
2.5A	TR-11BX632.5A
2.7A	TR-11BX632.7A
3A	TR-11BX633A
3.3A	TR-11BX633.3A
4A	TR-11BX634A
5A	TR-11BX635A
6A	TR-11BX636A
6.5A	TR-11BY636.5A
7A	TR-11BY637A
8A	TR-11BY638A
9A	TR-11BY639A
10A	TR-11BY6310A
12A	TR-11BY6312A
15A	TR-11BY6315A
16A	TR-11BY6316A

\* SPECIAL ORDER ONLY. Contact Altech for more details.

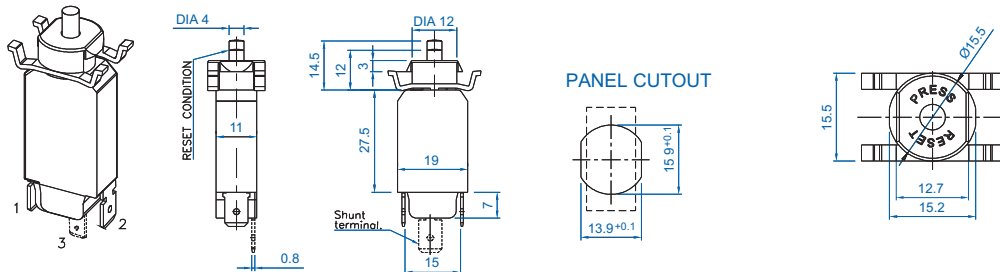
PCB Mounting and additional Shunt Terminal available, please contact Altech.

## TR-11 Dimensions & Mounting Options

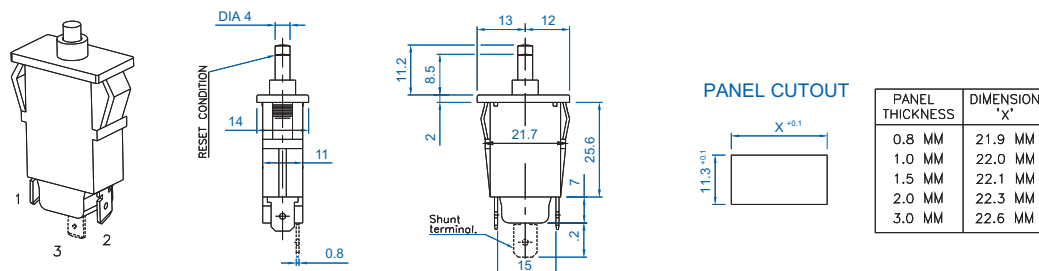
### Central Mounting



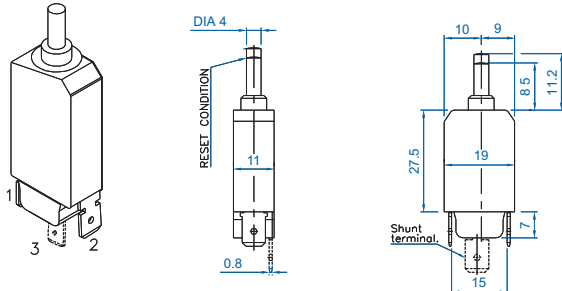
### Wing Clips



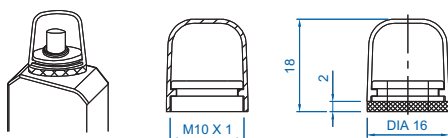
### Snap Fitting



### Integral Mounting



### Dust Cover



Cover is suitable for central mounting type circuit breaker to provide dust & splash protection (IP 54).  
Type/Cat. No.: DC TR11 C

Dimensions in mm (to convert to inches multiply by 0.03937)