

## Description

Single pole thermal-magnetic circuit breakers with tease-free, trip-free, press-to-reset snap action mechanism and special dual button manual release which avoids the danger of unintended disconnection (M-type TM CBE to EN 60934). Surface mounted, compact design available with fast acting, standard and delayed switching characteristics. Options include auxiliary contact and remote electrical disconnection.

## Typical applications

Heavy duty vehicles, battery systems, process control.

## Ordering information

### Type No.

- 446** single pole base mounting, fast characteristic curve
- 447** single pole base mounting, medium delay characteristic curve
- 449** single pole base mounting, delayed characteristic curve

### Terminal design, mounting

**K** screw terminals M12, insertion nuts M8

### Manual release

**H** standard

### Version

**N** general application (type 446 only)

**FN** general application (types 447 and 449 only)

### Auxiliary contacts (optional)

**Si** 2 electrically separate auxiliary contacts with screw terminals M3.5 and blade terminals DIN 46244-C-MS-S

### Remote trip (optional for types 447 and 449)

**FA24** DC 24 V coil voltage

### Current ratings

**30...400 A** type 446

**100...400 A** type 447

**125...500 A** type 449

**447 - K - H - FN - ... - ... - 400 A** ordering example

The exact part number required can be built up from the table of choices shown above. Ordering references for optional features should be omitted if not required.

## Standard current ratings and typical internal resistance values

Current ratings (A)	Internal resistance (Ω)	Current ratings (A)	Internal resistance (Ω)
<b>Type 446:</b>		<b>Type 447:</b>	
30	0.006	100	< 0.002
40	0.0048	125	< 0.001
50	0.0038	160	< 0.001
60	0.0028	225	< 0.001
70	0.0025	300	< 0.001
80	0.0023	400	< 0.001
90	0.0019	<b>Type 449:</b>	
100	0.0016	125	< 0.001
125	< 0.001	160	< 0.001
150	< 0.001	225	< 0.001
170	< 0.001	315	< 0.001
200	< 0.001	350	< 0.001
225	< 0.001	400	< 0.001
250	< 0.001	500	< 0.001
300	< 0.001	only with 50 % ON duty	
350	< 0.001		
400	< 0.001		

All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.



**446-... 447-... 449-...**

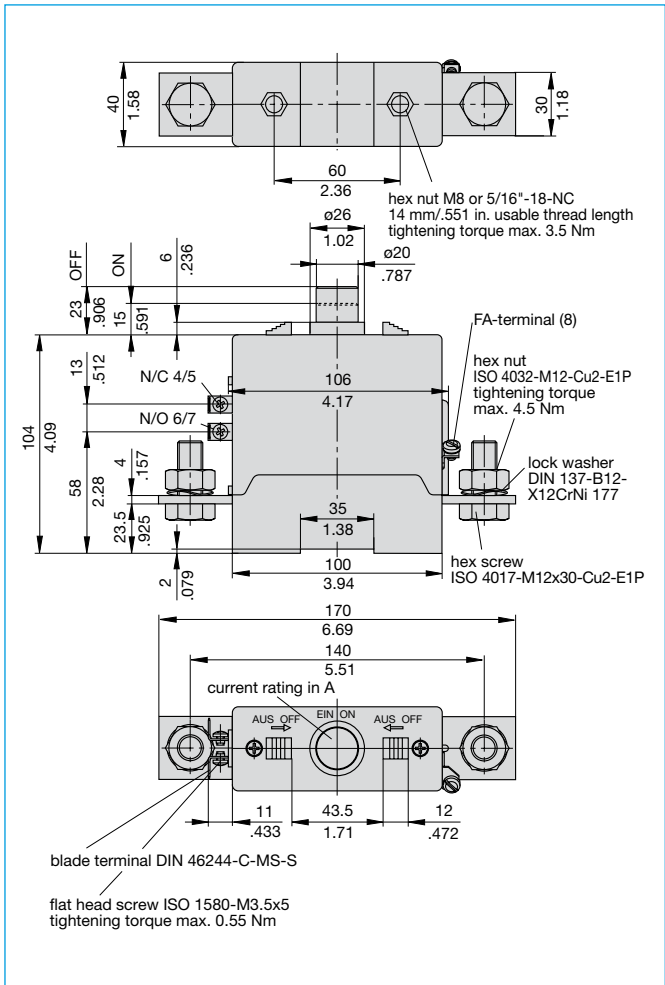
## Technical data

Voltage rating	DC 28 V	
Current rating range	type 446: 30...400 A type 447: 100...400 A type 449: 125...500 A	
Auxiliary circuit	10 A	
Electrical remote disconnection (-FA)	operating voltage DC 12 V or DC 24 V operating current approx. 18 A or 12 A max. pulse time 10 ms < t <sub>ON</sub> < 20 ms / t <sub>OFF</sub> > 10 s switching time < 20 ms	
Typical life	1,000 operations at I <sub>N</sub> 2,000 operations mechanical	
Ambient temperature	-55...+75 °C (-67...+167 °F)	
Insulation co-ordination (IEC 60664 and 60664A)	rated impulse withstand voltage 1.5 kV	pollution degree 3
Dielectric strength (IEC 60664 and 60664A)	test voltage operating area main circuit to auxiliary contacts	AC 1,500 V AC 1,500 V
Insulation resistance	> 100 MΩ (DC 500 V)	
Interrupting capacity I <sub>cn</sub>	10,000 A	
Degree of protection (IEC 60529/DIN 40050)	operating area IP40 terminal area IP00	
Vibration	to VG 95210, sheet 19, IEC 60068-2-6, test Fc: without aux. contacts: 10 g (56-500 Hz), ± 0.76 mm (10-55 Hz) with auxiliary contacts: 4 g (56-500 Hz), ± 0.30 mm (10-56 Hz)	
Shock	to VG 95210, sheet 28, IEC 60068-2-27, test Ea: without aux. contacts: 50 g (11 ms) with auxiliary contacts: 20 g (11 ms)	
Corrosion	96 hours at 5 % salt mist to VG 95210, sheet 2, IEC 60068-2-11, test Ka	
Humidity	240 hours at 95 % RH to VG 95210, sheet 7, IEC 60068-2-3, test C	
Mass	approx. 850 g	

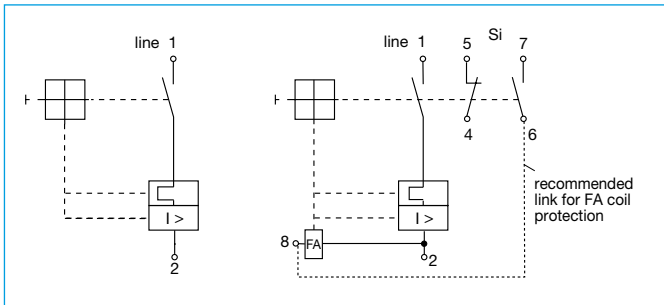
## Approvals

Authority	Voltage ratings	Current ratings
<b>Type 446:</b>	UL	DC 28 V
<b>Type 447:</b>	UL	DC 28 V
	QPL Sweden	DC 28 V
<b>Type 449:</b>	UL	DC 28 V
	VG 95345, part 15	DC 28 V

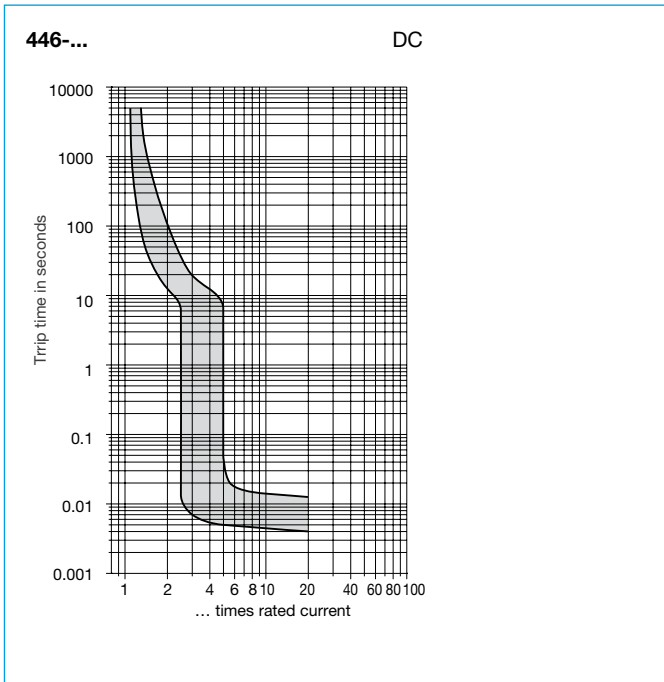
**Dimensions**



**Internal connection diagrams**



**Typical time/current characteristics at +23 °C/+73.4 °F**



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This is a metric design and millimeter dimensions take precedence ( $\frac{mm}{inch}$ )

**Typical time/current characteristics**

