

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
S	screw terminals M12, insertion nuts 5/16-18
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)	
FA12	DC 12 V coil voltage
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

Type	Current rating (A)	Internal resistance (Ω)	Type	Current rating (A)	Internal resistance (Ω)
Type 446	30	0.006	Type 447	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			
	100	0.0016	Type 449	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			
	350	< 0.001			
	400	< 0.001			
					only with 50 % ON duty

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-...

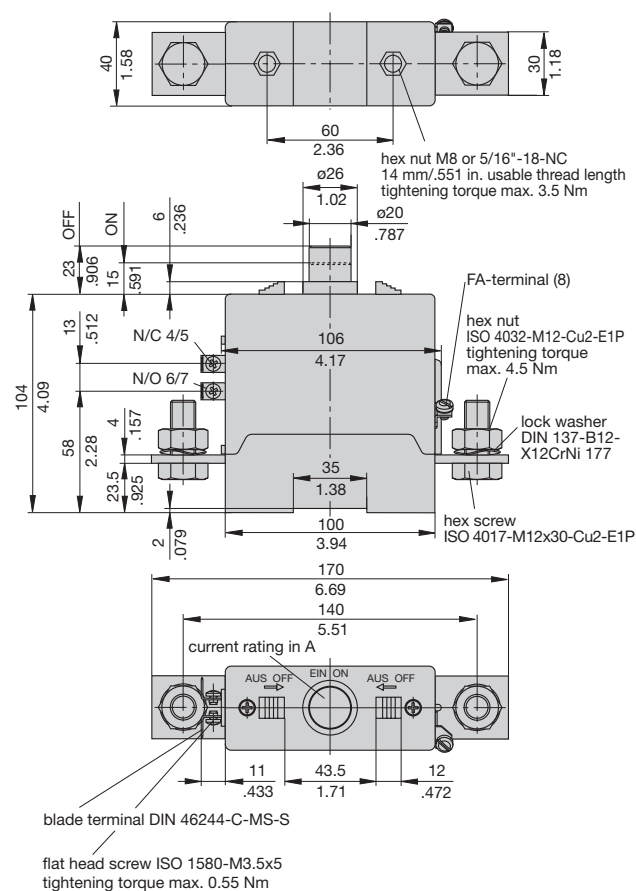
Technical data

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 _{ON} < 20 ms / t _{OFF} > 10 s switching time < 20 ms	
Typical life	1,000 operations at I _N 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 AC 1,000 V	operating area AC 1,000 V main circuit to auxiliary contacts AC 1,000 V
Insulation resistance	>100 MΩ (DC 500 V)	
Interrupting capacity I _{cn}	10,000 A	
Degree of protection (IEC 60529/DIN 40050)	operating area IP40 terminal area IP00	
Vibration	without auxiliary 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) to VG 95210, sheet 19/IEC 60068-2-6, test Fc	
Shock	without auxiliary contacts: 50 g (11 ms) with auxiliary contacts: 20 g (11 ms) to VG 95210, sheet 28/IEC 60068-2-27, test Ea	
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

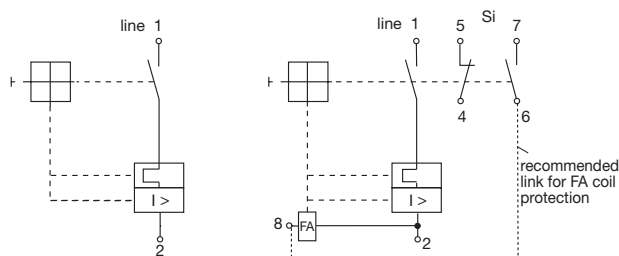
Authority	Voltage ratings	Current ratings
Type 446: UL	DC 28 V	30...400 A
Type 447: UL	DC 28 V	100...400 A
	QPL Sweden	DC 28 V 125...400 A
Type 449: UL	DC 28 V	125...350 A
	VG 95345, part 15	DC 28 V 125...500 A

Dimensions

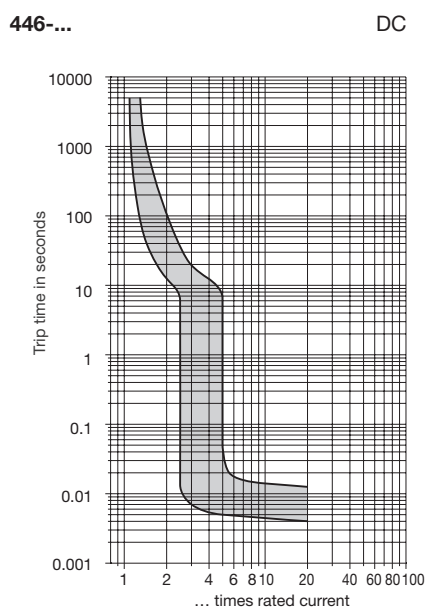


This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

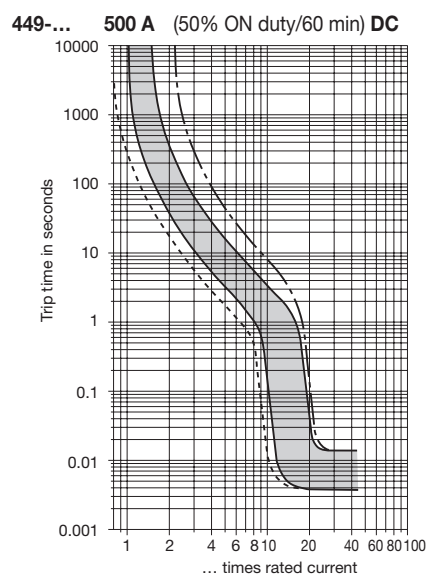
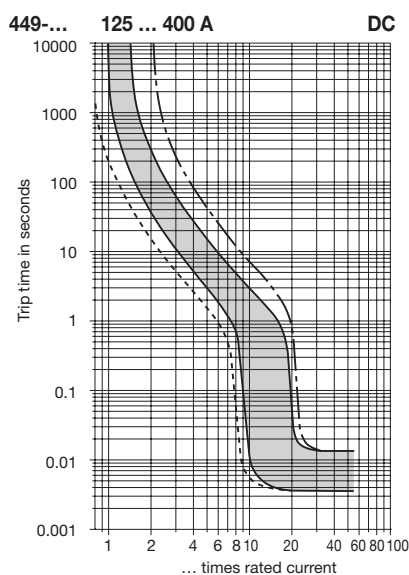
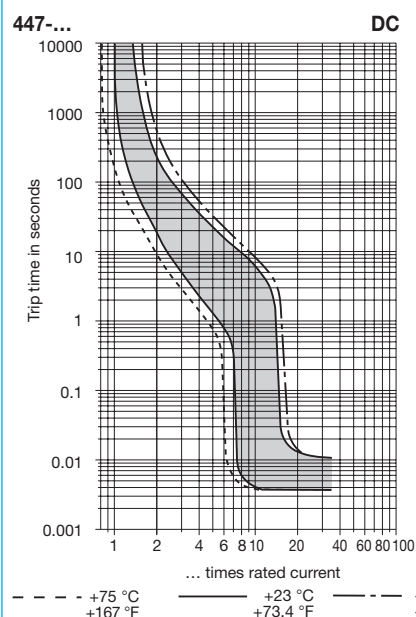
Internal connection diagrams



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



Typical time/current characteristics



Circuit breakers with remote disconnection facility will trip 10% faster.