

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 / 447 / 449	single pole base mounting
Terminal design, mounting	
K	screw terminals M12, insertion nuts M8
S	screw terminals M12, insertion nuts 5/16"
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 M 3.5 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 - - - 200 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 rating (A)	Internal resistance (Ω)	Current rating (A)	Internal resistance (Ω)
446		447	
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	449	
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		



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 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 IP 40 terminal area IP 00	
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
VG 95345, part 15	DC 28 V	125...500 A (449)
QPL Sweden	DC 28 V	125...400 A (447)
UL	DC 28 V	30...400 A (446) 100...400 A (447) 125...350 A (449)

Internal connection diagrams

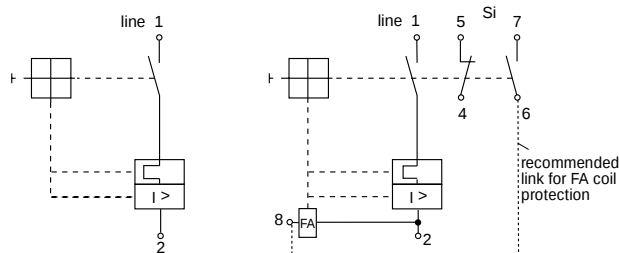
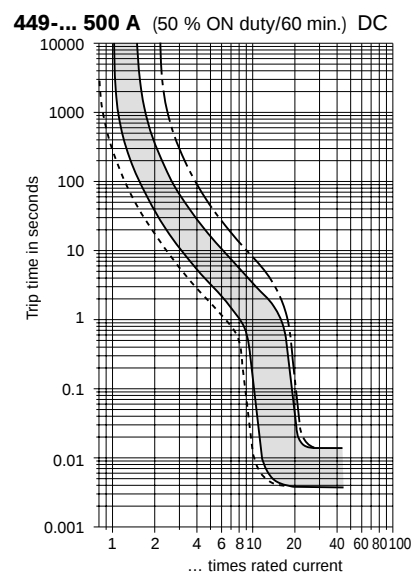


Figure 1 is a log-log plot showing the trip time in seconds (Y-axis, ranging from 0.001 to 10000) versus the times rated current (X-axis, ranging from 1 to 100). The curve illustrates the inverse relationship between trip time and current magnitude. The trip time is highest at low currents (around 5000 seconds at 1.1 times rated current) and decreases rapidly as the current increases. The trip time reaches a minimum of approximately 0.005 seconds between 2 and 4 times rated current, then slightly increases to about 0.01 seconds at 20 times rated current.

Typical time/current characteristics



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.