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)

- **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. **Please be informed that we have minimum ordering quantities to be observed.**

Standard current ratings and typical internal resistance values

Current ratings (A)	Internal resistance (Ω)	Current ratings (A)	Internal resistance (Ω)
Type 446:		**Type 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	**Type 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		

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

For further details please see: www.e-t-a.de/ti_e

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 operating current max. pulse time switching time	 DC 12 V or DC 24 V approx. 18 A or 12 A 10 ms < t_{ON} < 20 ms / t_{OFF} > 10 s < 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)	Overvoltage category pollution degree 2 / 3 Resulting in a rated impulse withstand voltage of 500 V at DC 28 V to DIN EN 60664-1
Dielectric strength (IEC 60664 and 60664A) operating area main circuit to auxiliary contacts	test voltage AC 1,500 V AC 1,500 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 aux. contacts: with auxiliary contacts:	to VG 95210, sheet 19, IEC 60068-2-6, test Fc: 10 g (56-500 Hz), ± 0.76 mm (10-55 Hz) 4 g (56-500 Hz), ± 0.30 mm (10-56 Hz)
Shock without aux. contacts: with auxiliary contacts:	to VG 95210, sheet 28, IEC 60068-2-27, test Ea: 50 g (11 ms) 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

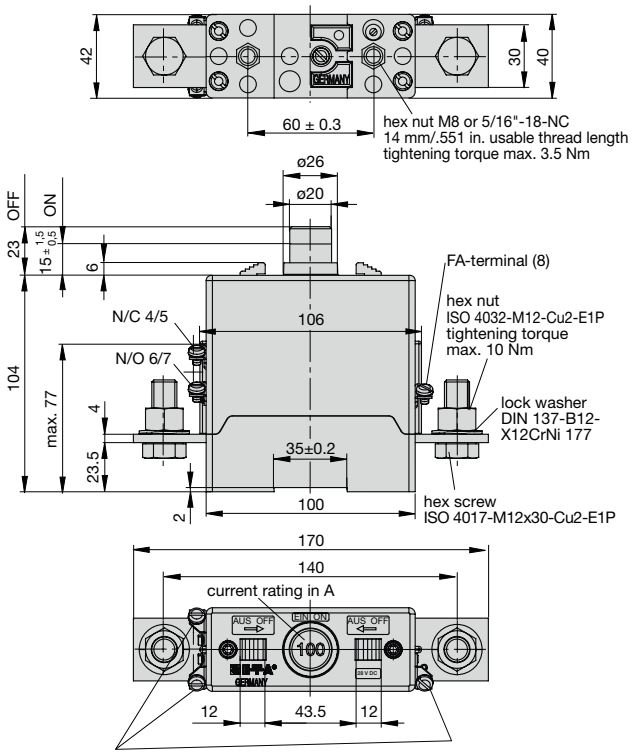
Approvals

Authority		Standard	Rated voltage	Current ratings
Type 446/ Type 447	UL	UL 1077	DC 28 V	up to 400 A
	CSA	C22.2 No 235	DC 28 V	up to 400 A
Type 449:	UL	UL 1077	DC 28 V	100...350 A
	CSA	C22.2 No 235	DC 28 V	100…350 A
	Bw	95345, part 15	DC 28 V	125...500 A

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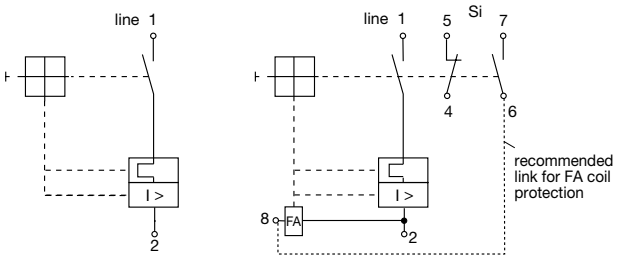
Dimensions

447-K-H-FN-Si-FA (<350A)
449-K-H-FN-Si-FA (<350A)

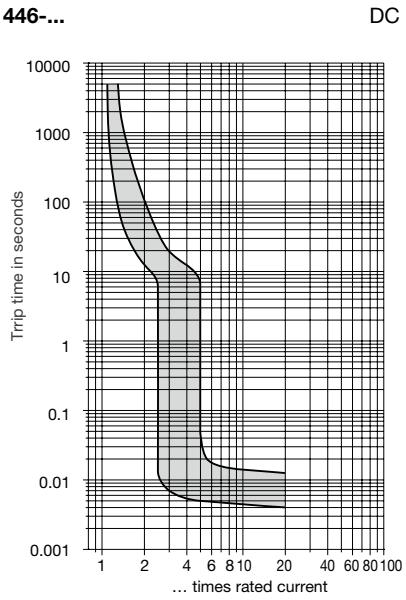


This is a metric design and millimeter dimensions take precedence ($\frac{mm}{inch}$)

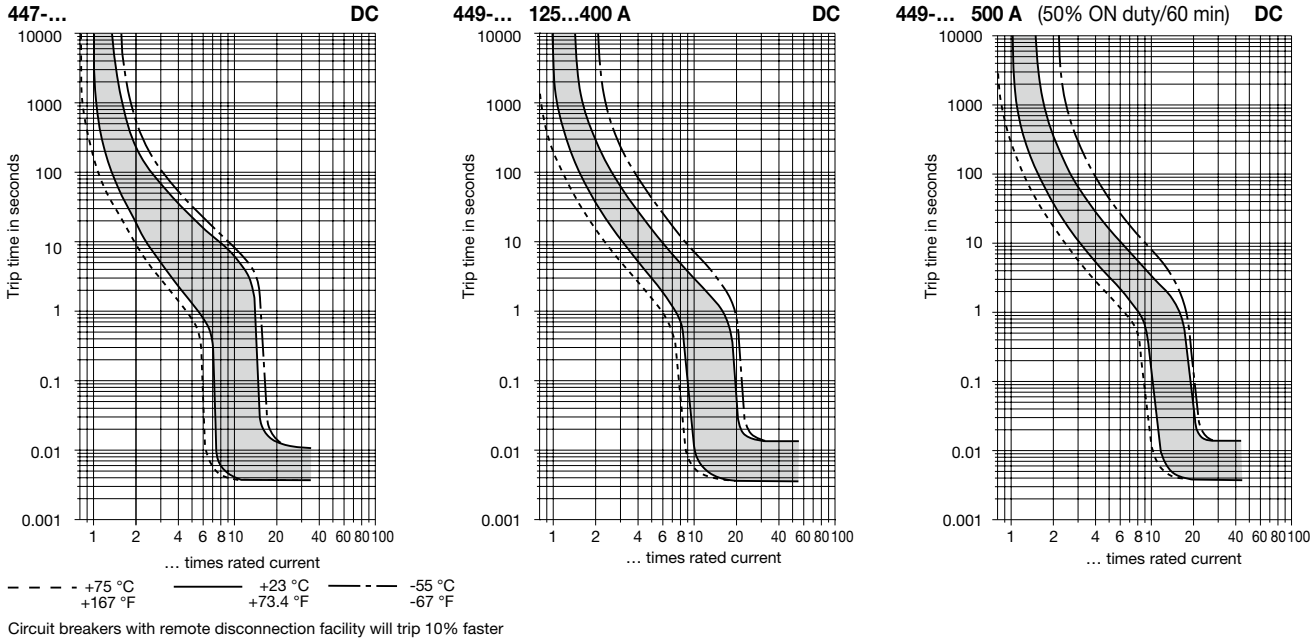
Internal connection diagrams



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



Typical time/current characteristics



Circuit breakers with remote disconnection facility will trip 10% faster