

TMC

Thermomagnetic Circuit Breaker

CLIPLINE

Data Sheet
100695_01_en

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Description

As system engineering becomes more automated, the demands as regards availability of technical equipment is increasing. Safety and protective equipment are particularly affected.

The enormous requirements where protective equipment is concerned, however, are more than fulfilled by the thermomagnetic circuit breaker. It has the following features:

- Thermomagnetic triggering system
- Modular and flexible structure
- Auxiliary contacts for fault assessment
- Fine nominal current gradations, which guarantee reliable protection of sensitive equipment and systems

The course of the thermomagnetic characteristic curve can be seen in the idealized characteristic curve below. With a delayed tripping mechanism, the thermal part of the characteristic curve protects against overload. High overload and short circuit currents cause the magnetic part of the circuit breaker to operate without delay and it is triggered within a matter of milliseconds.

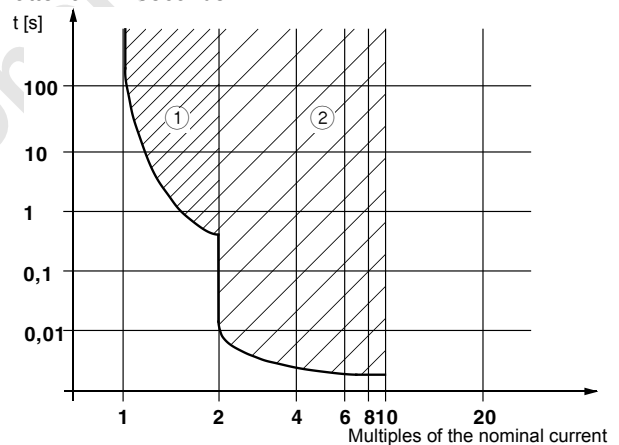


Figure 1 Idealized characteristic curve

- ① Thermal triggering range
- ② Magnetic triggering range



Make sure you always use the latest documentation.
It can be downloaded at www.download.phoenixcontact.com.

A conversion table is available on the Internet at
www.download.phoenixcontact.com/general/7000_en_00.pdf.




This data sheet is valid for all products listed on the following page:

Ordering Data

Thermomagnetic Circuit Breaker

Description	Type	Order No.	Pcs./Pck.
Thermomagnetic circuit breaker, with universal foot for mounting on  or 	TMC... (see ordering key)		6

Accessories

Description	Type	Order No.	Pcs./Pck.
Insertion bridge, insulated, 80-pos. 	EB 80-12 (I_{max} : 50 A) (with center infeed I_N : 80 A)	3009338	1
Zack strip, 10-section, white	ZB 6 (ordering data see CLIPLINE catalog)		
Screwdriver	SZS 0,6X3,5	1205053	10

Ordering Key

Type	Main Current Paths	Characteristic Curves	Auxiliary Contact Versions	Nom. Current
TMC	1 ≙ 1-position 2 ≙ 2-position 3 ≙ 3-position	F1 ≙ thermal $1.05 \times I_N \dots 1.4 \times I_N$, magnetic $2 \times I_N \dots 4 \times I_N$ DC (fast blow), only for DC applications M1 ≙ thermal $1,05-1,4 I_N$, magnetic $6 \times I_N \dots 12 \times I_N$ AC, $7.8 \times I_N \dots 15.6 \times I_N$ DC (normal blow)	100 ≙ 1-pos.: 1 N/O contact 200 ≙ 1-pos.: 1 N/C contact 120 ≙ 2-pos.: 1 N/O contact, 1 N/C contact 122 ≙ 3-pos.: 1 N/O contact, 2 N/C contacts	0,2A 2,5A 0,3A 3A 0,4A 4A 0,5A 5A 0,6A 6A 0,8A 8A 1A 10A 1,2A 12A 2A 16A

Ordering example: One TMC with 1-pos. main current path, one N/O contact, normal blow characteristic curve and a nominal current of 2 A: **TMC 1 M1 100 2A**


Technical Data

Technical Data in Accordance With IEC/DIN VDE

Auxiliary contact: max. load current	1 A at 2.5 mm ²
Max. cross section with insertion bridge (solid and stranded)	1.5 mm ²
Rated surge voltage	4 kV
Contamination class	3
Surge voltage category	III
Insulating material group	I

Connection Capacity	Main Contact	Auxiliary Contact
Nominal voltage	250 V AC (65 V DC)	250 V AC (65 V DC)
Nominal current	See ordering key	See ordering key, 16 A max.
Connection capacity		
Solid	0.2 mm ² ... 6 mm ²	0.2 mm ² ... 2.5 mm ²
Stranded	0.2 mm ² ... 4 mm ²	0.2 mm ² ... 1.5 mm ²
Connection capacity (stranded with ferrule)		
without plastic sleeve	0.25 mm ² ... 4 mm ²	0.25 mm ² ... 1.5 mm ²
with plastic sleeve	0.25 mm ² ... 2.5 mm ²	0.25 mm ² ... 1.5 mm ²
Two conductors with same cross section		
Solid and stranded	0.2 mm ² ... 1 mm ²	0.2 mm ² ... 0.75 mm ²
Stranded with ferrule without plastic sleeve	0.2 mm ² ... 1 mm ²	0.2 mm ² ... 0.5 mm ²
Stranded with TWIN ferrule with plastic sleeve	0.5 mm ² ... 2.5 mm ²	0.5 mm ² ... 0.75 mm ²
Stripping length	12 mm	12 mm

Connection Capacity (Continued)	Main Contact	Auxiliary Contact
Cylindrical gauge (IEC 60947-1)	A 3	A 1
Thread	M3	M3
Torque	0.6 Nm ... 0.8 Nm	0.6 Nm ... 0.8 Nm

General Data	
Width x Length	12.5 mm x 83.5 mm
Height	
On DIN rail NS 35/ 7,5...	96 mm
On DIN rail NS 35/15...	103.5 mm
On DIN rail NS 32...	100.5 mm
Insulating material	PA-F
Inflammability class in accordance with UL 94	V0
Approvals	

Approval Data	UL	CSA/CUL
Nominal voltage	250 V AC (65 V DC)	250 V AC (65 V DC)
Nominal current	16 A	16 A
Conductor sizes	AWG 24 ... 10 (14)	AWG 28 ... 10 (14)

Back-up Fuse

A back-up fuse together with a circuit breaker must always be used if there is the risk of the maximum switching current being exceeded in the event of a fault. The maximum switching current, the internal resistance and the resulting back-up fuse are shown in the table.

Nominal Current [A]	I.v.h.b.c. Back-up Fuse [A]	Internal Resistance [Ω]		Interrupting Capacity in Acc. With EN 60934 [A]
		F1 (Fast Blow) for DC	M1 (Normal Blow) for DC/AC	
0.2	any	39.3	26.1	400
0.3	any	17.5	11.6	400
0.4	any	9.2	6.6	400
0.5	any	6.8	4.1	400
0.6	any	4.2	3	400
0.8	any	2.8	1.65	400
1	any	1.6	1.10	400
1.5	25	0.78	0.47	400
2	25	0.42	0.28	400
2.5	25	0.26	0.183	400
3	25	0.18	0.124	400
4	25	0.12	0.077	400
5	25	0.092	0.063	400
6	50	0.054	0.045	800
8	50	0.025	≤ 0.02	800
10	50	0.022	≤ 0.02	800
12	50	≤ 0.02	≤ 0.02	800
16	50	≤ 0.02	≤ 0.02	800

Tripping Characteristics

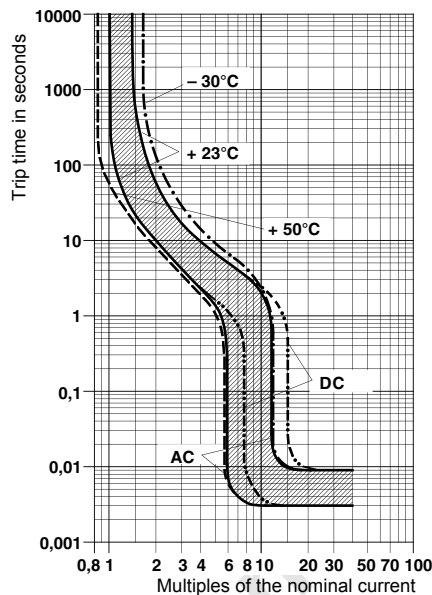
The thermomagnetic circuit breaker is available in 18 fine nominal current gradations and as a one-position or multi-position version. The version with the normal blow tripping characteristic (M1) is equally suitable for applications with AC and with DC current. The fast-blow (F1) characteristic curve version is suitable for applications with DC current.

If several circuit breakers are loaded simultaneously, then the rise in the temperature caused by the components heating up each other is equivalent to a rise in the ambient temperature. In this case, only 80% of the nominal current can be supplied. Alternatively the load current can be increased by a multiplication factor and the circuit breaker can then be dimensioned accordingly:

Ambient Temperature [°C]	-10	0	10	20	30	40	50	60
Multiplication Factor	0.84	0.92	1	1	1	1.08	0.16	1.24

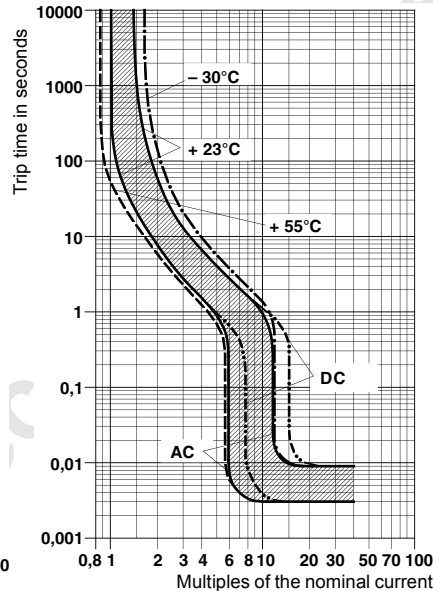
Normal Blow (M1): Nominal Value 0.2 A ... 6 A

- lower tripping limit: $1.05 \times I_N$
- upper tripping limit: $1.4 \times I_N$



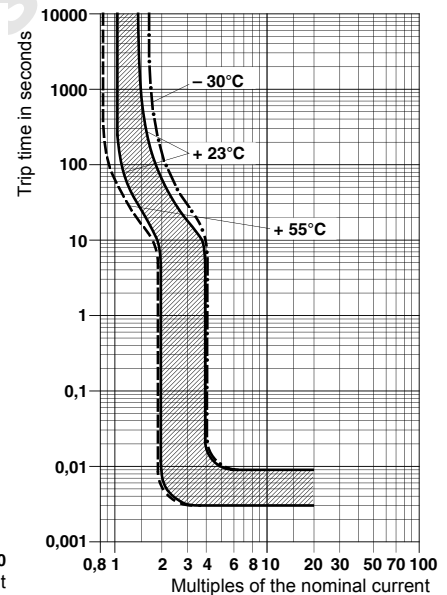
Normal Blow (M1): Nominal Value 8 A ... 16 A

- lower tripping limit: $1.05 \times I_N$
- upper tripping limit: $1.4 \times I_N$

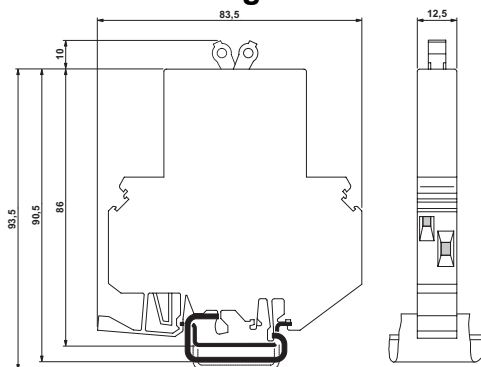


Fast Blow (F1): Nominal Value 0.2 A ... 16 A (only for DC applications!)

- lower tripping limit: $1.05 \times I_N$
- upper tripping limit: $1.4 \times I_N$



Dimensional Drawing



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