E-T-A Thermal-Magnetic Circuit Breaker 2210-T2..

Description

One, two and three pole thermal-magnetic circuit breakers with trip-free mechanism and toggle actuation (S-type TM CBE to EN 60934/IEC 934). Featuring a combi-foot design for both symmetric and asymmetric rail mounting. Available with auxiliary contact (1 x N/O or 1 x N/C) for status signalling. Two and three pole models are internally linked to ensure that both/all poles trip in the event of an overload on one pole, even if the actuator is held in the ON position. This CBE can be supplied in current ratings up to 32 A with a choice of characteristic curves. All screw terminals are recessed for safety. Approved to CBE standard EN 60934 (IEC 60934).

Typical applications

Process control equipment, robotics, machine tool control, communications systems, instrumentation.

2210-T2..

single pole 3 pole

Ordering information

Type No.

2210 single and multipole thermal-magnetic circuit breaker

Mounting

T rail mounting

Actuator design

2 toggle

Number of poles

1 single pole protected
2 2 pole protected
3 3 pole protected
5 2 pole, protected on one pole only

Accessories

0 without accessories

Terminal design (main contacts)

K0 screw terminals

Characteristic curve

F1 fast acting: therm.1.01-1.4xI_N; magn.2-4xI_N DC (DC only)
F2 fast acting: therm.1.01-1.4xI_N; magn.3,5-6,5xI_N AC/4,5-8,5xI_N DC
M1 standard delay: therm. 1.01-1.4xI_N; magn. 6-12xI_N AC, 7.8-15.6xI_N DC
T1 delayed: therm. 1.01-1.4 I_N; magn. 10-20xI_N AC
T2 thermal only, 1.01-1.4xI_N
M3 standard delay, low resistance: therm. 1.4-1.8xI_N; magn. 6-12xI_N AC, 7.8-15.6 x I_N DC

Auxiliary contact design

H without intermediate position

Auxiliary contacts

0 without auxiliary contacts
1 with auxiliary contacts
2 auxiliary contacts on pole 1 only (multipole devices)
3 auxiliary contacts on pole 1 and 3 (3pole devices)

Auxiliary contact function (see diagrams)

2 1 N/O contact
3 1 N/C contact

Auxiliary contact - terminal design

1 screw terminals

Current ratings

0.1...32 A

2210 - T 2 1 0 - K0 M1- H 1 2 1 - 10 A ordering example

Technical data

Voltage rating	AC 250 V; 3 AC 433 V (50/60 Hz); DC 65 V (UL: AC 277/480 V; DC 65 V)
Current rating range	0.1...32 A for curves M1, T1, T2 (32 A resistive load only) 0.1...16 A for curves F1, F2, M3
Auxiliary circuit	1 A, AC 240 V / DC 65 V
Typical life	10,000 operations at 1 x I_N
Ambient temperature	-30...+60 °C (-22...+140 °F) T 60
Insulation co-ordination (IEC 60664 and 60664 A)	rated impulse withstand voltage 2.5 kV; pollution degree 2 reinforced insulation in operating area
Dielectric strength (IEC 60664 and 60664A) operating area main/aux. circuit pole/pole	test voltage AC 3,000 V AC 3,000 V AC 1,500 V
Insulation resistance	> 100 MΩ (DC 500 V)
Interrupting capacity I_{cn}	0.1...5 A 400 A; 6...32 A 800 A; curve T2 : 0.1...32 A 15 x I_N curve M3: 0.1...2 A AC 200A /DC 400A
Interrupting capacity (UL 1077)	I_N: 0.1...16 A / 20...32 A 1 + 2 pole: AC 277 V /5,000 A / AC 277 V /2,000 A 3 pole: 3 AC 480 V /5,000 A / 3 AC 480 V /2,000 A 1 + 2 pole: DC 65 V /2,000 A / DC 65 V / 2,000 A
Degree of protection (IEC 60529/DIN 40050)	operating area IP30 terminal area IP20
Vibration	curve F1: 3 g (57-500 Hz), ±0.23 mm (10-57 Hz) curves M1, M3, T1, T2: 5 g (57-500 Hz), ±0.38 mm (10-57 Hz) to IEC 60068-2-6, test Fc 10 frequency cycles/axis
Shock	curve F1: 25 g (11 ms), directions 1,2,3,4,5 10 g (11 ms), direction 6 curves M1, M3, T1, T2: 25 g (11 ms), directions 1,2,3,4,5 20 g (11 ms), direction 6 to IEC 60068-2-27, test Ea
Corrosion	96 hours at 5 % salt mist to IEC 60068-2-11, test Ka
Humidity	240 hours at 95 % RH to IEC 60068-2-3, test Ca
Mass	approx. 60 g per pole

Approvals

Authority	Voltage ratings	Current ratings
VDE (EN 60934)	3 AC 433 V, AC 250 V, DC 65 V	0.1...32 A
LRoS, BV	3 AC 415 V, AC 250 V, DC 65 V	0.1...32 A
UL, CSA	3 AC 480 V, AC 277 V, DC 65 V	0.1...32 A

Standard current ratings and typical internal resistance values

Current rating (A)	Internal resistance (Ω) F1 fast acting for DC only	F2 fast acting delay for AC + DC	M1 standard for AC + DC	T1 delayed low resistance nur für AC	M3 standard delay for AC + DC	T2 thermal for AC + DC
0.1	162	162	92	81	42	77
0.2	39.3	39.3	26.1	24.2	11.7	23
0.3	17.5	17.5	11.6	10.4	5.6	10.2
0.4	9.2	9.2	6,6	6.0	2.9	5.7
0.5	6.8	6.8	4,1	3.9	1.75	3,7
0.6	4.2	4.2	3	2.7	1.42	2.6
0.8	2.8	2.8	1.65	1.53	0.75	1.39
1	1.6	1.6	1,10	0.98	0.5	0.9
1.5	0.78	0.78	0.47	0.42	0.22	0.36
2	0.42	0.42	0.28	0.24	0.136	0.19
2.5	0.26	0,26	0.183	0.17	0.083	0.141
3	0.18	0.18	0.124	0.12	0.057	0.091
4	0.12	0.12	0.077	0.073	0.041	0.051
5	0.092	0.092	0.063	0.055	0.032	0.040
6	0.054	0.054	0.045	0.039	0.021	0.027
8	0.025	0.025	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02
10	0.022	0.02	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02
12	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02
16	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02
20	-	-	≤ 0.02	≤ 0.02	-	≤ 0.02
25	-	-	≤ 0.02	≤ 0.02	-	≤ 0.02
32	-	-	≤ 0.02	≤ 0.02	-	≤ 0.02

Internal connection diagrams

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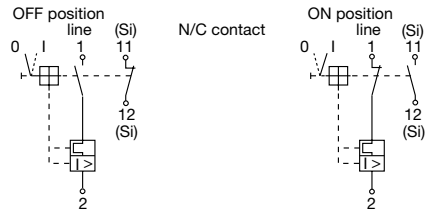

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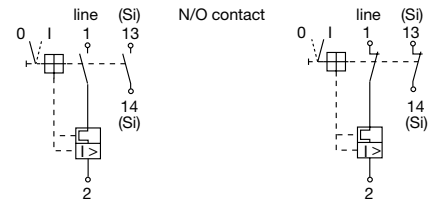
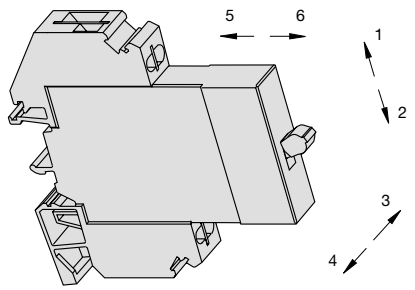
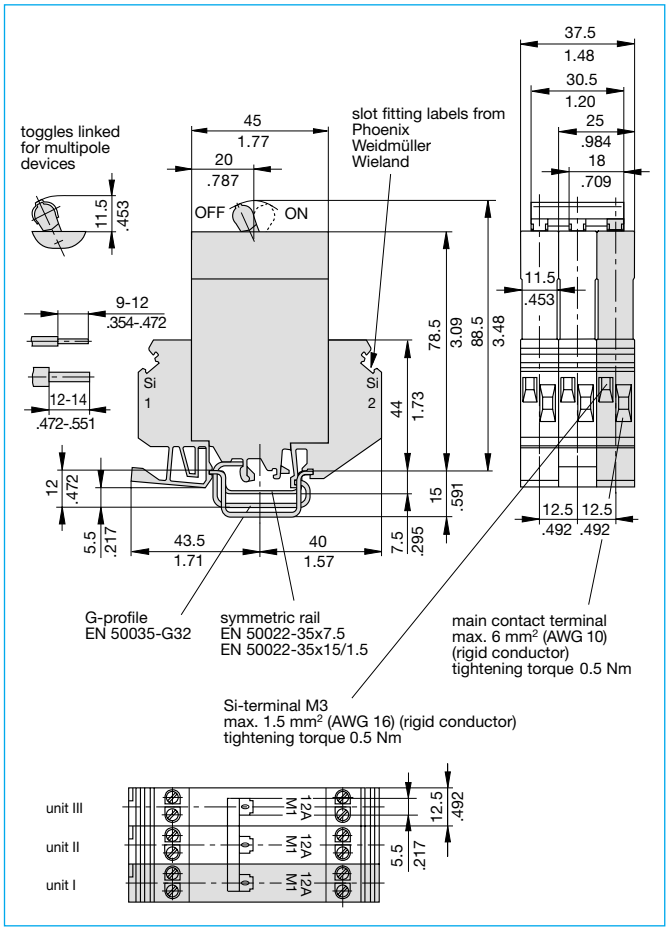


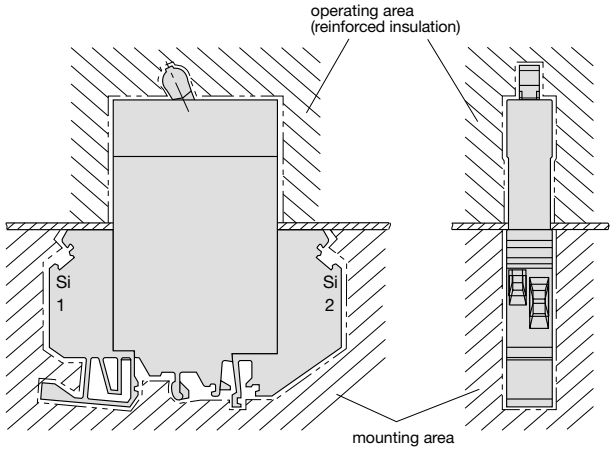
Shock directions



Dimensions



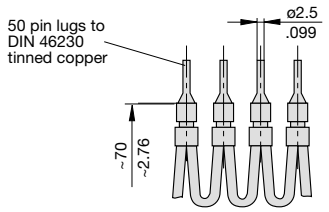
Installation drawing



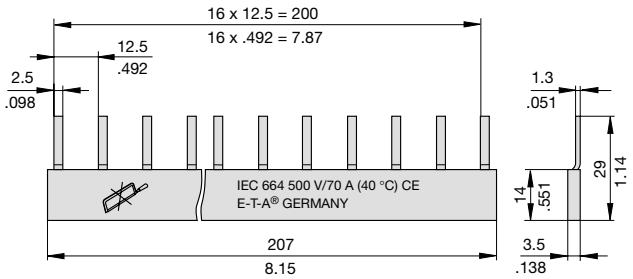
This is a metric design and millimeter dimensions take precedence ($\frac{mm}{inch}$)

Accessories

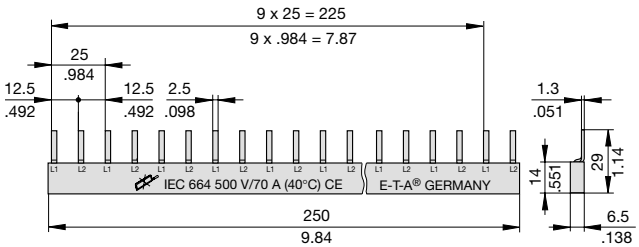
Connector bus links -K10
X210 589 01/2.5 mm², (AWG 14) (black) up to 20 A max. load
X210 589 02/1.5 mm², (AWG 16) (brown) up to 13 A max. load



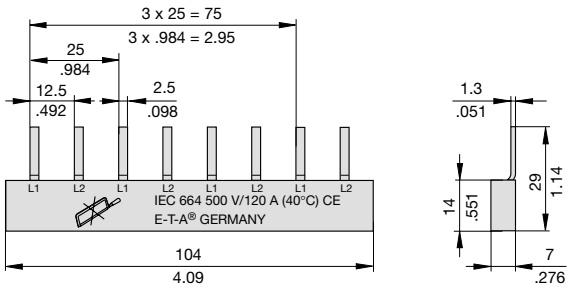
Bus bar for 1pole units (17-way), up to 70 A max. load
X221 498 01



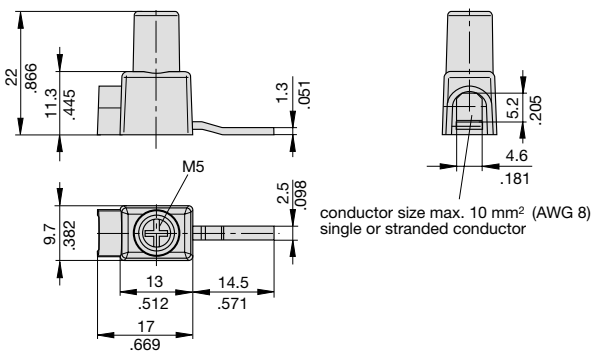
Bus bar for 2pole units (2 x 10-way), up to 120 A max. load
X221 497 01



Bus bar for 2 pole units (2 x 4-way), up to 120 A max. load
X222 002 01

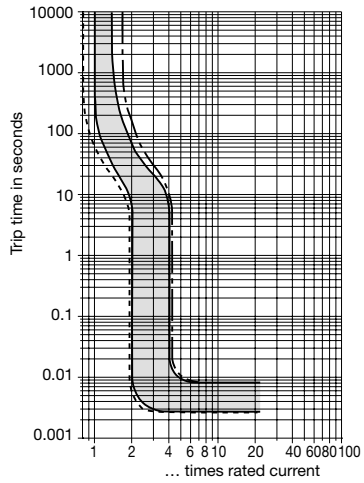


Supply terminal for bus bar (up to 70 A max. load)
X221 496 01

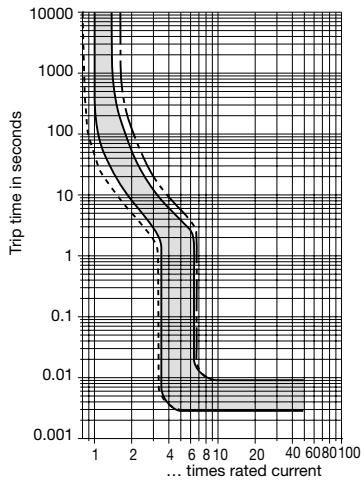


Typical time/current characteristics

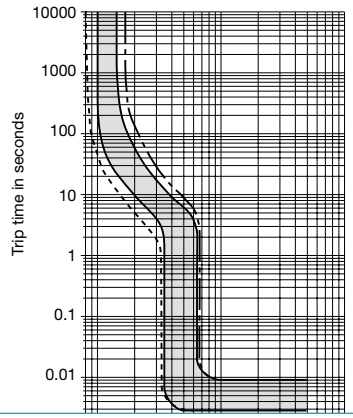
-F1 0.1 ... 16 A **DC only**



-F2 0.1 ... 7.5 A **AC/ DC** [1)]



-F2 8 ... 16 A **AC/ DC** [1)]



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

Typical time/current characteristics

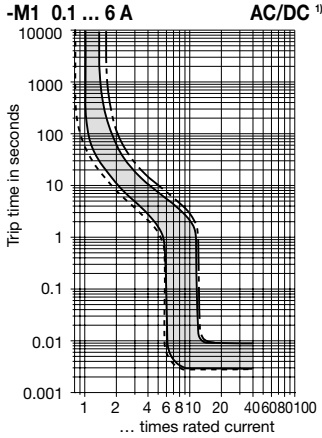
The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section 9 – Technical information.

Ambient temperature	°F	-22	-4	+14	+32	+73.4	+86	+104	+122	+140
	°C	-30	-20	-10	0	+23	+30	+40	+50	+60
Derating factor		0.76	0.79	0.83	0.88	1	1.04	1.11	1.19	1.29

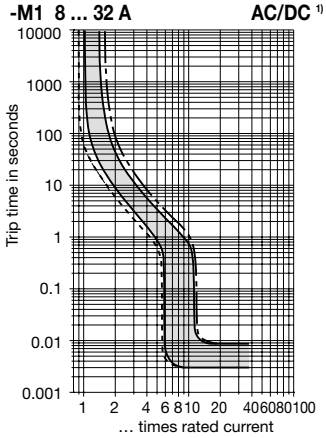
Multi pole devices: all poles symmetrically loaded. With single pole overload, thermal tripping will be at max. 1.7 x I_N with curves F1, F2, M1 and T2, and at max. 2.2 x I_N with curve M3.

[1] Magnetic tripping currents are increased by 30% on DC supplies.

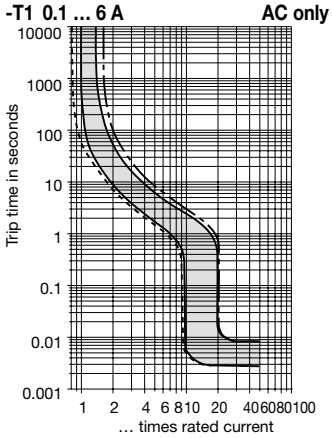
-M1 0.1 ... 6 A AC/DC [1]



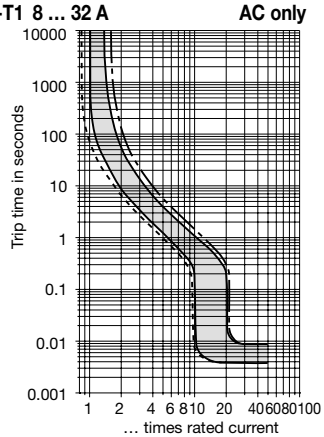
-M1 8 ... 32 A AC/DC [1]



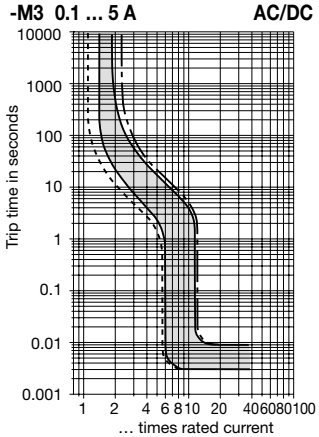
-T1 0.1 ... 6 A AC only



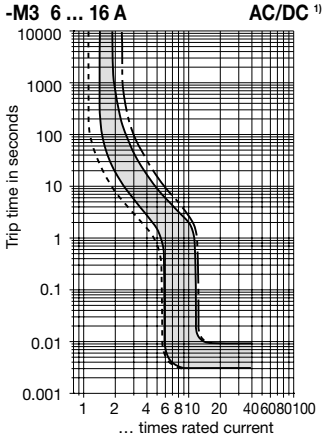
-T1 8 ... 32 A AC only



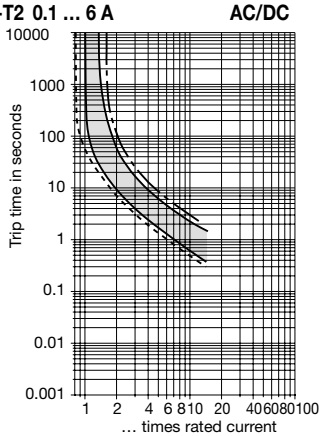
-M3 0.1 ... 5 A AC/DC [1]



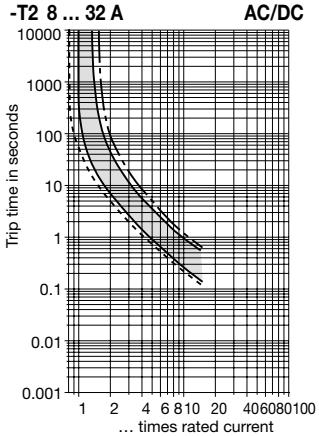
-M3 6 ... 16 A AC/DC [1]



-T2 0.1 ... 6 A AC/DC



-T2 8 ... 32 A AC/DC



– – – – +60 °C +140 °F ——— +23 °C +73.4 °F —·— -30 °C -22 °F

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.