

ETA 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

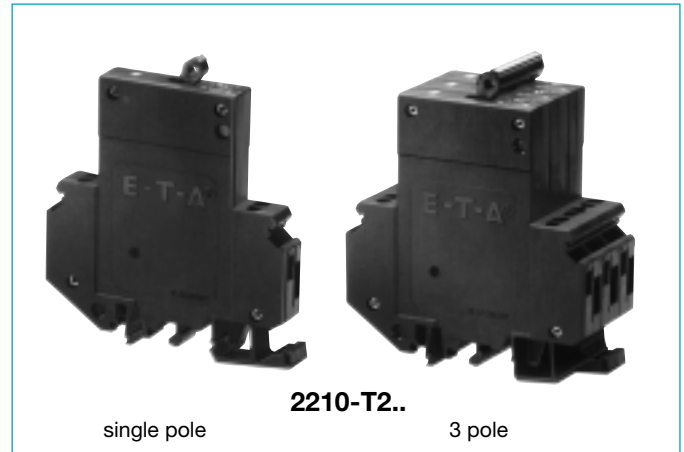
Process control equipment, robotics, machine tool control, communications systems, instrumentation.

Ordering information

Type No.	
2210 single and multi pole 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 (multi pole devices)
3	auxiliary contacts on pole 1 and 3 (3 pole 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

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.



Technical data

Voltage rating	AC 250 V; 3 AC 433 V (50/60 Hz); DC 65 V UL/CSA: 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 1xI _N	
Ambient temperature	-30...+60 °C (-22...+140 °F) T 60	
Insulation co-ordination (IEC 60664 and 60664 A)	Rated impulse withstand voltage	Pollution degree
	2.5 kV	2
	reinforced insulation in operating area	
Dielectric strength (IEC 60664 and 60664 A)	Test voltage operating area	AC 3,000 V
	main/aux. circuit pole/pole	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 15xI _N Curve M3: 0.1... 2 A AC 200 A /DC 400 A	
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 IP 30 terminal area IP 20	
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	

Thermal-Magnetic Circuit Breaker 2210-T2..

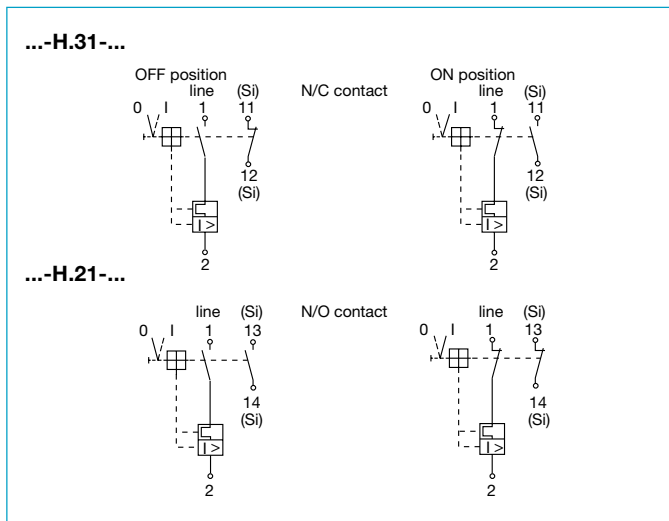
Standard current ratings and typical internal resistance values

Current rating (A)	Internal resistance (Ω)				
	F1 fast acting for DC only F2 fast acting for AC + DC	M1 standard delay AC + DC	T1 delayed AC only	M3 low resistance standard delay AC + DC	T2 thermal AC + DC
0.1	162	92	81	42	77
0.2	39.3	26.1	24.2	11.7	23
0.3	17.5	11.6	10.4	5.6	10.2
0.4	9.2	6.6	6.0	2.9	5.7
0.5	6.8	4.1	3.9	1.75	3.7
0.6	4.2	3	2.7	1.42	2.6
0.8	2.8	1.65	1.53	0.75	1.39
1	1.6	1.10	0.98	0.5	0.9
1.5	0.78	0.47	0.42	0.22	0.36
2	0.42	0.28	0.24	0.136	0.19
2.5	0.26	0.183	0.17	0.083	0.141
3	0.18	0.124	0.12	0.057	0.091
4	0.12	0.077	0.073	0.041	0.051
5	0.092	0.063	0.055	0.032	0.040
6	0.054	0.045	0.039	0.021	0.027
8	0.025	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02
10	0.022	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02
12	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02	≤ 0.02
16	≤ 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

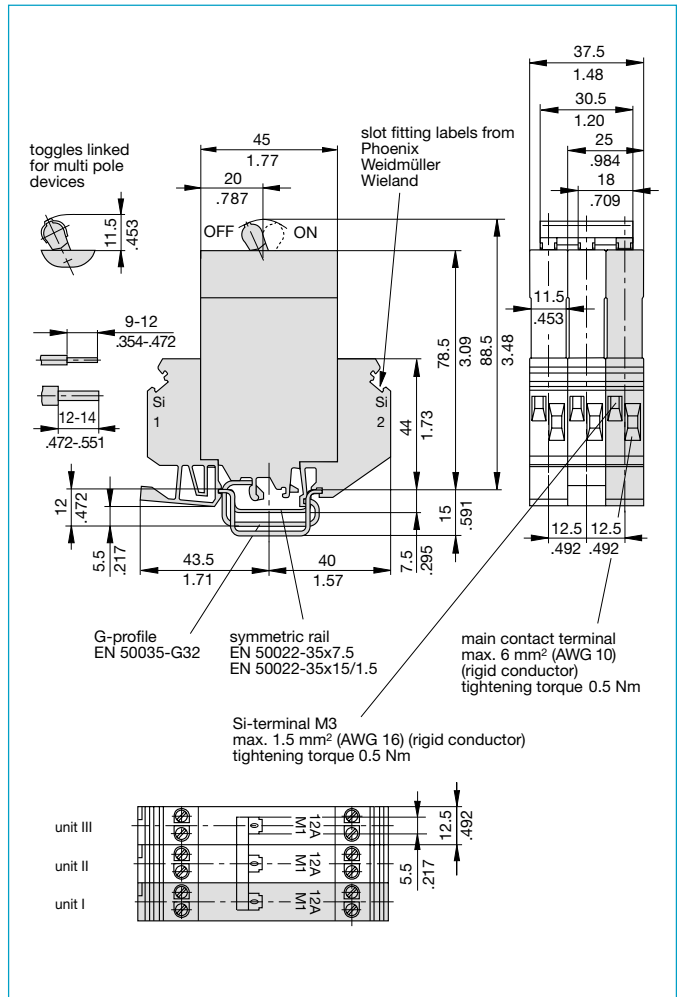
Approvals

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

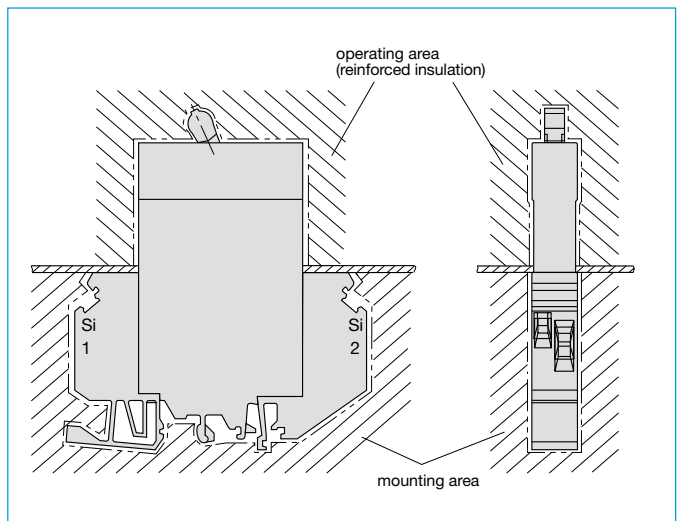
Internal connection diagrams



Dimensions



Installation drawing

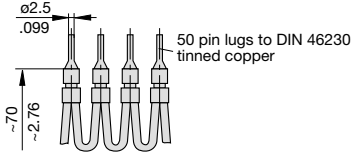


This is a metric design and millimeter dimensions take precedence ($\frac{mm}{inch}$)

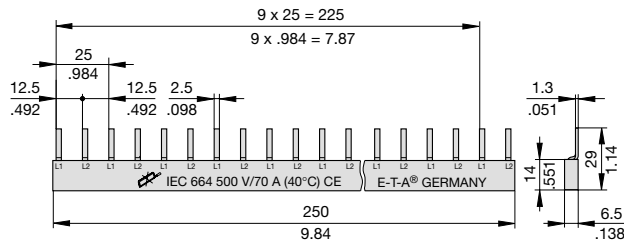
Accessories

Connector bus links -K10

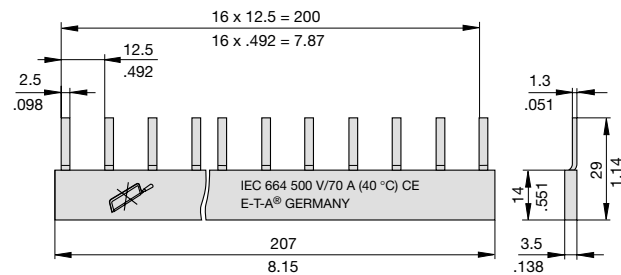
X210 589 01/2.5 mm² (black) up to 20 A max. load
X210 589 02/1.5 mm² (brown) up to 13 A max. load



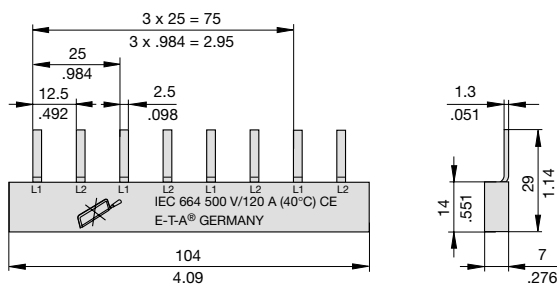
Bus bar for 2 pole units (2 x 10 way), up to 120 A max. load **X221 497 01**



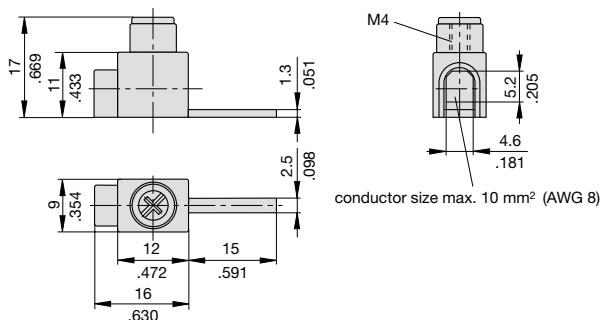
Bus bar for 1 pole units (17 way), up to 70 A max. load **X221 498 01**



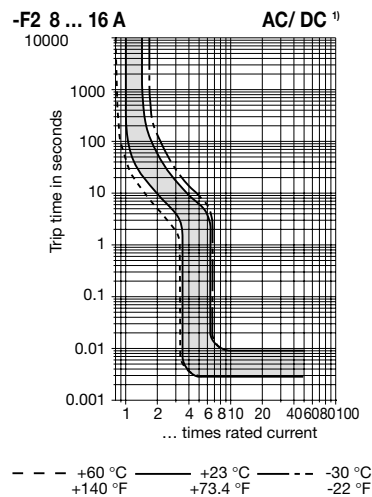
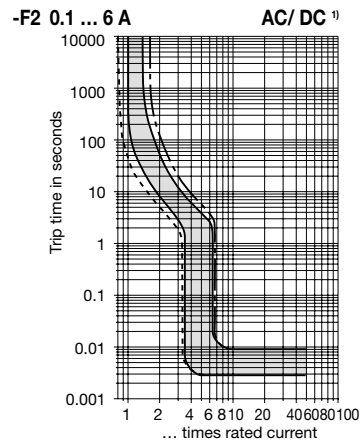
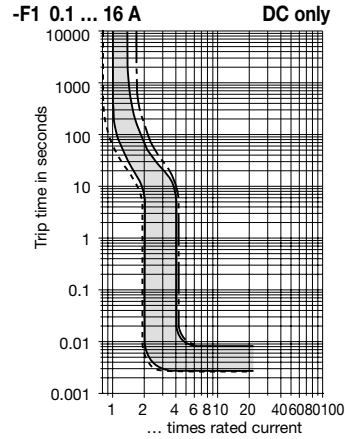
Bus bar for 2 pole units (2 x 4 way), up to 120 A max. load **X222 002 01**



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



Typical time/current characteristics



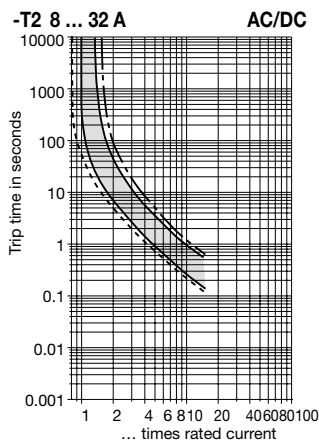
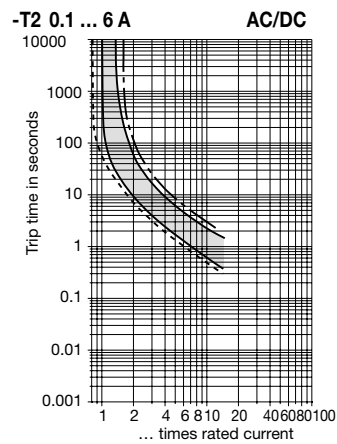
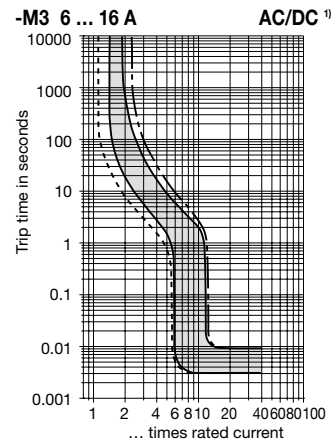
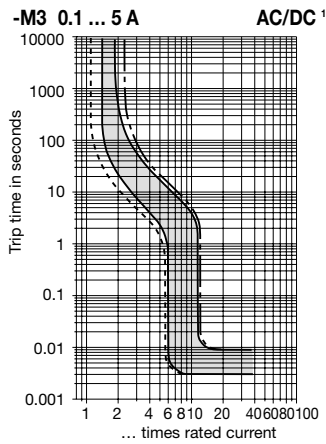
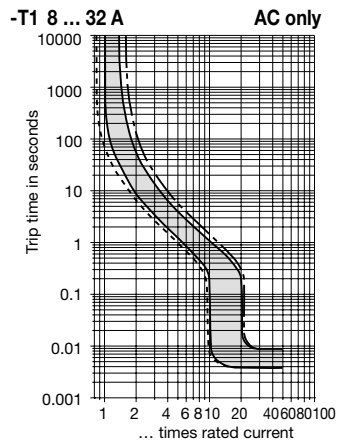
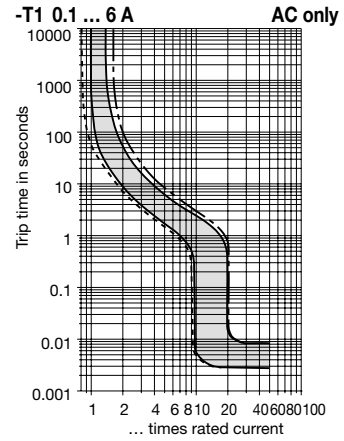
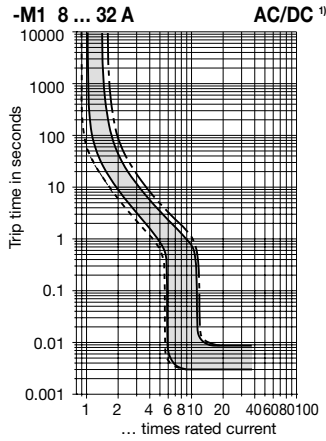
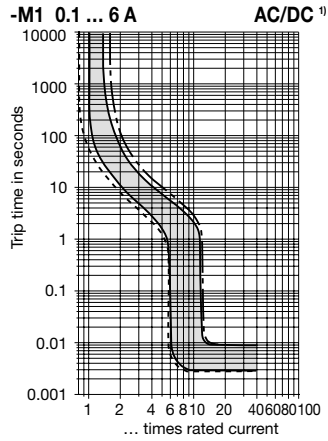
This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

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 temp. °F	-22	-4	+14	+32	+50	+73.4	+86	+104	+122	+140
°C	-30	-20	-10	0	+10	+23	+30	+40	+50	+60
Multiplication factor	0.76	0.79	0.83	0.88	0.93	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. $1.7xI_N$ with curves F1, M1 and T2, and at max. $2.2xI_N$ with curve M3.



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

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