

Description

Single pole thermal-magnetic circuit breaker with tease-free, trip-free, snap action mechanism and two button operation (M-type TM CBE to EN 60934). Featuring a narrow profile housing, recessed terminals, standard EN rail mounting, and precision CBE performance. Approved to CBE standard EN 60934 (IEC 60934).

Typical applications

Process control systems, instrumentation, rail vehicles.

Ordering information

Type No.	
201	single pole, rail mounted version
201-WA	low-resistance version
Option	
2705	fitted with adapter X 200 409 01
Current ratings	
0.05...16 A (type 201)	
0.05...10 A (type 201-WA)	
201 - ... - ... - 10 A	ordering example

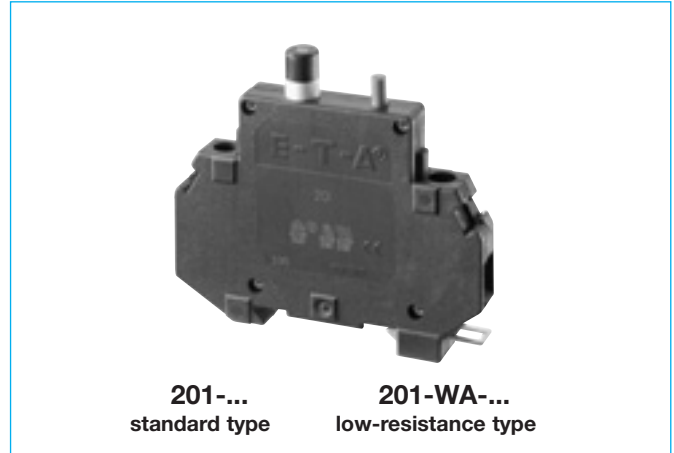
The exact part number required can be built up from the table of choices shown above. Ordering references for optional features should be omitted if not required.

Standard current ratings and typical internal resistance values

Current rating (A)	Internal resistance (Ω)		Current rating (A)	Internal resistance (Ω)	
	201	201-WA		201	201-WA
0.05	447	211	3	0.19	0.054
0.1	131	48	4	0.090	0.035
0.2	40	12.4	5	0.061	0.025
0.3	19.3	5.7	6	0.041	< 0.02
0.4	10.4	3.1	7	0.034	< 0.02
0.5	7.1	2.0	8	< 0.02	< 0.02
0.6	4.3	1.32	10	< 0.02	< 0.02
0.8	2.5	0.76	12	< 0.02	
1	1.67	0.49	14	< 0.02	
1.5	0.61	0.21	15	< 0.02	
2	0.38	0.101	16	< 0.02	
2.5	0.24	0.078			

Approvals

Authority	Voltage ratings	Current ratings
VDE (EN 60 934)	AC 240 V; DC 65 V	0.05...16 A
CSA, UL	AC 250 V; DC 80 V	0.05...16 A

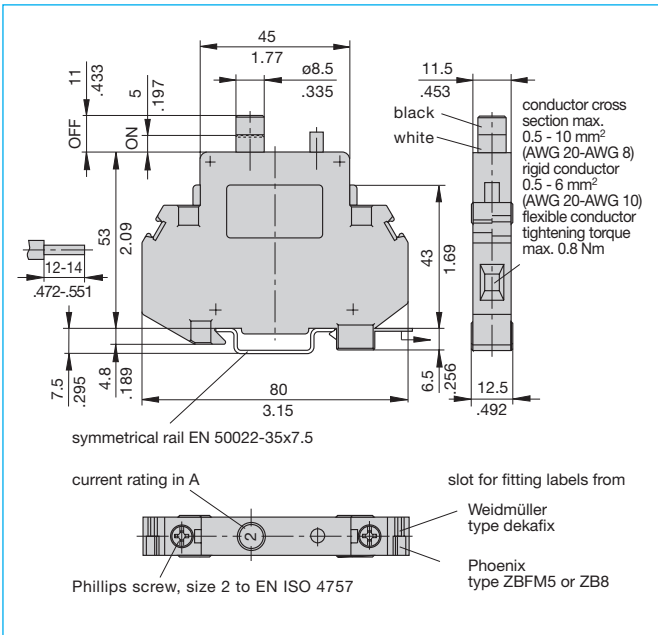


Technical data

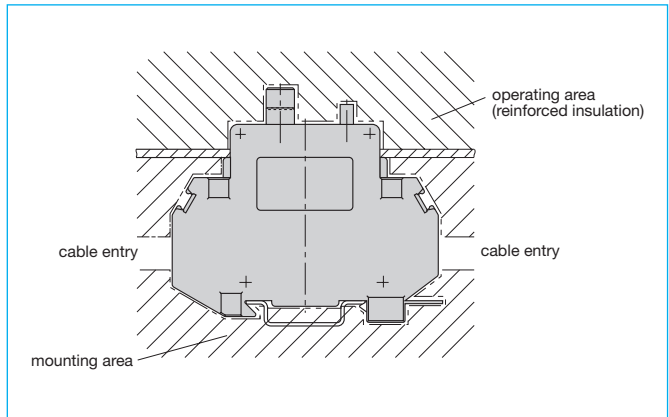
For further details please see chapter: Technical Information

Voltage rating	AC 240 V (50/60 Hz); DC 65 V (UL: AC 250 V; DC 80 V)		
Current rating range	201: 0.05...16 A 201-WA: 0.05...10 A		
Typical life	5,000 operations at $1 \times I_N$, inductive 5,000 operations at $2 \times I_N$, resistive		
Ambient temperature	-30...+60 °C (-22...+140 °F)		
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	test voltage AC 3,000 V		
Insulation resistance	> 100 M Ω (DC 500 V)		
Interrupting capacity I_{cn}	201 0.05...0.8 A 1...2 A 2.5...16 A	201-WA 0.05...0.2 A 0.3...2 A 2.5...10 A	self-limiting 200 A 400 A
Interrupting capacity (UL 1077)	I_N 0.05...16 A 0.05...16 A	U_N AC 250 V DC 80 V	1,000 A 1,000 A
Degree of protection (IEC 60529/DIN 40050)	operating area IP40 terminal area IP20		
Vibration	5 g (57-500 Hz), ± 0.38 mm (10-57 Hz) to IEC 60068-2-6, test Fc 10 frequency cycles/axis		
Shock	25 g (11 ms) 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		

Dimensions

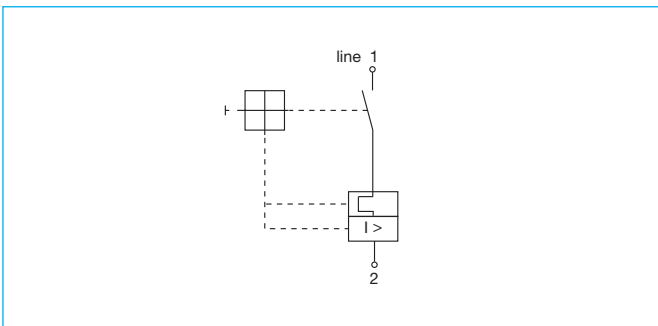


Installation drawing



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

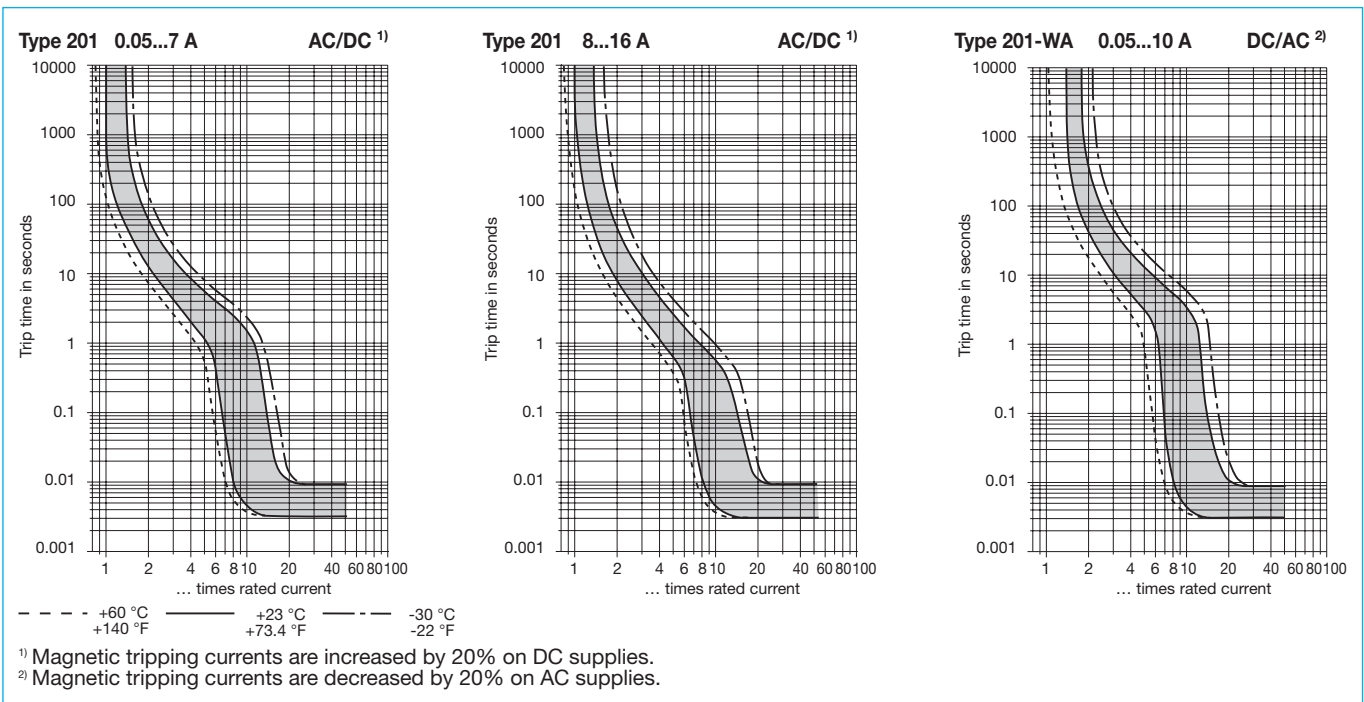
Internal connection diagram



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.

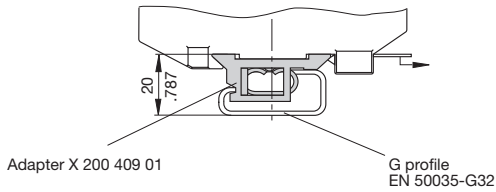
Ambient temperature °F	-22	-4	+14	+32	+73.4	+104	+122	+140
°C	-30	-20	-10	0	+23	+40	+50	+60
Derating factor	0.76	0.79	0.83	0.88	1	1.08	1.16	1.24

Typical time/current characteristics

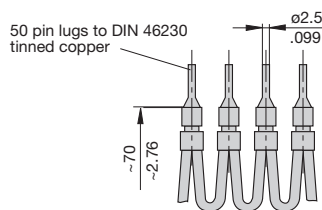


Accessories

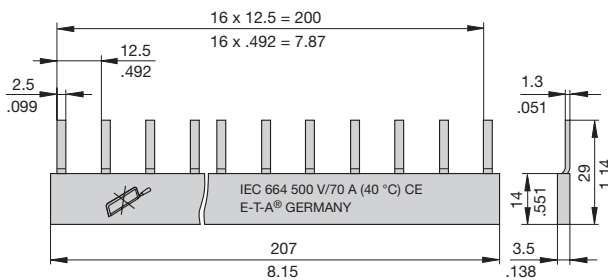
**Adapter for EN rail 50035-G32 specified as a separate item
X 200 409 01**



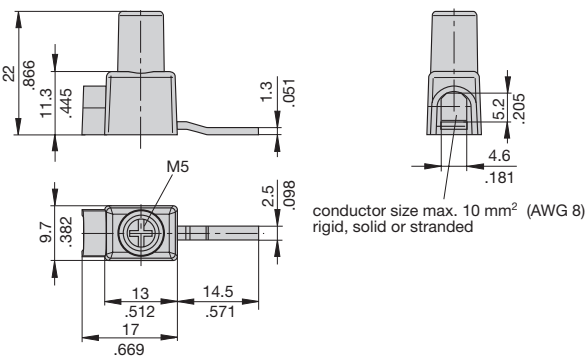
Connector bus links -K10
X 210 589 01/2.5 mm², (AWG 14) (black) up to 20 A max. load
X 210 589 02/1.5 mm², (AWG 16) (brown) up to 13 A max. load



Bus bar
X 221 498 01 (17-way)
 up to 70 A max. load



Supply terminal for bus bar
X 221 496 01
 up to 70 A max. load



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

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.

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). Designed for panel or plug-in mounting. Available with auxiliary contacts (1 x N/O, 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. A choice of characteristic curves further extends the range of applications possibilities for these CBEs. Special auxiliary contact versions for industrial atmosphere and low voltages (e.g. 5 V) available on request. Approved to CBE standard EN 60934 (IEC 60934). Suitable for use in distribution rails – see section 7.

Typical applications

Process control equipment, robotics, machine tool control, communications systems, instrumentation, rail vehicles. Special versions, e.g. for aggressive environmental conditions and low voltages (e.g. 5 V) on request.

Ordering information

Type No.

2210 single or multipole thermal-magnetic circuit breaker

Mounting

S socket or panel mounting

Actuator design

2 toggle

Number of poles

1 1-pole protected

2 2-pole protected

3 3-pole protected

5 2-pole, protected on one pole only

Panel mounting

0 without hardware

1 with M3 thread

2 with 6/32 thread

Terminal design (main contacts)

P1 blade terminals 6.3-0.8 (QC .250)

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. 1.01-1.4xI_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; 7.8-15.6xI_N DC

Intermediate position

H without intermediate position (standard)

Z with intermediate position

Auxiliary contacts

0 without auxiliary contacts

1 with auxiliary contacts in all poles

2 with auxiliary contacts in pole 1 (only multipole devices)

3 with auxiliary contacts in poles 1 and 3 (≥ 3-pole devices)

Auxiliary contact function (see diagram)

1 one each N/C and N/O (standard)

2 one N/O contact (23/24)

3 one N/C contact (11/12)

Auxiliary contact - terminal design

1 same as main terminals

Current ratings

0.1...25 A

2210 - S 2 1 0 - P1 F1 - H 1 1 1 - 10 A ordering example

Remote trip coil available to special order.



2210-S2..

Technical data

For further details please see chapter: **Technical Information**

Voltage rating AC 250 V*; 3 AC 433 V (50-60Hz); DC 65 V (*UL: AC 277 V; DC 65 V)

Current rating range 0.1...25 A for curves M1, T1, T2
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, inductive

Ambient temperature -30...+60 °C (-22...140 °F) T 60

Insulation co-ordination (IEC 60664 and 60664A)	rated impulse withstand voltage	pollution degree
	2.5 kV	2
reinforced insulation in operating area		

Dielectric strength (IEC 60664 and 60664A)	test voltage	
	operating area	AC 3,000 V
	main/aux. circuit	AC 1,500 V
	aux. circuit 11-12/23-24 pole/pole	AC 1,000 V AC 1,500 V

Insulation resistance > 100 MΩ (DC 500 V)

Interrupting capacity I_{cn} 0.1...5 A 400 A; 6...25 A 800 A
curve T2 : 0.1...25 A 15 x I_N
curve M3: 0.1...2 A AC 200 A / DC 400 A

Interrupting capacity (UL 1077)	I _N U _N	0.1...8 A	10...16 A	20...25 A	0.1...25 A
		AC 250 V	AC 125 V	AC 250 V	DC 65 V
1-pole	1,000 A	2,000 A	3,500 A	2,000 A	
2-pole	2,000 A	2,000 A	3,500 A	2,000 A	
3-pole	3AC 250V	3AC 250V	3AC 216V	3,500 A	
		2,000 A	2,000 A	3,500 A	

Degree of protection operating area IP30
(IEC 60529/DIN 40050) terminal area IP00

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 in 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. 50 g per pole

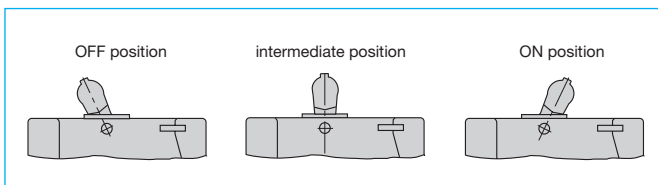
Standard current ratings and typical internal resistance values

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

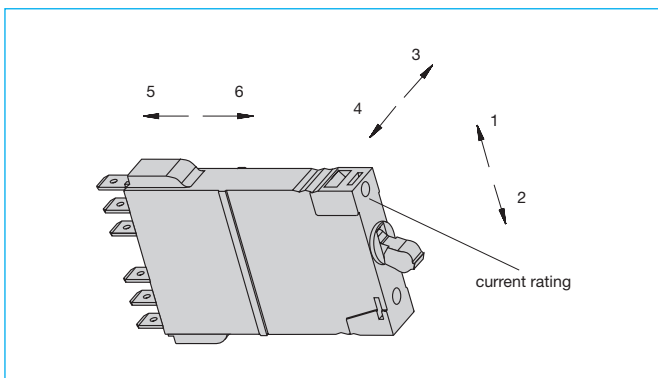
Approvals

Authority	Voltage ratings	Current ratings
VDE (EN 60934)	AC 250 V; DC 65 V; 3 AC 433 V	0.1...25 A
UL, CSA	AC 277 V; DC 65 V; AC 277/480 V	0.1...25 A
BV	3 AC 415 V; AC 250 V; DC 65 V	0.2...20 A

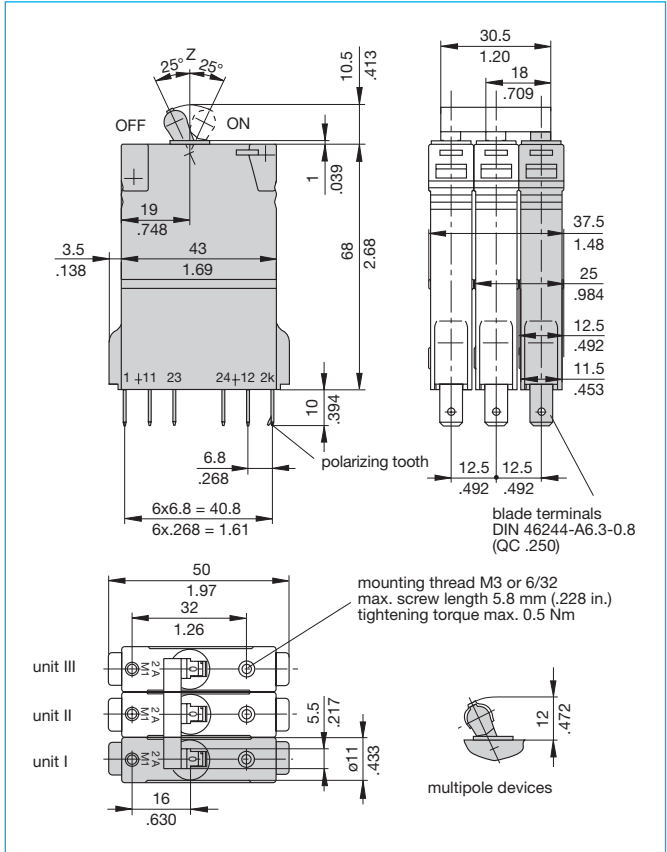
Toggle positions



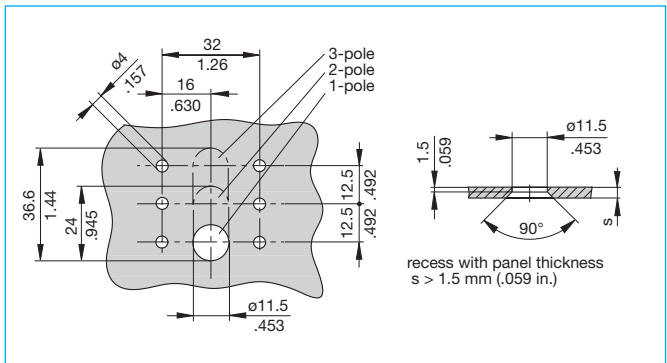
Shock directions



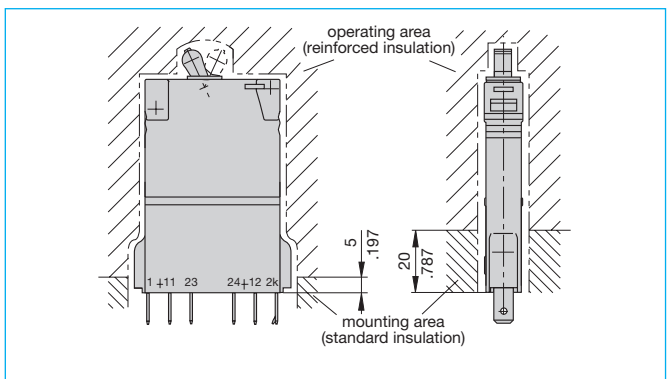
Dimensions



Cut-out dimensions



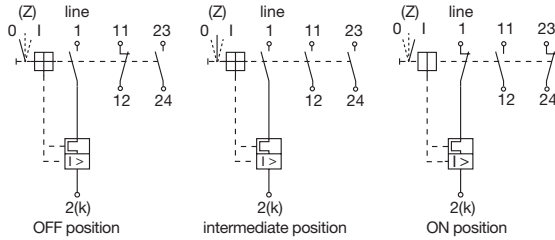
Installation drawing



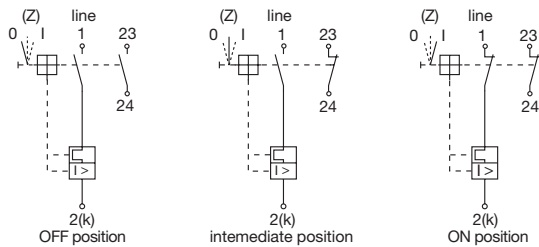
This is a metric design and millimeter dimensions take precedence (mm/inch)

Internal connection diagrams

with auxiliary contact function 1 (one each N/O and N/C)
 (...-H111-...) without intermediate position
 (...-Z111-...) with intermediate position



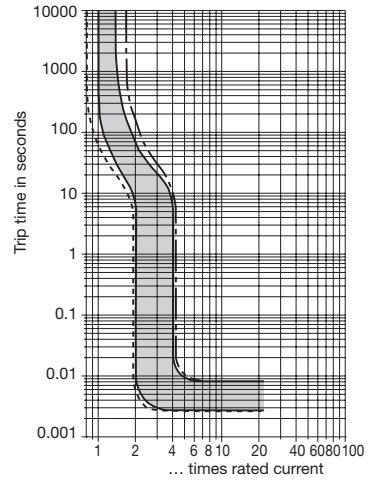
with auxiliary contact function 4 (available with -Z only)



Typical time/current characteristics

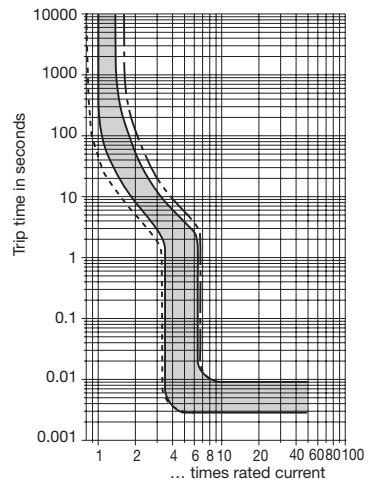
-F1 0.1 ... 16 A

DC only



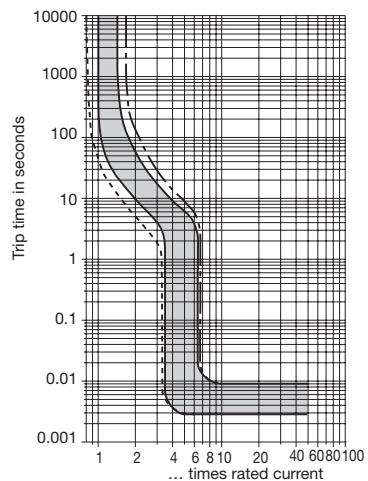
-F2 0.1 ... 7.5 A

AC/ DC ¹⁾



-F2 8 ... 16 A

AC/ DC ¹⁾



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

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

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

Multipole 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.

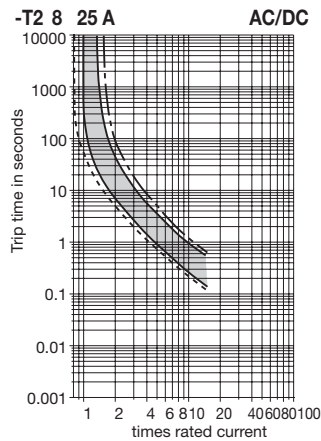
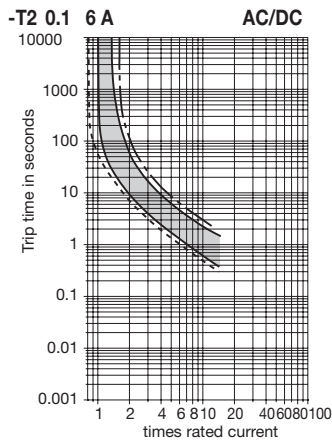
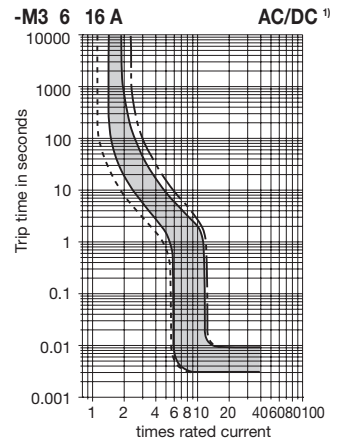
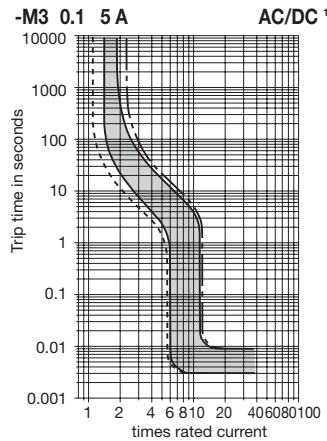
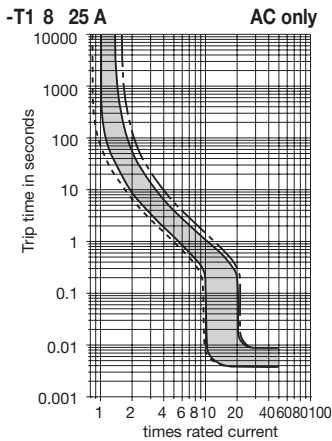
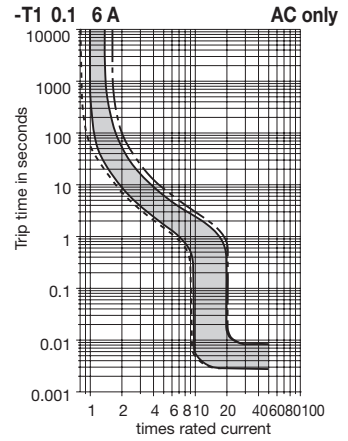
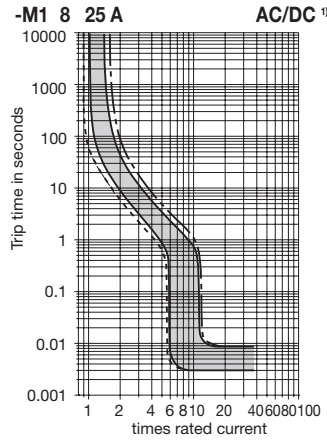
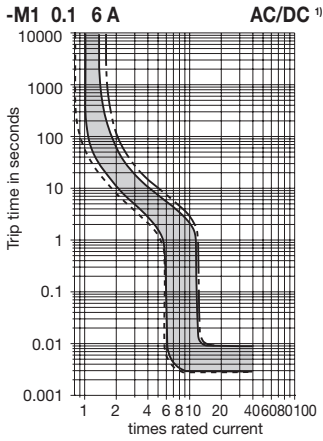
Typical time/current characteristics

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. $1.7 \times I_N$ with curves F1, F2, M1 and T2, and at max. $2.2 \times I_N$ with curve M3.

¹⁾ Magnetic tripping currents are increased by 30% on DC supplies (curves M1, M3, T1).

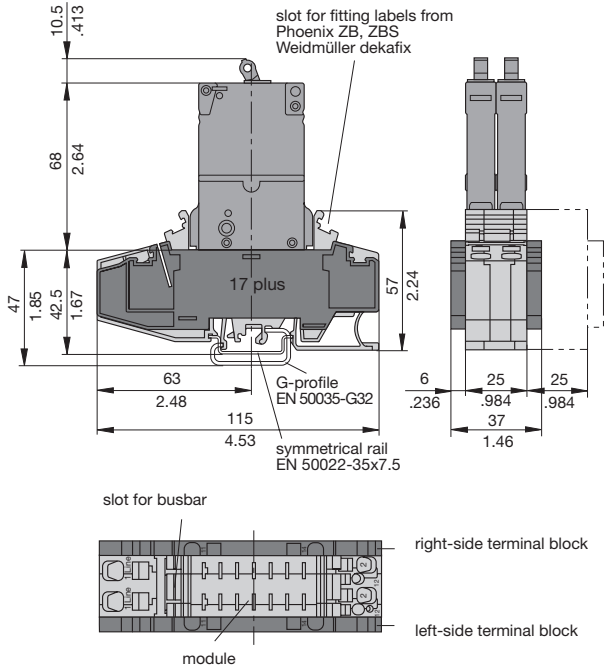


- - - +60 °C
 +140 °F
 ——— +23 °C
 +73.4 °F
 - - - -30 °C
 -22 °F

Accessories

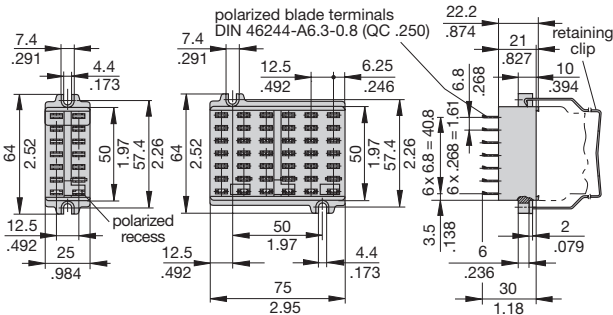
Module 17plus

For technical data see section 7 - Power distribution systems

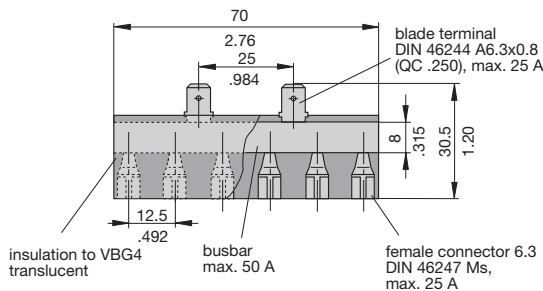


2-way mounting socket 23-P10-Si (up to 16 A max. load) (retaining clip Y 302 974 01 available on request)

6-way mounting socket 63-P10-Si



Bus bar 50 A, 6-way, for type 63-P10-Si socket X 221 760 11

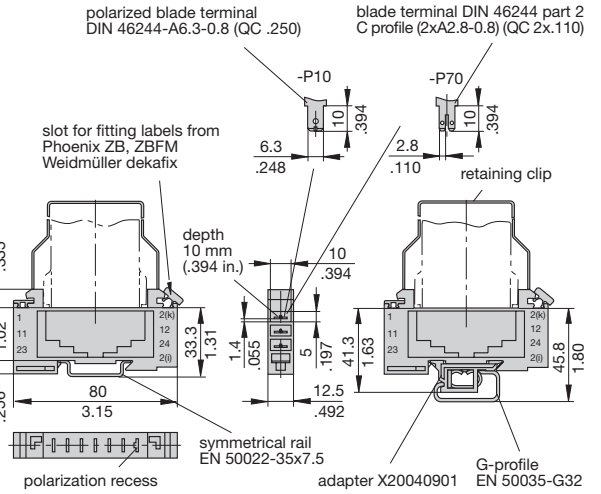


Single mounting sockets (with adapter)

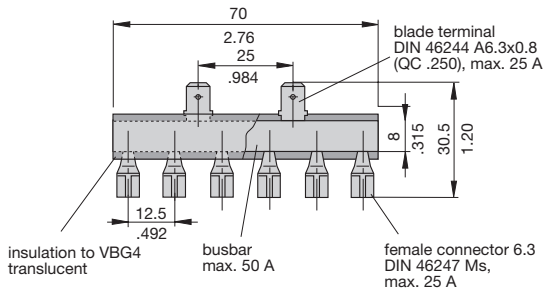
(up to 16 A max. load)

17-P10-Si
17-P70-Si (retaining clip Y 302 974 21 available on request)

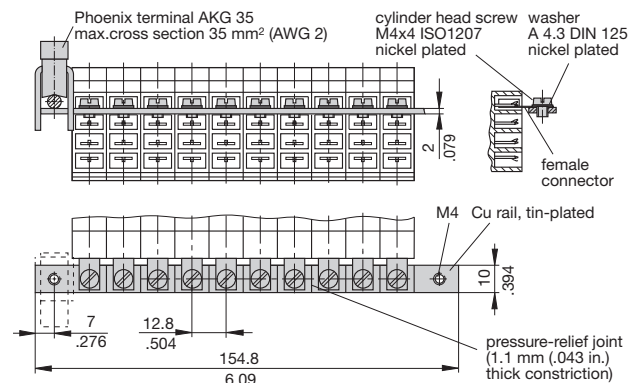
17-P10-Si-20025
17-P70-Si-20025



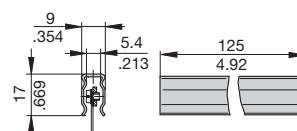
Bus bar 50 A (6-way) for type 17-P10-Si socket X 221 760 01



Bus bar (10-way) (supplied as a complete package) for type 17 socket (for max. 100 A continuous load), more positions available on request X 211 157 01 with terminal X 211 157 02 without terminal



Insulating sleeving for bus bar (10-way) Y 303 824 01



This is a metric design and millimeter dimensions take precedence (mm/inch)

Description

Single pole thermal-magnetic circuit breaker with trip-free mechanism and toggle actuation. Two-chamber construction with cascade contact arrangement to provide high voltage DC capability and high switching performance.

Designed for plug-in mounting in distribution rail X 2210-S0606J (see section 7) or terminal blocks 23-P10-Si-202005 and 63-P10-Si-202005. Approved to CBE standard EN 60934 (IEC 60934).

Typical applications

Communications systems, power supplies, process control equipment.

Ordering information

Type No.	
2210	thermal-magnetic circuit breaker, toggle operated
Mounting	
S291	socket or panel mounting with M3 thread
Terminal design	
P9	blade terminals, for distribution rails X2210-S.. and X2210-K..
Characteristic curve	
M2	medium delay
Style	
410033	single pole with two chambers (one chamber protected only), 1 break contact Si1
Current ratings	
1...25 A	
2210 - S291 - P9 M2 - 410033 - 10 A ordering example	

Standard current ratings and typical internal resistance values

Current rating (A)	Internal resistance (Ω)
1	1.10
2	0.25
3	0.13
4	0.07
6	0.04
8	0.02
10	0.02
16	< 0.02
25*	< 0.02
*80% I_N continuous load	



2210-S291-P9M2-410033-...A

Technical data

Voltage rating	AC 250 V; DC 65 V	
Current rating range	1...25 A	
Auxiliary circuit	1 A, AC 240 V/DC 65 V	
Typical life	> 10,000 operations at 1 x I_N > 20,000 operations mechanical	
Ambient temperature	-30°C...+60 °C (-22...+140 °F)	
Insulation co-ordination (IEC 60664 and 60664A)	rated impulse withstand voltage 2.5 kV	pollution degree 2 reinforced insulation in operating area
Dielectric strength (IEC 60664 and 60664A)	test voltage operating area AC 3,000 V main to aux. circuit AC 1,500 V	
Insulation resistance	> 100 M Ω (DC 500 V)	
Interrupting capacity I_{cn}	AC 250 V 1,000 A $\cos\phi = 0.8$ DC 65 V 2,000 A L/R = 4 ms	
Degree of protection (IEC 60529/DIN 40050)	operating area IP30 terminal area IP00	
Vibration	5 g (57-500 Hz), \pm 0.38 mm (10-57 Hz); to IEC 60068-2-6, test Fc 10 frequency cycles/axis	
Shock	25 g (11ms) directions 1, 2, 3, 4, 5 20 g (11 ms) direction 6 to IEC 60068-2-27, test Ea	
Corrosion	96 hours in 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. 80 g	

Approvals

Authority	Voltage ratings	Current ratings
VDE (EN 60934)	AC 250 V; DC 65 V	1...25 A

Description

Single pole thermal-magnetic circuit breaker with trip-free mechanism and toggle actuation. Two-chamber construction with cascade contact arrangement to provide high voltage DC capability and high switching performance.

Designed for plug-in mounting in distribution rail X 2210-S0606J (see section 7) or terminal blocks 23-P10-Si-202005 and 63-P10-Si-202005. Approved to CBE standard EN 60934 (IEC 60934).

Typical applications

Communications systems, power supplies, process control equipment.

Ordering information

Type No.	
2210	thermal-magnetic circuit breaker, toggle operated
Mounting	
S291	socket or panel mounting with M3 thread
Terminal design	
P9	blade terminals, for distribution rails X2210-S.. and X2210-K..
Characteristic curve	
M2	medium delay
Style	
410005	single pole with two chambers (protected), 1 break contact Si1
Current ratings	
0.4...25 A	
2210 - S291 - P9 M2 - 410005 - 10 A ordering example	

Standard current ratings and typical internal resistance values

Current rating (A)	Internal resistance (Ω)	Current rating (A)	Internal resistance (Ω)
0.4	6.87	6	0.09
0.65	2.96	8	0.03
1	1.84	10	0.03
1.6	0.75	12	0.02
2	0.50	16	< 0.02
2.5	0.35	20*	< 0.02
3	0.25	25*	< 0.02
4	0.15	*80% I _N continuous load	

Approvals

Authority	Voltage ratings	Current ratings
VDE (EN 60934)	AC 250 V; DC 65 V	0.4...25A

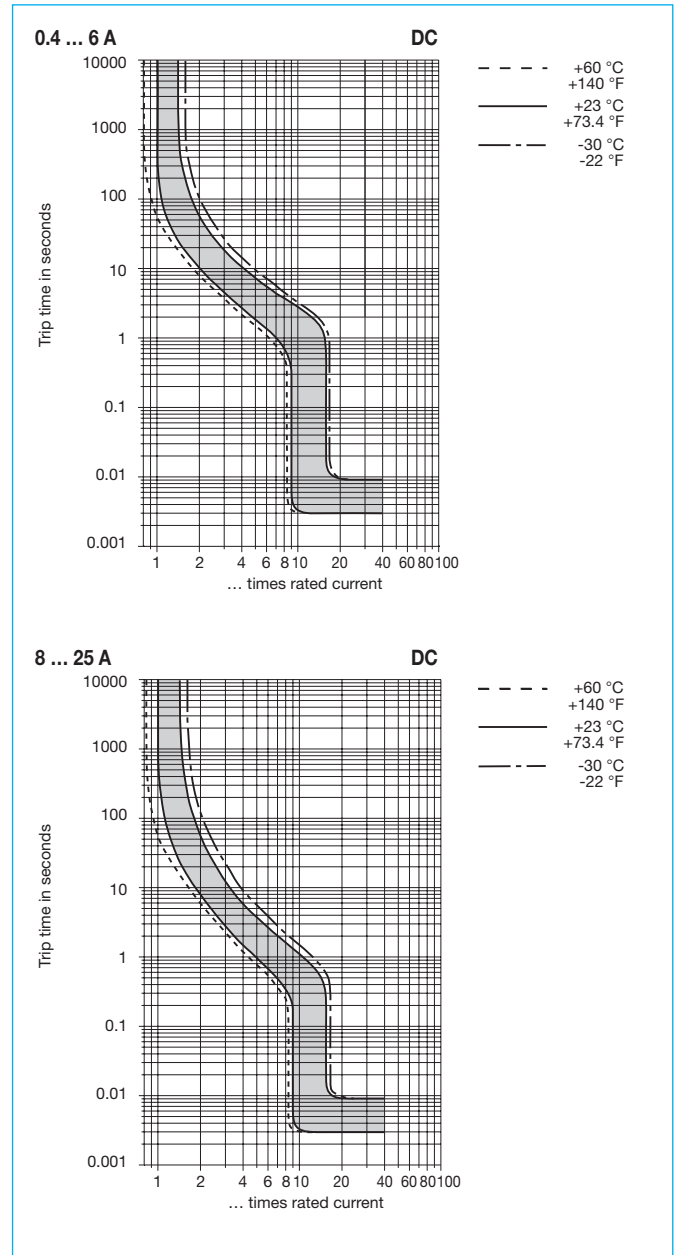
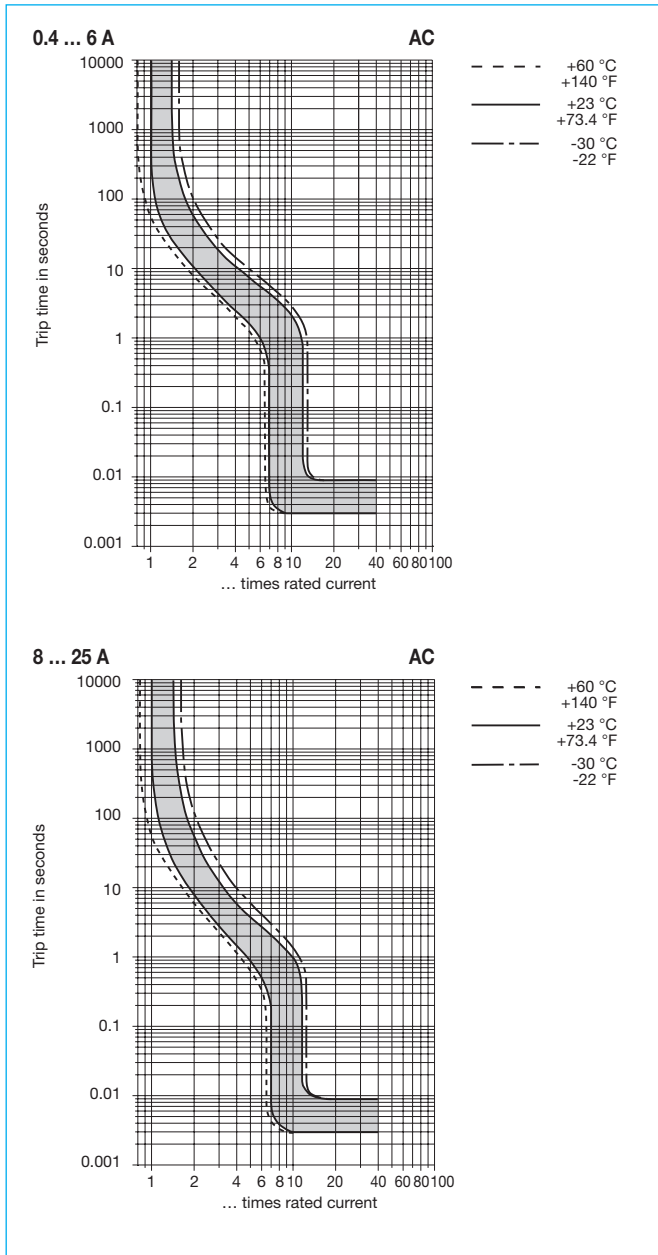


2210-S291-P9M2-410005-...A

Technical data

Voltage rating	AC 250 V; DC 65 V	
Current rating range	0.4...25 A	
Auxiliary circuit	1 A, AC 240 V/DC 65 V	
Typical life	> 10,000 operations at 1 x I _N > 20,000 operations mechanical	
Ambient temperature	-30°C...+60 °C (-22...+140 °F)	
Insulation co-ordination (IEC 60664 and 60664A)	rated impulse withstand voltage 2.5 kV	pollution degree 2 reinforced insulation in operating area
Dielectric strength (IEC 60664 and 60664A)	test voltage operating area main to aux. circuit	AC 3,000 V AC 1,500 V
Insulation resistance	> 100 MΩ (DC 500 V)	
Interrupting capacity I _{cn}	AC 250 V 0.4...1 A 1.6...25 A DC 65 V 0.4...4 A 6...25 A	cosφ = 0.8 self-limiting 2,000 A L/R = 4 ms self-limiting 3,500 A
Degree of protection (IEC 60529/DIN 40050)	operating area IP30 terminal area IP00	
Vibration	5 g (57-500 Hz), ± 0.38 mm (10-57 Hz); to IEC 60068-2-6, test Fc 10 frequency cycles/axis	
Shock	25 g (11ms) directions 1, 2, 3, 4, 5 20 g (11 ms) direction 6 to IEC 60068-2-27, test Ea	
Corrosion	96 hours in 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. 80 g	

Typical time/current characteristics

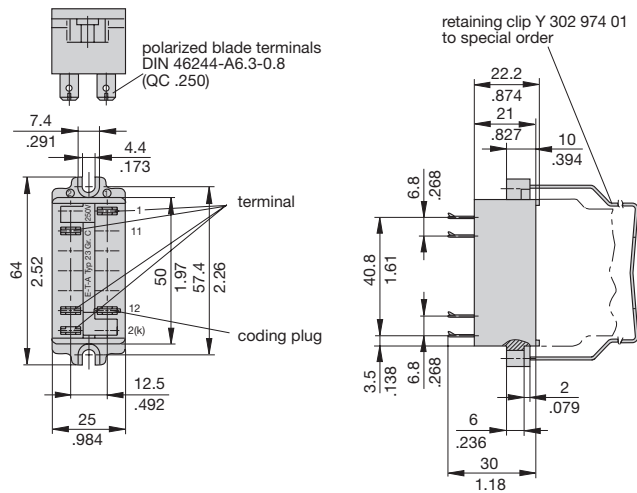


The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section 9 – Technical information.

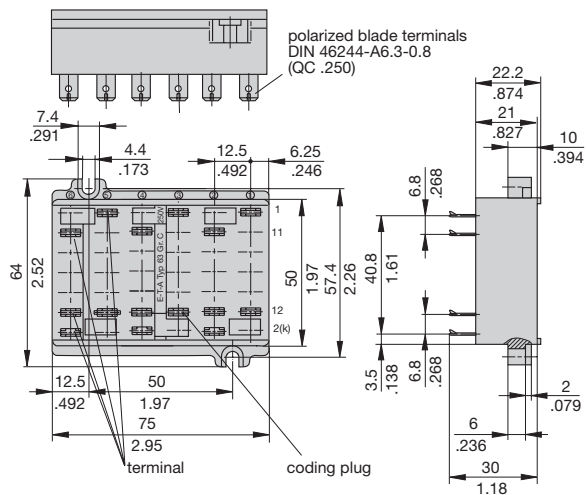
Ambient temperature °F	-22	-4	+14	+32	+73.4	+86	+104	+122	+140
°C	-30	-20	-10	0	+23	+30	+40	+50	+60
Derating factor	0.76	0.79	0.83	0.88	1	1.04	1.11	1.19	1.29

Accessories

Mounting sockets 23-P10-Si-202005



63-P10-Si-202005



Distribution rail X2210-S06... see section 7.

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

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.

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

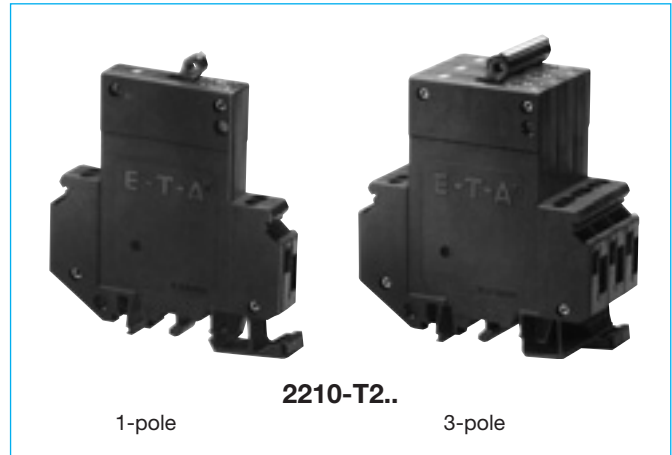
Process control equipment, robotics, machine tool control, communications systems, instrumentation.

Ordering information

Type No.	2210	single and 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, 7.8-15.6xI _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 (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

Approvals

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



Technical data

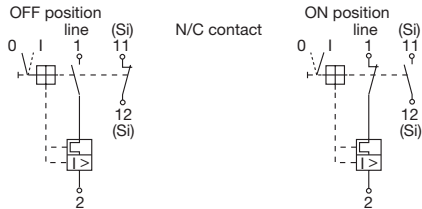
For further details please see chapter: Technical Information		
Voltage rating	AC 250 V; 3 AC 433 V (50/60 Hz); DC 65 V (UL: AC 277/480 V; DC 65 V)	
Current rating range	0.1...32 A for curves M1, T1, T2 0.1...16 A for curves F1, F2, M3	
Auxiliary circuit	1 A, AC 240 V / DC 65 V	
Typical life	3 AC 433 V; AC 250 V: 0.1...25 A 10,000 operations at 1 x I _N , inductive DC 65 V: 0.1...32 A 10,000 operations at 1 x I _N , inductive 3 AC 433 V; AC 250 V: 32 A 10,000 operations at 1 x I _N , resistive	
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)	test voltage operating area main/aux. circuit pole/pole	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 1- + 2-pole 3-pole 1- + 2-pole	0.1...16 A AC 277 V / 5,000 A 3 AC 480 V / 5,000 A DC 65 V / 2,000 A 20...32 A AC 277 V / 2,000 A 3 AC 480 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	

Standard current ratings and typical internal resistance values

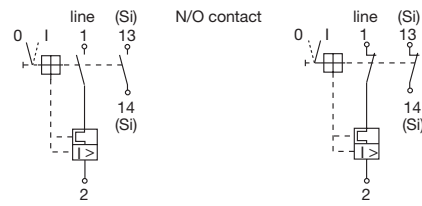
Current rating (A)	Internal resistance (Ω)					
	F1 fast acting for DC only	F2 fast acting delay for AC + DC	M1 standard for AC + DC	T1 delayed low resistance nur für AC	M3 standard delay for AC + DC	T2 thermal for AC + DC
0.1	162	162	92	81	42	77
0.2	39.3	39.3	26.1	24.2	11.7	23
0.3	17.5	17.5	11.6	10.4	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

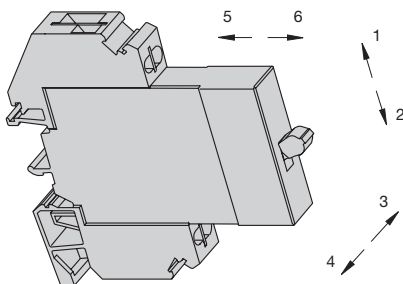
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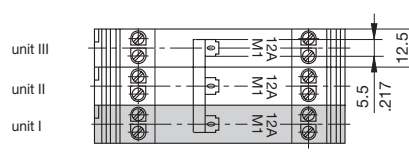
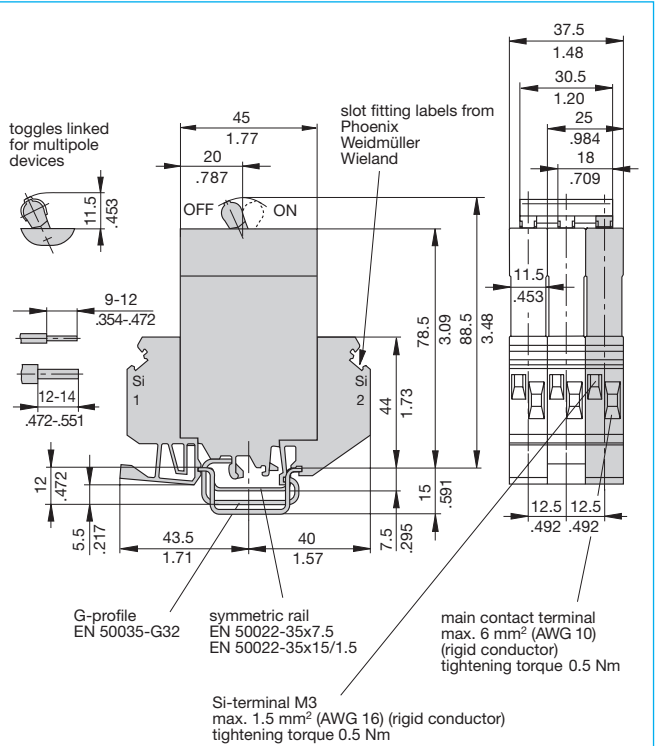
...-H121-...



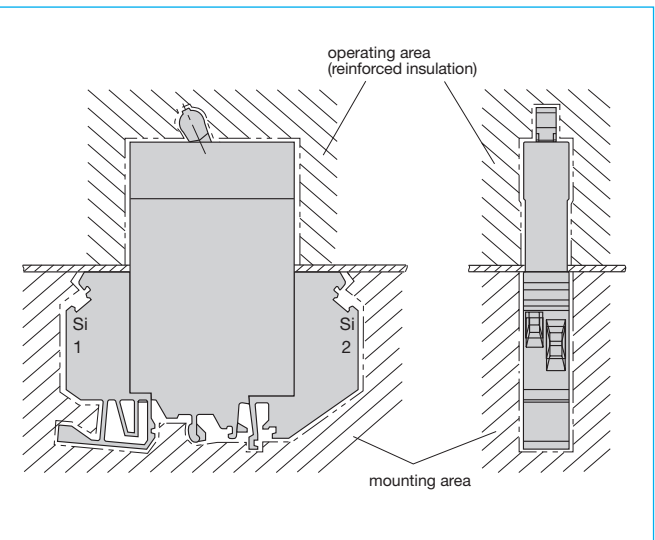
Shock directions



Dimensions



Installation drawing

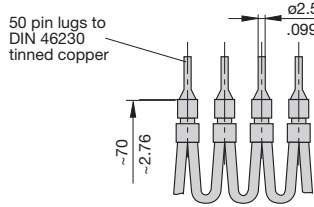


This is a metric design and millimeter dimensions take precedence (mm/inch)

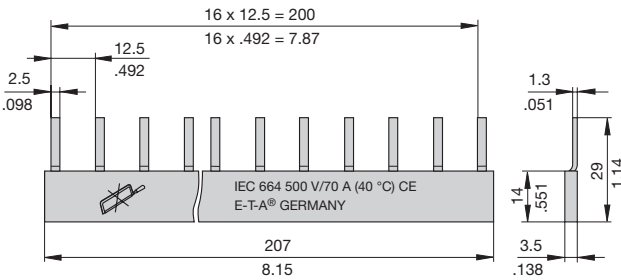
Accessories

Connector bus links -K10

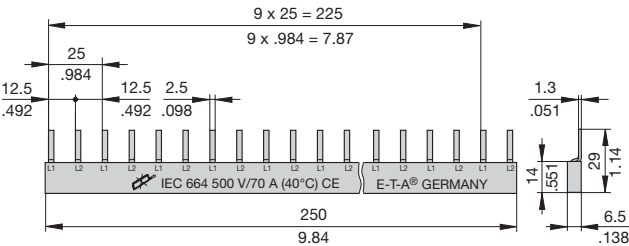
X210 589 01/2.5 mm², (AWG 14) (black) up to 20 A max. load
 X210 589 02/1.5 mm², (AWG 16) (brown) up to 13 A max. load



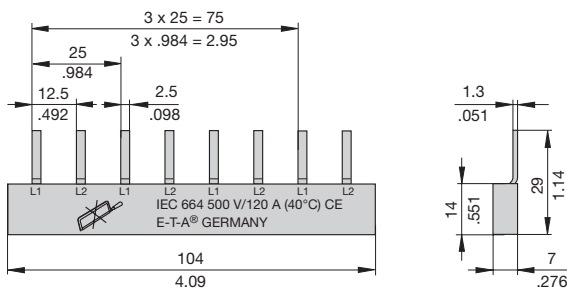
Bus bar for 1-pole units (17-way), up to 70 A max. load X221 498 01



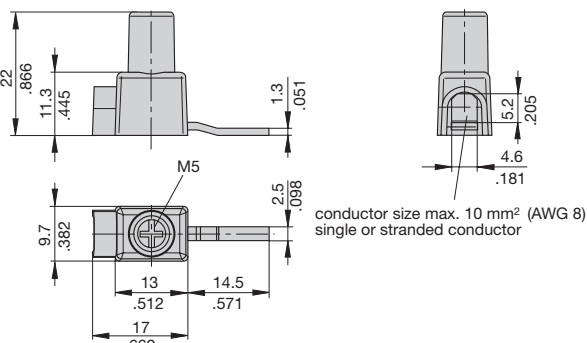
Bus bar for 2-pole units (2 x 10-way), up to 120 A max. load X221 497 01



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



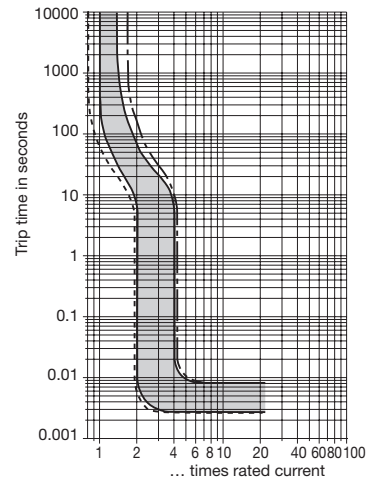
Supply terminal for bus bar (up to 70 A max. load) X221 496 01



Typical time/current characteristics

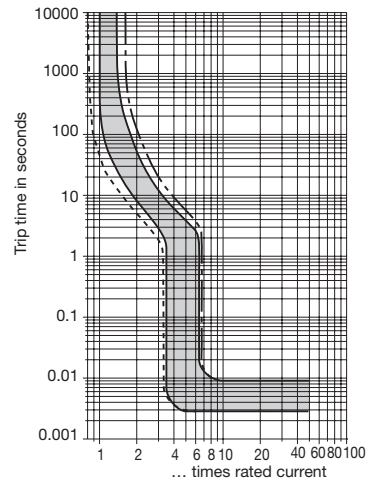
-F1 0.1 ... 16 A

DC only



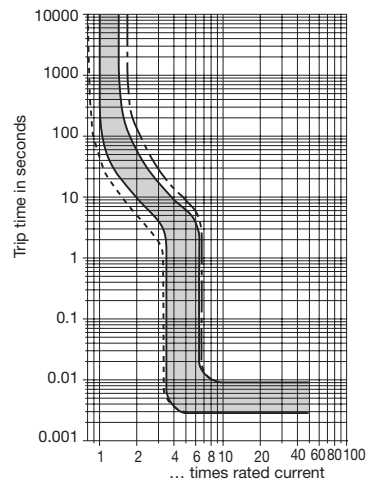
-F2 0.1 ... 7.5 A

AC/ DC ¹⁾



-F2 8 ... 16 A

AC/ DC ¹⁾



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

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

This is a metric design and millimeter dimensions take precedence (mm / inch)

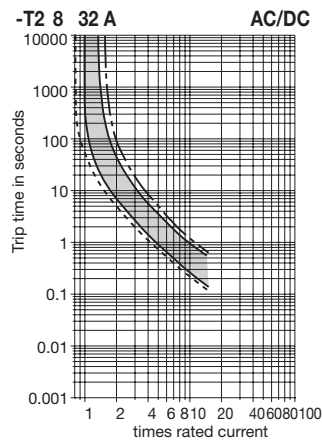
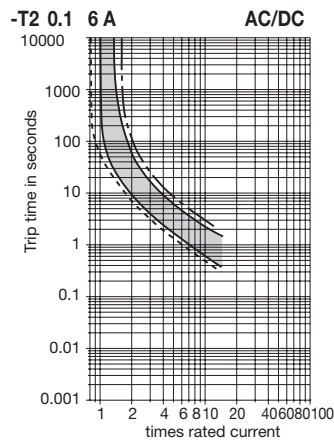
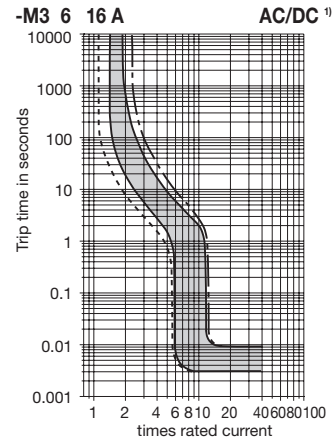
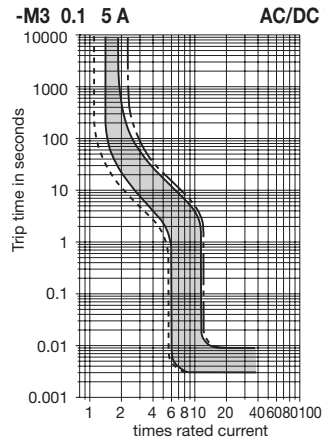
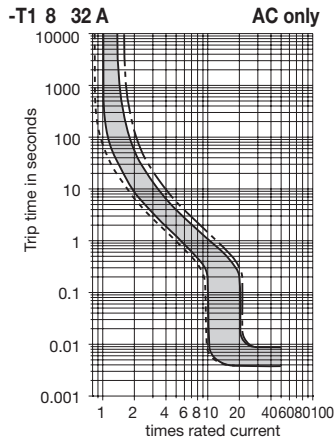
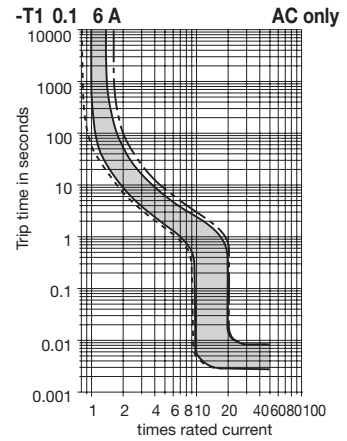
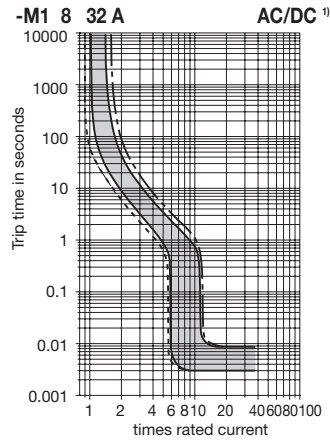
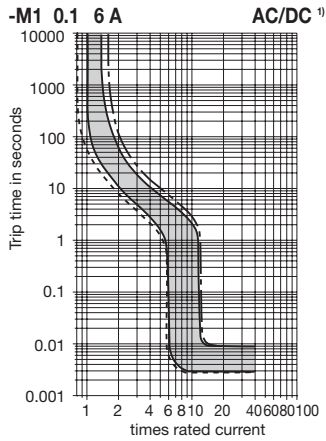
Typical time/current characteristics

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. $1.7 \times I_N$ with curves F1, F2, M1 and T2, and at max. $2.2 \times I_N$ with curve M3.

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



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

Description

Miniaturised two pole thermal-magnetic circuit breakers with trip-free mechanism and toggle actuation (S-type TM CBE to EN 60934). Fitted with panel mounting flange and push-on termination, also suitable for mounting on Euro Cards. Available with auxiliary contacts and a choice of fast, medium or long delay characteristics. Complies with CBE standard EN 60934 (IEC 60934).

Typical applications

Control equipment, communications systems, instrumentation.

Ordering information

Type No.	
2215	double pole thermal-magnetic circuit breaker
Mounting	
F1	flange mounting, with M3 mounting thread
Number of poles	
2	2-pole protected
5	2-pole, protected on one pole only
Accessories	
0	without
Terminal design (main contacts)	
P1	blade terminals 6.3x0.8mm (QC .250) without shunt terminal
Characteristic curve	
F1	fast acting: 1.01-1.4xI _N ; magn. 2-4xI _N DC (DC only)
M1	standard delay: therm. 1.01-1.4xI _N ; magn. 4.5-10.5xI _N DC; magn. 3.5-8xI _N AC
T1	delayed: therm. 1.01-1.4xI _N ; magn. 8-17xI _N DC; magn. 6-13xI _N AC
T3	delayed: therm. 1.01-1.4xI _N ; magn. 13-20xI _N DC magn. 9.5-15.5xI _N AC
Auxiliary contacts	
S0	without auxiliary contacts
S1	with auxiliary contacts (change over)
S2	with auxiliary contact on pole 1 only
Auxiliary contact - terminal design	
1	blade terminals 6.3x0.8
Current ratings	
0.05...10 A	
2215 - F1 2 0 - P1 F1 - S1 1 - 0.5 A ordering example	

Standard current ratings and typical internal resistance values

Current ratings (A)	Internal resistance per pole (Ω)	Current ratings (A)	Internal resistance per pole (Ω)
0.05	440	1.5	0.55
0.1	108	2	0.34
0.2	29.9	2.5	0.21
0.3	14.2	3	0.15
0.4	7.9	4	0.096
0.5	5.0	5	0.069
0.6	3.5	6	0.055
0.8	1.8	8	≤ 0.02
1	1.2	10	≤ 0.02

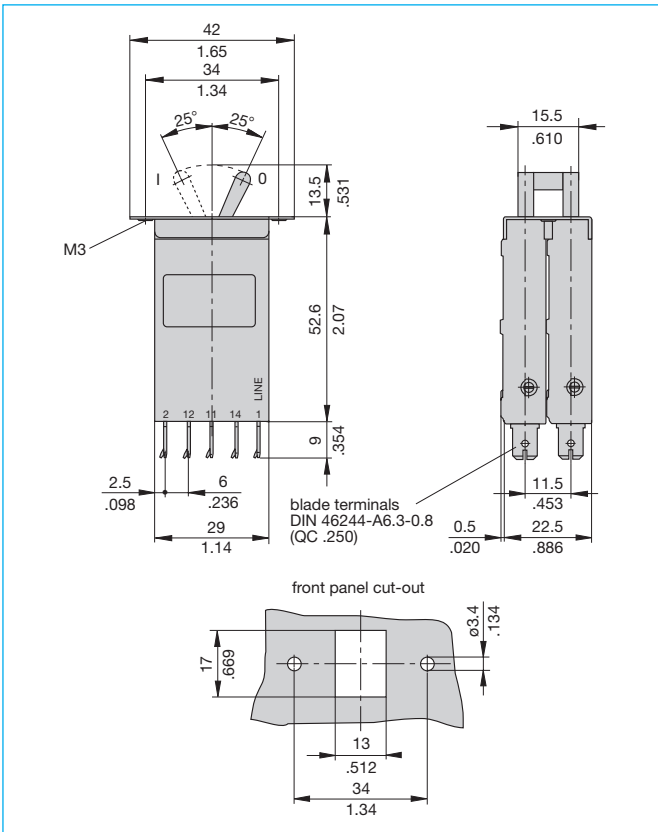


2215-F1...

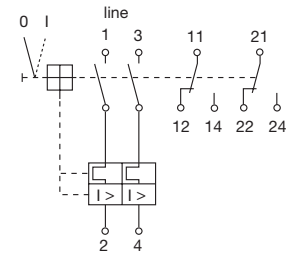
Technical data

Voltage rating	AC 250 V (50/60 Hz); DC 50 V (UL: AC 250 V; DC 75 V) (higher DC voltage to special order)	
Current rating range	0.05...10 A	
Auxiliary circuit	1 A, AC 250 V/DC 28 V resistive load	
Typical life	10,000 operations at 1 x I _N	
Ambient temperature	-30...+60 °C (-22...+140 °F)	
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)	test voltage	operating area
	AC 3,000 V	AC 1,500 V
	pole/pole	AC 1,500 V
	main/aux. circuit	AC 1,500 V
Insulation resistance	> 100 MΩ (DC 500 V)	
Interrupting capacity I _{cn}	600 A	
Degree of protection (IEC 60529/DIN 40050)	operating area IP30 terminal area IP00	
Vibration	curve F1: 6 g (57-500 Hz), ±0.46 mm (10-57 Hz)	
	curves M1, T1, T3: 8 g (57-500 Hz), ±0.61 mm (10-57 Hz) to IEC 60068-2-6, test Fc 10 frequency cycles/axis	
Shock	curves F1, M1, T1, T3: 30 g (11 ms), directions 1, 2, 3, 4, 5	
	curve F1: 10 g (11 ms), direction 6	
	curves M1, T1, T3: 15 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. 50 g	

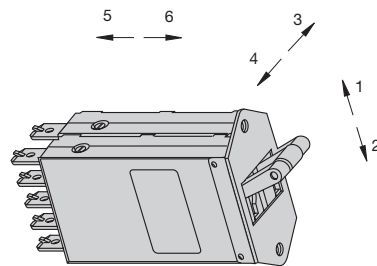
Dimensions 2215-F1...



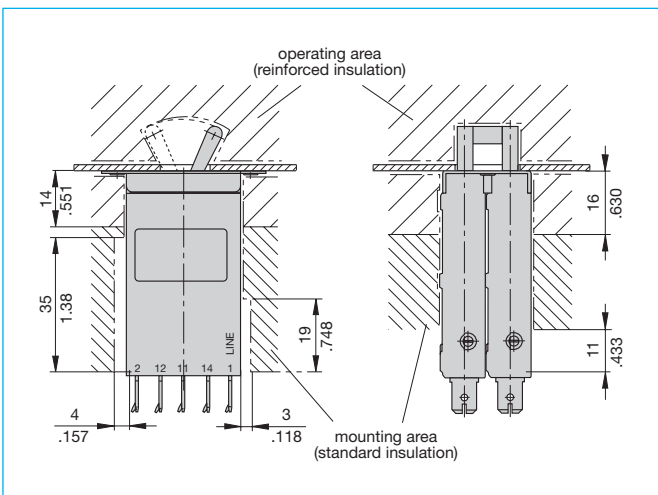
Internal connection diagram



Shock directions



Installation drawing



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

Typical time/current characteristics

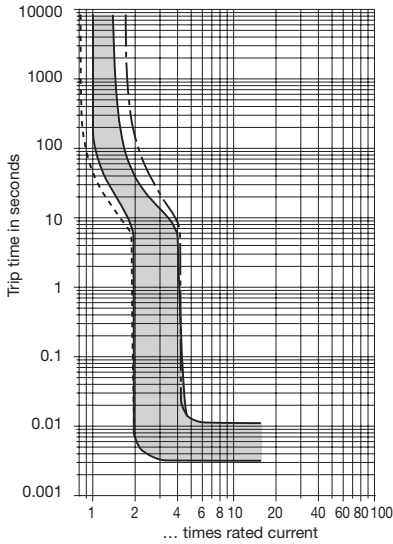
The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section 9 - Technical information.

0.05...10 A:

Ambient temperature °F	-22	-4	+14	+32	+50	+73.4	+86	+104	+122	+140
°C	-30	-20	-10	0	+10	+23	+30	+40	+50	+60
Derating factor	0.76	0.79	0.83	0.88	0.93	1	1.04	1.11	1.19	1.29

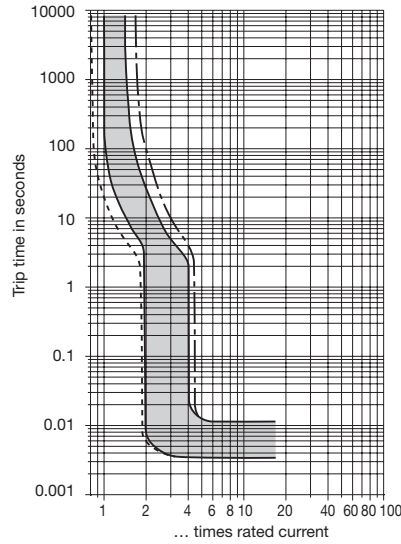
-F1 0.05 ... 6 A

DC only



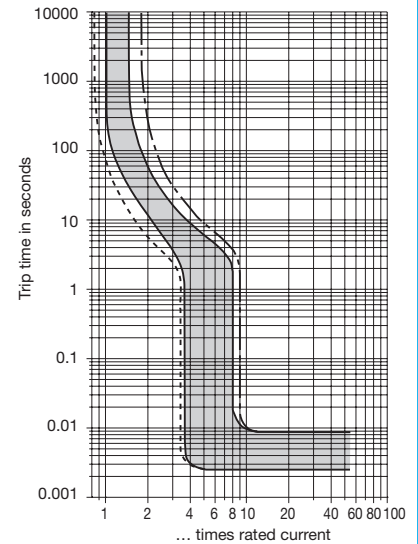
-F1 8 ... 10 A

DC only



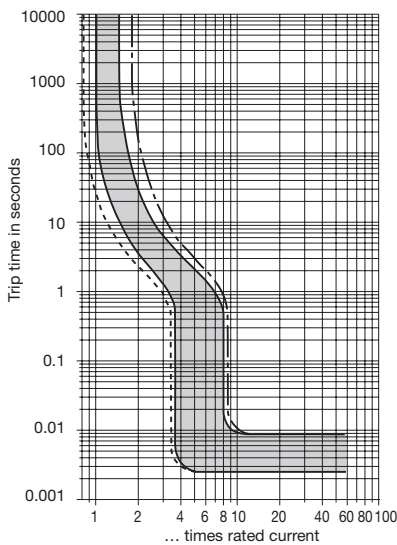
-M1 0.05 ... 6 A

AC/DC ¹⁾



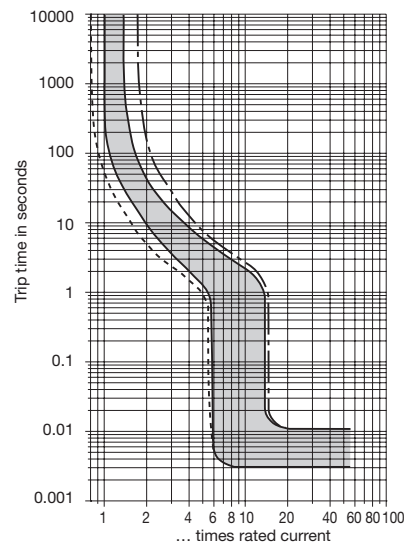
-M1 8 ... 10 A

AC/DC ¹⁾



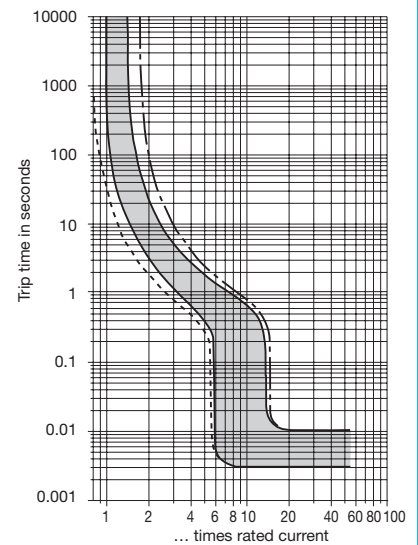
-T1 0.05 ... 6 A

AC/DC ¹⁾



-T1 8 ... 10 A

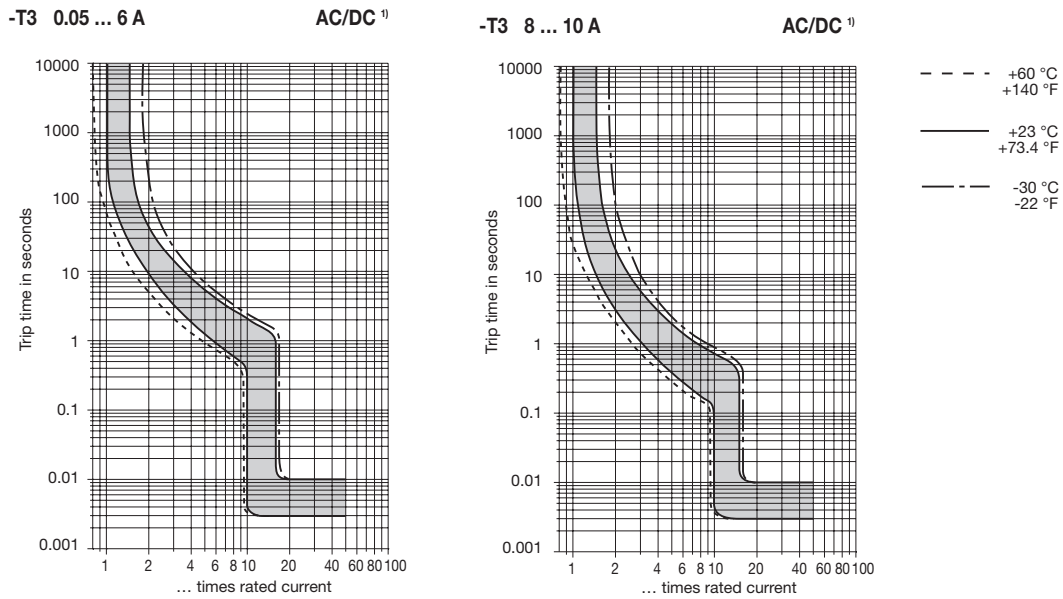
AC/DC ¹⁾



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

¹⁾ Magnetic tripping currents are increased by 30% on DC supplies (curve M1 and T1).

Typical time/current characteristics



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

Description

Miniaturised single pole thermal-magnetic circuit breakers with trip-free mechanism and toggle actuation (S-type TM CBE to EN 60934). Two designs provide the option of either printed circuit board or threadneck panel mounting. A separate shunt tap terminal and auxiliary contacts are available. Fast acting, medium or long delay characteristics can be specified for both models.

Suitable for use in distribution rails – see section 7.
Complies with CBE standard EN 60934 (IEC 60935).

Typical applications

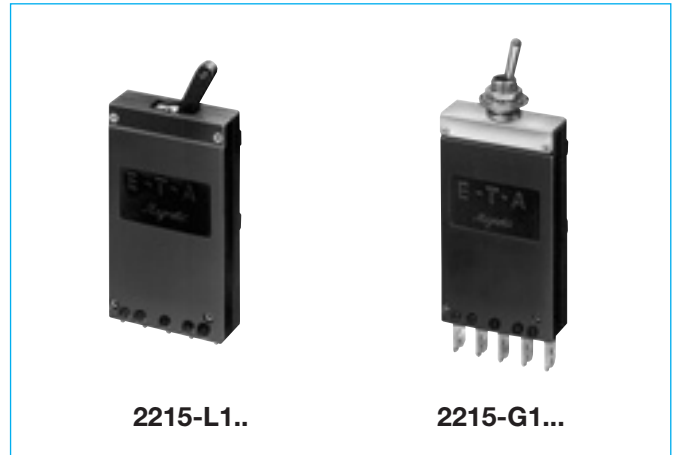
Control equipment, communications systems, instrumentation.
Suitable for mounting on Euro cards.

Ordering information

Type No.	2215 single pole thermal-magnetic circuit breaker		
Mounting	G1 threadneck panel mounting L1 PCB mounting		
Number of poles	1 1-pole protected		
Mounting hardware	0 without accessories 1 2 hex nuts 1/4"-40 UNS-2A, serrated washer, location pin (-G1 only)		
Terminal design (main contacts)	P1 blade terminals 6.3-0.8, without shunt terminal B1 blade terminals 6.3-0.8, with shunt terminal L1 solder pins, without shunt terminal M1 solder pins, with shunt terminal		
Characteristic curve	F1 fast acting: 1.01-1.4xI _N ; magn. 2-4xI _N DC (DC only) M1 standard delay: therm. 1.01-1.4xI _N ; magn. 4.5-10.5xI _N DC; magn. 3.5-8xI _N AC T1 delayed: therm. 1.01-1.4xI _N ; DC magn. 8-17xI _N DC, 6-13xI _N AC T3 delayed: therm. 1.01-1.4xI _N ; magn. 13-20xI _N DC magn. 9.5-15.5xI _N AC		
Auxiliary contacts	S0 without auxiliary contact S1 with auxiliary contact (change over)		
Auxiliary contact - terminal design	1 blade terminals 6.3x0.8 (QC .250) 2 solder pins		
Current ratings	0.05...10 A		
2215 - G1 1 1 - P1 F1 - S1 1 - 0.5 A ordering example			

Standard current ratings and typical internal resistance values

Current ratings (A)	Internal resistance (Ω)	Current ratings (A)	Internal resistance (Ω)
0.05	440	1.5	0.55
0.1	108	2	0.34
0.2	29.9	2.5	0.21
0.3	14.2	3	0.15
0.4	7.9	4	0.084
0.5	5.0	5	0.057
0.6	3.5	6	0.043
0.8	1.8	8	≤ 0.02
1	1.2	10	≤ 0.02



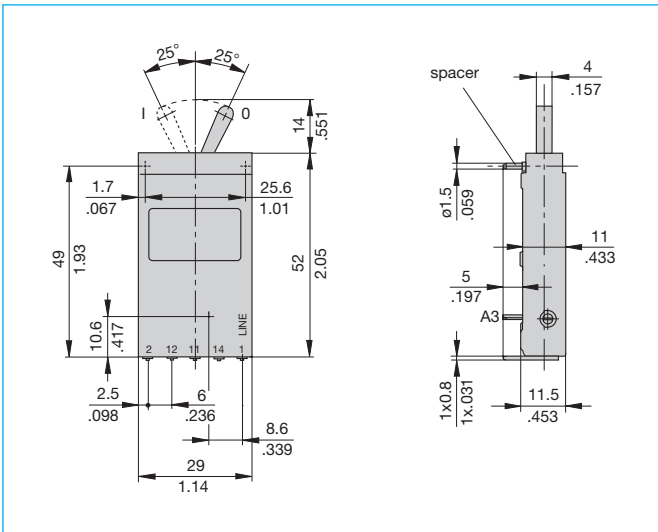
Technical data

Voltage rating	AC 250 V (50/60 Hz); DC 50 V (UL: AC 250 V; DC 75 V)		
Current rating range	0.05...10 A (higher current ratings to special order)		
Auxiliary circuit	1 A, AC 250 V/DC 28 V		
Typical life	10,000 operations at 1 x I _N		
Ambient temperature	-30...+60 °C (-22...+140 °F)		
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)	test voltage operating area AC 3,000 V main/aux. circuit AC 1,500 V		
Insulation resistance	> 100 MΩ (DC 500 V)		
Interrupting capacity I _{cn}	300 A		
Interrupting capacity (UL 1077)	I _N	U _N	
	0.05 A	AC 250 V	200 A
	0.1...6 A	AC 250 V	1,000 A
	8...10 A	AC 250 V	2,000 A
	0.05...10 A	DC 50 V	1,000 A
	0.05...10 A	DC 75 V	800 A
Degree of protection (IEC 60529/DIN 40050)	operating area IP30 terminal area IP00		
Vibration	curve F1: 6 g (57-500 Hz), ±0.46 mm (10-57 Hz) curves M1, T1, T3: 8 g (57-500 Hz), ±0.61 mm (10-57 Hz) to IEC 60068-2-6, test Fc 10 frequency cycles/axis		
Shock	curves F1, M1, T1, T3: 30 g (11 ms), directions 1, 2, 3, 4, 5, curve F1: 10 g (11 ms), direction 6 curves M1, T1, T3: 15 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. 25 g		

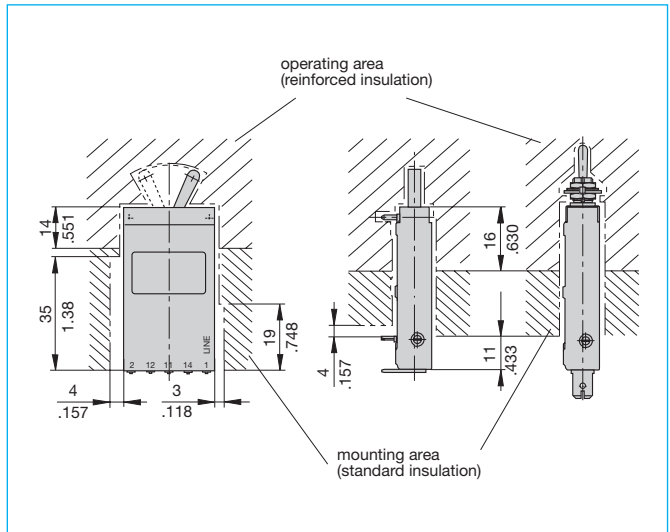
Approvals

Authority	Voltage ratings	Current ratings
UL	AC 250 V DC 75 V	0.05...10 A 0.05...20 A
GSA	AC 250 V; DC 48 V	0.05...10 A

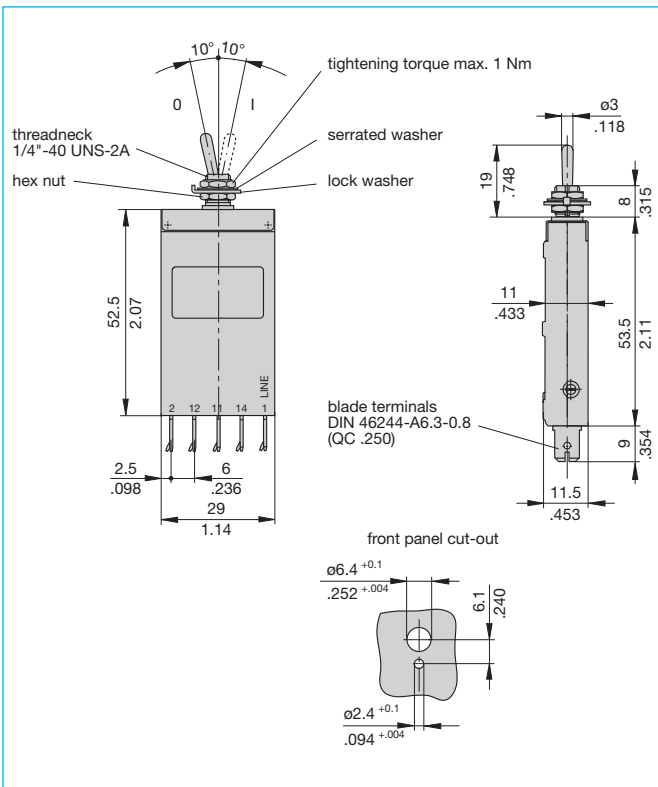
Dimensions 2215-L1..



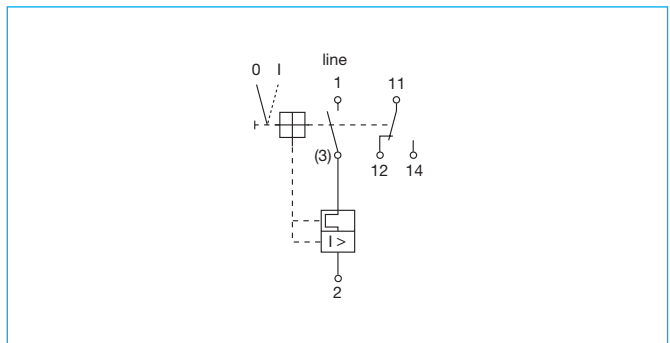
Installation drawing



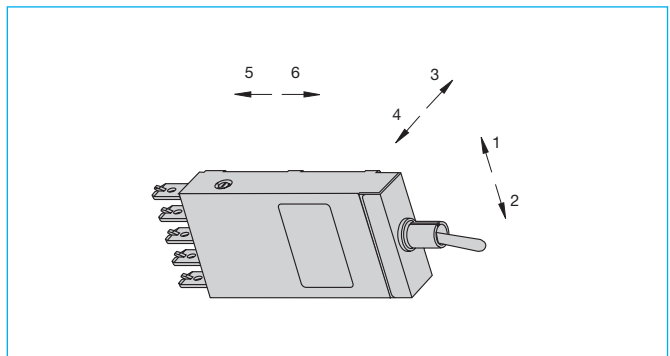
Dimensions 2215-G1..



Internal connection diagram



Shock directions



Typical time/current characteristics

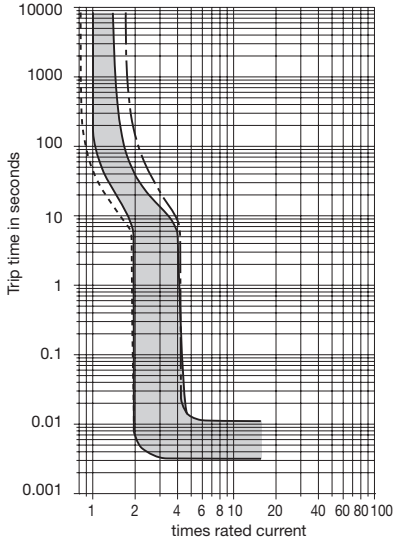
The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section 9 - Technical information.

0.05...10 A:

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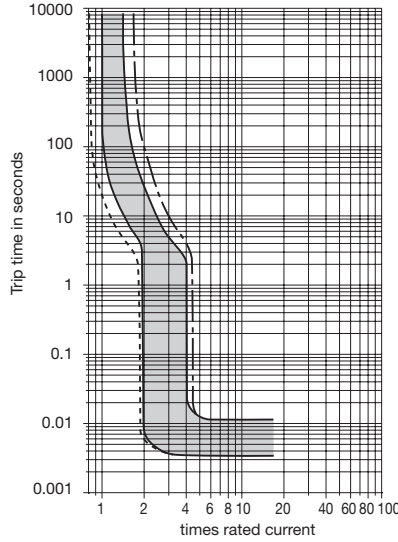
-F1 0.05 6 A

DC only



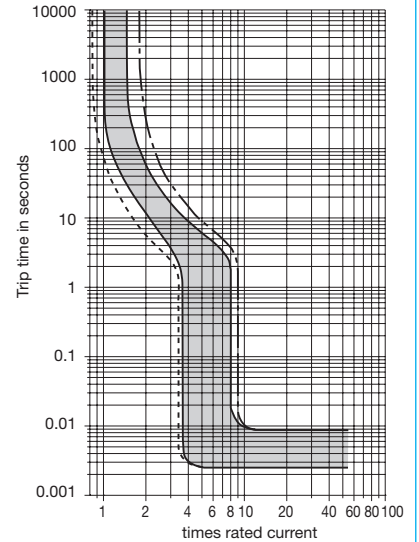
-F1 8 10 A

DC only



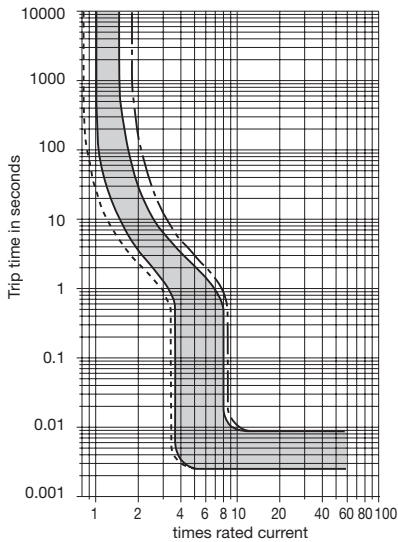
-M1 0.05 6 A

AC/DC ¹⁾



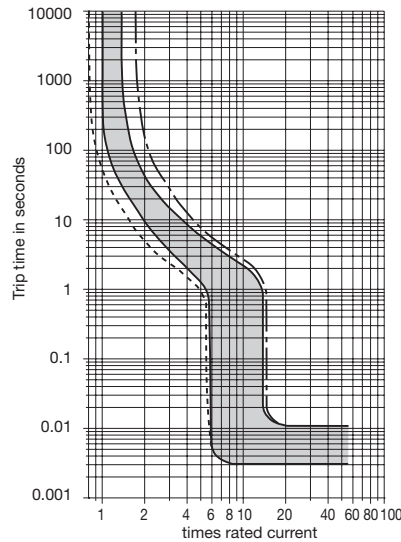
-M1 8 10 A

AC/DC ¹⁾



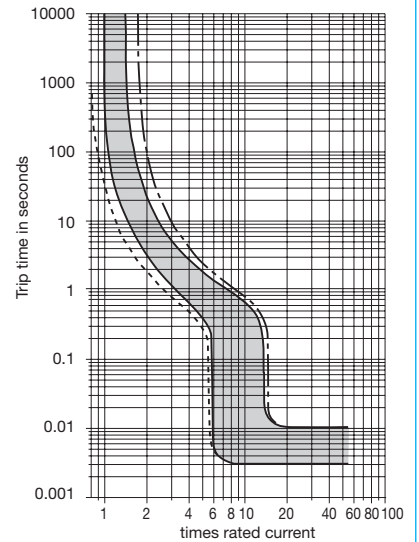
-T1 0.05 6 A

AC/DC ¹⁾



-T1 8 10 A

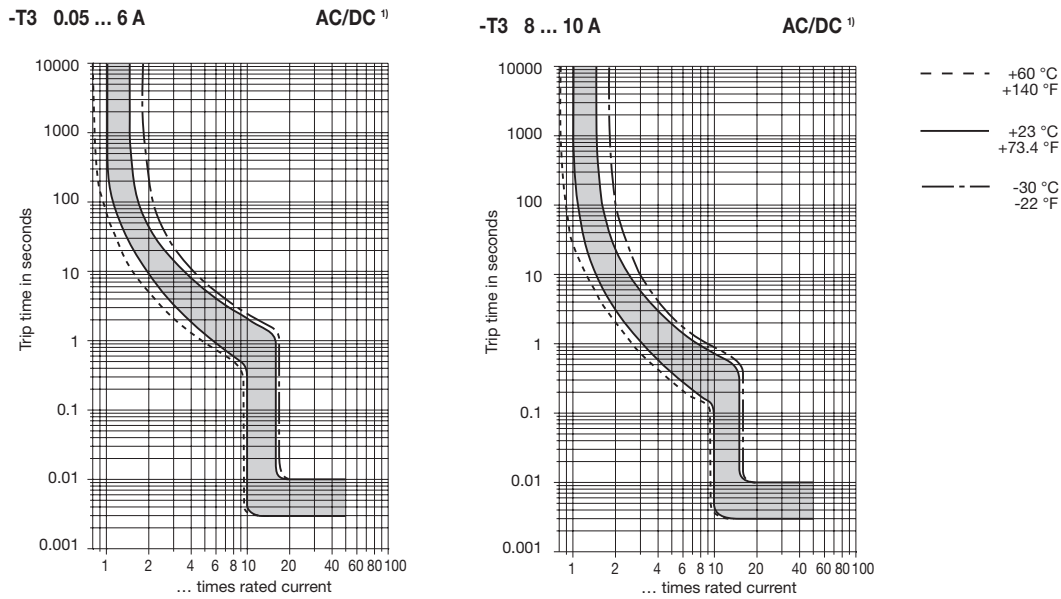
AC/DC ¹⁾



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

¹⁾ Magnetic tripping currents are increased by 30% on DC supplies (curve M1 and T1).

Typical time/current characteristics



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

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.