

Description

Single pole and multipole thermal-magnetic miniature circuit breakers (MCBs) in accordance with EN 60947-2, UL 1077 and UL 489 for DIN rail mounting, with toggle actuation, visual status indication and high rupture capacity. A positively trip-free snap action mechanism ensures reliable switching behaviour. A range of trip characteristics and add-on modules allow a great variety of applications.

Typical applications

Protection of cables, motors, generators and transformers, thyristors and silicon rectifiers. Protection of computers and their peripheral equipment, industrial process control systems, telecommunications equipment, power supplies, USPs and elevators.

Technical Data

Voltage rating and current rating range

to IEC 60947-2	1-pole; AC 230 V; 1 A...63 A; inductive load 2, 3, 4-pole; AC 400 V, 1 A...63 A; inductive load
to UL 1077	1-pole; AC 277 V; 1 A...63 A; inductive load 2, 3, 4-pole; AC 480 V, 1 A...63 A; inductive load
to UL 489	1-pole; AC 120 V; 1A...32 A; inductive load 2, 3-pole; AC 240 V, 1 A...32 A; inductive load 1-pole; AC 277 V; 1 A...20 A; inductive load 2, 3-pole; AC 480 V; 1 A...20 A; inductive load 1-pole; DC 60 V; 1 A...32 A; inductive load 2-pole; DC 125 V; 1A...32 A; inductive load

Typical life

Mechanically	20,000 cycles				
Electrically to IEC 60947- 2	1,500 cycles U_N ; 1 In; cos phi= 0.8 (AC) + 8,500 cycles, mechanical + 12 cycles; U_N ; 6 In; cos phi= 0.5; (AC)				
Electrically to UL 1077, § 21, 22	I_N	cycles	U_N	I_{nc}	cos phi
1-pole	1...63 A	50	AC 240 V	6 In	0.40-0.50
		+ 6,000	AC 240 V	1 In	0.75-0.80
1-pole	1...63 A	50	AC 277 V	1.5 In	0.75-0.80
		+ 6,000	AC 277 V	1 In	0.75-0.80
2-, 3-, 4-pole	1...63 A	50	AC 480 V	6 In	0.40-0.50
		+ 6,000	AC 480 V	1 In	0.75-0.80

Typical life and reduced short-circuit rupture capacity to UL 489, test sequence Y

6,000 cycles; U_N ; 1 In;
cos phi= 0.75-0.8 (AC)
+ 4,000 cycles, mechanical
+ 2 operations (O-CO); U_N ; 1,500 A;
cos phi= 0.45-0.5 (AC)



Technical Data

Rupture capacity

Rupture capacity (Ics) to IEC 60947-2	3 operations (O-CO-CO); U_N ; 7,500 A; cos phi= 0.5 (AC)
Rupture capacity (Icu) to IEC 60947-2	2 operations (O-CO); U_N ; 10,000 A; cos phi= 0.5 (AC)
Short circuit rupture capacity to UL 489, test sequence Z	3 operations (O-CO-CO); U_N ; 10,000 A; cos phi= 0.45 - 0.5 (AC)

Short circuit current I_{nc} to UL 1077, §25

	I_N	U_N	I_{nc}	cos phi
1-pole	1...63 A	AC 240 V	7,500 A, U1	0.75-0.80
1-pole	1...63 A	AC 277 V	5,000 A, U1	0.75-0.80
2-, 3-, 4-pole	1...63 A	AC 480 V	5,000 A, U1	0.75-0.80

Overload rupture capacity UL 489, test sequence X

	I_N	cycles	U_N	I_{nc}	cos phi	L/R
1-pole	1...32 A	50	AC 120 V	6 In (min. 150 A)	0.45-0.50	---
2, 3-pole	1...32 A	50	AC 240 V	6 In (min. 150 A)	0.45-0.50	---
1-pole	1...20 A	50	AC 277 V	150 A	0.45-0.50	---
2.3-pole	1...20 A	50	AC 480 V	150 A	0.45-0.50	---

Insulation coordination 6 kV / 3 (reinforced insulation at operating area)

Protection class IP20

Vibration (sinusoidal) test to IEC 60068-2-6, test Fc ± 0.38 mm (10 – 57 Hz), 5 g (57 – 500 Hz)
10 frequency cycles per axis

Shock, test to IEC 60068-2-27, test Ea 30 g (11 ms)

Corrosion, test to IEC 60068-2-11, test Ka 96 hrs. in 5% salt mist

Humidity, test to IEC 60068-2-78, test Cab 48 hours at 95% RH, temperature +40 °C

Terminals screw terminals
vertical connection possible by means of busbars

Technical Data

Tightening torque	2 Nm max.
Cable cross section	≤35 mm ²
Ambient temperature:	-35 °C ...+ 70 °C
Mounting	rail mounting
Mass	approx. 116 g per pole (EN 60947-2/UL 1077) approx. 131 g per pole (UL 489)

Order numbering code

Type No.

4230 single and multipole thermal-magnetic miniature circuit breaker

Mounting

T1 rail mounting

Number of poles

- 1 single pole protected
- 2 double pole protected
- 3 three pole protected
- 4 four pole protected*

Accessories

0 without

Terminals

K0 screw terminals

Characteristic curve

B: thermal 1.05 - 1.30 In; magnetic 3.2 - 4.8 In

C: thermal 1.05 - 1.30 In; magnetic 6.4 - 9.6 In

D: thermal 1.05 - 1.30 In; magnetic 9.6 - 14.4 In

Approvals

E EN 60947-2 (TÜV) / UL 1077

U UL 489 (only 1-, 2- & 3-pole) / EN 60947-2 (TÜV)

Current ratings:

1, 2, 4, 6, 10, 16, 20, 25, 32 (40, 50, 63 A)*

4230 - T1 1 0 - K0 C E - 10 A ordering example

* not for UL 489

Current ratings and voltage drop @ +25°C

Voltage drop in V at I_N

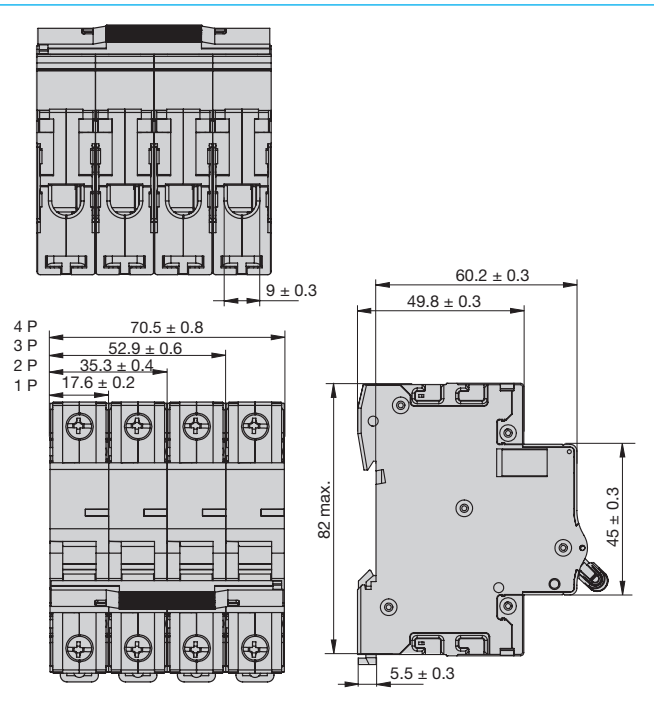
I _N (A)	1	2	4	6	10	16
V	3.0	1.5	0.75	0.50	0.30	0.22
I _N (A)	20	25	32	40	50	63
V	0.23	0.18	0.19	0.19	0.18	0.21

Approvals

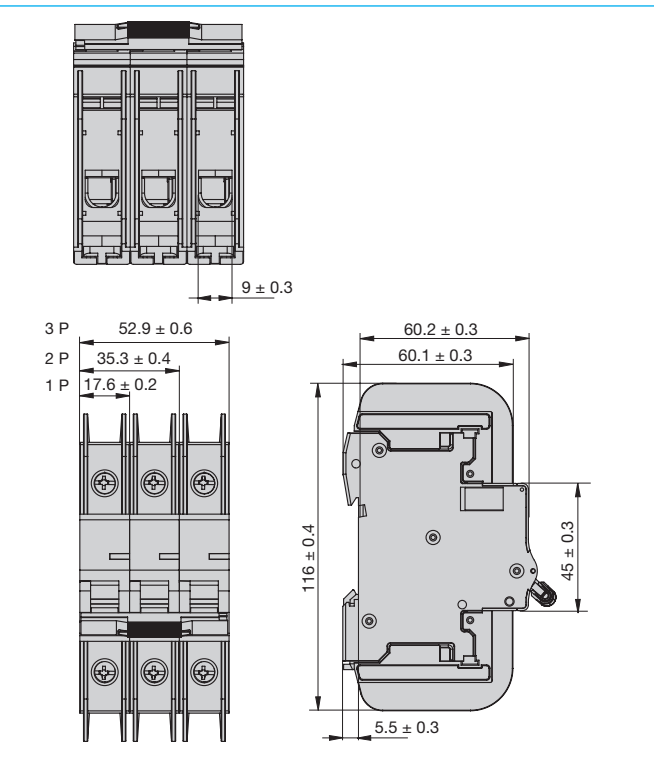
Approval authority / standard:

TÜV Rheinland / EN 60947-2
UL / UL1077 / CSA-C22.2 No. 235
UL / UL489 / CSA-C22.2 No. 5

Dimensions – EN 60947-2 / UL1077 version

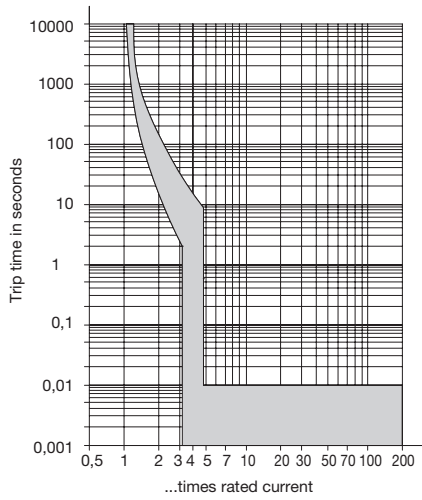


Dimensions – UL 489 version

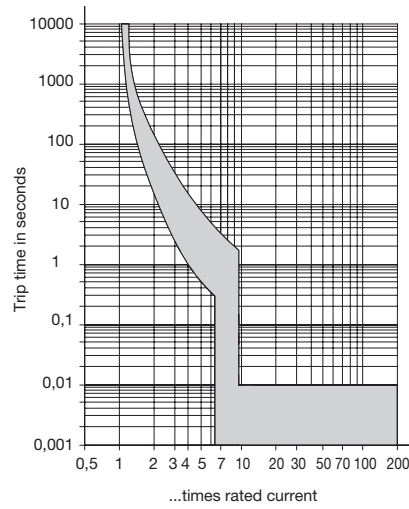


Time/current characteristics

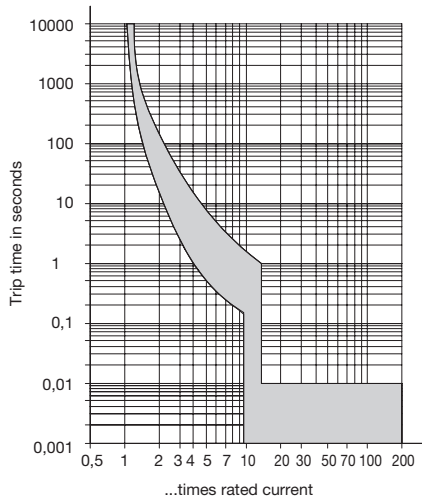
B Curve



C Curve



D Curve



Schematic diagrams

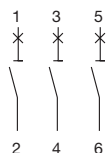
1-pole



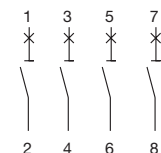
2-pole



3-pole



4-pole



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.

Max. operating currents depending on ambient temperature

Rated current I_N (A)	Max. operating currents depending on ambient temperature T (A)										
	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	+5°C	+10°C	+15°C
1	1.27	1.25	1.23	1.21	1.19	1.17	1.15	1.13	1.10	1.08	1.06
2	2.54	2.50	2.46	2.42	2.38	2.34	2.30	2.26	2.20	2.16	2.12
4	5.08	5.00	4.92	4.84	4.76	4.68	4.60	4.52	4.40	4.32	4.24
6	7.70	7.58	7.46	7.34	7.21	7.09	6.96	6.83	6.70	6.56	6.42
10	13.89	13.62	13.35	13.07	12.81	12.53	12.23	11.93	11.63	11.33	11.01
16	20.78	20.43	20.08	19.75	19.40	19.05	18.70	18.33	17.96	17.58	17.20
20	25.67	25.28	24.88	24.47	24.06	23.64	23.22	22.78	22.34	21.89	21.43
25	32.21	31.72	31.22	30.70	30.18	29.65	29.10	28.55	27.98	27.41	26.82
32	41.04	40.46	39.82	39.17	38.51	37.84	37.15	36.47	35.75	35.03	34.30
40	51.63	50.86	50.04	49.21	48.37	47.51	46.63	45.74	44.83	43.90	42.95
50	64.92	63.97	62.92	61.86	60.77	59.67	58.54	57.40	56.23	55.05	53.81
63	83.48	82.06	80.64	79.19	77.72	76.22	74.70	73.14	71.54	69.91	68.24

Rated current I_N (A)	Max. operating currents depending on ambient temperature T (A)										
	+20°C	+25°C	+30°C	+35°C	+40°C	+45°C	+50°C	+55°C	+60°C	+65°C	+70°C
1	1.05	1.02	1.00	0.97	0.94	0.91	0.89	0.86	0.83	0.80	0.77
2	2.10	2.04	2.00	1.94	1.88	1.82	1.78	1.72	1.66	1.60	1.54
4	4.20	4.08	4.00	3.88	3.76	3.64	3.56	3.44	3.32	3.20	3.08
6	6.27	6.14	6.00	5.84	5.68	5.52	5.36	5.19	5.01	4.83	4.64
10	10.67	10.34	10.00	9.63	9.24	8.85	8.45	8.01	7.55	7.06	6.55
16	16.80	16.40	16.00	15.55	15.11	14.66	14.20	13.71	13.21	12.70	12.75
20	20.96	20.47	20.00	19.47	18.95	18.42	17.87	17.30	16.71	16.10	15.47
25	26.22	25.61	25.00	24.33	23.67	23.00	22.28	21.56	20.80	20.02	19.21
32	33.54	32.77	32.00	31.17	30.34	29.48	28.69	27.69	26.75	25.78	24.77
40	41.98	40.99	40.00	38.93	37.85	36.75	35.61	34.43	33.21	31.95	30.63
50	52.56	51.28	50.00	47.82	46.24	44.81	43.33	41.81	40.23	38.58	35.77
63	66.53	64.78	63.00	60.11	58.19	56.21	54.16	52.03	49.81	47.50	43.05

Description

Add-on module for circuit breaker type 4230-T. The auxiliary switch has a change-over contact as signal contact and is operated with actuation of the MCB.

Typical applications

Status monitoring of MCB and/or the connected loads.

Mounting

The add-on module is mounted on the left side of the MCB (seen from the front). For mounting, the MCB has to be in the OFF position.

Order numbering code

Type No.	
X4230 Add-on module for type 4230-T	
Module type	
S	aux. contact switch
Style	
0	change-over contact
Terminals	
1	screw terminals
Key for nominal output	
A	AC voltage DC voltage
Rated voltage	Rated current Rated voltage Rated current
240 V	6 A 24 V 6 A
415 V	3 A 48 V 2 A
130 V	1 A
Delivery condition:	
L	supplied separately, has to be mounted by the user
X4230-S 0 1 A L ordering example	

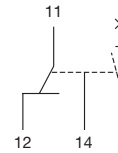
Technical Data

Voltage ratings:	AC 240 V	AC 415 V	DC 24 V	DC 48 V	DC 130 V
Current ratings:	6 A	3 A	6 A	2 A	1 A
Typical life	20,000 cycles				
Tightening torque	1 Nm max.				
Ambient temperature	-35 °C ...+ 70 °C				
Width	9 mm				
Mass	approx. 29 g				

Approvals

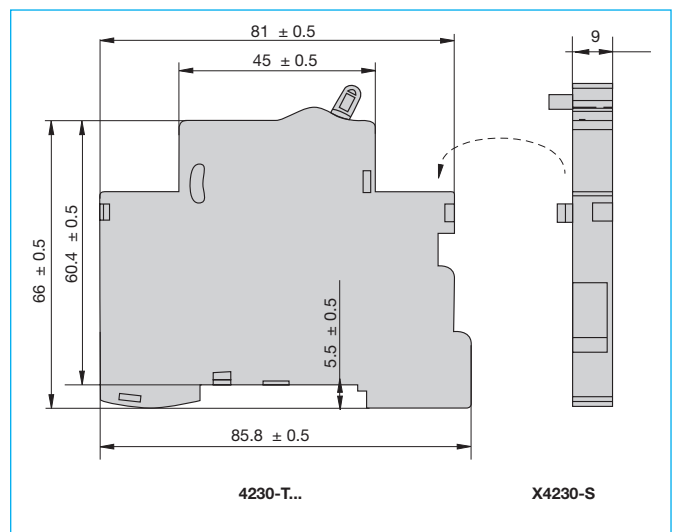
Approval authority / standard:
TÜV (IEC 60947-5)

Schematic diagrams



Note
As soon as the auxiliary contact module is mounted on the MCB, the terminals 11 and 14 are connected when the MCB is in ON condition. Terminals 11 and 12 are connected when the MCB is in OFF condition.

Mounting principle



Description

Add-on module for MCB type 4230-T. The fault indicator has a change-over contact as signal contact. There will only be a signal when the MCB has tripped on grounds of a failure (overload, short circuit) and not when the MCB has been switched on or off manually. By actuating the reset lever on the front the tripping signal is acknowledged.

Typical applications

Status monitoring of MCB and/or the connected loads.

Mounting

The add-on module is mounted on the left side of the MCB (seen from the front). For mounting, the MCB has to be in the OFF position.

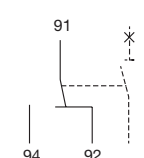
Order numbering code

Type No.					
X4230 add-on module for type 4230-T					
Module type					
A	fault indicator module				
Style					
0	change-over contact				
Terminals					
1	screw terminals				
Key for nominal output					
A	AC voltage		DC voltage		
	Rated voltage	Rated current	Rated voltage	Rated current	
	240 V	6 A	24 V	6 A	
	415 V	3 A	48 V	2 A	
			130 V	1 A	
Delivery condition:					
L	supplied separately, has to be mounted by the user				
X4230-A 0 1 A L ordering example					

Technical Data

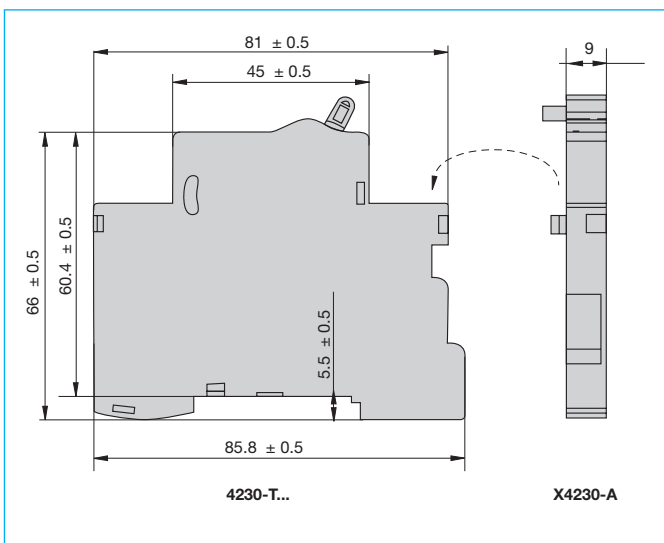
Voltage ratings:	AC 240 V	AC 415 V	DC 24 V	DC 48 V	DC 130 V
Current ratings:	6 A	3 A	6 A	2 A	1 A
Typical life	20,000 cycles				
Tightening torque	1 Nm max.				
Ambient temperature	-35 °C ...+ 70 °C				
Width	9 mm				
Mass	approx. 29 g				

Schematic diagrams



Note
As soon as the auxiliary contact module is mounted on the MCB, the terminals 91 and 92 are connected when the MCB is in ON condition; the terminals 91 and 94 are connected when the MCB has tripped electrically; the terminals 91 and 92 are connected when the MCB has been tripped manually; at the same time the terminals 91 and 94 do not have contact.

Mounting principle



3

Description

Add-on module for MCB type 4230-T. The working current module serves for remote trip of the MCB and for signalling whether the MCB was tripped electrically or manually.

Typical applications

Electrical remote trip of safety equipment with simultaneous monitoring of MCB status or its connected load.

Mounting

The add-on module is mounted on the left side of the MCB (seen from the front). For mounting, the MCB has to be in the OFF position. When auxiliary contact module/fault indicator module and a working current module are mounted at the same time, the working current module always has to be mounted first.

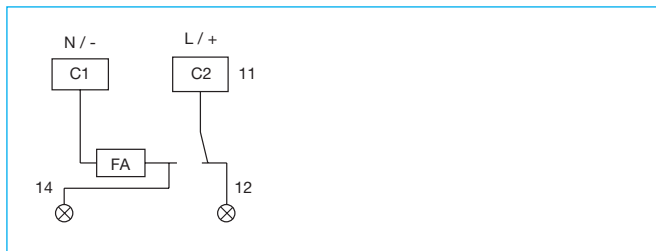
Order numbering code

Type No.				
X4230 add-on module for type 4230-T				
Module type				
F	working current module			
Style				
A	magnetic coil and auxiliary switch (changeover) physically isolated from the MCB			
Terminals				
1	screw terminals			
Delivery condition:				
L	supplied separately, has to be mounted by the user			
Rated voltage				
	AC 240 V			
	AC 415 V			
	DC 24 V			
	DC 48 V			
X4230- F A 1 L - AC 240 V ordering example				

Technical Data

Voltage ratings:	AC 415 V	AC 240 V	DC 48 V	DC 24 V
Min. trip voltage	AC 200 V	AC 160 V	DC 24 V	DC 16 V
Power consumption	240 W	240 W	200 W	200 W
Rated current of auxiliary contact	3 A	6 A	2 A	6 A
Trip time	< 10 ms			
Typical life	20,000 cycles			
Tightening torque	1 Nm max.			
Ambient temperature	-35 °C ...+ 70 °C			
Width	18 mm			
Mass	approx. 60 g			

Schematic diagrams



Mounting principle

