

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.

Technical Data

Voltage rating and current rating range

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

Endurance

Mechanically	20,000 cycles
Electrically	6,000 cycles



Technical Data

Rupture capacity

to IEC/EN 60947-2 (Ics)	7,500 A
to IEC/EN 60947-2 (Icu)	10,000 A
to UL 489	10,000 A

to UL1077

Number of poles	Un	In	TC	OL	SC
1-pole	AC 240 V	1...63 A	1	1	7.5 kA, U1
1-pole	AC 277 V	1...63 A	1	0	5 kA, U1
2-, 3-, 4-pole	AC 480 V	1...63 A	1	1	7.5 kA, U1
1-pole	DC 60 V	1...63 A	1	0	7.5 kA, U1
2-pole in series	DC 125 V	1...63 A	1	0	7.5 kA, U1

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

Degree of protection 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

Tightening torque 2 Nm max.

Cable cross section ≤35 mm²

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 high performance 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 * I_N; magnetic 3.2 - 4.8*I_N

C: thermal 1.05 - 1.30 * I_N; magnetic 6.4 - 9.6*I_N

D: thermal 1.05 - 1.30 * I_N; magnetic 9.6 - 14.4*I_N

Approvals

E IEC/EN 60947-2 (TÜV) / UL 1077

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

IEC/EN 60947-2 (TÜV)

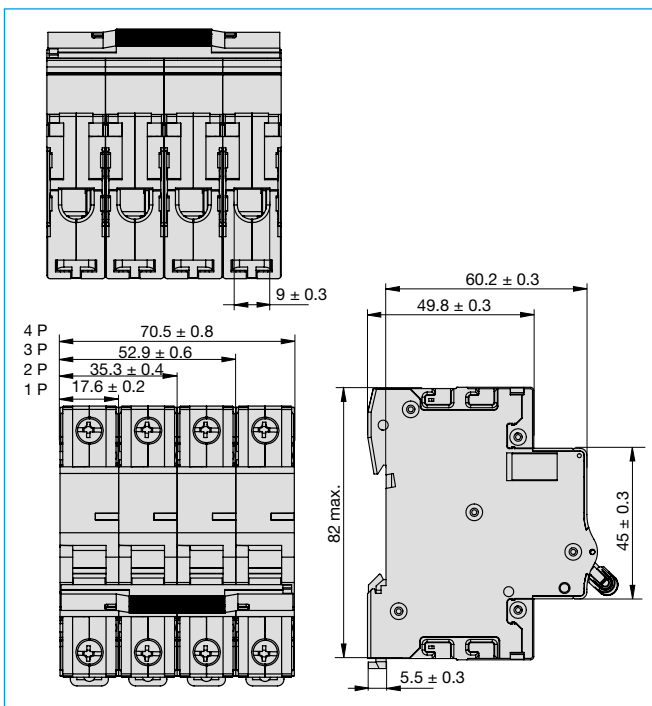
Current ratings:

- 1, 1.2, 1.5, 1.6, 2, 3, 4, 5, 6, 7, 8, 10, 12, 13, 15, 16, 20, 25, 30, 32, 35, 40, 50, 60, 63 A

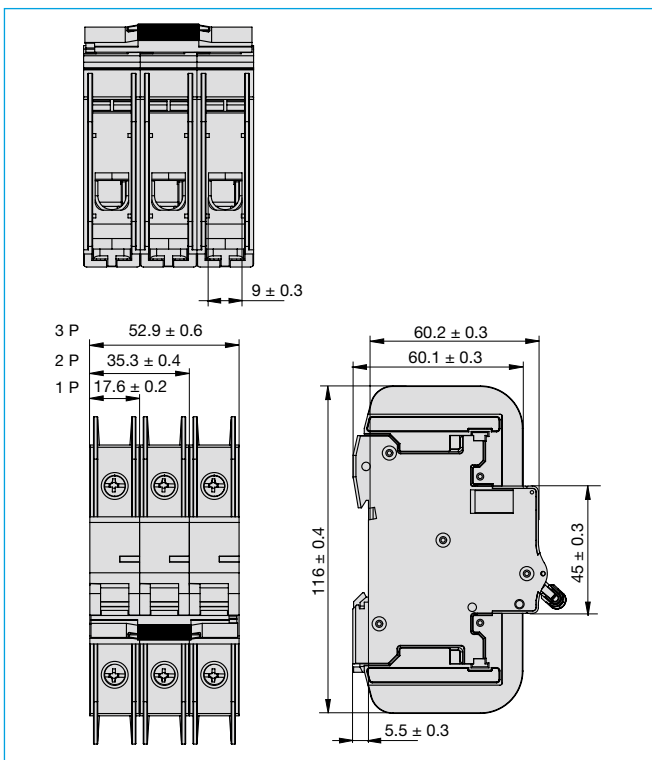
4230 - T1 1 0 - K0 C E - 10 A ordering example

* not for UL 489

Dimensions - IEC/EN 60947-2 / UL1077 version



Dimensions - UL 489 version



Current ratings and voltage drop @ +25°C

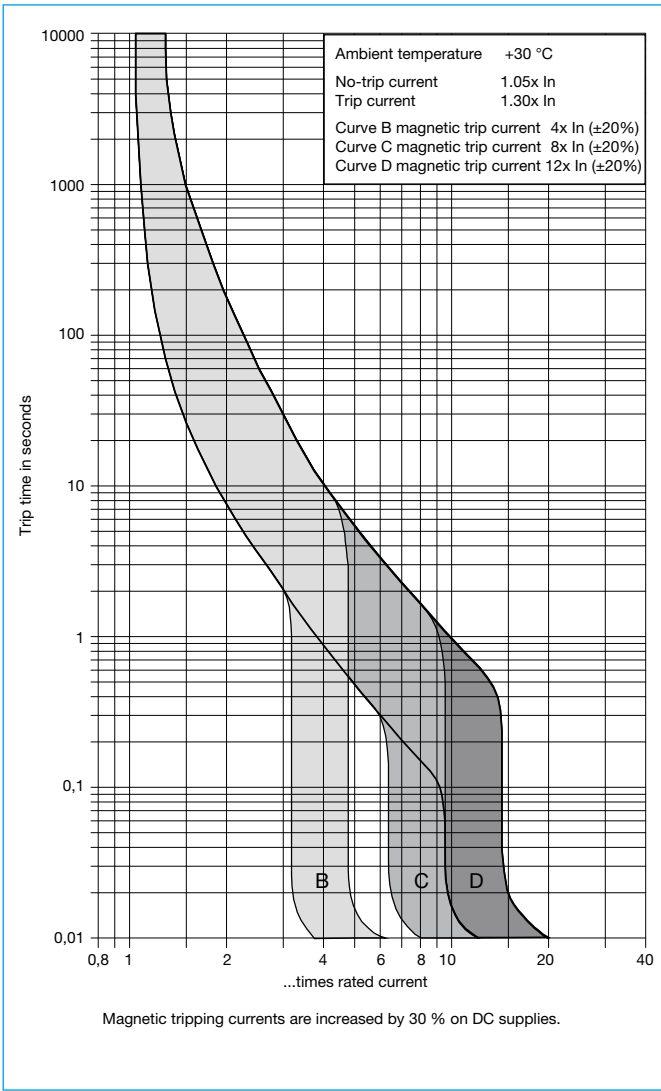
Voltage drop in V at 1 I_N

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

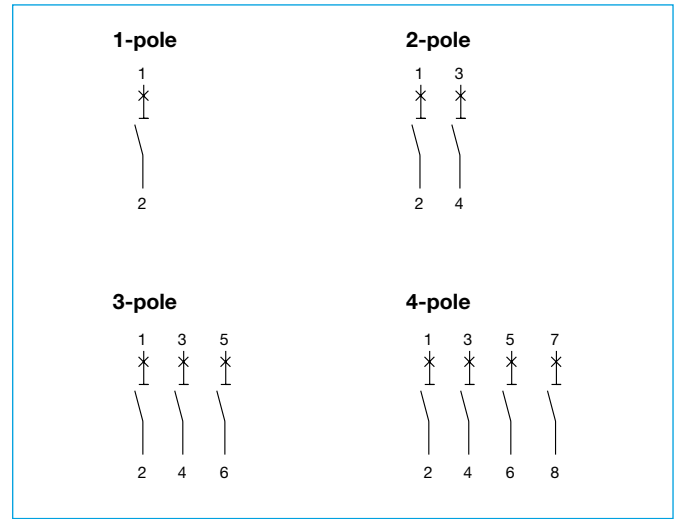
Approvals

Approval authority	Standard	Rated voltage	Current ratings
TÜV	IEC/EN 60947-2:	AC 230/400 V	1 A, 2 A, 4 A, 6 A, 10 A, 16 A, 20 A, 25 A, 32 A, 40 A, 50 A, 63 A
UL	UL 1077 / CSA-C22.2 No. 235	AC 480Y/277 V DC 60 V, DC 125 V	1...63 A 1...63 A
UL	UL 489 / CSA-C22.2 No. 5	AC 240 V AC 480Y/277 V DC 60 V, DC 125 V	1...63 A 1...32 A 1...63 A

Time/current characteristics



Schematic diagrams



All dimensions without tolerances are for reference only. E-T-A reserves the right change specifications at any time 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 (to IEC/EN 60947-5-1)

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

B (to UL 489)

Rated voltage	Rated current	Rated voltage	Rated current
12...240 V	6 A	12...24 V	6 A
277 V	3 A	48 V	3 A
		110...220 V	1,5 A

Delivery condition:

L supplied separately, has to be mounted by the user

X4230- S 0 1 A L ordering example

Technical Data

Rated currents to IEC/EN 60947-5-1:

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

Rated currents to UL 489:

Voltage ratings:	AC 12... 240 V	AC 277 V	DC 12 ... 24 V	DC 48 V	DC 110 ... 220 V
Current ratings:	6 A	3 A	6 A	3 A	1,5 A

Endurance 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	Types
TÜV	IEC/EN 60947-5-1	with key index "A"
UL	UL 489	with key index "B"

Mounting instructions

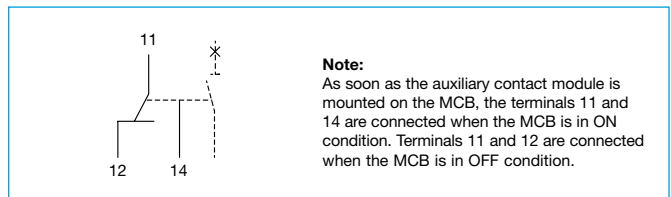
Mounting to MCB to UL 489

The following steps have to be carried out for mounting the auxiliary contact module:

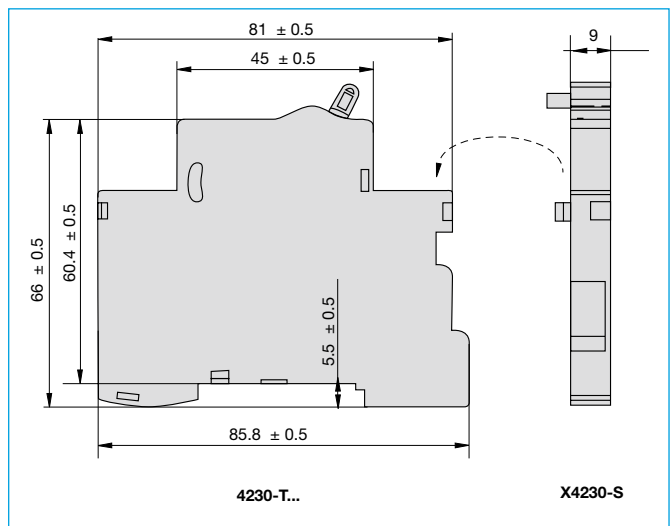
- Remove the left-side covers for the latching notches of the auxiliary contact module on both isolation pieces of the MCB, e.g. by means of a screw driver
- Pull off the isolation pieces from the MCB to the front
- Remove blanking plug on MCB to open left-side holes for latching notches of auxiliary switch
- Re-insert isolation pieces onto MCB
- Pull off left-side adhesive cover and carefully remove the perforated cover below

Caution: the MCB to UL489 must only be operated with the insulation pieces fitted.

Schematic diagrams



Mounting principle



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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 tripped on grounds of a failure (overload, short circuit), but not when the MCB was 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 (to IEC/EN 60947-5-1)			
AC voltage	DC voltage		
Rated voltage	Rated current	Rated voltage	Rated current
240 V	6 A	24 V	6 A
277 V	3 A	48 V	2 A
		130 V	1 A
B (to UL 489)			
12...240 V	6 A	12...24 V	6 A
415 V	3 A	48 V	3 A
		130 V	1.5 A
Delivery condition:			
L	supplied separately, has to be mounted by the user		
X4230-A 0 1 A L ordering example			

Technical Data

Rated currents to IEC/EN 60947-5-1:

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

Rated currents to UL 489:

Voltage ratings:	AC 12... 240 V	AC 277 V	DC 12 ... 24 V	DC 48 V	DC 110 ... 220 V
Current ratings:	6 A	3 A	6 A	3 A	1.5 A

Endurance	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	Types
UL	UL 489	with key index "B"

Mounting instructions

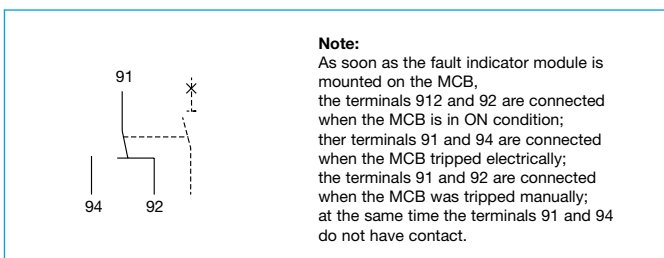
Mounting to MCB to UL 489

The following steps have to be carried out for mounting the fault indicator module:

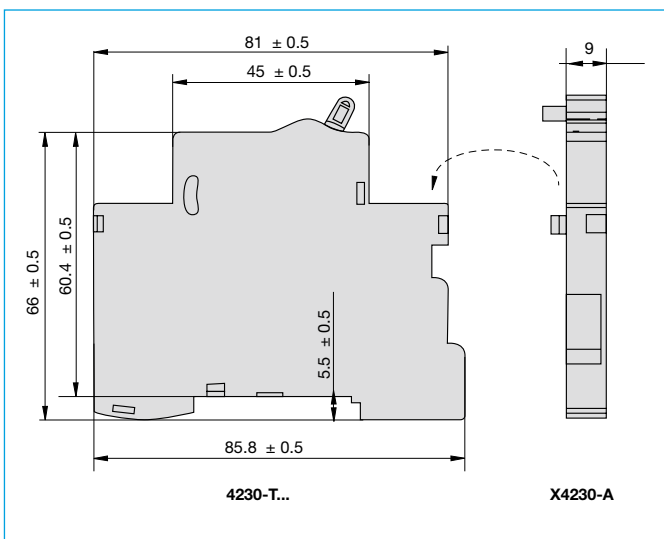
- Remove the left-side covers for the latching notches of the fault indicator module on both isolation pieces of the MCB, e.g. by means of a screw driver
- Pull off the isolation pieces from the MCB to the front
- Remove blanking plug on MCB to open left-side holes for latching notches of indicator switch
- Re-insert isolation pieces onto MCB
- Pull off left-side adhesive cover and carefully remove the perforated cover below

Caution: the MCB to UL489 must only be operated with the insulation pieces fitted.

Schematic diagrams



Mounting principle



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

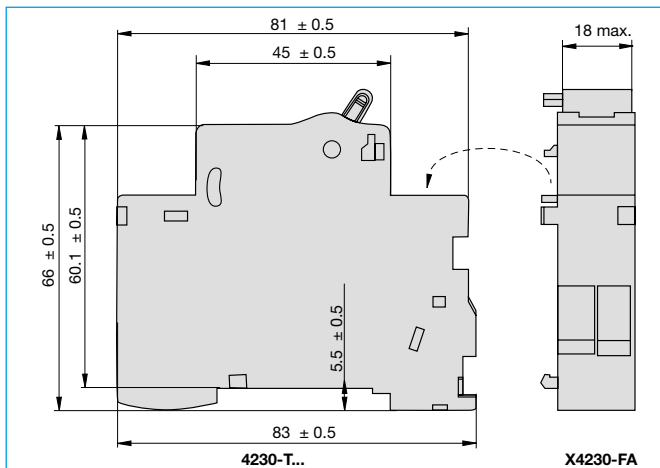
The add-on module is mounted on the left side of the MCB (seen from the front). For mounting, the MCB has to be in the OFF position. When auxiliary contact module/fault indicator module and a working current module are mounted at the same time, the working current module always has to be mounted first.

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
Approvals	
A	without
B	UL 489
Delivery condition:	
L	supplied separately, has to be mounted by the user
Rated voltage	
Approval	
A	B
AC 120 V	--- UL 489
AC 240 V	without UL 489
AC 277 V	--- UL 489
AC 415 V	without ---
DC 12 V	--- UL 489
DC 24 V	without UL 489
DC 48 V	without UL 489
DC 125 V	--- UL 489

X4230- F A 1 A L - AC 240 V ordering example

Mounting principle



Technical Data

Voltage ratings AC	AC 415 V	AC 277 V	AC 240 V	AC 120 V
Min. trip voltage	AC 200 V	AC 160 V	AC 160 V	AC 80 V
Power consumption	240 W	240 W	200 W	200 W
min. response power	35 W	35 W	35 W	35 W
Rated current of auxiliary contact	3 A	3 A	6 A	6 A
Voltage ratings DC	DC 125 V	DC 48 V	DC 24 V	DC 12 V
Min. trip voltage	DC 80 V	DC 24 V	DC 16 V	DC 8 V
Power consumption	200 W	200 W	200 W	200 W
min. response power	30 VA	30 VA	30 VA	30 VA
Rated current of auxiliary contact	1.5 A	2 A	6 A	6 A
Trip time	< 10 ms			
Endurance	20,000 cycles			
Tightening torque	1 Nm max.			
Ambient temperature	-35 °C...+ 70 °C			
Width	18 mm			
Mass	approx. 60 g			

Mounting instructions

Mounting to MCB to UL 489

The following steps have to be carried out for mounting the working current module:

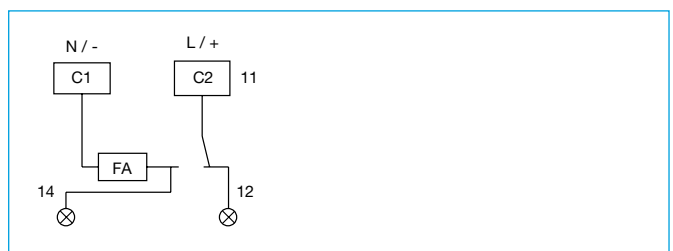
- Remove the left-side covers for the latching notches of the working current module on both isolation pieces of the MCB, e.g. by means of a screw driver
- Pull off the isolation pieces from the MCB to the front
- Remove blanking plug on MCB to open left-side holes for latching notches of working current module
- Re-insert isolation pieces onto MCB
- Pull off left-side adhesive cover and carefully remove the perforated cover below

Caution: the MCB to UL489 must only be operated with the insulation pieces fitted.

Approvals

Approval authority	Standard	Types
UL	UL 489	Approval type "B" according to ordering number code

Schematic diagrams

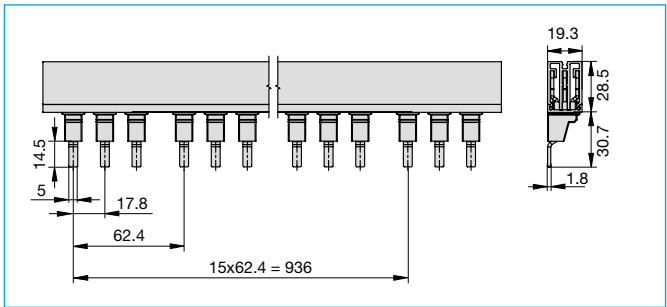


Busbars UL 489 to be cut to length

Busbars for the connection of circuit breakers **type 4230-..U.. to UL 489**. The busbars of 1m length can individually be cut to a suitable length for the application and isolated with end caps. Depending on the control cabinet design, the supply is by means of supply terminals without increasing the installation width or by means of a terminal block directly on the rail without increasing the installation height.

The models marked with "HS" are suitable for use with auxiliary contact modules with a width of 9 mm.

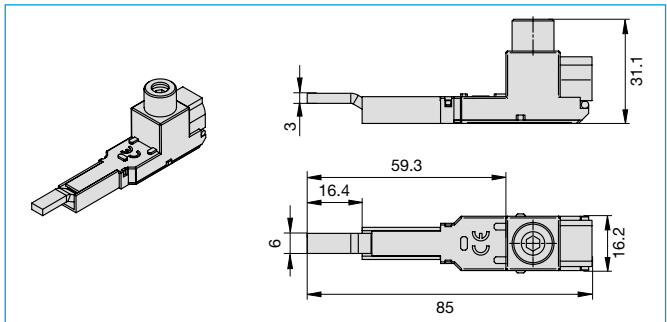
Busbar cross section: 18 mm²
 Max. busbar current I_S (at 35°C):
 with supply at the end: 80 A
 with supply in the middle: 160 A
 Short circuit strength I_{CC}: 10 kA
 Max. operating voltage: 480 V AC/DC
 Degree of protection: IP20
 Step size: 17.8 mm



Accessories for busbars UL489 that can be cut to length:

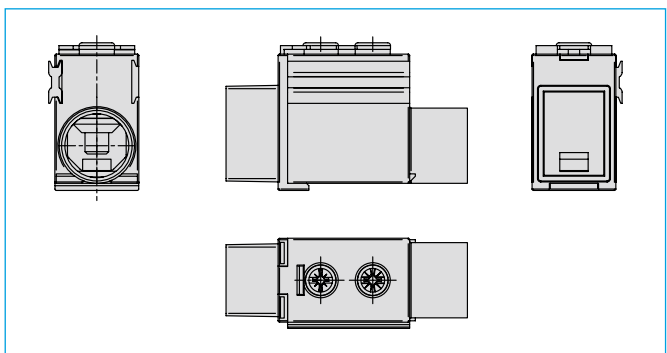
**supply terminal
part no. X4230-FTUC35**

Cross-section 2.5-35 mm² (2-14 AWG),
 Tightening torque: 5.5 Nm (50 lbf.in)
 Ampacity: max. 115 A



**Terminal block
part no. X4230-FBU50**

Cross-section 1.5-50 mm² (1-14 AWG),
 solid/stranded
 1.5-35 mm² (2-14 AWG),
 finely stranded with wire end ferrule
 Tightening torque: supply: 3.5 Nm (35 lbf.in)
 output (track side): 2.5 Nm (22 lbf.in)
 Ampacity: max. 115 A



**end caps
part no. X4230-EC1**

Accessories for all busbars UL489 that can be cut to length:

**Protection against brush contact
part no. X4230-TC2**

for covering unused modules

3



Number of poles	Number of modules	part no.
1-pole	57	X4230-BU157P18S
2-pole	56	X4230-BU256P18S
3-pole	57	X4230-BU357P18S
1-pole + HS	37	X4230-BU137P18H2S
2-pole + HS	46	X4230-BU246P18H1S
3-pole + HS	48	X4230-BU348P18H1S

HS = application with auxiliary switch 9 mm

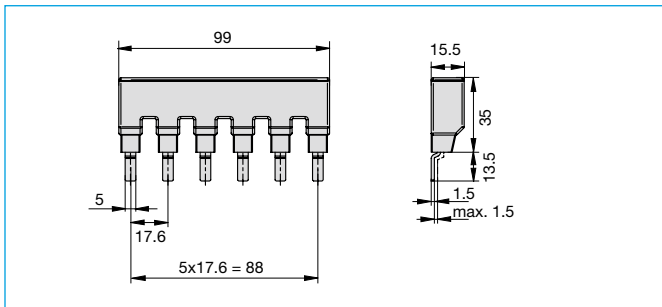
Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

Busbars UL 489, cannot be cut to length

Busbars for the connection of circuit breakers **type 4230-..U..** to **UL489**. Depending on busbar type suitable for up to 18 poles.

Busbar cross section: 16 mm²
 Max. busbar current I_S: 115 A
 Short circuit strength I_{CC}: 10 kA
 Max. operating voltage: 480 V AC/DC
 Degree of protection: IP20
 Step size: 17.6 mm

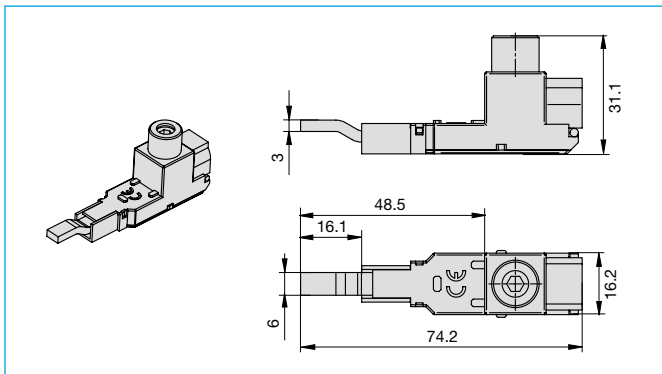
Number of poles	Number of modules	part no.
1-pole	6	X4230-BU106P16A
1-pole	12	X4230-BU112P16A
1-pole	18	X4230-BU118P16A
2-pole	6	X4230-BU206P16A
2-pole	12	X4230-BU212P16A
2-pole	18	X4230-BU218P16A
3-pole	6	X4230-BU306P16A
3-pole	12	X4230-BU312P16A
3-pole	18	X4230-BU318P16A



Accessories for busbars UL489 that cannot be cut to length:

supply terminal
part no. X4230-FTU35

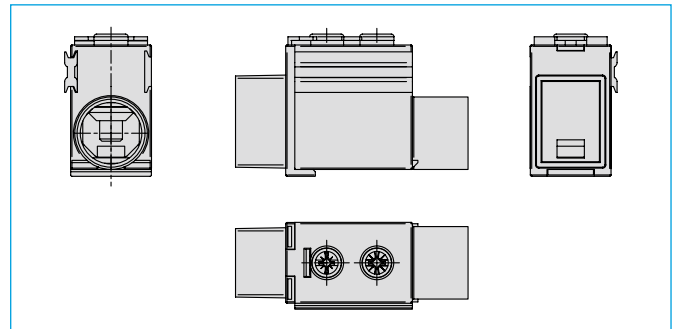
Cross-section: 2.5-35 mm² (2-14 AWG),
 Tightening torque: 5.5 Nm (50 lbf.in)
 Ampacity: max. 115 A



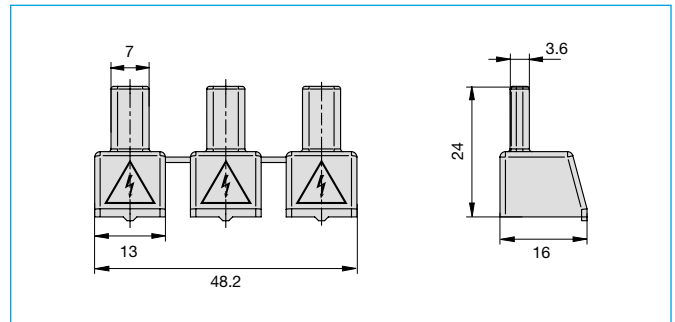
Accessories for busbars UL489 that cannot be cut to length:

Terminal block
part no. X4230-FBU50

Cross-section: 1.5-50 mm² (1-14 AWG), solid/stranded
 1.5-35 mm² (2-14 AWG), finely stranded with wire end ferrule:
 Tightening torque: supply: 3.5 Nm (35 lbf.in)
 output (track side): 2.5 Nm (22 lbf.in)
 Ampacity: max. 115 A



Protection against brush contact
part no. X4230-TC1



Approvals

Approval authority	Standard	Types
UL	UL 489	X4230-BU...
UL	UL 508	X4230-BR...

Busbars UL 508 to be cut to length

Busbars for the connection of circuit breakers **type 4230-..E..** to **UL1077** The busbars of 1m length can individually be cut to a suitable length for the application and isolated with end caps.

Depending on the control cabinet design, the supply is by means of supply terminals without increasing the installation width or by means of a terminal block directly on the rail without increasing the installation height.

The models marked with "HS" are suitable for use with auxiliary contact modules with a width of 9mm.

Busbar cross section: 18 mm²

Max. busbar current I_S (at 35°C):

with supply at the end: 80 A

with supply in the middle: 160 A

Short circuit strength I_{CC}: 10 kA

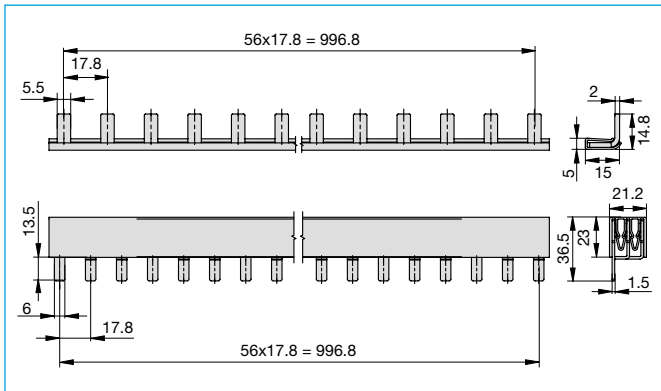
Max. operating voltage: 480 V AC/DC

Degree of protection: IP20

Step size: 17.8 mm

Number of poles	Number of modules	part no.
1-pole	57	X4230-BR157P18SB
2-pole	56	X4230-BR256P18SL
3-pole	57	X4230-BR357P18SL
1-pole + HS	37	X4230-BR137P18H1SB
2-pole + HS	46	X4230-BR246P18H1SL
3-pole + HS	48	X4230-BR348P18H1SL

HS = application with auxiliary switch 9 mm



end caps

for single pole busbars:

part no. X4230-EC2

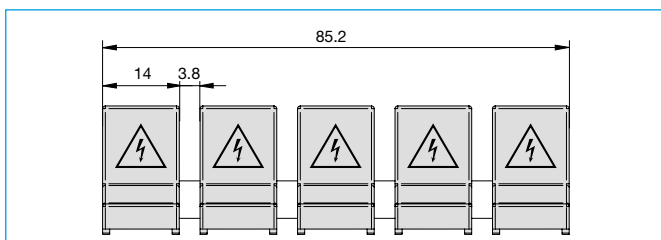
for multipole busbars:

part no. X4230-EC3

Protection against brush contact

part no. X4230-TC3

for covering unused modules.



Accessories for busbars UL508 that can be cut to length:

supply terminals

for single pole busbars:

part no. X4230-FTR135

for multipole busbars:

part no. X4230-FTR335

Cross-section

6 - 50 mm² (1-10 AWG),

solid/stranded

6 - 35 mm² (2-10 AWG),

finely stranded with wire

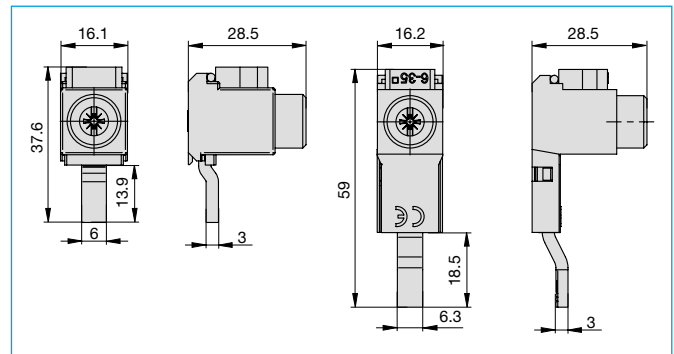
end ferrule

5.5 Nm (50 lbf.in)

max. 115 A

Tightening torque:

Ampacity:



Accessories for busbars UL508 that can be cut to length:

Terminal block

part no. X4230-FBR50

Cross-section

6 - 50 mm² (1-10 AWG),

solid/stranded

6 - 35 mm² (2-10 AWG),

finely stranded with wire end

ferrule:

Tightening torque:

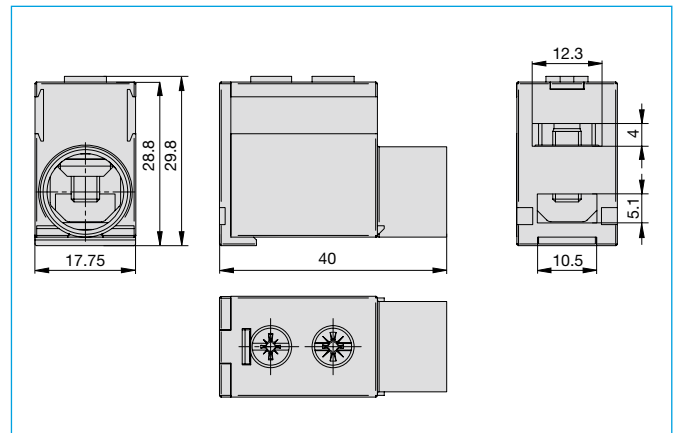
supply: 3.5 Nm (35 lbf.in)

output (track side):

2.5 Nm (22 lbf.in)

max. 115 A

Ampacity:



Busbars for IEC applications, to be cut to length

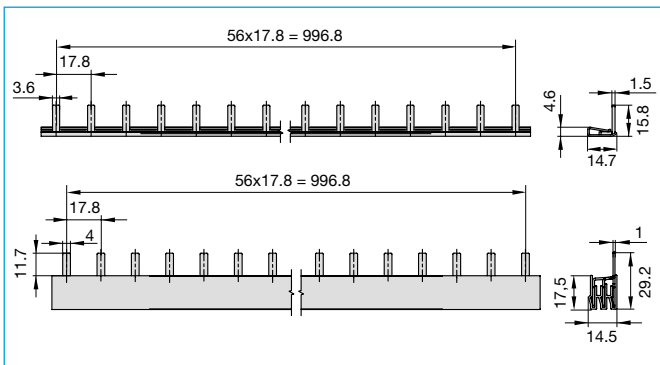
Busbars for the connection of circuit breakers **type 4230-..E.. to IEC 60947-2**. The busbars of 1m length can individually be cut to a suitable length for the application and isolated with end caps.

The models marked with "HS" are suitable for use with auxiliary contact modules with a width of 9 mm.

Busbar cross section: 16 mm²
 Max. busbar current I_s (at 35°C):
 with supply at the end: 80 A
 with supply in the middle: 130 A
 Short circuit strength I_{cc}: 10 kA
 Max. operating voltage: 690 V AC/DC
 Degree of protection: IP20
 Step size: 17.8 mm

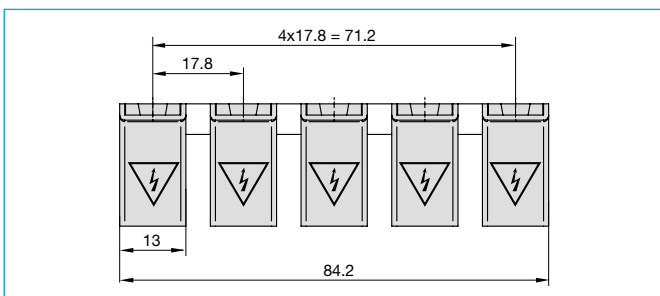
Number of poles	Number of modules	part no.
1-pole	57	Y 311 622 01
2-pole	56	Y 311 623 01
3-pole	57	Y 311 624 01
4-pole	56	Y 311 625 01
1-pole + HS	37	Y 311 626 01
2-pole + HS	46	Y 311 627 01
3-pole + HS	48	Y 311 628 01
4-pole + HS	52	Y 311 629 01

HS = application with auxiliary switch 9 mm



end caps
 for single pole busbars: part no. Y 307 851 01
 for 2-/3-pole busbars: part no. Y 308 506 01
 for four-pole busbars: part no. Y 311 633 01

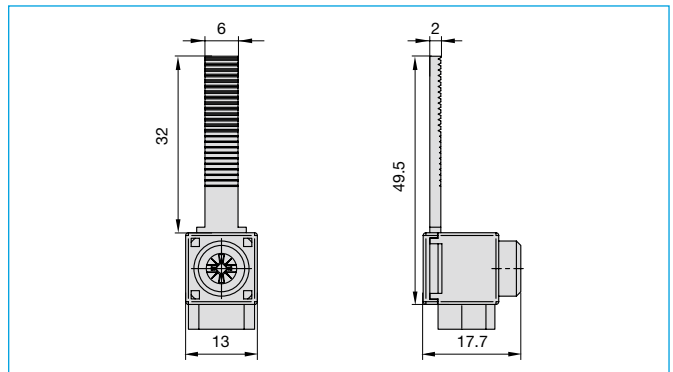
Protection against brush contact
 part no. Y 311 632 01



Accessories for busbars to IEC 60947 that can be cut to length:

supply terminal for multiple busbars:
part number Y 311 630 01

Cross-section: 6–25 mm², solid/stranded
 4–16 mm², finely stranded with wire end ferrule:
 Ampacity: max. 80 A



Accessories for busbars to IEC 60947 that can be cut to length:

supply terminal for multiple busbars:
part no. Y 311 631 01

Cross-section: 6–50 mm², solid/stranded
 4–35 mm², finely stranded with wire end ferrule:
 Tightening torque: 1 Nm (at 6 mm²)
 3.5 Nm (at 50 mm²)
 Ampacity: max. 125 A
 Degree of protection: IP20, isolated bottom

