
TECHNICAL CATALOG

FORMULA™ UL

Low voltage molded case
circuit breakers up to 250 A



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FORMULA is a result of ABB SACE's long history of developing effective circuit breakers. It was developed to be simple, but amazes with its extreme quality and versatility.

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FORMULA.

Simplicity and quality in a single product.

FORMULA is a result of ABB SACE's long history of developing effective circuit breakers. It was developed to be simple, but amazes with its extreme quality and versatility.

The highlights of the FORMULA line of molded case circuit breakers include:

- Quick and easy selection and ordering with few, but essential, versions of circuit breakers
- Multiple polarities, dedicated to various applications
- Accompanying accessory line
- Reduced circuit breaker depths

The FORMULA family consists of two frames, A1 and A2, which reach up to 100 A and 250 A respectively. Both frames are available in the fixed version with front terminals.

The protection trip unit has fixed thermal and magnetic threshold values for putting the circuit breaker into service more rapidly. A reduced number of part numbers simplifies selection and makes ordering easier. Installation is easy and the circuit breaker is ready for use immediately.



The easy and precise choice.



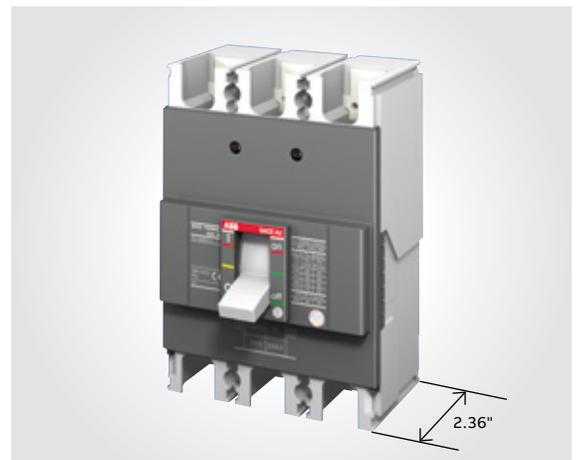
How simple and functional can a range of molded case circuit breakers be? By asking this elementary question, ABB conceived the idea for this family of circuit breakers. The result is FORMULA, the perfect synthesis between ABB SACE's recognized quality, reliability and simplicity. Simple, with regard to installation, sizing and fitting of accessories.

Reducing dimensions without compromising performance and reliability is an ABB SACE trademark that helps with installation and increases the work space inside switchboards and panels. FORMULA's compact design is a great advantage, especially for OEMs, panel builders and installers.

Quality in all applications.

Quality is versatility. ABB offers both three-pole and two-pole versions up to 250 A, along with a single-pole version up to 100 A, opening the door to the most varied application fields.

Quality is compact overall dimensions. The FORMULA A1 and A2 depth of under 2.5" is one of the the lowest on the market up to 250 A.



Construction characteristics

General information

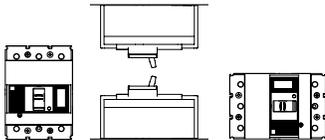
- 01 Double insulation
- 02 Positive operation
- 03 Installation positions
- 04 Test pushbutton



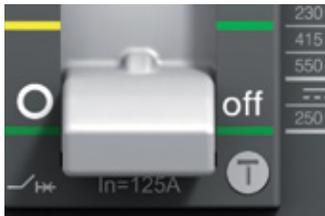
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All the molded case circuit breakers in the FORMULA family are constructed in accordance with the following construction characteristics:

- Double insulation
- Positive operation
- Isolation behavior
- Electromagnetic compatibility
- Topicalization
- Reverse feedable power supply

Versatility of the installation. It is possible to mount the circuit breaker in the horizontal, vertical or lying down position without undergoing any derating of the rated characteristics.

No nominal performance derating for use up to an altitude of 6562 ft. Above 6562 ft., the properties of the atmosphere (composition of the air, dielectric strength, cooling power and pressure) change, have an impact on the main parameters that define the circuit breaker. The altitude table below gives the changes to the main performance parameters.

FORMULA circuit breakers can be used in ambient temperatures between -25 °C to 70 °C (-13 °F to 158 °F) and stored in a room with atmospheric temperature between -40 °C to 70 °C (-40 °F to 158 °F).

All FORMULA circuit breakers are fitted with a test pushbutton, which allows the release test to be performed. This test must be carried out with the circuit breaker closed.

Altitude

		6600 ft.		8500 ft.		13000 ft.	
		A1	A2	A1	A2	A1	A2
Rated service voltage, U_e	(V)	240	240	228	228	192	192
Rated uninterrupted current	%	100	100	99	99	96	96

Weight

	A1 (lbs.)	A2 (lbs.)
Circuit breaker 1-pole	0.54	—
Circuit breaker 2-pole	1.04	1.61
Circuit breaker 3-pole	1.54	2.43

Construction characteristics

Regulations and reference standards

—
01 Hologram



—
01

Conformity with standards

- Standards
 - IEC 60947-2
 - UL 489
- Directives
 - EC directive: “Low voltage directives” (LVD) no. 2006/95/CE (in replacement of 73/23/CEE and subsequent amendments)
 - EC directive: “Electromagnetic compatibility directive” (EMC) no. 89/336 EEC

Certification of conformity with the product standards is carried out in the ABB SACE test lab (accredited by SINAL — certificate No. 062/1997) in respect of the EN 45011 European Standard, by the Italian certification body ACAE (Association for Certification of Electrical Apparatus), member of the European LOVAG organization (Low Voltage Agreement Group) and by the Swedish certification body SEMKO belonging to the international IECEE organization.

The FORMULA series has a hologram on the front, obtained using special anti-forgery techniques, as a guarantee of the quality and genuineness of the circuit breaker as an ABB SACE product.

Company quality system

The ABB SACE quality system conforms with the following standards:

- ISO 9001 International standard
- EN ISO 9001 (equivalent) European standards
- UNI EN ISO 9001 (equivalent) Italian standards

The ABB SACE quality system attained its first certification with the RINA certification body in 1990.

Environmental management system, social responsibility and ethics

Attention to protection of the environment is a priority commitment for ABB SACE. Confirmation of this is the realization of an environmental management system certified by RINA in conformity with the International ISO14001 Standard. ABB SACE was the first industry in the electromechanical sector in Italy to obtain this recognition. In 1999, the environmental management system was integrated with the occupational health and safety management system according to the OHSAS 18001 standard and later, in 2005, with the SA 8000 (social accountability 8000) standard, committing itself to respect of business ethics and working conditions.

The commitment to environmental protection is evident through:

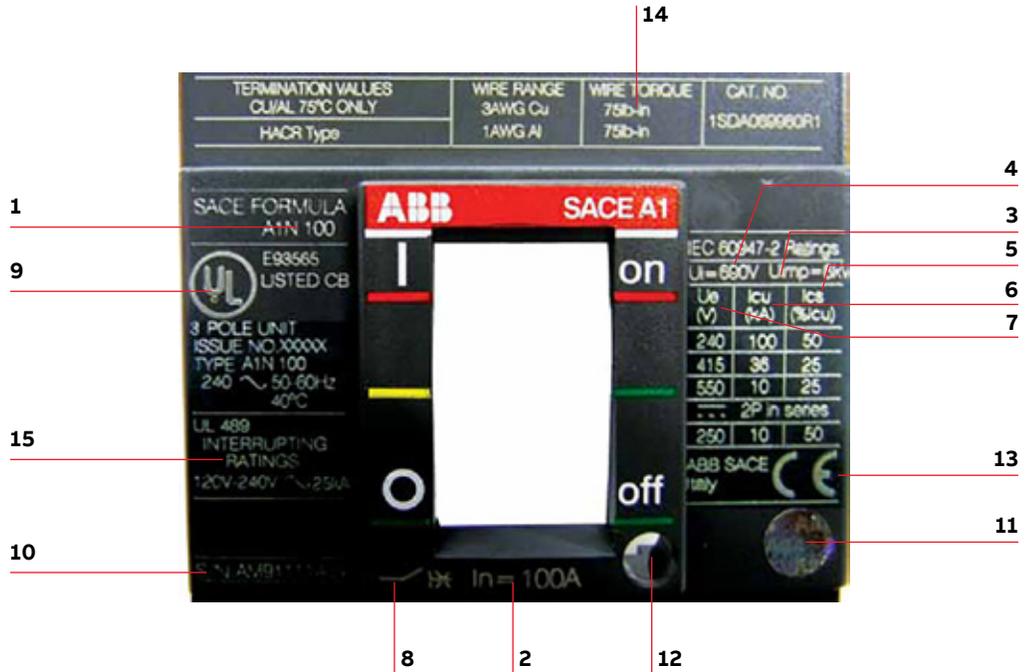
- Selection of materials, processes and packaging that optimize the true environmental impact of the product
- Use of recyclable materials
- Voluntary compliance with the RoHS directive

Construction characteristics

Identification of the FORMULA circuit breakers

The characteristics of the circuit breakers are given on the label on the front of the circuit breaker.

Front label



1. Name of the circuit breaker and performance level
2. In: rated uninterrupted current*
3. Uimp: rated impulse withstand voltage*
4. Ui: insulation voltage*
5. Ics: rated short circuit service breaking capacity*
6. Icu: rated ultimate short circuit breaking capacity*
7. Ue: rated service voltage*
8. Symbol of isolation behavior*
9. Reference standard and file number
10. Serial number
11. Anti-forgery
12. Test pushbutton
13. CE Marking
14. Lug information
15. UL interrupting ratings

* In compliance with the IEC 60947-2 Standard

Circuit breakers for power distribution

General characteristics

The FORMULA circuit breakers from 15 A to 250 A consist of the interruption component together with the trip unit and can be installed:

- Directly on the back plate of cubicles
- On a DIN rail

They are characterized by:

- Fixed version
- Polarity: 1-pole, 2-pole, 3-pole
- Maximum breaking capacity of 25 kA at 240 V AC
- Fixed thermal-magnetic trip unit (TMF) for protection of networks in alternating current
- A single depth of 2.36"
- Standard front terminals

FORMULA A1

- 01 1-pole
- 02 2-pole
- 03 3-pole
- 04 2-pole
- 05 3-pole



01



02



03

FORMULA A2



04



05

Circuit breakers for power distribution

Thermal-magnetic trip unit

The thermal-magnetic trip units TMF, with fixed thermal and magnetic threshold, are generally used in power distribution plants. They allow protection against overloads due to the thermal device and protection against short circuit due to the magnetic device:

- Thermal protection (L): fixed threshold $I_1 = 1 \times I_n$, with long inverse time trip curve
- Magnetic protection (I): fixed threshold $I_3 = 10 \times I_n$, with instantaneous trip curve

Fixed thermal-magnetic trip unit TMF

An example with FORMULA A2 $I_n = 125$ A



Thermal protection symbol

Magnetic protection symbol

Thermal protection value

Magnetic protection value

FORMULA A1 with trip unit TMF

TMF		I_n (A)	15	20	25	30	40	50	60	70	80	90	100
L $I_1 = 1 \times I_n$	I_n (A)	15	20	25	30	40	50	60	70	80	90	100	
	Neutral (A) — 100%	15	20	25	30	40	50	60	70	80	90	100	
I $I_3 = 10 \times I_n$	I_3 (A)	300 ¹⁾	300 ¹⁾	300 ¹⁾	300 ¹⁾	400	500	600	700	800	900	1000	
	Neutral (A) — 100%	300	300	300	600	400	500	600	700	800	900	1000	

1) Single- and two-pole versions have an I_3 (3) of 400.

FORMULA A2 with trip unit TMF

TMF		I_n (A)	125	150	175	200	225	250
L $I_1 = 1 \times I_n$	I_n (A)	125	150	175	200	225	250	
	Neutral (A) — 100%	125	150	175	200	225	250	
I $I_3 = 10 \times I_n$	I_3 (A)	1250	1500	1750	2000	2250	2500	
	Neutral (A) — 100%	1250	1500	1750	2000	2250	2500	

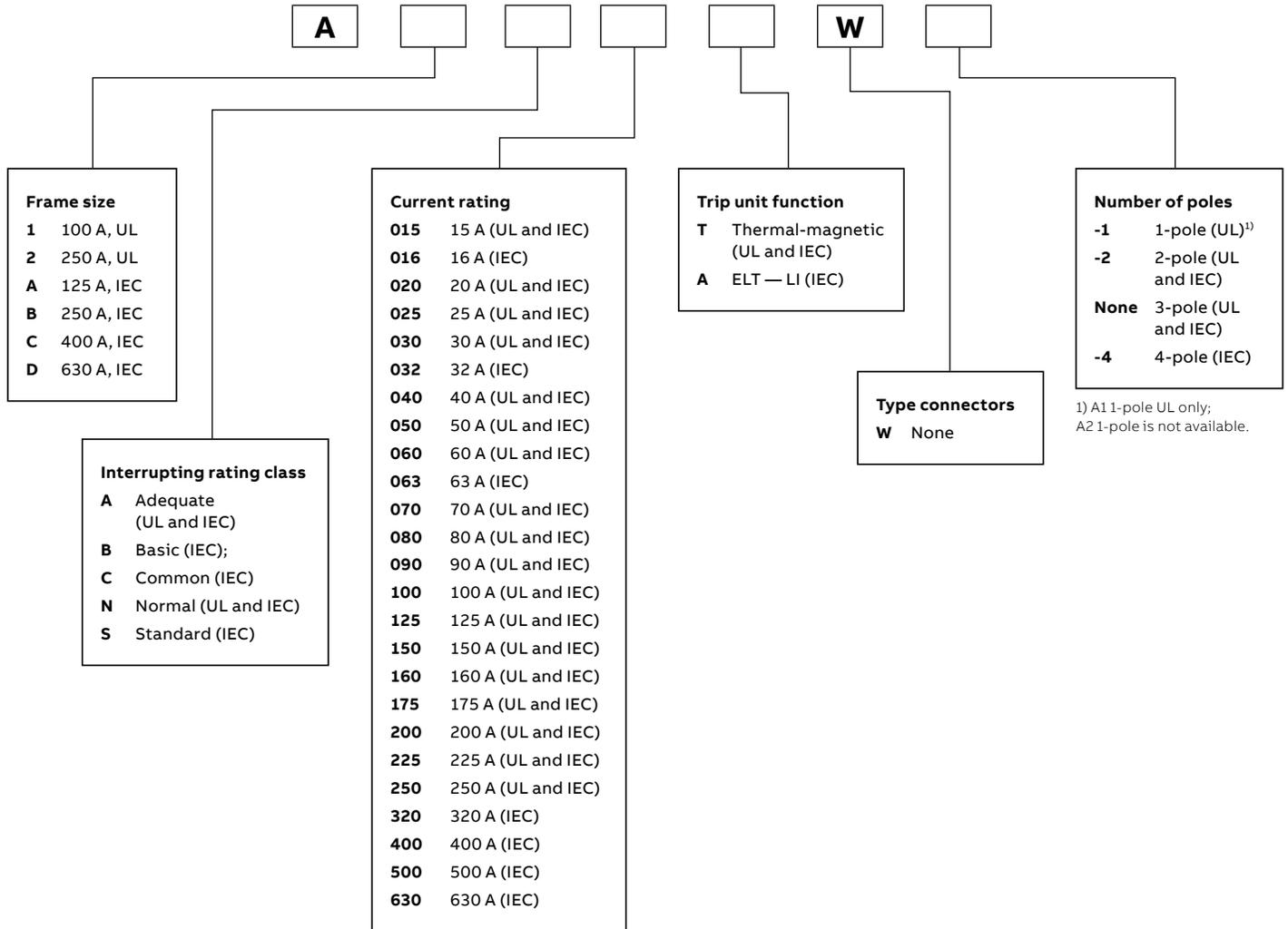
Circuit breakers for power distribution

Technical data

		A1				A2			
Frame size	A	100				250			
Rated current, In	A	15–100				125–250			
Poles	No.	1, 2, 3				2, 3			
Rated service voltage, Ue (AC) 50–60 Hz (DC)	V	240 (1p, 2p, 3p) 125 (1p), 250 (2p,3p)				240 (2p, 3p) 250 (2p,3p)			
Versions		Fixed				Fixed			
Performance Level		A		N		A		N	
Pole	No.	1	2, 3	1	2, 3	2, 3		2, 3	
Rated ultimate short circuit breaking capacity, Icu									
Interrupting rating at 240 V 50–60 Hz (AC)	kA	10	10	18	25	10		25	
Interrupting rating at 125 V (DC) 1-pole (in 2012)	kA	5	–	10	–	–		–	
Interrupting rating at 250 V (DC) 2-pole in series (2p, 3p) (in 2012)	kA	–	5	–	10	10		25	
Reference standard		UL 489				UL 489			
Isolation behavior		Yes				Yes			
Mounting onto DIN rail		DIN EN 50022				DIN EN 50022			
Dimensions (width x depth x height)									
1-pole	in.	1.00 x 2.36 x 5.12				–			
2-pole	in.	2.00 x 2.36 x 5.12				2.76 x 2.36 x 5.91			
3-pole	in.	3.00 x 2.36 x 5.12				4.13 x 2.36 x 5.91			
Weight									
1-pole	lbs.	0.54				–			
2-pole	lbs.	1.04				1.61			
3-pole	lbs.	1.54				2.43			
Trip unit — Thermal-magnetic TMF		Yes				Yes			

Circuit breakers for power distribution

Part number scheme



Circuit breakers for power distribution

A1 ordering information



—
A1 100 A — Fixed (F) 1-pole — Front terminals (F), thermal-magnetic trip unit — TMF Icu (240 V)

In	I ₃	A (10 kA)	N (18 kA)
15	400	A1A015TW-1	A1N015TW-1
20	400	A1A020TW-1	A1N020TW-1
25	400	A1A025TW-1	A1N025TW-1
30	400	A1A030TW-1	A1N030TW-1
40	400	A1A040TW-1	A1N040TW-1
50	500	A1A050TW-1	A1N050TW-1
60	600	A1A060TW-1	A1N060TW-1
70	700	A1A070TW-1	A1N070TW-1
80	800	A1A080TW-1	A1N080TW-1
90	900	A1A090TW-1	A1N090TW-1
100	1000	A1A100TW-1	A1N100TW-1



—
A1 100 A — Fixed (F) 2-pole — Front terminals (F), thermal-magnetic trip unit — TMF Icu (240 V)

In	I ₃	A (10 kA)	N (25 kA)
15	400	A1A015TW-2	A1N015TW-2
20	400	A1A020TW-2	A1N020TW-2
25	400	A1A025TW-2	A1N025TW-2
30	400	A1A030TW-2	A1N030TW-2
40	400	A1A040TW-2	A1N040TW-2
50	500	A1A050TW-2	A1N050TW-2
60	600	A1A060TW-2	A1N060TW-2
70	700	A1A070TW-2	A1N070TW-2
80	800	A1A080TW-2	A1N080TW-2
90	900	A1A090TW-2	A1N090TW-2
100	1000	A1A100TW-2	A1N100TW-2



—
A1 100 A — Fixed (F) 3-pole — Front terminals (F), thermal-magnetic trip unit — TMF Icu (240 V)

In	I ₃	A (10 kA)	N (25 kA)
15	300	A1A015TW	A1N015TW
20	300	A1A020TW	A1N020TW
25	300	A1A025TW	A1N025TW
30	300	A1A030TW	A1N030TW
40	400	A1A040TW	A1N040TW
50	500	A1A050TW	A1N050TW
60	600	A1A060TW	A1N060TW
70	700	A1A070TW	A1N070TW
80	800	A1A080TW	A1N080TW
90	900	A1A090TW	A1N090TW
100	1000	A1A100TW	A1N100TW

Circuit breakers for power distribution

A2 ordering information



—
A2 250 A — Fixed (F) 2-pole — Front terminals (F), thermal-magnetic trip unit — TMF Icu (240 V)

In	I ₃	A (10 kA)	N (25 kA)
125	1250	A2A125TW-2	A2N125TW-2
150	1500	A2A150TW-2	A2N150TW-2
175	1750	A2A175TW-2	A2N175TW-2
200	2000	A2A200TW-2	A2N200TW-2
225	2250	A2A225TW-2	A2N225TW-2
250	2500	A2A250TW-2	A2N250TW-2



—
A2 250 A — Fixed (F) 3-pole — Front terminals (F), thermal-magnetic trip unit — TMF Icu (240 V)

In	I ₃	A (10 kA)	N (25 kA)
125	1250	A2A125TW	A2N125TW
150	1500	A2A150TW	A2N150TW
175	1750	A2A175TW	A2N175TW
200	2000	A2A200TW	A2N200TW
225	2250	A2A225TW	A2N225TW
250	2500	A2A250TW	A2N250TW

Accessories

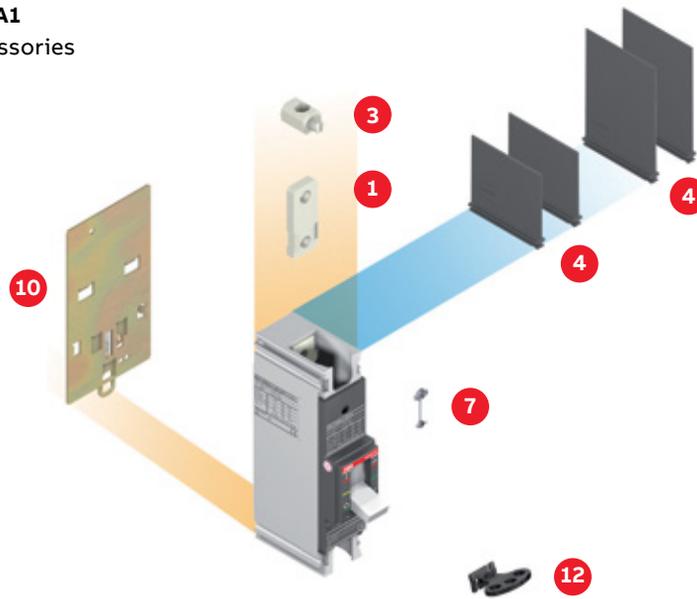
Panorama of accessories

Caption

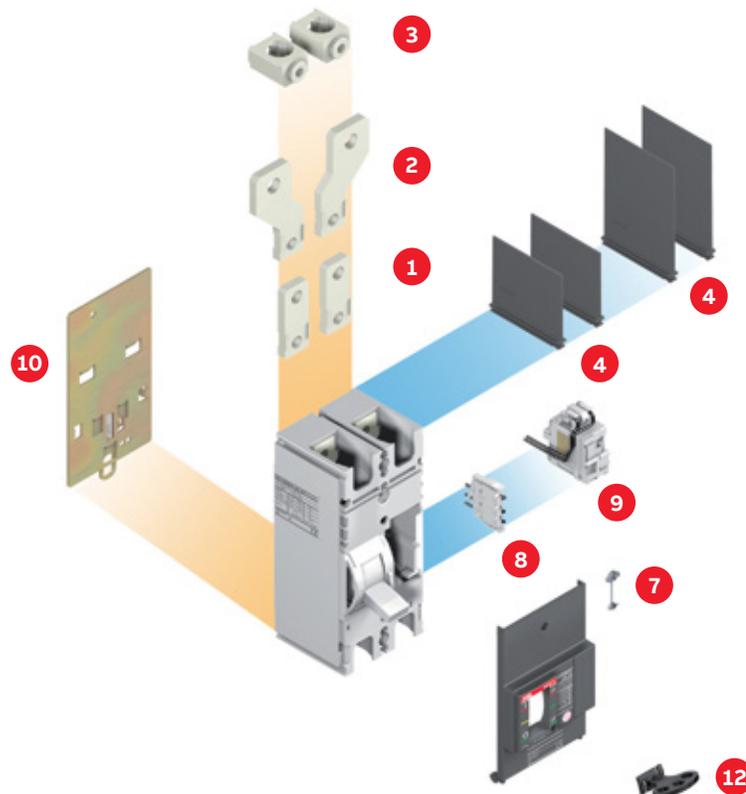
- 1** EF: extended front terminals ¹
- 2** ES: extended spread terminals ¹
- 3** FC CuAl: front terminals for copper and aluminum cables
- 4** PS: phase separators
- 5** HTC: high terminal cover
- 6** LTC: low terminal cover
- 7** Sealable screw ¹
- 8** AUX-C/AUE-C: auxiliary contact
- 9** SOR-C/UVR-C: service releases
- 10** DIN: DIN rail ¹
- 12** PLL: padlocks
- 14** RHD: rotary handle direct
- 15** RHE: extended rotary handle
- 16** Key lock ¹

¹ IEC rated only.
Not UL rated.

FORMULA A1 1-pole accessories



FORMULA A1-A2 2-pole accessories



All FORMULA accessories are sold separately to be field installed.

Accessories

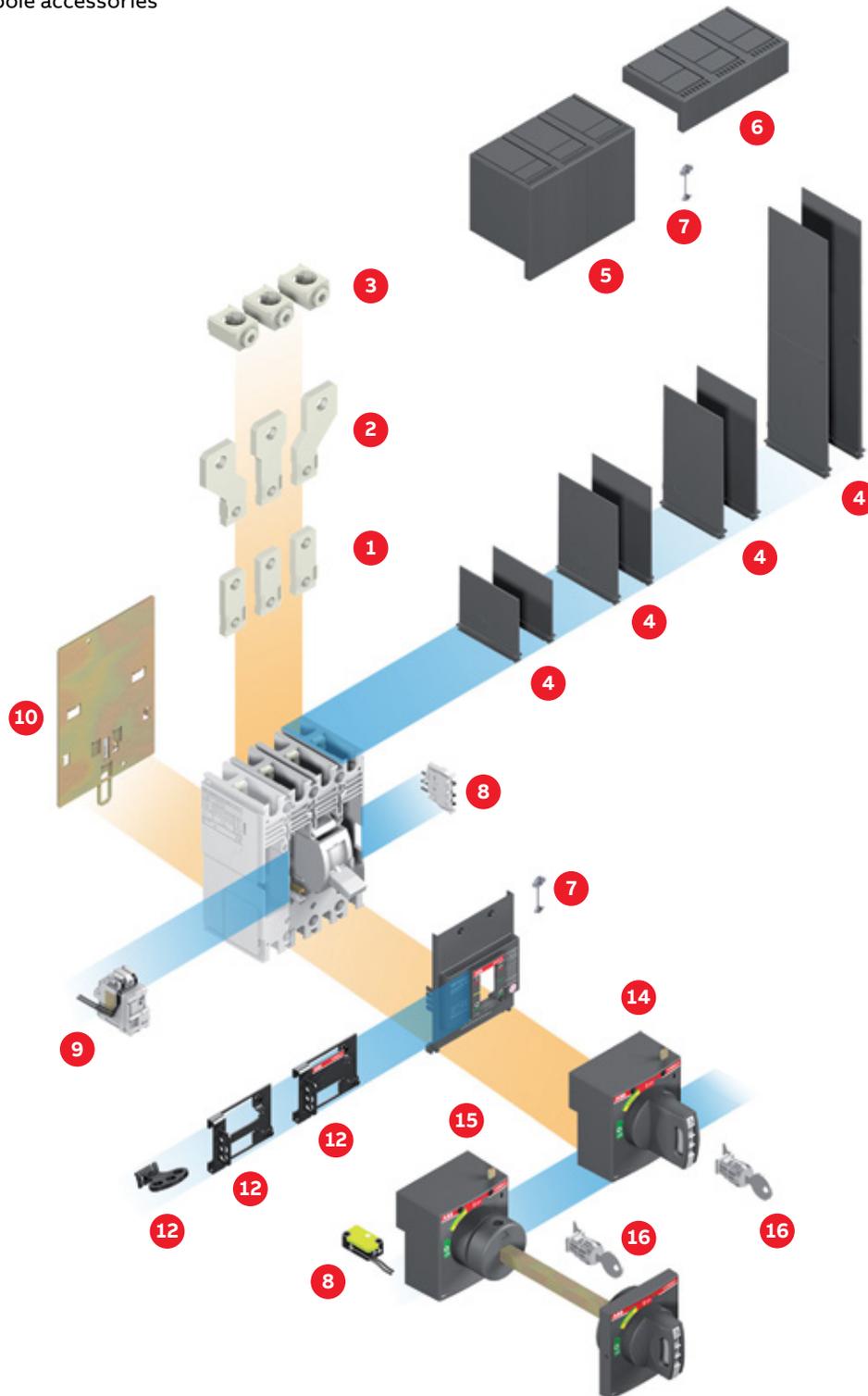
Panorama of the accessories

Caption

- 1** EF: extended front terminals ¹
- 2** ES: extended spread terminals ¹
- 3** FC CuAl: front terminals for copper and aluminum cables
- 4** PS: phase separators
- 5** HTC: high terminal cover
- 6** LTC: low terminal cover
- 7** Sealable screw ¹
- 8** AUX-C/AUE-C: auxiliary contact
- 9** SOR-C/UVR-C: service releases
- 10** DIN: DIN rail ¹
- 12** PLL: padlocks
- 14** RHD: rotary handle direct
- 15** RHE: extended rotary handle
- 16** Key lock ¹

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Not UL rated.

FORMULA A1-A2 3-pole accessories



All FORMULA accessories are sold separately to be field installed.

Accessories

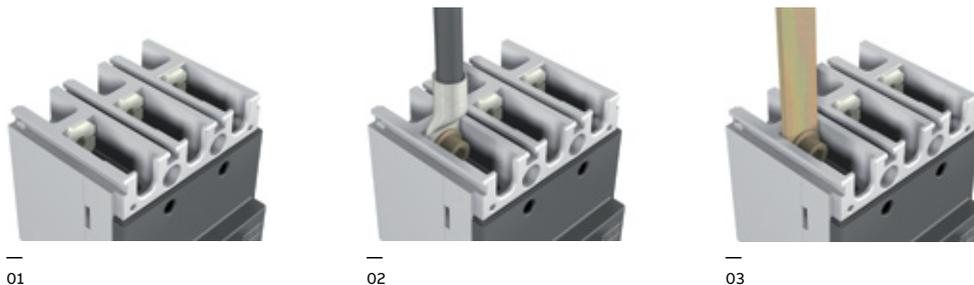
Mechanical accessories

- 01 Terminal F
- 02 Terminal F with cable lug
- 03 Terminal F with busbar
- 04 Terminal EF
- 05 Terminal EF with busbar

Connection terminals

The connection terminals allow the circuit breaker to be connected in the most suitable way for the desired application. Various termination options are available in both UL and IEC rated formats. The front terminals allow cables or busbars to be connected directly from the front of the circuit breaker (cable lugs are not included). Different types of terminals can be combined (for example, one type for the line and a different type for the load side).

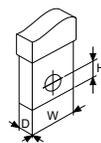
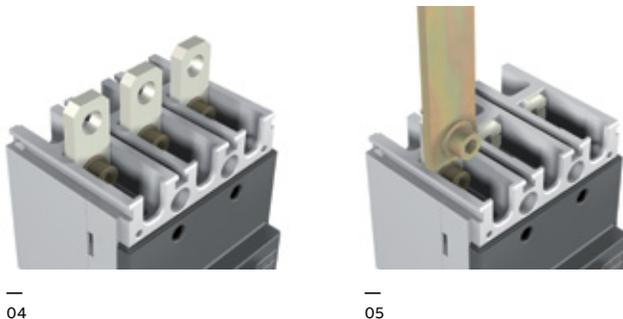
The standard version of the circuit breaker is supplied with front terminals (F). Alternative terminal options are sold separately.



Front terminals — F

Type	Pole	Busbar dimensions (mm/in.)						Cable lug (mm/in.)			Tightening torques		Terminal covers (mm/in.)					Separators (mm/in.)	
		W	H	D	ø	W	ø	Terminal	Cable or busbar	2/ 0.07	7.5/ 0.29	50/ 1.96	60/ 2.36	50/ 1.96	80/ 3.14	100/ 3.93	200/ 7.87		
A1	1 2 3	15/0.59	6/0.23	5/0.19	6.5/0.25	15/0.59	6.5/0.25	-	-	M6	4	-	-	R	-	S (1)	-	R	-
A2	2 3	25/0.98	8/0.31	6/0.23	8.5/0.33	24/0.94	8.5/0.33	-	-	M8	8	-	-	-	R	-	S (1)	R	-

(1) Separators are supplied on line side



NA = Not available
 W = Width
 H = Hole height
 D = Depth
 ø = Diameter
 S = Standard
 R = On request

Front extended terminals — EF (IEC only)

Type	Pole	Busbar dimensions (mm/in.)			Cable lug (mm/in.)		Tightening torques			Terminal covers (mm/in.)					Separators (mm/in.)			
		W	D	ø	W	ø	Terminal	Cable or busbar	2/ 0.07	7.5/ 0.29	50/ 1.96	60/ 2.36	50/ 1.96	80/ 3.14	100/ 3.93	200/ 7.87		
A1	1 2 3	15/0.59	5/0.19	8.5/0.33	15/0.59	8.5/0.33	M6	3	M8	9	-	-	R	-	S	-	R	-
A2	2 3	25/0.98	6/0.23	9/0.35	NA	NA	M8	8	M8	9	-	-	-	R	-	(1)	R	-

(1) In EF terminal kit, the phase separators are not provided, but for a correct installation, it is necessary to use the phase separators already provided with the circuit breaker base.

Accessories

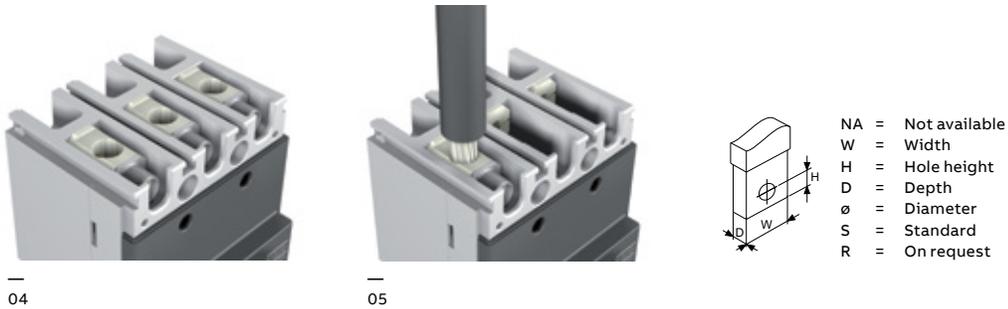
Mechanical accessories

- 01 Terminal ES
- 02 Terminal ES with cable lug
- 03 Terminal ES with busbar
- 04 Terminal FCCuAl
- 04 Terminal FCCuAl with cable



Front extended spread terminal — ES (IEC only)

Type	Pole	Busbar dimensions (mm/in.)			Cable lug (mm/in.)		Tightening torques				Terminal covers (mm/in.)					Separators (mm/in.)			
		W	D	ø	W	ø	Terminal	Cable or busbar	2/ 0.07	7.5/ 0.29	50/ 1.96	60/ 2.36	50/ 1.96	80/ 3.14	100/ 3.93	200/ 7.87	S	R	
A1	2 3	20/0.78	6/0.23	8.5/0.33	20/0.78	8.5/0.33	M6	3	M8	9	—	—	—	—	—	—	—	S	—
A2	2 3	30/1.18	4/0.15	10.5/0.41	10.5/0.41	NA	M8	8	M10	18	—	—	—	—	—	—	—	S	—



Front terminals for copper aluminum cables — FC CuAl

Type	Assembly	Pole	Cable (mm/in.)		Tightening torques		Length of Cable stripping (mm/in.)	Terminal covers (mm/in.)					Separators (mm/in.)					
			Rigid	Terminal	Terminal	Cable or busbar		2/ 0.07	7.5/ 0.29	50/ 1.96	60/ 2.36	50/ 1.96	80/ 3.14	100/ 3.93	200/ 7.87			
A1	Internal 1 ⁽¹⁾ 2 ⁽¹⁾ 3	3	14–2 AWG	M6	35 lb-in	—	14–10 AWG; 20 lb-in 8 AWG; 35 lb-in 6–2 AWG; 75 lb-in	16/0.62	—	S ⁽¹⁾	R	—	—	—	—	—	—	—
A1	Internal 1 ⁽¹⁾ 2 ⁽¹⁾ 3	3	4–1 AWG	M6	35 lb-in	—	75 lb-in	16/0.62	—	S ⁽¹⁾	R	—	—	—	—	—	—	—
A2	Internal	2 3	1 AWG–300 kcmil	M8	135 lb-in	—	135 lb-in	20/0.78	—	S ⁽¹⁾	—	R	—	—	—	—	—	—
A2	Internal	2 3	300–350 kcmil	M8	135 lb-in	—	177 lb-in	22/0.86	—	S ⁽¹⁾	—	R	—	—	—	—	—	—

(1) Terminal covers are not supplied for 1p and 2p. The use of phase separators, supplied with the standard circuit breaker, and the insulating of switchboard door are mandatory.

Accessories

Mechanical accessories

Front terminals

	1 piece	2 pieces	3 pieces	4 pieces	6 pieces
KIT F A1	KA1F-1	KA1F-2	KA1F-3	KA1F-4	KA1F-6
KIT F A2	–	KA2F-2	KA2F-3	KA2F-4	KA2F-6

Front extended terminals (IEC only)

	1 piece	2 pieces	3 pieces	4 pieces	6 pieces
KIT EF A1	KA1EF-1	KA1EF-2	KA1EF-3	KA1EF-4	KA1EF-6
KIT EF A2	–	KA2EF-2	KA2EF-3	KA2EF-4	KA2EF-6

Front extended spread terminals (IEC only)

	1 piece	2 pieces	3 pieces	4 pieces	6 pieces
KIT ES A1	KA1ES-1	KA1ES-2	KA1ES-3	KA1ES-4	KA1ES-6
KIT ES A2	–	KA2ES-2	KA2ES-3	KA2ES-4	KA2ES-6

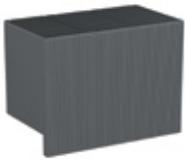
Front terminals for copper aluminum cables — FC CuAl

	1 piece	2 pieces	3 pieces	4 pieces	6 pieces
KIT FC CuAl A1 80 A	KA1080-1	KA1080-2	KA1080-3	KA1080-4	KA1080-6
KIT FC CuAl A1 100 A	KA1100-1	KA1100-2	KA1100-3	KA1100-4	KA1100-6
KIT FC CuAl A2; 250 A Cu cables and 225A Al cables	–	KA2225-2	KA2225-3	KA2225-4	KA2225-6
KIT FC CuAl A2 250 A	–	KA2250-2	KA2250-3	KA2250-4	KA2250-6

Accessories

Mechanical accessories

- 01 High terminal cover (HTC)
- 02 Low terminal cover (LTC)
- 03 Sealable screw
- 04 Phase separators (PS)



01



02



03



04

Terminal covers, phase separators and sealable screws

Both high (HTC) and low (LTC) terminal covers are applied to the circuit breaker to avoid accidental contact with live parts and, in this way, to ensure protection against direct contact. The terminal covers are pre-punched for knock-out on the front to facilitate installation of busbars and/or cables, providing correct insulation.

The phase separator partitions (PS) allow the insulation characteristics between phases to be increased near the connections. They are mounted on the front by inserting them into the corresponding slots and can be applied either prior to or when the circuit breaker is already installed. The phase separators are incompatible with both the high and the low terminal covers.

Terminal covers

	A1	A2
HTC 3-pole, 2 pieces	KA1HTC-3	KA2HTC-3
LTC 3-pole, 2 pieces	KA1LTC-3	KA2LTC-3
Sealable screws for terminal covers	KA2SSW-T	—
Sealable screws for front	KA2SSW-F	—

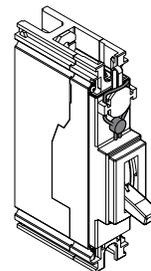
Phase separators

	A1		A2	
	2 pieces	4 pieces	2 pieces	4 pieces
PB 50 mm	KA1PBL-2	KA1PBL-3	—	—
PB 80 mm	—	—	KA2PBL-2	KA2PBL-3
PB 100 mm	KA2PBH-2	KA2PBH-3	KA2PBH-2	KA2PBH-3
Sealable screws for front (IEC only)	KA2SSW-F	—	—	—

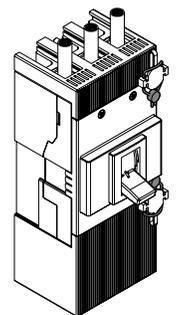
The lead sealing kit includes screws, which, when used, prevent removal of the terminal covers and/or circuit breaker fronts, acting as a protection against direct contact and tampering. The screws can be locked with a wire and sealed with lead.

The compulsory and optional phase separators and terminal covers needed for correct installation and insulation of the circuit breaker are indicated in the “connection terminals” section of the accessories chapter and in the “overall dimension” chapter.

Diagrams



Sealable screw onto the circuit breaker front



Sealable screw onto the terminal covers

Accessories

Mechanical accessories

- 01 Direct handle (RHD)
- 02 Extended handle (RHE)



01



02

Rotary handle operating mechanism

A rotary handle operating mechanism is a control device that allows the circuit breaker to be comfortably operated by means of a rotary handle.

There are two types of handles:

- Direct (RHD): installed directly on the front of the circuit breaker
- Extended (RHE): installed through the switchboard door; RHE interacts with the circuit breaker behind the door by means of a transmission rod

The rotary handles, in the direct and extended version, are available for the three-pole A1 and A2 circuit breakers both in the standard version (grey) and in the emergency version (red on a yellow background).

Information/settings visible and accessible to the user:

- Circuit breaker nameplate
- Indication of the 3 positions: open (OFF), closed (ON), tripped (TRIP)
- Access to the test pushbutton of the rotary handle release (only RHD)

Rotary handle operating mechanisms can be ordered:

- By using the pre-configured “kit” code (RHD and RHE)
- By ordering the following three devices (only RHE):
 - Rotary handle on door of the compartment: standard (RHE_H) or emergency (RHE_H_EM)
 - Transmission rod of 500 mm (RHE_S); the minimum and maximum distances between the mounting surface and the door are 62.5 mm/2.46 in. and 479.5 mm/18.88 in.
 - Base for circuit breaker (RHE_B)

It is possible to accessorize the handles with a vast range of key locks and padlocks. Each rotary handle takes up to 3 padlocks (7 mm/0.28 in. Ø stem). (See the “locks” paragraph in the accessories chapter.)

The direct and extended rotary handles allow use of the early auxiliary contacts on closing in order to supply the undervoltage release with power early in relation to closing of the main circuit breaker contacts (see the “early auxiliary contacts” paragraph in the accessories chapter).

Rotary handle component

	A1-A2
RHD A1-A2 STAND. DIRECT	KA2RHD
RHD_EM A1-A2 EMER. DIRECT	KA2RHDEM
RHE A1-A2 STAND. RETURNED	KA2RHE
RHE_EM A1-A2 EMER. RETURNED	KA2RHEEM
RHE_B A1-A2 SIDEB.R.DIST.ADJ.ROT.HAND	KA2RHE-B
RHE_S A1-A2 ROD R.D.ADJ.ROT.HAN	KA2RHE-S
RHE_H A1-A2 HANDLE R.D.ADJ.ROT.HAN	KA2RHE-H
RHE_H A1-A2 HAND.EME.R.D.ADJ.ROT.HAN	KA2RHE-HEM

Accessories

Mechanical accessories

- 01 Fixed padlock in open position (PLL)
- 02 Fixed padlock in open and closed position (PLL)
- 03 Removable padlock in open position (PLL)

Locks

Locks are devices (with padlocks or keys) which prevent the circuit breaker closing or opening operation. They can be applied:

- Directly onto the front of the circuit breaker
- Onto the direct/extended rotary handle operating mechanism
- Onto the front for lever operating mechanisms

Locking the circuit breaker in the open position ensures isolation of the circuit according to the IEC 60947-2 Standard. Locking in closed position does not prevent release of the mechanism following a fault.



01



02



03

Type of lock		Circuit breaker	Polarity	Optional/standard supply	CB lock position	Type of lock	Withdraw ability of key
Circuit breaker	PLL — Fixed padlock	A1-A2	3	Optional	Open-closed	Padlocks — max. 3 padlocks Ø stem 7 mm (not supplied)	—
	PLL — Fixed padlock	A1-A2	3	Optional	Open	Padlocks — max. 3 padlocks Ø stem 7 mm (not supplied)	—
	PLL — Removable padlock	A1-A2	1 ²⁾ , 2, 3	Optional	Open	Padlocks — max. 3 padlocks Ø stem 7 mm (not supplied)	—
Rotary handle direct and extended	Padlock in open position	A1-A2	3	Standard	Open	Padlocks — max. 3 padlocks Ø stem 7 mm (not supplied)	—
	Compartment door lock	A1-A2	3	Standard	Closed	Door lock ⁽¹⁾	—
	RHL-S Lock with key in open pos.	A1-A2	3	Optional	Open	Same Ronis keys	Open
	RHL-D Lock with key in open pos.	A1-A2	3	Optional	Open	Different Ronis keys	Open
	RHL-D Lock with key in open and closed position	A1-A2	3	Optional	Open-closed	Different Ronis keys	Open/closed

(1) Function can be completely excluded by the customer during assembly of the handle (A1 and A2).

(2) A2 is not available in a single-pole version.

Accessories

Mechanical accessories

—
01 Circuit breaker with fixed padlock in open position
—

02 Circuit breaker with fixed padlock in open and closed position
—

03 Key lock for direct handle
—

04 Key lock for extended handle
—



01



02



03



04

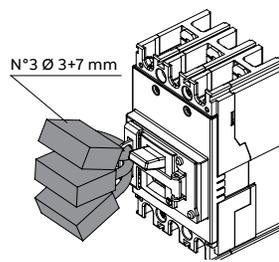
— Padlocks for lever operating mechanism of the circuit breaker

	A1-A2
PLL — Padlocks removable in open position	KA2LDOR
PLL — Padlocks fixed in open position	KA2LDO
PLL — Padlocks fixed in open and closed position	KA2LD

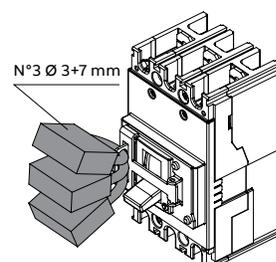
— Key lock on handle and front for lever operating mechanism (IEC only)

	A1-A2
RHL-D Lock in open position, different keys	KA2RHLO
RHL-S Lock in open position, same keys type A	KA2RHLO-A
RHL-S Lock in open position, same keys type B	KA2RHLO-B
RHL-S Lock in open position, same keys type C	KA2RHLO-C
RHL-S Lock in open position, same keys type D	KA2RHLO-D
RHL-D Lock in open/closed position, different keys	KA2RHL

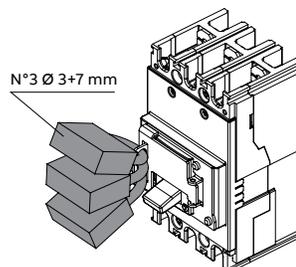
Diagrams



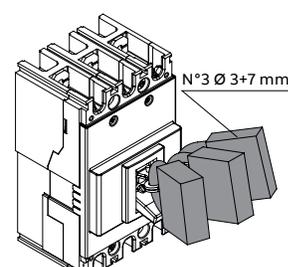
Fixed padlock in open/closed position



Fixed padlock in open/closed position



Fixed padlock in open position



Removable padlock in open position

Accessories

Mechanical accessories

01 Bracket for DIN rail



Bracket for mounting on DIN rail

The bracket, applied on the back of the circuit breakers, allows installation on a standardized DIN EN 50022 rail so as to simplify mounting in standard installations.

The bracket for mounting on DIN rail can be used with all the circuit breakers in the FORMULA family, with the exception of A3:

- A1 in 1p, 2p, 3p version
- A2 in 2p, 3p version

Bracket for mounting on DIN rail (IEC only, not labeled for UL)

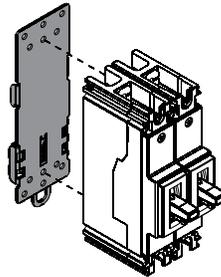
Bracket for 1p, 2p, 3p

A1-A2

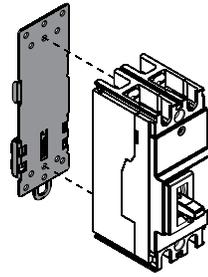
KA2DIN

01

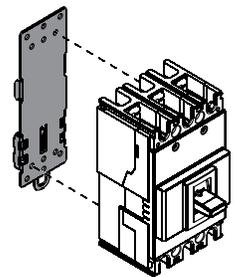
Diagrams



Bracket for DIN rail
for 1p circuit breaker



Bracket for DIN rail
for 2p circuit breaker



Bracket for DIN rail
for 3p circuit breaker

Accessories

Electrical accessories

—
01 Cabled service release
SOR-C and UVR-C



—
01

Service releases

The cabled shunt opening release SOR-C allows for opening of the circuit breaker by means of a non-permanent electrical control. Operation of the release is guaranteed for a voltage between 70% and 110% of the power supply rated voltage value U_n , in both alternating and direct current. It is fitted with an integrated limit contact for cutting off the power supply.

The cabled undervoltage release UVR-C ensures opening of the circuit breaker for lack/lowering of the release power supply voltage. Opening is guaranteed when the voltage is between 70% and 35% of U_n . After tripping, the circuit breaker can be closed again starting from a voltage higher than 85% of U_n . With the undervoltage release de-energized, it is impossible to close the circuit breaker and/or the main contacts.

The service releases SOR-C and UVR-C for Formula can be mounted as alternatives to each other and are only available in the cabled version (20AWB cable section/0.5 mm²), with 1 m long cables. For A1 and A2, screw-less, snap-on assembly is carried out in the special internal compartment of the circuit breaker. In the following circuit breakers:

- Two-pole (A1, A2), the SOR-C or UVR-C can be mounted as an alternative in the right-hand slot
- Three-pole (A1, A2), the SOR-C or UVR-C can be mounted as an alternative in the left-hand slot

SOR-C — Electrical characteristics

		Absorbed power on inrush	
		SOR-C A1-A2	
Versions	AC (VA)	DC (W)	
12 V DC		50	
24–30 V AC/DC	50–65	50–65	
48–60 V AC/DC	60	60	
110–127 V AC — 110–125 V DC	50	50	
220–240 V AC — 220–250 V DC	50–60	50–60	

UVR-C — Electrical characteristics

		Absorbed power during normal operation	
		UVR-C A1-A2	
Version	AC (VA)	DC (W)	
24–30 V AC/DC	1.5	1.5	
48 V AC/DC	1	1	
60 V AC/DC	1	1	
110–127 V AC — 110–125 V DC	2	2	
220–240 V AC — 220–250 V DC	2.5	2.5	

Accessories

Electrical accessories

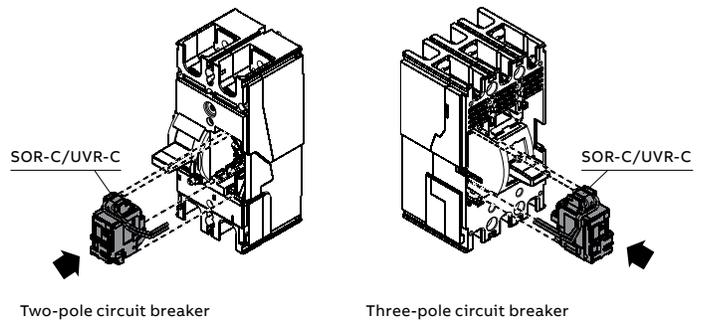
— Shunt opening release — SOR-C

	A1–A2
SOR-C 12 V DC	KA2S9
SOR-C 24–30 V AC/DC	KA2S8
SOR-C 48–60 V AC/DC	KA2S7
SOR-C 110–127 V AC — 110–125 V DC	KA2S4
SOR-C 220–240 V AC — 220–250 V DC	KA2S2

— Undervoltage release — UVR-C

	A1–A2
UVR-C 12 V DC	KA2U9
UVR-C 24–30 V AC/DC	KA2U8
UVR-C 48 V AC/DC	KA2U7
UVR-C 60 V AC/DC	KA2U5
UVR-C 110–127 V AC — 110–125 V DC	KA2U4
UVR-C 220–240 V AC — 220–250 V DC	KA2U2

Diagrams



Accessories

Electrical accessories

—
01 Cabled auxiliary
contact



—
01

Auxiliary contacts for electrical signals

The auxiliary contacts allow information about the state of the circuit breaker to be available through an electronic signal to another apparatus.

The signals available are as follows:

- Form C (open/closed): signaling the position of the circuit breaker power contacts (Q)
- Bell alarm (release trip): signaling circuit breaker opening due to tripping of the thermal-magnetic or electronic trip unit (due to overload or short circuit), of the opening of the shunt opening release or undervoltage release (SOR-C or UVR-C) or by activation of the test pushbutton (SY)

Auxiliary contacts AUX-C Q, AUX-C SY

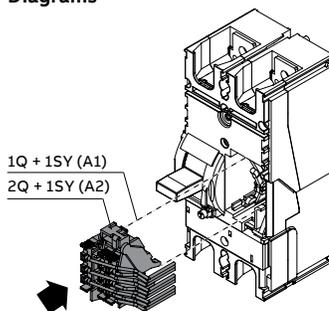
The auxiliary contacts for A1 and A2 snap into the special slot of the circuit breaker without the use of any screws. All the auxiliary contacts are supplied in the cabled version (20 AWG cable section/0.5 mm²), with loose cables 1 m long.

An AUX-C contact is also available as a spare part, and it can be used as Q or SY according to the slot of the circuit breaker in which it is inserted.

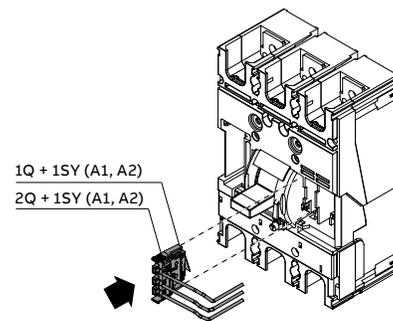
AUX-C — Electrical characteristics

Category of use (IEC 60947-5-1)	Voltage (V)	Current (A)
AC-12/AC-13/AC-14	125	6
AC-15	125	5
AC-12/AC-13/AC-14	250	6
AC-15	250	4
DC-12	110	0.5
DC-14	110	0.05
DC-12	250	0.3
DC-14	250	0.03

Diagrams



Two-pole circuit breaker



Three-pole circuit breaker

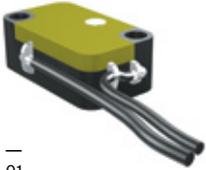
Accessories

Electrical accessories

01 Early auxiliary contact

Auxiliary contacts — AUX-C

	A1		A2	
	2-pole	3-pole	2-pole	3-pole
Cabled version (numbered cables)				
AUX-C 1Q+1SY 250 V AC/DC	KA2AS-2	KA2AS	–	KA2AS
AUX-C 2Q+1SY 250 V A2 2p	–	KA2AS2	KA2AS2-2	KA2AS2
AUX-C 1Q+1SY 24 V DC	KA2ASAU-2	KA2ASAU	–	KA2ASAU
AUX-C 2Q+1SY 24 V DC	–	KA2AS2AU	KA2AS2AU-2	KA2AS2AU
Cabled version (spare parts) (IEC only)				
AUX-C 250 V 1 CONT. A1-A2	KA2ASSP			



01

Early auxiliary contacts AUE-C (IEC only)

The cabled early auxiliary contacts (AUE-C) are normally open contacts, which allow the undervoltage release to be supplied in advance prior to the closing of the main contacts in conformity with the IEC 60204-1, VDE 0113 standards.

It is possible to insert up to two early auxiliary contacts on closing inside the direct and extended rotary handle operating mechanism for three-pole circuit breakers. The contacts, supplied in the cabled version with cables 1 m long (20 AWG cable section/0.5 mm²), must be ordered in combination with an undervoltage release.

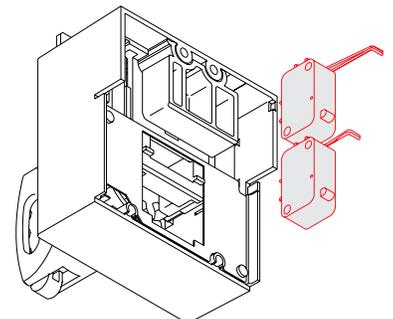
AUE - C — Electrical characteristics

Voltage (V)	Current (A)	
	AC	DC
125 DC	–	0.5
250 AC/DC	12	0.3

Early auxiliary contacts — AUE-C (IEC only)

	A1-A2
AUE-C	KA2RH-EM

Diagram



Temperature performance

All FORMULA circuit breakers can be used under the following environmental conditions:

- -25 °C to 70 °C (-13 °F to 158 °F): range of temperature where the circuit breaker is installed
- -40 °C to 70 °C (-40 °F to 158 °F): range of temperature where the circuit breaker is stored

To determine tripping time using time/current curves, use $I t$ °C values indicated in the tables below.

FORMULA A1 circuit breaker with thermal-magnetic trip unit TMF

In (A)	10 °C	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C
5	6.5	6.1	5.8	5.4	5	4.8	4.5
10	12.9	12.2	11.5	10.8	10	9.6	9.0
15	19.4	18.4	17.3	16.2	15	14.4	13.5
20	24.6	23.5	22.4	21.2	20	19.2	18.0
25	29.2	28.2	27.2	25.9	25	24.0	22.5
30	36.8	35.3	33.6	31.8	30	28.8	27.0
40	46.7	45.2	43.5	41.5	40	38.3	36.0
50	58.3	56.5	54.3	51.9	50	47.9	45.0
60	70.0	67.8	65.2	62.2	60	57.5	54.0
70	81.7	79.1	76.1	72.6	70	67.1	63.0
80	91.0	88.5	85.6	82.1	80	76.7	72.0
90	102.4	99.6	96.3	92.4	90	86.3	81.0
100	116.7	113.0	108.7	103.7	100	95.9	90.0

FORMULA A2 circuit breaker with thermal-magnetic trip unit TMF

In (A)	10 °C	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C
125	161	153	144	135	125	114	102
150	184	176	168	159	150	138	126
160	196	188	179	169	160	148	135
175	215	206	196	185	175	160	144
200	246	235	224	212	200	183	165
225	290	276	260	243	225	205	184
250	323	306	289	270	250	228	204

Note: Temperature ratings and performances above are per IEC standard test results.

Dissipated power

For each circuit breaker, the table below gives the dissipated power values for a single-pole circuit breaker. The maximum total dissipated power of

a two-pole or three-pole circuit breaker used at 50/60 Hz is equal to the dissipated power for the single-pole multiplied by the number of poles.

—
Power (with pole) TMF

In (A)	A1	A2
15	2.5	—
20	3	—
25	3	—
30	4	—
40	4.5	—
50	5.5	—
60	6	—
70	8	—
80	9	—
90	7	—
100	8	—
125	—	7
150	—	8
175	—	10
200	—	12
225	—	14
250	—	16

Note: Dissipated power values above are per IEC standard test results.

Information for reading and graphic symbols

State of operation represented

The diagrams are shown under the following conditions:

- Circuit breaker open
- Circuits without voltage
- Trip unit not tripped

Incompatibility A1 A2

Accessory circuits cannot be supplied with single-pole circuit breakers. The applications indicated in figures 1-2-6, which are supplied as an alternative, can be supplied with two-pole circuit breakers. All the applications indicated in the figures can be supplied with three-pole circuit breakers. Figures 1-2-3-4 are provided as an alternative. Figures 5-6 are provided as an alternative. See pages 33–34.

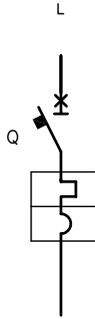
Graphic symbols (IEC 60617 and CEI 3-14 to 3-26 standards)

	Thermal effect
	Electromagnetic effect
	Mechanical connection (link)
	Operated by pushing
	Operated by turning
	Connection of conductors
	Terminal
	Plug and socket (male and female)
	Resistor (general symbol)
	Current transformer

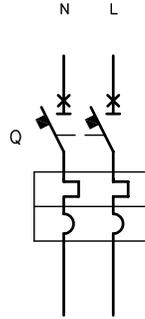
	Make contact
	Break contact
	Change-over break before make contact
	Circuit breaker with automatic release
	Operating device (general symbol)
	Instantaneous overcurrent or rate-of-rise relay
	Overcurrent relay with inverse long time-lag characteristic

Wiring diagrams for circuit breakers

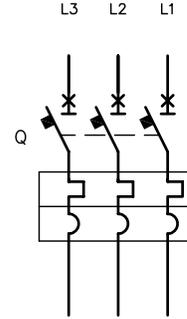
Operating status A1 A2



Single-pole circuit breaker¹⁾
with thermal-magnetic trip unit
1) A1 only



Two-pole circuit breaker
with thermal-magnetic trip unit



Three-pole circuit breaker
with thermal-magnetic trip unit

Caption

Q = Main circuit breaker

Electrical accessories

Shunt opening and undervoltage releases A1 A2

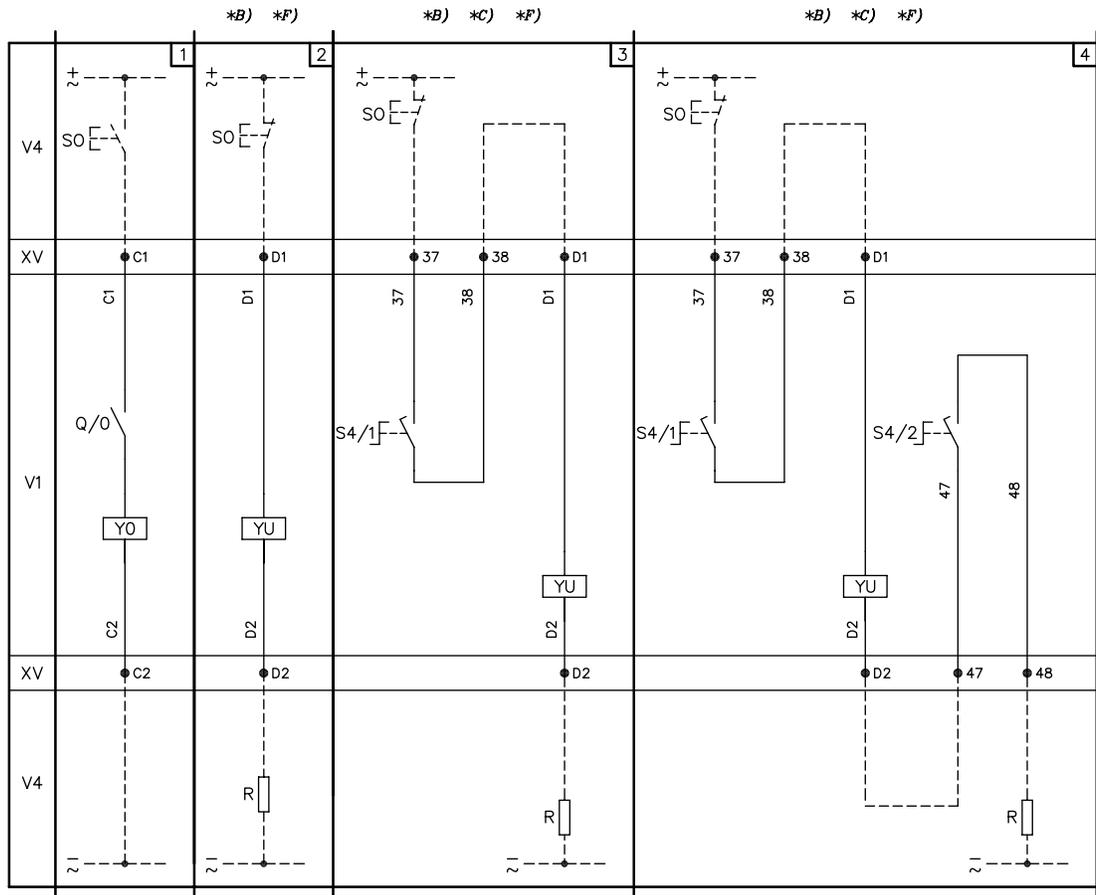


Figure:

- 1) Shunt opening release (SOR-C or YO)
- 2) Undervoltage release (UVR-C or YU)
- 3) Instantaneous undervoltage release with an early contact in series (AUE-C+UVR-C)
- 4) Instantaneous undervoltage release with two early contacts in series (AUE-C+UVR-C)

Notes

- B) The undervoltage release is supplied for power supply branched on the supply side of the circuit breaker or from an independent source: circuit breaker closing is only allowed with the release energized (the lock on closing is made mechanically).
- C) The S4/1 and S4/2 contacts shown in figures 3–4 open the circuit with circuit breaker open and close it when a manual closing command is given by means of the rotary handle in accordance with the standards regarding machine tools (closing does not take place in any case if the undervoltage release is not supplied).
- F) Additional external undervoltage resistor supplied at 250 V DC.

Caption

- Q/0 = Circuit breaker auxiliary contacts
 R = Resistor (see note F)
 S4/1-2 = Early auxiliary contacts activated by the rotary handle of the circuit breaker (see note C)
 SO = Pushbutton or contact for opening the circuit breaker
 V1 = Circuit breaker applications
 V4 = Indicative apparatus and connections for control and signaling, outside the circuit breaker
 XV = Terminal boards of the applications
 YO = Shunt opening release (SOR-C)
 YU = Undervoltage release (UVR-C) (see notes B and C)

Electrical accessories

Auxiliary contacts A1 A2

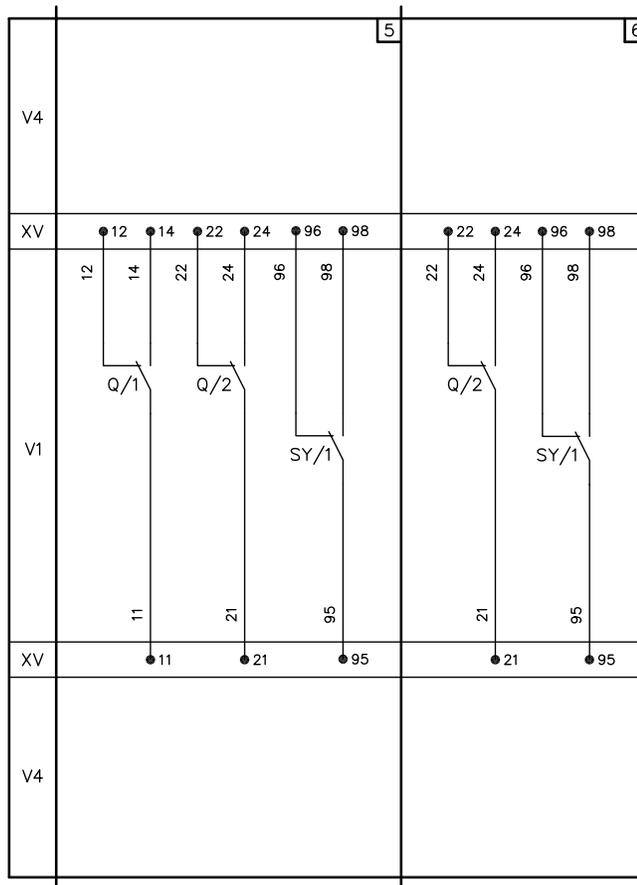


Figure:

- 5) Two changeover contacts for electrical signaling of circuit breaker open/closed and one changeover contact for signaling circuit breaker in tripped position due to thermal-magnetic trip unit or SOR-C or UVR-C intervention (2Q+1SY)
- 6) One changeover contact for electrical signaling of circuit breaker open/closed and one changeover contact for signaling circuit breaker in tripped position due to thermal-magnetic trip unit or SOR-C or UVR-C intervention (1Q+1SY)

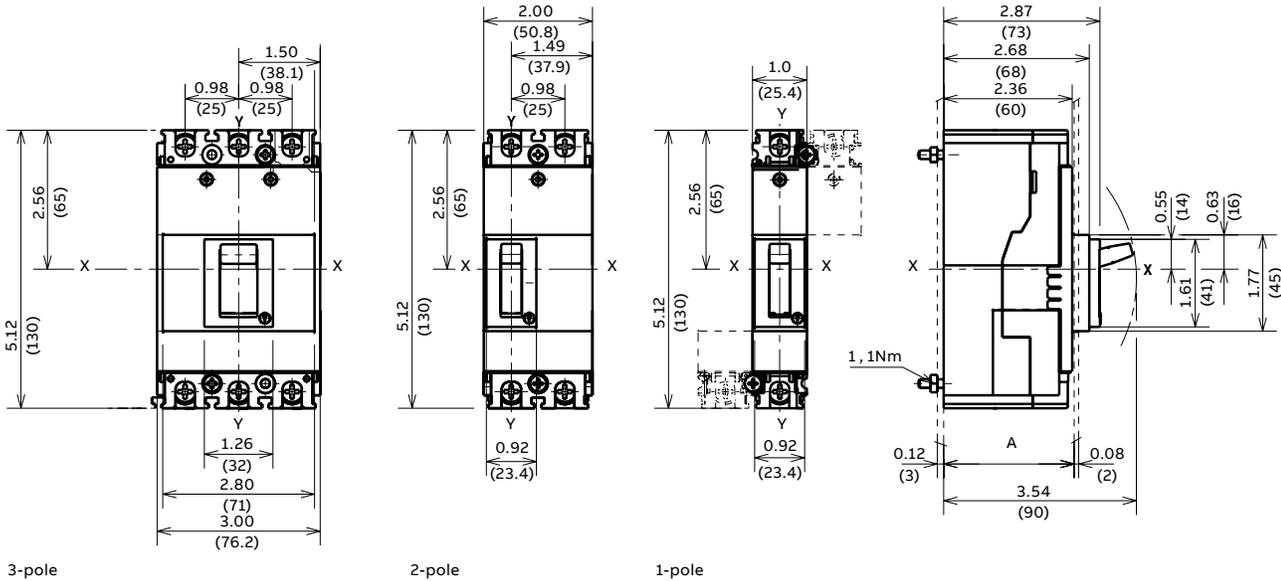
Caption

- Q/1, 2 = Circuit breaker auxiliary contacts
 SY = Contact for electrical signaling circuit breaker open due to trip of the thermal-magnetic trip unit YO (SOR-C), YU (UVR-C) (tripped position)
 V1 = Circuit breaker applications
 V4 = Indicative apparatus and connections for control and signaling, outside the circuit breaker
 XV = Terminal boards of the applications

Approximate dimensions

A1 — Circuit breaker and terminals

Mounting onto the back plate

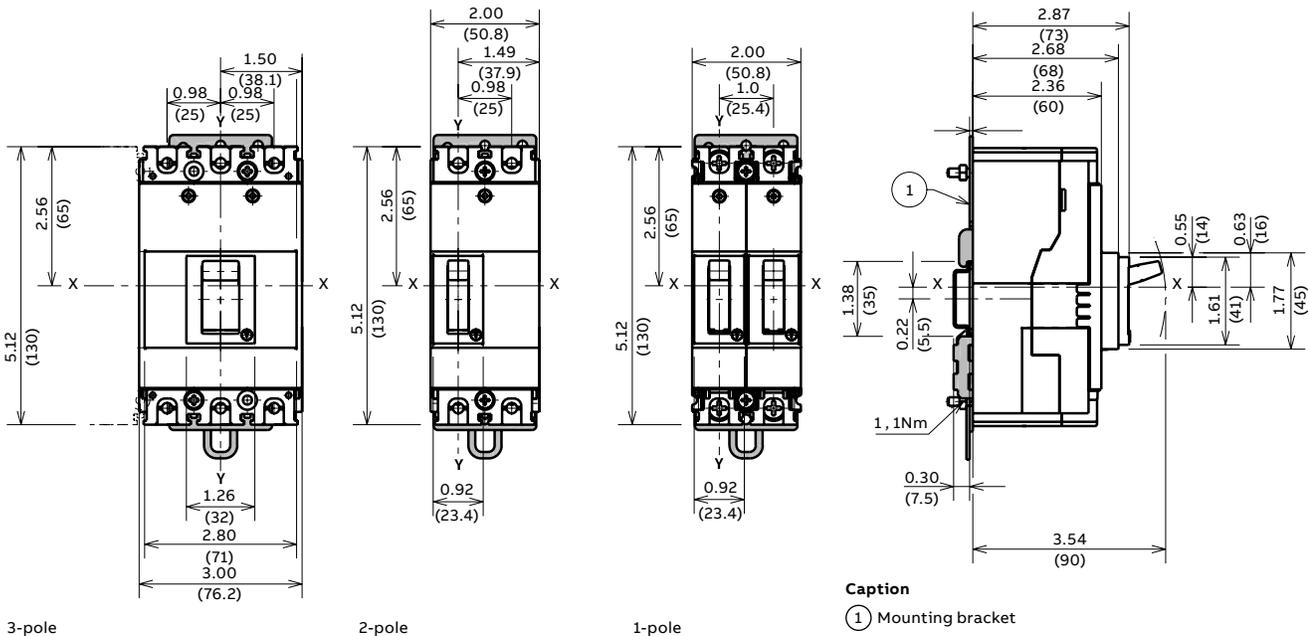


Distance between compartment door and back of switchboard		A (mm/in.)
Without flange	1-, 2- and 3-pole	69/2.72
	1-, 2- and 3-pole	61/2.40

The circuit breaker installed at:

- A = 69 mm/2.72 in. has the face around the operating lever extending from the compartment door.
- A = 61 mm/2.40 in. has the face around the operating lever and steel with construction characteristics extending from the compartment door.

Mounting onto DIN 50022 rail



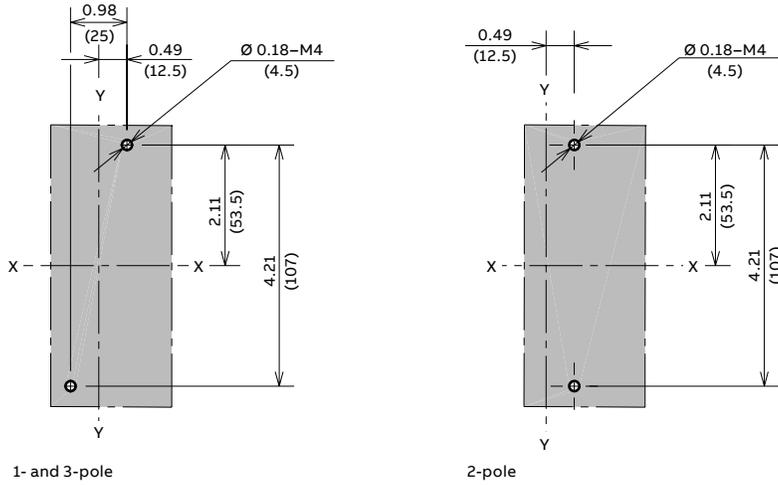
Caption
 ① Mounting bracket

Dimensions shown are in inches (mm).

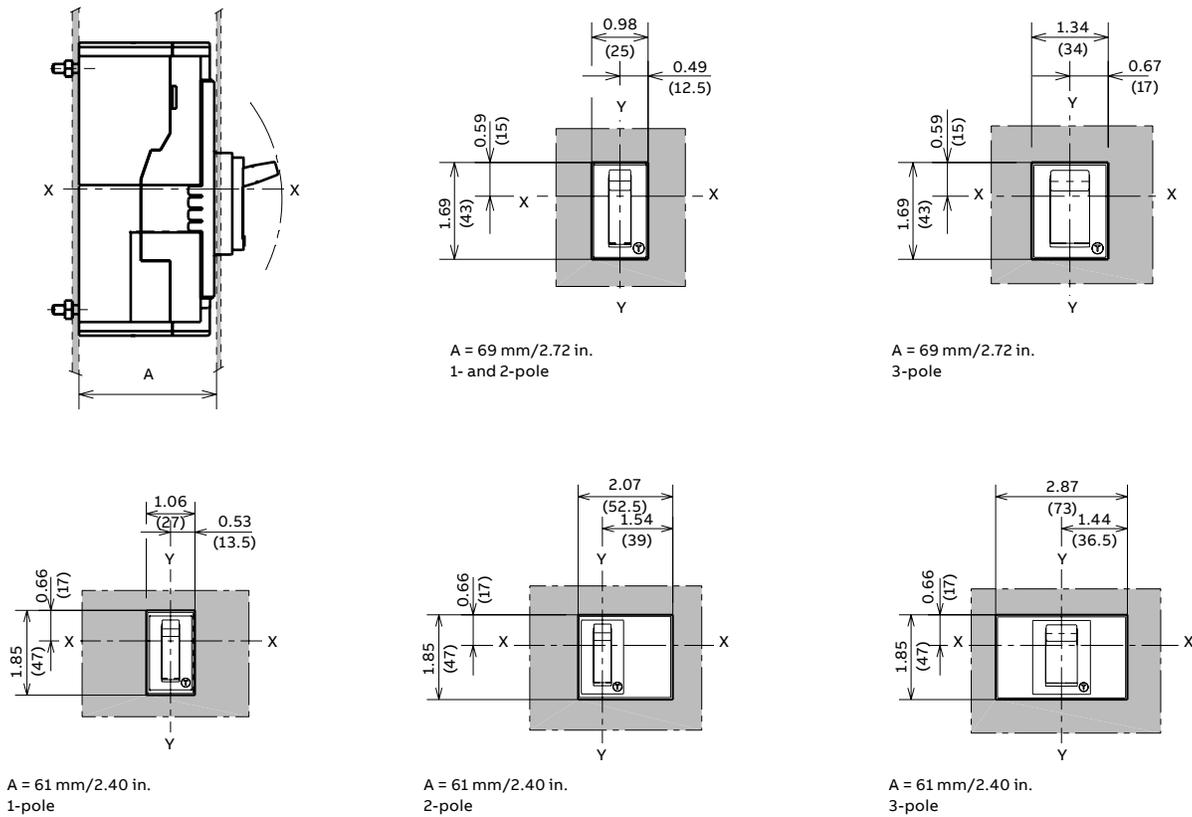
Approximate dimensions

A1 — Circuit breaker and terminals

Drilling templates for support sheet



Drilling templates for compartment door

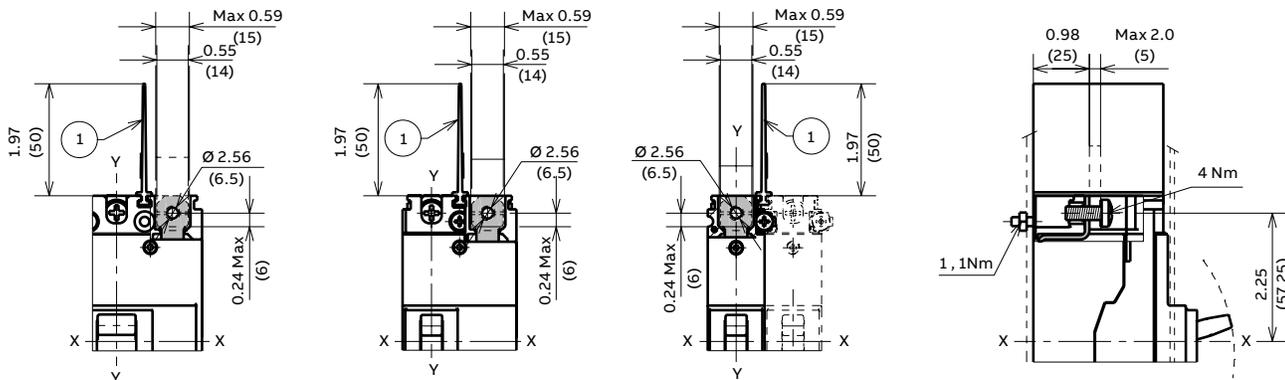


Dimensions shown are in inches (mm).

Approximate dimensions

A1 — Circuit breaker and terminals

F Terminals



3-pole

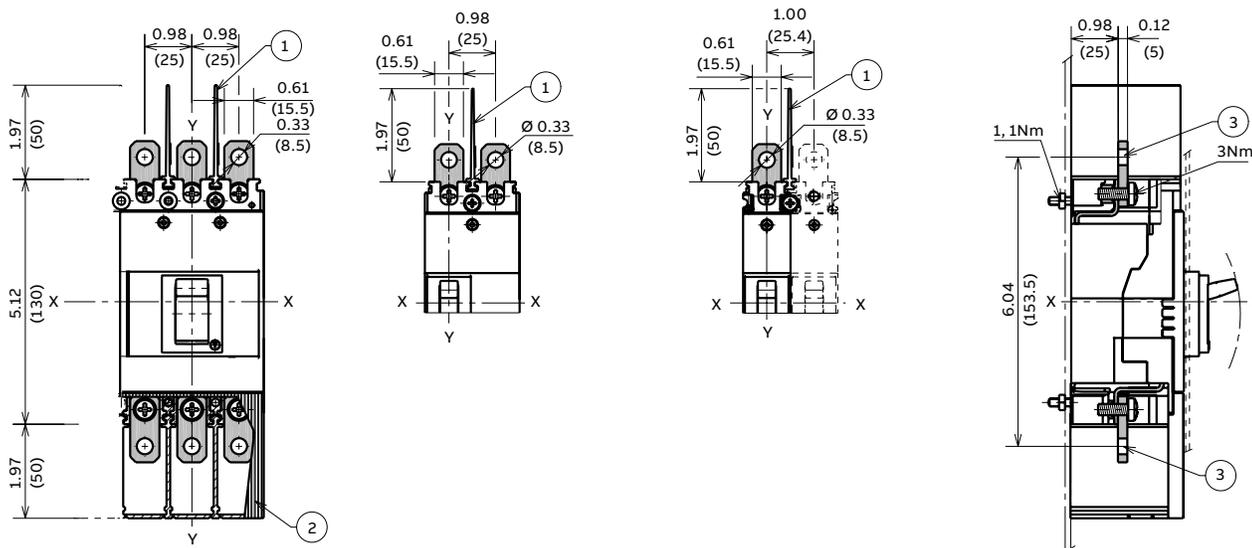
2-pole

1-pole

Caption

- ① 50 mm insulating barriers between the terminals (compulsory) supplied

EF Terminals



3-pole

2-pole

1-pole

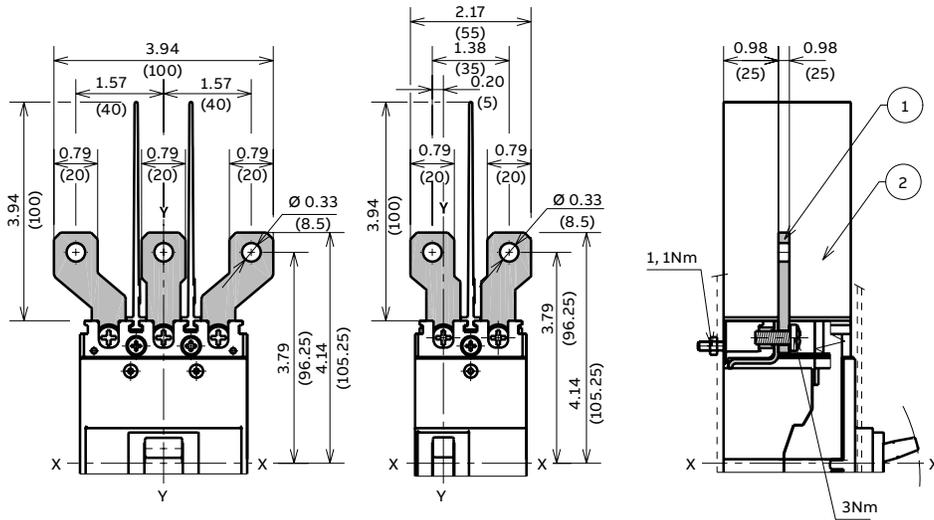
Caption

- ① 50 mm insulating barriers between the terminals (compulsory) not supplied with EF terminals kit, but with the circuit breaker in base version
- ② Top terminal covers with IP40 degree of protection (on request)
- ③ Front extended terminals

Approximate dimensions

A1 — Circuit breaker and terminals

ES Terminals



3-pole

2-pole

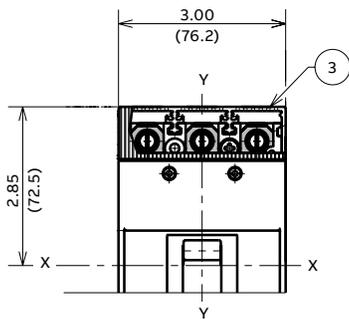
Caption

- ① Front extended spread terminals
- ② 100 mm insulating barriers between the terminals (compulsory) supplied

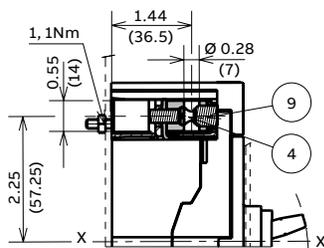
Approximate dimensions

A1 — Circuit breaker and terminals

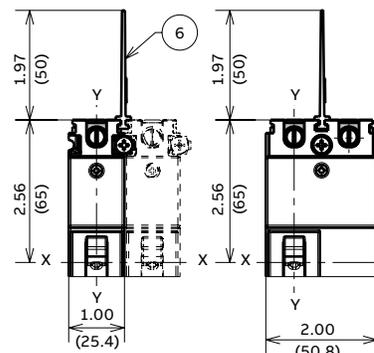
FC CuAl 14–2 AWG Terminals



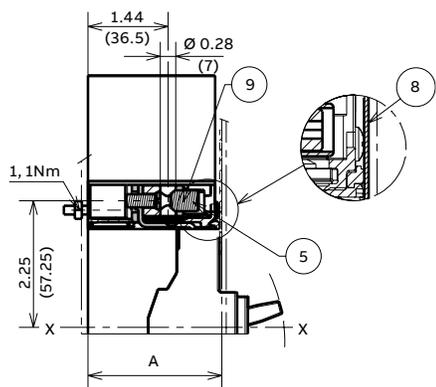
3-pole



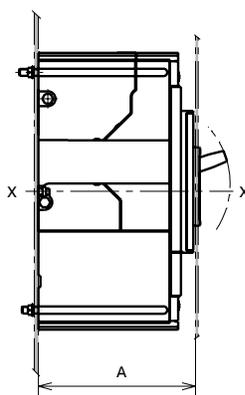
3-pole



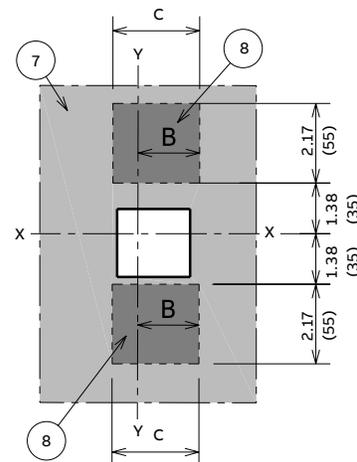
1- and 2-pole



1- and 2-pole



1- and 2-pole



1- and 2-pole

	A mm/in)	B (mm/in.)	C (mm/in.)	
Without flange	69/2.72	33/1.30	66/2.60	1-pole
	69/2.72	58/2.28	91/3.58	2-pole
	61*/2.40*	33/1.30	66/2.60	1-pole
	61*/2.40*	58/2.28	91/3.58	2-pole

* Distance only possible with insulation plate max. 1 mm/0.04 in. thick

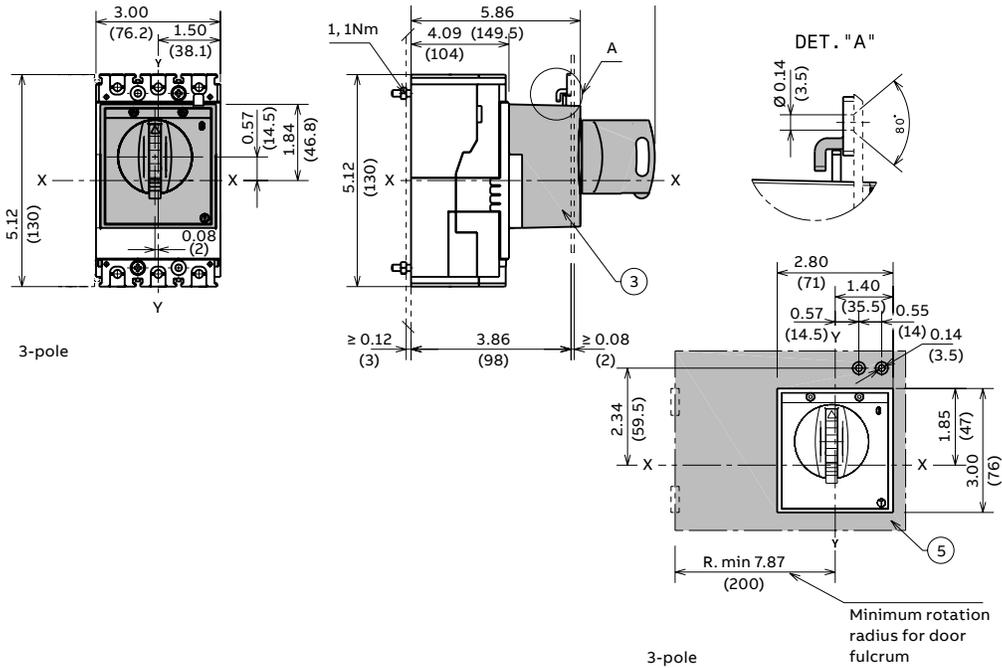
Caption

- ③ Bottom terminal covers with IP40 degree of protection (compulsory)
- ④ FC CuAl 14–2 AWG terminals
- ⑥ 50 mm insulating barriers between the terminals (compulsory) not supplied with FC CuAl terminals kit, but with the circuit breaker in base version
- ⑦ Compartment door drilling template and mounting insulation (provided by customer)
- ⑧ Compulsory internal 1-pole and 2-pole insulation plates (provided by customer)

Approximate dimensions

A1 — Accessories

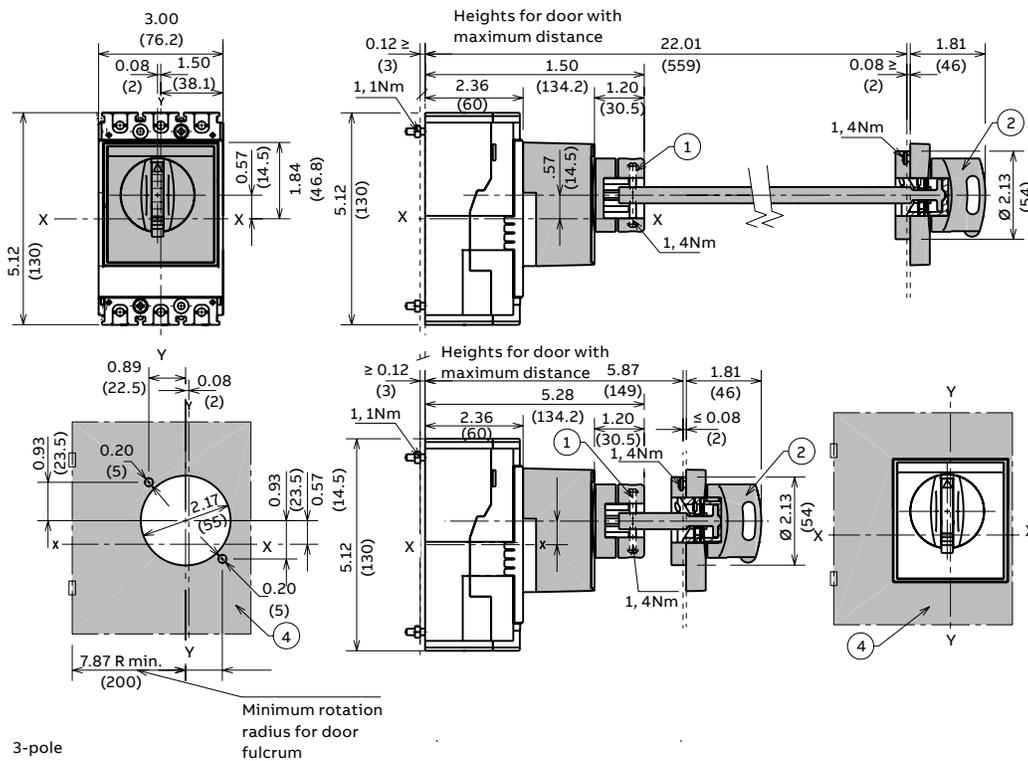
Rotary handle operating mechanism on circuit breaker and compartment door drilling template (RHD)



Caption

- ③ Rotary handle operating mechanism on circuit breaker
- ⑤ Template for drilling compartment with direct handle

Rotary handle operating mechanism on compartment door and compartment door drilling template (RHE)



Caption

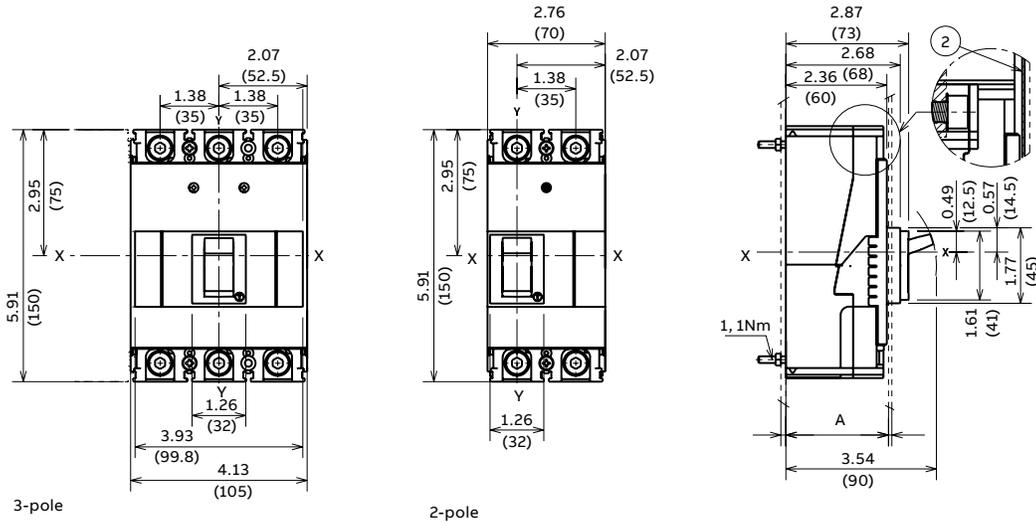
- ① Transmission group
- ② Extended rotary handle operating mechanism
- ④ Template for drilling compartment with extended rotary handle

Dimensions shown are in inches (mm).

Approximate dimensions

A2 — Circuit breaker and terminals

Mounting on the back plate

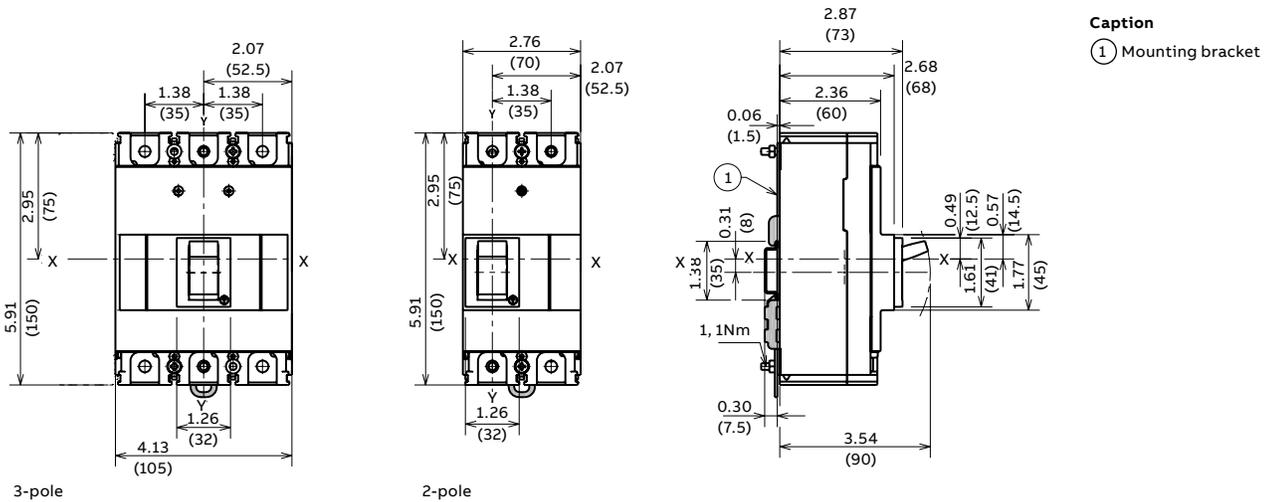


Distance between compartment door and back of switchboard		A (mm/in.)
Without flange	2- and 3-pole	69/2.72
	2- and 3-pole	61/2.40

The circuit breaker installed at:

- A = 69 mm/2.72 in. has the face around the operating lever extending from the compartment door.
- A = 61 mm/2.40 in. has the face around the operating lever and steel with construction characteristics extending from the compartment door.

Mounting onto DIN 50022 rail

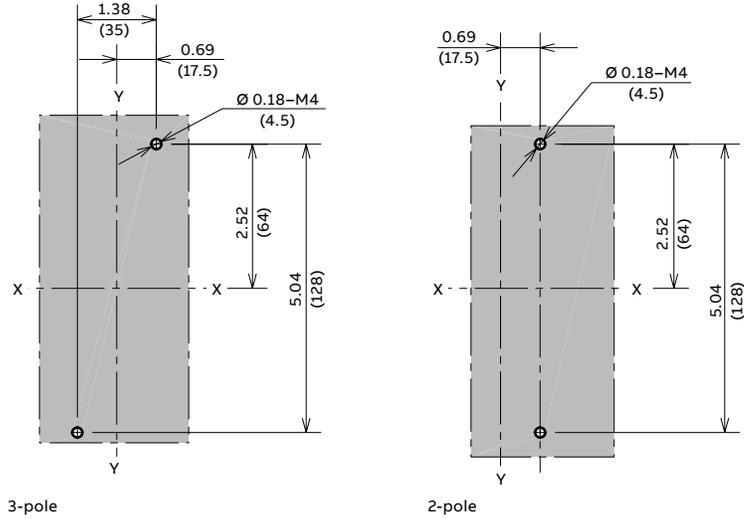


Dimensions shown are in inches (mm).

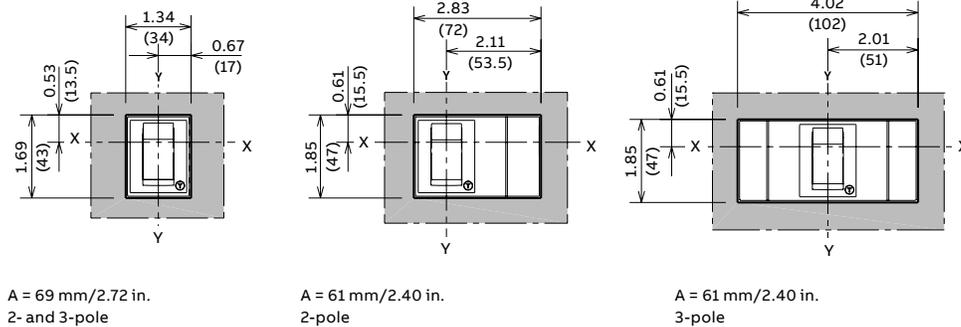
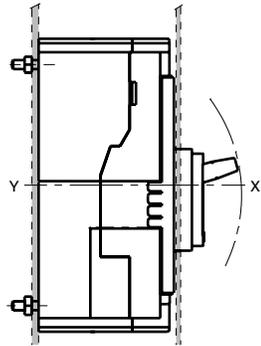
Approximate dimensions

A2 — Circuit breaker and terminals

Drilling templates for support sheet



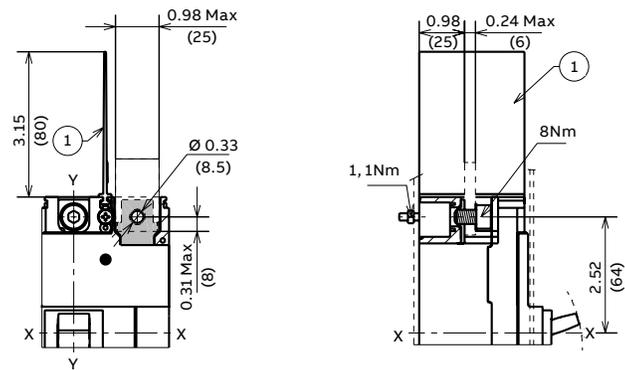
Compartment door drilling templates



Approximate dimensions

A2 — Circuit breaker and terminals

F Terminals

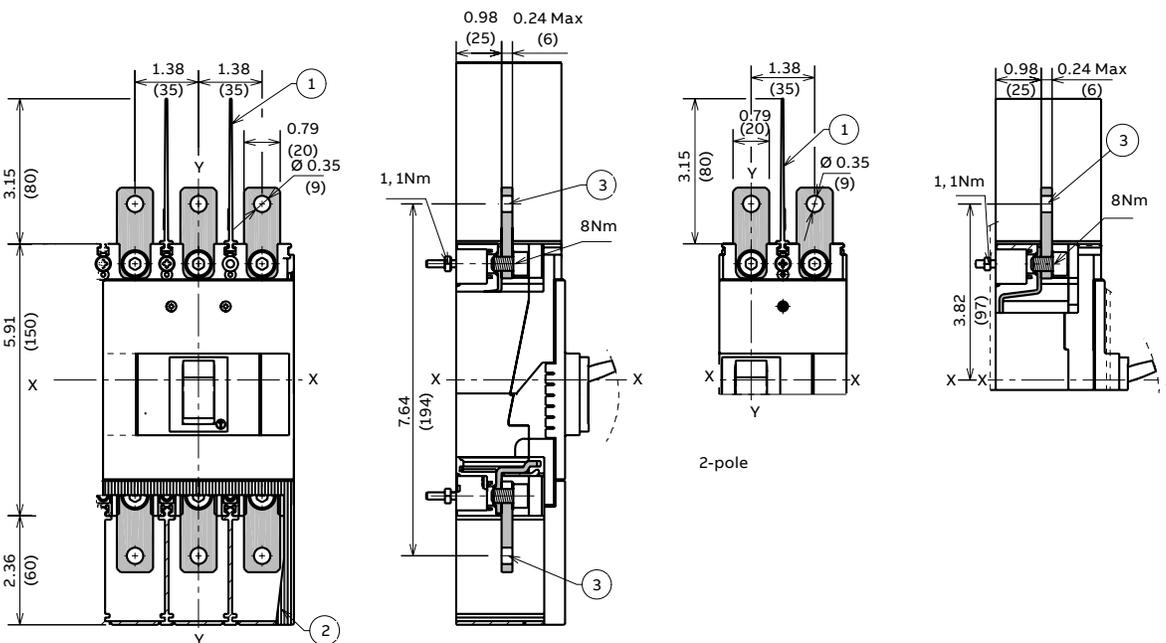


2- and 3-pole

Caption

- ① 80 mm insulating barriers between the terminals (compulsory) supplied

EF Terminals



3-pole

2-pole

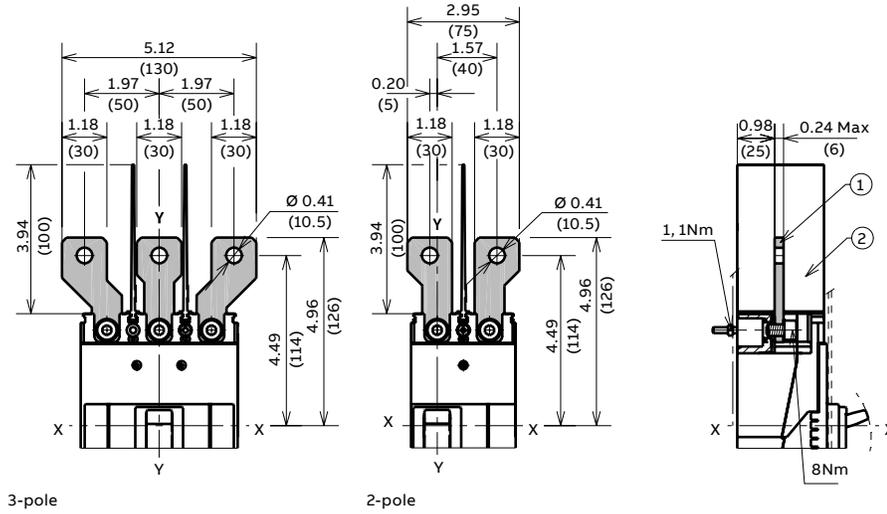
Caption

- ① 80 mm insulating barriers between the terminals (compulsory) not supplied with EF terminals kit, but with the circuit breaker in base version
- ② Top terminal covers with IP40 degree of protection (on request)
- ③ Front extended terminals

Approximate dimensions

A2 — Circuit breaker and terminals

ES Terminals



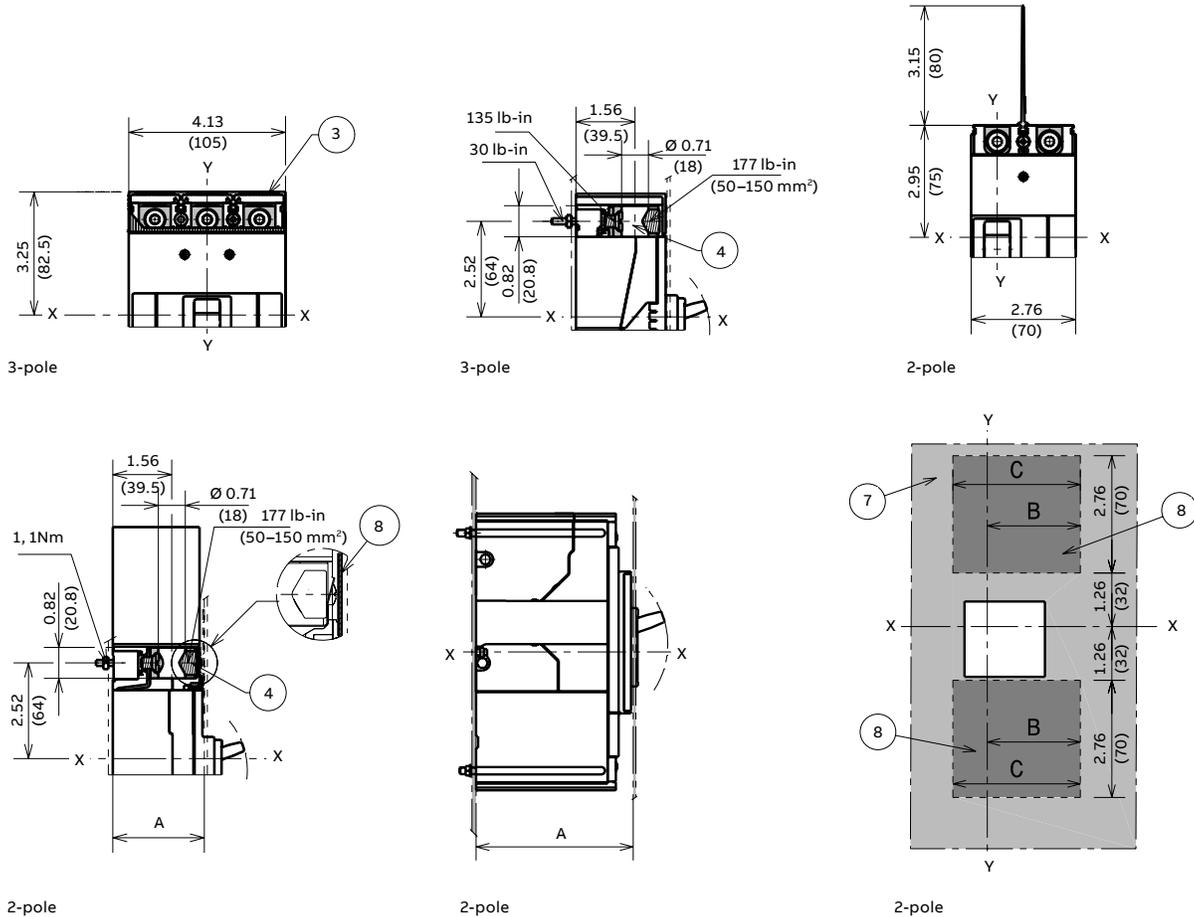
Caption

- ① Front extended spread terminals
- ② 100 mm insulating barriers between the terminals (compulsory) supplied

Approximate dimensions

A2 — Circuit breaker and terminals

FC CuAl 300 kcmil–350 kcmil terminals



	A (mm/in)	
Without flange	69/2.72	2-pole
	61/2.40	2-pole

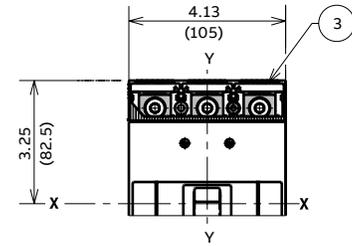
Caption

- ③ Terminal covers (compulsory)
- ⑤ Terminals FC CuAl 300 kcmil–350 kcmil
- ⑥ 80 mm insulating barriers between the terminals (compulsory) not supplied with FC CuAl terminals kit, but with the circuit breaker in base version
- ⑧ Compulsory internal insulation plates (provided by customer) max. 1 mm/0.039 in. thick

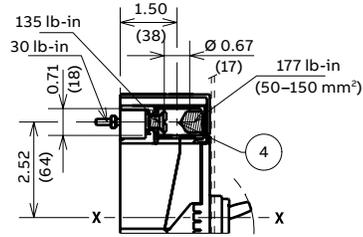
Approximate dimensions

A2 — Circuit breaker and terminals

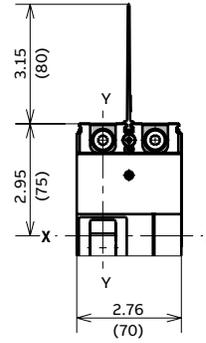
FC CuAl 1 AWG–300 kcmil terminals



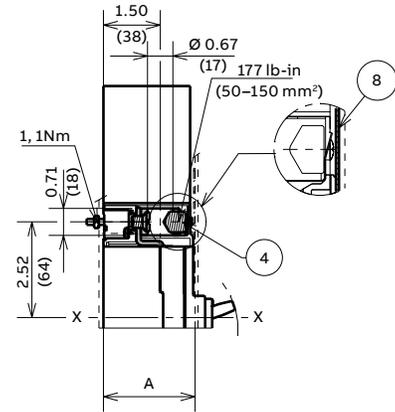
3-pole



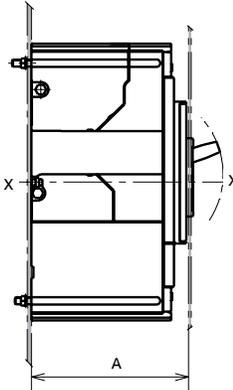
3-pole



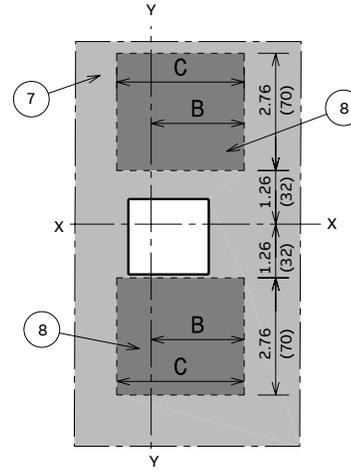
2-pole



2-pole



2-pole



2-pole

	A (mm/in.)	
Without flange	69/2.72	2-pole
	61/2.40	2-pole

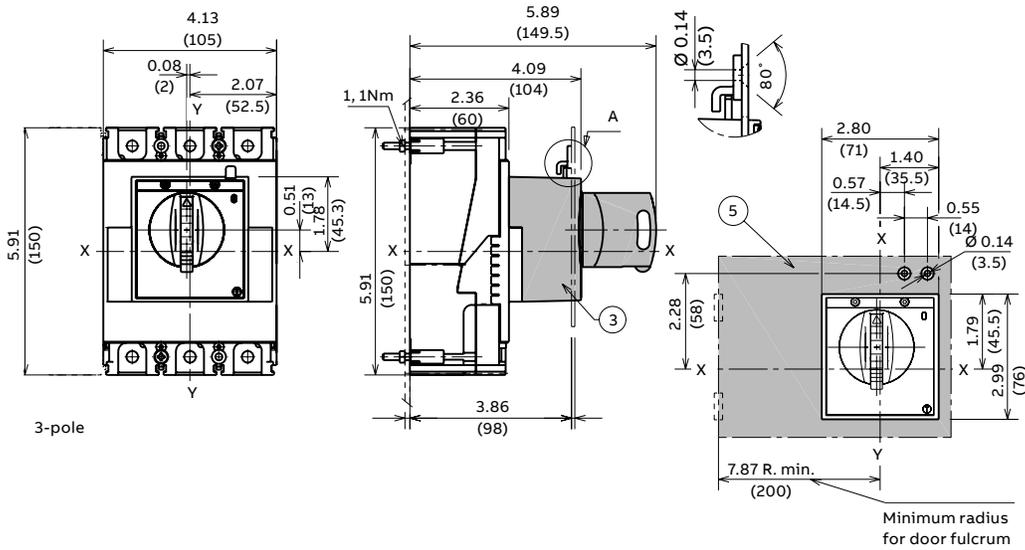
Caption

- ③ Terminal covers (compulsory)
- ④ Terminals FC CuAl 1 AWG–300 kcmil
- ⑥ 80 mm insulating barriers between the terminals (compulsory) not supplied with FC CuAl terminals kit, but with the circuit breaker in base version
- ⑧ Compulsory internal insulation plates (provided by customer) max. 1 mm/0.039 in. thick

Approximate dimensions

A2 — Accessories

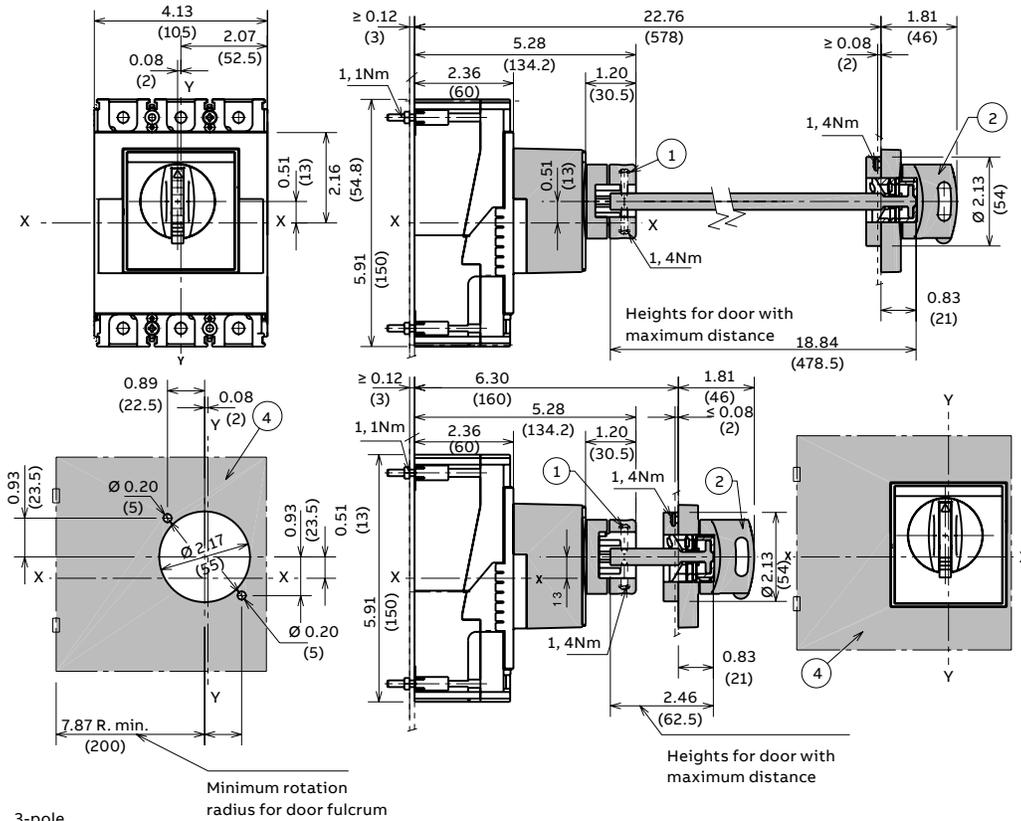
Rotary handle operating mechanism on compartment door and compartment door drilling template (RHD)



Caption

- ③ Rotary handle operating mechanism on circuit breaker
- ⑤ Template for compartment drilling with direct handle

Rotary handle operating mechanism on circuit breaker and compartment door drilling template (RHE)



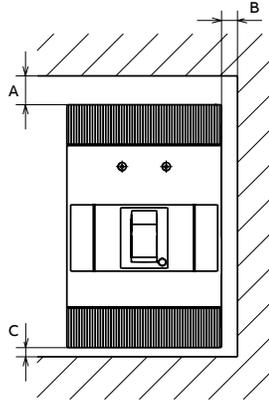
Caption

- ① Transmission group
- ② Extended rotary handle operating mechanism
- ④ Template for drilling compartment with extended rotary handle

Dimensions shown are in inches (mm).

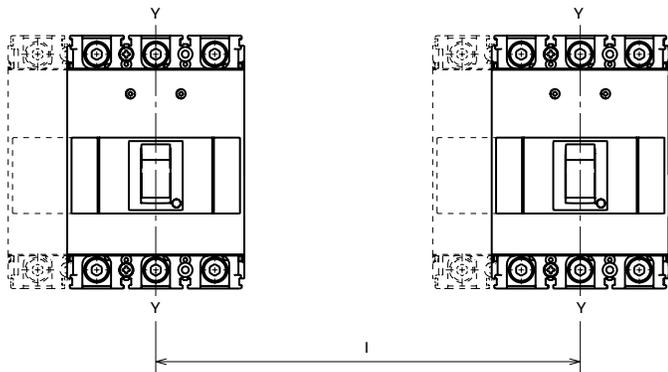
Approximate dimensions

Minimum insulation distances



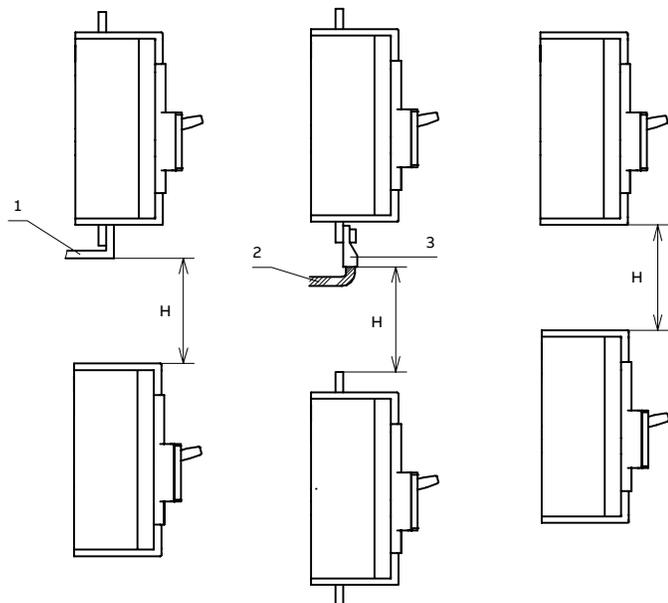
Minimum insulation distances for installation in cubicles

	A (mm/in.)	B (mm/in.)	C (mm/in.)
A1 — 1p, 2p, 3p	50/1.97	50/1.97	50/1.97
A2 — 2p, 3p	50/1.97	50/1.97	50/1.97



Minimum center distance between two side by side circuit breakers

	Circuit breaker width (mm/in.)			Center distance I (mm/in.)		
	1-pole	2-pole	3-pole	1-pole	2-pole	3-pole
A1	25.4/1.00	50.8/2.00	76.2/3.00	25.4/1.00	50.8/2.00	76.2/3.00
A2	-	70/2.76	105/4.13	36/1.42	70/2.76	105/4.13



Minimum center distance between two stacked circuit breakers

	H (mm/in.)
A1	80/3.15
A2	400/15.75

Caption

- ① Connection not insulated
- ② Insulated cable
- ③ Cable terminal

Additional information

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