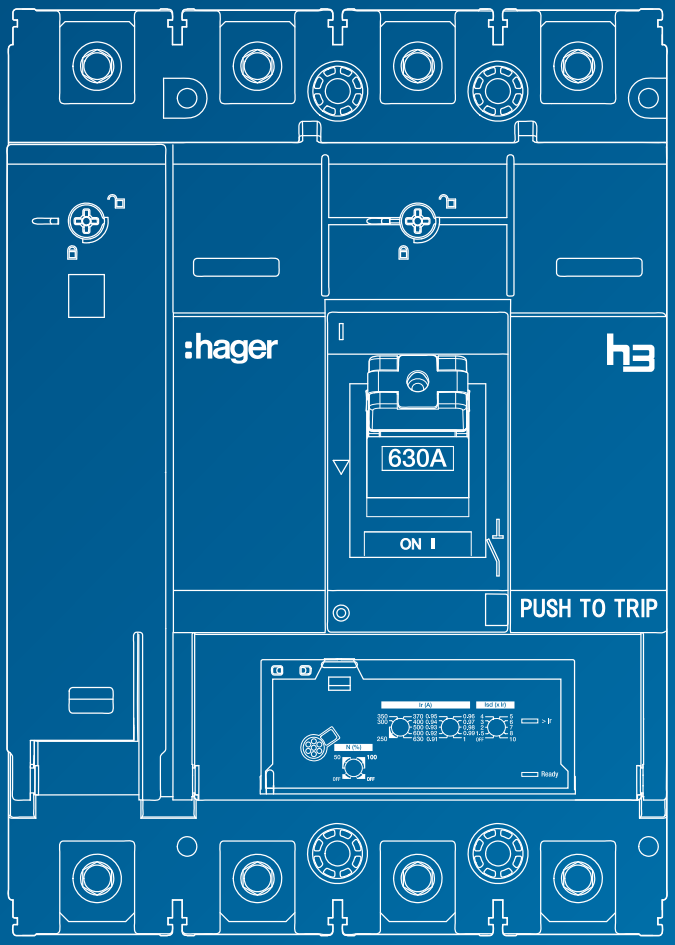
Technical catalogue

h3

Moulded Case Circuit breakers
x630



:hager

DISCLAIMER:
Whilst every effort has been made to ensure the reliability of the information is correct at time of publication, Hager cannot guarantee the accuracy of all information contained herein. Corrections and amendments, once verified, will be included in future editions.

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x630 MCCBs, RCD Add-on block, Connections, Covers, Auxiliaries, Plug-in and withdrawable breakers, Handle-locking and motor operator

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Hager reinforces its range of Moulded Case Circuit Breakers by introducing h3 x630. Available from 250 to 630 A in 3 and 4 poles, h3 x630 ensures reliable protection for low voltage distribution systems up to 415 V AC.

Special attention has been given to ergonomics to ease the integration of h3 x630 circuit breakers in electrical panel boards with different types of mounting such as plug-ins or draw-out systems with front or rear connections and direct, external, rotary & automatic operations.



h3 x630 TM



h3 x630 LSnI

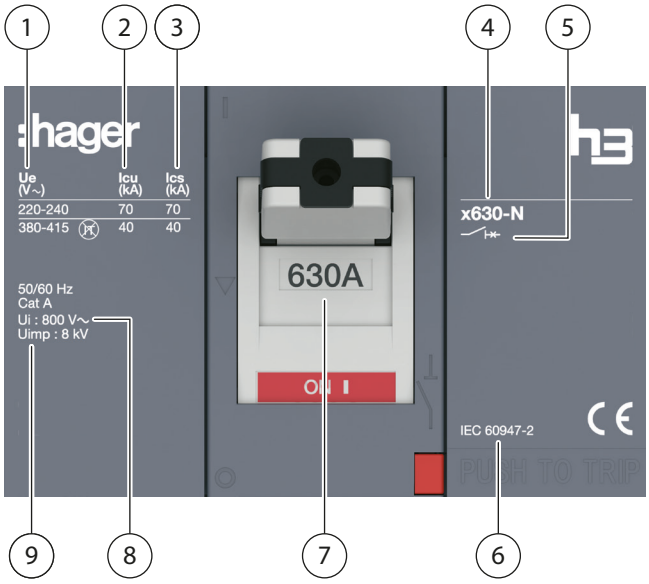
h3 Moulded Case Circuit Breaker at a glance

- Frame size x630
- Rated current from 250 A to 630 A
- Icu up to 70 kA, Ics up to 70 kA (415 V~)
- 3 and 4 poles with left hand side neutral
- Rated nominal voltage 415 V~
- Magnetic, Thermal Magnetic and Electronic Trip Units
- Wide range of accessories available
- Switch disconnectors

	H	N	M	E
	25 kA	40 kA	50 kA	70 kA
x630	250 to 630 A			

	Switch	MCCB		
		TM	MAG (ICB)	LSnI
x630	400 - 630 A	250 to 630 A	320 to 500 A	250 to 630 A

Information on product



Standardised characteristics on the product

1. Ue : Operational voltage
2. Icu: Ultimate breaking capacity per rated operational voltage Ue
3. Ics: Service breaking capacity per rated operational voltage Ue
4. Circuit breaker type, frame size and breaking capacity classification
5. Symbol for Circuit Breaker suitable for isolation
6. Approvals and Standard Compliance
7. Nominal rating
8. Ui: Rated insulation voltage
9. Uimp: Rated impulse withstand voltage

Breaking capacity classification:

	Icu (380 – 415 V~)
H	25 kA
N	40 kA
M	50 kA
E	70 kA

Compliance with standards
h3 x630 circuit breakers and auxiliaries comply to the following Standards:

International standards:
- IEC 60947-1: general rules
- IEC 60947-2: circuit breakers
- IEC 60947-3: switch-disconnectors
- IEC 60947-5-1: control circuit devices and switching elements

European standards
- EN 60947-1: General rules
- EN 60947-2: Circuit breakers
- EN 60947-3: Switch disconnectors
- EN 60947-5-1: Control circuit devices and switching elements

National standards:
- China CCC, GB/T140248.2
- China CCC, GB/T140248.3
- China CCC, GB/T140248.1

Pollution degree
h3 x630 circuit breakers are certified for operation in pollution-degree 3 environments as defined by IEC standards 60947-1.

Ambient temperature
h3 x630 circuit breakers can be used from -25 °C to 70 °C.
For ambient temperatures different than 50 °C, TM devices must be derated.
Electronic circuit breakers must be derated when the ambient temperature is greater than 50 °C.

Please refer to chapter ”Installation and operating recommendations” on page 49.

h3 x630 circuit breakers should be put into service under normal ambient, operating temperature conditions.

The acceptable storage temperature range in the original packing is from -35 °C to 70 °C.

Electromagnetic disturbances

h3 x630 circuit breakers are protected against:

- overvoltage caused by circuit switching,
- overvoltage caused by atmospheric disturbances or a distribution-system outage (e.g. failure of a lighting system),
- devices emitting radio waves (radios, walkie-talkies, radar, etc.),
- electrostatic discharges produced directly by users.

Immunity levels for h3 comply with:

- IEC/EN 60947-2: Low-voltage switchgear and controlgear, part 2: Circuit breakers:
- Annex F 4.1: Harmonic of current, Annex F 4.7: Deep current
- Annex B: Immunity tests for residual current protection
- IEC/EN 61000-4-2: Electrostatic-discharge immunity tests
- IEC/EN 61000-4-3: Radiated, radio-frequency, electromagnetic-field immunity tests
- IEC/EN 61000-4-4: Electrical fast transient/burst immunity tests
- IEC/EN 61000-4-5: Surge immunity tests
- IEC/EN 61000-4-6: Immunity tests for conducted disturbances induced by radio-frequency fields
- CISPR 11: Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.

Suitable for isolation with positive contact indication

All h3 x630 circuit breakers are suitable for isolation as defined in IEC 60947-2 standard :

- The isolation position corresponds to the O (OFF) position.
- The operating handle does not indicate the OFF position unless contacts are open and respect the insulation distances.
- Padlocks cannot be installed unless contacts are open and the operating handle is in a stable position. Installation of a rotary handle does not alter the reliability of the position-indication system.

The isolation function is certified by tests guaranteeing:

- Mechanical reliability of the position indication system,
- Absence of leakage currents,
- Capacity to withstand overvoltage between upstream and downstream connections.

The tripped position does not ensure isolation with positive contact indication; only the OFF position guarantees isolation.

Vibrations

h3 x630 circuit breakers withstand mechanical vibrations.
h3 x630 circuit breakers comply to IEC 60068-2-52:

- 2.0 to 13.2 Hz and amplitude ±1 mm
- 13.2 to 100 Hz acceleration ±0.7 G.
- Resonance frequency (±1 mm/±0.7 G) during 90 min

Excessive vibration may cause false tripping and/or damage to connections and/or mechanical parts.

Circuit breakers				**x630**			
Number of poles				3, 4			
General characteristics							
Current rating In (A)	TM		(A)	250 - 300 - 320 - 400 - 500 - 630			
	MAG (ICB)		(A)	250 - 320 - 400 - 500			
	LSnI		(A)	250 - 400 - 630			
Operational voltage, (AC)		Ue	(V)	220 - 415			
Frequency		f	(Hz)	50/60			
Rated insulation voltage		Ui	(V)	800			
Rated impulse withstand voltage		Uimp	(kV)	8			
Suitability for isolation				yes			
Utilisation category (IEC60947-2)	TM / MAG (ICB)			A			
	LSnI > 400 A			A			
	LSnI <= 400 A			B			
Pollution degree				3			
Breaking capacity level				H	N	M	E
Rated ultimate short-circuit breaking capacity, (Icu)							
(AC) 50/60 Hz 220/240 V		Icu	(kA)	35	70	85	100
(AC) 50/60 Hz 380/415 V		Icu	(kA)	25	40	50	70
Rated service short-circuit breaking capacity, (Ics)							
(AC) 50/60 Hz 220/240 V		Ics	(kA)	35	70	85	100
(AC) 50/60 Hz 380/415 V		Ics	(kA)	25	40	50	70
Mechanical endurance in number of cycles ON/OFF (IEC 60947-2)				15 000			
Electrical endurance in number of cycles at 440 V~ (IEC 60947-2)				6 000 for ≤ 400 A 4 000 for > 400 A			
Protection							
Thermal magnetic trip unit: TM				**yes**			
T adjustable, M adjustable				yes			
Calibration temperature for thermal magnetic trip units				50 °C for ≤ 500 A 30 °C for 630 A			
Electronic trip unit: LSnI				**yes**			

Technical changes reserved

Circuit breakers			**x630**
Environment			
Operating temperature			-25 °C to +70 °C
Storage temperature			-35 °C to +70 °C
Tropicalisation			95 % HR at 55 °C
Altitude		(m)	≤ 2000
Terminations			
Pitch		(mm)	45
Maximal terminal torque		(Nm)	18
Terminal width		(mm)	32
Dimensions			
Height		(mm)	260
Width	3P	(mm)	140
	4P	(mm)	185
Depth		(mm)	150
Weight	3P	(kg)	5.8
	4P	(kg)	7.6

TM

h3 x630 circuit breakers fitted with thermal-magnetic trip units are for use in electrical distribution applications. They are used for protection of conductors and loads supplied by transformers or generators and also if the fault current is limited due to the impedance of the conductor lengths. Settings are made with adjustment dials at the front of the products.

TM adjustable



Trip unit TM adjustable

Thermal protection Ir (A)

Thermal protection against overloads is based on the principle of a bimetal actuator working in an inverse time curve I^2t based on temperature rise limits. Over this limit the bimetal actuator trips the circuit breaker.
Ir is adjustable from 0.63 to 1 times the nominal rating (In) of the circuit breaker.
Time delay is non-adjustable.

Magnetic protection Ii (A)

Magnetic protection against short-circuits is adjustable and allows instantaneous tripping.
x630: adjustable from 5 to 10 times the nominal rating (In) of circuit breakers up to 400 A, 4 to 8 times for 500 A and 630 A.



Trip unit TM with neutral adjustment

Protection against earth leakage current

Protection against earth leakage current is ensured by an RCD add-on block fitted to the circuit breaker or an RCD relay operating the shunt trip release or under voltage coil of the circuit breaker (option as an accessory).

Neutral protection on TM circuit breakers

x630 TM circuit breakers are available as:
- 3P3D
- 4P4D + N (0-100 %): thermal neutral protection set in OFF or 100 % of the MCCB nominal rating.
- 4P4D + N (0-50 %): thermal neutral protection set in OFF or 50 % of the MCCB nominal rating for 630 A.

TM fix

Thermal protection Ir (A)

Ir is fixed at the nominal rating (In) of the circuit breaker.
Time delay is non-adjustable.

Magnetic protection Ii (A)

Magnetic protection against short-circuits is fixed and allows instantaneous tripping.
x630: 10 times the nominal rating (In) of circuit breakers up to 400 A, 8 times for 500 A and 630 A.

Neutral protection on TM circuit breakers

x630 TM circuit breakers are available as:
- 3P3D
- 4P3D
- 4P4D + N (100 %): thermal neutral protection set in 100 % of the MCCB nominal rating.

TM adjustable pick-up trip units

In at 50 °C	250 A	320 A	400 A	630 A*
Thermal protection				
Ir … x In (tripping current between 1.05 and 1.30 x Ir)	adjustable 0.63 - 0.8 - 1			
Time delay tr	non-adjustable			
Magnetic protection				
Ii (+/- 20 %)	adjustable 5 - 6 - 7 - 8 - 9 - 10			adjustable 4 - 5 - 6 - 7 - 8
Time delay	none			
Neutral protection				
3P	-			
4P	0 % or 100 % of In			0 % or 100 % 0 % or 50 % of In

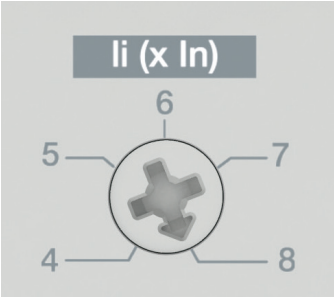
TM fixed threshold trip units

Both thermal protection pick-up (Ir) and magnetic protection pick-up (Ii) are fixed and not adjustable.

In at 50 °C	250 A	320 A	400 A	500 A	630 A*
Thermal protection					
Ir … x In (tripping current between 1.05 and 1.30 x Ir)	1				
Time delay tr	non-adjustable				
Magnetic protection					
Ii (+/- 20 %)	10			8	
Time delay	none				
Neutral protection					
3P	-				
4P3D	0 % of In				
4P4D	non-adjustable (100 % of In)				

* Thermo-magnetic MCCBs with In = 630A are calibrated at 30°C.

MAG (ICB)
h3 x630 circuit breakers fitted with magnetic trip units are for use in electrical distribution applications where only magnetic protection is required. They are mainly used for motor protection in association with a thermal relay and a power contactor.



Trip unit MAG

Magnetic protection Ii (A)
Magnetic protection against short-circuits is adjustable and allows instantaneous tripping.
x630: adjustable from 5 to 10 times the rating (In) of circuit breakers for 320 A, 4 to 8 times for 500 A.

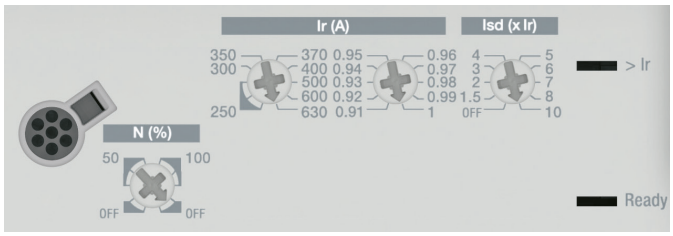
Circuit breakers with MAG trip unit
x630 MAG circuit breakers are available as 3P (3P3D) and 4P (4P4D).

MAG trip units

In	320 A	500 A
Magnetic protection		
Ii (+/- 20 %)	adjustable 5 - 6 - 7 - 8 - 9 - 10	adjustable 4 - 5 - 6 - 7 - 8
Time delay	none	
Neutral protection		
3P	-	
4P	same as phase	

Technical changes reserved

LSnI
h3 x630 circuit breakers fitted with LSnI trip units are for use in electrical distribution applications. They are used for protection of conductors and loads supplied by transformers or generators and also if the fault current is limited due to the impedance of the conductor lengths. Settings via adjustment dials are at front of the products and allow an accurate protection settings and a tripping curve independant of the ambiant temperature.



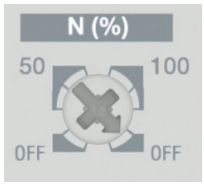
Trip unit LSnI

Long time protection L
Long time protection provides an inverse time curve I^2t against overloads.
Fine tunning of Ir (A) is done with 2 dials.
Time delay tr (s) is non-adjustable.

Short time protection S
Short time protection is for short-circuits. Isd (A) is adjustable with a dial from 1.5 to 10 times the long time protection Ir of the circuit breaker. Short time protection can be disabled.
Time delay tsd is non-adjustable.

Non-adjustable instantaneous protection Ii
Instantaneous short-circuit protection Ii (A) is fixed.
Non tripping time delay is 10 ms and the maximum tripping time delay is 50 ms.

Protection against earth leakage current
Protection against earth leakage current is ensured by an RCD add-on block fitted to the circuit breaker or an RCD relay operating the shunt trip release or under voltage coil of the circuit breaker (option as an accessory).



Neutral protection dial LSnI trip unit

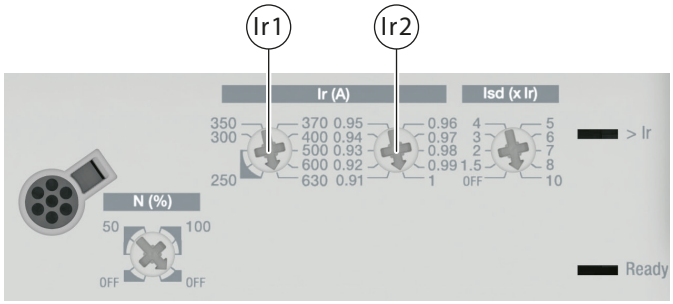
Neutral protection on LSnI circuit breakers
x630 LSnI circuit breakers are available as:
- 3P3D
- 4P4D: Neutral protection is set with a dial on one of the following positions: OFF/ 50 % of Ir and Isd/ 100 % of Ir and Isd. Time delay remains the same as tr and tsd.

Front LED Indicators
Ready LED: Green when the trip unit is ready to protect. It blinks in orange in case of a failure in the trip unit auto test. If the latter occurs, the MCCB is considered defective and no longer guarantees the protection of the electrical installation. Off when in the normal state. It starts blinking red when I ≥ 105% Ir and remains red in case I > 112% Ir.


Maintenance port (MIP)

Maintenance port (MIP)
Connection for Configuration Tool HTP610H.

LSnI trip units



LSnI trip units

		In	250 A	400 A	630 A
Long time protection					
Ir (tripping current between 1.05 and 1.30 x Ir)					
Ir1		In = 250 A	90 - 100 - 110 - 125 - 140 - 160 - 180 - 200 - 225 - 250		
		In = 400 A	160 - 180 - 200 - 225 - 250 - 300 - 350 - 370 - 400		
		In = 630 A	250 - 300 - 350 - 370 - 400 - 500 - 600 - 630		
Ir = Ir1 x Ir2		fine tunning Ir2	0.91 - 0.92 - 0.93 - 0.94 - 0.95 - 0.96 - 0.97 - 0.98 - 0.99 - 1		
Time delay (s) accuracy -21% / +1%		tr at 6 x Ir	5		
S Short time protection					
		Isd = OFF ; = Ir x ... accuracy +/- 10 %	1.5 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 10		
Time delay (ms)		tsd	100		
		Non-tripping time	80		
		Maximum breaking time	150		
I Instantaneous protection					
		Ii accuracy +/- 15 %	fixed 12 x In		fixed 11 x In
Time delay (ms)			non-adjustable		
		Non-tripping time	10		
		Maximum breaking time	50		
Neutral protection (only for 4P)					
		Neutral protection = Phase protection (Ir, Isd) x	OFF - 50 % - 100 %		
		Instantaneous protection	same as phase		
		Time delay	same as phase for tr, tsd and instantaneous		

Switch-disconnector range

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Presentation

The h3 x630 switch disconnectors comply with the IEC60947-1 and IEC 60947-3 standards. They are mainly used in electrical distribution applications such as:

- isolation and coupling of busbars
- isolation of main and sub-distribution boards
- isolation of local enclosures
- isolation of final distribution enclosures for commercial and industrial applications

The h3 x630 switch disconnectors are compatible with the following standard accessories of the h3 MCCB range:

- motor operators
- direct and external rotary operators
- plug-in and withdrawable systems
- internal accessories: AX, AL, SHT and UVR
- terminal protections
- terminal extensions and cable terminals
- interlocking systems

Switch-disconnector protection

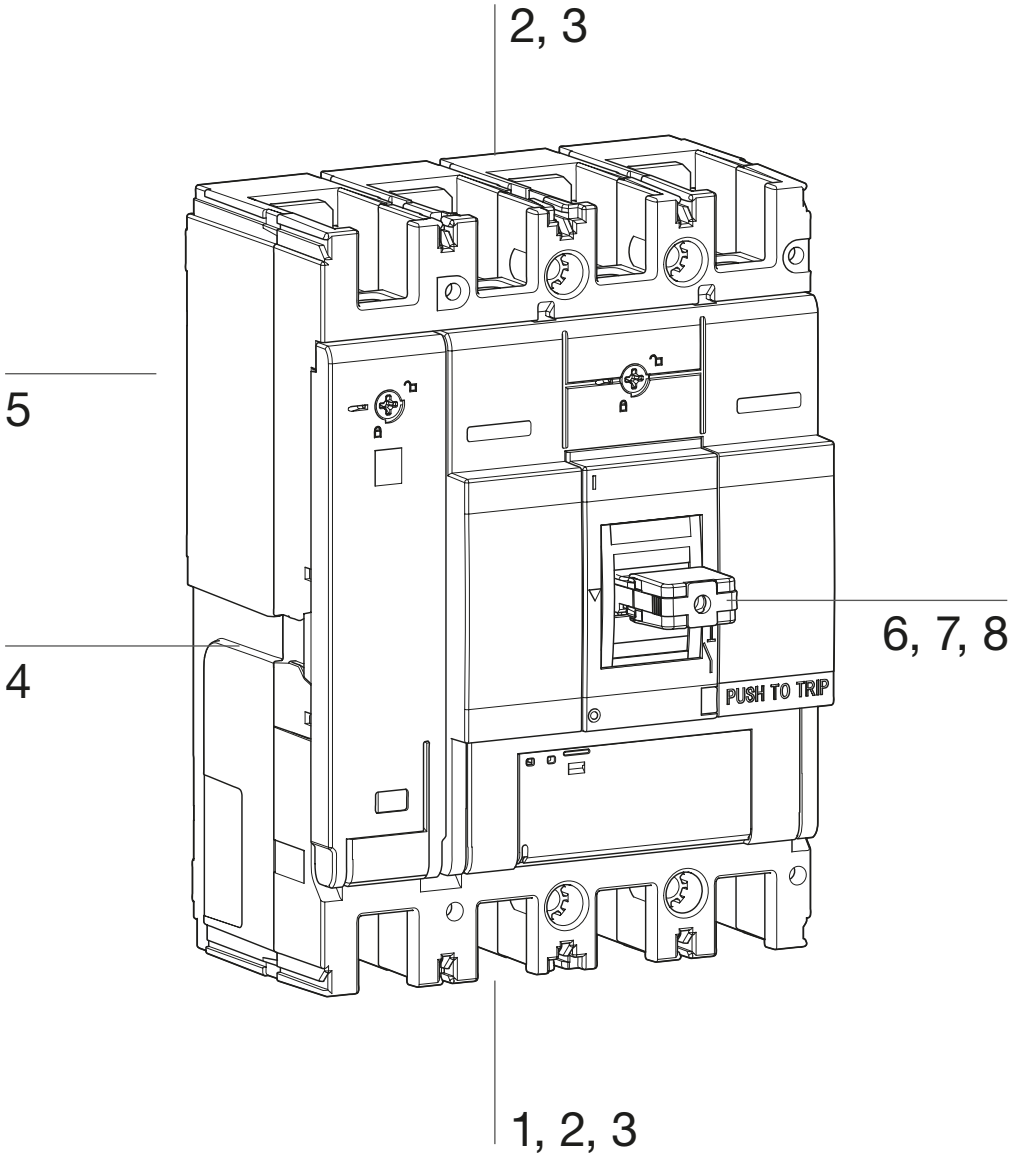
The h3 x630 switch disconnector is suitable to switch ON and OFF loads operating according to the utilisation category AC 22A / AC 23A in 415 V and DC 22A / DC 23A in 250 V. In addition to that, they ensure the complete disconnection ow the load. Moreover, the disconnection can be assured by a padlocking element fitted onto the Switch-disconnector. As for the protection against overload and short-circuit, it must be done by an upstream device, in compliance with installation standards.

Technical changes reserved

Switch-disconnectors					**x630**	
Number of poles					3, 4	
General characteristics						
Nominal current					400	630
Operational current	Ie	[A]	AC22A	220/240 V AC	400	630
				380/415V AC	400	630
				660/690V AC	400	630
			AC23A	220/240 V AC	400	500
				380/415V AC	400	500
				660/690V AC	400	500
			DC23A	125 V DC 1P	400	630
				250 V DC 2P	400	630
				375 V DC 3P	400	630
				500 V DC 4P	400	630
Short-circuit making capacity @ 380-415 V AC	Icm	[kA] peak			7.6	13
Short time withstand current	Icw	[kA]		1 s	5	7.6
Operational voltage, (AC)	Ue	[V]			415	
Frequency	f	[Hz]			50 / 60	
Rated insulation voltage	Ui	[V]			800	
Impulse withstand voltage	Uimp	[kV]			8	
Suitability for isolation					yes	
Pollution degree					3	
Mechanical endurance in number of operations					30000	30000
Electric endurance in number of cycles			In	440 V AC	6000	4000
			In	690 V AC	1000	1000
			In/2	500 V DC	1500	1500
			In	500 V DC	1000	1000
Dimensions						
Height				(mm)	260	
Width		3P		(mm)	140	
		4P		(mm)	185	
Depth					150	
Weight		3P		(kg)	4.8	
		4P		(kg)	6.4	

Accessories

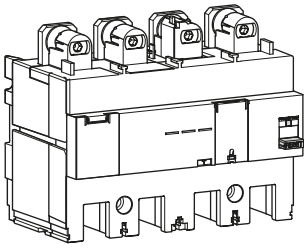
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Technical changes reserved

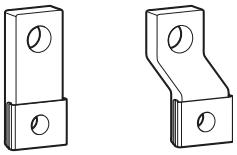
1. Earth leakage protection

RCD add-on block
page 22

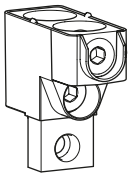


2. Connection accessories

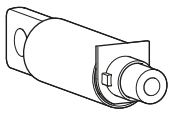
Straight and spread bar extensions
page 25



External terminals
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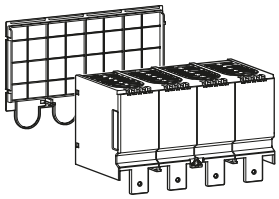


Rear connectors
page 26

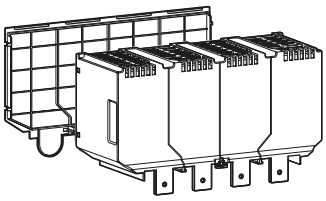


3. Connection insulation

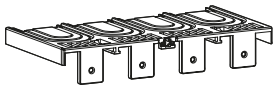
Straight
page 27



Spreader
page 27

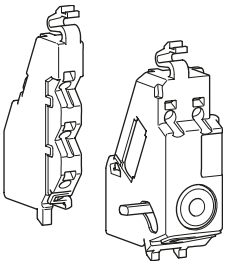


Rear and Plug-in
page 26



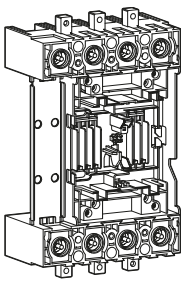
4. Auxiliaries

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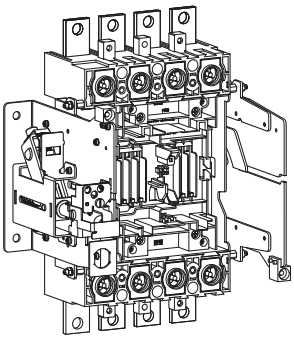


5. Mounting types

Plug-in
page 36

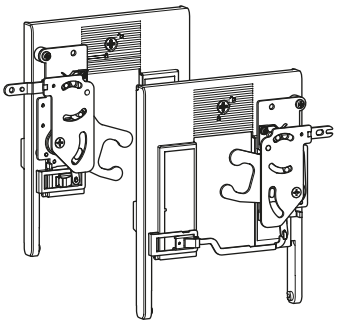


Withdrawable
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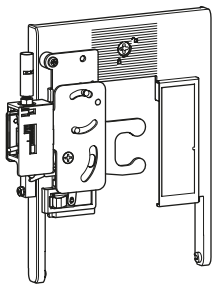


6. Interlocking accessories

Link Interlock
page 45

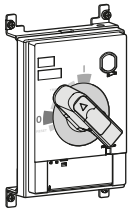


Cable Interlock
page 45

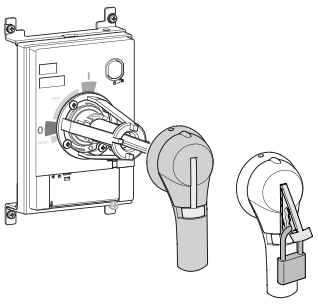


7. Handles and motor operators

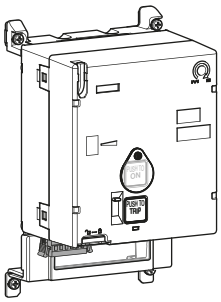
Direct rotary handle
page 39



On door rotary handle
page 39

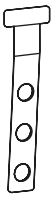


Motor operator
page 40



8. Locking and sealing accessories

Padlock accessories
page 42



Key lock
page 43



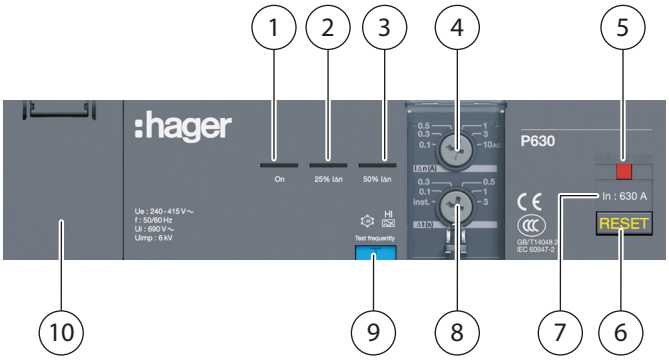
RCD add-on block



h3 x630 combined with RCD add-on block

The earth leakage protection is ensured by the RCD add-on block, which is mounted directly under the MCCB. The RCD add-on block directly commands the tripping mechanism of the circuit breaker mechanically (except the alarm-only version). The RCD add-on block is self-supplied and requires no external power source.

Technical changes reserved



1. On LED: Green when the RCD add-on block is ready to protect against earth leakage fault.
2. 25 % IΔn LED: Orange, when the earth leakage fault detected is greater than 25 % of the IΔn already set.
3. 50 % IΔn LED: Red, when the earth leakage fault detected is greater than 50 % of the IΔn already set.
4. IΔn Sensitivity dial
5. Push to test button for the test of the mechanical link between the RCD add-on block and the circuit beaker
6. Reset button: Resets the RCD add-on block so it can be operational again after trip ping due an earth leakage fault.
7. Rating indication
8. IΔt time delay dial
9. Test button simulating an earth-fault for regular check-up on the tripping function
10. Housing of the RCD auxiliary contacts

RCD add-on block x630

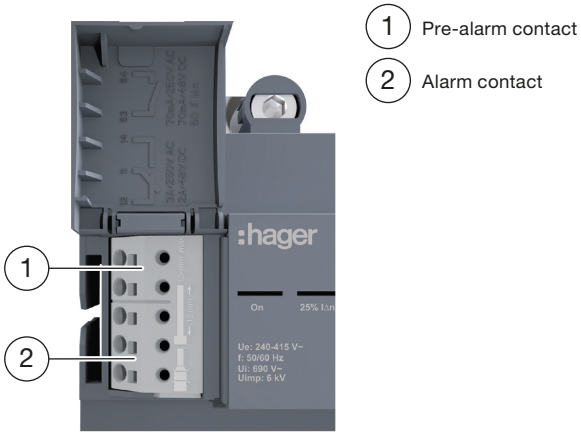
An alarm-only RCD version is available; it doesn't trip the circuit breaker to ensure service continuity.
Three versions of RCD add-on-block are available:

RCD versions	**Adjustable**	**Alarm only**
400 A	x	x
630 A	x	x
Rated IΔn (A)	0.1 - 0.3 - 0.5 - 1 - 3 - 10	0.1 - 0.3 - 0.5 - 1 - 3 - 10
Time delay IΔt (s)	inst - 0.1 - 0.3 - 0.5 - 1 - 3	inst - 0.1 - 0.3 - 0.5 - 1 - 3

Frequency	50/60 Hz
Ui	690 V
Uimp	6 kV
Nb of poles	4P
Voltage	220-415 V~
RCD type	A for IΔn ≤ 3 A AC for IΔn = 10 A

RCD auxiliary contacts
Two auxiliary contacts are available at the front of the product and protected by a cover. They are available for two versions: adjustable and alarm only.

RCD Add-on block for x630



1 Pre-alarm contact
2 Alarm contact

Auxiliary terminals on RCD add-on block

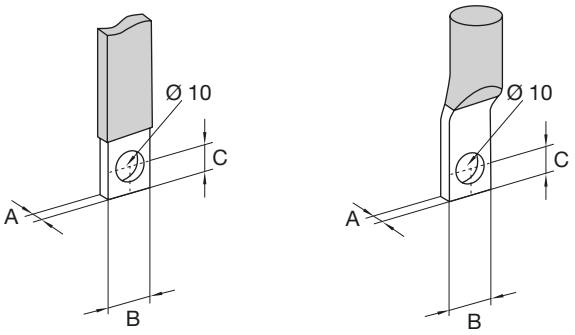
Auxiliary contacts

	Pre-alarm (50% I Δn)	Alarm (100% I Δn)
Type	1NO	1NO.NC
Maximum current for AC voltage	70 mA 250 V~	3 A 250 V~ AC15
Maximum current for DC voltage	70 mA 48 V DC	2 A 48 V DC
Type of wire	rigid or flexible	rigid or flexible
Maximum section	1.5 mm^2	1.5 mm^2

Protection can also be ensured by the combination of a residual current relay and an external core balanced transformer.

The h3 x630 circuits breakers are delivered without cable terminals and fitted with M10 screws to be connected with bars or cables fitted with lugs. Connection accessories are available to adapt the circuit breaker for bare cables, for bars or rear connection. Spreader and external multi-cable terminals are also available.

Connection of bars or cables with lugs



Copper bar and lug

Lugs used for cable connection or bars have to match the following dimensions:

Bars and lugs dimensions

(mm)	A	B	C
x630	1.2... 12	max 32	12

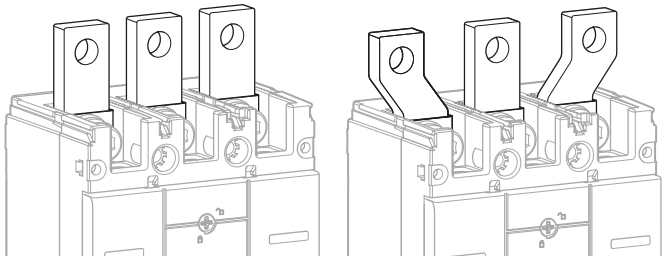
Tightening of bars or cables with lugs to the following tightening torque specifications:

Bars or cables tightening torques

x630	18 Nm

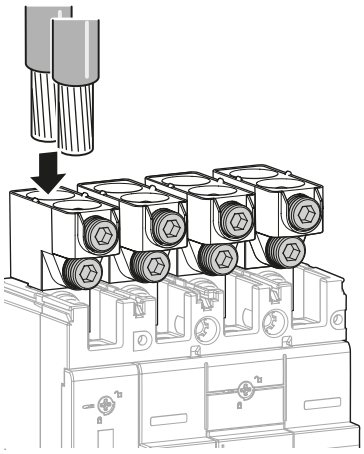
Interphase barriers or terminal covers are recommended. They are mandatory in some cases. 2 or 3 (for 4P) interphase barriers are delivered with the breaker. They are compatible with the external cable terminals. Interphase barriers are also separately available.

Straight and spread bar extensions


Bar extensions

Straight bar extensions and spreader extensions are available separately. They may be mounted with the M10 screws delivered with the breaker. Spreader extensions can be used to increase the pitch. For x630 the 45 mm pitch can be increased to 60 mm. Insulation accessories may be required. Please refer to "Insulation accessories" on page 29.

External cable terminals for x630



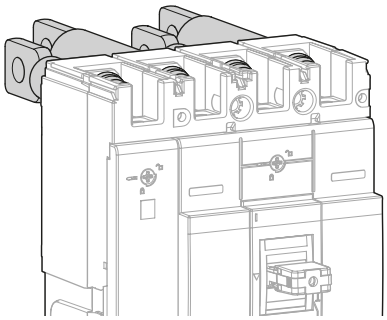
2 wires cable terminal x630

These external cable terminals are screwed directly into the terminals of the circuit breakers. They are made of aluminum and are suitable for Cu or Al wires. 2 or 3 (for 4P) interphase barriers are delivered with the breaker. They are compatible with the external cable terminals. Interphase barriers are also available as an option. Insulation accessories may be required. Please refer to "Insulation accessories" on page 29.

External cable terminals Cu/Al x630

	Capacity rigid/ flexible	Tightening torque
1 wire	35 … 300 mm²	25 Nm
2 wires	35 … 300 mm²	25 Nm

Rear connection

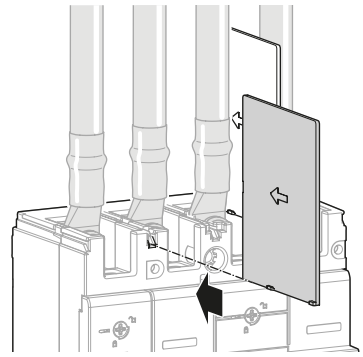


Rear connection x630

The h3 x630 circuit breakers can be fitted with rear connections if connection from the back is required. Rear connections are suitable for bars or cables with lugs. Bars may be positioned horizontally, vertically or at a 45° angle. The rear connections are fitted to the device connection terminals.

Technical changes reserved

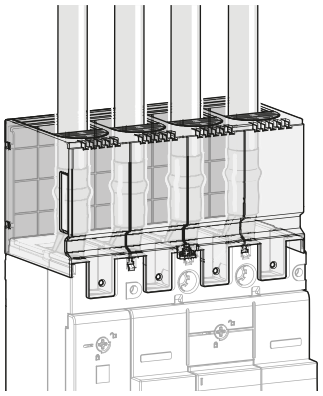
Interphase barriers



Interphase barriers x630

2 or 3 (for 4P) interphase barriers are delivered with the breaker. They are compatible with the external cable terminals. Interphase barriers are also separately available.

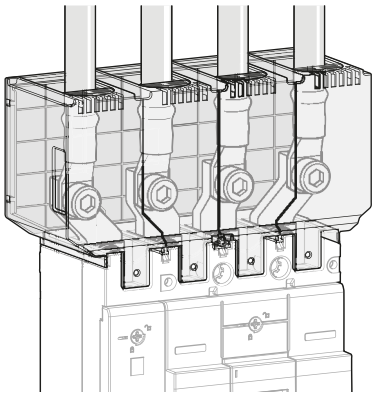
Straight terminal covers



Straight cover x630

x630 breakers can be fitted with straight terminal covers when used with cables, with lugs or straight bars. The straight terminal covers provide internal separation between phases.

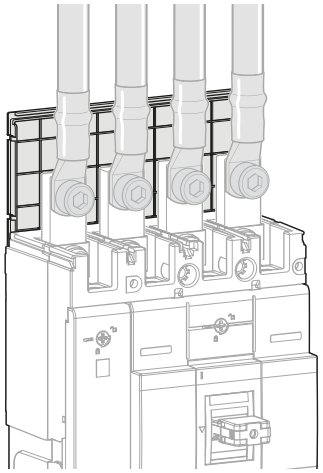
Spreader terminal covers



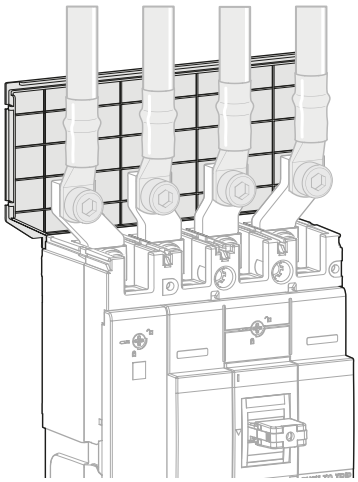
Spreader cover x630

x630 circuit breakers can be fitted with spreader terminal covers in case of use of spreader extensions. They provide the same phase separation as the straight terminal covers and can be combined with rear insulation plates.

Insulation plates



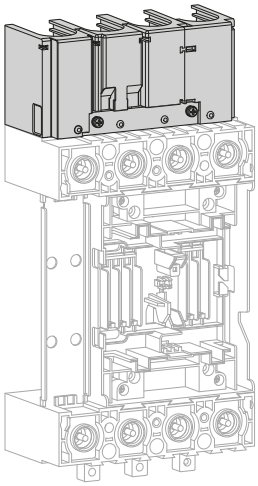
Insulation plate x630



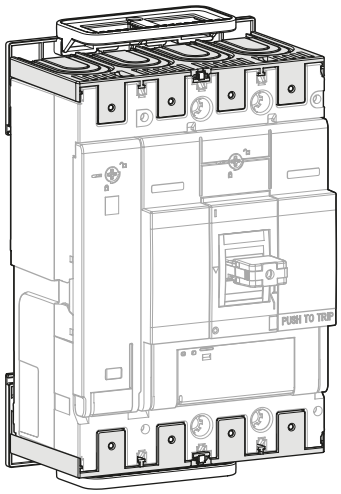
Insulation plate for spreader x630

Rear insulation plates provide complete insulation of the connections from the back.

Front covers for rear and plug-in connections



Terminal cover for plug-in base



Terminal cover for rear connection and plug-in adaptor

x630 circuit breakers can be fitted with terminal covers to ensure insulation on front connections in case of use of rear connections or for use of plug-in disposal.

These covers provide an IP40 protection degree and are sealable.

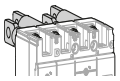
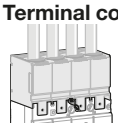
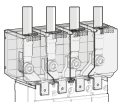
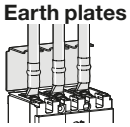
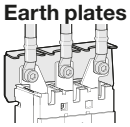
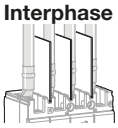
Insulation accessories

Insulation accessories may be required even mandatory in some case. This table gives the rules to be respected to ensure the insulation of the live part around the h3 x630 circuit breakers.

		Front connection				**Rear connection**	**Plug-in or withdrawable on back plate**		**Plug-in flush-mounted**
Accessories		No insulation accessory	Interphase barriers	Earth plate	Terminal covers	Terminal covers for rear connections	Terminal covers for MCCB	Terminal covers for plug-in base	Terminal covers for MCCB
Type of conductor									
	Insulated bars or cables	Possible	Possible	Possible	Possible	-	-	-	-
	Non insulated bars or ring lugs	No	Mandatory *	Mandatory when In = 630 A	Mandatory for IP20 *	Recommended	Mandatory	Mandatory	Mandatory
	Extension terminals	No	Mandatory *	Possible	Mandatory for IP20 *	-	-	-	-
	Cables with external cable terminals	No	Mandatory *	Mandatory	Mandatory for IP20 *	-	-	-	-

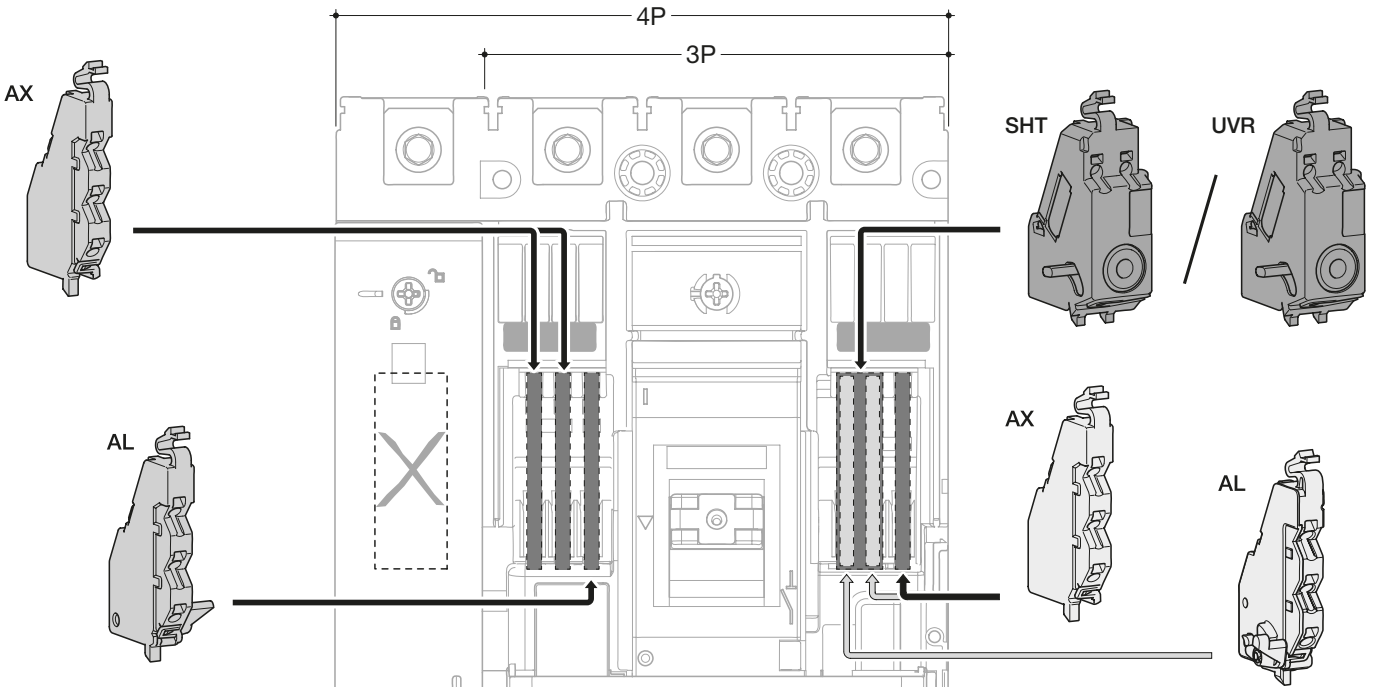
* fitted on top only if direct feeding / fitted on top and bottom if reverse feeding

Connection and compatibility chart

	Collar terminal	Straight terminal extension	Spreader terminal extension	Rear connection	L connection
					
Terminal covers for straight connections 	☑	☑	–	–	–
Terminal covers for extended spreader 	–	–	☑	–	–
Earth plates for straight terminal covers 	☑	☑	–	–	–
Earth plates for spreader terminal covers 	–	–	☑	–	–
Terminal covers for rear connection or plug-in 	–	–	–	☑	☑
Interphase barriers 	☑	☑	☑	–	–

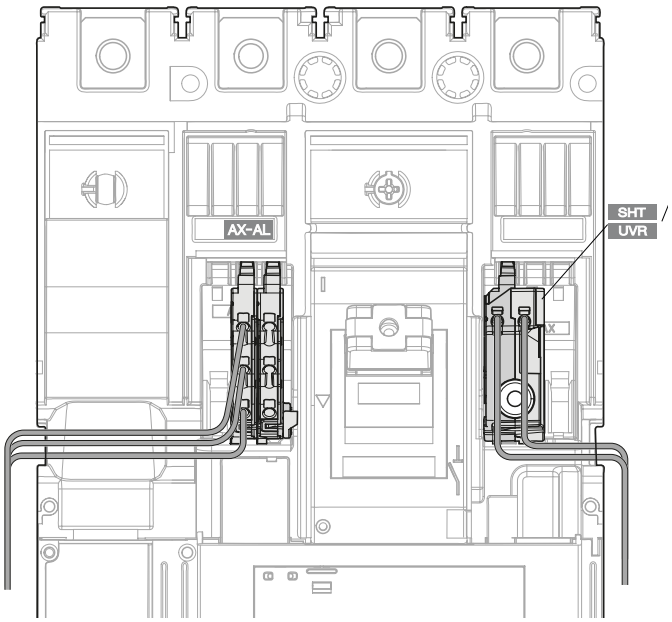
Selection of auxiliaries
x630 breakers have internal locations dedicated to the mounting of the following electrical auxiliaries.

x630
4 AX ON/OFF
2 AL trip indication
1 UVR / UVR with delay or 1 SHT



Auxiliary location

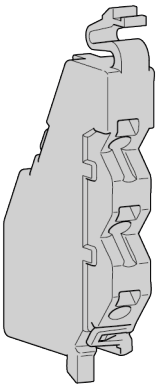
Connection of auxiliaries



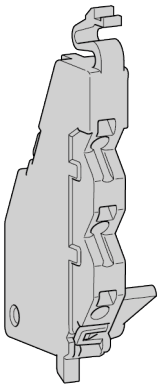
Auxiliary cabling

The maximum wire cross section is 1.25 mm^2 for auxiliary contacts (AX or AL), shunt trip releases SHT or undervoltage releases UVR. These auxiliaries are fitted with spring terminals. It is recommended to route the wires from the inside to the outside of the breaker, under the front auxiliary cover, in the following way.

AX auxiliary and AL alarm indication contacts



AX auxiliary



AL auxiliary

Indication contacts provide remote information of the circuit breaker status and can thus be used for indications, electrical locking, relays, etc.
They are NO.NC contacts.

AX contacts indicate the position Open/Closed of the circuit breaker contacts.
AL contacts indicate that the circuit breaker has tripped due to:

- An electrical fault (overload, short circuit)
- The operation of a shunt trip release
- Undervoltage release
- The “push-to-trip” button operation.

AL contacts resets when the circuit breaker is reset.

Installation and connection

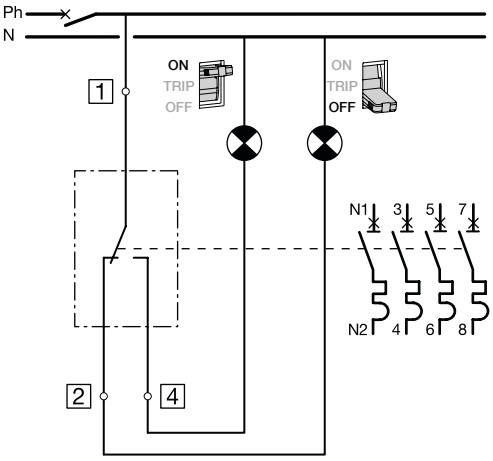
The AX and AL contacts have dedicated locations behind the front cover of the circuit breaker.

Each spring terminal may be connected by one 0.5 ...1.25 mm² flexible or rigid wire.

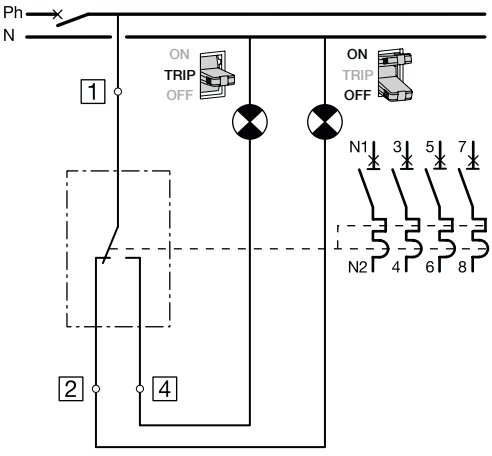
Electrical characteristics

Nominal current for standard AX and AL:
250 V / AC-14 = 3 A
250 V / AC-15 = 1 A
125 V / DC-12 = 0.4 A

Nominal current for low-level AX and AL:
30 V / DC-12 = 0.1 A
125 V / AC14 = 0.1 A



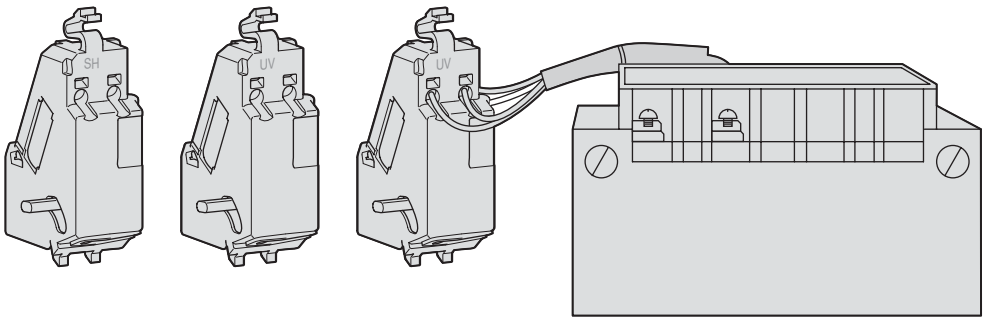
AX auxiliary



AL auxiliary

Technical changes reserved

SHT shunt trip and UVR undervoltage release coils



SHT and UVR

A shunt trip or an undervoltage release coil can be used to trip the circuit breaker using a control signal. They are for a remote tripping of the circuit breaker.

A SHT shunt trip release coil trips the circuit breaker when the control voltage rises above 70 % of its rated nominal voltage (Un). It is an impulse signal (> 20 ms) or a maintained control signal.

Shunt trip release 110...130 V~ is suitable for ground-fault protection when combined with a Class I ground-fault sensing element.

A UVR undervoltage release trips the circuit breaker when the control voltage drops below 70 % to 35 % of its rated voltage.

A delayed UVR undervoltage release coil eliminates the risk of nuisance tripping due to a transient drop voltage lasting less than 500 ms. For shorter micro-outages, a system of capacitors provides temporary supply to the UVR at U > 0.7 Un to ensure non tripping.

Electrical characteristics

SHT

Operating voltage	Un	24 V DC	48 V DC	100-120 V~	200-240 V~	380-450 V~
Operating range		75-125 % Un		85-110 % Un		
Exciting current	mA	30.0	30.0	14.0	14.0	6.50
Power consumption	VA	0.72	1.44	1.68	3.36	2.93
Electrical endurances at 415 V AC	cycles	6000	6000	6000	6000	6000
Mechanical endurances ON/OFF	cycles	15000	15000	15000	15000	15000

UVR

Operating voltage	Un	24 V DC	100-120 V~	200-240 V~	380-450 V~
Closing voltage		> 85 % Un			
Release voltage		70 % Un > … > 35 % Un			
Opening voltage		< 35 % Un			
Exciting current	mA	23.0	12.0	6.3	5.2
Power consumption	VA	0.56	1.4	1.5	2.3
Electrical endurances at 415 V AC	cycles	6000	6000	6000	6000
Mechanical endurances ON/OFF	cycles	15000	15000	15000	15000

UVR with delay

Operating voltage	Un	24 V DC	110 V~	240 V~	440 V~
Closing voltage		> 85 % Un			
Release voltage		70 % Un > … > 35 % Un			
Opening voltage		< 35 % Un			
Delay	ms	500			
Exciting current	mA	23.0	12.0	6.3	5.2
Power consumption	VA	0.56	1.4	1.5	2.3
Electrical endurances at 415 V AC	cycles	6000	6000	6000	6000
Mechanical endurances ON/OFF	cycles	15000	15000	15000	15000

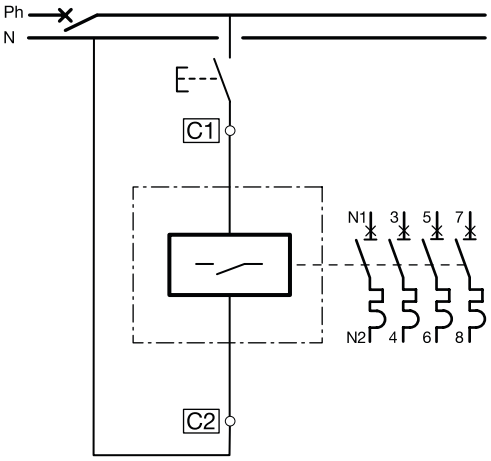
Technical changes reserved

Installation and connection

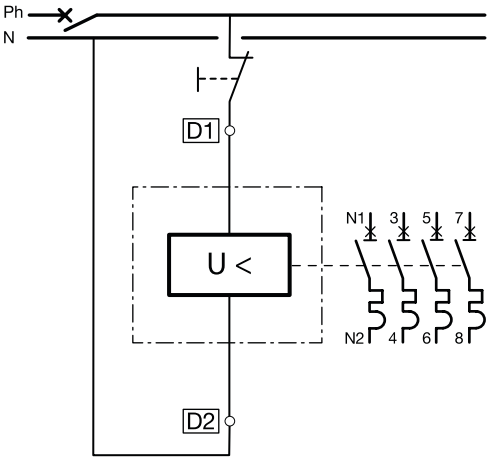
The SHT and UVR releases have dedicated locations behind the front auxiliary cover of the circuit breaker.
Each spring terminal may be connected by one flexible or rigid cable of 0.5...1.25 mm².

Operation
The circuit breaker must be reset locally after being tripped by the shunt trip or undervoltage release.
Tripping by the shunt trip or undervoltage release has priority over manual closing. When a tripping command from a SHT or UVR coils is active it is not possible to manually operate the circuit breaker and close the main contacts, even temporarily.

Tripping coil endurance
100 % of the rated mechanical endurance of the circuit breaker.

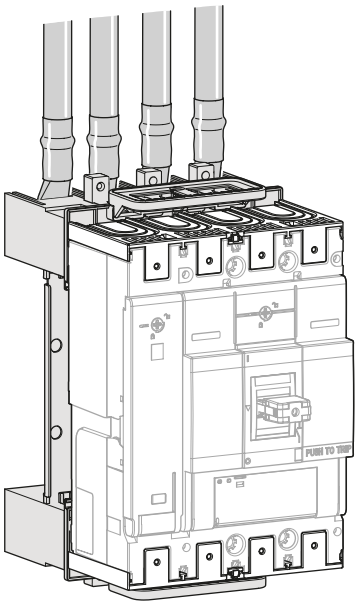


SHT

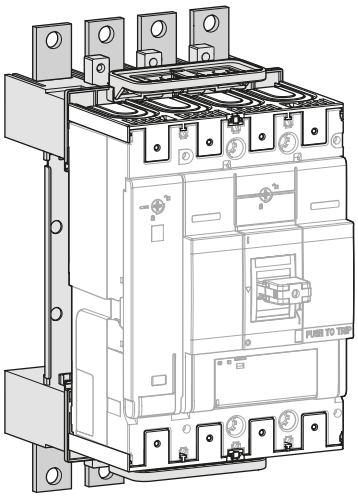


UVR

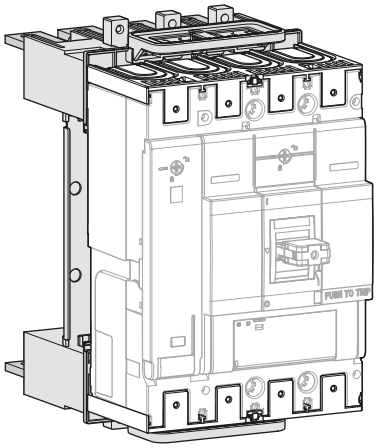
Plug-in system



Plug-in for cables fitted with lugs



Plug-in with front terminals

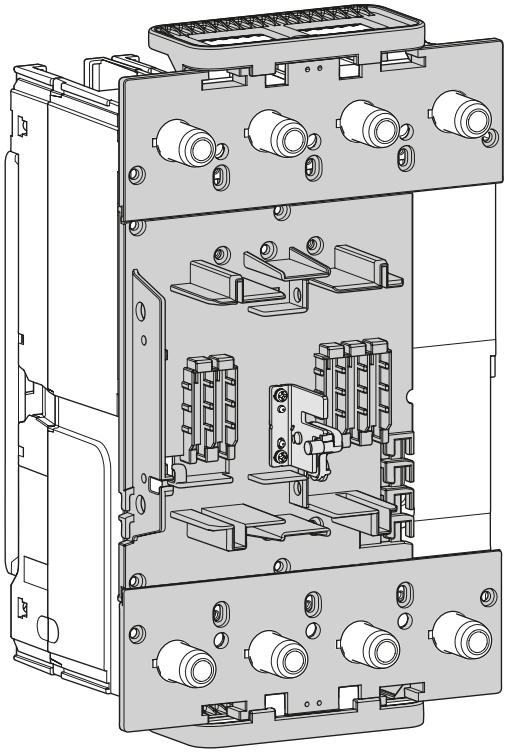


Plug-in with rear terminals

The plug-in system consists of an extraction mechanism directly mounted onto the circuit breaker and allows easy replacement of the device without removing the power conductors. The plug-in system ensures protection degree IP20 when the circuit breaker is removed.
The circuit breaker fitted with the plug-in system can be mounted in both vertical and horizontal positions.

The plug-in kit is composed of several accessories:
- Plug-in base
- Plug-in breaker adaptor fitted with safety trip

Also available as an option:
- Auxiliary connectors
- Safety trip
- Front and rear connection terminals

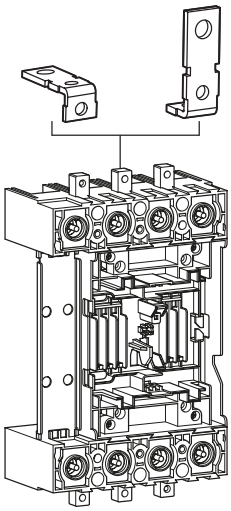


Plug-in breaker adaptor

Auxiliary connectors:
Up to five auxiliary connectors can be mounted onto the plug-in base breaker adapter. The connectors are used to report the signal of the auxiliaries contacts / shunt trip / UVR installed inside the breaker to the plug-in base. It makes the extraction of the MCCB easier.

Safety trip:
A safety trip accessory can be mounted on the plug-in adaptor to trip the circuit breaker when removed without it having been set to the OFF position.

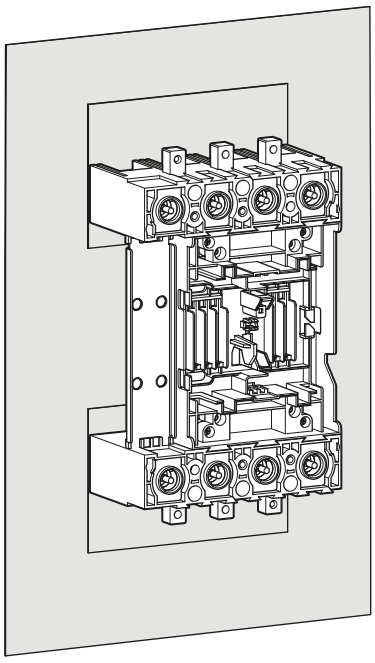
Plug-in system: Front or rear connection terminals



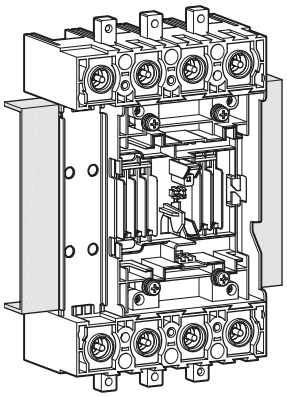
Plug-in base

The plug-in base is supplied with terminal connections. Separate front or rear connection terminals can be mounted onto the base depending on the connection arrangement needed.

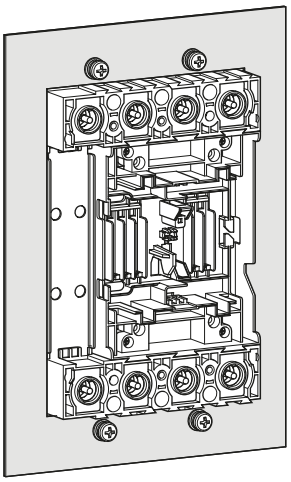
The plug-in base can be mounted on a back plate, a back U-plate or on a flush mounting plate.
It is delivered with two isolating shields if mounting is on a plain metallic back plate.



Plug-in on back plate

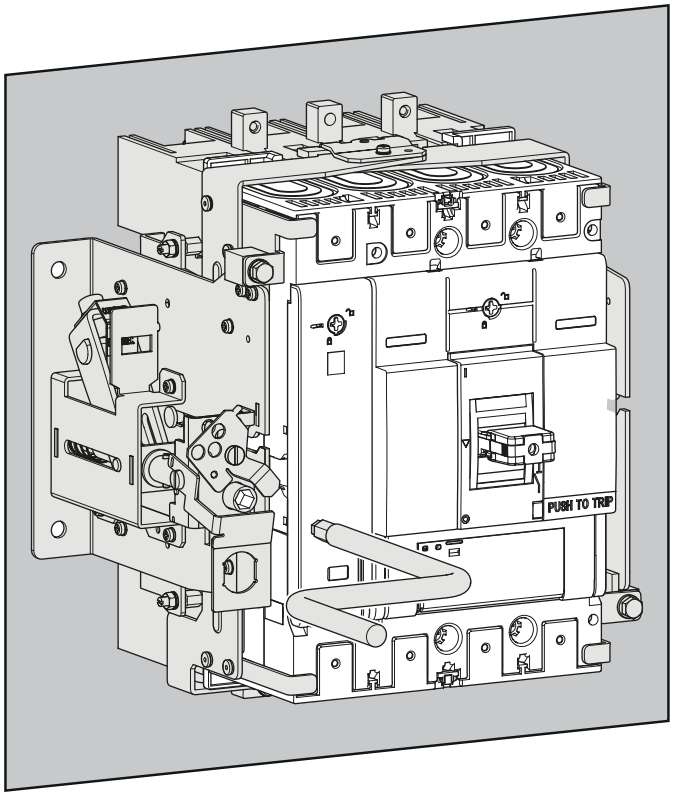


Plug-in on U-plate



Plug-in flush mounted

Withdrawable system



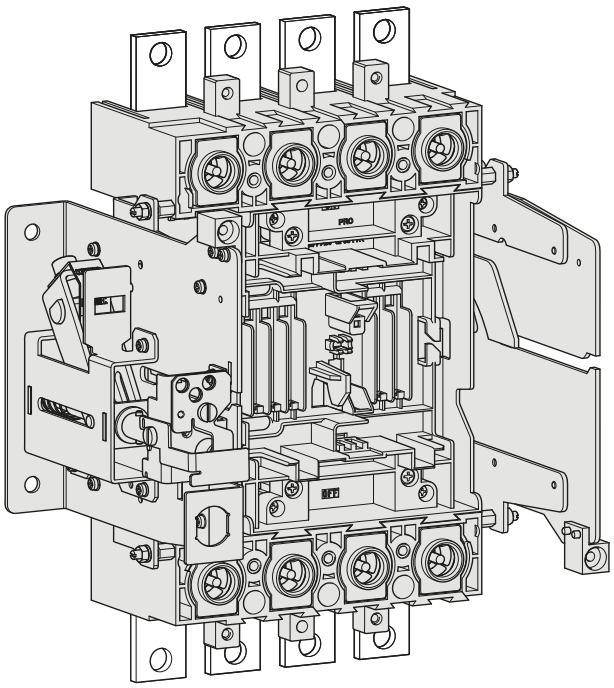
x630 withdrawable

Based on the x630 plug-in system, the withdrawable system allows easy handling of the circuit breaker. It permits its disconnection without having to remove it completely from the installation.
The withdrawable system is compatible with circuit breakers mounted in a vertical position only.

The withdrawable system has 3 positions:
- Connected: the power circuit is connected,
- Disconnected: the power circuit is disconnected; the MCCB is isolated and can be operated in order to test the internal auxiliaries,
- Removed: the MCCB is detached and can be removed from the installation.

The withdrawable kit is composed of the following parts:
- Chassis
- Plug-in breaker adaptor fitted with driving case

Also available as an option:
- Auxiliary connectors
- Safety trip
- Position switch
- Front connection terminals



Withdrawable base x630

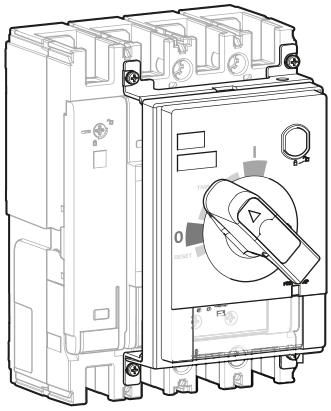
The withdrawable adaptor must be mounted to the back of the MCCB.
Up to 5 auxiliary connectors can be mounted onto the plug-in to automatically connect and disconnect the internal AX, AL, shunt trip or undervoltage auxiliaries fitted into the MCCB.
As an option, a safety trip accessory can be mounted onto the withdrawable system. This option trips the MCCB when it is removed from the base without it having been set to the OFF position

As an option, a position switch can be mounted on the withdrawable adaptor to indicate through an auxiliary circuit the connected or disconnected position of the MCCB. The withdrawable base is not supplied with terminal connections. Separate front or rear bar terminals can be mounted onto the base depending on the connection arrangement needed.

It is delivered with two isolating shields in case it needs to be mounted on a metallic back plate.

Technical changes reserved

Direct rotary handles



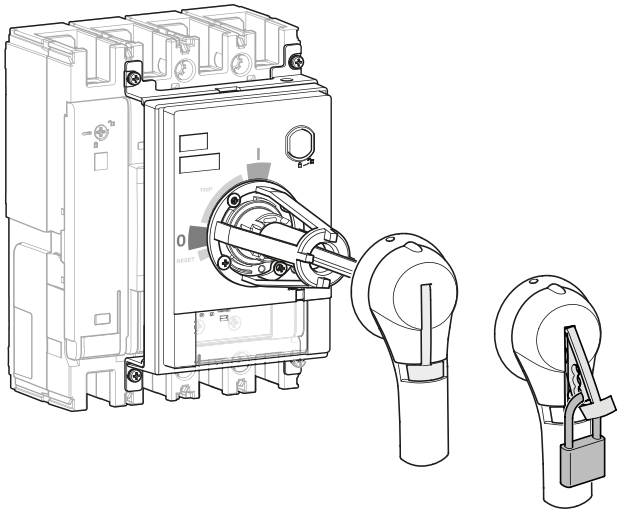
Rotary handle x630

Direct rotary handle features:

- Suitable for insulation,
- Clear indication of the 3 positions: ON, OFF and TRIP,
- Circuit breaker built-in push to the trip button accessible on the direct rotary handle,
- Trip unit dial settings accessible through the direct rotary handle,
- Integrated padlocking facility. Keylock as an option.

The circuit breaker can be locked in ON or OFF positions with one to three padlocks (not supplied). Padlock shackle: Ø 5.5 - 8 mm.
Locking in ON position does not prevent the circuit breaker from tripping when there is a fault. In this case, when the circuit breaker trips the handleis on TRIP position. To reset, it is necessary to unlock the direct rotary handle.
A different direct rotary handle providing the door interlocking function is avaialble to prevent the door opening when the circuit breaker is in the ON position.
A Ronis type keylock is available as an option to mount on the direct rotary handle base. The keylock ensures the circuit breaker locks in both OFF or ON positions or only in OFF position.

On door rotary handles



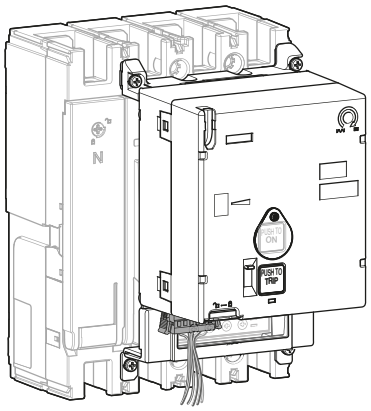
On door rotary handle x630

On door rotary handle features:

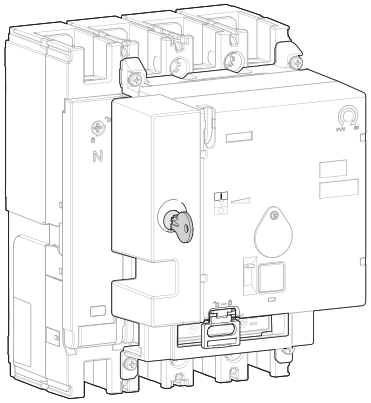
- Suitable for insulation,
- Clear indication of the 3 positions: ON, OFF and TRIP,
- Circuit breaker built-in push to the trip button accessible on the base fitted directly onto the circuit breaker,
- Trip unit dial settings accessible through the base,
- Integrated padlocking facility. Keylock as an option to mount on the base.

The circuit breaker can be locked in OFF position with one to three padlocks (not supplied). Padlock shackle: Ø 5.5 - 8 mm.
It is necessary to unlock the extended rotary handle in order to reset the circuit breaker after tripping.
A Ronis type keylock is available as an option to mount on the panel door. The keylock ensures the circuit breaker locks in OFF position.

Motor operator



Motor operator x630



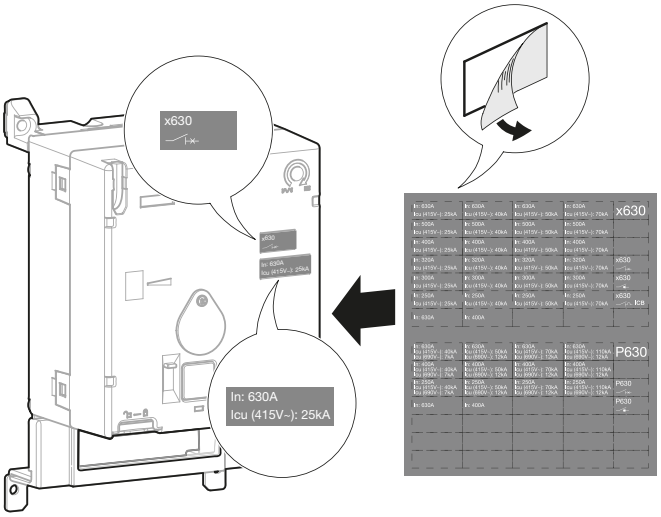
Motor operator with keylock

Applications:
- Local motor-driven operation, centralised operation, automatic distribution control,
- Normal/standby source changeover or switching to a replacement source to ensure availability or optimise energy costs,
- Load shedding and reconnection,
- Synchro-coupling.

An electrical motor operator can be fitted onto the x630 circuit breaker for remote ON and OFF switching.

Motor operator features:
- Fast operation to ON (<100 ms),
- Contact position indication,
- Suitable for insulation,
- Locking in OFF position with padlock as standard,
- Locking in OFF position with optional key lock,
- With or without automatic reset function,
- Voltage presence indication,
- Electrical interlocking (optional).

A label showing the circuit breaker characteristics can be posted in front of the motor operator (supplied as standard).

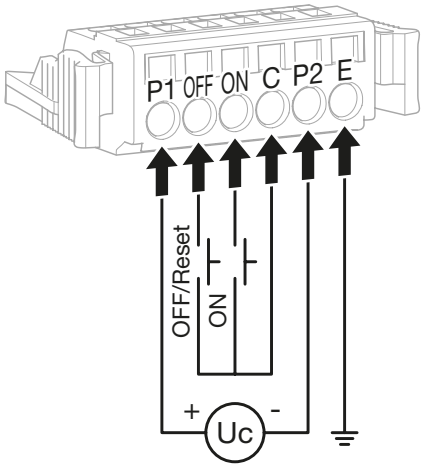


Stickers for motor operators

Technical changes reserved

Motor operator with auto-reset mode
An auto-reset motor operator version allows automatic resetting of the circuit breaker after tripping.

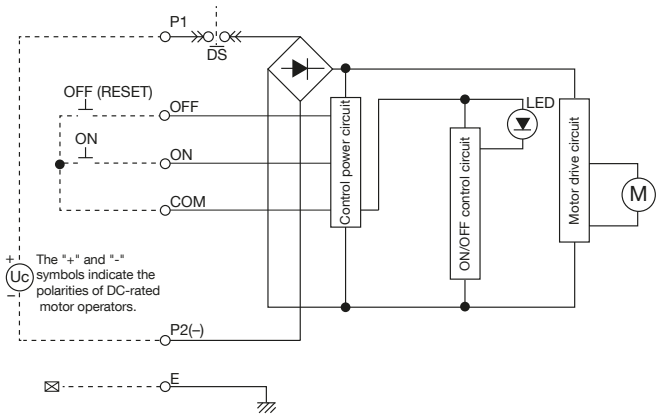
Remote command
The remote command circuit is based on an ON and OFF signal with a screwless terminal that is compatible with cables up to 2 mm².



Terminal Motor operator

ON and OFF command is available with the following power supply:
- 24-48 V DC
- 100-120 V DC
- 100-240 V AC

Plug-in and withdrawable mounting accessories are compatible with the x630 circuit breaker fitted with an electrical motor operator.
Accessories available as an option:
- Keylock for locking in the OFF position,
- Electrical interlocking.

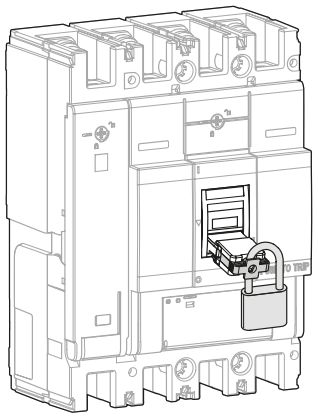


Rated operating voltage		Un	24-48 V DC	100-110 V DC	110-240 V AC
Frequency		Hz	-	-	50 / 60
Operating current / Starting current Peak value	ON	A	-	-	-
	OFF, RESET	A	6.7	1.2	1.0
Operating method			Direct drive		
Operating time	ON	s	0.1		
	OFF	s	1.4		
	RESET	s	1.5		
Operating frequency		Cycle / min.	4		
Power supply required		VA	300 min.		

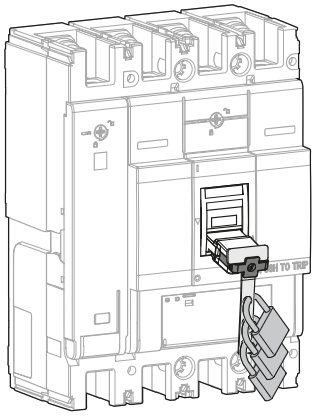
Locking system

Padlocking systems can be fitted with up to three padlocks with diameters of 5-8 mm.
Locking in the OFF position ensures isolation and compliance to the IEC 60947-2 standard.

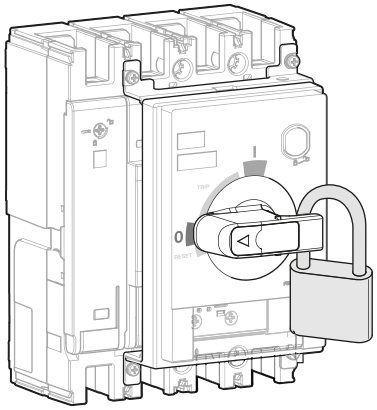
Device	Function	Means	Specific accessory
Standalone MCCB	Lock in OFF or ON position	Padlock	-
		Cable tie	-
		Up to 3 padlocks	Palocking kit
Direct rotary handle	Lock in OFF or ON position	Up to 3 padlocks	-
	Lock in OFF or ON position	Keylock	Locking device + keylock
Extended rotary handle	Lock in OFF position	Up to 3 padlocks	-
	Lock in OFF or ON positon	Keylock	Locking device + keylock
Motor operator	Lock in OFF position	Up to 3 padlocks	-
		Keylock	Locking device + keylock
Drawout	Lock in DISCONNECT or CONNECT position	Up to 3 padlocks	-
		Keylock	Locking device + keylock
	Lock only in DISCONNECT position	Keylock	Locking device + keylock



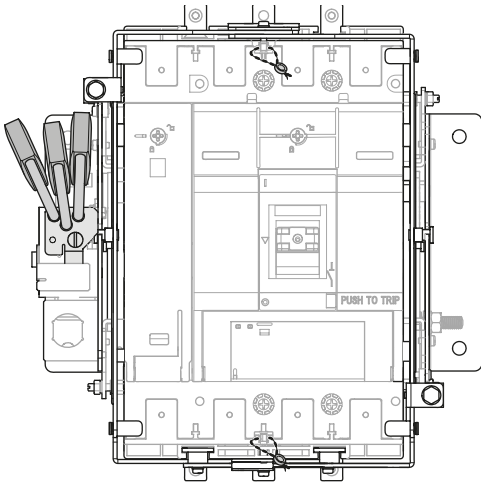
Direct Padlock up to 4 mm diameter



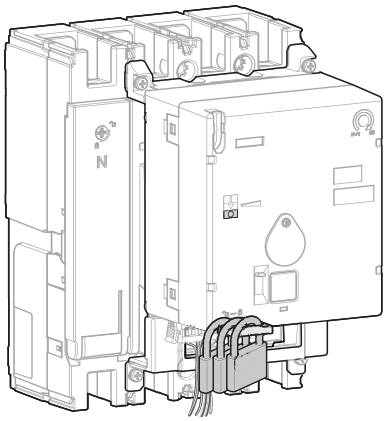
Padlocking kit



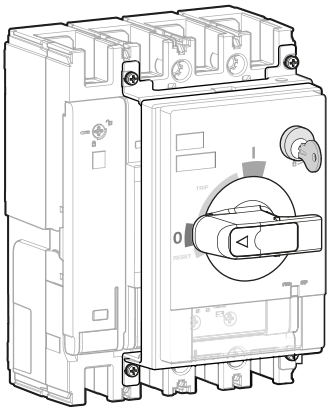
Padlock direct rotary handle



Padlock withdrawable x630

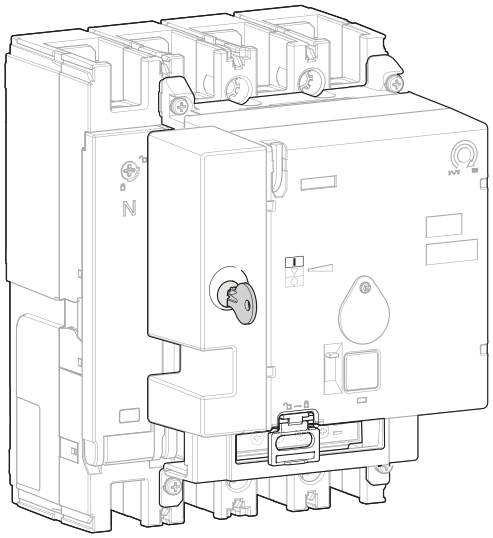


Padlock motor operator

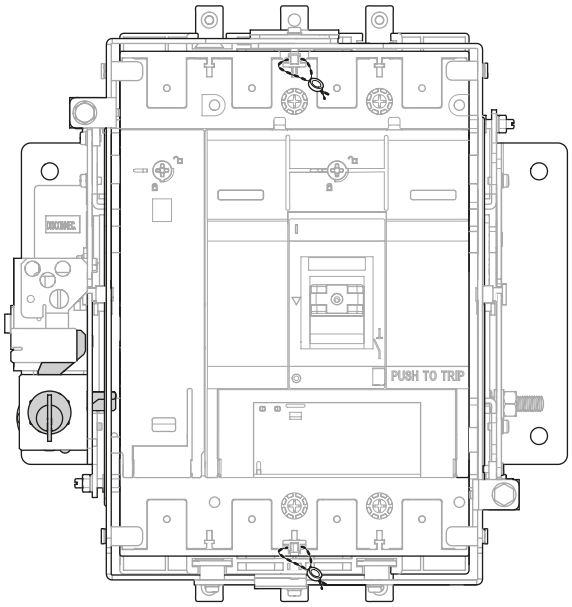


Key lock direct rotary handle

Technical changes reserved



Key lock motor operator x630

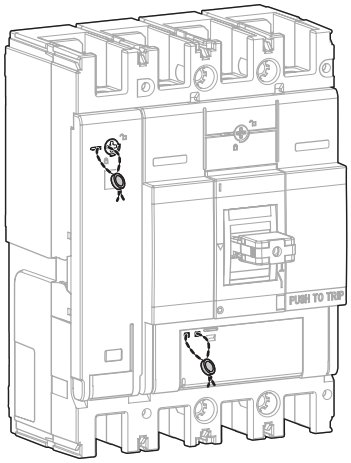


Key lock withdrawable x630

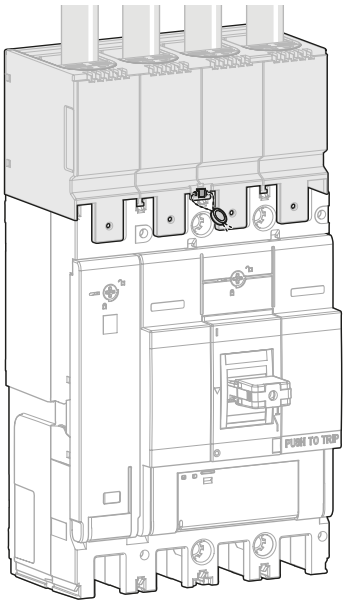
Sealing

A sealing accessory is available on request. Each sealing kit contains all parts necessary to seal the circuit breakers as indicated below.

Circuit breaker

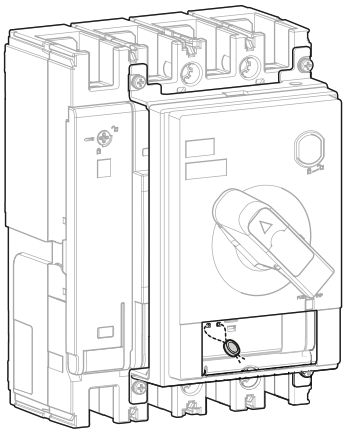


Seals on front covers



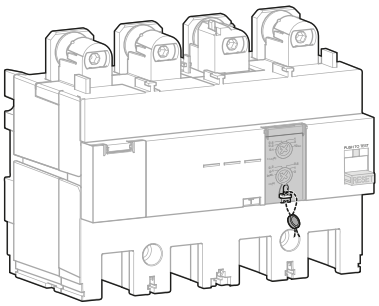
Seal on terminal cover x630

Direct rotary handle



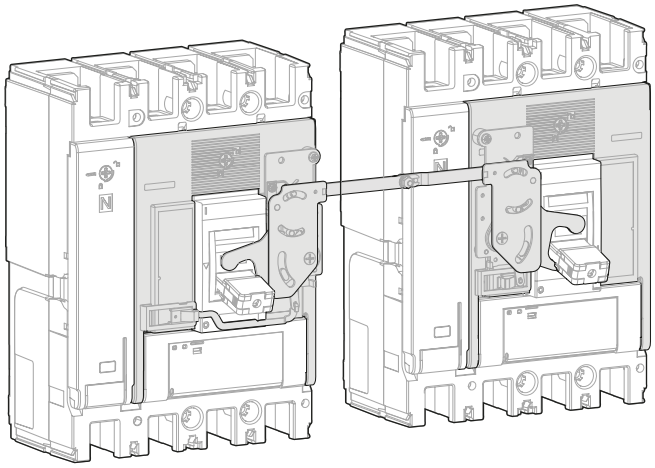
Seal on front cover rotary handle x630

RCD add-on block



Seal on motor operator

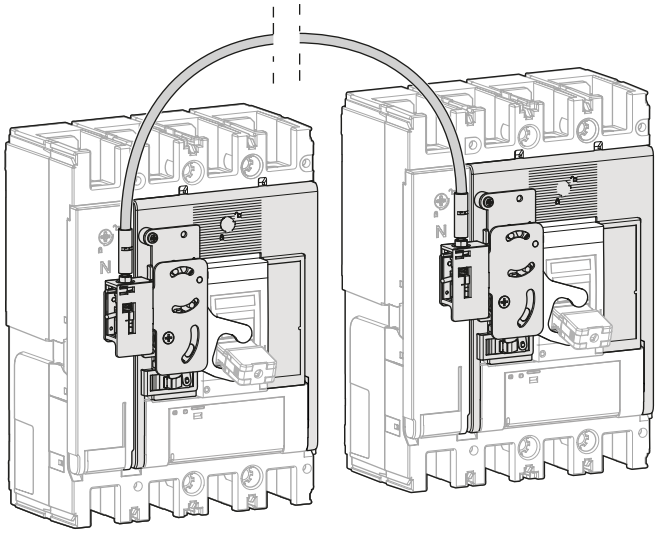
Link interlock



This solution is a connecting rod to make a link between two h3 x630 circuit breakers mounted side by side.
This accessory interlocks mechanically two circuit breakers in order to prevent from the following operations:
- Switch ON a circuit breaker when the other one is already in ON position
- Switch ON a circuit breaker when the other one is in TRIP position.

The link interlock accessory is a set of two link interlock front covers that shall be mounted on the front side of the interlocked circuit breakers

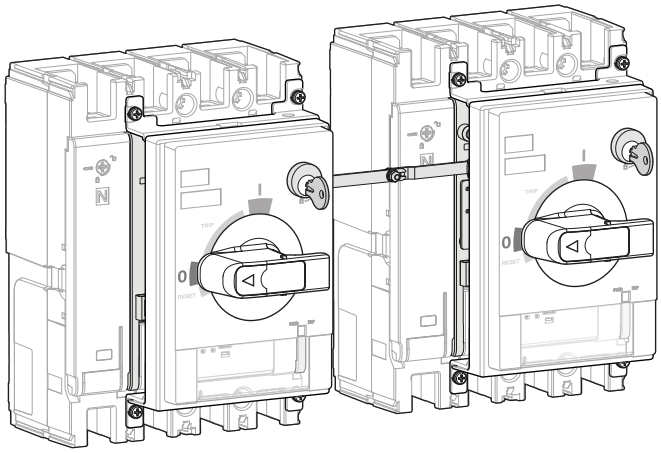
Cable interlock



This solution allows two h3 x630 circuit breakers to be interlocked.
Both circuit breakers don't necessary need to be of the same frame size nor mounted side by side thanks to the interlocking cable.
This accessory interlocks mechanically two circuit breakers in order to prevent from the following operations:
- Switch ON a circuit breaker when the other one is already in ON position
- Switch ON a circuit breaker when the other one is in TRIP position.

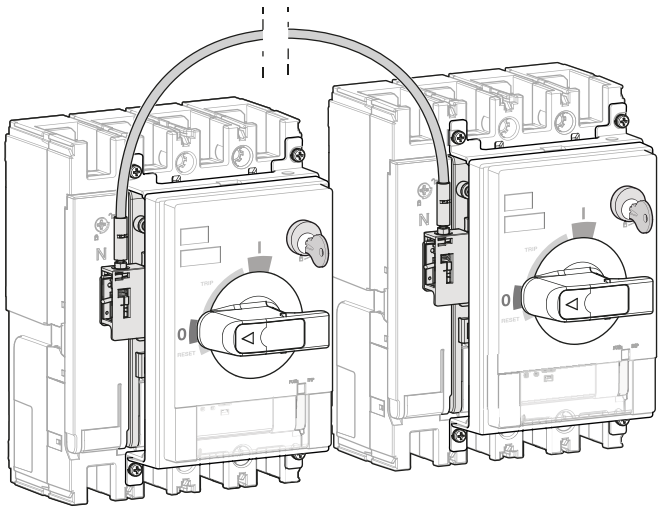
Three accessory references are needed to realise the cable interlock solution
- The mechanical interlocking front cover for each MCCB. It is mounted on the breaker.
- The cable available in 1 m or 1.5 m.

Interlocking combined with rotary handles

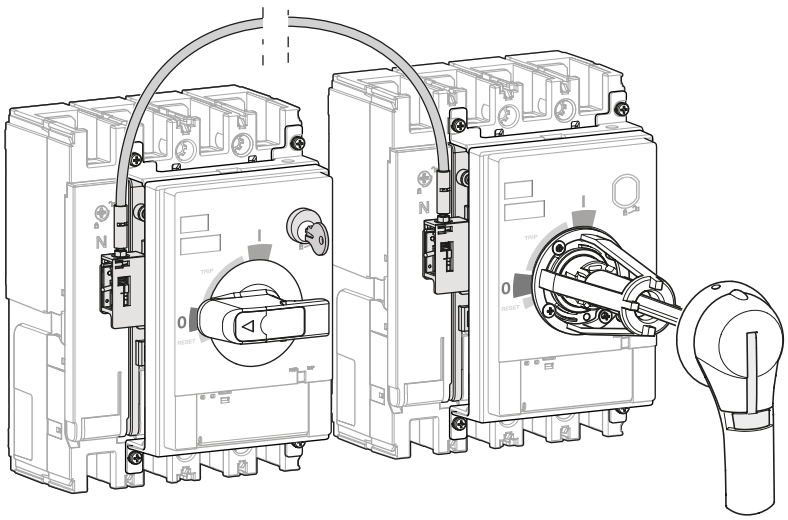


This solution is a connecting rod to make a link between two h3 x630 circuit breakers mounted side by side.
This accessory interlocks mechanically two circuit breakers in order to prevent from the following operations:
- Switch ON a circuit breaker when the other one is already in ON position
- Switch ON a circuit breaker when the other one is in TRIP position.

The link interlock accessory is a set of two Link Interlock Front Covers that shall be mounted on the front side of the interlocked circuit breakers
Operating the MCCBs is done using the rotary handle mechanism.

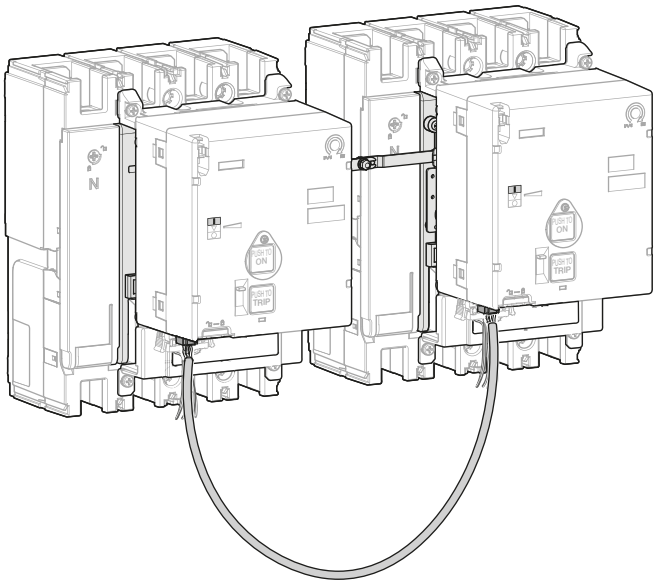


Interlocking solutions are compatible with direct and on-door rotary handles.



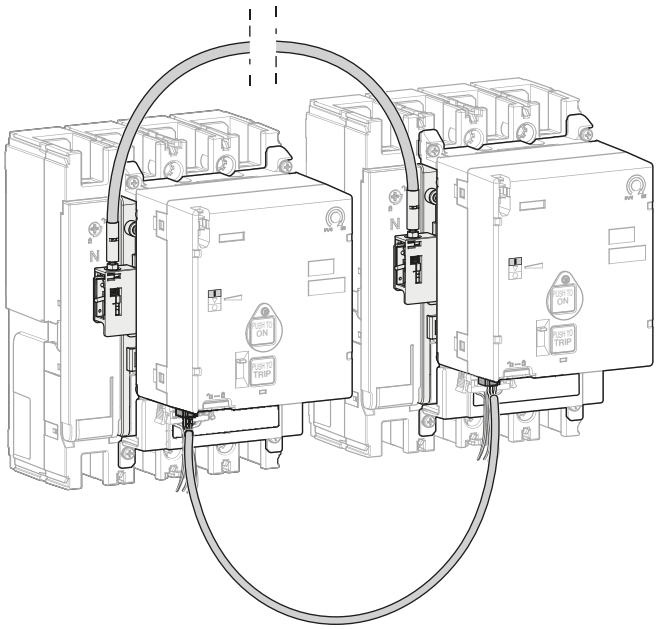
Technical changes reserved

Link interlocking combined with motor operators



Interlocking solutions are compatible with motor operators on x630 circuit breakers.
In this case, in addition to the mechanical interlocking, it is mandatory to use the electrical interlock accessory in order to secure the complete interlocking system.

Cable interlocking combined with motor operators



This solution allows the interlocking of two h3 MCCBs using a cable.
The MCCBs can be of different frame sizes and not necessarily located next to each other. Two cable lengths are proposed to increase the flexbility of the installation.

In this case, in addition to the mechanical interlocking, it is mandatory to use the electrical interlock accessory in order to secure the complete interlocking system.

Installation and operating recommendations

	Page
01 Installation and operating conditions	50
02 Safety clearances and minimum distances	54
03 Power loss	56

Altitude derating
Up to an altitude of 2000 m above sea level, there is no derating to apply on electrical properties of the h3 x630. Above 2000 m a reduction of the air density decreases the heat dissipation of the circuit breaker and downgrades the dielectric strength. A derating on electrical characteristics must be applied as indicated below to compensate this phenomenon.

The following table gives the corrections to apply for altitudes above 2000 m. The breaking capacities Icu and Ics remain unchanged.

Altitude (m)	2000	3000	4000	5000
Dielectric withstand voltage (V)	2500	2160	1900	1670
Ui Insulation voltage (V)	800	690	610	535
Maximum operating voltage (V)	415	415	415	415
Ith Maximum thermal current (A)	1	0.96	0.93	0.9

Vibrations
h3 x630 circuit breaker withstand mechanical vibrations.
h3 complies to IEC 60068-2-6:
- 2.0 to 13.2 Hz and amplitude ±1 mm
- 13.2 to 100 Hz acceleration ±0.7 G.
- Resonance frequency (±1 mm/±0.7 G) during 90 min

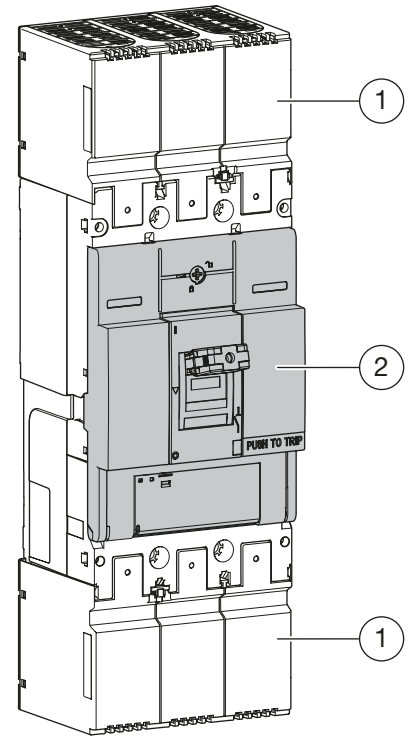
Excessive vibration may cause false tripping and/or damage to connections and/or mechanical parts.

Electromagnetic disturbances
h3 x630 circuit breakers are protected against:
- overvoltage caused by circuit switching,
- overvoltage caused by atmospheric disturbances or a distribution-system outage (e.g. failure of a lighting system),
- devices emitting radio waves (radios, walkie-talkies, radar, etc.),
- electrostatic discharges produced directly by users.

x630 circuit breakers have successfully passed the electromagnetic-compatibility tests (EMC) with immunity levels listed in the General Characteristics chapter.

Degree protection marking
h3 x630 circuit breakers comply with the following degree protection markings as defined by IEC 60529 and IEC 60947-1 standards, Appendix C.
Connection parts without terminal covers may be IP20 or less depending on the isolation protection applied on the cables

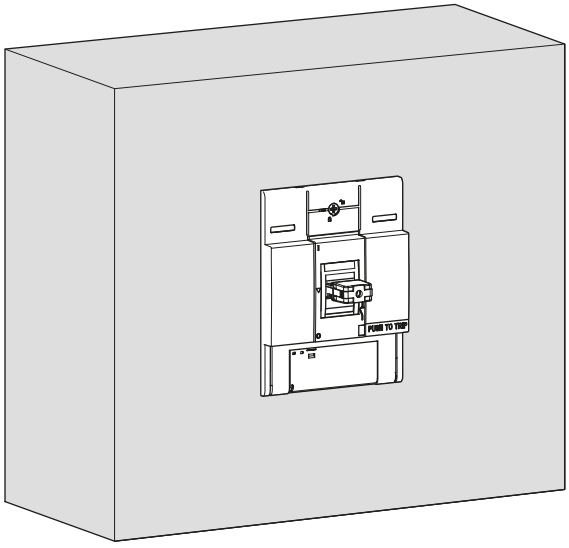
Degree of protection IP40 is achieved when an h3 x630 circuit breaker is installed in a switchboard with a front panel cutout covering a minimum the protection settings window. Higher protection degree of IP55 can be achieved by installing a door mounted external rotary handle.



IP of the different areas

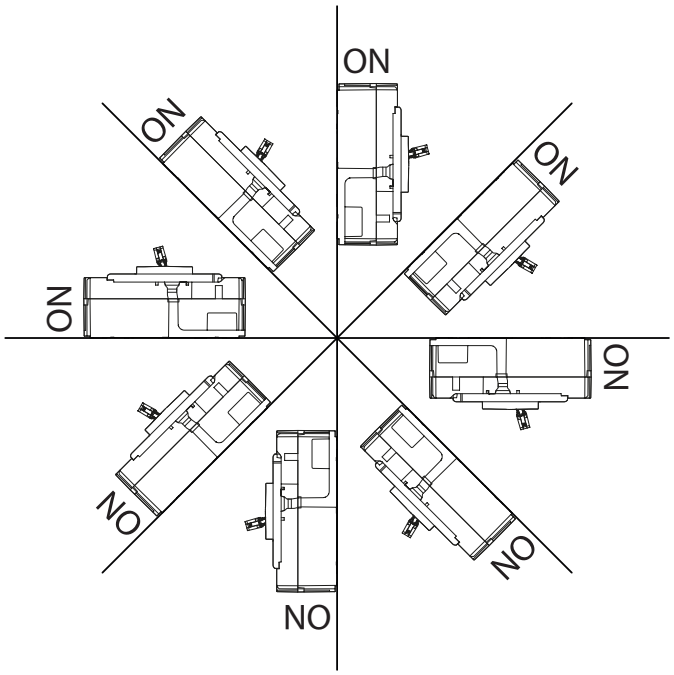
(1) IP20: side, back, terminal cover

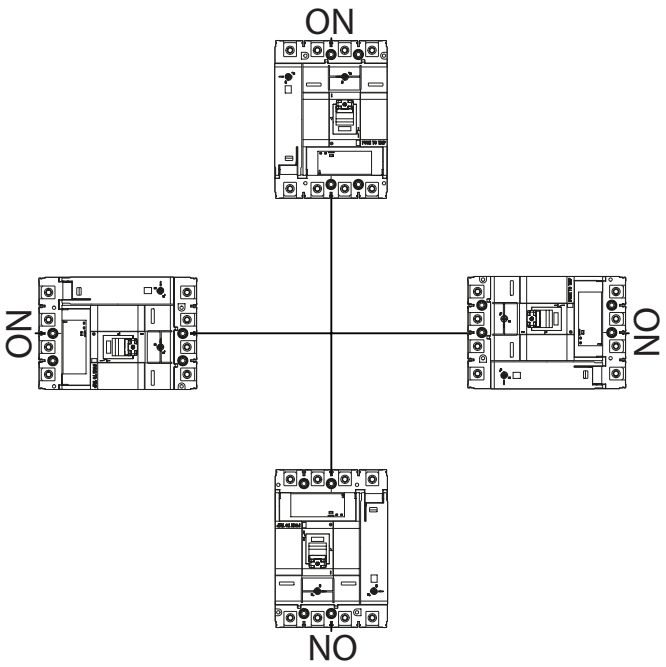
(2) IP40: front cover



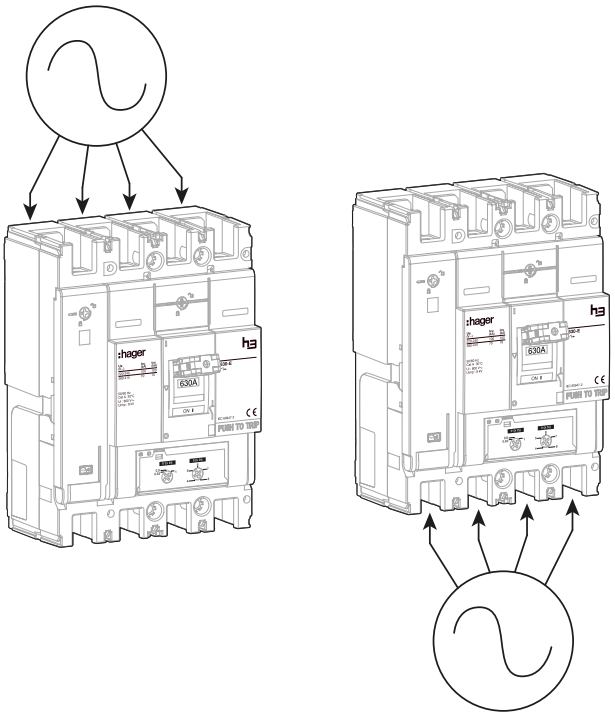
Front panel IP40

Mounting position
h3 x630 circuit breakers can be mounted at any angle without affecting the performance and the characteristics.





Direction of power supply
h3 x630 circuit breakers can be supplied from either the top or the bottom, without any decrease in performance.
All connections and insulation accessories can be used on circuit breakers supplied either from the top or from the bottom.



Derating due to temperature on "TM" circuit breaker
h3 x630 circuit breakers are calibrated at 50 °C ambient temperature for the overload protection up to 500 A and 30 °C for 630A. This means that when the ambient temperature is less or greater than calibrated temperature, the Ir protection pick-up threshold is slightly modified.

h3 x630 circuit breakers have to be derated as indicated in the table below:

Ambient temperature influences on Ir settings of the x630 "TM adjustable" circuit breaker

		Temperature °C												
In (A)	**Ir ... x In**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**
250	**0.63**	221.6	214.9	207.9	200.7	193.3	185.5	177.4	168.9	160	150.5	140.4	129.5	117.7
	0.8	252.0	246.1	240.1	233.9	227.5	220.9	214.2	207.2	200	192.5	184.7	176.6	168.1
	1	293.3	288.2	283.1	277.8	272.5	267.1	261.5	255.8	250	244.1	238.0	231.7	225.3
320	**0.63**	287.3	277.9	268.1	258.0	247.5	236.5	225.0	212.9	200	186.2	171.4	155.1	136.9
	0.8	324.1	315.8	307.2	298.5	289.4	280.1	270.4	260.4	250	239.1	227.7	215.8	203.1
	1	380.7	373.6	366.5	359.1	351.7	344.0	336.2	328.2	320	311.6	302.9	294.0	284.8
400	**0.63**	352.3	341.2	329.7	317.8	305.5	292.6	279.1	265.0	250	234.1	217.0	198.5	178.0
	0.8	405.0	395.4	385.5	375.4	365.0	354.3	343.2	331.8	320	307.7	295.0	281.6	267.6
	1	470.7	462.5	454.1	445.5	436.8	427.9	418.8	409.5	400	390.3	380.3	370.0	359.4
630	**0.63**	485.2	465.4	444.6	422.9	400	375.7	349.7	321.6	290.8	256.4	216.5	167.4	95.8
	0.8	570.5	553.7	536.4	518.5	500	480.8	460.8	439.8	417.8	394.6	370.0	343.5	314.9
	1	687.3	673.4	659.2	644.8	630	614.9	599.3	583.4	567.0	550.1	532.7	514.7	496.1

Ambient temperature influences on Ir settings of the x630 "TM fix" circuit breaker

	Temperature °C												
In (A)	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**
250	293.3	288.2	283.1	277.8	272.5	267.1	261.5	255.8	250	244.1	238.0	231.7	225.3
300	364.0	356.7	349.1	341.4	333.6	325.5	317.2	308.7	300	291.0	281.7	272.1	262.2
320	380.7	373.6	366.5	359.1	351.7	344.0	336.2	328.2	320	311.6	302.9	294.0	284.8
400	470.7	462.5	454.1	445.5	436.8	427.9	418.8	409.5	400	390.3	380.3	370.0	359.4
500	629.7	615.0	599.9	584.5	568.6	552.2	535.4	518.0	500	481.3	461.9	441.6	420.4
630	687.3	673.4	659.2	644.8	630	614.9	599.3	583.4	567.0	550.1	532.7	514.7	496.1

Ambient temperature influences on nominal ratings (In) of the LSnI circuit breaker

The temperature of the LSnI Circuit Breaker depends on the current flow and the ambient temperature.

Above 50 °C ambient temperature a derating on the nominal rating must be applied to not exceed the maximum thermal withstand of the circuit breaker.

However the ambient temperature does not affect the protection setting of LSnI circuit breakers.

	Temperature °C			
In (A)	**50**	**60**	**65**	**70**
250	250	250	250	250
400	400	400	400	400
630	630	622	570	510

Derating of Plug in and AOB

For circuit breakers equipped with RCD Add-on block, plug In or drawout systems, an additional derating coefficient has to be applied.

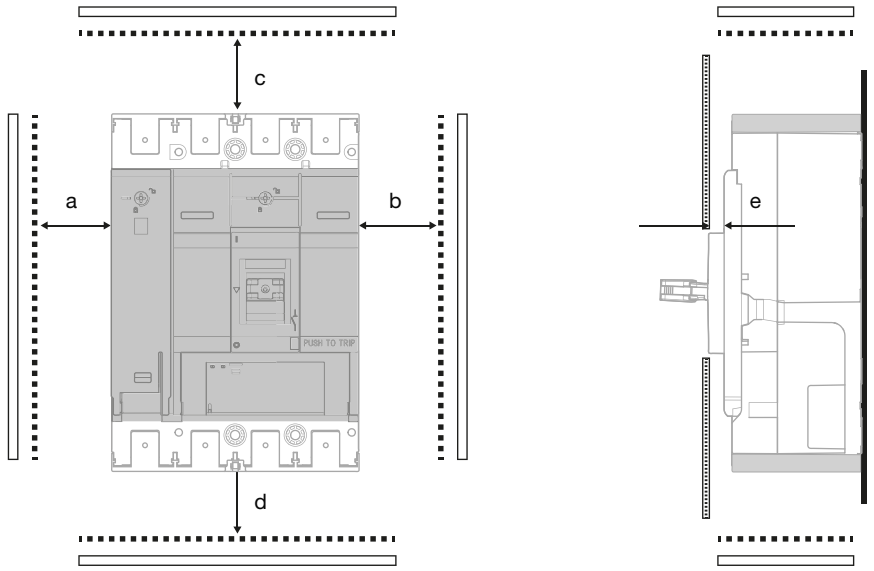
In (A)	**Coefficient**
< 630	1
630	0.97

Insulation distances
The insulation distances between the MCCB and its surroundings (earthed metal parts – insulators, etc.) must be maintained to prevent arcing faults which may occur due to conductive ionised gas.
In some cases where other specifications require different insulation distances to those shown here, the greater distance must be maintained. In case two different models are installed above each other, the insulation distance between the two models should be according to the model specifications of the breaker on the downside.

h3 breakers can be mounted side by side without minimum insulation distance.

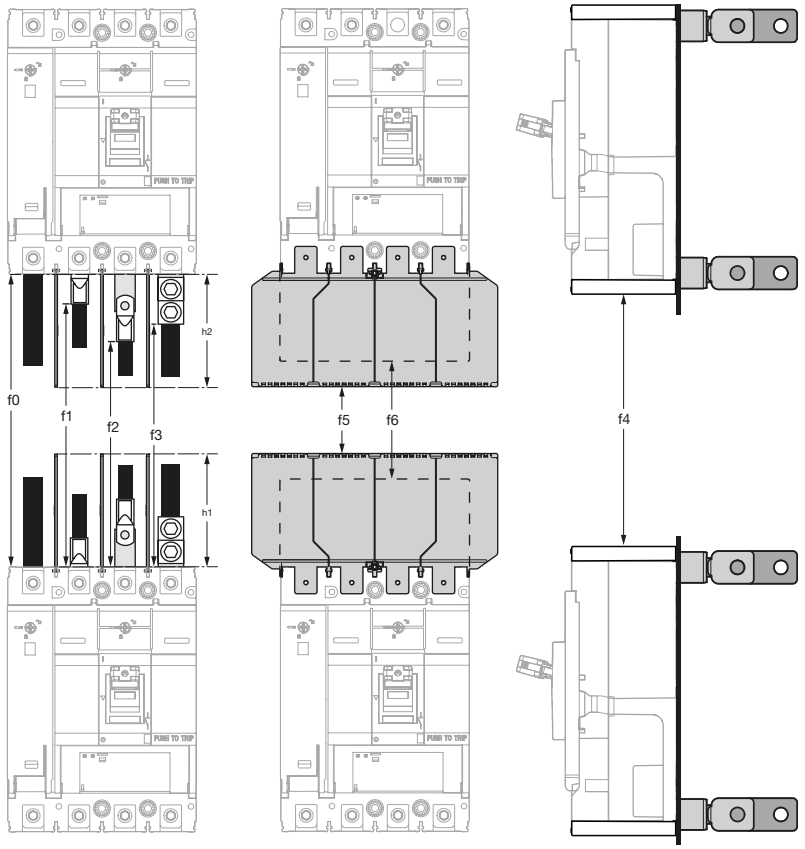
NOTE
Exposed conductors must be insulated up to the circuit breaker terminals. We recommend using interphase barriers or connection covers.
If the optional connector covers are used, isolate the exposed conductor until it overlaps the connector cover.

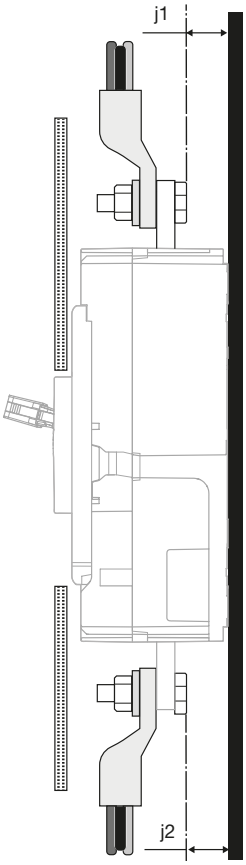
Minimum distance between h3 breaker and top, bottom or side panel



x630 ≤ 415 V without connection accessories	Earthed metallic plate	Isolated plate				
		No accessory	Interpole barrier	Terminal cover straight	Terminal cover spreader	Terminal cover zero
a (mm)	≥ 80	0	0	0	30	0
b (mm)	≥ 80	0	0	0	30	0
c (mm)	≥ 80	≥ 50	≥ 110	≥ 90	≥ 120	≥ 110
d (mm)	≥ 80	≥ 50	≥ 110	≥ 90	≥ 120	≥ 110
e (mm)	0	0	0	0	0	0

Minimum distance h3 breaker connections



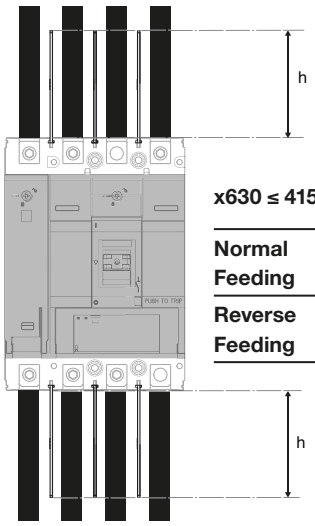


Dimension (mm)	Type of connection	Type of protection	x630
f0	Isolated bar	Interpole barrier	≥ 350
f1	Ring Lug	Interpole barrier	≥ 350
f2	Extender	Interpole barrier	≥ 350
f3	External alu collar	Interpole barrier	≥ 350
f4	Rear connection	Terminal cover zero	≥ 220
f5	Spreader	Terminal cover spreader	≥ 50
f6	Ring Lug	Terminal cover straight	≥ 110
f6	Extender	Terminal cover straight	≥ 110
f6	External alu collar	Terminal cover straight	≥ 110
h1	Ring Lug + Interpole barrier	Normal Feeding	0
		Reverse Feeding	0
h2 (mm)	Ring Lug + Interpole barrier	Normal Feeding	0
		Reverse Feeding	0

x630 ≤ 415 V	j1 (mm) upstream	j2 (mm) downstream
Normal Feeding	≥ 25	≥ 25
Reverse Feeding	≥ 25	≥ 25

In case j1 or j2 < 25, an insulation earth plate is mandatory

Case interphase barrier



x630 ≤ 415 V	h (mm) upstream	h (mm) downstream
Normal Feeding	110	0
Reverse Feeding	110	110

Power loss

Thermal power loss values of h3 x630 circuit breakers are used to calculate total temperature rise in the switchboard in which they are installed.

The values indicated in the tables below are typical values for a device operating at a full rated load with a frequency of 50/60 Hz.

The value of the impedance per pole is provided as a general indication for a new device. It is determined on the basis of the measured voltage drop.

The value indicated is the power loss per pole at In, 50/60 Hz. Measurement and calculation of power loss are carried out in compliance with the recommendations of Annex G of standard IEC 60947-2.

Total power loss at full rated load and 50/60 Hz is equal to power losses per pole multiplied by 3.

Power loss TM & MAG (ICB) circuit breakers

	Rating In (A)	Z per pole (mΩ)	P / pole (W)	P / product 3P or 4P (W)
x630	250	0.38	23.8	71.4
	300	0.24	22.0	66.0
	320	0.24	25.0	75.0
	400	0.16	26.0	80.0
	500	0.15	38.0	114.0
	630	0.13	52.5	145.2

Power loss LSnI circuit breakers

	Rating In (A)	Z per pole (mΩ)	P / pole (W)	P / product 3P or 4P (W)
x630	250	0.20	12.3	36.8
	400	0.19	19.3	57.8
	630	0.16	39.6	119.0

Power loss switches disconnectors

	Rating In (A)	Z per pole (mΩ)	P / pole (W)	P / product 3P or 4P (W)
x630	400	0.24	38.7	116.0
	630	0.15	58.7	176.0

Technical changes reserved

Additional power loss

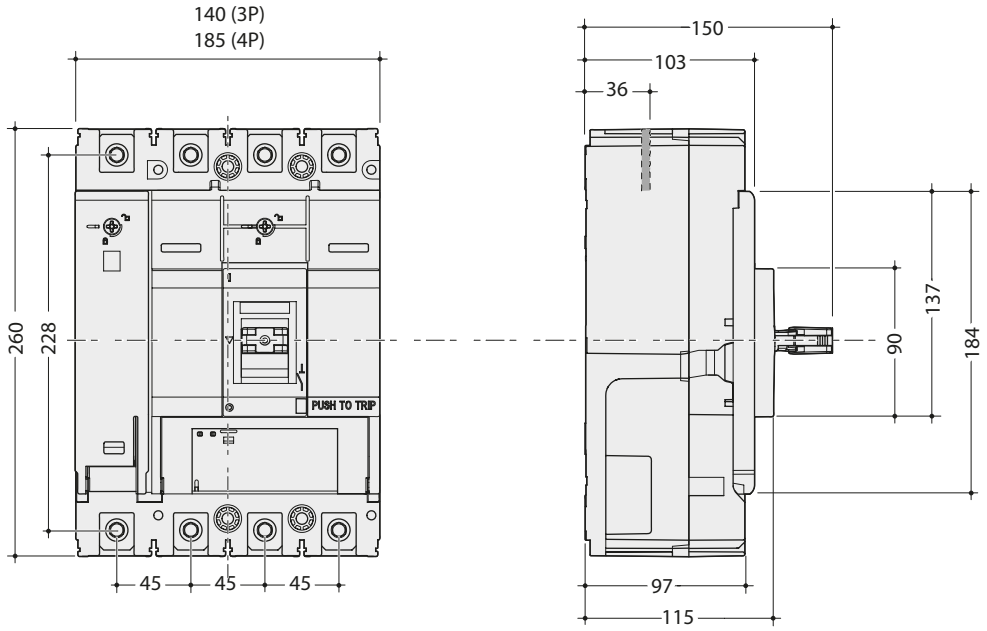
Power loss caused by the mounting accessories has to be taken into account. Thus, the total power loss is equal to the sum of the power loss of the circuit breaker and all the corresponding mounting accessories

		P/breaker	**Addtional P/ accessory kit (W)**						
	Rating In (A)	3P or 4P (W)	RCD add-on block	External cable terminal		Rear connection	Straight bar	Spreader	Plug-in/ Withdr.
				1 wire	2 wires				
x630 TM	250	71.4	13.6	82.5	50.6	7.0	4.8	5.4	11.4
	300	66.0	13.6	118.8	72.9	10.1	6.9	7.8	16.5
	320	75.0	17.4	135.2	82.9	11.5	9.1	9.0	18.6
	400	80.0	21.7	211.2	129.6	17.9	12.6	13.8	29.1
	500	114.0	34.3	-	202.5	28.0	10.5	12.0	36.9
	630	145.2	34.3	-	321.5	44.0	16.7	19.0	58.5
x630 LSnI	250	36.8	13.6	82.5	50.6	7.0	4.8	5.4	11.4
	400	57.8	21.7	211.2	129.6	17.9	12.6	13.8	29.1
	630	119.0	34.3	-	321.5	44.0	16.7	19.0	58.5

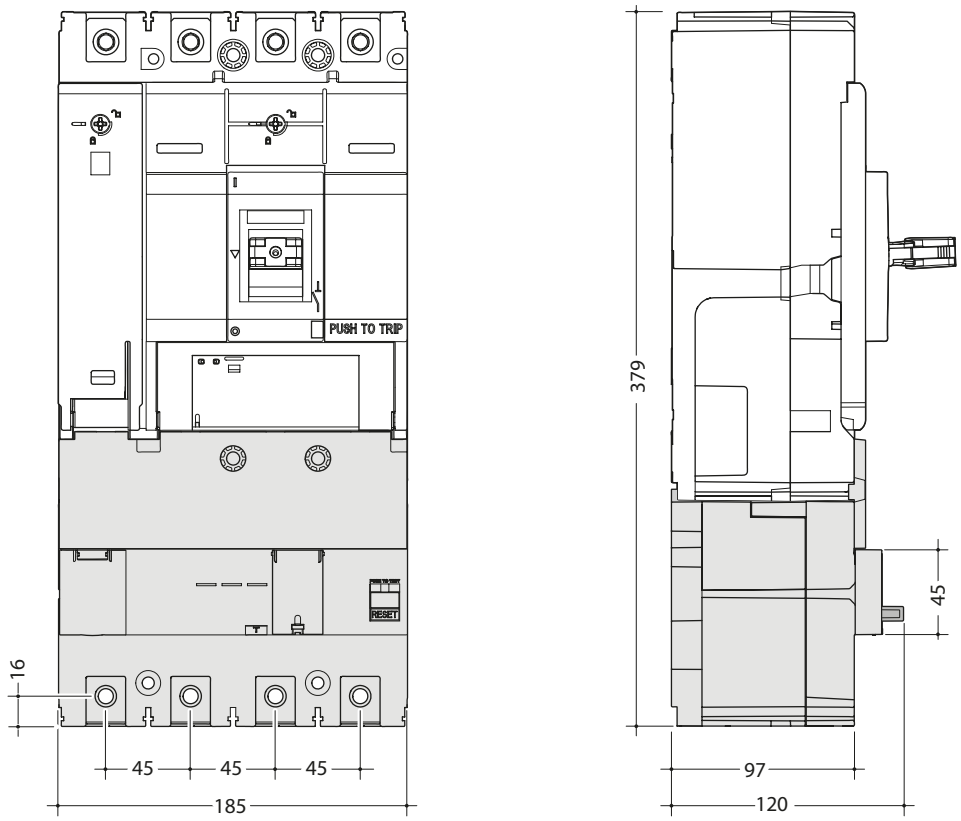
Dimensions and connections

		Page
01	Circuit breakers and RCD add-on block	60
02	Front panel cutouts	64
03	Circuit breakers plug-in	65
04	Circuit breakers withdrawables	67
05	Handles and motor operators	68
06	Power connections	72

Dimension x630

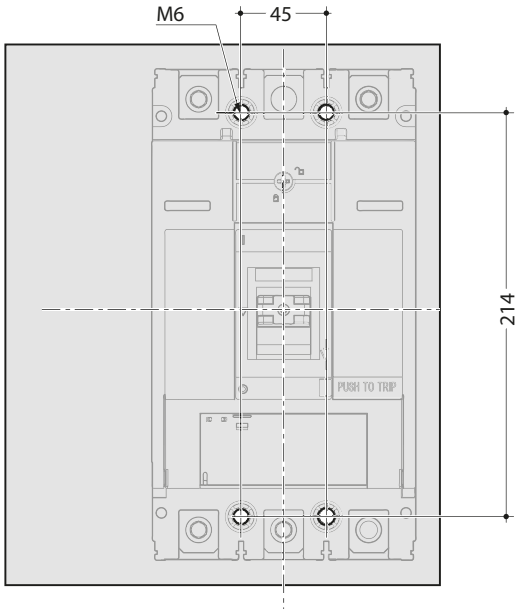


Dimension RCD Add-on block

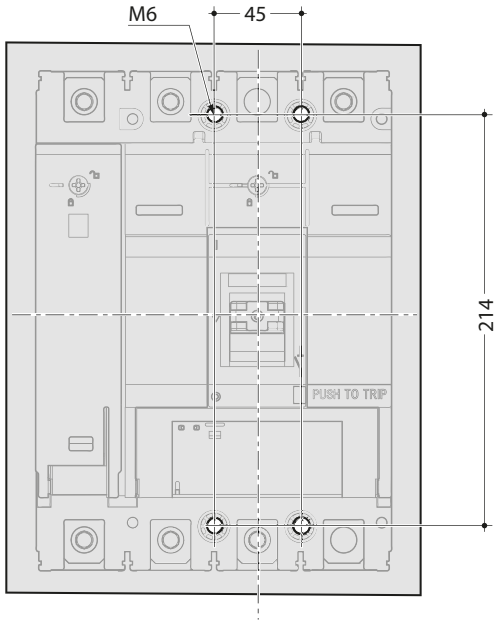


x630 back plate drilling pattern

3P

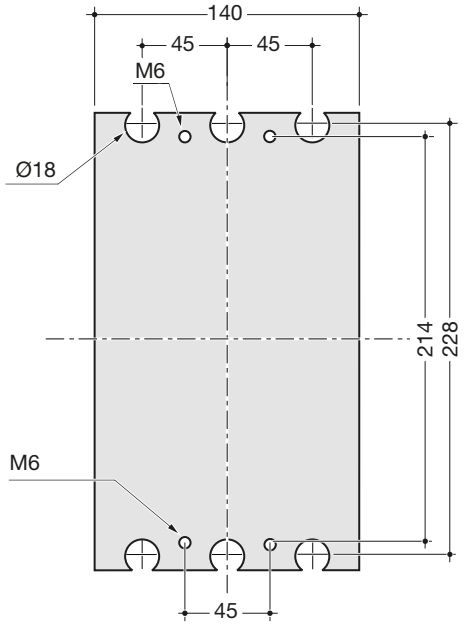


4P

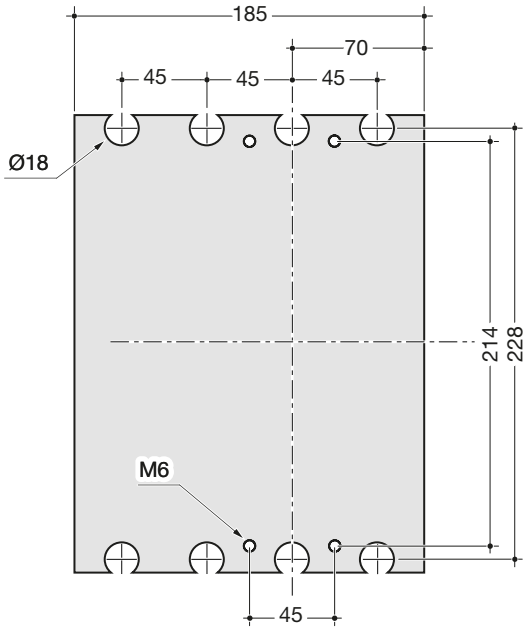


x630 rear connection back plate drilling pattern

3P

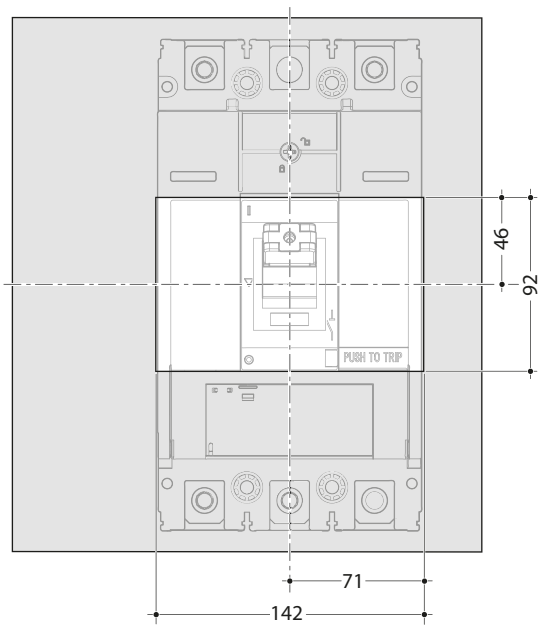


4P

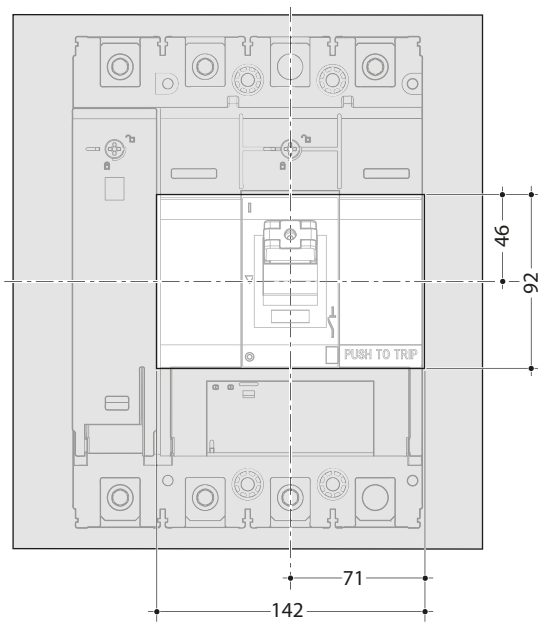


Panel cut-out breaker x630

3P

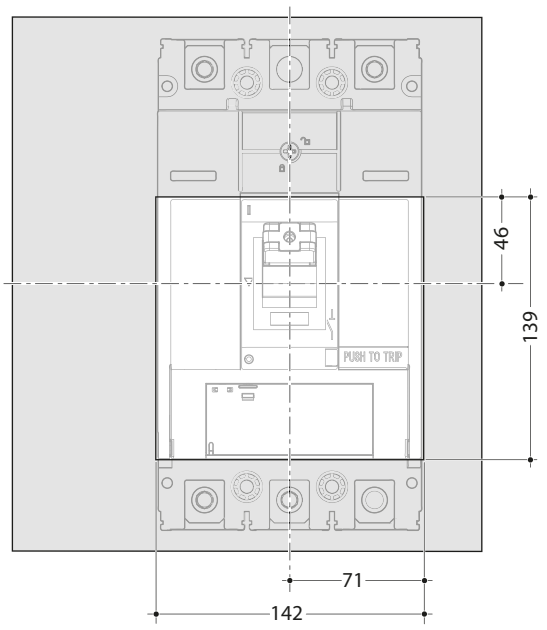


4P

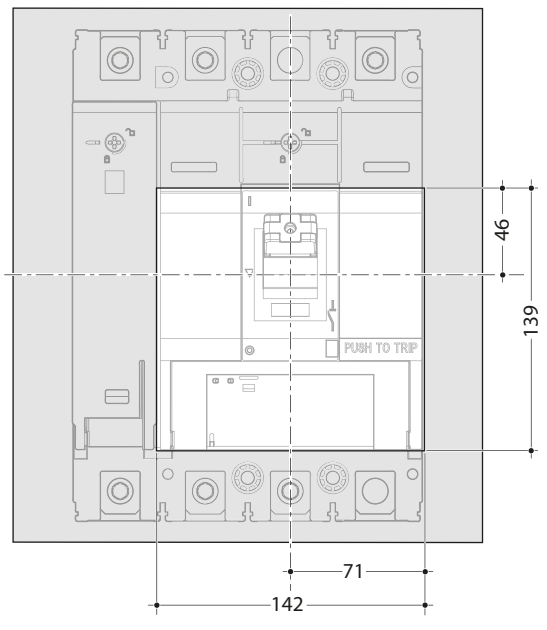


x630

3P

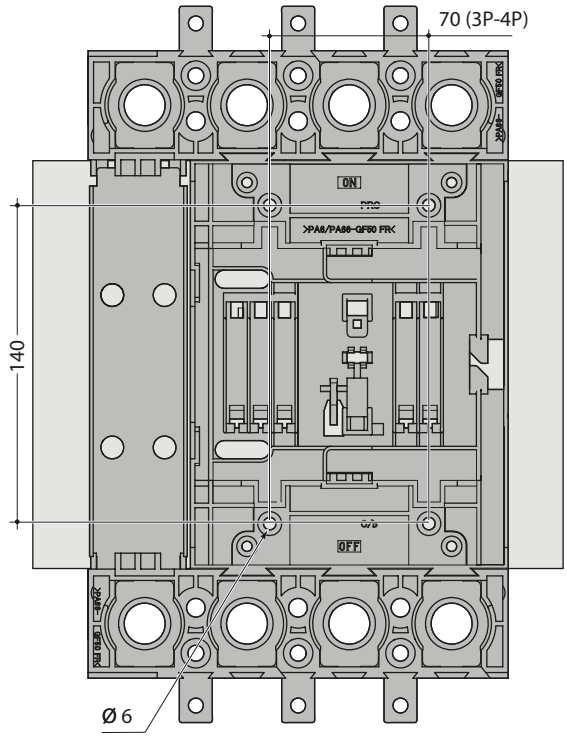


4P



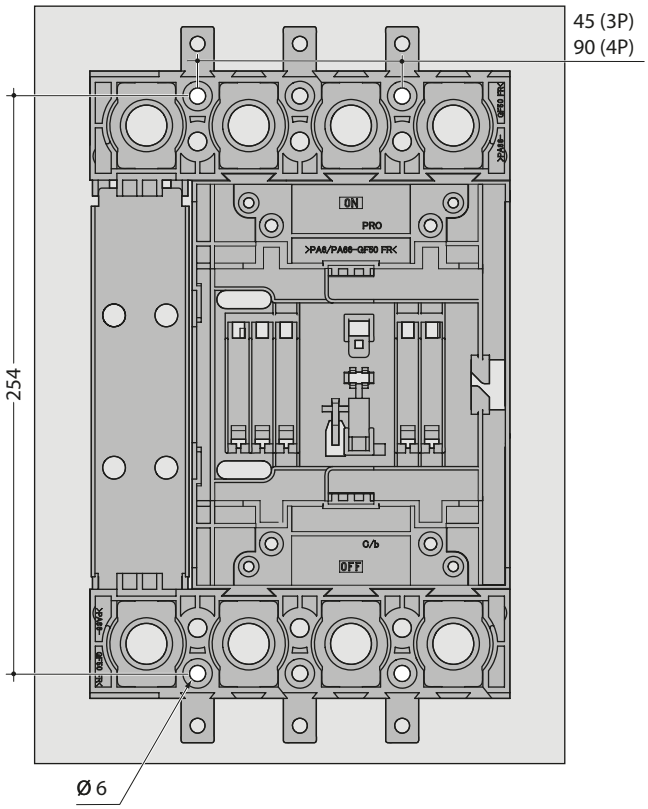
x630 plug-in kit drilling pattern for U plate

3P + 4P



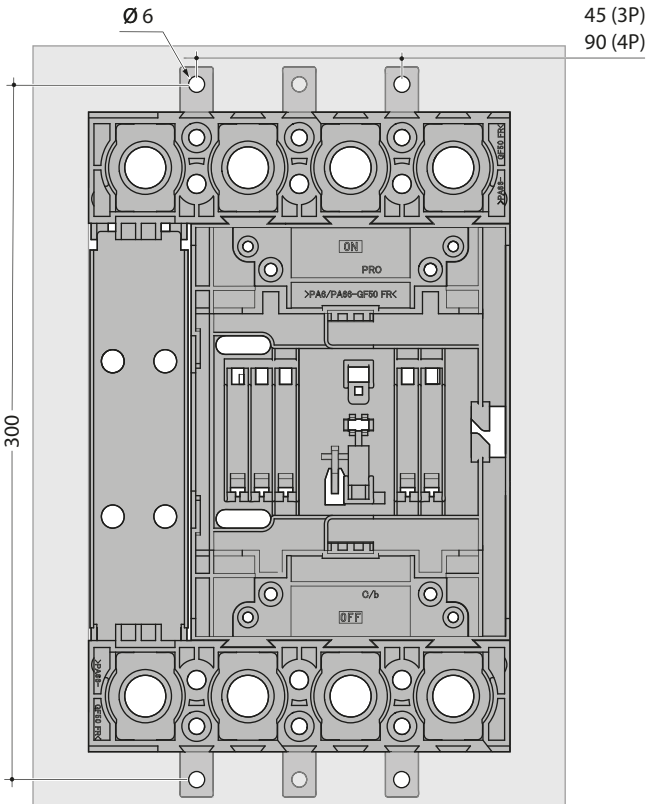
x630 plug-in kit drilling pattern for solid back plate

3P + 4P



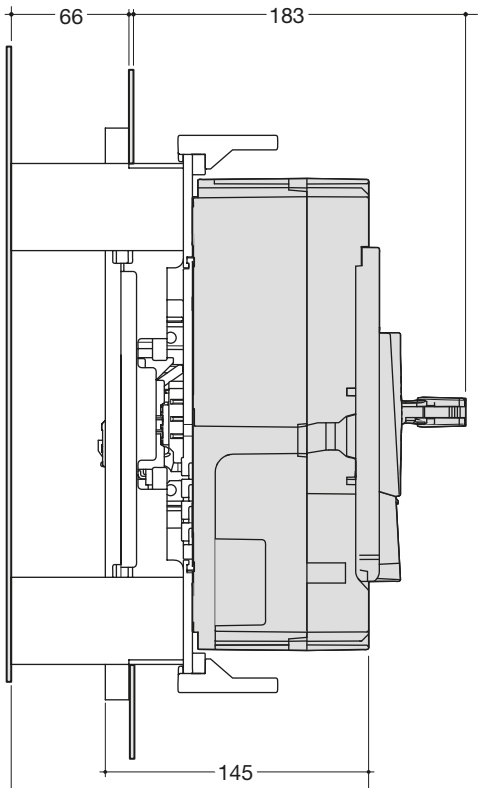
x630 plug-in kit drilling pattern for flush mounting

3P + 4P

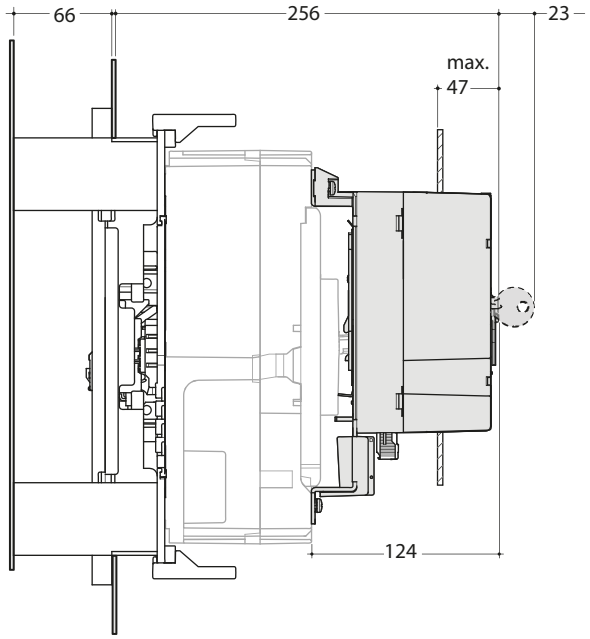


P630 circuit breaker on plug-in kit

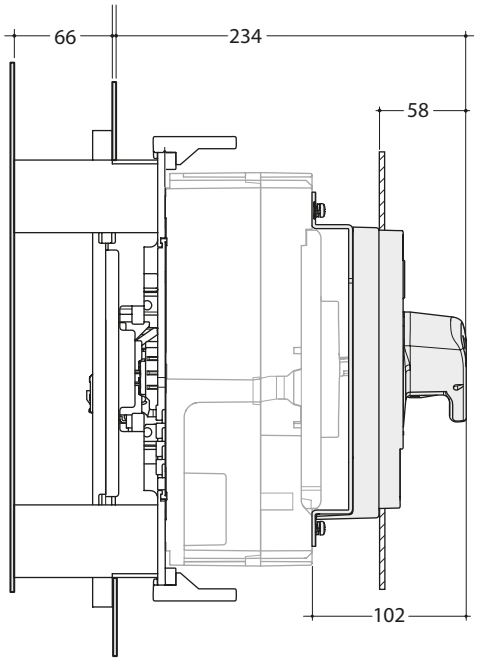
3P + 4P



x630 Motor operator on plug-in circuit breaker

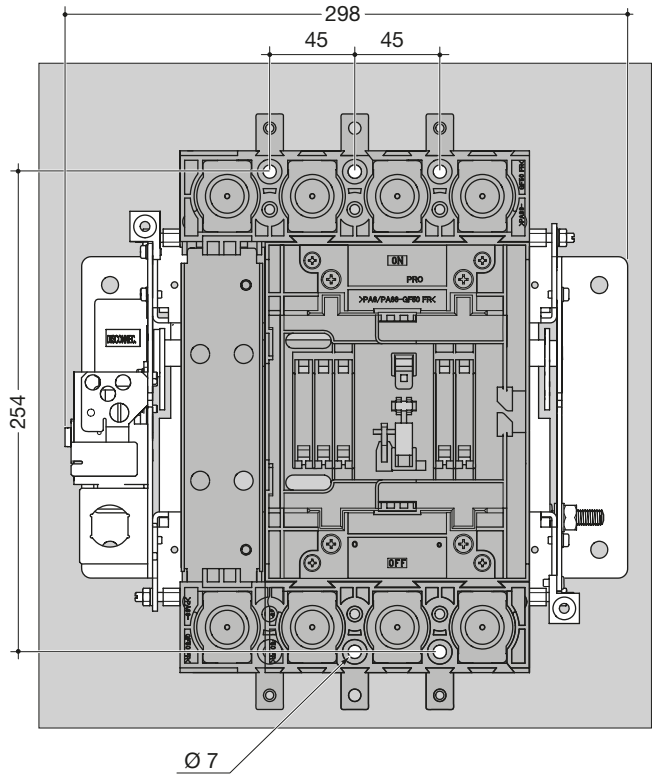


x630 Rotary handle on plug-in circuit breaker

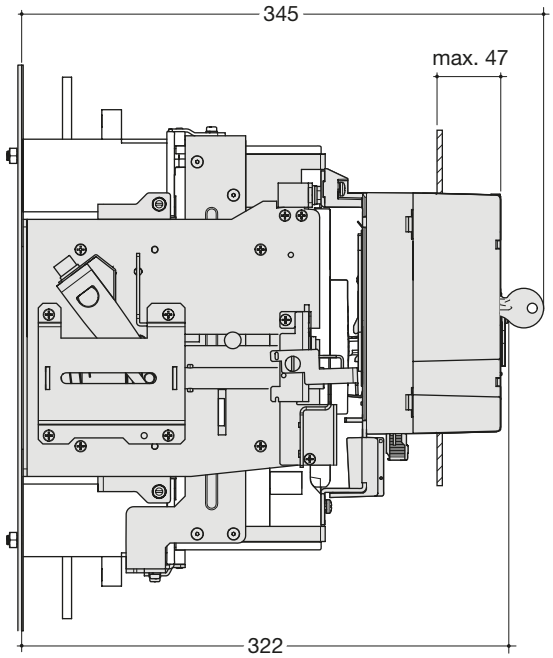


Technical changes reserved

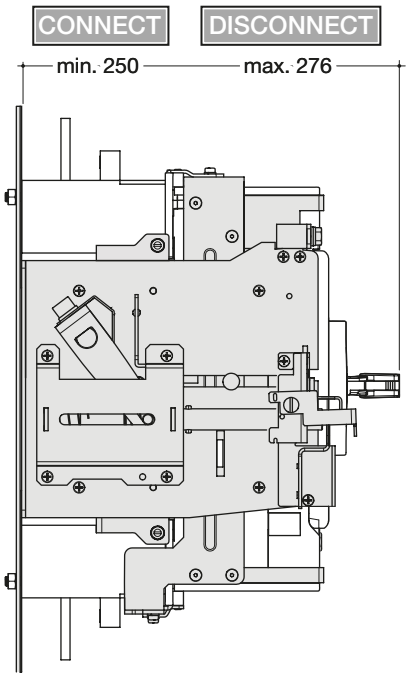
Drilling drawing Withdrawable back plate x630
3P + 4P



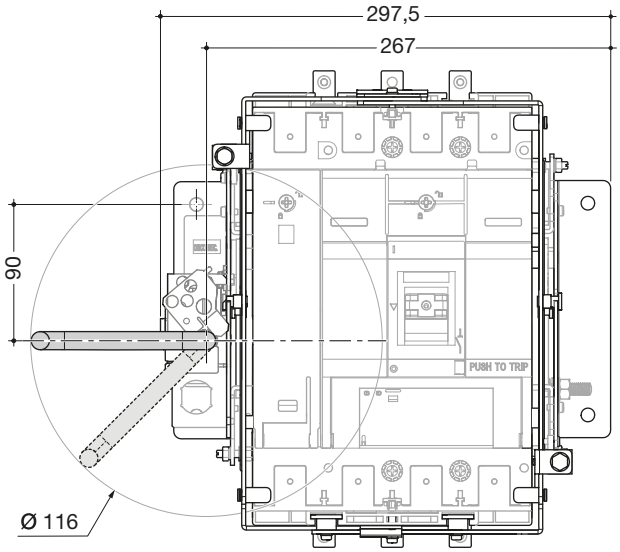
Motor operator on withdrawable circuit breaker x630



Drawout system x630

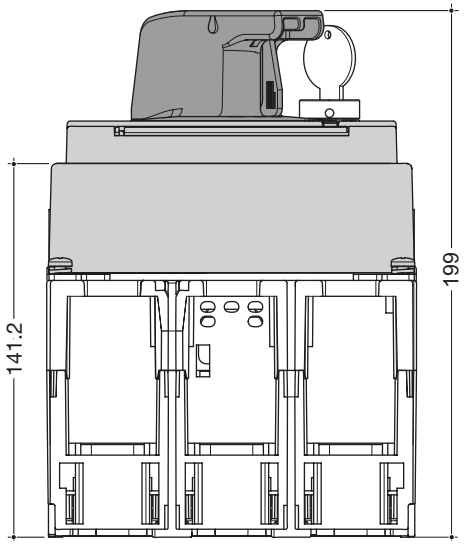


Drawout system x630

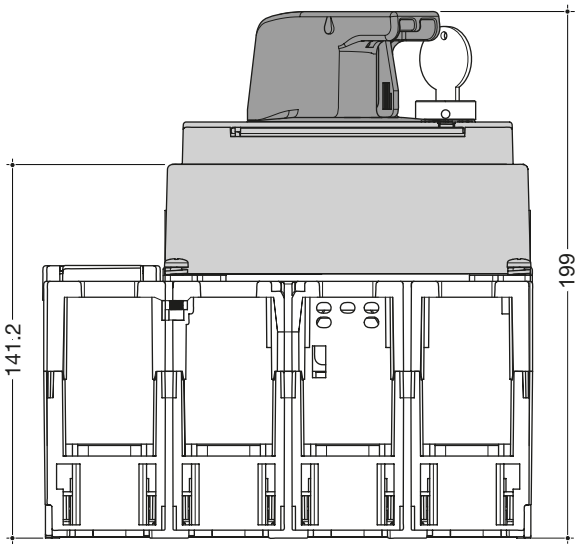


Rotary handle x630

3P

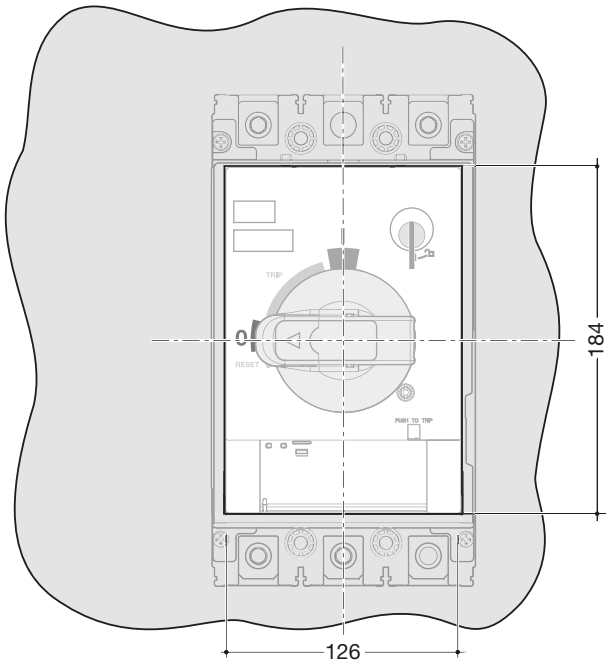


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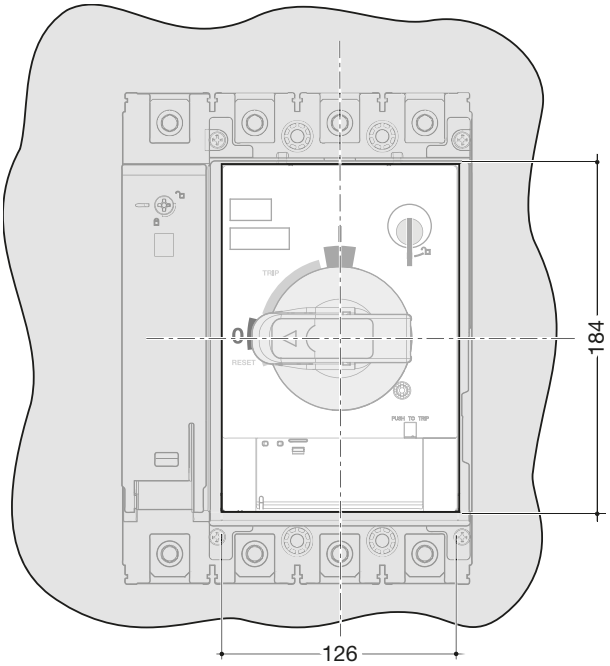


Panel cut-out rotary handle x630

3P

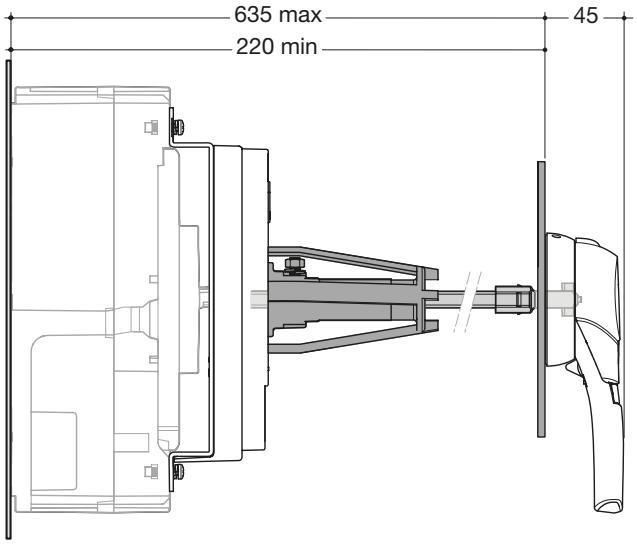


4P

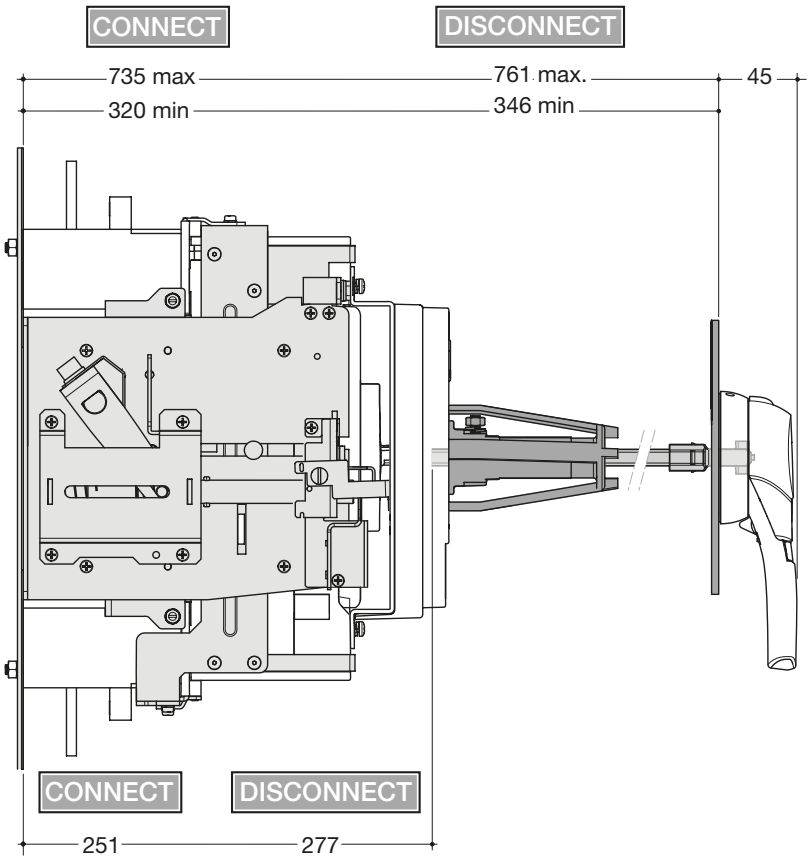


66_Panel_cut-out_rot_han_x630_4P

Extended rotary handle x630

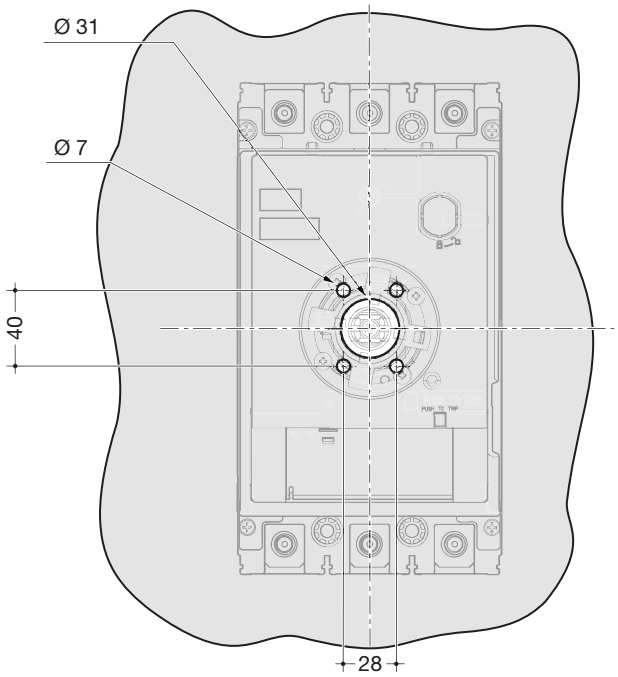


Extended rotary handle x630 on drawout

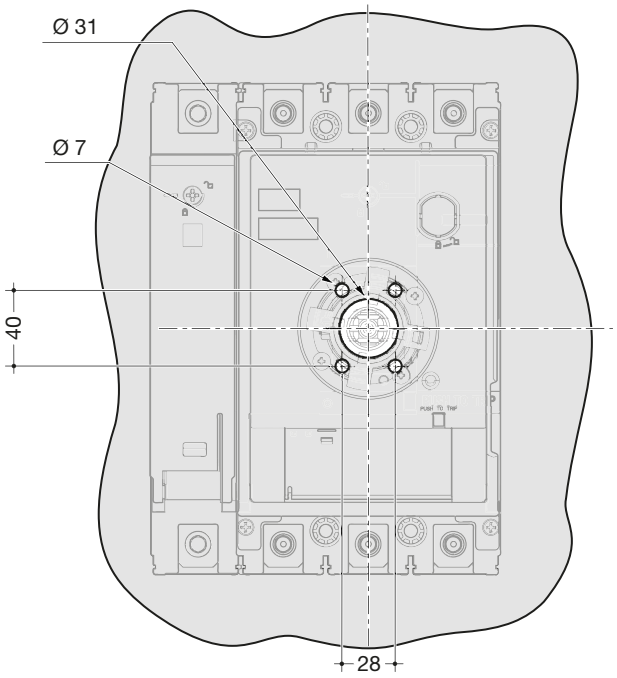


Panel cut-out extended rotary handle x630

3P

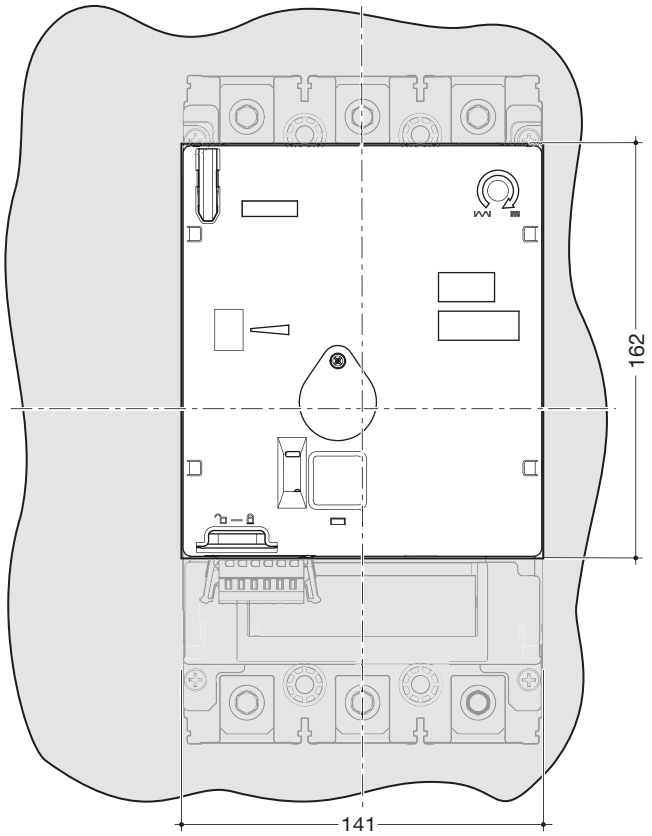


4P

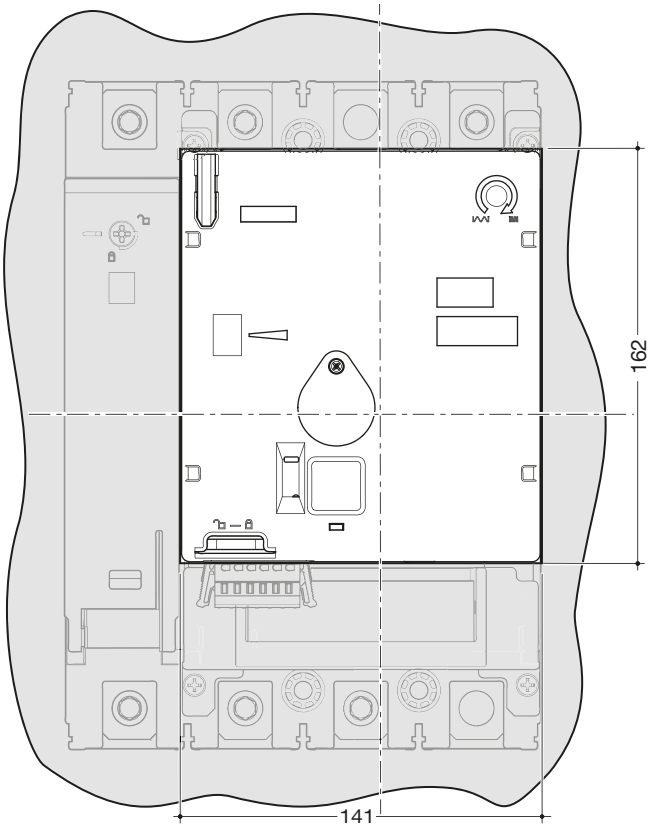


Panel cut-out motor operator x630

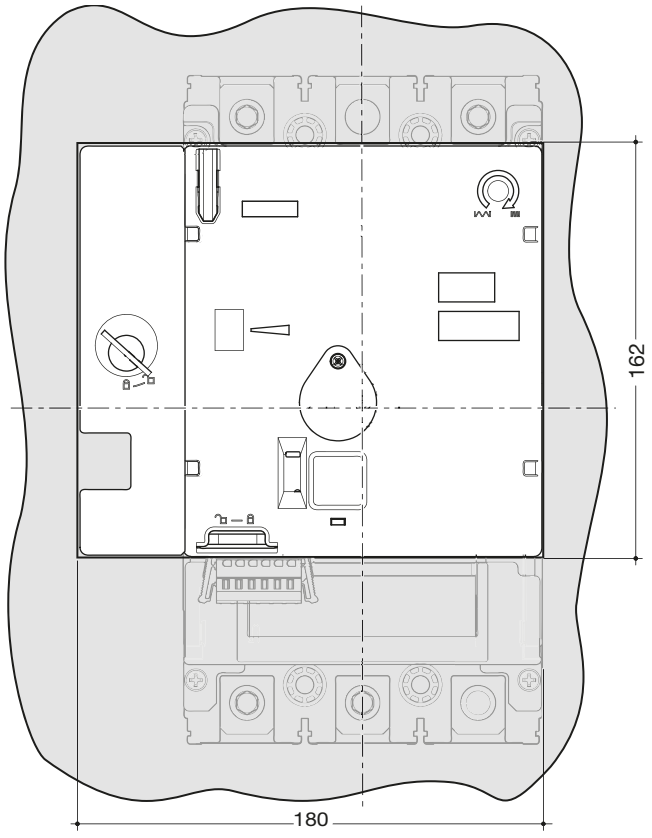
3P



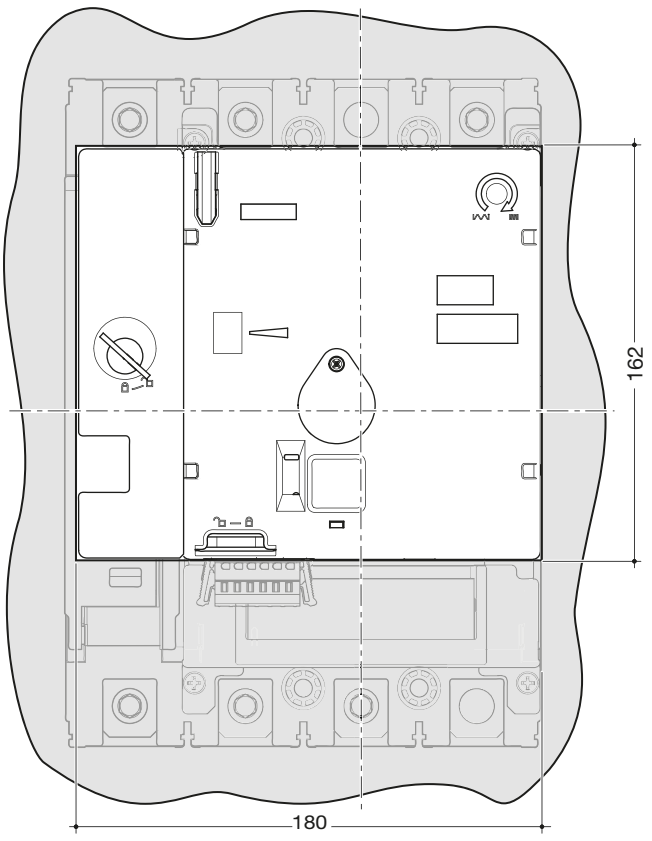
4P



3P with keylock



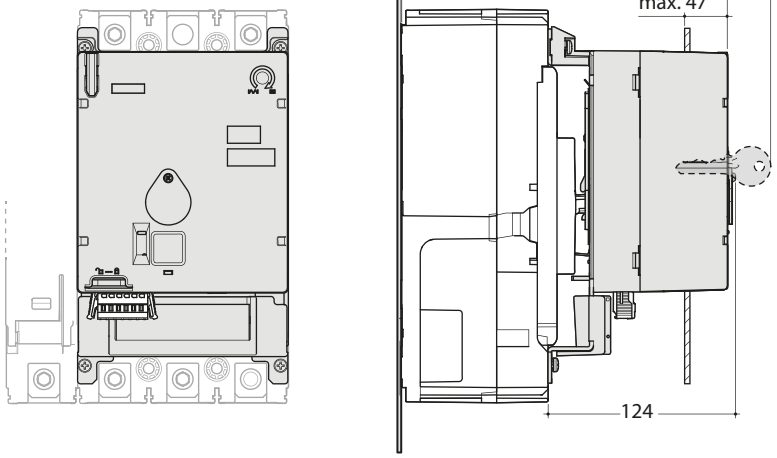
4P with keylock



Motor operator with fixed circuit breaker x630

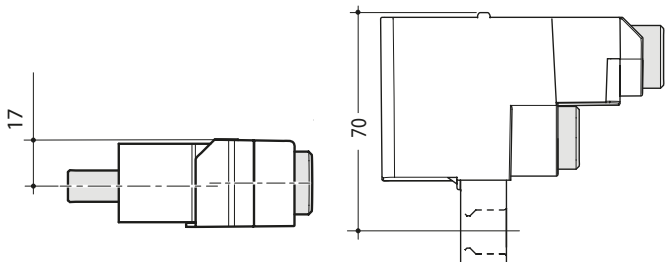
3P

4P



AL/Cu external cable terminals x630

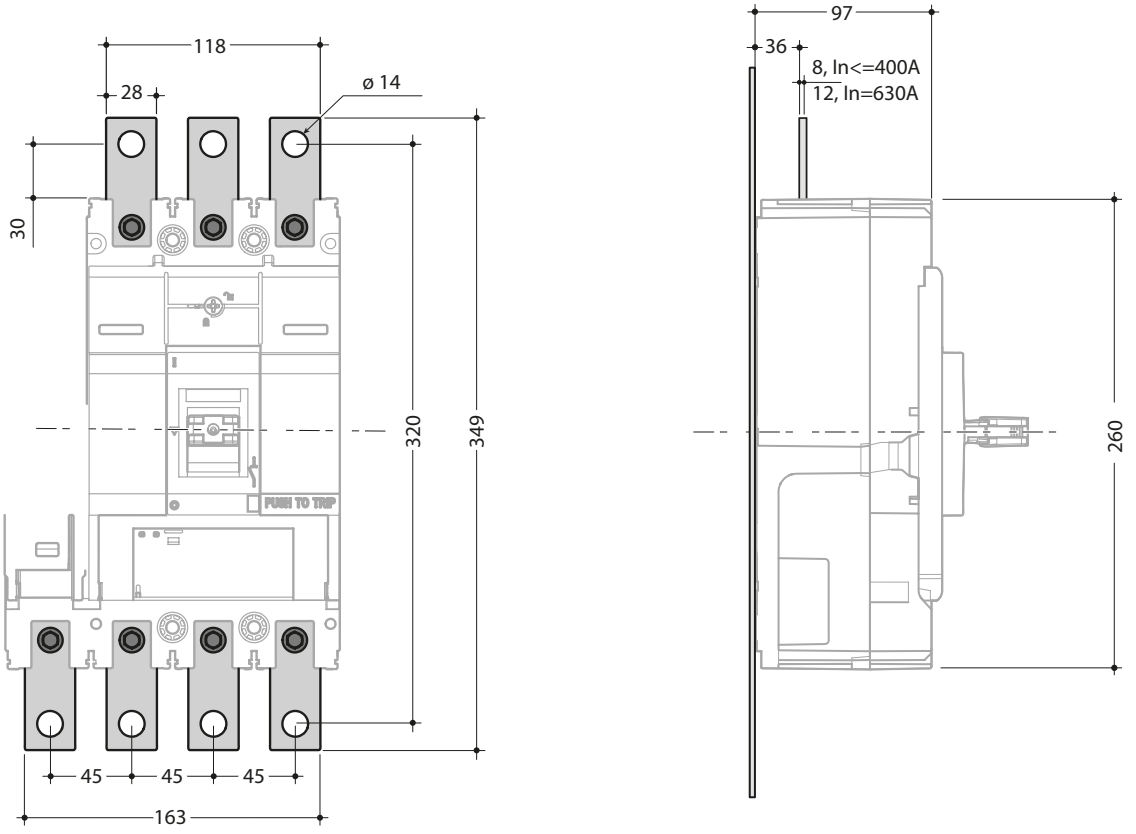
1 wire **2 wires**



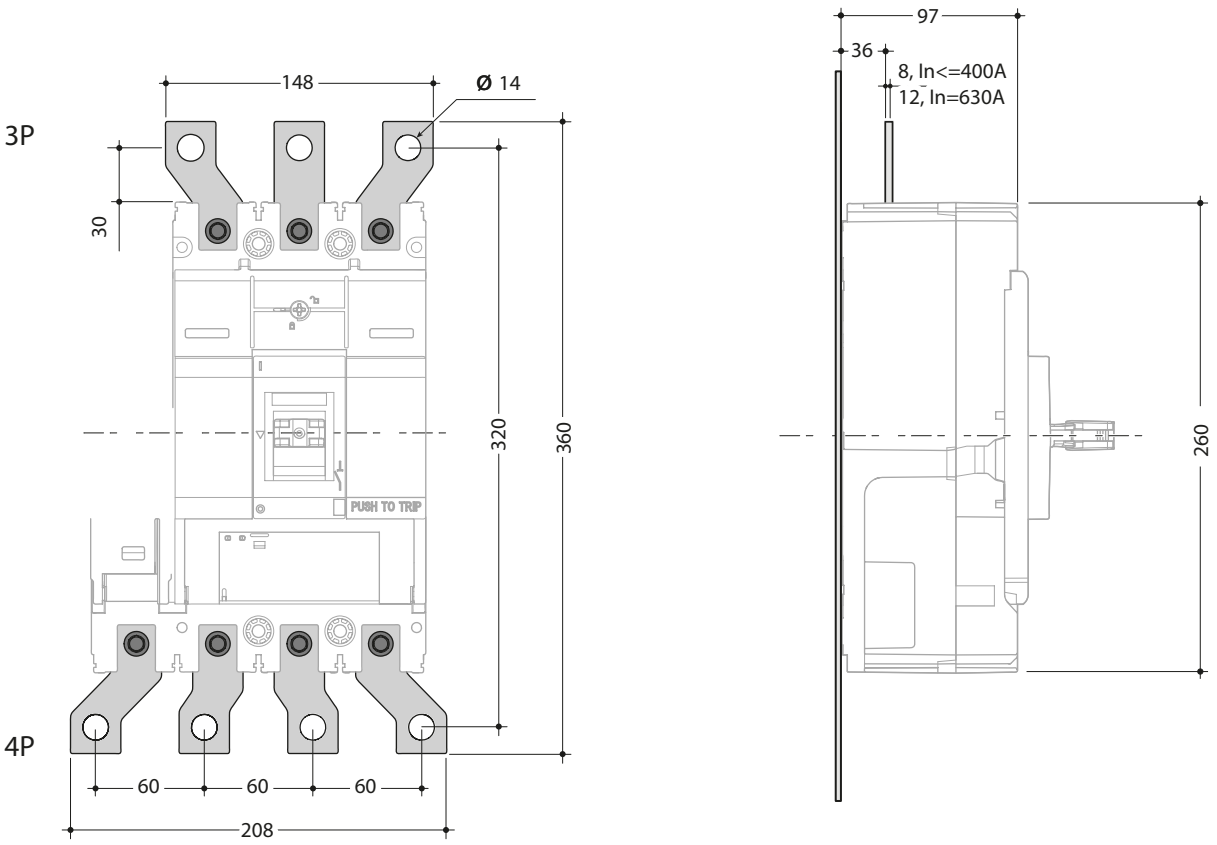
Straight terminal extension x630

3P

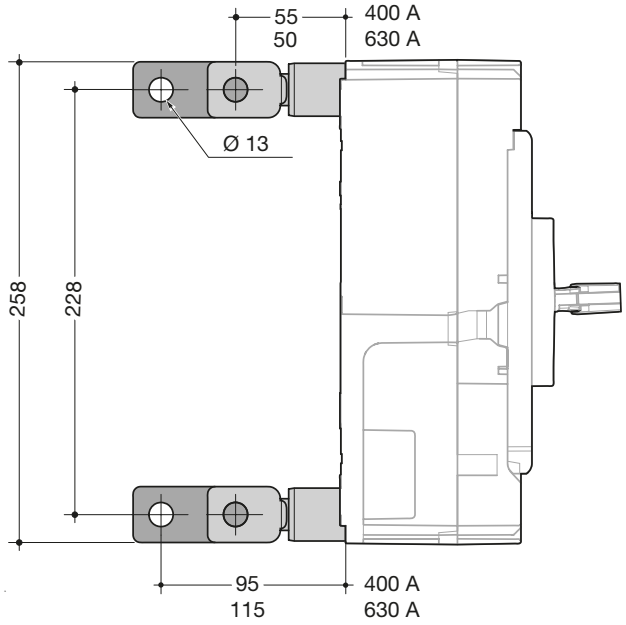
4P



Spreader terminal extension x630



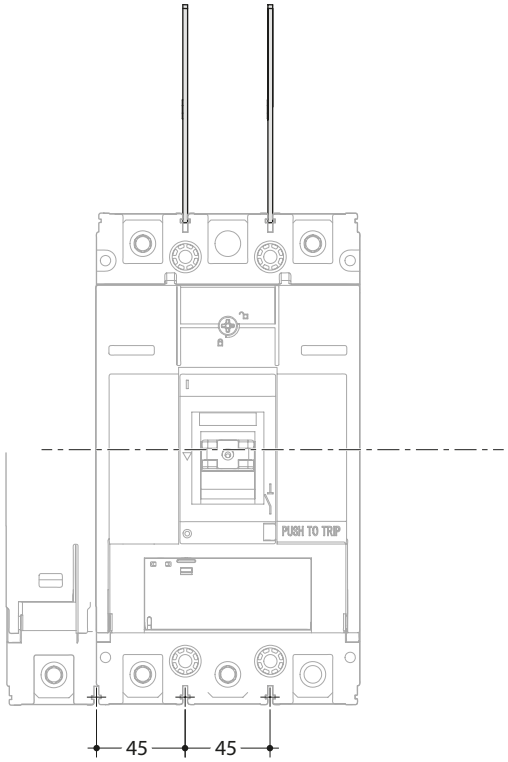
Rear connection x630

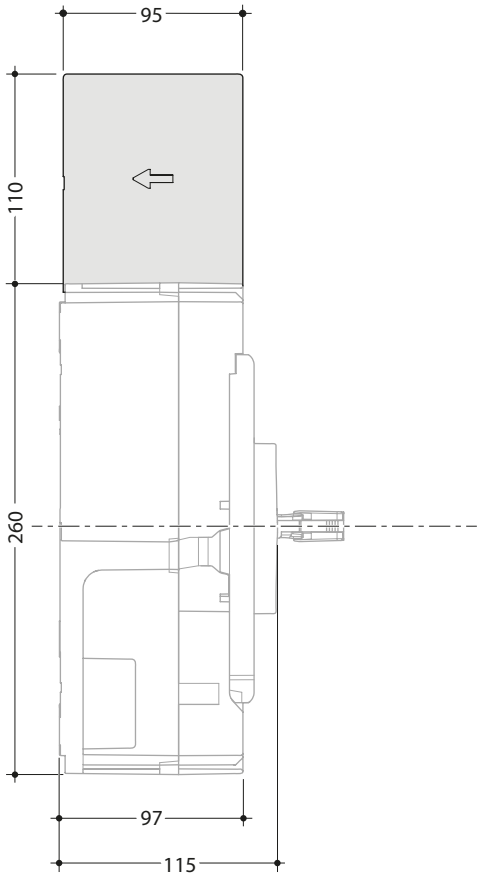


Interphase barrier x630

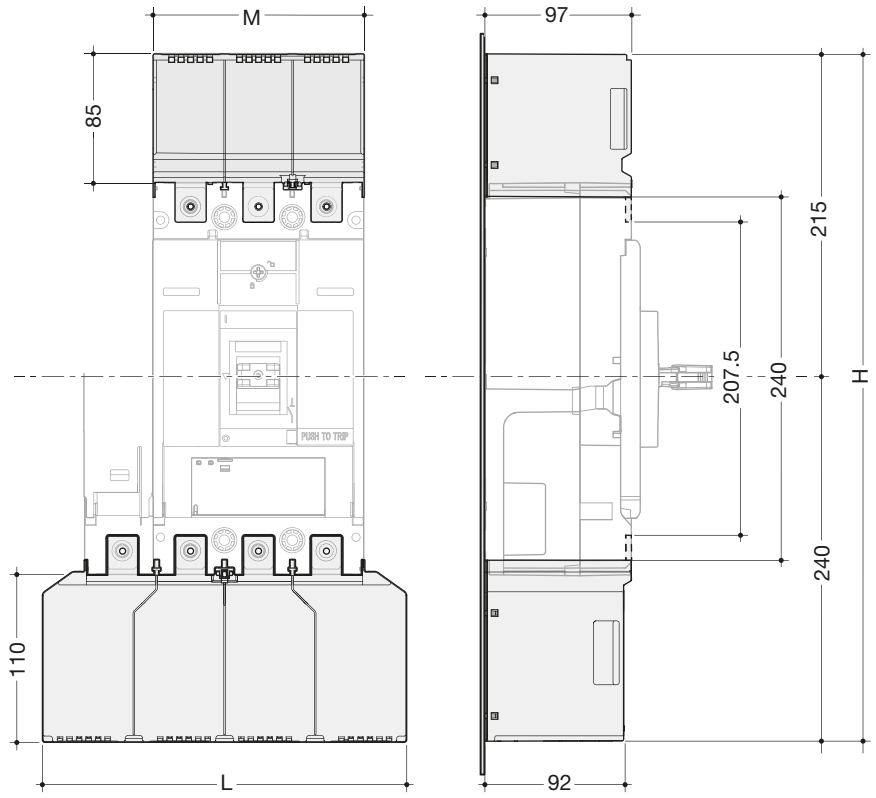
3P

4P





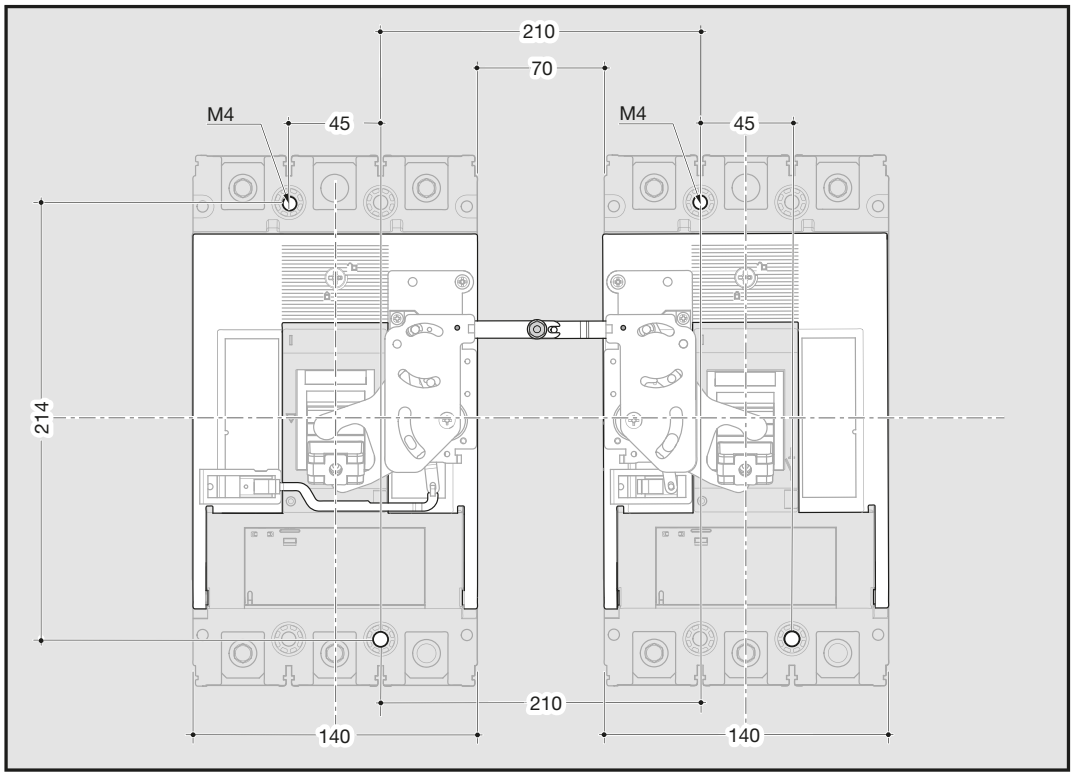
Terminal cover x630



	Spreader **L** (mm)	**Straight** **M** (mm)
3P	180	140
4P	240	185
H	480	430

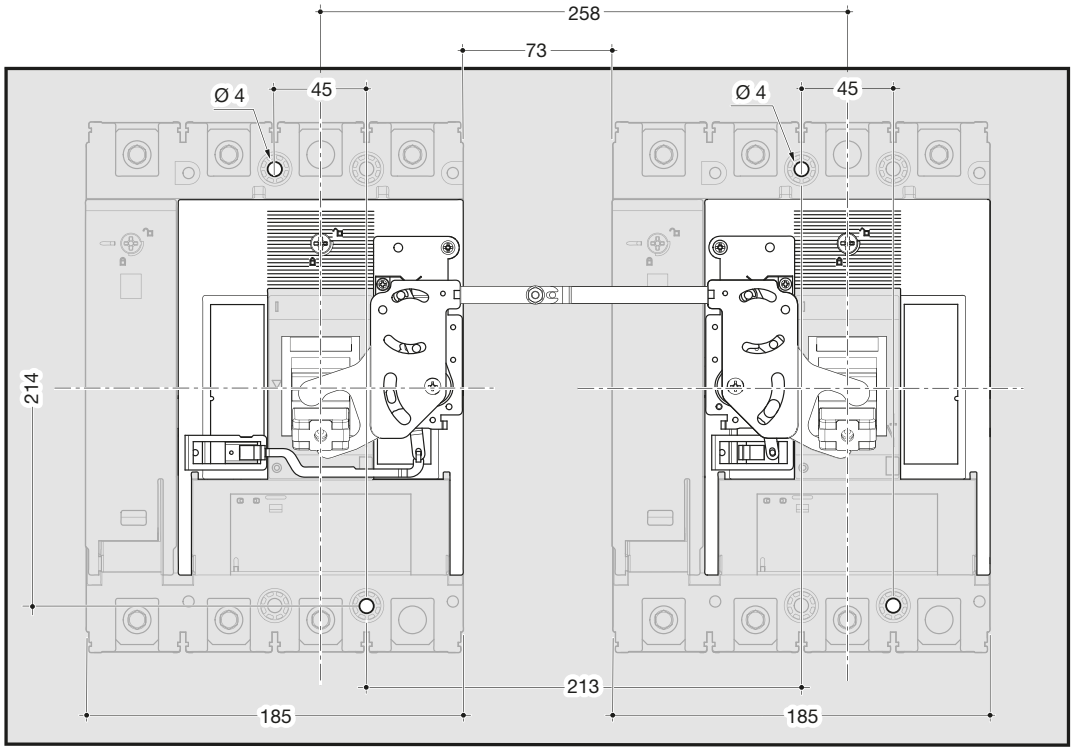
x630 Terminal cover

Link x630 3P



x630 link Accessorier

Link x630 4P



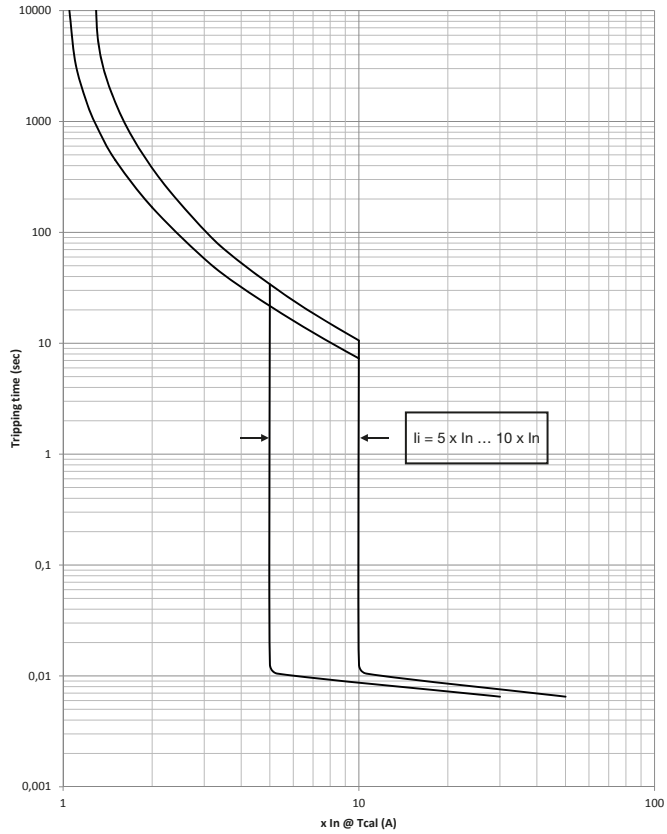
x630 link Accessorier 4P

Complementary characteristics

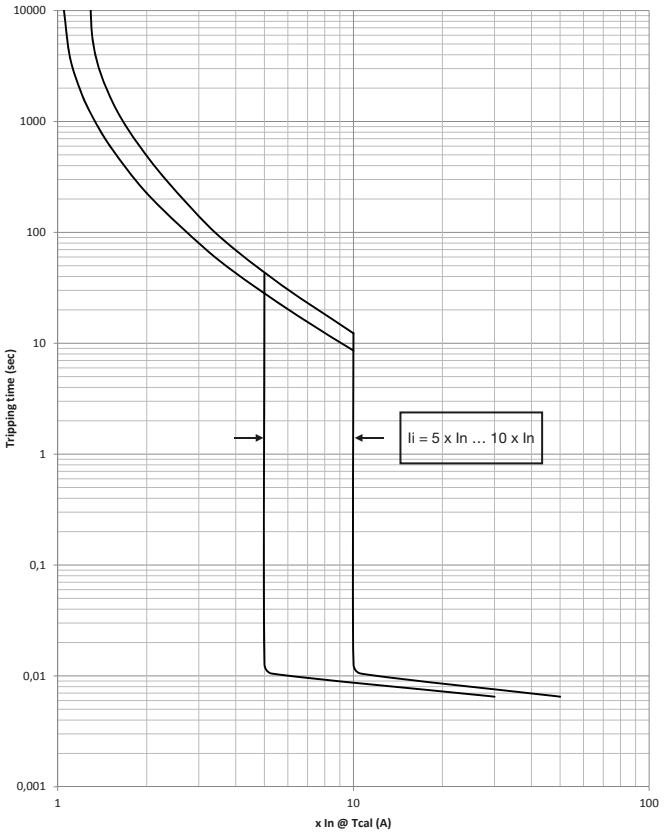
		Page
01	Tripping curves	80
02	Current and energy limiting curves	86

x630 TM adjustable

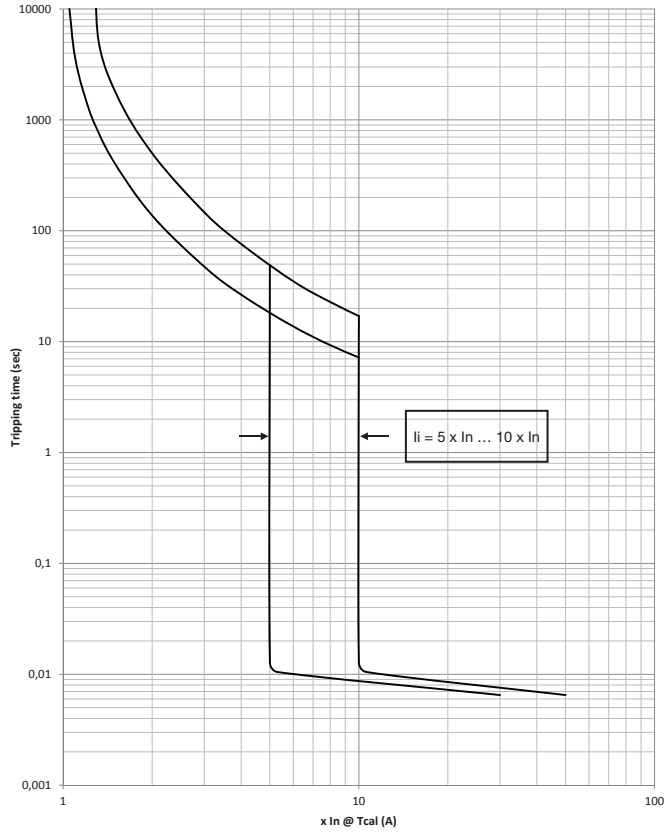
250 A



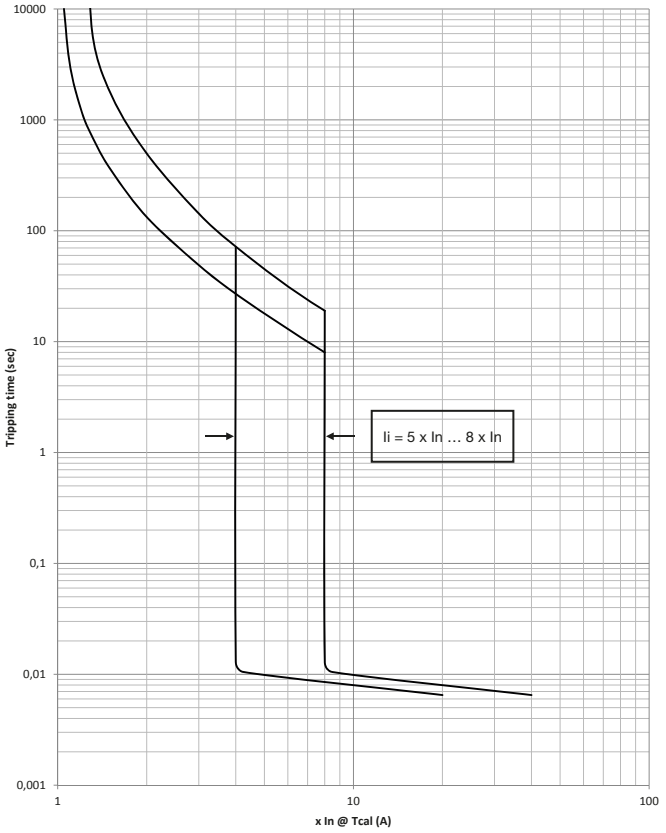
320A



400A



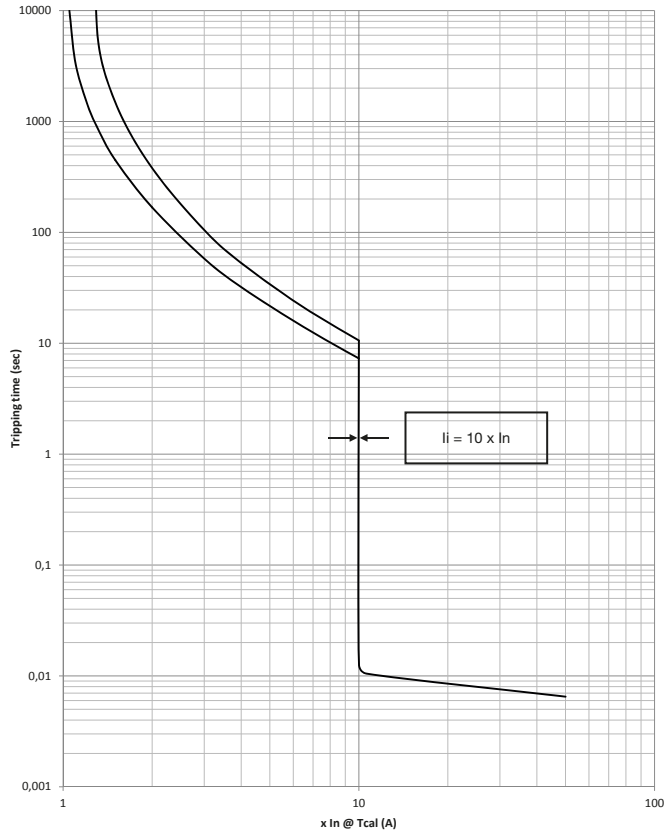
630A



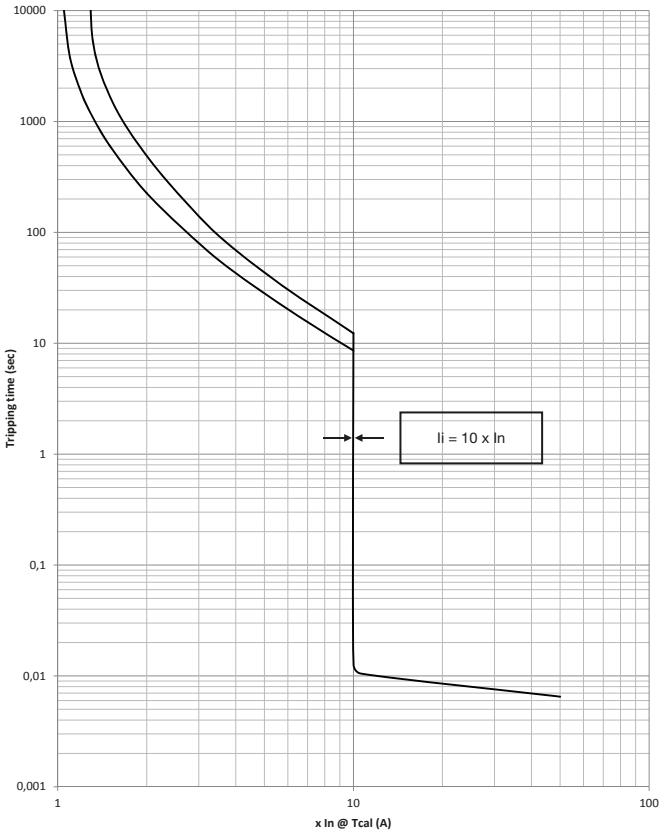
Note:
For tripping tolerances refer to chapter
“Trip units” on page 10.

x630 TM fix

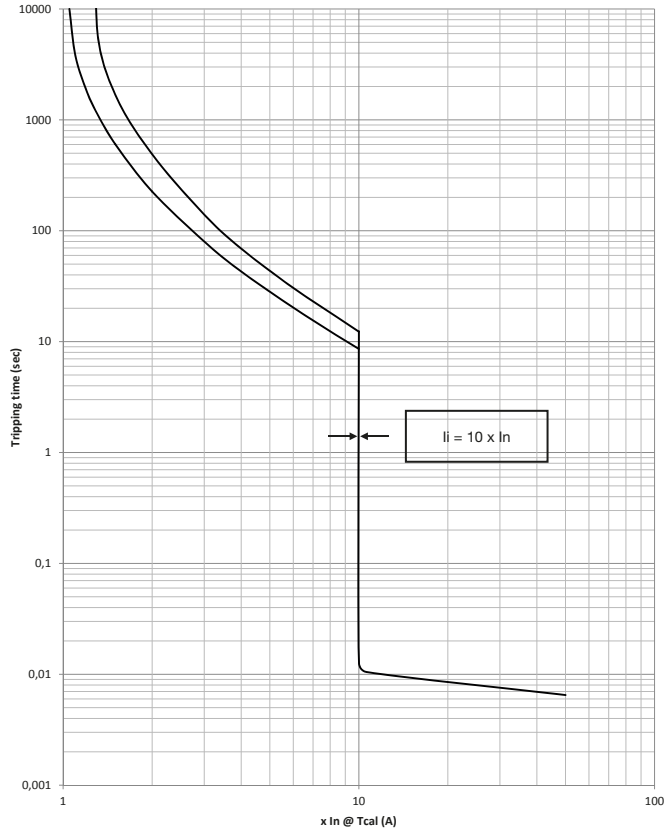
250 A



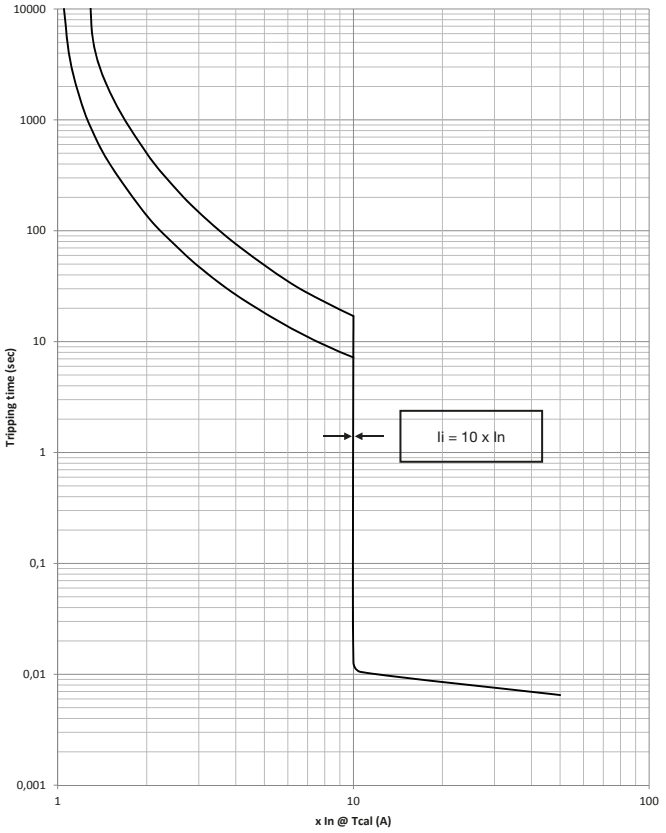
300A



320A



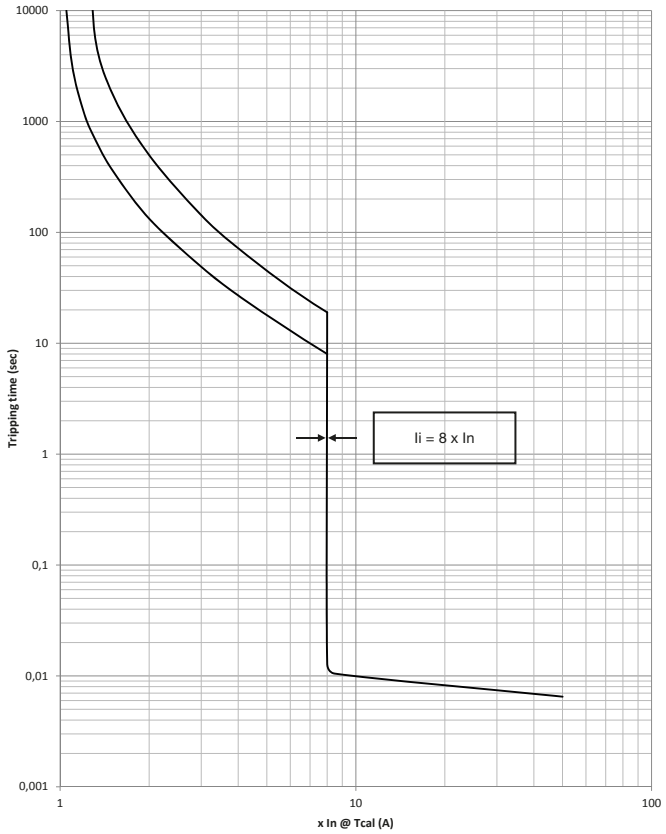
400A



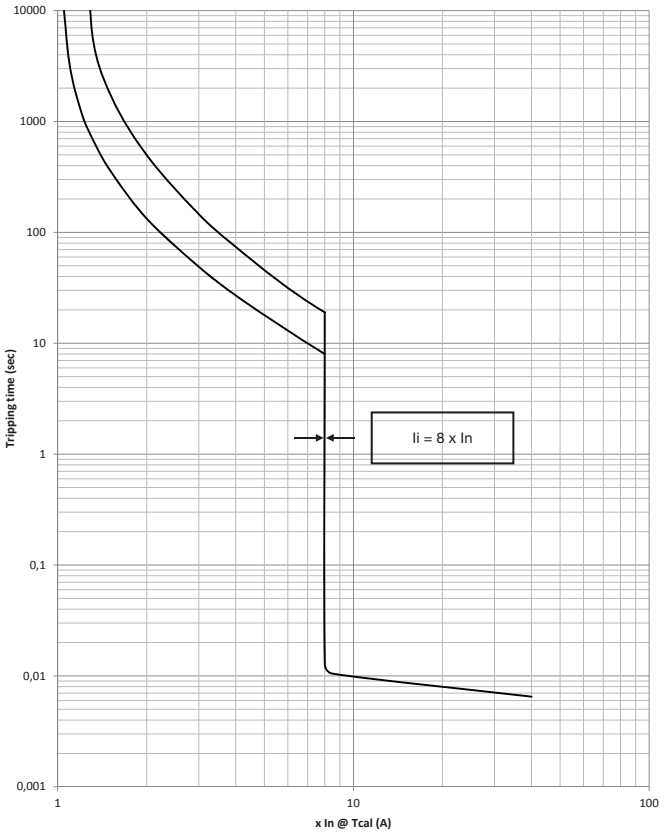
Note:
For tripping tolerances refer to chapter
“Trip units” on page 10.

x630 TM fix

500 A



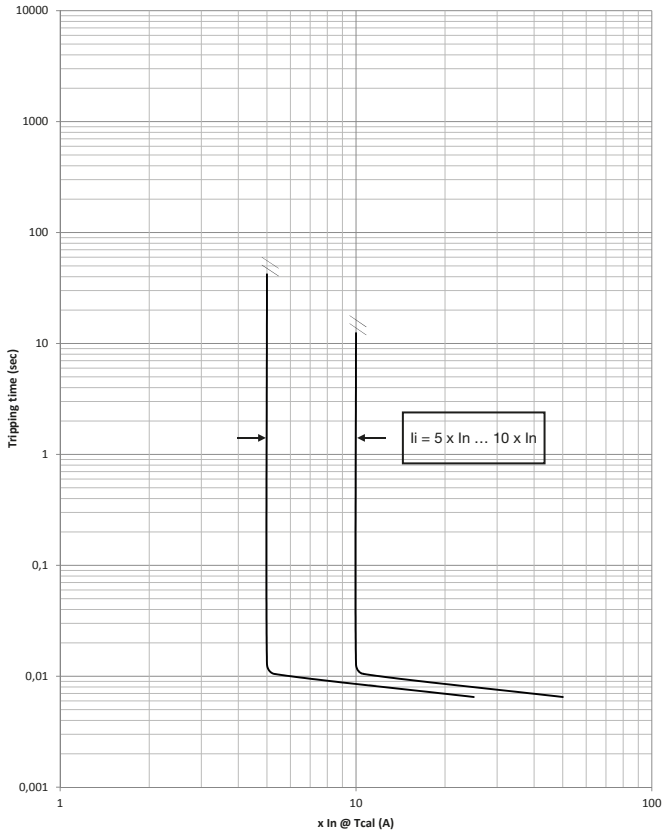
630A



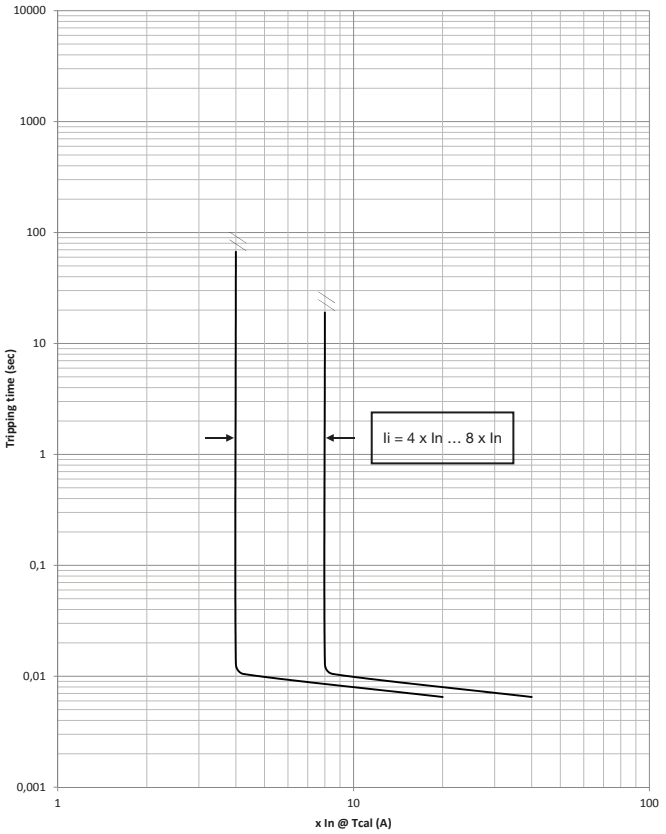
Note:
For tripping tolerances refer to chapter
“Trip units” on page 10.

x630 MAG (ICB)

320 A



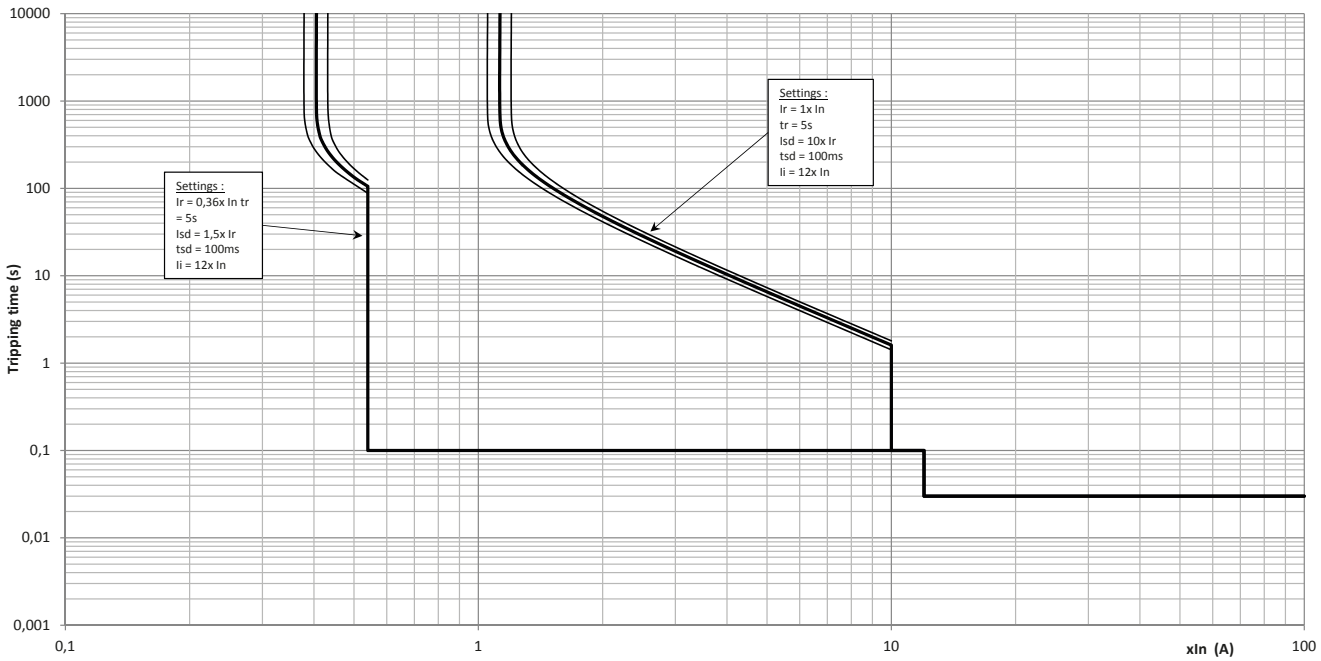
500A



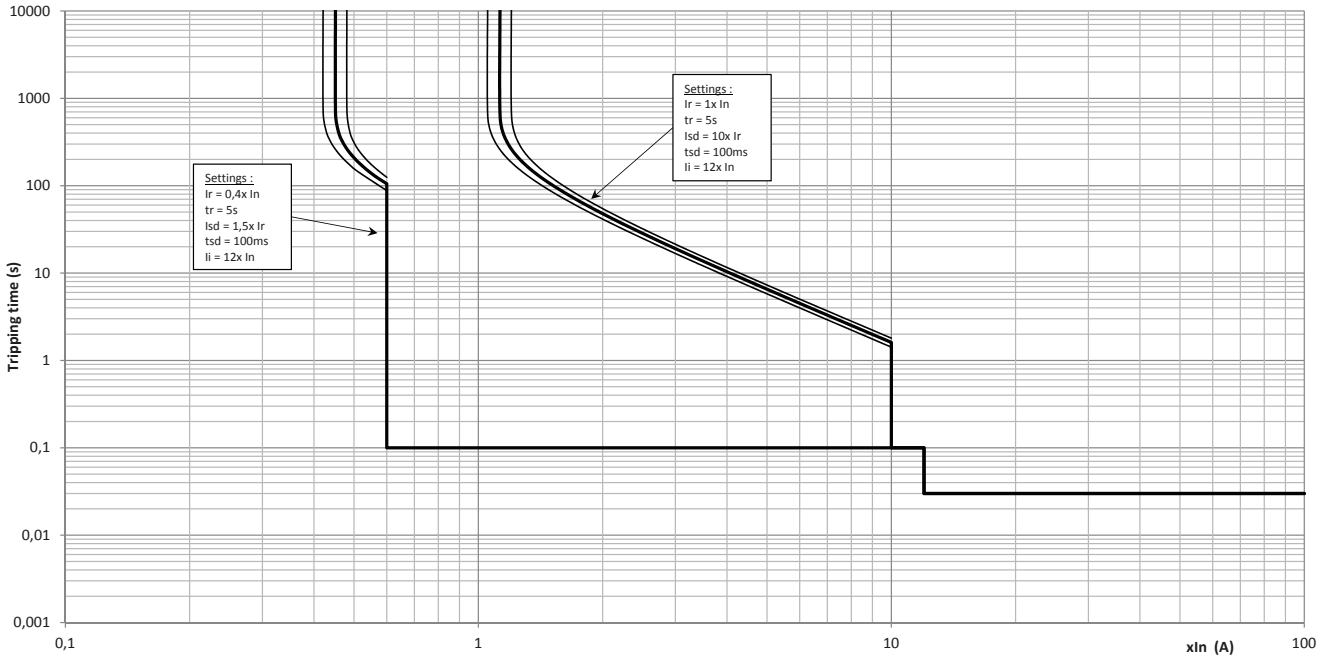
Note:
For tripping tolerances refer to chapter
“Trip units” on page 10.

x630 LSnI

250 A



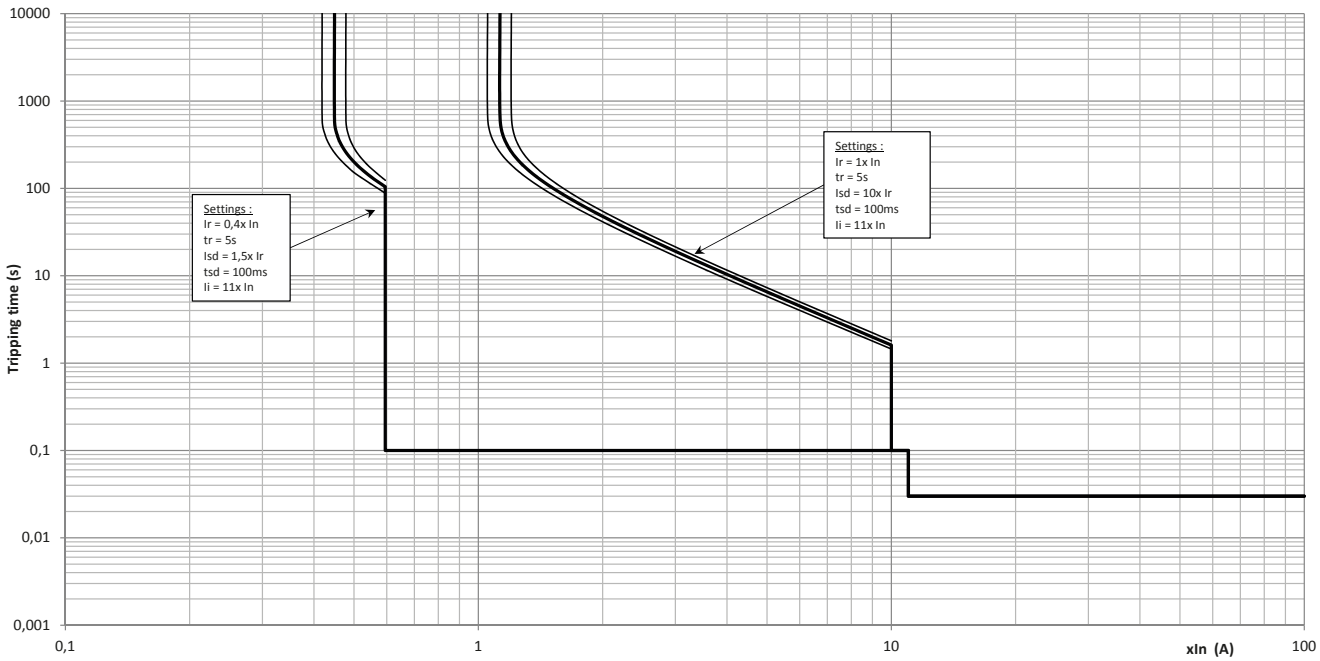
400 A



Note:
For tripping tolerances refer to chapter
“Trip units” on page 10.

x630 LSnI

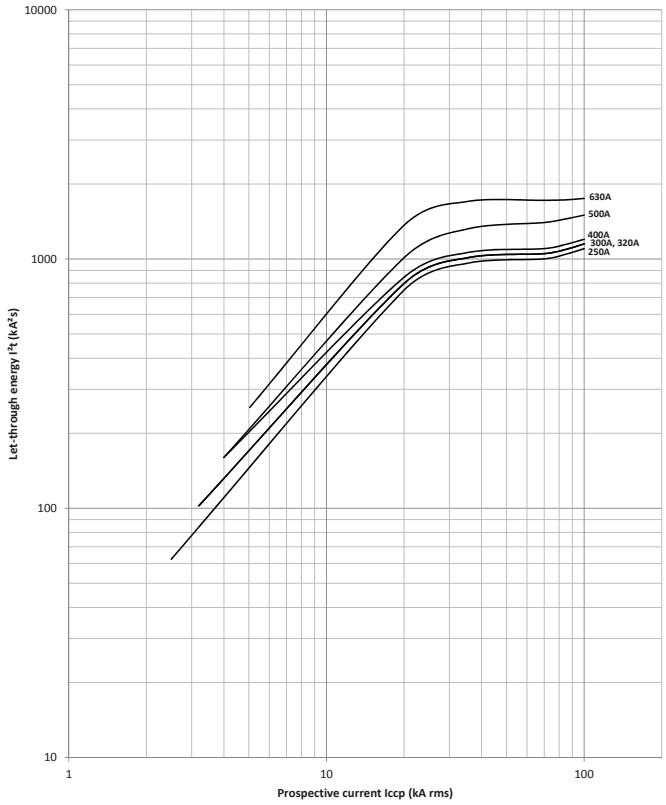
630 A



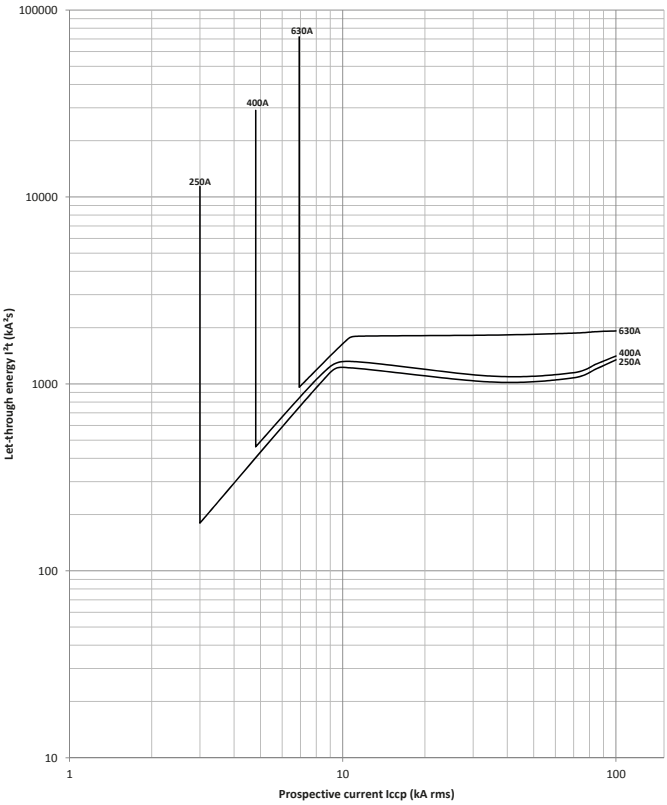
Note:
For tripping tolerances refer to chapter
“Trip units” on page 10.

Energy limiting characteristics 220/240 V AC

x630 TM



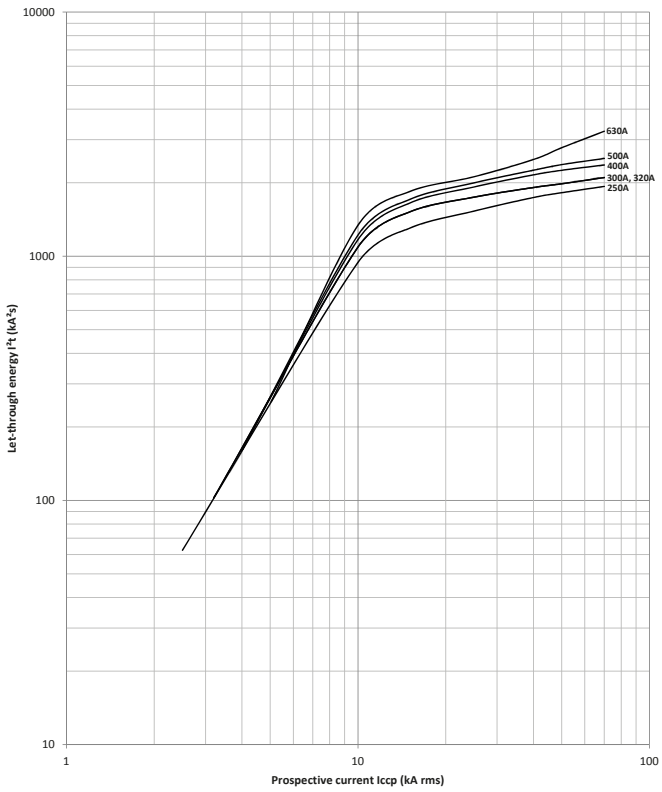
x630 LSnI



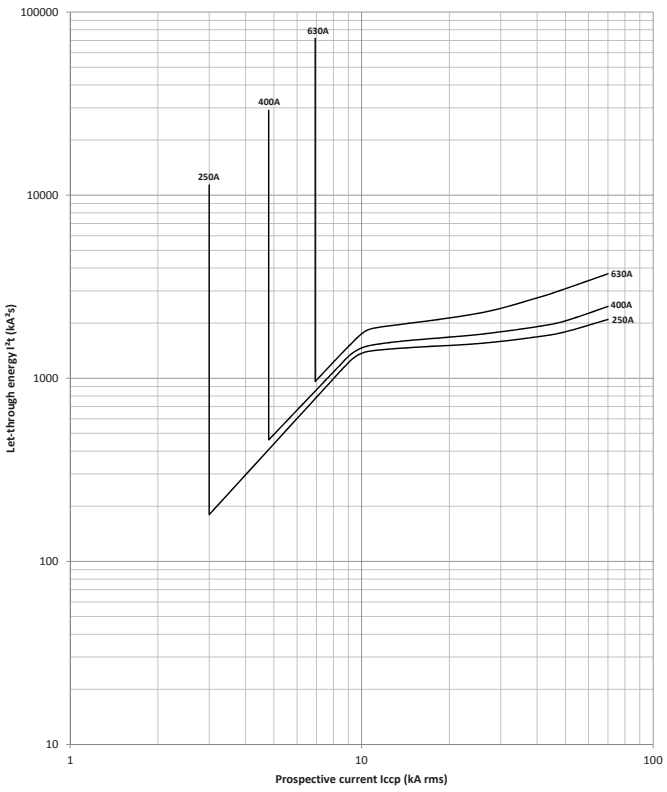
Note:
For tripping tolerances refer to chapter
“Trip units” on page 10.

Energy limiting characteristics 380/415 V AC

x630 TM



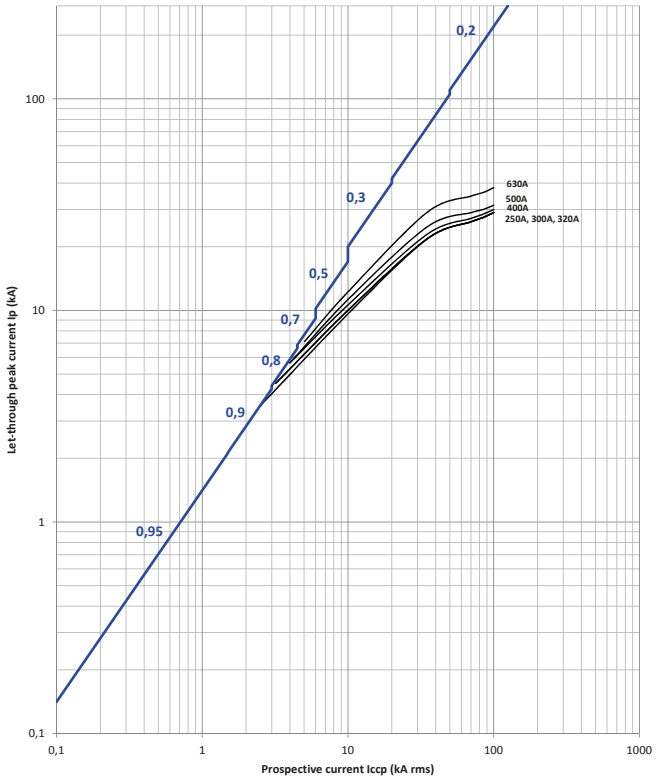
x630 LSnI



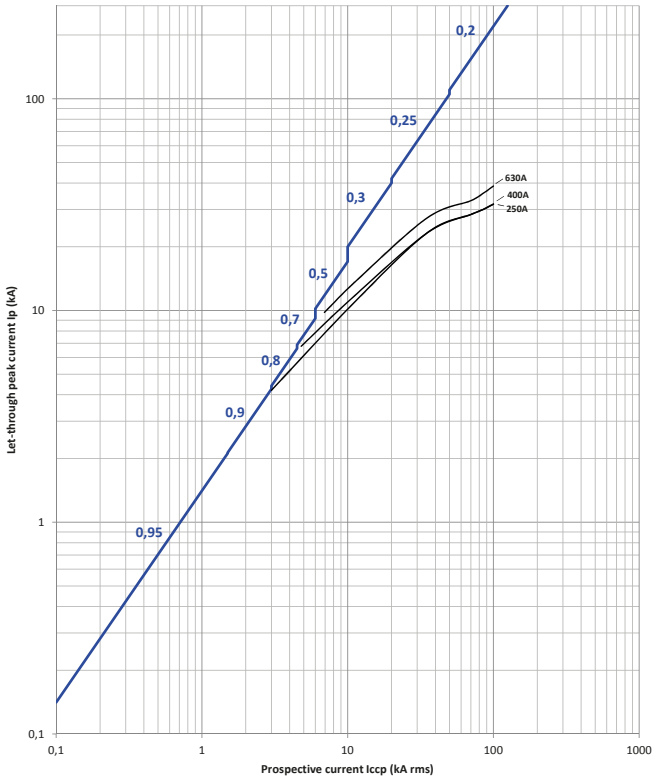
Note:
For tripping tolerances refer to chapter
“Trip units” on page 10.

Current limiting characteristics 220/240 V AC

x630 TM or MAG



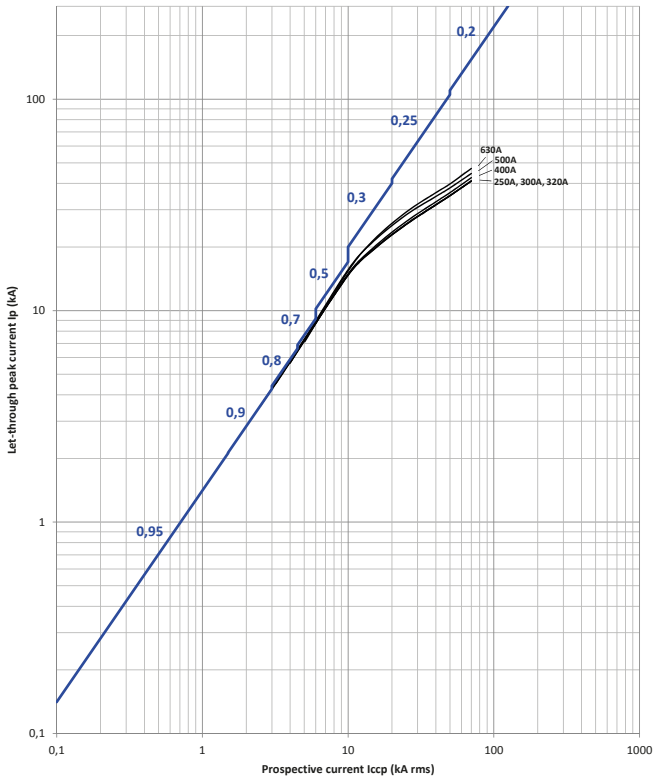
x630 LSnI



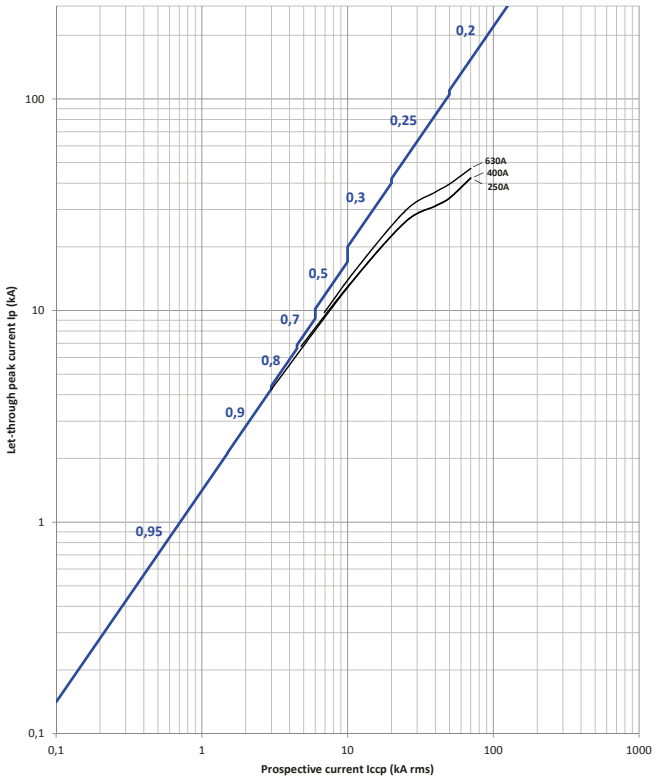
Note:
For tripping tolerances refer to chapter
“Trip units” on page 10.

Current limiting characteristics 380/415 V AC

x630 TM or MAG



x630 LSnI



Note:
For tripping tolerances refer to chapter
“Trip units” on page 10.

List of the references

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h3 x630 TM adjustable

Icu / Ics 400 / 415 V~	**In**	**3 poles**	4 **poles**	
			N: 0-50 %	N: 0-100 %
25 kA / 25 kA	250 A	HHJ250DR		HHJ251DR
	320 A	HHJ320DR		HHJ321DR
	400 A	HHJ400DR		HHJ401DR
	630 A	HHJ630DE	HHJ632DE	HHJ631DE
40 kA / 40 kA	250 A	HNJ250DR		HNJ251DR
	320 A	HNJ320DR		HNJ321DR
	400 A	HNJ400DR		HNJ401DR
	630 A	HNJ630DE	HNJ632DE	HNJ631DE
50 kA / 50 kA	250 A	HMJ250DR		HMJ251DR
	320 A	HMJ320DR		HMJ321DR
	400 A	HMJ400DR		HMJ401DR
	630 A	HMJ630DE	HMJ632DE	HMJ631DE
70 kA / 70 kA	250 A	HEJ250DR		HEJ251DR
	320 A	HEJ320DR		HEJ321DR
	400 A	HEJ400DR		HEJ401DR
	630 A	HEJ630DE	HEJ632DE	HEJ631DE

Technical changes reserved

h3 x630 TM fix

Icu / Ics 400 / 415 V~	**In**	**3 poles**	4 **poles**	
			4P3D	4P4D
25 kA / 25 kA	250 A	HHJ250ER	HHJ253ER	HHJ251ER
	320 A	HHJ320ER	HHJ323ER	HHJ321ER
	400 A	HHJ400ER	HHJ403ER	HHJ401ER
	500 A	HHJ500ER	HHJ503ER	HHJ501ER
	630 A	HHJ630EE	HHJ633EE	HHJ631EE
40 kA / 40 kA	250 A	HNJ250ER	HNJ253ER	HNJ251ER
	320 A	HNJ320ER	HNJ323ER	HNJ321ER
	400 A	HNJ400ER	HNJ403ER	HNJ401ER
	500 A	HNJ500ER	HNJ503ER	HNJ501ER
	630 A	HNJ630EE	HNJ633EE	HNJ631EE
50 kA / 50 kA	250 A	HMJ250ER	HMJ253ER	HMJ251ER
	320 A	HMJ320ER	HMJ323ER	HMJ321ER
	400 A	HMJ400ER	HMJ403ER	HMJ401ER
	500 A	HMJ500ER	HMJ503ER	HMJ501ER
	630 A	HMJ630EE	HMJ633EE	HMJ631EE
70 kA / 70 kA	250 A	HEJ250ER	HEJ253ER	HEJ251ER
	320 A	HEJ320ER	HEJ323ER	HEJ321ER
	400 A	HEJ400ER	HEJ403ER	HEJ401ER
	500 A	HEJ500ER	HEJ503ER	HEJ501ER
	630 A	HEJ630EE	HEJ633EE	HEJ631EE

h3 x630 MAG (ICB)

Icu / Ics 400 / 415 V~	**In**	**3 poles**	**4 poles**
40 kA / 40 kA	320 A	HNJ320BR	HNJ321BR
	500 A	HNJ500BR	HNJ501BR
50 kA / 50 kA	320 A	HMJ320BR	HMJ321BR
	500 A	HMJ500BR	HMJ501BR
70 kA / 70 kA	320 A	HEJ320BR	HEJ321BR
	500 A	HEJ500BR	HEJ501BR

h3 x630 LSnI

Icu / Ics 400 / 415 V~	**In**	**3 poles**	**4 poles** N:0-50-100 %
25 kA / 25 kA	250 A	HHJ250GR	HHJ251GR
	400 A	HHJ400GR	HHJ401GR
	630 A	HHJ630GR	HHJ631GR
40 kA / 40 kA	250 A	HNJ250GR	HNJ251GR
	400 A	HNJ400GR	HNJ401GR
	630 A	HNJ630GR	HNJ631GR
50 kA / 50 kA	250 A	HMJ250GR	HMJ251GR
	400 A	HMJ400GR	HMJ401GR
	630 A	HMJ630GR	HMJ631GR
70 kA / 70 kA	250 A	HEJ250GR	HEJ251GR
	400 A	HEJ400GR	HEJ401GR
	630 A	HEJ630GR	HEJ631GR

Technical changes reserved

RCD add-on block for x630

	In	x630
Adjustable RCD	400 A	HBW400H
	630 A	HBW630H
Alarm only	400 A	HBW400L
	630 A	HBW630L

Cable terminals

		Poles	x630
Integrated	1 wire Cu/Al	3P	HYW001H
		4P	HYW002H
External	2 wires Cu/Al	3P	HYW007H
		4P	HYW008H
Interphase barrier	110 mm	3/4P	HYW019H

*) Please refer to “Installation and operating recommendations — Safety clearances and minimum distances” chapter for more detailed information about the installation of interphase barriers.

Terminal extensions

	In	Poles	x630
Straight terminal extension	up to 400 A	3/4P	HYW010H
	up to 630 A	3/4P	HYW013H
Spreader terminal extension	up to 400 A	3P	HYW011H
		4P	HYW012H
	up to 630 A	3P	HYW014H
		4P	HYW015H
Rear connection	up to 400 A	3P	HYD031H
		4P	HYD032H
	up to 630 A	3P	HYD033H
		4P	HYD034H

Technical changes reserved

Terminal covers and isolators

	Poles	x630
Terminal cover for straight terminal extensions	3P	HYW021H
	4P	HYW022H
Terminal cover for spreader terminal extensions	3P	HYW023H
	4P	HYW024H
Terminal cover for rear & plug-in connections	3P	HYW025H
	4P	HYW026H
Isolating earth plate for straight terminal cover	3P	HYW050H
	4P	HYW051H
Isolating earth plate for spreader terminal cover	3P	HYW052H
	4P	HYW053H

Auxiliary contacts

AX	-		HXA021H
	Low level		HXA025H
AL left side	-		HXA024H
	Low level		HXA026H
AL right side	-		HXA027H
	Low level		HXA028H
Shunt trip release	24 V DC		HXA001H
	48 V DC		HXA002H
	100-120 V~		HXA003H
	200-240 V~		HXA004H
	380-450 V~		HXA005H
Undervoltage release	24 V DC		HXA011H
	100-120 V~		HXA013H
	200-240 V~		HXA014H
	380-450 V~		HXA015H
Delayed UVR	24 V DC		HXA051H
	110 V~		HXA053H
	240 V~		HXA054H
	440 V~		HXA055H
Cable kit	0.75 mm^2	6 wires	HYA035H

Technical changes reserved

Withdrawable breakers

		x630
Base for withdrawable breaker	3P	HYW330H
	4P	HYW331H
Withdrawable breaker adaptor with safety trip	3P	HYW332H
	4P	HYW333H
Locking key kit		HXW890H
Auxiliary circuit terminal	Base side	HYC250H
	MCCB side 2 wires	HYC352H
	MCCB side 3 wires	HYC353H
L connection	1P	HYW328H
Special terminal cover	3P	HYW321H
	4P	HYW322H
Position Switch		HYC255H
Spare safety trip (safety trip included as standard)		HYW256H
	Kit for Quadro SX and Unimes H enclosures	HYW257H

Plug-in breakers

		x630
Plug-in base	3P	HYW200H
	4P	HYW201H
Plug-in adaptator for MCCB	3P	HYW300H
	4P	HYW301H
Auxiliary circuit terminal	Base side	HYC250H
	MCCB side 2 wires	HYC352H
	MCCB side 3 wires	HYC353H
L connection	1P	HYT328H
Special terminal cover	3P	HYW321H
	4P	HYW322H
Safety trip		HYW256H
	Kit for Quadro SX and Unimes H enclosures	HYW257H

Handles

	x630
Direct rotary handle	HXW030H
Direct rotary handle with interlocking	HXW032H
Key kit for rotary handle	HXW888H
Key lock only for rotary handle	HXS999H
On door rotary handle kit with handle and shaft	HXW031H
Extended toggle	HXW033H

Locking

	x630
Padlocking kit	HXA039H

Mechanical interlocking

		x630
Link Interlock kit	3P	HXW165H
	4P	HXW166H
1 front cover for interlocking by cable		HXW066H
Cable for interlock	1 m	HXB070H
	1.5 m	HXB071H

Motor operator

		x630
Motor operator with auto-reset (K) = with key	24-48V DC	HXW040H(K)
	100-110V DC	HXW041H(K)
	110-240 V~	HXW042H(K)
Motor operator without auto-reset (K) = with key	24-48V DC	HXW043H(K)
	100-110V DC	HXW046H(K)
	110-240 V~	HXW044H(K)
Electrical interlock for motor operator	For 2 x x630 motors	HXD068H
	For P250 / x630 motors	HXB069H

Technical changes reserved

Glossary

Ajustment dial
Internal term: knob

AL
Alarm switch

AX
Auxiliary switch

Breaking capacity
The value of prospective current that a switching device is capable of breaking at a stated voltage under prescribed conditions of use and behaviour. Reference is generally made to the rated ultimate short-circuit breaking capacity (Icu) and the service breaking capacity (Ics).

Cascading
Also called coordination, cascading takes into account the current-limiting capacity of a circuit breaker. There is a possibility to install downstream circuit breakers with lower Icu performance levels. The upstream circuit breaker reduces any high short-circuit currents. This makes it possible to install downstream circuit breakers with breaking capacities less than the prospective short-circuit current at their point of installation. The main advantage of cascading is to reduce the overall cost of switchgear, as the current is limited throughout the circuit downstream of the limiting circuit breaker. Cascading applies to all the devices fitted downstream.

Circuit breaker
General term for Moulded Case Circuit Breaker or MCCB

International Protection Marking (IP)
Defines protection of circuit breakers against the penetration of solid objects and liquids, using two digits according to standard IEC 60259. Each digit corresponds to a level of protection, where 0 indicates no protection.

- First digit (0 to 6): protection against penetration of solid foreign objects.
  1 corresponds to protection against objects with a diameter > 50 mm, 6 corresponds to total protection against dust.
- Second digit (0 to 9): protection against penetration of liquids (water).
  1 corresponds to protection against falling drops of water (condensation), 9 corresponds to continuous immersion.

Delayed undervoltage release
Undervoltage release with a given delayed tripping time.

Delayed UVR
Delayed undervoltage release

Discrimination
Also called selectivity, discrimination is ensured between upstream and downstream circuit breakers if, when a fault occurs, only the circuit breaker placed immediately upstream of the fault trips. Discrimination is the key to ensure the continuity of service of an installation.

Energy
Name of h3+ circuit breakers fitted with measurement, alarm and communication features.

Low level auxiliary contact
The low internal impedance of these contacts allows to switch low current levels under low voltages.

Trip unit
Integrated underneath the handle of the circuit breaker, this part is responsible of tripping the circuit breaker depending on the protection parameters that the user sets.

MAG trip unit
Magnetic trip unit

MCCB
Moulded Case Circuit Breaker

MIP
Maintenance Interface Port

Motor operator
Accessory used to remotely open, close and recharge the MCCB.

Pitch
Distance between connection terminals of the circcuit breakers.

Pollution degree
Conventional number based on the amount of conductive or hygroscopic dust, ionized gas or salt and on the relative humidity and its frequency of occurrence, resulting in hygroscopic absorption or condensation of moisture leading to reduction in dielectric strength and/or surface resistivity. h3 circuit breakers are degree 3 according to Standard IEC 60947-1 (conductive pollution occurs, or dry, non-conductive pollution occurs which becomes conductive due to condensation).

Rated service short-circuit breaking capacity (Ics)
Expressed as a percentage of Icu, it provides an indication of the robustness of the device under severe conditions. It is confirmed by a test sequence O - CO - CO at Ics. It is followed by a test to prove that that the device operates correctly at its rated current and the protection system suffers from no damage.

Rated ultimate short-circuit breaking capacity (Icu)
Expressed in kA, it indicates the maximum breaking capacity of the circuit breaker. It is confirmed by a test sequence O - CO (according to IEC 60947-2) at Icu, followed by a test to prove that the circuit is correctly isolated. This test ensures user safety.

Direct rotary handle
Optional handle with the same three positions I (ON), O (OFF) and TRIPPED as the MCCB handle. It maintains suitability for isolation and offers optional locking using a keylock or a padlock.

On door rotary handle
Rotary handle with an extended shaft to control MCCBs from the door of switchboards. It has the same characteristics as direct rotary handles. It offers multiple locking possibilities using a keylock, a padlock or a door interlock.

Safety clearance
When installing a circuit breaker, minimum distances (safety clearances) must be maintained between the device and panels, bars and other protection systems installed nearby. These distances, which depend on the ultimate breaking capacity, are defined by tests according to standard IEC 60947-2.

Shunt trip release
Release operating when supplied with current. It makes circuit-breaker opening when it receives a pulse-type or maintained command.

TM trip unit
Thermal magnetic trip unit

Undervoltage release
Release operating when the supply voltage drops below the given level.

Withdrawable circuit breaker
Internal term: Draw-out

Technical changes reserved

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