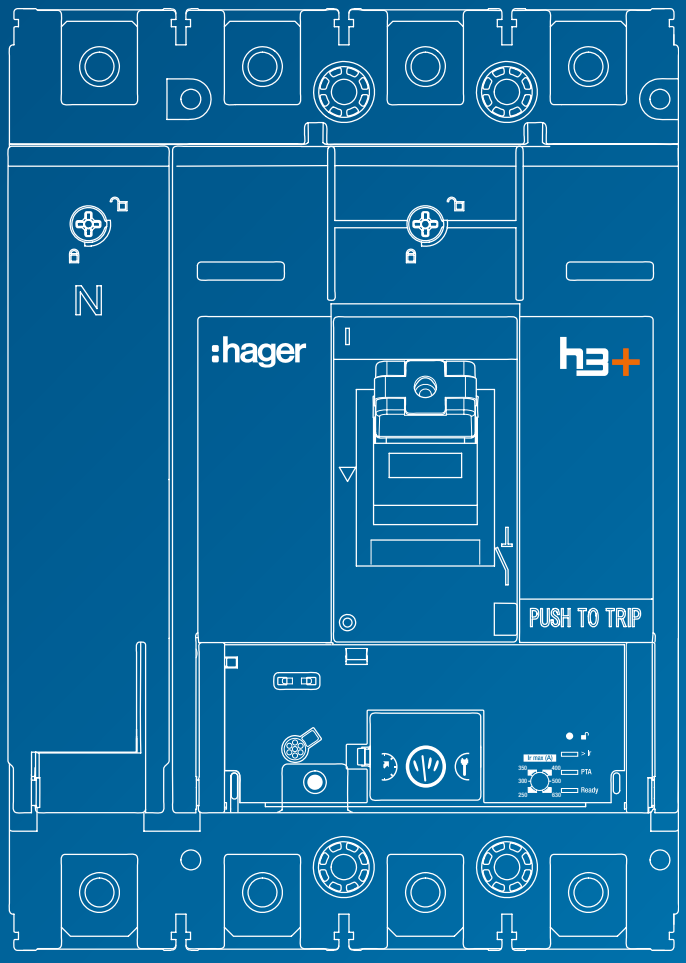
Technical catalogue

h3+

Moulded Case Circuit breakers
up to 630A



: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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h3+ presentation

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The new generation of Hager Moulded Case Circuit Breakers h3+ ensures reliable protection against overloads and short circuits, combined with accurate integrated energy monitoring for all low voltage distribution systems. With a compact frame size, available from 25 to 630 A in 3 and 4 poles, h3+ offers high protection performance with a breaking capacity up to 110 kA.
h3+ MCCBs, available with either a built-in thermal-magnetic trip unit or electronic trip unit, offer flexible protection settings to ease discrimination in all electrical distribution installations.
Hager is meeting the latest energy efficiency standards by introducing new features to its offer of Moulded Case Circuit Breakers.

Users will benefit from a class 1 energy monitoring and communication system compatible with Modbus RTU protocol, that will allow them to configure protections parameters, monitor energy consumptions and manage alarms.
Special attention has been given to ergonomics in order to facilitate the integration of h3+ MCCB in electrical panel boards. Different methods of mounting are proposed along with different types of connections to increase the flexibility of installation.



h3+ P160 1P TM



h3+ P160 3P Energy



h3+ P250 3P Energy



h3+ P630 Energy 3P Energy

h3+ Moulded Case Circuit Breaker at a glance
The h3+ range of MCCB can be briefly described as follows:
- Three frame sizes: P160, P250 and P630
- Rated current from 25 A to 630 A
- Icu and Ics up to 110 kA (415 V~)
- Available in 1, 3 and 4 poles
- Rated nominal voltage Ue up to 800 V~
- Thermal-Magnetic, Magnetic and Electronic Trip Units
- Wide range of accessories

h3+ Switch-disconnectors
- P160 ratings: 125 A, 160 A
- P250 ratings: 200 A, 250 A
- P630 ratings: 400 A, 630 A

Energy electronic trip unit with:
- Embedded display
- Measurement features (I, U, P, E, PF, THD…)
- Class 1 accuracy on energy measurements according to IEC 61557-12
- Alarm management and event histories
- Output contacts (PTA, OAC)
- Modbus RTU communication for remote monitoring and control
- MIP Connector
- Communication accessories (Panel display, COM module…)

	H	N	M	E	S	P	TM	MAG (ICB)	LSnI	LSI	LSIG	Energy
	25 kA	40 kA	50 kA	70 kA	85 kA	110 kA						
P160	X	X	X	X			25 to 160 A		40 to 160 A		-	40 to 160 A
P250	X	X	X	X	X		50 to 250 A	100 to 250 A	40 to 250 A			
P630		X	X	X		X	250 to 630 A					

Technical changes reserved

Range overview

Switch-disconnector



Switch

Magnetic



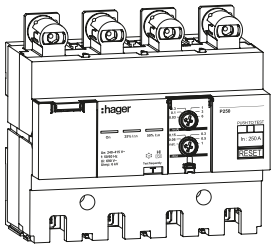
MAG (ICB)

Thermal-magnetic

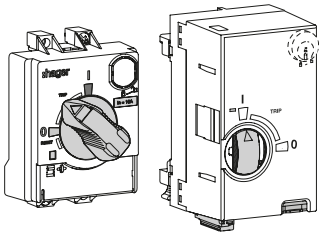


TM adj

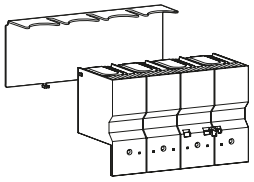
Accessories



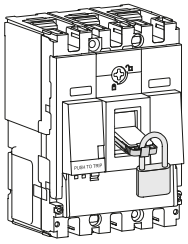
Earth leakage



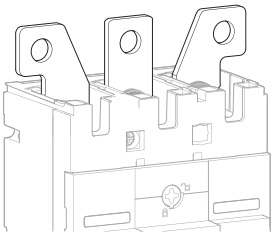
Handles and motor operator



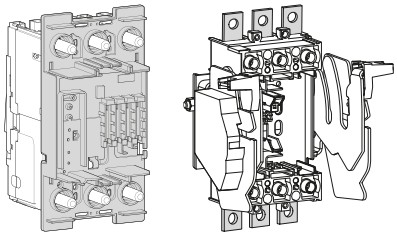
Insulation



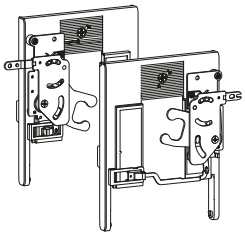
Locking and sealing

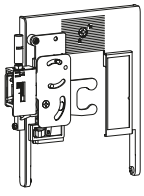


Connections



Mounting types





Interlocking accessories

Technical changes reserved

Electronic Range



LSnI



LSI

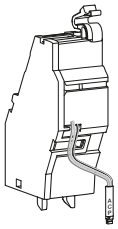


LSIG

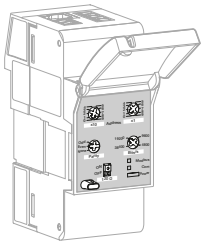


Energy

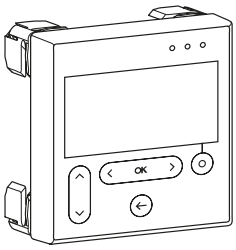
Communication devices



AX/AL Energy

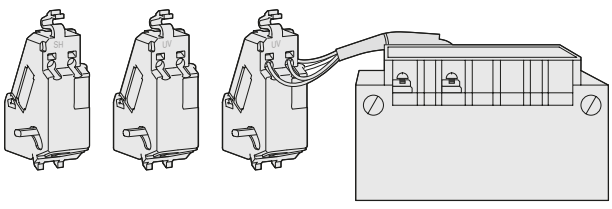


Modbus Modules



Display

Auxiliaries



Shunt trip and under voltage releases

h3+ communication system





h3+ communication schematic

The h3+ communication system allows the establishment of local and remote communication between the Energy MCCB and its surroundings.

Local monitoring is done using either the embedded display or the panel display on which the user can see all the measurements collected by the power meter integrated in the Energy MCCB. As for the local controlling, it can be done using either the OAC output contact or the PTA output contact. In addition to that, a dedicated port exists to connect the MCCB locally to the h3+ Configuration tool that will allow to do the configuration and the test of the MCCB along with a visualisation of all measurements collected by the MCCB itself.

Remote monitoring can be done by connecting the MCCB Energy via the Modbus COM Module to the hager agardio.manager server. The communication with agardio.manager works according to Modbus RTU protocol.

The h3+ communication system contributes in increasing energy efficiency, improving electrical power quality, maintaining the continuity of supply and alerting the user in case of any malfunction.

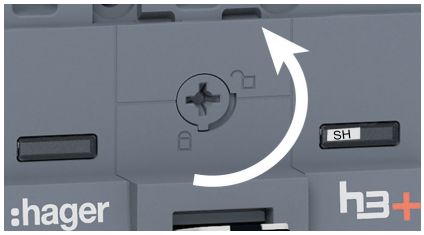
Overview of the main functionalities provided by the h3+ communication system:

- Checking MCCB status:
  On/Off position, trip indication and fault-trip indication
- Visualising measurements:
  mainly I, U, f, P, E, and THD.
- Configuration of the protection settings, measurement parameters and custom alarms.
- Managing alarms by the means of embedded output contacts: PTA and OAC.
- Operating commands:
  open, close, and trip by the means of accessories such as the motor operator and the Shunt trip/Undervoltage releases.
- Operating data:
  settings, alarms, events and maintenance indicators.

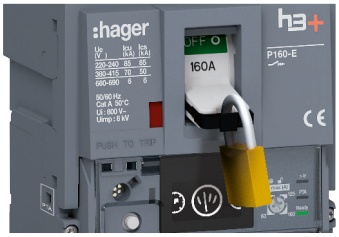
The Maintenance Interface Port (MIP) located at the front of the electronic trip units is used to interface the MCCB to the h3+ Configuration tool.
This tool is suitable for an expert use of the h3+ electronic trip units. It provides functions such as configuration, monitoring and test.

Technical changes reserved

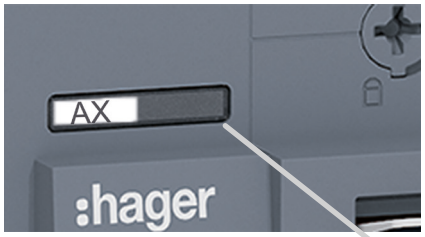
h3+ Energy highlights



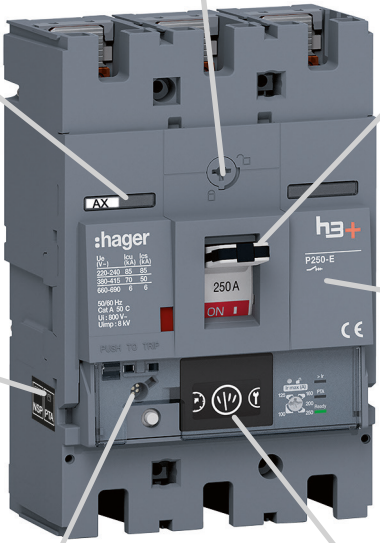
Fast opening ¼ turn screw
Eases the access to auxiliary and communication cavities.

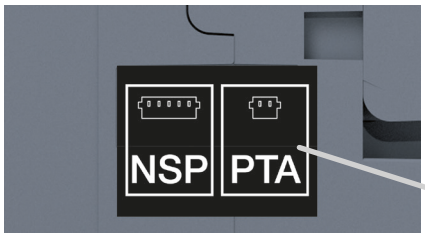


Integrated padlocking facility
Up to 4 mm Ø padlocks handled without accessory tool.

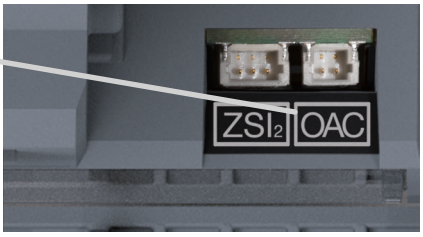


Auxiliary indication windows
Presence of auxiliaries easily visible.

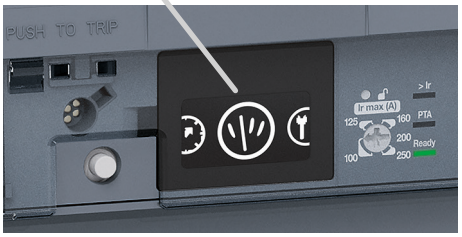




Integrated PTA output contact
Output contact dedicated to the overload prealarm.



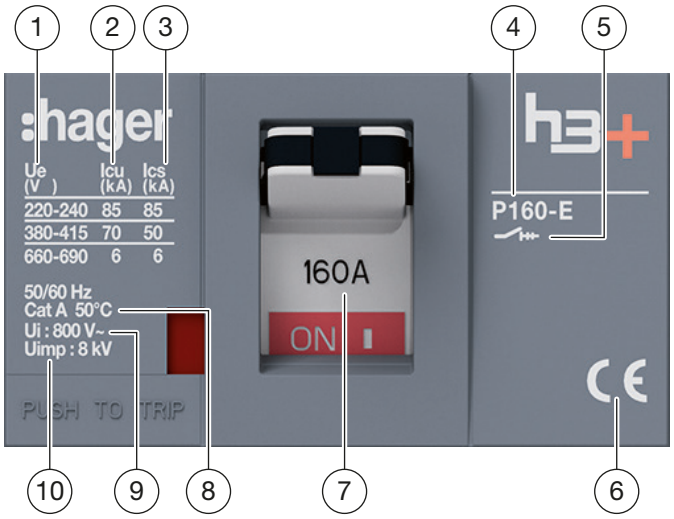
Integrated OAC output contact
Output contact assignable to a custom alarm with access behind the front cover.



High contrast display
Display on h3+ Energy MCCB benefits from OLED technology and can be oriented in any direction to match the MCCB ortientation..

h3+ Configuration tool
Wireless access to the electronic trip units for configuration, test and diagnostic.

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. Calibration temperature
9. Ui: Rated insulation voltage
10. Uimp: Rated impulse withstand voltage

Breaking capacity classification:

	Icu (380 – 415 V~)
H	25 kA
N	40 kA
M	50 kA
E	70 kA
S	85 kA
P	110 kA

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

Ambient temperature
h3+ P160, P250 and P630 circuit breakers can be used from -25 °C to 70 °C.
For ambient temperatures greater 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 79.

h3+ P160, P250 and P630 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.

Technical changes reserved

Electromagnetic disturbances
h3+ 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 (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.

Over-current Discrimination (Selectivity)
h3+ circuit breakers provide all characteristics required to apply over-current protective co-ordination as defined in the IEC 60947-1.
Depending on the type of two or more h3+ MCCBs in series, total or partial discrimination (selectivity) can be achieved.

Total over-current discrimination (Total selectivity):
In case of two MCCBs in series, the circuit breaker at the downstream level ensures the protection without tripping the circuit breaker at the upstream level.

Partial over-current discrimination (Partial selectivity):
In case of two MCCBs in series, the MCCB at the downstream level ensures the protection up to a given value of over-current level without tripping the MCCB at the upstream level.

Discrimination tables between different associations of protection devices (ACB-MCCB-MCB) are given in a separate document.

Cascading
Cascading or back-up protection means that the current limiting capacity of a MCCB makes it possible to install downstream circuit breakers that have lower Icu levels.

The different values of short-circuit currents between different associations of protection devices (ACB-MCCB-MCB) are given in cascading tables that are published in a separate document.

Suitable for isolation with positive contact indication
All h3+ P160, P250 and P630 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+ P160, P250 and P630 circuit breakers withstand mechanical vibrations.
h3+ circuit breakers comply 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.

Circuit breakers				**P160**				**P250**					**P630**				
Number of poles				3, 4				3, 4					3, 4				
General characteristics																	
Rated current at 50 °C	In	(A)		160				250					630				
Current rated range		(A)		25 - 160 (Thermal Magnetic), 40 - 160 (Electronic)				50 - 250 (Thermal Magnetic), 40 - 250 (Electronic)					250 - 630				
Operational voltage, (AC)	Ue	(V)		220 - 690				220 - 690					220 - 690				
Frequency	f	(Hz)		50/60				50/60					50/60				
Operational voltage, (DC)	Ue	(V)	1P	125				125					125				
			2P	250				250					250				
			3P	375				375					375				
			4P	500				500					500				
Rated insulation voltage	Ui	(V)		800				800					800				
Rated impulse withstand voltage	Uimp	(kV)		8				8					8				
Suitability for isolation				yes				yes					yes				
Utilisation category (IEC60947-2)				A				A					B ≤400A A > 400A				
Pollution degree				3				3					3				
Breaking capacity level				H	N	M	E	H	N	M	E	S	H	N	M	E	P
Rated ultimate short-circuit breaking capacity, (Icu)																	
(AC) 50/60 Hz 220/240 V	Icu	(kA)		35	50	65	85	35	50	65	85	85	35	70	85	100	125
(AC) 50/60 Hz 380/415 V	Icu	(kA)		25	40	50	70	25	40	50	70	85	25	40	50	70	110
(AC) 50/60 Hz 660/690 V*	Icu	(kA)		6	6	6	6	6	6	6	6	6	7	7	12	12	12
(AC) 50/60 Hz 660/690/800 V**	Icu	(kA)		-	-	-	-	-	-	-	-	-	-	-	20	20	20
(DC) 125 V 1P	Icu	(kA)		5	10	15	20	5	10	15	20	20	6(1)	6(1)	6(1)	8(2)	8(2)
(DC) 250 V 2P	Icu	(kA)		5	10	15	20	5	10	15	20	20	6(1)	6	6(1)	8(2)	8(2)
(DC) 375 V 3P	Icu	(kA)		5	10	15	20	5	10	15	20	20	6(1)	6(1)	6(1)	8(2)	8(2)
(DC) 500 V 4P	Icu	(kA)		5	10	15	20	5	10	15	20	20	6(1)	6(1)	6(1)	8(2)	8(2)
Rated service short-circuit breaking capacity, (Ics)																	
(AC) 50/60 Hz 220/240 V	Ics	(kA)		35	50	65	85	35	50	65	85	85	35	70	85	100	125
(AC) 50/60 Hz 380/415 V	Ics	(kA)		25	40	50	50	25	40	50	50	50	25	40	50	70	110
(AC) 50/60 Hz 660/690 V	Ics	(kA)		6	6	6	6	6	6	6	6	6	7	7	12	12	12
(AC) 50/60 Hz 800 V**	Ics	(kA)		-	-	-	-	-	-	-	-	-	-	-	10	10	10
(DC) 125 V 1P	Ics	(kA)		5	5	7.5	10	5	5	7.5	10	10	6(1)	6(1)	6(1)	8(2)	8(2)
(DC) 250 V 2P	Ics	(kA)		5	5	7.5	10	5	5	7.5	10	10	6(1)	6	6(1)	8(2)	8(2)
(DC) 375 V 3P	Ics	(kA)		5	5	7.5	10	5	5	7.5	10	10	6(1)	6(1)	6(1)	8(2)	8(2)
(DC) 500 V 4P	Ics	(kA)		5	5	7.5	10	5	5	7.5	10	10	6(1)	6(1)	6(1)	8(2)	8(2)
Mechanical endurance in number of operations (IEC 60947-2)				40 000				40 000					30 000				
Electrical endurance in number of cycles	440 V AC (IEC 60947-2)			10 000				10 000					6 000 ≤ 400A 4 000 > 400A				
	800 V AC**			-				-					2 000				
	500 V DC In			1 000				1 000					1 000				
	500 V DC In/2			1 500				1 500					1 500				

* : Electronic trip unit
** : TM trip unit
(1) : Value for 630 A. For In ≤ 400 A, Icu = Ics = 7.5 kA
(2) : Value for 630 A. For In ≤ 400 A, Icu = Ics = 10 kA

Technical changes reserved

Circuit breakers			P160	P250	P630
Environment					
Operating temperature			-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Storage temperature			-35 °C to +70 °C	-35 °C to +70 °C	-35 °C to +70 °C
Tropicalisation			95 % HR at 55 °C	95 % HR at 55 °C	95 % HR at 55 °C
Altitude		(m)	≤ 2000	≤ 2000	≤ 2000
Terminations					
Pitch		(mm)	30	35	45
Maximal terminal torque		(Nm)	6	12	18
Terminal width		(mm)	21	25	32
Dimensions					
Height		(mm)	130	165	260
Width	3P	(mm)	90	105	140
	4P	(mm)	120	140	185
Depth		(mm)	97	97	150
Weight	3P	(kg)	1.1	1.5	5.8
	4P	(kg)	1.4	1.9	7.6

Circuit breakers	P160	P250	P630
Protection	yes	yes	yes
MAG (ICB): Ii adjustable	yes	yes	yes
TM (Thermal magnetic): Ir adjustable, Ii adjustable, neutral protection adjustable on 4P	yes	yes	yes
LSnI: Ir adjustable, tr fixed, Isd adjustable, tsd fixed, Ii fixed, neutral protection adjustable on 4P	yes	yes	yes
LSI: Ir & tr adjustable, Isd & tsd adjustable, Ii adjustable, neutral protection adjustable on 4P	yes	yes	yes
LSIG: Ir & tr adjustable, Isd & tsd adjustable, Ii adjustable, Ig & tg fixed, neutral protection adjustable on 4P	no	yes	yes
Energy: Ir & tr adjustable, Isd & tsd adjustable, Ii adjustable, Ig & tg adjustable, neutral protection adjustable on 4P	yes	yes	yes
Earth leakage protection with add-on block	no	yes	yes
Earth leakage protection with relay	yes	yes	yes

Measurement and advanced functions

Trip unit version	LSnI	LSI	Energy	LSnI	LSI	LSIG	Energy	LSnI	LSI	LSIG	Energy
Embedded display of measurements and trip causes	no	no	yes	no	no	no	yes	no	no	no	yes
PTA output contact	no	yes	yes	no	yes	yes	yes	no	yes	yes	yes
OAC output contact	no	no	yes	no	no	no	yes	no	no	no	yes
MIP connector for Configuration tool	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Options											
Panel display	no	no	yes	no	no	no	yes	no	no	no	yes
Communication module	no	no	yes	no	no	no	yes	no	no	no	yes
MCCB status, operation and trip counters via AX/AL Energy	no	no	yes	no	no	no	yes	no	no	no	yes
Configuration tool	yes*	yes*	yes	yes*	yes*	yes*	yes	yes*	yes*	yes*	yes

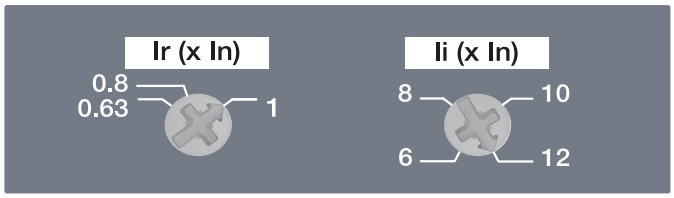
(*) limited to certain functions.

h3+ electromechanical range

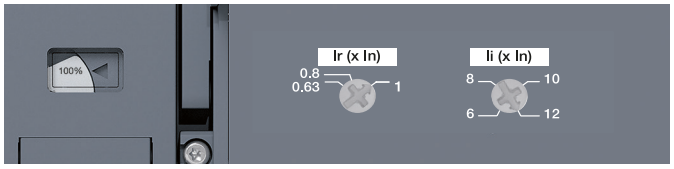
		Page
01	TM and MAG (ICB) trip units	18

TM

h3+ 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.



Trip unit TM



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).
P160 can only be associated with an RCD relay.
P250 works with both solutions.

Neutral protection on TM circuit breakers

P160 and P250 TM circuit breakers are available as:

- 3P3D:
  3-pole device with detection on each pole, neutral protection is not possible.
- 4P4D:
  4-pole device with adjustable neutral protection on the left pole.

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.
The thermal protection threshold Ir can be adjusted between 0.63xIn and In.
Time delay is fixed.

Magnetic protection Ii (A)

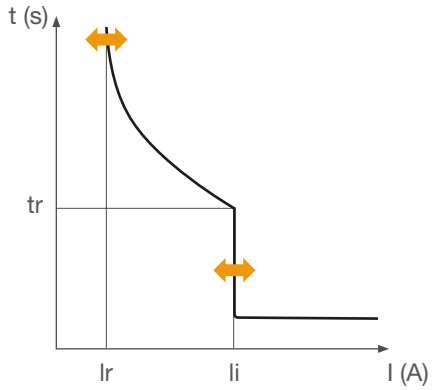
Magnetic protection against short-circuits is adjustable and allows instantaneous tripping.
P160: adjustable from 6 to 12 times the nominal rating (In) of circuit breakers up to 125 A and 6 to 10 times for the 160 A.
P250: adjustable from 6 to 13 times the nominal rating (In) of circuit breakers up to 160 A, 6 to 12 times for 200 A and 6 to 10 times for 250 A.
P630: adjustable from 4 to 10 times the nominal rating (In) of circuit breakers up to 400 A and from 4 to 8 times the nominal rating (In) for 630 A.
For DC installations, the magnetic threshold can be calculated by the following formula:
[Ii DC] = [Ii AC] x [DC/AC ratio]

	In	Ii setting in AC	DC/AC ratio
P160	Up to 125 A	6x In	1.25
		12x In	1.25
	160 A	6x In	1.25
		10x In	1.25
P250	Up to 160 A	6x In	1.25
		13x In	1.25
	200 A	6x In	1.25
		12x In	1.25
	250 A	6x In	1.25
		10x In	1.25
P630	250 A	5x In	0.85
		10 xIn	1.10
	400 A	5x In	0.85
		10x In	1.15
	630 A	4x In	1.00
		8x In	1.25

Technical changes reserved

TM trip units



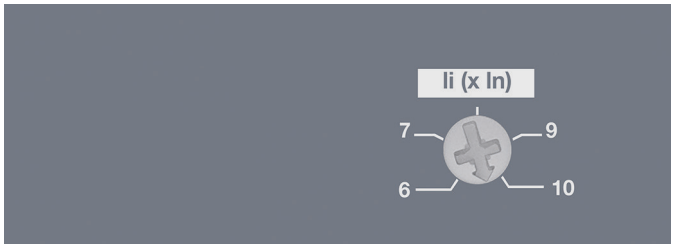


In at 50 °C	25 A	40 A	50 A	63 A	80 A	100 A	125 A	160 A	200 A	250 A	320 A	400 A	630 A*
P160	x	x		x	x	x	x	x					
P250			x	x	x	x	x	x	x	x			
P630										x	x	x	x
Thermal protection													
Ir … x In (tripping current between 1.05 and 1.30 x Ir)	adjustable 0.63 - 0.8 - 1												
Time delay tr	fixed												
Magnetic protection													
Ii (+/- 20 %) x In	adjustable												
P160	6 - 8 - 10 - 12							6 - 7 - 8 - 9 -10					
P250		6 - 8 - 10 - 13							6 - 8 - 10 - 12	6 - 7 - 8 - 9 - 10			
P630										5 - 6 - 7 - 8 - 9 - 10			4 - 5 - 6 - 7 - 8
Time delay	fixed												
Neutral protection													
3P	-												
4P	0 % or 100 % of Ir												0 % or 100 % 0 % or 50 % of In

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

MAG (ICB)

The h3+ circuit breakers fitted with magnetic trip units are destinated for a 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

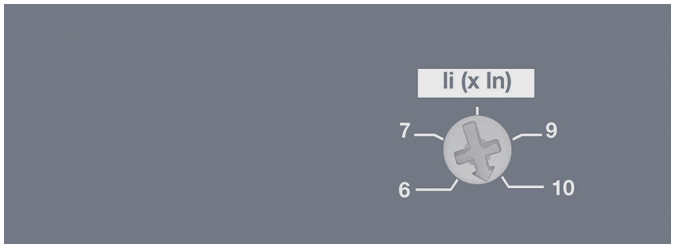
Magnetic protection Ii (A)

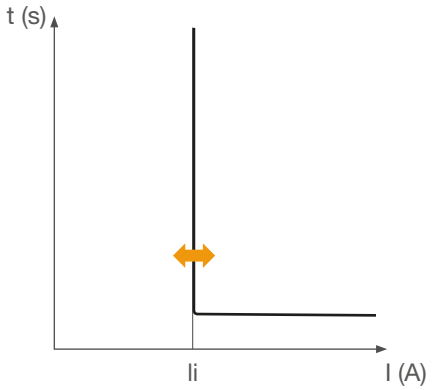
Magnetic protection against short-circuits is adjustable and allows instantaneous tripping.
P160: adjustable from 6 to 12 times the rating (In) of circuit breakers up to 125 A and 6 to 10 times for the 160 A.
P250: adjustable from 6 to 13 times the rating (In) of circuit breakers up to 160 A, 6 to 12 times for 200 A and 6 to 10 times for 250 A.

Circuit breakers with MAG trip unit

P160 and P250 MAG circuit breakers are available as 3P (3P3D) and 4P (4P4D).

MAG trip units





In at 50 °C	25 A	40 A	50 A	63 A	80 A	100 A	125 A	160 A	200 A	250 A	320 A	500 A
P160	x	x	x	x	x	x	x	x				
P250						x	x	x	x	x		
P630											x	x
Magnetic protection												
Ii (+/- 20 %) x In	adjustable											
P160	6 - 8 - 10 - 12							6 - 7 - 8 - 9 -10				
P250						6 - 8 -10 -13			6 - 8 - 10 - 12	6 - 7 - 8 - 9 - 10		
P630											5 - 6 - 7 - 8 - 9 - 10	4 - 5 - 6 - 7 - 8
Time delay	fixed											
Neutral protection												
3P	-											
4P	same as phases											

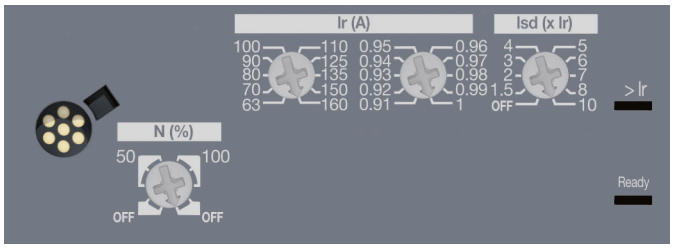
Technical changes reserved

h3+ electronic range

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01 Electronic trip units	24
02 Communication devices	36

LSnI

h3+ circuit breakers fitted with LSnI trip units are for use in electrical distribution applications. They are used for protection of conductors 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 tuning of Ir (A) is done with 2 dials.
Time delay tr (s) is non-adjustable.

Short time protection S

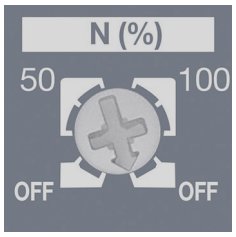
Short time protection is for short-circuits. Isd (A) is adjustable with a dial from 1.5 to 10 times the long time protection Ir of the circuit breaker. Short time protection can be disabled.
Time delay tsd is non-adjustable.

Non-adjustable instantaneous protection Ii

Instantaneous short-circuit protection Ii (A) is fixed.
Non tripping time delay is 10 ms and the maximum breaking 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).
P160 can only be associated with a separate RCD relay.
P250 works with both solutions.

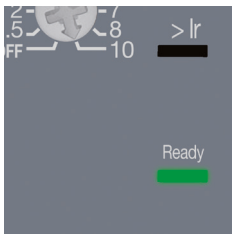


Neutral protection dial

Neutral protection on LSnI circuit breakers

P160 and P250 LSnI circuit breakers are available as:

- 3P3D: No neutral protection.
- 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

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.
> Ir LED: It starts blinking red when I ≥ 105% Ir and remains red in case I > 112% Ir.



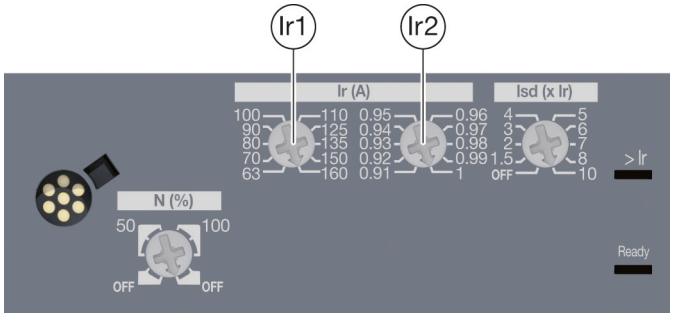
MIP Connector

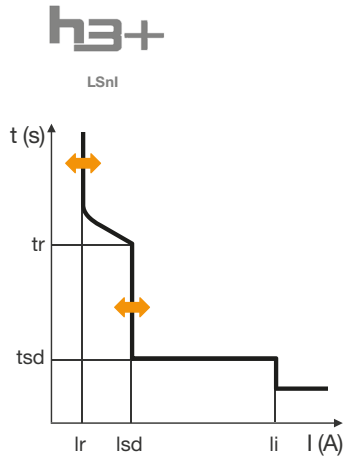
MIP Connector

Connection for Configuration tool Hager Power setup.

Technical changes reserved

LSnI trip units





In		40 A	100 A	160 A	250 A	400 A	630 A
	P160	X	X	X			
	P250	X	X	X	X		
	P630				X	X	X

Long time protection

Ir (pick-up tripping between 1.05 and 1.20 x Ir)

Ir1 (A)	In = 40 A	16 - 18 - 20 - 22 - 25 - 28 - 32 - 34 - 37 - 40
	In = 100 A	40 - 45 - 50 - 57 - 63 - 72 - 80 - 87 - 93 - 100
	In = 160 A	63 - 70 - 80 - 90 - 100 - 110 - 125 - 135 - 150 - 160
	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 (A) = Ir1 x Ir2	Fine tuning 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

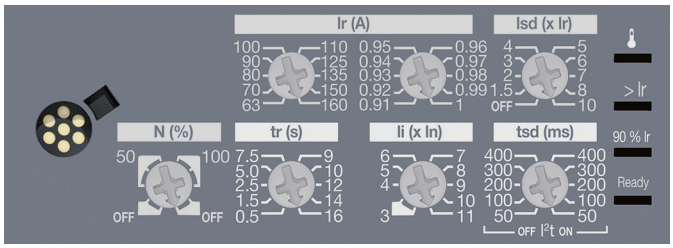
Instantaneous pickup Ii = In x … accuracy +/- 15 %	P160 - P250 : In = 40 A ; 100 A	15
	P160 - P250 : In = 160 A ; 250 A	11
	P630 : In = 250 A ; 400 A	12
	P630 : In = 630 A	11
Time delay (ms)		-
	Non-tripping time	10
	Maximum breaking time	50

Neutral protection (only for 4P)

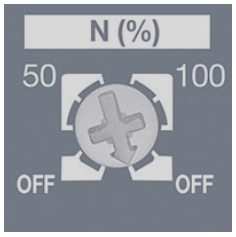
Neutral protection = Phase protection (Ir, Isd) x …		OFF - 50 % - 100 %
	Instantaneous protection	same as phases
	Time delay	same as phases for tr, tsd and instantaneous

LSI

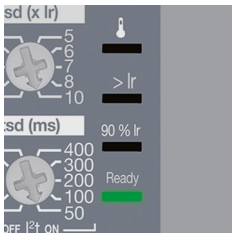
h3+ circuit breakers fitted with LSI trip units are for use in electrical distribution applications for protection of conductors and loads in case of a wide range of protection settings is required. Settings with adjustment dials are at front of products and allow an accurate protection setting and a tripping curve that is independent of the ambient temperature.



Trip unit LSI



Neutral protection dial LSI trip unit



Front LED indicators



MIP Connector

Long time protection L

Long-time protection provides an inverse time curve I^2t against overloads.
Fine tuning of Ir (A) is done with two dials.
Time delay tr (s) is adjustable via one dial.

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 adjustable using a dial from 50 to 400 ms with the possibility of including an inverse time curve (I^2t OFF or ON).

Instantaneous protection Ii

Instantaneous short-circuit protection Ii (A) is adjustable from:
- 3 to 15 times the nominal current In for circuit breakers with In up to 100 A,
- 3 to 11 times the nominal current In for P160 and P250 circuit breakers with In 160 A or 250 A and for P630 with In 630 A.
- 3 to 12 times the nominal current In for P630 circuit breakers with In 250 A or 400 A;

Non-tripping time delay is 10 ms and the maximum breaking 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).
P160 can only be associated with an RCD relay.
P250 and P630 work with both solutions.

Neutral protection on LSIG circuit breakers

P160, P250 and P630 LSI circuit breakers are available as:
- 3P3D: No neutral protection.
- 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

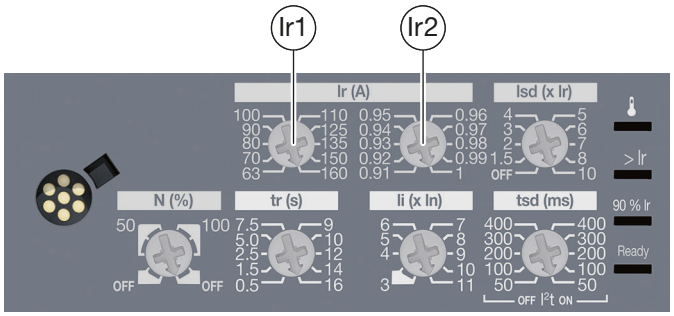
Temperature LED: It turns red when the internal temperature of the trip unit reaches 105 °C.
> Ir LED: It starts blinking red when I ≥ 105 % Ir and remains red in case I > 112 % Ir.
90 % Ir LED: It starts blinking orange when I ≥ 90 % Ir and remains orange when the corresponding PTA output contact is activated.
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.

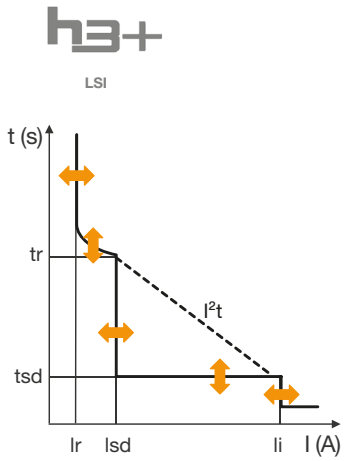
MIP Connector

Connection for Configuration tool Hager Power setup.

Technical changes reserved

LSI trip units





In		40 A	100 A	160 A	250 A	400 A	630 A
	P160	X	X	X			
	P250	X	X	X	X		
	P630				X	X	X

Long time protection

Ir (pick-up tripping between 1.05 and 1.20 x Ir)

Ir1 (A)	In = 40 A	16 - 18 - 20 - 22 - 25 - 28 - 32 - 34 - 37 - 40
	In = 100 A	40 - 45 - 50 - 57 - 63 - 72 - 80 - 87 - 93 - 100
	In = 160 A	63 - 70 - 80 - 90 - 100 - 110 - 125 - 135 - 150 - 160
	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 (A) = Ir1 x Ir2	Fine tuning 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	0.5 - 1.5 - 2.5 - 5 - 7.5 - 9 - 10 - 12 - 14 - 16

S Short time protection

Isd = OFF ; = Ir x …	Accuracy +/- 10 %	1.5 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 10				
Time delay (ms)	tsd I²t OFF	50	100	200	300	400
	tsd I²t ON	50	100	200	300	400
	Non-tripping time	20	80	180	280	380
	Maximum breaking time	80	150	250	350	450

I Instantaneous protection

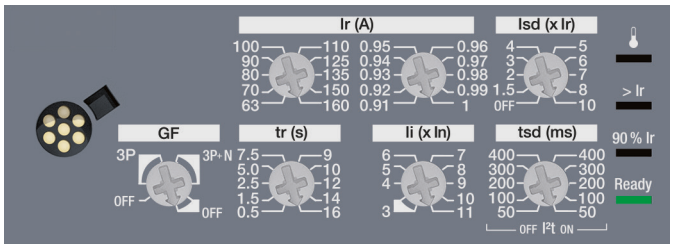
Instantaneous pickup Ii = In x … accuracy +/- 15 %	P160 - P250	In = 40 A ; 100 A	3 - 4 - 5 - 6 - 7 - 8 - 10 - 12 - 15
		In = 160 A ; 250 A	3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11
	P630	In = 250 A ; 400 A	3 - 4 - 5 - 6 - 7 - 8 - 10 - 11 - 12
		In = 630 A	3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11
Time delay (ms)		Non-tripping time	10
		Maximum breaking time	50

Neutral protection (only for 4P)

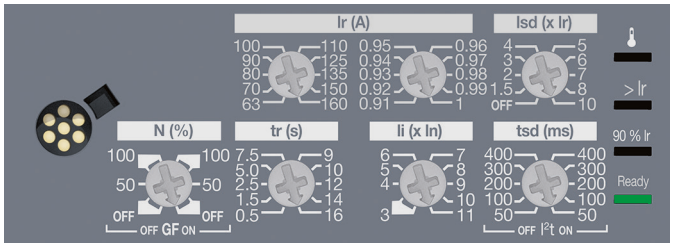
Neutral protection = Phase protection (Ir, Isd) x …		OFF - 50 % - 100 %
	Instantaneous protection	same as phases
	Time delay	same as phases for tr, tsd and instantaneous time delays for phases

LSIG

h3+ circuit breakers fitted with LSIG trip units are for use in electrical distribution applications for protection of conductors and loads in cases where a ground fault protection is required in a TN-S earthing system. Settings are done with adjustment dials located at the front of the products. These dials allow accurate protection setting and a tripping curve independent of the ambient temperature.



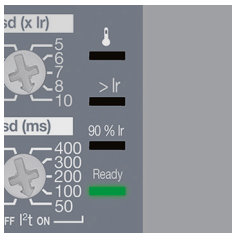
Trip unit LSIG for 3 poles



Trip unit LSIG for 4 poles



Neutral protection dial LSIG trip unit



Front LED indicators



MIP Connector

Long time protection L

Long time protection provides an inverse time curve I^2t against overloads.
Fine tuning of Ir (A) is done with two dials.
Time delay tr (s) is adjustable via one dial.

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 adjustable via a dial from 50 to 400 ms with the possibility of including an inverse time curve (I^2t OFF or ON).

Instantaneous protection Ii

Instantaneous short-circuit protection Ii (A) is adjustable from:
- 3 to 15 times the nominal current In for circuit breakers with In up to 100 A,
- 3 to 11 times the nominal current In for P250 circuit breakers with In 160 A or 250 A.
- 3 to 12 times the nominal current In for P630 circuit breakers with In 250 A or 400 A;

Non-tripping time delay is 10 ms and the maximum breaking time delay is 50 ms.

Ground fault protection G

Ground fault protection is an insulation fault type including a portion of an inverse time curve I^2t. It can be activated or deactivated (GF OFF or ON). It is with a fixed pick-up Ig of 40% x In for In = 40 A, 20% x In for In > 40 A and fixed time delay tg of 200 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).
P160 can only be associated with an RCD relay.
P250 and P630 works with both solutions.

Neutral protection on LSI circuit breakers

P160, P250 and P630 LSIG circuit breakers are available as:
- 3P3D: No neutral protection.
- 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

Temperature LED: It turns red when the internal temperature of the trip unit has reached 105 °C.

Thermal LED:
I<90%*Ir: None of LED are activated.
90%*Ir<I<105%*Ir:
- 3rd LED will be activated as Orange fix color

105%*Ir< I<112%*Ir:
- 2nd LED will be activated as Red blinking
- 3rd LED will be activated as Orange fix color

112%*Ir<I:
- 2nd LED will be activated as Red fix color
- 3rd LED will be activated as Orange fix color

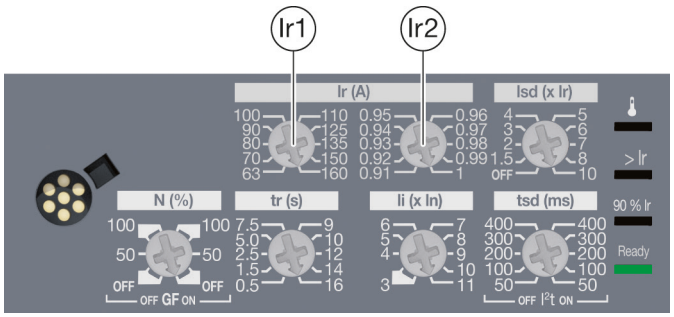
Ready LED:
- When the trip unit is ready to protect, the LED is Green fix color
- If the LED is Red blinking, it means is an auto test.

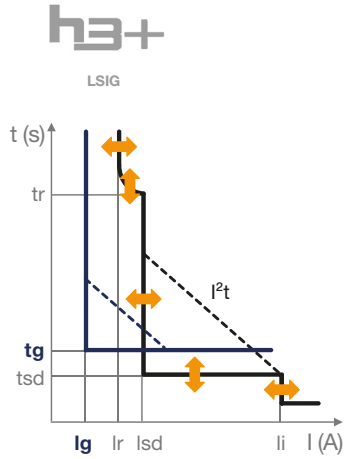
MIP Connector

Connection for Configuration tool Hager Power setup.

Technical changes reserved

LSIG trip units





In		40 A	100 A	160 A	250 A	400 A	630 A
	P250	X	X	X	X		
	P630				X	X	X

Long time protection

Ir (pick-up tripping between 1.05 and 1.20 x Ir)

Ir1 (A)	In = 40 A	16 - 18 - 20 - 22 - 25 - 28 - 32 - 34 - 37 - 40
	In = 100 A	40 - 45 - 50 - 57 - 63 - 72 - 80 - 87 - 93 - 100
	In = 160 A	63 - 70 - 80 - 90 - 100 - 110 - 125 - 135 - 150 - 160
	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 (A) = Ir1 x Ir2	Fine tuning 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	0.5 - 1.5 - 2.5 - 5 - 7.5 - 9 - 10 - 12 - 14 - 16

S Short time protection

Isd = OFF ; = Ir x …	Accuracy +/- 10 %	1.5 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 10				
Time delay (ms)	tsd I²t OFF	50	100	200	300	400
	tsd I²t ON	50	100	200	300	400
	Non-tripping time	20	80	180	280	380
	Maximum breaking time	80	150	250	350	450

I Instantaneous protection

Instantaneous pickup Ii = In x … accuracy +/- 15 %	P160 - P250	In = 40 A ; 100 A	3 - 4 - 5 - 6 - 7 - 8 - 10 - 12 - 15
		In = 160 A ; 250 A	3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11
	P630	In = 250 A ; 400 A	3 - 4 - 5 - 6 - 7 - 8 - 10 - 11 - 12
		In = 630 A	3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11
Time delay (ms)		Non-tripping time	10
		Maximum breaking time	50

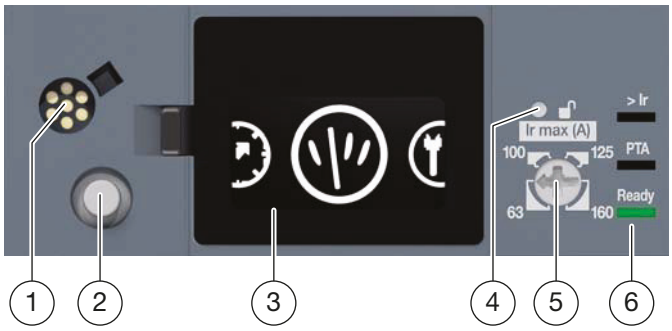
G Ground fault protection

GF = OFF; GF = ON with Ig (A) = …%In	In = 40 A	40
	In > 40 A	20
Time Delay (ms)	tg I²t OFF	200
	tg I²t ON	200
	Non-tripping time	180
	Maximum breaking time	250

Neutral protection (only for 4P)

Neutral protection = Phase protection (Ir, Isd) x …		OFF - 50 % - 100 %
	Instantaneous protection	same as phases
	Time delay	same as phases for tr, tsd and instantaneous time delays for phases

Energy trip units



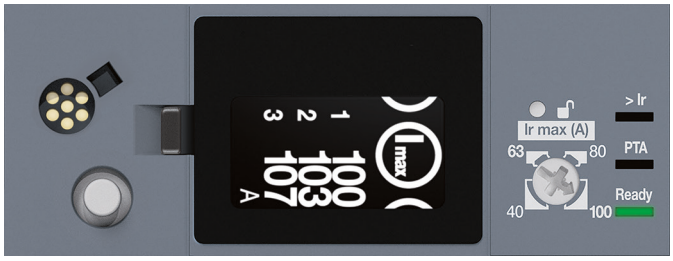
1. Maintenance interface Port (MIP)
2. h3+ joystick
3. Embedded display
4. Unlock button
5. Ir max dial
6. Front LED indicators

h3+ MCCBs fitted with Energy trip units are for protection of conductors and loads in electrical distribution applications. They present a wide range of settings to cope with the requirements of load protection and circuit selectivity in electrical distributions.
Furthermore, they offer the user the possibility to do energy management by showing all measurements collected by the embedded sensors working on the basis of Rogowski technology.
Moreover, advanced remote functions and alarm management features are provided.

Energy functions:

- Measurements visualisation
- Protection settings configuration
- Alarm management
- Integrated OAC contact and PTA output contact
- Event logs
- Communication interface to the Panel display and to the Modbus COM module

Embedded display h3+ Energy

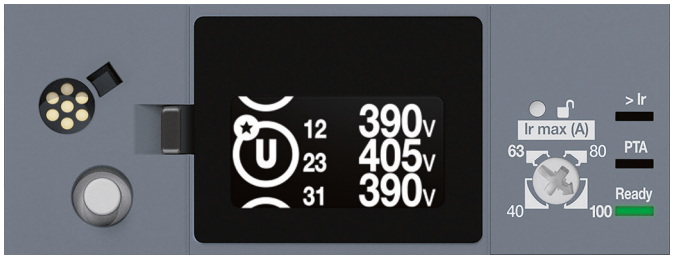


Embedded display horizontal

h3+ Energy MCCBs display the protection settings and the main measurements on the high contrast embedded screen. The h3+ joystick located at the front of the MCCB allows the navigation through the four main menus: Protection, Measure, Configuration and Information.

Even if the Energy trip unit is self-powered by a minimum of current flowing through the MCCB, an external 24 V DC power supply is recommended to make the display available under all operating conditions and to allow the Energy trip unit to fulfill all the functions of measurement and memorisation of events (Trips, alarms).
An easy configuration of the screen rotation by 90°, 180° or 270° is possible to guarantee a good reading of the display regardless of the mounting position of the Energy MCCB.
Moreover, the user can set his favourite measurements that will keep scrolling on the screen when the embedded display is in Live mode.

Measurements



Embedded display Measurements menu

The h3+ Energy MCCBs measure real time rms value of the current, voltage, frequency, power and others.
Every instantaneous measurement can be associated with a maximeter. Maximeters can be reset.

The h3+ Energy MCCBs also measure all energies with a Class 1 accuracy according to IEC 61557-12.
The partial energy can be reset.
Power demand values can also be calculated by h3+ Energy MCCB. These calculations can be made using a fixed or sliding interval that can be set from 5 to 60 minutes in steps of 1 minute. The calculation window can be synchronised with a signal sent via the communication system through the Com module. These demand values can be used to provide trend curves and forecasts based on this data. They will provide basic data to draw a load profile and to adjust consumption to the subscribed power.
In addition to that, h3+ Energy MCCBs measure the total harmonic distortion (THD) of current and voltage.

Technical changes reserved

Measurements

			Embedded display	HTD210H Panel display
Real time rms measurements				
Current	Phase and neutral	I1, I2, I3; IN	x	x
	Average	Iavg = (I1+I2+I3)/3		x
	Highest current of 3 phases	Imax of I1, I2, I3, IN		x
	Ground fault	IG	x	x
	Unbalanced between phases	% Iavg		x
Voltage	Phase to phase	U12, U23, U31	x	x
	Phase to neutral	V1N, V2N, V3N	x	x
	Average phase to phase	Uavg = (U12 + U21 + U23) / 3		x
	Average phase to neutral	Vavg = (V1N + V2N + V3N) / 3		x
	Unbalanced	% Uavg and % Vavg		x
	Phase sequence	1 - 2 - 3, 1 - 3 - 2	x	x
Frequency	Frequency	f	x	x
Power	Active	P, total / per phase	x	x
	Reactive	Q, total / per phase	x	x
	Apparent	S, total / per phase		x
	Power factor and cos ϕ (fundamental)	PF and cos ϕ, total and per phase	x (cos ϕ tot)	x
Maximeter				
	Last maximum of real time rms voltage, current and power measurements	Reset via Embedded display (voltage, current, power) or HTD210H	x	x
Energy metering				
Energy	Active (kWh), reactive (kvarh), apparent (kVAh)	Total, partial, direct, reverse	x (except apparent energy)	x
Demand values				
Demand power	Active (kW), reactive (kvar), apparent (kVA)	Present value on the selected window Maximum demand since last reset		x
On demand value	Sliding, fixed or com-synchronised	Adjustable from 5 to 60 minutes in steps of 1 minute		x
Power quality				
Total harmonic distortion	Of voltage	THDU, THDV of the Ph-Ph and Ph-N voltage		x
	Of current	THDI of the phase current		x

Measurement accuracy

Accuracies are those of the entire measurement system, including the sensors:

- Current: Class 0.5 according to IEC 61557-12
- Voltage: Class 0.5 according to to IEC 61557-12
- Power and energy: Class 1 according to to IEC 61557-12
- Frequency: Class 0.2 according to IEC 61557-12

Unlock button



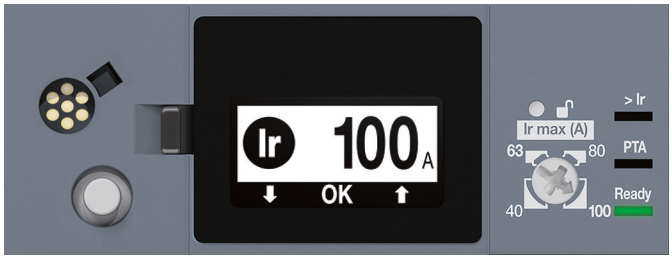
Access to setting modifications or reset of measurements via the embedded display is protected by a locking function. The embedded display can be unlocked by the unlock button which can only be handled by a tool. It is recommended to use a less sharp tool like a pencil than a screwdriver or a knife.

In unlocked mode the embedded display changes its colour and shows an “unlocking” icon. The unlocked mode is also activated by handling the Ir max dial.

The embedded display can be relocked via the h3+ joystick or automatically after 30 seconds of non-use.

Protection settings

h3+ Energy MCCB provides a long time protection L with an adjustable current pick-up Ir and adjustable time delay tr. They provide also a short time protection S with adjustable Isd and tsd and with the possibility of including an inverse time curve (I^2t OFF or ON) part. Instantaneous short-circuit protection Ii is also adjustable with a fixed time delay.



Embedded display Protection settings

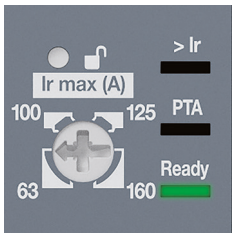
Ground fault protection can be activated or deactivated. It is with adjustable pick-up Ig and adjustable time delay tg. It is an insulation fault type including a portion of an inverse time curve I^2t (I^2t ground OFF or ON).

Neutral protection is available on 4P Energy MCCB:
It is adjustable in following positions: OFF; 50 % of Ir and Isd; 100 % of Ir and Isd. Time delay remains the same as tr and tsd.

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).
P160 can only be associated with a RCD relay.
P250 works with both solutions.

Current pick-up threshold Ir

The current pick-up Ir is set by the Ir max dial. Handling the Ir max dial automatically unlocks the embedded display. The effective Ir value is displayed on the display. It is then possible to fine tune the Ir and other protection settings via the display joystick. Without any joystick action or dial handle after 30 seconds, the embedded display will lock.



Front LED indicators

Front LED indicators

> Ir LED: It starts blinking red when I ≥ 105 % Ir and remains red in case I > 112 % Ir.
PTA LED: It starts blinking orange when PTA threshold is reached (default 90 %) and remains orange when the corresponding PTA output contact is activated.
Ready LED: Green when the trip unit is ready to protect. It blinks in orange in case of a failure in the Energy trip unit auto test. If the latter occurs, the MCCB is considered defective and no longer guarantees the protection of the electrical installation.

Autotest consists of testing all the sensors of the trip unit to make sure that the trip unit is ready to protect.

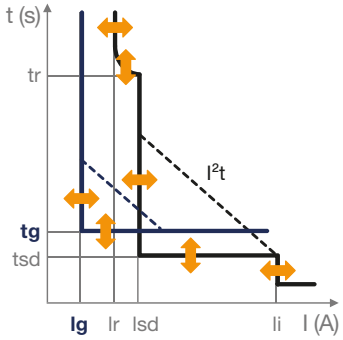
A failure in the autotsest trips the MCCB and means that the MCCB should be replaced immediately.

Technical changes reserved

Energy trip units



h3+
Energy



In		40 A	100 A	160 A	250 A	400 A	630 A
	P160	X	X	X			
	P250	X	X	X	X		
	P630				X	X	X

Long time protection

Ir (pick-up tripping between 1.05 and 1.20 x Ir)

Ir (A) ; Ir max (A)	In = 40 A	16 - 25 - 32 - 40
	In = 100 A	40 - 63 - 80 - 100
	In = 160 A	63 - 100 - 125 - 160
	In = 250 A	90 - 100 - 125 - 160 - 200 - 250
	In = 400 A	160 - 200 - 250 - 300 - 350 - 400
	In = 630 A	250 - 300 - 350 - 400 - 500 - 630

Fine tuning of 1A steps below Ir max is available using the dial on the front of the tripping unit until reaching the minimal value.

Time delay (s) accuracy -21% / +1%	tr (s) at 6 x Ir	0.5 - 1.5 - 2.5 - 5 - 7.5 - 9 - 10 - 12 - 14 - 16

S Short time protection

Isd = OFF ; = Ir x …	Accuracy +/- 10 %	1.5 to 10 with steps of 0.5					
Time delay (ms)	tsd I^2t OFF	50	100	200	300	400	
	tsd I^2t ON	50	100	200	300	400	
	Non-tripping time	20	80	180	280	380	
	Maximum breaking time	80	150	250	350	450	

I Instantaneous protection

Instantaneous pickup Ii = In x … accuracy +/- 15 %	P160 - P250	In = 40 A ; 100 A	3 to 15 with steps of 0.5
		In = 160 A ; 250 A	3 to 11 with steps of 0.5
	P630	In = 250 A ; 400 A	3 to 12 with steps of 0.5
		In = 630 A	3 to 11 with steps of 0.5
Time delay (ms)		Non-tripping time	10
		Maximum breaking time	50

G Ground fault protection

Ground fault pickup Ig Ig = OFF; = % In	In = 40 A	40 to 100 with steps of 5					
	In > 40 A	20 to 100 with steps of 5					
Time Delay (ms)	tg I^2t OFF	50	100	200	300	400	500
	tg I^2t ON	50	100	200	300	400	500
	Non-tripping time	20	80	180	280	380	480
	Maximum breaking time	80	150	250	350	450	550

Note : Power supply required on P630 / 250A for GF setting tg<100ms with Ig<80A

Neutral protection (only for 4P)

Neutral protection = Phase protection	(Ir, Isd) x …	OFF - 50 % - 100 %
	Instantaneous protection	same as phases
	Time delay	same as phases for tr, tsd and instantaneous time delays for phases

Alarm management
The Energy MCCBs allow the management of four types of alarms:
- Overload prealarm
- Trip alarm
- Custom alarm
- System alarm

Overload prealarm
The overload prealarm PTA is a predefined alarm to be set in % of Ir and % of tr with a default value of 90 % x Ir and 50 % of tr.
It is assigned to the PTA output contact.

Trip alarm
There are five types of trip alarms. They correspond to the following events: Long time trip L, Short time trip S, Instantaneus trip I, Ground fault trip G, trip test (performed from Configuration tool).

Custom alarm
The user can activate up to twelve custom alarms to audit an event of measurement by defining thresholds and time delays.
The same measurement can be used for different custom alarms to precisely monitor certain values, e.g. the frequency or the voltage.
Priorities can be set for the Trip alarms and the twelve custom alarms.

System alarm
There are three types of System alarms: Trip unit internal error, Trip unit overtemperature and Neutral pole disconnection.
System alarms are non settable high priority alarms.
Alarms can be set and read via the Panel display HTD210H or the Configuration tool Hager Power setup.

Event management
The h3+ Energy MCCBs have a non-volatile memory that saves all data on alarm events, trip events and settings change events, counter values even if power supply is lost.
Time-stamped log table:
- 10 last trip events
- 40 last custom alarm events
- 5 last settings of each setting parameter

Each event is stored with:
- Time-stamping: date and time of event
- Status for custom alarms: pick up / drop out

The h3+ Energy event logs can be displayed on the Panel Display HTD210H (trip and alarm events), via the Configuration tool Hager Power setup (trip, alarm and setting events) or via Modbus communication.

Zone selective interlocking (ZSI)

The h3+ Energy MCCBs are fitted with ZSI connectors to interconnect h3+ Energy MCCBs to provide zone selective interlocking for short-time (Isd) and ground-fault (Ig) protection, without a time delay. For Energy P160, the ZSI function is available only with one terminal (ZSI2) to connect to an upstream circuit breaker. For Energy P250, the ZSI function is available with one terminal (ZSI2) to connect to an upstream circuit breaker and with another terminal (ZSI1) to connect to a downstream circuit breaker.

Technical changes reserved

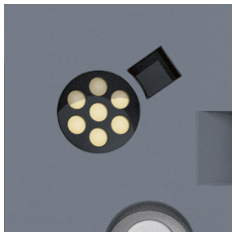
Connectivity on h3+ electronic MCCB



NSP / PTA connection ports on Energy 3P MCCBs



PTA output contact



MIP connector



H3+ Energy CIP, ACP, ZSI and OAC connectors

PTA output contact

All h3+ LSI, LSIG and Energy MCCBs have an integrated PTA output contact on the left side of the product.
This contact is associated to the overload prealarm PTA function fitted on the LSI, LSIG and Energy MCCBs.

It is a digital output contact with the following characteristics:
- ≤ 24 VDC, 100 mA.

MIP connector

All h3+ LSnI, LSI, LSIG and Energy MCCBs have a maintenance connector on the front of the device to connect to the Configuration Tool Hager Power setup (see next page).

NSP port

In a 3-phase installation with distributed neutral where a 3-pole Energy MCCB is fitted, it is necessary to measure the neutral voltage to guarantee accurate measurements.

Neutral sensor port exists only on 3P Energy MCCBs.
In order to guarantee a high accuracy on measurement it is necessary to connect the neutral conductor to the NSP port using the voltage tap cable (HTC160H).

	LSnI	LSI	LSIG	Energy	
				3P	4P
MIP connector	x	x	x	x	x
PTA output contact	-	x	x	x	x
NSP port	-	-	-	x	-

OAC output contact

The Energy MCCBs have an integrated OAC output contact on the right side inside of the product.
The user can assign one of the following types of alarms to the OAC output contact:
- Overload prealarm
- Custom alarm
- System alarm

It is a digital output contact with the following characteristics:
- ≤ 24 VDC, 100 mA.

Communication Interface Port (CIP)

Each MCCB Energy is fitted with two communication interface ports.
The ports are used to connect the panel display or the COM module.
Moreover, this port can be used to supply the Energy MCCB with 24V DC in condition to sustain from using one of the two accessories mentioned above.

	CIP x 2	ZSI_1	ZSI_2	ACP	OAC
	COM Module Panel display	Zone selective interlocking		AX/AL Energy	Alarm assignement
P160 Energy	X	-	X	X	X
P250 Energy	X	X	X	X	X
P630 Energy	X	X	X	X	X

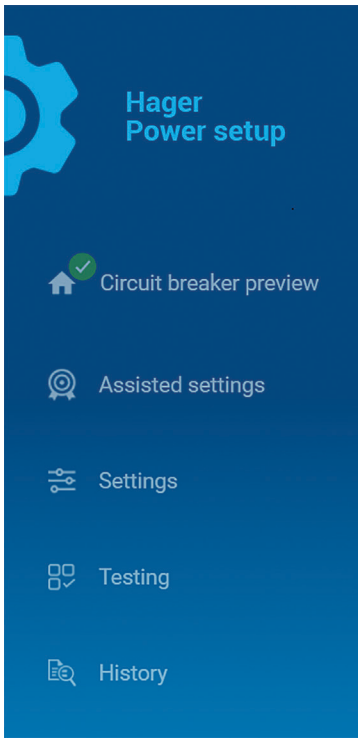
Hager Power setup software*

Hager Power setup is a software designed for testing and commissioning of h3+ moulded case circuit breakers.
Thanks to the menu “Assisted Settings”, the software allows to generate a commissioning report that can serve as conformity proof between the real protection settings and the short-circuit and selectivity calculations. For this purpose it is necessary to import the setting values from the Hagercad.
It offers an intuitive interface to set the protection parameters. It also allows to visualize and modify all the parameters of the circuit breaker.
It is possible to realise a control check of the circuit breaker’s protection function and to provoke an electromechanical tripping.
It is of a great use during the functional test of output contacts’ cabling. Hence, it allows the opening and the closing of output contacts such as OAC, PTA and ZSI.
The results of the different tests can be published in a test report that can be generated at any time whether it is in the cabling workshop or on site upon the receival of the product.
The access to Hager Power setup functionalities is possible through six menus:
Circuit breaker status, maintenance information and main technical characteristics.

Main functions

- Display of circuit breaker status, maintenance information and main technical characteristics.
- Realise a commissioning or an assisted setting thanks to the importation of protection settings from Hager
- Generate and import test report and commissioning reports.
- Realise a control check of the protection function of the electronic trip units.
- Execute a forced electromechanical tripping of the circuit breaker.
- Visualise and modify all protection settings of electronic trip units.
- Visualise on-going alarms.
- Download and export settings of electronic trip units in CSV format.
- Save all breaker setting of the “Energy” family in order to upload them on one or multiple similar circuit breakers.
- Force the opening or the closing of output contacts such as: OAC, PTA and ZSI.
- Display active alarms.
- Check events log and export it in a CSV format file.
- Display available operating counters’ status (maneuver cycles, number of trippings …).
- Manage passwords of communication module and panel displays.

Hager Power setup is available for download on Hager website in your country.



Breaker status, maintenance information and main technical characteristics.

Three-steps procedure 1. Set 2.Test, 3.Trip in order to put the circuit breaker in service based on settings imported from the Hager software. Moreover, this menu allows generating a detailed commissioning report.

Access to all settings of the circuit breaker.

Access to forced electromechanical tripping and activation of available output contacts. Moreover, this menu allows generating a testing report.

Access to events log
Preview of active alarms
Dashboard of operating counters.

Required configuration	Minimal	Recommended
Operating system	Windows 10 x32 bits	Windows 10 x64 bits
Memory	4 Go RAM	8 Go RAM
Hard disc space	50 Mo	50 Mo
Components	Microsoft .NET Framework 4.7.2 .NET Core Runtime 3.1.13 .NET Desktop Runtime 3.1.13 Microsoft web view 2 v1.0.818.14	Microsoft .NET Framework 4.7.2 or higher .NET Core Runtime 3.1.13 or higher .NET Desktop Runtime 3.1.13 or higher Microsoft web view 2 v1.0.818.14 or higher
Resolution	1024x768 pixels	1280x1024 pixels

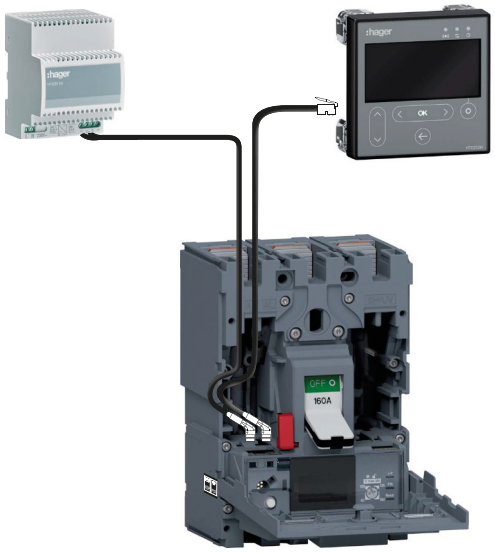
* : Available as of December 2022

Technical changes reserved

Panel display



h3+ Panel display



h3+ Energy MCCB connected to power supply



h3+ Energy MCCB connected via COM module to power supply

The Panel display HTD210H is used as a remote display of the h3+ Energy MCCB.
It shows information such as the MCCB status, most of measured values, the circuit breaker parameters and the events such as trip alarms and custom alarms.
In addition to that, modification of the protection settings and modification of the measurement settings are possible. The alarms can also be set-up and activated.
This slim device can easily be mounted on a door or a switchboard panel behind the door thanks to the provided attaching clips.
Only one accessory cable is necessary to connect the Panel display to the Energy circuit breaker (included 24 V DC supply).
The front of the device is protected with a transparent cover in order to achieve a protection of IP65 once mounted on an appropriate switchboard.
The LCD screen is backlit for very easy reading even under poor ambient lighting.

Mounting and connection

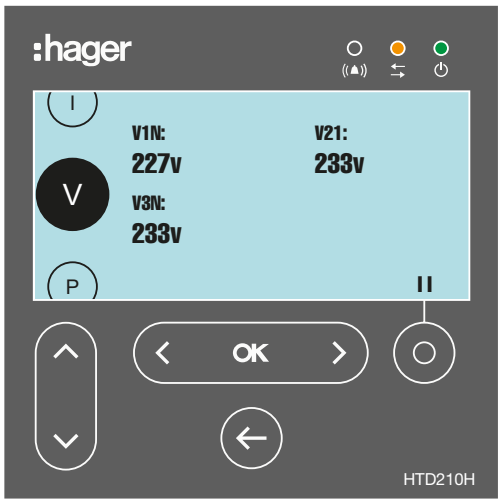
The connection between the MCCB h3+ Energy and the Panel display HTD210H is done using the CIP Adaptor cable. This CIP Adaptor has a RJ9 plug to fit behind the Panel display and at the other side a connector adapted to fit in the MCCB.
It drives not only the communication between both devices but also the 24 V DC voltage supply which is necessarily provided by an external power supply connected directly to the MCCB or via the COM module if Modbus communication is also used.
The external power supply must be Safety Extra Low Voltage (SELV) type, with galvanic isolation between the power supply input (AC voltage) and the power supply output (DC voltage).

Recommended power supply: HTG911H.

The CIP adaptor cable is not only used to connect the Panel display and the MCCB together but also to connect the COM module and the MCCB together. It is available in different lengths.

CIP Adaptor length	Panel display - MCCB	COM module - MCCB
0.5 m	x	x
1.5 m	x	x
3 m	x	x
5 m	x	x
10 m	x	x

Live mode



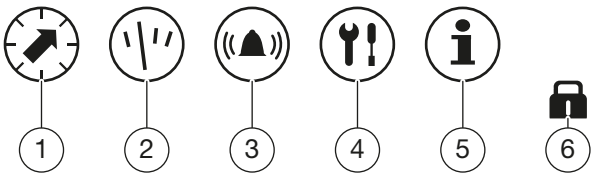
The panel display HTD210H allows to overview permanently a selection of measured values. In Live mode it is able to display continuously a scrolling list of measurements previously selected as favourites.
The Panel display enters in Live mode at the start-up or after two minutes of non-use. The Live mode can also be activated by the navigation.

Alarms and events

All trip alarms or custom alarms are notified by the Panel display. The notification depends on the priority level defined previously at the alarm set-up:

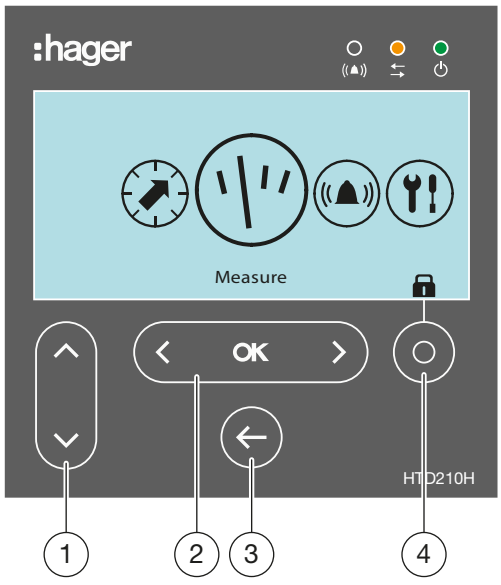
- high priority: a pop-up window displays the time-stamped description of the alarm and the red alarm LED flashes.
- medium priority: the red alarm LED flashes and the description of the alarm can be seen via the contextual alarm menu.
- low priority: no display on the screen.

Moreover, the last saved trip events and alarm events can be seen in event lists.



Main menus

1. **Protection**: it allows the user to check on the protection parameters and change them if he is allowed to.
2. **Measures**: it allows to show most of the values measured by the MCCB.
3. **Alarms**: it allows to configure all the alarms, the PTA output contact and the OAC output contact.
4. **Configuration**: it allows to configure the measurement settings and the display settings.
5. **Information**: status and identification information of the MCCB, list of events.
6. **Lock menu**



1. Up and down keys
2. Left; OK; Right key
3. Back key
4. Contextual key

Navigation

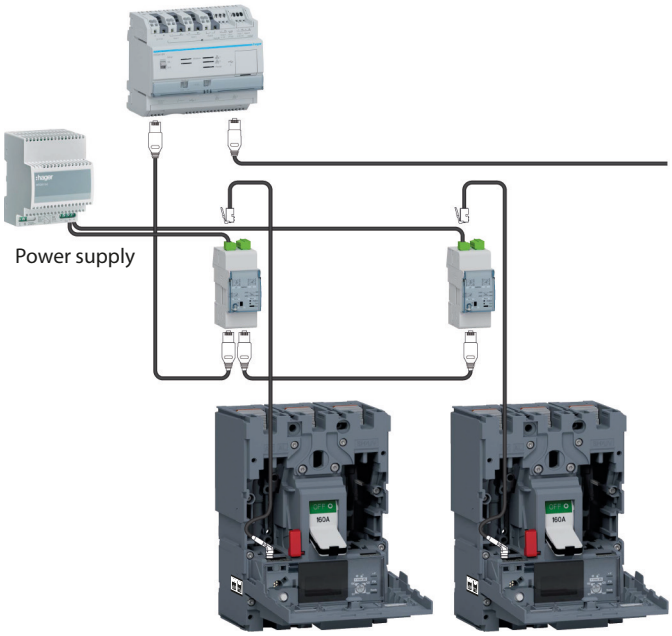
The navigation through the menus is done using seven touch keys on the front.
The contextual key may be used to unlock the modification of the settings, to pause the scrolling in Live mode, to select the measurements as favourite and to view the current alarms.
At first power on, the user can select the display language (English, Chinese, French, German, Italian, Spanish, Portuguese).

Technical characteristics

- Dimensions: 97 x 97 x 46 mm (27 mm behind the door)
- Panel/Door cut-out: 92 x 92 mm
- Screen dimension: 37 x 78 mm
- Azurin Backlighting
- Alarm LED: red blinking
- Communication LED: yellow blinking
- Power LED: green
- Consumption: 85 mA
- Operating temperature range -10 °C…+55 °C
- Installation category III
- IP rating of front side IP65 (back side IP20)
- Rated supply voltage: DC 24 V (+/- 30 %)

Technical changes reserved

Modbus communication



h3+ Energy MCCBs connected to a modbus communication network

The h3+ Energy MCCB can be connected to a modbus communication network via the COM module. Thanks to the prewired RJ45 modbus cable adaptors and to the prewired CIP Adaptor, the connection of Energy MCCBs into a modbus communication environment has become easier.

As a result, it is easy to achieve quickly a modbus daisy chain connection between the COM module and Hager's agardio.manager.

Each COM module can be connected to one MCCB h3+ Energy.

Up to 31 COM modules or other Hager modbus slaves can be connected to the agardio.manager HTG411H.



COM module HTC310H



COM module HTC320H

COM module

The COM module HTC310H or HTC320H is a modbus RTU interface with modbus address adjustable from 1 to 99 by mean of 2 dials. Baud speed and parity are also adjustable via dials. An embedded 120 Ω termination impedance can be activated via a switch on the device.

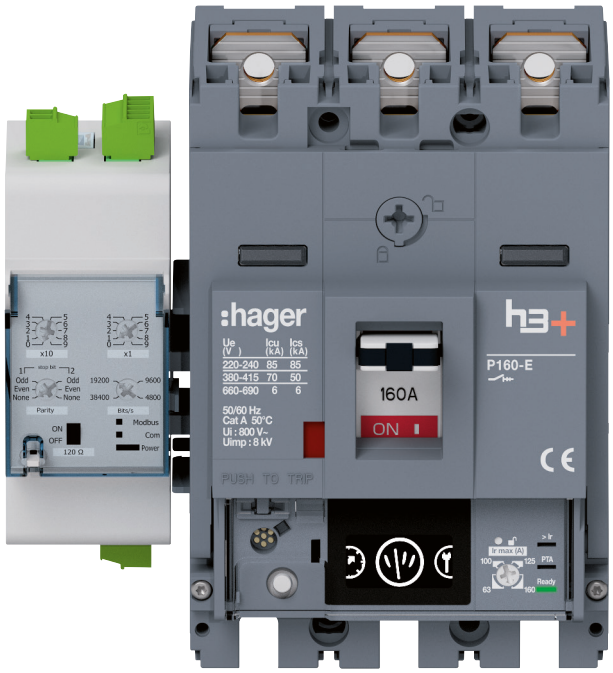
Integrated digital inputs and outputs

Compared to the basic COM module HTC310H, the HTC320H is a COM module with two 24 V DC inputs and two 24/48 V DC outputs which can be controlled via Modbus communication.
For instance, the 2 inputs can be used to pass the pre-trip alarm and trip contacts of the RCD add-on block to upper level of supervision.
The 2 outputs can be used to drive the command of the motor operator accessory and achieve a remote ON/ OFF operation of the Energy MCCB through Modbus communication.

Technical characteristics

- Width: 2 modules
- Digital Inputs: typical 24 V DC 15 – 30 V DC), 2 mA - 15 mA, minimum on state duration 50 ms, 5-pins connector at the top of the device (wires from 0.5 to 1.5 mm^2)
- Digital Output: - ≤ 100 V DC (typical 24, 48 V DC), 10 µA - 50 mA, Pulse mini 100 ms, mini period 1 s, 10 ms delay, - 4-pins connector on the bottom of the device (wires from 0.5 to 1.5 mm^2)
- Module consumption: 40 mA / 24 V DC
- Supply voltage: 24 V DC (+/- 30%).

Mounting of COM module

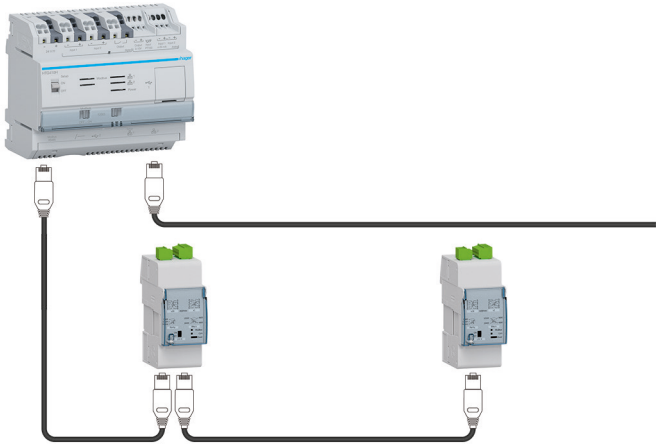


The COM module can be mounted on a DIN rail or at the side of the MCCB thanks to the side support.

One piece of side support is delivered with the COM module to allow fixing the COM module at the side of the MCCB. It can also be used to guide the cables and wires coming from inside the MCCB such as the CIP Adaptor cable between the circuit breaker and the COM module or between the circuit breaker and the Panel display.
It is also useful to guide the outgoing auxiliary wires in case of use AX/AL Energy.

The COM module has a screw terminal on the top to connect a 24 V DC power supply in order to operate properly. This 24 V power supply is conveyed to MCCB via the CIP Adaptor connected between the COM module and the MCCB.

Two RJ45 terminals on the bottom of the device allow the realisation of a daisy chain connection from upstream agardio.manager or upstream other COM module to the next COM module.



COM Modules with modbus cables

Connection accessories

Different lengths and types of prewired RJ45 modbus conductors are available to make the installation easier even if the conductor shield has to be connected as close as possible to a protective ground.

Prewired modbus cable RJ45 – RJ45	Prewired modbus cable RJ45 – RJ45 with earth	Prewired modbus cable Wire – RJ45 with earth
0.2 m	-	-
1 m	1 m	-
2 m	2 m	-
-	-	3 m
5 m	5 m	-



CIP adaptor cables

The communication between the MCCB h3+ Energy and the COM module is done using the CIP adaptor cable. It is available in different lengths.

CIP Adaptor length	Panel display - MCCB	COM module - MCCB
0.5 m	x	x
1.5 m	x	x
3 m	x	x
5 m	x	x
10 m	x	x

Technical changes reserved

AX/AL Energy



AX/AL Energy auxiliary module

The optional AX/AL Energy auxiliary module is used to communicate the ON/OFF mechanical status of the MCCB to the Energy trip unit. It also includes an operation cycle counter and a trip fault cycle counter to acquire the number of operation cycles and the number of trip fault cycles in the Energy trip unit.
These status and numbers can then be displayed on the embedded display of MCCB or on the optional HTD210H Panel display and they are also available via modbus communication.
The counters can be used as maintenance indicators with Configuration tool Hager Power setup:
- Mechanical operation cycle counter.
- Mechanical and electrical trip fault cycle counter.

The optional AX/AL Energy auxiliary module is recommended to provide remote AX and AL indication on auxiliary circuits such as warning light, electrical locking, relays, etc.
It includes AX NO or NC contacts and AL NO or 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 or an undervoltage release.
- The “push-to-trip” button operation.



AX/AL window

The optional AX/AL Energy auxiliary module has a dedicated location behind the front cover of the circuit breaker and a dedicated ACP terminal in the circuit breaker. Its presence is visible from the front facet through AX or AL windows.

It is available in three versions:
- only counter
- counter and AX/AL 250 V AC 2 m prewired contacts
- counter and AX/AL 125 V AC (low level) 2 m prewired contacts

Prewired contact: 0.34 mm^2 wires.

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

Nominal current for 125 V AC AX/AL (low level):
- 125 V / AC-14 = 0.1 A
- 30 V / DC-12 = 0.1 A

Switch-disconnector range

		Page
01	Presentation	44

Presentation

The h3+ 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+ 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+ 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

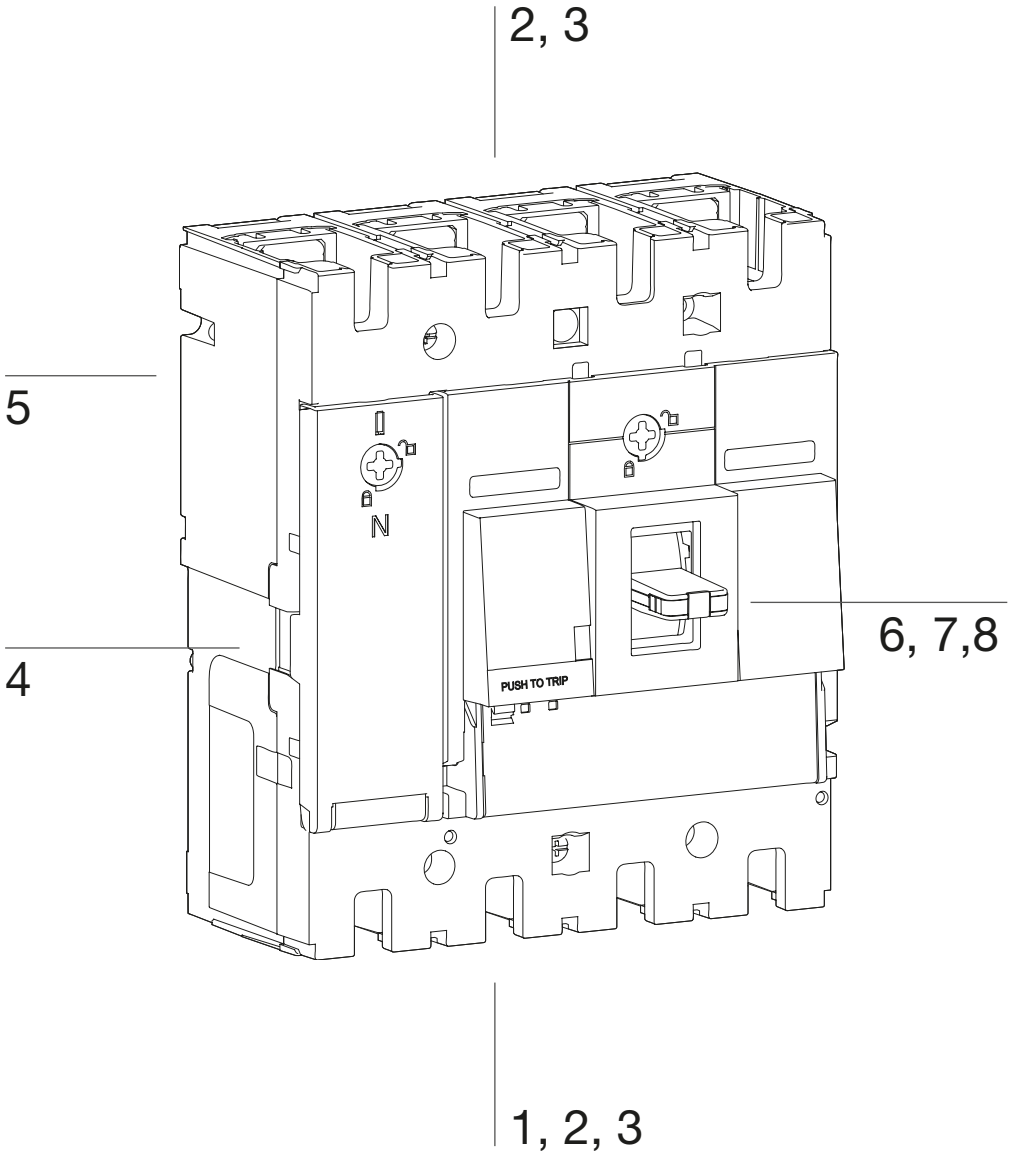
Switch-disconnectors					P160		P250		P630	
Number of poles					3, 4		3, 4		3, 4	
General characteristics										
Nominal current					125	160	200	250	400	630
Operational current	Ie	[A]	AC22A	220/240 V AC	125	160	200	250	400	630
				380/415V AC	125	160	200	250	400	630
				660/690V AC	125	160	200	250	400	630
			AC23A	220/240 V AC	125	160	200	250	400	500
				380/415V AC	125	160	200	250	400	500
				660/690V AC	125	160	200	250	400	500
			DC23A	125 V DC 1P	125	160	200	250	400	630
				250 V DC 2P	125	160	200	250	400	630
				375 V DC 3P	125	160	200	250	400	630
				500 V DC 4P	125	160	200	250	400	630
Short-circuit making capacity	Icm	[kA] peak	380-415 V AC		2.8	2.8	5	5	7.6	13
			500 V DC 4P		2	2	4	4	7.5	9
Short time withstand current	Icw	[kA]	1 s		2	2	3.6	3.6	5	7.6
Operational voltage, (AC)	Ue	[V]			690					
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					20000	20000	20000	20000	30000	30000
Electric endurance in number of cycles			In	440 V AC	10000	10000	10000	10000	6000	4000
			In	690 V AC	1500	1500	1500	1500	1000	1000
			In/2	500 V DC	1500	1500	1500	1500	1500	1500
			In	500 V DC	1000	1000	1000	1000	1000	1000
Dimensions										
Height				(mm)	130		165		260	
Width		3P		(mm)	90		105		140	
		4P		(mm)	120		140		185	
Depth					97		97		150	
Weight		3P		(kg)	0.97		1.05		4.8	
		4P		(kg)	1.32		1.91		6.4	

Accessories

	Page
01 Overview	48
02 Earth leakage protection	50
03 Connection accessories	52
04 Insulation accessories	55
05 Auxiliaries	59
06 Mounting types	64
07 Handles and motor operators	70
08 Locking and sealing accessories	73
09 Interlocking accessories	76

⚠ WARNING

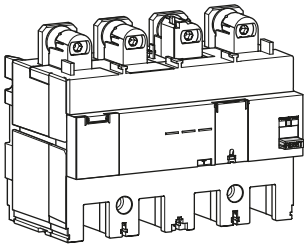
hager confirms that the accessories/auxiliaries described in the next pages have undergone tests and validation programs and can be used safely with hager MCCBs.



Technical changes reserved

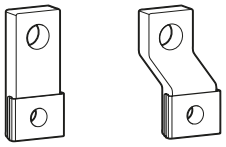
1. Earth leakage protection

RCD add-on block
page 50

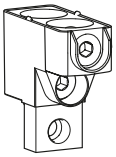


2. Connection accessories

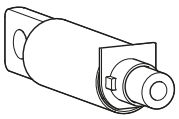
Straight and spread bar extensions
page 54



External cable terminals
page 54

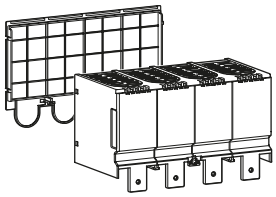


Rear connection
page 54

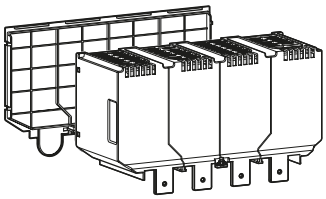


3. Connection insulation

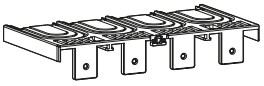
Straight
page 57



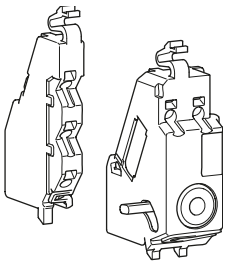
Spreader
page 57



Rear and Plug-in
page 58

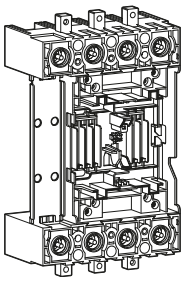


4. Auxiliaries
page 59

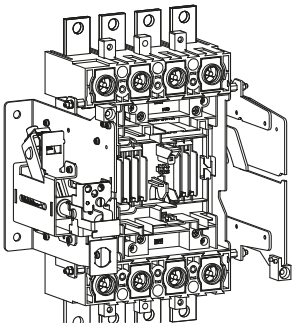


5. Mounting types

Plug-in
page 65

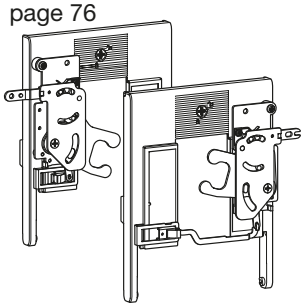


Withdrawable
page 68

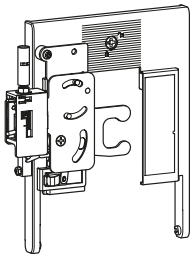


6. Interlocking accessories

Mechanical interlock by link
page 76

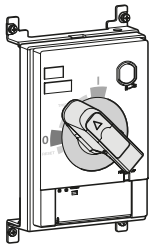


Mechanical interlock by cable
page 76

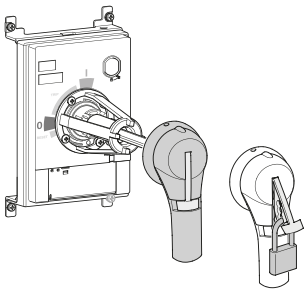


7. Handles and motor operators

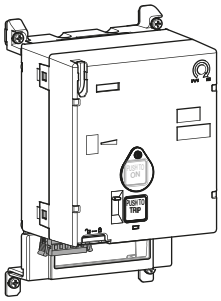
Direct rotary handle
page 70



On door rotary handle
page 70

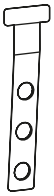


Motor operator
page 71



8. Locking and sealing acessories

Padlock accessories
page 73



Key lock
page 74

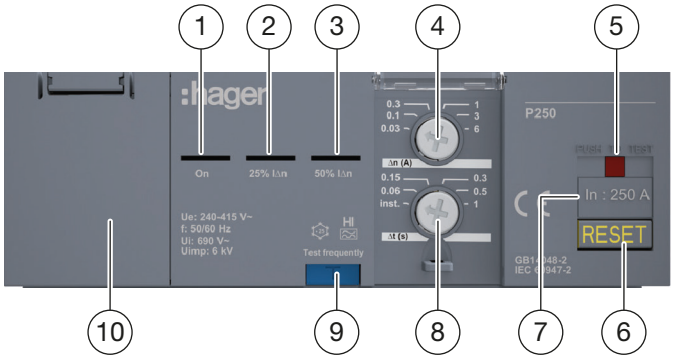


RCD add-on block



h3+ P250 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 requires connecting at least two phases in order to be supplied.
A test button exists on the front side of the product to allow testing the mechanical link between the MCCB and the RCD underneath no external power source. The RCD add-on block is available for the P250 and P630 circuit breakers.



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.

Technical changes reserved

Three versions of RCD add-on block are available:

RDC versions		**Fixed**			**Adjustable / Alarm**		
Frame	**Rating**		IΔn (A)	Time delay Δt (s)		Rated IΔn (A)	Time delay Δt (s)
P250	100 A	x	0.3	inst	x	0.03 - 0.1 - 0.3 - 1 - 3 - 6	inst - 0.06 - 0.15 - 0.3 - 0.5 - 1
	160 A	x	0.3	inst	x		
	250 A	-			x		
P630	400 A	-			x	0.1 - 0.3 - 0.5 - 1.3 - 10	inst - 0.1 - 0.3 - 0.5 - 1- 3
	630 A	-			x		

Characteristics

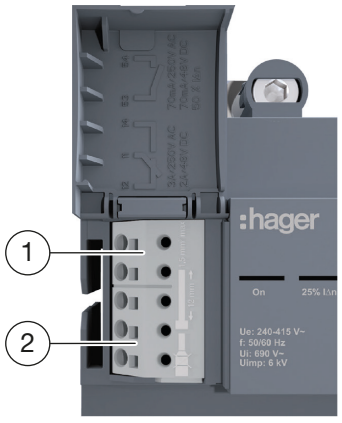
Frequency	50/60 Hz
Ui	690 V
Uimp	6 kV
Nb of poles	4P
Ph-ph voltage Ue	220-415 V~
RCD type	A for IΔn **≤** 6 AC for IΔn **=10**

Note: MCCB RCD add-on blocks (type A and AC) are compatible with type B RCBOs or RCCBs fitted downstream.

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



1 Pre-alarm contact

2 Alarm contact

Auxiliary terminals on RCD add-on block

Auxiliary contacts	**Pre-alarm**	**Alarm**
Type	1NO	1NO.NC
Maximum current for AC voltage	70 mA 250 V~	3 A 250 V~
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 cross 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.

Connection accessories

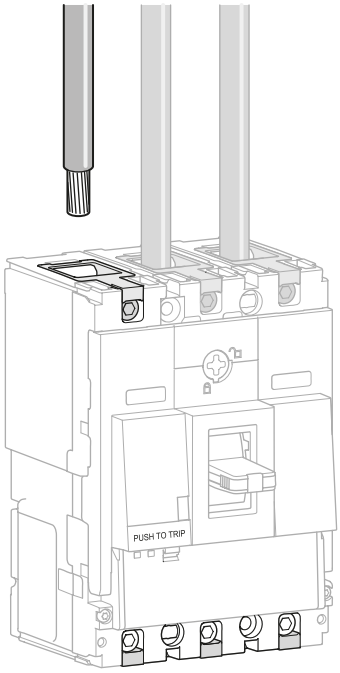
The h3+ circuit breakers are delivered with or without cable terminals depending on the chosen version:

- with cable terminal
- with front connection

P160 MCCB are available in both versions and P250 and P630 are available only with front connection (without cable terminals).

Connection accessories are available to adapt the circuit breaker for bare cables, bars or rear connections. Spreader and external multi-cable terminals are also available.

P160 MCCB with cage connections (CTC)



Cable connection

The h3+ circuit breaker versions with cable terminals are delivered with terminals compatible for bare cables, straight and bar extensions.

Bars and lugs dimensions

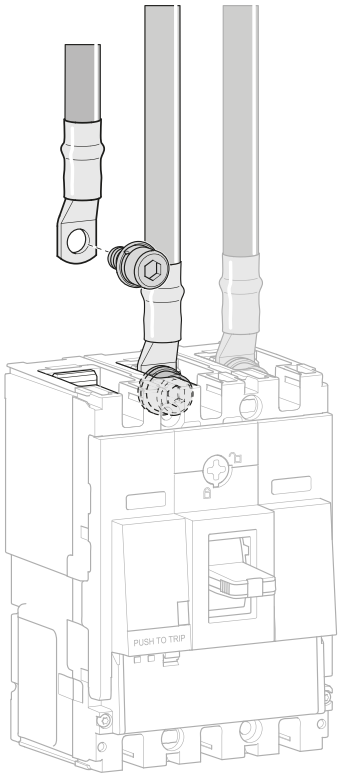
Cross section rigid / flexible (mm^2)	Tightening torque (Nm)
6…95	6
6…70	6

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

The integrated cable terminals can be removed. The MCCB could then also be used with bars or lugs. In this case M8 screws are needed.

Technical changes reserved

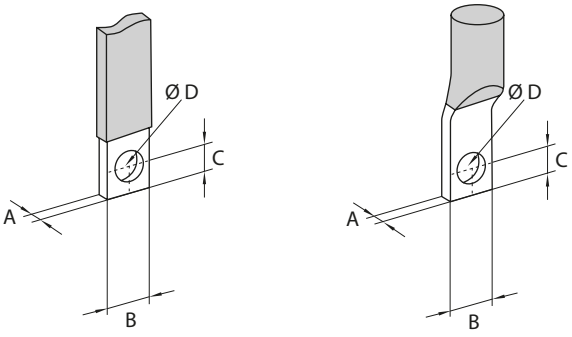
MCCB with front connections (FTC)



Front connection

The h3+ circuit breakers versions with front connections are delivered with M8 screws for P160 - P630 and M6 screws for P250. Thus, cables fitted with lugs or bars can be connected.

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	øD
P160	0.8…4	max 21	9.8	8.5
P250	1.2…4	max 25	11	8.5
P630	1.2…12	max 32	11	10

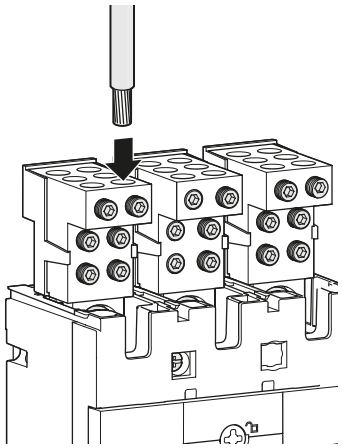
Tightening of bars or cables with lugs to the following tightening torque specifications:

Bars or cables tightening torques

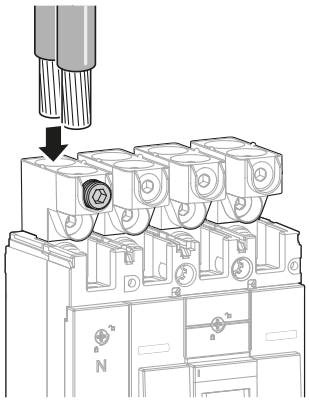
P160	6 Nm
P250	12 Nm
P630	24 Nm

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

External cable terminals



6 wires cable terminal P160



2 wires cable terminal P630

The 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 circuit breaker. They are compatible with the external cable terminals. Insulation accessories may be required. Please refer to “Insulation accessories” on page 55.

External cable terminals Cu/Al P160

	Cross section rigid/flexible	Tightening torque
1 wire	35…120 mm² 35…95 mm²	25 Nm
6 wires	4…25 mm² 4…16 mm²	3 Nm

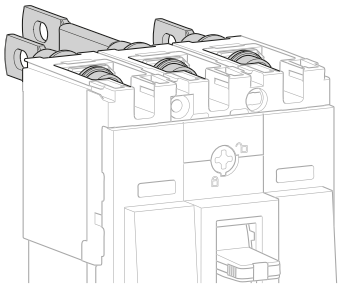
External cable terminals Cu/Al P250

	Cross section rigid/flexible	Tightening torque
1 wire	50…185 mm² 50…185 mm²	25 Nm
2 wires	35…120 mm² 35…95 mm²	25 Nm
6 wires	6…35 mm² 6…35 mm²	6 Nm

External cable terminals Cu/Al P630

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

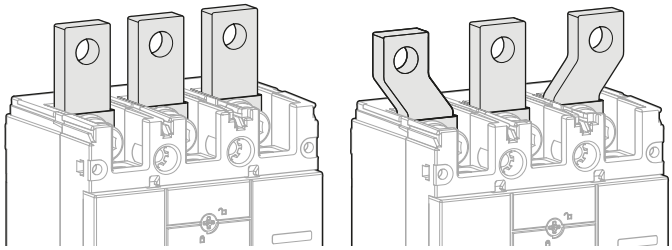
Rear connection



Rear connection P160

The h3+ circuit breakers can be fitted with rear connections. 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 directly screwed to the device connection terminals.

Straight and spread bar extensions



Bar extensions for P630

Straight bar extenions and spreader extensions are available separately with P160 (FTC / CTC) - P250 - P630 MCCBs. Spreader extensions are mainly used to increase the pitch of the MCCBs
Insulation accessories such as interphase barriers or terminal covers with insulation plates may be required. Please refer to “Insulation accessories” on page 55.

Technical changes reserved

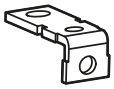
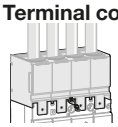
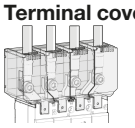
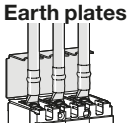
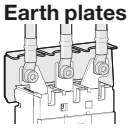
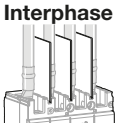
Insulation accessories

Insulation accessories may be required or even mandatory in some cases. This table gives the rules to be respected to ensure the insulation of the live parts around the h3+ 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
AC applications: Ue ≤ 500 VAC									
Type of conductor									
	Insulated bars or cables	Possible	Possible	Possible	Possible	-	-	-	-
	Non insulated bars or ring lugs	No	Mandatory *	Possible	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 *	-	-	-	-
AC applications: Ue > 500 VAC or DC applications									
Type of conductor									
	Insulated bars or cables	No	Mandatory *	Possible for P160-P250 Mandatory for P630	Possible	-	-	-	-
	Non insulated bars or ring lugs	No	Mandatory *	Possible for P160-P250 Mandatory for P630	Mandatory for IP20 *	Mandatory	Mandatory	Mandatory	Mandatory
	Extension terminals	No	Mandatory *	Possible for P160-P250 Mandatory for P630	Mandatory for IP20 *	-	-	-	-
	Cables with external cable terminals	No	Mandatory *	Mandatory	Mandatory for IP20 *	-	-	-	-

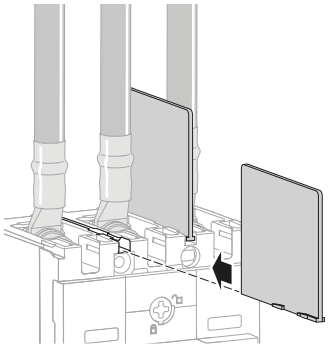
* fitted on top only if direct feeding / fitted on top and bottom if reverse feeding

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 lug-in 	–	–	–	☑	☑
Interphase barriers 	☑	☑	☑	–	–

Technical changes reserved

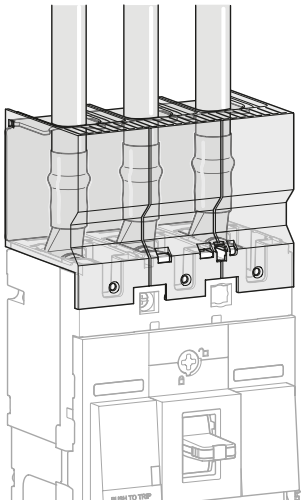
Interphase barriers



Interphase barriers P160

4 (for 3P) or 6 (for 4P) interphase barriers are delivered with the MCCB. They are compatible with the external cable terminals. Interphase barriers are also separately available.

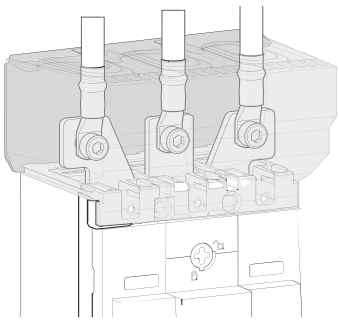
Straight terminal covers



Straight cover

P160, P250 and P630 MCCBs 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. They are available in one size for both the P160, P250 and P630 circuit breakers.

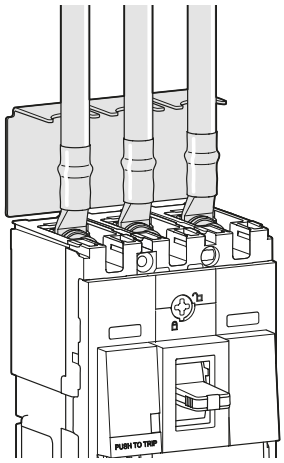
Spreader terminal covers



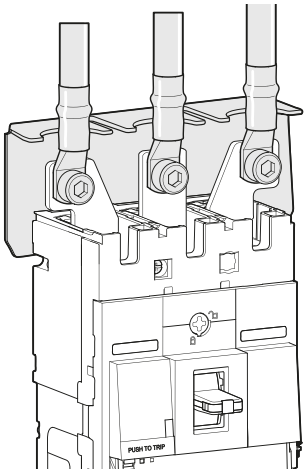
Spreader cover

P160, P250 and P630 MCCs can be fitted with spreader terminal covers when spreader extensions are fitted. They ensure an insulation between phases too.

Insulation plates



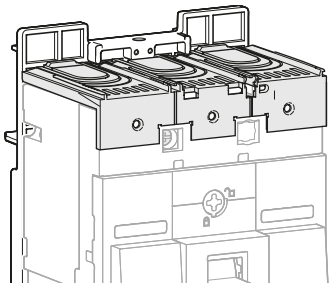
Insulation plate



Insulation plate for spreaders

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

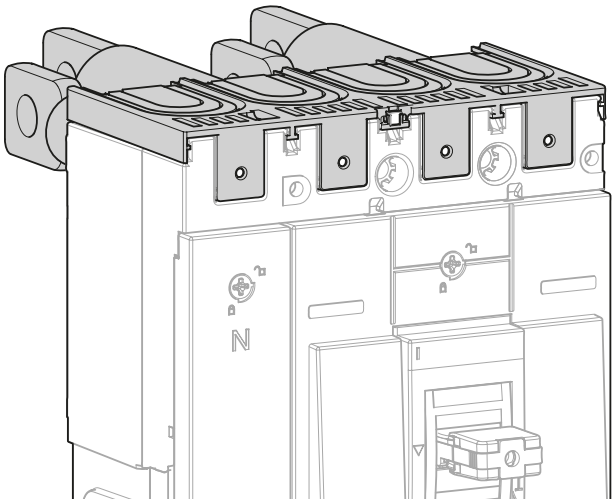
Front covers for rear and plug-in connections



Front cover

P160, P250 and P630 circuit breakers can be fitted with terminal covers to ensure insulation on front connections in case of use when rear connections or plug-in are fitted.

These covers provide an IP40 protection degree. They can be mounted after the circuit breaker's installation on a back plate or a DIN rail. They are sealable.



Front cover

Technical changes reserved

Selection of auxiliaries
All MCCBs share the same internal auxiliaries. The installation of the auxiliaries is simple and does not require any specific tool.

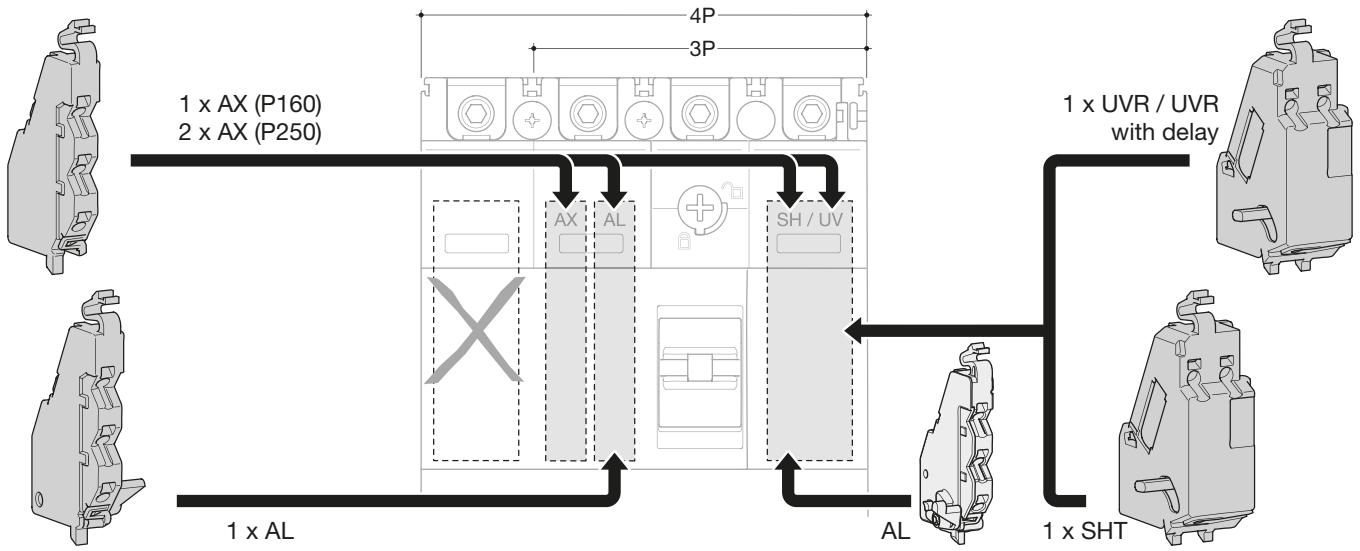
P160-P250 and P630 MCCBs have internal locations dedicated to the mounting of the following electrical auxiliaries.

P160
4 AX ON/OFF
2 AL trip indication
1 UVR / UVR with delay or 1 SHT

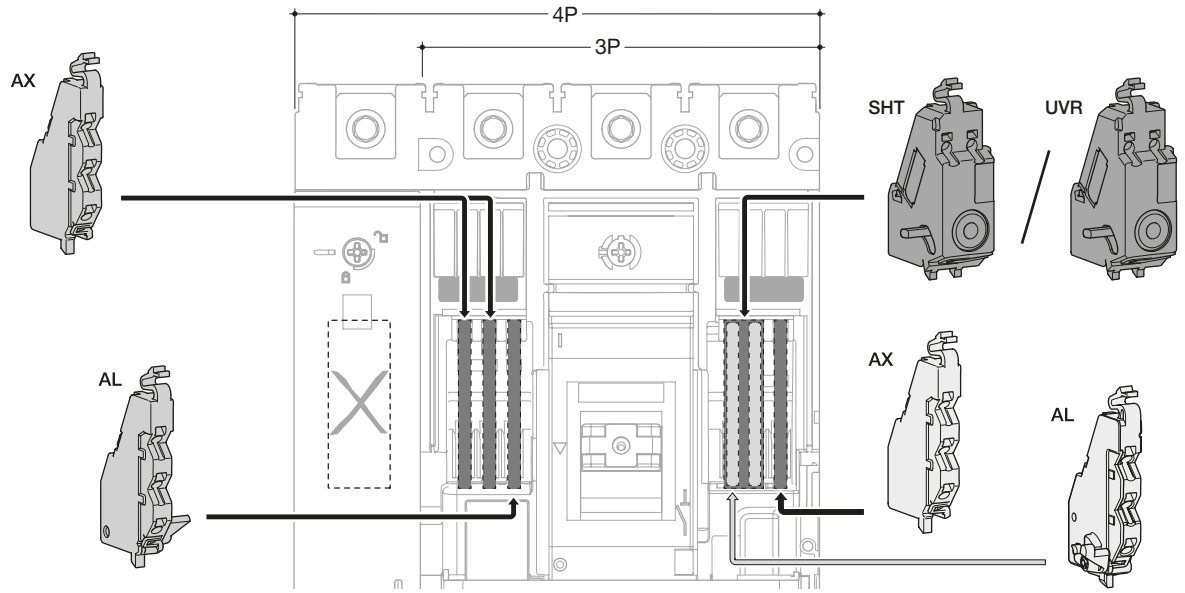
P250
4 AX ON/OFF
2 AL trip indication
1 UVR / UVR with delay or 1 SHT

P630
3 AX ON/OFF
2 AL trip indication
1 UVR / UVR with delay or 1 SHT

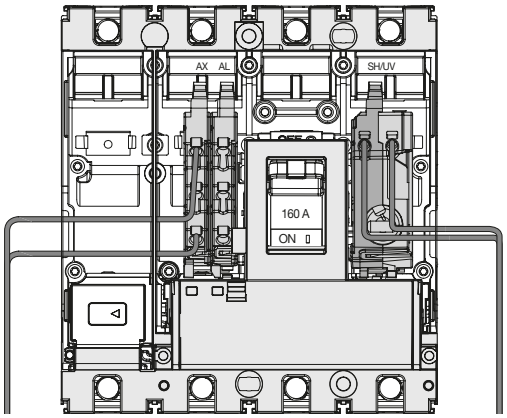
Location of auxiliaries P160 - P250



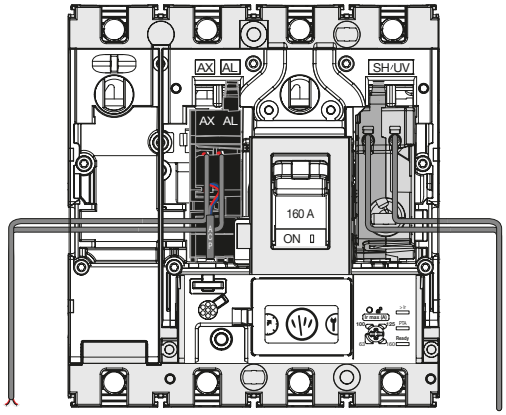
Location of auxiliaries P630



Connection of auxiliaries



Auxiliary cabling on TM MCCB

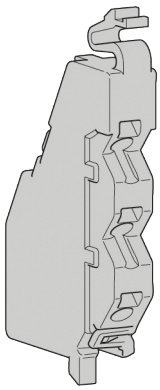


Auxiliary cabling on Energy MCCB

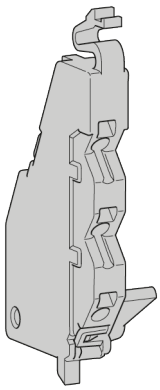
The maximum wire cross section is 1.25 mm2 for auxiliary contacts (AX or AL), shunt trip releases SHT or undervoltage releases UVR. These auxiliaries are fitted with spring terminals. It is recommended to route the wires from the inside to the outside of the circuit breaker, under the front auxiliary cover, in the following way.
The AX/AL - Energy dedicated to the Energy MCCB is fitted with prewired contacts.

It is possible to use standard AX and AL auxiliaries on P160, P250, P630 Energy MCCBs instead of the dedicated AX/AL Energy auxiliary.

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 or an undervoltage release.
- The “push-to-trip” button operation.

AL contacts reset when the circuit breaker is reset.

Technical changes reserved

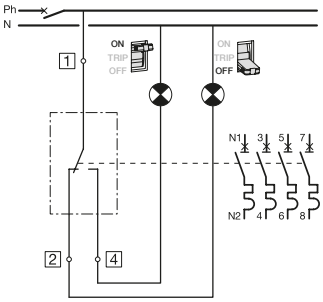
Installation and connection



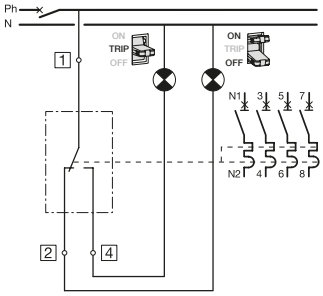
Left side Auxiliary P160

The AX and AL contacts have dedicated locations behind the front cover of the circuit breaker and their presence is visible from the front face through an Auxiliary window.

Each spring terminal may be connected by one 0.5…1.25 mm^2 flexible or rigid wire.



AX auxiliary



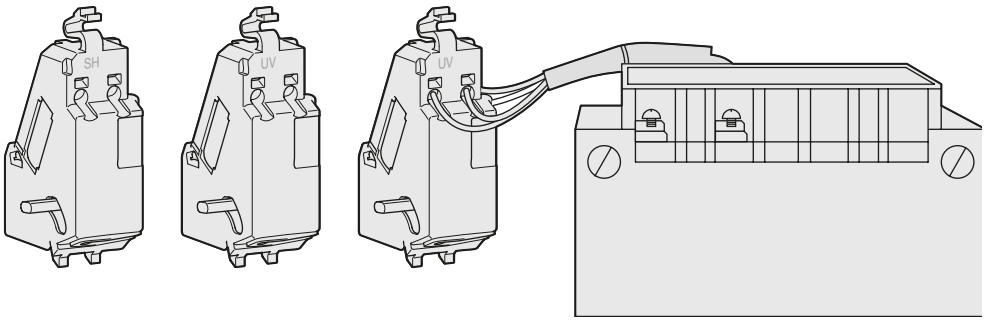
AL auxiliary

Electrical characteristics

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

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

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

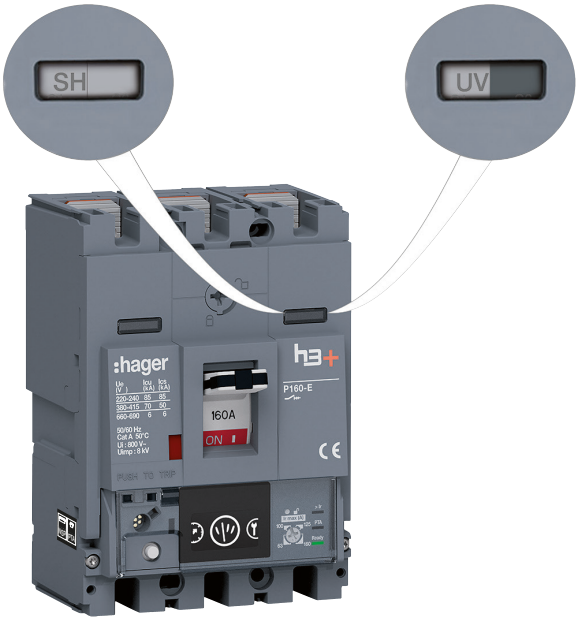
Operating voltage	Un	24 V DC	100-120 V~	200-240 V~	380-450 V~
Closing voltage		> 85 % Un			
Release voltage		70 % Un > … > 35 % Un			
Opening voltage		< 35 % Un			
Exciting current	mA	23.0	12.0	6.3	5.2
Power consumption	VA	0.56	1.4	1.5	2.3
Electrical endurances at 415 V AC	cycles	6000	6000	6000	6000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



Right side Auxiliary window P160

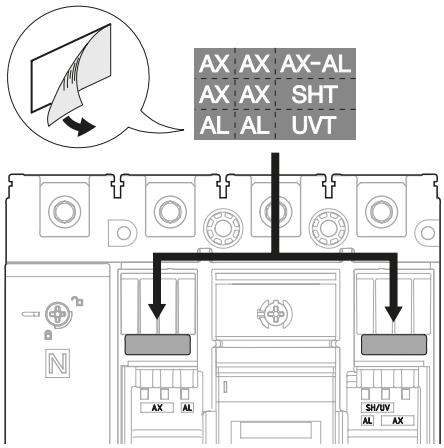
The SHT and UVR releases have dedicated locations behind the front auxiliary cover of the circuit breaker and their presence is visible on the front through an Auxiliary window. On P630 MCCBs, the presence of the internal auxiliaries is identified by a sticker that needs to be placed in a dedicated location behind the auxiliary window.
Each spring terminal may be connected by one flexible or rigid cable of 0.5…1.25 mm².

Operation

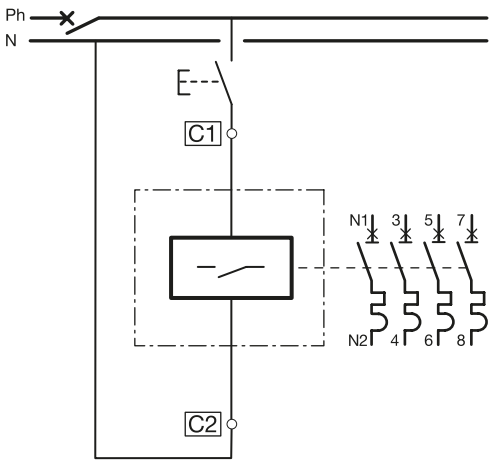
The circuit breaker must be reset locally after being tripped by the shunt trip or undervoltage release.
Tripping by the shunt trip or undervoltage release has priority over manual closing. When a tripping command from a SHT or UVR coil is active, it is not possible to manually operate the circuit breaker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

SHT and UVR endurance

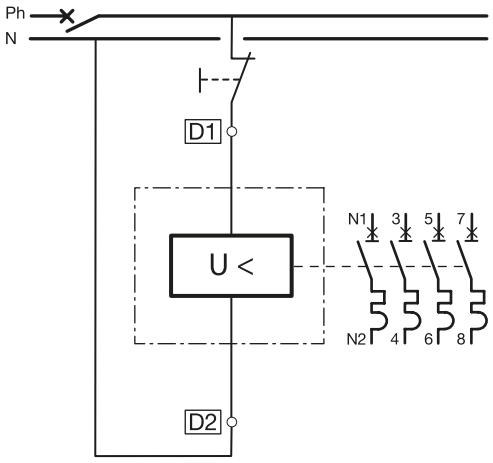
100 % of the rated mechanical endurance of the circuit breaker.



Internal auxiliaries identification on P630

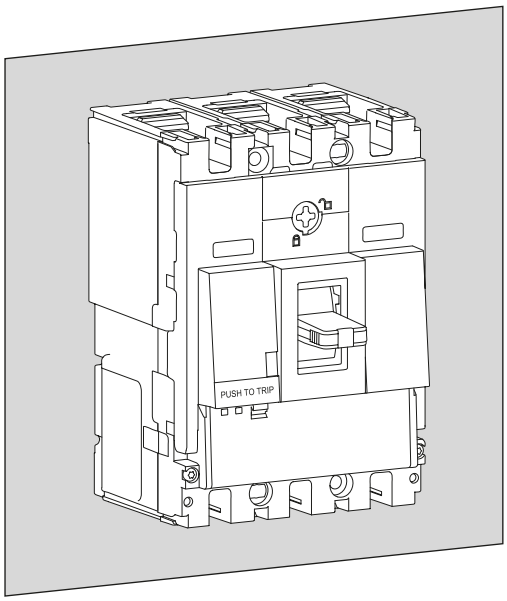


SHT



UVR

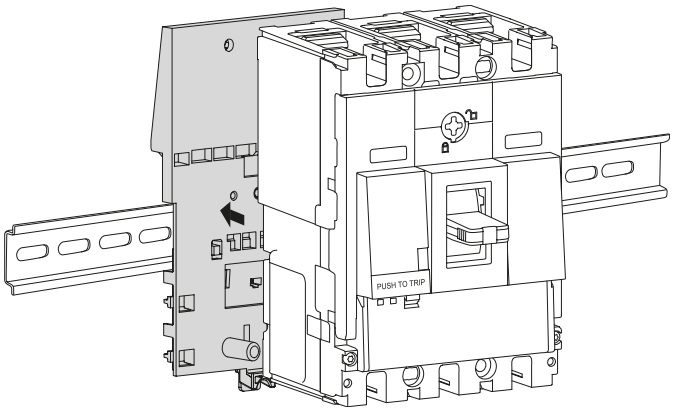
Fixed on back plate



P160 on back plate

P160, P250 and P630 circuit breakers can be mounted as fixed device on a back plate.

DIN rail adaptor

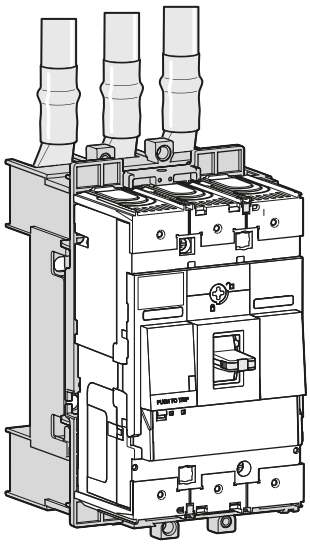


P160 and DIN rail adaptor

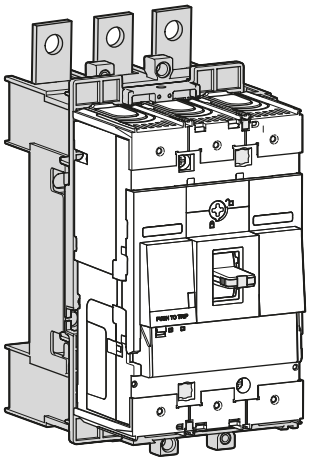
If needed, the P160 and the P250 circuit breakers can be mounted on a DIN rail with a specific accessory fitted on the back.

Technical changes reserved

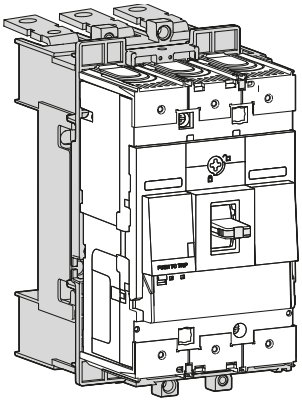
Plug-in system



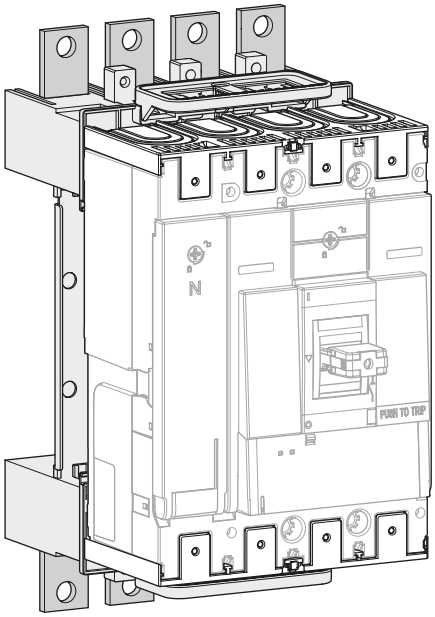
Plug-in for cables fitted with lug P250



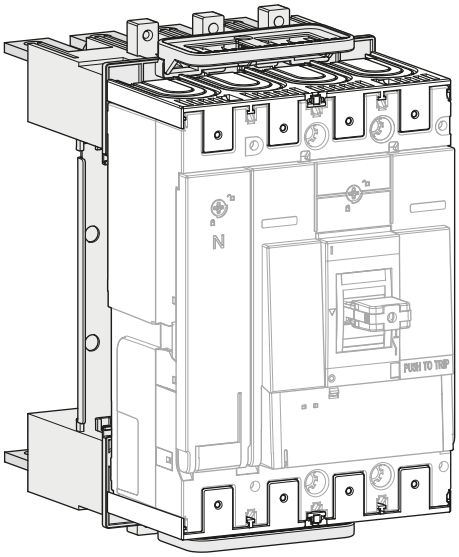
Plug-in with front terminal P250



Plug-in with rear terminal P250



Plug-in P630 with front terminal P630

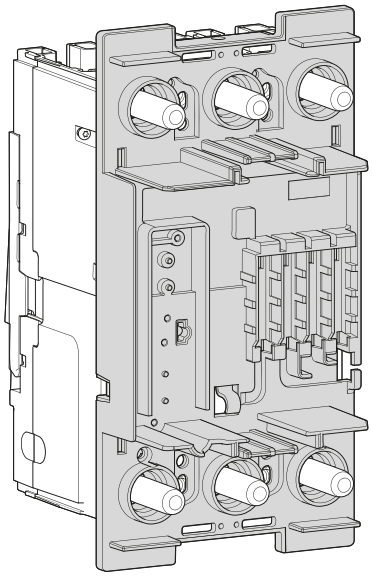


Plug-in with rear terminal P630

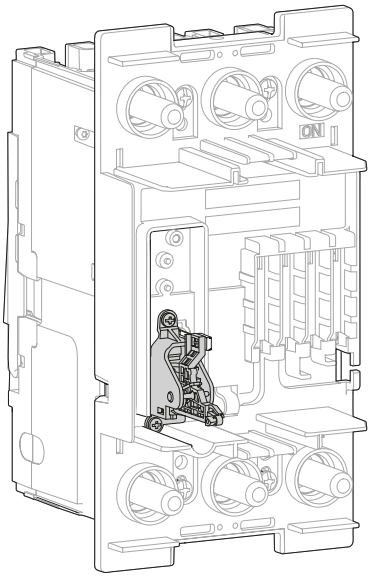
The plug-in system consists of an extraction mechanism directly mounted onto the circuit breaker and allows easy replacement of the device without removing the power conductors. The plug-in system ensures protection degree IP20 when the circuit breaker is removed.
The connection to the plug-in system of P160 and P250 can be done using cables fitted with lugs, front terminal extensions or rear terminals using the L connection that is separately available.
As for the P630 plug-in system, the connection is done using either front terminal extensions or rear terminals using the L connection.
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 circuit breaker fitted with safety trip

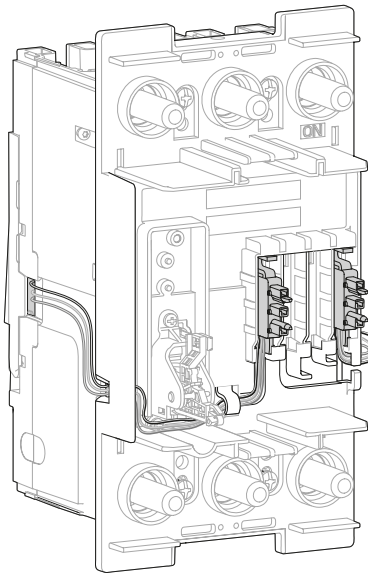
Also available as an option:
- Auxiliary connectors
- Safety trip
- Front and rear connection terminals cables or bars



P250 Plug-in circuit breaker adaptor



P250 Plug-in circuit breaker adaptor fitted with safety trip



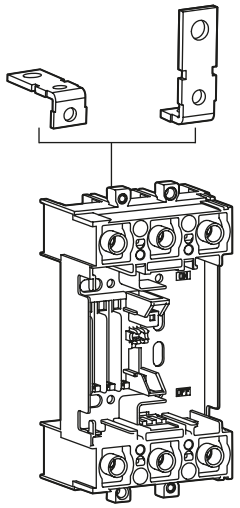
P250 Plug-in circuit breaker adaptor fitted with internal auxiliaries

Auxiliary contact:
Up to three auxiliary connectors can be mounted onto the plug-in of the P160. As for the P250 and P630, four connectors can be mounted on its plug-in accessory. The connectors are used to automatically connect or disconnect the internal AX/AL auxiliary contacts, the shunt trip or the undervoltage auxiliaries that are fitted inside the circuit breaker.

Safety trip:
For P160, P250 and P630 plug-in systems, a safety trip accessory is supplied and can be mounted on the plug-in base to trip the circuit breaker when removed without having been set to the OFF position.

Technical changes reserved

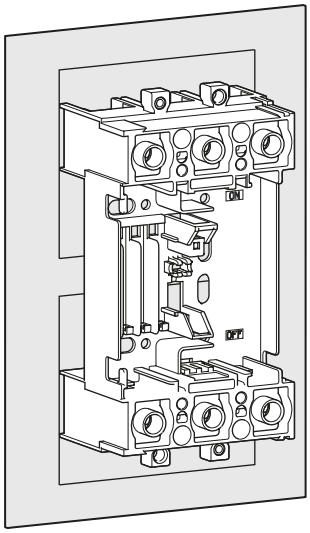
Plug-in system: Front or rear connection terminals



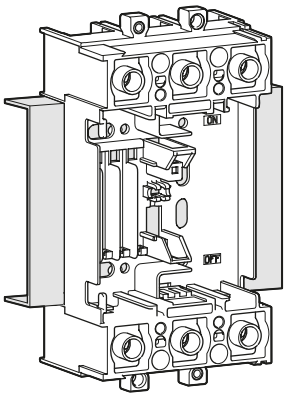
Plug-in base

Separate front or rear connection terminals can be mounted onto the base depending on the connection arrangement needed.

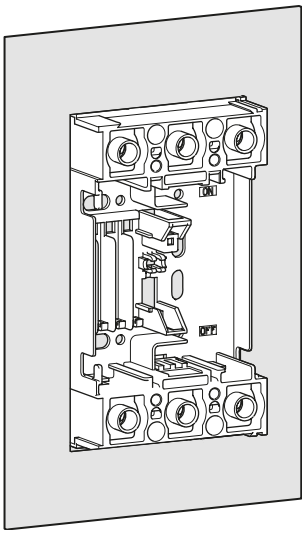
The plug-in base can be mounted on a back plate, a back U-plate or a flush mounting plate.
It is delivered with two isolating shields if mounting is on a plain metallic back plate.



Plug-in on back plate

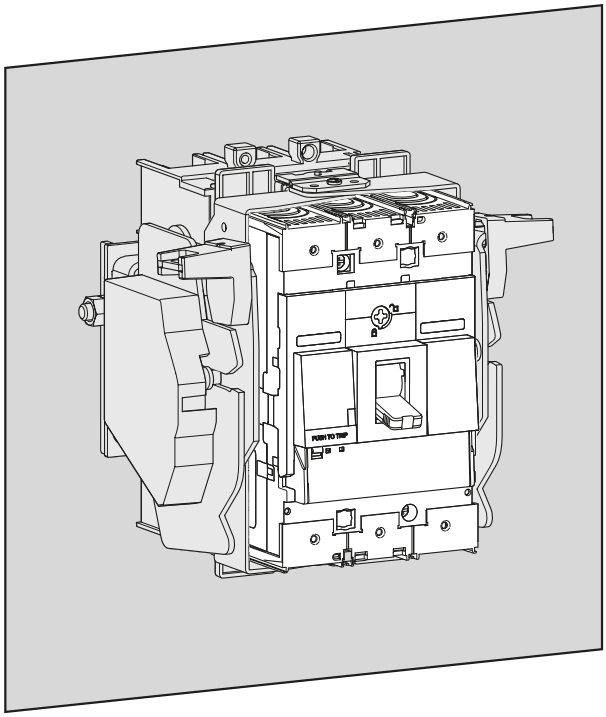


Plug-in on U-plate



Plug-in flushmounted

Withdrawable system



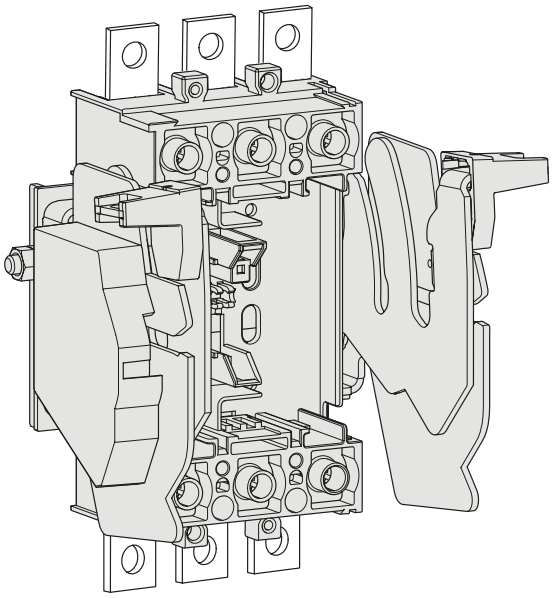
P250 withdrawable

Based on the P250 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 to check auxiliary operation.
- Removed: the MCCB is detached and can be removed from the installation.

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

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



Withdrawable base P250

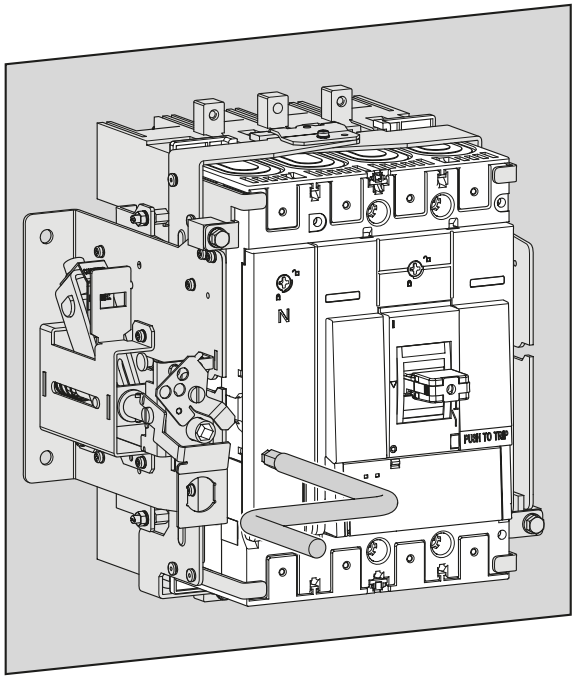
The withdrawable adaptor must be mounted to the back of the MCCB.
Up to 5 auxiliary connectors can be mounted onto the plug-in to automatically connect and disconnect the internal AX/AL, shunt trip or undervoltage auxiliaries fitted into the MCCB.
As an option, a safety trip accessory can be mounted 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 into the withdrawable base. 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

Withdrawable system



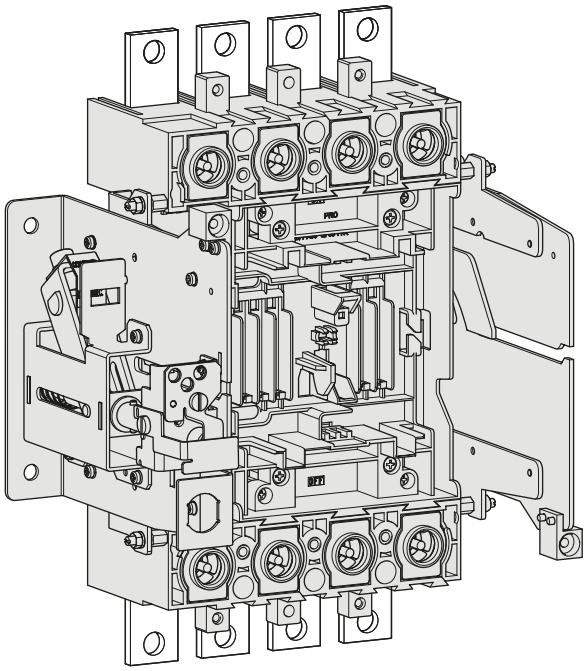
P630 withdrawable

Based on the P630 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 to check auxiliary operation.
- Removed: the MCCB is detached and can be removed from the installation.

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

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



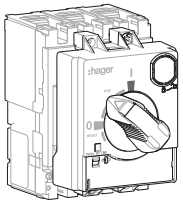
Withdrawable base P630

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.

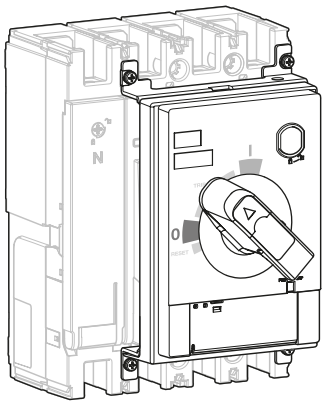
As an option, a position switch can be mounted on the withdrawable adaptor to indicate through an auxiliary circuit the connected or disconnected position of the MCCB into the withdrawable base. The withdrawable base is not supplied with terminal connections. Separate front or rear bar terminals can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

Direct rotary handles



Rotary handle P160



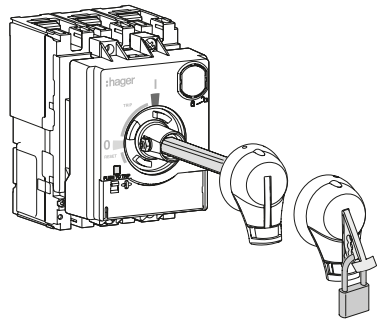
Rotary handle P630

Direct rotary handle features:

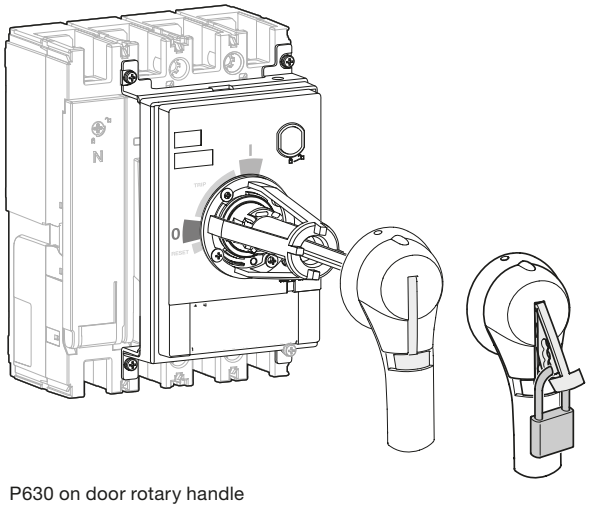
- Suitable for insulation,
- Clear indication of the 3 positions: ON, OFF and TRIP,
- Circuit breaker built-in “PUSH TO TRIP” test button accessible on the direct rotary handle,
- Trip unit dial settings accessible through the direct rotary handle,
- Integrated padlocking facility. Keylock as an option.
- ¼ turn screws to ease the mounting in front of P160-P250 MCCBs and facilitate the access to the internal auxiliary contacts.

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 handle is 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



P160 on door rotary handle



P630 on door rotary handle

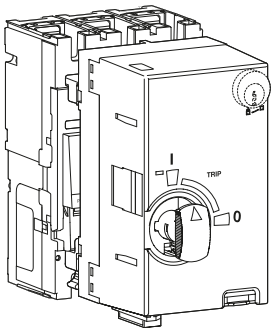
On door rotary handle features:

- Suitable for insulation,
- Clear indication of the 3 positions: ON, OFF and TRIP,
- Circuit breaker built-in “PUSH TO TRIP” test 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.
- ¼ turn screws to ease the mounting in front of P160-P250 MCCBs and facilitate the access to the internal auxiliary contacts.

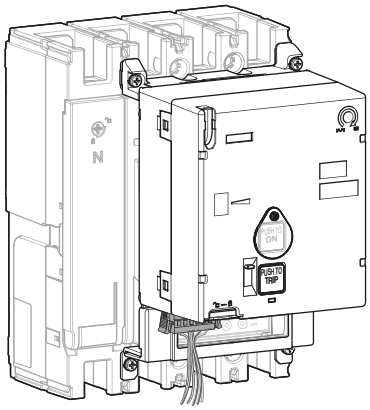
The circuit breaker can be locked in OFF position with one to three padlocks (not supplied). Padlock shackle: Ø 5.5 - 8 mm.
It is necessary to unlock the extended rotary handle in order to reset the circuit breaker after tripping.
A Ronis type keylock is available as an option to mount on the base fitted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

Technical changes reserved

Motor operator



Motor operator P250



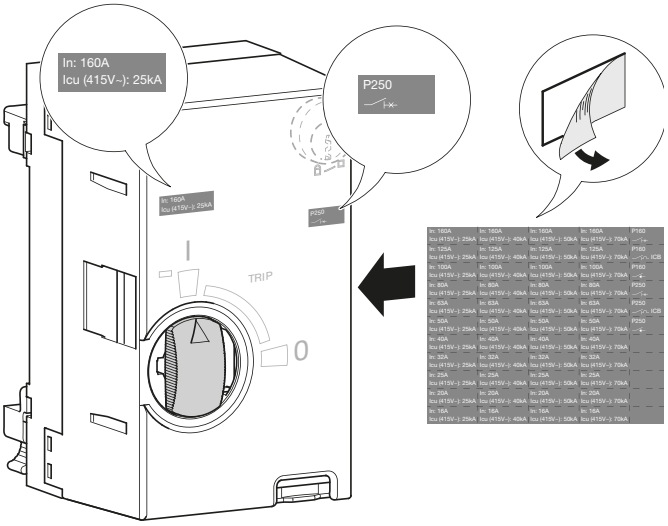
Motor operator P630

Applications:
The motor operator allows to remote a P250 or a P630 circuit breaker. It allows to centralize or perform automatic control of the energy distribution or perform any operation without intervening locally on the circuit breaker such as changing the source, load shedding, coupling...

- The motor operator has a manual control for local operation in the ON or OFF position of the circuit breaker.
- The motor operator can be locked in the OFF position using a padlock as standard and is also available as an option with a key lock.
- Two motor operator versions are available: with or without automatic reset.
- The auto-reset allows the circuit breaker to be reset to the OFF position automatically after a trip. Equipped with this function, the motor operator returns the automatic circuit breaker from the TRIP position to the OFF position.

Motor operator features:
- Tool-free installation with ¼ turn levers for P250 motors,
- Fast operation (<100 ms),
- Position contact 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 (different versions),
- Voltage presence indication,
- Electrical interlocking (optional).

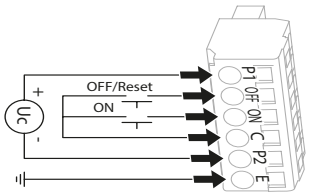
A label showing the circuit breaker characteristics can be stuck in front of the motor operator (supplied as standard).



Marking stick on Motor operator

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.

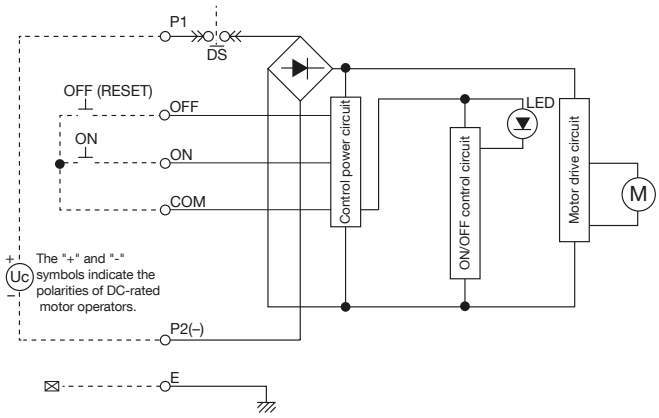


Terminal Motor operator

LED	Info
Steady Green	Power Ok / On
Flashing Green	Electrical interlock cable disconected Missing electrical interlock plug
Flashing Green/Red LED indicates wrong behavior of Motor and can be due to :	- Supply power < 300VA : not enough voltage or output current, especially for DC version - Motor cannot operate MCCB due to blocking mechanism (MCCB cannot close or reset

ON and OFF command is available with several power supply voltages in AC or DC.

Plug-in and withdrawable mounting accessories are compatible with the P250 circuit breaker fitted with an electrical motor operator.
- Accessories available as an option:
- Keylock for locking in the OFF position,
- Electrical interlocking.



For P250 motors

Rated operating voltage		Un	24 V DC	48 V DC	100-110 V DC	200-220 V DC	100-110 V AC	200-220 V AC	230-240 V AC
Frequency		Hz	-	-	-	-	50 / 60	50 / 60	50 / 60
Operating current		A	14	12	3.4	4.2	3.6	3.6	3.4
Inrush current Peak value		A	27	17	7.6	5.9	8.7	6.6	6
Operating method			Direct drive						
Operating time ON, OFF, RESET		ms	<100						
Operating frequency		Cycle / min.	10						
Power supply required		VA	>300						
Endurance value (Operating cycles) (1)			8000						

(1) Operating cycles are guaranteed according to the IEC 60947-2 standard. The condition of frequency: 120 times per 1 hour.

For P630 motors

Rated operating voltage		Un	24 V DC	48 V DC	100-120 V DC	100-110 V AC	200-240 V AC
Frequency		Hz	-	-	-	50 / 60	50 / 60
Operating current	ON	A	-	-	-	-	-
	OFF, RESET	A	6.7	3.5	1.4	1.7	1.4
Inrush current Peak value	ON	A	12	12	4.1	4.1	4.0
	OFF, RESET	A	15.3	7.4	4.4	4.2	3.9
Operating method			Spring charged				
Operating time	ON	s	0.1				
	OFF, RESET	s	1.5				
Operating frequency		Cycle / min.	10				
Power supply required		VA	>300				
Endurance value (Operating cycles) (1)			5000				

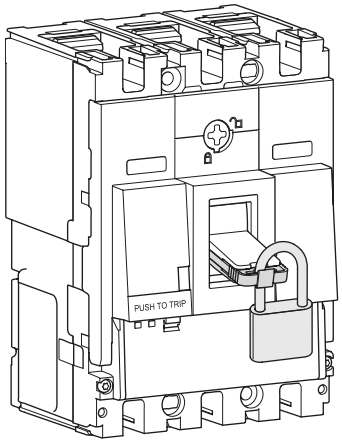
(1) Operating cycles are guaranteed according to the IEC 60947-2 standard. The condition of frequency: 60 times per 1 hour.

Technical changes reserved

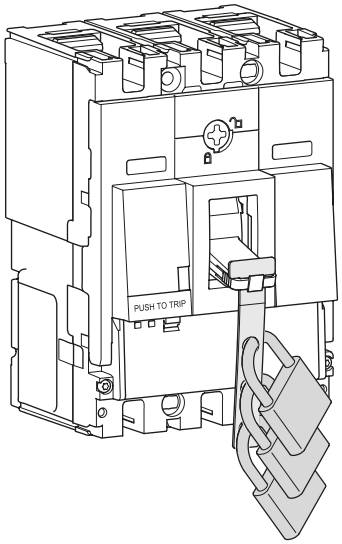
Locking system

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

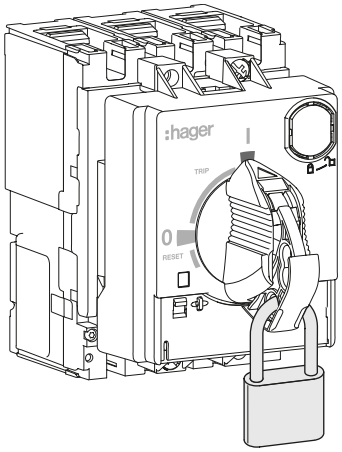
Device	Function	Means	Specific accessory
Standalone MCCB	Lock in OFF or ON position	Padlock	-
		Cable tie	-
		Up to 3 padlocks	Palocking kit
Direct rotary handle	Lock in OFF or ON position	Up to 3 padlocks	-
	Lock in OFF or ON position	Keylock	Locking device + keylock
Extended rotary handle	Lock in OFF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



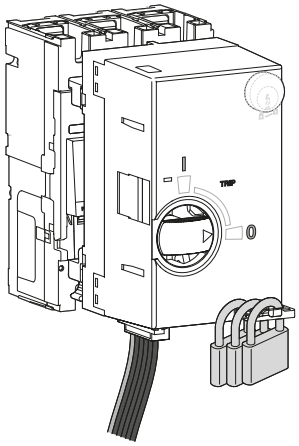
Direct with 4 mm shackle padlock



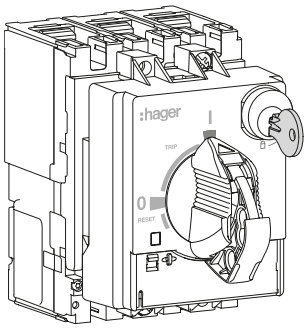
Padlocking kit with three pieces of up to 6 mm shackle padlocks



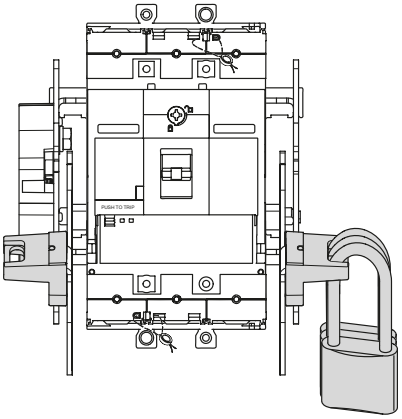
Padlock direct rotary handle



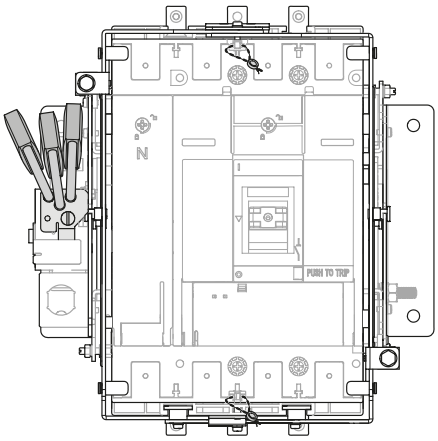
Padlock motor operator



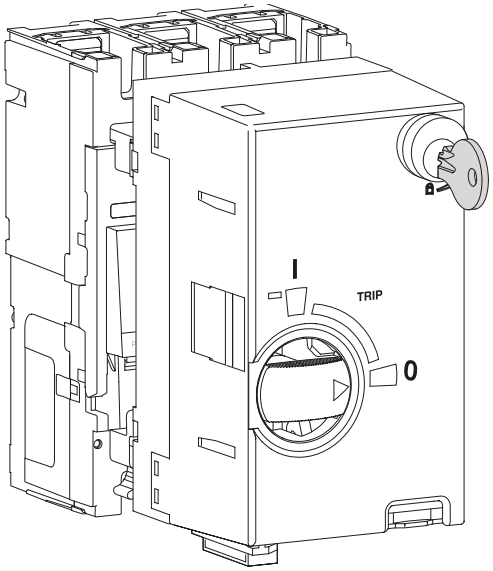
Key lock direct rotary handle



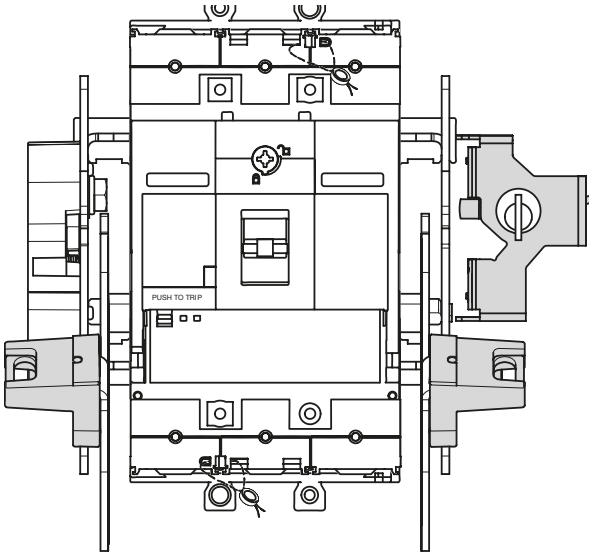
Key lock motor operator P250



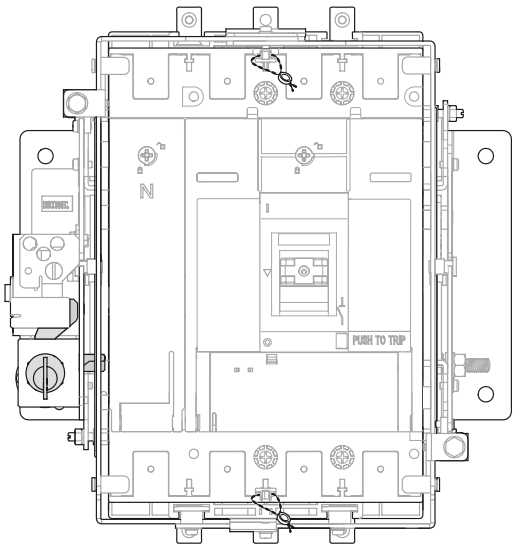
Key lock withdrawable P630



Key lock motor operator P250



Key lock withdrawable P250

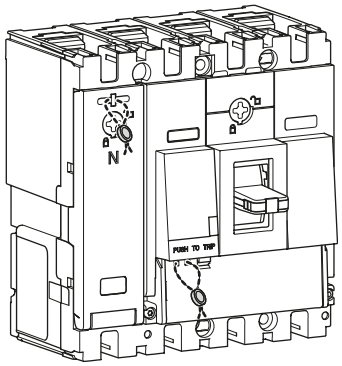


Key lock withdrawable P630

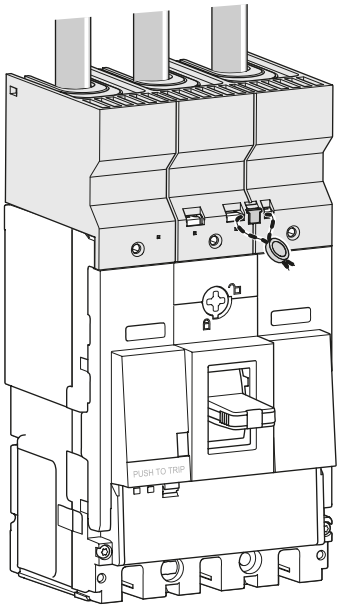
Technical changes reserved

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

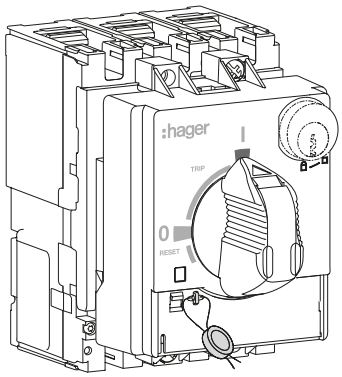


Seals on front covers



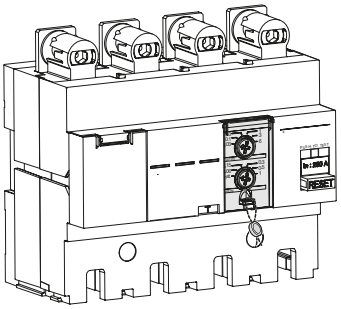
Seal on terminal cover P160

Direct rotary handle



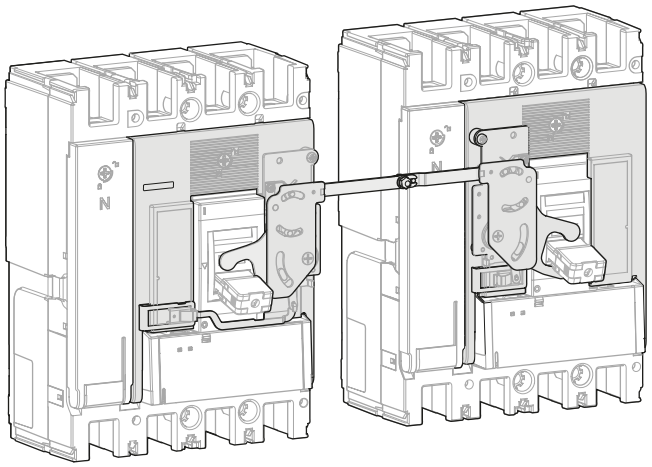
Seal on front cover rotary handle P160

RCD add-on block



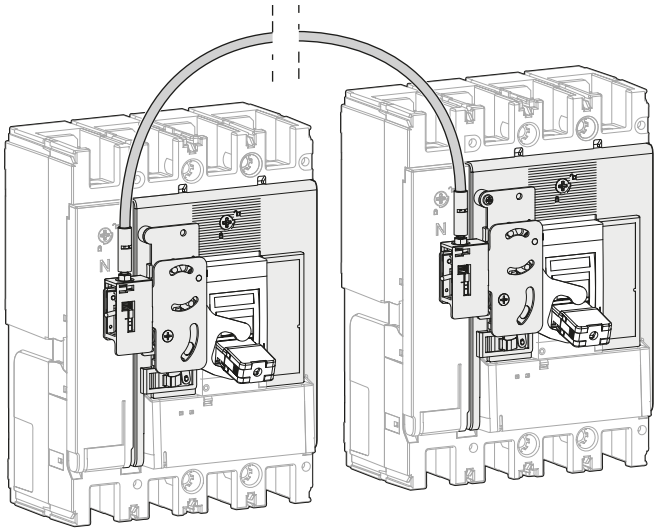
Seal on RCD add-on block

Mechanical interlock by link

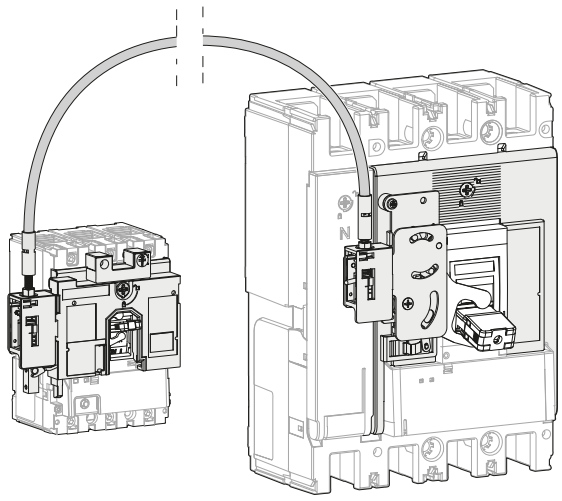


This solution is a connecting rod to make a link between two h3+ MCCBs of the same frame size mounted side by side.
This accessory interlocks mechanically two circuit breakers in order to prevent from the following operations:
- Switch ON a circuit breaker when the other one is already in ON position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

Mechanical interlock by cable

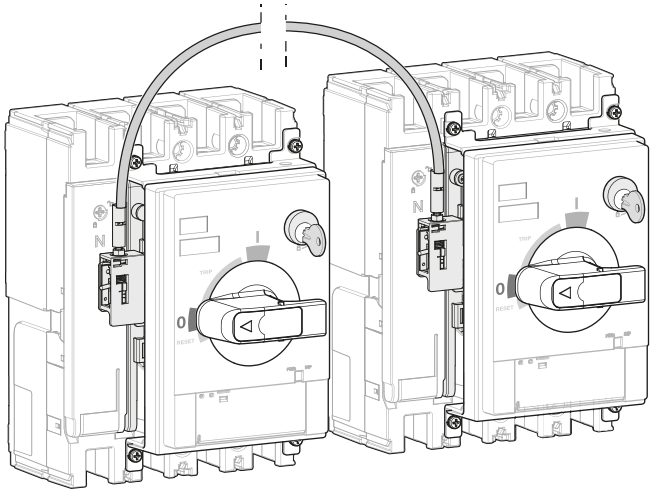


This solution allows two h3+ MCCBs of the same or different frame sizes to be interlocked.
Both circuit breakers don't necessary need to be of the same size nor mounted side by side thanks to the interlocking cable.
This accessory interlocks mechanically two circuit breakers in order to prevent from 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 circuit breaker.
- The cable available in 1 m or 1.5 m.

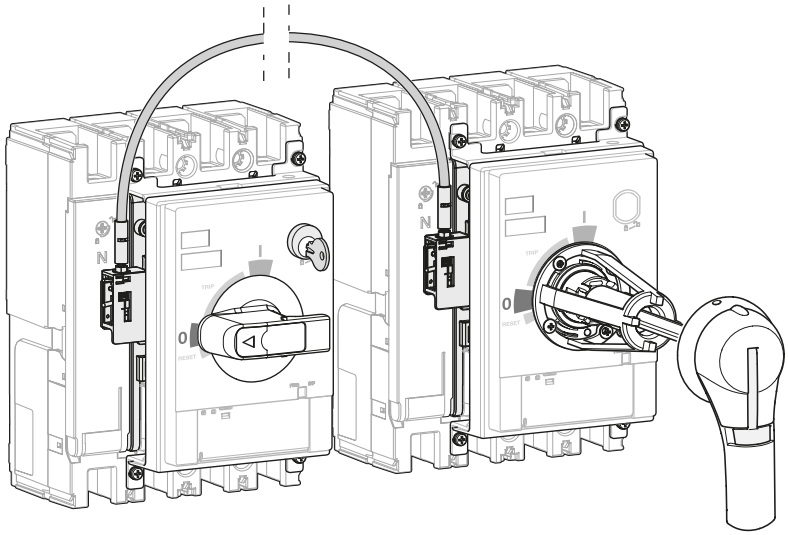


Technical changes reserved

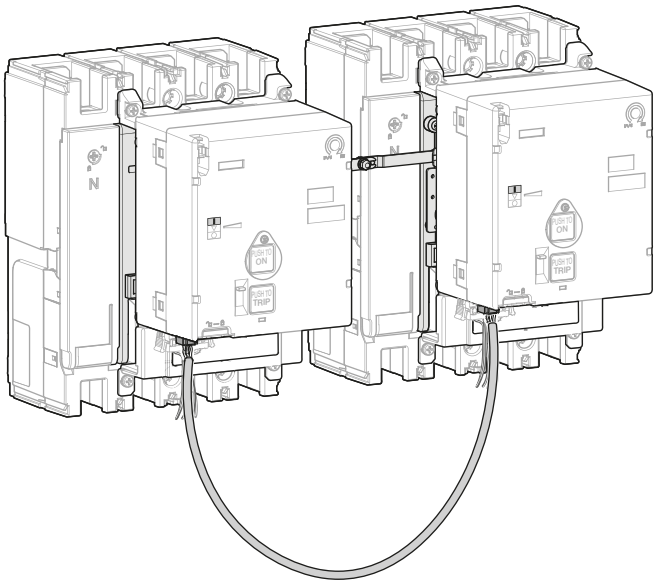
Interlocking combined with rotary handles



Cable interlocking solution is compatible with direct and on-door rotary handles.
Operating the MCCBs is done using the rotary handle mechanism.
Interlocking solutions are compatible with direct and on-door rotary handles.

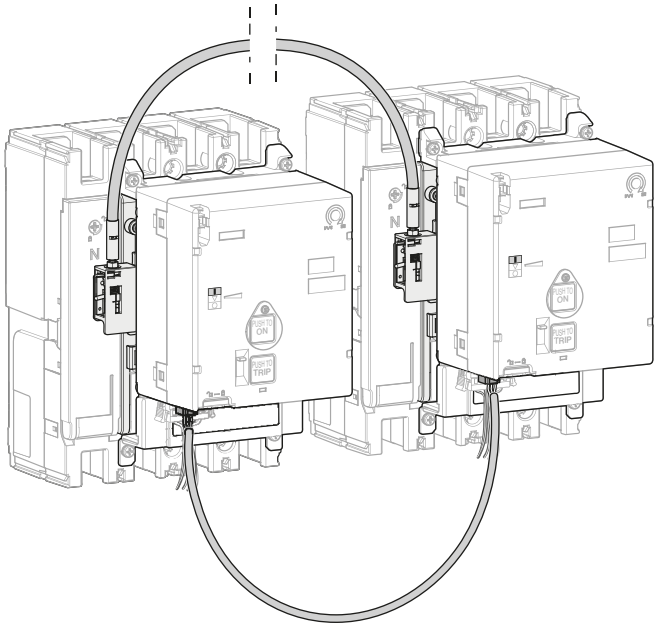


Link interlocking combined with motor operators



This solution is a solid connecting rod to make a link between two h3+ MCCBs of the same frame size mounted side by side.
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.

Technical changes reserved

Installation and operating recommendations

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01	Installation and operating conditions	80
02	Safety clearances and minimum distances	84
03	Power loss	86

Altitude derating

Up to an altitude of 2 000 m above sea level, there is no derating to apply on electrical properties of the h3+ P160 P250 and P630. Above 2 000 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 2 000 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)	690	600	525	460
Ith Maximum thermal current (A) at 50 °C	1	0.96	0.93	0.9

Vibrations

h3+ P160, P250 and P630 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

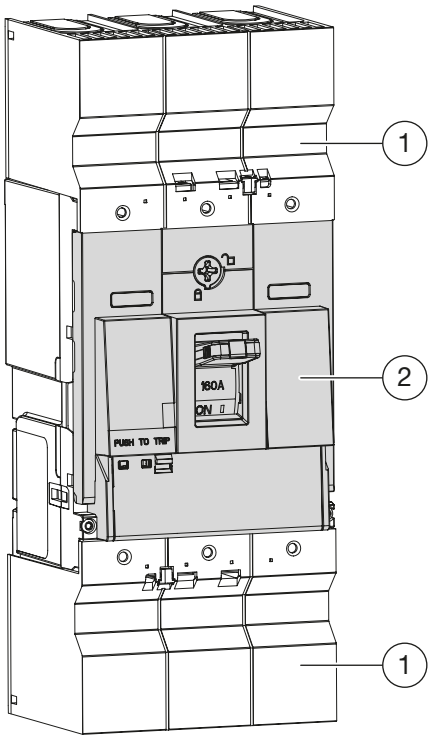
h3+ circuit breakers are protected against:
- overvoltage caused by circuit switching,
- overvoltage caused by atmospheric disturbances or a distribution-system outage (e.g. failure of a lighting system),
- devices emitting radio waves (radios, walkie-talkies, radar, etc.),
- electrostatic discharges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

P160, P250 and P630 circuit breakers have successfully passed the electromagnetic-compatibility tests (EMC) with immunity levels listed in the General Characteristics chapter.

International protection marking

h3+ circuit breakers comply with the following international 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.

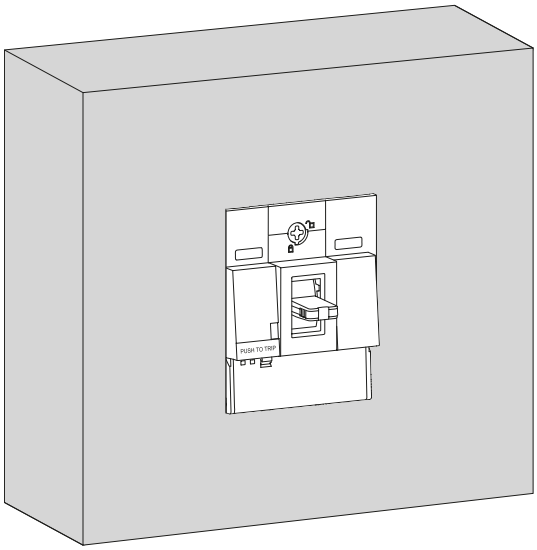
Degree of protection IP40 is achieved when an h3+ circuit breaker is installed in a switchboard with a front panel cut-out covering a minimum the protection settings window. Higher protection degree of IP65 can be achieved by installing a door mounted external rotary handle.



IP of the different areas

1 IP20: side, back, terminal cover

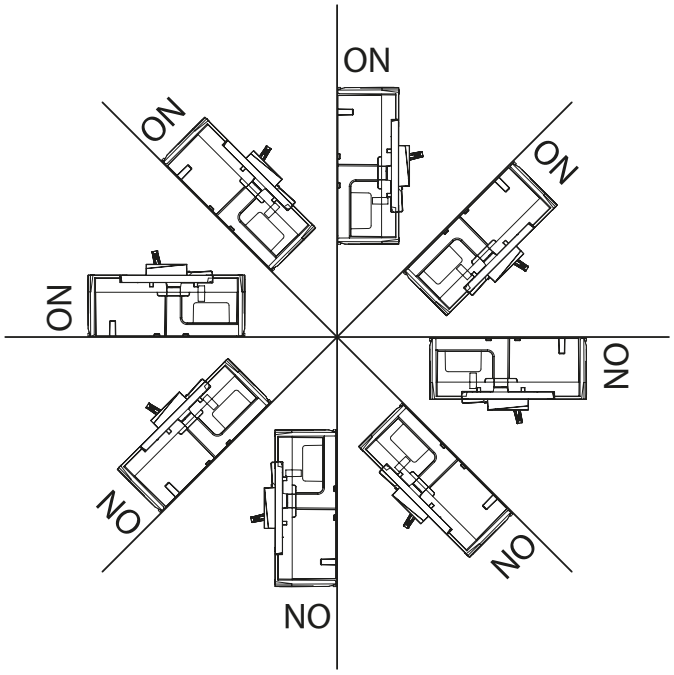
2 IP40: front cover

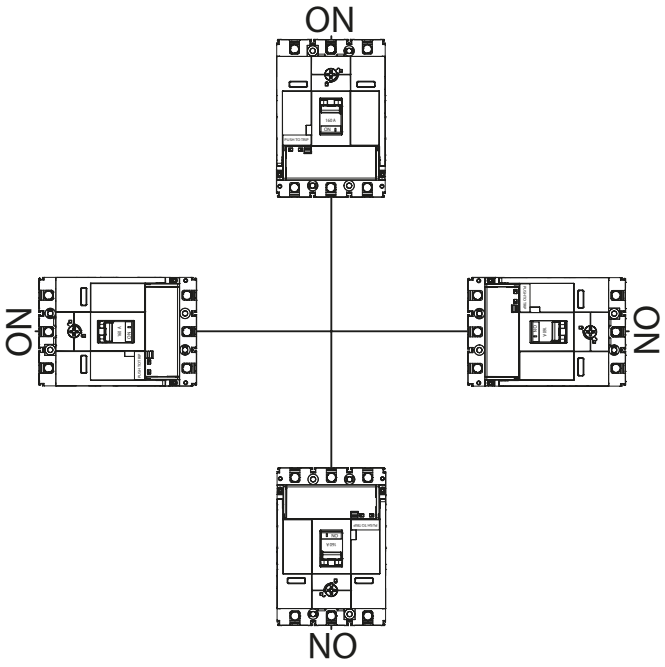


Front panel IP40

Mounting position

h3+ P160, P250 and P630 circuit breakers can be mounted at any angle without affecting the performance and the characteristics.





Direction of power supply

For AC applications, h3+ 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 and RCD add-on blocs supplied either from the top or from the bottom.

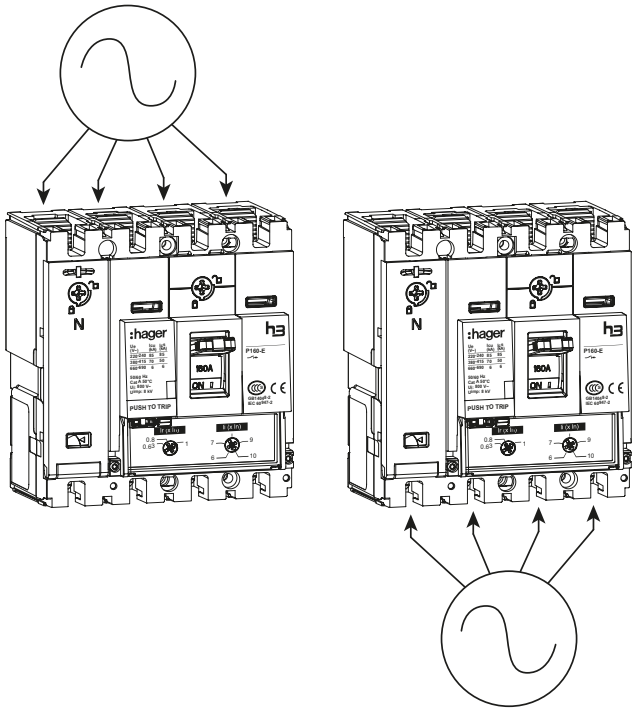
For DC applications :

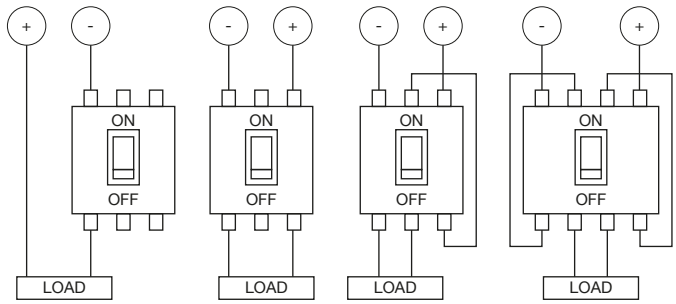
- Connection in series

It allows breaking higher voltages for a same nominal current.

- Connection in parallel

It allows breaking higher currents for the same operational voltage.





1P connected in series | 2P connected in series | 3P connected in series | 4P connected in series

Cable between two poles in series should have a length of a least 2 meters.

Derating due to temperature

h3+ P160 and P250 thermo-magnetic circuit breakers are calibrated at 50 °C ambient temperature for the overload protection. This means that when the ambient temperature is less or greater than 50 °C, the Ir protection pick-up threshold is slightly modified.

h3+ P160 and P250 circuit breakers have to be derated as indicated in the table below:

Ambient temperature influences on Ir settings of the P160 TM circuit breaker

		Temperature °C												
In (A)	**Ir … x In**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**
25	**0.63**	19.3	18.9	18.5	18.1	17.7	17.3	16.9	16.4	16	15.5	15.1	14.6	14.1
	0.8	24.1	23.6	23.2	22.7	22.2	21.6	21.1	20.6	20	19.4	18.8	18.2	17.6
	1	30.1	29.6	28.9	28.3	27.7	27.0	26.4	25.7	25	24.3	23.5	22.8	22.0
40	**0.63**	31.2	30.5	29.8	29.0	28.3	27.5	26.7	25.9	25	24.1	23.2	22.2	21.2
	0.8	39.9	39.0	38.1	37.2	36.2	35.2	34.2	33.1	32	30.9	29.7	28.5	27.2
	1	49.9	48.8	47.6	46.5	45.2	44.0	42.7	41.4	40	38.6	37.1	35.6	34.0
63	**0.63**	55.3	53.6	51.9	50.1	48.3	46.3	44.3	42.2	40	37.7	35.1	32.5	29.5
	0.8	69.1	67.0	64.9	62.6	60.3	57.9	55.4	52.8	50	47.1	43.9	40.6	36.9
	1	87.1	84.5	81.7	78.9	76.0	73.0	69.8	66.5	63	59.3	55.4	51.1	46.5
80	**0.63**	64.0	62.4	60.8	59.1	57.4	55.6	53.8	51.9	50	48.0	45.9	43.6	41.3
	0.8	80.6	78.6	76.6	74.5	72.3	70.1	67.8	65.5	63	60.4	57.8	55.0	52.0
	1	102.3	99.8	97.2	94.6	91.8	89.0	86.1	83.1	80	76.8	73.4	69.8	66.1
100	**0.63**	78.3	76.5	74.8	72.9	71.1	69.1	67.1	65.1	63	60.8	58.6	56.2	53.8
	0.8	99.4	97.2	94.9	92.6	90.2	87.8	85.3	82.7	80	77.2	74.4	71.4	68.3
	1	124.3	121.5	118.7	115.8	112.8	109.7	106.6	103.3	100	96.5	93.0	89.2	85.3
125	**0.63**	94.0	92.4	90.7	89.0	87.3	85.5	83.7	81.9	80	78.1	76.1	74.1	72.0
	0.8	117.5	115.5	113.4	111.3	109.1	106.9	104.7	102.4	100	97.6	95.1	92.6	90.0
	1	146.9	144.3	141.7	139.1	136.4	133.6	130.8	127.9	125	122.0	118.9	115.7	112.5
160	**0.63**	120.1	117.7	115.4	113.0	110.5	108.0	105.4	102.7	100	97.2	94.3	91.3	88.3
	0.8	150.1	147.2	144.2	141.2	138.1	135.0	131.7	128.4	125	121.5	117.9	114.2	110.3
	1	192.1	188.4	184.6	180.7	176.8	172.7	168.6	164.4	160	155.5	150.9	146.2	141.2

Ambient temperature influences on Ir settings of the P250 TM circuit breaker

		Temperature °C												
In (A)	**Ir … x In**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**
50	**0.63**	40.4	39.4	38.4	37.4	36.4	35.4	34.3	33.2	32	30.8	29.5	28.2	26.9
	0.8	50.4	49.3	48.0	46.8	45.5	44.2	42.8	41.4	40	38.5	36.9	35.3	33.6
	1	63.1	61.6	60.1	58.5	56.9	55.3	53.6	51.8	50	48.1	46.2	44.1	42.0
63	**0.63**	52.8	51.3	49.9	48.4	46.8	45.2	43.5	41.8	40	38.1	36.1	34.0	31.7
	0.8	66.0	64.2	62.4	60.5	58.5	56.5	54.4	52.3	50	47.6	45.1	42.5	39.7
	1	83.1	80.9	78.6	76.2	73.7	71.2	68.6	65.9	63	60.0	56.9	53.5	50.0
100	**0.63**	81.7	79.6	77.4	75.2	72.9	70.6	68.1	65.6	63	60.3	57.4	54.4	51.2
	0.8	103.7	101.0	98.3	95.5	92.6	89.6	86.5	83.3	80	76.5	72.9	69.1	65.0
	1	129.6	126.3	122.9	119.4	115.8	112.0	108.2	104.2	100	95.7	91.1	86.3	81.2
125	**0.63**	97.1	95.1	93.1	91.0	88.9	86.8	84.6	82.3	80	77.6	75.1	72.6	69.9
	0.8	121.3	118.9	116.4	113.8	111.2	108.5	105.7	102.9	100	97.0	93.9	90.7	87.4
	1	151.7	148.6	145.5	142.3	139.0	135.6	132.2	128.6	125	121.3	117.4	113.4	109.3
160	**0.63**	124.7	121.9	119.0	116.1	113.1	109.9	106.7	103.4	100	96.5	92.8	89.0	85.0
	0.8	155.9	152.4	148.8	145.1	141.3	137.4	133.4	129.3	125	120.6	116.0	111.2	106.2
	1	199.6	195.1	190.5	185.7	180.9	175.9	170.8	165.5	160	154.3	148.5	142.3	135.9
200	**0.63**	164.9	160.5	155.9	151.2	146.3	141.3	136.1	130.7	125	119.1	112.8	106.2	99.2
	0.8	211.1	205.4	199.5	193.5	187.3	180.9	174.2	167.2	160	152.4	144.4	136.0	127.0
	1	263.8	256.7	249.4	241.9	234.1	226.1	217.7	209.0	200	190.5	180.5	170.0	158.7
250	**0.63**	198.5	194.1	189.6	185.0	180.3	175.4	170.4	165.3	160	154.5	148.8	142.9	136.7
	0.8	248.1	242.6	237.0	231.3	225.4	219.3	213.1	206.6	200	193.1	186.0	178.6	170.9
	1	310.2	303.3	296.3	289.1	281.7	274.1	266.3	258.3	250	241.4	232.5	223.3	213.7

Technical changes reserved

Ambient temperature influences on Ir settings of the P630 TM 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 nominal ratings (In) of the electronic circuit breakers

The temperature of the electronic 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 electronic circuit breakers.

		Temperature °C			
	In (A)	**50**	**60**	**65**	**70**
P160	**40**	40	40	40	40
	100	100	100	100	100
	160	160	159	145	135
P250	**40**	40	40	40	40
	100	100	100	100	100
	160	160	160	145	135
	250	250	240	220	200
P630	**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.

		Rating Coefficient	
	Nominal rating	**AOB**	**Plug In**
P160	**≤ 160 A**	x	1
P250	**≤ 250 A**	1	1
P630	**< 630 A**	0,97	1
	630 A	0,9	0,9

Insulation distances

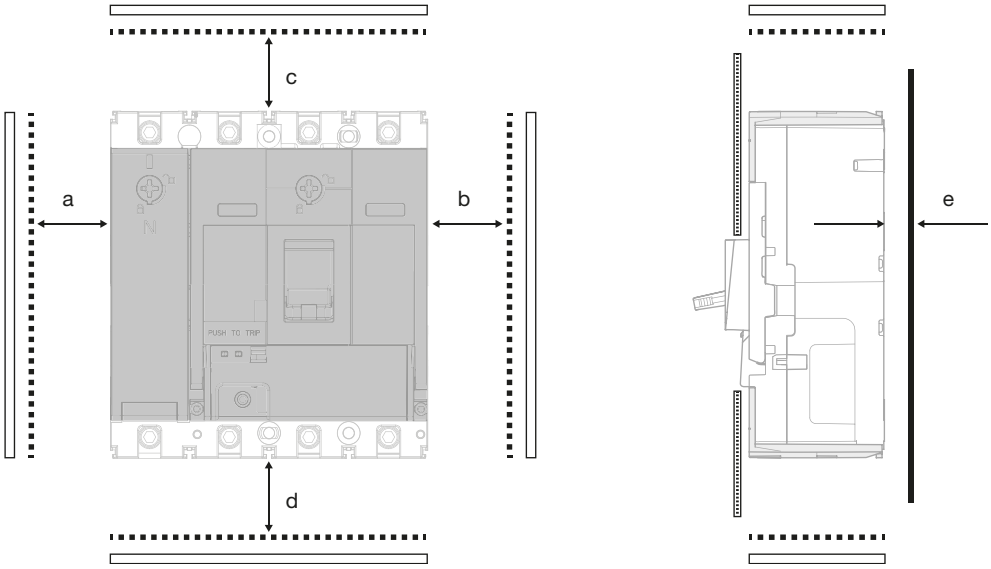
The insulation distances between the MCCB and its surroundings (earthed metal parts – insulators, etc.) must be maintained to prevent arcing faults which may occur due to conductive ionised gas.
In some cases where other specifications require different insulation distances to those shown here, the greater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

h3+ MCCBs 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.

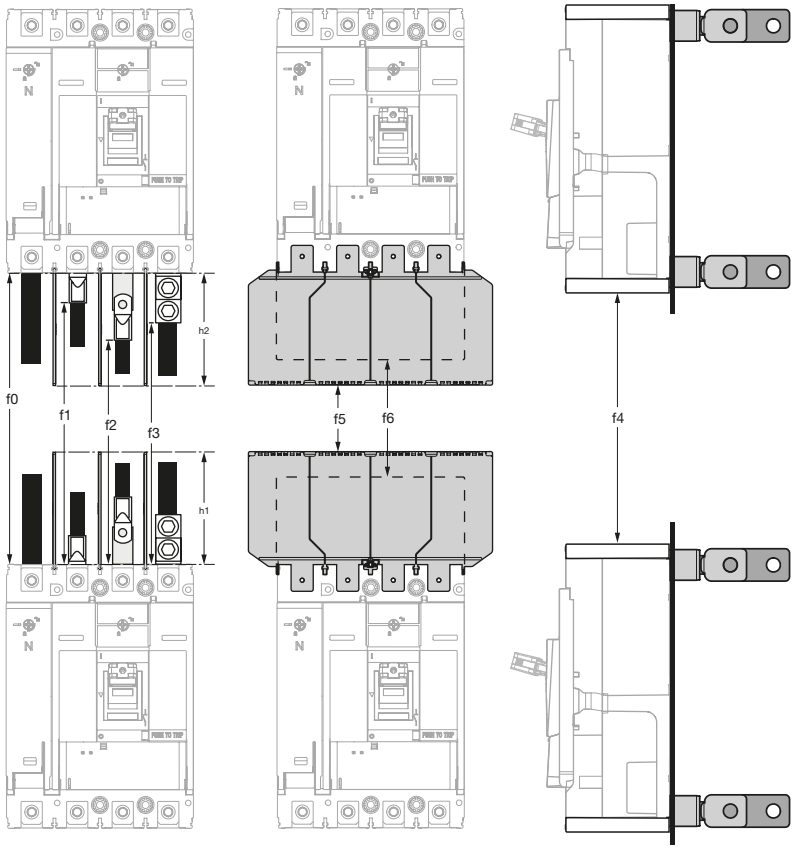
Minimum distance between h3+ MCCB and top, bottom or side panel



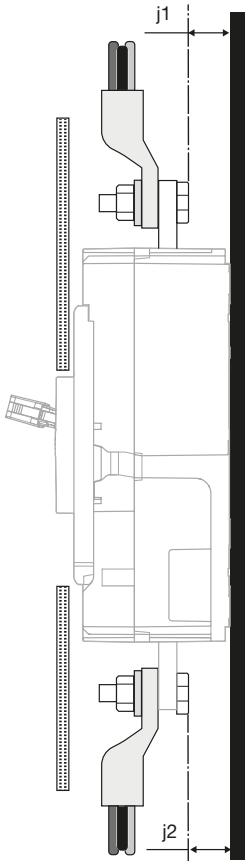
	Earthed metallic plate				**Non-metallic plate**		
Ue ≤ 690 V AC	P160	P250	P630		P160	P250	P630
Breaking capacity	Icu ≤ 70kA	Icu ≤ 70kA	Icu ≤ 70kA	Icu ≤ 110kA			
a / b (mm)	≥ 50	≥ 50	≥ 80	≥ 80	0	0	0
c / d (mm)	≥ 50	≥ 50	≥ 80	≥ 120	≥ 75	≥ 100	≥ 100
e (mm)	0	0	0	0	0	0	0
Ue ≤ 500 V DC							
a / b (mm)	≥ 50	≥ 50	≥ 80	≥ 80	0	0	0
c / d (mm)	≥ 50	≥ 50	≥ 120	≥ 120	≥ 75	≥ 100	≥ 100
e (mm)	0	0	0	0	0	0	0

Technical changes reserved

Minimum distance h3 breaker connections



Dimension (mm)	Type of connection	Type of protection	P160	P250	P630	
					≤ 415V	690V
f0	Isolated bar	Interpole barrier	≥ 100	≥ 200	≥ 350	-
f1	Ring Lug	Interpole barrier	≥ 100	≥ 200	≥ 350	-
f2	Extender	Interpole barrier	≥ 100	≥ 200	≥ 350	-
f3	External alu collar	Interpole barrier	≥ 100	≥ 200	≥ 350	-
f4	Rear connection	Terminal cover zero	≥ 75	≥ 150	≥ 220	≥ 260
f5	Spreader	Terminal cover spreader	≥ 50	≥ 50	≥ 50	≥ 50
f6	Ring Lug	Terminal cover straight	≥ 50	≥ 50	≥ 110	≥ 110
f6	Extender	Terminal cover straight	≥ 50	≥ 50	≥ 110	≥ 110
f6	External alu collar	Terminal cover straight	≥ 50	≥ 50	≥ 110	≥ 110
h1	Ring Lug + Interpole barrier	Normal Feeding	≥ 50	≥ 100	0	≥ 110
		Reverse Feeding	≥ 50	≥ 100	0	≥ 110
h2	Ring Lug + Interpole barrier	Normal Feeding	0	0	0	≥ 110
		Reverse Feeding	≥ 50	≥ 100	0	≥ 110



Dimension (mm)		P160	P250	P630
j1 (mm) upstream / j2 (mm) down-stream	Normal Feeding / Reverse Feeding	≥ 8	≥ 8	≥ 25

In case j1 or j2 is lower than the indicated values, an insulation earth plate is mandatory.

Power loss

Thermal power loss values of h3+ 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 resistance 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 Appendix 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 circuit breakers

	Rating In (A)	Z per pole (mΩ)	P / pole (W)	P / product 3P or 4P (W)
P160	25	10.4	6.5	19.5
	32	8.8	9	27
	40	5.8	9.3	27.9
	63	0.88	3.5	10.5
	80	0.92	5.9	17.7
	100	0.67	6.7	20.1
	125	0.68	10.7	32.1
	160	0.55	14.1	42.3
P250	50	2.00	5	15
	63	1.17	4.65	13.95
	100	0.60	6	18
	125	0.60	9.3	27.9
	160	0.38	9.7	29.1
	200	0.30	12	36
	250	0.27	16.9	50.7
P630	250	0.33	20.6	61.8
	300	0.23	20.5	61.5
	320	0.23	23.3	69.9
	400	0.23	36	108
	630	0.12	46.9	140.7

Power loss electronic circuit breakers

	Rating In (A)	Z per pole (mΩ)	P / pole (W)	P / product 3P or 4P (W)
P160	40	0.35	0.56	1.68
	100	0.35	3.5	10.5
	160	0.35	9	27
P250	40	0.24	0.38	1.2
	100	0.24	2.4	7.2
	160	0.24	6.14	18.4
	250	0.24	15	45
P630	250	0.23	12.3	36.8
	400	0.18	19.3	57.8
	630	0.11	39.6	119

Technical changes reserved

Additional power loss

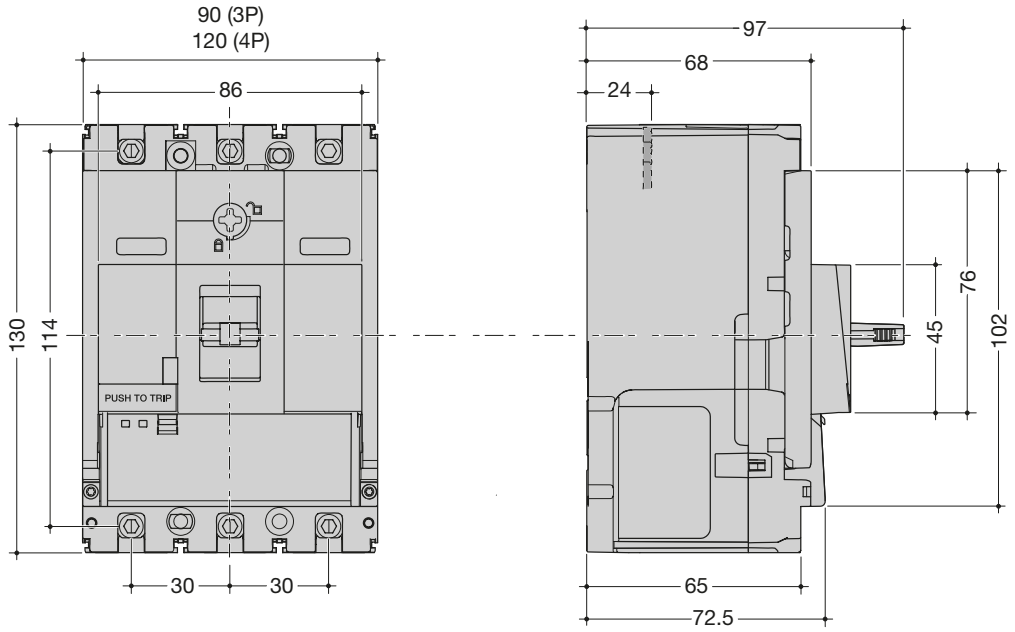
Power loss caused by the mounting accessories has to be taken into account. Thus, the total power loss is equal to the sum of the power loss of the circuit breaker and all the corresponding mounting accessories.

		P/MCCB	**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	6 wires				
P160 TM	25	19.5	-	0.05	-	0.04	0.58	0.14	0.12	0.53
	32	27		0.08		0.07	0.95	0.23	0.20	0.86
	40	27.9		0.12		0.11	1.48	0.35	0.31	1.34
	63	10.5		0.30		0.28	1.31	0.88	0.77	1.95
	80	17.7		0.48		0.46	2.12	1.42	1.24	3.15
	100	20.1		0.75		0.71	3.31	2.21	1.93	4.92
	125	32.1		1.17		1.12	5.18	3.46	3.02	7.50
	160	42.3		1.92		1.83	8.48	5.67	4.95	10.4
P250 TM	50	15	3.2	0.18	0.20	0.20	0.56	0.17	0.20	0.4
	63	13.95		0.29	0.32	0.32	0.89	0.26	0.31	0.7
	100	18		0.72	0.82	0.82	2.23	0.66	0.78	1.7
	125	27.9	5.6	1.13	1.28	1.28	3.49	1.03	1.22	2.6
	160	29.1		1.84	2.09	2.09	5.71	1.69	2.00	4.2
	200	36	17.75	2.88	2.69	3.26	8.93	2.64	3.12	6.6
	250	50.7		4.5	5.1	4.2	13.95	4.08	4.80	10.3
P160 electronic	40	1.68	-	0.12	-	0.11	1.48	0.35	0.31	1.34
	100	10.5		0.75		0.71	3.31	2.21	1.93	4.92
	160	27		1.92		1.83	8.48	5.67	4.95	10.4
P250 electronic	40	1.2	3.2	0.12	0.13	0.11	0.56	0.17	0.20	0.4
	100	7.2		0.72	0.82	0.67	2.23	0.66	0.78	1.7
	160	18.4	5.6	1.84	2.09	1.72	5.71	1.69	2.00	4.2
	250	45	12.75	4.5	5.1	4.2	13.95	4.08	4.80	10.3
P630 electronic	250	36.8	13.6	82.5	50.63	-	7	4.8	5.4	11.4
	400	90	21.7	211.2	129.6		17.9	12.6	13.8	29.1
	630	175.8	34.3	-	321.49		44	16.7	19	58.5

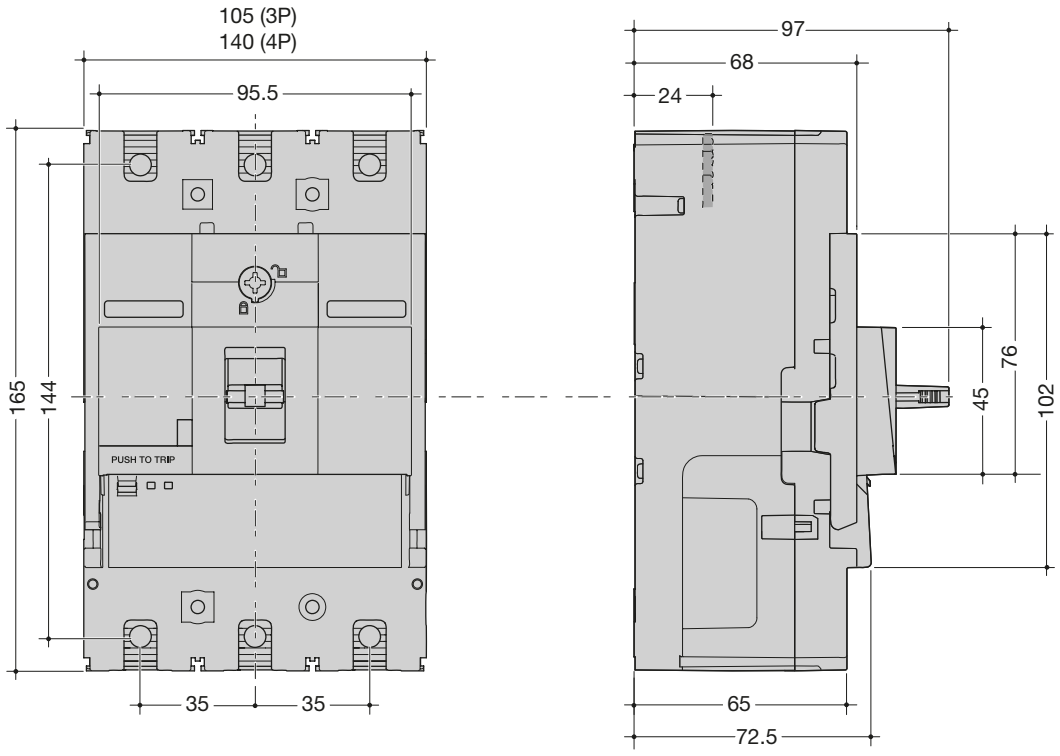
Dimensions and connections

		Page
01	Circuit breakers and RCD add-on block	90
02	Circuit breakers plug-in	97
03	Circuit breakers withdrawables	100
04	Handles and motor operators	89
05	Front panel cut-outs	109
06	Power connections	112
07	Panel display	122

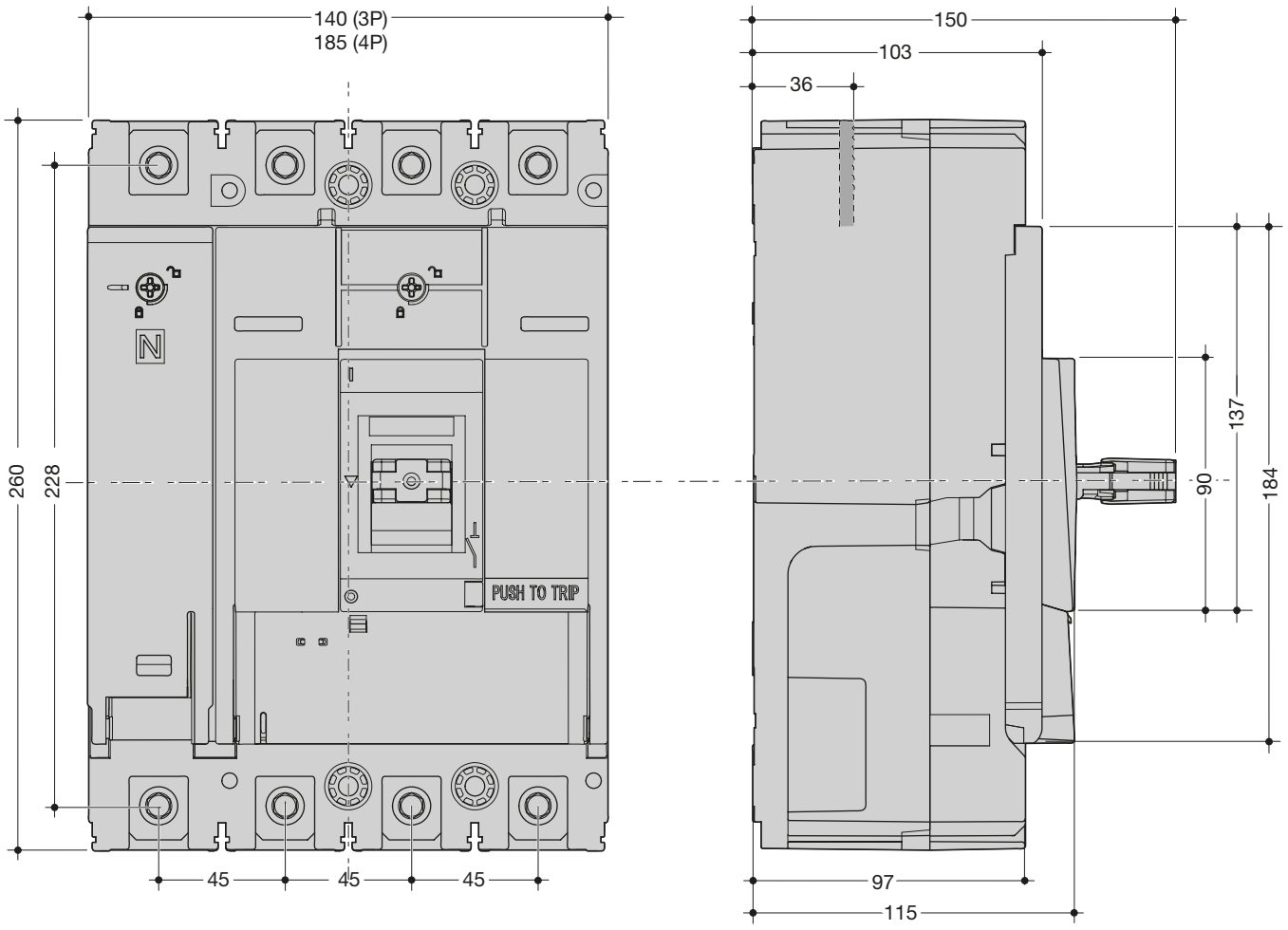
Dimension P160



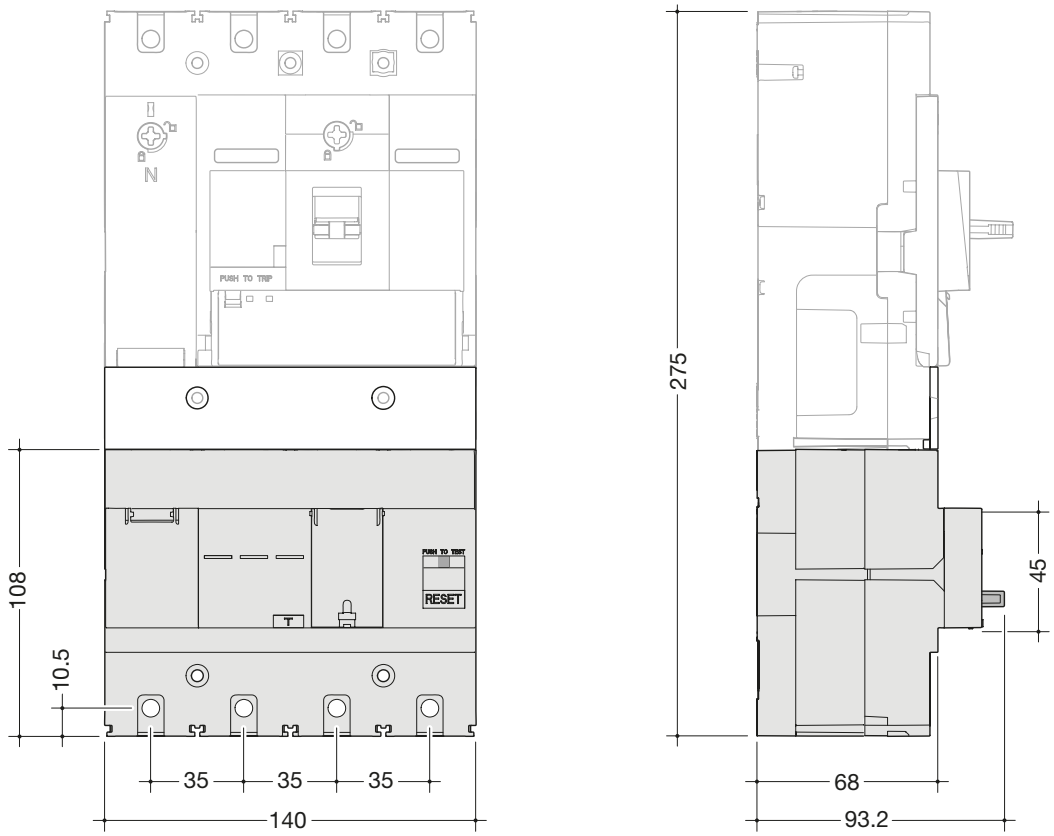
Dimension P250



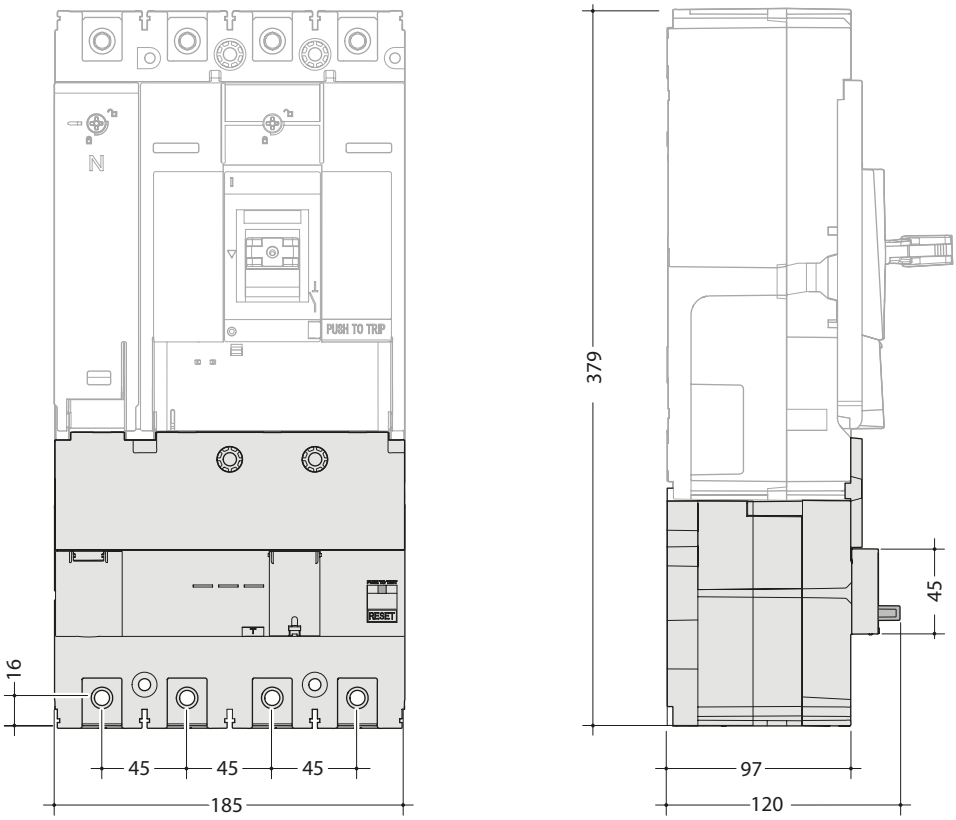
Dimension P630



Dimension RCD Add-on block P250



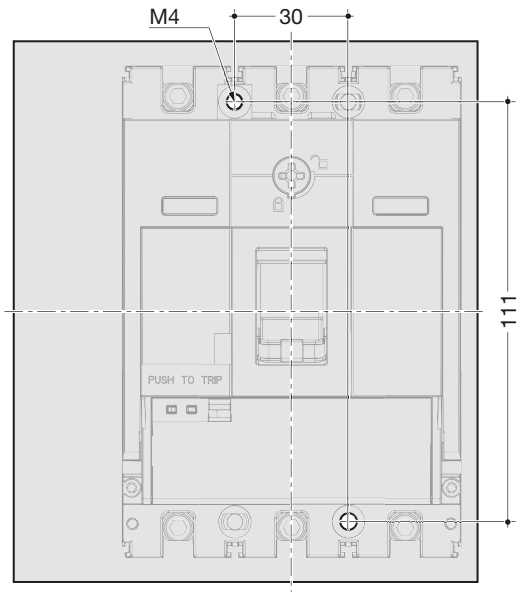
Dimension RCD Add-on block P630



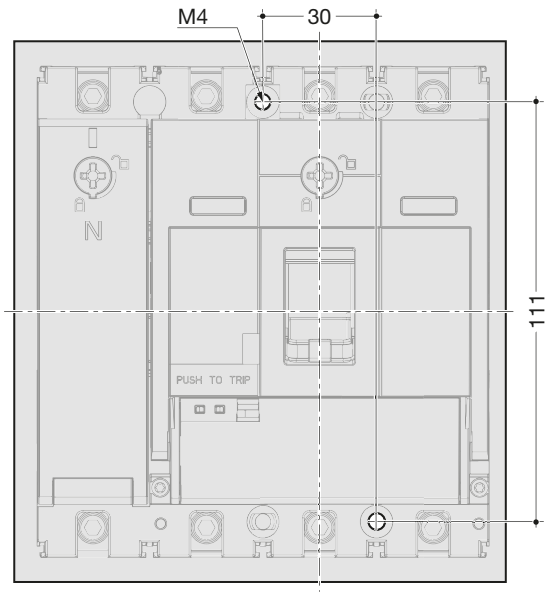
Technical changes reserved

P160 back plate drilling pattern

3P

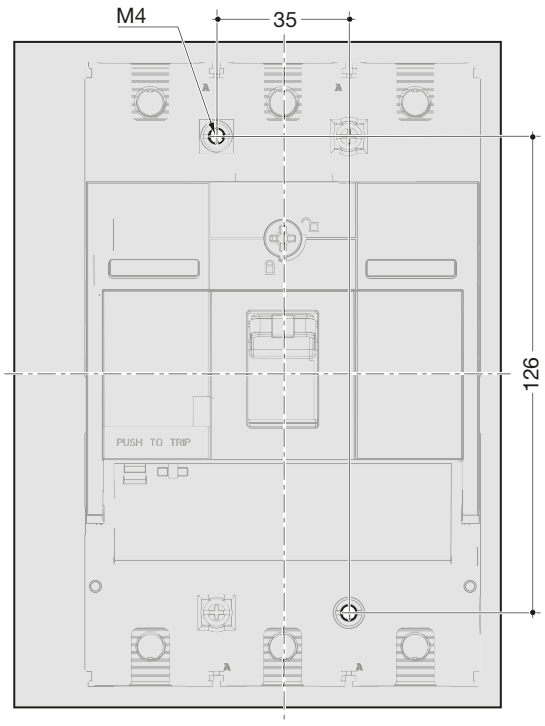


4P

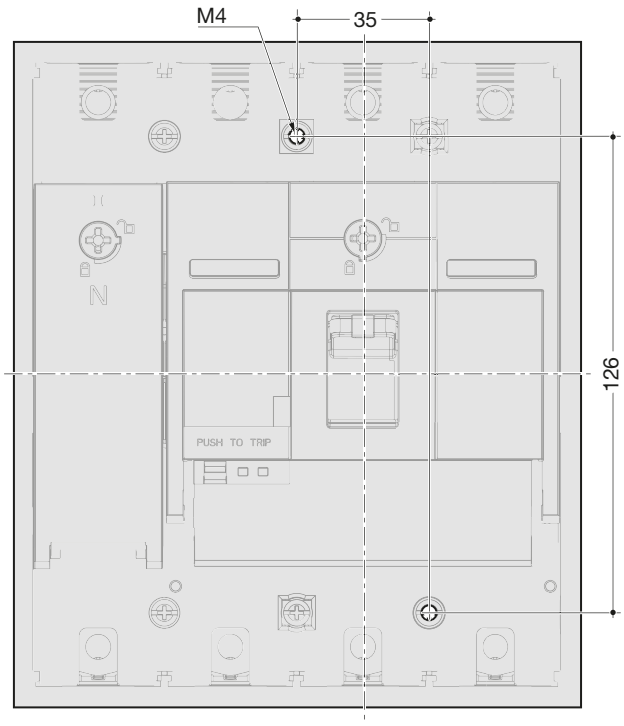


P250 back plate drilling pattern

3P

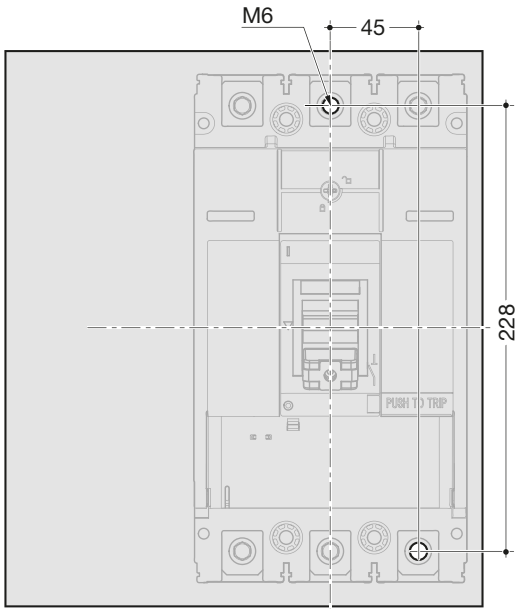


4P

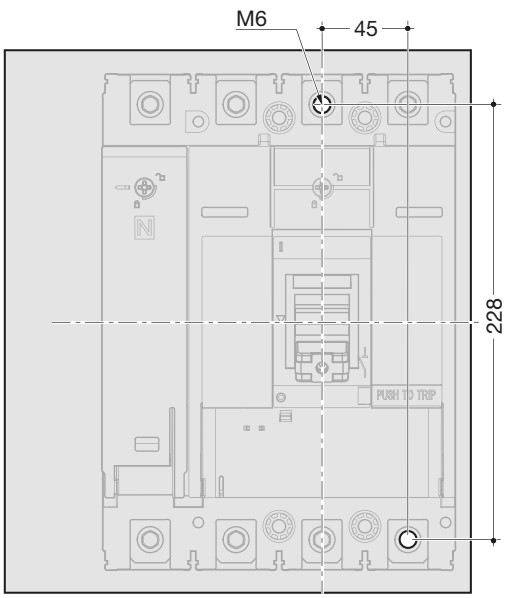


P630 back plate drilling pattern

3P

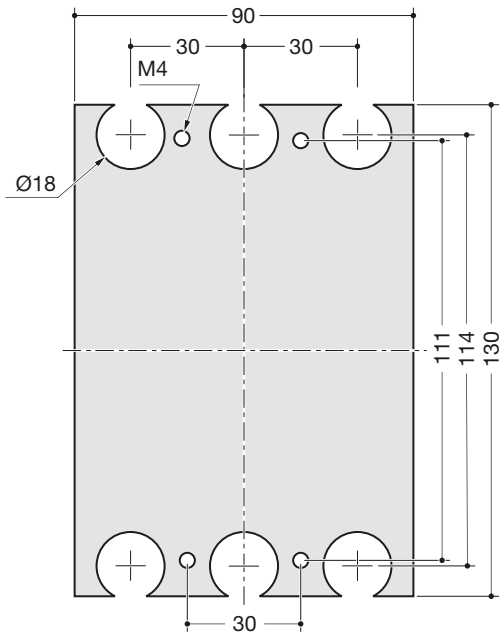


4P

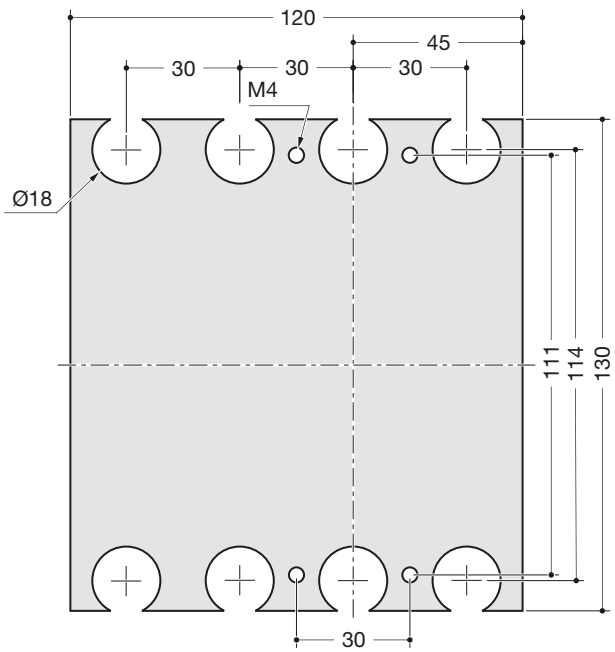


P160 rear connection back plate drilling pattern

3P

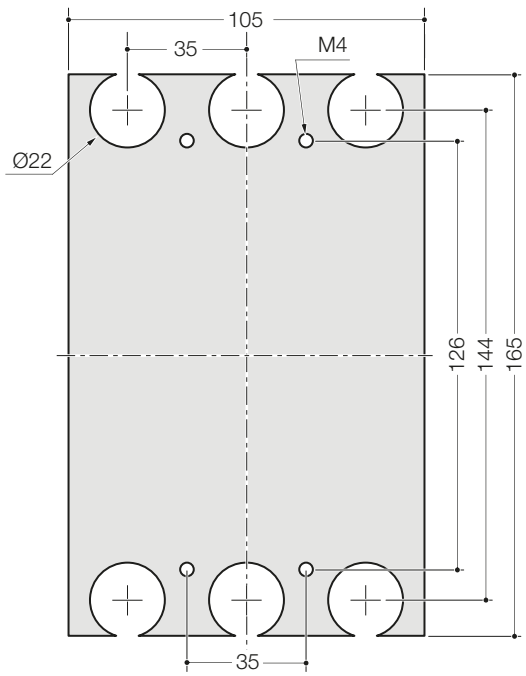


4P

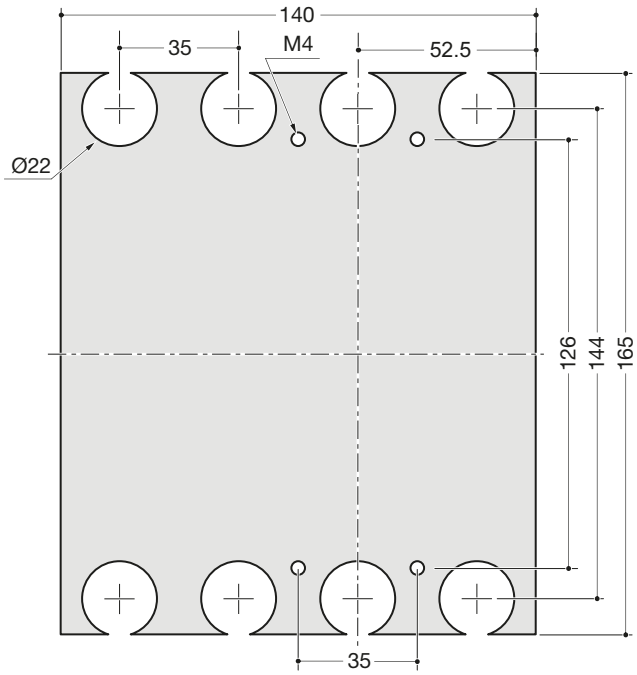


P250 rear connection back plate drilling pattern

3P

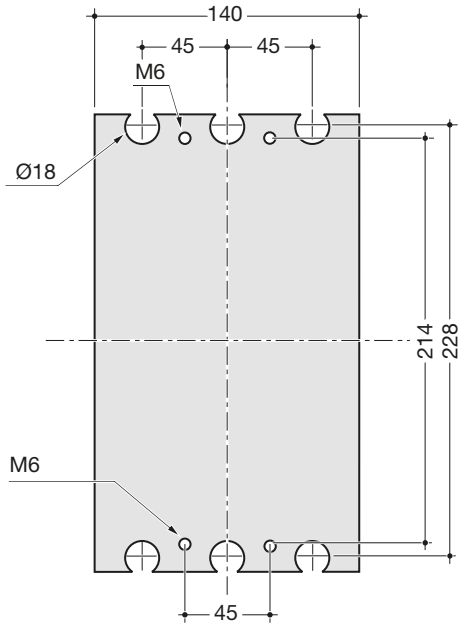


4P

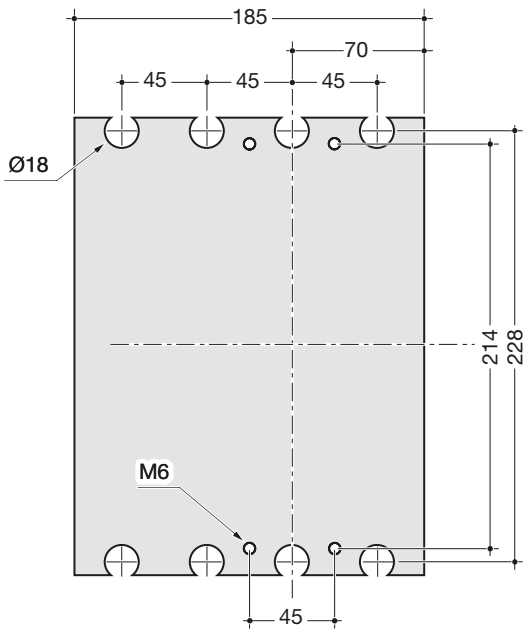


P630 rear connection back plate drilling pattern

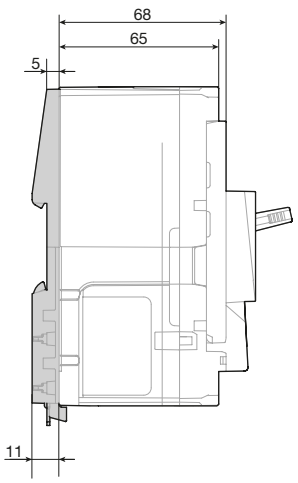
3P



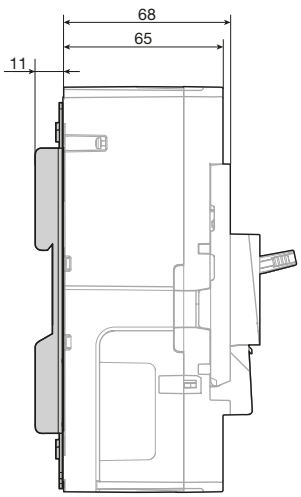
4P



P160 DIN rail adaptor



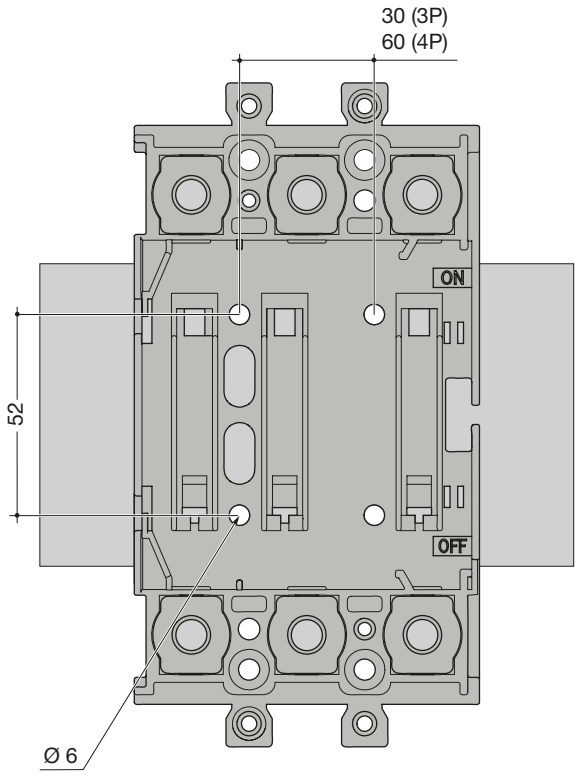
P250 DIN rail adaptor



Technical changes reserved

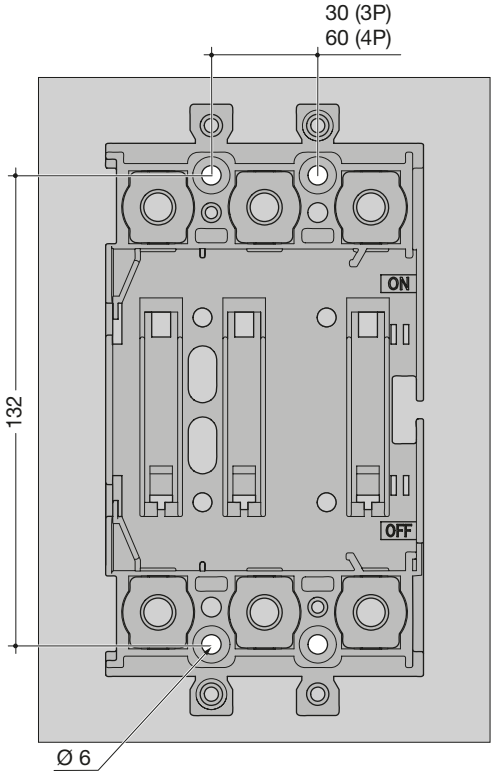
P160 plug-in kit drilling pattern for U plate

3P + 4P



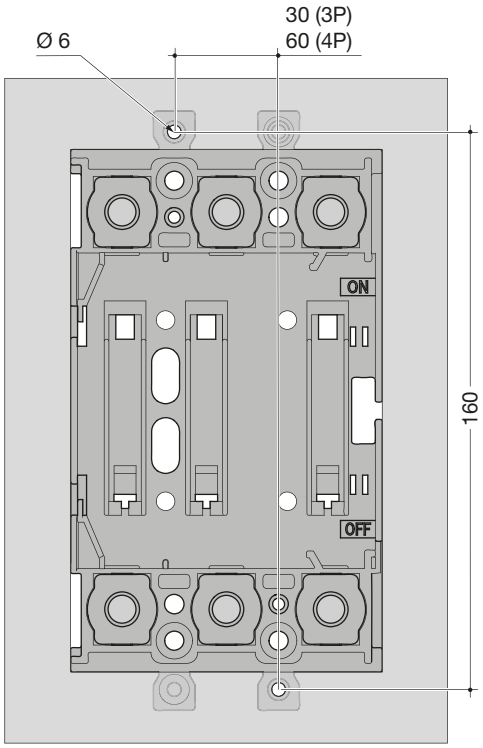
P160 plug-in kit drilling pattern for solid back plate

3P + 4P



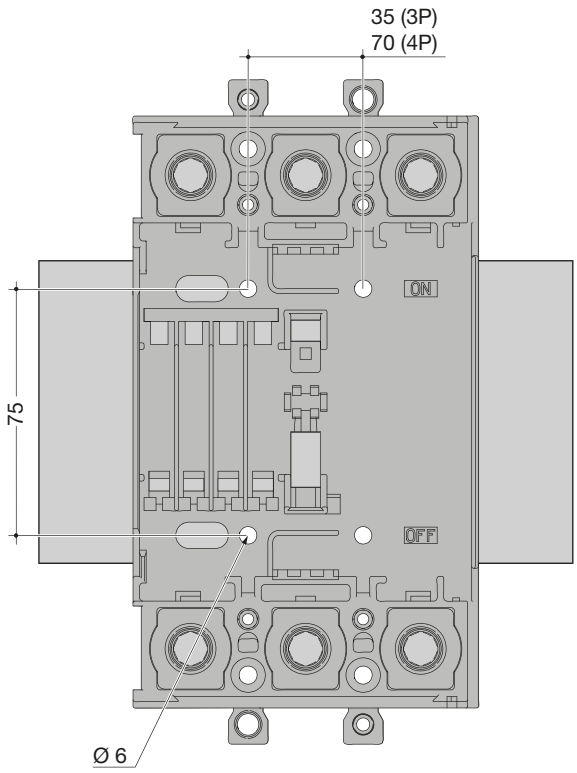
P160 plug-in kit drilling pattern for flush mounting

3P + 4 P



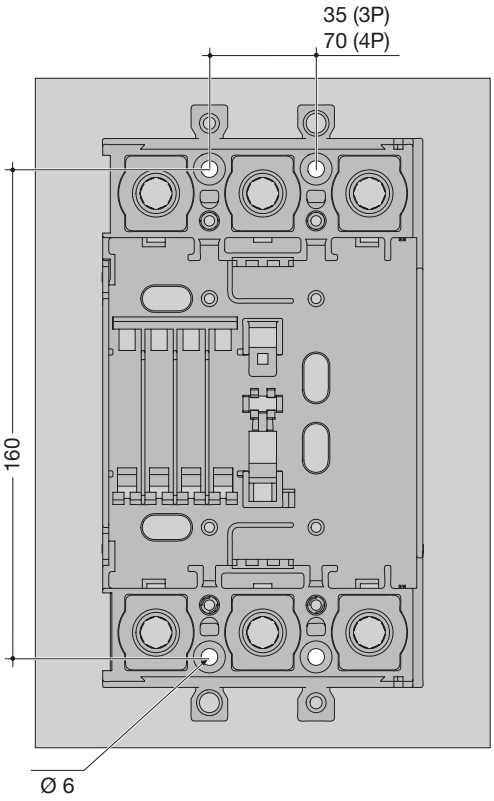
P250 plug-in kit drilling pattern for U plate

3P + 4P



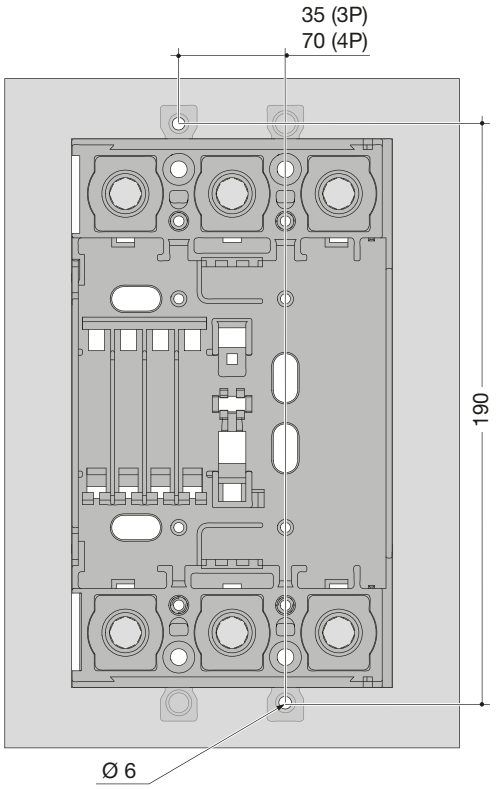
P250 plug-in kit drilling pattern for solid back plate

3P + 4P



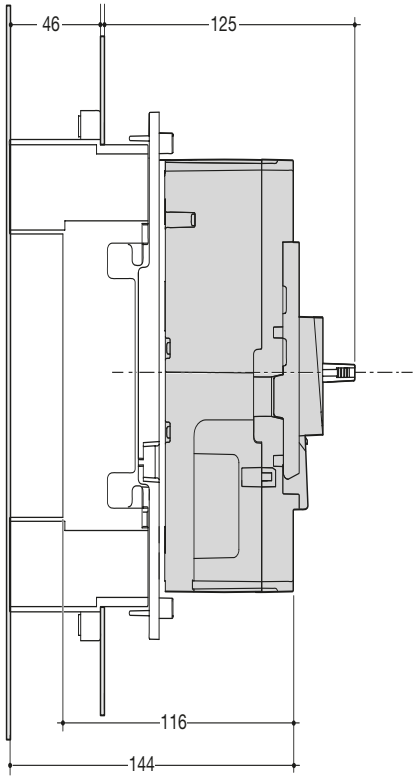
P250 plug-in kit drilling pattern for flush mounting

3P + 4P



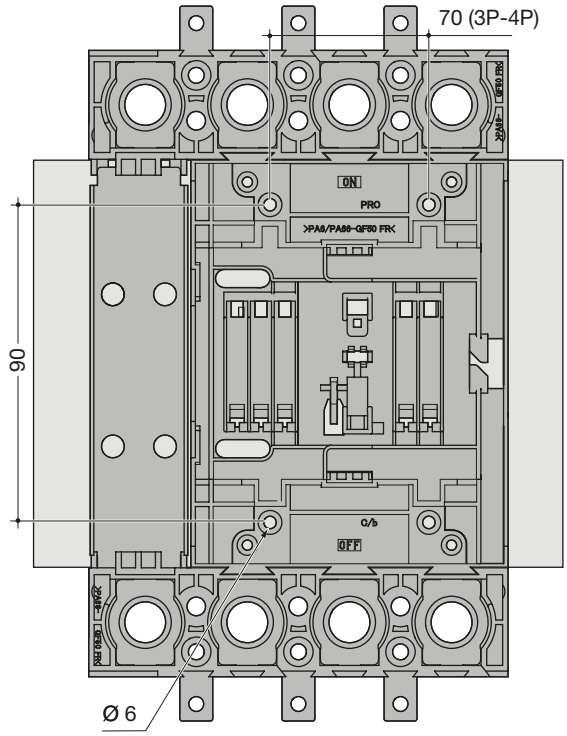
P250 circuit breaker on plug-in kit

3P + 4P



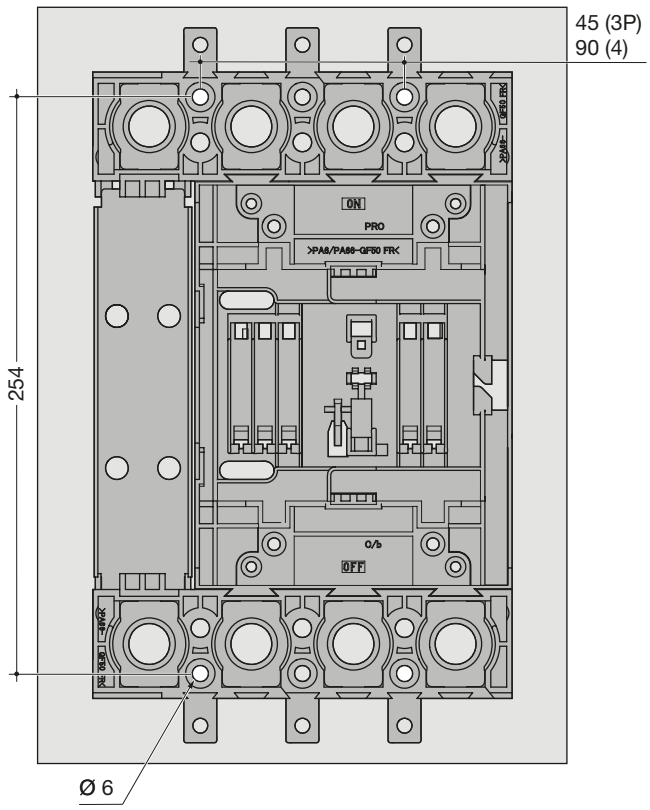
P630 plug-in kit drilling pattern for U plate

3P + 4P



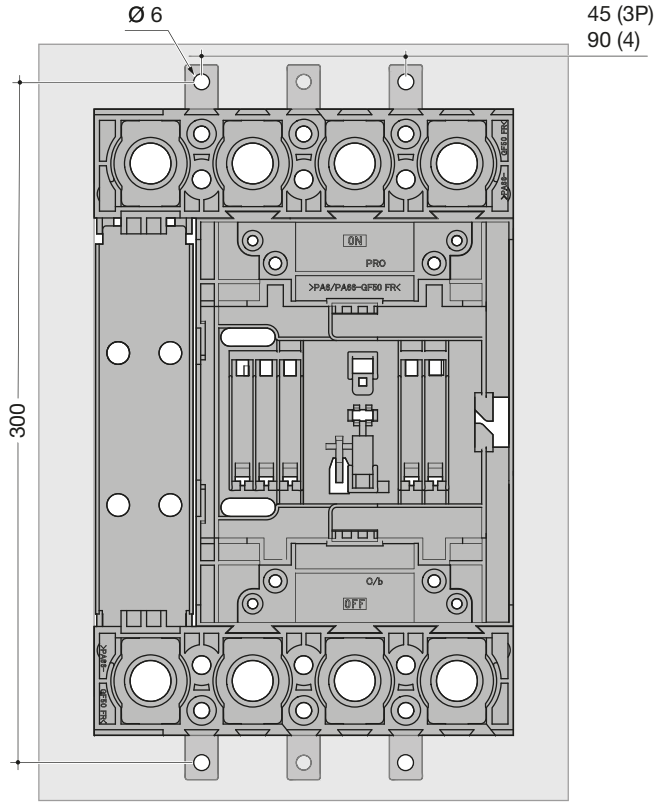
P630 plug-in kit drilling pattern for solid back plate

3P + 4P



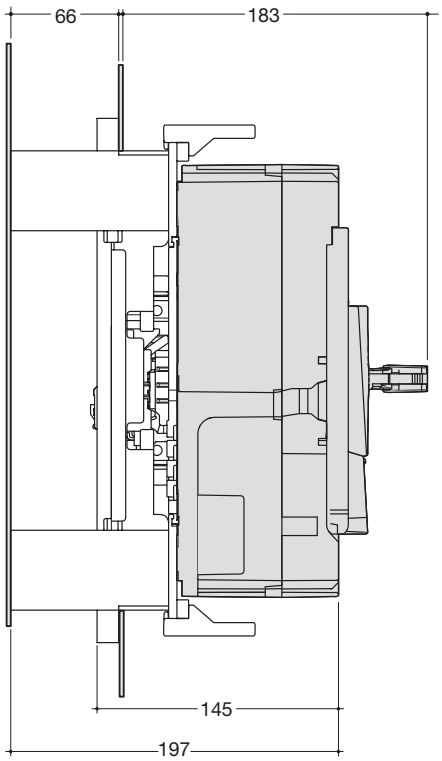
P630 plug-in kit drilling pattern for flush mounting

3P + 4P



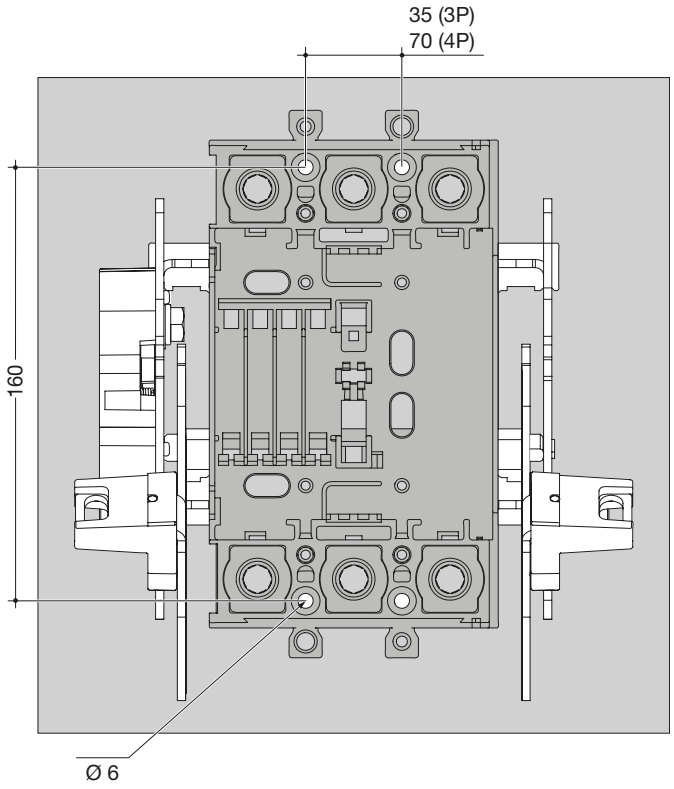
P630 circuit breaker on plug-in kit

3P + 4P



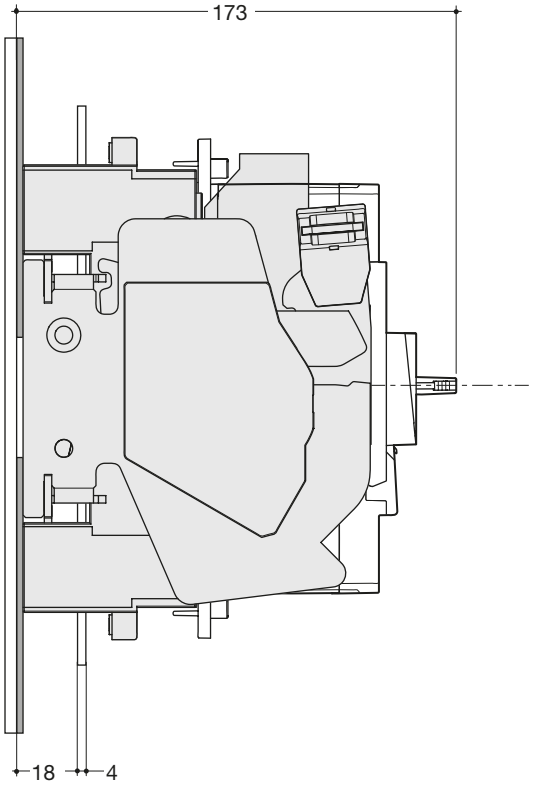
P250 withdrawable plate drilling pattern

3P + 4P



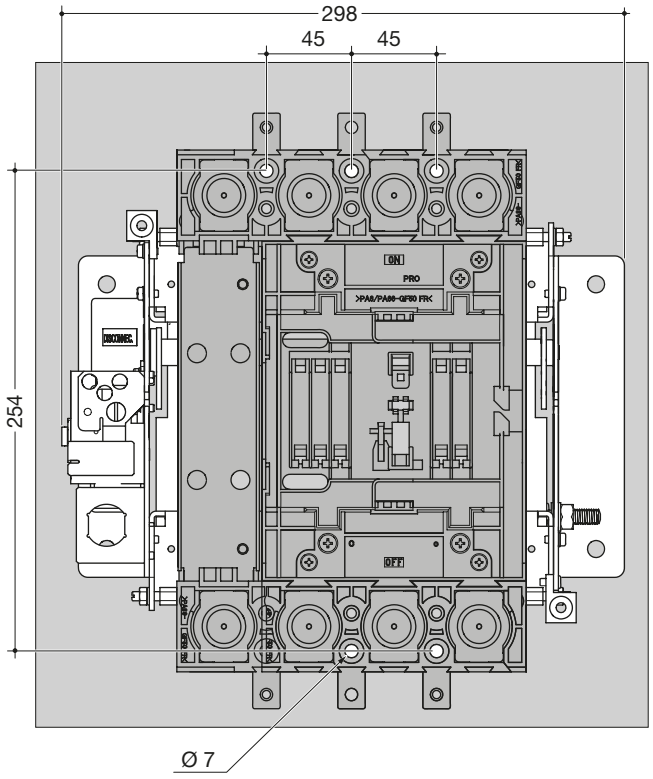
P250 circuit breaker on withdrawable plate

3P + 4P



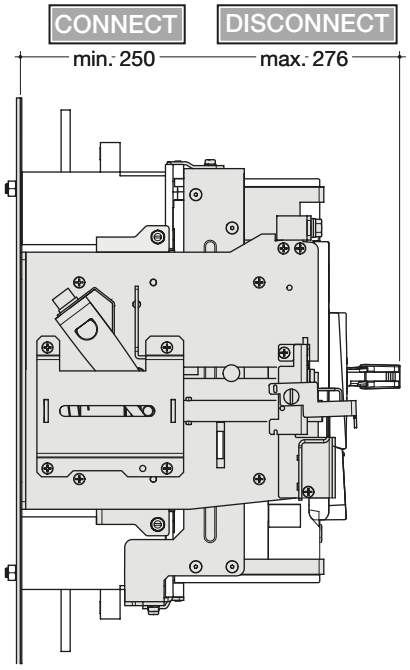
P630 withdrawable plate drilling pattern

3P + 4P



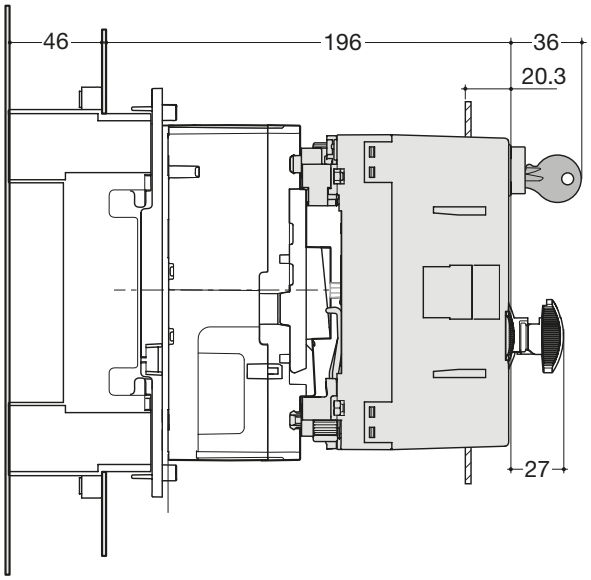
P630 circuit breaker on withdrawable plate

3P + 4P



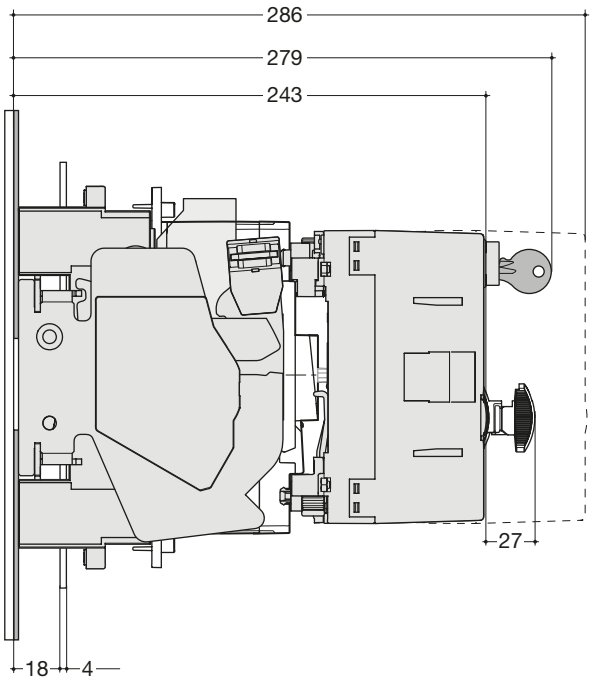
P250 Motor operator on plug-in circuit breaker

3P + 4P



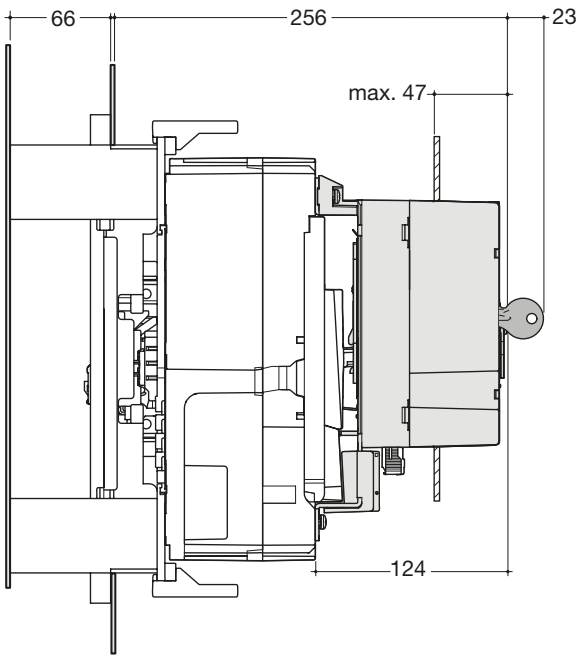
P250 Motor operator on withdrawable circuit breaker

3P + 4P



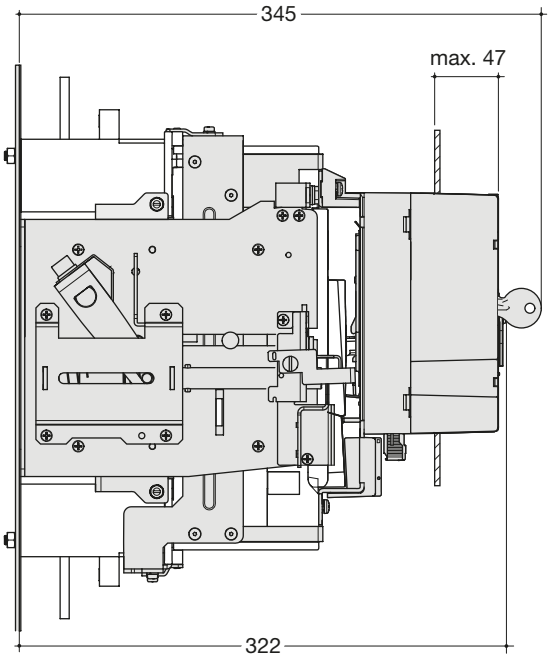
P630 Motor operator on plug-in circuit breaker

3P + 4P

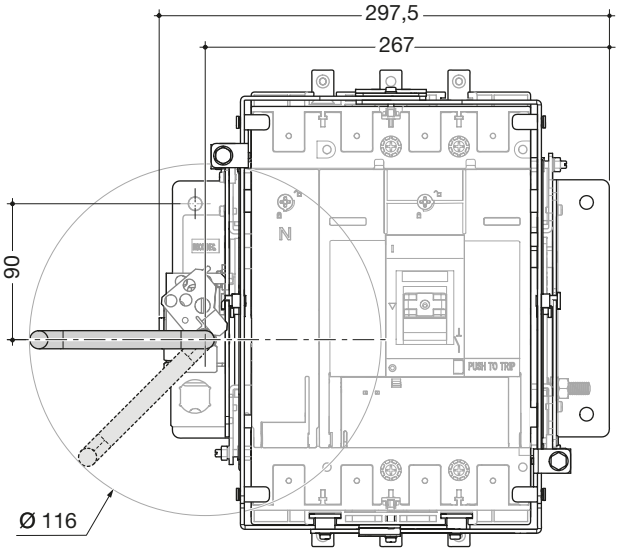


P630 Motor operator on withdrawable circuit breaker

3P + 4P

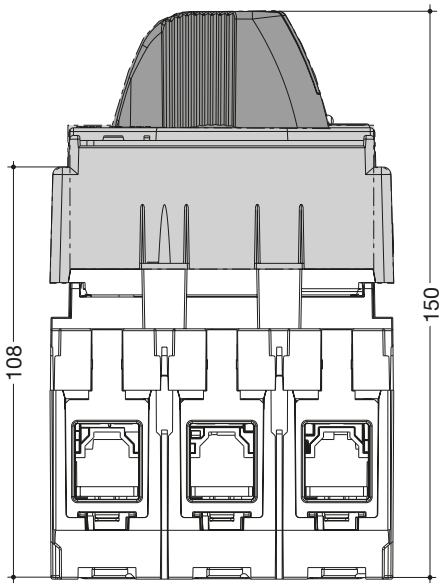


Drawout system P630

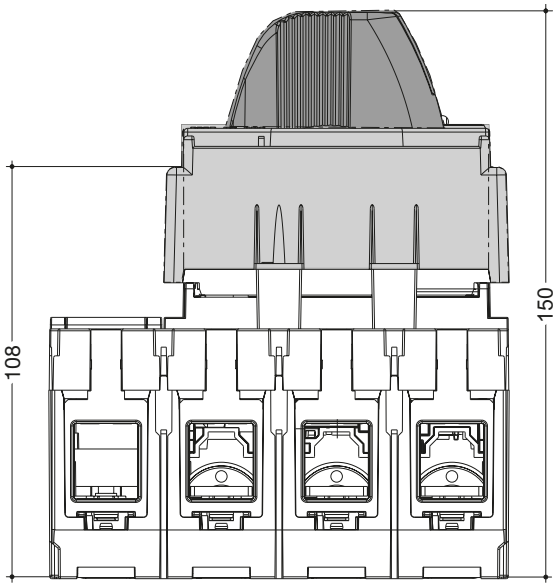


Rotary handle P160

3P

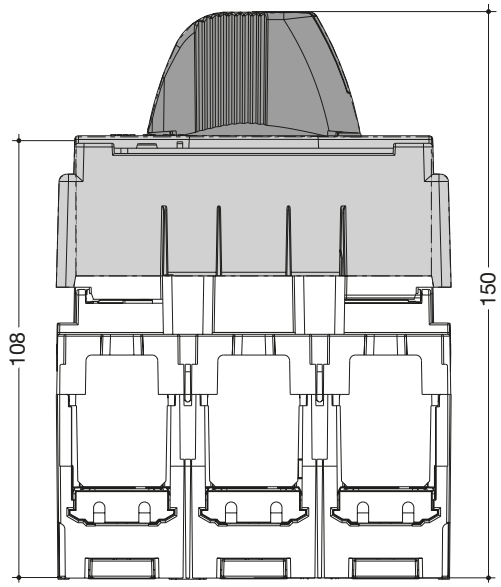


4P

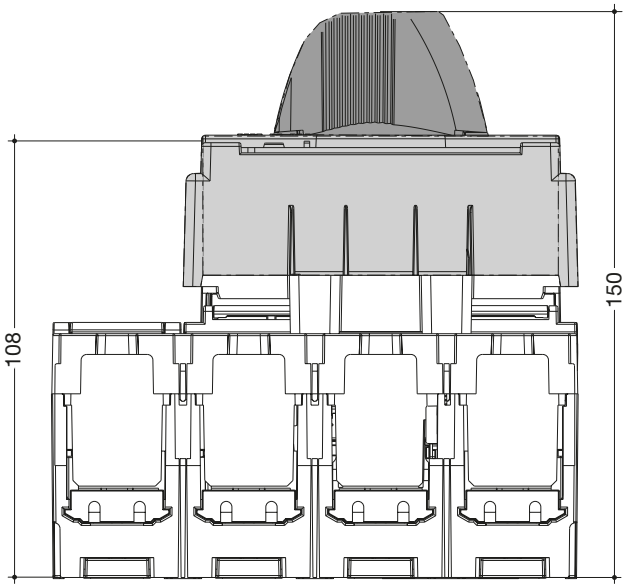


Rotary handle P250

3P

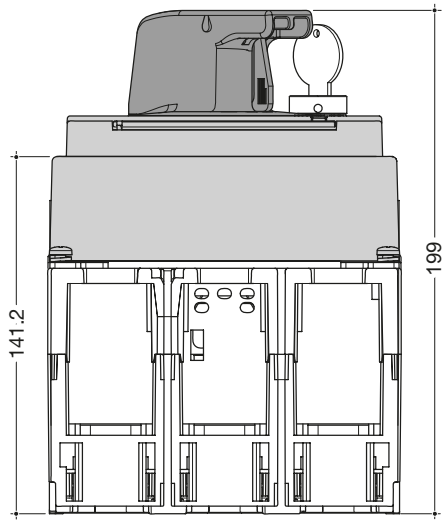


4P

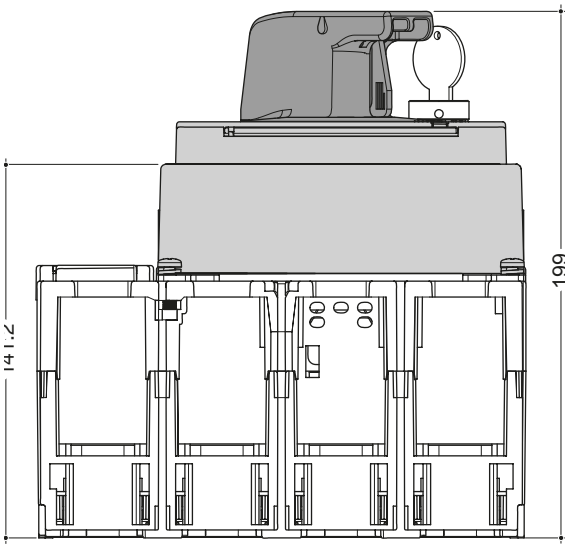


Rotary handle P630

3P

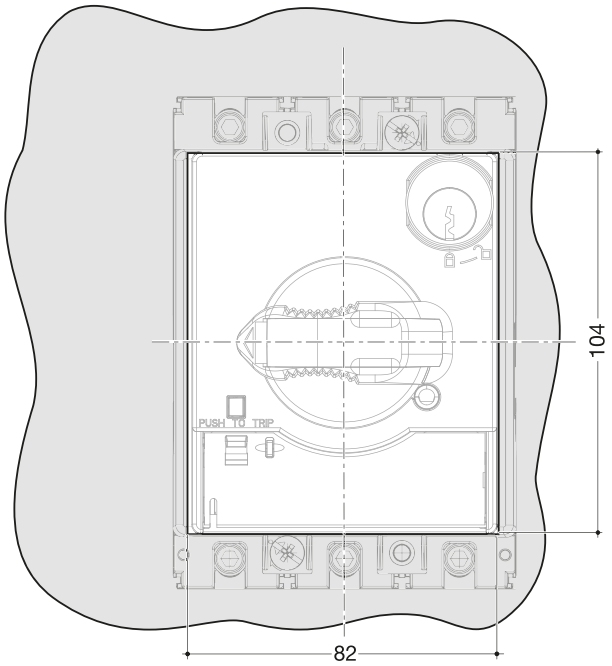


4P

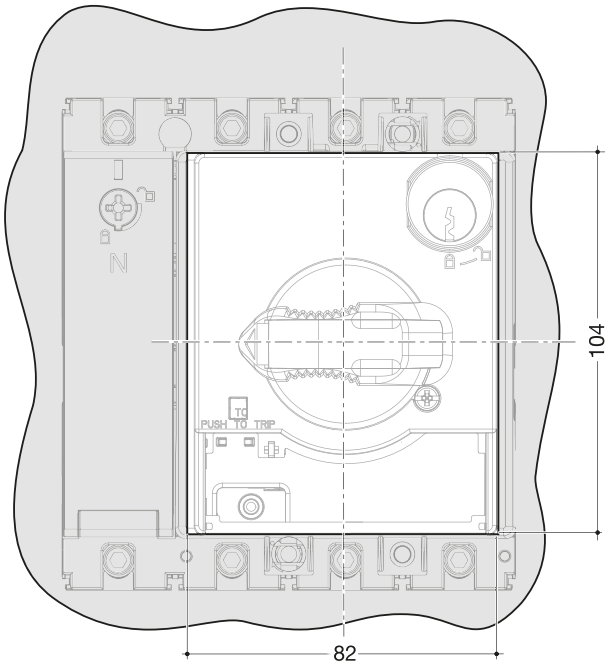


Panel cut-out rotary handle P160

3P

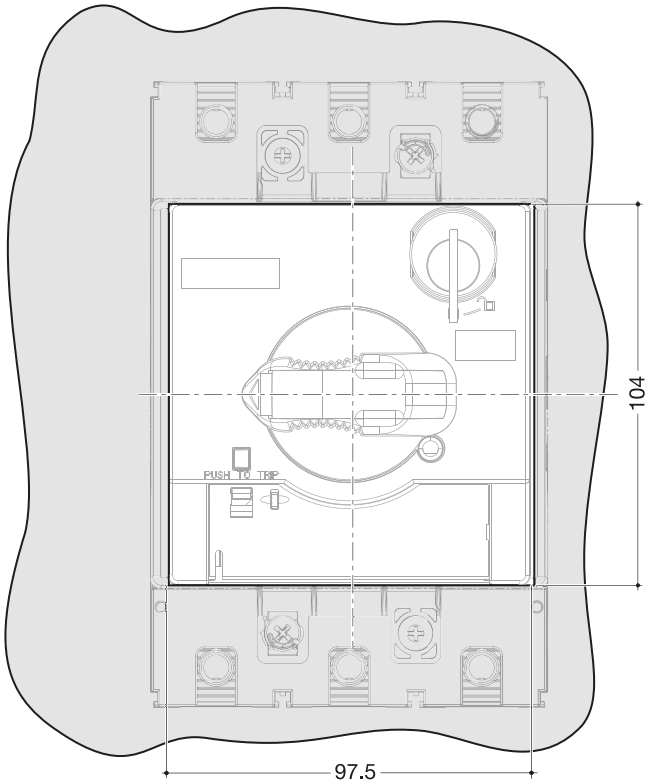


4P

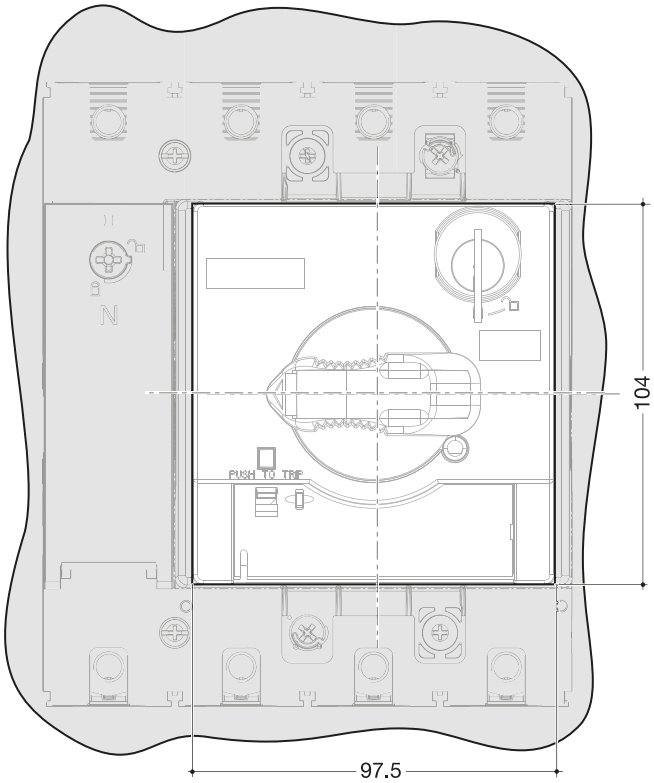


Panel cut-out rotary handle P250

3P

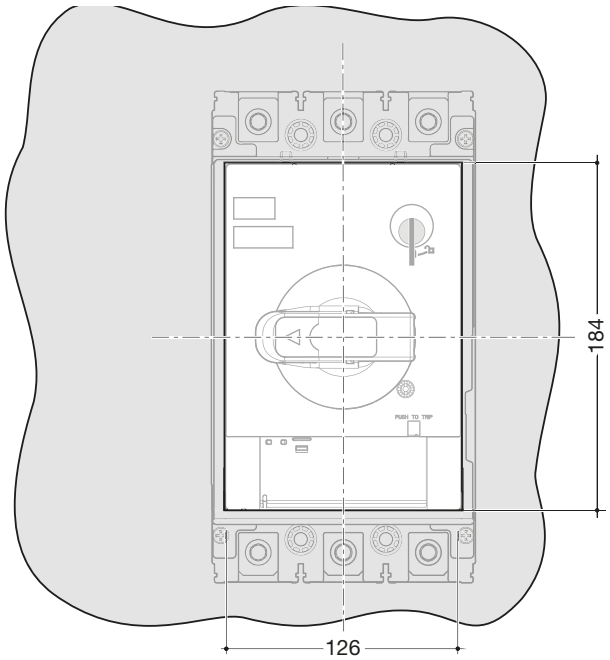


4P

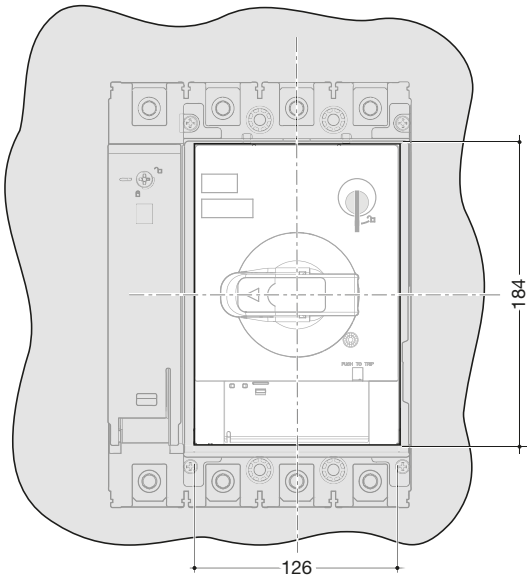


Panel cut-out rotary handle P630

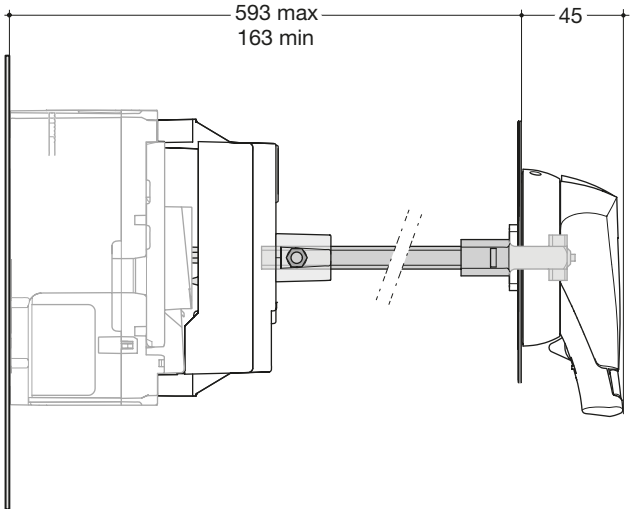
3P



4P

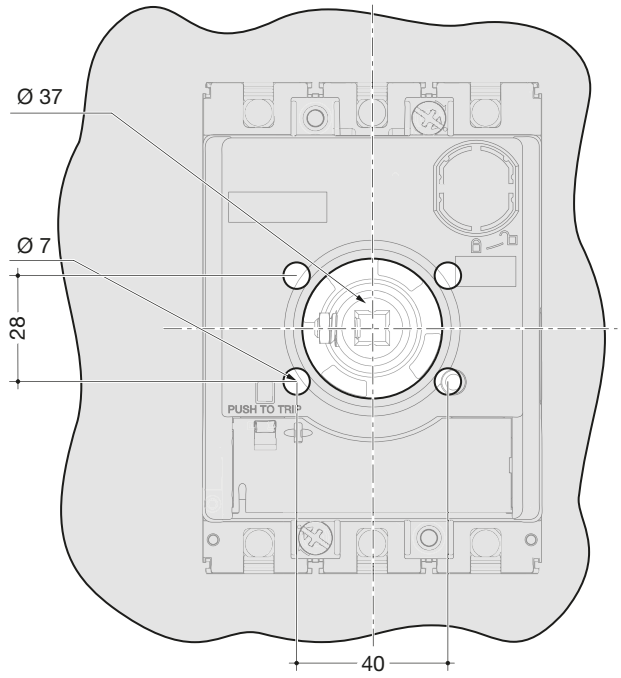


Extended rotary handle P160/P250

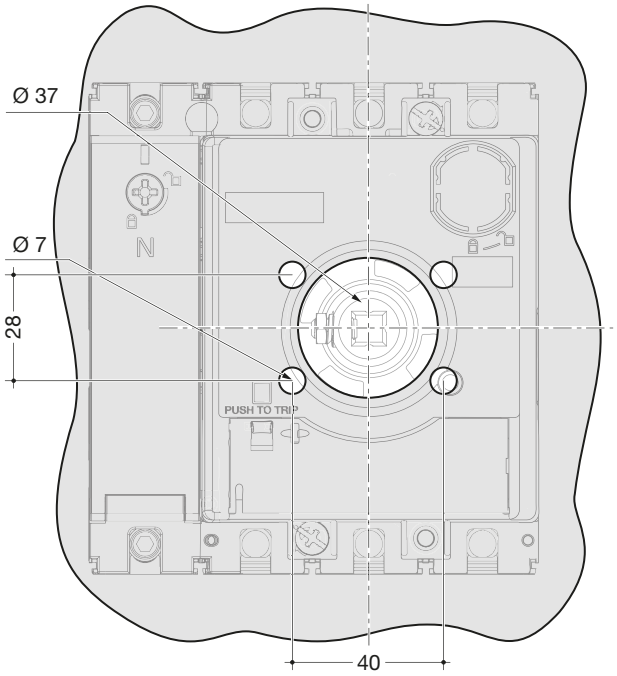


Panel cut-out extended rotary handle P160/P250

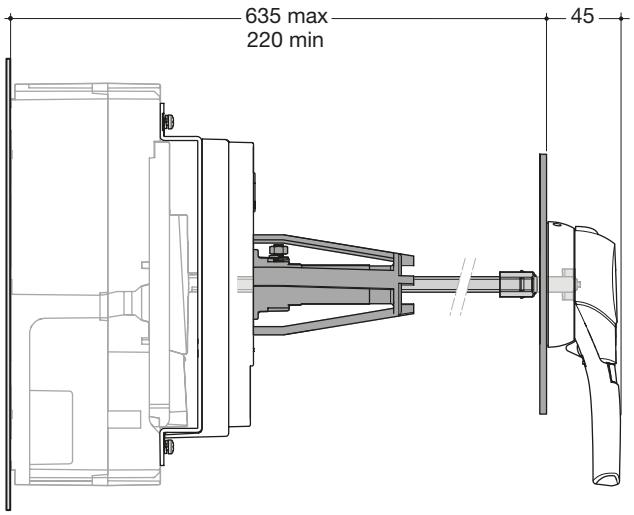
3P



4P

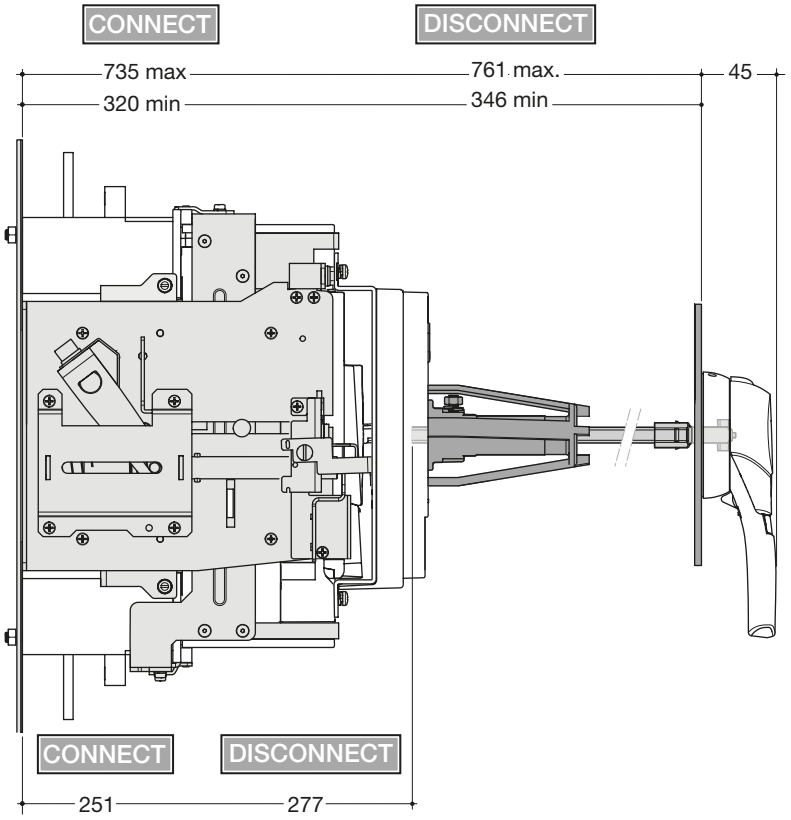


Extended rotary handle P630



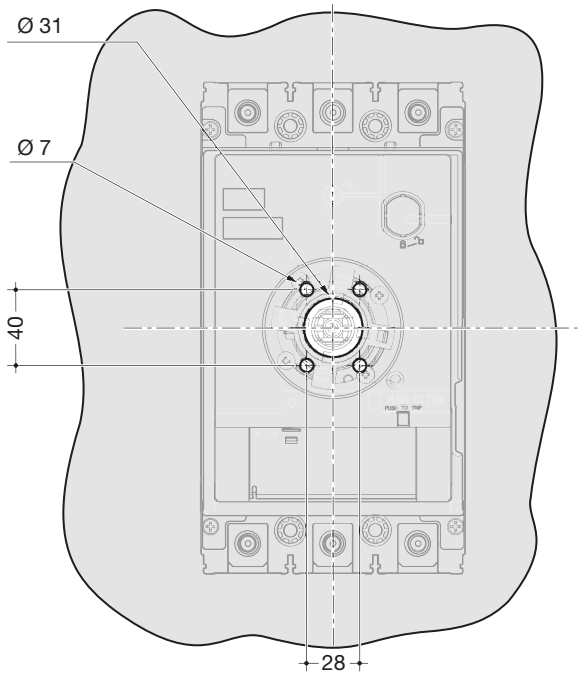
Technical changes reserved

Extended rotary handle P630 on drawout

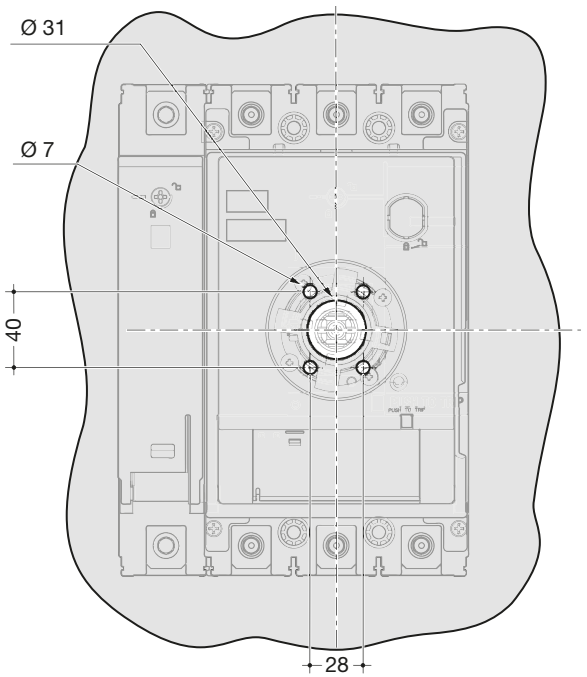


Panel cut-out extended rotary handle P630

3P

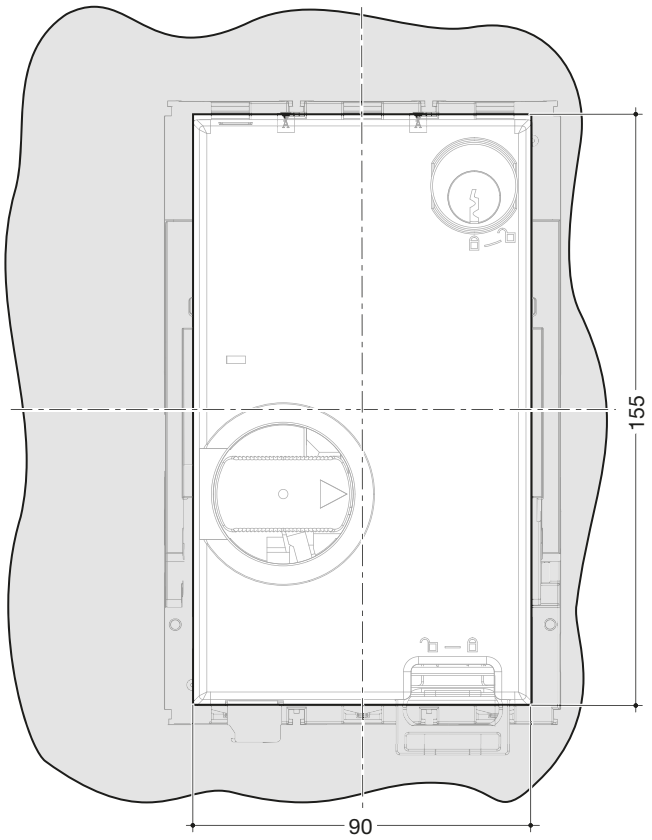


4P

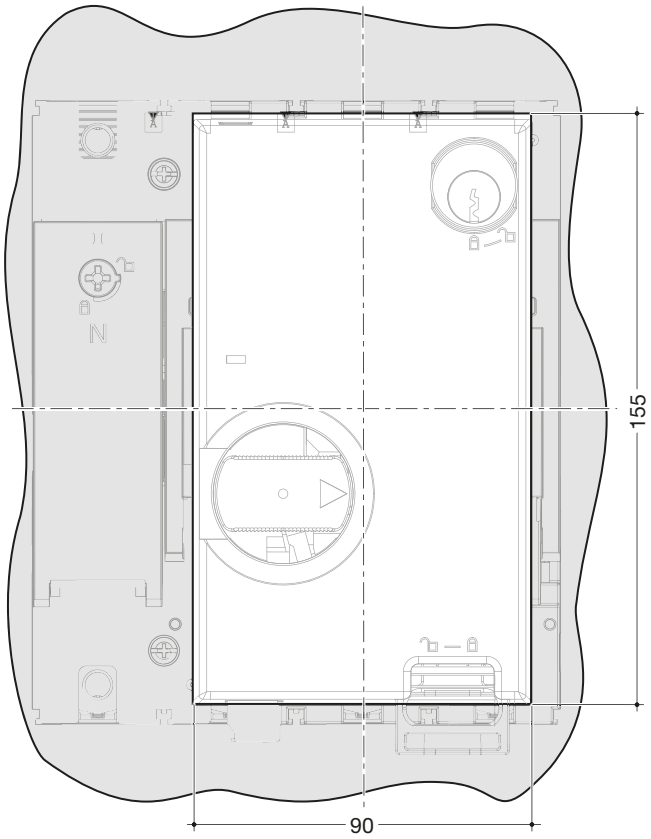


Panel cut-out motor operator P250

3P



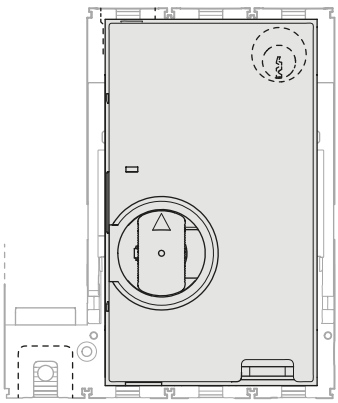
4P

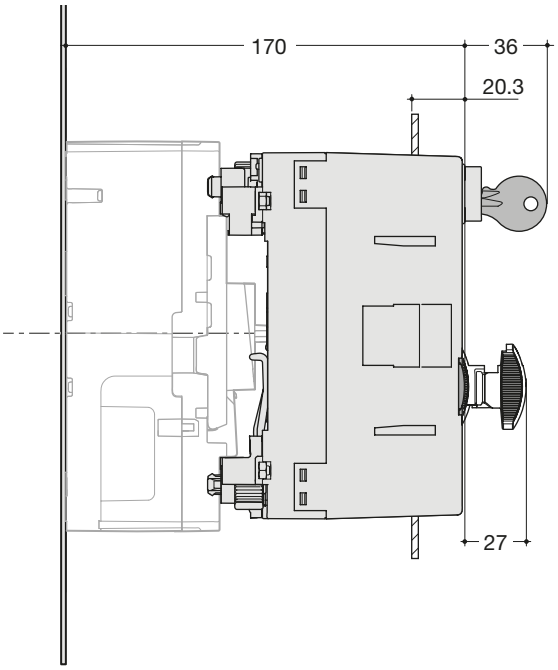


Motor operator with fixed circuit breaker P250

3P

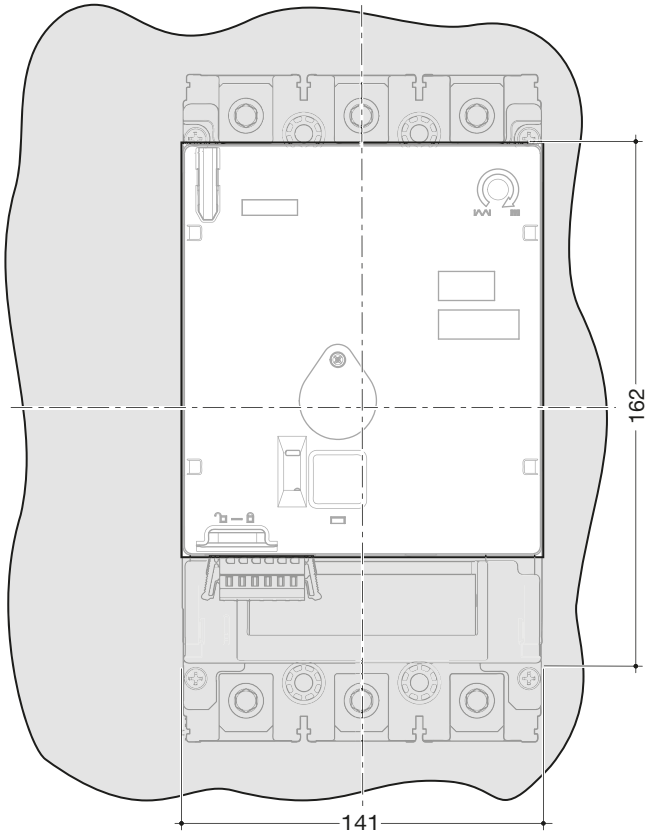
4P



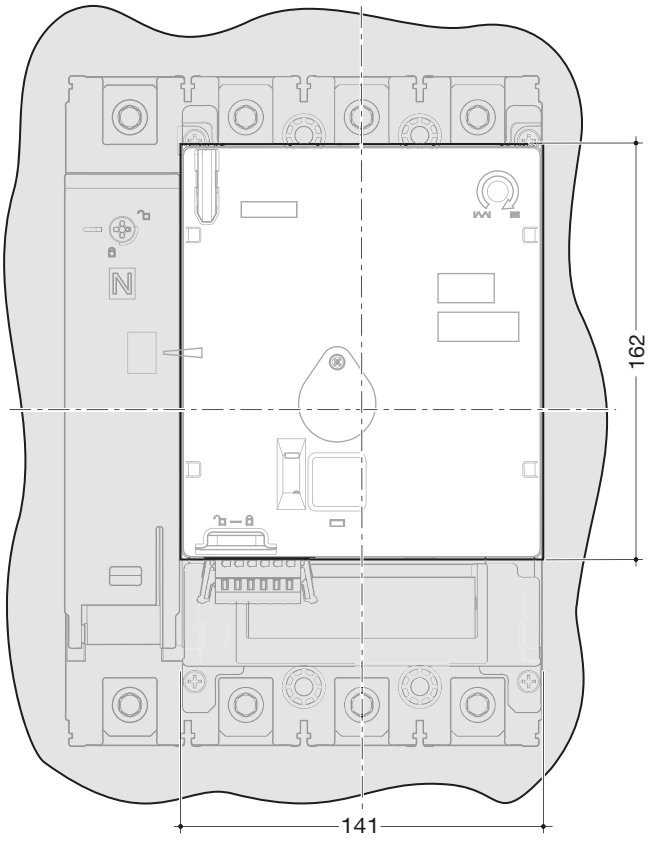


Panel cut-out motor operator P630

3P

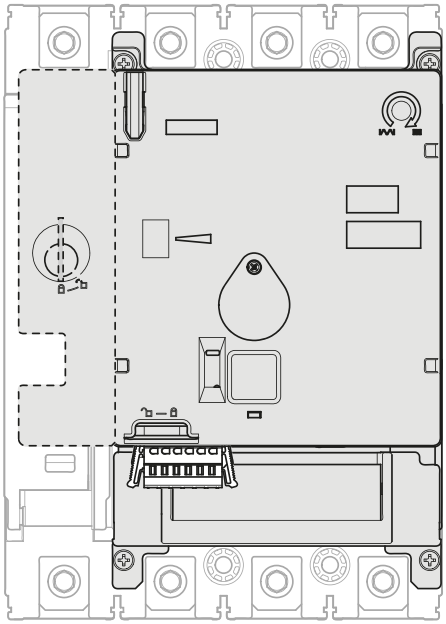


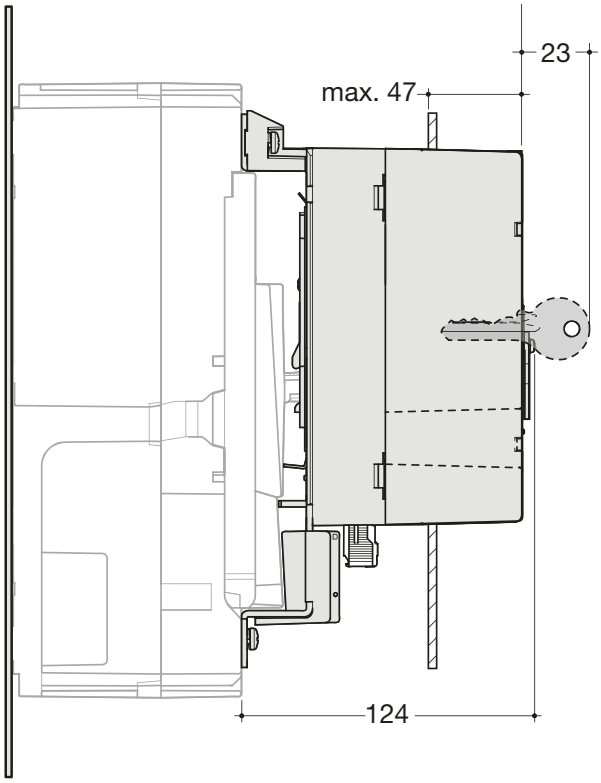
4P



Motor operator with fixed circuit breaker P630

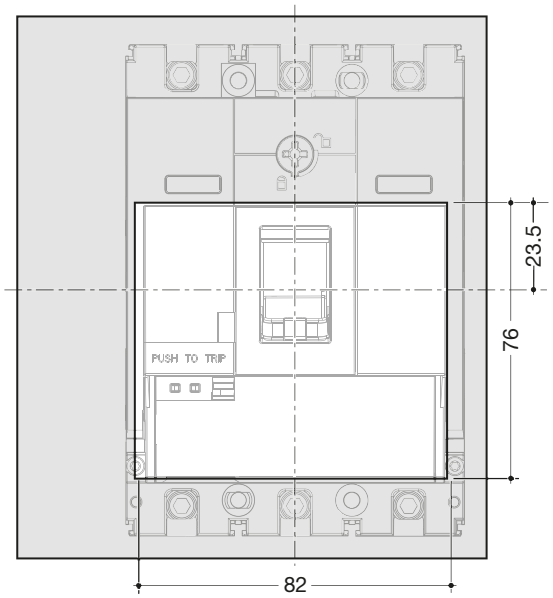
4P



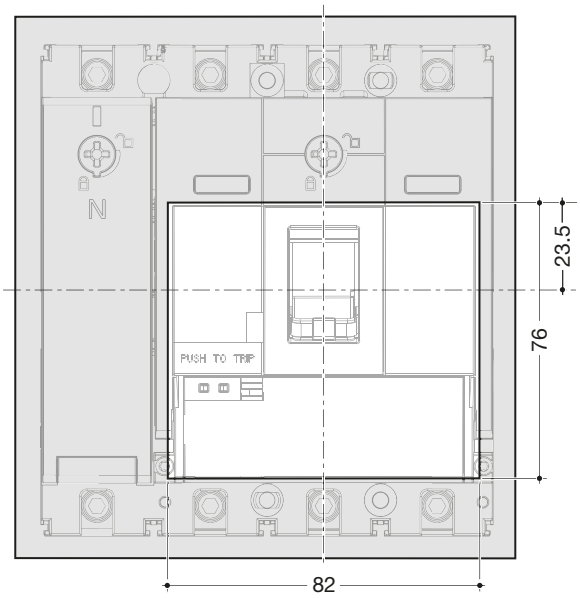


Panel cut-out circuit breaker P160

3P

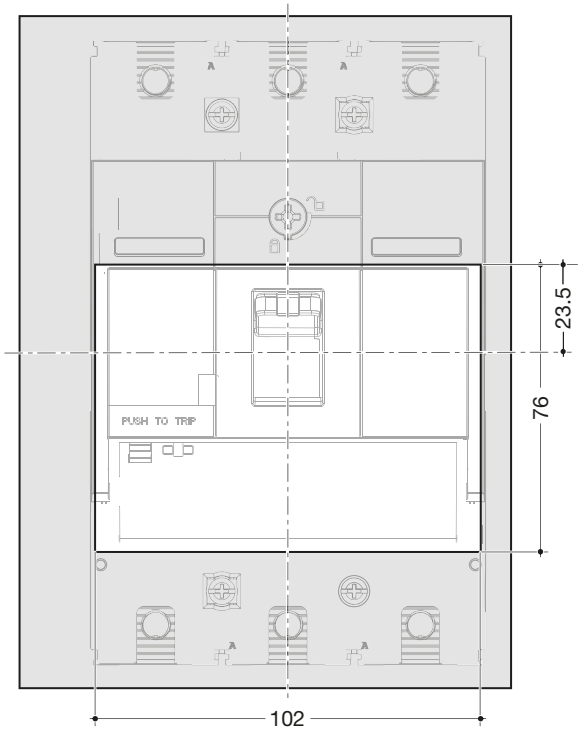


4P

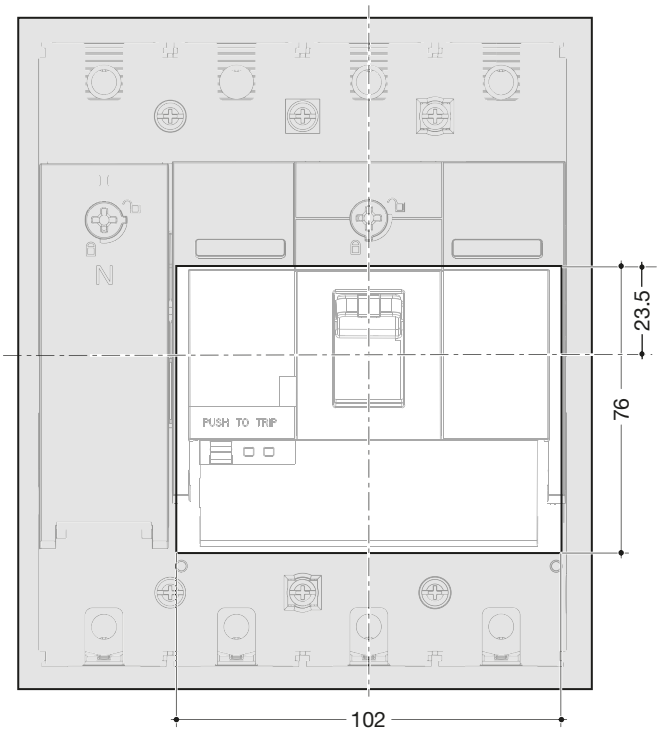


Panel cut-out circuit breaker P250

3P



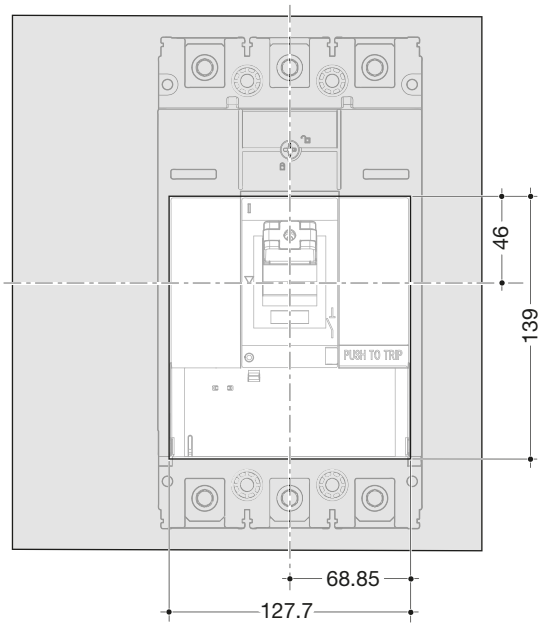
4P



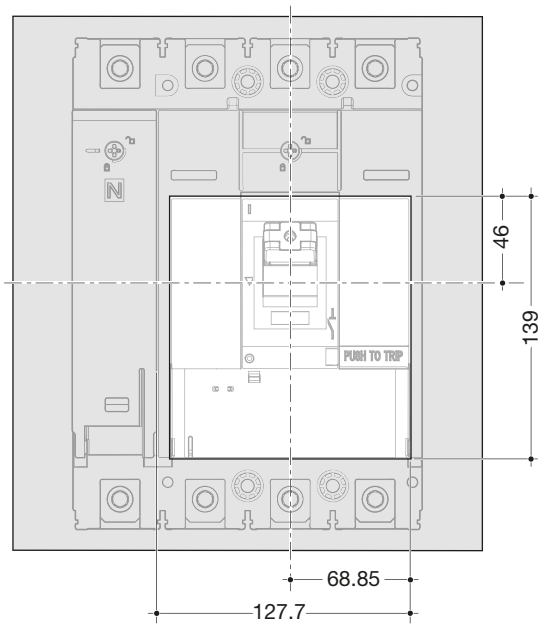
Technical changes reserved

Panel cut-out circuit breaker P630

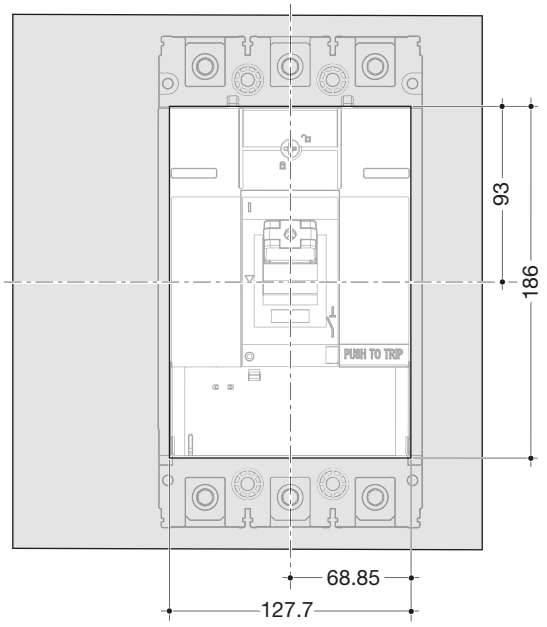
3P



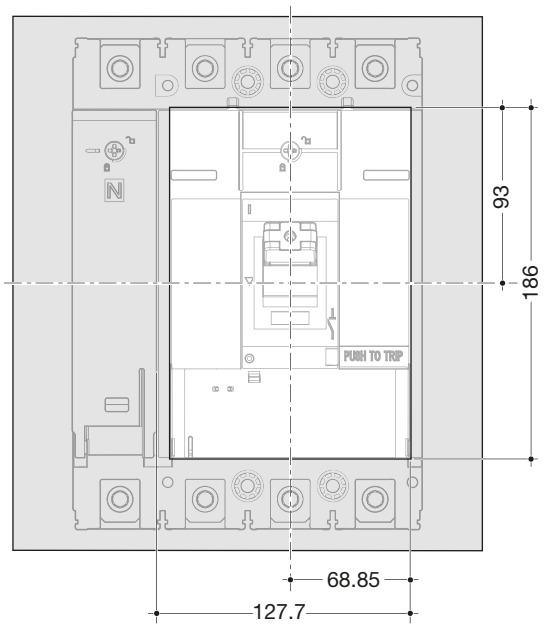
4P



3P

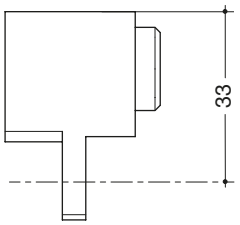


4P

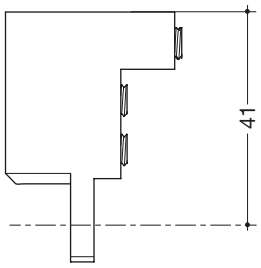


Al/Cu external cable terminals P160

1 wire

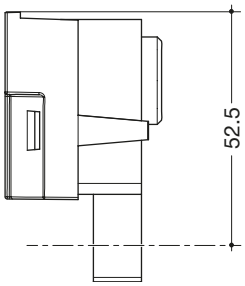


6 wires

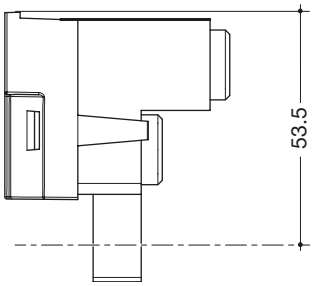


Al/Cu external cable terminals P250

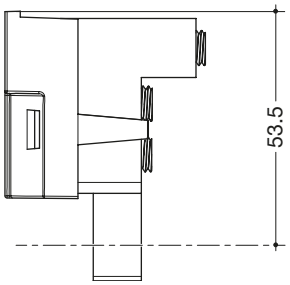
1 wire



2 wires

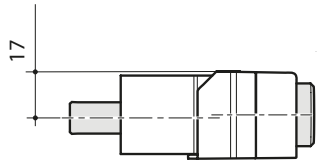


6 wires

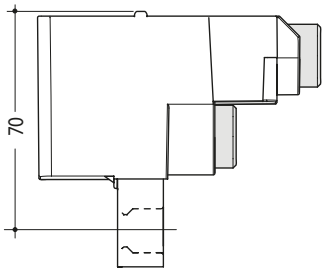


Al/Cu external cable terminals P630

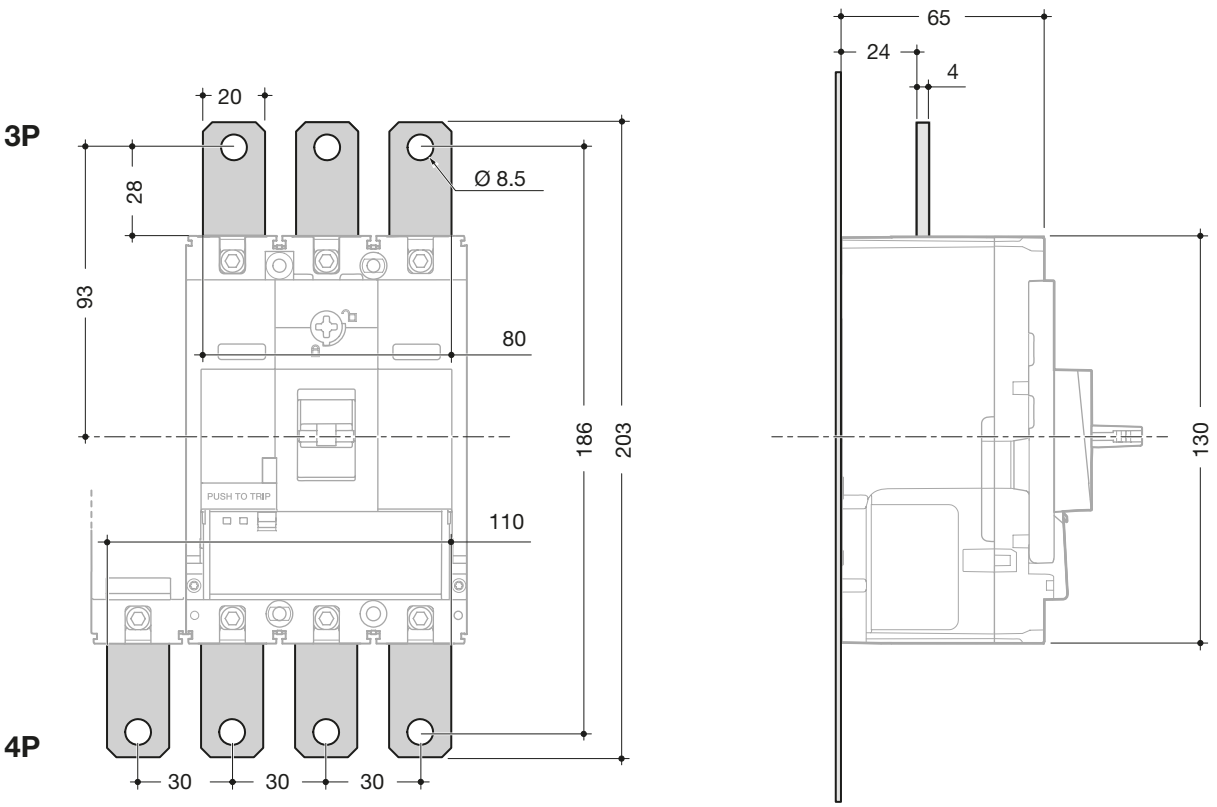
1 wire



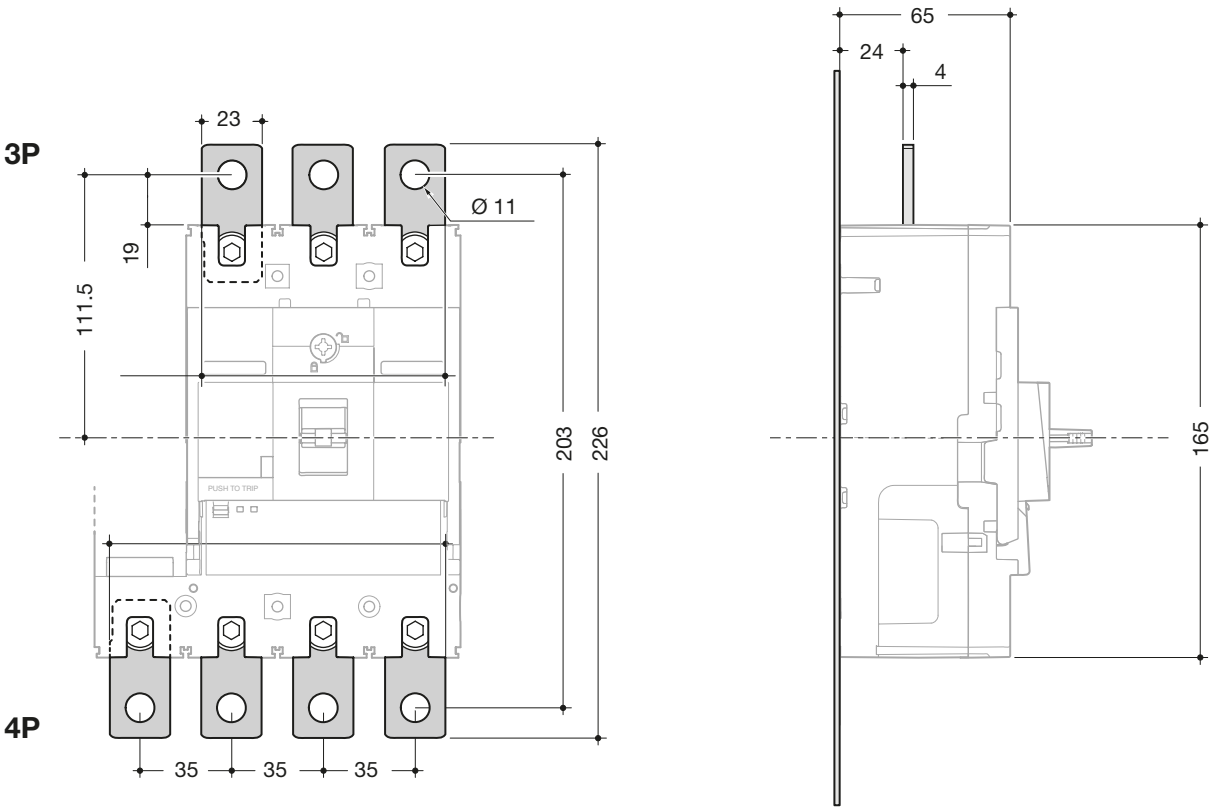
2 wires



Straight terminal extensions P160



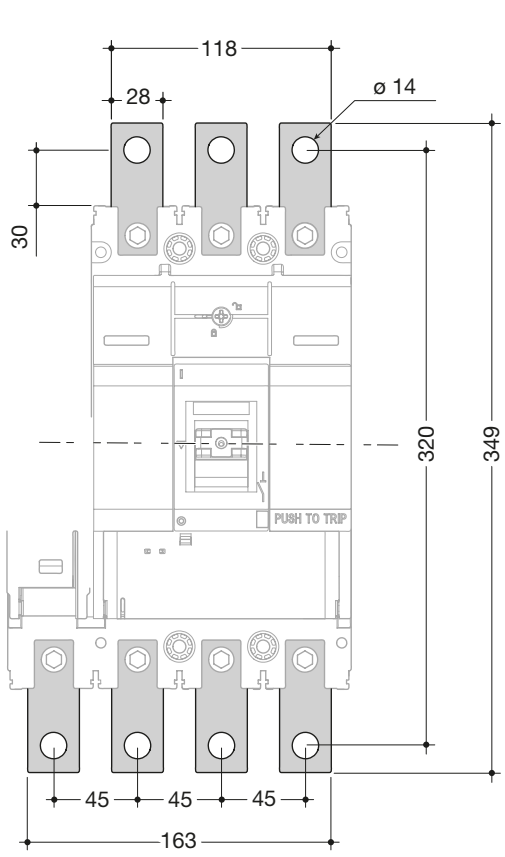
Straight terminal extensions P250

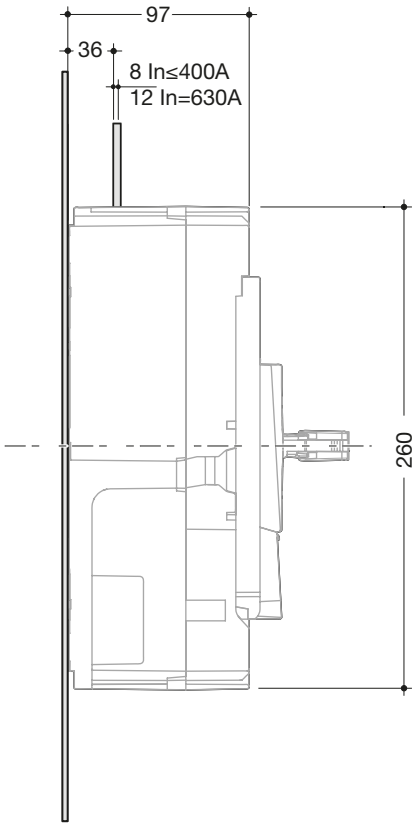


Straight terminal extensions P630

3P

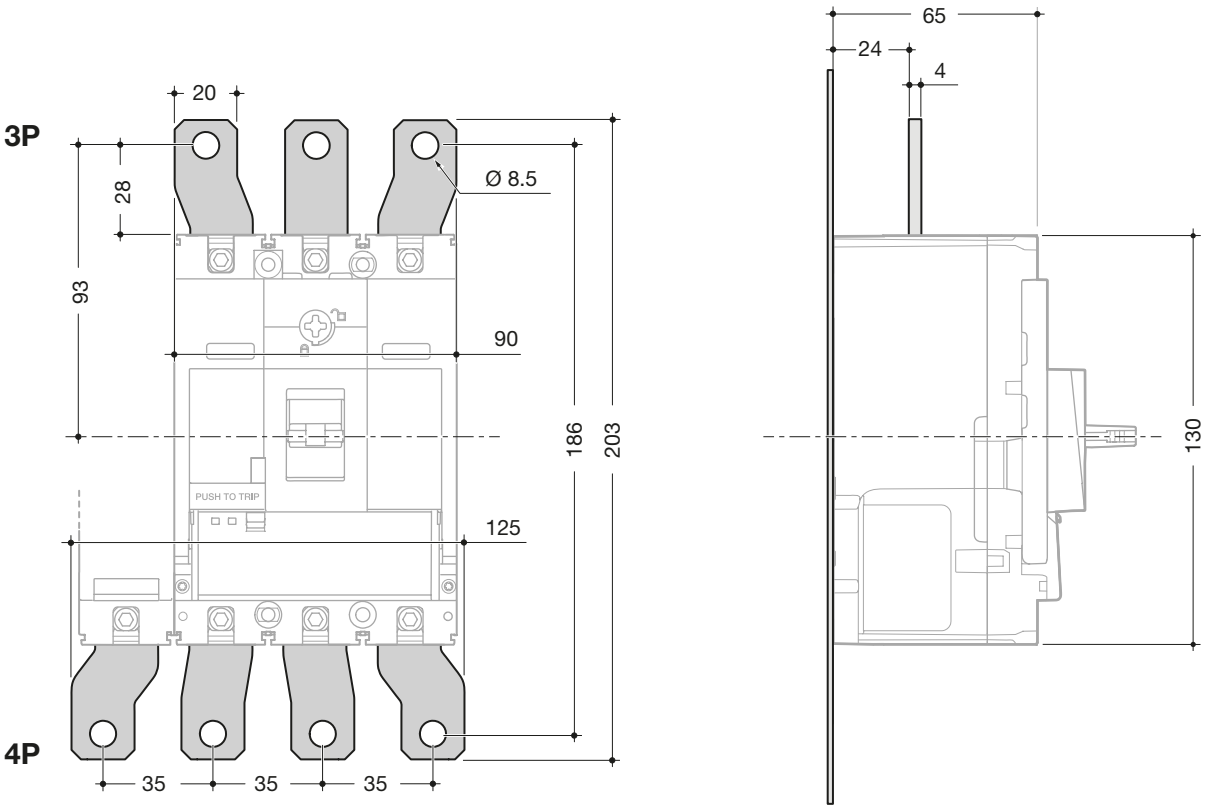
4P



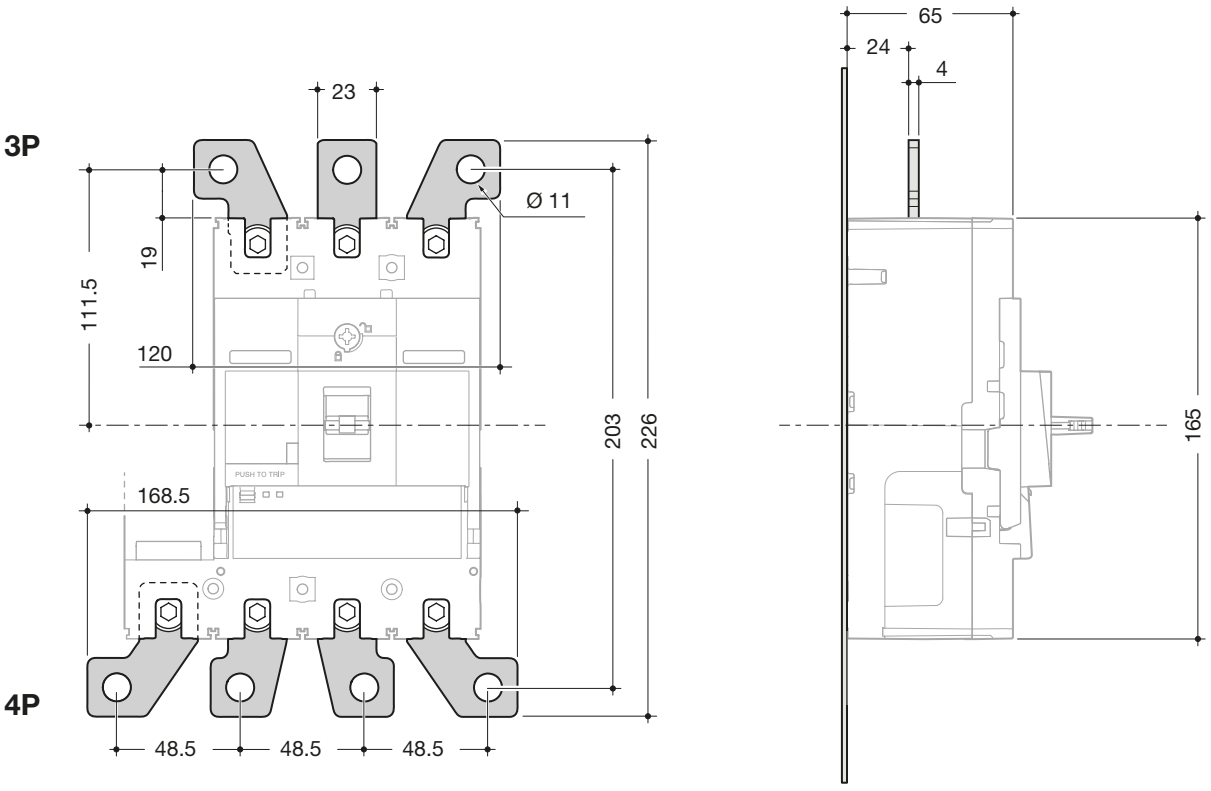


Technical changes reserved

Spreaders P160



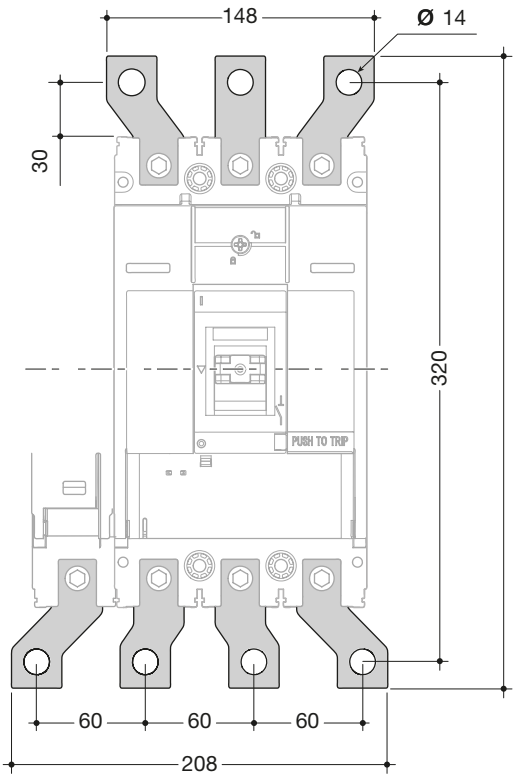
Spreaders P250

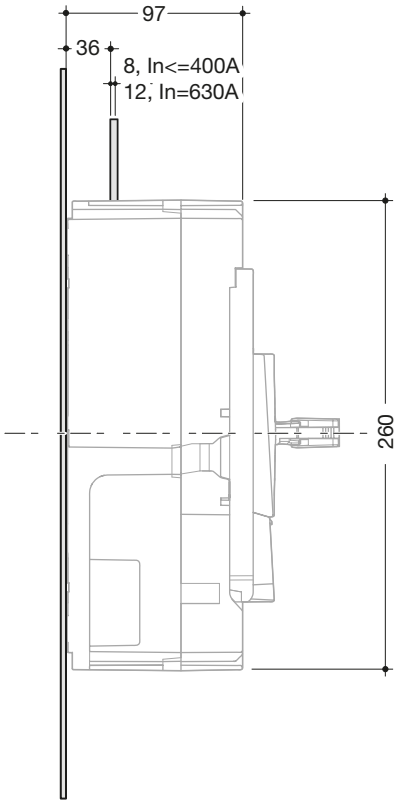


Spreaders P630

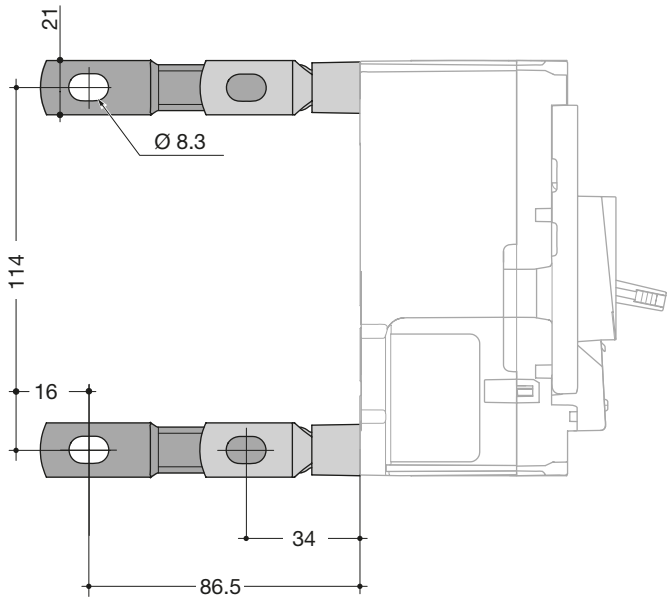
3P

4P

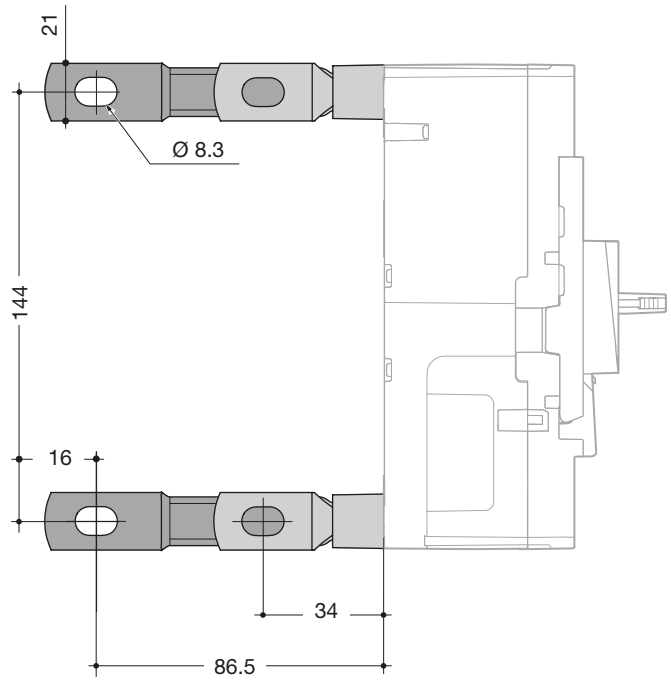




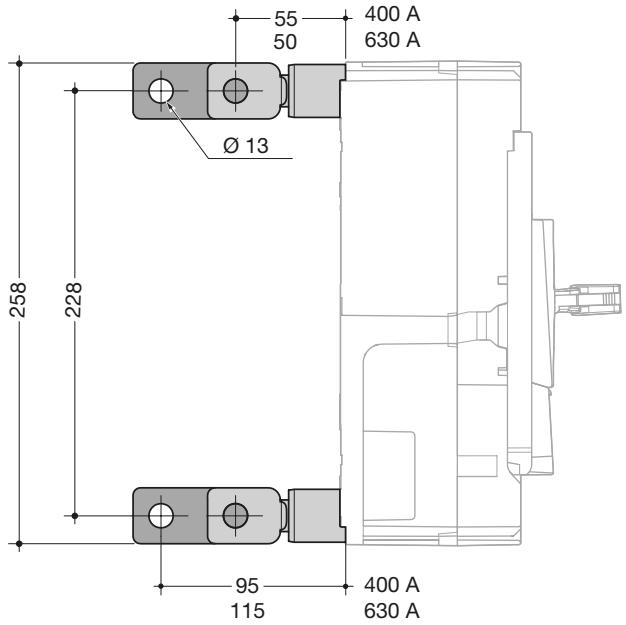
Rear connections P160



Rear connections P250



Rear connections P630

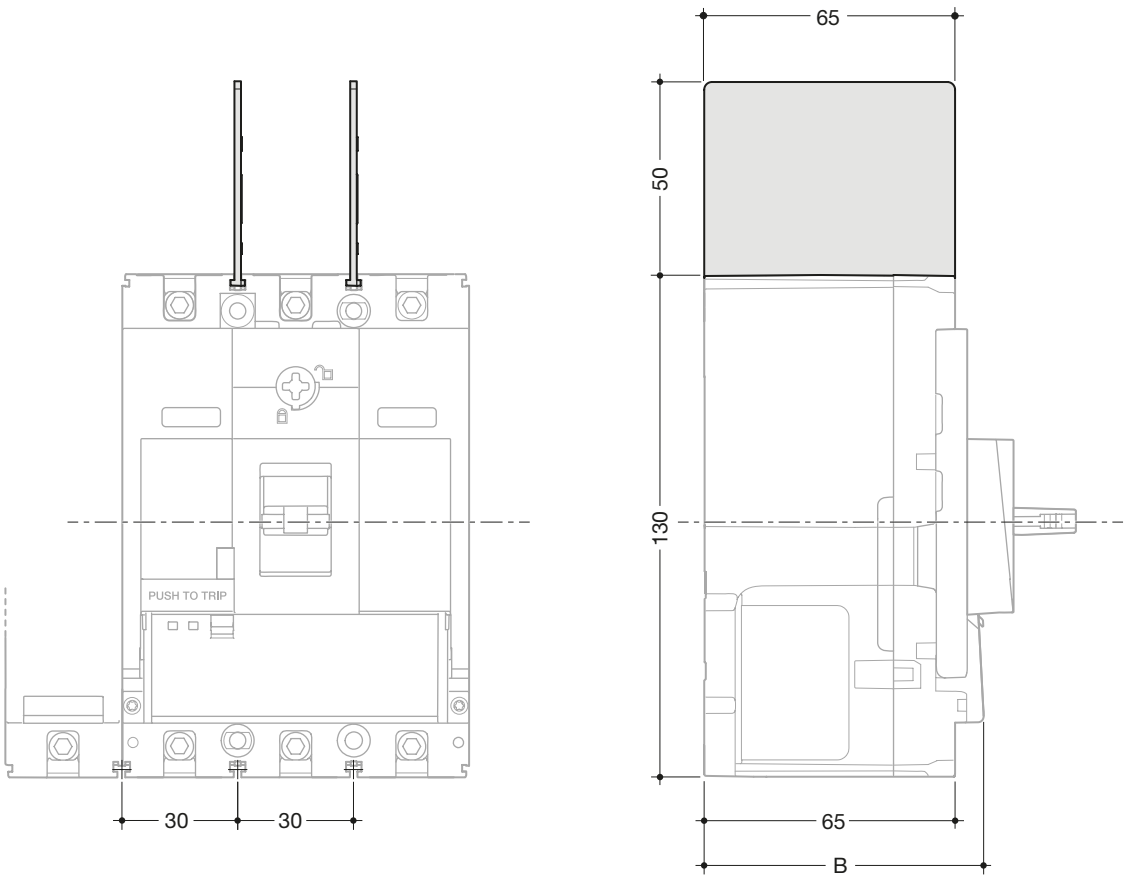


Technical changes reserved

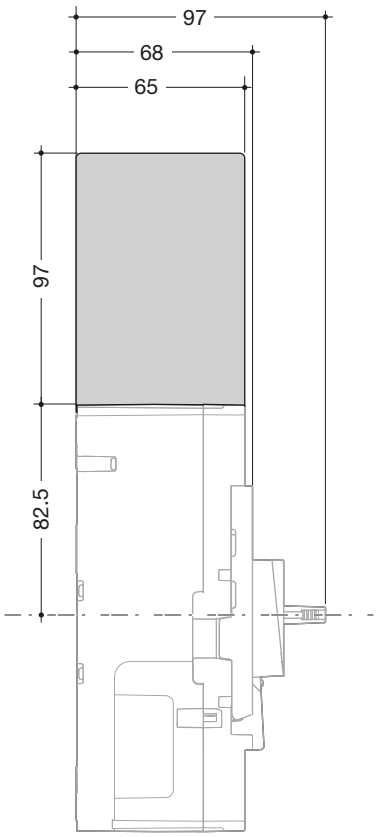
Interphase barriers P160

3P

4P



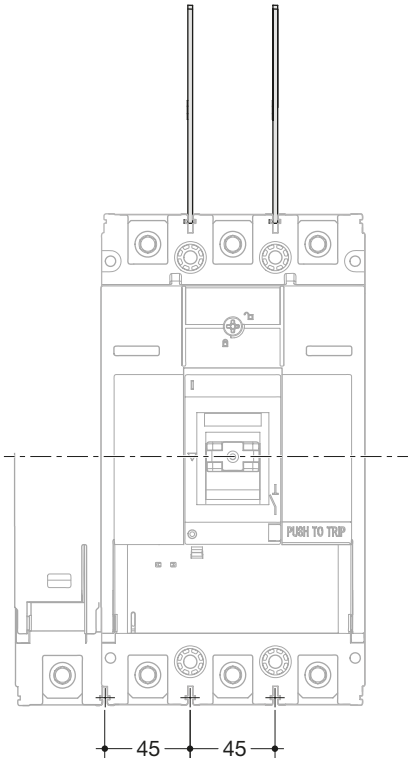
Interphase barriers P250

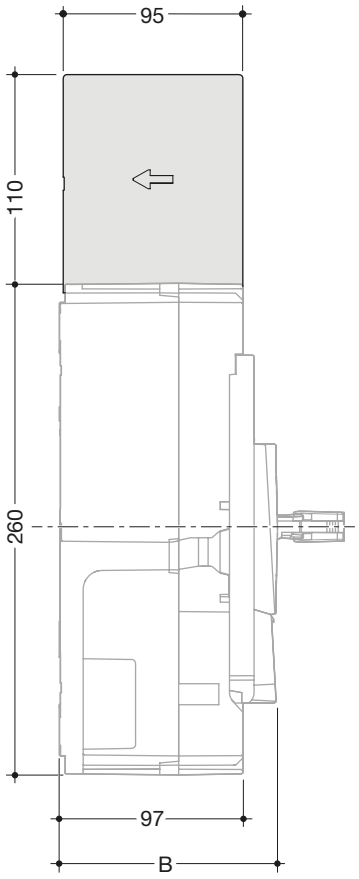


Interphase barriers P630

3P

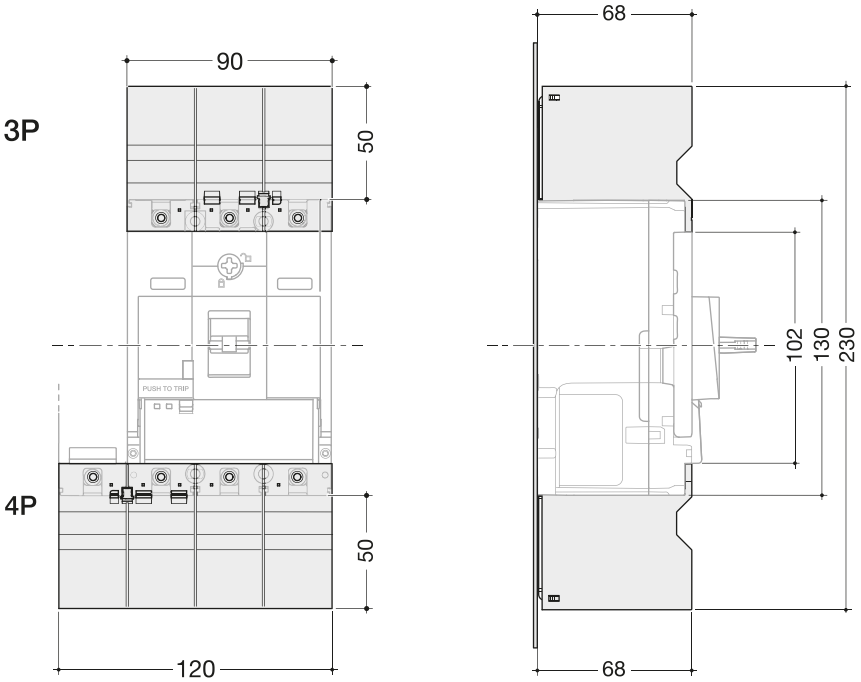
4P





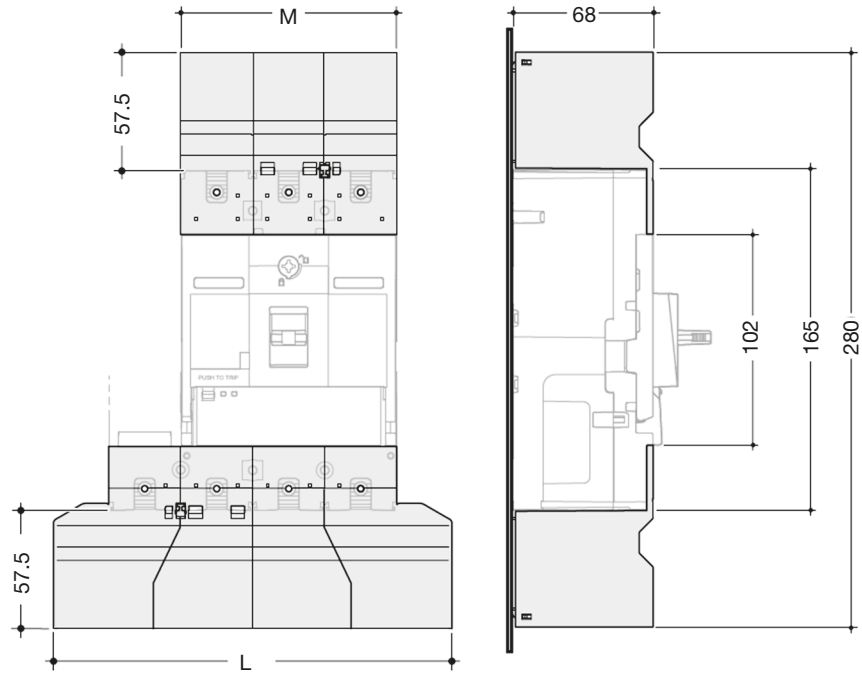
	B (mm)
TM LSI	72.5
Energy	74.5

Terminal cover P160



P160 Terminal cover

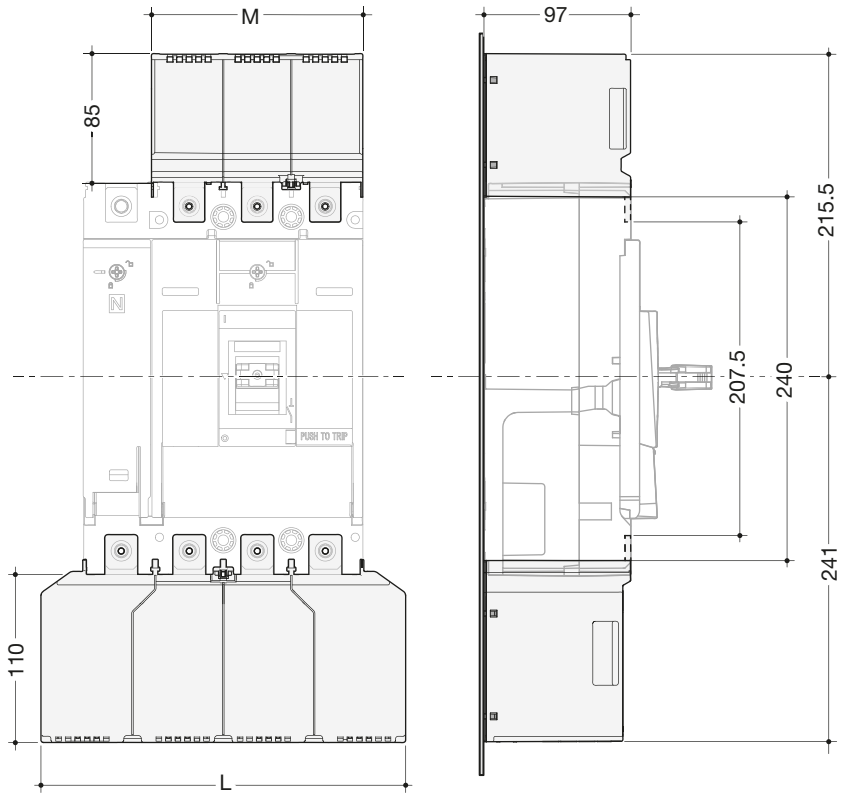
Terminal cover P250



P250 Terminal cover

	L (mm)	**M** (mm)
3P	145.5	105
4P	193.5	140

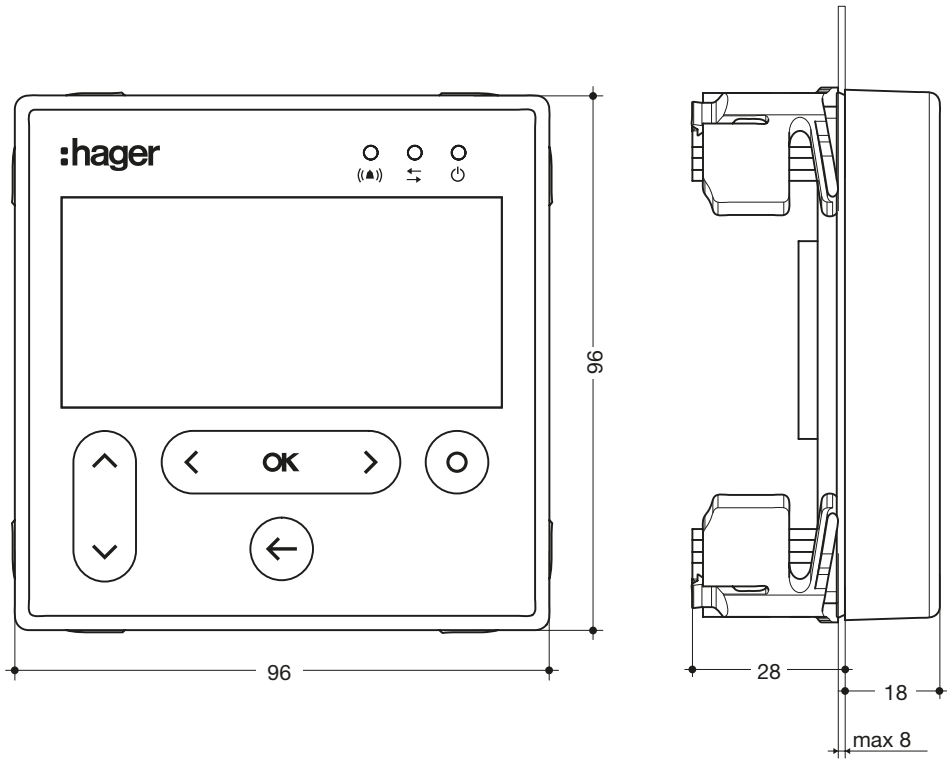
Terminal cover P630



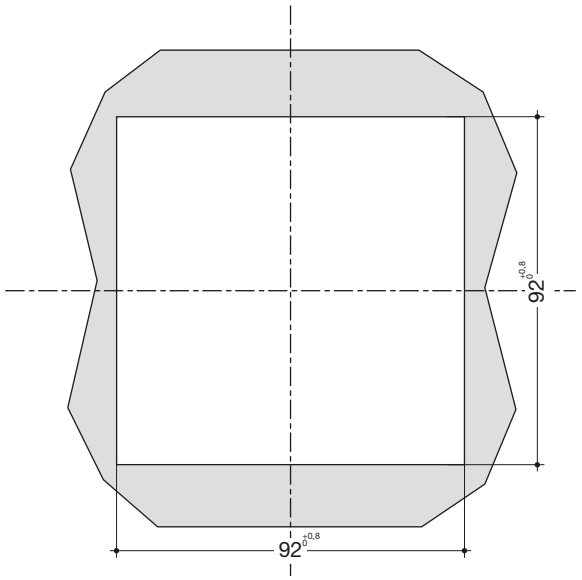
P630 Terminal cover

Technical changes reserved

Panel display



Cut-out

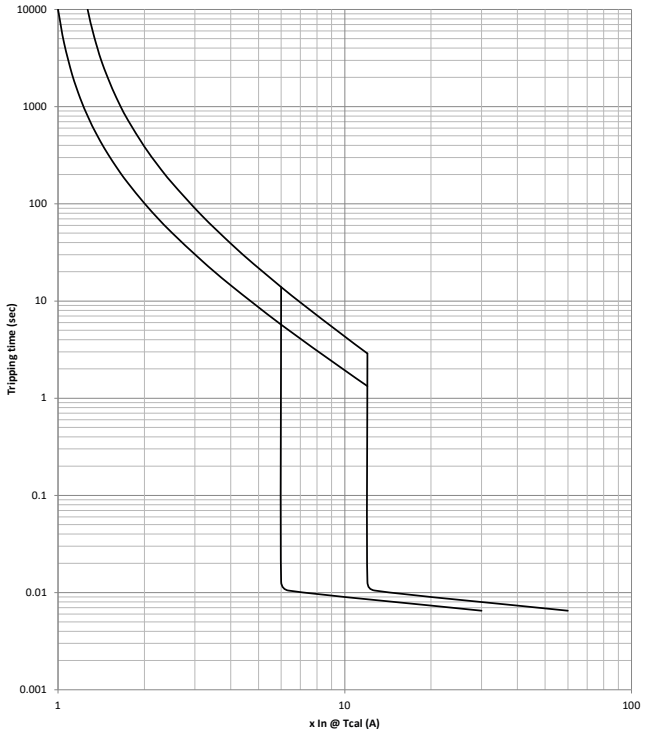


Complementary characteristics

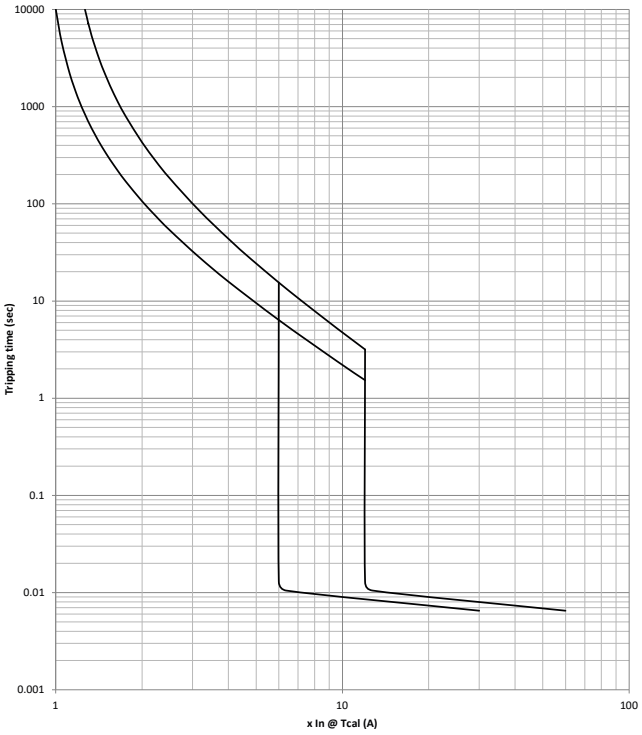
		Page
01	Tripping curves	126
02	Current and energy limiting curves	153

P160 TM adjustable

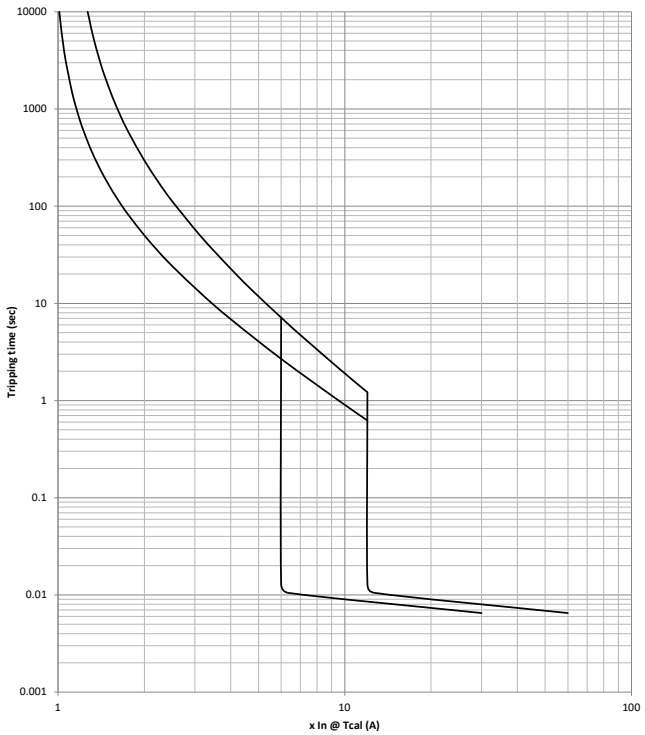
25 A



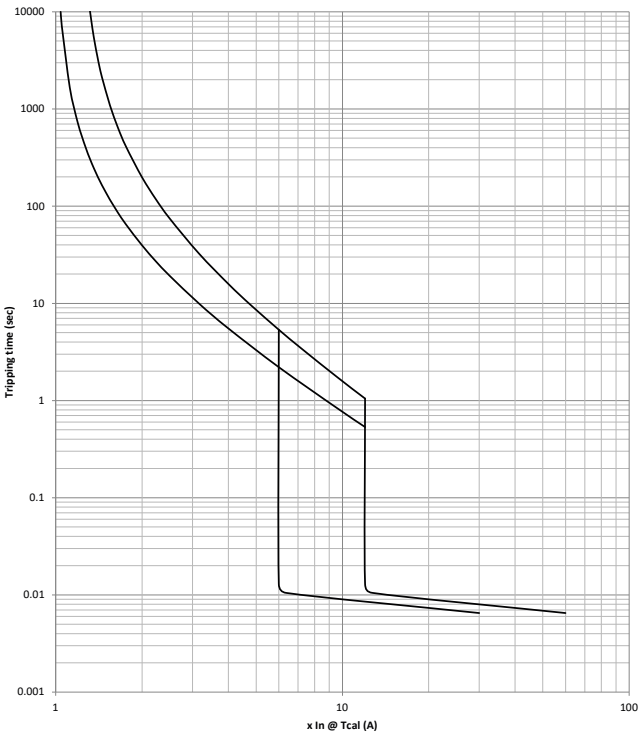
40 A



63 A



80 A

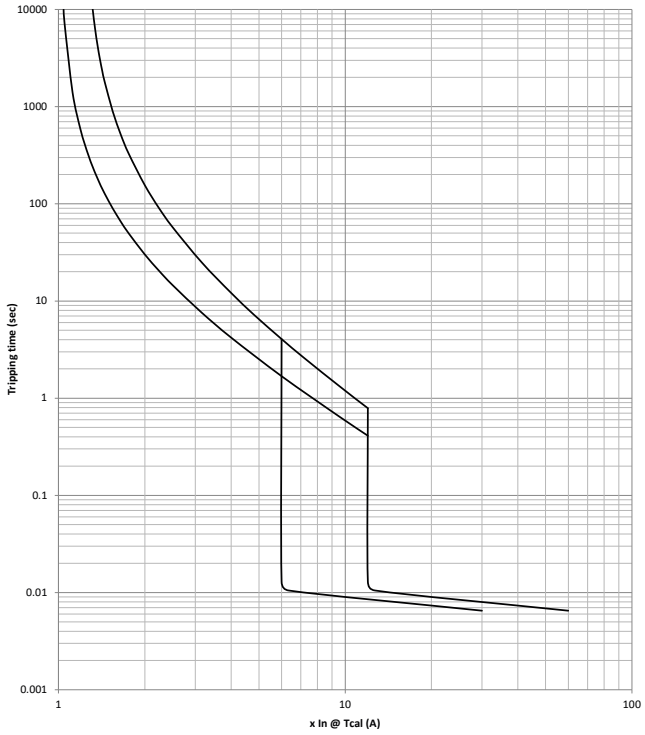


Note:
For tripping tolerances refer to chapter
“TM trip units” on page 19.

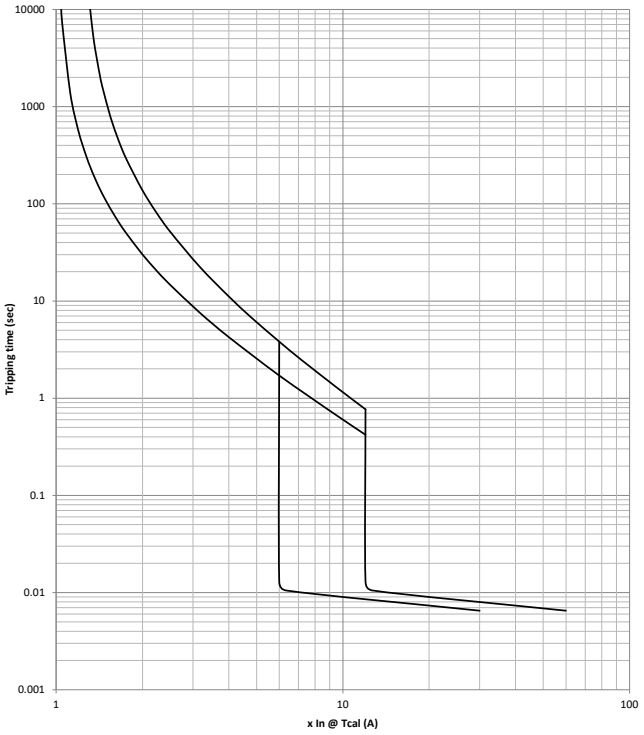
Technical changes reserved

P160 TM adjustable

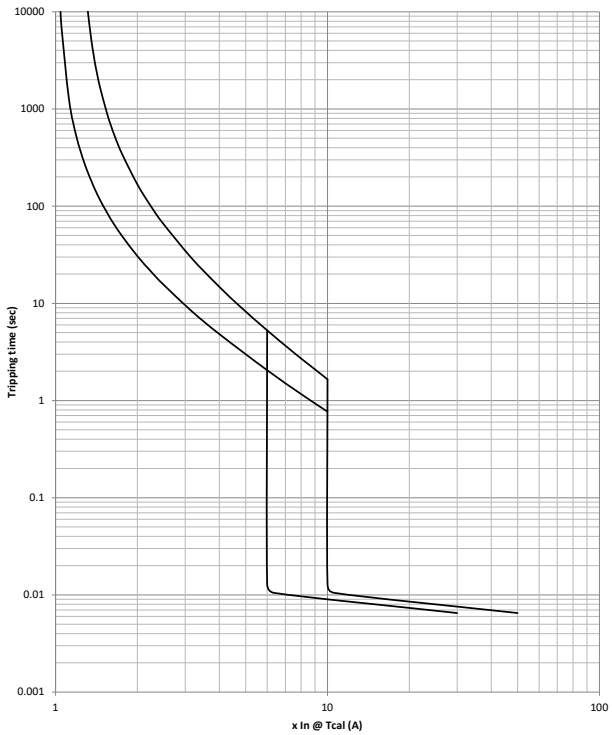
100 A



125 A



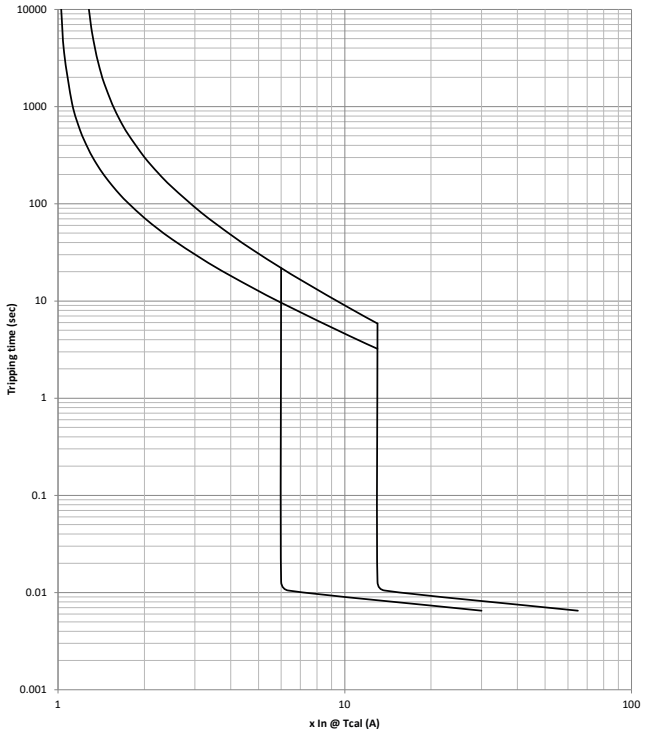
160 A



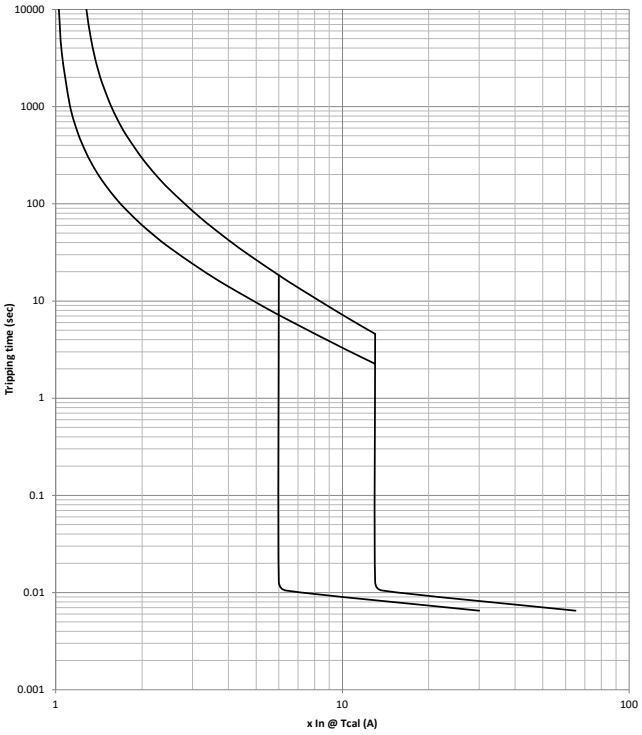
Note:
For tripping tolerances refer to chapter
“TM trip units” on page 19.

P250 TM adjustable

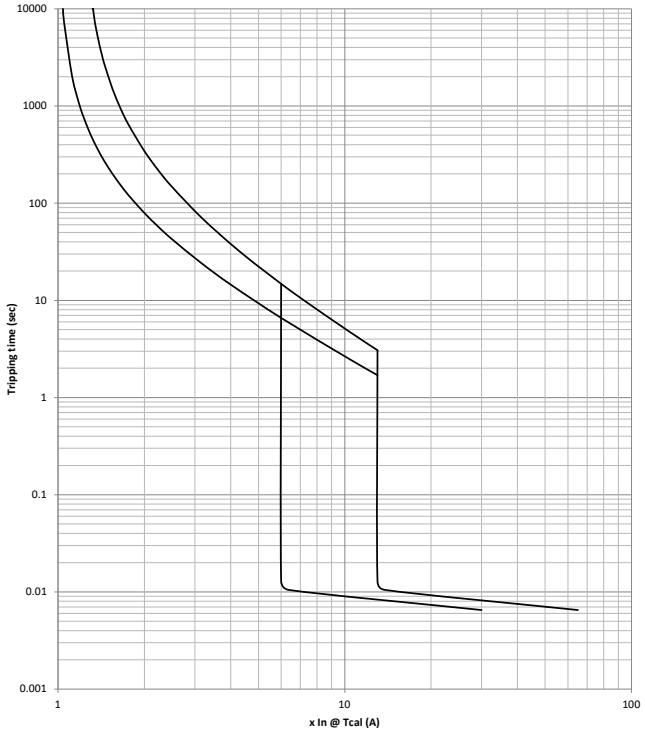
50 A



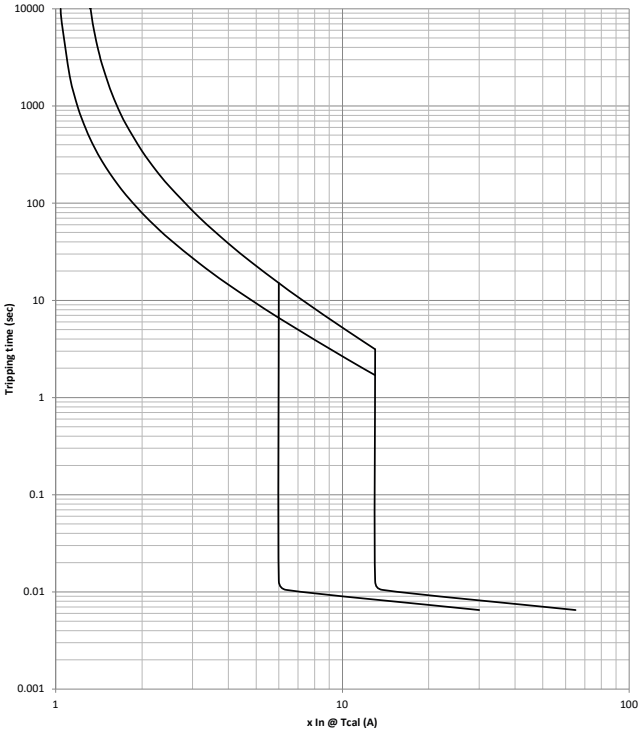
63 A



100 A



125 A

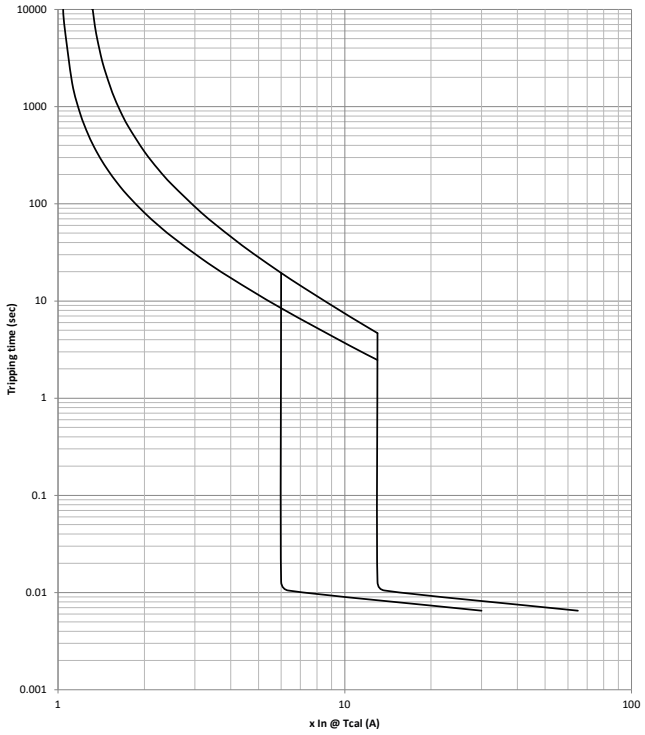


Note:
For tripping tolerances refer to chapter
“TM trip units” on page 19.

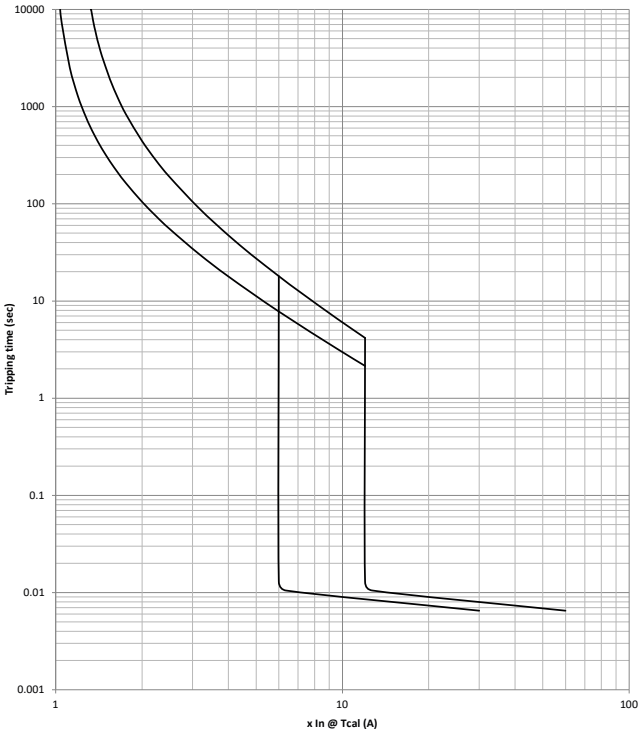
Technical changes reserved

P250 TM adjustable

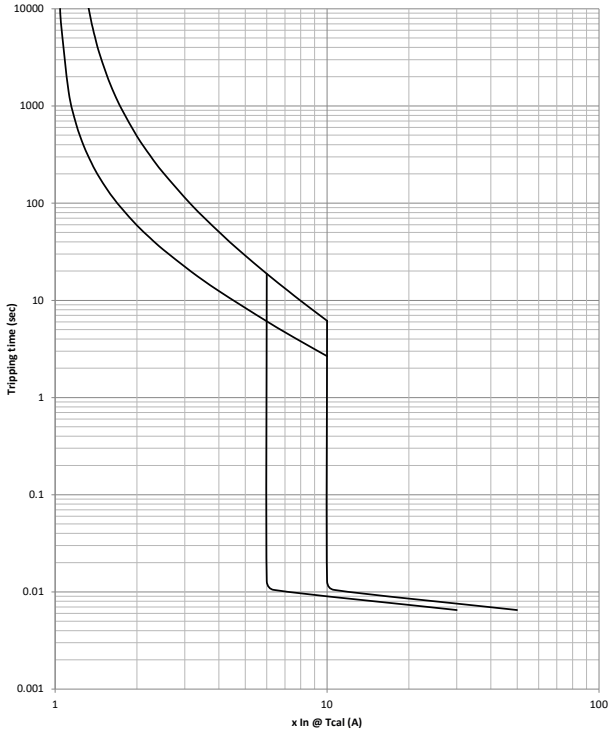
160 A



200 A



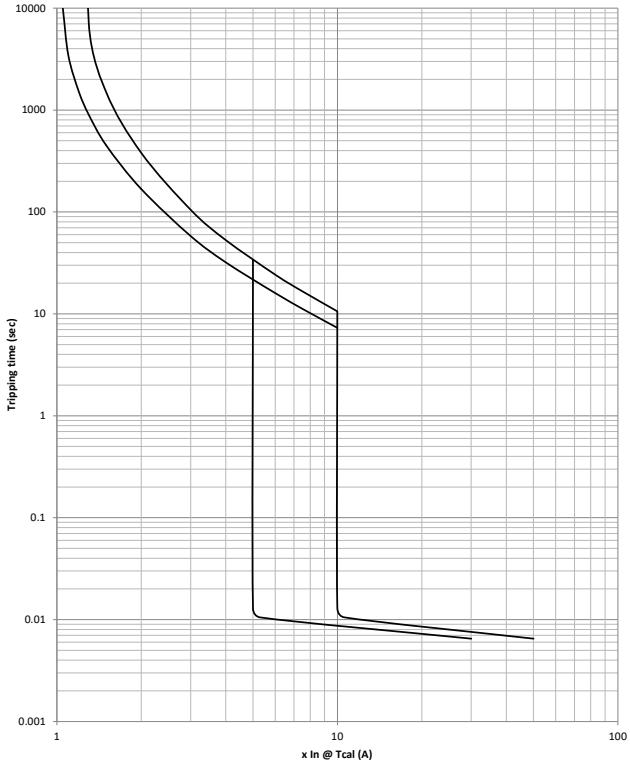
250 A



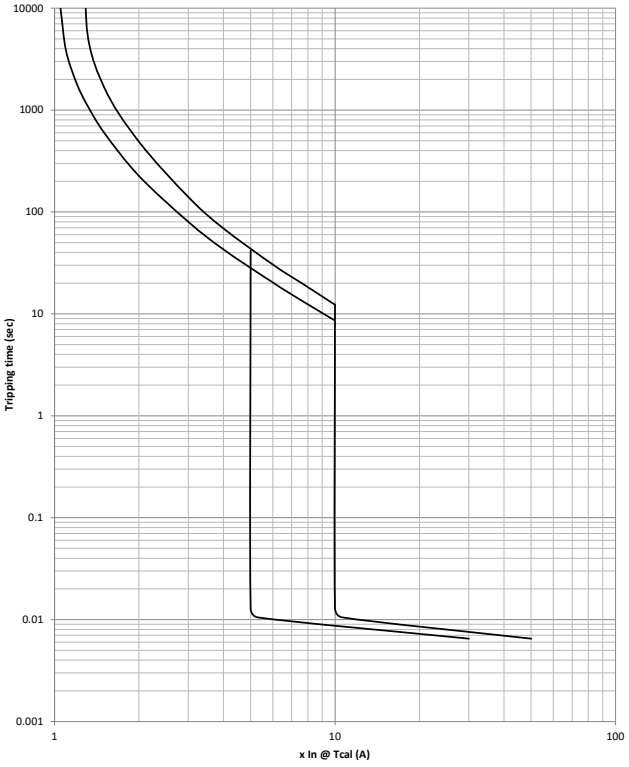
Note:
For tripping tolerances refer to chapter
“TM trip units” on page 19.

P630 TM adjustable

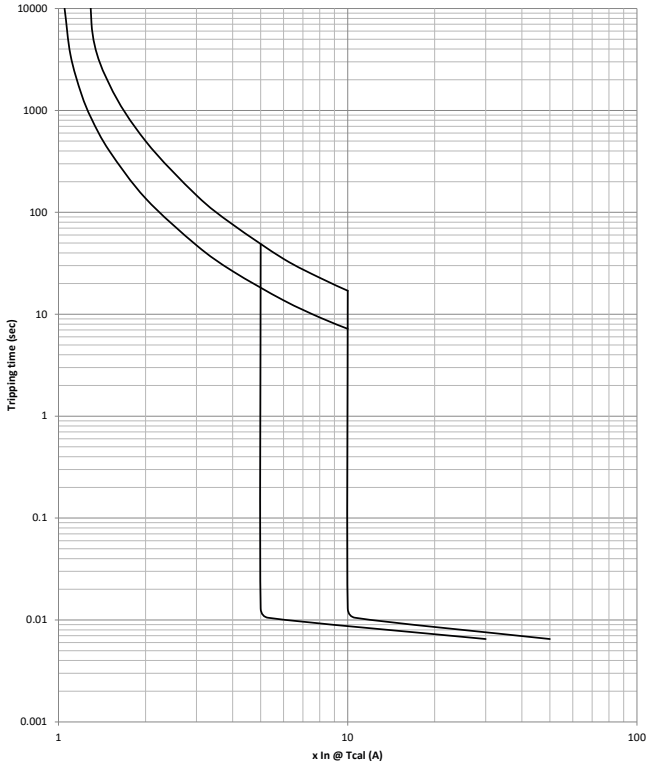
250 A



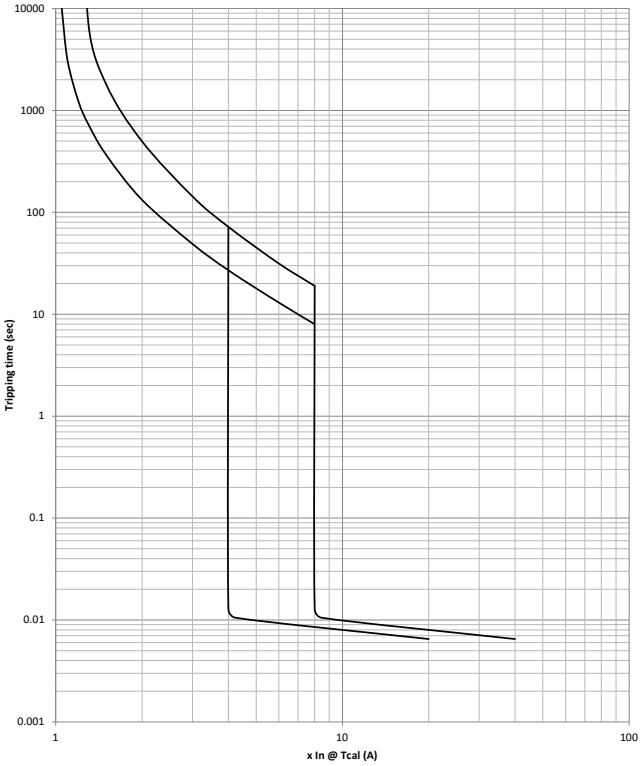
320 A



400 A



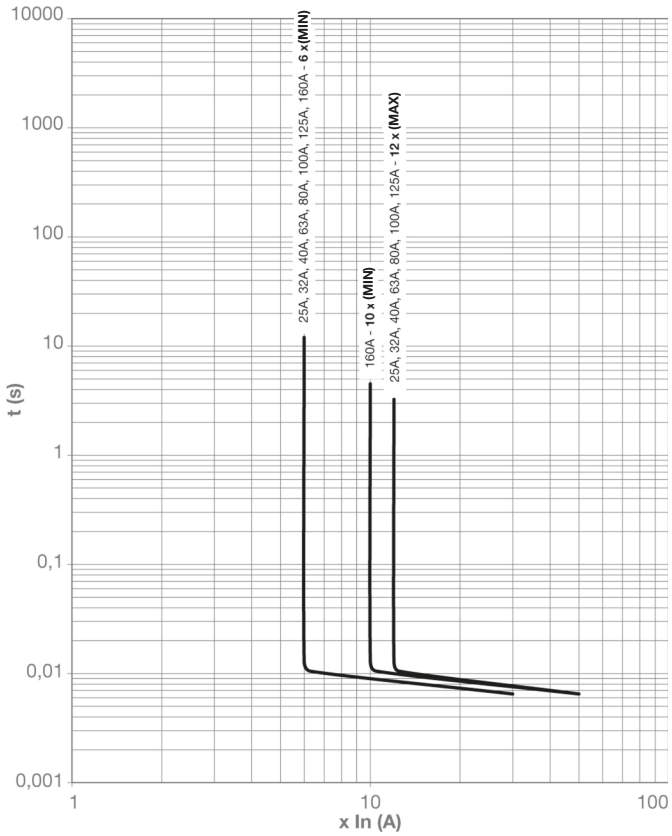
630 A



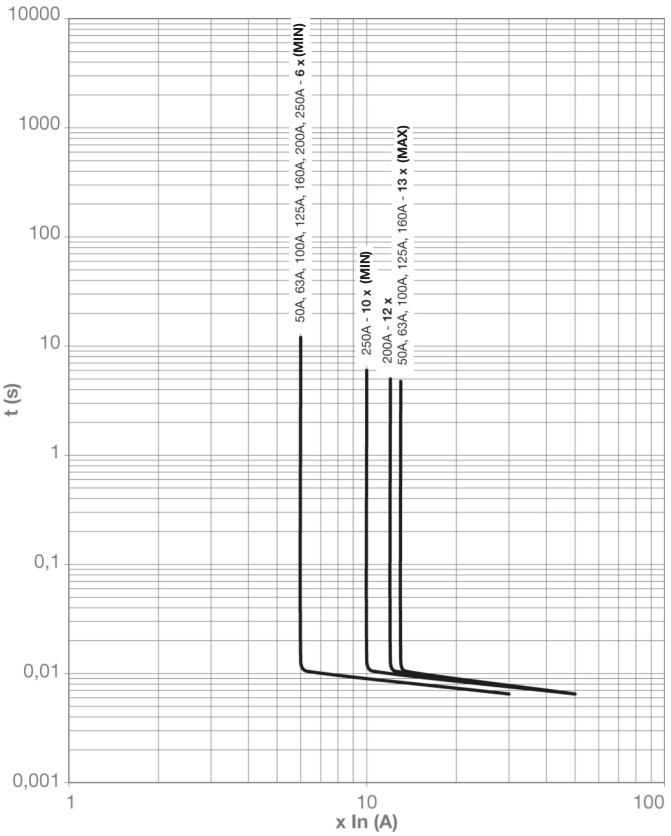
Note:
For tripping tolerances refer to chapter
“TM trip units” on page 19.

Technical changes reserved

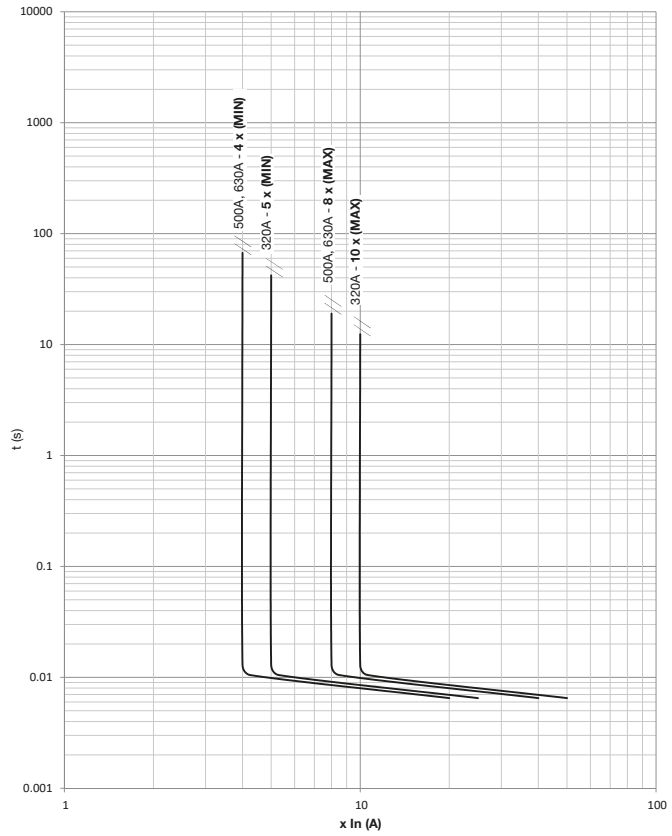
P160 MAG (ICB)



P250 MAG (ICB)



P630 MAG (ICB)

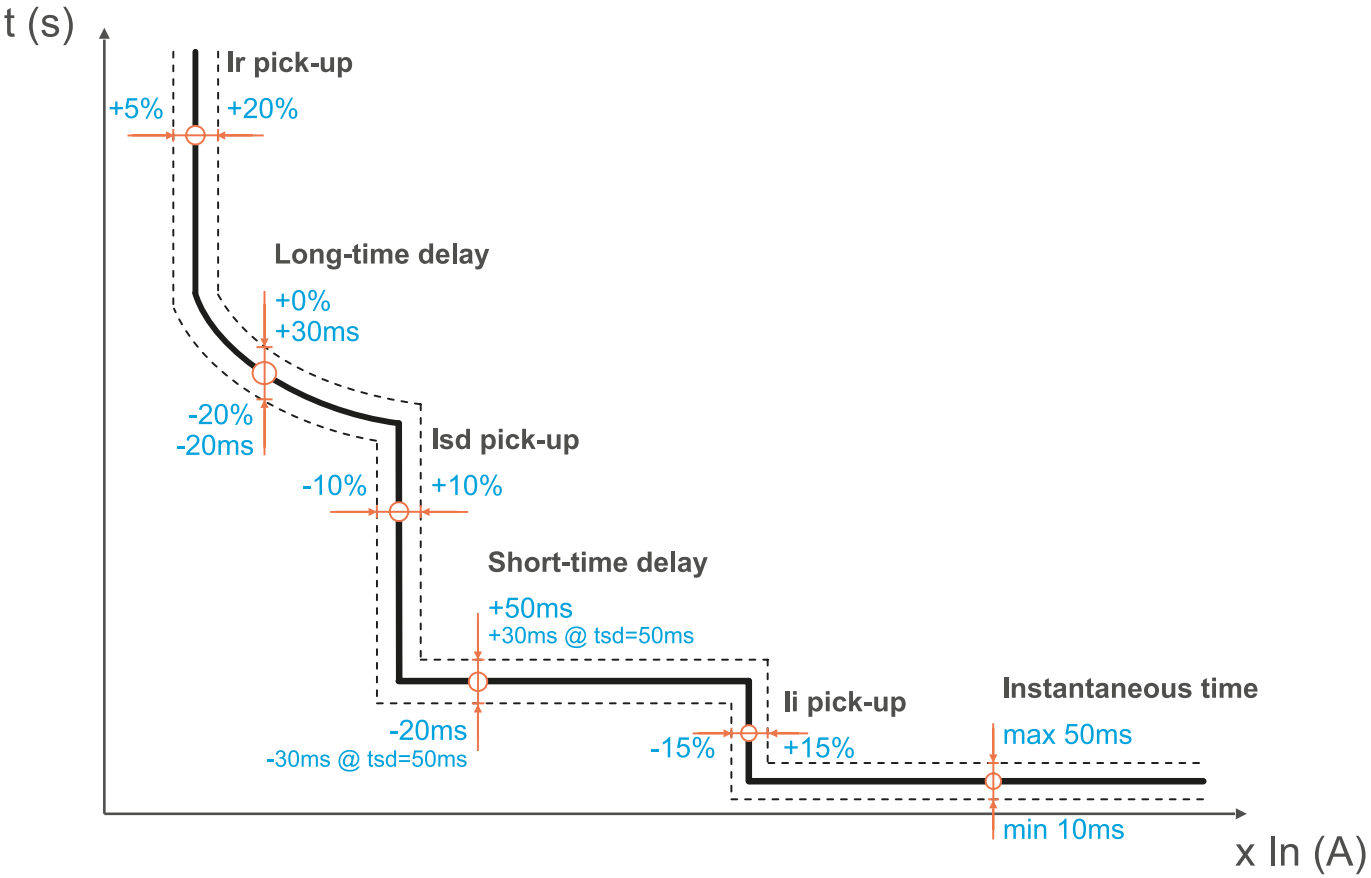


Note:
For tripping tolerances refer to chapter
“TM trip units” on page 19.

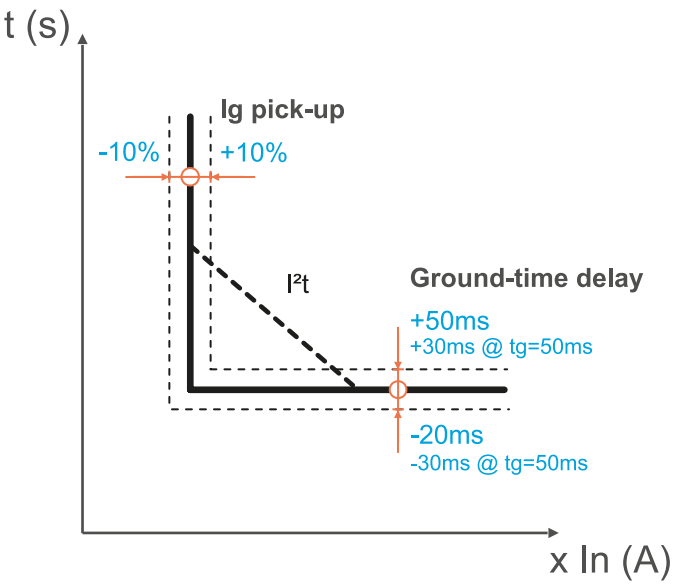
Tripping tolerance of electronic trip units

Tolerances limits for tripping curves of electronic trip units are not described on tripping curves drawing.
Both following diagrams give the tolerance to take in account on further LSnI, LSI, LSIG, Energy and G tripping curves drawings

Tolerance limits of LSnI, LSI, LSIG and Energy tripping curves



Tolerance limits of G characteristic of Energy trip unit

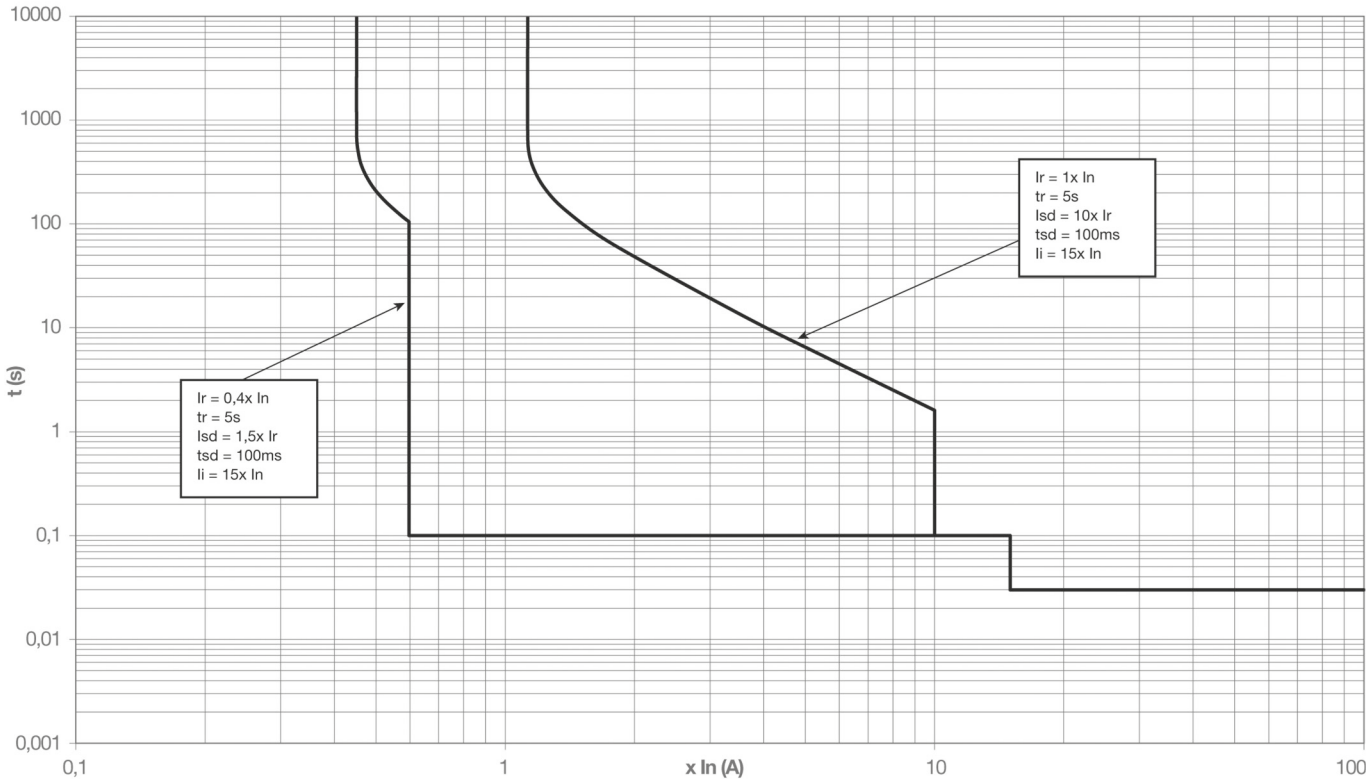


Note:
For tripping tolerances refer to chapter
“MAG trip units” on page 20.

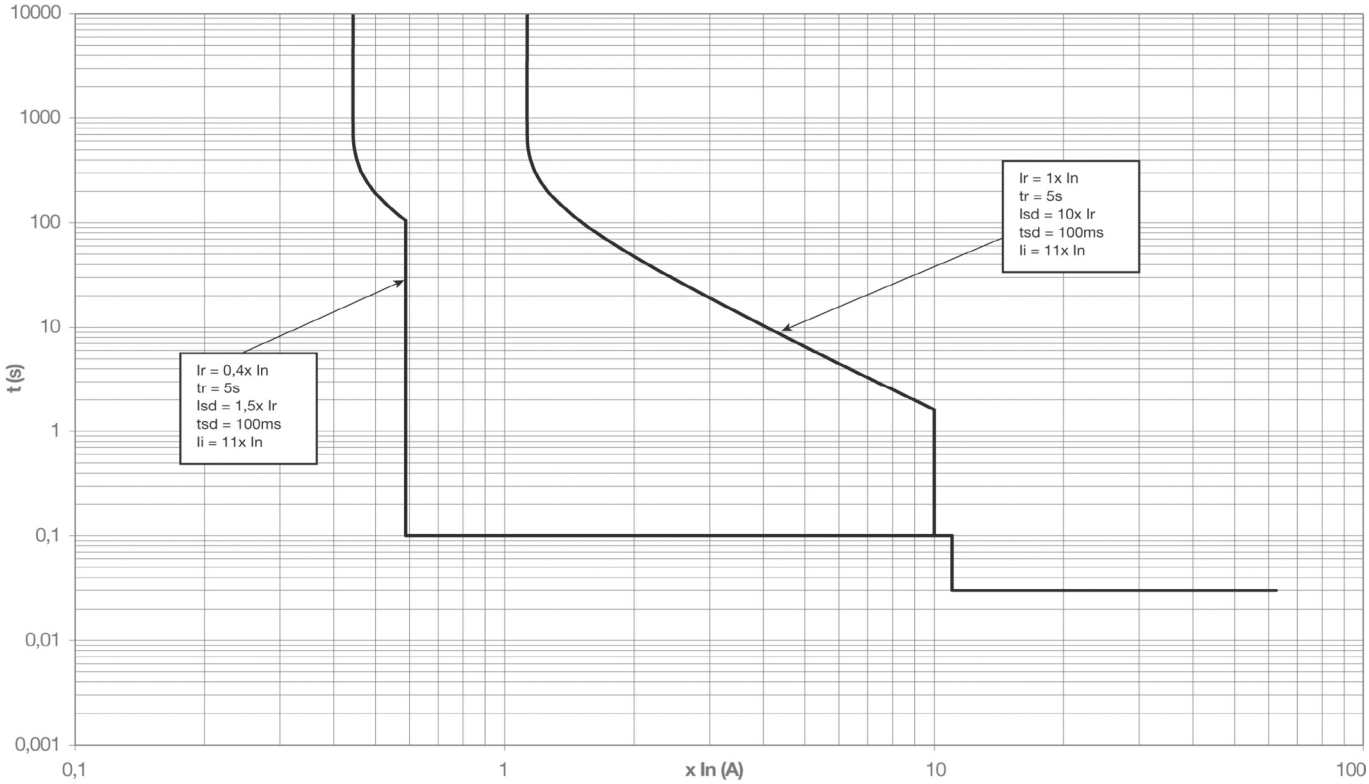
Technical changes reserved

P160 LSnI

40 - 100 A

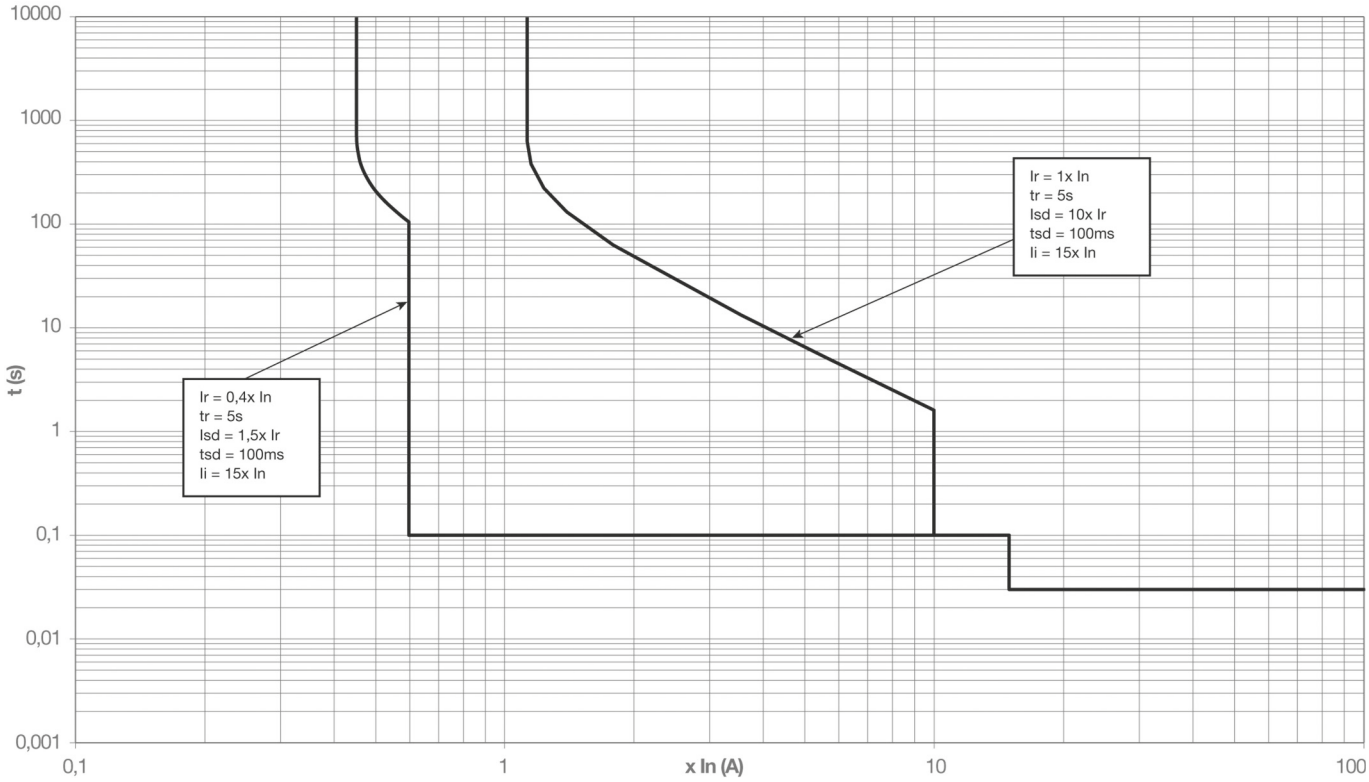


160 A

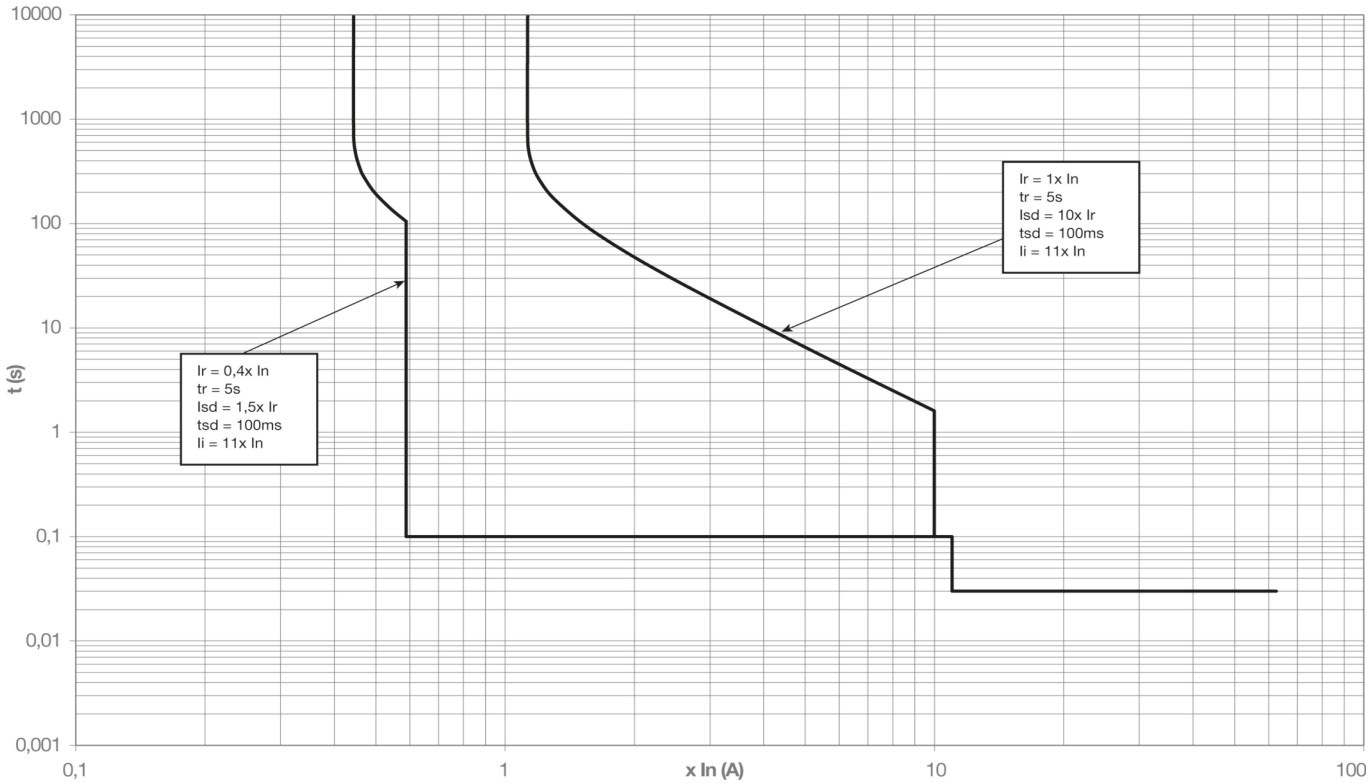


P250 LSnI

40 - 100 A



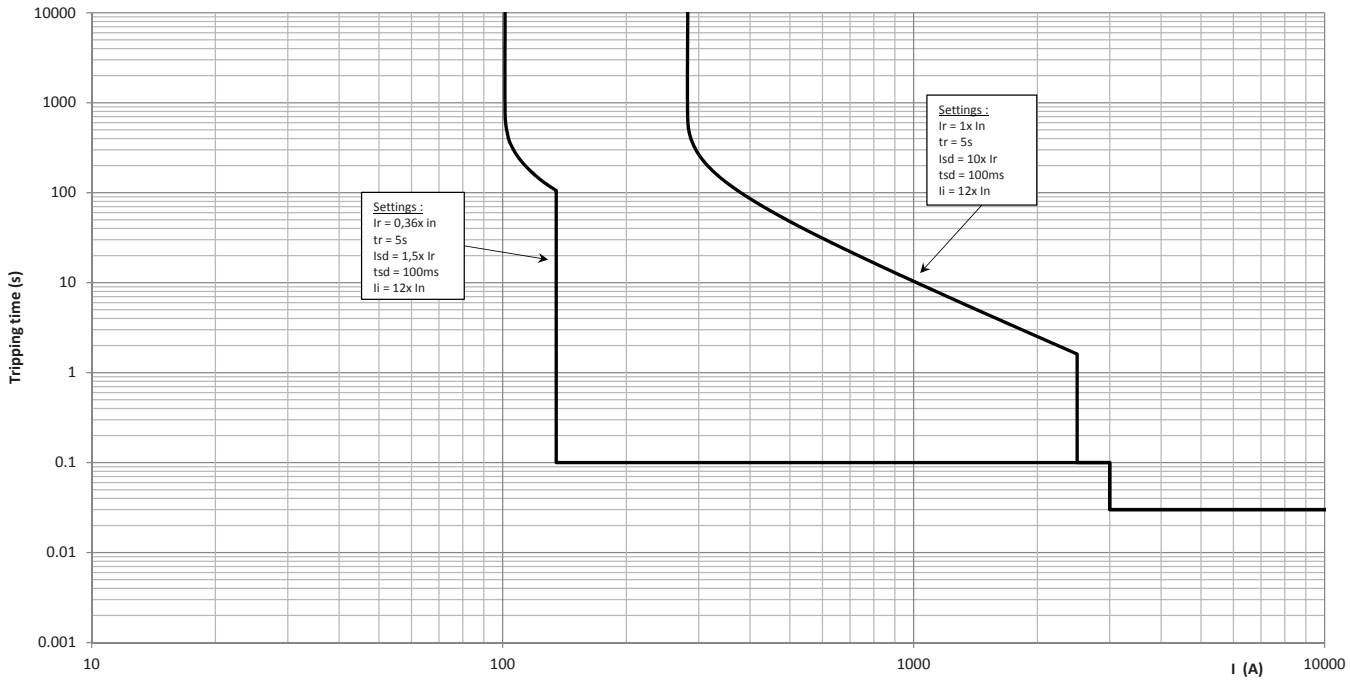
160 - 250 A



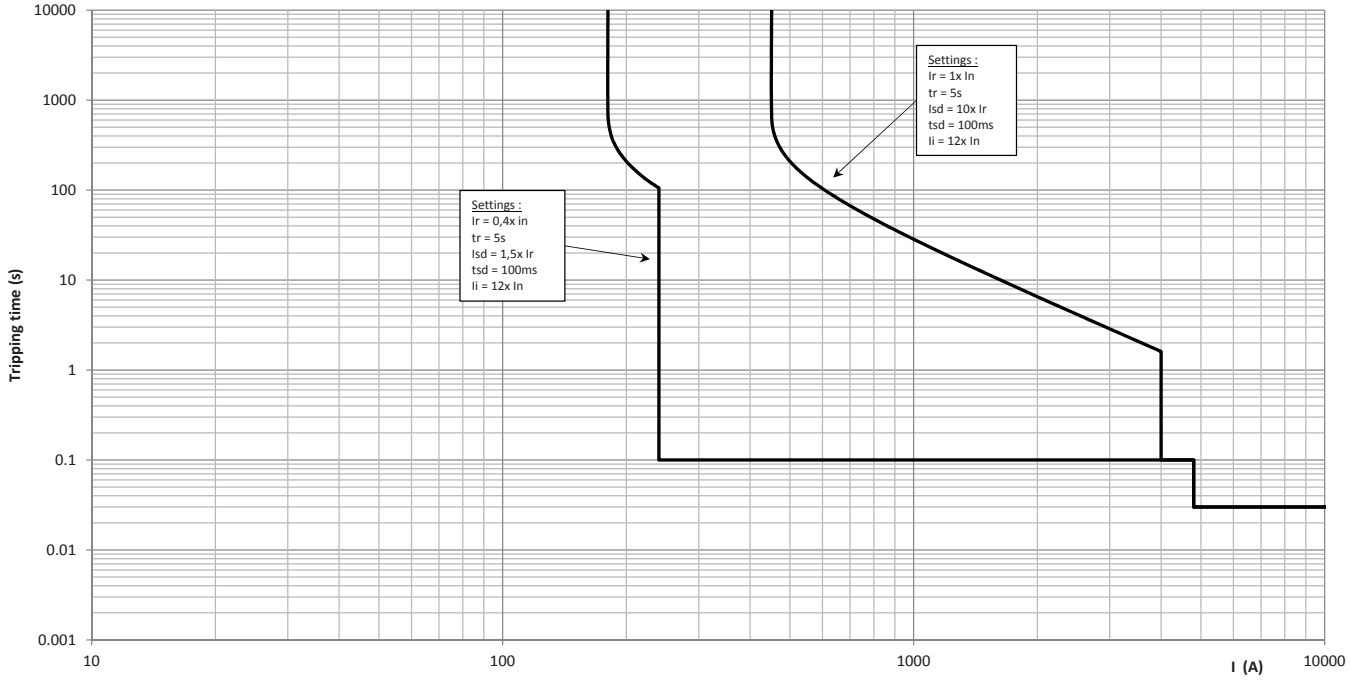
Technical changes reserved

P630 LSnI

250 A

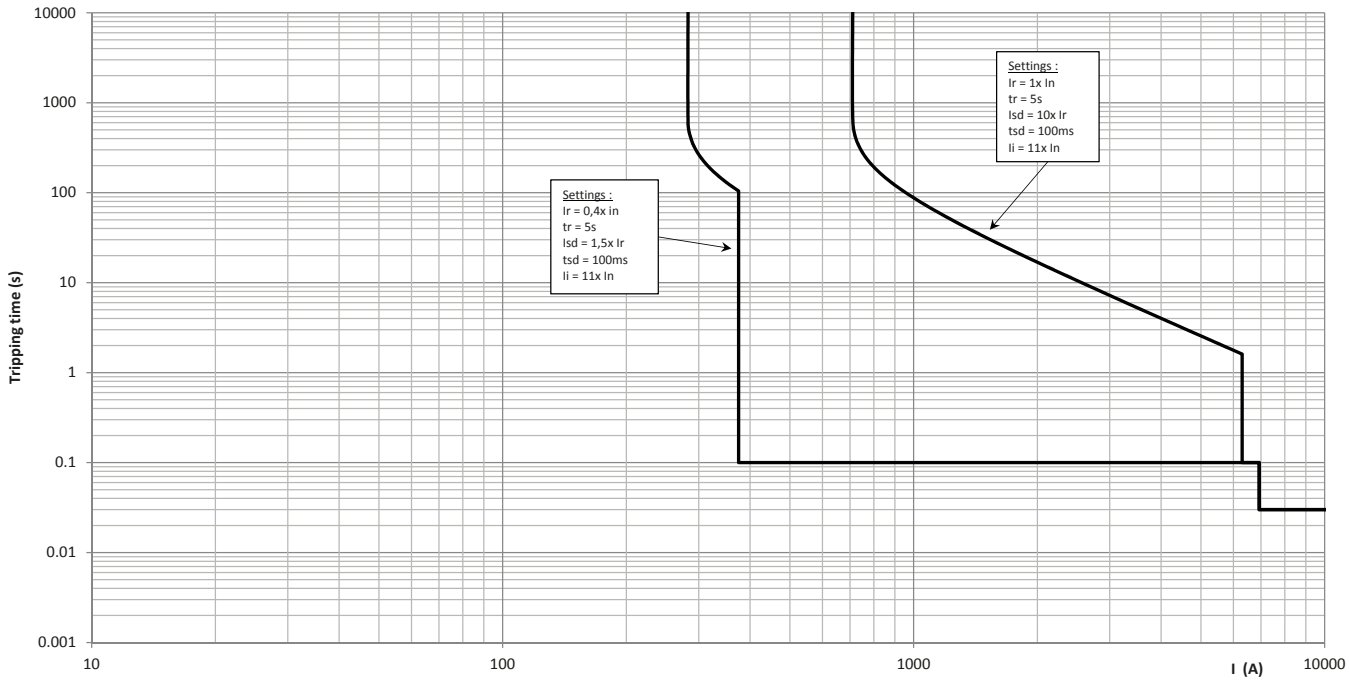


400 A



P630 LSnI

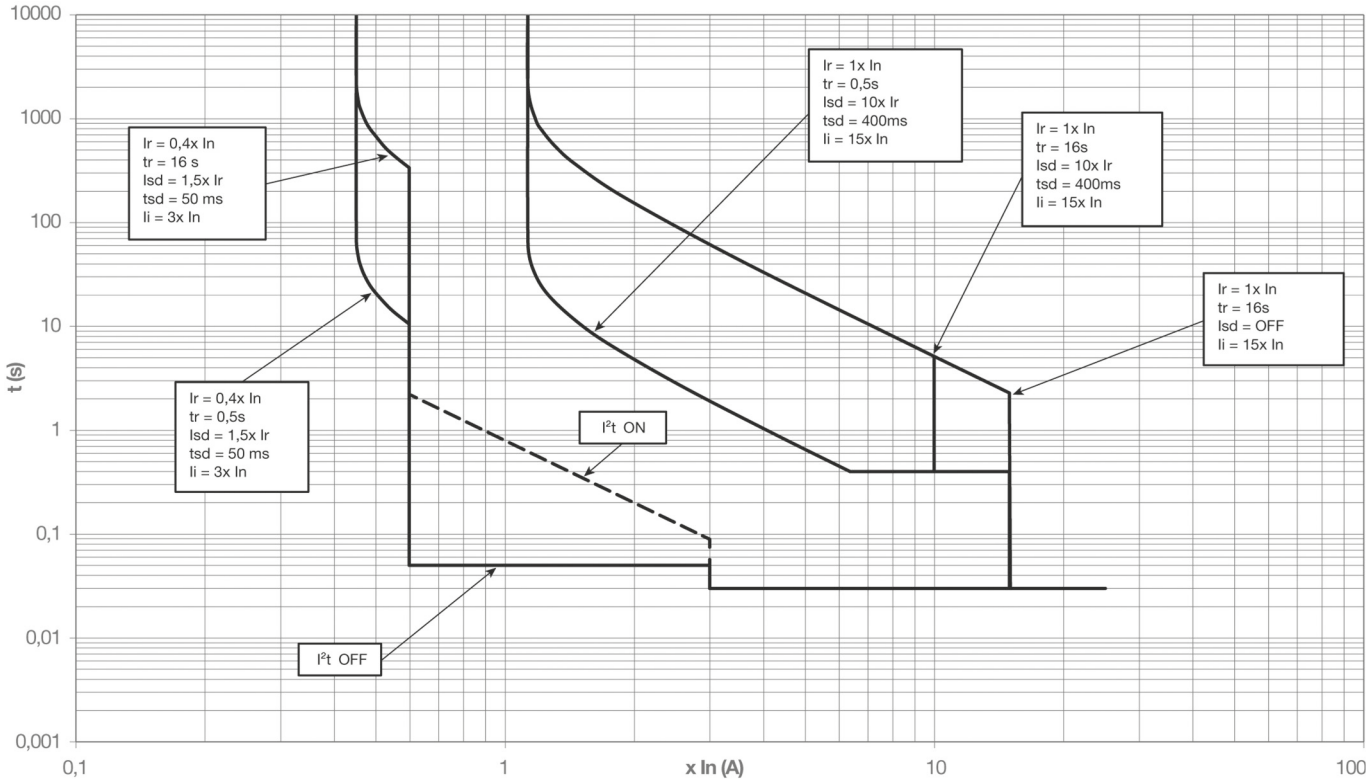
630 A



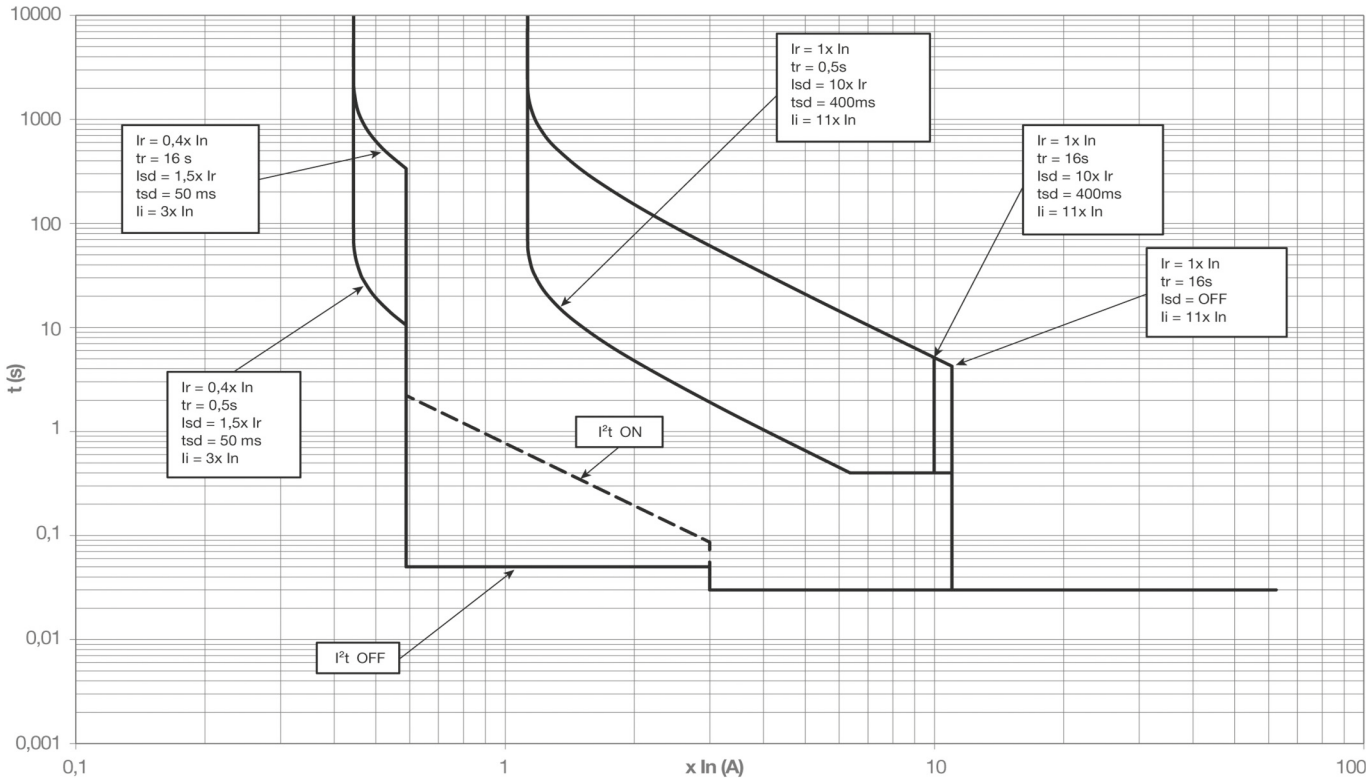
Technical changes reserved

P160 LSI

40 - 100 A

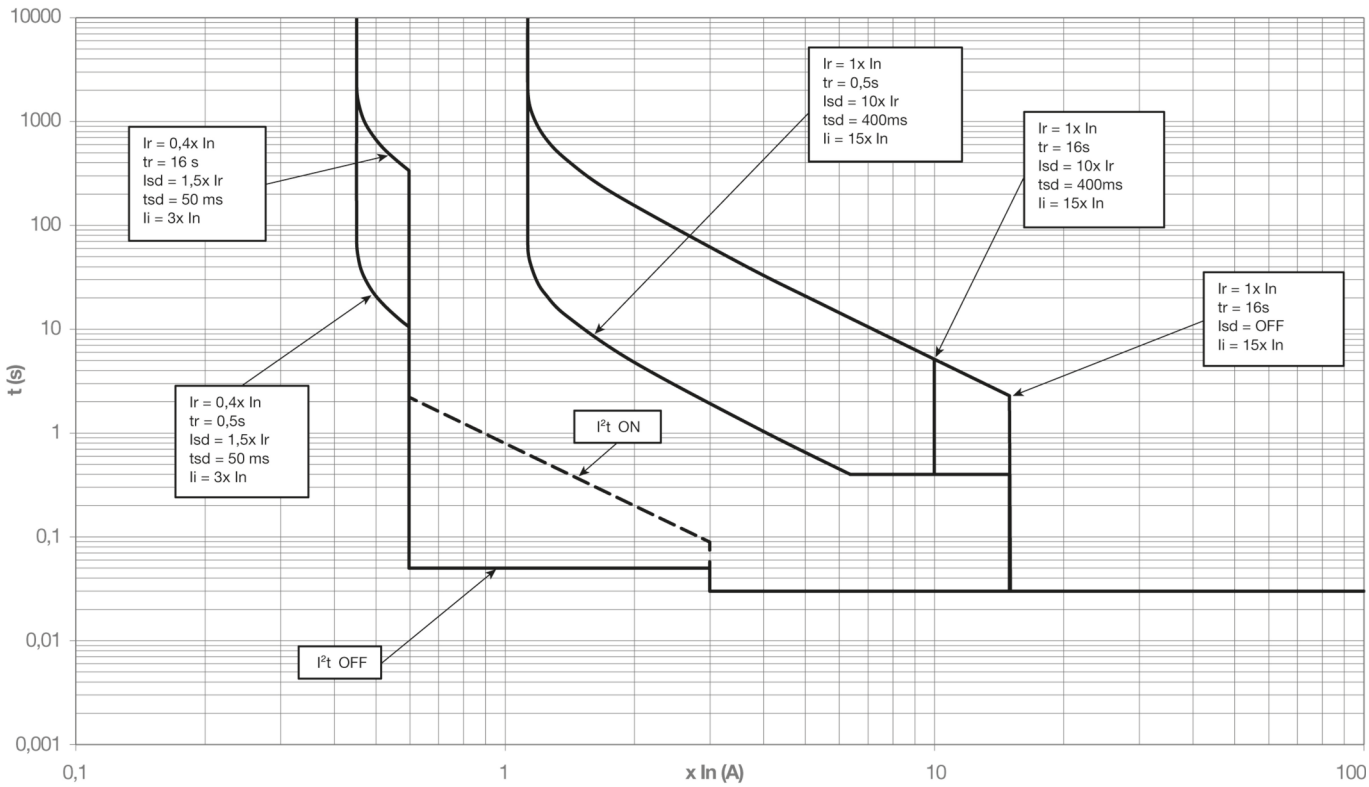


160 A

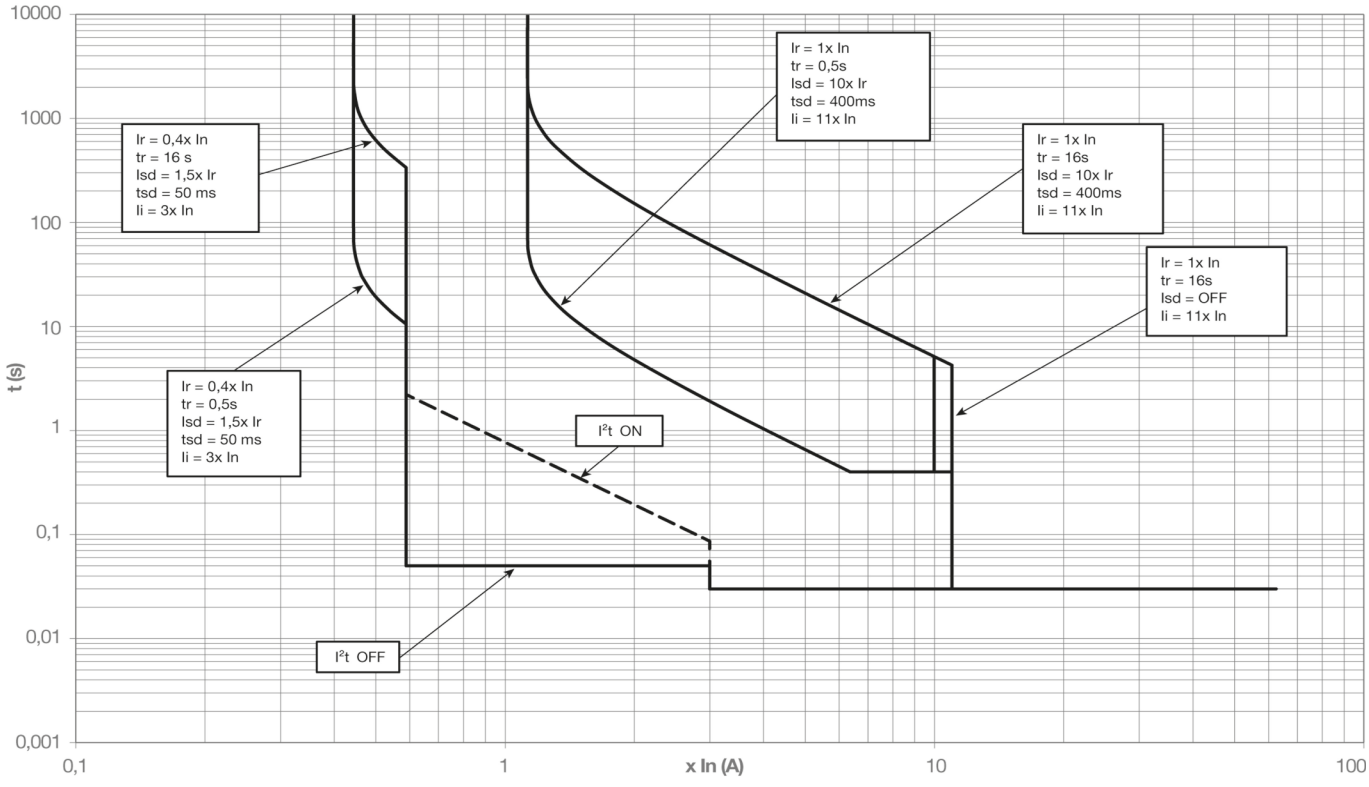


P250 LSI

40 - 100 A



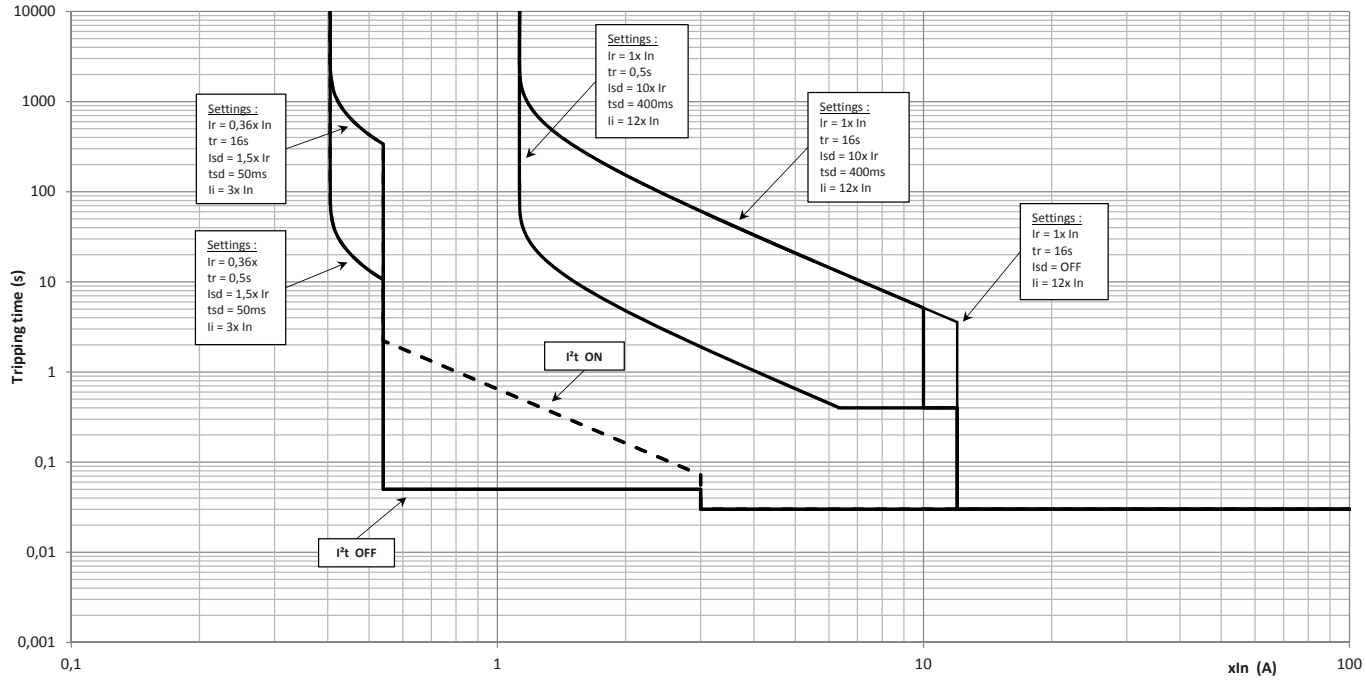
160 - 250 A



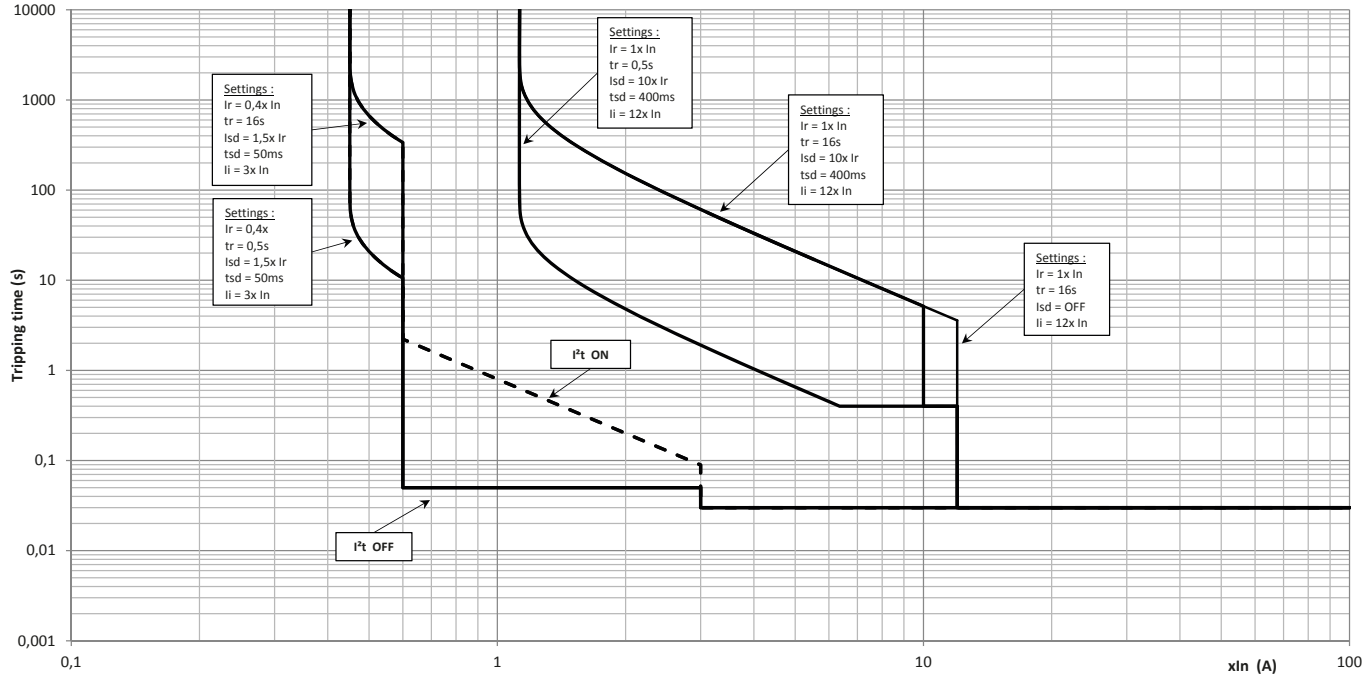
Technical changes reserved

P630 LSI

250 A

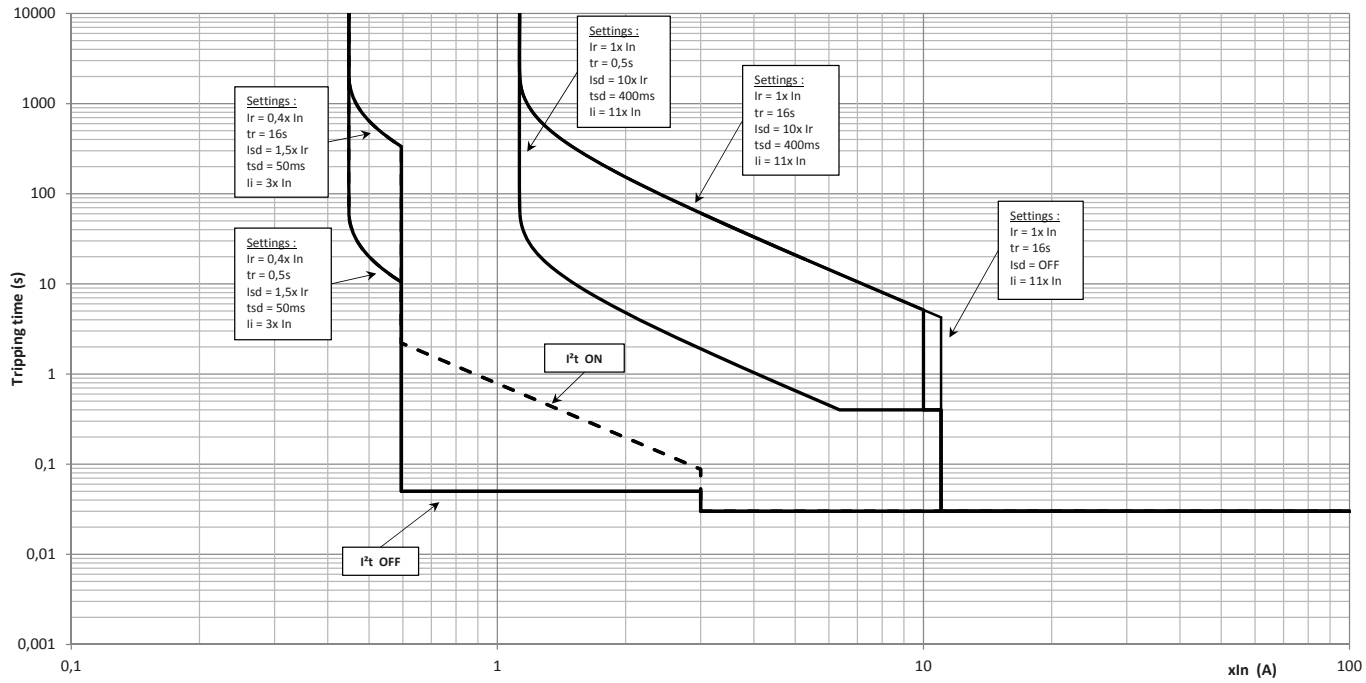


400 A



P630 LSI

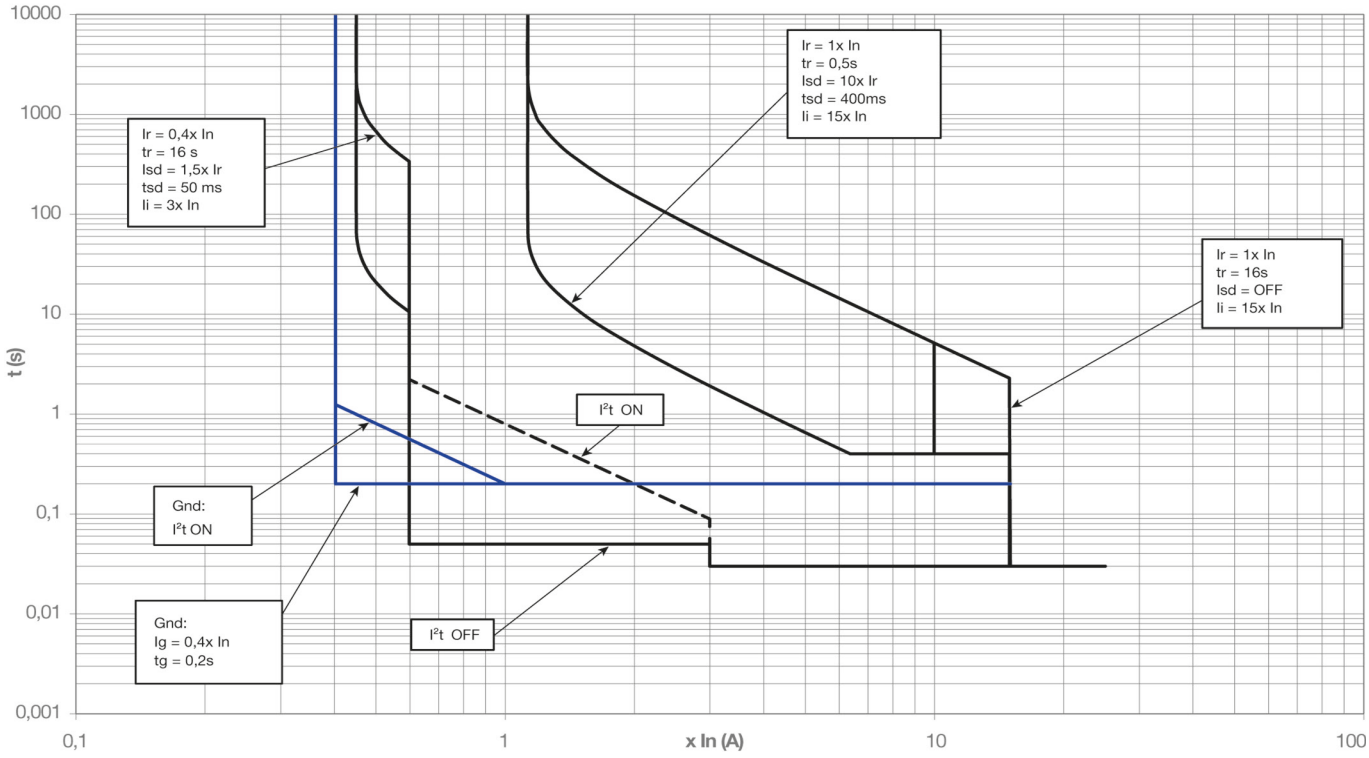
630 A



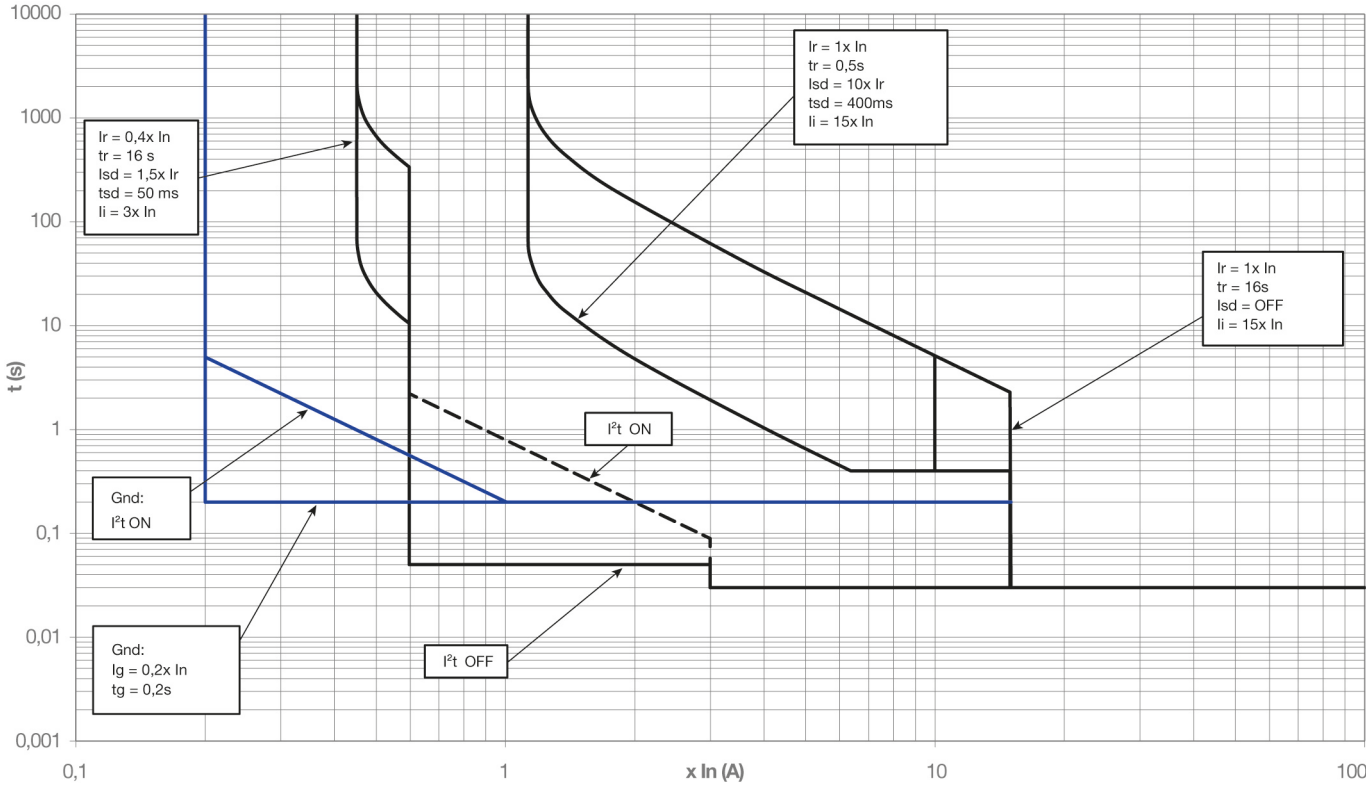
Technical changes reserved

P250 LSIG

40 A

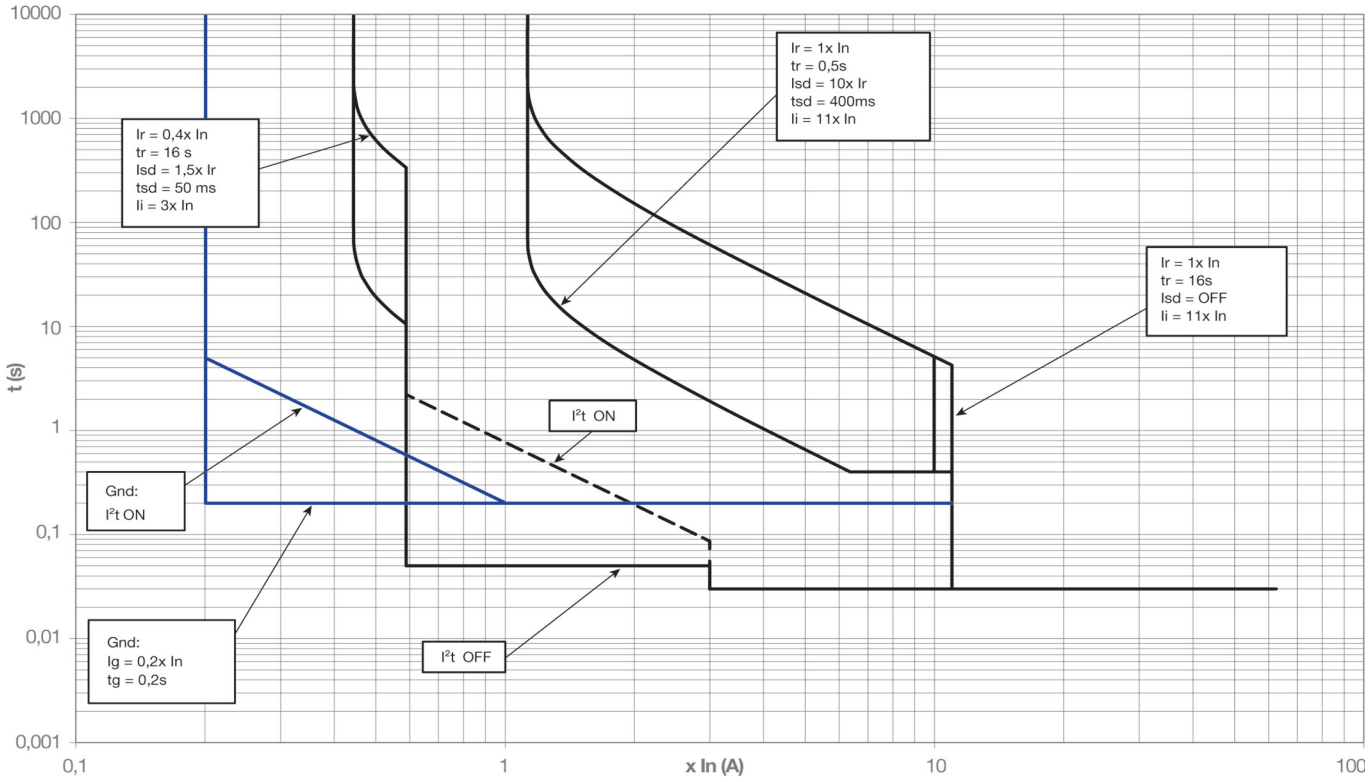


100 A

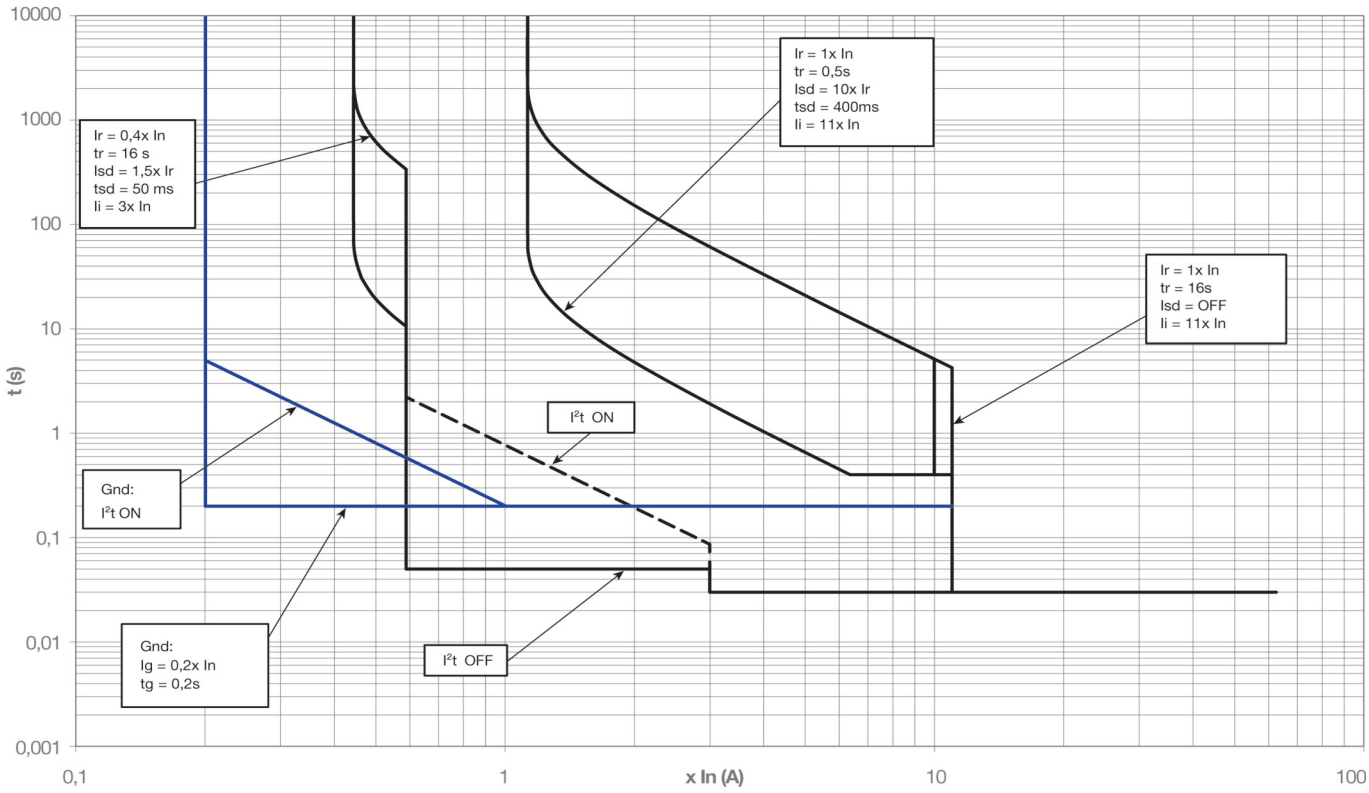


P250 LSIG

160 A



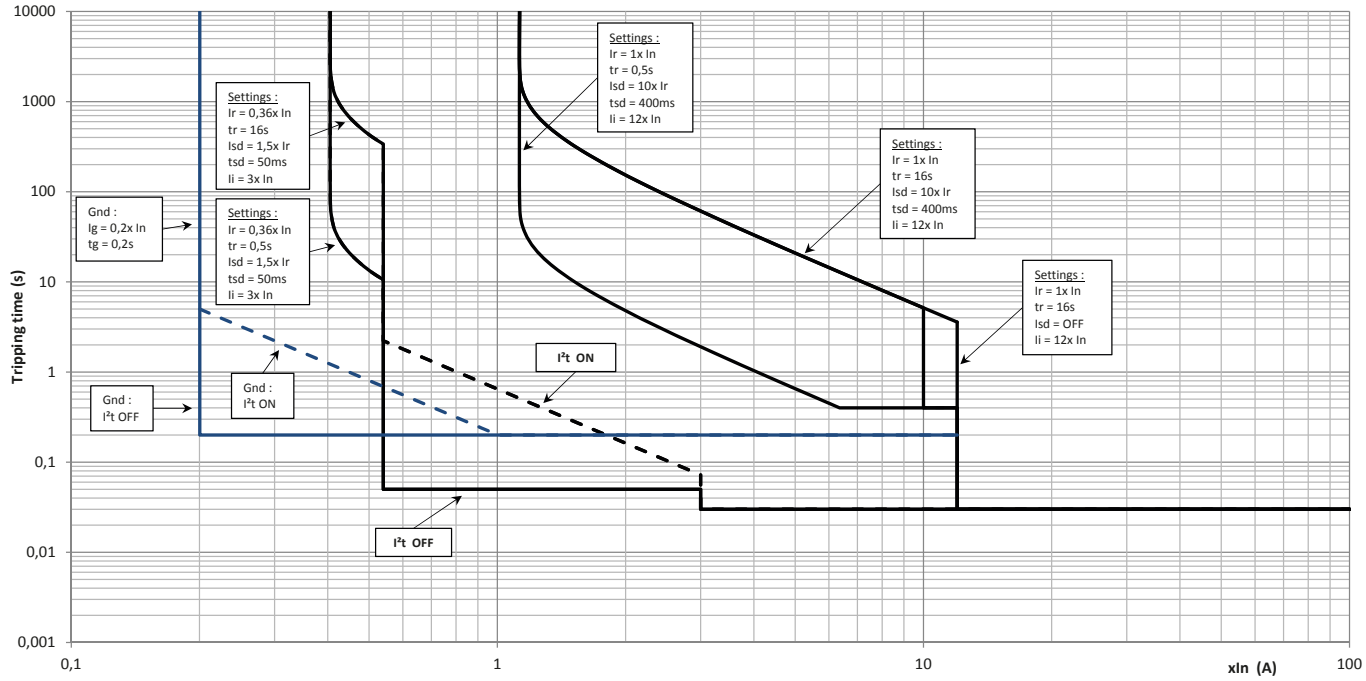
250 A



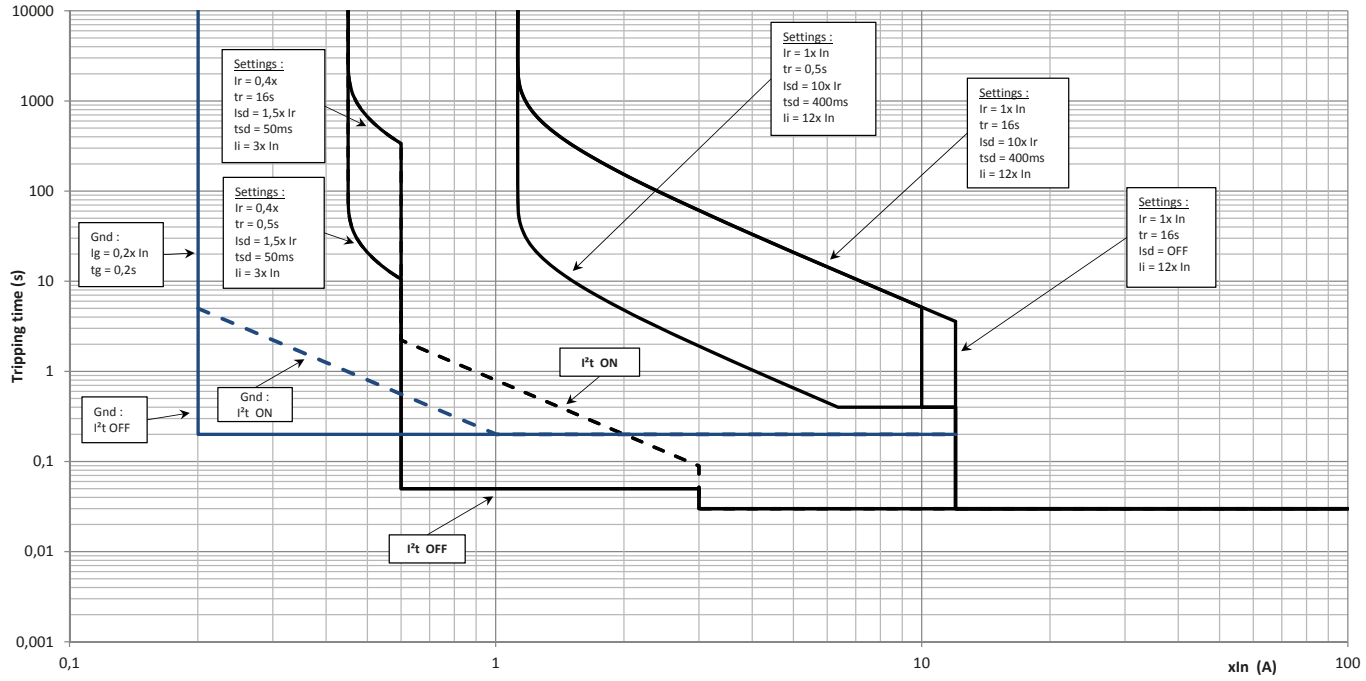
Technical changes reserved

P630 LSIG

250 A

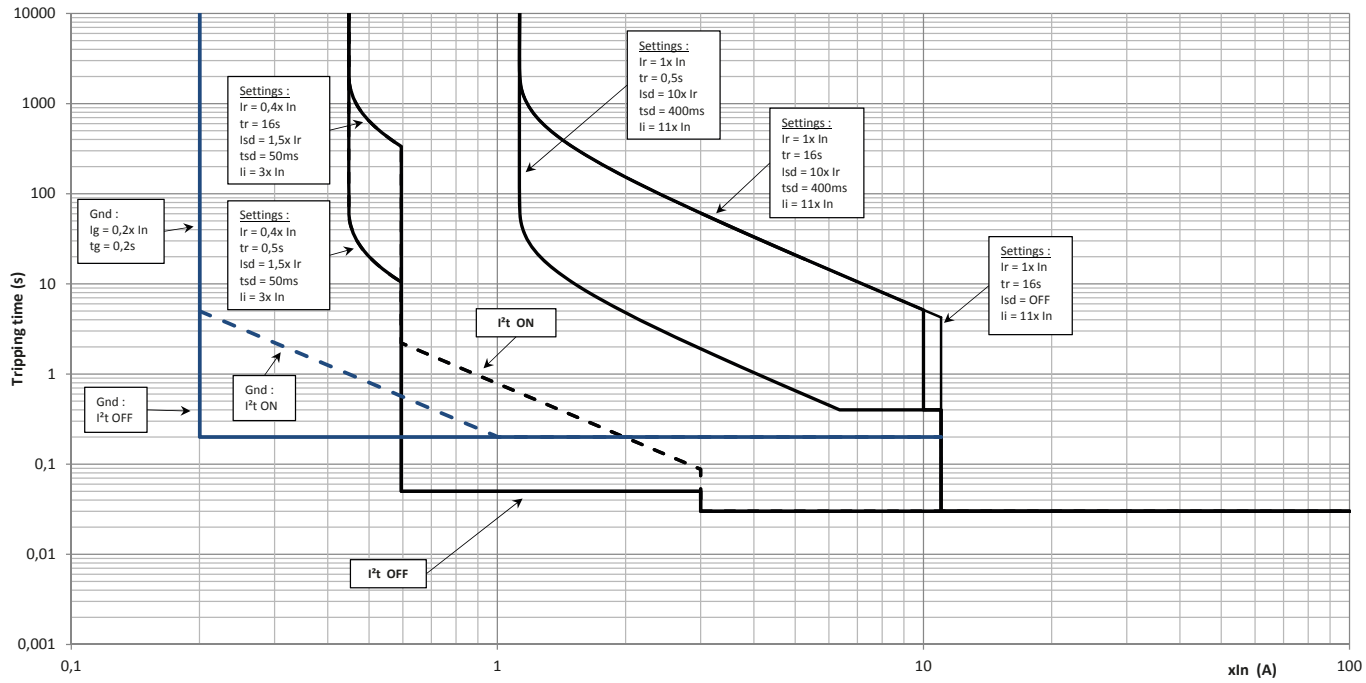


400 A



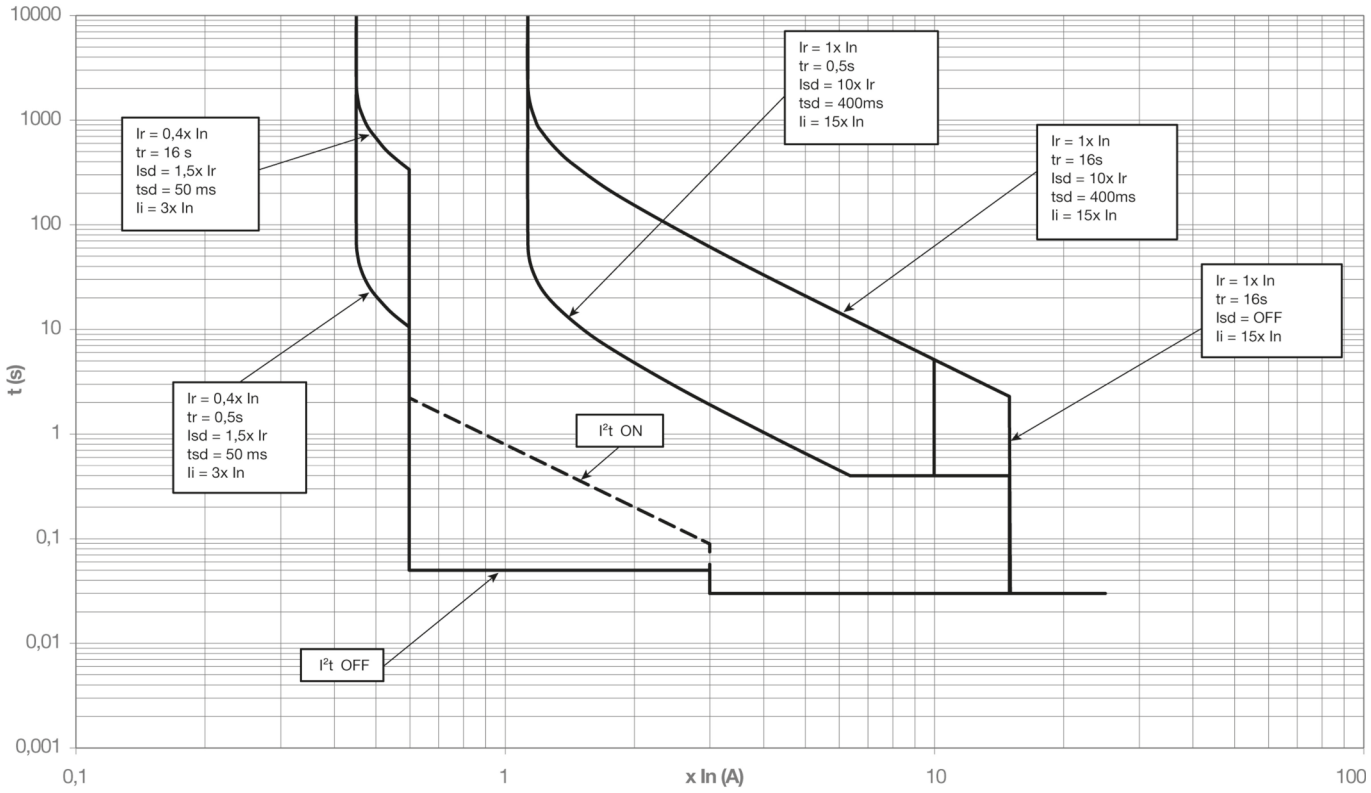
P630 LSIG

630 A

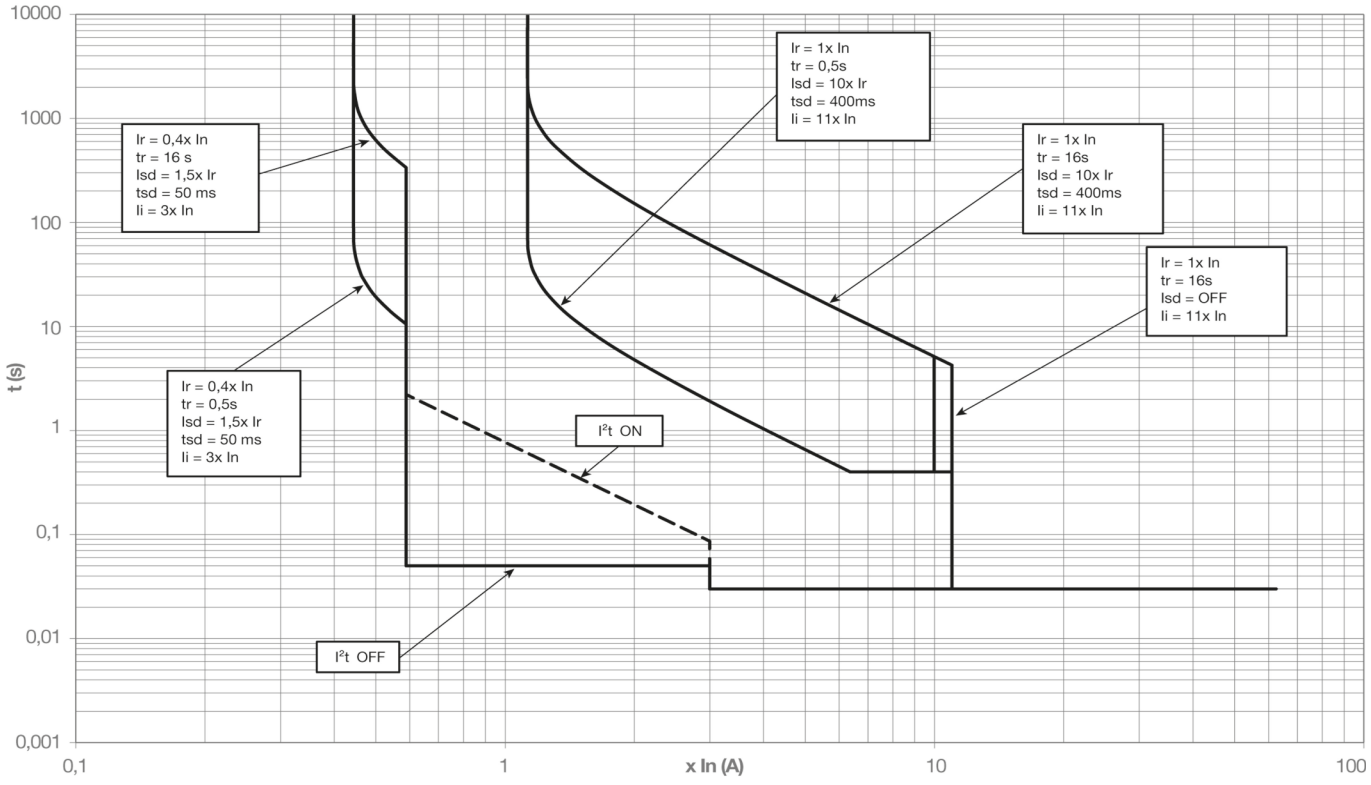


P160 Energy

40 -100 A

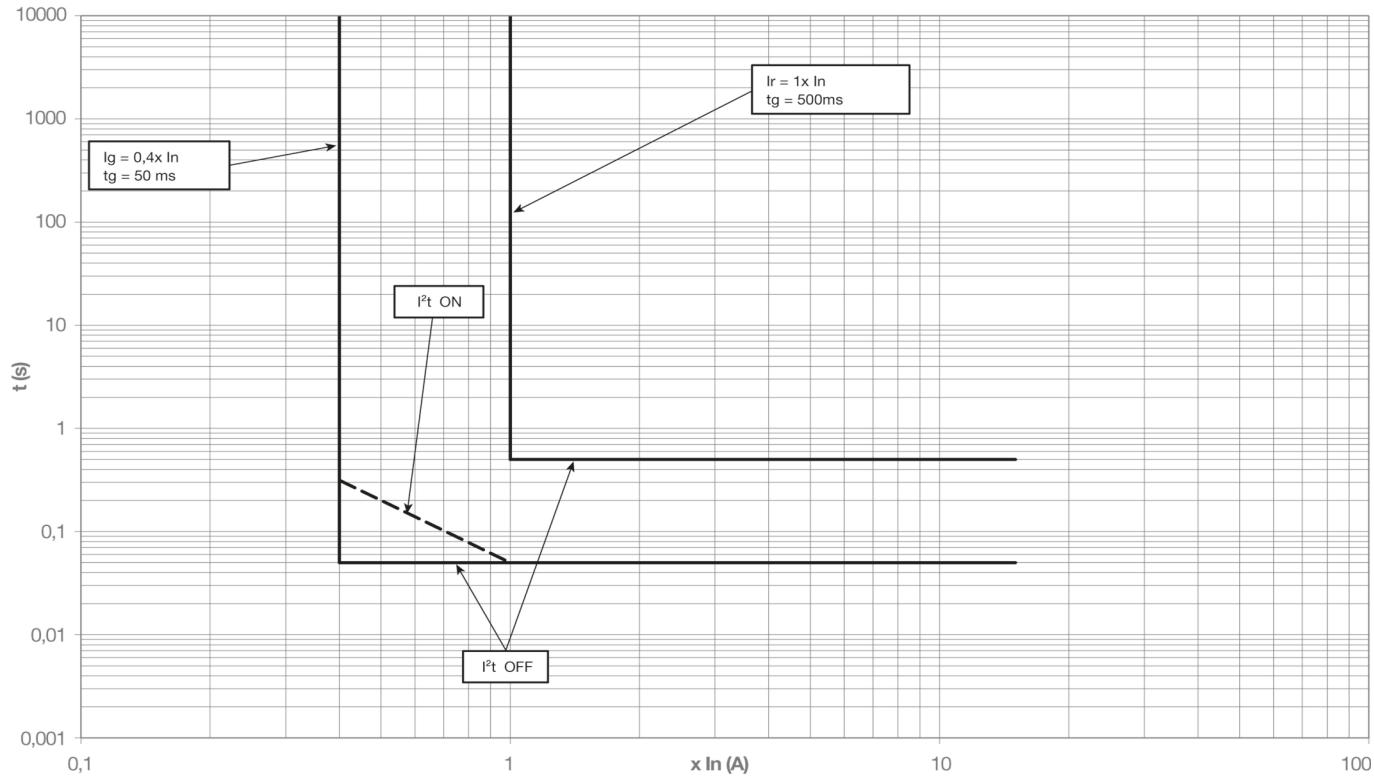


160 A

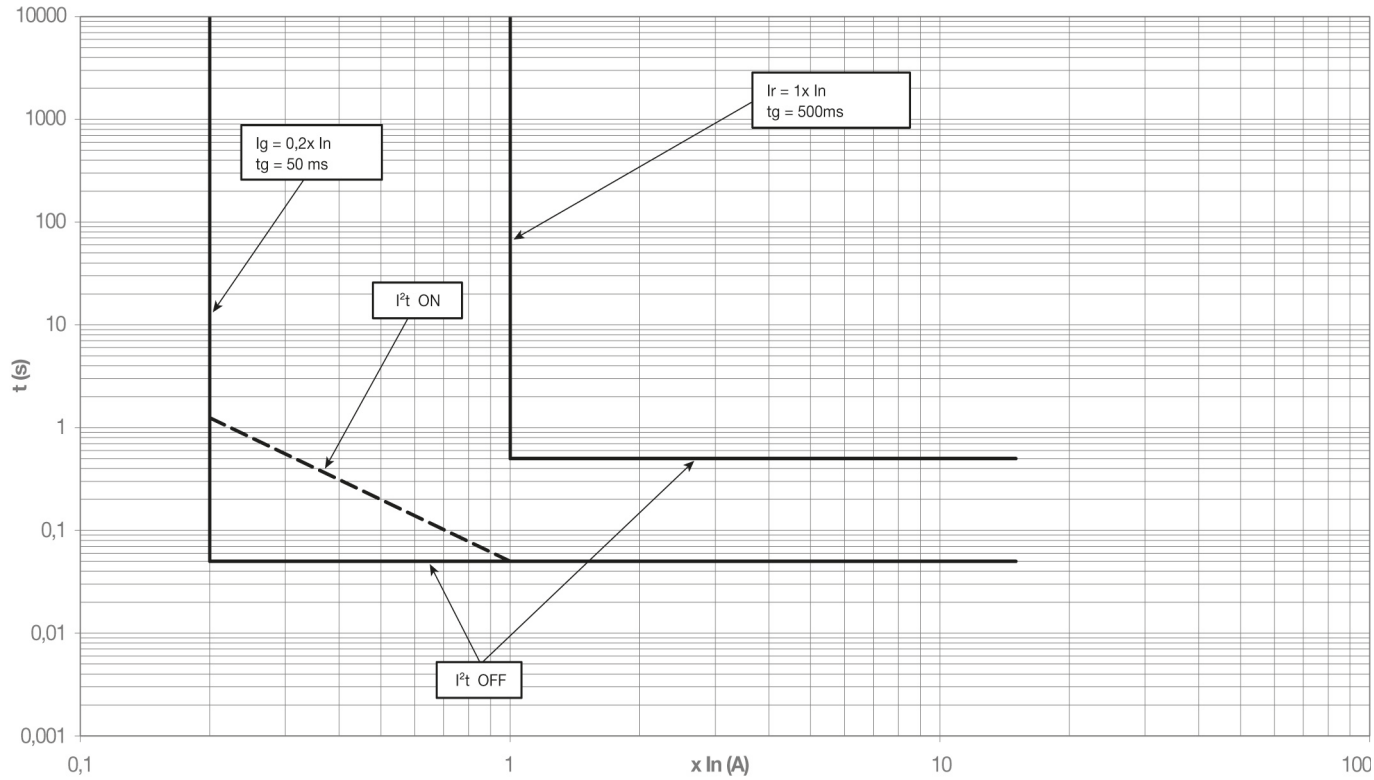


P160 Energy

40 A Ground fault protection



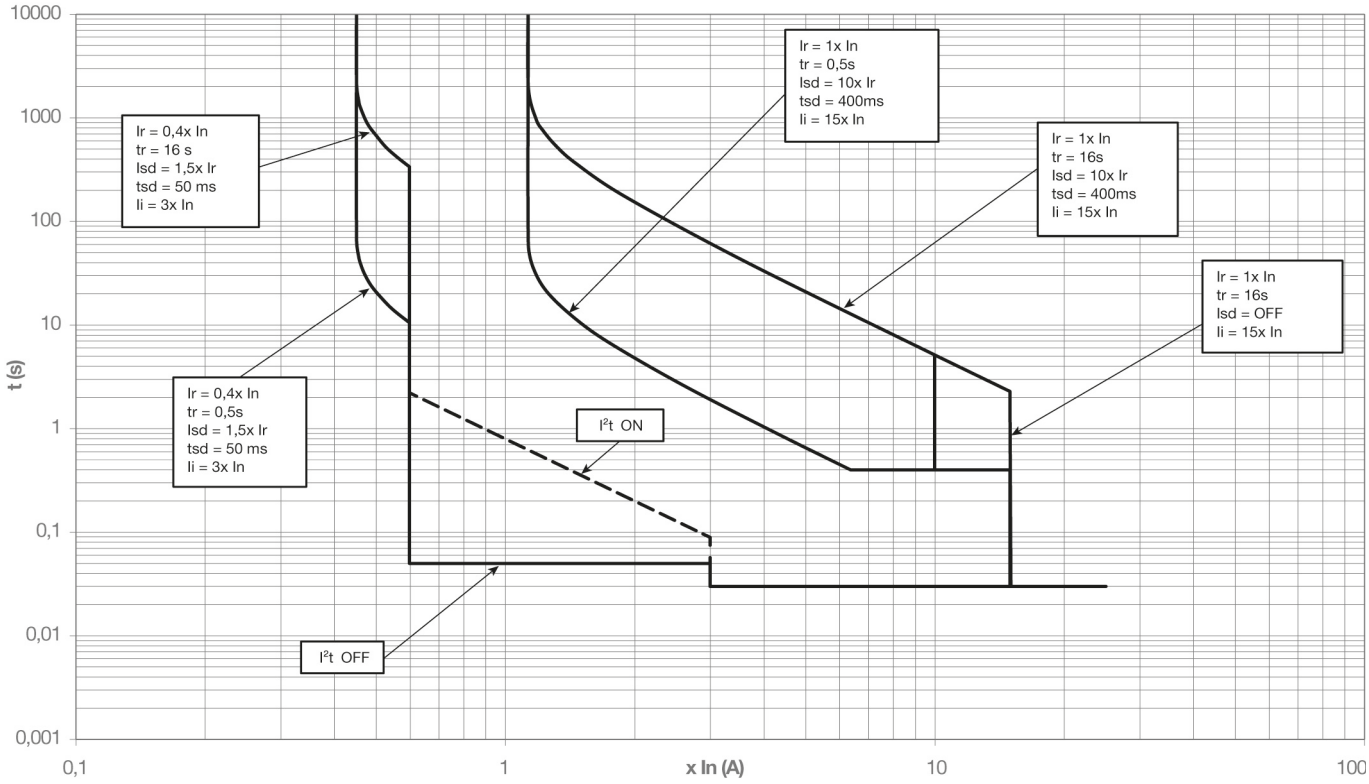
100 - 160 A Ground fault protection



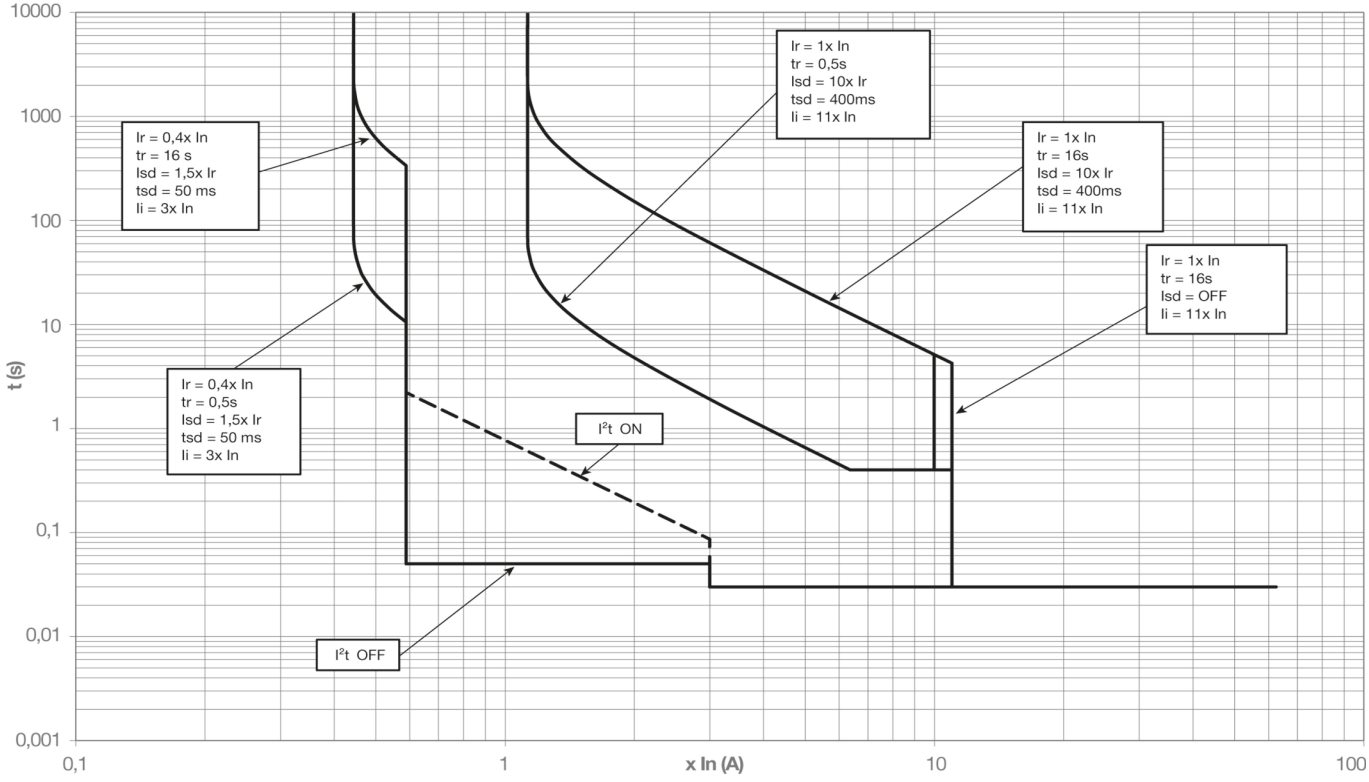
Technical changes reserved

P250 Energy

40 -100 A

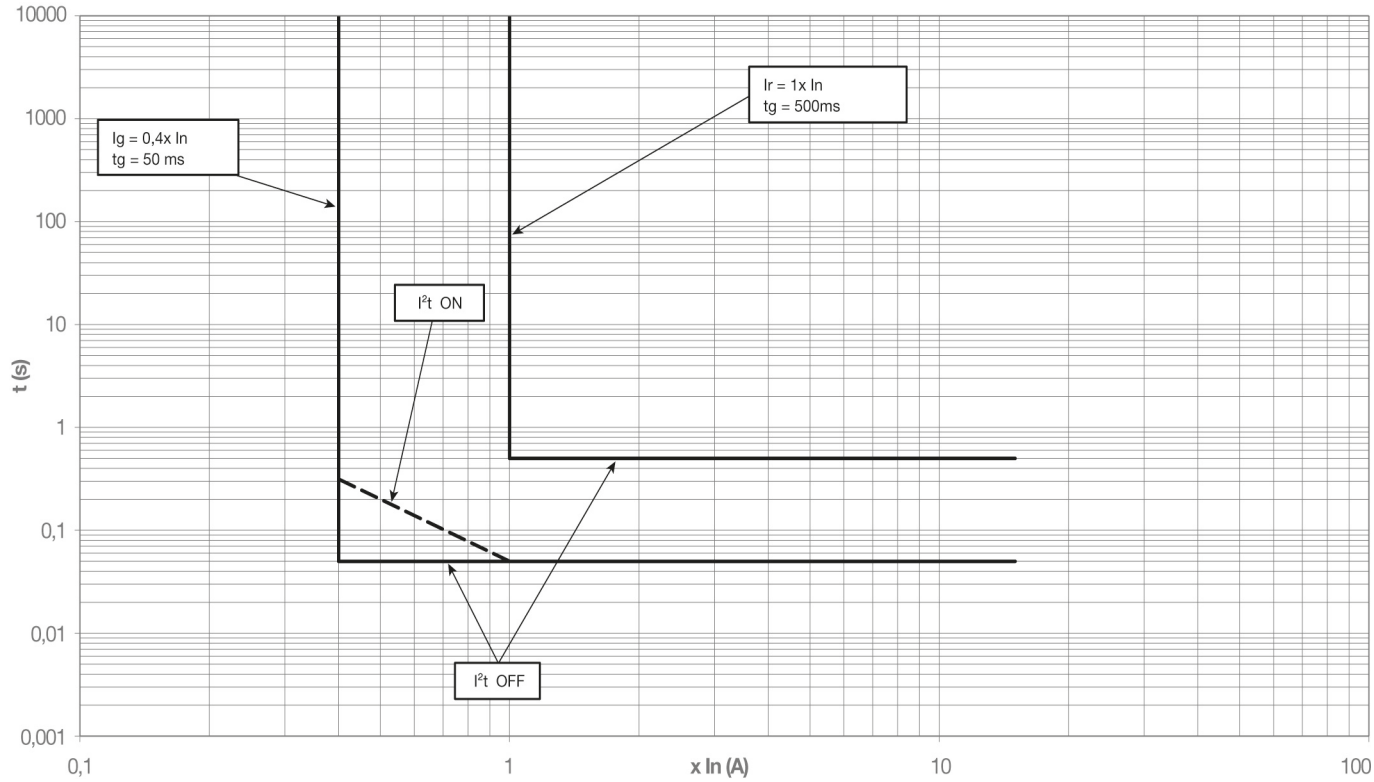


160 - 250 A

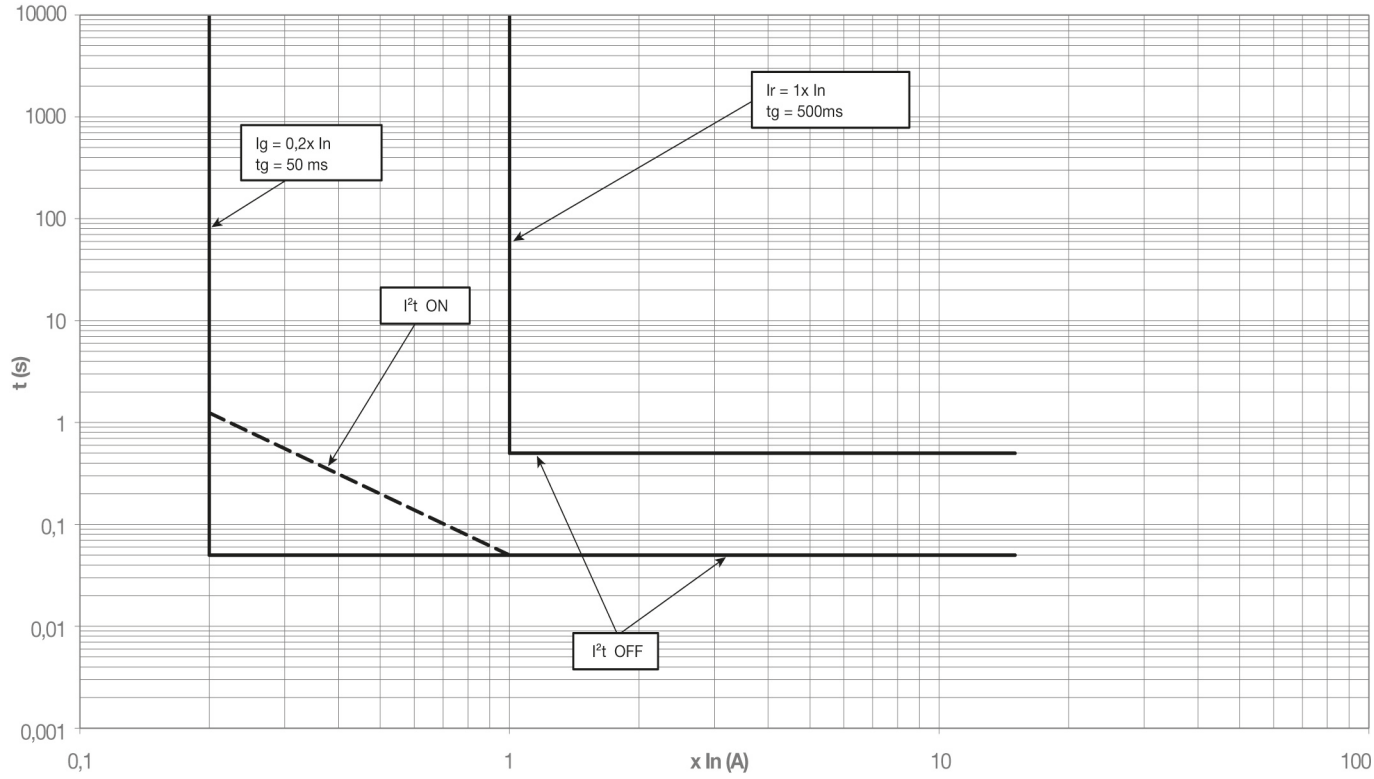


P250 Energy

40 A Ground fault protection



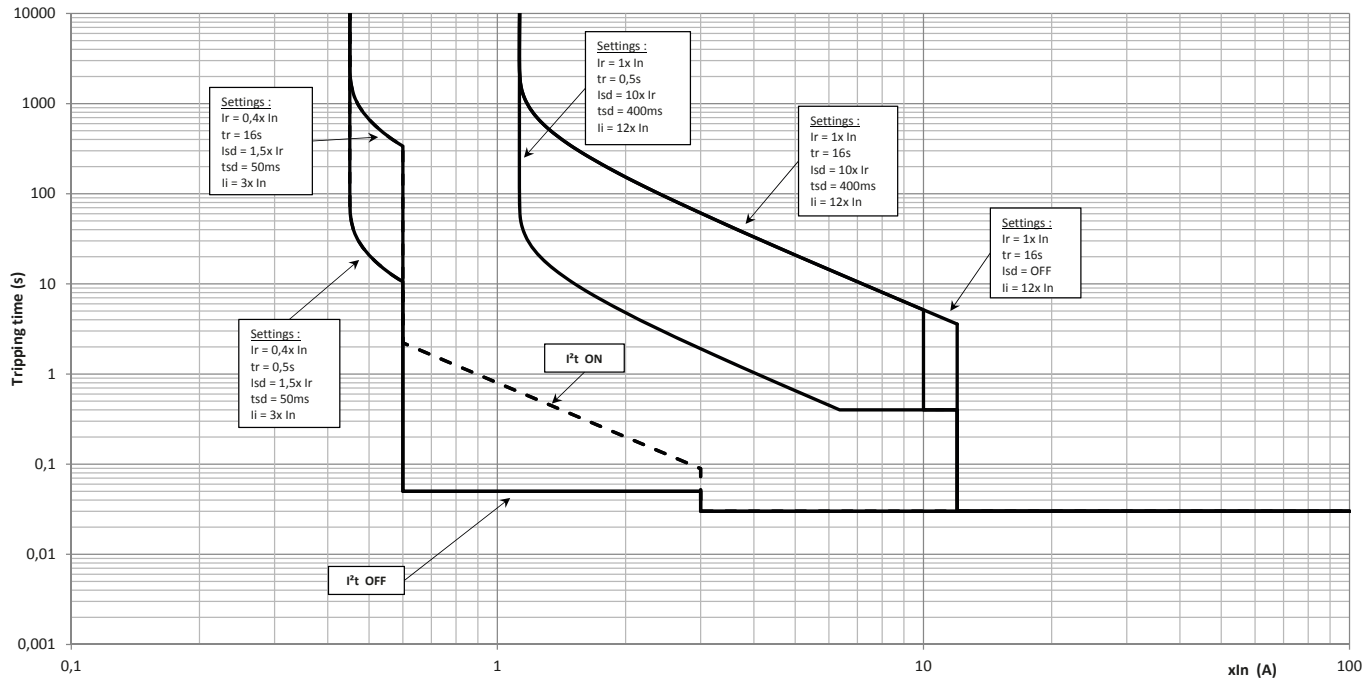
100 - 250 A Ground fault protection



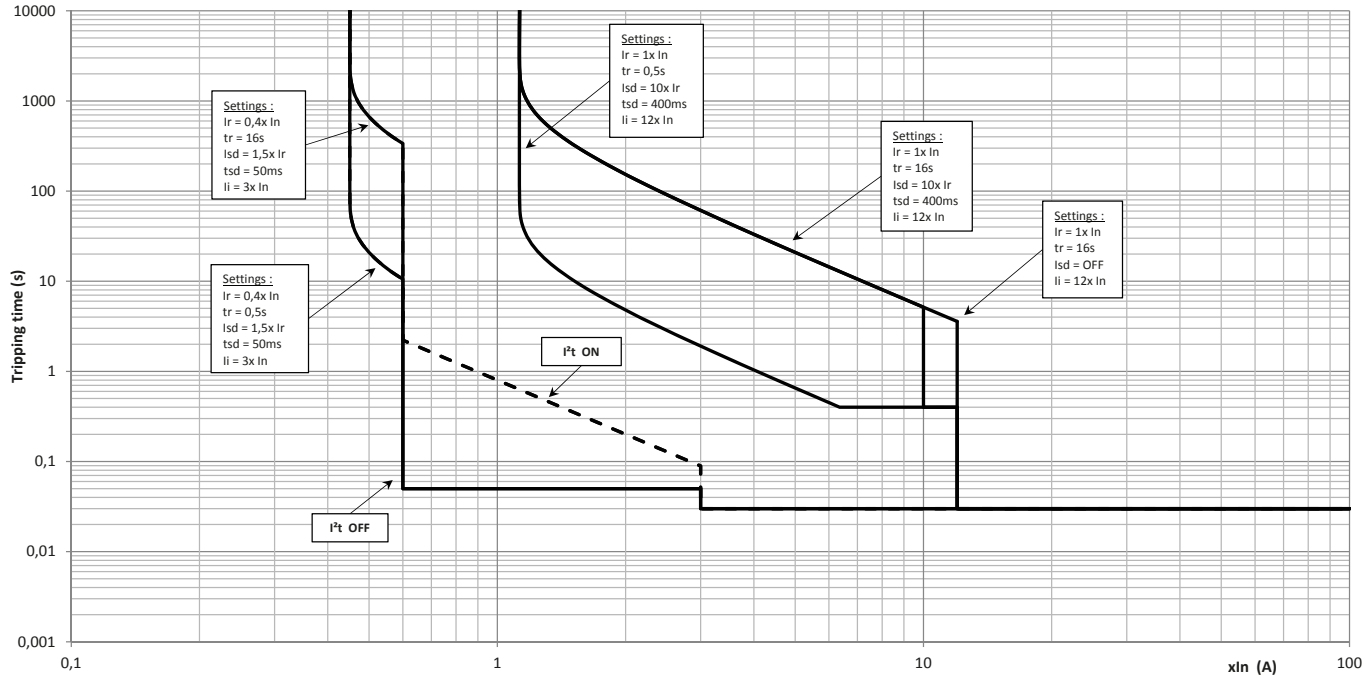
Technical changes reserved

P630 Energy

250 A

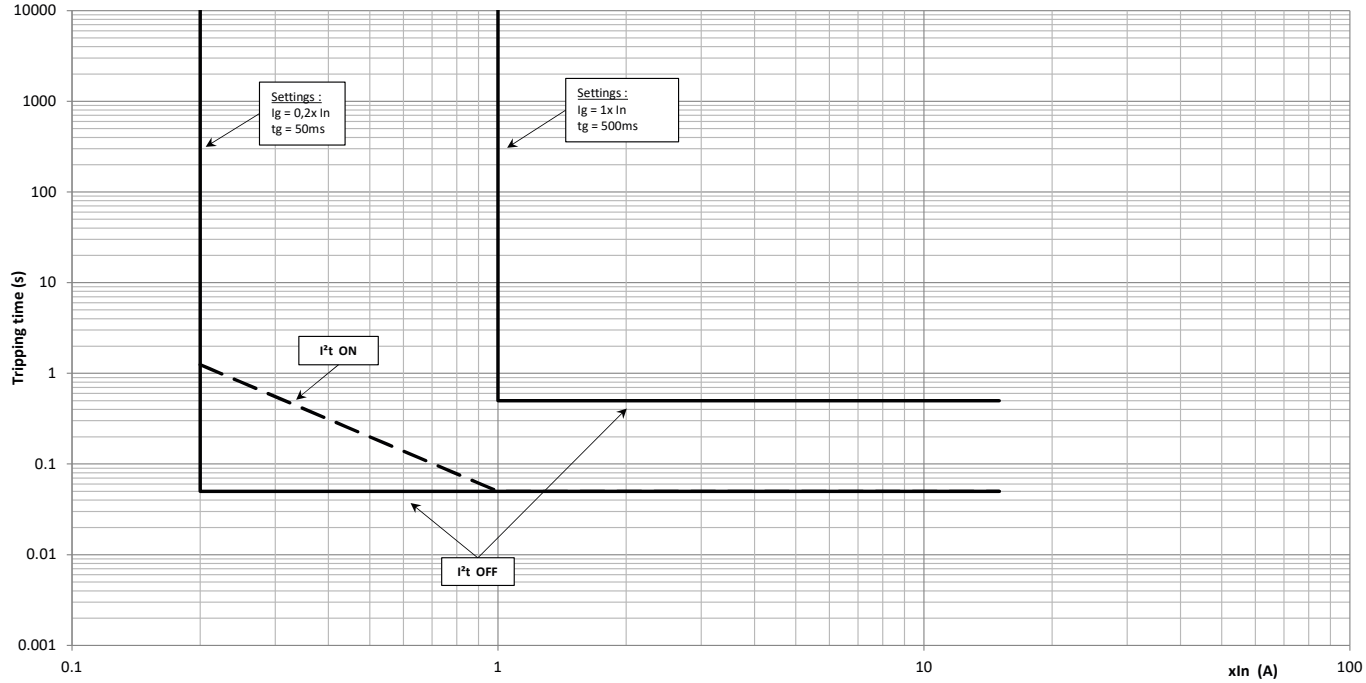


400 A

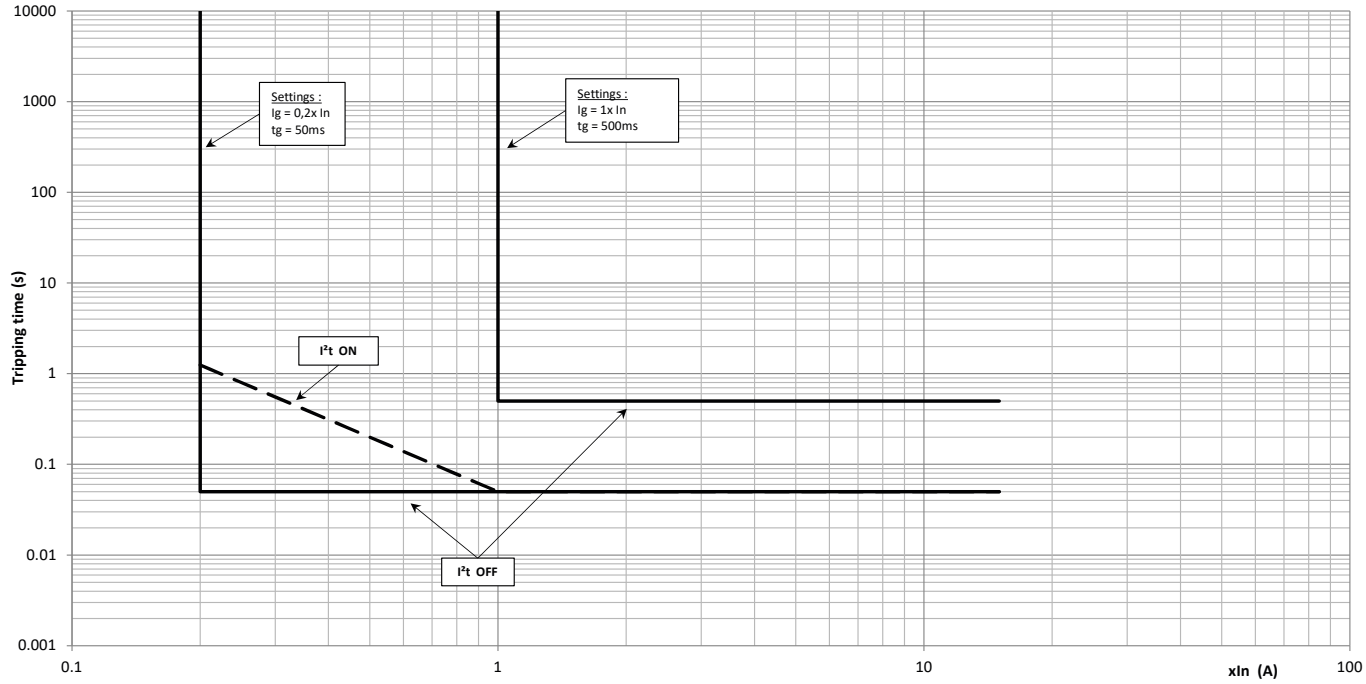


P630 Energy

250 A Ground fault protection



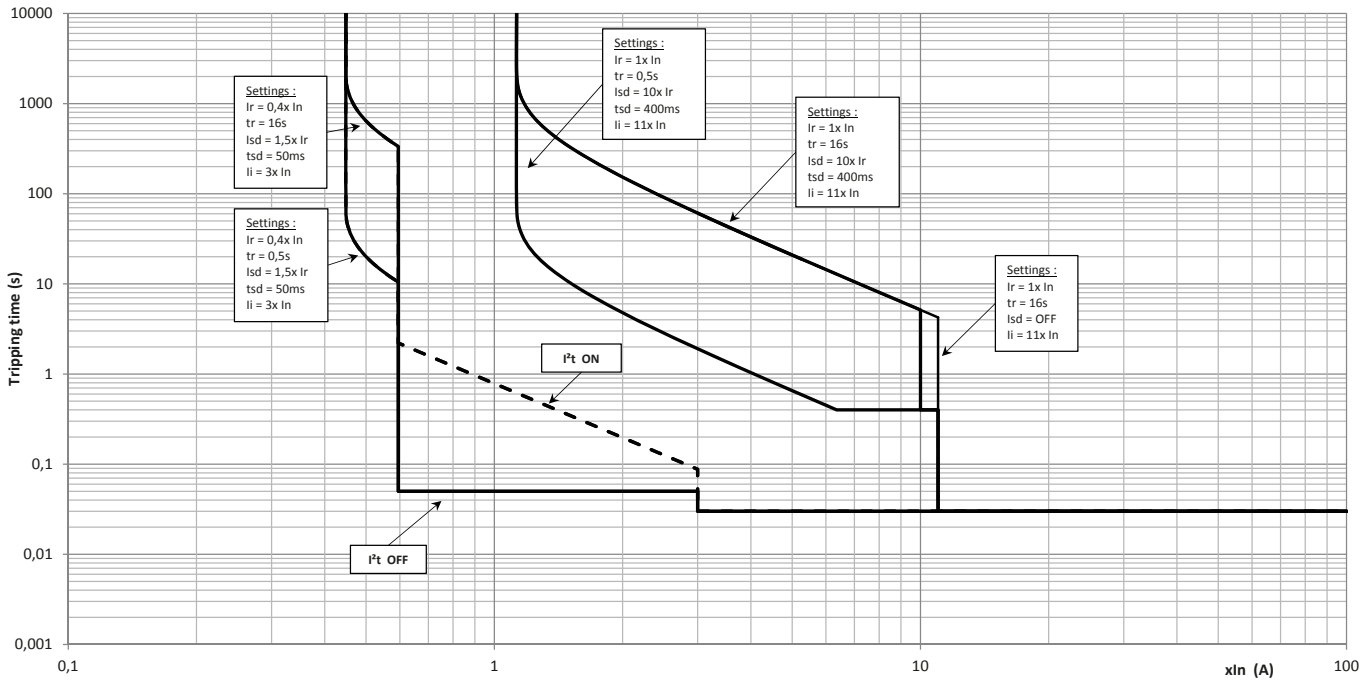
400 A Ground fault protection



Technical changes reserved

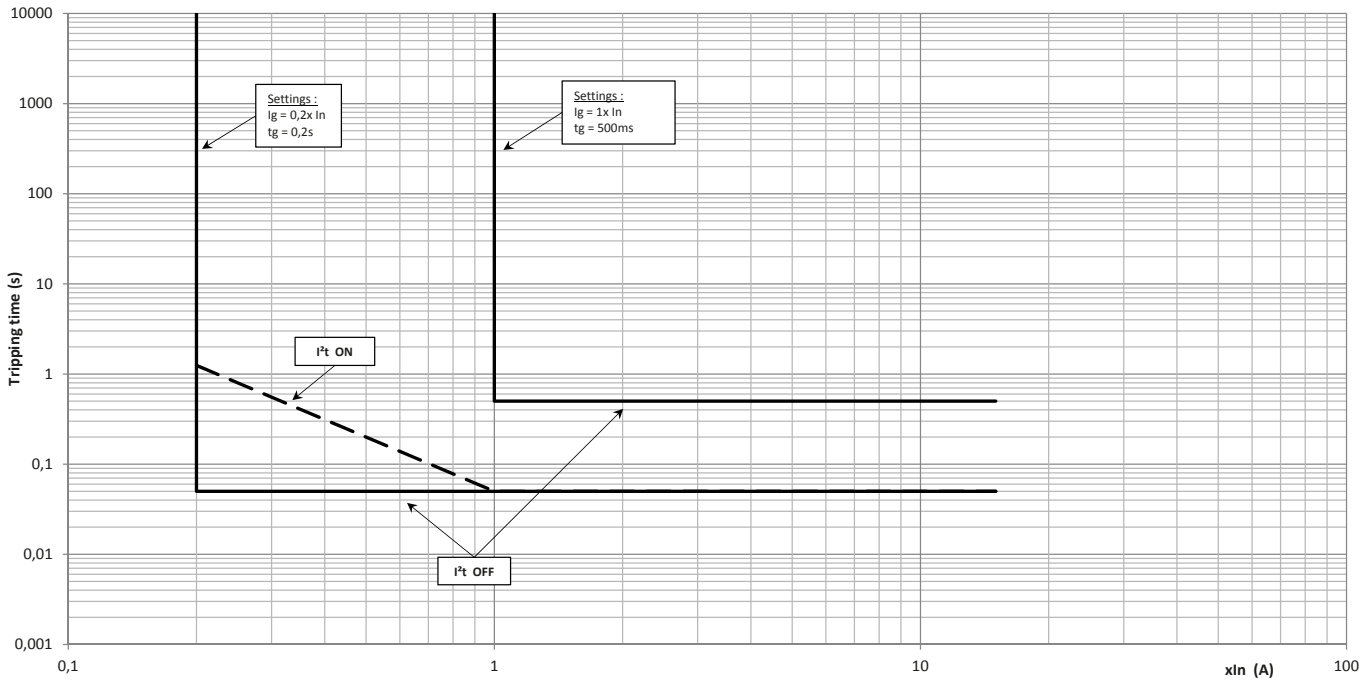
P630 Energy

630 A



P630 Energy

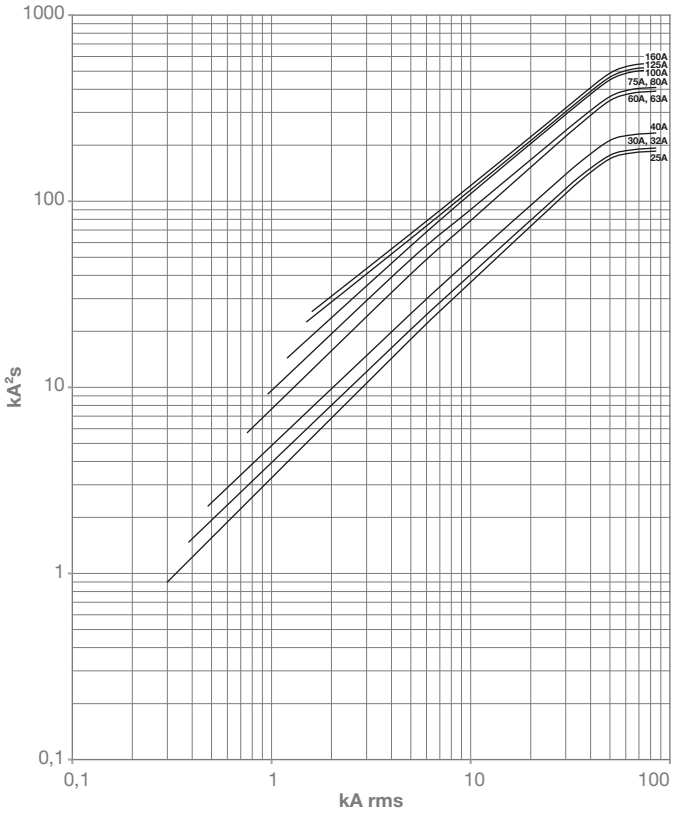
630 A Ground fault protection



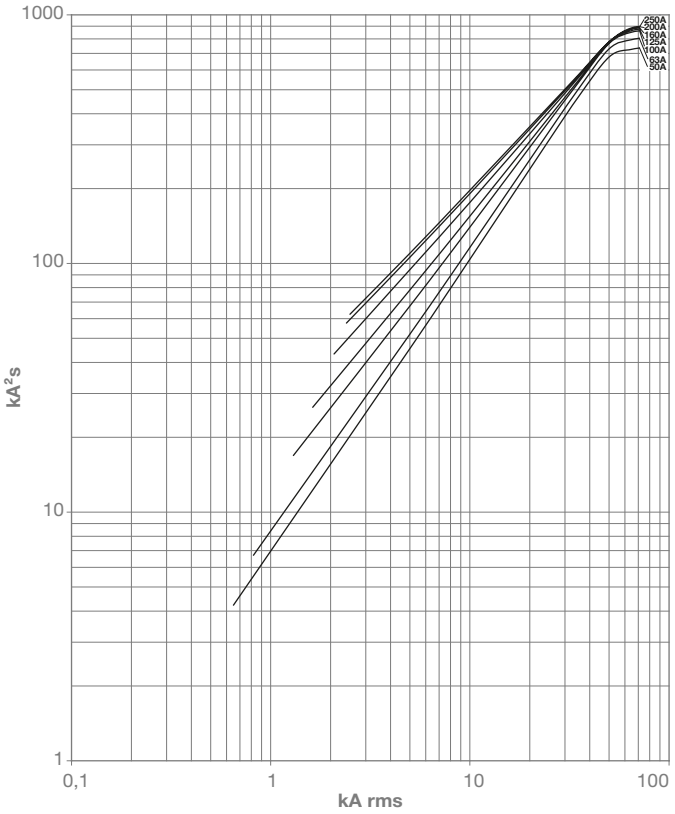
Technical changes reserved

Energy limiting characteristics 220/240 V AC

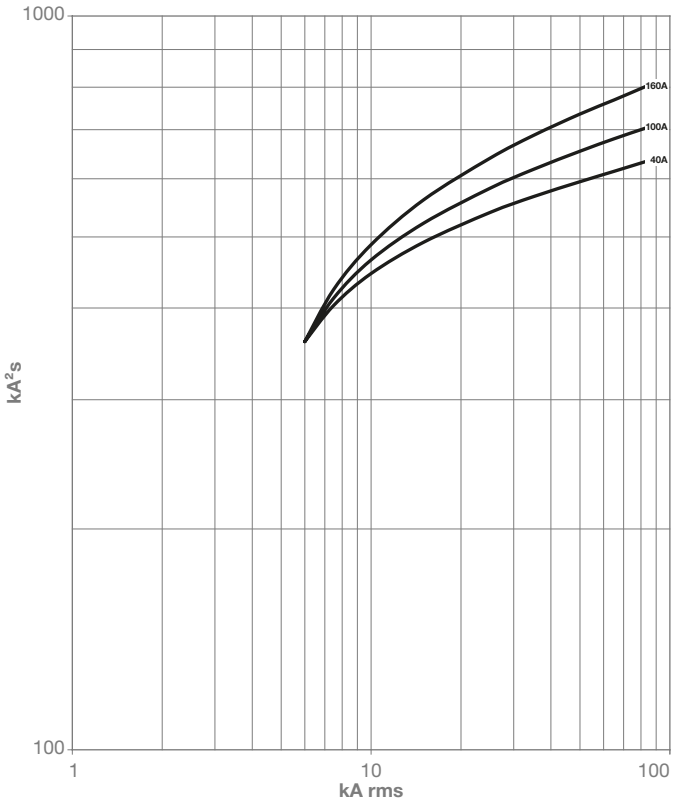
P160 TM or MAG



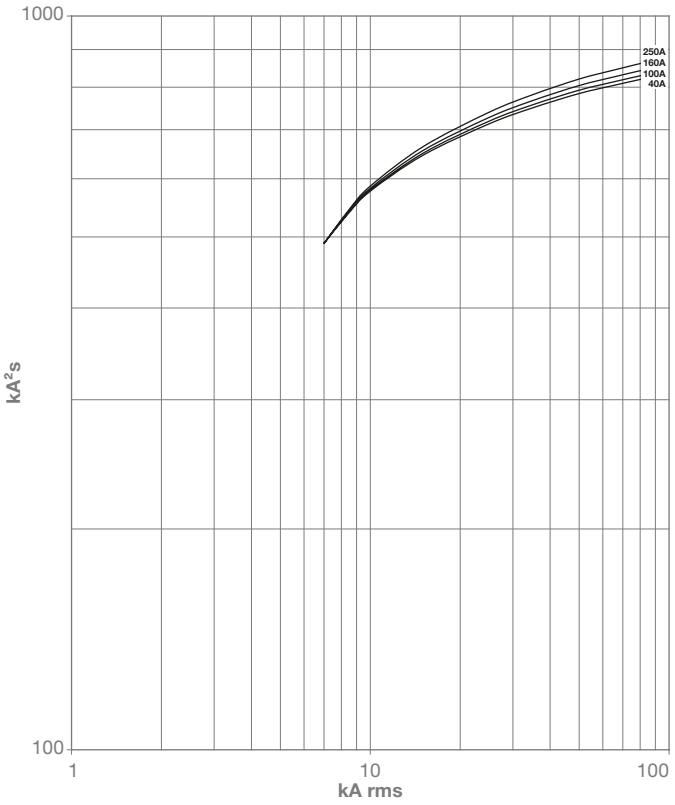
P250 TM or MAG



P160 Electronic

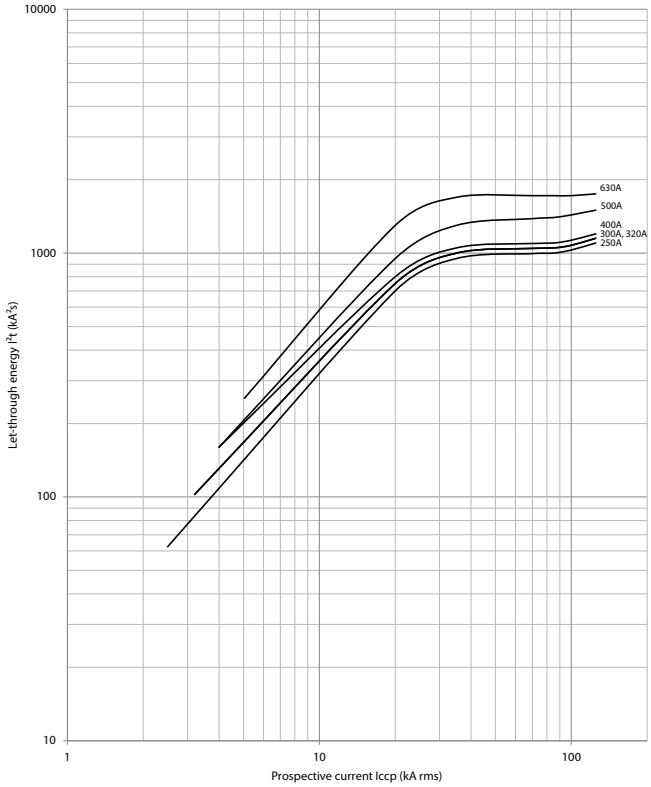


P250 Electronic

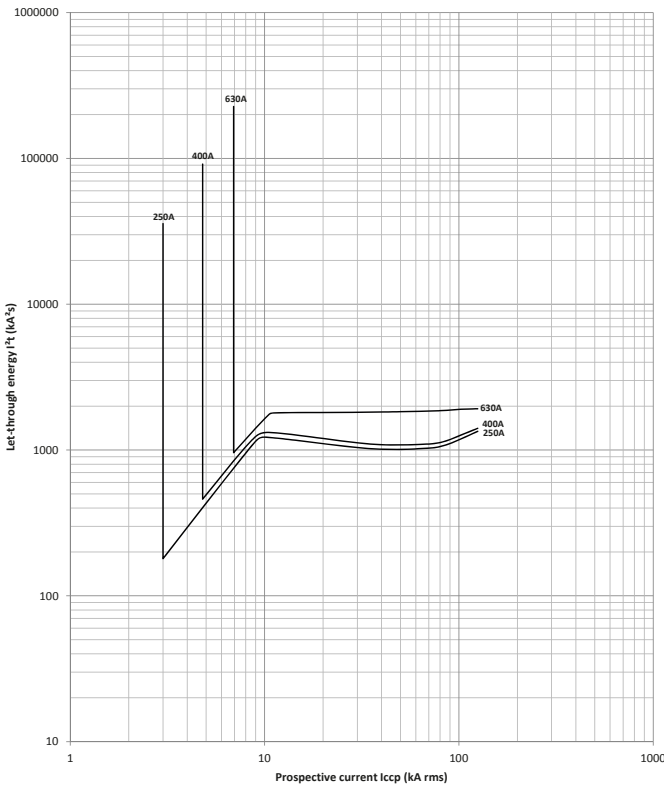


Energy limiting characteristics 220/240 V AC

P630 TM or MAG



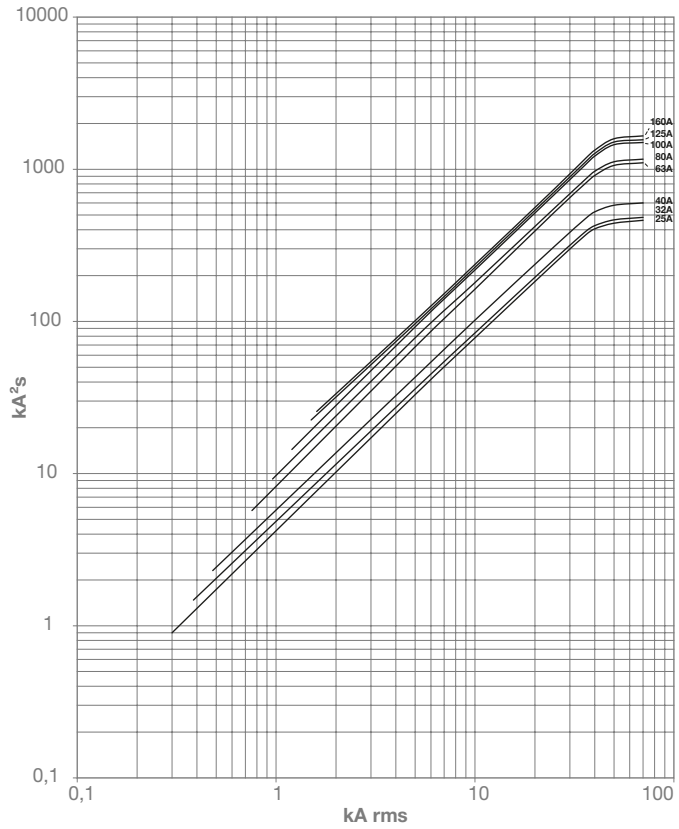
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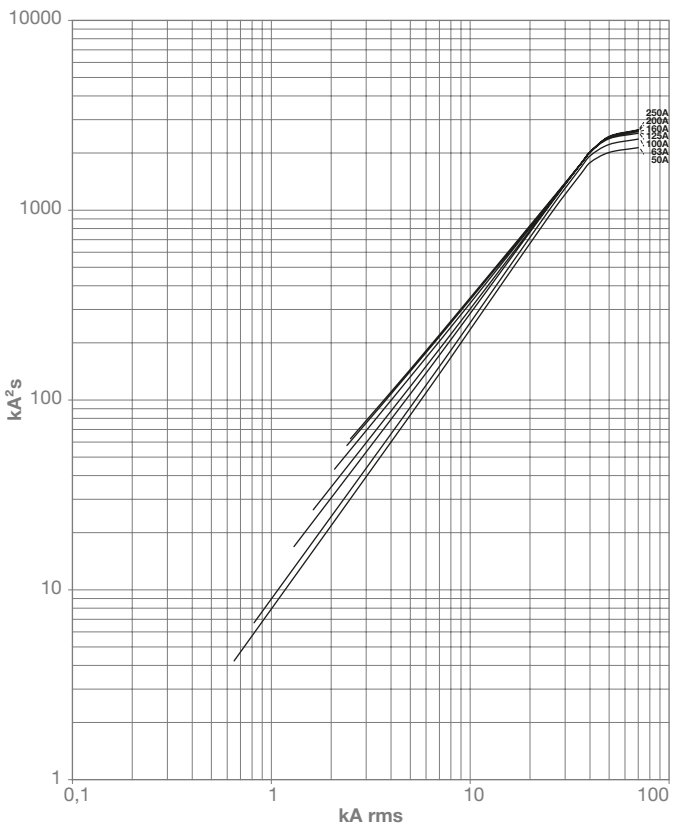
Technical changes reserved

Energy limiting characteristics 380/415 V AC

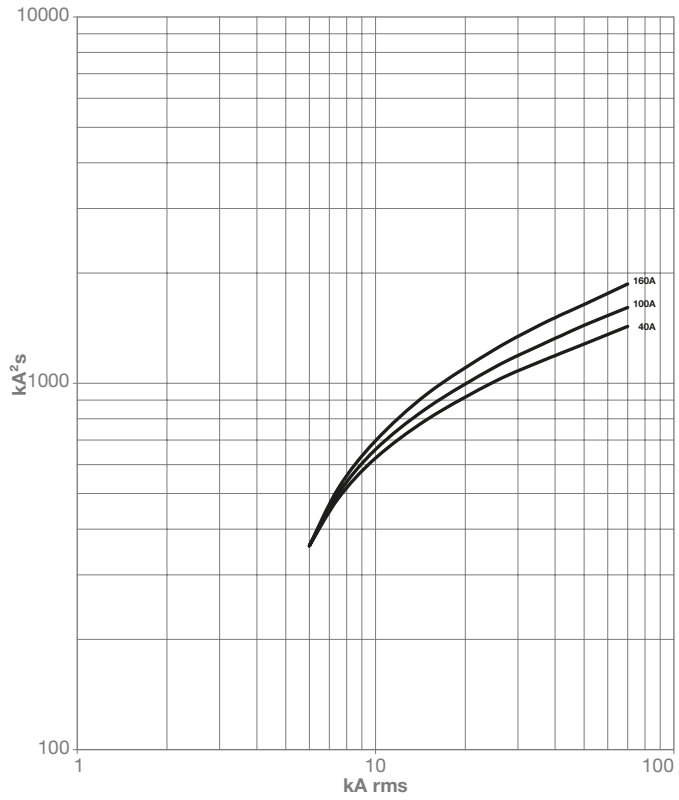
P160 TM or MAG



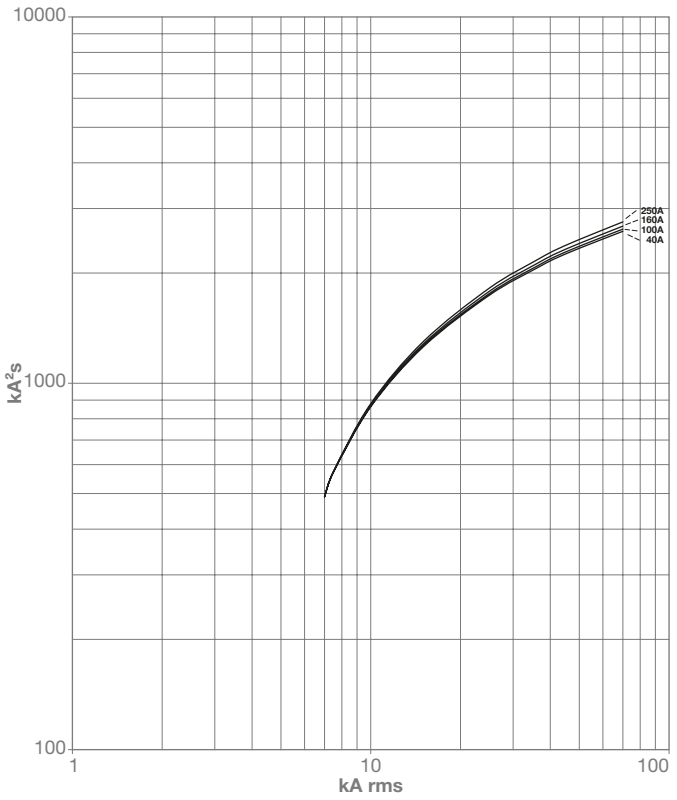
P250 TM or MAG



P160 LSnI 3P

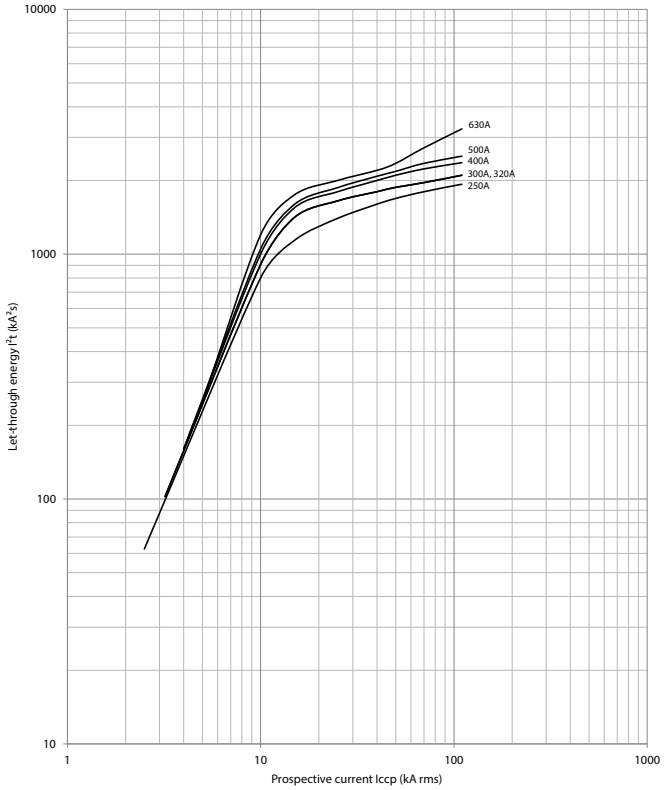


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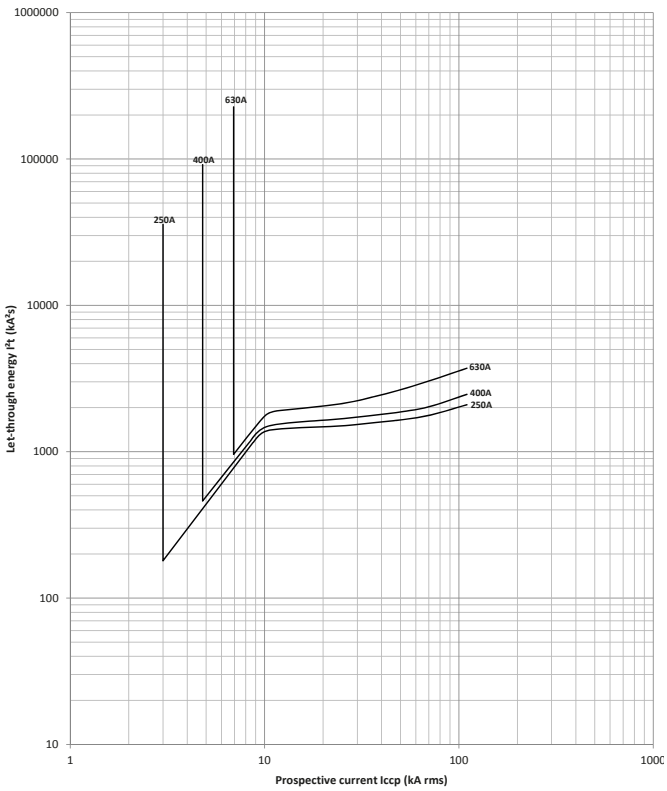


Energy limiting characteristics 380/415 V AC

P630 TM or MAG



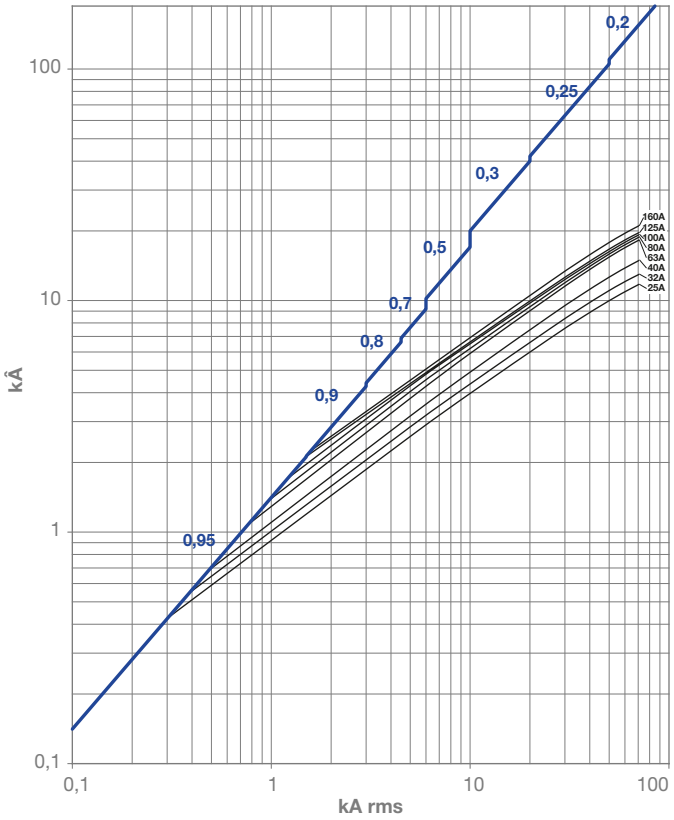
P630 Electronic



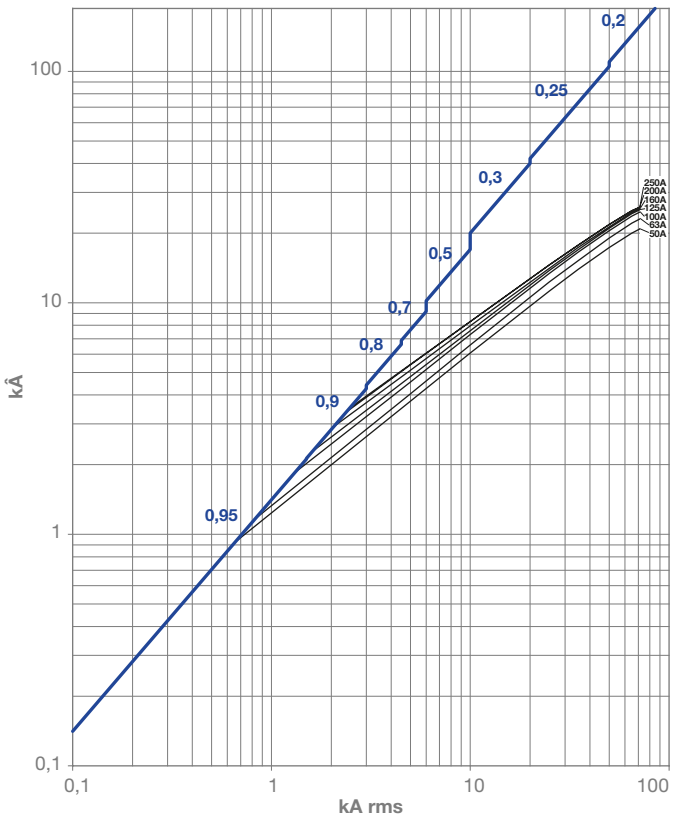
Technical changes reserved

Current limiting characteristics 220/240 V AC

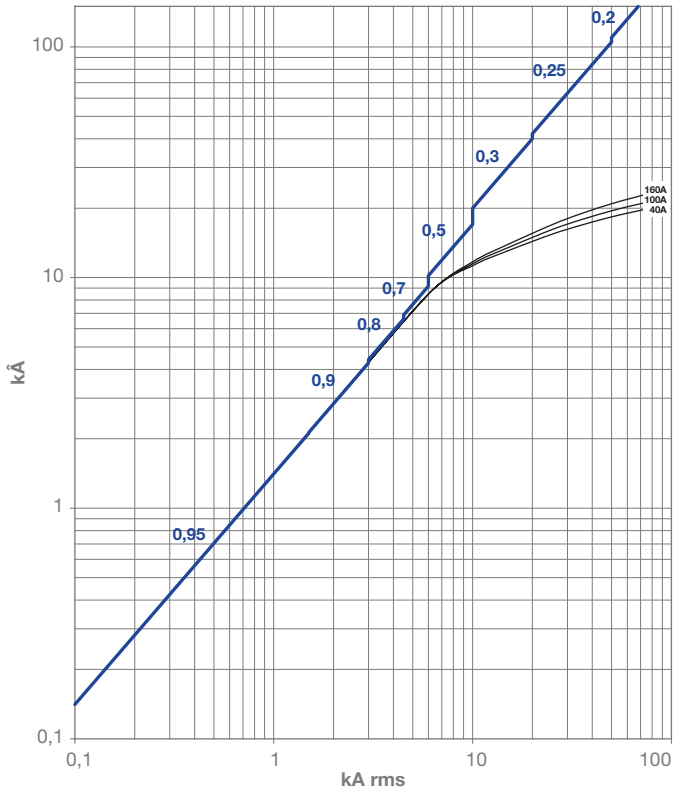
P160 TM or MAG



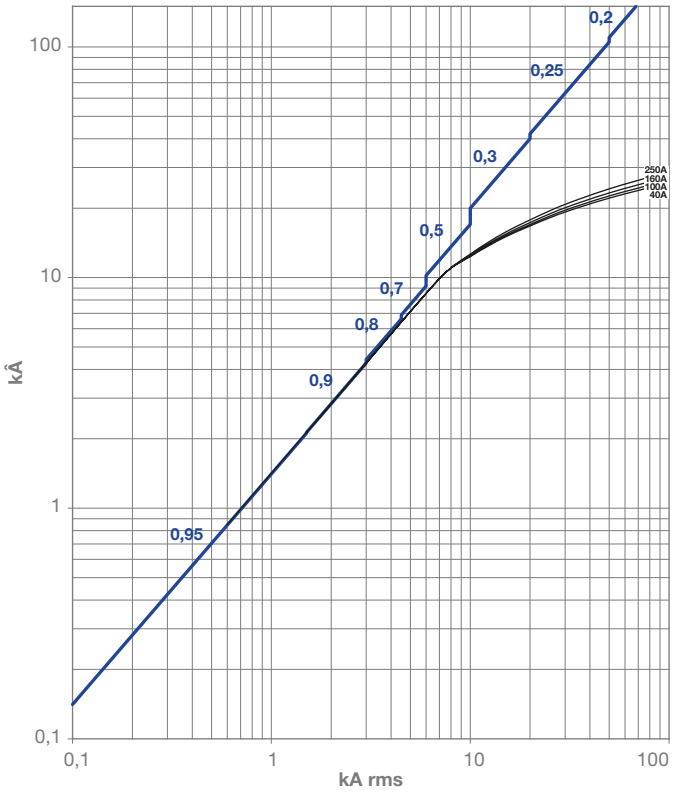
P250 TM or MAG



P160 Electronic

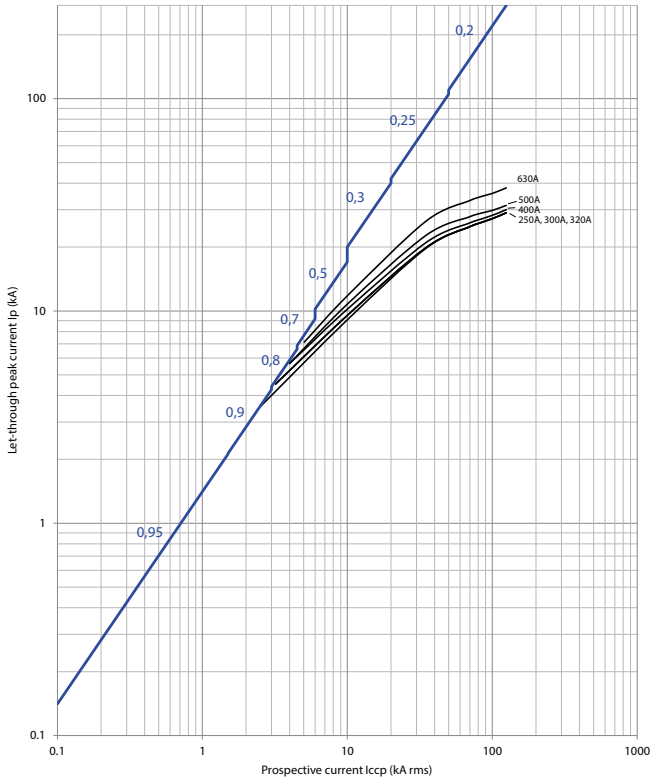


P250 Electronic

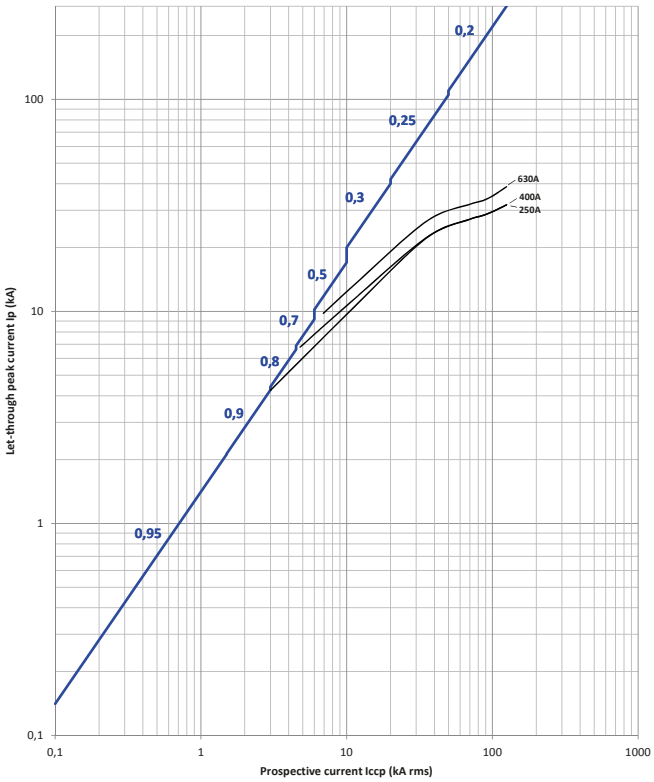


Current limiting characteristics 220/240 V AC

P630 TM or MAG



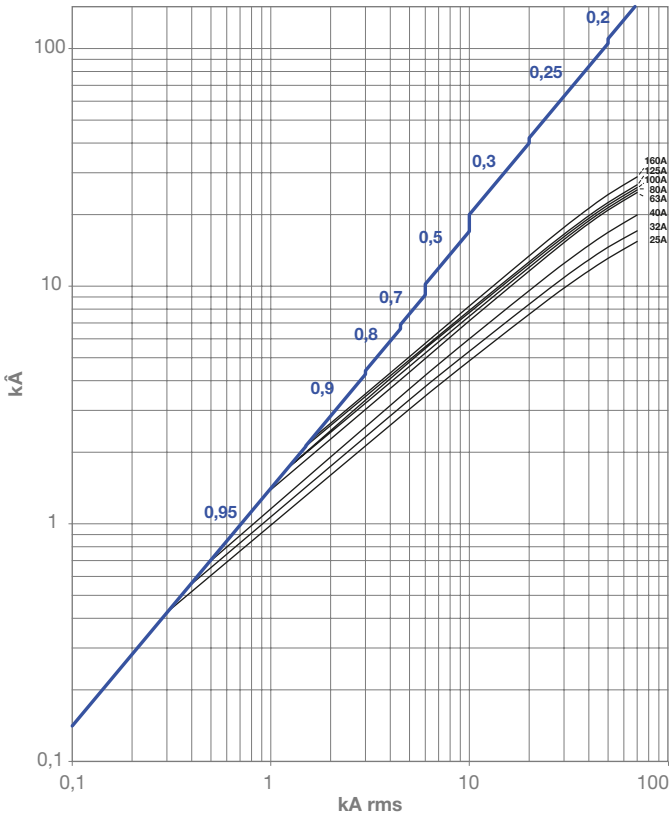
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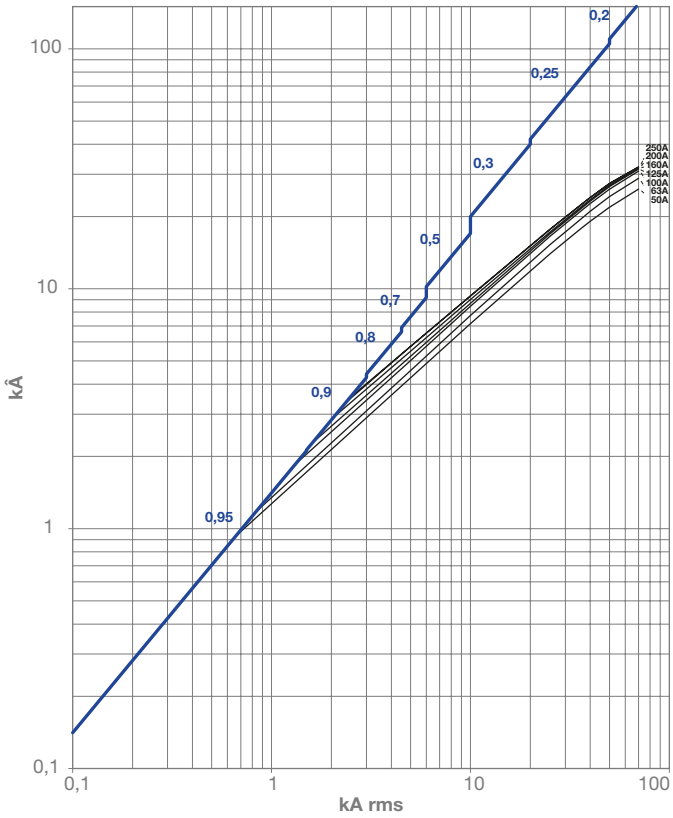
Technical changes reserved

Current limiting characteristics 380/415 V AC

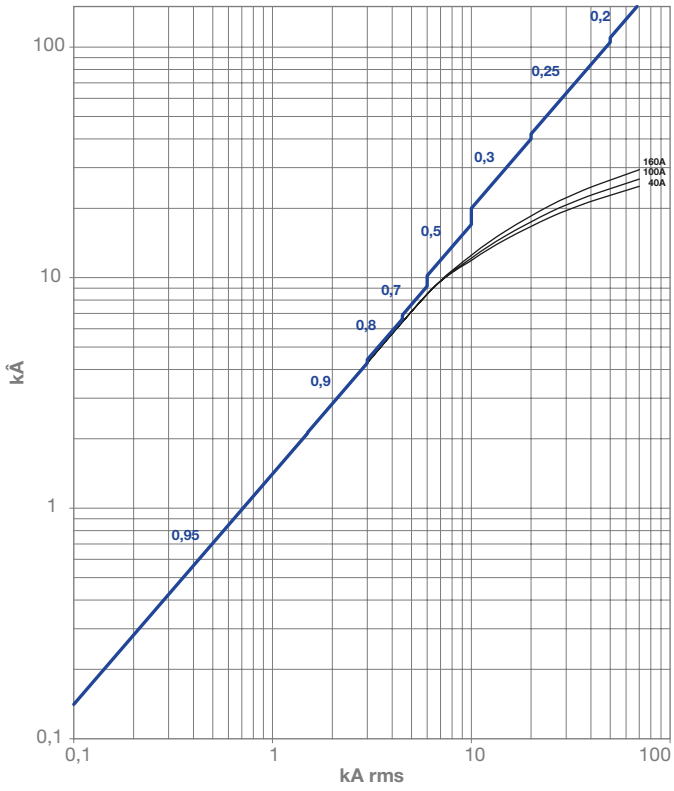
P160 TM or MAG



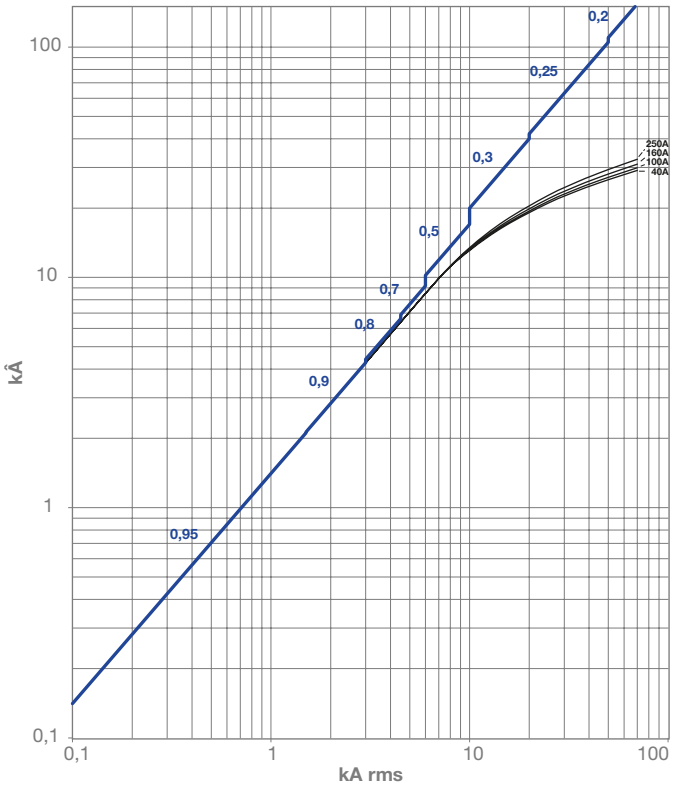
P250 TM or MAG



P160 Electronic

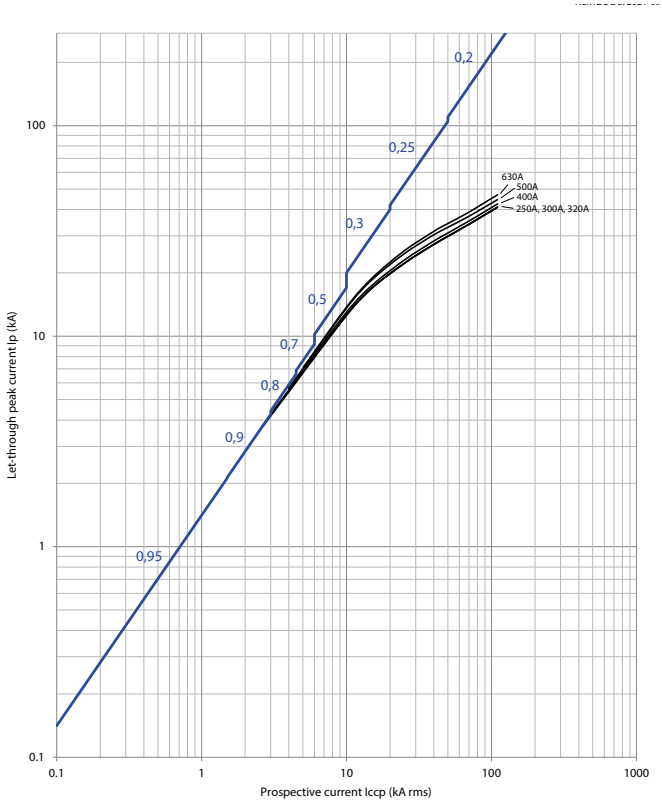


P250 Electronic

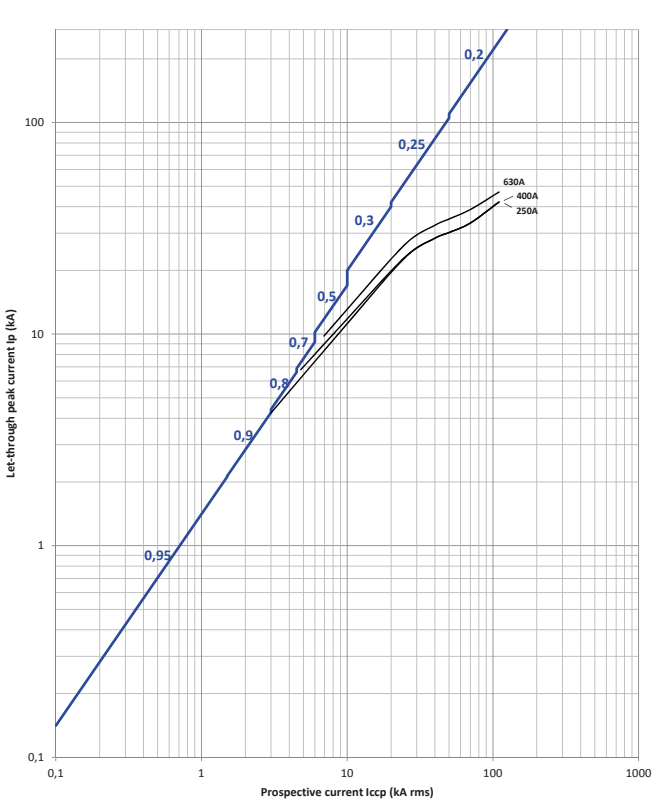


Current limiting characteristics 380/415 V AC

P630 TM or MAG

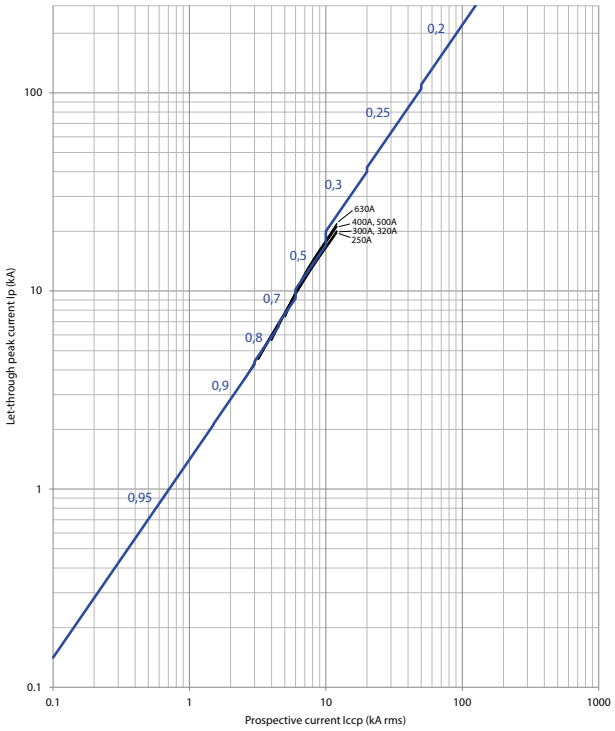


P630 Electronic

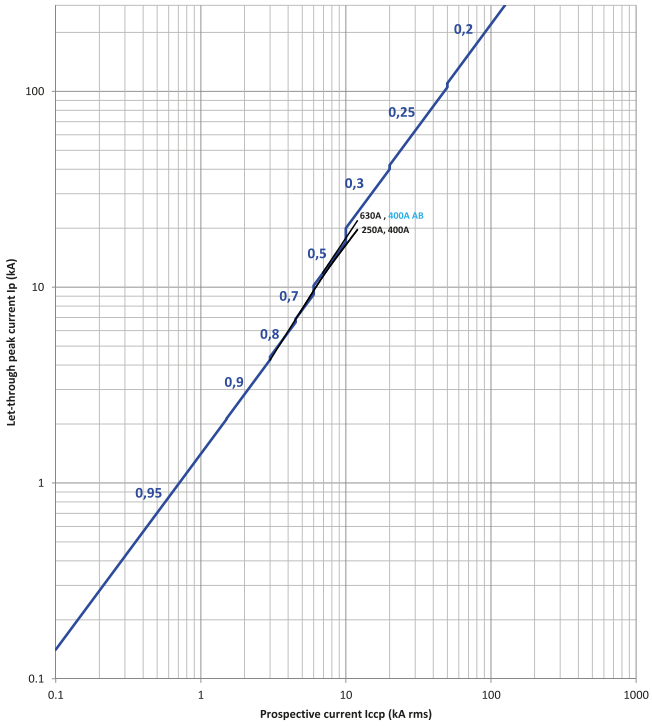


Current limiting characteristics 660/690 V AC

P630 TM or MAG



P630 Electronic



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h3+ P160 - TM adjustable with front connection


HES161DR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-100 %	4 poles N: 0-63 %	4 poles N: 0-50 %
25 kA / 25 kA	25	HHS025DR	HHS026DR		
	40	HHS040DR	HHS041DR		
	63	HHS063DR	HHS064DR		
	80	HHS080DR	HHS081DR		
	100	HHS100DR	HHS101DR	HHS102DR	
	125	HHS125DR	HHS126DR		HHS127DR
	160	HHS160DR	HHS161DR		HHS162DR
40 kA / 40 kA	25	HNS025DR	HNS026DR		
	40	HNS040DR	HNS041DR		
	63	HNS063DR	HNS064DR		
	80	HNS080DR	HNS081DR		
	100	HNS100DR	HNS101DR	HNS102DR	
	125	HNS125DR	HNS126DR		HNS127DR
	160	HNS160DR	HNS161DR		HNS162DR
50 kA / 50 kA	25	HMS025DR	HMS026DR		
	40	HMS040DR	HMS041DR		
	63	HMS063DR	HMS064DR		
	80	HMS080DR	HMS081DR		
	100	HMS100DR	HMS101DR	HMS102DR	
	125	HMS125DR	HMS126DR		HMS127DR
	160	HMS160DR	HMS161DR		HMS162DR
70 kA / 50 kA	25	HES025DR	HES026DR		
	40	HES040DR	HES041DR		
	63	HES063DR	HES064DR		
	80	HES080DR	HES081DR		
	100	HES100DR	HES101DR	HES102DR	
	125	HES125DR	HES126DR		HES127DR
	160	HES160DR	HES161DR		HES162DR

Technical changes reserved

h3+ P160 - TM fixed with cable terminals


HDS123EC

Icu / Ics 400 - 415 V~	In (A)	1 poles
18 kA / 18 kA	16	HDS014EC
	20	HDS018EC
	25	HDS023EC
	32	HDS030EC
	40	HDS038EC
	50	HDS048EC
	63	HDS061EC
	80	HDS078EC
	100	HDS098EC
	125	HDS123EC
25 kA / 20 kA	16	HHS014EC
	20	HHS018EC
	25	HHS023EC
	32	HHS030EC
	40	HHS038EC
	50	HHS048EC
	63	HHS061EC
	80	HHS078EC
	100	HHS098EC
	125	HHS123EC

h3+ P160 - TM adjustable with cable terminals


HES161DC

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-100 %	4 poles N: 0-63 %	4 poles N: 0-50 %
25 kA / 25 kA	25	HHS025DC	HHS026DC		
	40	HHS040DC	HHS041DC		
	63	HHS063DC	HHS064DC		
	80	HHS080DC	HHS081DC		
	100	HHS100DC	HHS101DC	HHS102DC	
	125	HHS125DC	HHS126DC		HHS127DC
	160	HHS160DC	HHS161DC		HHS162DC
40 kA / 40 kA	25	HNS025DC	HNS026DC		
	40	HNS040DC	HNS041DC		
	63	HNS063DC	HNS064DC		
	80	HNS080DC	HNS081DC		
	100	HNS100DC	HNS101DC	HNS102DC	
	125	HNS125DC	HNS126DC		HNS127DC
	160	HNS160DC	HNS161DC		HNS162DC
50 kA / 50 kA	25	HMS025DC	HMS026DC		
	40	HMS040DC	HMS041DC		
	63	HMS063DC	HMS064DC		
	80	HMS080DC	HMS081DC		
	100	HMS100DC	HMS101DC	HMS102DC	
	125	HMS125DC	HMS126DC		HMS127DC
	160	HMS160DC	HMS161DC		HMS162DC
70 kA / 50 kA	25	HES025DC	HES026DC		
	40	HES040DC	HES041DC		
	63	HES063DC	HES064DC		
	80	HES080DC	HES081DC		
	100	HES100DC	HES101DC	HES102DC	
	125	HES125DC	HES126DC		HES127DC
	160	HES160DC	HES161DC		HES162DC

Technical changes reserved

h3+ P160 - MAG with front connection


HES161BR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles
25 kA / 25 kA	25	HHS025BR	HHS026BR
	40	HHS040BR	HHS041BR
	50	HHS050BR	HHS051BR
	63	HHS063BR	HHS064BR
	80	HHS080BR	HHS081BR
	100	HHS100BR	HHS101BR
	125	HHS125BR	HHS126BR
	160	HHS160BR	HHS161BR
40 kA /40 kA	25	HNS025BR	HNS026BR
	40	HNS040BR	HNS041BR
	50	HNS050BR	HNS051BR
	63	HNS063BR	HNS064BR
	80	HNS080BR	HNS081BR
	100	HNS100BR	HNS101BR
	125	HNS125BR	HNS126BR
	160	HNS160BR	HNS161BR
50 kA / 50 kA	25	HMS025BR	HMS026BR
	40	HMS040BR	HMS041BR
	50	HMS050BR	HMS051BR
	63	HMS063BR	HMS064BR
	80	HMS080BR	HMS081BR
	100	HMS100BR	HMS101BR
	125	HMS125BR	HMS126BR
	160	HMS160BR	HMS161BR
70 kA / 50 kA	25	HES025BR	HES026BR
	40	HES040BR	HES041BR
	50	HES050BR	HES051BR
	63	HES063BR	HES064BR
	80	HES080BR	HES081BR
	100	HES100BR	HES101BR
	125	HES125BR	HES126BR
	160	HES160BR	HES161BR

h3+ P160 - MAG with cable terminals


HES161BC

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles
25 kA / 25 kA	25	HHS025BC	HHS026BC
	40	HHS040BC	HHS041BC
	50	HHS050BC	HHS051BC
	63	HHS063BC	HHS064BC
	80	HHS080BC	HHS081BC
	100	HHS100BC	HHS101BC
	125	HHS125BC	HHS126BC
	160	HHS160BC	HHS161BC
40 kA / 40 kA	25	HNS025BC	HNS026BC
	40	HNS040BC	HNS041BC
	50	HNS050BC	HNS051BC
	63	HNS063BC	HNS064BC
	80	HNS080BC	HNS081BC
	100	HNS100BC	HNS101BC
	125	HNS125BC	HNS126BC
	160	HNS160BC	HNS161BC
50 kA / 50 kA	25	HMS025BC	HMS026BC
	40	HMS040BC	HMS041BC
	50	HMS050BC	HMS051BC
	63	HMS063BC	HMS064BC
	80	HMS080BC	HMS081BC
	100	HMS100BC	HMS101BC
	125	HMS125BC	HMS126BC
	160	HMS160BC	HMS161BC
70 kA / 50 kA	25	HES025BC	HES026BC
	40	HES040BC	HES041BC
	50	HES050BC	HES051BC
	63	HES063BC	HES064BC
	80	HES080BC	HES081BC
	100	HES100BC	HES101BC
	125	HES125BC	HES126BC
	160	HES160BC	HES161BC

Technical changes reserved

h3+ P160 - LSnI with front connection


HES161GR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
25 kA / 25 kA	40	HHS040GR	HHS041GR
	100	HHS100GR	HHS101GR
	160	HHS160GR	HHS161GR
40 kA / 40 kA	40	HNS040GR	HNS041GR
	100	HNS100GR	HNS101GR
	160	HNS160GR	HNS161GR
50 kA / 50 kA	40	HMS040GR	HMS041GR
	100	HMS100GR	HMS101GR
	160	HMS160GR	HMS161GR
70 kA / 50 kA	40	HES040GR	HES041GR
	100	HES100GR	HES101GR
	160	HES160GR	HES161GR

h3+ P160 - LSnI with cable terminals


HES161GC

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
25 kA / 25 kA	40	HHS040GC	HHS041GC
	100	HHS100GC	HHS101GC
	160	HHS160GC	HHS161GC
40 kA / 40 kA	40	HNS040GC	HNS041GC
	100	HNS100GC	HNS101GC
	160	HNS160GC	HNS161GC
50 kA / 50 kA	40	HMS040GC	HMS041GC
	100	HMS100GC	HMS101GC
	160	HMS160GC	HMS161GC
70 kA / 50 kA	40	HES040GC	HES041GC
	100	HES100GC	HES101GC
	160	HES160GC	HES161GC

h3+ P160 - LSI with front connection


HES161JR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
25 kA / 25 kA	40	HHS040JR	HHS041JR
	100	HHS100JR	HHS101JR
	160	HHS160JR	HHS161JR
40 kA / 40 kA	40	HNS040JR	HNS041JR
	100	HNS100JR	HNS101JR
	160	HNS160JR	HNS161JR
50 kA / 50 kA	40	HMS040JR	HMS041JR
	100	HMS100JR	HMS101JR
	160	HMS160JR	HMS161JR
70 kA / 50 kA	40	HES040JR	HES041JR
	100	HES100JR	HES101JR
	160	HES160JR	HES161JR

h3+ P160 - LSI with cable terminals


HES161JC

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
25 kA / 25 kA	40	HHS040JC	HHS041JC
	100	HHS100JC	HHS101JC
	160	HHS160JC	HHS161JC
40 kA / 40 kA	40	HNS040JC	HNS041JC
	100	HNS100JC	HNS101JC
	160	HNS160JC	HNS161JC
50 kA / 50 kA	40	HMS040JC	HMS041JC
	100	HMS100JC	HMS101JC
	160	HMS160JC	HMS161JC
70 kA / 50 kA	40	HES040JC	HES041JC
	100	HES100JC	HES101JC
	160	HES160JC	HES161JC

Technical changes reserved

h3+ P160 - Energy with front connection


HES161NR

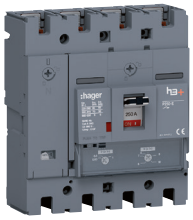
Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
25 kA / 25 kA	40	HHS040NR	HHS041NR
	100	HHS100NR	HHS101NR
	160	HHS160NR	HHS161NR
40 kA / 40 kA	40	HNS040NR	HNS041NR
	100	HNS100NR	HNS101NR
	160	HNS160NR	HNS161NR
50 kA / 50 kA	40	HMS040NR	HMS041NR
	100	HMS100NR	HMS101NR
	160	HMS160NR	HMS161NR
70 kA / 50 kA	40	HES040NR	HES041NR
	100	HES100NR	HES101NR
	160	HES160NR	HES161NR

h3+ P160 - Energy with cable terminals


HES161NC

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
25 kA / 25 kA	40	HHS040NC	HHS041NC
	100	HHS100NC	HHS101NC
	160	HHS160NC	HHS161NC
40 kA / 40 kA	40	HNS040NC	HNS041NC
	100	HNS100NC	HNS101NC
	160	HNS160NC	HNS161NC
50 kA / 50 kA	40	HMS040NC	HMS041NC
	100	HMS100NC	HMS101NC
	160	HMS160NC	HMS161NC
70 kA / 50 kA	40	HES040NC	HES041NC
	100	HES100NC	HES101NC
	160	HES160NC	HES161NC

h3+ P250 - TM adjustable with front connection


HET251DR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-100 %	4 poles N: 0-63 %	4 poles N: 0-50 %
25 kA / 25 kA	50	HHT050DR	HHT051DR		
	63	HHT063DR	HHT064DR		
	100	HHT100DR	HHT101DR	HHT102DR	
	125	HHT125DR	HHT126DR		HHT127DR
	160	HHT160DR	HHT161DR		HHT162DR
	200	HHT200DR	HHT201DR		HHT202DR
	250	HHT250DR	HHT251DR		HHT252DR
40 kA / 40 kA	50	HNT050DR	HNT051DR		
	63	HNT063DR	HNT064DR		
	100	HNT100DR	HNT101DR	HNT102DR	
	125	HNT125DR	HNT126DR		HNT127DR
	160	HNT160DR	HNT161DR		HNT162DR
	200	HNT200DR	HNT201DR		HNT202DR
	250	HNT250DR	HNT251DR		HNT252DR
50 kA / 50 kA	50	HMT050DR	HMT051DR		
	63	HMT063DR	HMT064DR		
	100	HMT100DR	HMT101DR	HMT102DR	
	125	HMT125DR	HMT126DR		HMT127DR
	160	HMT160DR	HMT161DR		HMT162DR
	200	HMT200DR	HMT201DR		HMT202DR
	250	HMT250DR	HMT251DR		HMT252DR
70 kA / 50 kA	50	HET050DR	HET051DR		
	63	HET063DR	HET064DR		
	100	HET100DR	HET101DR	HET102DR	
	125	HET125DR	HET126DR		HET127DR
	160	HET160DR	HET161DR		HET162DR
	200	HET200DR	HET201DR		HET202DR
	250	HET250DR	HET251DR		HET252DR
85 kA / 50 kA	50	HST050DR	HST051DR		
	63	HST063DR	HST064DR		
	100	HST100DR	HST101DR		
	125	HST125DR	HST126DR		
	160	HST160DR	HST161DR		
	200	HST200DR	HST201DR		
	250	HST250DR	HST251DR		

Technical changes reserved

h3+ P250 - MAG with front connection


HET251BR

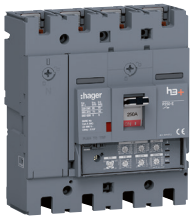
Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles
25 kA / 25 kA	100	HHT100BR	HHT101BR
	125	HHT125BR	HHT126BR
	160	HHT160BR	HHT161BR
	200	HHT200BR	HHT201BR
	250	HHT250BR	HHT251BR
40 kA / 40 kA	100	HNT100BR	HNT101BR
	125	HNT125BR	HNT126BR
	160	HNT160BR	HNT161BR
	200	HNT200BR	HNT201BR
	250	HNT250BR	HNT251BR
50 kA / 50 kA	100	HMT100BR	HMT101BR
	125	HMT125BR	HMT126BR
	160	HMT160BR	HMT161BR
	200	HMT200BR	HMT201BR
	250	HMT250BR	HMT251BR
70 kA / 50 kA	100	HET100BR	HET101BR
	125	HET125BR	HET126BR
	160	HET160BR	HET161BR
	200	HET200BR	HET201BR
	250	HET250BR	HET251BR

h3+ P250 - LSnI with front connection


HET251GR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
25 kA / 25 kA	40	HHT040GR	HHT041GR
	100	HHT100GR	HHT101GR
	160	HHT160GR	HHT161GR
	250	HHT250GR	HHT251GR
40 kA / 40 kA	40	HNT040GR	HNT041GR
	100	HNT100GR	HNT101GR
	160	HNT160GR	HNT161GR
	250	HNT250GR	HNT251GR
50 kA / 50 kA	40	HMT040GR	HMT041GR
	100	HMT100GR	HMT101GR
	160	HMT160GR	HMT161GR
	250	HMT250GR	HMT251GR
70 kA / 50 kA	40	HET040GR	HET041GR
	100	HET100GR	HET101GR
	160	HET160GR	HET161GR
	250	HET250GR	HET251GR

h3+ P250 - LSI with front connection


HET251JR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
25 kA / 25 kA	40	HHT040JR	HHT041JR
	100	HHT100JR	HHT101JR
	160	HHT160JR	HHT161JR
	250	HHT250JR	HHT251JR
40 kA / 40 kA	40	HNT040JR	HNT041JR
	100	HNT100JR	HNT101JR
	160	HNT160JR	HNT161JR
	250	HNT250JR	HNT251JR
50 kA / 50 kA	40	HMT040JR	HMT041JR
	100	HMT100JR	HMT101JR
	160	HMT160JR	HMT161JR
	250	HMT250JR	HMT251JR
70 kA / 50 kA	40	HET040JR	HET041JR
	100	HET100JR	HET101JR
	160	HET160JR	HET161JR
	250	HET250JR	HET251JR
85 kA / 50 kA	40	HST040JR	HST041JR
	100	HST100JR	HST101JR
	160	HST160JR	HST161JR
	250	HST250JR	HST251JR

h3+ P250 - LSIG with front connection


HET250LR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
25 kA / 25 kA	40	HHT040LR	HHT041LR
	100	HHT100LR	HHT101LR
	160	HHT160LR	HHT161LR
	250	HHT250LR	HHT251LR
40 kA / 40 kA	40	HNT040LR	HNT041LR
	100	HNT100LR	HNT101LR
	160	HNT160LR	HNT161LR
	250	HNT250LR	HNT251LR
50 kA / 50 kA	40	HMT040LR	HMT041LR
	100	HMT100LR	HMT101LR
	160	HMT160LR	HMT161LR
	250	HMT250LR	HMT251LR
70 kA / 50 kA	40	HET040LR	HET041LR
	100	HET100LR	HET101LR
	160	HET160LR	HET161LR
	250	HET250LR	HET251LR

Technical changes reserved

h3+ P250 - Energy with front connection


HET251NR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
25 kA / 25 kA	40	HHT040NR	HHT041NR
	100	HHT100NR	HHT101NR
	160	HHT160NR	HHT161NR
	250	HHT250NR	HHT251NR
40 kA / 40 kA	40	HNT040NR	HNT041NR
	100	HNT100NR	HNT101NR
	160	HNT160NR	HNT161NR
	250	HNT250NR	HNT251NR
50 kA / 50 kA	40	HMT040NR	HMT041NR
	100	HMT100NR	HMT101NR
	160	HMT160NR	HMT161NR
	250	HMT250NR	HMT251NR
70 kA / 50 kA	40	HET040NR	HET041NR
	100	HET100NR	HET101NR
	160	HET160NR	HET161NR
	250	HET250NR	HET251NR
85 kA / 50 kA	40	HST040NR	HST041NR
	100	HST100NR	HST101NR
	160	HST160NR	HST161NR
	250	HST250NR	HST251NR

h3+ P630 - TM adjustable with front connection


HPW321DR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-100%	4 poles N: 0-50%
25 kA / 25 kA	250	HHW250DR	HHW251DR	
	320	HHW320DR	HHW321DR	
	400	HHW400DR	HHW401DR	
	630	HHW630DE	HHW631DE	HHW632DE
40 kA / 40 kA	250	HNW250DR	HNW251DR	
	320	HNW320DR	HNW321DR	
	400	HNW400DR	HNW401DR	
	630	HNW630DE	HNW631DE	HNW632DE
50 kA / 50 kA	250	HMW250DR	HMW251DR	
	320	HMW320DR	HMW321DR	
	400	HMW400DR	HMW401DR	
	630	HMW630DE	HMW631DE	HMW632DE
70 kA / 70 kA	250	HEW250DR	HEW251DR	
	320	HEW320DR	HEW321DR	
	400	HEW400DR	HEW401DR	
	630	HEW630DE	HEW631DE	HEW632DE
110 kA / 110 kA	250	HPW250DR	HPW251DR	
	320	HPW320DR	HPW321DR	
	400	HPW400DR	HPW401DR	
	630	HPW630DE	HPW631DE	HPW632DE

h3+ P630 - MAG with front connection


HPW500BR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles
40 kA / 40 kA	320	HNW320BR	HNW321BR
	500	HNW500BR	HNW501BR
50 kA / 50 kA	320	HMW320BR	HMW321BR
	500	HMW500BR	HMW501BR
70 kA / 70 kA	320	HEW320BR	HEW321BR
	500	HEW500BR	HEW501BR
110 kA / 110 kA	320	HPW320BR	HPW321BR
	500	HPW500BR	HPW501BR

Technical changes reserved

h3+ P630 - LnSI with front connection


HPW631GR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
25 kA / 25 kA	250	HHW250GR	HHW251GR
	400	HHW400GR	HHW401GR
	630	HHW630GR	HHW631GR
40 kA / 40 kA	250	HNW250GR	HNW251GR
	400	HNW400GR	HNW401GR
	630	HNW630GR	HNW631GR
50 kA / 50 kA	250	HMW250GR	HMW251GR
	400	HMW400GR	HMW401GR
	630	HMW630GR	HMW631GR
70 kA / 70 kA	250	HEW250GR	HEW251GR
	400	HEW400GR	HEW401GR
	630	HEW630GR	HEW631GR
110 kA / 110 kA	250	HPW250GR	HPW251GR
	400	HPW400GR	HPW401GR
	630	HPW630GR	HPW631GR

h3+ P630 - LSI with front connection


HPW631JR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
40 kA / 40 kA	250	HNW250JR	HNW251JR
	400	HNW400JR	HNW401JR
	630	HNW630JR	HNW631JR
50 kA / 50 kA	250	HMW250JR	HMW251JR
	400	HMW400JR	HMW401JR
	630	HMW630JR	HMW631JR
70 kA / 70 kA	250	HEW250JR	HEW251JR
	400	HEW400JR	HEW401JR
	630	HEW630JR	HEW631JR
110 kA / 110 kA	250	HPW250JR	HPW251JR
	400	HPW400JR	HPW401JR
	630	HPW630JR	HPW631JR

h3+ P630 - LSIG with front connection


HPW631LR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
40 kA / 40 kA	250	HNW250LR	HNW251LR
	400	HNW400LR	HNW401LR
	630	HNW630LR	HNW631LR
50 kA / 50 kA	250	HMW250LR	HMW251LR
	400	HMW400LR	HMW401LR
	630	HMW630LR	HMW631LR
70 kA / 70 kA	250	HEW250LR	HEW251LR
	400	HEW400LR	HEW401LR
	630	HEW630LR	HEW631LR
110 kA / 110 kA	250	HPW250LR	HPW251LR
	400	HPW400LR	HPW401LR
	630	HPW630LR	HPW631LR

h3+ P630 - Energy with front connection


HPW631NR

Icu / Ics 400 - 415 V~	In (A)	3 poles	4 poles N: 0-50-100%
40 kA / 40 kA	250	HNW250NR	HNW251NR
	400	HNW400NR	HNW401NR
	630	HNW630NR	HNW631NR
50 kA / 50 kA	250	HMW250NR	HMW251NR
	400	HMW400NR	HMW401NR
	630	HMW630NR	HMW631NR
70 kA / 70 kA	250	HEW250NR	HEW251NR
	400	HEW400NR	HEW401NR
	630	HEW630NR	HEW631NR
110 kA / 110 kA	250	HPW250NR	HPW251NR
	400	HPW400NR	HPW401NR
	630	HPW630NR	HPW631NR

Technical changes reserved

RCD add-on block for P250

		In (A)	P250
 HBT160F	Fixed RCD	100 A	HBT100F
		160 A	HBT160F
		250 A	-
 HBT250H	Adjustable RCD	100 A	HBT100H
		160 A	HBT160H
		250 A	HBT250H
 HBT250L	Alarm only	100 A	HBT100L
		160 A	HBT160L
		250 A	HBT250L

RCD add-on block for P630

		In (A)	P630
 HBW630H	Adjustable RCD	400 A	HBW400H
		630 A	HBW630H
 HBW630L	Alarm only	400 A	HBW400L
		630 A	HBW630L

h3+ P160 - Switch disconnectors with front connections

	In (A)	3 poles	4 poles
	125	HCS125AR	HCS126AR
	160	HCS160AR	HCS161AR

HCS161AR

h3+ P160 - Switch disconnectors with cable terminals

	In (A)	3 poles	4 poles
	125	HCS125AC	HCS126AC
	160	HCS160AC	HCS161AC

HCS161AC

h3+ P250 - Switch disconnectors with front connections

	In (A)	3 poles	4 poles
	200	HCT200AR	HCT201AR
	250	HCT250AR	HCT251AR

HCT251AR

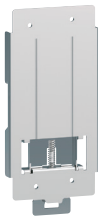
h3+ P630 - Switch disconnectors with front connections

	In (A)	3 poles	4 poles
	400	HCW400AR	HCW401AR
	630	HCW630AR	HCW631AR

HCW631AR

Technical changes reserved

DIN rail mounting

		Poles	P160	P250	P630
 HYT033H	DIN rail adaptor	3P / 4P	HYS033H	HYT033H	-

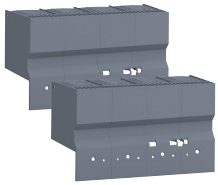
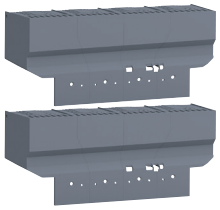
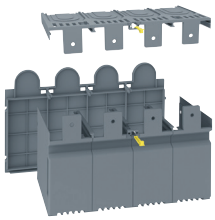
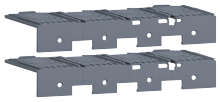
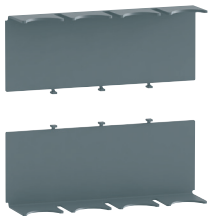
Cable terminals

			Poles	P160 Front connection	P160 Cable terminal	P250	P630
 HYT002H	Integrated	1 wire Cu/Al	3P	-	HYS001H	HYT001H	HYW001H
			4P	-	HYS002H	HYT002H	HYW002H
 HYT006H	External	1 wire Cu/Al	3P	HYS105H	HYS005H	HYT005H	-
			4P	HYS106H	HYS006H	HYT006H	-
		2 wires Cu/Al	3P	-		HYT007H	HYW007H
			4P	-		HYT008H	HYW008H
 HYT066H		6 wires Cu/Al	3P	HYS155H	HYS055H	HYT065H	-
			4P	HYS156H	HYS056H	HYT066H	-

Terminal extensions

		Poles	P160 Front connection	P160 Cable terminal	P250	P630
 HYB010H	Straight terminal extension	3P/4P	HYS010H	HYS013H	HYB010H	HYW010H (250-400A) HYW013H (630A)
 HYB012H	Spreader terminal extension	3P	HYS011H	HYS014H	HYB011H	HYW011H (250-400A) HYW014H (630A)
		4P	HYS012H	HYS015H	HYB012H	HYW012H (250-400A) HYW015H (630A)
 HYB032H	Rear connection	3P	HYS031H (16-50 A) HYS131H (63-160 A)		HYB031H	HYD031H (250-400A) HYD033H (630A)
		4P	HYS032H (16-50 A) HYS132H (63-160 A)		HYB032H	HYD032H (250-400A) HYD034H (630A)

Terminal covers and protections

			Poles	P160	P250	P630
 HYT022H	Top and bottom terminal cover for straight extensions		3P	HYS021H	HYT021H	HYW021H
			4P	HYS022H	HYT022H	HYW022H
 HYT024H	Top and bottom terminal cover for spread extensions		3P	HYS023H	HYT023H	HYW023H
			4P	HYS024H	HYT024H	HYW024H
 HYW061H	Top or bottom terminal covers for Unimes H		3P	HYS060H	HYT060H	HYW060H
			4P	HYS061H	HYT061H	HYW061H
 HYT026H	Top and bottom tover for rear & plug-in connections		3P	HYS025H	HYT025H	HYW025H
			4P	HYS026H	HYT026H	HYW026H
 HYT051H	Top and bottom isolating earth plate for Straight terminal cover		3P	HYS050H	HYT050H	HYW050H
			4P	HYS051H	HYT051H	HYW051H
 HYT053H	Top and bottom isolating Earth plate for Spread terminal cover		3P	HYS052H	HYT052H	HYW052H
			4P	HYS053H	HYT053H	HYW053H
 HYT019H	Interphase barrier	50 mm	3/4P	HYS019H	-	-
		100 mm	3/4P	HYT019H		HYW019H

Technical changes reserved

Electronic devices and accessories

			P160 / P250 / P630			
			LSnI	LSI	LSIG	Energy
 HXS121H	AX/AL Energy	For communication only	-	-	-	HXS120H
		COM + 250 V AC contact wires	-	-	-	HXS121H
		COM +125 V AC low level contact wires	-	-	-	HXS122H
 HTC320H	COM Module	Without I/O	-	-	-	HTC310H
		With I/O	-	-	-	HTC320H
		Side support for wire	-	-	-	HTC100H
 HTD210H	Panel display		-	-	-	HTD210H
 HTG911H	24 V DC Power supply		-	-	-	HTG911H

Electronic devices and accessories

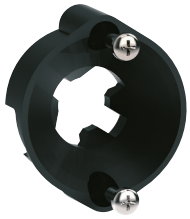
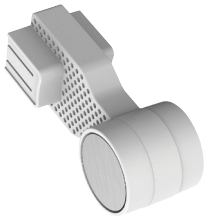
				P160 / P250 / P630			
				LSnI	LSI	LSIG	Energy
 HTC330H	CIP - Adaptor		0.5 m	-	-	-	HTC330H
			1.5 m	-	-	-	HTC340H
			3 m	-	-	-	HTC350H
			5 m	-	-	-	HTC360H
			10 m	-	-	-	HTC370H
 HTC140H	CIP - 24 V Adaptor		1.2 m	-	-	-	HTC140H
 HTC130H	OAC/PTA adaptor		1.2 m	-	HTC130H		
 HTC150H	ZSI adaptor		1.2 m	-	-	-	HTC150H
 HTC160H	NSP cable adaptor		1.2 m	-	-	-	HTC160H
	h3+ MIP to USB cable		1.2 m	-	HTL010H		
 HTG481H	Modbus cable	RJ45 - RJ45	0.2 m	-	-	-	HTG480H
			1 m	-	-	-	HTG481H
			2 m	-	-	-	HTG482H
			5 m	-	-	-	HTG484H
 HTG471H		RJ45 - RJ45 with earth	1 m	-	-	-	HTG471H
			2 m	-	-	-	HTG472H
			5 m	-	-	-	HTG474H
 HTG465H		RJ45 with earth	3 m	-	-	-	HTG465H
 HTG485H			25 m	-	-	-	HTG485H

Technical changes reserved

Auxiliaries

				P160 / P250 / P630
 HXA021H	AX position auxiliary contact			HXA021H
			Low level	HXA025H
 HXA024H	AL triping auxiliary contact	Left side		HXA024H
			Low level	HXA026H
		Right side		HXA027H
			Low level	HXA028H
 HXA005H	Shunt trip release		24 V DC	HXA001H
			48 V DC	HXA002H
			100 - 120 V~	HXA003H
			200 - 240 V~	HXA004H
			380 - 450 V~	HXA005H
 HXA015H	Undervoltage release		24 V DC	HXA011H
			100 - 120 V~	HXA013H
			200 - 240 V~	HXA014H
			380 - 450 V~	HXA015H
 HXA051H	Delayed UVR		24 V DC	HXA051H
			110 V~	HXA053H
			240 V~	HXA054H
			440 V~	HXA055H
 HYA035H	Cable kit		0.75 mm² - 6 wires	HYA035H

Handles

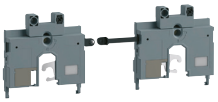
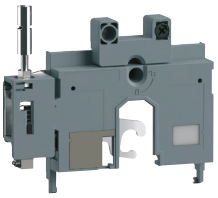
			P160	P250	P630
 HXT030H	Direct rotary handle		HXS030H	HXT030H	HXW030H
		with door locking	HXS032H	HXT032H	HXW032H
 HXS888H	Key kit for rotary handle		HXS888H		HXW888H
		key lock only	HXS999H		
 HXT031H	On door rotary handle	kit with black IP55 handle and 200 mm shaft	HXS031H	HXT031H	HXW031H
 HXS901H		kit with IP55 red/yellow handle and 200 mm shaft	-		HXW036H
		black & grey IP55	HXS901H		HXW901H
 HXS913H	Shaft extension	200 mm	HXS912H		HXW912H
		320 mm	HXS913H		HXW913H
		500 mm	HXS915H		HXW915H
 HXS920H	Shaft guide for door rotary handle		HXS920H		-
 HXW033H	Extended toggle		-		HXW033H

Locking kits

		P160	P250	P630
 HXA039H	Padlocking kit	HXA039H		
	Locking kit for on door rotary handle	HZC019		

Technical changes reserved

Mechanical interlocking

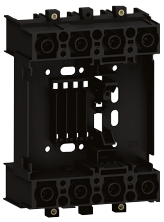
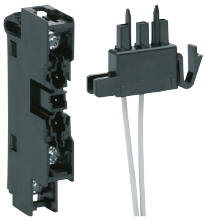
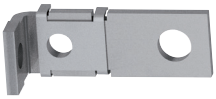
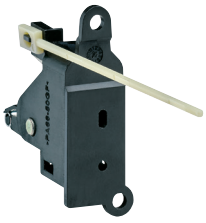
			P160	P250	P630
 HXT166H	Link interlock kit	3P	HXS165H	HXT165H	HXW165H
		4P	HXS166H	HXT166H	HXW166H
 HXT066H	Mechanical interlock (1 front cover)	3P / 4P	HXS066H	HXT066H	HXW066H
 HXB070H	Cable for mechanical interlock	1 m	HXB070H		
		1.5 m	HXB071H		

Motor operators

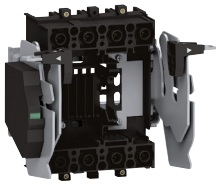
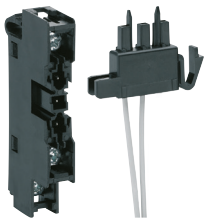
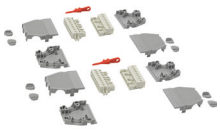
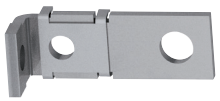
			P250	P630
 HXT040H	Motor operator with auto-reset	24 V DC	HXT040H	-
		24 - 48 V DC	-	HXW040H
		48 V DC	HXT048H	-
		100 - 110 V AC/DC	HXT041H	-
		100 - 120 V DC	-	HXW041H
		100 - 240 V AC	-	HXW042H
		200 - 220 V AC/DC	HXT045H	-
		230 - 240 V AC	HXT042H	-
 HXT040HK	Motor operator with auto-reset and Ronis key lock	24 V DC	HXT040HK	-
		24 - 48 V DC	-	HXW040HK
		48 V DC	HXT048HK	-
		100 - 110 V AC/DC	HXT041HK	-
		100 - 120 V DC	-	HXW041HK
		100 - 240 V AC	-	HXW042HK
		200 - 220 V AC/DC	HXT045HK	-
		230 - 240 V AC	HXT042HK	-
 HXT043H	Motor operator without auto-reset	24 V DC	HXT043H	-
		24 - 48 V DC	-	HXW043H
		48 V DC	HXT049H	-
		100 - 110 V AC/DC	HXT046H	-
		100 - 120 V DC	-	HXW046H
		100 - 240 V AC	-	HXW044H
		200 - 220 V AC/DC	HXT047H	-
		230 - 240 V AC	HXT044H	-
 HXT043HK	Motor operator without auto-reset and Ronis key lock	24 V DC	HXT043HK	-
		24 - 48 V DC	-	HXW043HK
		48 V DC	HXT049HK	-
		100 - 110 V AC/DC	HXT046HK	-
		100 - 120 V DC	-	HXW046HK
		100 - 240 V AC	-	HXW044HK
		200 - 220 V AC/DC	HXT047HK	-
		230 - 240 V AC	HXT044HK	-
 HXB068H	Electrical interlock for Motor operator	For 2 same motors	HXB068H	HXD068H
		For P250 to P630 motors	HXB069H	

Technical changes reserved

Plug-in system

			P160	P250	P630
 HYT201H	Plug-in base	3P	HYS200H	HYT200H	HYW200H
		4P	HYS201H	HYT201H	HYW201H
 HYT301H	Plug-in circuit breaker conversion kit	3P	HYS300H HYS310H (≤50 A)	HYT300H	HYW300H
		4P	HYS301H HYS311H (≤50 A)	HYT301H	HYW301H
 HYC250H HYC352H	Auxiliary circuit terminal	Base side	HYC250H		
		MCCB side 2 wires	HYC352H		
		MCCB side 3 wires	HYC353H		
 HYT328H	L connection	1P	HYS328H	HYT328H	HYW328H
 HYC321H	Terminal cover for plug-in base	3P	HYS321H	HYC321H	HYD321H
		4P	HYS322H	HYC322H	HYD322H
 HYS256H	Safety trip		HYS256H		HYW256H
		Kit for Quadro SX and Unimes H enclosures	HYS257H	HYT257H	HYW257H

Withdrawable system

			P250	P630
 HYT331H	Base for withdrawable circuit breaker	3P	HYT330H	HYW330H
		4P	HYT331H	HYW331H
 HYT333H	Withdrawable circuit breaker adaptor with safety trip	3P	HYT332H	HYW332H
		4P	HYT333H	HYW333H
 HXT890H	Locking key kit		HXT890H	HXW890H
 HYC250H HYC352H	Auxiliary circuit terminal	Base side	HYC250H	
		MCCB side 2 wires	HYC352H	
		MCCB side 3 wires	HYC353H	
 HYW350H	External auxiliary connectors		-	HYW350H
 HYT328H	L connection	1P	HYT328H	HYW328H
	Position switch		HYC255H	
 HYS256H	Spare safety trip (safety trip included as standard)		HYS256H	HYW256H
		Kit for Quadro SX and Unimes H enclosures	HYT257H	HYW257H

Technical changes reserved

Glossary

Adjustment dial
Knob for a manual adjustment of the circuit breaker settings.

ACP
AX/AL communication port. Dedicated terminal to connect the AX/AL Energy device.

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.

CIP
Communication Interface Port. Terminal to connect the COM Module or the Panel display.

Circuit breaker
General term for Moulded Case Circuit Breaker or MCCB.

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

Delayed UVR
Delayed undervoltage release

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.

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.

Energy trip unit
Electronic trip unit with adjustable L, S, I and G. Also fitted with measurement, alarm and communication features.

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.

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

LSnI trip unit
Electronic trip unit with adjustable Ir and Isd and with fixed tr and tsd. Instantaneous Ii is fixed.

LSI trip unit
Electronic trip unit with adjustable L, S and I.

LSIG trip unit
Electronic trip unit with adjustable L, S, I and with fixed G.

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.

OAC
Optional Alarm Contact (digital output contact).

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.

Pitch
Distance between connection terminals of the circuit 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).

PTA
Pre-trip alarm. Also name of associated output contact.

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 - t - CO - t - CO at Ics. It is followed by a test to prove 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 - t - 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.

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

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.

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

Withdrawable circuit breaker
Circuit breaker which can easily be disconnected from the installation thanks to a draw-out system.

ZSI
Zone Selective Interlocking

Technical changes reserved

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