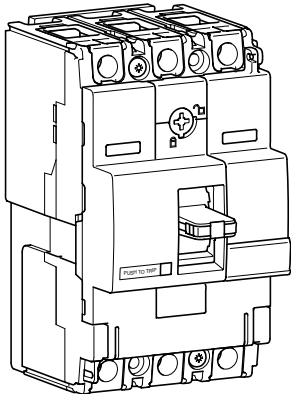


Frame	x160				x250		
Product	MCS Switch	MCCB			MCS Switch	MCCB	
Reference	HCA	HDA	HHA	HNA	HCB	HHB	HNB
Number of poles	[No.] 3-4	1-2-3-4	1-2-3-4	3-4	3-4		
Electrical characteristics							
Rated current	I_n [A]	160			250		
Current rated range	[A]	125-160	16-125 (1P), 16-160 (2, 3, 4P)		250	100-250	
Rated service voltage, (AC)	U_e [V]	220-440			220-440		
Frequency	F [Hz]	50/60			50/60		
Rated insulation voltage	U_i [V]	690			800		
Rated impulse withstand voltage	U_{imp} [kV]	8			8		
Rated ultimate short-circuit breaking capacity, (I_{cu})							
(AC) 50-60 Hz 220/230 V	I_{cu} [kA]	-	25	35	85	-	35
(AC) 50-60 Hz 380/415 V	I_{cu} [kA]	-	18	25	40	-	25
(AC) 50-60 Hz 480/500/525 V	I_{cu} [kA]	-	6	7.5	12.5	-	-
(AC) 50-60 Hz 660/690 V	I_{cu} [kA]	-	-	-	6	-	-
(DC) 250 V - 2 poles in series	I_{cu} [kA]	-	12.5	20	25	-	25
Rated service short-circuit breaking capacity, (I_{cs})							
(AC) 50-60 Hz 220/230 V	I_{cs} [kA]	-	25	25	40	-	25
(AC) 50-60 Hz 380/415 V	I_{cs} [kA]	-	18	20	20	-	20
(AC) 50-60 Hz 480/500/525 V	I_{cs} [kA]	-	3	4	7.5	-	-
(AC) 50-60 Hz 660/690 V	I_{cs} [kA]	-	-	-	3	-	-
(DC) 250 V - 2 poles in series	I_{cs} [kA]	-	7	10	13	-	13
Rated short-circuit making capacity	I_{cm} [kA]	2.8	-	-	-	6	-
Rated short-time withstand current for 1s	I_{cw} [kA]	2	-	-	-	3	-
Category of use (EN 60947-2)		-	A			-	A
Calibration temperature		-	50°C			-	50°C
Derating 40°C		-	100%			-	100%
	50°C	-	100%			-	100%
	55°C	-	95%			-	94%
	60°C	-	93%			-	91%
	65°C	-	90%			-	88%
Suitability for isolation		ok				ok	
Electric endurance in number of cycles		10000				10000	
Mechanical endurance in number of operations		20000				20000	
Operating temperature		-25 to +70°C			-25 to +70°C		
Storage temperature		-35 to +70°C			-35 to +70°C		
Power loss (at I_n for 3P)	[W]	39			60		
Reference standard		IEC 60947-3	IEC 60947-2		IEC 60947-3	IEC 60947-2	
Releases: switch		ok	-		ok	-	
Releases: TM (thermomagnetic)		-	ok		-	ok	
T fixed, M fixed		-	ok (1P)		-	ok	
T adjustable, M fixed		-	ok		-	-	
T adjustable, M adjustable		-	-		-	ok	
Thermal adjustment value		-	0.63 to 1 x I_n		-	0.63 to 1 x I_n	
Magnetic adjustment value		-	-		-	6-8-10-13 x I_n (200A) 5-7-9-11 I_n (250A)	
Releases: LSI (electronic)		-	-		-	-	
Long delay		-	-		-	-	
Short delay		-	-		-	-	
Time delay		-	-		-	-	
Terminations							
Standard terminal type		cage			lugs		
Maximum terminal capacity		95 mm ²			185 mm ² (cage)		
Terminal width	mm	-			25		
Terminal shields		ok			ok		
Cage terminal		integrated			ok		
Extended connections		ok			ok		
Rear connections		no			ok		
Dimensions							
Height	mm	130			165		
Width	1P mm	-	25	-	-	-	-
	2P mm	-	50	-	-	-	-
	3P mm	75			105		
	4P mm	100			140		
Depth	mm	68			68		
Weight	1P kg	-	0.29	-	-	-	-
	2P kg	-	0.48	-	-	-	-
	3P kg	0.715			1.3		
	4P kg	0.95			1.6		

Product Frame	Add-on blocks			
	x160	x160	x160	x250
Number of poles	3, 4	3, 4	3, 4	4
Tripping Access	mechanical	mechanical	mechanical	mechanical
Standards CEI/EN 60947-2 appendix B	✓	✓	✓	✓
Electrical Characteristics				
Max rated current (40) I_n A	I_n	125A	125 - 160A	160 - 250A
Rated service voltage U_e V AC (50/60Hz)	U_e	240 - 415V	240 - 415V	240 - 415V
Mechanical Characteristics				
Top and bottom supply		✓	✓	✓
For tripping, no additional external electrical sources		✓	✓	✓
Possible operating with two active phases		✓	✓	✓
Settings				
Sensitivity $I_{\Delta n}$	$I_{\Delta n}$ (A)	300mA	0.03, 0.1, 0.3, 1, 3, 6A	0.03, 0.1, 0.3, 1, 3, 6A
Time delay Δt	Δt (s)	inst.	inst., 0.06, 0.15, 0.3, 0.5, 1	inst., 0.06, 0.15, 0.3, 0.5, 1
Max. opening time	ms	10	10	10
Delay add-on block is not possible if $I_{\Delta n} = 30mA$		-	✓	✓
Selective product		-	✓	✓
Mechanical test button		✓	✓	✓
Isolating test without cable removal		✓	✓	✓
Electrical test button		✓	✓	✓
Reset button		✓	✓	✓
Sealable setting button		-	✓	✓
Isolation level signaling by led 25 and 50%		-	✓	✓
I_n running signalisation by led		-	✓	✓
Residual default signaling contact		✓	✓	✓
Signaling contact 50% I_{dn}		-	✓	✓
Anti-transient	type AC	✓	✓	✓
Pulsating DC current	type A	✓	✓	✓
High immunity	type HI	✓	✓	✓
-25°C		✓	✓	✓
Accessories and connection				
Steel terminal cage (x3/x4)		✓	✓	accessories
Connection by lugs		-	-	✓
Extended connections (x4)		✓	✓	✓
Spreaders (x4)		✓	✓	✓
Terminal covers (3P/4P)		-	-	✓
Interphase barriers (x3)		✓	✓	✓
Rigid cables connection capacity mm ²		4 - 95	4 - 95	35 - 185
Flexible cables connection capacity mm ²	(with terminal)	4 - 70	4 - 70	35 - 150
Tightening torque Nm		6	6	12
Copper bar (width) in mm		-	-	25
Mounting				
Clips on DIN rail		✓	✓	-
Fixed on mounting plate		-	-	✓
Fixation type		side	side	bottom
Mounting by customer		✓	✓	✓
Dimensions and weight				
Dimensions (WxHxD) in mm Side mounted 4P	W	100	100	140
	H	165	165	107.5
	D	95	95	85
Weight	3P	1.4	1.4	-
	4P	1.55	1.55	1.2

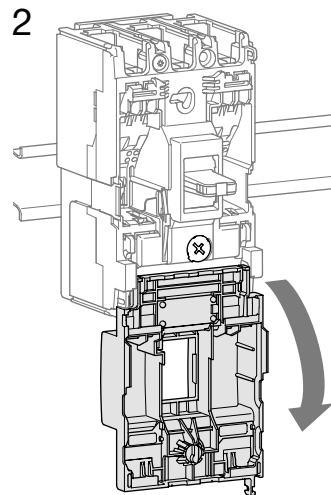
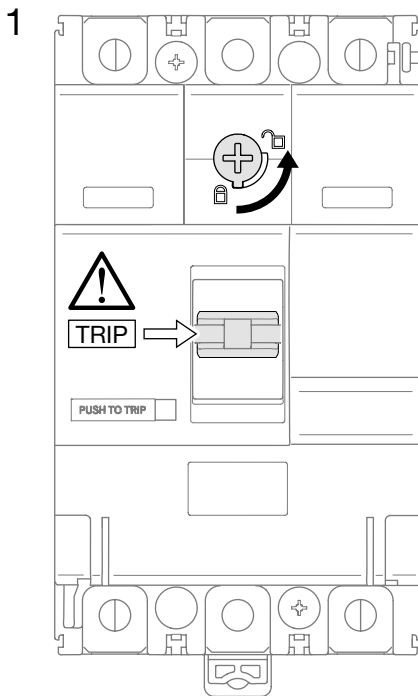
MCCBs



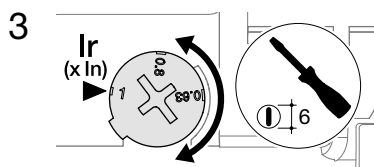
		220/240V AC IEC 60 947-2	380/415V AC IEC 60 947-2
HDA	I_{cu}	25 kA	18 kA
	I_{cs}	25 kA	18 kA
HHA	I_{cu}	35 kA	25 kA
	I_{cs}	25 kA	20 kA
HCA	I_{cm}	-	2.8 kA
	I_{cw}	-	2 kA - 1s

Commercial
Distribution

Thermal settings



For DIN rail mounting, use **HYA033H**.



Thermal adjustment from 0.63 to $1 \times I_n$

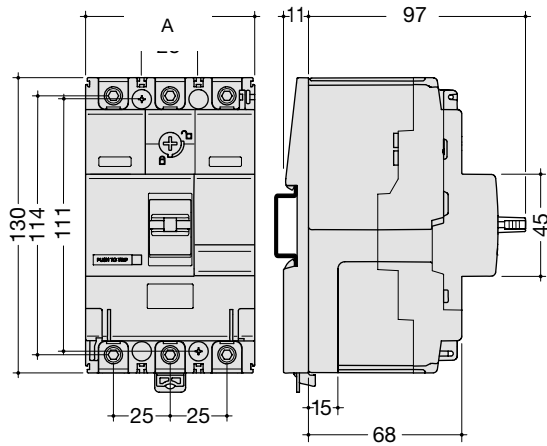
Magnetic adjustment fixed $> 10 \times I_n$

I_n	16 - 50 A	63 - 80 A	100 - 125 A	160 A
I_{mag}	600 A	1000 A	1500 A	1600 A

Dimensions

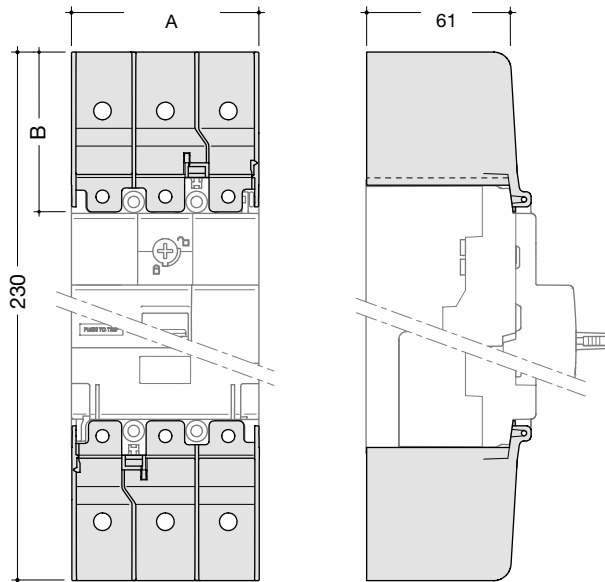
MCCB x160

Commercial
Distribution



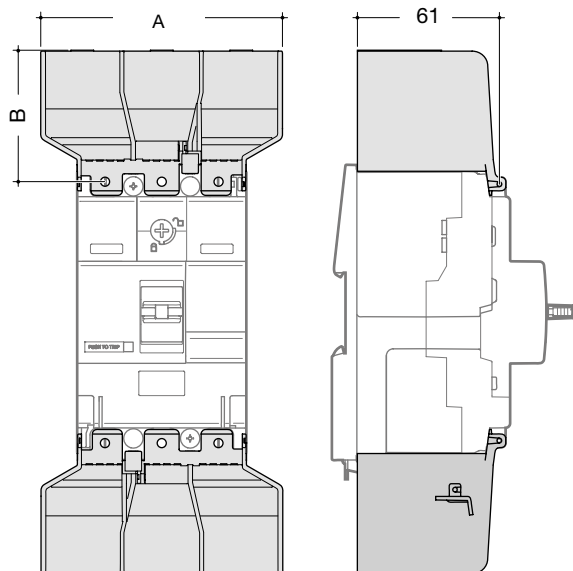
	A (mm)
1P	24.8
3P	74.5
4P	99.5

Terminal covers for extended straight connections



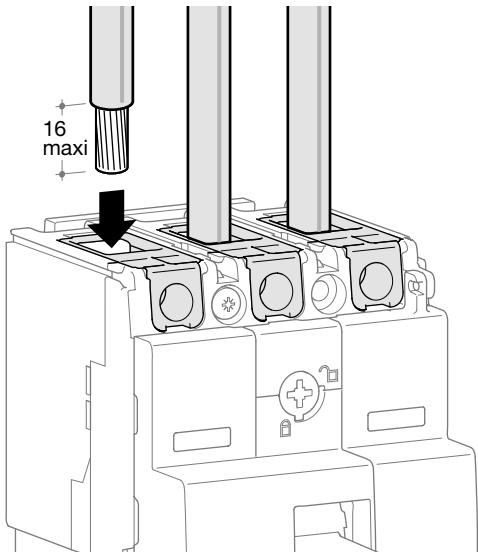
	A (mm)
1P	24.4
3P	74.5
4P	99.5

Terminal cover for extended spreader connections






	A (mm)
3P	106.5
4P	141.5



Connection with terminals



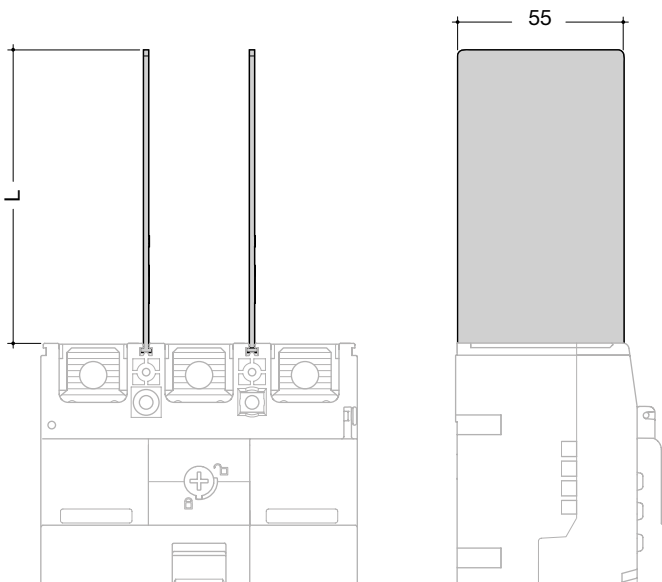
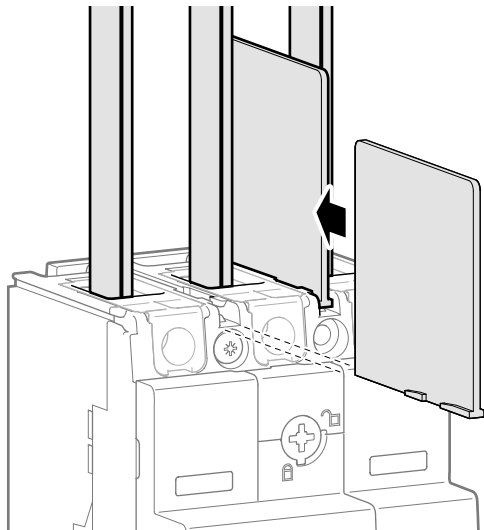
Terminals for copper conductors (standard)

	min. 6 mm ²	max. 70 mm ²
	min. 6 mm ²	max. 95 mm ²
	6 Nm	

Terminals for aluminium / copper conductors (accessory)
HYA005H, HYA006H

	min. 35 mm ²	max. 70 mm ²
	10 Nm	

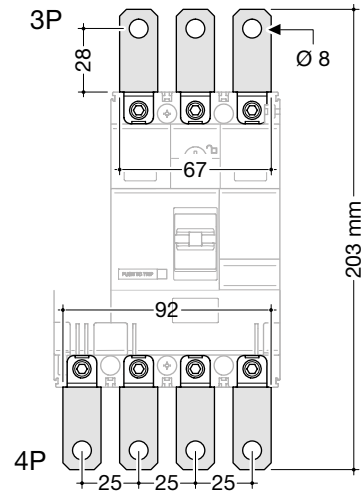
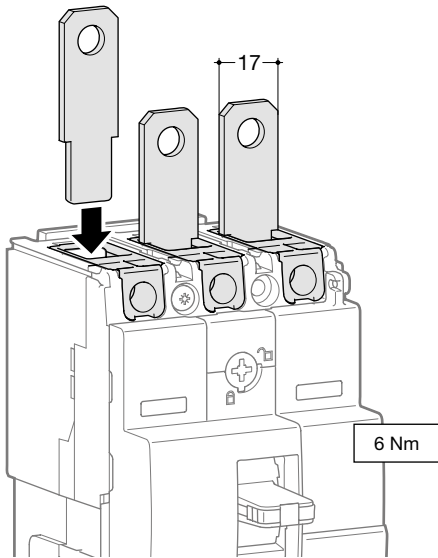
Interphase barriers



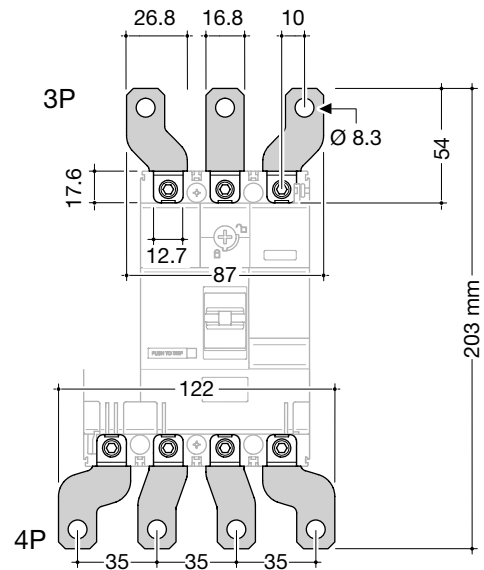
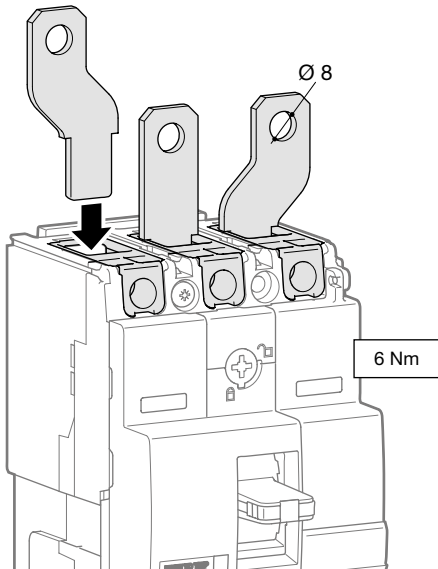
	L (mm)
HYA019H	50
HYB019H	97

Extended straight connections

Commercial
Distribution

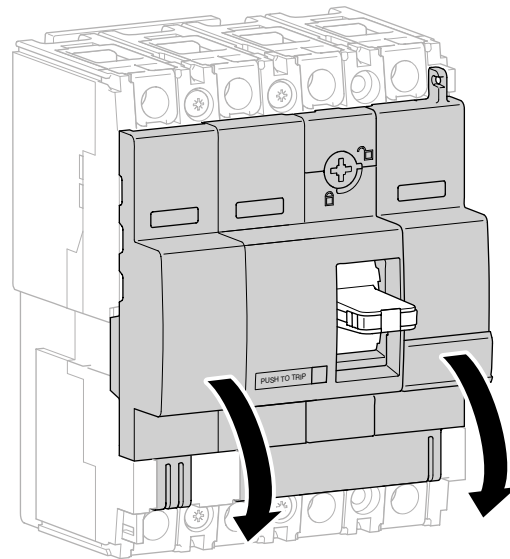
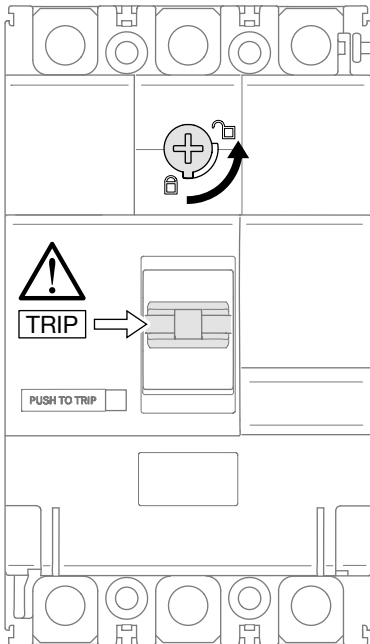


Extended spreader connections



Auxiliaries

Auxiliaries for MCCBs and moulded case switches

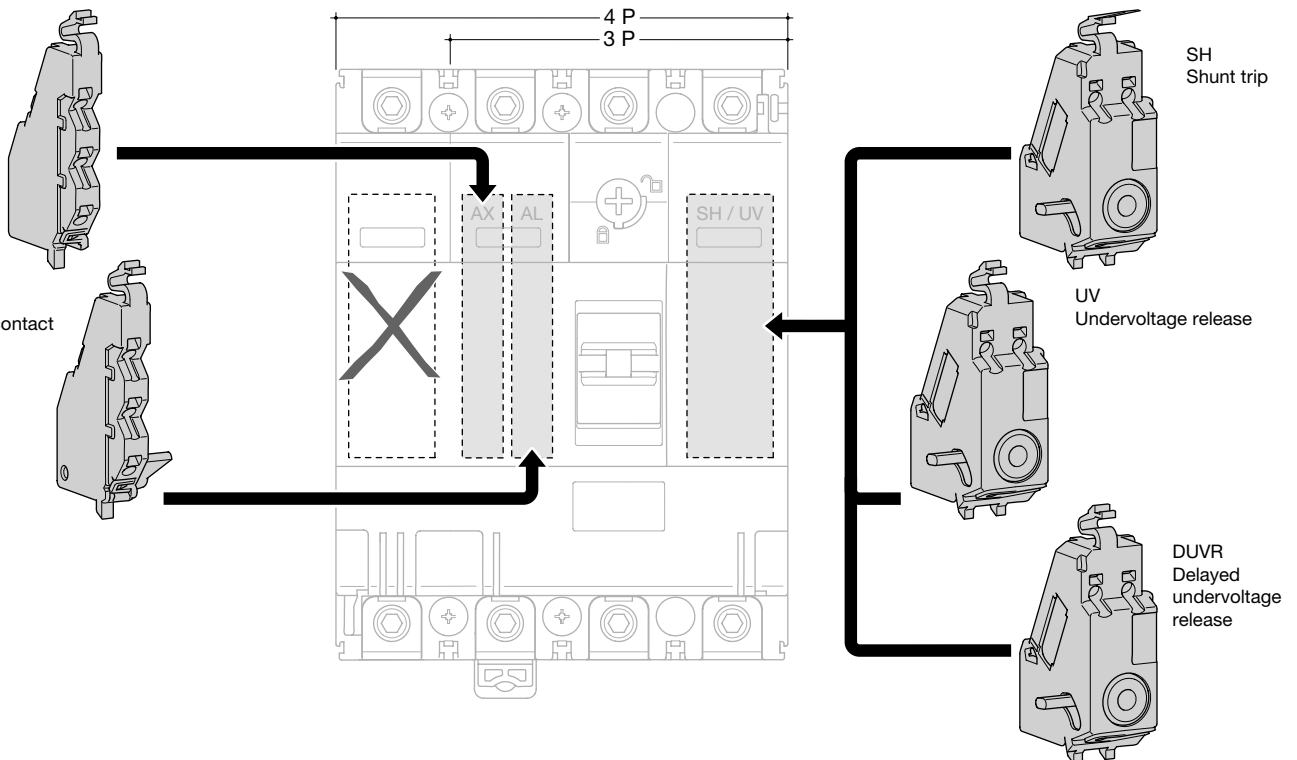


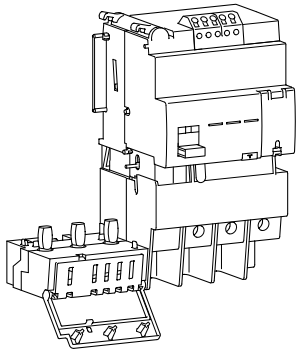
Commercial
Distribution

Mounting combination for auxiliaries and releases

AX
Auxiliary contact

AL
Alarm contact





When associated with MCCB, the add-on block provides an earth fault protection and protects against electrical shocks by direct or indirect contact.

The add-on blocks are protected against nuisance tripping caused by transient voltages. It's able to detect sinusoidal alternating currents and residual pulsating direct currents (A type). It also avoids miss tripping (HI type - High Immunity).

Characteristics

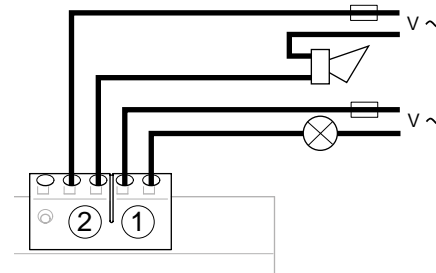
Reset button :
Signals add-on block tripping and must be reset before switching on the installation.

Test button for RCD function :
Checks the electrical operating of the MCCB / Add-on block association.

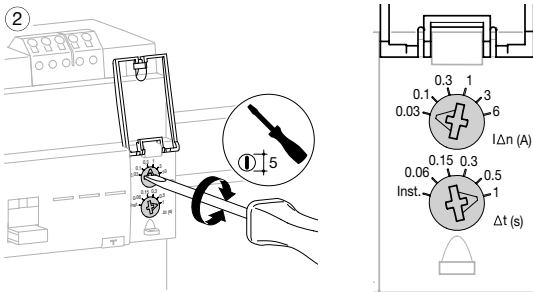
Mechanical test button :
Checks the mechanical operating of the MCCB / Add-on block association.

LED signaling residual current level in the installation:
25% (orange) and 50% (red) $I_{\Delta n}$; green light to signal correct operating.

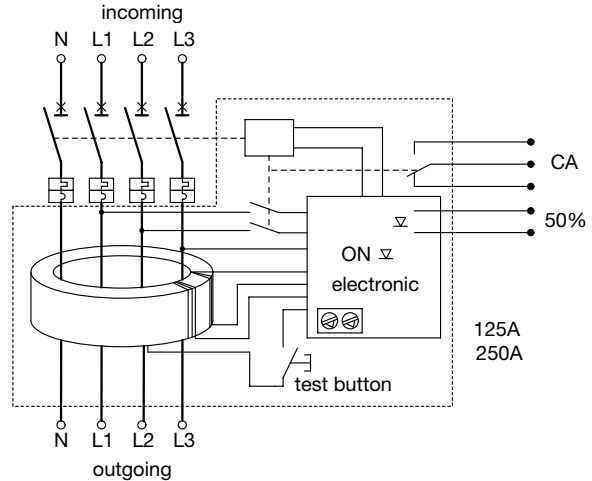
Remote tripping and advanced warning (50% $I_{\Delta n}$) signaling thanks to these contacts:



Earth leakage current ($I_{\Delta n}$) and delay (Δt) setting

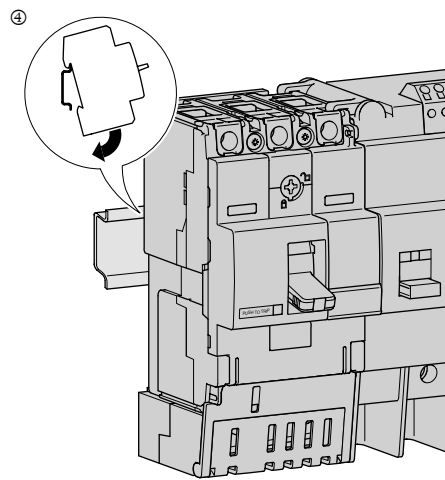
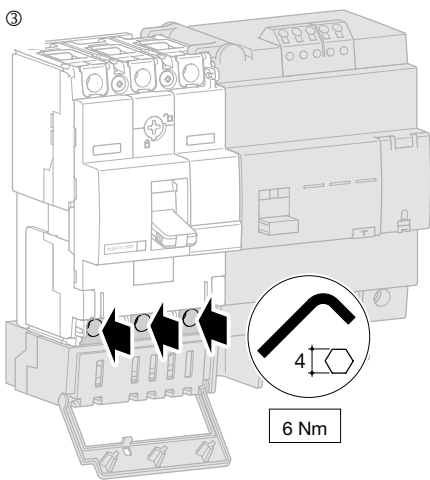
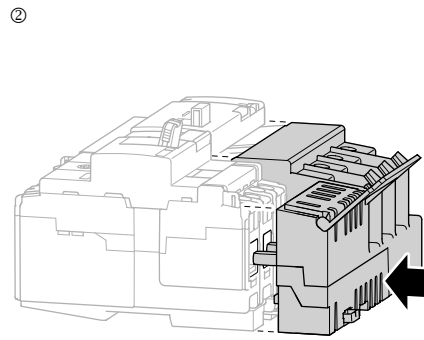
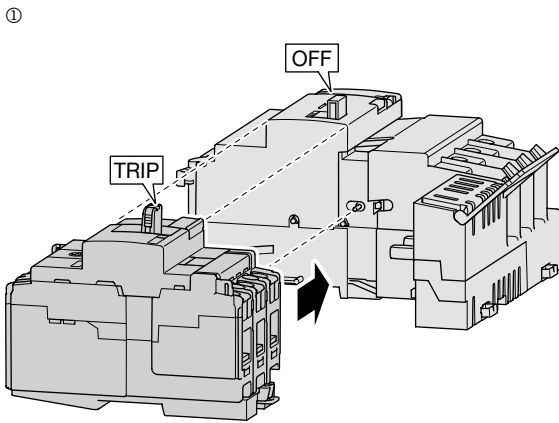


Add-on block operating



		A ($I_{\Delta n}$)					
		0.03	0.1	0.3	1	3	6
(t_{Δ}) S	Inst.	OK	OK	OK	OK	OK	OK
	0.06	no	OK	OK	OK	OK	OK
	0.15	no	OK	OK	OK	OK	OK
	0.3	no	OK	OK	OK	OK	OK
	0.5	no	OK	OK	OK	OK	OK
	1	no	OK	OK	OK	OK	OK

Add-on block mounting

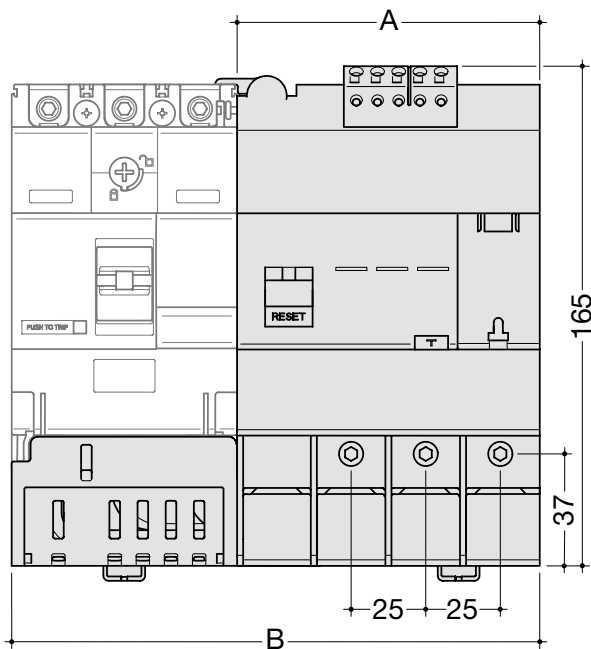


Exclusive drawer assembly system allows quick mounting and makes MCCB and add-on block association a complete monoblock unit.

Reinforced insulation connection (class II)

System avoids the omission of terminal tightening

Dimensions

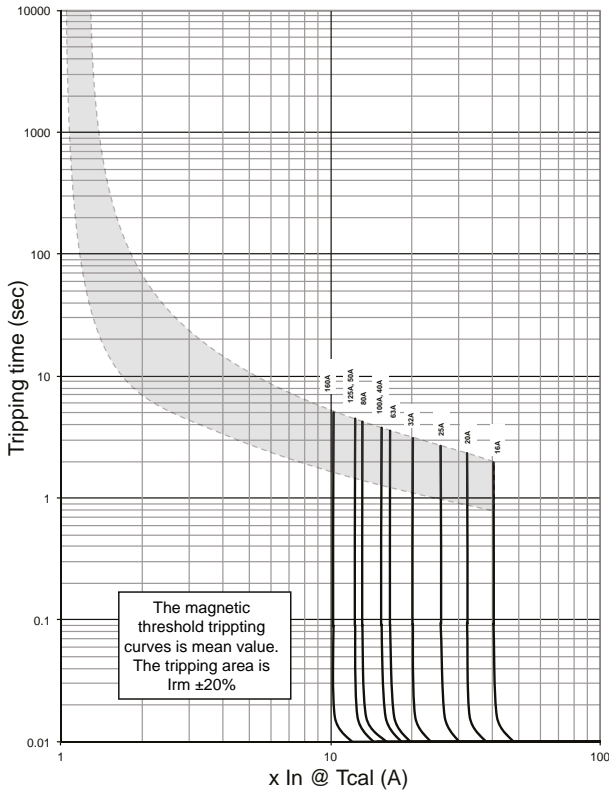


	3P	4P
A (mm)	100	100
B (mm)	174.5	199.5

Tripping curve

MCCB x160

Commercial Distribution



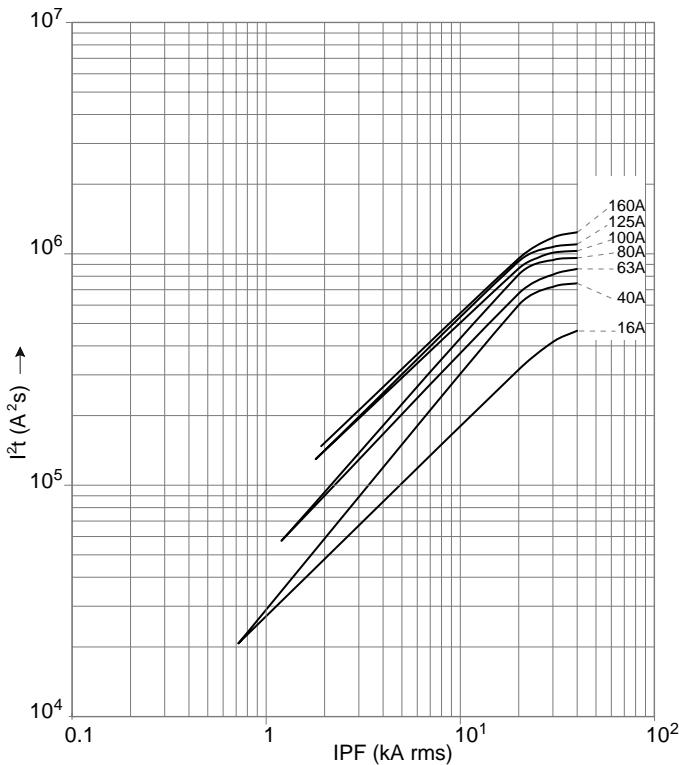
The earth fault loop impedance requirements for larger devices can be calculated by the formula given in BS7671:2008

$$Z_s \leq 230 \times C_{min}$$

Where $I_a = I_n$ of MCCB x Mag setting x 1.2

Thermal constraint curve at 400V (Let-through energy)

MCCB x160



MCCB Disconnection Data

Earth Fault Loop Impedance Data

Disconnection time 0.2s, 0.4s, 1s

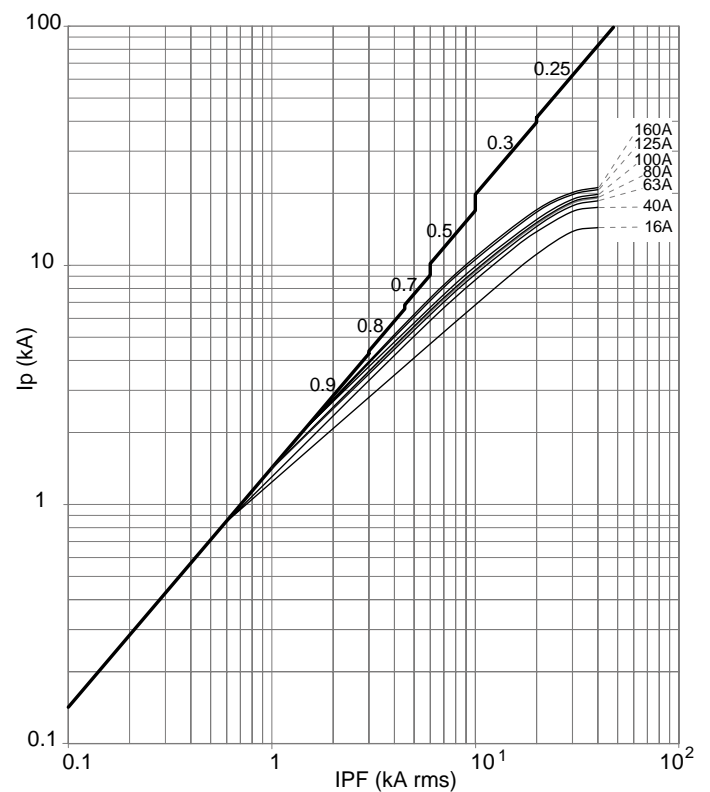
Device rating (A)	Instantaneous trip (xI_n)	Instantaneous trip (A)	add 20% tolerance (I_a)	$Z_s = (230 \times 0.95) / I_a$
16	40.3	644.8	773.8	0.28
20	32.2	644.0	773	0.28
25	25.7	643	771	0.28
32	20.13	644.2	773.0	0.28
40	15.0	600.0	720.0	0.30
50	12.0	600.0	720.0	0.30
63	16.6	1045.8	1255.0	0.17
80	13.1	1048.0	1258	0.17
100	15.4	1540.0	1848.0	0.12
126	12.3	1538	1845.0	0.12
160	10.22	1635.2	1962.2	0.11

Disconnection time 5s

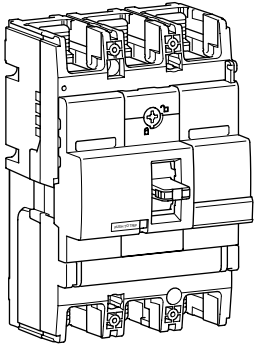
Device rating (A)	trip (xI_n)	I_a (A)	$Z_s = (230 \times 0.95) / I_a$
16	10	160	1.37
20	10	200	1.09
25	10	250	0.87
32	10	320	0.68
40	10	400	0.55
50	10	500	0.44
63	10	630	0.35
80	10	800	0.27
100	10	1000	0.22
125	10	1250	0.17
160	10	1600	0.14

Current limiting curve at 400V (Let-through peak current)

MCCB x160



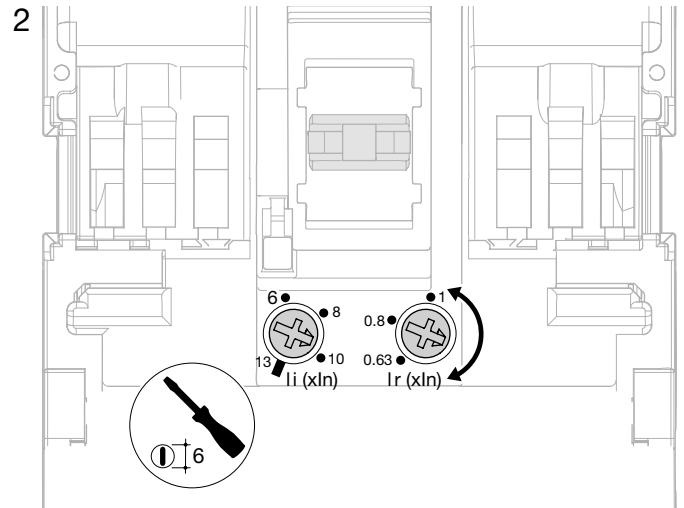
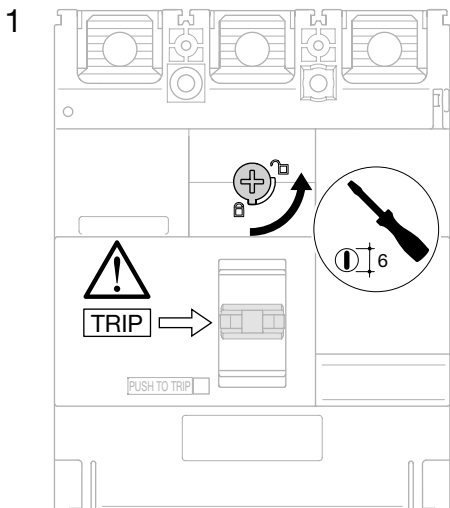
MCCBs



		220/240V AC IEC 60 947-2	380/415V AC IEC 60 947-2
HHB	l _{cu}	35 kA	25 kA
	l _{cs}	25 kA	20 kA
HNB	l _{cu}	85 kA	40 kA
	l _{cs}	40 kA	20 kA
HCB	l _{cm}	-	9 kA
	l _{cw}	-	3 kA - 1s

Commercial Distribution

Magnetic and thermal settings

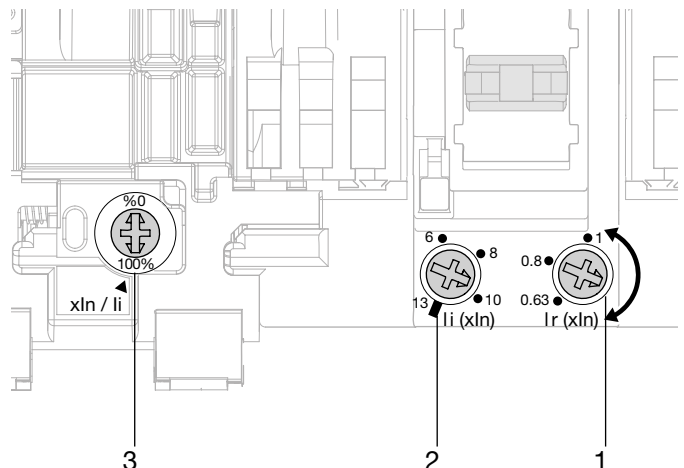


Thermal adjustment from 0.63, 0.8, 1 x I_n

Magnetic adjustment from 6 to 13 x I_n (100 - 200A)

from 5 to 11 x I_n (250A)

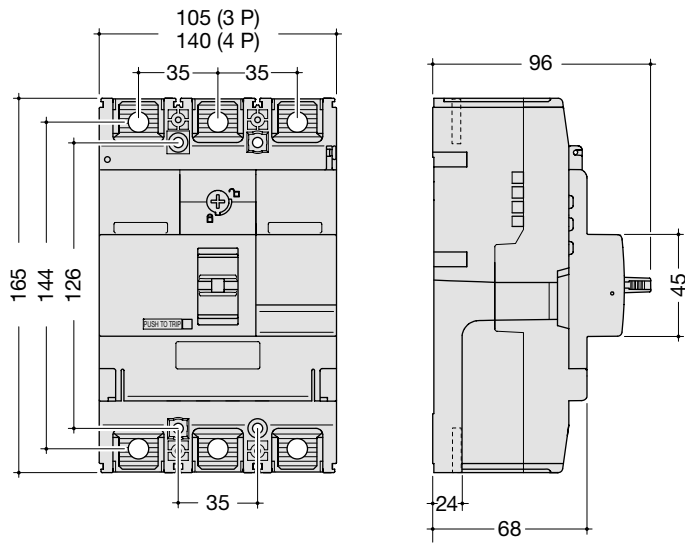
	100 - 200A	250A
I _r (x I _n) 1	0.63 - 0.8 - 1 x I _n	
I _i (x I _n) 2	6 - 8 - 10 - 13 x I _n	5 - 7 - 9 - 11 x I _n
x I _n /I _i 3	0 - 100%	
	0 - 60%	



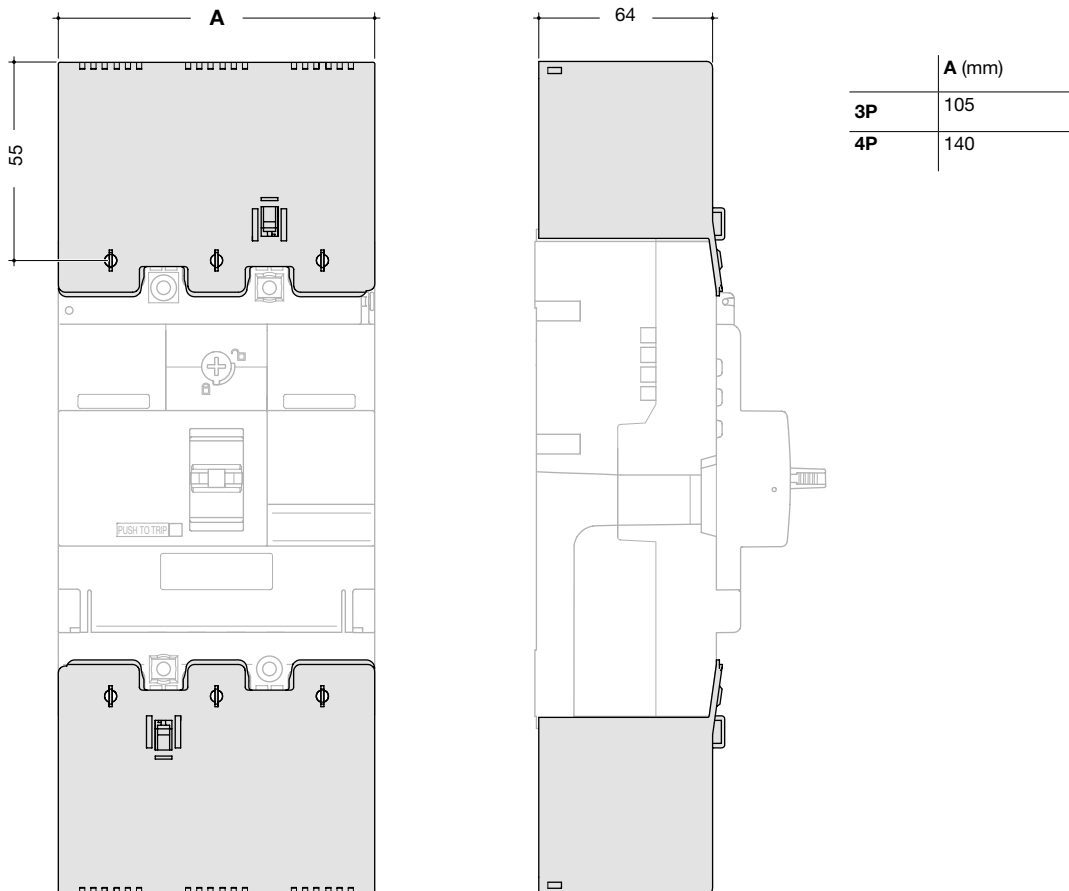
Dimensions

MCCB x250

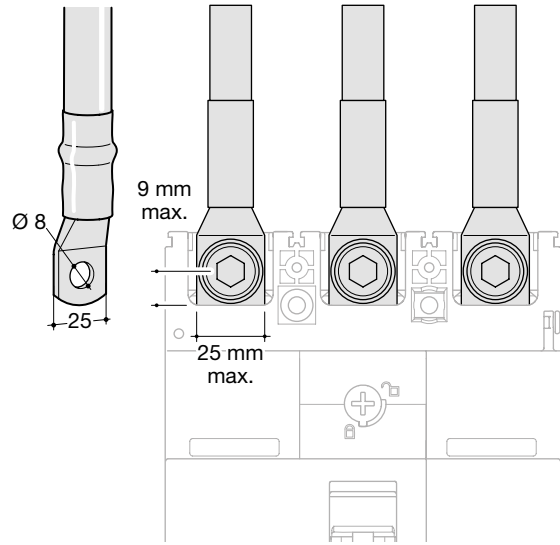
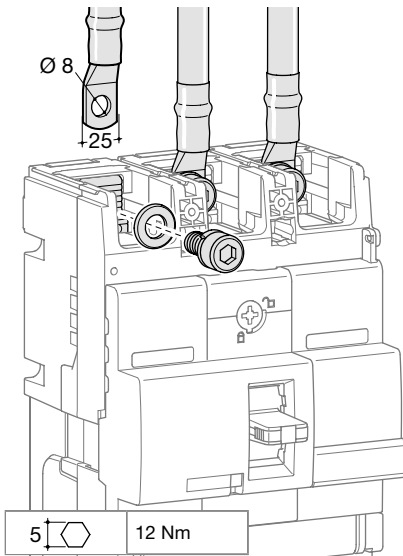
Commercial
 Distribution



Terminal covers for extended straight connections

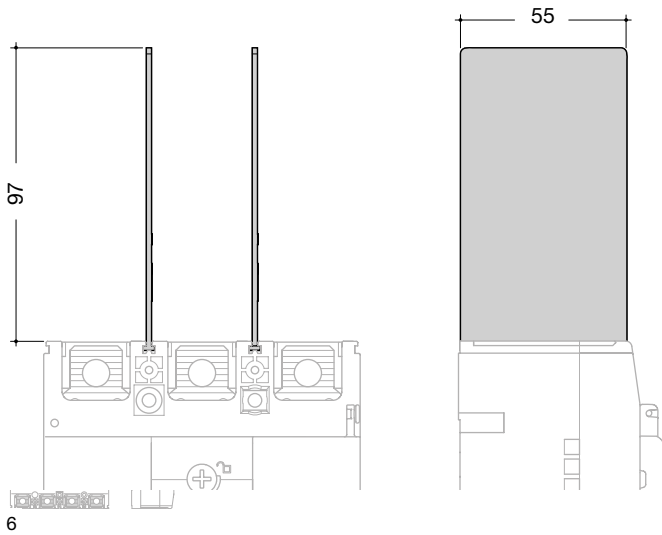


Connection with end lugs



Commercial
Distribution

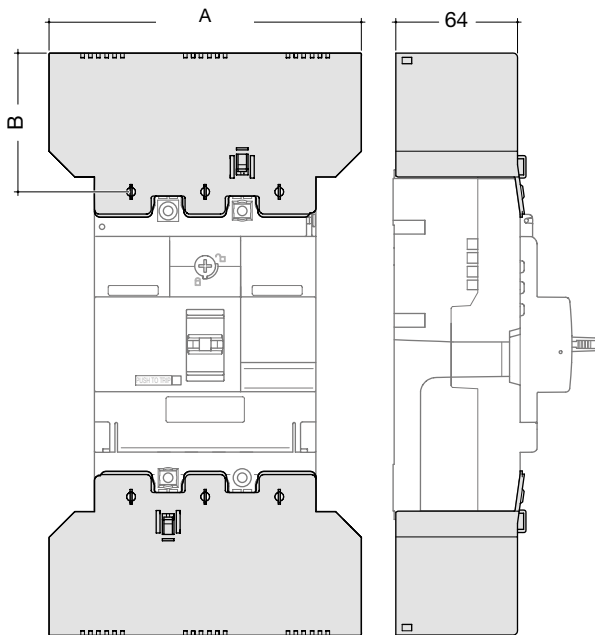
Interphase barriers



6

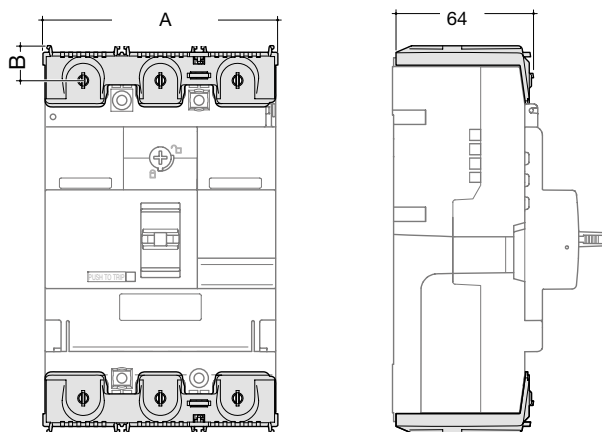
Accessories

Terminal cover for extended spreader connections



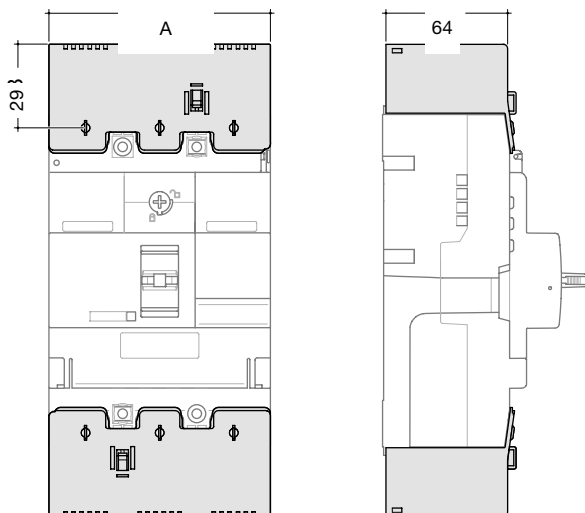
	A (mm)	B (mm)	C (mm)
3P	147.5	54.5	64
4P	196	54.5	64

Terminal cover for rear connections



	A (mm)
3P	105
4P	140

Terminal covers for collar terminals

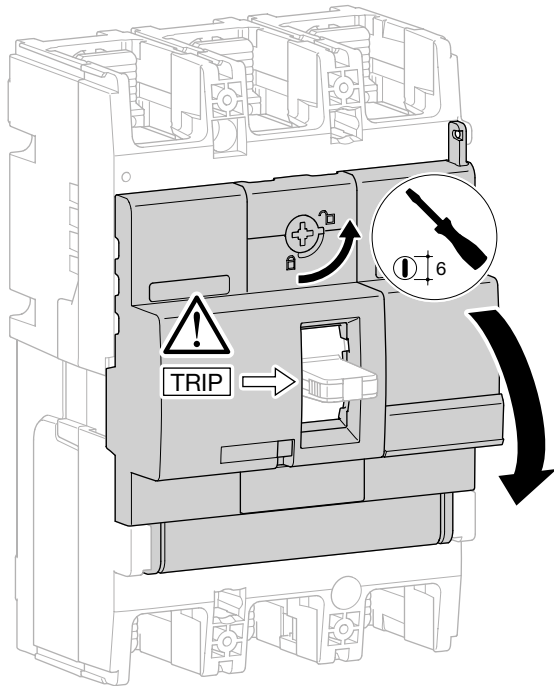


	A (mm)
3P	105
4P	140

Auxiliaries

Auxiliaries for MCCBs and moulded case switches

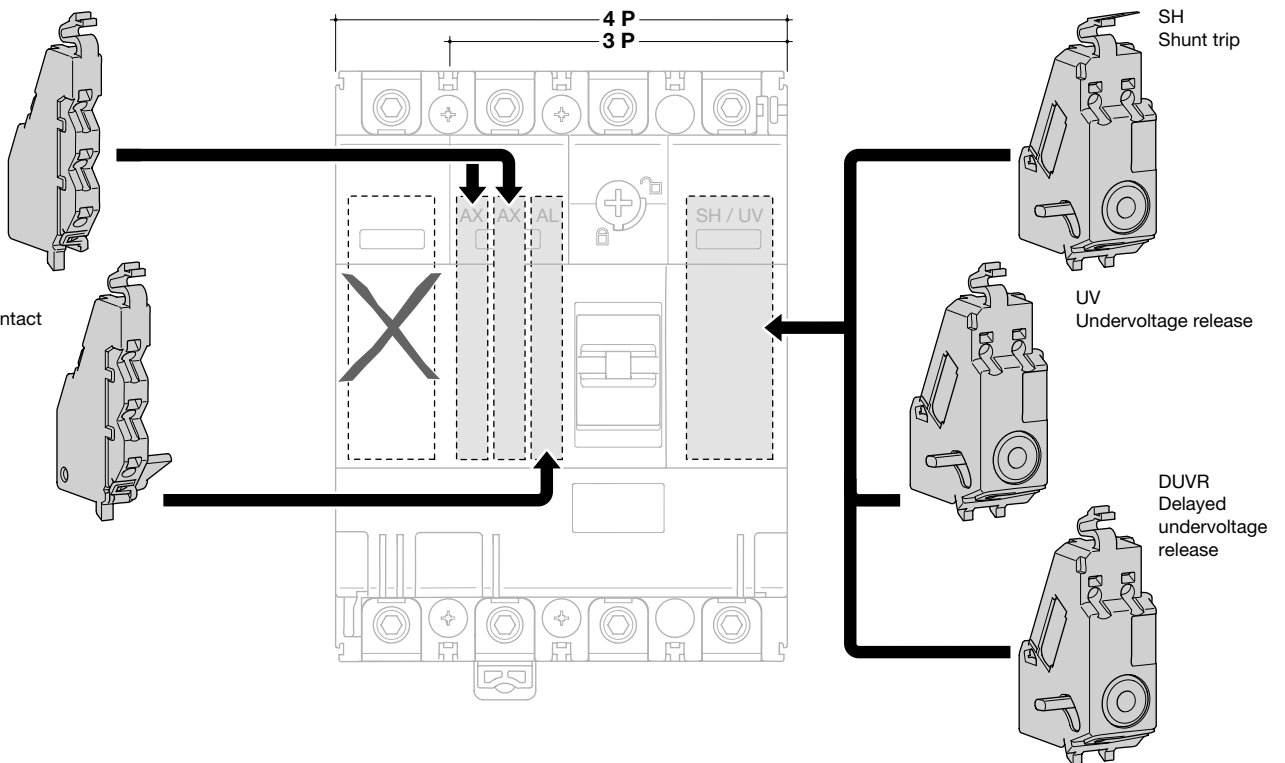
Commercial
Distribution



Mounting combination for auxiliaries and releases

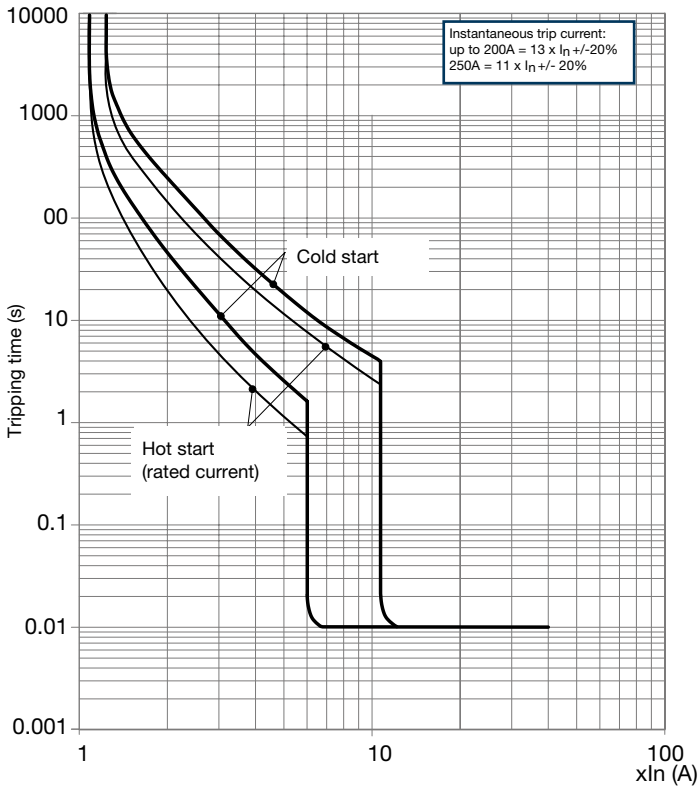
AX
Auxiliary contact

AL
Alarm contact



Tripping curve

MCCB x250

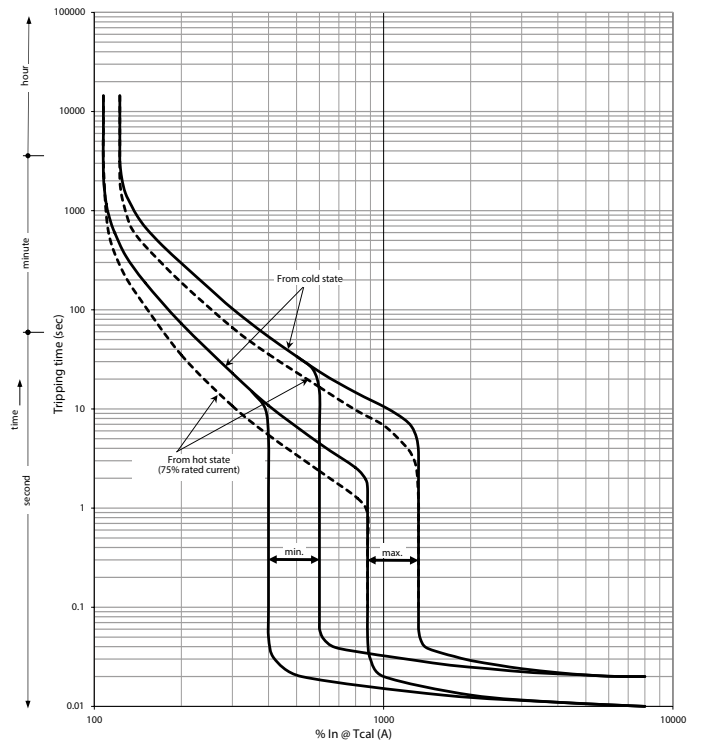


Earth fault loop impedance (Z_s) can be calculated from the formula $Z_s \leq \frac{230}{I_a} \times 0.95$

Where $I_a = I_n$ of MCCB x mag setting x 1.2

Tripping curve

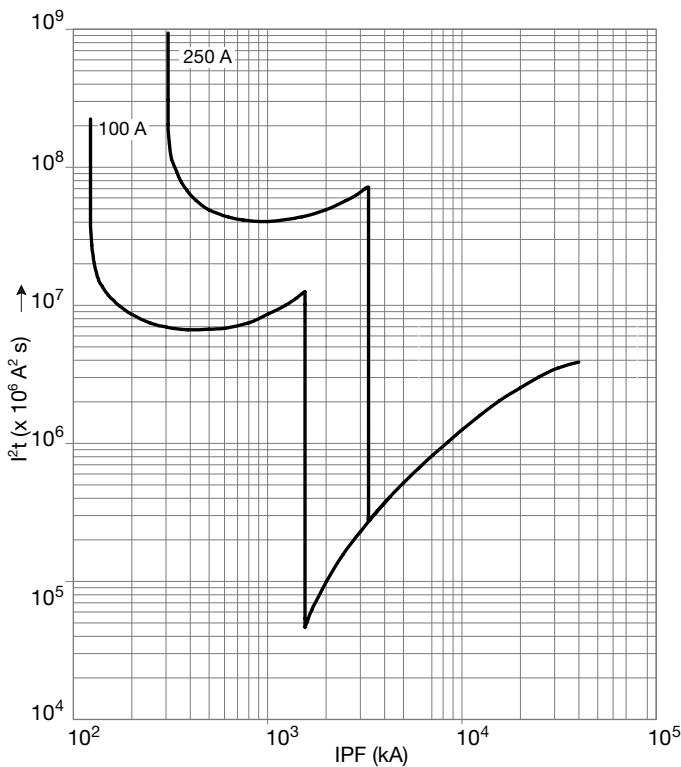
MCCB h250 TM



Commercial Distribution

Thermal constraint curve at 400V (Let-through energy)

MCCB x250



Current limiting curve at 400V (Let-through peak current)

MCCB x250

