

**Moulded case circuit breakers h1600, selection and protection**

Electronic trip unit LSI  
 - Long delay (thermal equivalent) adjustable:  
 $I_r = 0,4$  to  $1 \times I_n$   
 - short delay (magnetic equivalent) adjustable:  
 $2,5$  to  $10 \times I_r$   
 - time delay:  $0,1-0,2$  s

3 pole, 3 trip units,  
 4 pole, 4 trip units,  
 adjustable neutral  $0 - 50\% - 100\%$

Mechanical test button,  
 lockable settings.

**Connection:**

Directly on copper cable terminal,  
 with end lug max. width: 60 mm

Comply with IEC 60 947-2.

**Trip-free switches**

Allows tripping at distance using a voltmeterical trip unit (optional)

Comply with IEC 60 947-3.  
 AC 23A / DC 22A



HNF990H

Designation	Characteristics	In	Cat. ref.	
			3P	4P
<b>MCCBs h1600 50kA LSI</b>	breaking capacity Icu : 50 kA (400/415 V AC) Ics: 50 kA	1250A	<b>HNF980H</b>	<b>HNF981H</b>
	adjustable thermal $I_r = 0,4$ to $1 \times I_n$ adjustable magnetic $2,5$ to $10 \times I_r$ time delay: $0,1-0,2$ s  neutral setting 0, 50, 100%	1600A	<b>HNF990H</b>	<b>HNF991H</b>
<b>MCCBs h1600 70kA LSI</b>	breaking capacity Icu : 70 kA (400/415 V AC) Ics: 50 kA	1250A	<b>HEF980H</b>	<b>HEF981H</b>
	adjustable thermal $I_r = 0,4$ to $1 \times I_n$ adjustable magnetic $2,5$ to $10 \times I_r$ time delay: $0,1-0,2$ s  neutral setting from 0, 50, 100%	1600A	<b>HEF990H</b>	<b>HEF991H</b>
<b>Trip-free switches</b>	suitable for AC 22A / AC 23A Ue : 415 V AC Icw (0,3 s) = 20 kA	1250A	<b>HCF980U</b>	<b>HCF981U</b>
		1600A	<b>HCF990H</b>	<b>HCF991U</b>

### Indication contacts

- 1 changeover switch (ON/OFF): indicates the position of the MCCB is "open" or "close".  
- 1 changeover alarm contact: indicates MCCB tripping.

### Coil connection

Connection capacity:  
0,75 mm<sup>2</sup> flexible or rigid cables  
Optional connection cables.  
The cable capacity of the terminals is 0,5 to 1,25 mm<sup>2</sup>.

### Shunt trip

Remotes tripping of MCCBs or trip-free switches.  
Operating voltage:  
0,7 to 1,1 x Un

### Under voltage release

Allows the tripping of MCCBs or trip-free switches when voltage level drop between 35 and 70% of Un. Pick up voltage 0,85 x Un






### Direct rotary handle

- padlockable  
- equipped with front cover and handle  
- fixing without any additional screw.

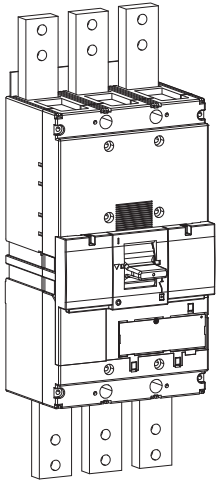
### Extended rotary handle

- IP 55  
- supplied complete with shaft and handle.

Rear connection: included

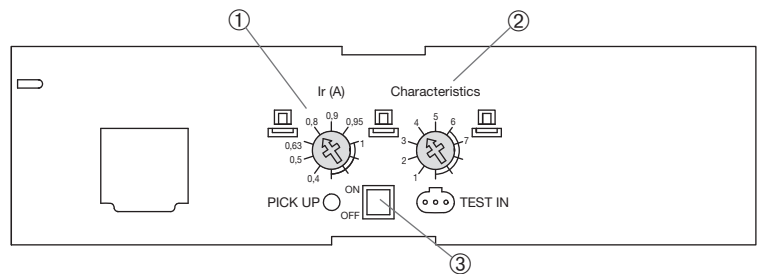
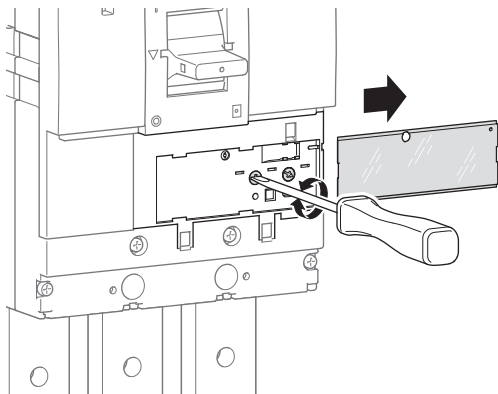
Designation	Characteristics	Cat. ref.
 HX C021H	<b>Auxiliary contacts</b> <b>AX</b> <b>AL</b> 1 changeover contact 250 V AC / 3A 125 V DC / 0,4A 1 NO + 1 NC	<b>HXC021H</b>
	1 changeover alarm contact 250 V AC / 3A 125 V DC / 0,4A 1 NO + 1 NC	<b>HXC024H</b>
 HX C024H	low level contact (ON/OFF) 125 V AC 1 NO + 1 NC	<b>HXC025H</b>
	low level alarm contact 125 V AC 1 NO + 1 NC	<b>HXC026H</b>
 HX C004H	<b>Shunt trips</b> <b>SH</b> 24 V DC	<b>HXF001H</b>
	48 V DC	<b>HXF002H</b>
	110 V DC	<b>HXF008H</b>
	100 - 120 V AC	<b>HXF003H</b>
	200 - 240 V AC	<b>HXF004H</b>
380 - 450 V AC	<b>HXF005H</b>	
 HX C014H	<b>Undervoltage releases</b> <b>UV</b> 24 V DC	<b>HXE011H</b>
	100 - 120 V DC	<b>HXE018H</b>
	200 - 240 V DC	<b>HXE019H</b>
	110 - 120 V AC	<b>HXE013H</b>
	220 - 240 V AC	<b>HXE014H</b>
380 - 415 V AC	<b>HXE015H</b>	
	<b>Delayed undervoltage releases</b> <b>DUVR</b> 24 V DC	<b>HXF051H</b>
	110 - 120 V AC	<b>HXF053H</b>
	220 - 240 V AC	<b>HXF054H</b>
	380 - 415 V AC	<b>HXF055H</b>
<b>Direct rotary handle</b>	padlockable handle, max Ø 8 mm	<b>HXF030H</b>
<b>Extended rotary handle</b>	padlockable handle, max Ø 8 mm	<b>HXF031H</b>
<b>Padlock</b>	to mount on MCCB for handle locking for 3 padlocks max Ø 8 mm	<b>HXF039H</b>
<b>Motor operators</b>	24 V DC	<b>HXF040H</b>
	200 - 230 V AC	<b>HXF042H</b>
<b>Interphase barriers</b>	set of 4 pieces	<b>HYD019H</b>
<b>Connection kit</b>	0,75 mm <sup>2</sup> set of 3 x 2 wires length: 1,30m	<b>HYA035H</b>

MCCBs



		220/240 V AC	380/415 V AC	660/690 V AC
<b>HNF</b>	I <sub>cu</sub> (kA)	100	50	25
	I <sub>cs</sub> (kA)	75	50	25
<b>HEF</b>	I <sub>cu</sub> (kA)	100	70	45
	I <sub>cs</sub> (kA)	75	50	34
<b>HCF</b>	I <sub>cm</sub> (kA)	-	45	-
	I <sub>cw</sub> (kA)	-	20 kA-0,3 s	-

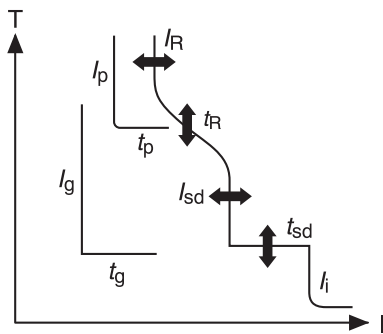
Electronic trip unit settings (LSI)



L - Long delay - protection against overloads: I<sub>r</sub> and t<sub>r</sub> settings

S - Short delay - protection against short circuits: I<sub>sd</sub> and t<sub>sd</sub> settings

I - Instantaneous - max. instantaneous threshold (< 10 ms) in case of short circuit: 2,5 to 10 x I<sub>r</sub>.



	① I <sub>r</sub> (A)	② I <sub>m</sub>	③ N
LSI	0,4 - 1 I <sub>n</sub>	2,5 - 10 I <sub>r</sub>	0% 50% 100 %

LSI	I <sub>n</sub> A				
	1250 - 1600 A				
	Long Time Delay		Short Time Delay		Inst
	I <sub>r</sub> (x I <sub>n</sub> )	t <sub>r</sub> (s)	i <sub>sd</sub> (x I <sub>r</sub> )	t <sub>sd</sub> (s)	I <sub>i</sub> (x I <sub>r</sub> )
① I <sub>r</sub> (x I <sub>n</sub> )	0,4	OK			
	0,5	OK			
	0,63	OK			
	0,8	OK			
	0,9	OK			
	0,95	OK			
	1	OK			
② Characteristics*	1	11s at 2 x I <sub>r</sub>	2,5	0,1	14 (max 12 x I <sub>n</sub> )
	2	21s at 2 x I <sub>r</sub>			
	3				
	4	5 s at 6 x I <sub>r</sub>	10	0,2	
	5	10 s at 6 x I <sub>r</sub>			
	6	19 s at 6 x I <sub>r</sub>			
	7	29 s at 6 x I <sub>r</sub>			
③ Neutral protection	0%				
	50%				
	100%				

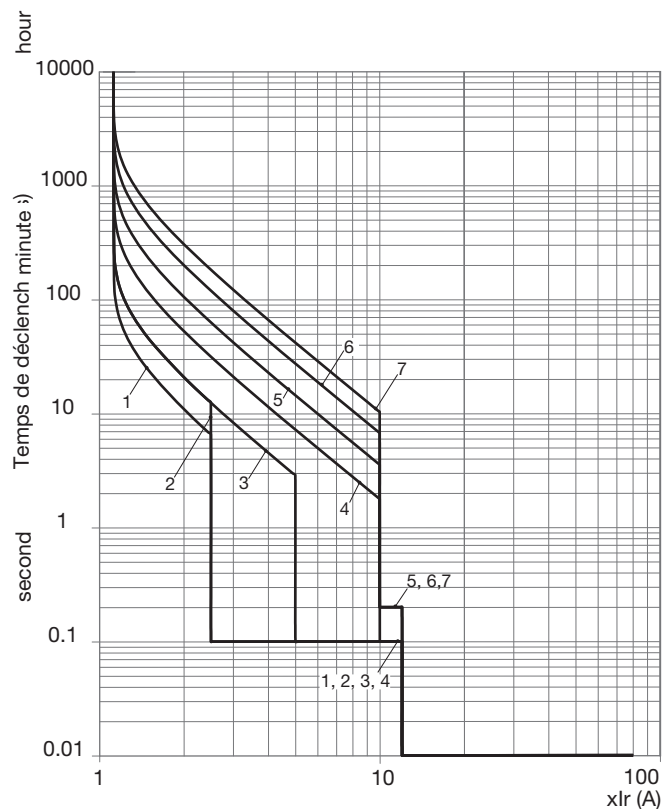
(\*) Characteristic 1 : use for generators protection.

Characteristic 2 to 4 - standard protection : options allow coordination optimisation with other products.

Characteristic 5 to 7 - motor protection: use positions according to motor starting characteristics.

Tripping curve

MCCB h1600 LSI



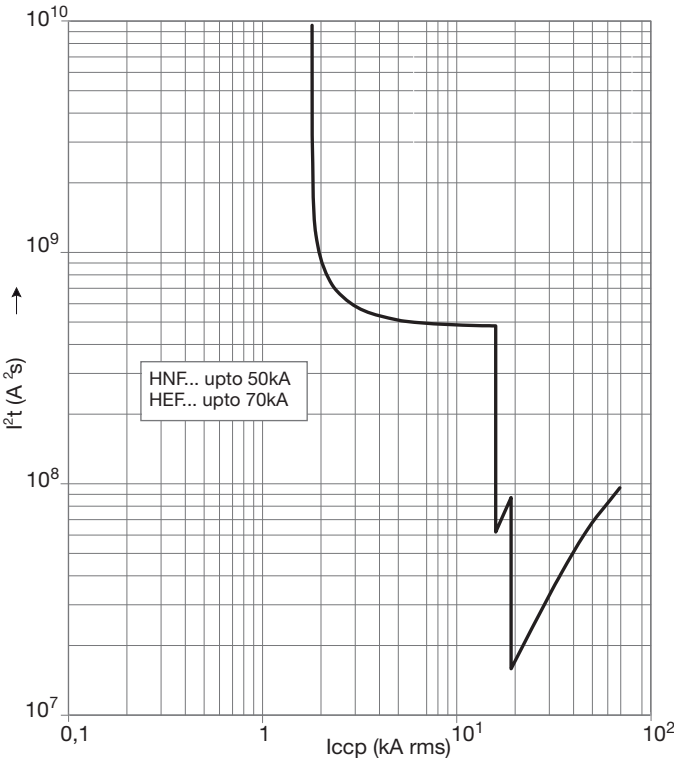
Electronic trip unit setting (LSI)

MCCBs 1250A and 1600A electronic

		$I_R$ (A)								
<b>LTD Pick-up current</b>		$I_R$	$x I_n$	0,4	0,5	0,63	0,8	0,9	0,95	1
<b>Characteristics</b>		No.		1	2	3	4	5	6	7
<b>Standard</b>	<b>LTD</b>	$t_R$	(s)	11	21	21	5	10	19	29
				200% x $I_R$			600% x $I_R$			
	<b>STD</b>	$I_{sd}$	$x I_R$	2,5		5	10			
		$t_{sd}$	(s)	0,1					0,2	
	<b>INST</b>	$I_i$	$x I_R$	14 (max : 12 x $I_n$ )						
<b>Optional</b>	<b>NP</b>	$I_N$	$x I_n$	0 - 0,5 - 1						
		$t_N$	(s)	$I_N = t_R$						

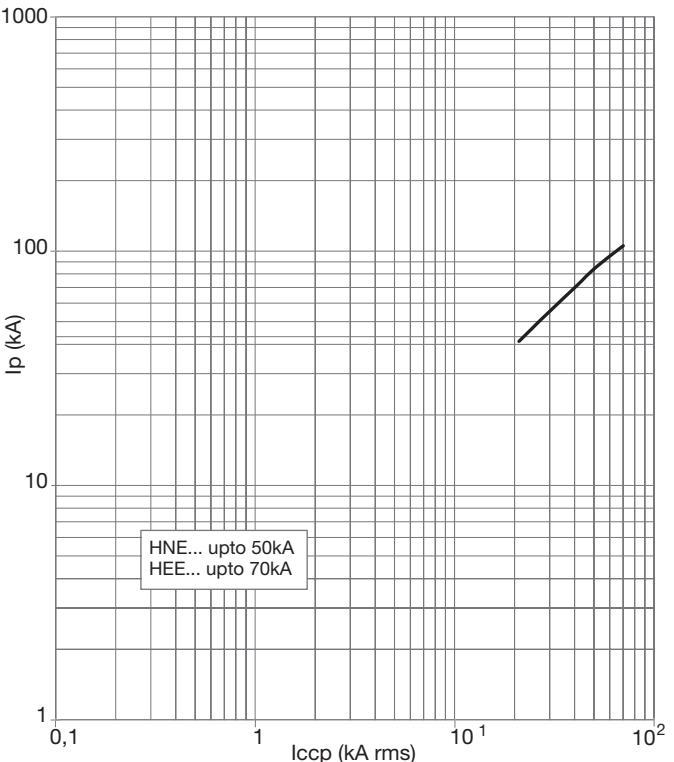
Thermal constraint curve at 400V (Let-through energy)

MCCB h1600



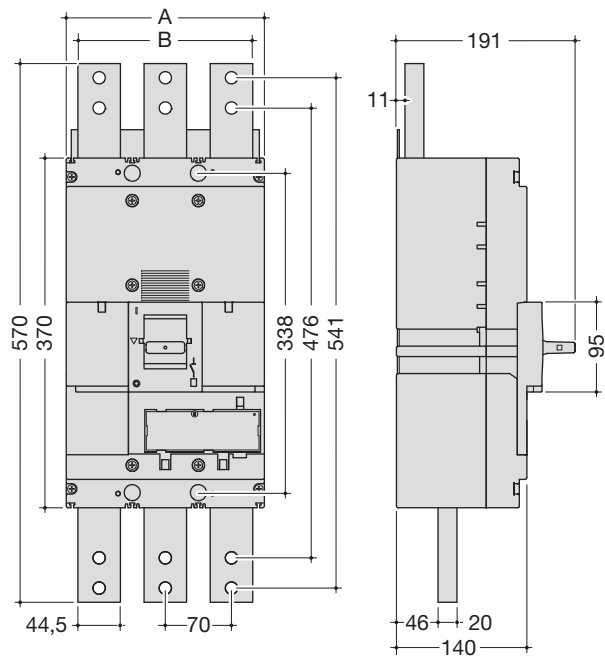
Current limiting curve at 400V (Let-through peak current)

MCCB h1600



Dimensions

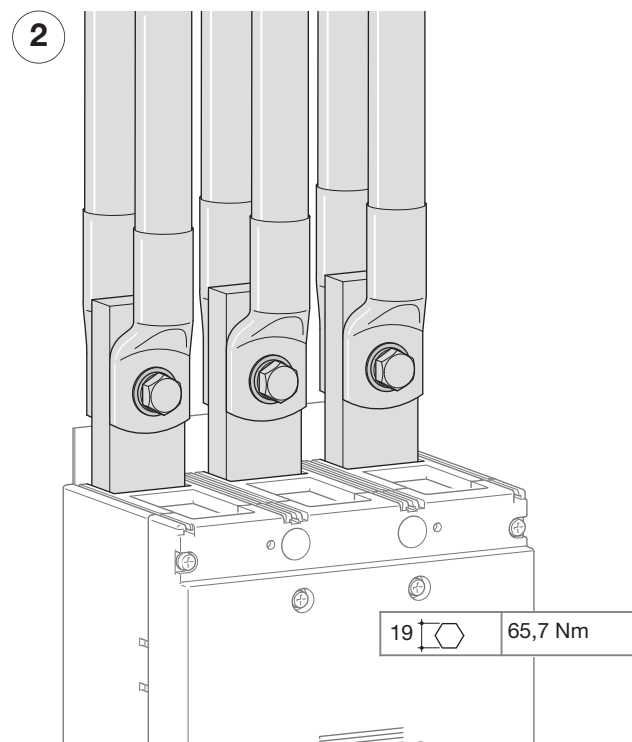
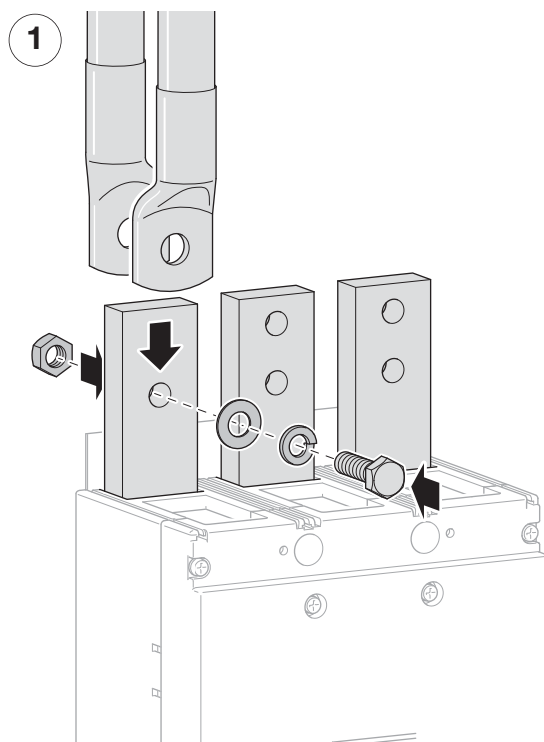
MCCBs



	A (mm)	B (mm)
3P	210	185
4P	280	255

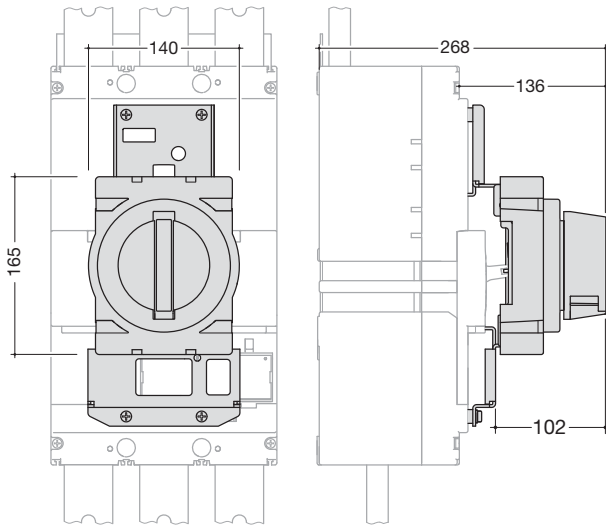
Connection

Connection with end lugs

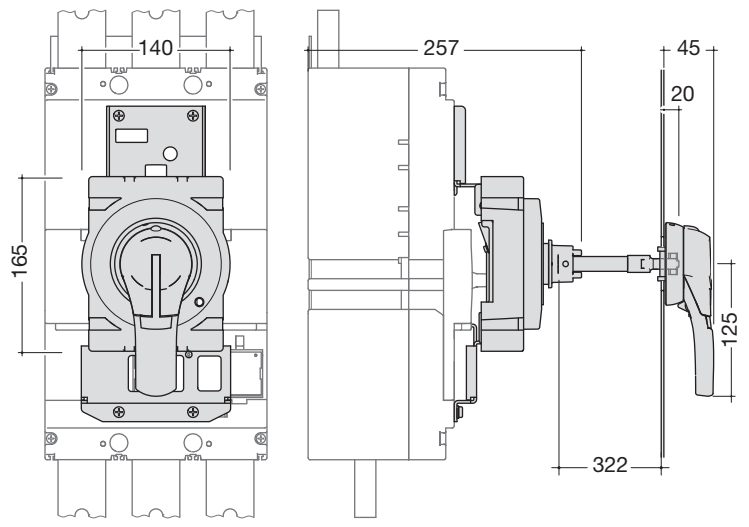


Accessories

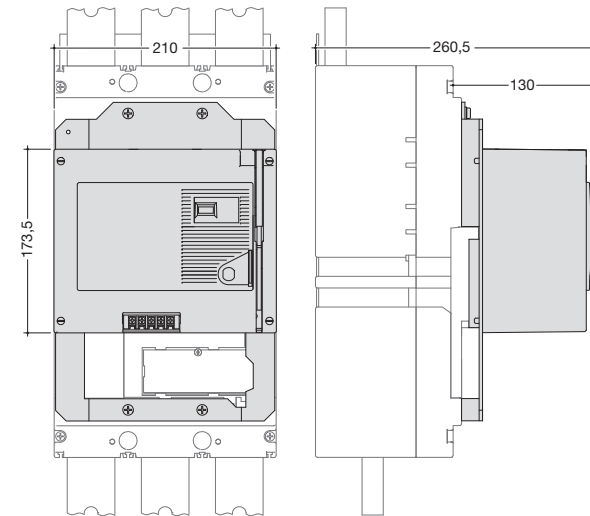
Direct rotary handle



Extended rotary handle

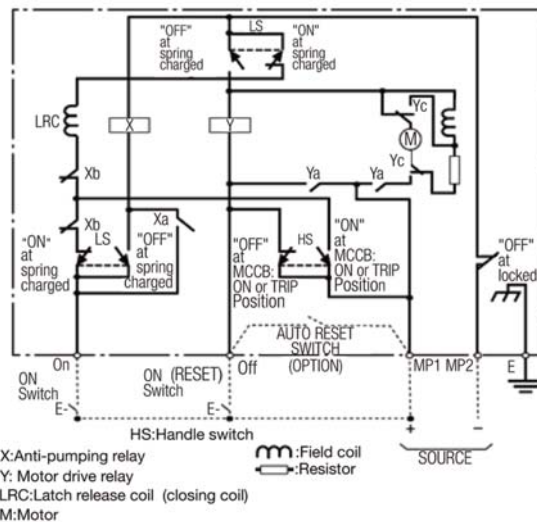


Motor operator



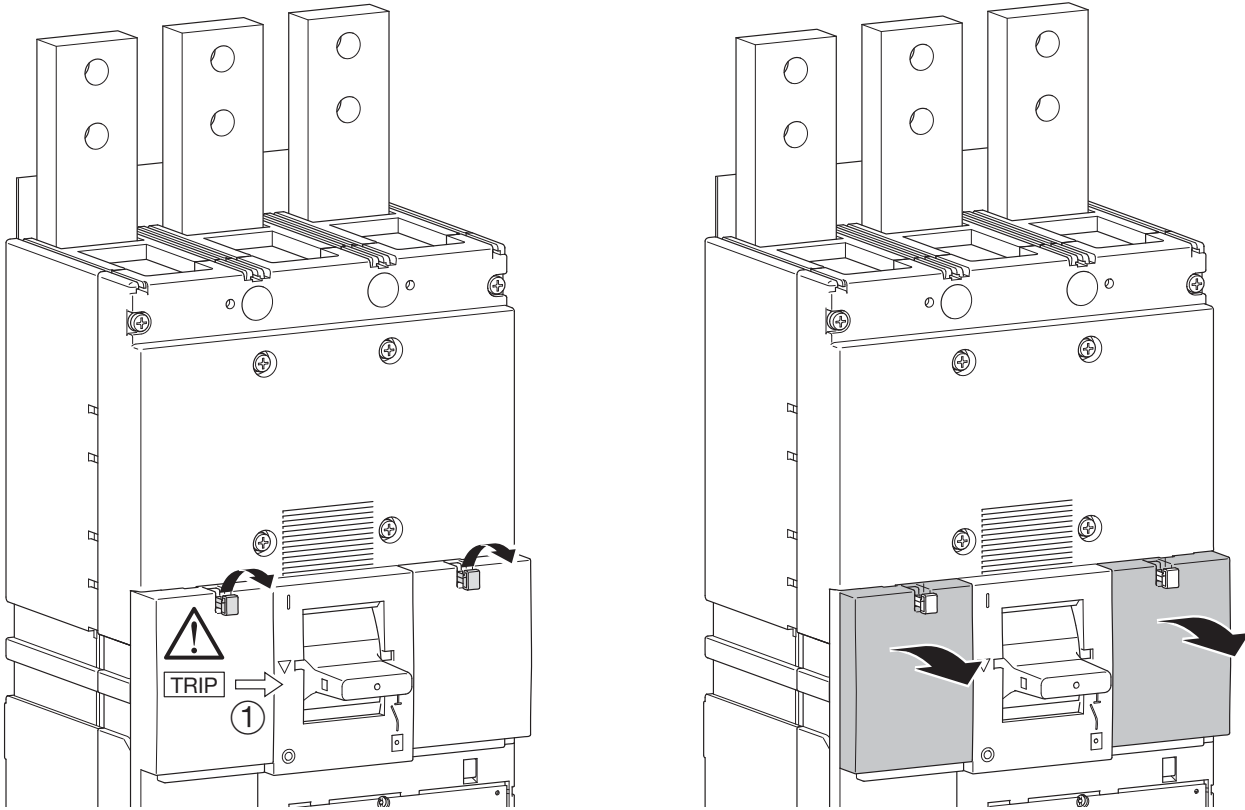
	HXF040H	HXF042H
Operating voltage	24V DC	200-230V AC
Operating current / starting current peak value (A)	24V DC	-/4,5 (ON) 4,0/12,0 (OFF, RESET)
	200-230V AC	- /1,2 (ON) 1,0/3,2 (OFF, RESET)
Operating time (s)	(ON)	0,06s
	(OFF)	3s
	(RESET)	3s
Power supply required	300VA min.	
Dielectric properties (1 min)	500V AC	1500V AC

Wiring diagram



**Auxiliaries**

**Auxiliaries for MCCBs and free tripping switches**



**Mounting combination for auxiliaries and releases**

