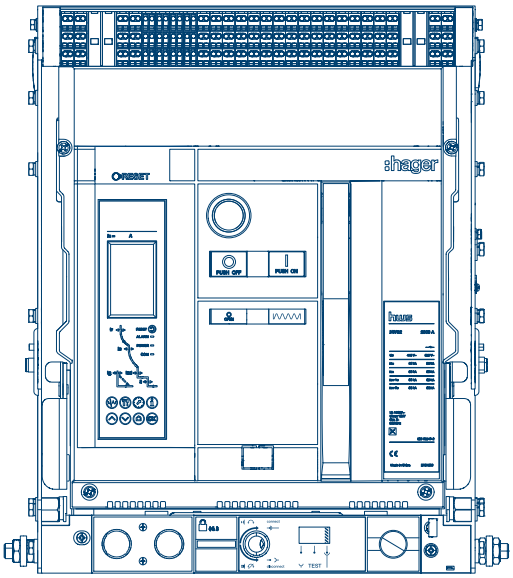
Technical catalogue

hws

HWS2 / HWS4



Air circuit breakers 630 A to 4000 A

DISCLAIMER:

While every effort has been made to ensure the reliability of the information at the time of publication, Hager cannot guarantee the accuracy of all information contained herein.

Corrections and changes, once verified, will be included in future releases.

1 hws circuit breakers range

1.1 General description

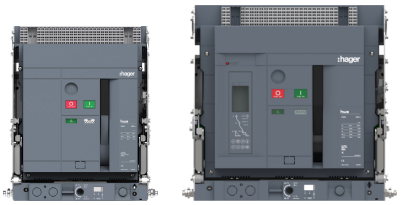
Our hws circuit breakers are designed for maximum safety, reliable performance and installation flexibility. With international certifications and a comprehensive range of accessories, they meet the needs of the most demanding applications.

Safety and compliance:

IEC 60947-2

- **Compliant with standards**: Our circuit breakers comply with IEC 60947 standards, ensuring maximum safety and proven reliability. All products are CE and CCC certified

Flexibility and adaptability:



- **Two optimised frame sizes:** Available with a current range of 630A to 4000A, our circuit breakers are suitable for a variety of diverse applications.
- **No de-rating up to 50°C:** Designed to operate efficiently even in high temperature environments.

Performance and reliability:

- **Icu = Ics = Icw (1sec):** Ensures total selectivity and optimum protection against high short circuit faults.
- **Breaking capacity adapted to various needs:** Our circuit breakers offer a breaking capacity adapted to a variety of needs, guaranteeing reliable protection.

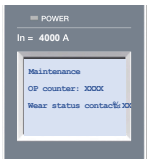
Easy installation and use:

- **Rotatable connections:** Facilitates connections to horizontal and vertical busbars, simplifying installation for panel builders.
- **Complete range:** Available in drawout or fixed versions, manual or electric operation, circuit breaker or disconnector version to meet all your needs.

Advanced protection:

- **Microprocessor based trip unit:** Offers LSI and LSIG versions with advanced protections, power and energy measurements.
- **Zone Selective Interlock (ZSI):** Provides intelligent discrimination for enhanced protection.

Accessories and easy maintenance:



- **Range of accessories:** Includes options for locking and interlocking, safety and security, as well as common accessories with the hw+ family for optimised inventory.
- **Contact wear status display:** Enables proactive maintenance and extended equipment life.

Communication and surveillance:

- **Compatible with Energy Management systems:** Incorporates RS485 Modbus communication for efficient monitoring and control.
- **Ground fault protection:** Offers increased safety with protection from 10% of nominal rating.

Microprocessor based electronic trip units are available in three types, designed to offer different levels of protection.

Type L

Designed for standard applications with L, S, I, G protection, this electronic trip unit has a user interface with settings dials.

Available in 2 versions, LSI and LSIG.

Type A

Enhanced by a LCD display with current measurement and L, S, I, G protection, this electronic trip unit can be installed in variety of applications .

Available in 2 versions, LSI and LSIG.

Type H

Designed for advanced applications of protection, alarm, measurement, control and inbuilt communication functions, this electronic trip unit has a user interface featuring touch controls completed by a large LCD display.

It is available in LSIG version.

These display the maximum instantaneous current flowing through the circuit breaker in real time.

hws circuit breakers range
General description

hws air circuit breakers are available:

- in two sizes HWS2 and HWS4,
- in 3 and 4 poles,
- from 630 A to 4000 A,
- in fixed and drawout versions.

The range offers high-performance protection with a breaking capacity up to 85 kA

		Rated current (In)								
	Icu	630 A	800 A	1000 A	1250 A	1600 A	2000 A	2500 A	3200 A	4000 A
HWS2	M: 50 kA	✓	✓	✓	✓	✓	✓			
	E: 66 kA	✓	✓	✓	✓	✓	✓			
HWS4	E: 66 kA						✓	✓	✓	
	S: 85 kA						✓	✓	✓	✓

1.2 Key benefits hws

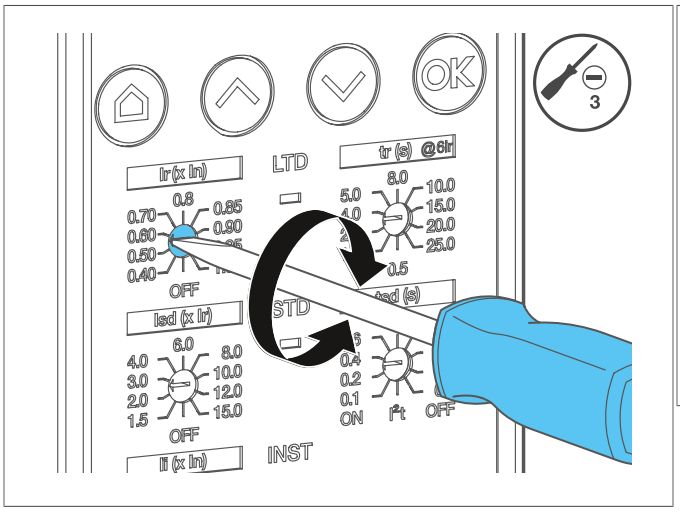
The new generation of hws air circuit breakers and switch disconnectors offers several key benefits.

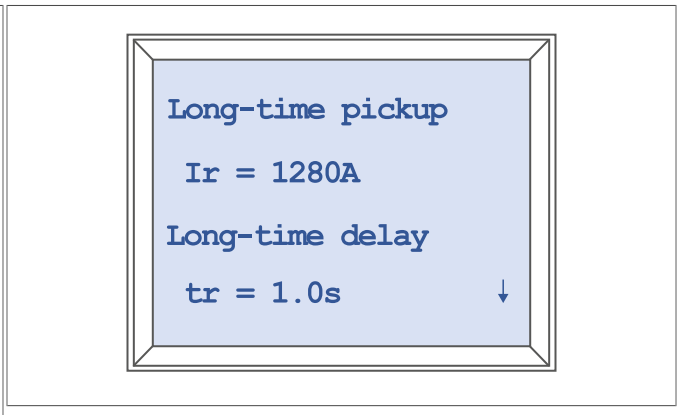
Benefit from the Type A trip unit's dynamic display.

The Type A trip unit's dynamic LCD display makes commissioning, operation and maintenance of your circuit breaker easier.

- **Dynamic settings display**

For Settings, the LCD display gives a precise indication of the setting values entered in amps and seconds.



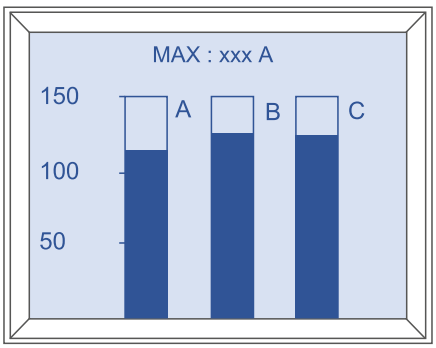


- **Settings viewable at all times**

The navigation buttons on the electronic trip unit allow switching between screens displaying all possible settings of the electronic trip unit.

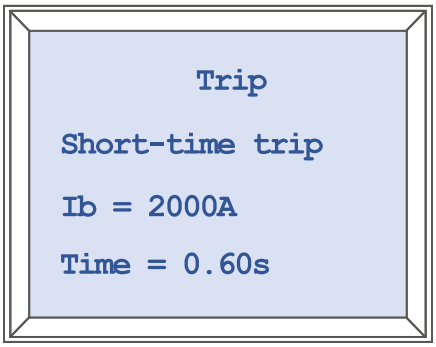
- **Dynamic load display**

The main screen displays the maximum current flowing through the circuit breaker for the phase concerned.



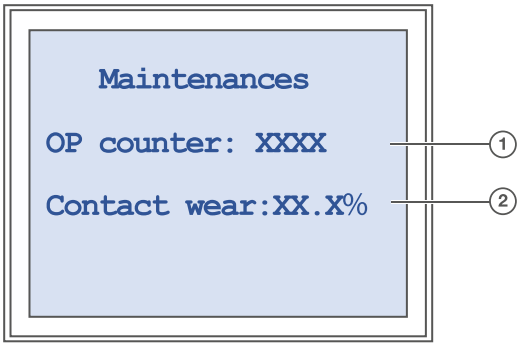
- **See the trip cause**

After each tripping, a detailed message indicates the trip cause and trip details.



- **Maintenance indicator**

It is possible to view the wear status of the power contacts and thus carry out maintenance operations on the circuit breaker.



① Indicates the number of operations on the circuit breaker.
② Indicates the wear rate of the power contacts.
Example: If the rate is 40, it indicates that the contacts are 40% worn.

- **Zone Selective Interlock (ZSI)**

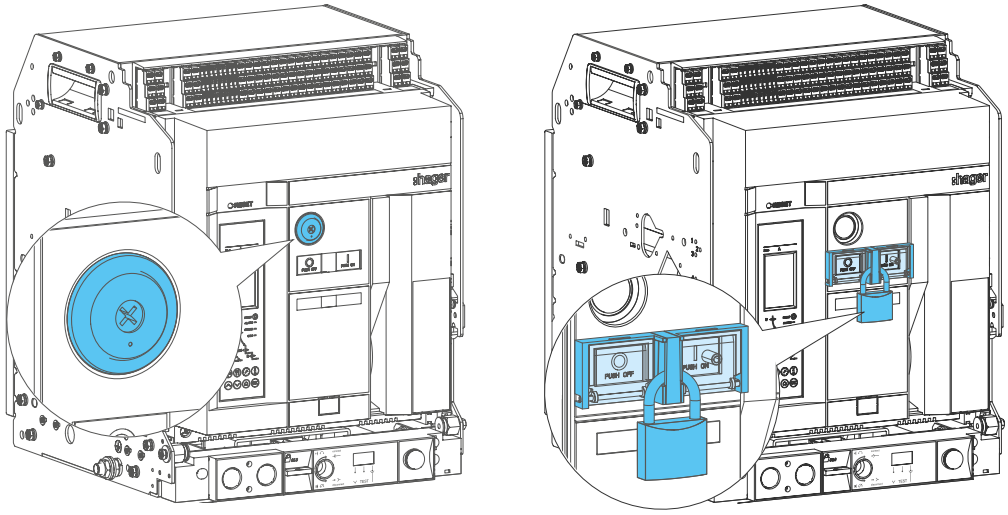
Provides intelligent discrimination for enhanced protection. This helps to limit the electro-dynamic stress on the installation in case of a short circuit fault or earth fault. The devices, conductors, busbars and busbar insulation and can thus benefit from this limitation.

Quick and easy installation of the key locks

The installation of key locks on the front of the circuit breaker is very easy.

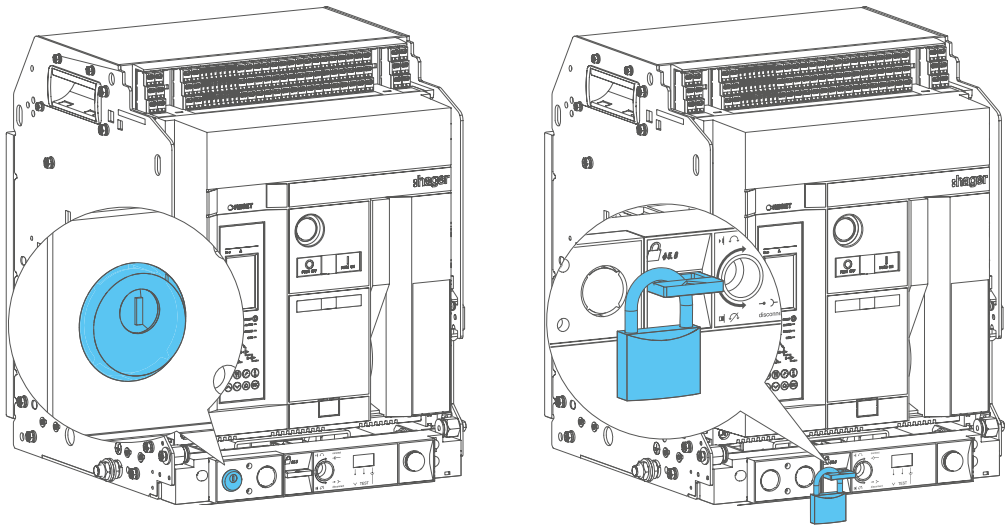
A single screw is enough to mount the OFF Locking Key (OLK) accessory on the front of the circuit breaker.

This accessory is used to lock the OFF Button or to have an interlocking between several circuit breakers.



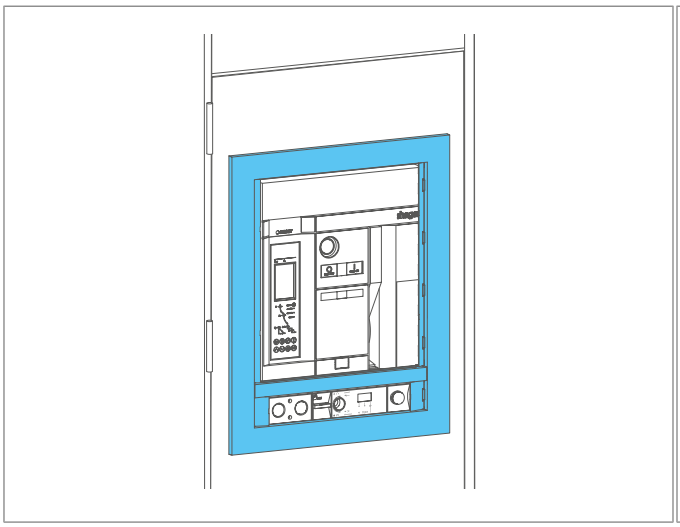
The chassis position locking system (CL), which is located on the chassis, offers the possibility of installing up to 2 cylindrical key locks.
Its easy installation saves time when fitting the locks.
This accessory can be used to lock the circuit breaker (moving part) in the Connected, Test or Disconnected position inside its chassis.

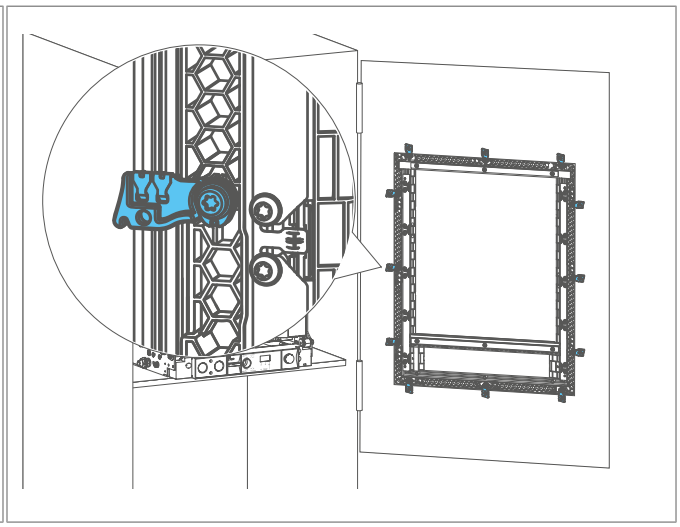
Locking can also be done using 1 to 3 padlocks with the tab located alongside.



Quick-to-mount DF door flange

The door flange of the hws range includes clamps at the back, enabling quick, tool-free installation. It's also no longer necessary to drill holes on the enclosure door, saving time and effort.

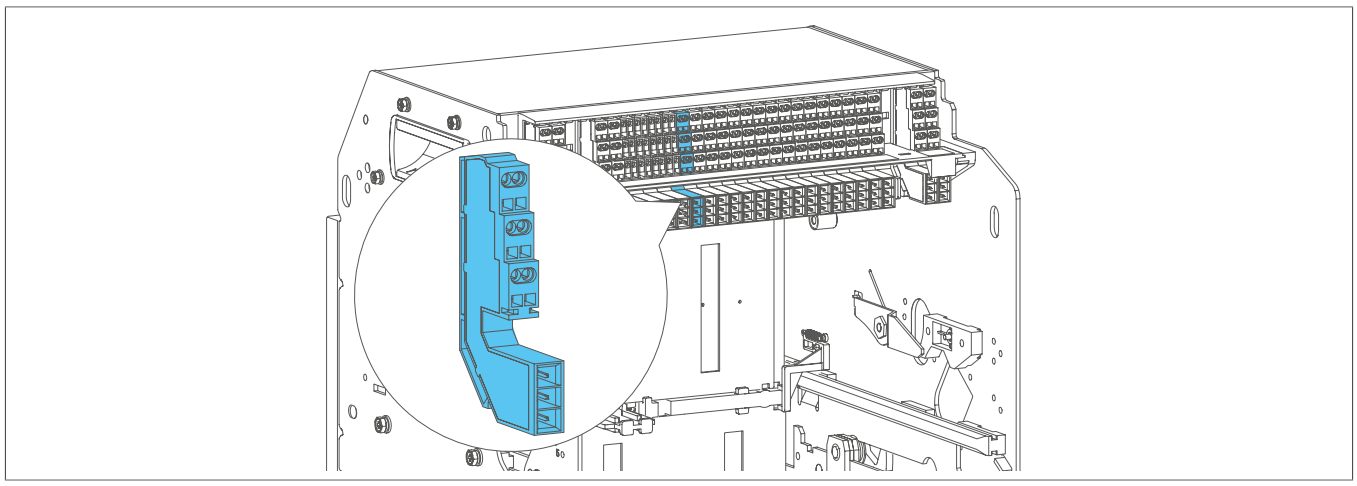




Screw-less terminal block connections for faster wiring of accessories

A connection terminal block is available to connect the various accessories to the circuit breaker.

- saves time: wiring is quick, easy and tool-free.
- safer: cable connection is ensured.
- test point: used to check for the presence of voltage with a voltmeter.
- Easy to connect and disconnect: the terminal can be released quickly and easily with a screwdriver.



1.3 Range overview

The hws range is equipped with circuit breakers and switch disconnectors.
Circuit breakers have an electronic trip unit.
switch disconnectors do not have an electronic trip unit.

HWS2 circuit breakers

3-pole

4-pole

HWS2 switch disconnectors

3-pole

4-pole

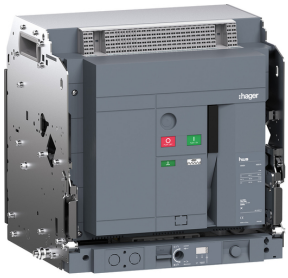
HWS4 circuit breakers

3-pole

4-pole

HWS4 switch disconnectors

3-pole

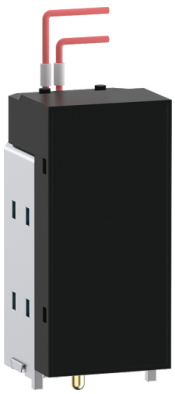


4-pole

Accessories

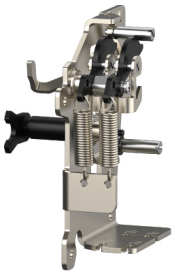
Connection accessories

Control accessories



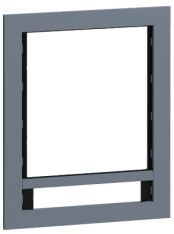
Signalling accessories

Interlocking accessories



Connection accessories

Protection accessories



Electronic trip units

Type L - LSI

Type L - LSIG

Type A - LSI

Type A - LSIG

Type H - LSIG

2 hws circuit breakers and switch disconnectors

2.1 Selection guide

Introduction to circuit breaker functions

Characteristics of the circuit breaker

Rated current In (A)	This is the maximum value of current that the circuit breaker can permanently withstand. This value is always stated for an ambient temperature (50 °C) in accordance with standard IEC 60947–2. If this temperature is higher, the operating current must be reduced.
Rated operational voltage Ue (V)	This is the voltage at which the circuit breaker has been designed to operate. The value provided is usually the maximum value.
Rated insulation voltage Ui (V)	This value indicates the insulation performance of the device. The dielectric test voltages (power frequency, impulse) are established based on this value.
Impulse withstand voltage Uimp (kV)	This value indicates the capacity of the device to withstand transient overvoltages such as lightning.
Rated ultimate short-circuit breaking capacity Icu (kA)	This is the maximum short circuit current that a circuit breaker can break for a given voltage and phase angle without being damaged. Tests are carried out according to the sequence O – t – CO. O represents an automatic tripping operation, t an interval of time and CO a closing operation followed by an automatic tripping operation. After the test, the circuit breaker must continue to provide a minimum level of safety (insulation, dielectric strength).
Rated service short-circuit breaking capacity Ics (kA)	This value is expressed in kA or as a percentage of Icu. The circuit breaker must be able to function normally after having cleared the Ics current three times according to the sequence O-t-CO-t-CO.
Rated short-time withstand current Icw (kA)	This is the short circuit current that a category B circuit breaker is able to withstand for a defined period of time without altering its characteristics. This value is intended to provide discrimination between upstream and downstream devices. The circuit breaker in question can remain closed while the fault is cleared by the downstream device.
Rated short-circuit making capacity Icm (peak kA)	This is the maximum current a device can establish at its rated voltage under standard conditions. Devices without a protection function, such as switches, should be capable of withstanding short-circuit currents with a value and duration resulting from the action of the associated protection device.

Switch disconnector protection

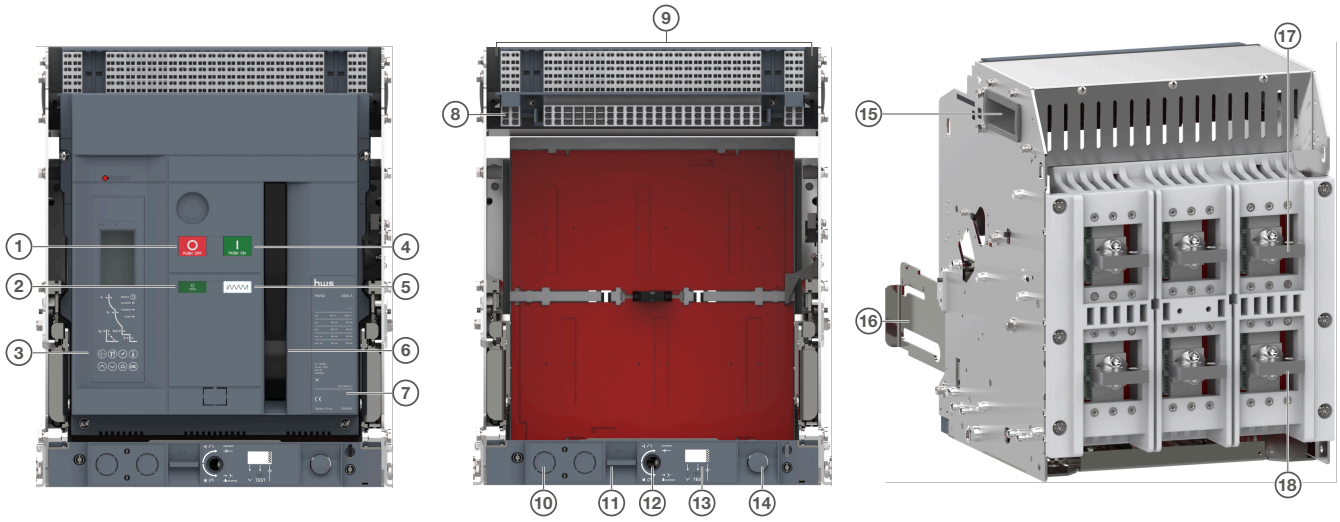
The hws switch disconnector is adapted to switching loads as per AC-22A and AC-23A. It guarantees the disconnection of the circuit which can be secured by the locking accessories available in the hws range.
Protection against overload and short circuit must be provided by a circuit breaker upstream of the switch disconnector and in compliance with installation standards.
The break is clearly visible through the status indicator.

Size		HWS2 - M	HWS2 - E	HWS4 - E	HWS4 - S
Version		fixed, drawout			
Number of poles		3-pole, 4-pole (left neutral as standard)			
Standard		IEC 60947-2 (circuit breaker), IEC 60947-3 (switch disconnector) / GB 14048.2			
Rated operational voltage	Ue (V)	690 V AC			
Rated insulation voltage	Ui (V)	1000 V AC			
Impulse withstand voltage	Uimp (kV)	12			
Pollution degree according to IEC 60947-1		4			
Frequency		50 / 60 Hz			
Selectivity category according to IEC 60947-2		B (circuit breaker), AC23A (switch disconnector)			
Rated current size	In Max (A)	2000 A		4000 A	
Rated frame size current	In (A) at 50°C	630 / 800 / 1000 / 1250 / 1600 / 2000		2000 / 2500 / 3200	2000 / 2500 / 3200 / 4000
Rated ultimate short-circuit breaking capacity	Icu 440 V (kA)	50	66	66	85
	Icu 690 V (kA)	42	55	55	75
Rated service short-circuit breaking capacity	Ics 440 V (kA)	50	66	66	85
	Ics 690 V (kA)	42	55	55	75
Short-time withstand current rating capacity	Icw 1 sec 440 V (kA)	50	66	66	85
	Icw 1 sec 690 V (kA)	42	55	55	75
	Icw 3 sec 440 V (kA)	36	50	55	66
	Icw 3 sec 690 V (kA)	36	50	55	66
Rated making capacity	Icm 440 V (kA)	105	145	145	187
	Icm 690 V (kA)	88	121	121	165
Break time (ms) (time between tripping order and arc extinction)		< 25 ms			
Closing time (ms)		< 60 ms			
Mechanical durability		12000		10000	
Electrical endurance (maintenance free)	440 V	8000		8000	
	690 V	4000		4000	
Dimension: W × H × D (Width × Height × Depth) (mm)	3P drawout	347×450×406.5		440×450×406.5	
	4P drawout	442×450×406.5		566×450×406.5	
	3P fixed	368×415.5×308		461×415.5×308	
	4P fixed	463×415.5×308		587×415.5×308	

Technical specifications: Switch disconnector version according to IEC 60947-3			
Rated frame size current	In (A)	630 / 800 / 1000 / 1250 / 1600 / 2000 / 2500	2500 / 3200 / 4000
Short-time withstand current rating capacity	Icw 1 sec @ 440 V (kA)	66	85
	Icw 1 sec @ 690 V (kA)	55	75
	Icw 3 sec @ 440 V (kA)	50	66
	Icw 3 sec @ 690 V (kA)	50	66
Rated making capacity	Icm @ 440 V (kA)	145	187
	Icm @ 690 V (kA)	121	165

2.2 Technical specifications

Descriptions of the circuit breakers and switch disconnectors



1. OFF push button
2. Contact opening and closing indicator
3. Electronic trip unit
4. ON push button
5. Charging spring status indicator
6. Charging handle
7. Type label
8. Connection interface
9. TB Terminal blocks
10. Locking of the circuit breaker position using CL key locks
11. Locking of the circuit breaker by padlock in the connected, test or disconnected position and position acknowledgement button
12. Place to insert rack-in/rack-out handle
13. Position indicator
14. Rack-in/rack-out handle storage
15. Lifting handle
16. Guide rail
17. Top connection
18. Bottom connection

Compliance with standards

hws air circuit breakers and the related auxiliary devices comply with 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

Pollution Degree
hws air circuit breakers are certified for operation in pollution degree 4 environments as defined by IEC standard 60664-1.

Temperature
hws circuit breakers can be used at temperatures between -25 °C and 70 °C.
In the case of ambient temperatures above 50°C, the devices must be derated (see Installation and operating conditions).
The acceptable storage temperature range in the original packing is from -40°C to 85°C for a circuit breaker without trip unit.
The acceptable storage temperature range in the original packing is from -25°C to 85°C for a circuit breaker with trip unit.

Humidity
hws air circuit breakers can be used in an atmosphere with a relative humidity of 45 to 85% max.

Altitude
hws circuit breakers can be used without derating up to an altitude of 2000 m. beyond this, refer to the values shown (see Installation and operating conditions).

Vibration
hws air circuit breakers are resistant to mechanical vibration.
They meet the requirements of 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) for 90 minutes

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

Shocks
hws air circuit breakers can withstand shocks with an acceleration of 200 m/s2 (20G) max.

Environment
hws air circuit breakers must be used in an environment without excess water vapour, oil vapour, dust or corrosive gases.
Without sudden temperature fluctuations and without condensation.

With the following levels of chemical compounds:

- Ammonia (NH3): 0.5 ppm max.
- Hydrogen sulphide (H2S)/sulphur dioxide (SO2)/hydrogen chloride (HCl): 0.1 ppm max.
- Chlorine (Cl2): 0.05 ppm max.

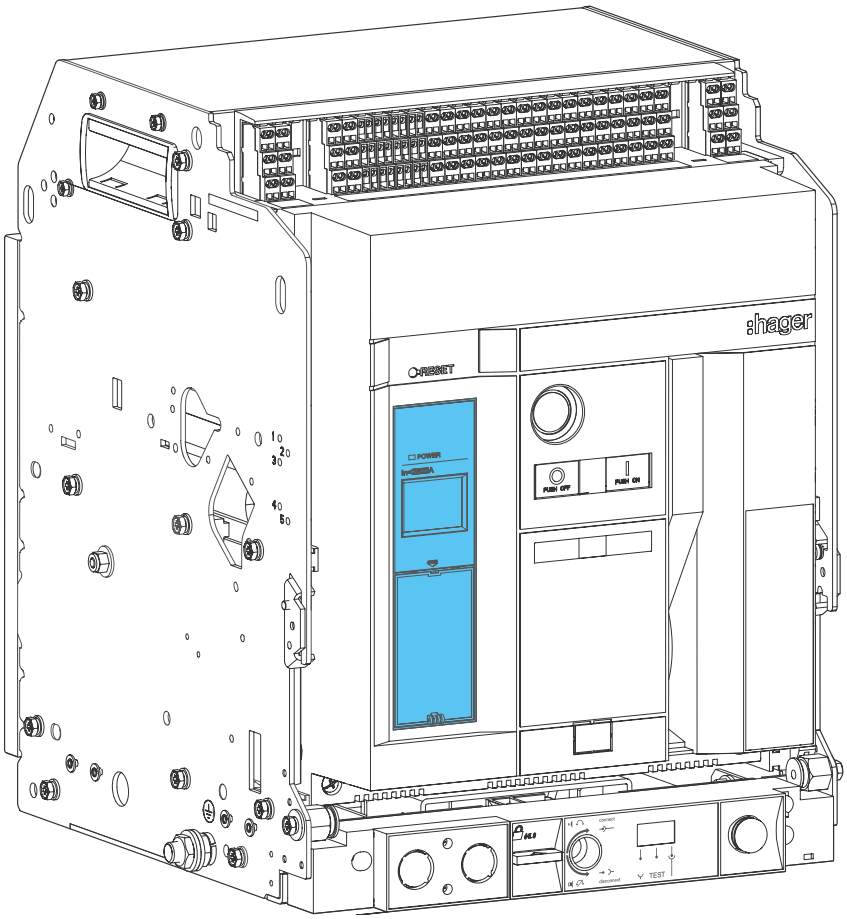
IP rating
The protection rating can be increased to IP20 by installing DF door flanges on the cut-out of the electrical cabinet's door.

3 Electronic trip units

3.1 L, A type trip unit

3.1.1 General description

hws circuit breakers are equipped with a trip unit on the front to protect against overloads, short circuits and earth faults.
With or without a display, the trip unit is equipped with dials to configure the protection parameters and monitor proper operation.
Type A (with display) and type L (without display) trip units are available in two versions: LSI and LSIG.



The standard functions are indicated in the following table.

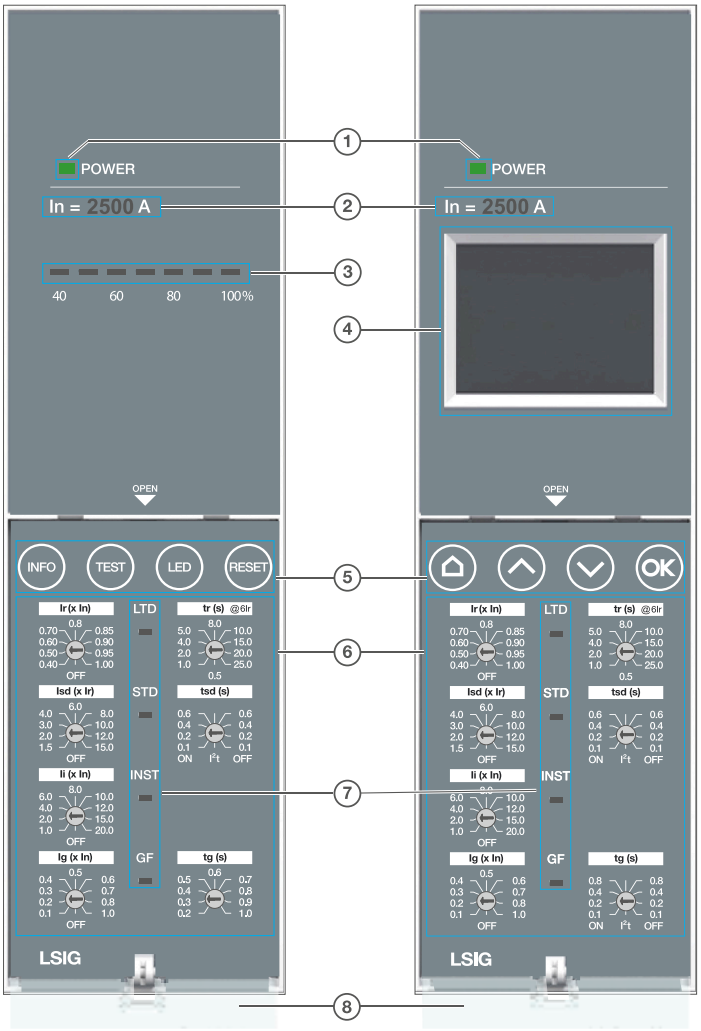
Standard functions	Type L	Type A
Long Time Delay protection against overcurrent (L) with time delay (Tr)	✓	✓
Short delay overcurrent protection (S) with time delay (Tsd)	✓	✓
Instantaneous protection against overcurrent (I)	✓	✓
Earth fault protection (G) with time delay (Tg)	✓[1]	✓[1]
Neutral protection	✓	✓
Thermal memory for overload protection	✓	✓
Instantaneous protection trip test	✓	✓

[1] Only for LSIG version

Electronic trip units
L, A type trip unit

Standard functions	Type L	Type A
Automatic analysis and conformity check of each indicator LED	✓	✓
Autodiagnosis of the backup function	✓	✓
Trip history	✓	✓
Autoprotection at closing on short circuit fault (MCR)	✓	✓
Load monitoring	-	✓
Overload pre-alarm	-	✓
Zone Selective Interlocking (ZSI)	-	✓

The following features are common to all trip unit versions without display (Type L) and with display (Type A):



1. Operation indicator light
2. Rated current value In of the circuit breaker
3. Signal lights indicating percentage of charge (Ir)
4. Display
5. **Type L**: 4 function keys (information, test, self-test, fault clearing)
   Type A: 4 function keys (back, up, down, confirm)
6. Setting dials of the trip unit
7. LSI or LSIG indicator lights depending on version
8. Trip unit cover

Information

The electronic trip unit must be powered in order for it to perform its protection functions. It is powered as long as a minimum current of 40% of the nominal current In passes through the circuit breaker.

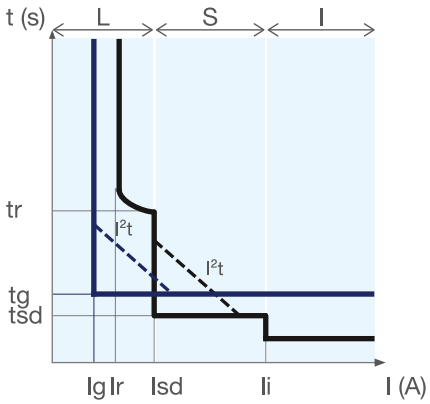
Nevertheless, it is strongly recommended that an external 240 V AC power supply be connected to terminal block TU (P1,P2) to guarantee optimal operation of the trip unit

3.1.2 List of protection devices

The trip unit protects against overcurrent and earth faults for all types of electrical distribution in accordance with the requirements of the standards IEC 60947-1 and 60947-2.

Protection system

- Long delay against overcurrent - **L**: Overload protection
- Short delay against overcurrent - **S**: Protection against low current short circuits
- Instantaneous against overcurrent - **I**: Protection against high current short circuits
- Earth fault - **G**: Phase-to-earth fault protection
- Neutral - **N**: Protection against overloads and short circuits which may flow through and damage the neutral conductors.



L	Ir	Long time delay protection threshold against overcurrent
	tr	Long time delay against overcurrent
S	Isd	Short time delay protection threshold against overcurrent
	tsd	Short time delay against overcurrent
	I^2t ON/OFF	Short time delay protection I^2t curve against overcurrent (activated/deactivated)
I	Ii	Instantaneous protection threshold against overcurrent
G	Ig	Earth-fault protection threshold
	tg	Earth-fault protection time delay
	I^2t ON/OFF	Earth-fault protection I^2t curve (activated/deactivated)
N	N	On 3P circuit breakers, protection can be obtained by connecting an external neutral pole (N).

Protection according to ANSI	Code
L	ANSI 49
S	ANSI 50TD/51
I	ANSI 50
G	ANSI 50N TD/51N

In addition to Instantaneous protection, all trip units include MCR protection (Making Current Release). This guarantees immediate tripping of the hws circuit breakers in cases of closing operation on a short-circuit.

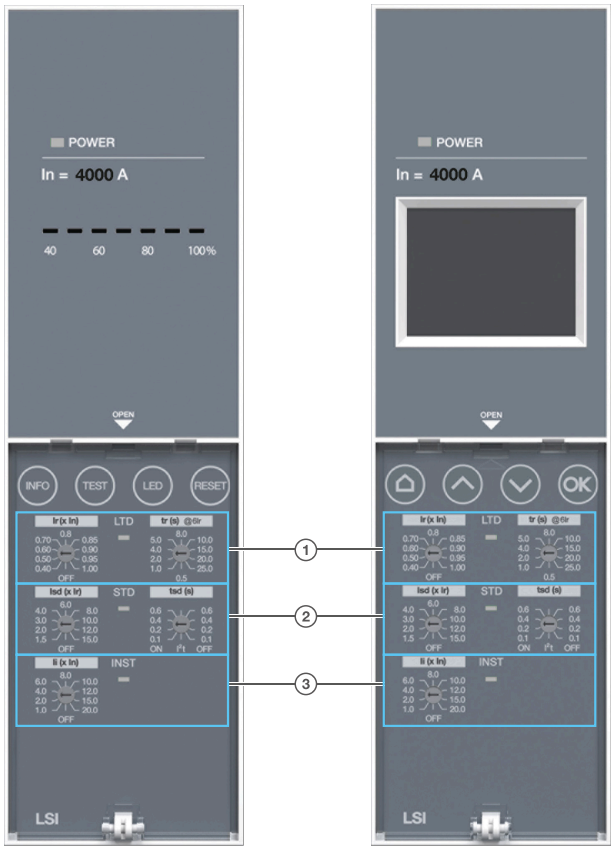
Protection setting
The protection settings can be modified using the dials and the display depending on the version.
All protection functions are based on the RMS value of the current, thus taking into account the presence of current harmonics.
The wide range of protection curve setting options facilitates coordination in terms of selectivity.

3.1.3 LSI trip unit

LSI trip unit

Type L and Type A electronic trip units are used to protect cables, busbar and equipment requiring a wide variety of protection settings.

The settings dials are accessible from the front of the circuit breakers, allowing precise adjustment of the protection settings. The protection adjusted in this way is independent of the ambient temperature.



1 **LTD long time delay protection**

The long time delay curve provides overload protection. Fine setting of Ir (A) is done using the Ir setting dial. The time delay tr(s) can be set via a dial from 0.5 to 25 s.

2 **STD short time delay protection**

Short time delay protection is provided for short circuits. The Isd (x Ir) current can be adjusted using a dial from 1.5 to 15 times the protection of the Ir Long Time Delay protection of the circuit breaker. This protection can also be deactivated (OFF). Time delay tsd (s) is adjustable via a dial from 100 to 600 ms with the possibility of including an inverse time curve (I^2t OFF or ON).

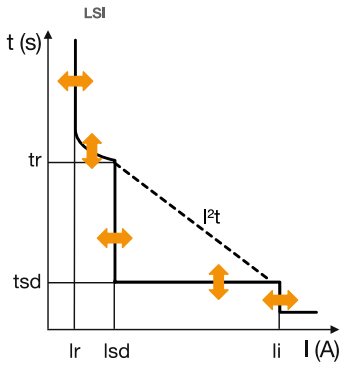
3 **INST Instantaneous Protection**

The Instantaneous protection against short-circuits Ii (x In) can be set using a dial from 1 to 20 times the rated current value In. This protection can also be deactivated (OFF).

Zone selectivity (ZSI) (Type A and Type H trip unit)

Zone selectivity (ZSI) is available on LSI trip units. It can be used for Short Time Delay protection (ZSI STD).

LSI trip unit



Rated current In									
In at 50 °C	630 A	800 A	1000 A	1250 A	1600 A	2000 A	2500 A	3200 A	4000 A

Long Time Delay protection L (ANSI 49)		
Ir (tripping threshold between 1.05 and 1.20 x Ir)		
Ir		0.4 - 0.5 - 0.6 - 0.7 - 0.8 - 0.85 - 0.9 - 0.95 - 1.0
Ir = ... x In (A)		0.4 x In … 1 x In
	In = 630 A	250 … 630 A
	In = 800 A	320 … 800 A
	In = 1000 A	400 … 1000 A
	In = 1250 A	500 … 1250 A
	In = 1600 A	640 … 1600 A
	In = 2000 A	800 ... 2000 A
	In = 2500 A	1000 ... 2500 A
	In = 3200 A	1280 ... 3200 A
	In = 4000 A	1600 ... 4000 A
Time delay (s)	tr	0.5 - 1.0 - 2.0 - 4.0 - 5.0 - 8.0 - 10.0 - 15.0 - 20.0 - 25.0
	accuracy	+10% to -10%

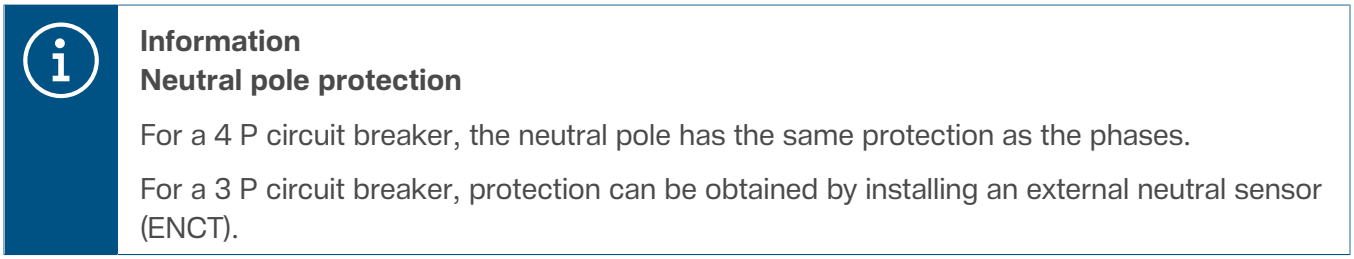
Electronic trip units
L, A type trip unit

Short Time Delay protection STD (ANSI 50TD/51)					
Isd = Ir x …		OFF - 1.5 - 2.0 - 3.0 - 4.0 - 6.0 - 8.0 - 10.0 - 12.0 - 15			
	accuracy	+/- 10 %			
Time delay (s)	tsd I^2t OFF	0.1	0.2	0.4	0.6
	tsd I^2t ON	0.1	0.2	0.4	0.6
Non-tripping time (s)		0.06	0.16	0.36	0.56
Maximum tripping time (s)		0.15	0.25	0.45	0.65
Maximum breaking time (s)		0.17	0.27	0.47	0.67

Instantaneous Protection INST (ANSI 50)		
Ii = In x …		OFF - 1.0 - 2.0 - 4.0 - 6.0 - 8.0 - 10.0 - 12.0 - 15.0 - 20.0
	accuracy	+/- 10 %
Tripping time (ms)		> 20
Maximum breaking time (ms)		50

Time delay for neutral protection

The time delays for neutral protection remain identical to the phase time delay adjustment values.



Information
Neutral pole protection

For a 4 P circuit breaker, the neutral pole has the same protection as the phases.

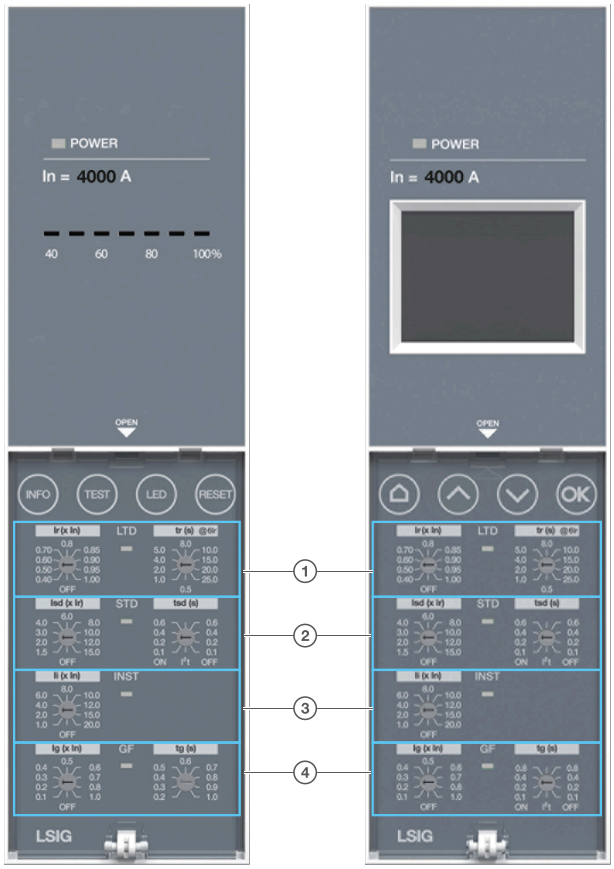
For a 3 P circuit breaker, protection can be obtained by installing an external neutral sensor (ENCT).

3.1.4 LSIG trip unit

LSIG trip unit

Type L and Type A electronic trip units are used to protect cable, busbar and equipment in TN earthing systems where earth fault protection is required.

The settings dials are accessible from the front of the circuit breakers, allowing precise adjustment of the protection settings. The protection adjusted in this way is independent of the ambient temperature.



① **LTD long time delay protection**

The long time delay curve provides overload protection. Fine setting of Ir (A) is done using the Ir setting dial. The time delay tr(s) can be set via a dial from 0.5 to 25 s.

② **STD short time delay protection**

Short time delay protection is provided for short circuits. The Isd (x Ir) current can be adjusted using a dial from 1.5 to 15 times the protection of the Ir Long Time Delay protection of the circuit breaker. This protection can also be deactivated (OFF). Time delay tsd (s) is adjustable via a dial from 100 to 600 ms with the possibility of including an inverse time curve (I^2t OFF or ON).

③ **INST Instantaneous Protection**

The Instantaneous protection against short-circuits Ii (x In) can be set using a dial from 1 to 20 times the rated current value In. This protection can also be deactivated (OFF).

④ **Earth fault protection GF**

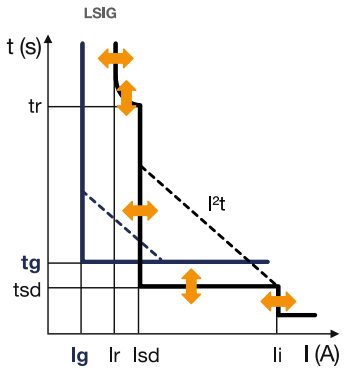
The earth protection is used against phase-to-earth faults. The earth fault currents can reach a high enough amplitude that they are similar to a short circuit. It is based on the calculation of the vector sum of the phases and the neutral current. The current Ig (x In) can be set using a dial from 0.1 to 1 times the rated current In. The earth fault protection can also be disabled (OFF). For the Type L trip unit, the time delay tg (s) is adjustable via a dial from 200 to 1000 ms. For the Type A trip unit, the time delay tg (s) is adjustable via a dial from 100 to 800 ms with the possibility of including an inverse time curve (I^2t OFF or ON).

Zone selectivity (ZSI) (Type A trip unit)

Zone selectivity (ZSI) is available on LSIG trip units. It can be used for the Short Time Delay protection (ZSI STD) and the Earth Fault protection (ZSI GF).

Electronic trip units
L, A type trip unit

LSIG trip unit



Rated current In									
In at 50 °C	630 A	800 A	1000 A	1250 A	1600 A	2000 A	2500 A	3200 A	4000 A

Long Time Delay protection L (ANSI 49)		
Ir (tripping threshold between 1.05 and 1.20 x Ir)		
Ir		0.4 - 0.5 - 0.6 - 0.7 - 0.8 - 0.85 - 0.9 - 0.95 - 1.0
Ir = ... x In (A)		0.4 x In … 1 x In
	In = 630 A	250 … 630 A
	In = 800 A	320 … 800 A
	In = 1000 A	400 … 1000 A
	In = 1250 A	500 … 1250 A
	In = 1600 A	640 … 1600 A
	In = 2000 A	800 ... 2000 A
	In = 2500 A	1000 ... 2500 A
	In = 3200 A	1280 ... 3200 A
	In = 4000 A	1600 ... 4000 A
Time delay (s)	tr	0.5 - 1.0 - 2.0 - 4.0 - 5.0 - 8.0 - 10.0 - 15.0 - 20.0 - 25.0
	accuracy	+10% to -10%

Short Time Delay protection STD (ANSI 50TD/51)					
Isd = Ir x …		OFF - 1.5 - 2.0 - 3.0 - 4.0 - 6.0 - 8.0 - 10.0 - 12.0 - 15			
	accuracy	+/- 10 %			
Time delay (s)	tsd I^2t OFF	0.1	0.2	0.4	0.6
	tsd I^2t ON	0.1	0.2	0.4	0.6
Non-tripping time (s)		0.06	0.16	0.36	0.56
Maximum tripping time (s)		0.15	0.25	0.45	0.65
Maximum breaking time (s)		0.17	0.27	0.47	0.67

Instantaneous Protection INST (ANSI 50)		
Ii = In x …		OFF - 1.0 - 2.0 - 4.0 - 6.0 - 8.0 - 10.0 - 12.0 - 15.0 - 20.0
	accuracy	+/- 10 %
Tripping time (ms)		> 20
Maximum breaking time (ms)		50

GF earth fault tripping (ANSI 50N TD/51N) (without display)									
Ig = In x …	OFF - 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8 - 1.0								
Time delay (s) tg	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0

GF earth fault tripping (ANSI 50N TD/51N) (with display)					
Ig = In x …	OFF - 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8 - 1.0				
Time delay (s)	tg I^2t OFF	0.1	0.2	0.4	0.8
	tg I^2t ON	0.1	0.2	0.4	0.8
Non-tripping time (s)		0.06	0.16	0.36	0.56
Maximum tripping time (s)		0.15	0.25	0.45	0.85
Maximum breaking time (s)		0.17	0.27	0.47	0.87

The i^2t earth-fault protection curve improves the selectivity of the earth faults with circuit breakers located upstream. This protection operates from the setting value Ir up to the nominal value In.
It can be adjusted using the tg dial.

Information

In the case of a 3-pole product, the earth fault protection is dependant on the presence of an ENCT external neutral sensor.

Time delay for neutral protection

The time delays for neutral protection remain identical to the phase time delay adjustment values.

Information
Neutral pole protection

For a 4 P circuit breaker, the neutral pole has the same protection as the phases.

For a 3 P circuit breaker, protection can be obtained by installing an external neutral se (ENCT).

4 Product References and identification

4.1 Product References

The unique identification code corresponds to the technical specifications of your circuit breaker. This code accurately reflects the intrinsic characteristics and actual parameters of the device you have selected. The characters of this technical codification are presented below.

		H	W	S	x	x	x	xx	x	x	x	x
hws frame sizes	HWS2 up to 2000A				2							
	HWS4 up to 4000A				4							
Breaking capacity	50 kA					M						
	66 kA					E						
	85 Ka					S						
	switch disconnectors					W						
Number of poles	3-pole						3					
	4-pole						4					
Rated current	630 A							06				
	800 A							08				
	1000 A							10				
	1250 A							12				
	1600 A							16				
	2000 A							20				
	2500 A							25				
	3200 A							32				
	4000 A							40				
Version	Drawout								D			
	Fixed								F			
Trip unit type	Switch-disconnector									0		
	Type L - LSI									1		
	Type L - LSIG									2		
	Type A - LSI									3		
	Type A - LSIG									4		
	Type H - LSIG									5		
Type of operation	Manual, without motor										A	
	MO/SH/DC 240 V AC										M	
	MO/SH/DC 415 V AC										N	
	MO/SH/DC 110 V DC										O	
	MO/SH/DC 220 V DC										P	
Market code	P											P
	E											E

Thus, you have a unique identification code of the type: HWSXXXXXXXXX which is the representation of your circuit breaker.

Example: HWS2M306D1ME corresponds to:

- an HWS2 size up to 2000 A,
- with a breaking capacity of 50 kA,
- 3-pole,
- with a rated current of 630 A,
- a drawout model,
- A Type L -LSI trip unit,
- equipped with a motor, SH and CC coil that operates at 240 V AC,
- corresponding country code.

4.2 Identification

HWS2 and HWS4 air circuit breakers can be identified by the various labels affixed to the product or packaging.

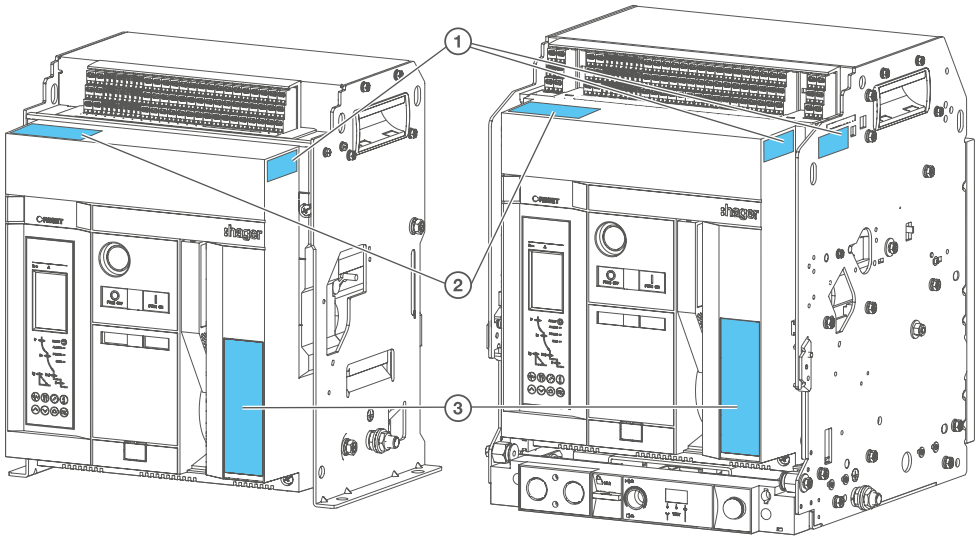


Fig. 1: Labels on fixed and drawout circuit breakers

① Identification label on the circuit breaker and the chassis
② Label for additional accessories
③ Circuit breaker rating label

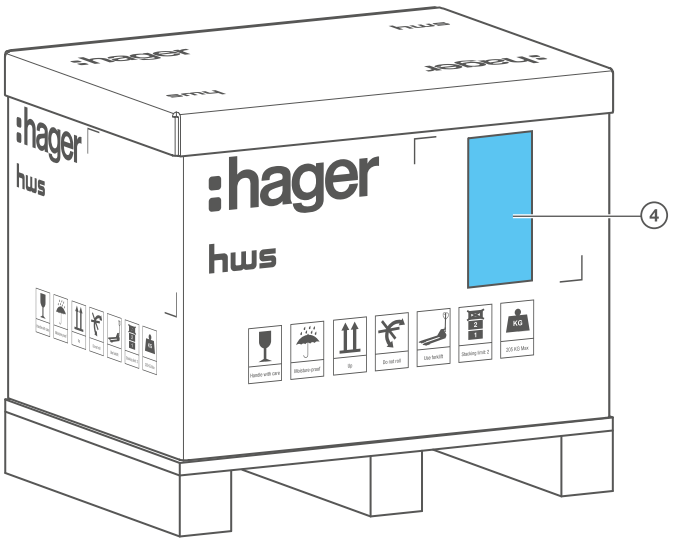


Fig. 2: Label on the packaging

④ Identification label on the packaging

Identification label on the circuit breaker and the chassis

Fig. 3: Identification label on the circuit breaker and the chassis

① Circuit breaker reference

Label for additional accessories

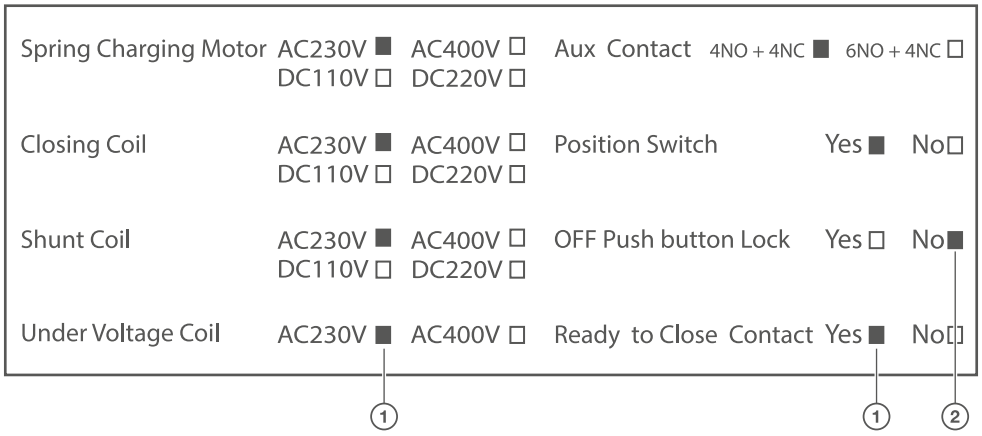


Fig. 4: Label for additional accessories

① Accessories fitted
② Accessory not fitted

Identification label for HWS2 and HWS4 circuit breakers and switch disconnectors

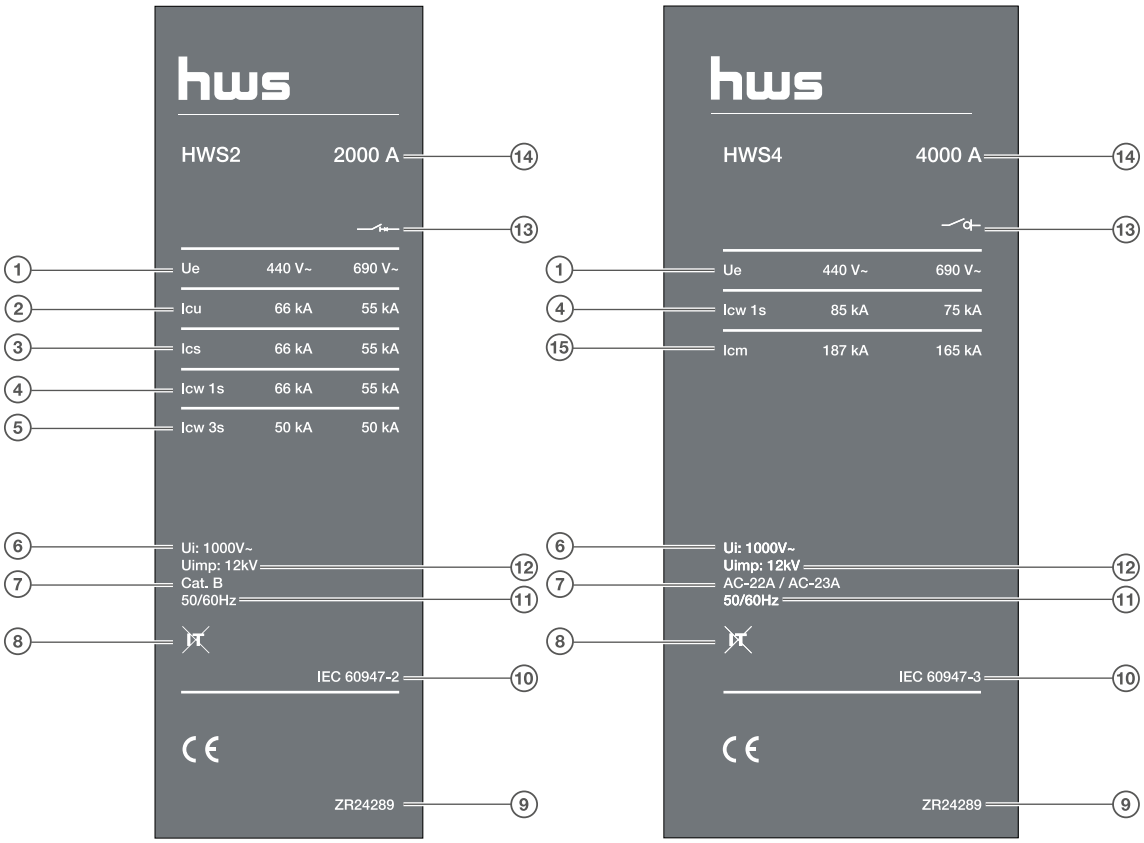


Fig. 5: Technical specification label for an HWS2 circuit breaker and an HWS4 switch-disconnector

1. Ue: Operating voltage
2. Icu: Rated ultimate short-circuit breaking capacity at the rated operating voltage Ue
3. Ics: Rated service short-circuit breaking capacity
4. Icw 1 s: Rated short-time withstand current for 1 second
5. Icw 3s: Rated short-time withstand current for 3 seconds
6. Ui: Rated insulation voltage
7. Category
8. Not suitable for protection in an IT earthing system
9. Manufacturing date code
10. Standards
11. Frequency
12. Uimp: Rated surge voltage
13. Symbol of a circuit breaker suitable for isolation or symbol of a switch-disconnector
14. Maximum rating of the circuit breaker
15. Icm: Rated short-circuit making capacity

Identification label on the packaging

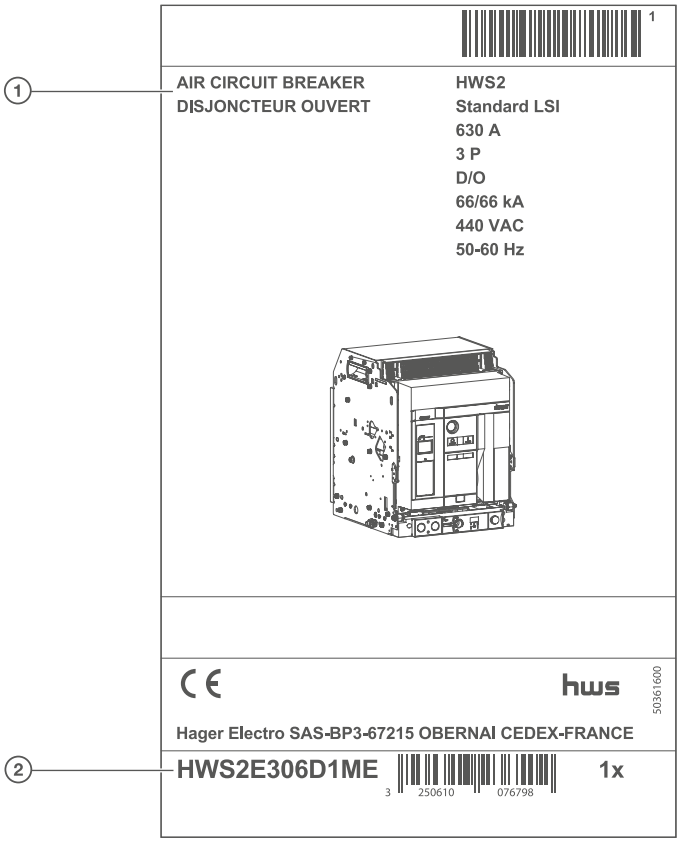


Fig. 6: Identification label on the packaging

① Main characteristics of the circuit breaker
② Circuit breaker reference

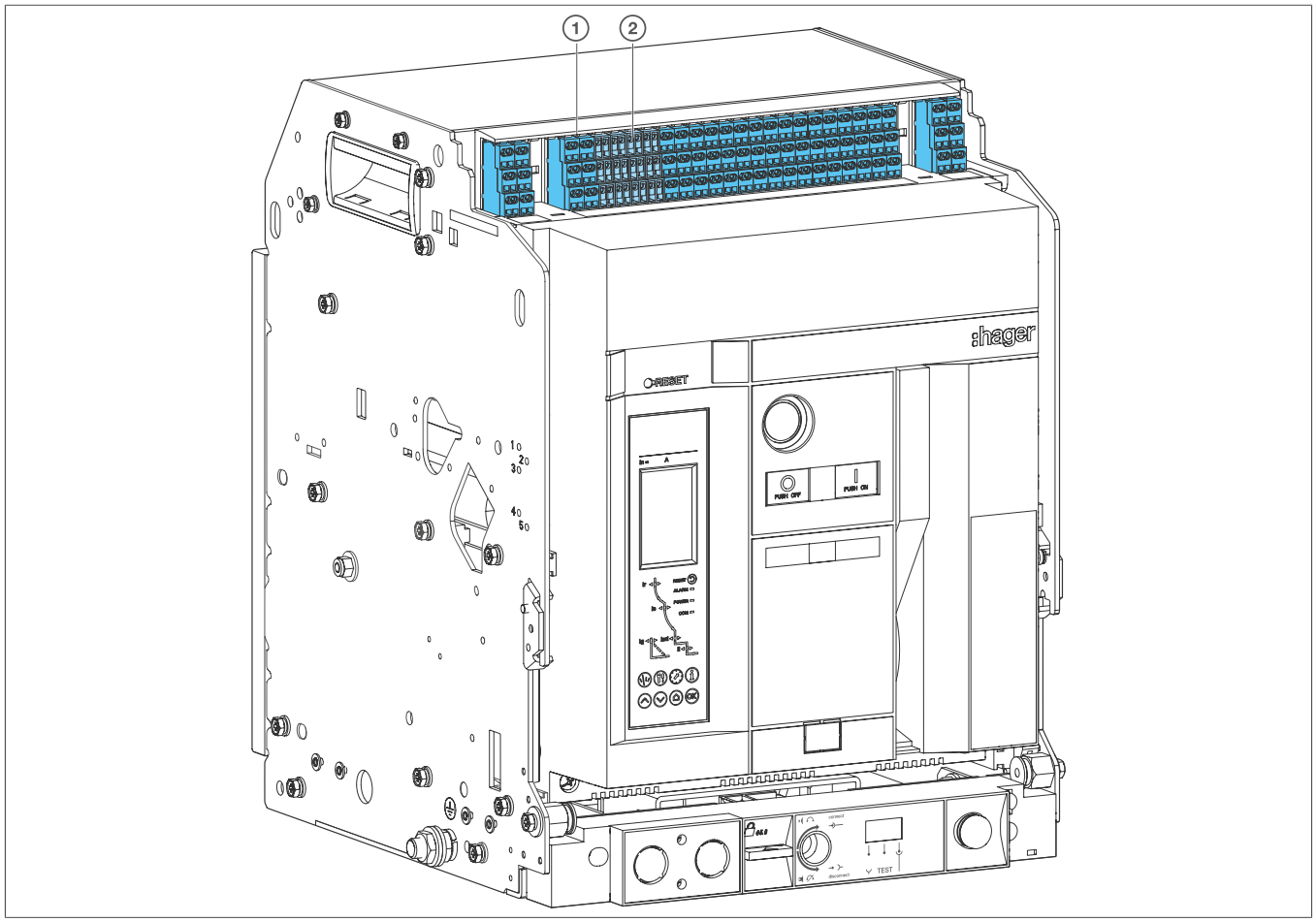
5 Accessories

5.1 List of accessories

	Drawout	Fixed
Connection accessories see page 41		
Type A connection terminal block	✓	✓
Type B connection terminal block	✓	✓
Control accessories see page 43		
SH shunt trip coil	✓	✓
CC closing coil	✓	✓
UV undervoltage release coil	✓	✓
UVTC Undervoltage Time Delay Controller	✓	✓
MO charging motor	✓	✓
Signalling accessories see page 48		
FS Fault trip contact	✓	✓
RTC Ready-to-Close contact	✓	✓
AX Auxiliary Contact	✓	✓
CYC Operation Cycle Counter	✓	✓
PS Position contact	✓	
Locking and interlocking accessories see page 53		
WIP wrong-insertion preventer for drawout circuit breaker	✓	
Locking the circuit breaker in OFF by OLK key lock	✓	✓
PBC Push-button cover	✓	✓
Locking of the insulating safety shutters	✓	
Insulated safety shutters	✓	
Locking of the position of the circuit breaker in its CL chassis	✓	
MI mechanical interlock	✓	✓
RI open door racking interlock	✓	
Power connection accessories see page 59		
Rear vertical / horizontal RC connections	✓	✓
Protection accessories see page 61		
TBC terminal cover	✓	✓
DF door flange	✓	✓
IB interphase barriers	✓	✓
ENCT External Neutral Sensor	✓	✓

5.2 Connection accessories

The connection accessories ensure the electrical connection between the circuit breaker and its accessories, ensuring reliable contact, secure installation and adaptability to the different mounting configurations and types of cables used in the electrical installation.



①	Type A connection terminal block	page 42
②	Type B connection terminal block	page 42

TB connection terminal block

This terminal block facilitates the wiring of control and signalling accessories thanks to an easy connection system:

- saves time: wiring is quick, easy and tool-free,
- safer: cable support is ensured,
- test point: used to check for the presence of voltage with a multimeter,
- cable disconnection: the terminal can be released quickly and easily with a screwdriver.

All air circuit breakers are supplied as standard with all connection terminal blocks. These terminals are removable and can be replaced by two types of terminals.

Description	Characteristics	
Type A		For: • AX Auxiliary contact. • RTC Ready-to-Close contact. • MO charging motor. • SH shunt trip coil. • CC closing coil. • UV undervoltage release coil. • Position contact.
Type B		For • FS Fault trip contact. • ZSI contact • Output alarm contacts • ENCT External Neutral Sensor

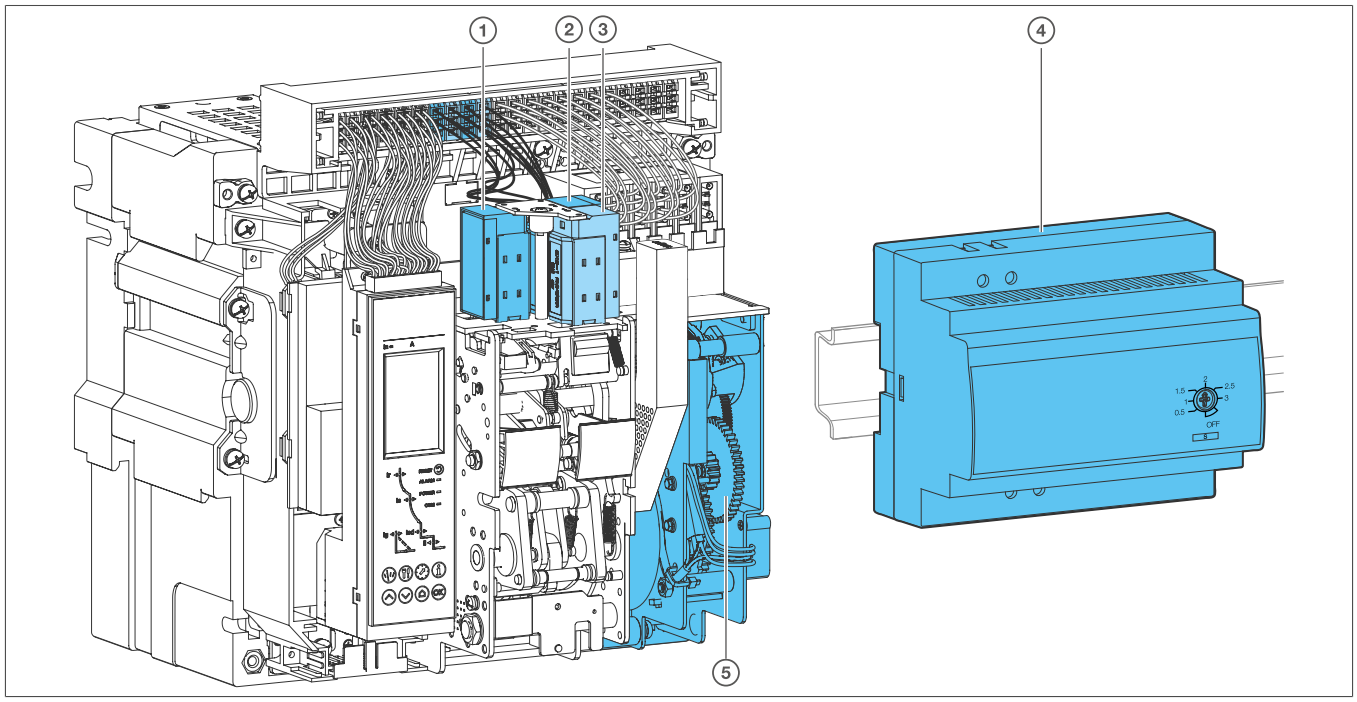
The cables (flexible or rigid) used must have a cross section between 0.6 mm² and 2.5 mm². In order to be properly held in place in the terminals, the connected cables must first be stripped from 10 to 12 mm and fitted with crimp terminals. The cables must not be twisted and only one cable is allowed per terminal.

5.3 Control accessories

Control accessories are used to perform circuit breaker opening, charging and closing operations.

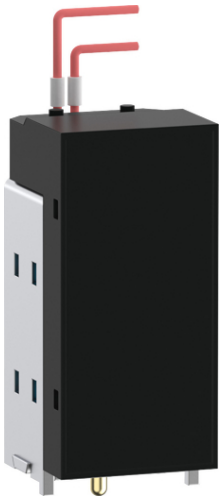
The command is carried out:

- locally via the charging handle and the opening and closing push-buttons,
- remotely via the TB terminal block connections of the control accessories.



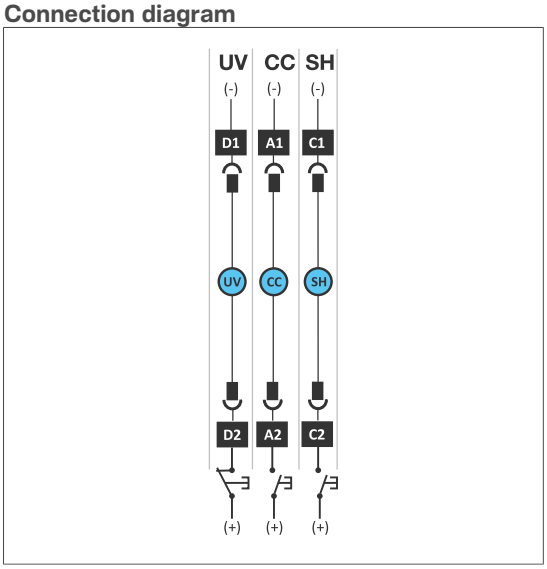
①	SH shunt trip coil	page 44
②	CC closing coil	page 45
③	UV undervoltage release coil	page 46
④	UVTC Undervoltage Time Delay Controller	page 46
⑤	MO motor	page 47

SH / CC / UV coils

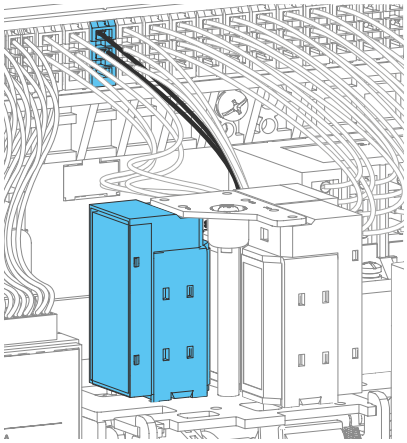


The SH coils are used to remotely open the circuit breaker and the CC closing coil is used to remotely close the circuit breaker. UV, SH and CC coils are installed behind the front cover of the circuit breaker. They are equipped with connectors to be placed in their respective positions. The connection takes place by means of terminals with a flexible or rigid cable of cross-section 0.6 to 2.5 mm².

Connection diagram



SH shunt trip coil



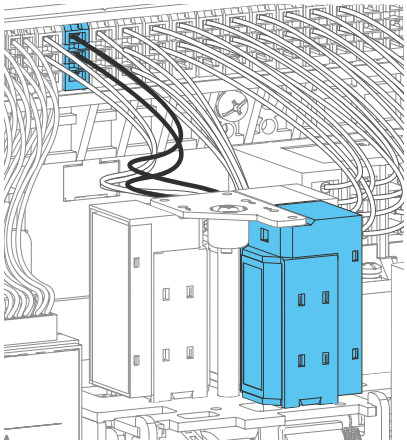
SH shunt trip coil in its position

The SH shunt trip coil activates the circuit breaker opening mechanism when it is energised.

The pulse duration must be at least 100 ms. The coil is suitable for continuous supply.

Electrical characteristics of the SH shunt trip coil	AC 240 V / 415 V	DC 110 V / 220 V
Frequency	50/60 Hz	-
Operating range	70 to 110% Vn	70 to 110% Vn
Inrush consumption (Min-Max range)	200-500 W (100 ms)	200-500 VA (100 ms)
Holding consumption (Min-Max range)	5-15 W	5-15 VA
IEC 60947	Yes	Yes

CC closing coil

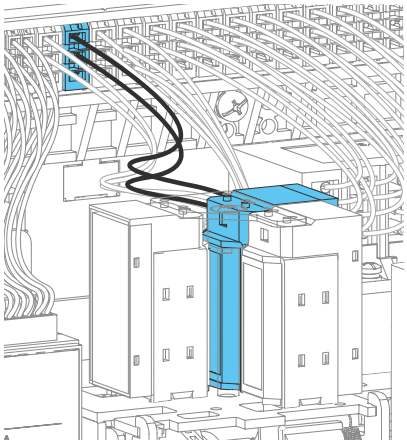


CC closing coil in its position

The CC closing coil activates the circuit breaker closing mechanism when it is energised. The pulse duration must be at least 100 ms. The coil is suitable for continuous supply.

Electrical characteristics of the CC closing coil	AC 240 V / 415 V	DC 110 V / 220 V
Frequency	50/60 Hz	-
Operating range	85 to 110% Vn	85 to 110% Vn
Inrush consumption (Min-Max range)	200-500 W (100 ms)	200-500 VA (100 ms)
Holding consumption (Min-Max range)	5-15 W	5-15 VA
IEC 60947	Yes	Yes

UV undervoltage release coil



UV undervoltage release coil in its housing

The UV undervoltage coil activates the circuit breaker opening mechanism when it is no longer supplied or when its rated voltage drops between 35% and 70% of the rated voltage.
The circuit breaker can only be closed when the coil supply voltage returns to normal or exceeds a certain threshold.
It is possible to add a UVTC undervoltage time delay controller to the UV voltage release coil to delay the operation of the coil and thus reduce nuisance (false) tripping of the circuit breaker.

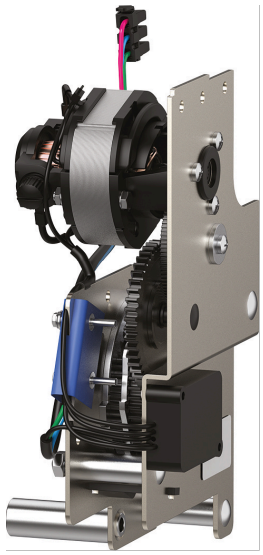
Electrical characteristics of UV undervoltage release coil	**AC 240 V / 415 V**
Frequency	50/60 Hz
Adjustable operating range - Opening	35 to 70% Vn
Adjustable operating range - Closing	85 to 110% Vn
Inrush consumption (Min-Max range)	200-500 W (100 ms)
Holding consumption (Min-Max range)	5-15 W
IEC 60947	Yes

UVTC Undervoltage Time Delay Controller

The UVTC undervoltage time delay controller delays the tripping of the UV voltage release coil in order to prevent nuisance tripping during a transient voltage drop of less than 3 seconds.
The time delay can be set to OFF - 0.5 - 1.0 - 1.5 - 2.0 - 2.5 - 3 seconds.
The time controller is attached to a DIN rail.

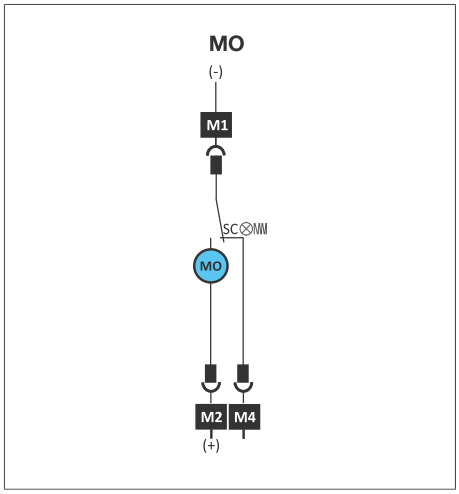
Electrical characteristics of UVTC undervoltage release coil
Rated voltage (Vn)
AC (V)
240
415

MO charging motor



The charging motor is used to automatically recharge the closing spring. Using the motor avoids manual charging of the spring and ensures that the spring is always kept in charged condition during normal operation. If the motor's power supply is unavailable or the voltage drops, the spring can be charged manually using the charging handle on the circuit breaker.

Connection diagram



Electrical characteristics of the HWS2 and HWS4 motors

Operating voltage (AC)	200 - 250 V	415 - 450 V
Frequency	50 / 60 Hz	50 / 60 Hz
Operating range	85 to 110% Vn	85 to 110% Vn
Rated current / max. peak (A)	1 / 3.1	0.5 / 1.4
Start-up activation (A)	2 to 3 In for 0.1 s	2 to 3 In for 0.1 s
Maximum arming time (s)	5	5
Active power (VA)	250	220
Operating frequency	maximum 3 cycles per minute	maximum 3 cycles per minute
Lifecycle [1]	10000	10000
IEC 60947 certification	Yes	Yes

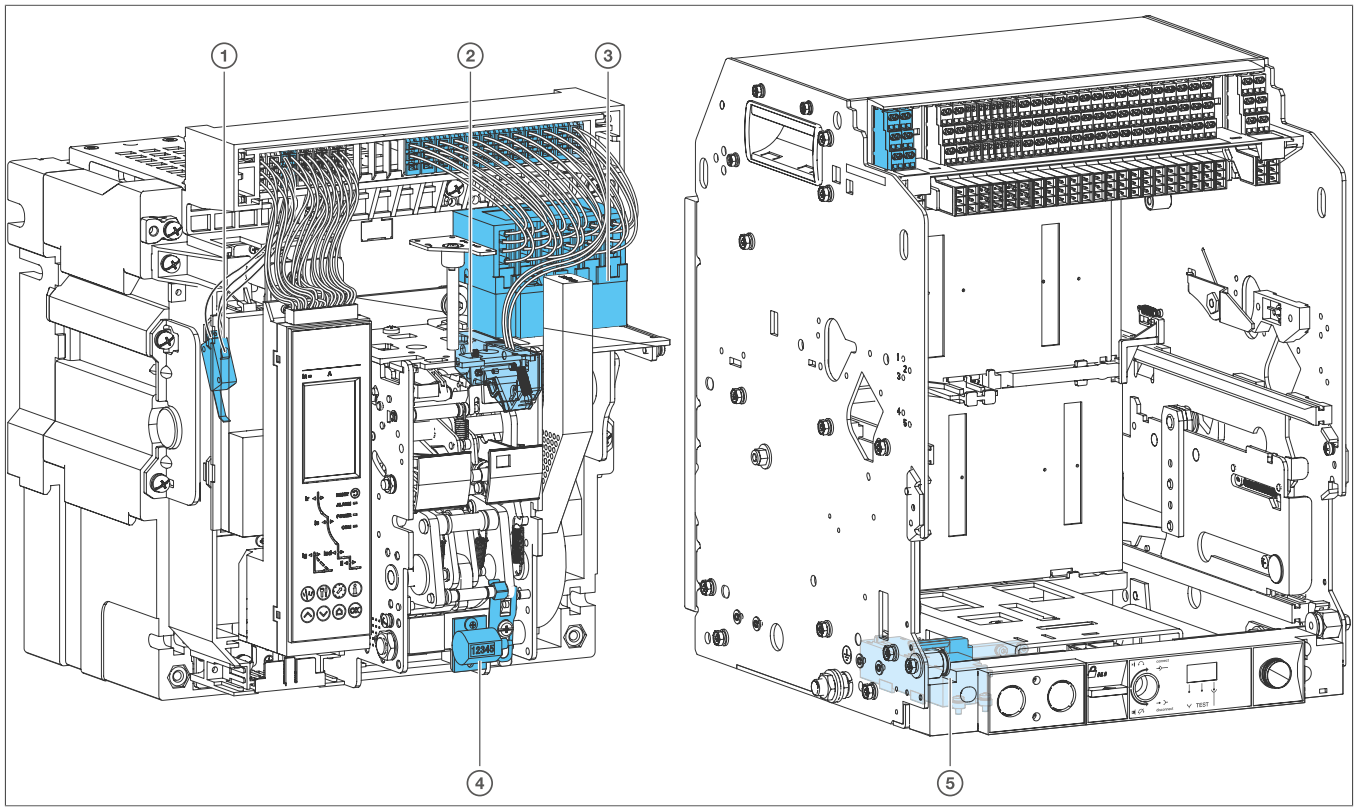
Electrical characteristics of the HWS2 and HWS4 motors

Operating voltage (DC)	100 - 130 V	200 - 250 V
Operating range	85 to 110% Vn	85 to 110% Vn
Rated current / max. peak (A)	2.3 / 5.1	1 / 3.1
Start-up activation (A)	2 to 3 In for 0.1 s	2 to 3 In for 0.1 s
Maximum arming time (s)	5	5
Active power (VA)	299	250
Operating frequency	maximum 3 cycles per minute	maximum 3 cycles per minute
Life cycle [1]	10000	10000
IEC 60947 certification	Yes	Yes

[1] Test performed with a frequency of 2 cycles per minute

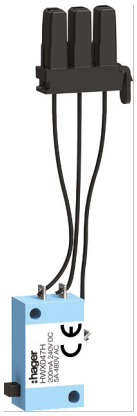
5.4 Signalling accessories

The signalling accessories provide information about the operation of the circuit breaker, including its open or closed state, the occurrence of faults in the electrical circuit and the count of the operating cycles performed.



①	FS Fault trip contact	page 49
②	RTC Ready-to-Close contact	page 50
③	AX Auxiliary Contact	page 51
④	CYC Operation Cycle Counter	page 51
⑤	PS Position contact	page 52

FS Fault trip contact



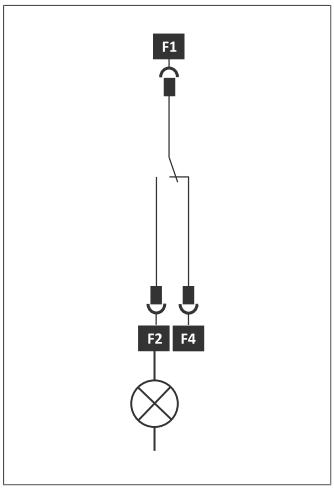
The FS fault trip contact is used to signal the opening of the circuit breaker following a trip due to an electrical fault. The causes for the tripping can be of different types:

- overload,
- short circuit,
- GF earth fault,
- critical system alarm.

The contact returns to its rest position when the circuit breaker is reset using the “RESET” button on the front of the circuit breaker.

An FS contact is built into all circuit breakers.

Connection diagram



Characteristics of the FS fault trip contact

Minimum load			**15 V 2 mA**
Breaking capacity (A)	Usage[1]	Ue (V)	AC12
	V AC	230	5.0
		400	5.0
	Usage[1]	Ue (V)	DC12
	V CC	110	5.0
		220	2.5

[1] According to standard IEC 60947-5-1

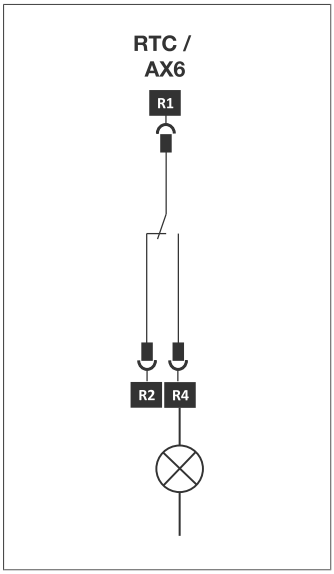
RTC Ready-to-Close contact

The RTC ready to close contact indicates that the circuit breaker has verified the closing conditions and that it is ready to receive the closing command. The contact changes status when all of these conditions are met:

- the circuit breaker is open,
- the status indicator of the closing spring shows it is in the charged state,
- The UV voltage release coil is supplied see (Control accessories / UV undervoltage release coil) ,
- The SH shunt trip coil is not supplied see (Control accessories / SH shunt trip coil) ,
- the circuit breaker is in connected position,
- the circuit breaker is not locked in the open state by a padlock or key,
- the circuit breaker is not interlocked with a second circuit breaker,
- the 'RESET' re-arm button is pressed.

The circuit breaker can now be closed manually or remotely using a closing coil.

Connection diagram



If the RTC close ready contact is installed, the Ax6 auxiliary contact is no longer used.

Characteristics of the RTC ready-to-close-contact

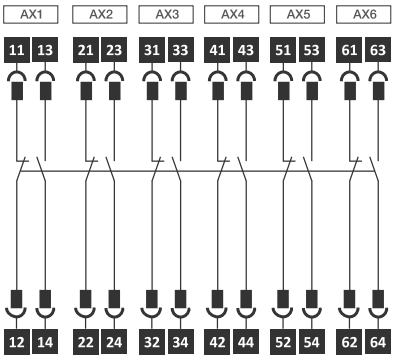
Minimum load			**15 V 2 mA**
Breaking capacity (A)	Usage[1]	Ue (V)	AC12
	V AC	230	5.0
		400	5.0
	Usage[1]	Ue (V)	DC12
	V CC	110	5.0
		220	2.5

[1] According to standard IEC 60947-5-1

AX Auxiliary Contact

The AX auxiliary contacts are used to remotely signal the open or closed status of the circuit breaker power contacts.
A block of 4 AX auxiliary contacts is fitted as standard with the circuit breaker, regardless of the range and can be replaced by a block of 6 contacts as an accessory.

Connection diagram



Characteristics of the AX contacts

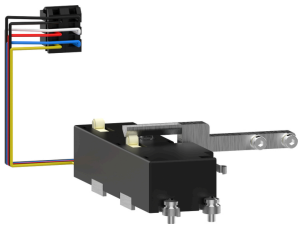
Minimum load			**15 V 2 mA**
Breaking capacity (A)	Usage[1]	Ue (V)	AC12
	V AC	230	5.0
		400	5.0
	Usage[1]	Ue (V)	DC12
	V CC	110	5.0
		220	2.5

CYC Operation Cycle Counter

The cycle counter indicates the circuit breaker's total number of electrical and mechanical operation cycles. The counter readings can be used as indicators for maintenance or inspection. The cycle counter is installed on the front side of the circuit breaker at the bottom section.

[1] According to standard IEC 60947-5-1

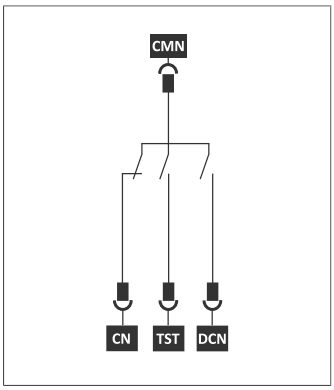
PS Position contact



This contact indicates one of the three positions of the circuit breaker inside the chassis according to its position on the terminal block support.

Location of the contact on the terminal block support	Indicates the position	Status of the power circuits	Status of the auxiliary circuits
DCN	Disconnected	Disconnected	Disconnected
TST	Test	Disconnected	Connected
CN	Connected	Connected	Connected

Connection diagram



PS position contact characteristics

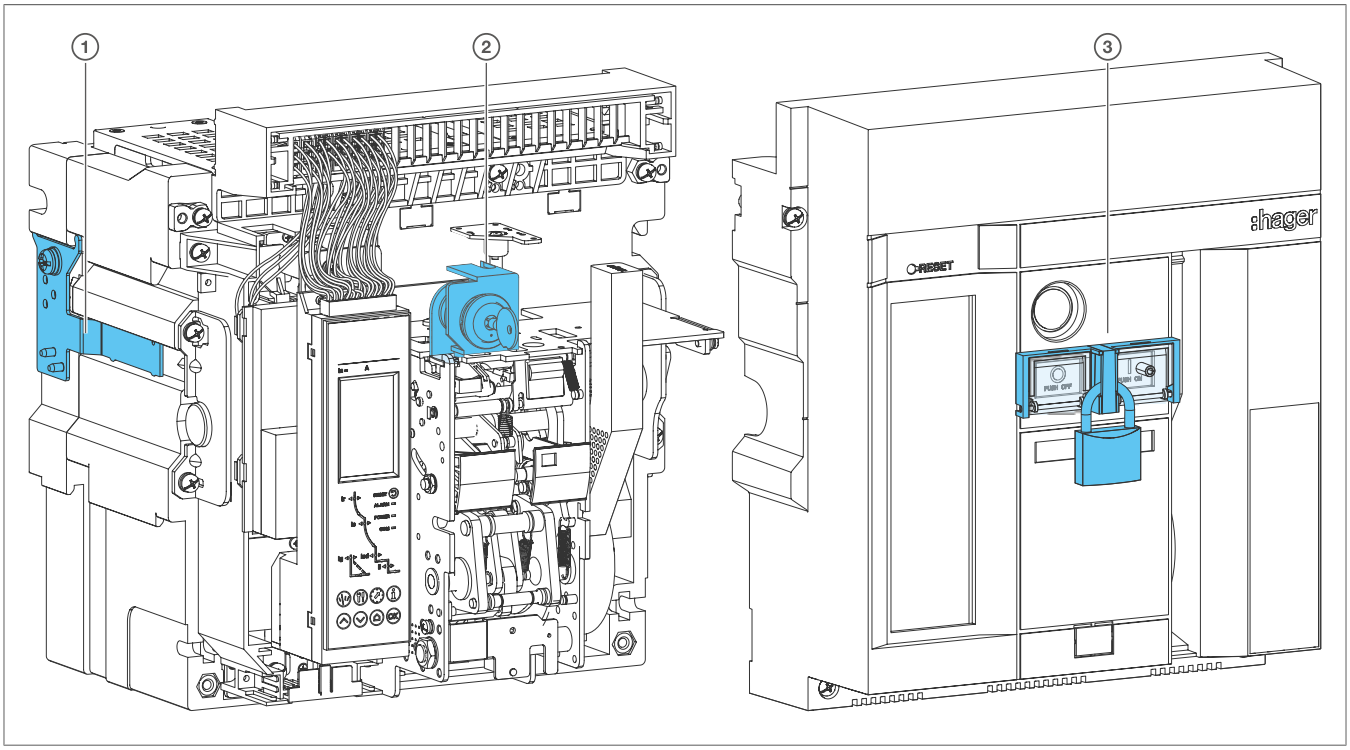
Minimum load			15 V 2 mA
Breaking capacity (A)	Usage[1]	Ue (V)	AC12
	V AC	230	5.0
		400	5.0
	Usage[1]	Ue (V)	DC12
	V CC	110	5.0
		220	2.5

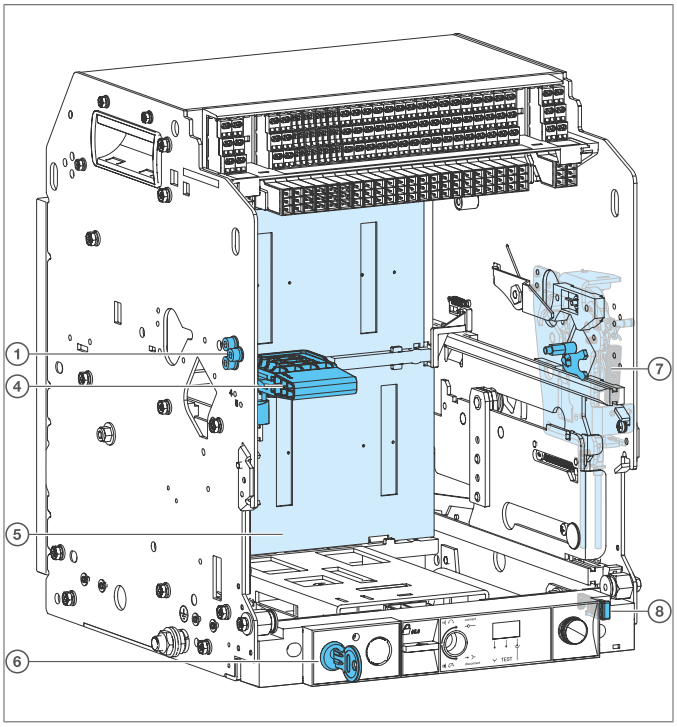
[1] According to standard IEC 60947-5-1

5.5 Locking and interlocking accessories

The locking and interlocking accessories are safety devices designed to protect users as well as the distribution system.
They:

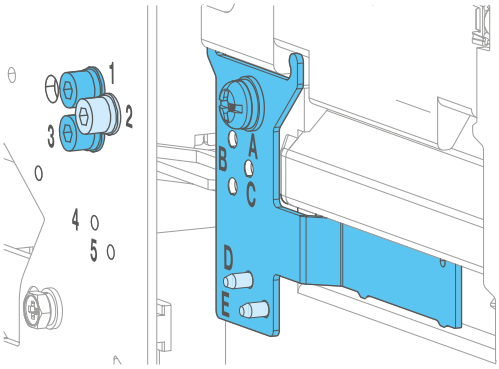
- give access to the circuit breaker only to authorised and approved operators.
- limit the risks of errors during operation.





WIP wrong-insertion preventer for drawout circuit breaker

The wrong insertion preventer is a mechanical device used to carry out a predetermined pairing of the circuit breaker with its chassis. This system must be installed on the chassis and the moving part of the device. Up to 10 different combinations can be made. The combination chosen on the chassis must correspond to the combination of the circuit breaker in order for the 2 parts to be compatible.



Example of installation with the combinations 123 for the chassis and DE for the HWS2 and HWS4 circuit breakers.

List of combinations

Chassis	Air circuit breaker
123	DE
124	CE
125	CD
134	BE
135	BD
145	BC
234	AE
235	AD
245	AC
345	AB

Locking the circuit breaker in OFF by OLK key lock

This locking device is used to lock the (OFF PUSH) button in pressed condition in order to prevent the circuit breaker from closing.

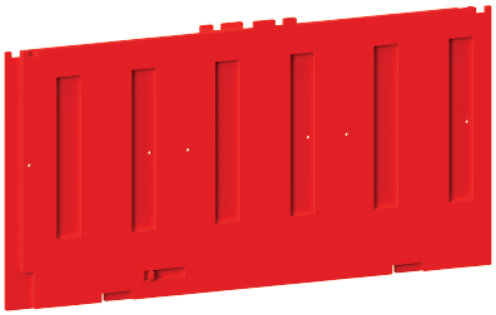
Locking device with OLK key locks as an accessory

The adapter accessory for the locking device for OLK key locks can be mounted on the front side of the circuit breaker. To lock the circuit breaker in the open state using a key lock, keep the circuit breaker OFF push button pressed and then turn the lock key till it is vertical. The key can be removed.

PBC Push-button cover

This cover is a device that prevents access to the open (PUSH OFF) and close (PUSH ON) buttons of the circuit breaker.
This prevents inadvertent or unauthorized commands.
It consists of two transparent lids that can be locked with a padlock.
The push buttons can be locked independently or together and up to 3 padlocks of Ø 6 mm can be installed.
The covers can be turned over to keep the PUSH OFF button pressed, preventing the circuit breaker from closing.

Insulated safety shutters



HWS2 and HWS4 safety shutters

Locking of the insulating safety shutters

- The safety shutters cover the contacts of the main circuit in the chassis when the circuit breaker is in the disconnected or test position. In this way they prevent accidental access to the jaw contacts. The IP20 protection class is now guaranteed. The upper and lower shutters operate together and can be padlocked together.
- The upper and lower shutters operate independently and can be padlocked separately. The padlocks block the safety shutters in the closed position and prevent a product being racked in. Up to three Ø5-Ø8 mm padlocks (not supplied) can be installed per shutter.

The shutters are factory fitted on each drawout hws chassis. The locking of the insulating safety shutters is factory supplied.

Locking of the position of the circuit breaker in its CL chassis

1 padlocking and position acknowledgement tab for HWS2 and HWS4 circuit breaker

This device is used to lock the circuit breaker in its chassis in disconnected, test or connected position and prevent the insertion of the rack in/rack out handle.
Locking can be by means of:

- Integrated locking device, by pulling on the padlock latch and position acknowledgement tab, installation of one to three Ø5-Ø8 mm padlocks (not provided),
- one or two key locks, available as an option.

Locking device with key locks, available as an option

2 key locks mounted on the locking device

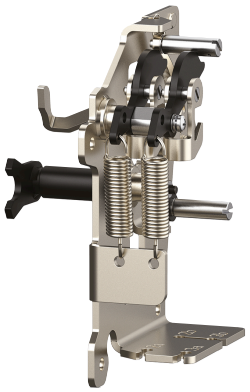
There are two possibilities for locking with keys:

- a single lock fitted in such as way as to achieve a simple locking of the circuit breaker,
- two different locks fitted in such a way as to achieve a double locking of the position, thereby guaranteeing a high level of security.

	Description
	Lock adapter kit

	Compatible locks		
	**Description**	**Characteristics**	**Key compatible with the type of lock**
	Key lock	type 1 – K1L1/L4	1, 4
		type 2 – K2L2/L4/L5	2, 4, 5
		type 3 – K3L3/L5	3, 5
		type 4 – K4L4	4
		type 5 – K5L5	5

MI mechanical interlock



Mechanical interlocking by cable makes it possible for 2 or 3 hws circuit breakers to be interlocked with each other. The cable interlocking system provides a higher degree of flexibility when it comes to integration into distribution systems:

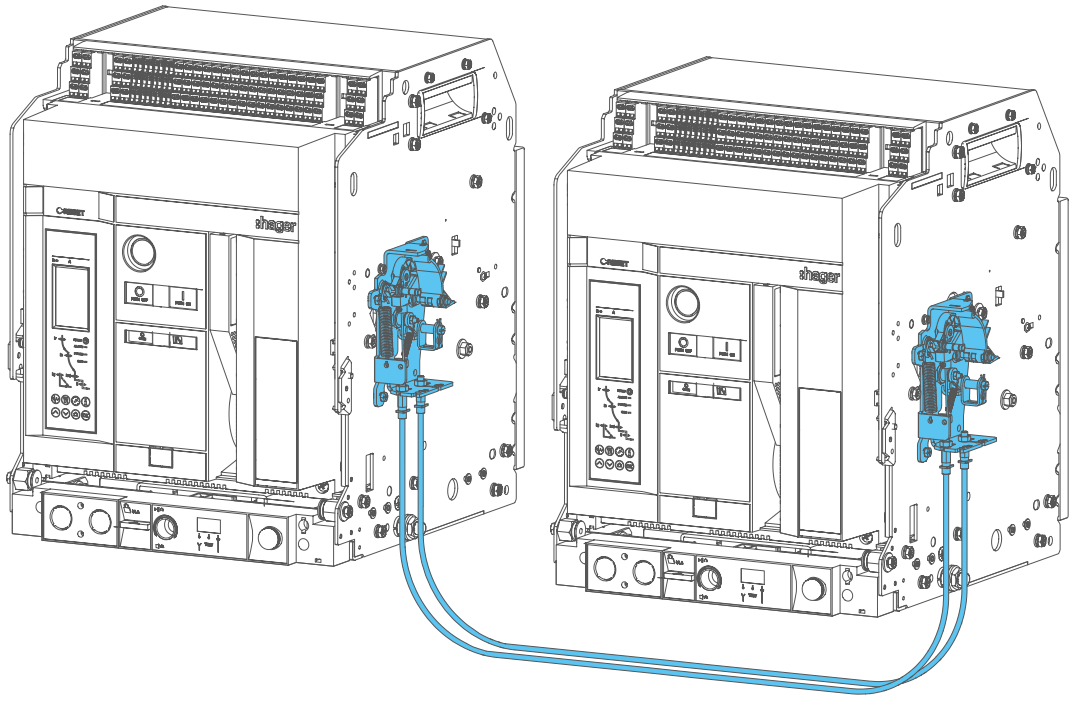
- All combinations of circuit breakers (3P, 4P, Fixed, Drawout) are possible.
- Circuit breakers can be installed one above the other or side by side.
- Several cable lengths (1.5, 3 and 5 meters) are available so as to be compatible with any type of installation.

Information

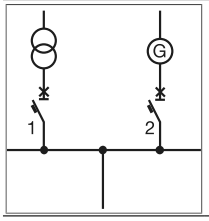
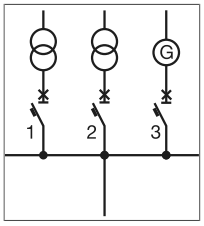
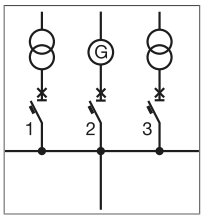
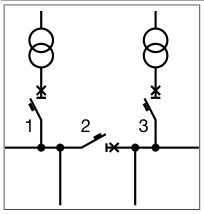
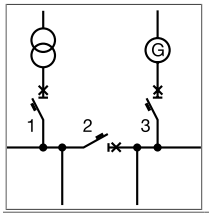
For any mechanical interlock installation, it is **mandatory** to install a **CYC operation cycle counter and PBC push button cover** on the circuit breaker.

Possibility of mechanical interlocking by cable:

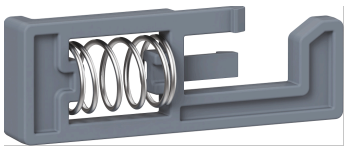
Vertical or horizontal with 2 circuit breakers:



HWS2 and HWS4 interlock types:

Diagram	Type	Locking logic	Description
	2S	**ACB1 ACB2** 0 0 1 0 0 1	Only one device out of two can be closed.
	3S	**ACB1 ACB2 ACB3** 0 0 0 1 0 0 0 1 0 0 0 1	Only one device out of three can be closed.
	3SX	**ACB1 ACB2 ACB3** 0 0 0 1 0 0 0 0 1 1 0 1 0 1 0	Allows two devices to be closed if the third is open. The latter can only be closed if the other two are open.
 	3C	**ACB1 ACB2 ACB3** 0 0 0 1 0 0 0 1 0 0 0 1 0 1 1 1 1 0 1 0 1	Two devices out of three can be closed at the same time.

RI open door racking interlock



This device prevents the racking handle being inserted into the place to insert/withdraw the racking handle when the door of the distribution board is open. For that reason the guide rail's input/output operation may only be performed once the distribution board's door has been closed, ensuring complete safety for the operating staff.

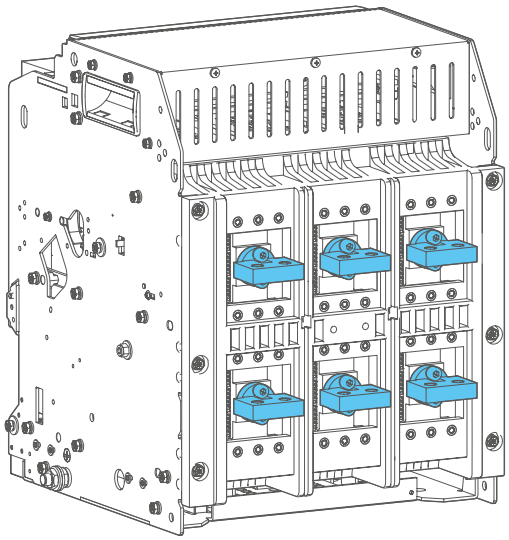
5.6 Power connection accessories

The connections facilitate the integration of the circuit breaker into distribution systems.

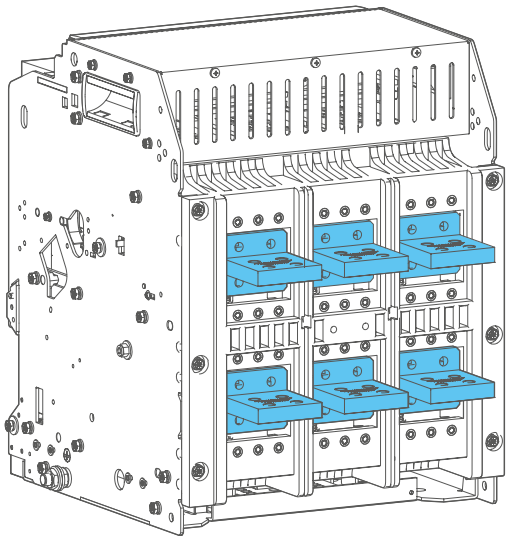
Connections

The circuit breakers hws are supplied with rear connection. A set of optional accessories can be used to adapt the connection to the busbar.
The rear connections can be easily rotated horizontally or vertically.

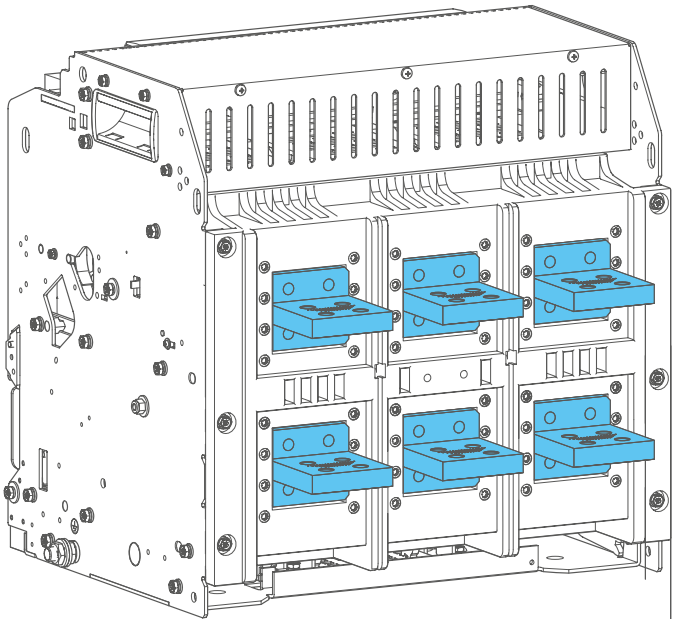
Rear vertical / horizontal RC connections 630 to 2000 A HWS2 for air circuit breaker in drawout / fixed version



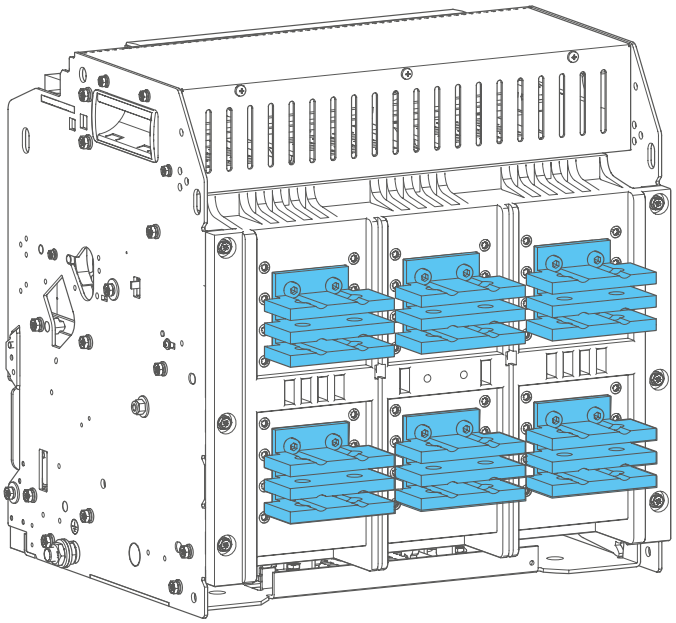
Rear vertical and horizontal RC connections from 630 to 2500 A HWS2 for switch disconnector in drawout / fixed version



Rear vertical and horizontal RC connections 2000 to 3200 A HWS4 for drawout and fixed version

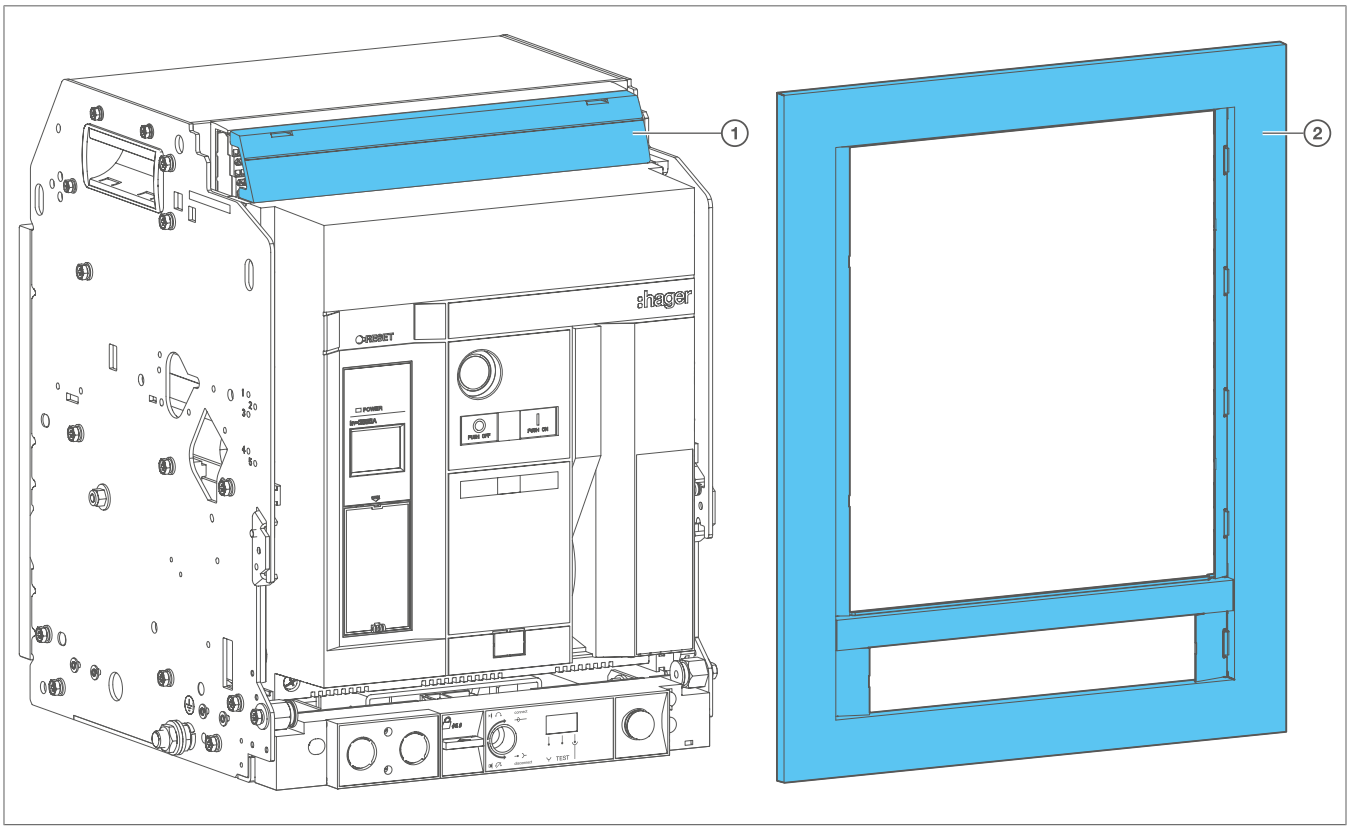


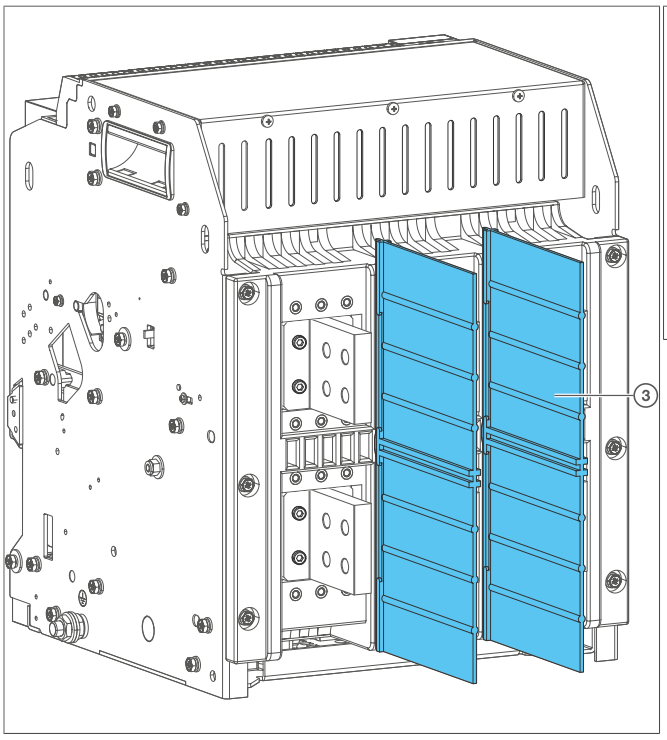
Rear vertical / horizontal RC connections RC 4000 A HWS4 for drawout and fixed version

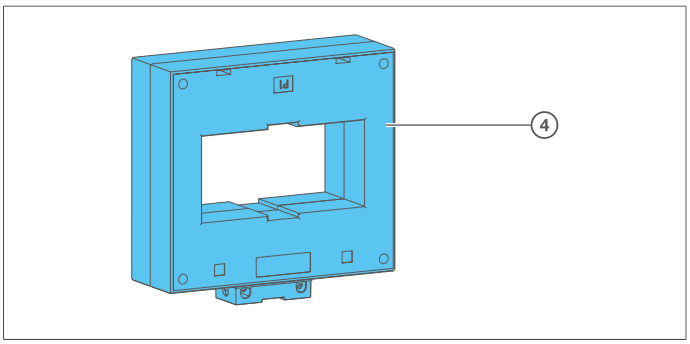


5.7 Protection accessories

Mechanical protection accessories increase the level of safety in the event of physical intervention on the installation.
The electrical protection accessories (ENCT) help to improve the level of electrical protection.







TBC terminal cover

The protective cover of the terminal block prevents access to the connection of electrical auxiliaries and also prevents any accidental contact.

DF door flange

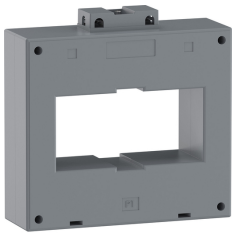
A cut-out is made on the electrical distribution board door to accommodate the front part of a fixed or drawout circuit breaker. The door frame fitted on the cut-out in the electrical distribution board door raises the protection class IP20. The door frame of the hws range includes flanges allowing it to be installed easily without tools. It can be installed on doors with a maximum thickness of 5 mm.

IB interphase barriers

The interphase barriers are complementary accessories mounted vertically between the rear connections of the circuit breakers.
Each interphase barrier improves the insulation between the connection and prevents arcing between two connections.

Information
Installing interphase barriers is mandatory on a circuit breaker if the voltage is greater than or equal to 500 V.

ENCT External Neutral Sensor



The ENCT external neutral current sensor allows neutral protection to be provided on a 3-pole circuit breaker in a TN earthing system.
It is installed on the neutral distribution bar and connects to the electronic trip unit using the ENCT terminal connection of the circuit breaker.

6 Installation and operating recommendations

6.1 Installation and operating conditions

Altitude derating

Up to an altitude of 2,000 m above sea level, there is no derating required for the electrical properties of the circuit breakers.

Above 2,000 m, a reduction in air density decreases the heat dissipation of the circuit breaker and lowers the dielectric strength.

A derating of the electrical specifications must be applied, to do this, please consult us.

Marking on the circuit breakers

Markings on the circuit breakers comply with the International Standard IEC 60947 1, Appendix C.

Vibrations

The circuit breakers withstand mechanical vibrations.

They comply with the standard IEC 60068-2-52:

- 2.0 to 13.2 Hz and amplitude ±1 mm
- 13.2 to 100 Hz acceleration ±0.7 G
- Resonance frequency ±1 mm/±0.7 G for 90 min

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

Electromagnetic interference

Circuit breakers are protected against:

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

The circuit breakers have successfully passed the electromagnetic compatibility tests (EMC) with immunity levels listed in the chapter Selection guide

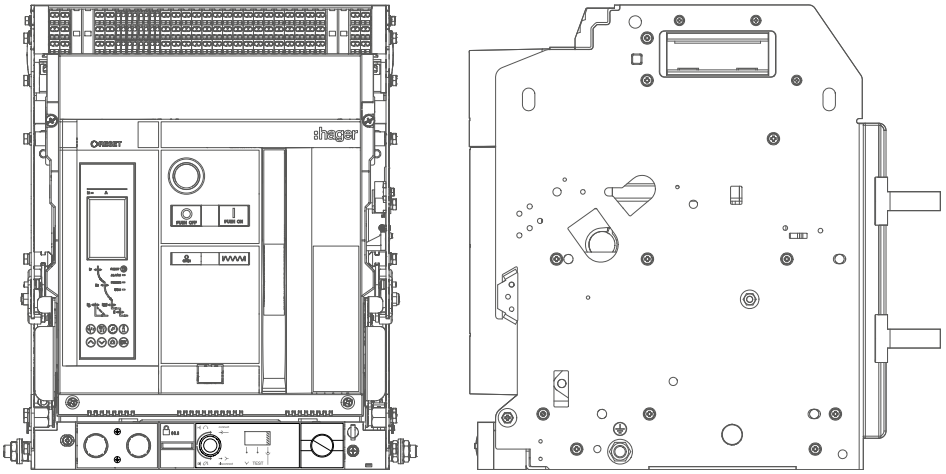
IP protection levels

The protection level of circuit breakers depends on its integration in its distribution board.

The front panel and connection terminal block are IP20.

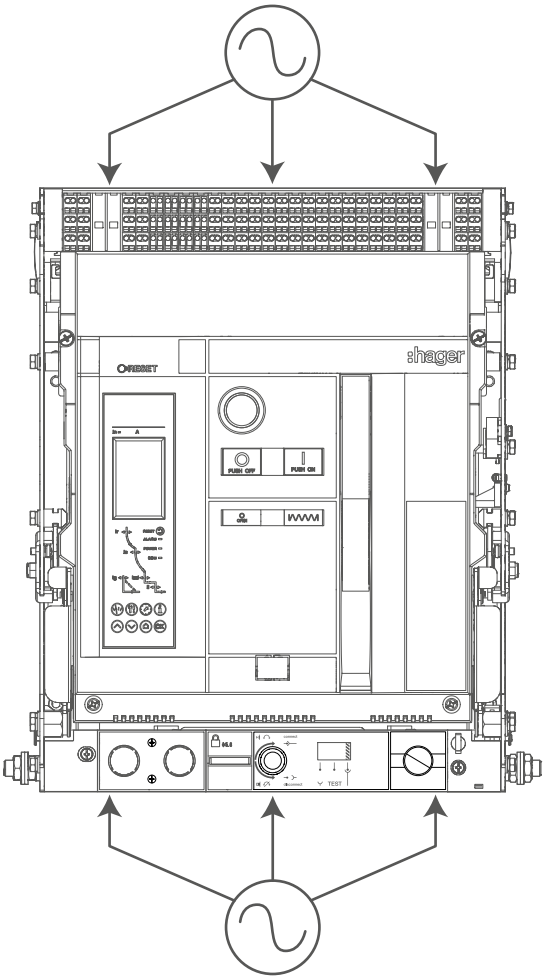
Mounting orientation

The circuit breakers must be mounted vertically.



Supply direction

The circuit breakers can be powered from either the top or the bottom connections, without any decrease in performance.
All connections and insulation accessories can be used on circuit breakers powered either from the top or from the bottom.



Temperature derating

Circuit breakers are rated at an ambient temperature of 50°C for overload protection.
The temperature derating indicated below are derived from test conditions of IEC 60947-2 performed in the open air.

Influence of ambient temperature on the rated current values (In) of electronic circuit breakers

The temperature of electronic circuit breakers depends on the operating current and the ambient temperature.
However, ambient temperature does not affect the protection setting of electronic circuit breakers.

Derating table for rated current:

	Fixed version HWS2M: 50 kA				
	Temperature °C				
In (A)	40	50	60	65	70
630	630	630	630	630	630
800	800	800	800	800	800
1000	1000	1000	1000	1000	1000
1250	1250	1250	1250	1250	1250
1600	1600	1600	1600	1600	1560
2000	2000	2000	1985	1890	1795

	Fixed version HWS2E: 66 kA				
	Temperature °C				
40	50	60	65	70	
630	630	630	630	630	
800	800	800	800	800	
1000	1000	1000	1000	1000	
1250	1250	1250	1250	1250	
1600	1600	1600	1600	1600	
2000	2000	2000	2000	1910	

	Drawout version HWS2M: 50 kA				
	Temperature °C				
In (A)	40	50	60	65	70
630	630	630	630	630	630
800	800	800	800	800	800
1000	1000	1000	1000	1000	1000
1250	1250	1250	1250	1250	1250
1600	1600	1600	1600	1555	1470
2000	2000	2000	1860	1770	1675

	Drawout version HWS2E: 66 kA				
	Temperature °C				
40	50	60	65	70	
630	630	630	630	630	
800	800	800	800	800	
1000	1000	1000	1000	1000	
1250	1250	1250	1250	1250	
1600	1600	1600	1600	1580	
2000	2000	1985	1885	1785	

	Fixed version HWS4E: 66 kA				
	Temperature °C				
In (A)	40	50	60	65	70
2000	2000	2000	2000	2000	2000
2500	2500	2500	2500	2450	2325
3200	3200	3200	3200	3160	3020

	Fixed version HWS4S: 85 kA				
	Temperature °C				
40	50	60	65	70	
2000	2000	2000	2000	2000	
2500	2500	2500	2500	2500	
3200	3200	3200	3200	3200	
4000	4000	4000	4000	3810	

	Drawout version HWS4E: 66 kA				
	Temperature °C				
In (A)	40	50	60	65	70
2000	2000	2000	2000	2000	2000
2500	2500	2500	2400	2290	2165
3200	3200	3200	3150	3000	2840

	Drawout version HWS4S: 85 kA				
	Temperature °C				
40	50	60	65	70	
2000	2000	2000	2000	2000	
2500	2500	2500	2500	2500	
3200	3200	3200	3170	3030	
4000	4000	3980	3790	3580	

Safety clearance distance

The safety clearance distances between the circuit breaker and its enclosure parts (grounded metal parts) must be maintained to prevent arcing faults.

In some cases where other specifications require different isolation distances to those shown here, the greater distance must be maintained.

If two different circuit breaker models are installed one above the other, the safety clearance distance between the two models should comply with the model specifications of the bottom circuit breaker.

Warning

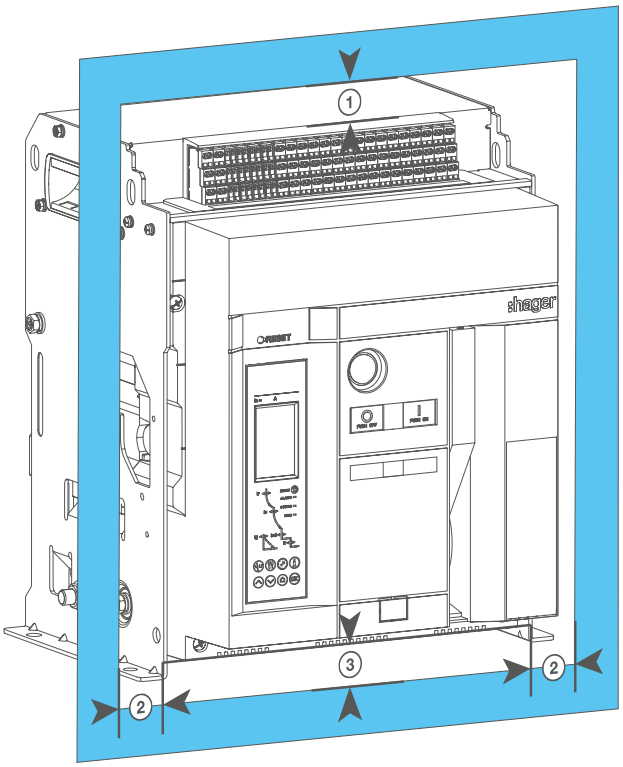
Risk of electric shock.

Danger to life, risk of injury due to electric shock, or risk of serious injury.

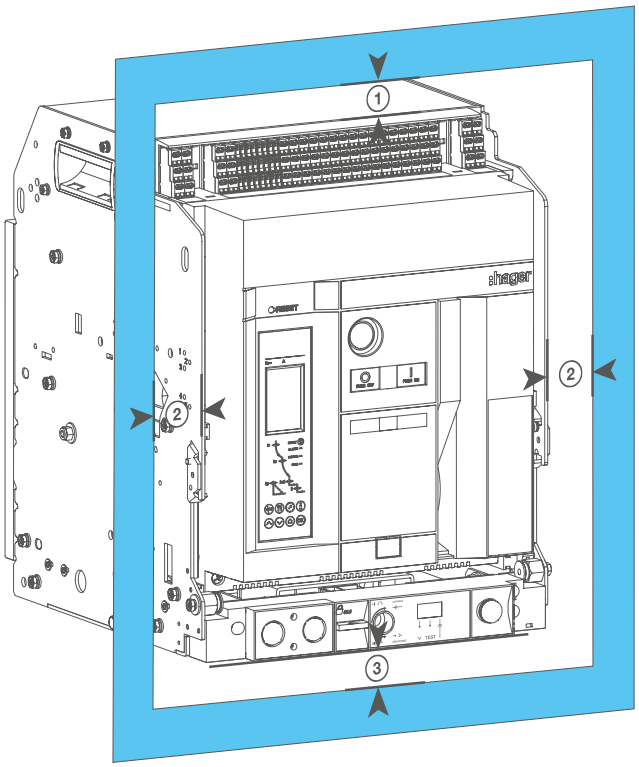
Make sure that the device is only operated by qualified personnel in accordance with the installation standards in force in the relevant country.

To ensure the safety of people and the installation, comply with the following safety clearances:

Fixed circuit breaker



Drawout circuit breaker



Air circuit breaker	Distance	Insulating material	Metallic material	Circuit breaker live (mm)
Fixed	1	0	0	0
	2	0	0	60
	3	0	0	0
Withdrawable	1	0	0	0
	2	0	0	60
	3	0	0	0

6.2 Power dissipation

Dissipated power

The dissipated power values of circuit breakers are used to calculate the heating in the distribution panel in which they are installed.

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

The value indicated is the power dissipation per pole at In, 50/60 Hz.

The measurement and calculation of power dissipation will be carried out in accordance with the recommendations of Annex G of the IEC 60947-2 standard.

The total power loss at full rated load and frequency of 50/60 Hz is equal to the power loss per pole multiplied by 3.

Power dissipation of HWS2M circuit breakers: 50 kA

Number of poles	Version	Rating In (A)	P / pole (W)	Total P / circuit breaker (W)
3 /4	Fixed	630	3	10
		800	6	18
		1000	10	31
		1250	17	52
		1600	28	84
		2000	46	137
	Drawout	630	11	33
		800	18	54
		1000	28	83
		1250	45	135
		1600	73	219
		2000	123	370

Power dissipation of HWS2E circuit breakers: 66 kA

Number of poles	Version	Rating In (A)	P / pole (W)	Total P / circuit breaker (W)
3 /4	Fixed	630	3	8
		800	5	14
		1000	8	23
		1250	13	38
		1600	21	64
		2000	34	102
	Drawout	630	8	24
		800	13	38
		1000	21	62
		1250	33	100
		1600	59	176
		2000	91	273

Power dissipation of HWS4E circuit breakers: 66 kA

Number of poles	Version	Rating In (A)	P / pole (W)	Total P / circuit breaker (W)
3 /4	Fixed	2000	42	126
		2500	69	208
		3200	108	324
	Drawout	2000	80	241
		2500	124	371
		3200	200	600

Power dissipation of HWS4S circuit breakers: 85 kA

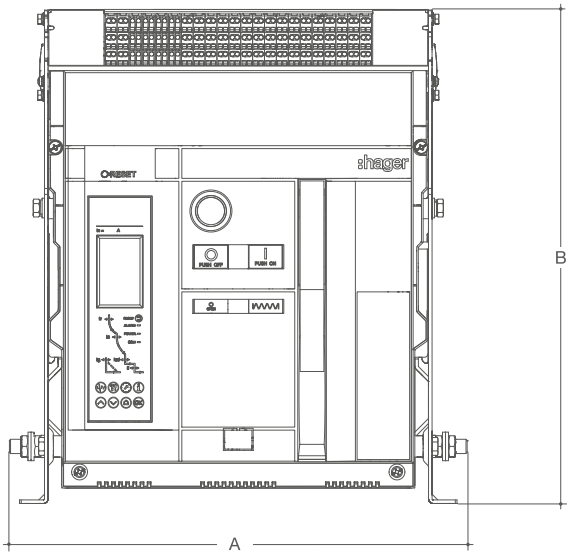
Number of poles	Version	Rating In (A)	P / pole (W)	Total P / circuit breaker (W)
3 /4	Fixed	2000	30	89
		2500	49	146
		3200	80	240
		4000	130	390
	Drawout	2000	46	138
		2500	75	226
		3200	166	497
		4000	267	800

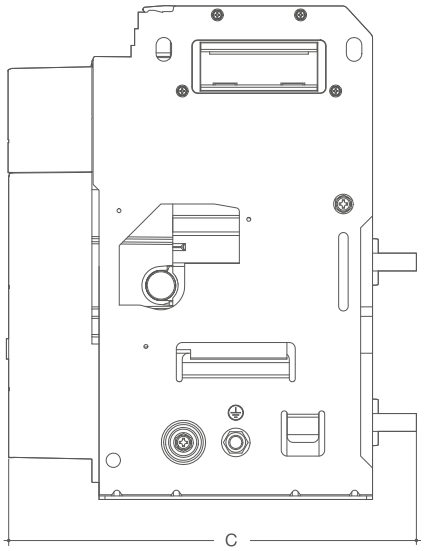
7 Dimensions

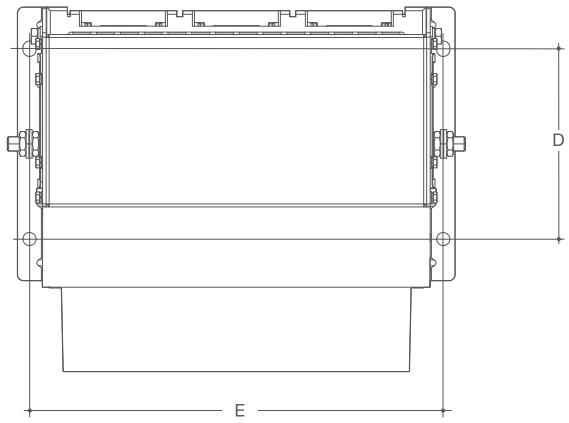
7.1 Circuit breakers

To install a fixed HWS2 or HWS4 circuit breaker, comply with the following dimensions for mounting:

Dimensions (max. value in mm)	HWS2		HWS4	
	3-pole	4-pole	3-pole	4-pole
Width A	385	480	478	604
Height B	416	416	416	416
Max depth C with connections	308	308	308	308
Pitch distance D mounting depth	160	160	160	160
Pitch distance E mounting width	348	443	441	567

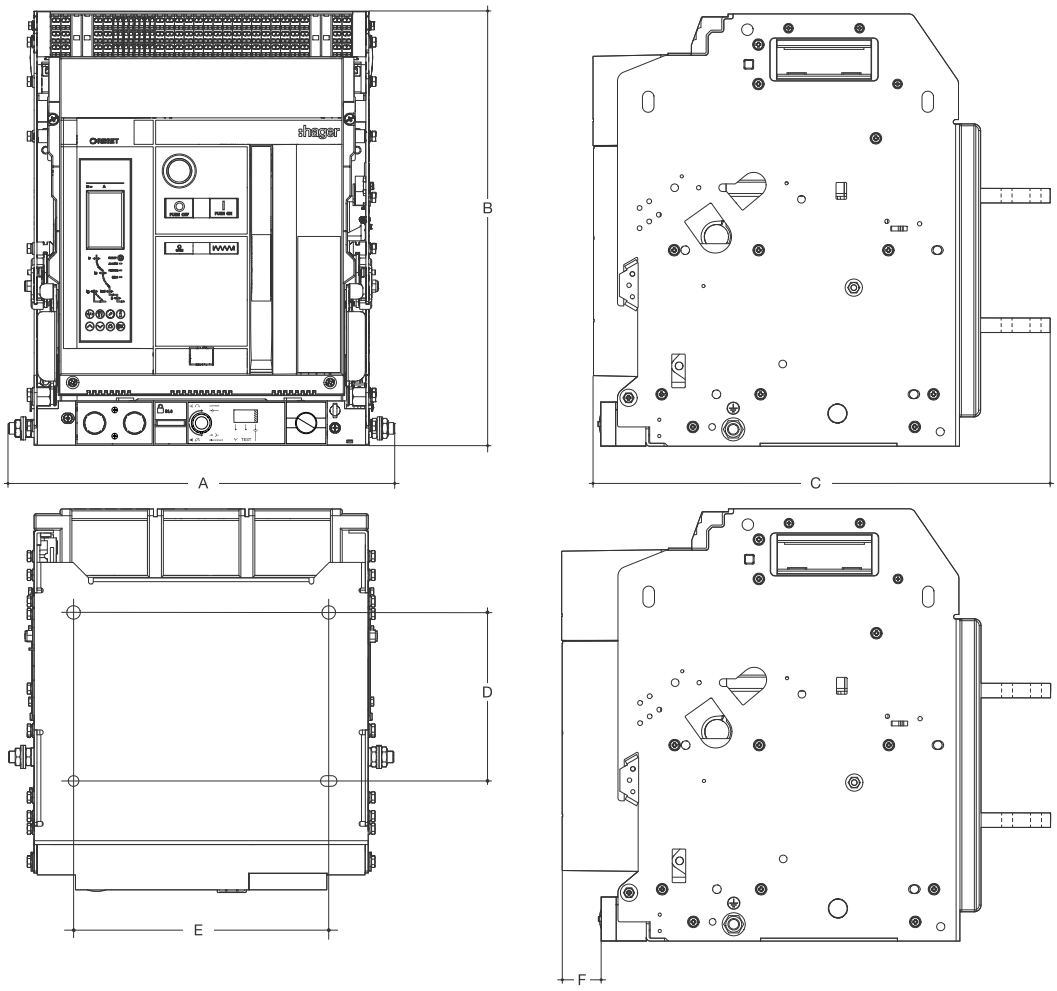






To install a drawout HWS2 or HWS4 circuit breaker, comply with the following dimensions for mounting:

Dimensions (max. value in mm)	**HWS2**		**HWS4**	
	3-pole	**4-pole**	**3-pole**	**4-pole**
Width A	400	495	493	619
Height B	450	450	450	450
Max depth C with connections	407	407	407	407
Pitch distance D mounting depth	175	175	175	175
Pitch distance E mounting width	265	360	325	440
Distance F - circuit breaker in the Test position	40	40	40	40
Distance F - circuit breaker in the Disconnected position.	56	56	56	56



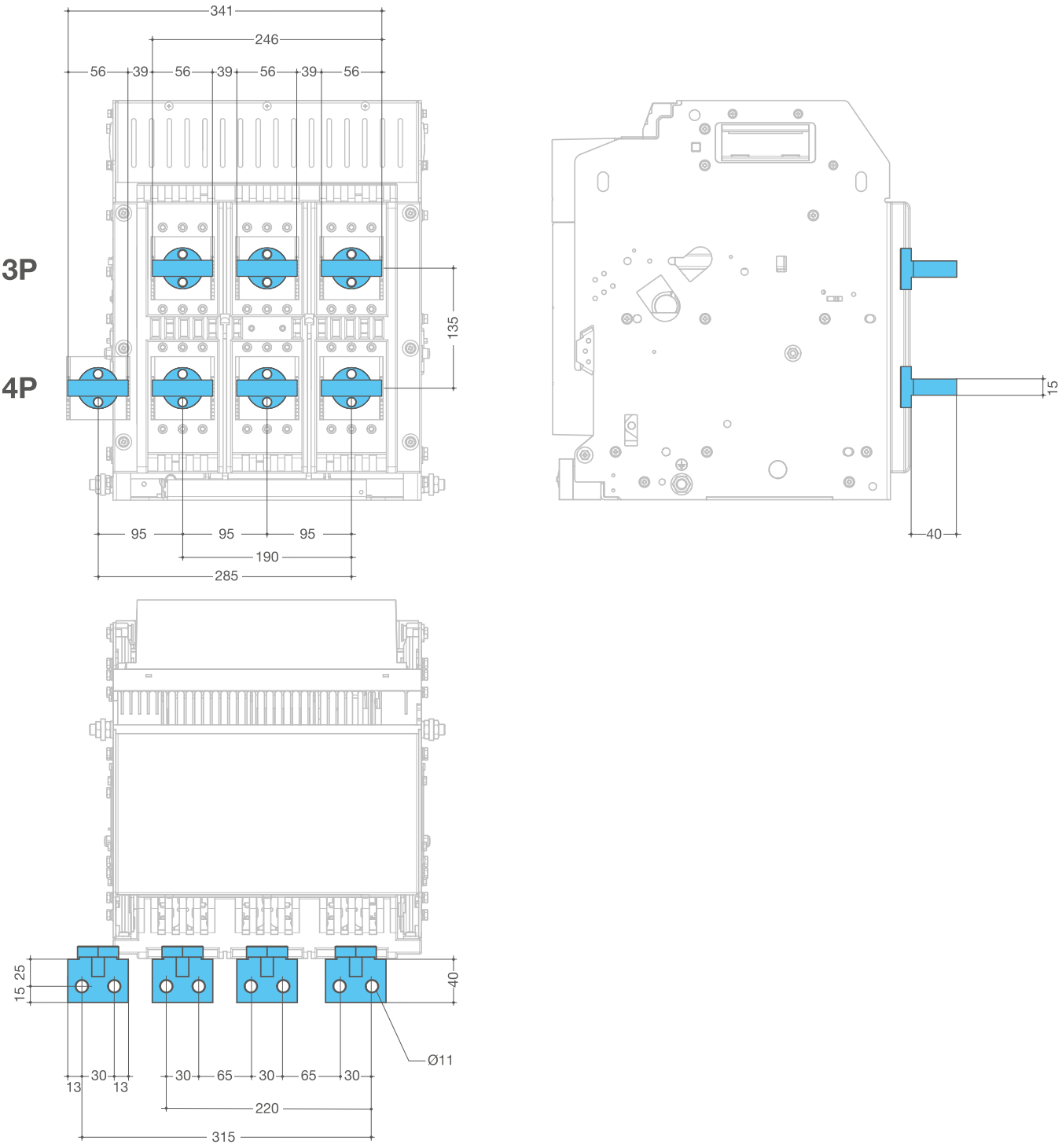
7.2 Connections

To connect an HWS2 circuit breaker, comply with the following connection dimensions. For more information on installing connections, refer to the instruction manuals 6LE009133A (630-2000A) and 6LE007869A.

For fixed or drawout 3-pole or 4-pole version from 630 A to 2000 A.

3P

4P

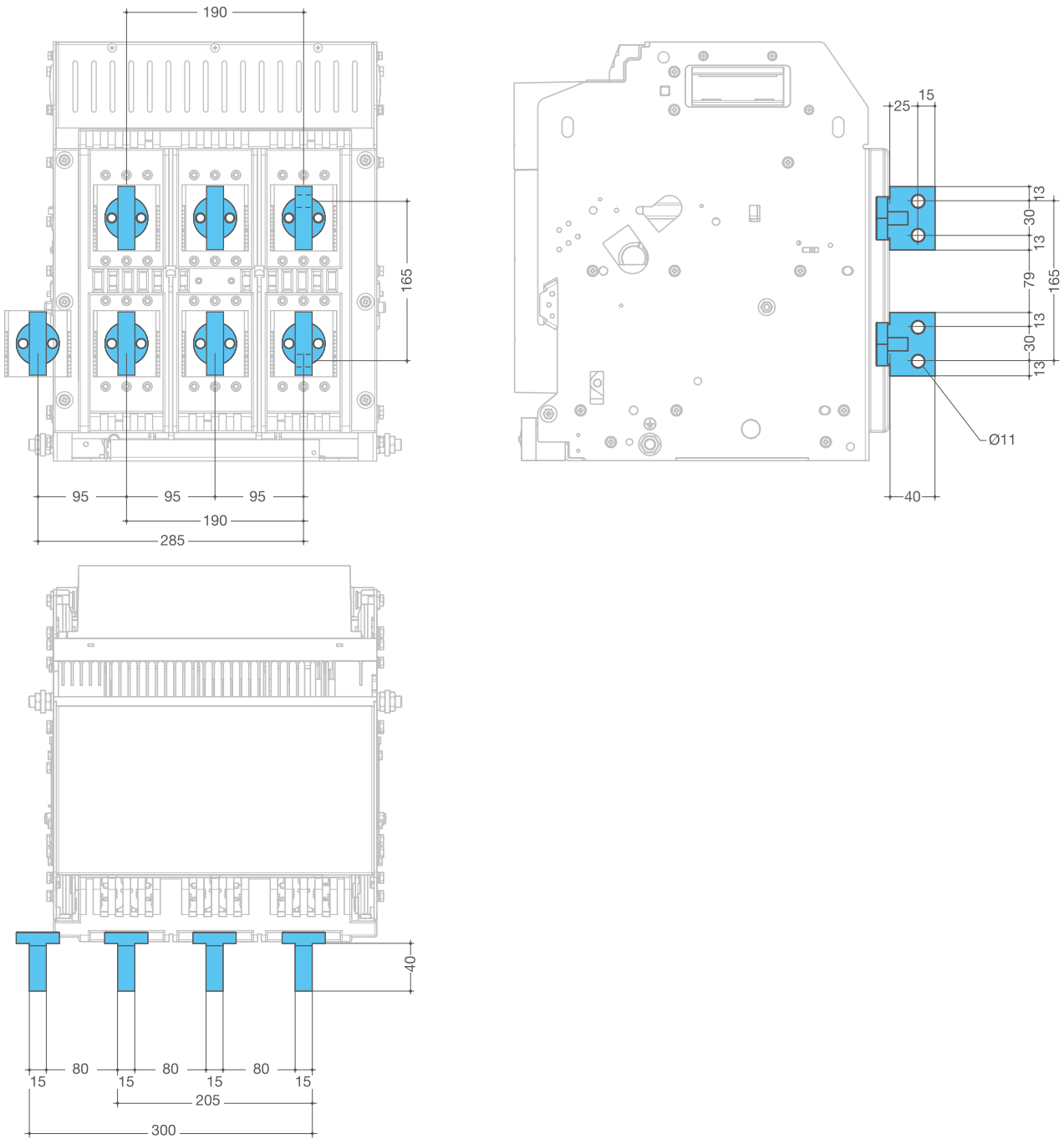


The dimensions given are valid for the fixed and drawout versions.

For fixed or drawout 3-pole or 4-pole version from 630 A to 2000 A.

3P

4P

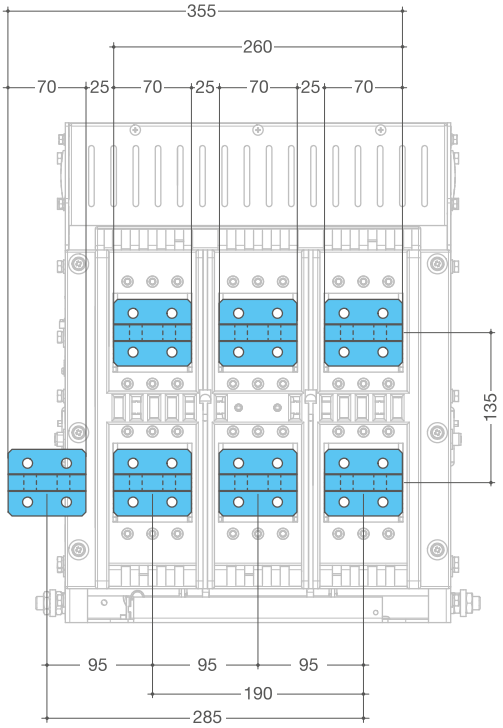


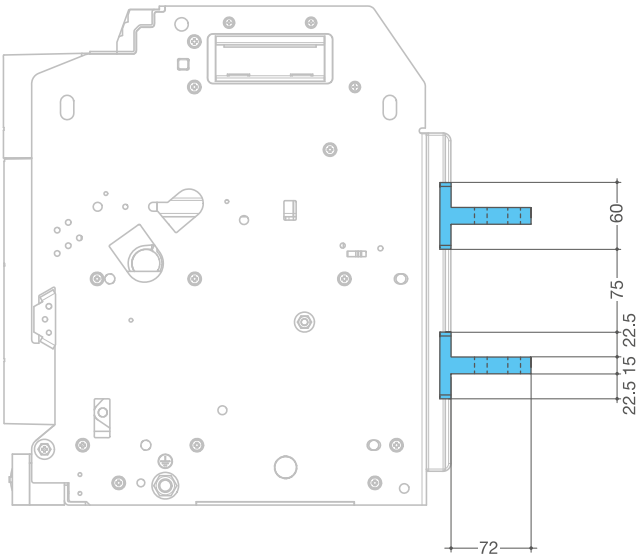
The dimensions given are valid for the fixed and drawout versions.

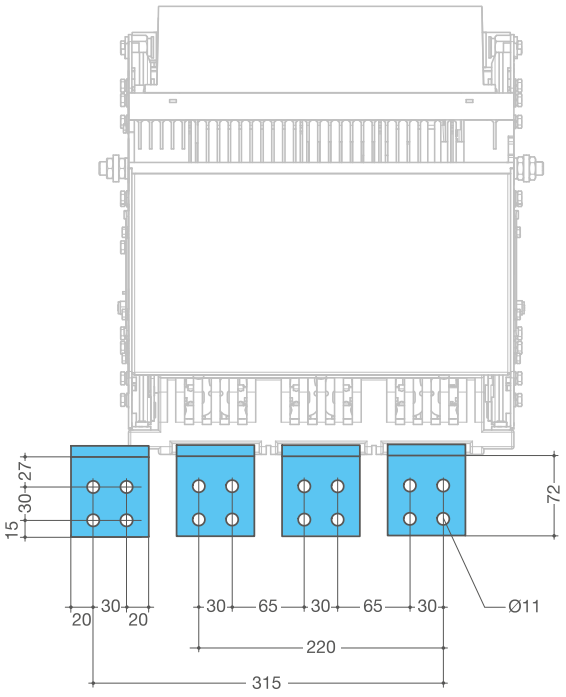
For fixed or drawout version 3-pole or 4-pole **switch disconnector** 630 - 2500 A.

3P

4P





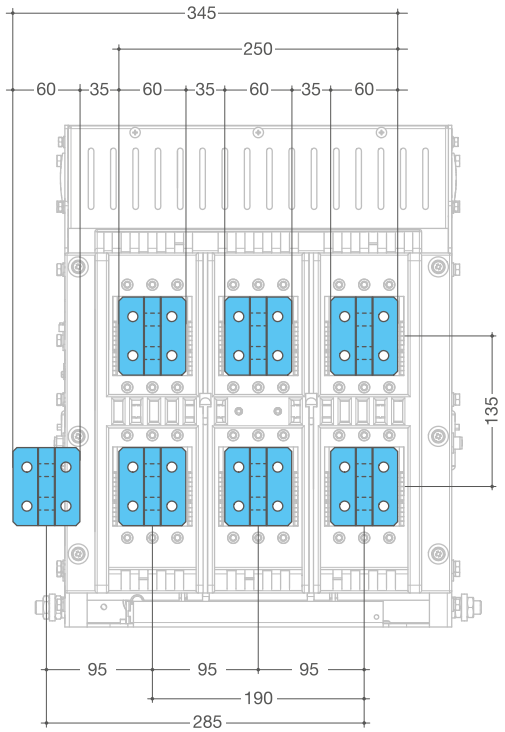


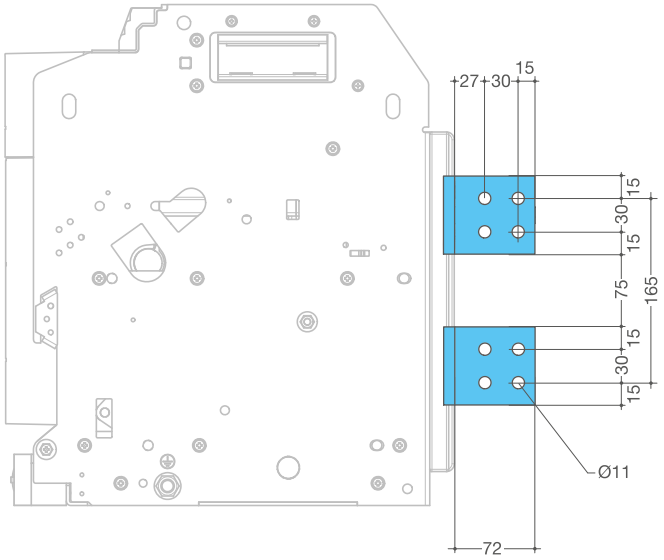
The dimensions given are valid for the fixed and drawout versions.

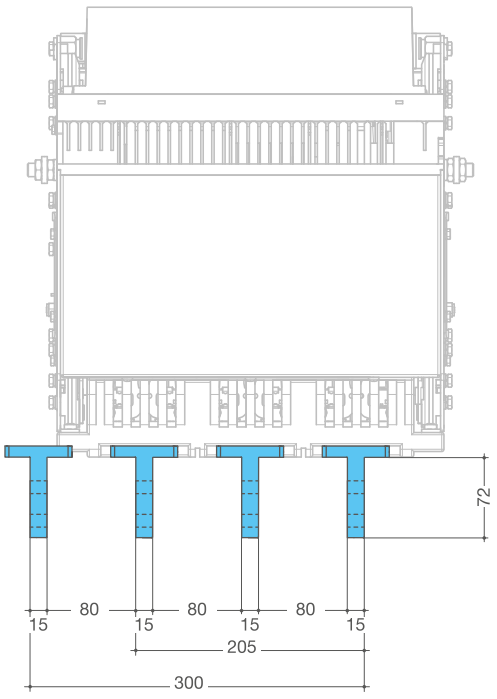
For fixed or drawout version 3-pole or 4-pole**switch disconnector** 630 - 2500 A.

3P

4P







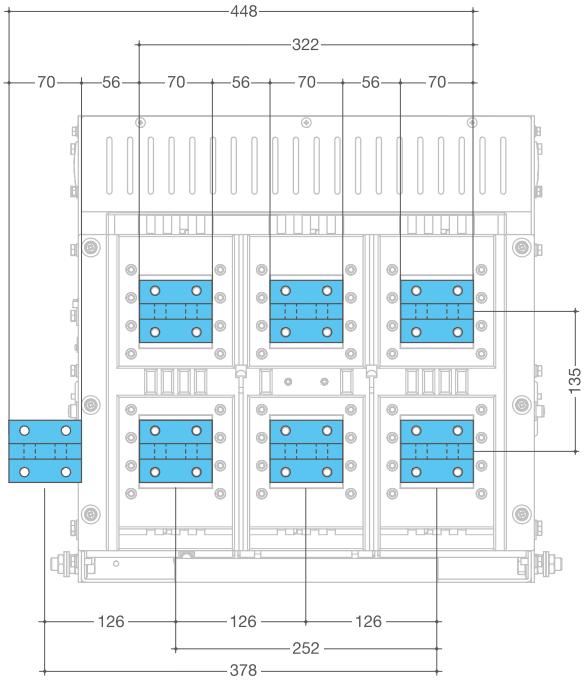
The dimensions given are valid for the fixed and drawout versions.

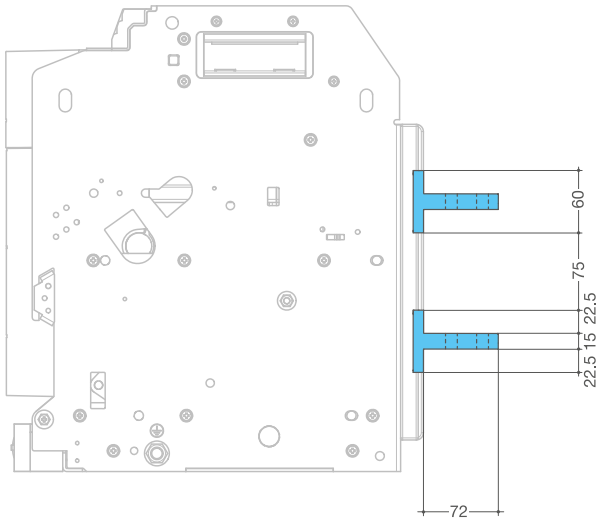
To connect an HWS4 circuit breaker, comply with the following connection dimensions. For more information on the installation of the connections, refer to the instruction manual 6LE009122A.

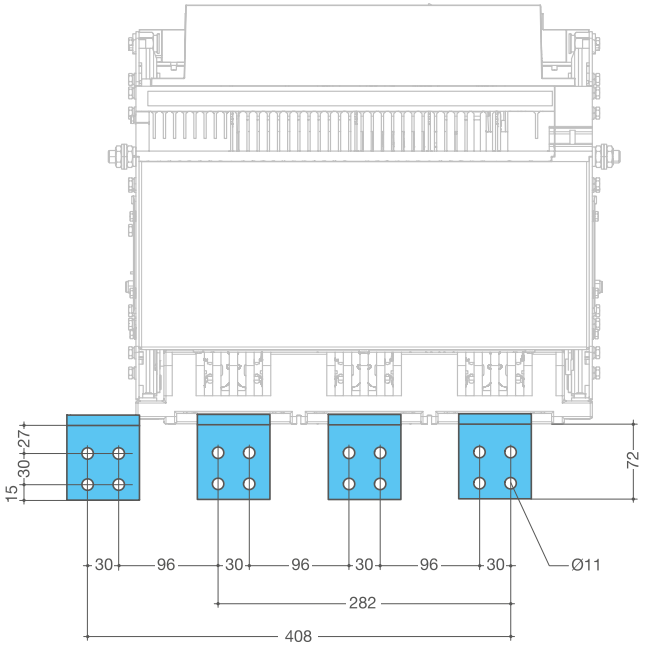
For fixed or drawout 3-pole or 4-pole version from 2000 A to 3200 A.

3P

4P





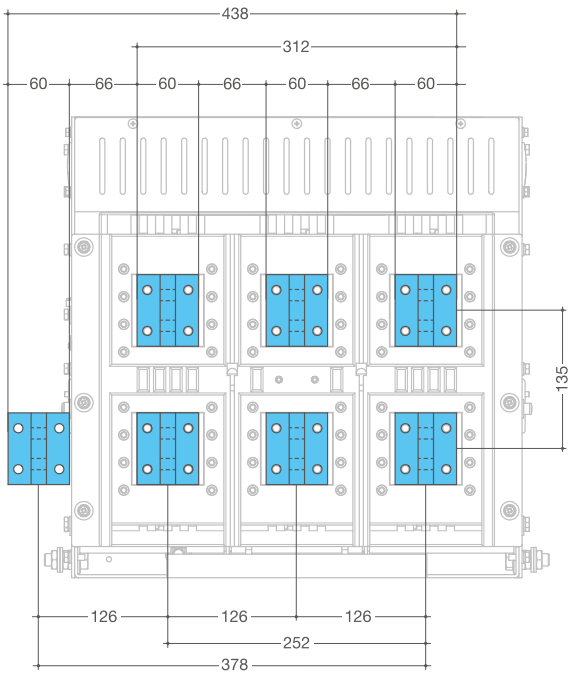


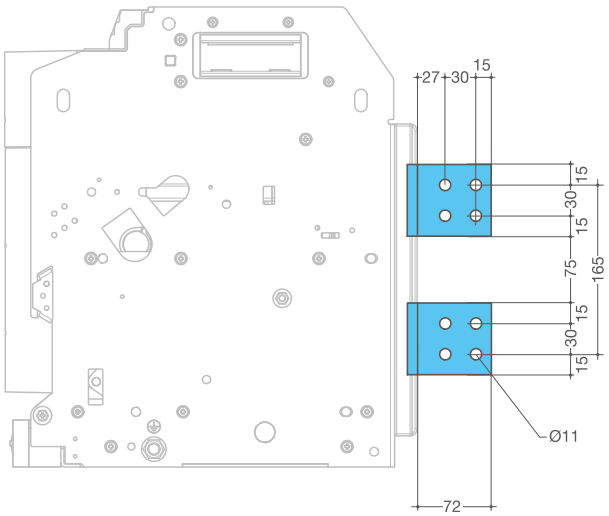
The dimensions given are valid for the fixed and drawout versions.

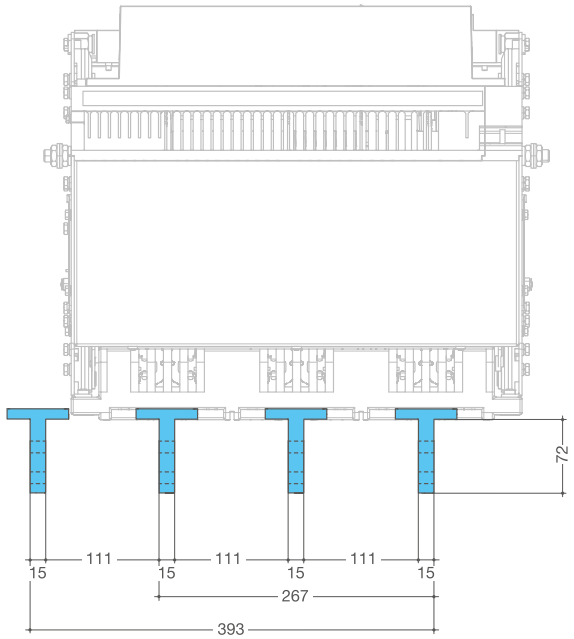
For fixed or drawout 3-pole or 4-pole version from 2000 A to 3200 A.

3P

4P

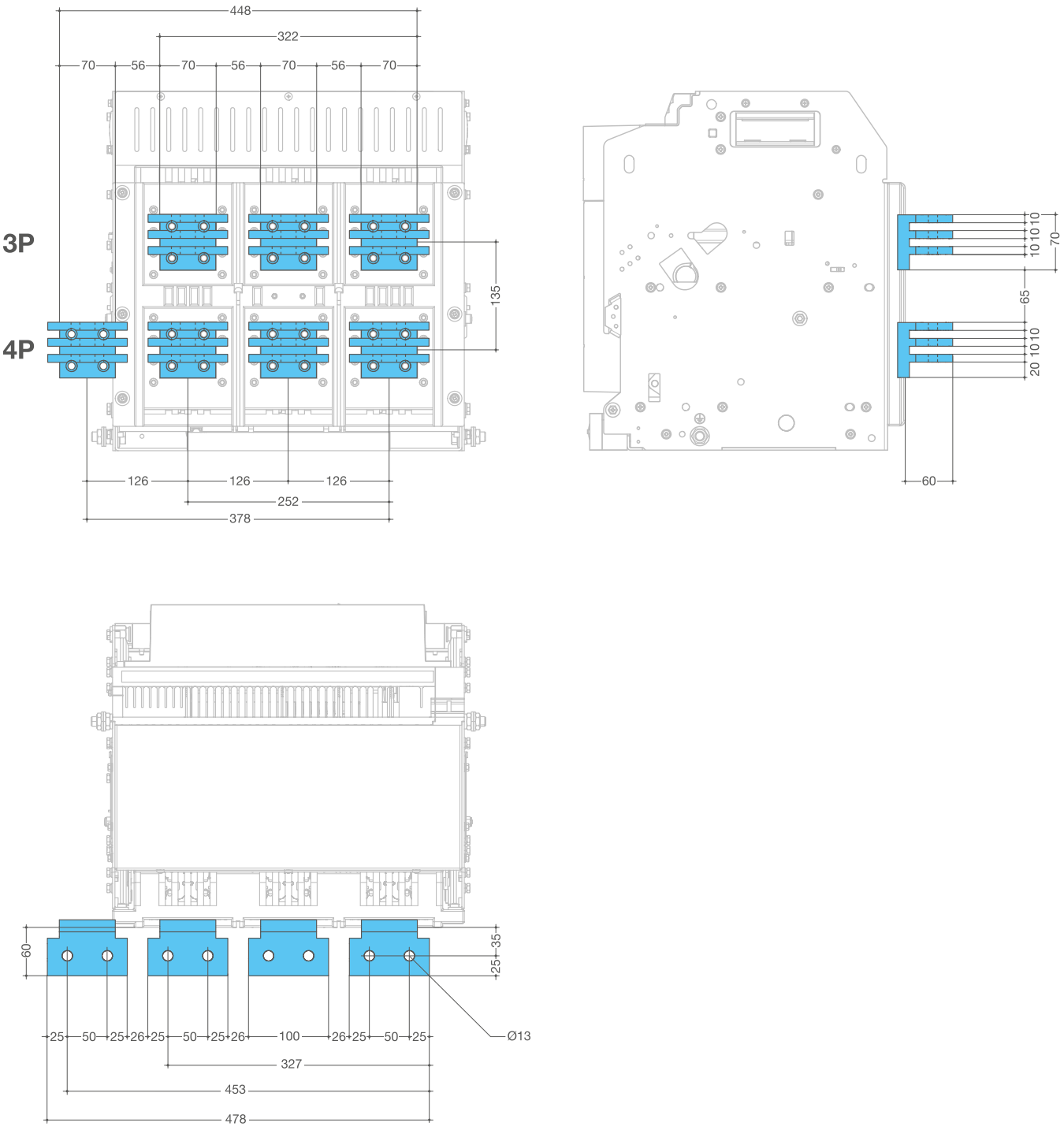






The dimensions given are valid for the fixed and drawout versions.

For fixed or drawout 3-pole or 4-pole version 4000 A.

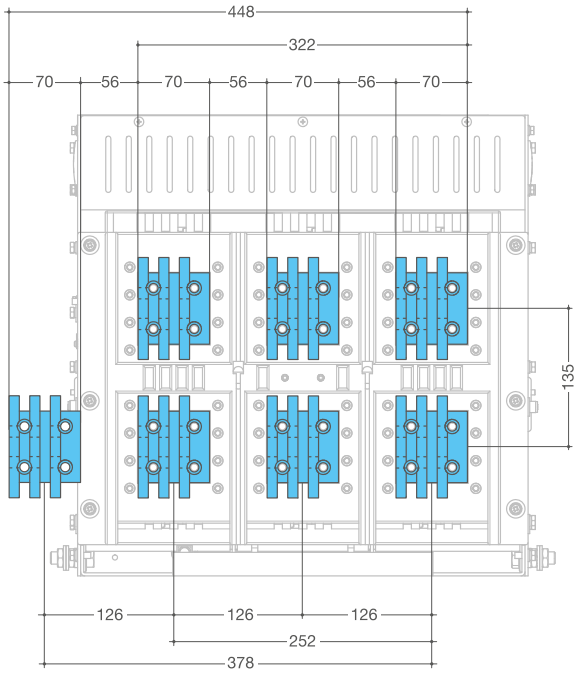


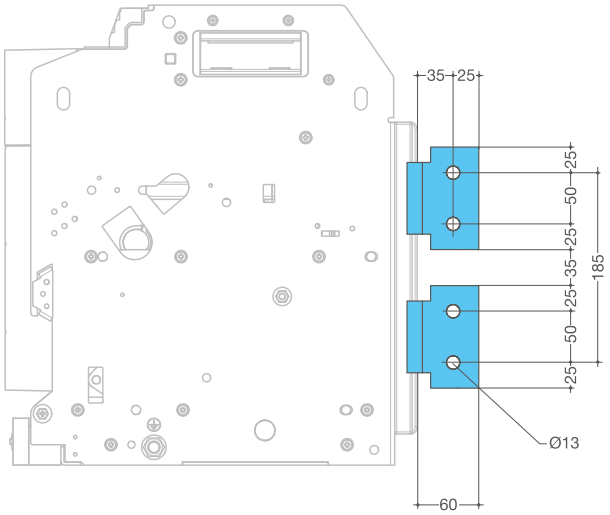
The dimensions given are valid for the fixed and drawout versions.

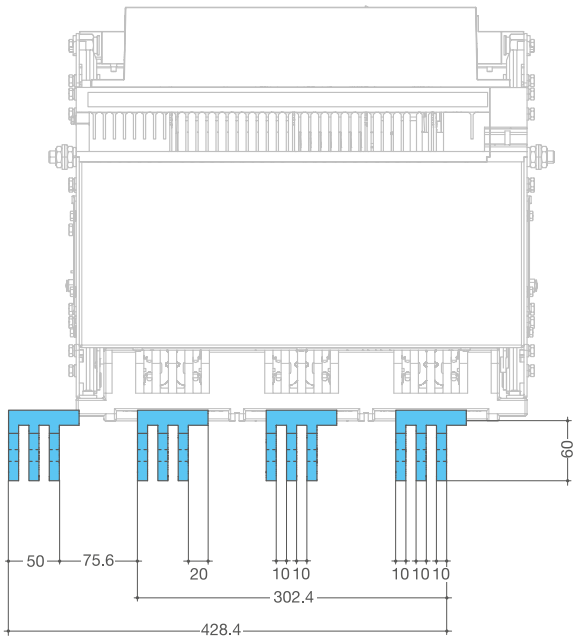
For fixed or drawout 3-pole or 4-pole version 4000 A.

3P

4P







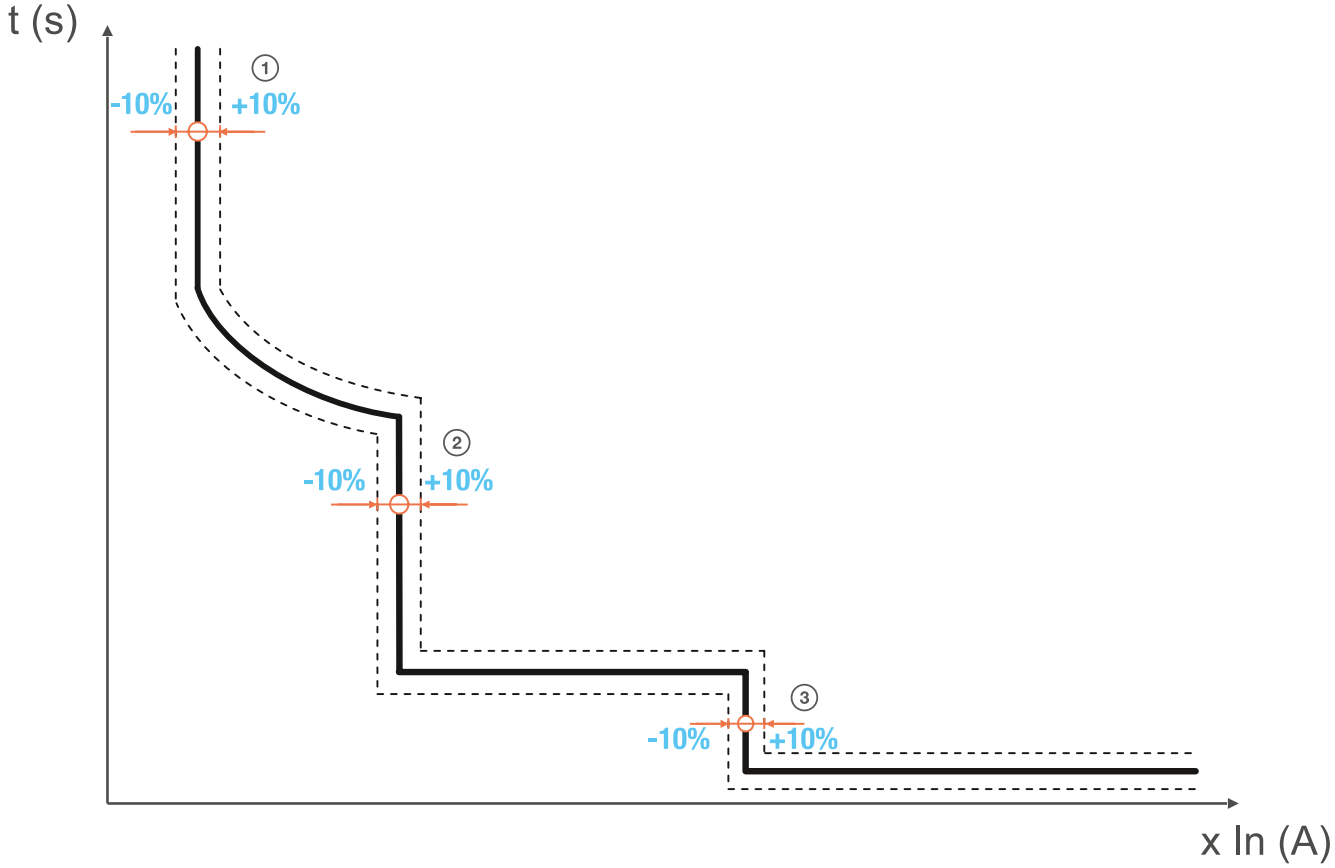
The dimensions given are valid for the fixed and drawout versions.

8 Protection curves

8.1 Tripping curves

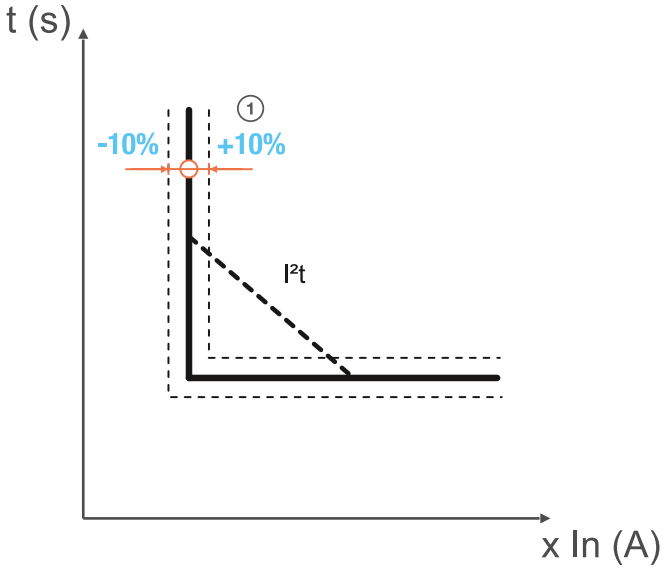
Operating tolerances of electronic trip units

The tolerances of the protection curves of electronic trip units are described below.



1. Ir_Long Time Delay protection threshold
2. Isd_Short Time Delay protection threshold
3. Instantaneous protection threshold Ii

Tolerances of the earth fault protection curve (GF) for the LSIG trip unit

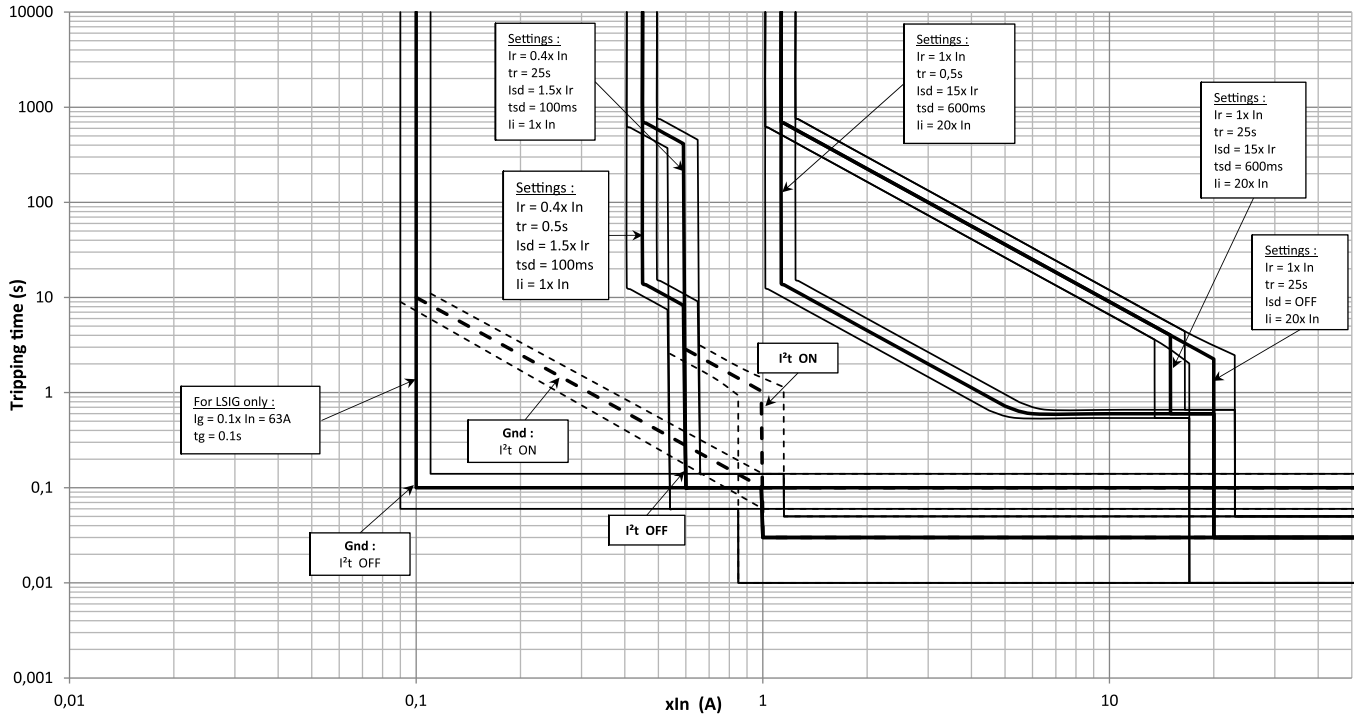


① Earth fault protection threshold Ig

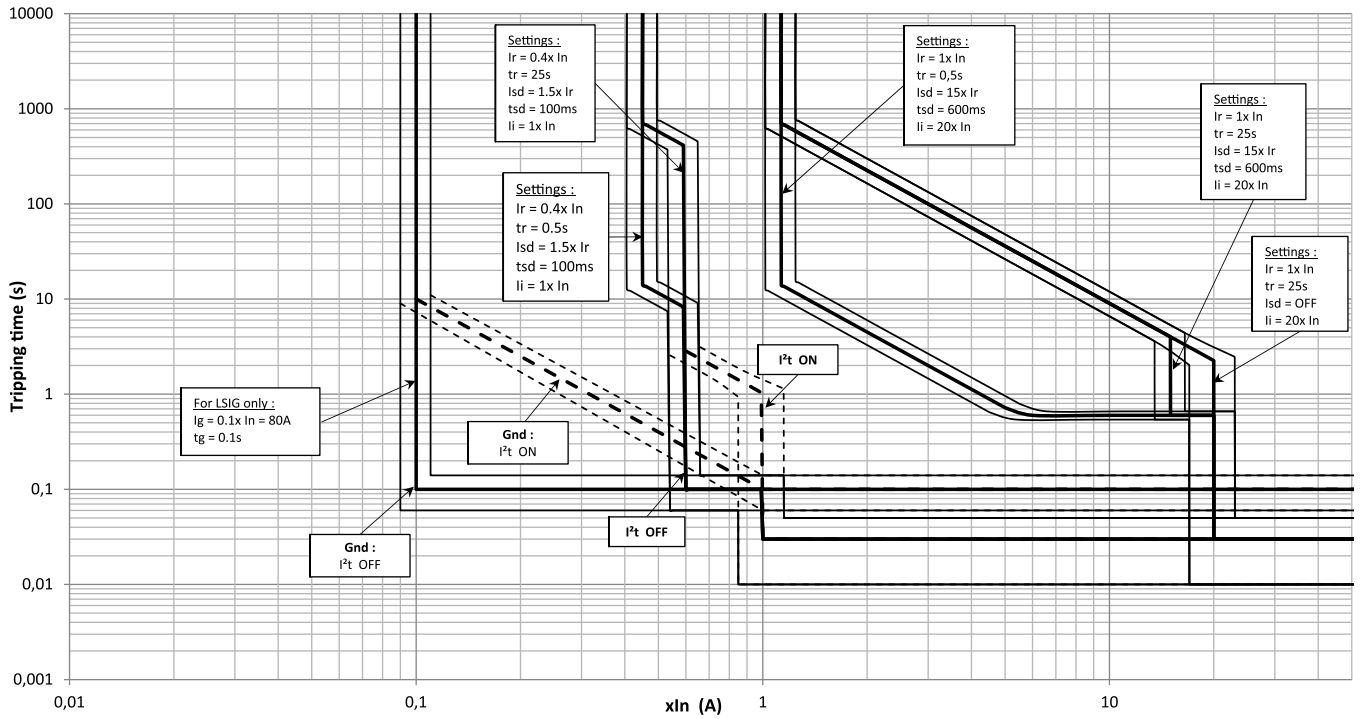
Trip time characteristics according to IEC 60947-2 for electronic trip units:

- LSI and LSIG.
- Type A and Type L.
- 3- and 4-pole versions.

Circuit breaker 630 A

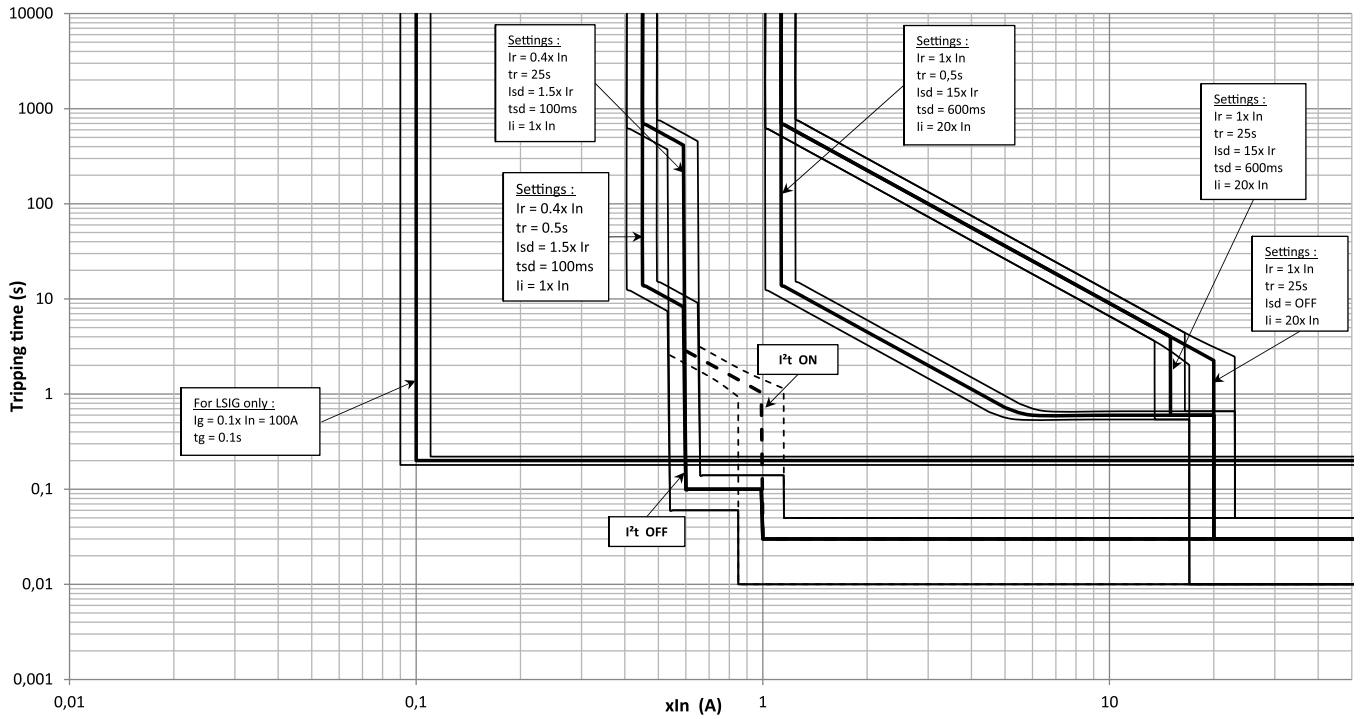


Circuit breaker 800 A

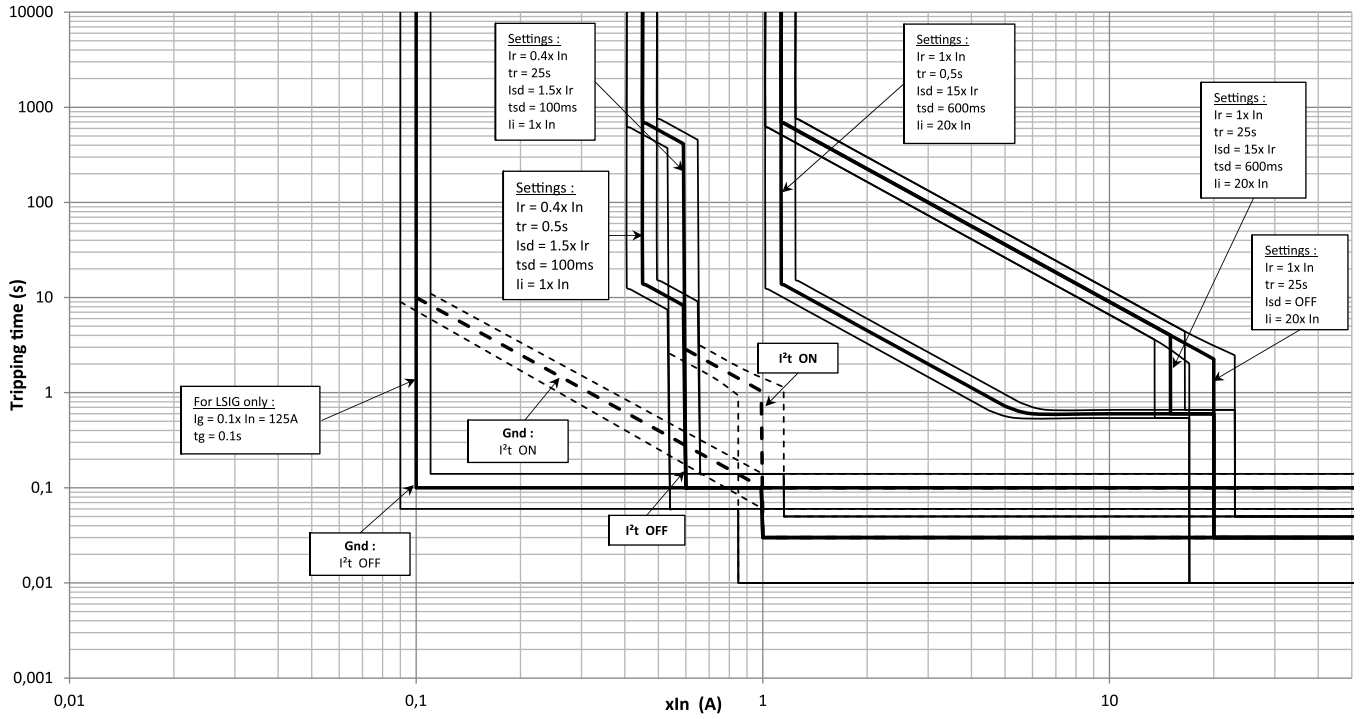


Protection curves
Tripping curves

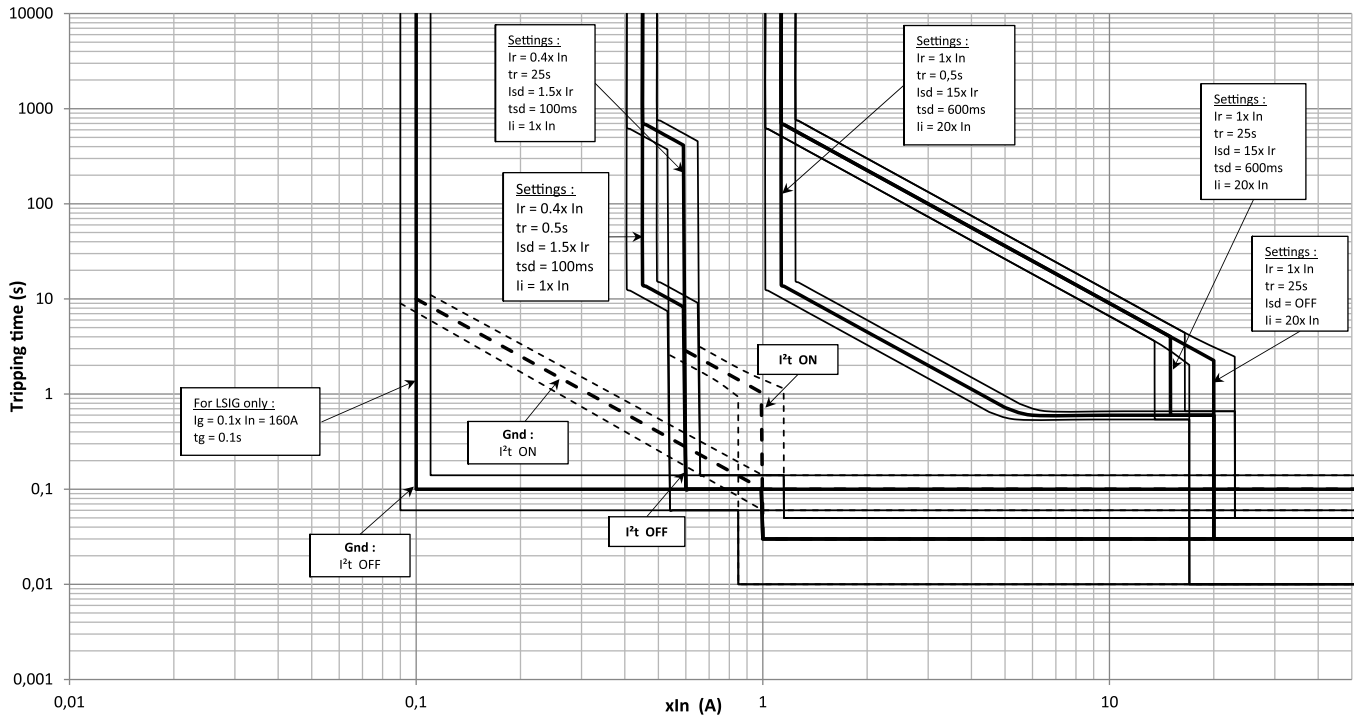
Circuit breaker 1000 A



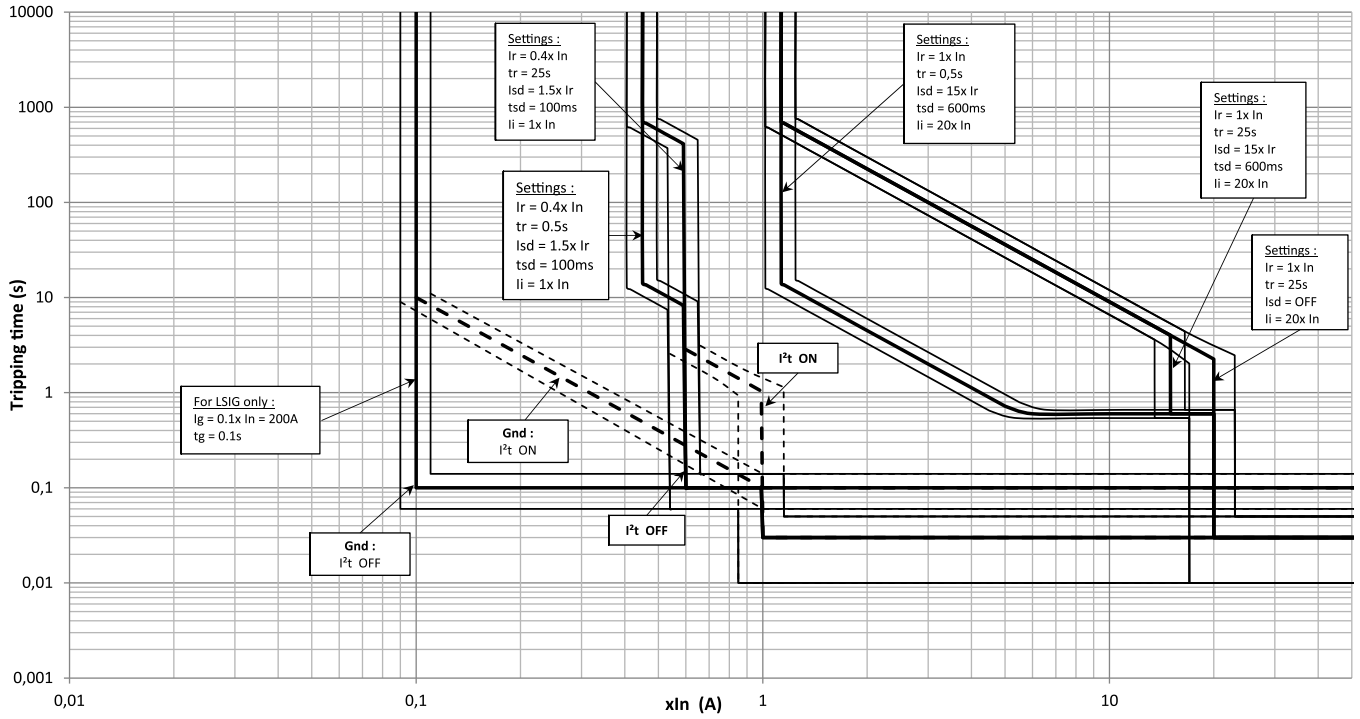
Circuit breaker 1250 A



Circuit breaker 1600 A

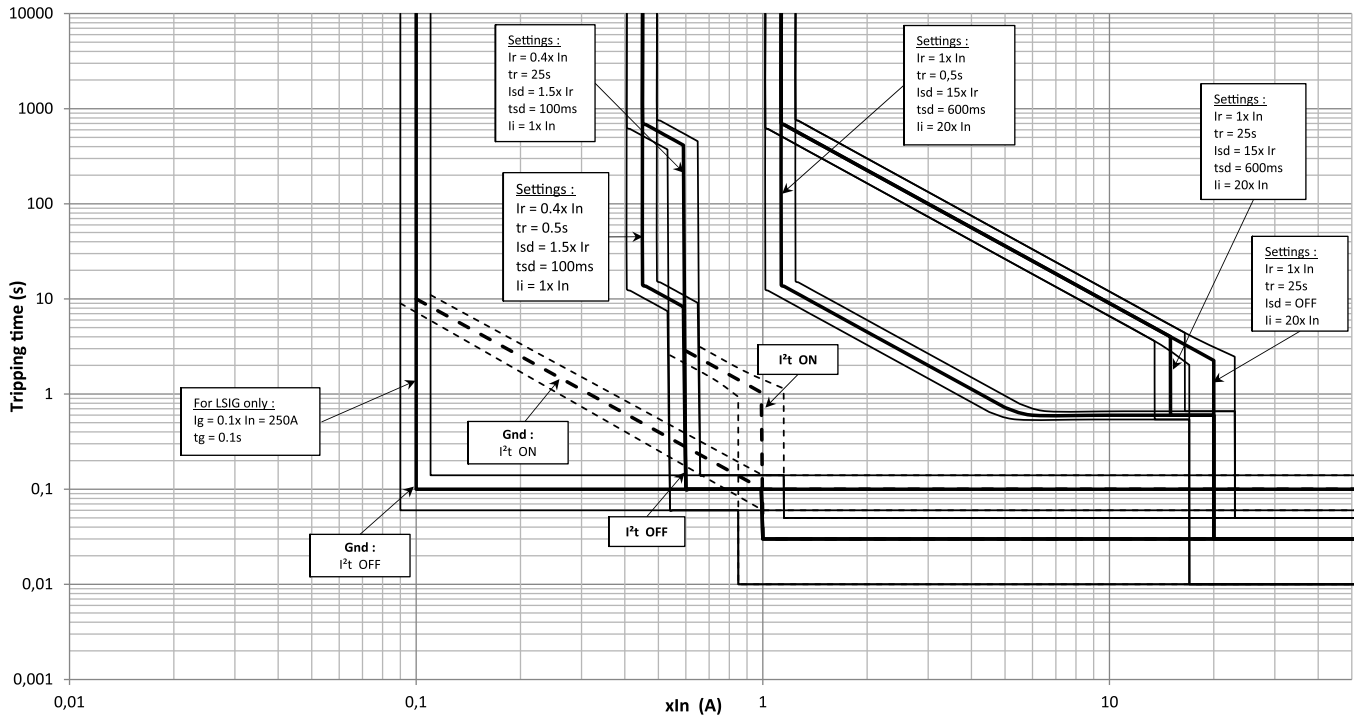


Circuit breaker 2000 A

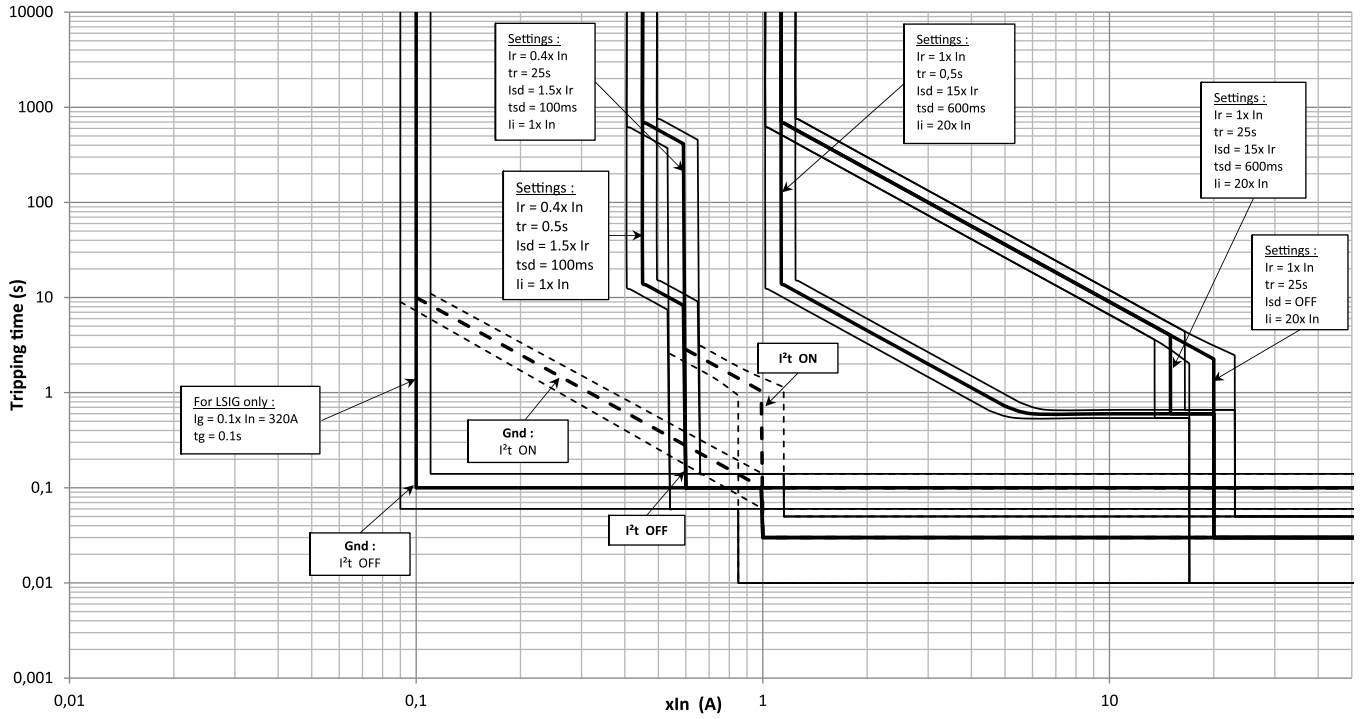


Protection curves
Tripping curves

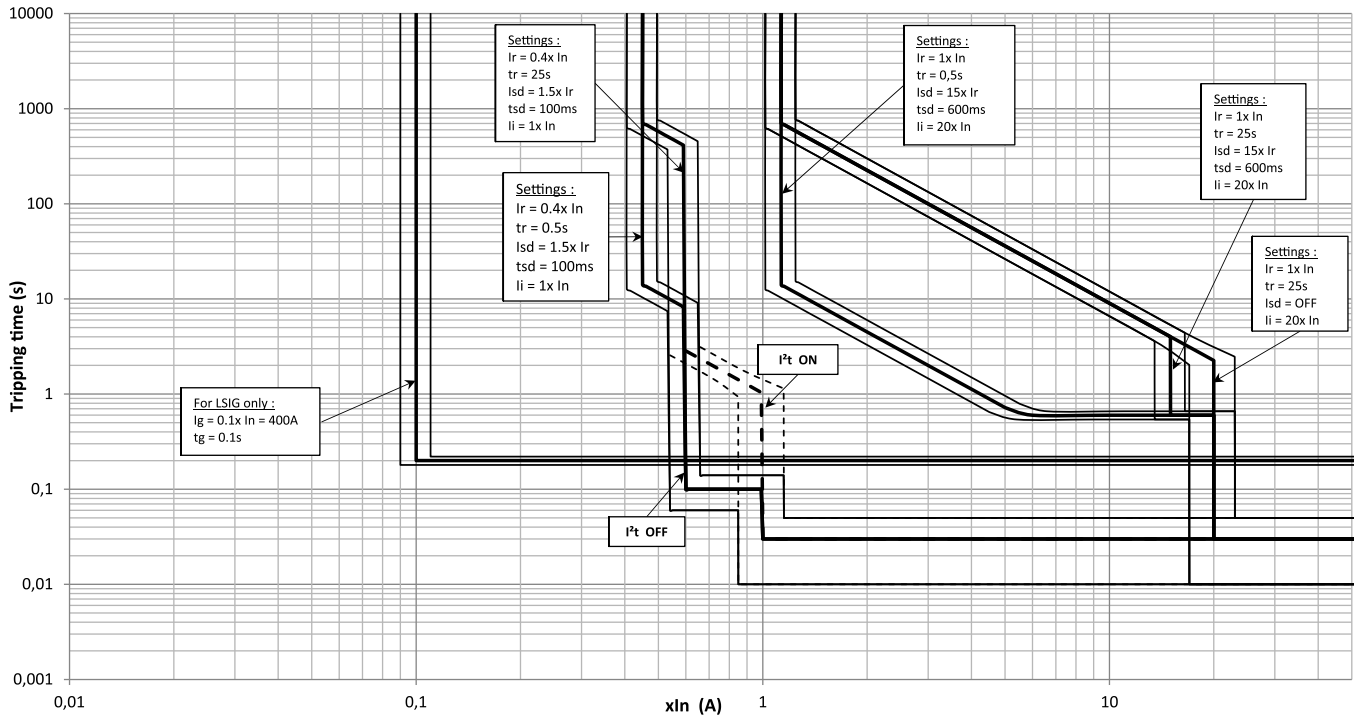
Circuit breaker 2500 A



Circuit breaker 3200 A

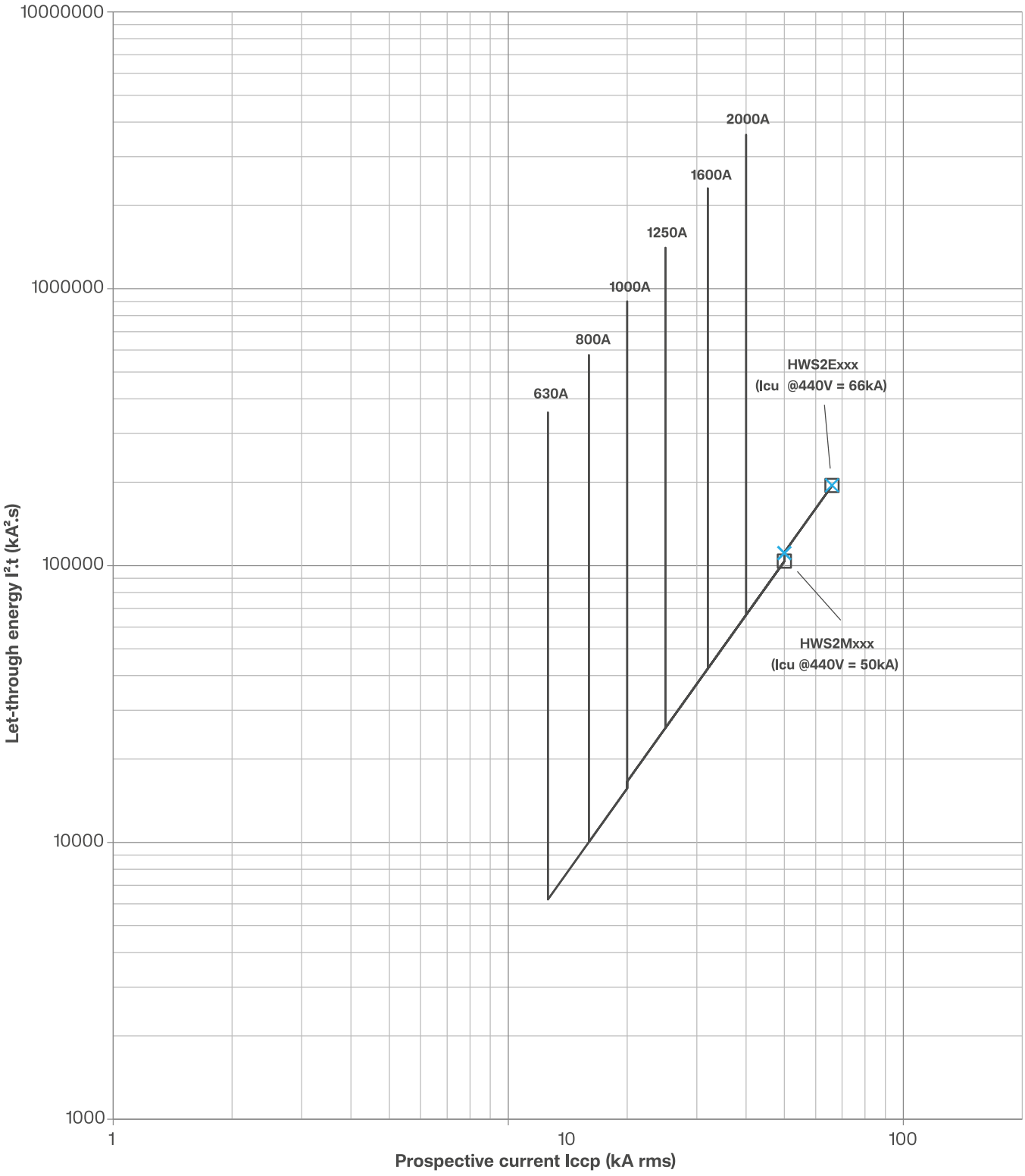


Circuit breaker 4000 A

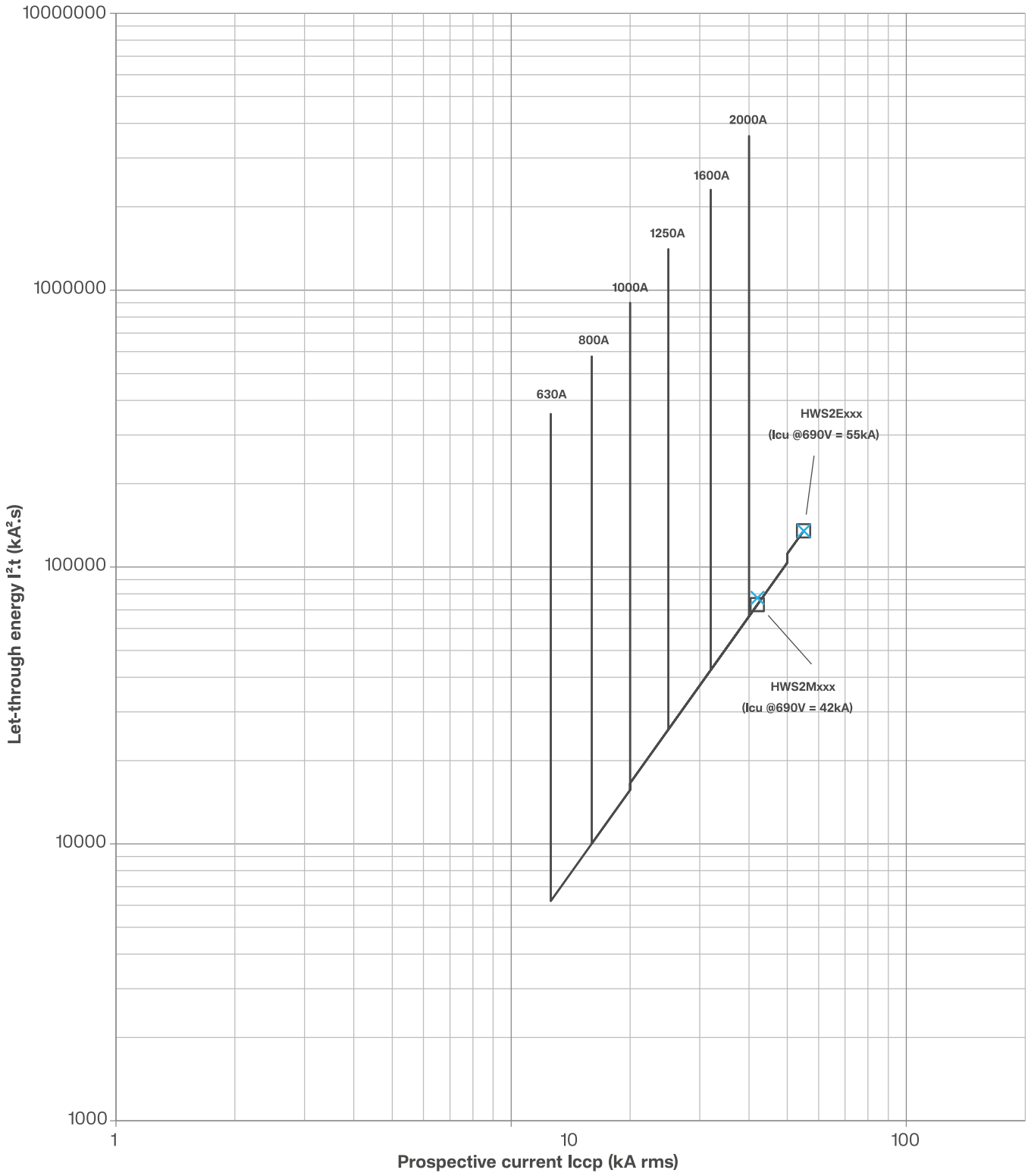


8.2 Thermal constraint and limitation curves

Energy limitation characteristics (let-through energy) 380/440 V AC for HWS2

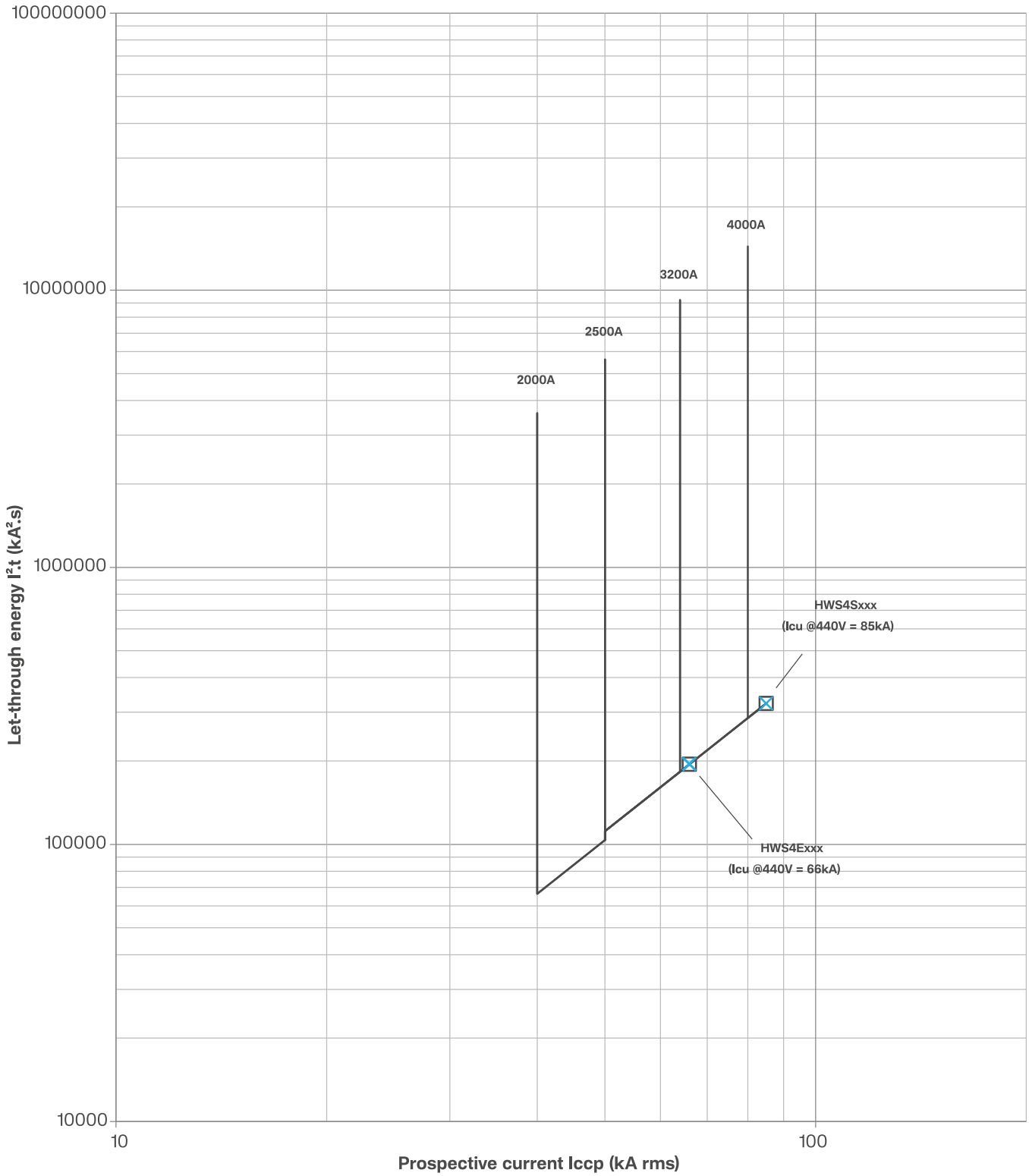


Energy limitation characteristics (let-through energy) above 440 V AC and up to 690 V AC for HWS2

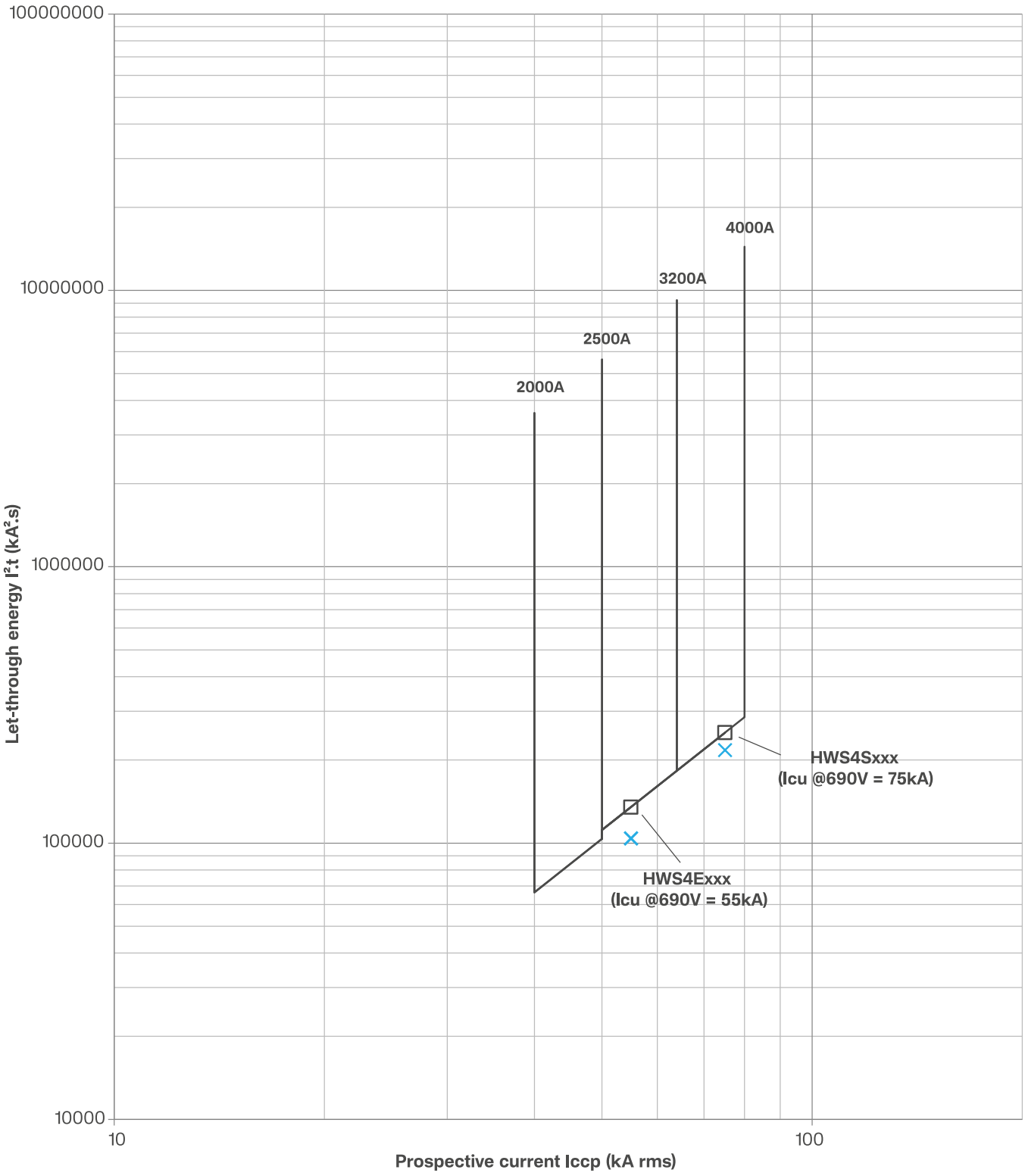


Protection curves
Thermal constraint and limitation curves

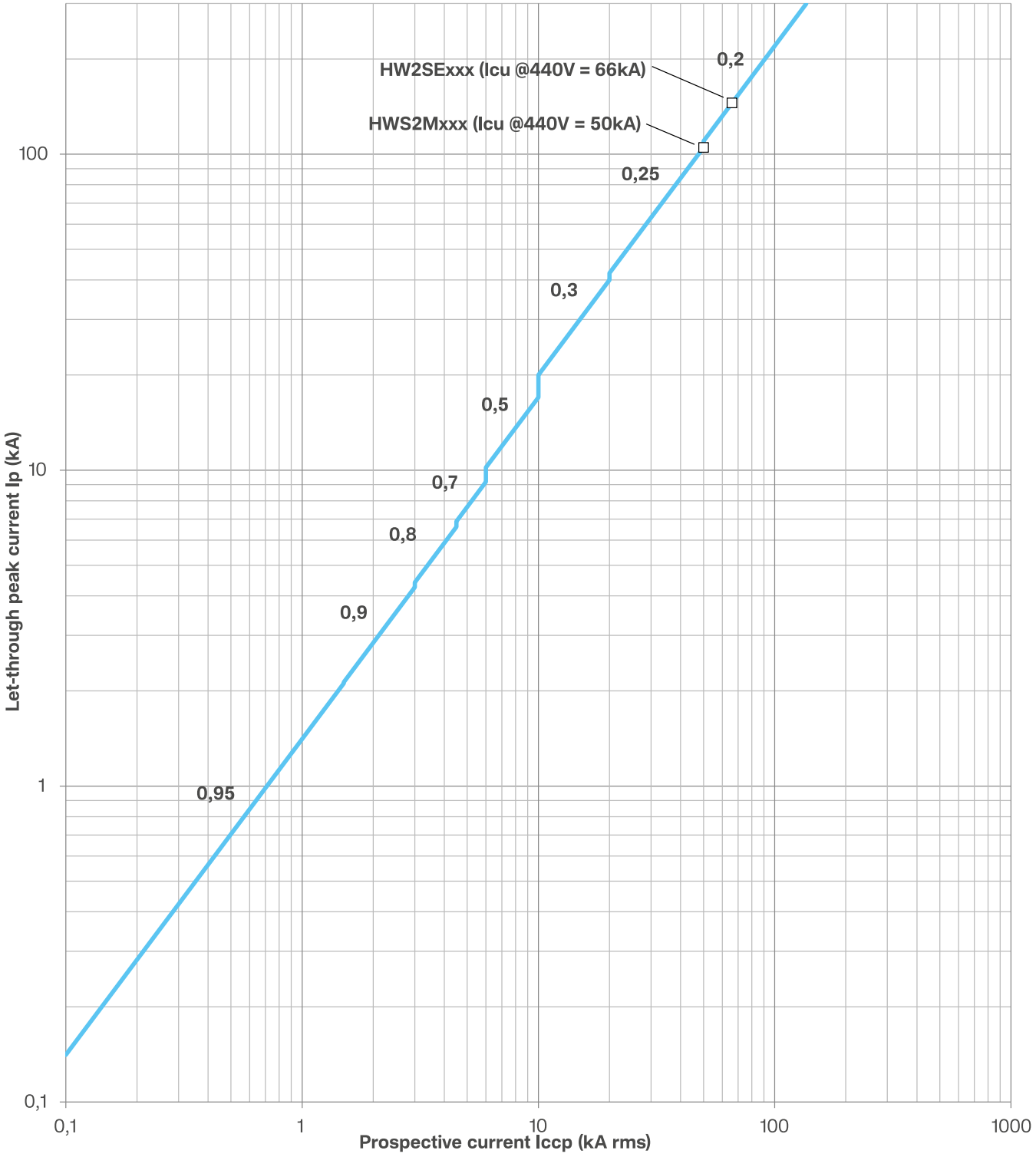
Energy limitation characteristics (let-through energy) 380/440 V AC for HWS4



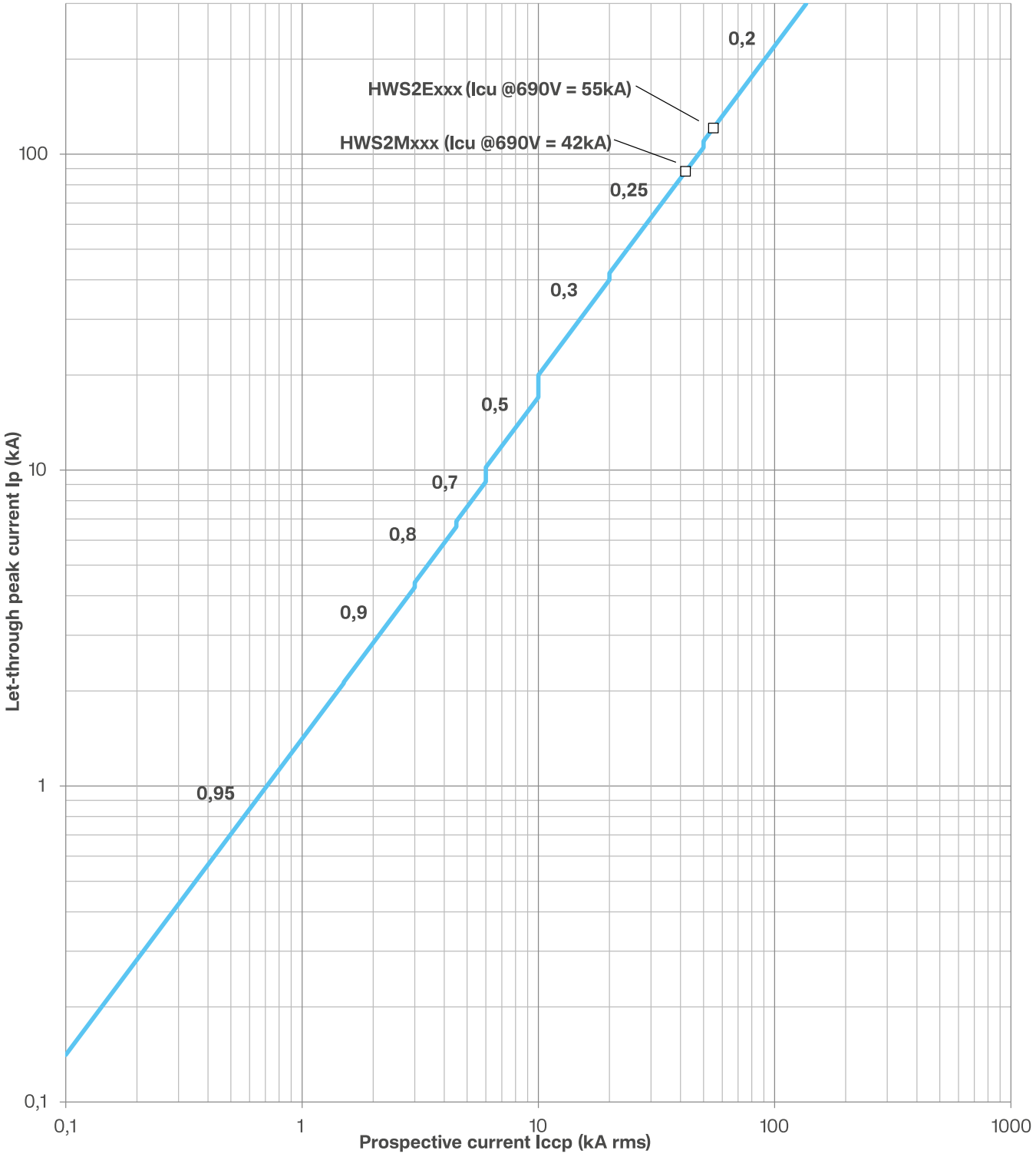
Energy limitation characteristics (let-through energy) above 440 V AC and up to 690 V AC for HWS4



Current limiting characteristics 380/440 V AC for HWS2

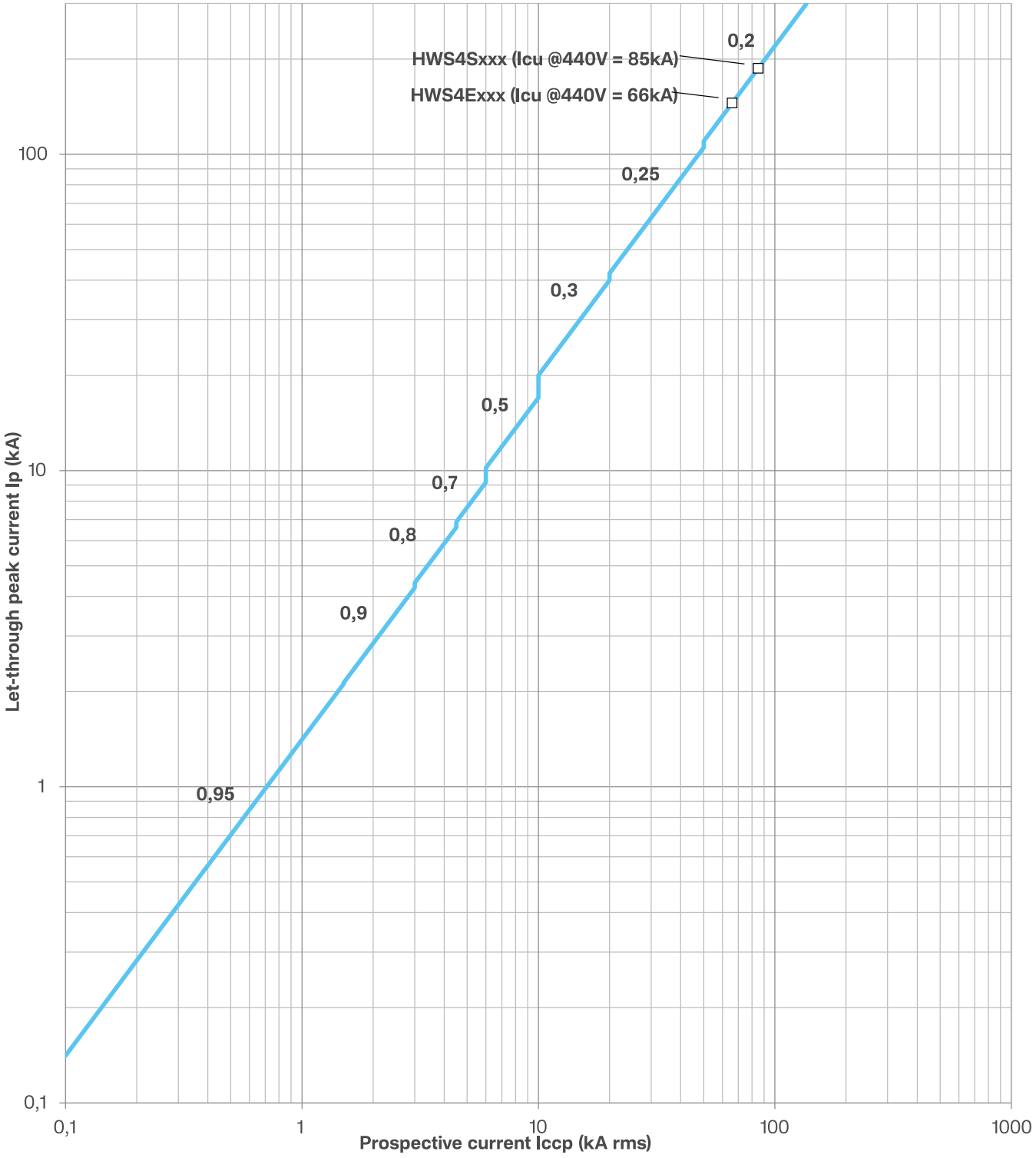


Current limiting characteristics above 440 V AC and up to 690 V AC for HWS2

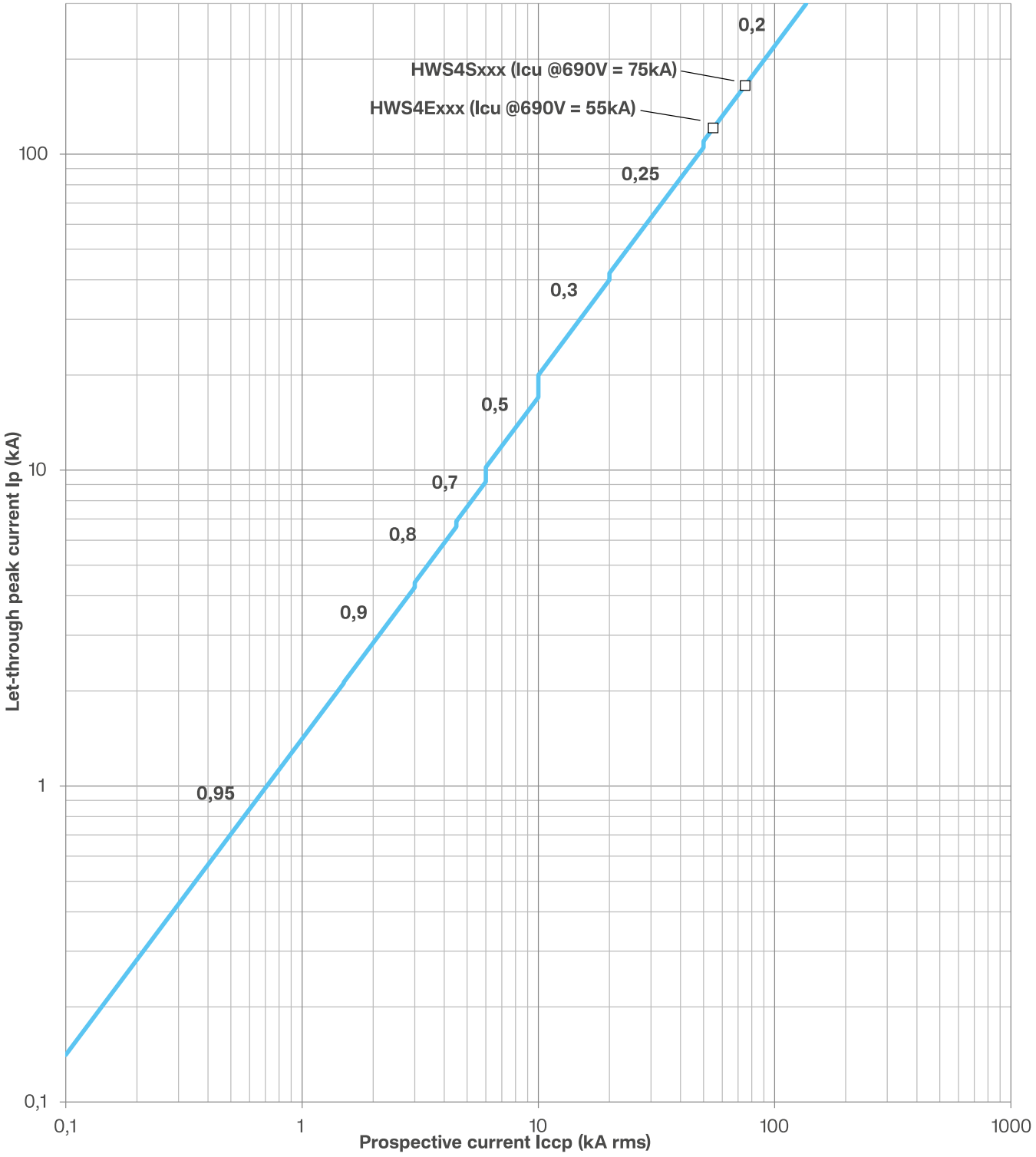


Protection curves
Thermal constraint and limitation curves

Current limiting characteristics 380/440 V AC for HWS4



Current limiting characteristics above 440 V AC and up to 690 V AC for HWS4



9 Lists of references

9.1 Fixed version

HWS2

Fixed air circuit breakers for electronic trip unit Type L - LSI HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306F1AE	HWS2M406F1AE
	800	HWS2M308F1AE	HWS2M408F1AE
	1000	HWS2M310F1AE	HWS2M410F1AE
	1250	HWS2M312F1AE	HWS2M412F1AE
	1600	HWS2M316F1AE	HWS2M416F1AE
	2000	HWS2M320F1AE	HWS2M420F1AE
66 kA	630	HWS2E306F1AE	HWS2E406F1AE
	800	HWS2E308F1AE	HWS2E408F1AE
	1000	HWS2E310F1AE	HWS2E410F1AE
	1250	HWS2E312F1AE	HWS2E412F1AE
	1600	HWS2E316F1AE	HWS2E416F1AE
	2000	HWS2E320F1AE	HWS2E420F1AE

Fixed air circuit breakers for electronic trip unit Type L - LSI SH - CC - MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306F1ME	HWS2M406F1ME
	800	HWS2M308F1ME	HWS2M408F1ME
	1000	HWS2M310F1ME	HWS2M410F1ME
	1250	HWS2M312F1ME	HWS2M412F1ME
	1600	HWS2M316F1ME	HWS2M416F1ME
	2000	HWS2M320F1ME	HWS2M420F1ME
66 kA	630	HWS2E306F1ME	HWS2E406F1ME
	800	HWS2E308F1ME	HWS2E408F1ME
	1000	HWS2E310F1ME	HWS2E410F1ME
	1250	HWS2E312F1ME	HWS2E412F1ME
	1600	HWS2E316F1ME	HWS2E416F1ME
	2000	HWS2E320F1ME	HWS2E420F1ME

Fixed air circuit breakers for electronic trip unit Type L - LSIG HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306F2AE	HWS2M406F2AE
	800	HWS2M308F2AE	HWS2M408F2AE
	1000	HWS2M310F2AE	HWS2M410F2AE
	1250	HWS2M312F2AE	HWS2M412F2AE
	1600	HWS2M316F2AE	HWS2M416F2AE
	2000	HWS2M320F2AE	HWS2M420F2AE
66 kA	630	HWS2E306F2AE	HWS2E406F2AE
	800	HWS2E308F2AE	HWS2E408F2AE
	1000	HWS2E310F2AE	HWS2E410F2AE
	1250	HWS2E312F2AE	HWS2E412F2AE
	1600	HWS2E316F2AE	HWS2E416F2AE
	2000	HWS2E320F2AE	HWS2E420F2AE

Lists of references
Fixed version

Fixed air circuit breakers for electronic trip unit Type L - LSIG SH - CC - MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306F2ME	HWS2M406F2ME
	800	HWS2M308F2ME	HWS2M408F2ME
	1000	HWS2M310F2ME	HWS2M410F2ME
	1250	HWS2M312F2ME	HWS2M412F2ME
	1600	HWS2M316F2ME	HWS2M416F2ME
	2000	HWS2M320F2ME	HWS2M420F2ME
66 kA	630	HWS2E306F2ME	HWS2E406F2ME
	800	HWS2E308F2ME	HWS2E408F2ME
	1000	HWS2E310F2ME	HWS2E410F2ME
	1250	HWS2E312F2ME	HWS2E412F2ME
	1600	HWS2E316F2ME	HWS2E416F2ME
	2000	HWS2E320F2ME	HWS2E420F2ME

Fixed air circuit breakers for electronic trip unit Type A - LSI HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306F3AE	HWS2M406F3AE
	800	HWS2M308F3AE	HWS2M408F3AE
	1000	HWS2M310F3AE	HWS2M410F3AE
	1250	HWS2M312F3AE	HWS2M412F3AE
	1600	HWS2M316F3AE	HWS2M416F3AE
	2000	HWS2M320F3AE	HWS2M420F3AE
66 kA	630	HWS2E306F3AE	HWS2E406F3AE
	800	HWS2E308F3AE	HWS2E408F3AE
	1000	HWS2E310F3AE	HWS2E410F3AE
	1250	HWS2E312F3AE	HWS2E412F3AE
	1600	HWS2E316F3AE	HWS2E416F3AE
	2000	HWS2E320F3AE	HWS2E420F3AE

Fixed air circuit breakers for electronic trip unit Type A - LSI SH - CC - MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306F3ME	HWS2M406F3ME
	800	HWS2M308F3ME	HWS2M408F3ME
	1000	HWS2M310F3ME	HWS2M410F3ME
	1250	HWS2M312F3ME	HWS2M412F3ME
	1600	HWS2M316F3ME	HWS2M416F3ME
	2000	HWS2M320F3ME	HWS2M420F3ME
66 kA	630	HWS2E306F3ME	HWS2E406F3ME
	800	HWS2E308F3ME	HWS2E408F3ME
	1000	HWS2E310F3ME	HWS2E410F3ME
	1250	HWS2E312F3ME	HWS2E412F3ME
	1600	HWS2E316F3ME	HWS2E416F3ME
	2000	HWS2E320F3ME	HWS2E420F3ME

Fixed air circuit breakers for electronic trip unit Type A - LSIG HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306F4AE	HWS2M406F4AE
	800	HWS2M308F4AE	HWS2M408F4AE
	1000	HWS2M310F4AE	HWS2M410F4AE
	1250	HWS2M312F4AE	HWS2M412F4AE
	1600	HWS2M316F4AE	HWS2M416F4AE
	2000	HWS2M320F4AE	HWS2M420F4AE
66 kA	630	HWS2E306F4AE	HWS2E406F4AE
	800	HWS2E308F4AE	HWS2E408F4AE
	1000	HWS2E310F4AE	HWS2E410F4AE
	1250	HWS2E312F4AE	HWS2E412F4AE
	1600	HWS2E316F4AE	HWS2E416F4AE
	2000	HWS2E320F4AE	HWS2E420F4AE

Fixed air circuit breakers for electronic trip unit Type A - LSIG SH - CC - MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306F4ME	HWS2M406F4ME
	800	HWS2M308F4ME	HWS2M408F4ME
	1000	HWS2M310F4ME	HWS2M410F4ME
	1250	HWS2M312F4ME	HWS2M412F4ME
	1600	HWS2M316F4ME	HWS2M416F4ME
	2000	HWS2M320F4ME	HWS2M420F4ME
66 kA	630	HWS2E306F4ME	HWS2E406F4ME
	800	HWS2E308F4ME	HWS2E408F4ME
	1000	HWS2E310F4ME	HWS2E410F4ME
	1250	HWS2E312F4ME	HWS2E412F4ME
	1600	HWS2E316F4ME	HWS2E416F4ME
	2000	HWS2E320F4ME	HWS2E420F4ME

Fixed switch disconnectors HWS2

In (A)	3-pole	4-pole
630	HWS2W306F0AE	HWS2W406F0AE
800	HWS2W308F0AE	HWS2W408F0AE
1000	HWS2W310F0AE	HWS2W410F0AE
1250	HWS2W312F0AE	HWS2W412F0AE
1600	HWS2W316F0AE	HWS2W416F0AE
2000	HWS2W320F0AE	HWS2W420F0AE
2500	HWS2W325F0AE	HWS2W425F0AE

Fixed switch disconnectors SH - DC - MO 240 V~ HWS2

In (A)	3-pole	4-pole
630	HWS2W306F0ME	HWS2W406F0ME
800	HWS2W308F0ME	HWS2W408F0ME
1000	HWS2W310F0ME	HWS2W410F0ME
1250	HWS2W312F0ME	HWS2W412F0ME
1600	HWS2W316F0ME	HWS2W416F0ME
2000	HWS2W320F0ME	HWS2W420F0ME
2500	HWS2W325F0ME	HWS2W425F0ME

Lists of references
Fixed version

HWS4

Fixed air circuit breakers for electronic trip unit Type L - LSI HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325F1AE	HWS4E425F1AE
	3200	HWS4E332F1AE	HWS4E432F1AE
85 kA	2000	HWS4S320F1AE	HWS4S420F1AE
	2500	HWS4S325F1AE	HWS4S425F1AE
	3200	HWS4S332F1AE	HWS4S432F1AE
	4000	HWS4S340F1AE	HWS4S440F1AE

Fixed air circuit breakers for electronic trip unit Type L - LSI SH - CC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325F1ME	HWS4E425F1ME
	3200	HWS4E332F1ME	HWS4E432F1ME
85 kA	2000	HWS4S320F1ME	HWS4S420F1ME
	2500	HWS4S325F1ME	HWS4S425F1ME
	3200	HWS4S332F1ME	HWS4S432F1ME
	4000	HWS4S340F1ME	HWS4S440F1ME

Fixed air circuit breakers for electronic trip unit Type L - LSIG HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325F2AE	HWS4E425F2AE
	3200	HWS4E332F2AE	HWS4E432F2AE
85 kA	2000	HWS4S320F2AE	HWS4S420F2AE
	2500	HWS4S325F2AE	HWS4S425F2AE
	3200	HWS4S332F2AE	HWS4S432F2AE
	4000	HWS4S340F2AE	HWS4S440F2AE

Fixed air circuit breakers for electronic trip unit Type L - LSIG SH - CC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325F2ME	HWS4E425F2ME
	3200	HWS4E332F2ME	HWS4E432F2ME
85 kA	2000	HWS4S320F2ME	HWS4S420F2ME
	2500	HWS4S325F2ME	HWS4S425F2ME
	3200	HWS4S332F2ME	HWS4S432F2ME
	4000	HWS4S340F2ME	HWS4S440F2ME

Fixed air circuit breakers for electronic trip unit Type A - LSI HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325F3AE	HWS4E425F3AE
	3200	HWS4E332F3AE	HWS4E432F3AE
85 kA	2000	HWS4S320F3AE	HWS4S420F3AE
	2500	HWS4S325F3AE	HWS4S425F3AE
	3200	HWS4S332F3AE	HWS4S432F3AE
	4000	HWS4S340F3AE	HWS4S440F3AE

Fixed air circuit breakers for electronic trip unit Type A - LSI SH - CC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325F3ME	HWS4E425F3ME
	3200	HWS4E332F3ME	HWS4E432F3ME
85 kA	2000	HWS4S320F3ME	HWS4S420F3ME
	2500	HWS4S325F3ME	HWS4S425F3ME
	3200	HWS4S332F3ME	HWS4S432F3ME
	4000	HWS4S340F3ME	HWS4S440F3ME

Fixed air circuit breakers for electronic trip unit Type A - LSIG HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325F4AE	HWS4E425F4AE
	3200	HWS4E332F4AE	HWS4E432F4AE
85 kA	2000	HWS4S320F4AE	HWS4S420F4AE
	2500	HWS4S325F4AE	HWS4S425F4AE
	3200	HWS4S332F4AE	HWS4S432F4AE
	4000	HWS4S340F4AE	HWS4S440F4AE

Fixed air circuit breakers for electronic trip unit Type A - LSI SH - CC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325F4ME	HWS4E425F4ME
	3200	HWS4E332F4ME	HWS4E432F4ME
85 kA	2000	HWS4S320F4ME	HWS4S420F4ME
	2500	HWS4S325F4ME	HWS4S425F4ME
	3200	HWS4S332F4ME	HWS4S432F4ME
	4000	HWS4S340F4ME	HWS4S440F4ME

Fixed switch disconnectors HWS4

In (A)	3-pole	4-pole
3200	HWS4W332F0AE	HWS4W432F0AE
4000	HWS4W340F0AE	HWS4W440F0AE

Fixed switch disconnectors SH - DC - MO 240 V~ HWS4

In (A)	3-pole	4-pole
3200	HWS4W332F0ME	HWS4W432F0ME
4000	HWS4W340F0ME	HWS4W440F0ME

9.2 Drawout version LSIG

HWS2

Drawout air circuit breakers Type L-LSI HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D1AE	HWS2M406D1AE
	800	HWS2M308D1AE	HWS2M408D1AE
	1000	HWS2M310D1AE	HWS2M410D1AE
	1250	HWS2M312D1AE	HWS2M412D1AE
	1600	HWS2M316D1AE	HWS2M416D1AE
	2000	HWS2M320D1AE	HWS2M420D1AE
66 kA	630	HWS2E306D1AE	HWS2E406D1AE
	800	HWS2E308D1AE	HWS2E408D1AE
	1000	HWS2E310D1AE	HWS2E410D1AE
	1250	HWS2E312D1AE	HWS2E412D1AE
	1600	HWS2E316D1AE	HWS2E416D1AE
	2000	HWS2E320D1AE	HWS2E420D1AE

Drawout air circuit breakers Type L-LSI SH CC MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D1ME	HWS2M406D1ME
	800	HWS2M308D1ME	HWS2M408D1ME
	1000	HWS2M310D1ME	HWS2M410D1ME
	1250	HWS2M312D1ME	HWS2M412D1ME
	1600	HWS2M316D1ME	HWS2M416D1ME
	2000	HWS2M320D1ME	HWS2M420D1ME
66 kA	630	HWS2E306D1ME	HWS2E406D1ME
	800	HWS2E308D1ME	HWS2E408D1ME
	1000	HWS2E310D1ME	HWS2E410D1ME
	1250	HWS2E312D1ME	HWS2E412D1ME
	1600	HWS2E316D1ME	HWS2E416D1ME
	2000	HWS2E320D1ME	HWS2E420D1ME

Drawout air circuit breakers Type L-LSIG HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D2AE	HWS2M406D2AE
	800	HWS2M308D2AE	HWS2M408D2AE
	1000	HWS2M310D2AE	HWS2M410D2AE
	1250	HWS2M312D2AE	HWS2M412D2AE
	1600	HWS2M316D2AE	HWS2M416D2AE
	2000	HWS2M320D2AE	HWS2M420D2AE
66 kA	630	HWS2E306D2AE	HWS2E406D2AE
	800	HWS2E308D2AE	HWS2E408D2AE
	1000	HWS2E310D2AE	HWS2E410D2AE
	1250	HWS2E312D2AE	HWS2E412D2AE
	1600	HWS2E316D2AE	HWS2E416D2AE
	2000	HWS2E320D2AE	HWS2E420D2AE

Drawout air circuit breakers Type L-LSIG SH CC MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D2ME	HWS2M406D2ME
	800	HWS2M308D2ME	HWS2M408D2ME
	1000	HWS2M310D2ME	HWS2M410D2ME
	1250	HWS2M312D2ME	HWS2M412D2ME
	1600	HWS2M316D2ME	HWS2M416D2ME
	2000	HWS2M320D2ME	HWS2M420D2ME
66 kA	630	HWS2E306D2ME	HWS2E406D2ME
	800	HWS2E308D2ME	HWS2E408D2ME
	1000	HWS2E310D2ME	HWS2E410D2ME
	1250	HWS2E312D2ME	HWS2E412D2ME
	1600	HWS2E316D2ME	HWS2E416D2ME
	2000	HWS2E320D2ME	HWS2E420D2ME

Drawout air circuit breakers Type A-LSI HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D3AE	HWS2M406D3AE
	800	HWS2M308D3AE	HWS2M408D3AE
	1000	HWS2M310D3AE	HWS2M410D3AE
	1250	HWS2M312D3AE	HWS2M412D3AE
	1600	HWS2M316D3AE	HWS2M416D3AE
	2000	HWS2M320D3AE	HWS2M420D3AE
66 kA	630	HWS2E306D3AE	HWS2E406D3AE
	800	HWS2E308D3AE	HWS2E408D3AE
	1000	HWS2E310D3AE	HWS2E410D3AE
	1250	HWS2E312D3AE	HWS2E412D3AE
	1600	HWS2E316D3AE	HWS2E416D3AE
	2000	HWS2E320D3AE	HWS2E420D3AE

Drawout air circuit breakers Type A-LSI SH CC MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D3ME	HWS2M406D3ME
	800	HWS2M308D3ME	HWS2M408D3ME
	1000	HWS2M310D3ME	HWS2M410D3ME
	1250	HWS2M312D3ME	HWS2M412D3ME
	1600	HWS2M316D3ME	HWS2M416D3ME
	2000	HWS2M320D3ME	HWS2M420D3ME
66 kA	630	HWS2E306D3ME	HWS2E406D3ME
	800	HWS2E308D3ME	HWS2E408D3ME
	1000	HWS2E310D3ME	HWS2E410D3ME
	1250	HWS2E312D3ME	HWS2E412D3ME
	1600	HWS2E316D3ME	HWS2E416D3ME
	2000	HWS2E320D3ME	HWS2E420D3ME

Lists of references
Drawout version LSIG

Drawout air circuit breakers Type A-LSIG HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D4AE	HWS2M406D4AE
	800	HWS2M308D4AE	HWS2M408D4AE
	1000	HWS2M310D4AE	HWS2M410D4AE
	1250	HWS2M312D4AE	HWS2M412D4AE
	1600	HWS2M316D4AE	HWS2M416D4AE
	2000	HWS2M320D4AE	HWS2M420D4AE
66 kA	630	HWS2E306D4AE	HWS2E406D4AE
	800	HWS2E308D4AE	HWS2E408D4AE
	1000	HWS2E310D4AE	HWS2E410D4AE
	1250	HWS2E312D4AE	HWS2E412D4AE
	1600	HWS2E316D4AE	HWS2E416D4AE
	2000	HWS2E320D4AE	HWS2E420D4AE

Drawout air circuit breakers Type-A LSIG SH CC MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D4ME	HWS2M406D4ME
	800	HWS2M308D4ME	HWS2M408D4ME
	1000	HWS2M310D4ME	HWS2M410D4ME
	1250	HWS2M312D4ME	HWS2M412D4ME
	1600	HWS2M316D4ME	HWS2M416D4ME
	2000	HWS2M320D4ME	HWS2M420D4ME
66 kA	630	HWS2E306D4ME	HWS2E406D4ME
	800	HWS2E308D4ME	HWS2E408D4ME
	1000	HWS2E310D4ME	HWS2E410D4ME
	1250	HWS2E312D4ME	HWS2E412D4ME
	1600	HWS2E316D4ME	HWS2E416D4ME
	2000	HWS2E320D4ME	HWS2E420D4ME

Drawout air circuit breakers Type-H LSIG SH CC MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	630	HWS2E306D5ME	HWS2E406D5ME
	800	HWS2E308D5ME	HWS2E408D5ME
	1000	HWS2E310D5ME	HWS2E410D5ME
	1250	HWS2E312D5ME	HWS2E412D5ME
	1600	HWS2E316D5ME	HWS2E416D5ME
	2000	HWS2E320D5ME	HWS2E420D5ME

Drawout switch disconnectors HWS2

In (A)	3-pole	4-pole
630	HWS2W306D0AE	HWS2W406D0AE
800	HWS2W308D0AE	HWS2W408D0AE
1000	HWS2W310D0AE	HWS2W410D0AE
1250	HWS2W312D0AE	HWS2W412D0AE
1600	HWS2W316D0AE	HWS2W416D0AE
2000	HWS2W320D0AE	HWS2W420D0AE
2500	HWS2W325D0AE	HWS2W425D0AE

Drawout switch disconnectors SH CC MO 240V~ HWS2

In (A)	3-pole	4-pole
630	HWS2W306D0ME	HWS2W406D0ME
800	HWS2W308D0ME	HWS2W408D0ME
1000	HWS2W310D0ME	HWS2W410D0ME
1250	HWS2W312D0ME	HWS2W412D0ME
1600	HWS2W316D0ME	HWS2W416D0ME
2000	HWS2W320D0ME	HWS2W420D0ME
2500	HWS2W325D0ME	HWS2W425D0ME

Lists of references
Drawout version LSIG

HWS4

Drawout air circuit breakers Type L-LSI HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D1AE	HWS4E425D1AE
	3200	HWS4E332D1AE	HWS4E432D1AE
85 kA	2000	HWS4S320D1AE	HWS4S420D1AE
	2500	HWS4S325D1AE	HWS4S425D1AE
	3200	HWS4S332D1AE	HWS4S432D1AE
	4000	HWS4S340D1AE	HWS4S440D1AE

Drawout air circuit breakers Type L-LSI SH - CC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D1ME	HWS4E425D1ME
	3200	HWS4E332D1ME	HWS4E432D1ME
85 kA	2000	HWS4S320D1ME	HWS4S420D1ME
	2500	HWS4S325D1ME	HWS4S425D1ME
	3200	HWS4S332D1ME	HWS4S432D1ME
	4000	HWS4S340D1ME	HWS4S440D1ME

Drawout air circuit breakers Type L-LSIG HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D2AE	HWS4E425D2AE
	3200	HWS4E332D2AE	HWS4E432D2AE
85 kA	2000	HWS4S320D2AE	HWS4S420D2AE
	2500	HWS4S325D2AE	HWS4S425D2AE
	3200	HWS4S332D2AE	HWS4S432D2AE
	4000	HWS4S340D2AE	HWS4S440D2AE

Drawout air circuit breakers Type L-LSIG SH - CC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D2ME	HWS4E425D2ME
	3200	HWS4E332D2ME	HWS4E432D2ME
85 kA	2000	HWS4S320D2ME	HWS4S420D2ME
	2500	HWS4S325D2ME	HWS4S425D2ME
	3200	HWS4S332D2ME	HWS4S432D2ME
	4000	HWS4S340D2ME	HWS4S440D2ME

Drawout air circuit breakers Type A-LSI HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D3AE	HWS4E425D3AE
	3200	HWS4E332D3AE	HWS4E432D3AE
85 kA	2000	HWS4S320D3AE	HWS4S420D3AE
	2500	HWS4S325D3AE	HWS4S425D3AE
	3200	HWS4S332D3AE	HWS4S432D3AE
	4000	HWS4S340D3AE	HWS4S440D3AE

Drawout air circuit breakers Type A-LSI SH - DC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D3ME	HWS4E425D3ME
	3200	HWS4E332D3ME	HWS4E432D3ME
85 kA	2000	HWS4S320D3ME	HWS4S420D3ME
	2500	HWS4S325D3ME	HWS4S425D3ME
	3200	HWS4S332D3ME	HWS4S432D3ME
	4000	HWS4S340D3ME	HWS4S440D3ME

Drawout air circuit breakers Type A-LSIG HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D4AE	HWS4E425D4AE
	3200	HWS4E332D4AE	HWS4E432D4AE
85 kA	2000	HWS4S320D4AE	HWS4S420D4AE
	2500	HWS4S325D4AE	HWS4S425D4AE
	3200	HWS4S332D4AE	HWS4S432D4AE
	4000	HWS4S340D4AE	HWS4S440D4AE

Drawout air circuit breakers Type A-LSIG SH - DC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D4ME	HWS4E425D4ME
	3200	HWS4E332D4ME	HWS4E432D4ME
85 kA	2000	HWS4S320D4ME	HWS4S420D4ME
	2500	HWS4S325D4ME	HWS4S425D4ME
	3200	HWS4S332D4ME	HWS4S432D4ME
	4000	HWS4S340D4ME	HWS4S440D4ME

Drawout air circuit breakers Type-H LSIG SH - CC - MO 415 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
85 kA	2000	HWS4S320D5ME	HWS4S420D5ME
	2500	HWS4S325D5ME	HWS4S425D5ME
	3200	HWS4S332D5ME	HWS4S432D5ME
	4000	HWS4S340D5ME	HWS4S440D5ME

Lists of references
Drawout version LSIG

Drawout switch disconnectors HWS4

In (A)	3-pole	4-pole
3200	HWS4W332D0AE	HWS4W432D0AE
4000	HWS4W340D0AE	HWS4W440D0AE

Drawout switch disconnectors SH CC MO 240V~ HWS4

In (A)	3-pole	4-pole
3200	HWS4W332D0ME	HWS4W432D0ME
4000	HWS4W340D0ME	HWS4W440D0ME

9.3 Drawout version

HWS2

Drawout air circuit breakers Type L-LSI HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D1AE	HWS2M406D1AE
	800	HWS2M308D1AE	HWS2M408D1AE
	1000	HWS2M310D1AE	HWS2M410D1AE
	1250	HWS2M312D1AE	HWS2M412D1AE
	1600	HWS2M316D1AE	HWS2M416D1AE
	2000	HWS2M320D1AE	HWS2M420D1AE
66 kA	630	HWS2E306D1AE	HWS2E406D1AE
	800	HWS2E308D1AE	HWS2E408D1AE
	1000	HWS2E310D1AE	HWS2E410D1AE
	1250	HWS2E312D1AE	HWS2E412D1AE
	1600	HWS2E316D1AE	HWS2E416D1AE
	2000	HWS2E320D1AE	HWS2E420D1AE

Drawout air circuit breakers Type L-LSI SH CC MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D1ME	HWS2M406D1ME
	800	HWS2M308D1ME	HWS2M408D1ME
	1000	HWS2M310D1ME	HWS2M410D1ME
	1250	HWS2M312D1ME	HWS2M412D1ME
	1600	HWS2M316D1ME	HWS2M416D1ME
	2000	HWS2M320D1ME	HWS2M420D1ME
66 kA	630	HWS2E306D1ME	HWS2E406D1ME
	800	HWS2E308D1ME	HWS2E408D1ME
	1000	HWS2E310D1ME	HWS2E410D1ME
	1250	HWS2E312D1ME	HWS2E412D1ME
	1600	HWS2E316D1ME	HWS2E416D1ME
	2000	HWS2E320D1ME	HWS2E420D1ME

Drawout air circuit breakers Type L-LSIG HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D2AE	HWS2M406D2AE
	800	HWS2M308D2AE	HWS2M408D2AE
	1000	HWS2M310D2AE	HWS2M410D2AE
	1250	HWS2M312D2AE	HWS2M412D2AE
	1600	HWS2M316D2AE	HWS2M416D2AE
	2000	HWS2M320D2AE	HWS2M420D2AE
66 kA	630	HWS2E306D2AE	HWS2E406D2AE
	800	HWS2E308D2AE	HWS2E408D2AE
	1000	HWS2E310D2AE	HWS2E410D2AE
	1250	HWS2E312D2AE	HWS2E412D2AE
	1600	HWS2E316D2AE	HWS2E416D2AE
	2000	HWS2E320D2AE	HWS2E420D2AE

Lists of references
Drawout version

Drawout air circuit breakers Type L-LSIG SH CC MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D2ME	HWS2M406D2ME
	800	HWS2M308D2ME	HWS2M408D2ME
	1000	HWS2M310D2ME	HWS2M410D2ME
	1250	HWS2M312D2ME	HWS2M412D2ME
	1600	HWS2M316D2ME	HWS2M416D2ME
	2000	HWS2M320D2ME	HWS2M420D2ME
66 kA	630	HWS2E306D2ME	HWS2E406D2ME
	800	HWS2E308D2ME	HWS2E408D2ME
	1000	HWS2E310D2ME	HWS2E410D2ME
	1250	HWS2E312D2ME	HWS2E412D2ME
	1600	HWS2E316D2ME	HWS2E416D2ME
	2000	HWS2E320D2ME	HWS2E420D2ME

Drawout air circuit breakers Type A-LSI HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D3AE	HWS2M406D3AE
	800	HWS2M308D3AE	HWS2M408D3AE
	1000	HWS2M310D3AE	HWS2M410D3AE
	1250	HWS2M312D3AE	HWS2M412D3AE
	1600	HWS2M316D3AE	HWS2M416D3AE
	2000	HWS2M320D3AE	HWS2M420D3AE
66 kA	630	HWS2E306D3AE	HWS2E406D3AE
	800	HWS2E308D3AE	HWS2E408D3AE
	1000	HWS2E310D3AE	HWS2E410D3AE
	1250	HWS2E312D3AE	HWS2E412D3AE
	1600	HWS2E316D3AE	HWS2E416D3AE
	2000	HWS2E320D3AE	HWS2E420D3AE

Drawout air circuit breakers Type A-LSI SH CC MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D3ME	HWS2M406D3ME
	800	HWS2M308D3ME	HWS2M408D3ME
	1000	HWS2M310D3ME	HWS2M410D3ME
	1250	HWS2M312D3ME	HWS2M412D3ME
	1600	HWS2M316D3ME	HWS2M416D3ME
	2000	HWS2M320D3ME	HWS2M420D3ME
66 kA	630	HWS2E306D3ME	HWS2E406D3ME
	800	HWS2E308D3ME	HWS2E408D3ME
	1000	HWS2E310D3ME	HWS2E410D3ME
	1250	HWS2E312D3ME	HWS2E412D3ME
	1600	HWS2E316D3ME	HWS2E416D3ME
	2000	HWS2E320D3ME	HWS2E420D3ME

Drawout air circuit breakers Type A-LSIG HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D4AE	HWS2M406D4AE
	800	HWS2M308D4AE	HWS2M408D4AE
	1000	HWS2M310D4AE	HWS2M410D4AE
	1250	HWS2M312D4AE	HWS2M412D4AE
	1600	HWS2M316D4AE	HWS2M416D4AE
	2000	HWS2M320D4AE	HWS2M420D4AE
66 kA	630	HWS2E306D4AE	HWS2E406D4AE
	800	HWS2E308D4AE	HWS2E408D4AE
	1000	HWS2E310D4AE	HWS2E410D4AE
	1250	HWS2E312D4AE	HWS2E412D4AE
	1600	HWS2E316D4AE	HWS2E416D4AE
	2000	HWS2E320D4AE	HWS2E420D4AE

Drawout air circuit breakers Type-A LSIG SH CC MO 240 V~ HWS2

Icu 380 – 440 V~	In (A)	3-pole	4-pole
50 kA	630	HWS2M306D4ME	HWS2M406D4ME
	800	HWS2M308D4ME	HWS2M408D4ME
	1000	HWS2M310D4ME	HWS2M410D4ME
	1250	HWS2M312D4ME	HWS2M412D4ME
	1600	HWS2M316D4ME	HWS2M416D4ME
	2000	HWS2M320D4ME	HWS2M420D4ME
66 kA	630	HWS2E306D4ME	HWS2E406D4ME
	800	HWS2E308D4ME	HWS2E408D4ME
	1000	HWS2E310D4ME	HWS2E410D4ME
	1250	HWS2E312D4ME	HWS2E412D4ME
	1600	HWS2E316D4ME	HWS2E416D4ME
	2000	HWS2E320D4ME	HWS2E420D4ME

Drawout switch disconnectors HWS2

In (A)	3-pole	4-pole
630	HWS2W306D0AE	HWS2W406D0AE
800	HWS2W308D0AE	HWS2W408D0AE
1000	HWS2W310D0AE	HWS2W410D0AE
1250	HWS2W312D0AE	HWS2W412D0AE
1600	HWS2W316D0AE	HWS2W416D0AE
2000	HWS2W320D0AE	HWS2W420D0AE
2500	HWS2W325D0AE	HWS2W425D0AE

Drawout switch disconnectors SH CC MO 240V~ HWS2

In (A)	3-pole	4-pole
630	HWS2W306D0ME	HWS2W406D0ME
800	HWS2W308D0ME	HWS2W408D0ME
1000	HWS2W310D0ME	HWS2W410D0ME
1250	HWS2W312D0ME	HWS2W412D0ME
1600	HWS2W316D0ME	HWS2W416D0ME
2000	HWS2W320D0ME	HWS2W420D0ME
2500	HWS2W325D0ME	HWS2W425D0ME

Lists of references
Drawout version

HWS4

Drawout air circuit breakers Type L-LSI HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D1AE	HWS4E425D1AE
	3200	HWS4E332D1AE	HWS4E432D1AE
85 kA	2000	HWS4S320D1AE	HWS4S420D1AE
	2500	HWS4S325D1AE	HWS4S425D1AE
	3200	HWS4S332D1AE	HWS4S432D1AE
	4000	HWS4S340D1AE	HWS4S440D1AE

Drawout air circuit breakers Type L-LSI SH - CC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D1ME	HWS4E425D1ME
	3200	HWS4E332D1ME	HWS4E432D1ME
85 kA	2000	HWS4S320D1ME	HWS4S420D1ME
	2500	HWS4S325D1ME	HWS4S425D1ME
	3200	HWS4S332D1ME	HWS4S432D1ME
	4000	HWS4S340D1ME	HWS4S440D1ME

Drawout air circuit breakers Type L-LSIG HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D2AE	HWS4E425D2AE
	3200	HWS4E332D2AE	HWS4E432D2AE
85 kA	2000	HWS4S320D2AE	HWS4S420D2AE
	2500	HWS4S325D2AE	HWS4S425D2AE
	3200	HWS4S332D2AE	HWS4S432D2AE
	4000	HWS4S340D2AE	HWS4S440D2AE

Drawout air circuit breakers Type L-LSIG SH - CC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D2ME	HWS4E425D2ME
	3200	HWS4E332D2ME	HWS4E432D2ME
85 kA	2000	HWS4S320D2ME	HWS4S420D2ME
	2500	HWS4S325D2ME	HWS4S425D2ME
	3200	HWS4S332D2ME	HWS4S432D2ME
	4000	HWS4S340D2ME	HWS4S440D2ME

Drawout air circuit breakers Type A-LSI HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D3AE	HWS4E425D3AE
	3200	HWS4E332D3AE	HWS4E432D3AE
85 kA	2000	HWS4S320D3AE	HWS4S420D3AE
	2500	HWS4S325D3AE	HWS4S425D3AE
	3200	HWS4S332D3AE	HWS4S432D3AE
	4000	HWS4S340D3AE	HWS4S440D3AE

Drawout air circuit breakers Type A-LSI SH - DC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D3ME	HWS4E425D3ME
	3200	HWS4E332D3ME	HWS4E432D3ME
85 kA	2000	HWS4S320D3ME	HWS4S420D3ME
	2500	HWS4S325D3ME	HWS4S425D3ME
	3200	HWS4S332D3ME	HWS4S432D3ME
	4000	HWS4S340D3ME	HWS4S440D3ME

Drawout air circuit breakers Type A-LSIG HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D4AE	HWS4E425D4AE
	3200	HWS4E332D4AE	HWS4E432D4AE
85 kA	2000	HWS4S320D4AE	HWS4S420D4AE
	2500	HWS4S325D4AE	HWS4S425D4AE
	3200	HWS4S332D4AE	HWS4S432D4AE
	4000	HWS4S340D4AE	HWS4S440D4AE

Drawout air circuit breakers Type A-LSIG SH - DC - MO 240 V~ HWS4

Icu 380 – 440 V~	In (A)	3-pole	4-pole
66 kA	2500	HWS4E325D4ME	HWS4E425D4ME
	3200	HWS4E332D4ME	HWS4E432D4ME
85 kA	2000	HWS4S320D4ME	HWS4S420D4ME
	2500	HWS4S325D4ME	HWS4S425D4ME
	3200	HWS4S332D4ME	HWS4S432D4ME
	4000	HWS4S340D4ME	HWS4S440D4ME

Drawout switch disconnectors HWS4

In (A)	3-pole	4-pole
3200	HWS4W332D0AE	HWS4W432D0AE
4000	HWS4W340D0AE	HWS4W440D0AE

Drawout switch disconnectors SH CC MO 240V~ HWS4

In (A)	3-pole	4-pole
3200	HWS4W332D0ME	HWS4W432D0ME
4000	HWS4W340D0ME	HWS4W440D0ME

9.4 Control accessories

SH shunt trip coil

Voltage	Inrush current (VA)	Holding current (VA)	Reference
240 V AC	200 - 500 W (100 ms)	5-15 W	HSX023H
415 V CA	200 - 500 W (100 ms)	5-15 W	HSX024H
110 V DC	200 - 500 W (100 ms)	5-15 VA	HSX723H
220 V CC	200 - 500 W (100 ms	5-15 VA	HSX724H

CC shunt trip coil

Voltage	Inrush current (VA)	Holding current (VA)	Reference
240 V AC	200 - 500 W (100 ms)	5-15 W	HSX028H
415 V CA	200 - 500 W (100 ms)	5-15 W	HSX029H
110 V DC	200 - 500 W (100 ms)	5-15 VA	HSX728H
220 V CC	200 - 500 W (100 ms	5-15 VA	HSX729H

UV shunt trip coil

Voltage	Inrush current (VA)	Holding current (VA)	Reference
240 V AC	200 - 500 W (100 ms)	5-15 W	HSX033H
415 V CA	200 - 500 W (100 ms)	5-15 W	HSX034H

UVTC Undervoltage Time Delay Controller

Voltage	Reference
240 V AC	HSY033H
415 V CA	HSY034H

MO charging motor

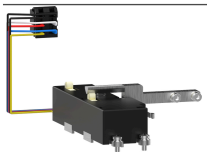
Voltage	Inrush current (A)	Holding current (A)	Reference
200 - 250 V AC	3.1	1	HSX014H
415 - 450 V AC	1.4	0.5	HSX016H
100 - 130 V DC	5.1	2.3	HSX714H
200 - 250 V DC	3.1	1	HSX716H

9.5 Signalling accessories

AX Auxiliary Contact

	Reference
Auxiliary contact 4NO+4NC	HSX042H
Auxiliary contact 6NO+6NC	HSX043H

PS Position contact



	Reference
Position contact	HSX050H

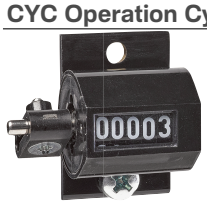
FS Fault trip contact

	Reference
FS Fault trip contact	HSX048H

RTC Ready-to-Close contact

	Reference
RTC Ready-to-Close contact	HSX092H

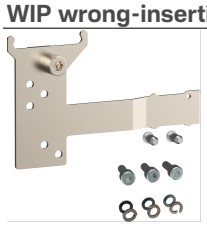
CYC Operation Cycle Counter



	Reference
On / Off cycle counter	HWX071H

9.6 Locking and interlocking accessories

WIP wrong-insertion preventer for drawout circuit breaker



	Reference
WIP wrong-insertion preventer for drawout circuit breaker	HWY277H

Locking the circuit breaker in OFF by OLK key lock

	Reference
Locking device with OLK type key lock (without lock)	HSY261H

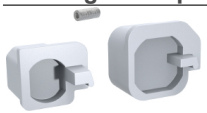
Key lock

	Reference
Type 2L / 1K	HSY262H
Type 3L / 2K	HSY263H
Type 5L / 3K	HSY264H

PBC Push-button cover

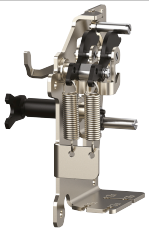
	Reference
PBC Push-button cover	HWY090H

Locking of the position of the circuit breaker in its CL chassis



	Reference
Locking device with key locks	HWY271H

MI mechanical interlock



	Reference
For fixed version - 2S	HWY226H
For drawout version - 2S	HWY227H
Set with a 1.5-metre-long cable	HWY218H
Set with a 3-metre-long cable	HWY228H

RI open door racking interlock

	Reference
RI open door racking interlock	HWY239H

9.7 Connection accessories

Rear vertical / horizontal RC connections for air circuit breaker

Number of poles	Position	Orientation	Rating (A)	Size	Reference
3-pole	top / bottom	vertical / horizontal	630 - 2000	HWS2	HWY058H
4-pole	top / bottom	vertical / horizontal	630 - 2000	HWS2	HWY059H

Rear vertical / horizontal RC connections for switch disconnector

Number of poles	Position	Orientation	Rating (A)	Size	Reference
3-pole	top / bottom	vertical / horizontal	630 - 2500	HWS2	HWY160H
4-pole	top / bottom	vertical / horizontal	630 - 2500	HWS2	HWY161H

Rear vertical / horizontal RC connections for air circuit breaker

Number of poles	Position	Orientation	Rating (A)	Size	Reference
3-pole	top / bottom	vertical / horizontal	2000 - 3200	HWS4	HWY068H
4-pole	top / bottom	vertical / horizontal	2000 - 3200	HWS4	HWY069H

Rear vertical / horizontal RC connections for air circuit breaker

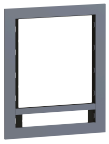
Number of poles	Position	Orientation	Rating (A)	Size	Reference
3-pole	top / bottom	vertical / horizontal	4000	HWS4	HWY168H
4-pole	top / bottom	vertical / horizontal	4000	HWS4	HWY169H

9.8 Protection accessories

TC terminal cover

Version	Size	Reference
Fixed / Drawout	HWS2 / HWS4	HSY100H

DF door flange



Version	Size	Reference
Fixed	HWS2	HWY286H
Drawout	HWS2	HWY287H
Fixed	HWS4	HWY290H
Drawout	HWS4	HWY291H

IB interphase barriers

Number of poles	Version	Reference
3-pole	Fixed	HWY246H
4-pole	Drawout	HWY247H
3-pole	Fixed	HWY248H
4-pole	Drawout	HWY249H

ENCT External Neutral Sensor

	Size	Reference
630-1600A external sensor	HWS2	HSY970H
2000A external sensor	HWS2	HSY971H
2000-4000A external sensor	HWS4	HSY972H

9.9 Connection accessories

TB connection terminal block

	Reference
Connection terminal block Type A 6/3 TB	HSY950H
Connection terminal block Type B 6/6 TB	HSY951H

10 Glossary

ANSI
American National Standards Institute. Each electrical protection corresponds to an ANSI code.

ENCT
External neutral current sensor.

GF
Earth fault protection.

INST
Instantaneous Protection

LTD
Long Time Delay. Long time delay.

MCR
Making Current Release. Automatic instantaneous protection upon closure of the power contacts for short-circuit fault.

Breaking capacity
The value of the 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 (Icu) breaking capacity and to the service short-circuit breaking capacity (Ics).

Ultimate short circuit breaking rating (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 properly isolated. This test ensures safety for the user.

PTA
Pre-Trip Alarm. Overload pre-alarm.

STD
Short Time Delay. Short time delay protection

ZSI
Zone Selective interlocking. Zone selectivity.

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