

ComPact NSXm accessories and auxiliaries

Selection of auxiliaries



Standard

All ComPact NSXm circuit breakers and switch-disconnectors have slots for the electrical auxiliaries listed below:

- 2 indication contacts (see page C-9) :
- 1 ON/OFF (OF)
- 1 trip indication (SD)
- either 1 MN undervoltage release or 1 MX shunt trip (see page C-10).

Remote indications

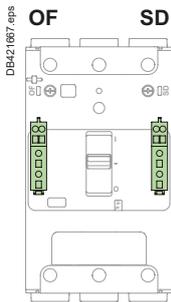
Circuit breakers with MicroLogic Vigi 4.1 may be equipped with an alarming / fault trip indication module to prevent to trip or to identify the type of fault (see page C-11).

All these auxiliaries may be installed with a rotary handle or a toggle handle.

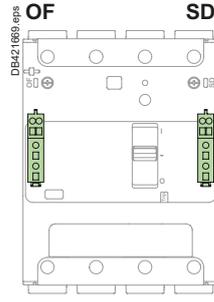
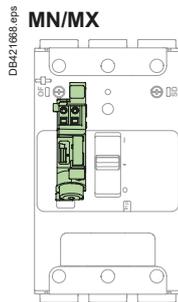
The following drawing indicates auxiliary possibilities depending on the type of device.



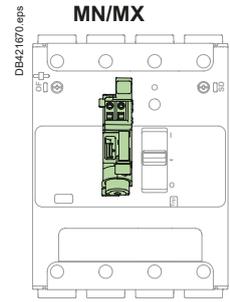
Thermal magnetic circuit breaker (TM-D), switch (NA)



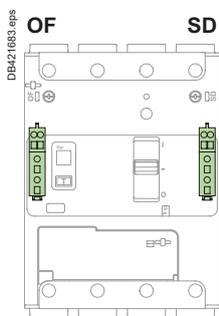
3 poles device



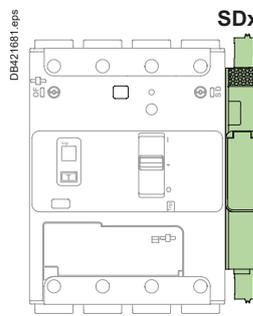
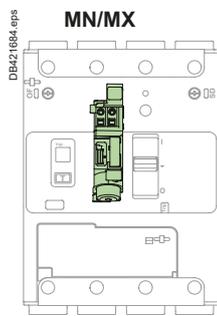
4 poles device



Earth leakage circuit breaker (MicroLogic Vigi 4.1)



3/4 poles device in 4 poles footprint



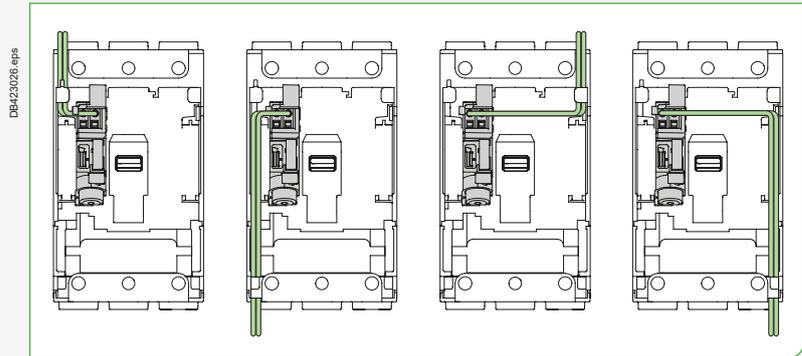
ComPact NSXm accessories and auxiliaries

Connection of auxiliaries

Wiring

Electrical accessories are fitted with numbered spring terminal blocks for wires. The maximum wire size is 1.5 mm² for auxiliary switches (OF or SD), shunt trip MX or undervoltage release MN.

Electrical accessory wire routing can be exited out any of the four corners of the breaker, under the accessory cover even when using long terminal shield



Customize your circuit breaker with accessories

ComPact NSXm accessories and auxiliaries

Indication contacts

Auxiliary and alarm indication contacts

Indication contacts provide remote information of the circuit breaker status and can thus be used for indications, electrical locking, relays, etc. They are common point changeover type contacts, with a normally open (NO) contact and a normally closed (NC) contact.

Open/Closed - Auxiliary switches (OF)

- Indicates the position of the circuit breaker contacts.

Trip indication - Alarm switch (SD)

- Indicates that the circuit breaker has tripped due to:
 - an electrical fault (overload, short circuit)
 - the operation of a shunt trip
 - undervoltage release
 - the "push-to-trip" button.
- Resets when the circuit breaker is reset.

Installation and connection

- The auxiliary switch (OF) and alarm switch (SD) indication contacts snap into cavities behind the front accessory cover of the circuit breaker and their presence is visible on the front face through green flags.
- One model serves for all indication functions depending on where it is fitted in the circuit breaker.
- Each NO and NC spring terminal may be connected by one 0.5...1.5 mm² flexible copper wire and by two for the common point.

Electrical characteristics of auxiliary contacts

Characteristics						
Rated thermal current (A)	5					
Minimum load	2 mA at 17 V DC					
Utilization cat. (IEC 60947-5-1)	AC12	AC15	DC12	DC13	DC14	
Operational current (A)	24 V AC/DC	5	5	5	2.5	1
	48 V AC/DC	5	5	2.5	1.2	0.2
	110...127 V AC / 110 V DC	5	4	0.6	0.35	0.05
	220/240 V AC	5	3	-	-	-
	250 V DC	-	-	0.3	0.05	0.03
	380/440 V AC	5	2.5	-	-	-
660/690 V AC	5	0.1	-	-	-	

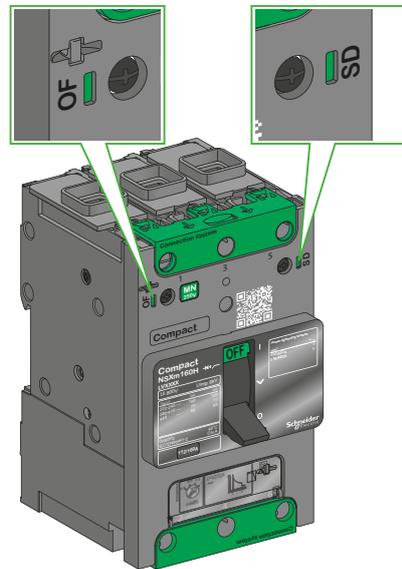
Standards

- Auxiliary indicator contacts comply with IEC 60947-5-1.
- Auxiliary contacts have also been tested according IEC 60 947-5-4.



Auxiliary Switch (OF) / Alarm Switch (SD).

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Customize your circuit breaker with accessories

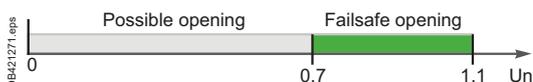
ComPact NSXm accessories and auxiliaries

Voltage release

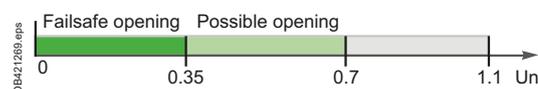


PB11983.eps

MX or MN voltage release.



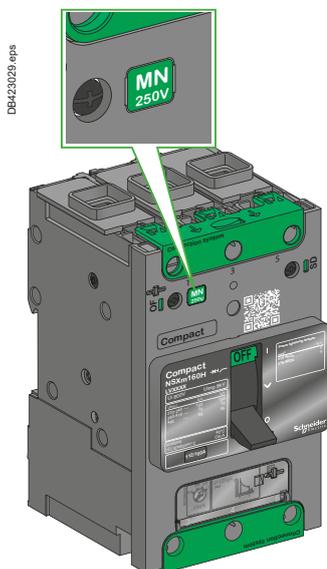
Opening conditions of the MX release.



Opening conditions of the MN release.



Closing conditions of the MN release.



DB42029.eps

Operating voltages for MN/MX.

Shunt trip (MX) and undervoltage release (MN)

A voltage release can be used to trip the circuit breaker using a control signal. They serve primarily for remote, emergency-off commands. It is advised to test the system every six months.

Shunt trip (MX)

- Trips the circuit breaker when the control voltage rises above 70 % of its rated voltage (U_n).
- Impulse type ≥ 20 ms or maintained control signals.
- Shunt trip 110...130 V AC is suitable for ground-fault protection when combined with a Class I ground-fault sensing element.
- Continuous duty rated coil ^[1].

Undervoltage release (MN)

- Trips the circuit breaker when the control voltage drops below 35 % of its rated voltage.
- Between 35 % and 70 % of the rated voltage opening is possible but not guaranteed.
- Above 70 % of the rated voltage, opening does not take place.
- Continuous duty rated coil.
- Circuit breaker closing is possible only if the voltage exceeds 85 % of the rated voltage. If an undervoltage condition exists, operation of the closing mechanism of the circuit breaker will not permit the main contacts to touch, even momentarily. This is commonly called "Kiss Free".

Time-delay unit for an undervoltage release (MN)

- A time delay unit eliminates the risk of nuisance tripping due to a transient voltage dip lasting less than 200 ms for fixed delay units and up to 3 seconds for adjustable units. For shorter micro-outages, a system of capacitors provides temporary supply to the MN at $U > 0.7 U_n$ to ensure non tripping.

The correspondence between MN and time-delay units is shown below.

Power supply	Corresponding MN
Unit with fixed delay 200 ms	
48 V AC	48 V DC
220 / 240 V AC	250 V DC
Unit with adjustable delay ≥ 200 ms	
48 - 60 V AC/DC	48 V DC
100 - 130 V AC/DC	125 V DC
220 - 250 V AC/DC	250 V DC

Installation and connection

- Accessories snap into cavities under the front accessory cover of the circuit breaker. The presence and characteristics of the voltage release is visible from the front face through a window
- Terminals are spring type in order to insure a fast and reliable connection
- Each terminal may be connected by one 0.5...1.5 mm² flexible copper wire.

Operation

- The circuit breaker must be reset locally after being tripped by shunt trip (MX) or undervoltage release (MN)
- Tripping by the shunt trip or undervoltage release has priority over manual closing; in the presence of a standing trip order such an action does not result in any closing, even temporarily, of the main contacts
- Endurance: 50 % of the rated mechanical endurance of the circuit breaker.

Standard

- MN/MX voltage releases comply with IEC 60947-2.

[1] Except for MX 24 V AC/DC (in case of continuous activation, may generate some minor perturbation in sensitive environment).

Customize your circuit breaker with accessories

ComPact NSXm accessories and auxiliaries

SDx module for MicroLogic Vigi 4.1

SDx module for ComPact NSXm MicroLogic Vigi 4.1

The SDx module provides alarming and fault differentiation for the ComPact NSXm with MicroLogic Vigi 4.1.

This module has 2 NO/NC outputs dry contacts. Each can be assigned with one of the following status:

- overload alarm (SDT105): current is higher than 105 % of the setting current (I_r)
- overload trip indication (SDT): circuit breaker has tripped due to an overload fault
- earth leakage alarm (SDV80): leakage current is higher than 80 % of the earth leakage trip threshold (I_{Δn})
- earth leakage trip indication (SDV): circuit breaker has tripped due to an earth leakage current.

Outputs are automatically reseted either when alarm disappear or when the circuit breaker is restarted.

Output characteristics

- 2 NO/NC dry contacts
- 24...250 V AC/DC
- 2 mA...5 A max
- AC15 (230 V max - 400 VA)
- DC13 (24 V - 50 W)

Power characteristics

- 24...240 V AC/DC

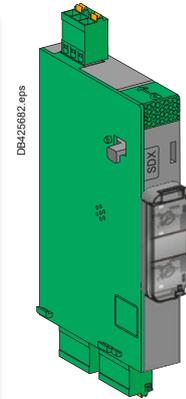
Front face indication



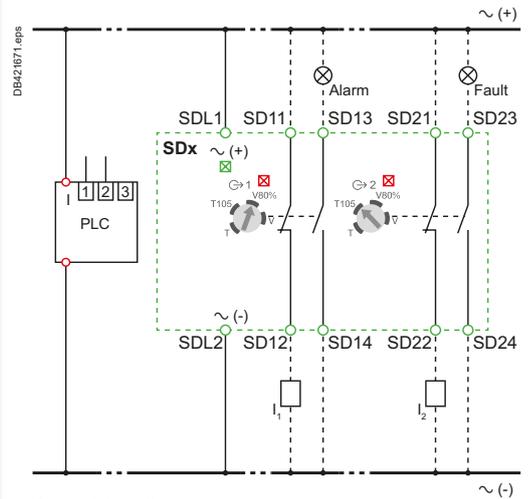
- green led "On": flashes slowly when the module is powered
- 2 red led for output status indication
- 2 setting dials

Installation and connection

The SDx module is clipped on the right side on the circuit breaker. Each removable spring terminal can be connected by one 0.5... 1.5 mm² copper wire.



SDx relay module with its terminal block.

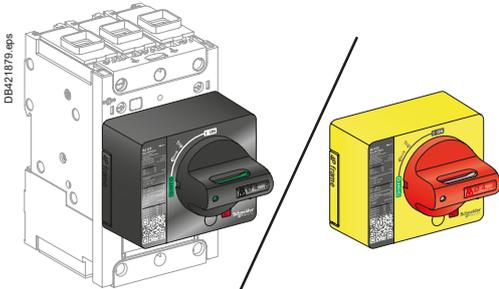


SDx wiring diagram.



ComPact NSXm accessories and auxiliaries

Rotary handles



Directly mounted rotary handle.

Direct rotary handles

Installation

The direct mounted rotary handle has to be mounted by 3 screws on the front accessory cover.

Operation

The direct rotary handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I) and tripped (Trip)
- access to the "push-to-trip" button
- visibility and access to the trip unit.

Device padlocking

The circuit breaker may be locked in the OFF position by using one to three padlocks (not supplied) or in ON position after customer modification of the rotary handle before installation, padlock shackle Ø4-8 mm. Locking in the ON position does not prevent the circuit breaker from tripping if a fault occurs. In this case, the handle remains in the ON position after the circuit breaker trips. Unlocking is required for the handle to go to the tripped then the OFF position.

Variations: door locking

Door locking built-in functionality can be activated by the customer to prevent opening the door when the circuit breaker is ON or in trip position. For exceptional situations, door locking can be temporarily disabled with a tool by qualified personnel to open the door when the circuit breaker is closed.

Models

- Standard with black handle.
- VDE type with red handle and yellow bezel for machine tool control.

Extended rotary handles

Installation

The door-mounted (extended) rotary handle is made up of:

- a unit that has to be screwed on the front accessory cover of the circuit breaker
- an assembly (handle mechanism and front plate) on the door that is always secured in the same position, whether the circuit breaker is installed vertically or horizontally
- an adjustable extension shaft.

The handle mechanism is fixed with a nut (Ø22 mm) to make assembly easier. The Laser Square tool (GVAPL01) can be used to accurately align the hole on the door with the circuit breaker.

Operation when door is closed

The door mounted handle makes it possible to operate a circuit breaker installed in an enclosure from the front. The door mounted operating handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I) and tripped (Trip)
- visibility and access to trip unit when the door is open
- degree of protection of the handle on the door: IP54 or IP65 as per 60520.

Mechanical door locking when device closed

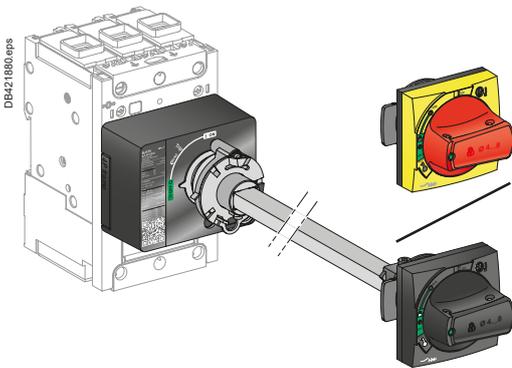
A standard feature of the extended rotary handle is a locking function, built into the shaft, that disables door opening when the circuit breaker is in the ON or tripped positions.

Door locking can be temporarily disabled with a tool by qualified personnel to open the door without opening the circuit breaker. This operation is not possible if the handle is locked by a padlock.

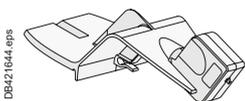
Device and door padlocking

Padlocking locks the circuit breaker handle and disables door opening:

- standard situation, in the OFF position, using 1 to 3 padlocks, shackle Ø4-8 mm, padlocks are not supplied
- for the black handle, with a voluntary modification of the door handle (to be done by the customer during installation), in the ON and OFF positions. Locking in the ON position does not prevent the circuit breaker from tripping if a fault occurs. In this case, the handle remains in the ON position after the circuit breaker trips. Unlocking is required for the handle to go to the tripped then the OFF position.



Door-mounted rotary handle.



Laser Square tool.

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ComPact NSXm accessories and auxiliaries

Rotary handles

Operation when door is opened

An open door shaft operator can be used to operate the circuit breaker when door is opened. This accessory complies with UL 508A.

The indication of the three positions OFF (O), ON (I) and tripped (Trip) is visible on the circuit breaker.

The circuit breaker itself may be locked in OFF position when the door is opened by 1 padlock / lockout hasp, shackle Ø4-8 mm.

Shaft length

The shaft length is the distance between the back of the circuit breaker and the door:

- minimum shaft length is 200 mm
- maximum shaft length is 600 mm
- shaft length must be adjusted.

Models

- Standard with black handle (IP54).
- VDE type with red handle and yellow bezel for machine tool control (IP54).
- IP65 with red handle and yellow bezel.

Side rotary handles (left or right)

Installation

The side-mounted rotary handle is made up of:

- a unit that has to be screwed on the front accessory cover of the circuit breaker
- an assembly (handle and front plate) on the side (left or right) of the enclosure
- an adjustable extension shaft.

The handle mechanism is fixed with a nut (Ø22 mm) to make assembly easier.

Operation

The side mounted rotary handle makes it possible to operate circuit breakers installed in enclosure from the side. The side mounted rotary handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I) and tripped (Trip). Moreover, the position is visible on the circuit breaker itself.
- visibility and access to trip unit when the door is open
- degree of protection of the handle on the side: IP54 or IP65 as per 60520.

Device padlocking

The circuit breaker may be locked in the OFF position, or, for the black rotary handle only, in ON position after voluntary modification of the side handle (to be done by the customer during installation), by using one to three padlocks, padlock shackle Ø4-8 mm ; padlocks are not supplied.

Locking in the ON position does not prevent free circuit breaker from tripping if a fault occurs. In this case, the handle remains in the ON position after the circuit breaker tripping. Unlocking is required to go to the tripped then the OFF position.

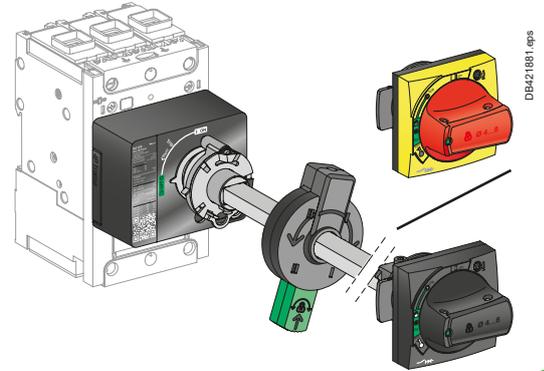
Shaft length

The shaft length is the distance between the side of the circuit breaker and the side of the enclosure:

- minimum shaft length is 45 mm
- maximum shaft length is 480 mm
- shaft length must be adjusted.

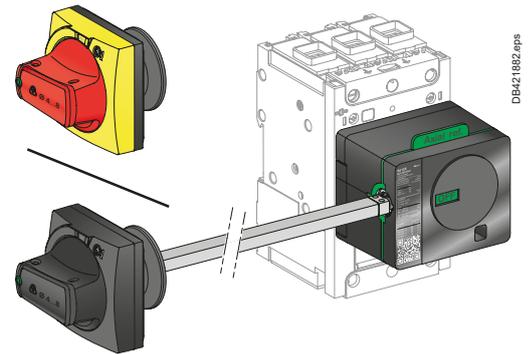
Models

- Standard with black handle (IP54).
- VDE type with red handle and yellow bezel for machine tool control (IP54).
- IP65 with red handle and yellow bezel (by ordering a standard one and an IP65 universal handle).



Door-mounted rotary handle with open door shaft operator.

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Side mounted rotary handle.

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C

ComPact NSXm accessories and auxiliaries

Locks and sealing accessories

Locks

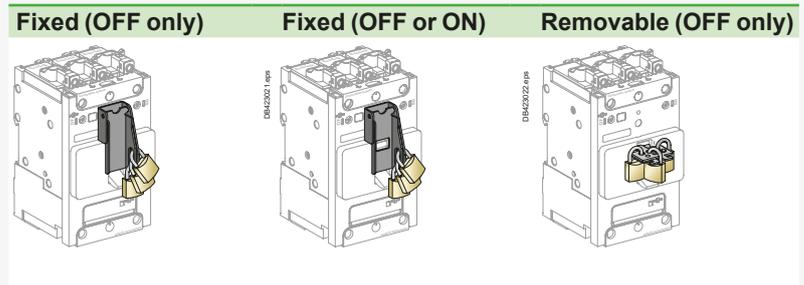
Padlocking systems can receive up to three padlocks with diameters of 5-8 mm ; padlocks not supplied. Locking in the OFF position guarantees isolation as per IEC 60947-2.

Control device	Function	Means	Required accessories
Toggle	Lock in OFF position	Padlock	Removable device
	Lock in OFF or ON position	Padlock	Fixed device
Direct rotary handle	Lock in OFF position	Padlock	Fixed device
	Lock in <ul style="list-style-type: none"> ■ OFF position ■ OFF or ON position ^[1] 	Padlock	-
Extended/side rotary handle	Lock in <ul style="list-style-type: none"> ■ OFF position ■ OFF or ON position ^[2] with door opening prevented	Padlock	-

[1] Following a simple modification of the mechanism.

[2] Following a simple modification of the mechanism - black handle only.

Handle padlocking device ^[1]



[1] Rotary handle has integrated padlocking capability.



Customize your circuit breaker with accessories

ComPact NSXm accessories and auxiliaries

Locks and sealing accessories

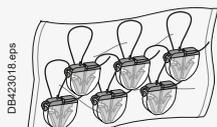
Sealing accessories

Sealing accessories are available. Each bag of accessories contains all the parts required for the types of sealing indicated below.

A bag contains:

- 6 sealing accessories
- 6 lead seals.

Types of seals and corresponding functions



LV429335: Bag of sealing accessories.

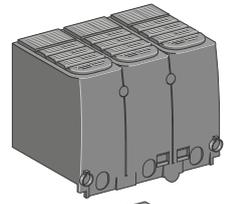
Protected operations			
Control type	<ul style="list-style-type: none"> ■ Front removal ■ Access to auxiliaries. 	<ul style="list-style-type: none"> ■ Access to power connections 	<ul style="list-style-type: none"> ■ Access to settings and test connector
Toggle			
Rotary handle			



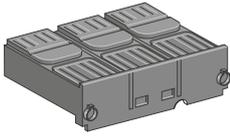
ComPact NSX accessories and auxiliaries

Overview fixed version

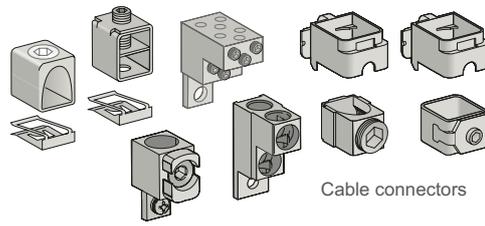
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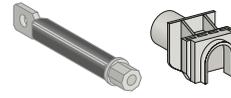
Sealable terminal shields



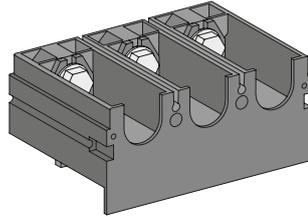
Interphase barriers



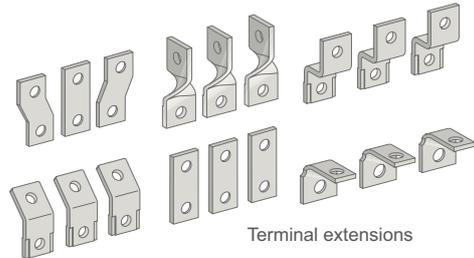
Cable connectors



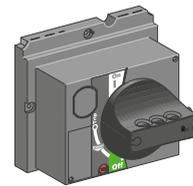
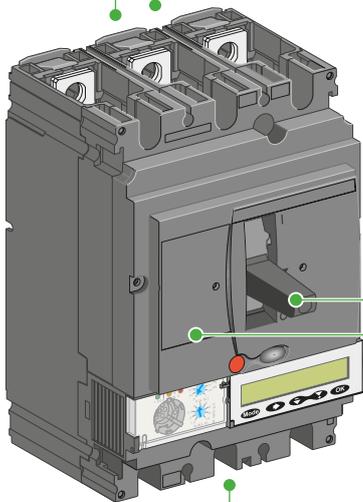
Rear connectors



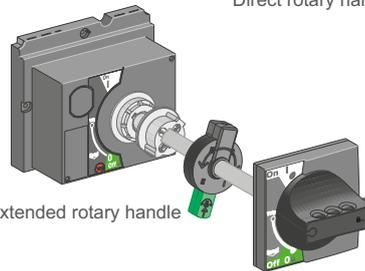
One-piece spreader



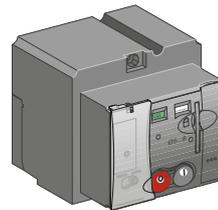
Terminal extensions



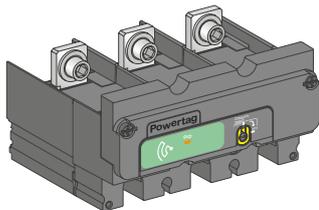
Direct rotary handle



Extended rotary handle



Motor mechanism



PowerTag NSX



BSCM module



Indication contact



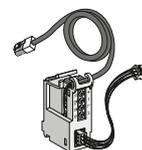
Voltage release



SDTAM module



SDx module

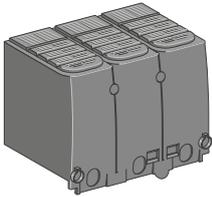


NSX cord

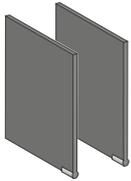
ComPact NSX accessories and auxiliaries

Overview plug-in and withdrawable versions

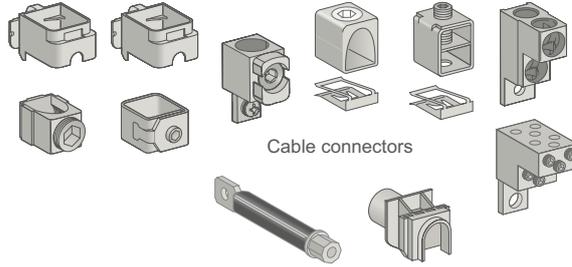
DB632572 eps



Sealable long terminal shields for plug-in base

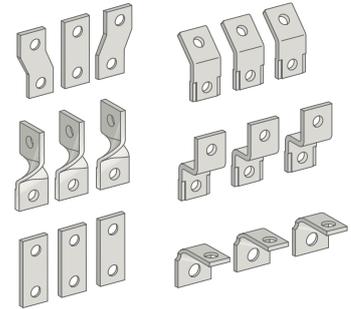


Interphase barriers

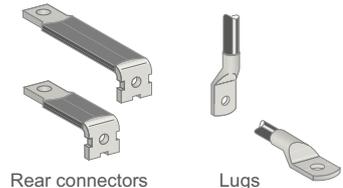


Cable connectors

Rear connectors

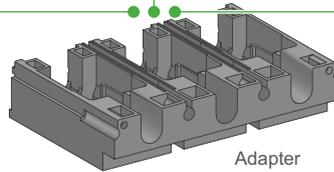


Terminal extensions

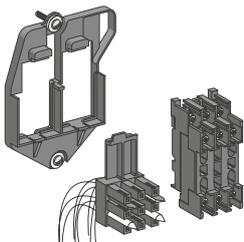


Rear connectors

Lugs



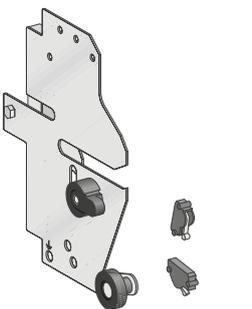
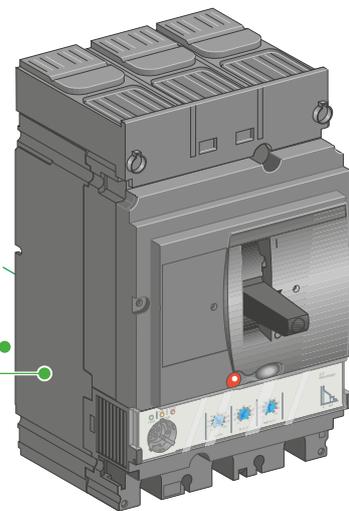
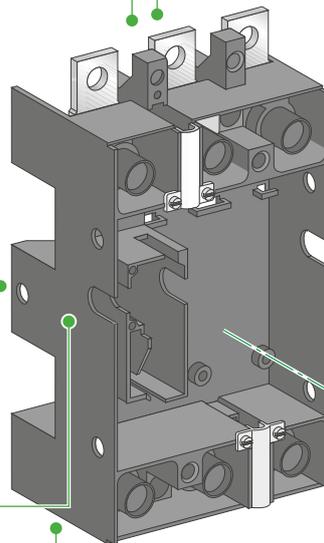
Adapter



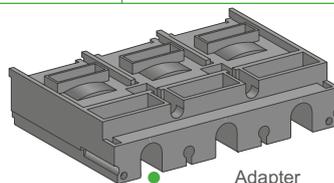
Automatic withdrawable auxiliary connector



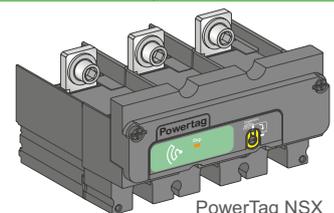
Manual auxiliary connector



Chassis side plate

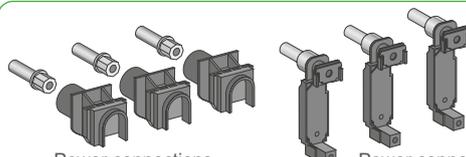


Adapter



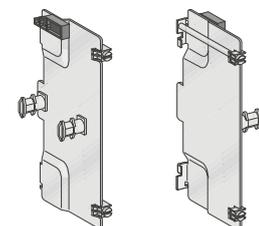
PowerTag NSX

[1]



Power connections

Power connections for Vigi add-on



Circuit breaker side plate

[1] For PowerLogic PowerTag NSX 630 A, add a 4 mm intercalary under the module when plate mounted (see page C-43).



ComPact NSX accessories and auxiliaries

Device installation

Plug-in circuit breakers

The plug-in version makes it possible to:

- extract and/or rapidly replace the circuit breaker without having to touch the connections on the base
- allow for the addition of future circuits by installing bases that will be equipped with a circuit breaker at a later date
- isolate the power circuits when the device is mounted on or through a panel. It acts as a barrier for the connections of the plug-in base. Insulation is made complete by the mandatory short terminal shields on the device. The degrees of protection are:
 - circuit breaker plugged in = IP4
 - circuit breaker removed = IP2
 - circuit breaker removed, base equipped with shutters = IP4.

Parts of a plug-in configuration

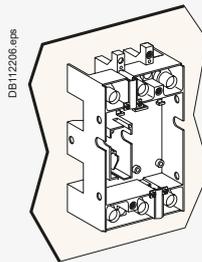
A plug-in configuration is made by adding a "plug-in kit" to a fixed device. To avoid connecting or disconnecting the power circuits under load conditions, a safety trip causes automatic tripping if the device is ON, before engaging or withdrawing it. The safety trip, supplied with the kit, must be installed on the device. If the device is disconnected, the safety trip does not operate. The device can be operated outside the switchboard.

Accessories

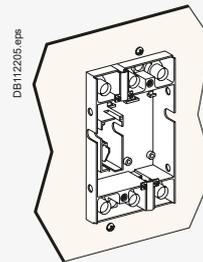
Optional insulation accessories are available.

- Terminal shields to protect against direct contact.
- Interphase barriers to reinforce insulation between phases and protect against direct contact.

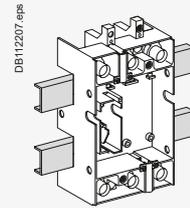
Mounting



Mounting on a backplate.



Mounting through a front panel.



Mounting on rails.

Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

Device installation

Withdrawable circuit breakers

In addition to the advantages provided by the base, installation on a chassis facilitates handling. It offers three positions, with transfer from one to the other after mechanical unlocking:

- connected: the power circuits are connected
- disconnected: the power circuits are disconnected, the device can be operated to check auxiliary operation
- removed: the device is free and can be removed from the chassis.

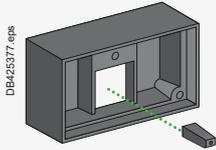
Parts of a withdrawable configuration

A withdrawable configuration requires two side plates installed on the base and two sides plates mounted on the circuit breaker. Similar to the plug-in version, a safety trip causes automatic tripping if the device is ON, before engaging or withdrawing it, and enables device operation in the disconnected position.

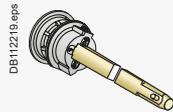
Accessories

Accessories are the same as for the base, with in addition:

- auxiliary contacts for installation on the fixed part, indicating the "connected" and "disconnected" positions
- locking by 1 to 3 padlocks (shackle diameter 5 to 8 mm), to:
 - prevent insertion for connection
 - lock the circuit breaker in connected or disconnected position
- toggle collar for circuit breakers with a toggle mounted through a front panel, intended to maintain the degree of protection whatever the position of the circuit breaker (supplied with a toggle extension)
- telescopic shaft for extended rotary handles. The door can then be closed with the device in the connected and disconnected positions.

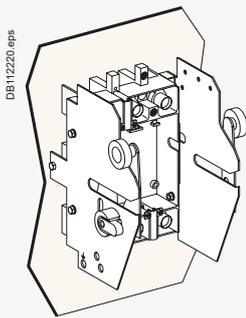


DB425377.eps
Protection collar for toggle and toggle extension to provide IP4 in the connected and disconnected positions.

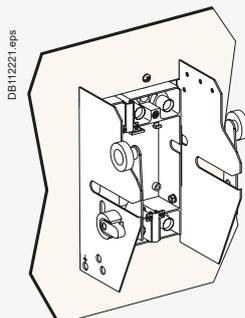


DB112219.eps
Telescopic shaft.

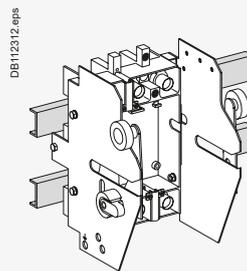
Mounting



DB112220.eps
Mounting on a backplate.



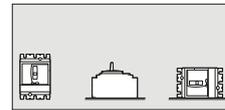
DB112221.eps
Mounting through a front panel.



DB112312.eps
Mounting on rails.



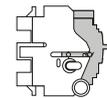
Withdrawable ComPact NSX250.



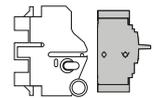
Installation positions.



Connected.



Disconnected.



Removed.

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DB112209.eps

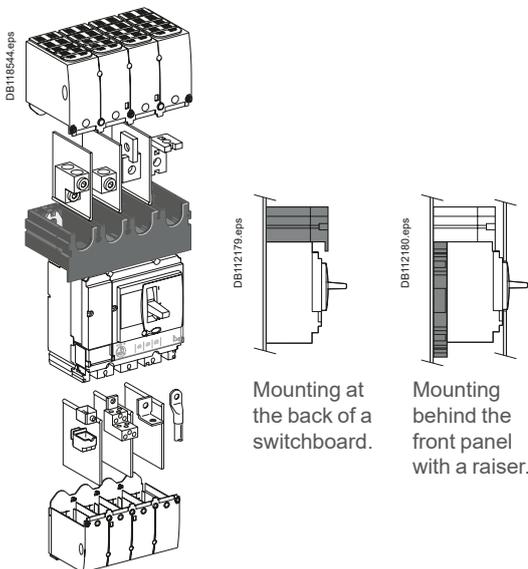
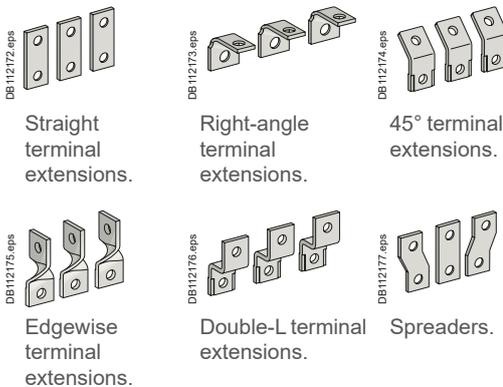
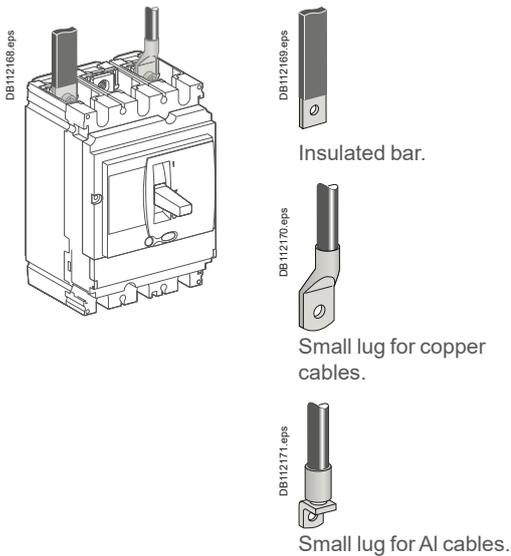
DB112210.eps



ComPact NSX accessories and auxiliaries

Connection of fixed devices

Fixed circuit breakers are designed for standard front connection using bars or cables with lugs. Cable connectors are available for bare cables. Rear connection is also possible.



Front connection

Bars or cables with lugs

Standard terminals

ComPact NSX100 to 630 come with terminals comprising snap-in nuts with screws:

- ComPact NSX100: M6 nuts and screws. ComPact NSX160/250: M8 nuts and screws
- ComPact NSX400/630: M10 nuts and screws.

These terminals may be used for:

- direct connection of insulated bars or cables with lugs
- terminal extensions offering a wide range of connection possibilities.

Interphase barriers or terminal shields are recommended. They are mandatory for certain connection accessories (in which case the interphase barriers are provided).

Bars

When the switchboard configuration has not been tested, insulated bars are mandatory.

Maximum size of bars

ComPact NSX circuit breaker		100/160/250	400/630
Without spreaders	pitch (mm)	35	45
	maximum bar size (mm)	20 x 2	32 x 6
With spreaders	pitch (mm)	45	52.5
	maximum bar size (mm)	32 x 2	40 x 10

Crimp lugs

There are two models, for aluminium and copper cables.

It is necessary to use narrow lugs, compatible with device connections. They must be used with interphase barriers or long terminal shields. The lugs are supplied with interphase barriers and may be used for the types of cables listed below.

Cable sizes for connection using lugs

ComPact NSX circuit breaker		100/160/250	400/630
Copper cables	size (mm ²)	120, 150, 185	240, 300
	crimping	hexagonal barrels or punching	
Aluminium cables	size (mm ²)	120, 150, 185	240, 300
	crimping	hexagonal barrels	

Terminal extensions

Extensions with anti-rotation ribs can be attached to the standard terminals to provide numerous connection possibilities in little space:

- straight terminal extensions
- right-angle terminal extensions
- edgewise terminal extensions
- double-L extensions
- 45° extensions.

Spreaders

Spreaders may be used to increase the pitch:

- NSX100 to 250: the 35 mm pitch can be increased to 45 mm
- NSX400/630: the 45 mm pitch can be increased to 52 or 70 mm.

Bars, cable lugs or cable connectors can be attached to the ends.

One-piece spreader for NSX100 to 250

Connection of large cables may require an increase in the distance between the device terminals.

The one-piece spreader is the means to:

- increase the 35 mm pitch of the NSX100 to 250 circuit-breaker terminals to the 45 mm pitch of a NSX400/630 device
- use all the connection and insulation accessories available for the next largest frame size (lugs, connectors, spreaders, right-angle and edgewise terminal extensions, terminal shields and interphase barriers).

It may also be used for ComPact INS switch-disconnectors.

Equipped with a single-piece spreader, ComPact NSX devices can be mounted:

- at the back of a switchboard
- behind the front panel with a raiser.

The one-piece spreader is also the means to:

- align devices with different frame sizes in the switchboard
- use the same mounting plate, whatever the device.

Pitch (mm) depending on the type of spreader

ComPact NSX circuit breaker	NSX100 to 250	NSX400 to 630
Without spreaders	35	45
With spreaders	45	52.5 or 70
With one-piece spreader	45	-

ComPact NSX accessories and auxiliaries

Connection of fixed devices

Bare cables

For bare cables (without lugs), the prefabricated bare-cable connectors may be used for both copper and aluminium cables.

1-cable connectors for ComPact NSX100 to 250

The connectors snap directly on to the device terminals or are secured by clips to right-angle and straight terminal extensions as well as spreaders.

1-cable connectors for ComPact NSX400 to 630

The connectors are screwed directly to the device terminals.

2-cable connectors for ComPact NSX100 to 250 and 400/630

The connectors are screwed to device terminals or right-angle terminal extensions.

Distribution connectors for ComPact NSX100 to 250

These connectors are screwed directly to device terminals. Interphase barriers are supplied with distribution connectors, but may be replaced by long terminal shields. Each connector can receive six cables with cross-sectional areas ranging from 1.5 to 35 mm² each.

Lineryg DX and Lineryg DP distribution block for ComPact NSX100 to 630

Lineryg DX and Lineryg DP connects directly to device terminals.

It is used to connect up to six or nine flexible or rigid cables with cross-sectional areas not exceeding 10 mm² or 16 mm², to each pole.

Connection is made to spring terminals without screws.

Maximum size of cables depending on the type of connector

ComPact NSX circuit breaker		100/160	250	400	630
Steel connectors	1.5 to 95 mm ²	●			
Aluminium connectors	25 to 95 mm ²	●	●		
	120 to 185 mm ²	●	●		
	120 to 240 mm ²	●	●		
	2 cables 50 to 120 mm ²	●	●		
	2 cables 35 to 240 mm ²			●	●
	35 to 300 mm ²			●	●
Distribution connectors	6 cables 35 mm ²	●	●		
Lineryg DX and Lineryg DP distribution blocks	6 or 9 cables 10/16 mm ²	●	●		

Rear connection

Device mounting on a backplate with suitable holes enables rear connection.

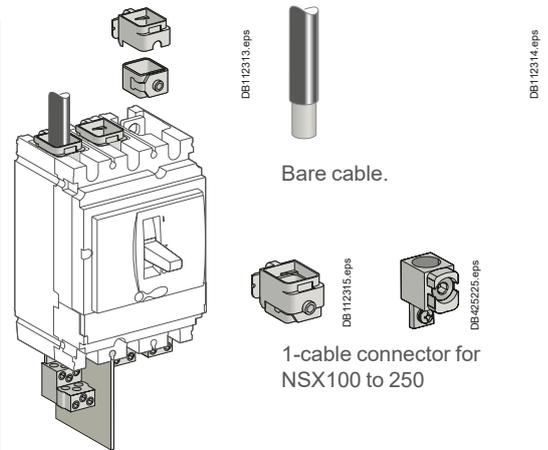
Bars or cables with lugs

Rear connections for bars or cables with lugs are available in two lengths. Bars may be positioned flat, on edge or at 45° angles depending on how the rear connections are positioned.

The rear connections are simply fitted to the device connection terminals. All combinations of rear connection lengths and positions are possible on a given device.

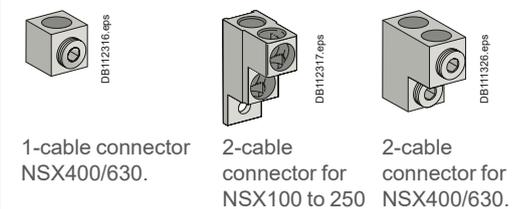
Bare cables

For the connection of bare cables, the 1-cable connectors for ComPact NSX100 to 250 may be secured to the rear connections using clips.



Bare cable.

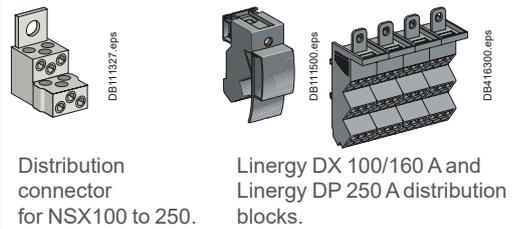
1-cable connector for NSX100 to 250



1-cable connector NSX400/630.

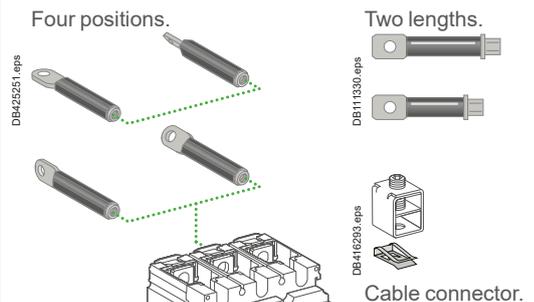
2-cable connector for NSX100 to 250

2-cable connector for NSX400/630.



Distribution connector for NSX100 to 250.

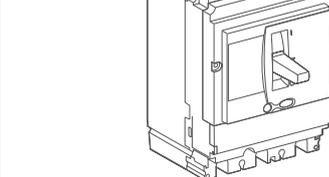
Lineryg DX 100/160 A and Lineryg DP 250 A distribution blocks.



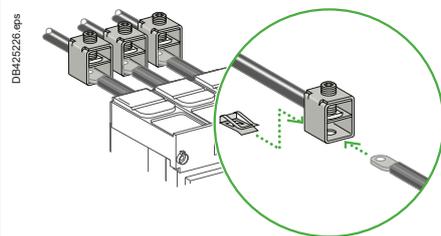
Four positions.

Two lengths.

Cable connector.



Rear connection.

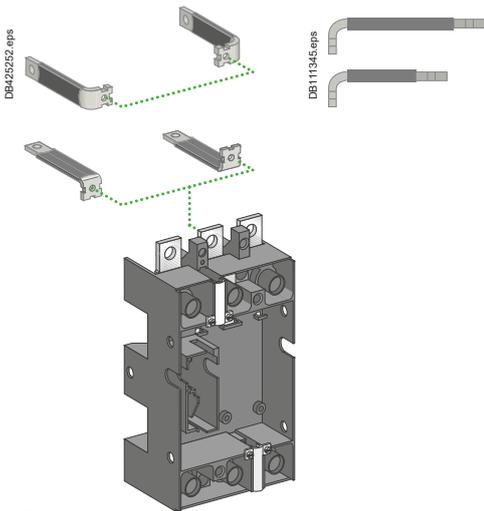


Connection of bare cables to NSX100 to 250 by clips.

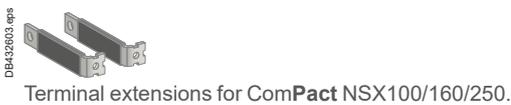
ComPact NSX accessories and auxiliaries

Connection of withdrawable and plug-in devices

Connection is identical for both withdrawable and plug-in versions. The same accessories as for fixed devices may be used.



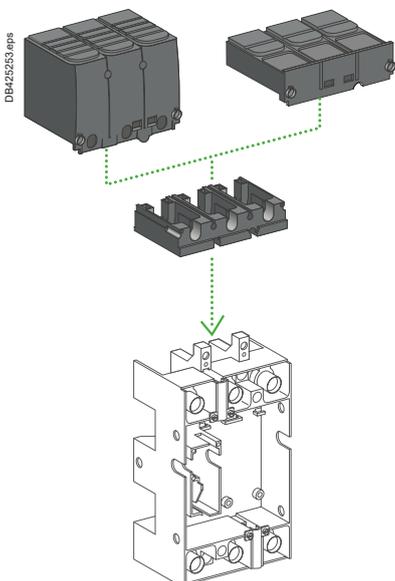
Four positions.



Terminal extensions for ComPact NSX100/160/250.



Terminal extensions for ComPact NSX400/630.

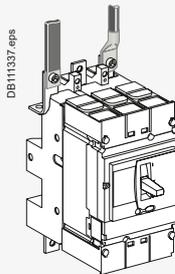


Bars or cables with lugs

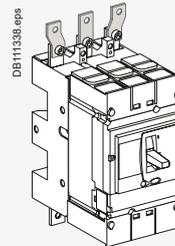
The plug-in base is equipped with terminals which, depending on their orientation, serve for front and rear connection.

For rear connection of a base mounted on a backplate, the terminals must be replaced by insulated, long right-angle terminal extensions.

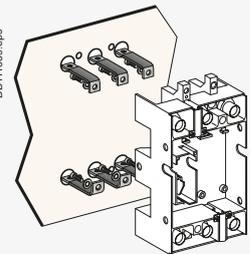
For ComPact NSX630 devices, connection most often requires the 52.5 or 70 mm pitch spreaders.



Front connection.



Front connection with spreaders.



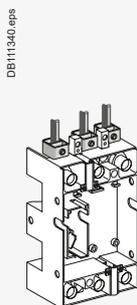
Rear connection of a base mounted on a backplate.

Connection accessories

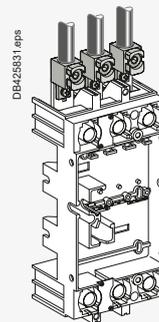
All accessories for fixed devices (bars, lugs, terminal extensions and spreaders) may be used with the plug-in base.

Bare cables

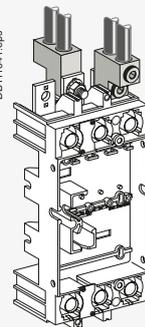
All terminals may be equipped with bare-cable connectors. See the "Connection of fixed devices" section.



With a 100 to 250 A base.



With 240 mm² cable connector for NSX100 to 250.

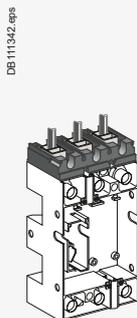


With a 400/630 A base.

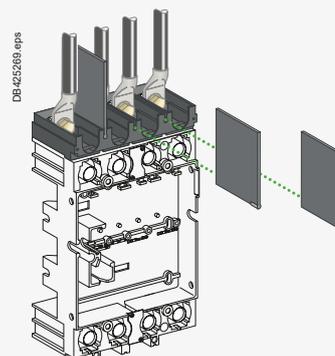
Adapter for plug-in base

The adapter is a plastic component for the 100 to 250 base and the 400/630 base that enables use of all the connection accessories of the fixed device.

It is required for interphase barriers and the long and short terminal shields.



Adapter for 100 to 250 A - 3P base. Connection with bars or cables with lugs.



Adapter for 400/630 A - 4P base. Connection with spreaders and interphase barriers.

Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

Insulation of live parts

Terminal shields

Insulating accessories used for protection against direct contact with power circuits. They provide IP40 degree of protection and IK07 mechanical impact protection.

Terminal-shield types

ComPact NSX100 to 250 and NSX400/630 3P or 4P can be equipped with:

- short terminal shields
- short terminal shields ≥ 500 V
- long terminal shields.

All terminal shields have holes or knock-outs in front for voltage-presence indicators.

Short terminal shields

They are used with:

- plug-in and withdrawable versions in all connection configurations
- fixed versions with rear connection.

Long terminal shields

They are used for front connection with cables or insulated bars.

They comprise two parts assembled with captive screws, forming an IP40 cover.

■ The top part is equipped with sliding grids with break marks for precise adaptation to cables or insulated bars.

■ The rear part completely blocks off the connection zone. Partially cut squares can be removed to adapt to all types of connection for cables with lugs or copper bars.

Long terminal shields may be mounted upstream and downstream of:

- fixed devices
- the base of plug-in and withdrawable versions, thus completing the insulation provided by the mandatory short terminal shields on the device
- the one-piece spreader for NSX100 to 250
- the 52.5 mm spreaders for NSX400/630.

Terminal shields and pitch

Combination possibilities are shown below.

Circuit breaker	NSX100/160/250		NSX400/630
Short terminal shields			
Pitch (mm)	35	45	
Long terminal shields			
Pitch (mm)	35	45	52.5

Interphase barriers

Safety accessories for maximum insulation at the power-connection points:

- they clip easily onto the circuit breaker
- single version for fixed devices and adapters on plug-in bases
- not compatible with terminal shields
- the adapter for the plug-in base is required for mounting on plug-in and withdrawable versions.

Rear insulating screens

Safety accessories providing insulation at the rear of the device.

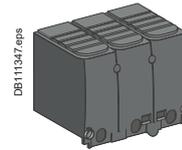
Their use is mandatory for devices with spreaders, installed on backplates, when terminal shields are not used.

The available screen dimensions are shown below.

Circuit breaker		NSX100/160/250	NSX400/630
3P	W x H x thickness (mm)	140 x 105 x 1	203 x 175 x 1.5
4P	W x H x thickness (mm)	175 x 105 x 1	275 x 175 x 1.5

Terminal shields are identical for fixed and plug-in/withdrawable versions and cover all applications up to 1000 V.

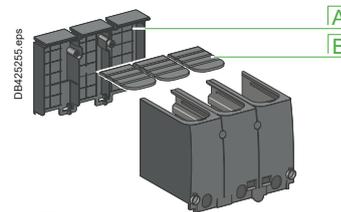
They exist for the 100 to 250 A and 400/630 A ratings, in long and short versions.



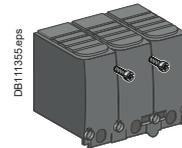
Long terminal shields.



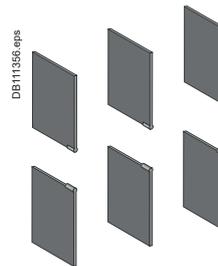
Short terminal shields.



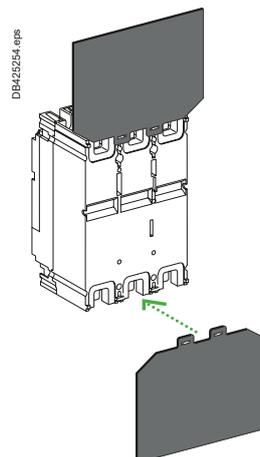
- A** Partially cut removable squares.
- B** Grids with break marks.



Assembled with captive screws.



Interphase barriers.



Rear insulating screens.



ComPact NSX accessories and auxiliaries

Selection of auxiliaries



Standard

All ComPact NSX100/160/250 circuit breakers and switch-disconnectors have slots for the electrical auxiliaries listed below.

5 indication contacts (see page C-30)

- 2 ON/OFF (OF1 and OF2)
- 1 trip indication (SD)
- 1 fault-trip indication (SDE)
- 1 earth-fault indication (SDV), when the device is equipped with a Vigi add-on.

1 remote-tripping release (see page C-33)

- either 1 MN undervoltage release
- or 1 MX shunt release.

Remote indications

Circuit breakers equipped with MicroLogic trip units may be equipped with a fault-trip indication to identify the type of fault by installing:

1 indication module with two outputs (see page C-31)

- either an SDx module with MicroLogic 2.2 / 4.2 / 5.2 A or E / 6.2 A or E or 7 E
- or an SDTAM module with MicroLogic 2.2 M or 6-2 E-M (motor protection).

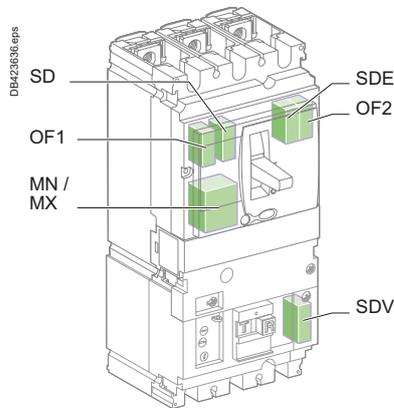
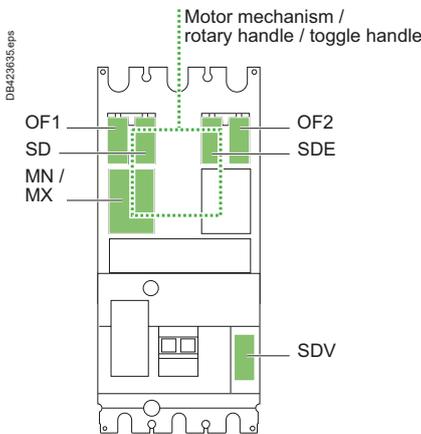
This module occupies the slots of one OF contact and an MN/MX release.

All these auxiliaries may be installed with a motor mechanism or a rotary handle or a toggle handle.

The following table indicates auxiliary possibilities depending on the type of trip unit.

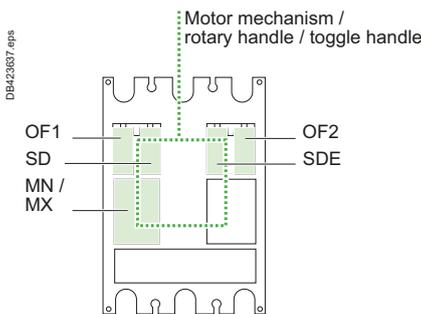
NA, TMD, TMG, MA

Standard



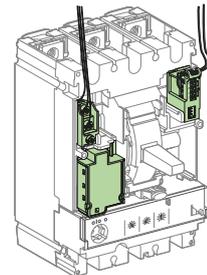
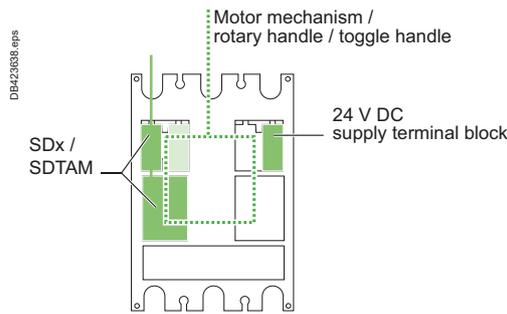
MicroLogic 2 / 4 / 5 / 6 / 7

Standard



or

Remote indications via SDx or SDTAM



The SDx or SDTAM uses the OF1 and MN/MX slots.

External connection is made via a terminal block in the OF1 slot.

The 24 V DC supply provides for the MicroLogic 5 / 6 / 7 display when the device is OFF or under low-load conditions.

Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

Selection of auxiliaries

Communication

Communication requires specific auxiliaries.

Communication of status indications

- 1 BSCM module.
- 1 NSX cord (internal terminal block) for both communication and 24 V DC supply to the BSCM. The insulated NSX cord is mandatory for system voltages greater than 480 V AC.

Communication of status conditions is compatible with a toggle handle and a rotary handle.

Communication of status indications and controls

This requires, in addition to the previous auxiliaries:

- 1 communicating motor mechanism connected to the BSCM.

Communication of measurements

Available on MicroLogic 5 / 6 / 7, the system consists of:

- 1 NSX cord (internal terminal block) for both communication and 24 V DC supply to the MicroLogic.

Communication of measurements is compatible with a standard or communicating motor mechanism and a rotary handle.

Communication of status indications, controls and measurements

Available on MicroLogic 5 / 6 / 7, the system consists of:

- 1 BSCM module
- 1 NSX cord (internal terminal block) for both communication and 24 V DC supply to the BSCM and the MicroLogic
- 1 communicating motor mechanism connected to the BSCM.

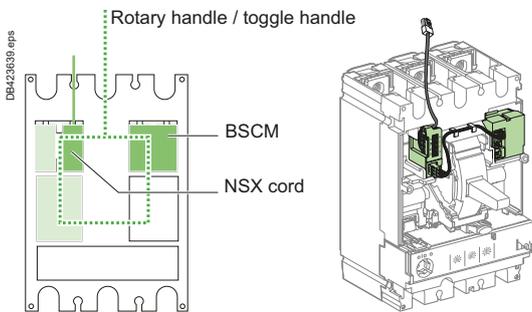
Installation of SDx or SDTAM is compatible with communication.

The following table indicates auxiliary possibilities depending on the type of trip unit.



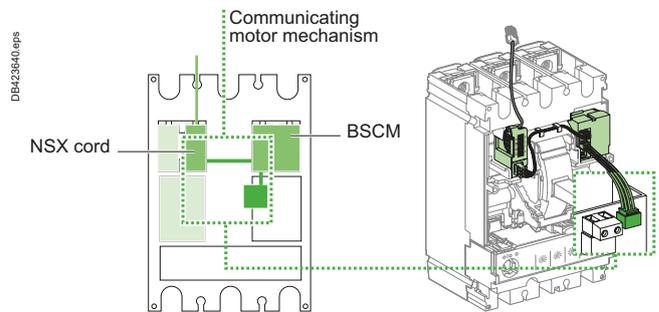
NA, TMD, TMG, MA, MicroLogic 2 / 4

Communication of status indications



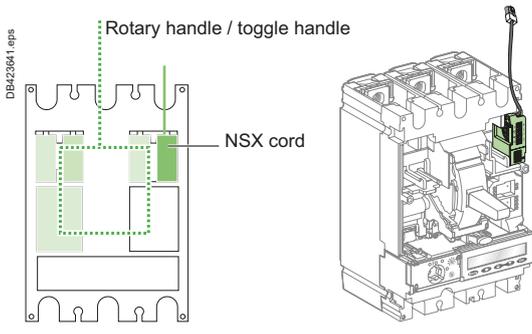
or

Communication of status indications and controls



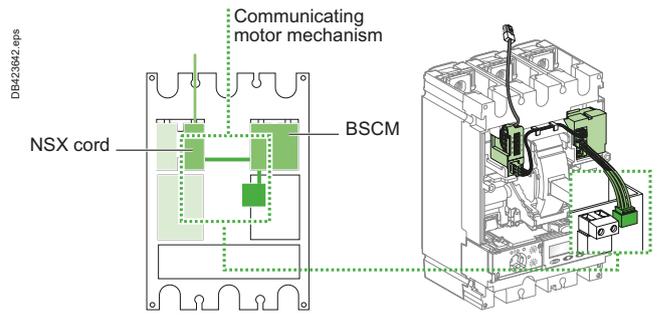
MicroLogic 5 / 6 / 7

Communication of measurements with or without FDM121 display



or

Communication of status indications, controls and measurements with or without FDM121 display



ComPact NSX accessories and auxiliaries

Selection of auxiliaries

Standard

All ComPact NSX400/630 circuit breakers and switch-disconnectors have slots for the electrical auxiliaries listed below.

7 indication contacts (see page C-30)

- 4 ON/OFF (OF1, OF2, OF3, OF4)
- 1 trip indication (SD)
- 1 fault-trip indication (SDE)
- 1 earth-fault indication (SDV), when the device is equipped with a Vigi add-on.

1 remote-tripping release (see page C-33)

- either 1 MN undervoltage release
- or 1 MX shunt release.

Remote indications

Circuit breakers equipped with MicroLogic trip units may be equipped with a fault-trip indication to identify the type of fault by installing:

1 indication module with two outputs (see page C-31)

- either an SDx module with MicroLogic 2.3 / 4.3 / 5.3 A or E / 6.3 A or E or 7 E
- or an SDTAM module with MicroLogic 2.3 M or 6-3 E-M (motor protection).

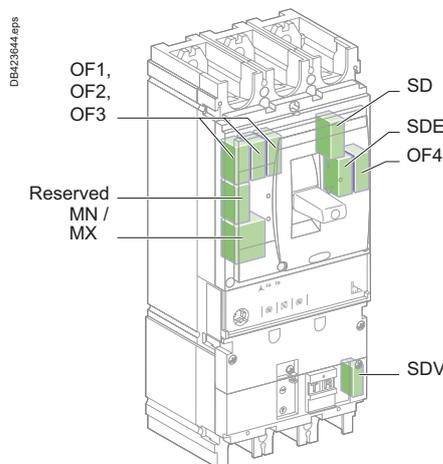
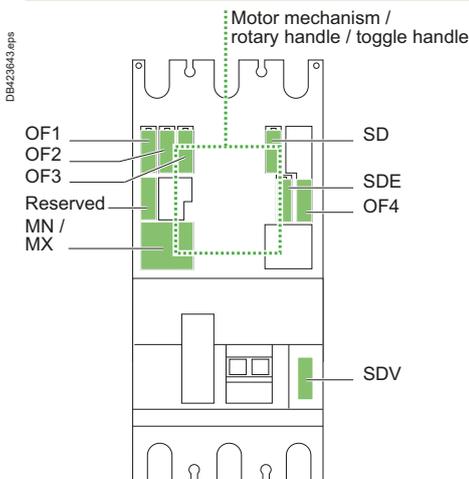
This module occupies the slots of an MN/MX release.

All these auxiliaries may be installed with a motor mechanism or a rotary handle or a toggle handle.

The following table indicates auxiliary possibilities depending on the type of trip unit.

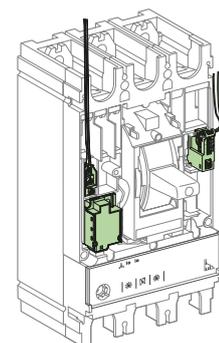
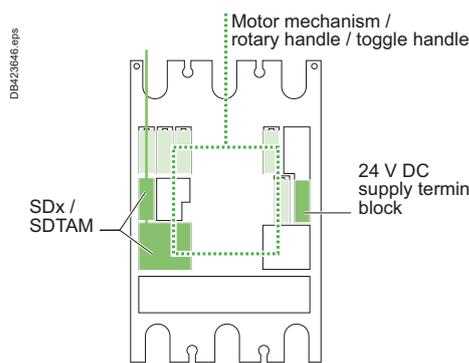
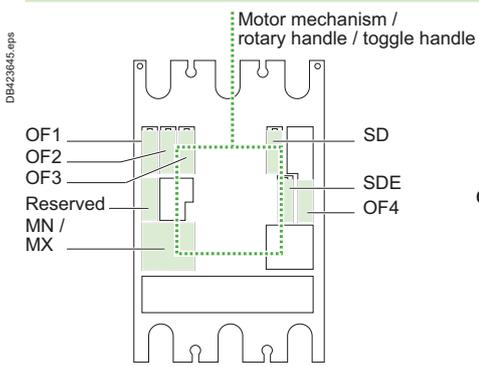
NA, MicroLogic 1.3 M

Standard



MicroLogic 2 / 4 / 5 / 6 / 7

Standard



The SDx or SDTAM uses the reserved slot and the MN/MX slots.

External connection is made via a terminal block in the reserved slot.

The 24 V DC supply provides for the MicroLogic 5 / 6 / 7 display when the device is OFF or under low-load conditions.

Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

Selection of auxiliaries

Communication

Communication requires specific auxiliaries.

Communication of status indications

- 1 BSCM module
- 1 NSX cord (internal terminal block) for both communication and 24 V DC supply to the BSCM. The insulated NSX cord is mandatory for system voltages greater than 480 V AC.

■ Communication of status conditions is compatible with a toggle handle and a rotary handle.

Communication of status indications and controls

This requires, in addition to the previous auxiliaries:

- 1 communicating motor mechanism connected to the BSCM.

Communication of measurements

Available on MicroLogic 5 / 6 / 7, the system consists of:

- 1 NSX cord (internal terminal block) for both communication and 24 V DC supply to the MicroLogic.

Communication of measurements is compatible with a standard or communicating motor mechanism and a rotary handle.

Communication of status indications, controls and measurements

Available on MicroLogic 5 / 6 / 7, the system consists of:

- 1 BSCM module
- 1 NSX cord (internal terminal block) for both communication and 24 V DC supply to the BSCM and the MicroLogic
- 1 communicating motor mechanism connected to the BSCM.

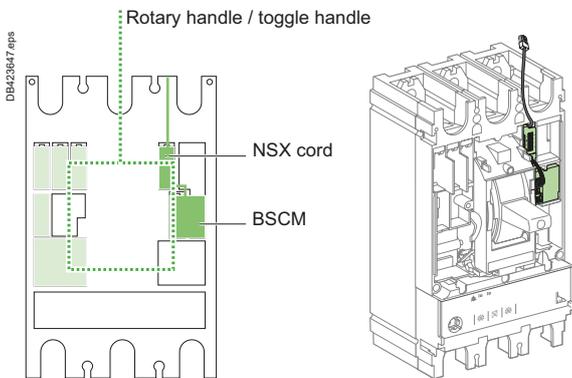
Installation of SDx or SDTAM is compatible with communication.

The following table indicates auxiliary possibilities depending on the type of trip unit.

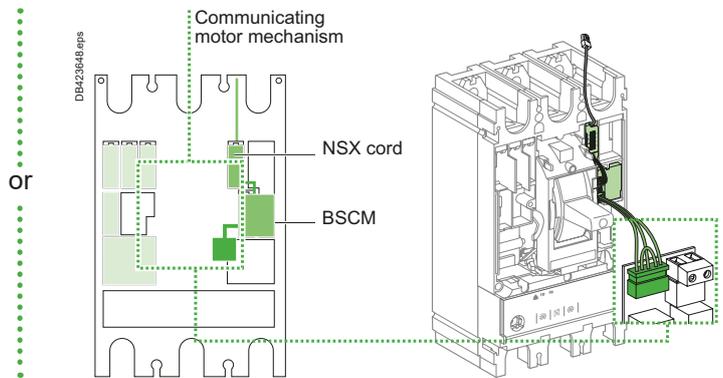


NA, MicroLogic 1.3 M, MicroLogic 2 / 4

Communication of status indications

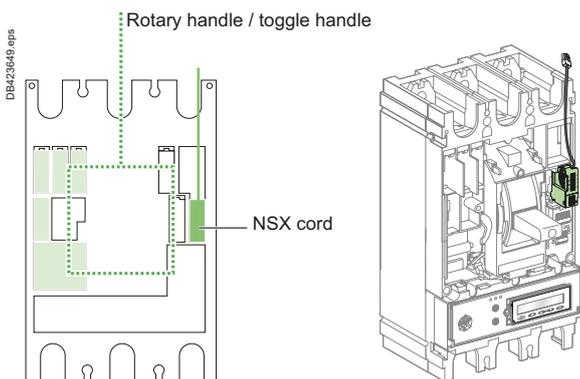


Communication of status indications and controls

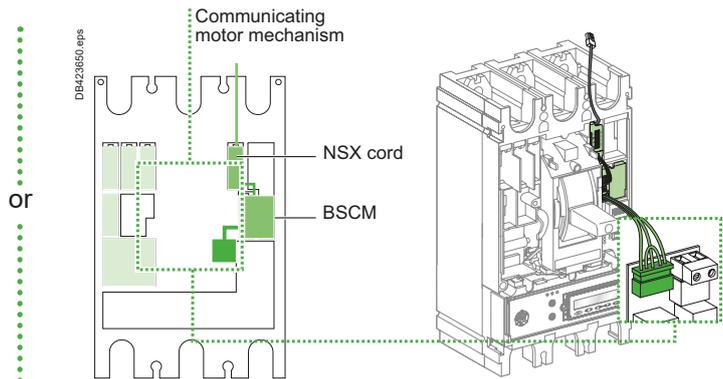


MicroLogic 5 / 6 / 7

Communication of status indications

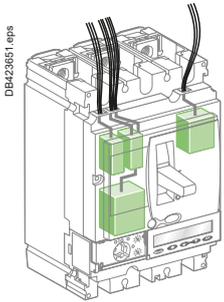


Communication of status indications, controls and measurements with or without FDM121 display



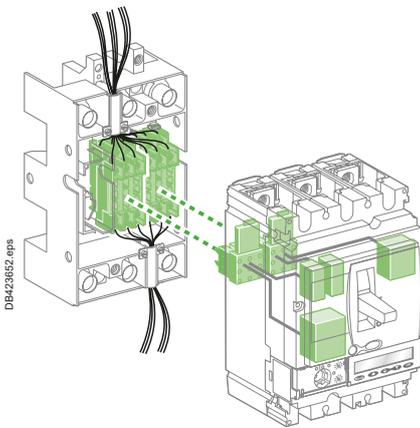
ComPact NSX accessories and auxiliaries

Connection of electrical auxiliaries



DB423651.eps

Fixed ComPact NSX.



DB423652.eps

Plug-in/withdrawable ComPact NSX.

Fixed ComPact NSX

Auxiliary circuits exit the device through a knock-out in the front cover.

Withdrawable or plug-in ComPact NSX

Automatic auxiliary connectors

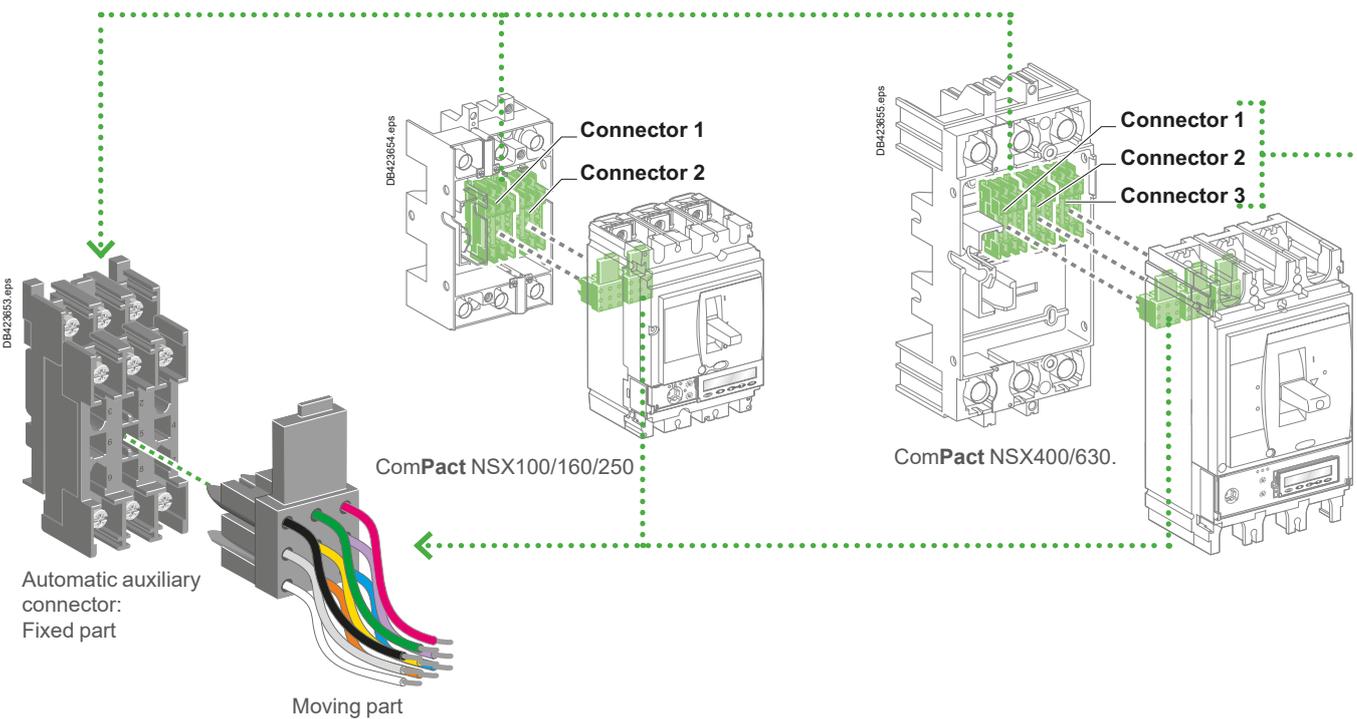
Auxiliary circuits exit the circuit breaker via one to three automatic auxiliary connectors (nine wires each). These are made up of:

- a moving part, connected to the circuit breaker via a support (one support per circuit breaker)
- a fixed part, mounted on the plug-in base, equipped with connectors for bare cables up to 2.5 mm².

MicroLogic trip unit options are also wired via the automatic auxiliary connectors.

Selection of automatic auxiliary connectors

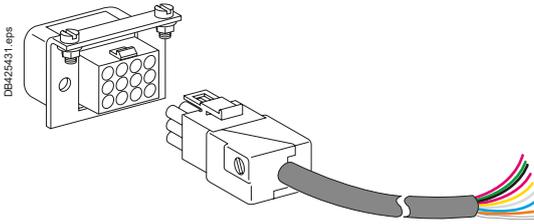
Depending on the functions installed, one to three automatic auxiliary connectors are required.



Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

Connection of electrical auxiliaries

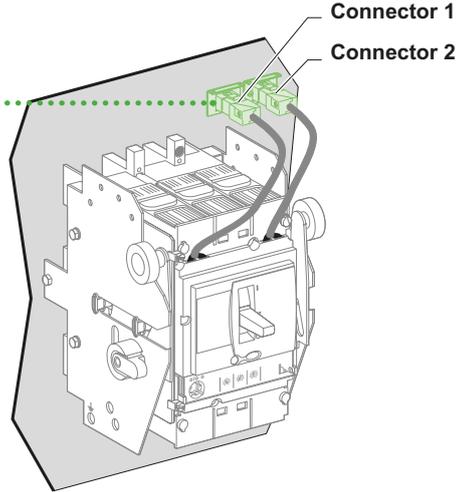


Nine-wire manual auxiliary connector.

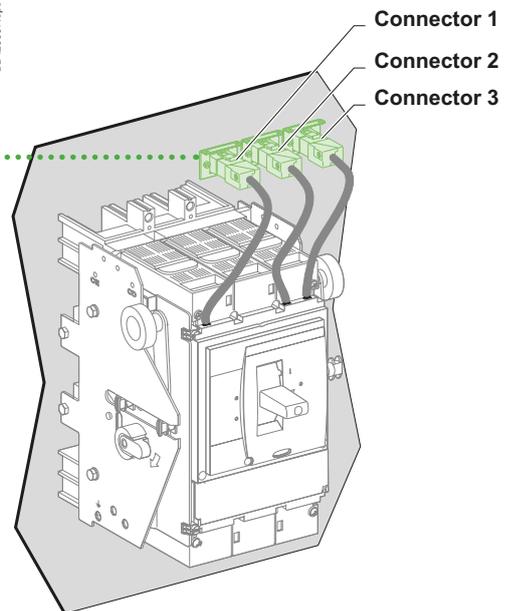
Withdrawable ComPact NSX

Manual auxiliary connectors

As an option to the automatic auxiliary connectors, withdrawable circuit breakers may be equipped with one to three plugs with nine wires each. In "disconnected" position, the auxiliaries remain connected. They can then be tested by operating the device.



ComPact NSX100/160/250.



ComPact NSX400/630.

Each auxiliary is equipped with a terminal block with numbered terminals for connection of wires up to:

- 1.5 mm² for auxiliary contacts and voltage releases
- 2.5 mm² for the motor-mechanism module.

Circuit breaker	Connector 1	Connector 2	Connector 3
	OF1 MN/MX or SDx/ SD or SDTAM	OF2/SDV / ZSI out ⁽¹⁾ SDE NSX cord MT MTc 24 V DC	OF3 OF4 ZSI in ZSI out
NSX100/160/250	●	●	-
NSX400/630	●	●	●

[1] Only for NSX100 to 250.

MT: motor mechanism.

MTc: communicating motor mechanism.



ComPact NSX accessories and auxiliaries

Indication contacts

One contact model provides circuit-breaker status indications (OF - SD - SDE - SDV).

An early-make or early-break contact, in conjunction with a rotary handle, can be used to anticipate device opening or closing.

A CE / CD contact indicates that the chassis is connected / disconnected.



Indication contacts.



CE/CD carriage switches.

These common-point changeover contacts provide remote circuit-breaker status information.

They can be used for indications, electrical locking, relaying, etc.

They comply with the IEC 60947-5 international standards.

Functions

Breaker-status indications, during normal operation or after a fault

A single type of contact provides all the different indication functions:

- OF (ON/OFF) indicates the position of the circuit breaker contacts
- SD (trip indication) indicates that the circuit breaker has tripped due to:
 - an overload
 - a short-circuit
 - an earth fault (Vigi) or a ground fault (MicroLogic 6)
 - operation of a voltage release
 - operation of the "push to trip" button
 - disconnection when the device is ON.

The SD contact returns to de-energised state when the circuit breaker is reset.

- SDE (fault-trip indication) indicates that the circuit breaker has tripped due to:
 - an overload
 - a short-circuit
 - an earth fault (Vigi) or a ground fault (MicroLogic 6).

The SD contact returns to de-energised state when the circuit breaker is reset.

- SDV indicates that the circuit breaker has tripped due to an earth fault. It returns to de-energised state when the Vigi add-on is reset.

All the above auxiliary contacts are also available in "low-level" versions capable of switching very low loads (e.g. for the control of PLCs or electronic circuits).

Rotary-handle position contact for early-make or early-break functions

- CAM (early-make or early-break function) contacts indicate the position of the rotary handle.

They are used in particular for advanced opening of safety trip devices (early break) or to energise a control device prior to circuit-breaker closing (early make).

Chassis-position contacts

- CE/CD (connected/disconnected) contacts are microswitch-type carriage switches for withdrawable circuit breakers.

Installation

- OF, SD, SDE and SDV functions: a single type of contact provides all these different indication functions, depending on where it is inserted in the device. The contacts clip into slots behind the front cover of the circuit breaker (or the Vigi add-on for the SDV function).

The SDE function on a ComPact NSX100 - 250 A equipped with a magnetic, thermal-magnetic or MicroLogic 2 trip unit requires the SDE actuator.

- CAM function: the contact fits into the rotary-handle unit (direct or extended).
- CE/CD function: the contacts clip into the fixed part of the chassis.

Electrical characteristics of auxiliary contacts

Contacts		Standard				Low level			
Types of contacts		All				OF, SD, SDE, SDV			
Rated thermal current (A)		6				5			
Minimum load		100 mA at 24 V DC				1 mA at 4 V DC			
Utilisation cat. (IEC 60947-5-1)		AC12	AC15	DC12	DC14	AC12	AC15	DC12	DC14
Operational current (A)	24 V AC/DC	6	6	6	1	5	3	5	1
	48 V AC/DC	6	6	2.5	0.2	5	3	2.5	0.2
	110 V AC/DC	6	5	0.6	0.05	5	2.5	0.6	0.05
	220/240 V AC	6	4	-	-	5	2	-	-
	250 V DC	-	-	0.3	0.03	5	-	0.3	0.03
	380/440 V AC	6	2	-	-	5	1.5	-	-
	480 V AC	6	1.5	-	-	5	1	-	-
660/690 V AC	6	0.1	-	-	-	-	-	-	

Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

SDx and SDTAM

SDx module

The SDx module remotes the trip or alarm conditions of ComPact NSX circuit breakers equipped with electronic protection.

The SD2 output, available on all MicroLogic trip units, corresponds to the overload-trip indication.

The SD4 output, available on MicroLogic 5 / 6 / 7, is assigned to:

- MicroLogic 5: overload (Ir)
- MicroLogic 6: overload (Ir) and ground fault (Ig)
- MicroLogic Vigi 7E: overload (Ir) and earth leakage fault (IΔn).

These two outputs automatically reset when the device is closed (turned ON). For MicroLogic 5 / 6 / 7, the SD2 and SD4 outputs can be reprogrammed to be assigned to other types of tripping or alarm.

Output characteristics

It is possible to assign a function:

- latching with a time delay. Return to the initial state occurs at the end of the time delay
 - permanent latching. In this case, return to the initial state takes place via the communication function.
- Static outputs: 24 to 415 V AC / V DC; 80 mA max.

SDTAM module

The SDTAM module is specifically for the motor-protection MicroLogic trip units 2.2 M, 2.3 M and 6.2 E-M, 6.3 E-M.

The SDTAM module, linked to the contactor controller, opens the contactor when an overload or other motor fault occurs, thus avoiding opening of the circuit breaker.

MicroLogic 2 M

The SD4 output opens the contactor 400 ms before normal circuit-breaker opening in the following cases:

- overload (long-time protection for the trip class)
- phase unbalance or phase loss.

The SD2 output serves to memorise contactor opening by SDTAM.

MicroLogic 6 E-M

The SD4 output opens the contactor 400 ms before normal circuit-breaker opening in the following cases:

- overload (long-time protection for the trip class)
- phase unbalance or phase loss
- locked rotor
- underload (undercurrent protection)
- long start.

The SD2 output serves to memorise contactor opening by SDTAM.

Output characteristics

Output reset can be:

- manual by a pushbutton included in the wiring diagram
- automatic after an adjustable time delay (1 to 15 minutes) to take into account the motor-cooling time.

Static outputs: 24 to 415 V AC / V DC; 80 mA max.

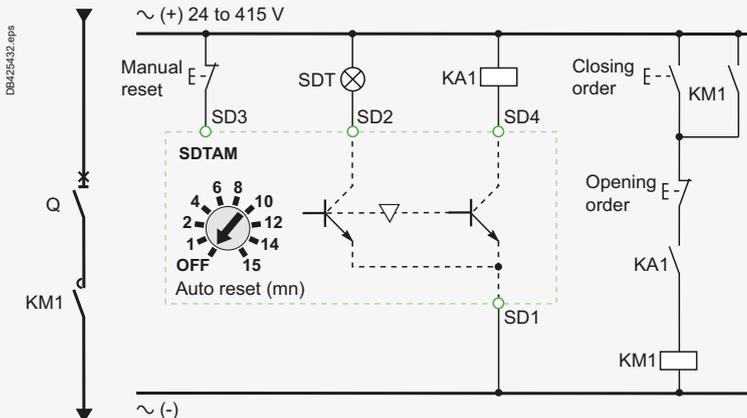
SDx and SDTAM are relay modules with two static outputs. They send different signals depending on the type of fault. They may not be used together.



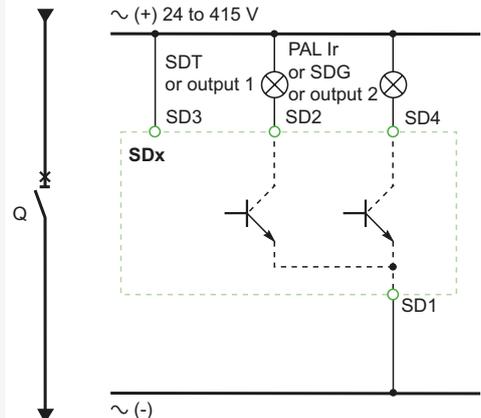
SDx relay module with its terminal block.



SDTAM relay module with its terminal block.



SDTAM wiring diagram with contactor control.



SDx wiring diagram.

ComPact NSX accessories and auxiliaries

Motor mechanism



ComPact NSX250 with motor mechanism.

When equipped with a **motor-mechanism** module, ComPact NSX circuit breakers feature very high mechanical endurance as well as easy and sure operation:

- all circuit-breaker indications and information remain visible and accessible, including trip-unit settings and indications
- suitability for isolation is maintained and padlocking remains possible
- double insulation of the front face.

A specific motor mechanism is required for operation via the communication function. This **communicating motor mechanism** must be connected to the BSCM module to receive the opening and closing orders. Operation is identical to that of a standard motor mechanism.

Applications

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

Operation

The type of operation is selected using the manual/auto mode selection switch (7). A transparent, lead-seal cover controls access to the switch.

Automatic

When the switch is in the "auto" position, the ON/OFF (I/O) buttons and the charging lever on the mechanism are locked.

- Circuit-breaker ON and OFF controlled by two impulse-type or maintained signals.
- Automatic spring charging following voluntary tripping (by MN or MX), with standard wiring.
- Mandatory manual reset following tripping due to an electrical fault.

Manual

When the switch is in the "manual" position, the ON/OFF (I/O) buttons may be used. A microswitch linked to the manual position can remote the information.

- Circuit-breaker ON and OFF controlled by 2 pushbuttons I/O.
- Recharging of stored-energy system by pumping the lever 8 times.
- Padlocking in OFF position.

Installation and connections

All installation (fixed, plug-in/withdrawable) and connection possibilities are maintained.

Motor-mechanism module connections are made behind its front cover to integrated terminals, for cables up to 2.5 mm².

Optional accessories

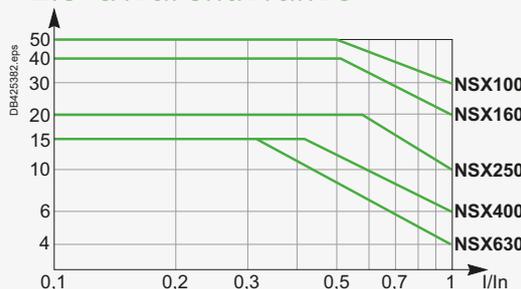
- Keylock for locking in OFF position.
- Operations counter for the ComPact NSX400/630, indicating the number of ON/OFF cycles. Must be installed on the front of the motor-mechanism module.

Characteristics

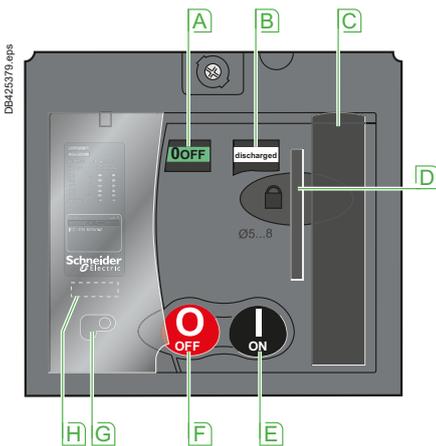
Motor mechanism		MT100 to MT630	
Response time (ms)	opening	< 700	
	closing	< 80	
Operating frequency	cycles/minute max.	4	
Control voltage (V)	DC	24/30 - 48/60 - 110/130 - 250	
	AC 50/60 Hz	48 (50 Hz) - 110/130 - 220/240 - 380/440	
Consumption ^[1]	DC (W)	opening	≤ 500
		closing	≤ 500
	AC (VA)	opening	≤ 500
		closing	≤ 500

[1] For NSX100 to NSX250, the inrush current is 2 In for 10 ms.

Electrical endurance



Circuit breaker + motor-mechanism module, in thousands of operations, at 440 V.



- A** Position indicator (positive contact indication)
- B** Spring status indicator (charged, discharged)
- C** Manual spring-charging lever
- D** Keylock device (optional)
Locking device (OFF position), using 1 to 3 padlocks, shackle diameter 5 to 8 mm, not supplied
- E** I (ON) pushbutton
- F** O (OFF) pushbutton
- G** Manual/auto mode selection switch. The position of this switch can be indicated remotely.
- H** Operation counter (ComPact NSX400/630)

Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

Remote tripping

MX or MN voltage releases are used to trip the circuit breaker. They serve primarily for remote, emergency-off commands. It is advised to test the system every six months.

MN undervoltage release

The MN release opens the circuit breaker when its supply voltage drops to a value below 35 % of its rated voltage U_n .

Undervoltage tripping, combined with an emergency-off button, provides fail-safe tripping. The MN release is continuously supplied, i.e. if supply is interrupted:

- either voluntarily, by the emergency-off button,
- or accidentally, through loss of power or faulty wiring, the release provokes opening of the circuit breaker.

Opening conditions

Circuit-breaker tripping by an MN release meets the requirements of standard IEC 60947-2.

- Automatic opening of the circuit breaker is ensured when the continuous voltage supply to the release $U \leq 0.35 \times U_n$.
- If the supply voltage is between 0.35 and 0.7 U_n , opening is possible, but not guaranteed. Above 0.7 U_n , opening does not take place.

Closing conditions

If there is no supply to the MN release, it is impossible to close the circuit breaker, either manually or electrically. Closing is ensured when the voltage supply to the release $U \geq 0.85 \times U_n$. Below this threshold, closing is not guaranteed.

Characteristics

Power supply	V AC	50/60 Hz: 24 - 48 - 100/130 - 200/240
		50 Hz: 380/415 60 Hz: 208/277
Operating threshold	V DC	12 - 24 - 30 - 48 - 60 - 125 -250
	Opening	0.35 to 0.7 U_n
	Closing	0.85 U_n
Operating range		0.85 to 1.1 U_n
Consumption (VA or W)		Pick-up: 10 - Hold: 5
Response time (ms)		50

Time-delay unit for an MN release

A time delay unit for the MN release eliminates the risk of nuisance tripping due to a transient voltage dip. For shorter micro-outages, a system of capacitors provides temporary supply to the MN at $U > 0.7$ to ensure non tripping.

The correspondence between MN releases and time-delay units is shown below.

Power supply	Corresponding MN release
Unit with fixed delay 200 ms	
48 V AC	48 V DC
220 / 240 V AC	250 V DC
Unit with adjustable delay ≥ 200 ms	
48 - 60 V AC/DC	48 V DC
100 - 130 V AC/DC	125 V DC
220 - 250 V AC/DC	250 V DC

MX shunt release

The MX release opens the circuit breaker via an impulse-type (≥ 20 ms) or maintained order.

Opening conditions

When the MX release is supplied, it automatically opens the circuit breaker. Opening is ensured for a voltage $U \geq 0.7 \times U_n$.

Characteristics

Power supply	V AC	50/60 Hz: 24 - 48 - 100/130 - 200/240
		50 Hz: 380/415 60 Hz: 208/277
Operating range	V DC	12 - 24 - 30 - 48 - 60 - 125 -250
		0.7 to 1.1 U_n
Consumption (VA or W)		Pick-up: 10
Response time (ms)		50

Circuit breaker control by MN or MX

When the circuit breaker has been tripped by an MN or MX release, it must be reset before it can be reclosed.

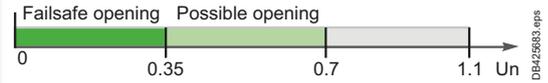
MN or MX tripping takes priority over manual closing.

In the presence of a standing trip order, closing of the contacts, even temporary, is not possible.

Connection using wires up to 1.5 mm² to integrated terminal blocks.



MX or MN voltage release.



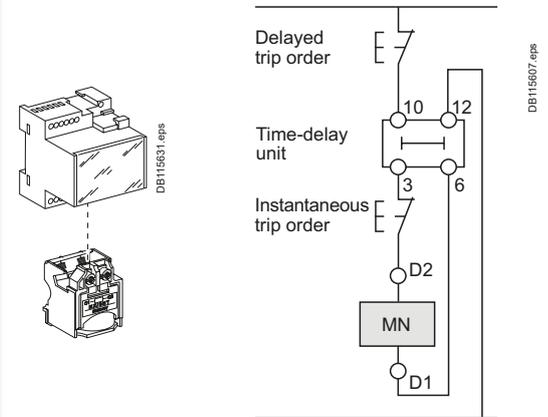
Opening conditions of the MN release.



Closing conditions of the MN release.

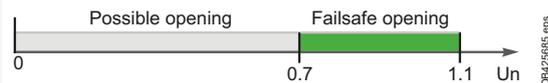


MN voltage release.



MN release with a time-delay unit.

Wiring diagram for emergency-off function with MN + time-delay unit.



Opening conditions of the MX release.

Note: circuit breaker opening using an MN or MX release must be reserved for safety functions. This type of tripping increases wear on the opening mechanism. Repeated use reduces the mechanical endurance of the circuit breaker by 50 %.

ComPact NSX accessories and auxiliaries

Rotary handles

There are two types of rotary handle:

- direct rotary handle
- extended rotary handle.

There are two models:

- standard with a black handle
- red handle and yellow front for machine-tool control.



ComPact NSX with a rotary handle.



ComPact NSX with an MCC rotary handle.



ComPact NSX with a CNOMO machine-tool rotary handle.



ComPact NSX with an extended rotary handle installed at the back of a switchboard, with the keylock option and key.

Direct rotary handle

Standard handle

Degree of protection IP40, IK07.

The direct rotary handle maintains:

- visibility of and access to trip-unit settings
- suitability for isolation
- indication of the three positions O (OFF), I (ON) and tripped
- access to the "push to trip" button.

Device locking

The rotary handle facilitates circuit-breaker locking.

- Padlocking:
 - standard situation, in the OFF position, using 1 to 3 padlocks, shackle diameter 5 to 8 mm, not supplied
 - with a simple modification, in the ON and OFF positions. Locking in the ON position does not prevent free circuit-breaker tripping if a fault occurs. In this case, the handle remains the ON position after the circuit breaker tripping. Unlocking is required to go to the tripped then the OFF position.
- Keylock (and padlock)

It is possible to install a Ronis or Profalux keylock (optional) on the base of the handle to obtain the same functions as with a padlock.

Early-make or early-break contacts (optional)

Early-make and/or early-break contacts may be used with the rotary handle. It is thus possible to:

- supply an MN undervoltage release before the circuit breaker closes
- open the contactor control circuit before the circuit breaker opens.

MCC switchboard control

Control of an MCC switchboard is achieved by adding a kit to the standard handle. In addition to the standard functions, the kit offers the characteristics listed below.

Higher degree of protection IP

Degree of protection IP43, IK07.

The IP is increased by a built-in gasket.

Door locking depending on device position

■ The door cannot be opened if the circuit breaker is ON or in the tripped position. For exceptional situations, door locking can be temporarily disabled with a tool to open the door when the circuit breaker is closed.

- Circuit-breaker closing is disabled if the door is open. This function can be deactivated.

Machine-tool control in compliance with CNOMO

Control of a machine-tool is achieved by adding a kit to the standard handle. In addition to the standard functions, the kit offers the characteristics listed below.

Enhanced waterproofness and mechanical protection

- Degree of protection IP54, IK08.
- Compliance with CNOMO E03.81.501N.

Extended rotary handle

Degree of protection IP55, IK08.

The extended rotary handle makes it possible to operate circuit breakers installed at the back of switchboards, from the switchboard front.

It maintains:

- visibility of and access to trip-unit settings
- suitability for isolation
- indication of the three positions O (OFF), I (ON) and tripped.

Mechanical door locking when device closed

A standard feature of the extended rotary handle is a locking function, built into the shaft, that disables door opening when the circuit breaker is in the ON or tripped positions.

Door locking can be temporarily disabled with a tool to open the door without opening the circuit breaker. This operation is not possible if the handle is locked by a padlock.

Voluntary disabling of mechanical door locking

A modification to the handle, that can be carried out on site, completely disables door locking, including when a padlock is installed on the handle. The modification is reversible.

When a number of extended rotary handles are installed on a door, this disabling function is the means to ensure door locking by a single device.

Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

Rotary handles

Extended rotary handle (cont.)

Operation when door is opened

An open door shaft operator can be used to operate the circuit breaker when door is opened. This accessory complies with UL508.

The indication of the three positions OFF (O), ON (I) and tripped (Trip) is visible on the circuit breaker.

Device and door padlocking

Padlocking locks the circuit-breaker handle and disables door opening:

- standard situation, in the OFF position, using 1 to 3 padlocks, shackle diameter 5 to 8 mm, not supplied
- with a simple modification, in the ON and OFF positions. Locking in the ON position does not prevent free circuit-breaker tripping if a fault occurs. In this case, the handle remains in the ON position after the circuit breaker tripping. Unlocking is required to go to the tripped then the OFF position.

If the door controls were modified to voluntarily disable door locking, padlocking does not lock the door, but does disable handle operation of the device.

Device locking using a keylock inside the switchboard

It is possible to install a Ronis or Profalux keylock (optional) on the base of the rotary handle to lock the device in the OFF position or in either the ON or OFF positions.

Accessory for device operation with the door open

When the device is equipped with an extended rotary handle, a control accessory mounted on the shaft makes it possible to operate the device with the door open.

- The device can be padlocked in the OFF position.
- The accessory complies with UL508.

Early-make or early-break contacts (optional)

The extended rotary handle offers the same possibilities with early-make and/or early-break contacts as the standard rotary handle.

Parts of the extended rotary handles

- A unit that replaces the front cover of the circuit breaker (secured by screws).
- An assembly (handle and front plate) on the door that is always secured in the same position, whether the circuit breaker is installed vertically or horizontally.
- An extension shaft that must be adjusted to the distance. The min/max distance between the back of circuit breaker and door is:
 - 185...600 mm for ComPact NSX100 to 250
 - 209...600 mm for ComPact NSX400/630.

For withdrawable devices, the extended rotary handle is also available with a telescopic shaft to compensate for device disconnection. In this case, the min/max distances are:

- 248...600 mm for ComPact NSX100 to 250
- 272...600 mm for ComPact NSX400/630.

Manual source-changeover systems

An additional accessory interlocks two devices with rotary handles to create a source-changeover system. Closing of one device is possible only if the second is open.

This function is compatible with direct or extended rotary handles.

Up to three padlocks can be used to lock in the OFF or ON position.



ComPact NSX accessories and auxiliaries

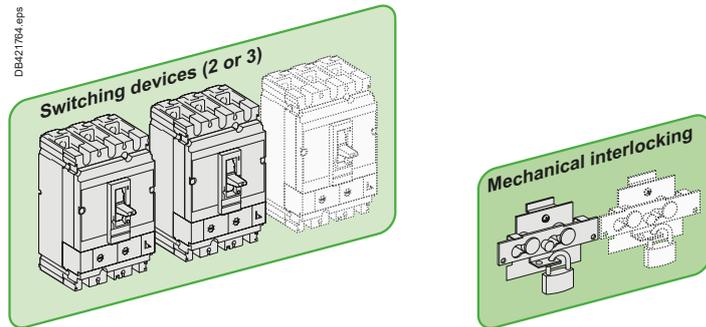
Manual and Automatic Transfer Switch

Schneider Electric offers source change-over systems based on ComPact and MasterPact devices. They are made of up to 3 circuit breakers or switch-disconnectors linked by an electrical interlocking system that may have different configurations. Moreover, a mechanical interlocking system must be added to protect against electrical malfunctions or incorrect manual operations. In addition, a controller can be used for automatically control the source transfer. The following pages present the different solutions for mechanical and electrical interlocking and associated controllers.

M

Manual source-changeover system

(or MTSE: Manual Transfer Switching Equipment)



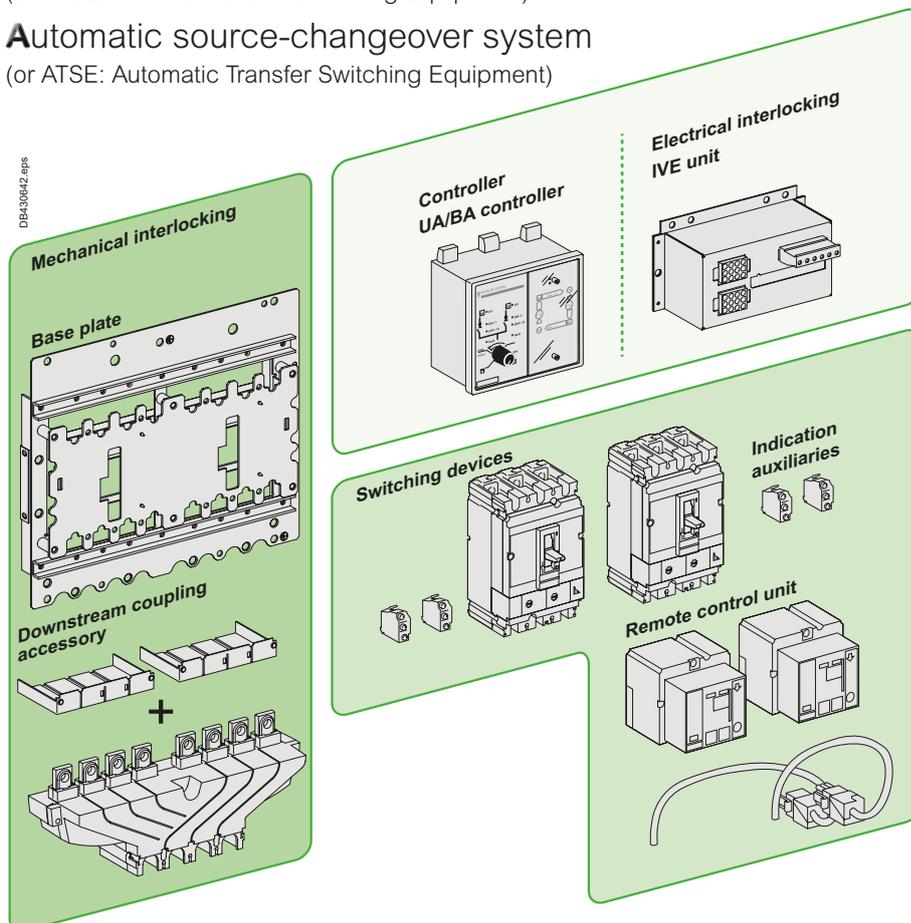
R/A

Remote-operated source-changeover system

(or RTSE: Remote Transfer Switching Equipment)

Automatic source-changeover system

(or ATSE: Automatic Transfer Switching Equipment)



Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

Mechanical interlocking

Interlocking of two or three toggle-controlled devices

Interlocking system

Two devices can be interlocked using this system. Two identical interlocking systems can be used to interlock three devices installed side by side.

Authorised positions:

- one device closed (ON), the others open (OFF)
- all devices open (OFF).

The system is locked using one or two padlocks (shackle Ø5 to 8 mm).

This system can be expanded to more than three devices.

There are two interlocking-system models:

- one for ComPact INS/INV
- one for ComPact NSX100 to NSX250
- one for ComPact NSX400 to NSX630.

Combinations of Normal and Replacement devices

All toggle-controlled fixed or plug-in ComPact NSX100 to NSX630 circuit breakers and switch-disconnectors of the same frame size can be interlocked. The devices must be either all fixed or all plug-in versions.

Interlocking of two devices by rotary handles

Interlocking system

Interlocking involves padlocking the rotary handles on two devices which may be either circuit breakers or switch-disconnectors.

Authorised positions:

- one device closed (ON), the other open (OFF)
- both devices open (OFF).

The system is locked using up to three padlocks (shackle Ø5 to 8 mm).

There are two interlocking-system models:

- one for ComPact INS/INV
- one for ComPact NSX100 to NSX250
- one for ComPact NSX400 to NSX630.

Combinations of Normal and Replacement devices

All rotary-handle fixed or plug-in ComPact NSX100 to NSX630 circuit breakers and switch-disconnectors of the same frame size can be interlocked. The devices must be either all fixed or all plug-in versions.

Interlocking of two devices by base plate

Interlocking system

A base plate designed for two ComPact NSX devices can be installed horizontally or vertically on a mounting rail. Interlocking is carried out on the base plate by a mechanism located behind the devices. In this way, access to the device controls and trip units is not blocked.

Combinations of Normal and Replacement devices

All rotary-handle and toggle-controlled ComPact NSX100 to NSX630 circuit breakers and switch-disconnectors can be interlocked. Devices must be either all fixed or all plug-in versions, with or without earth-leakage protection or measurement modules.

An adaptation kit is required to interlock:

- two plug-in devices
- a ComPact NSX100 to NSX250 with an NSX400 to NSX630.

Connection to the downstream installation can be made easier using a coupling accessory.

Interlocking of devices by keylocks (captive keys)

Interlocking using keylocks is very simple and makes it possible to interlock two or more devices that are physically distant or that have very different characteristics, for example medium-voltage and low-voltage devices or a ComPact NSX100 to NSX630 switch-disconnector and circuit breaker.

Interlocking system

Each device is equipped with an identical keylock and the key is captive on the closed (ON) device. A single key is available for all devices. It is necessary to first open (OFF position) the device with the key before the key can be withdrawn and used to close another device.

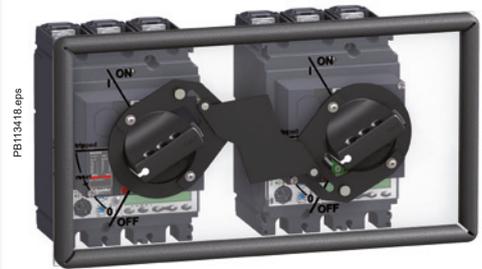
A system of wall-mounted captive key boxes makes a large number of combinations possible between many devices.

Combinations of Normal and Replacement devices

All rotary-handle ComPact NSX100 to NSX630 circuit breakers and switch-disconnectors can be interlocked between each other or with any other device equipped with the same type of keylock.



Interlocking of two or three toggle-controlled devices.



Interlocking of two devices by rotary handles.



Interlocking on a base plate.

> TransferPact
(source-changeover systems)



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ComPact NSX accessories and auxiliaries

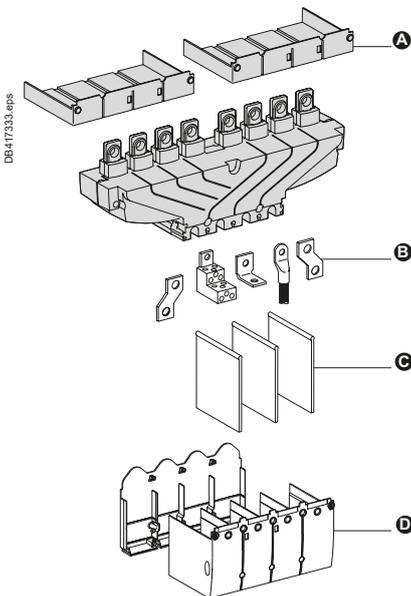
Mechanical and electrical interlocking for source-changeover systems



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Remote-operated source-changeover system.

- A** Circuit breaker QS1 equipped with a motor mechanism and auxiliary contacts, connected to the N source
- B** Circuit breaker QS2 equipped with a motor mechanism and auxiliary contacts, connected to the R source
- C** Base plate with mechanical interlocking
- D** Electrical interlocking unit IVE
- E** Coupling accessory (downstream connection)



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- A** Short terminal shields
- B** Terminals
- C** Interphase barriers
- D** Long terminal shields

It is made up of two devices with motor mechanisms, mounted on a base plate and combined with:

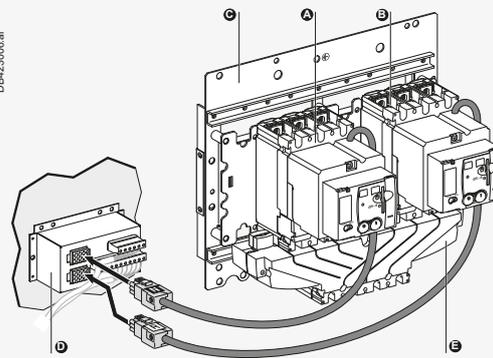
- an electrical interlocking unit
- optional mechanical interlocking system.

Electrical interlocking unit (IVE)

Interlocks two devices equipped with motor mechanisms and auxiliary contacts. The IVE unit is mandatory to ensure the necessary time-delays required for safe switching.

Mechanical interlocking system

The mechanical interlocking system is strongly recommended to limit the effects of design or wiring errors and to avoid manual switching errors.



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Downstream coupling accessory

This accessory simplifies connection to bars and cables with lugs. It may be used to couple two circuit breakers of the same size.

Pitch between outgoing terminals:

- ComPact NSX100 to NSX250: 35 mm
- ComPact NSX400 to NSX630: 45 mm.

For ComPact NSX circuit breakers, the downstream coupling accessory can be used only with **fixed versions**.

Connection and insulation accessories

The coupling accessory can be fitted with the same connection and insulation accessories as the circuit breakers.

Possible uses	Downstream coupling	
	Possible mounting	Outgoing pitch (mm)
Remote-operated source-changeover systems		
NSX100 to NSX250	●	35
NSX400 to NSX630	●	45

ComPact NSX accessories and auxiliaries

Automatic source-changeover systems with controller

By combining a remote-operated source-changeover system with an integrated BA or UA automatic controller, it is possible to automatically control source transfer according to user-selected sequences. These controllers can be used on source-changeover systems comprising 2 circuit breakers. For source-changeover systems comprising 3 circuit breakers, the automatic control diagram must be prepared by the installer as a complement to diagrams provided in the “electrical diagrams” section of the catalog source-changeover systems.



BA controller.



UA controller.



TransferPact ACP control plate.

Functions of the BA and UA controllers

Controller		BA	UA				
Compatible circuit breakers		ComPact NSX100 to 630 circuit breakers					
4-position switch							
Automatic operation		<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Forced operation on Normal source		<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Forced operation on Replacement source		<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Stop (both Normal and Replacement sources OFF)		<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Automatic operation							
Monitoring of the Normal source and automatic transfer from one source to the other		<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Engine generator set start-up control			<input checked="" type="radio"/>				
Delayed shutdown (adjustable) of engine generator set			<input checked="" type="radio"/>				
Load shedding and reconnection of non-priority loads			<input checked="" type="radio"/>				
Transfer to Replacement source if one of the Normal source phases is absent			<input checked="" type="radio"/>				
Test							
By opening the P25M circuit breaker upstream of the controller		<input checked="" type="radio"/>					
By pressing the test button on the front of the controller			<input checked="" type="radio"/>				
Indications							
Circuit-breaker status indication on the front of the controller: ON, OFF, fault trip		<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Automatic-mode indication contact		<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Other functions							
Selection of type of Normal source (single-phase or three-phase)			<input checked="" type="radio"/>				
Voluntary transfer to Replacement source		<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Forced operation on Normal source if Replacement source is not operational			<input checked="" type="radio"/>				
Additional test contact (not part of controller)		<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Transfer to Replacement source only if contact closed (e.g. for a UR frequency check)		<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Setting of maximum start-up time for the Replacement-source			<input checked="" type="radio"/>				
Power supply							
Control voltages ^[1]	220 to 240 V 50/60 Hz	<input checked="" type="radio"/>	<input checked="" type="radio"/>				
	380 to 415 V 50/60 Hz	<input checked="" type="radio"/>	<input checked="" type="radio"/>				
	440 V 60 Hz	<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Operating thresholds							
Undervoltage	0.35 Un ≤ voltage ≤ 0.7 Un	<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Phase failure	0.5 Un ≤ voltage ≤ 0.7 Un		<input checked="" type="radio"/>				
Voltage presence	voltage ≥ 0.85 Un	<input checked="" type="radio"/>	<input checked="" type="radio"/>				
Characteristics of output contacts (dry, volt-free contacts)							
Rated thermal current (A)	8						
Minimum load	10 mA at 12 V						
		AC				DC	
Utilisation category (IEC 60947-5-1)		AC12	AC13	AC14	AC15	DC12	DC13
Operational current (A)	24 V	8	7	5	6	8	2
	48 V	8	7	5	5	2	-
	110 V	8	6	4	4	0.6	-
	220/240 V	8	6	4	3	-	-
	250 V	-	-	-	-	0.4	-
	380/415 V	5	-	-	-	-	-
440 V	4	-	-	-	-	-	
660/690 V	-	-	-	-	-	-	

[1] The controller is powered by the ACP control plate. The same voltage must be used for the ACP plate, the IVE unit and the circuit-breaker operating mechanisms. If this voltage is the same as the source voltage, then the “Normal” and “Replacement” sources can be used directly for the power supply. If not, an isolation transformer must be used.



ComPact NSX accessories and auxiliaries

Additional measurement module: PowerLogic PowerTag NSX

PowerTag NSX is a ComPact NSX wireless-communication modules for 3P and 3P+N electrical networks, mounted directly on the bottom side of the circuit breaker or the Vigi add-on. PowerTag NSX provides capability to measure energy, monitor voltage loss, and trigger alarms. It then delivers useful data for monitoring and diagnosis of the associated circuit breaker to a concentrator.

In combination with PowerTag Acti9, you can take advantage of a full wireless class 1 solution to monitor energy and to be aware in case of voltage loss or alarming at any level of a distribution panel, being able to take immediately the right actions in case of electrical issue. In addition to monitoring and alarming, PowerTag solution provides a complete knowledge of real time electrical values with a rich and accurate data transfer every 5 seconds.

PowerTag energy sensors can be quickly and easily installed in new or existing panels at any time. Compared to traditional metering solutions, installation time and commissioning are much shorter with no wiring, hence an error proof high density solution and a built-in class 1 accuracy.



PowerLogic PowerTag NSX.

Functions

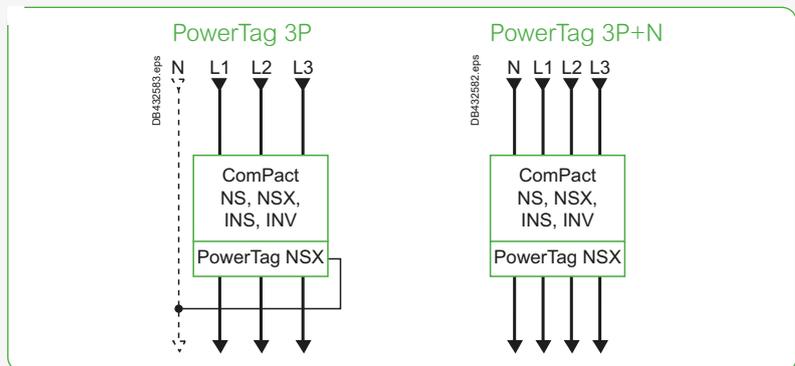
PowerTag NSX energy sensor measures the following values in accordance with the IEC 61557-12 standard:

- Energy (4 quadrants):
 - Active energy (kWh): total and partial, delivered and received.
 - Active energy per phase (kWh): total.
 - Reactive energy (VARh): partial, delivered and received.
- Power:
 - Active power (W): total and per phase
 - Reactive power (VAR): total
 - Apparent power (VA): total.
- Voltages (V): phase-to-phase (U12, U23, U31) and phase-to-neutral (V1N, V2N, V3N)
- Currents (A): per phase (I1, I2, I3)
- Frequency
- Power factor
- Voltage loss alarm:
 - PowerTag energy sensor sends a "voltage loss" alarm and the current-per-phase value before being de-energized,
 - At "voltage loss", PowerTag adds an overload alarm if the current is higher than the rated current of the associated protective device.

Installation

The module is self-powered and is installed for fixed devices directly on the bottom side of the circuit breaker or Vigi add-on terminals. For plug-in devices, it has to be installed on the base itself.

PowerTag NSX 3P has to be used with 3P devices, and an external neutral voltage tap is provided in case of the installation has a neutral to provide phase-to-neutral voltages, active energy per phase and power per phase. PowerTag 3P+N has to be used with 4P devices.



PowerTag NSX modules are compatible with ComPact NSX100/160/250, ComPact NSX400/630, ComPact INS250-100A to 250A, ComPact INS320/400/500/630, ComPact INV100/160/200/250, ComPact INV320/400/500/630, ComPact NS100/160/250 and ComPact NS400/630.

In case of retrofit, following points have to be checked:

- Clearance to be able to add PowerTag module (see dimensions in chapter E) and to respect bending radius of cables
- Condition of power connectors: to be replaced if damaged
- Tightening torques depending of the connector used

ComPact NSX accessories and auxiliaries

Additional measurement module: PowerLogic PowerTag NSX

 How to Install PowerTag in Your Existing Panel

 How to Commission Your PowerTag

 Introducing PowerTag®
The Smallest Wireless Energy Sensor Available

Integration in concentrator

PowerTag Link concentrate wirelessly data from PowerTag and make them available over Ethernet:

For Commercial & Building applications		
PowerTag Link (Monitoring)	PowerTag Link HD (Monitoring)	Smartlink SI B (Monitoring & Control)
		
A9XMWD20	A9XMWD100	A9XMZA08

For Small Business applications
PowerTag Link C (Monitoring)

A9XELC10

Concentrator embedded web pages allow:

- to do commissioning
- to display measured values
- to set and display alarms and pre-alarms.

PowerTag NSX is also compatible with Wiser Energy (Residential). Refer to the concentrator catalogs for more information.

Commissioning

Commissioning can be done very easily:

- for PowerTag Link C: with a smartphone
- for PowerTag Link, PowerTag Link HD and Smartlink SI B: with embedded webpages or with EcoStruxure Power Commission which provides a test report for system integration with all the Modbus registers, including bits and descriptions associated.



ComPact NSX accessories and auxiliaries

Additional measurement module: PowerLogic PowerTag NSX

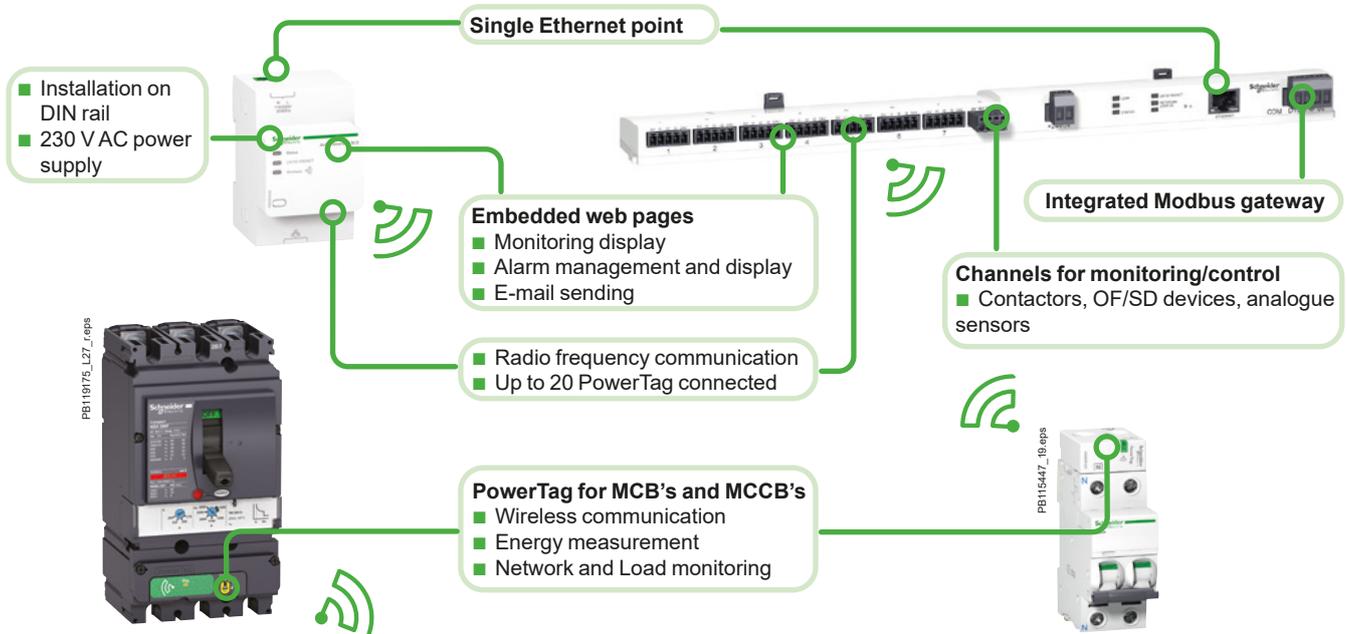


Metering and monitoring

PowerTag Link / PowerTag Link HD (Ethernet)

Metering, monitoring and control

Smartlink SI B (Ethernet)



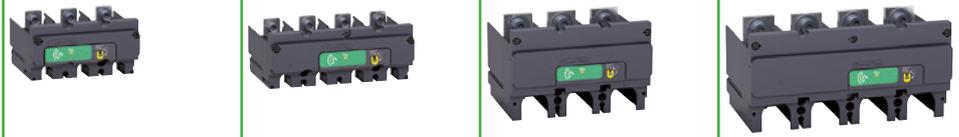
Technical characteristics

Main characteristics				
Rated voltage	Un	Phase-to-neutral	230 VAC ± 20 %	
		Phase-to-phase	400 VAC ± 20 %	
Frequency			50/60 Hz	
Operating current	In		250 A / 630 A	
Maximum operating current			1.2 x In	
Saturation current			2 x In	
Maximum consumption			3.7 VA	
Starting current	Ist		160 mA / 400 mA	
Base current	Ib		40 A / 100 A	
Additional characteristics				
Operating temperature			-25 °C to +70 °C	
Storage temperature			-50 °C to +85 °C	
Overtoltage category		As per IEC 61010-1	Cat. IV	
Measuring category		As per IEC 61010-2-30	Cat. III	
Pollution degree			3	
Altitude			Up to 2000 m without derating [1]	
Degree of protection device			IP20 IK07	
Radio-frequency communication				
ISM band 2.4 GHz			2.4 GHz to 2.4835 GHz	
Channels		As per IEEE 802.15.4	11 to 26	
Isotropic Radiated Power		Equivalent (EIRP)	0 dBm	
Maximum transmission time			< 5 ms	
Channel occupancy		For 1 device	messages sent every 5 seconds	
Characteristics of measuring functions				
Function	Symbol	Performance as per IEC 61557-12		Measuring range (250 A / 630 A)
		Class	Measuring range (250 A / 630 A)	
Active power (per phase, total)	P	1	4 to 250 A / 10 to 630 A	88 W to 416 kW / 221 W to 1048 kW
Total reactive power	Q _A	2		
Total apparent power	S _A	2		88 VAR to 416 kVAR / 221 VAR to 1048 kVAR
Active Energy (per phase, total, partial)	E _a	1		88 VA to 416 kVA / 221 VA to 1048 kVA
Total reactive Energy	E _{rA}	2		0 to 281.10 ⁹ kWh
Frequency	f	1	45 to 55 Hz	45 to 65 Hz
Phase current	I	1	8 to 250 A / 20 to 630 A	160 mA to 500 A / 400 mA to 1260 A
Voltages (Line to Line)	U	0.5	Un ± 20 %	320 to 480 VAC
Power factor (arithmetic)	PF _A	1	From 0.5 inductive to 0.8 capacitive	-1 to 1

[1] Above 2000 m, please consult us.

ComPact NSX accessories and auxiliaries

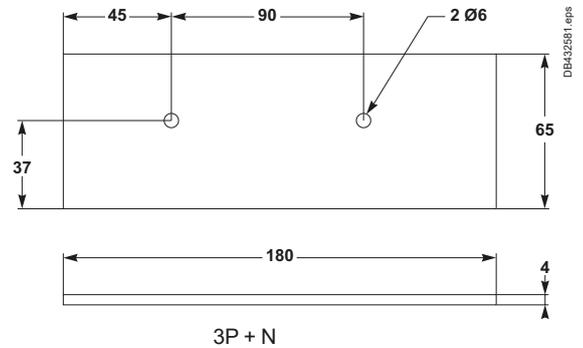
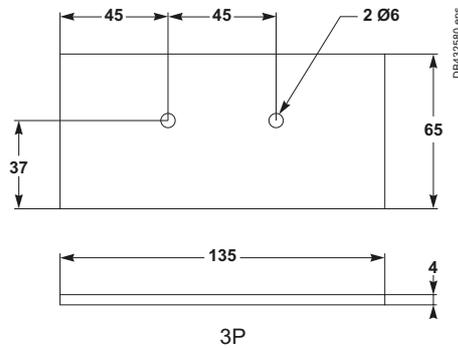
Additional measurement module: PowerLogic PowerTag NSX



Products (AC network)	Mounting position	250 3P	250 3P+N	630 3P	630 3P+N
ComPact					
Circuit breakers					
NSX100/160/250 B/F/N/H/S/L/R Fixed	3P Bottom	✓	-	-	-
	4P Bottom	-	✓	-	-
NSX400/630 F/N/H/S/L/R Fixed	3P Bottom	-	-	✓	-
	4P Bottom	-	-	-	✓
NSX100/160/250 B/F/N/H/S/L/R Plug-In (mounted on the base)	3P Top / Bottom	✓	-	-	-
	4P Top / Bottom	-	✓ [1]	-	-
NSX400/630 F/N/H/S/L/R Plug-In (mounted on the base)	3P Top / Bottom	-	-	✓ [2]	-
	4P Top / Bottom	-	-	-	✓ [1] [2]
NS100/160/250 N/SX/H/L Fixed	3P Bottom	✓	-	-	-
	4P Bottom	-	✓	-	-
NS400/630 N/H/L Fixed	3P Bottom	-	-	✓	-
	4P Bottom	-	-	-	✓
NS100/160/250 N/SX/H/L Plug-in (mounted on the base)	3P Top / Bottom	✓	-	-	-
	4P Top / Bottom	-	✓ [1]	-	-
NS400/630 N/H/L Plug-in (mounted on the base)	3P Top / Bottom	-	-	✓ [2]	-
	4P Top / Bottom	-	-	-	✓ [1] [2]
Circuit breakers equipped with Vigi block					
NSX100/160/250 B/F/N/H/S/L/R Fixed	3P Bottom	✓	-	-	-
	4P Bottom	-	✓	-	-
NSX400/630 F/N/H/S/L/R Fixed	3P Bottom	-	-	✓	-
	4P Bottom	-	-	-	✓
NSX100/160/250 B/F/N/H/S/L/R Plug-In (mounted on the base)	3P Top	✓	-	-	-
NSX400/630 F/N/H/S/L/R Plug-In (mounted on the base)	3P Top	-	-	✓ [2]	-
Switches					
INS250/INV - 100/160/200/250	3P Bottom	-	✓	-	-
	4P Top / Bottom	-	✓ [1]	-	-
INS/INV - 320/400/500/630	3P Bottom	-	-	-	✓
	4P Top / Bottom	-	-	-	✓ [1]

[1] neutral on the right when mounted on top side

[2] when plate mounted, need to add an intercalary wedging plate under the PowerTag module with following dimensions:



ComPact NSX accessories and auxiliaries

Additional measurement and indication modules

PE102795-32.eps



Voltage-presence indicator.

Voltage-presence indicator

The indicator detects and indicates that circuit breaker terminals are supplied with power.

Installation

- Mounted in the long or short terminal shields, via the knockouts.
- May be positioned upstream or downstream of the circuit breaker.
- Degree of protection IP40, IK04.
- Not compatible with the motor-mechanism module.

Electrical characteristics

Operates on all networks with voltages ranging from 220 to 550 V AC.

Current-transformer module

This module enables direct connection of a measurement device such as an ammeter or a power meter.

Installation

- The module is installed directly on the downstream circuit-breaker terminals.
- Degree of protection IP40, IK04.
- Class II insulation between front and the power circuits.
- Connection to 6 integrated connectors for cables up to 2.5 mm².

Electrical characteristics

- Current transformer with 5 A secondary winding.
- Class 3 for the following output-power consumptions:

Accuracy:

- 100 A rating: 1.6 VA
- 150 A rating: 3 VA
- 250 A rating: 5 VA
- 400/600 A rating: 8 VA.

Current-transformer module with voltage measurement outputs

This module enables direct connection of a digital measurement device such as a Power Meter PM700, PM800, etc. (not supplied).

Installation

- The module is installed directly on the downstream circuit-breaker terminals.
- Degree of protection IP40, IK04.
- Class II insulation between front and the power circuits.
- Built-in connectors for cables from 1.5 to 2.5 mm².

Electrical characteristics

- Rated operational voltage U_e: 530 V
- Frequencies of measured values: 50...60 Hz
- Three CTs with 5 A secondary windings for the rated primary current I_n:
 - class 0.5 to 1 for rated power consumption values at the output:
 - 125 A, 150 A and 250 A ratings: class 1 for 1.1 VA
 - 400/600 A rating: class 0.5 for 2 VA
 - Connection using a 2.5 mm² cable up to 2.5 m long.
 - Four voltage measurement outputs including protection with automatic reset.
 - voltage measurement output resistance 3500 Ω ±25 %, maximum current 1 mA
 - The voltage measurement outputs are intended only for measurements (1 mA max.) and may not be used to supply the display.

Ammeter and I_{max} ammeter modules

Ammeter module

Measures and displays (dial-type ammeter) the current of each phase (selection of phases by 3-position switch in front).

I_{max} ammeter module

Measures and displays (dial-type ammeter) the maximum current flowing in the middle phase. The I_{max} value can be reset on the front.

Installation

- Identical for both types of ammeter module.
- The module is installed directly on the downstream circuit-breaker terminals.
- The ammeter clips into the module in any of four 90° positions, i.e. it can be installed on devices mounted both vertically and horizontally.
- Degree of protection IP40, IK04.
- Class II insulation between front and the power circuits.

Electrical characteristics

- Ammeter module: accuracy class 4.5.
- I_{max} ammeter module: accuracy ±6 %.
- Maximum currents are displayed only if they last ≥ 15 minutes.

PE105123.eps



ComPact NSX with current-transformer module.

PE105124.eps



ComPact NSX with ammeter module.

Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

Additional measurement and indication modules

Vigi add-on Alarm

This module detects and indicates an insulation drop on a load circuit (TN-S or TT systems).

Operation is identical to that of a Vigi add-on, but without circuit-breaker tripping.

Indication by a red LED in front.

An auxiliary contact may be installed for remote insulation-drop indications.

When insulation drops below a minimum, user-set threshold, the LED goes on and the auxiliary contact switches. The fault indication cannot be cancelled except by pressing the manual reset button.

Installation

- The module is installed directly on the downstream circuit-breaker terminals.
- Degree of protection IP40, IK04.
- Double insulation of the front face.

Electrical characteristics

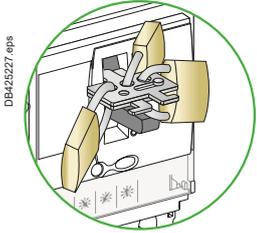
- Settings: 100 - 200 - 500 - 1000 mA.
- Accuracy: -50 +0 %.
- Time delay following insulation drop: 5 to 10 seconds.
- AC-system voltage: 200 to 440 V AC.



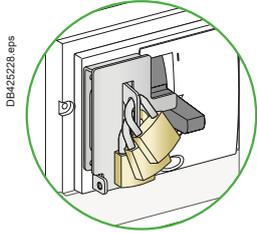
Vigi add-on Alarm.

ComPact NSX accessories and auxiliaries

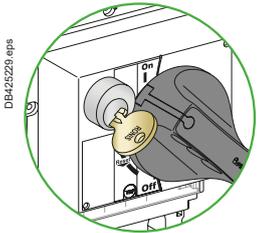
Locks



Toggle locking using padlocks and an accessory:
Removable device



Fixed device attached to the case ^[3].



Rotary-handle locking using a keylock.

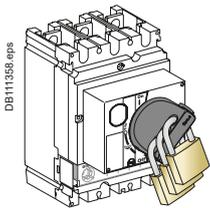
Locking in the OFF position guarantees isolation as per IEC 60947-2. Padlocking systems can receive up to three padlocks with shackle diameters ranging from 5 to 8 mm (padlocks not supplied). Certain locking systems require an additional accessory.

Control device	Function	Means	Required accessories
Toggle	Lock in OFF position	Padlock	Removable device
	Lock in OFF or ON position	Padlock	Fixed device
Direct rotary handle	Lock in	Padlock	-
	■ OFF position	Keylock	Locking device + keylock
	■ OFF or ON position ^[1]		
MCC	Lock in	Padlock	-
	■ OFF position		
	■ OFF or ON position ^[1]		
CNOMO	Lock in	Padlock	-
	■ OFF position		
	■ OFF or ON position ^[1]		
Extended rotary handle	Lock in	Padlock	-
	■ OFF position		
	■ OFF or ON position ^[1] with door opening prevented ^[2]		
	Lock in OFF position	Padlock	UL508 control accessory
	■ OFF or ON position ^[1] inside the switchboard	Keylock	Locking device + keylock
Motor mechanism	Lock in OFF position	Padlock	-
	remote operation disabled	Keylock	Locking device + keylock
Withdrawable circuit breaker	Lock in	Padlock	-
	■ disconnected position	Keylock	Locking device + keylock
	■ connected position	Keylock	Locking device + keylock

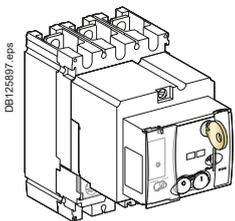
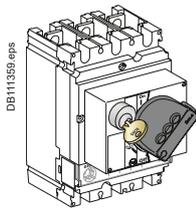
[1] Following a simple modification of the mechanism.

[2] Unless door locking has been voluntarily disabled.

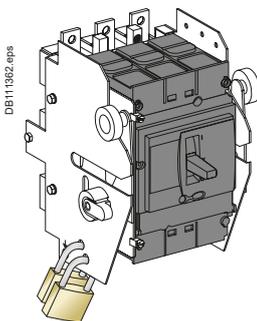
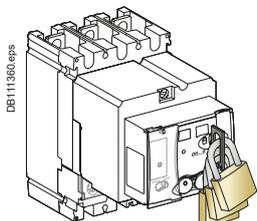
[3] Only for 3P-4P.



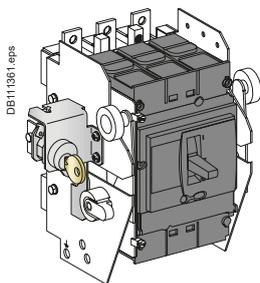
Rotary-handle locking using a padlock or a keylock.



Motor-mechanism locking using a padlock or a keylock.



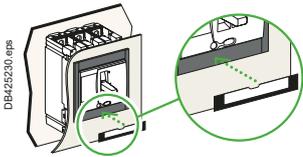
Chassis locking in the connected position.



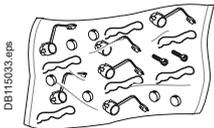
Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

Sealing accessories



Identification accessories.



Sealing accessories.

Outgoing-circuit identification

ComPact NSX100 to 630 can be equipped with label holders supplied in sets of ten (cat. no. LV429226). They are compatible with escutcheons.

Sealing accessories

Sealing accessories are available. Each bag of accessories contains all the parts required for the types of sealing indicated below.

- A bag contains:
- 6 sealing accessories
 - 6 lead seals
 - 0.5 m of wire
 - 2 screws.

Types of seals and corresponding functions

Toggle control	DB425256.eps	DB425257.eps	DB425261.eps	
Rotary handle	DB425258.eps	DB425259.eps	DB425260.eps	
Motor mechanism	DB425262.eps	DB425263.eps	DB425264.eps	DB425265.eps
Types of seals	Front-cover fixing screw	Trip-unit transparent cover	Motor-mechanism transparent cover	Terminal-shield fixing screw
Protected operations	<ul style="list-style-type: none"> ■ front removal ■ access to auxiliaries ■ trip-unit removal. 	<ul style="list-style-type: none"> ■ modification of settings ■ access to test connector. 	<ul style="list-style-type: none"> ■ access to manual/auto mode selection switch: depending on its position, manual ^[1] or automatic operation is not possible. [1] In this case, local operation is not possible. 	<ul style="list-style-type: none"> ■ access to power connections (protection against direct contact).
Access to Vigi add-on settings	DB425266.eps	DB425267.eps		
Types of seals	Vigi add-on fixing device	Protection cover for settings		
Protected operations	<ul style="list-style-type: none"> ■ removal of the Vigi add-on. 	<ul style="list-style-type: none"> ■ modification of settings. 		



ComPact NSX accessories and auxiliaries

Individual enclosures

PB103589-40.epa



IP55 metal enclosure.



PB105120.epa



IP55 insulating enclosure.

Individual enclosures are available for ComPact NSX/ComPact NSX Vigi add-on devices with two, three or four poles.

All fixed, front connections are possible, except right-angle, 45°, double-L and edgewise terminal extensions.

All spreaders may be installed in the enclosures intended for ComPact NSX/ComPact NSX Vigi add-on 250 to 630 devices, except the 70 mm spreaders for NSX400/630.

Two models of enclosures

■ IP55 metal individual enclosure, with:

- metal enclosure
- door with keylock and cut-out for rotary handle
- extended rotary handle, IP55, IK08, black or red/yellow
- device mounting plate
- removable plate (without holes) for cable entry through bottom.

■ IP55 insulating individual enclosure, with:

- polyester insulating enclosure
- transparent cover, screwed, neoprene gasket, with cut-out for extended rotary handle
- extended rotary handle, IP55, IK08, black or red/yellow
- device mounting plate
- 2 removable plates (without holes) for cable entry through bottom and/or top.

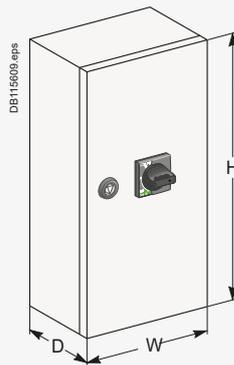
Dimensions (H x W x D in mm)

■ Metal enclosures:

□ ComPact NSX100/160	450 x 350 x 250
□ ComPact NSX250 and ComPact NSX100 to 250 Vigi add-on	650 x 350 x 250
□ ComPact NSX400	650 x 350 x 250
□ ComPact NSX630 and ComPact NSX400/630 Vigi add-on	850 x 600 x 250

■ Insulating enclosures:

□ ComPact NSX100/160	360 x 270 x 235
□ ComPact NSX250 and ComPact NSX100/160 Vigi add-on	540 x 270 x 235
□ ComPact NSX400/630	720 x 360 x 235
□ ComPact NSX250/630 Vigi add-on	720 x 360 x 235



DB115609.epa

Customize your circuit breaker with accessories

ComPact NSX accessories and auxiliaries

Escutcheons and protection collars

IP30 or IP40 escutcheons for fixed devices

IP30

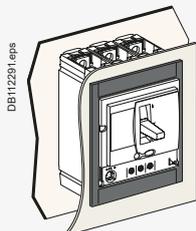
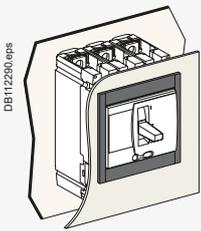
The three types are glued to the cut-out in the front door of the switchboard:

- escutcheon for all control types (toggle, rotary handle or motor mechanism)
- without access to the trip unit
- with access to the trip unit
- for Vigi add-on, can be combined with the above.

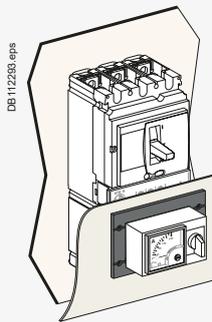
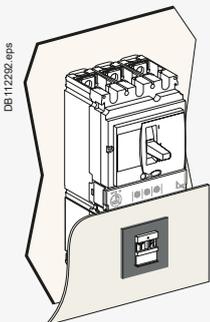
IP40

The four types, with a gasket, are screwed to the door cut-out:

- three escutcheons identical to the previous, but IP40
- a wide model for Vigi and ammeter modules that can be combined with the above.



Escutcheon for toggle without and with access to the trip unit.



Escutcheon for Vigi add-on.

Wide escutcheon for ammeter.

Escutcheons are an optional feature mounted on the switchboard door. They increase the degree of protection to IP40, IK07. Protection collars maintain the degree of protection, whatever the position of the device (connected, disconnected).



IP30 escutcheon.



IP30 escutcheon with access to the trip unit.



ComPact NSX accessories and auxiliaries

Escutcheons and protection collars



PB103777_36.eps

Escutcheon with collar for toggle.



PB103790_36.eps

Escutcheon for Vigi add-on.



PB103775_40.eps

Toggle cover.



PB103820_35.eps

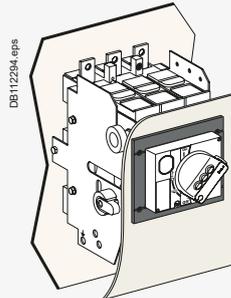
NS retrofit front cover.

IP40 escutcheons for withdrawable devices

IP40 for withdrawable devices

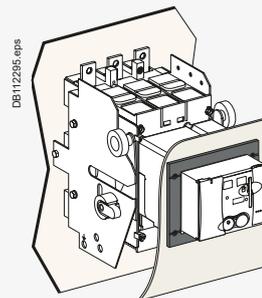
The two types, with a gasket, are screwed to the door cut-out:

- for rotary handle or motor mechanism: standard IP40 escutcheon
- for toggle with extension: standard escutcheon + collar for withdrawal.



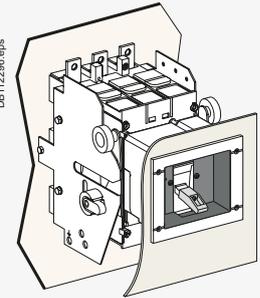
DB112284.eps

Standard escutcheon with rotary handle.



DB112285.eps

Standard escutcheon for motor mechanism.



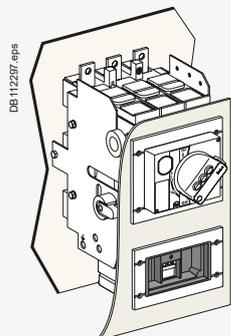
DB112286.eps

Standard escutcheon with collar for withdrawal, for toggle.

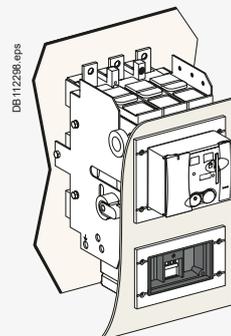
IP40 for Vigi add-on on withdrawable devices

The two types, with a gasket, are screwed to the door cut-out:

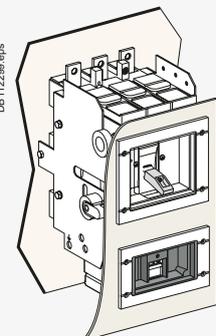
- for rotary handle or motor mechanism: standard IP40 escutcheon
- for toggle: standard escutcheon + collar for withdrawal.



DB112287.eps



DB112288.eps



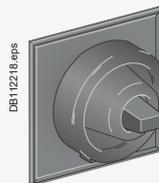
DB112289.eps

Escutcheon for Vigi add-on, with escutcheons for the three types of control.

IP43 toggle cover

Available only for devices with toggles. Fits over toggle and front cover of the device.

- Mounted on the front of the circuit breaker.
- Degree of protection IP43, IK07.



DB112218.eps

Toggle cover.

Retrofit front covers

These replacement front covers make it possible to install NSX devices in existing switchboards containing NS devices by installing the NS-type retrofit covers on the NSX devices.

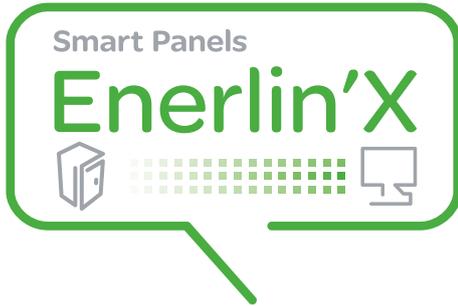
- NS100 to 250 cover.
- NS400/630 cover.

Smart Panel integration

- Enerlin'x functions**
 - Communication wiring system..... D-2
 - Overview of functions..... D-3
- Enerlin'X digital system**
 - Overview D-4
- Com'X 510**
 - Energy server..... D-6
- FDM128 Ethernet switchboard displayD-8**
- FDM121 switchboard display D-10**
- IFE interface**
 - IFE switchboard server D-12
 - IFM Modbus interface..... D-14
- Components**
 - I/O Application module..... D-16
- Customer engineering tool: EcoStruxure Power**
 - Commission software..... D-18



Other chapters	
Select your circuit breakers and switch-disconnectors	A-1
Select your protection	B-1
Customize your circuit breaker with accessories.....	C-1
Switchboard integration	E-1
Catalog numbers	F-1
Glossary	G-1
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Get circuit breaker status and electrical values
Available information and functions



MicroLogic trip units for 3 poles, 4 poles ComPact circuit breakers

Available functions	MicroLogic type	
Status indications		
ON/OFF (O/F)	A	E
Fault-trip SDE	A	E
Connected / disconnected / test position CE/CD/CT (I/O module only)	A	E
Controls		
Open	A	E
Close	A	E
Measurements		
Instantaneous measurement information	A	E
Averaged measurement information		E
Maximeter / minimeter	A	E
Energy metering		E
Demand for current and power		E
Power quality		E
Operating assistance		
Protection and alarm settings	A	E
Histories	A	E
Time stamped event tables	A	E
Maintenance indicators	A	E

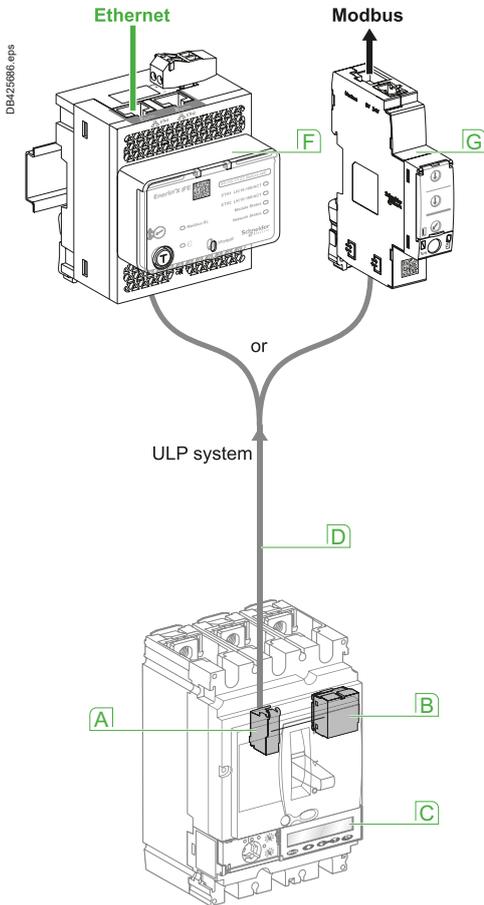
All ComPact circuit breakers are equipped with a MicroLogic trip unit. This adjustable unit is mainly designed for tripping the circuit breaker in case of necessity and monitoring the downstream circuit. Alarms may be programmed for remote indications. Electrical measurements, operation data for predictive maintenance, are provided for local display or distant monitoring.

Smart Panel integration

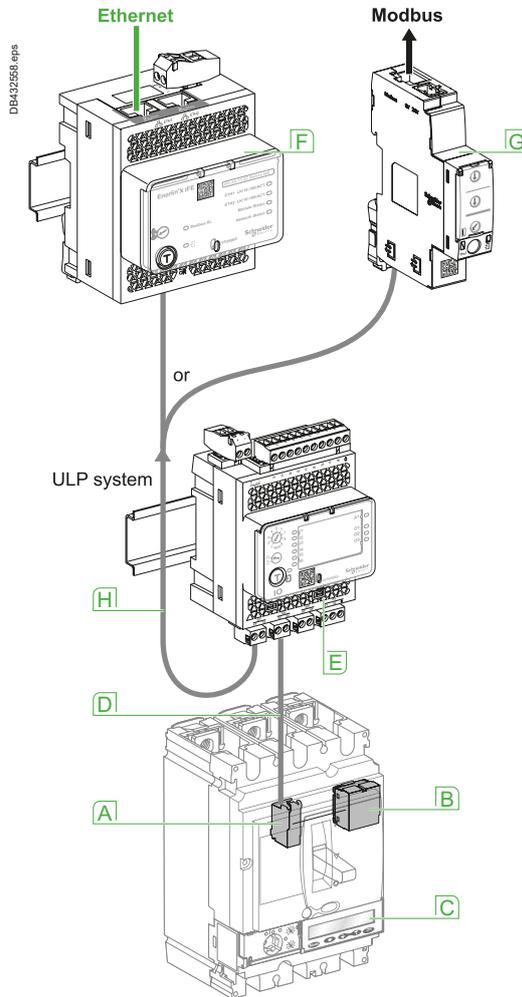
Enerlin'x functions

Overview of functions

Fixed ComPact NSX circuit breaker



Drawout ComPact NSX circuit breaker



- A** Internal terminal block for communication via NSX cord
- B** BSCM module
- C** MicroLogic trip unit
- D** NSX cord
- E** I/O module
- F** IFE interface module
- G** IFM module
- H** ULP cable



ULP system

is a fast communication link dedicated to circuit breaker monitoring and control. Based on a RS485 physical liaison with cable segments up to 5 meters, it is well adapted to severe environment. A choice of 6 pre-connectorized cables with different length is provided.

IFE interface ULP to Ethernet interface module

Provides and IP address to any circuit breaker fitted with an ULP port. The IFE interface makes all available data from the circuit breaker accessible from an Ethernet compatible display (FDM128), a PC with common browser, or IFE switchboard server which generates its own web pages.

IFM ULP to Modbus Interface module

Makes all available data of a circuit breaker fitted with an ULP port accessible via a Modbus network. IFM acts as a Modbus slave, accessible from a Modbus master (IFE switchboard server, Acti 9 Smartlink Ethernet or Com'X).

I/O I/O application module

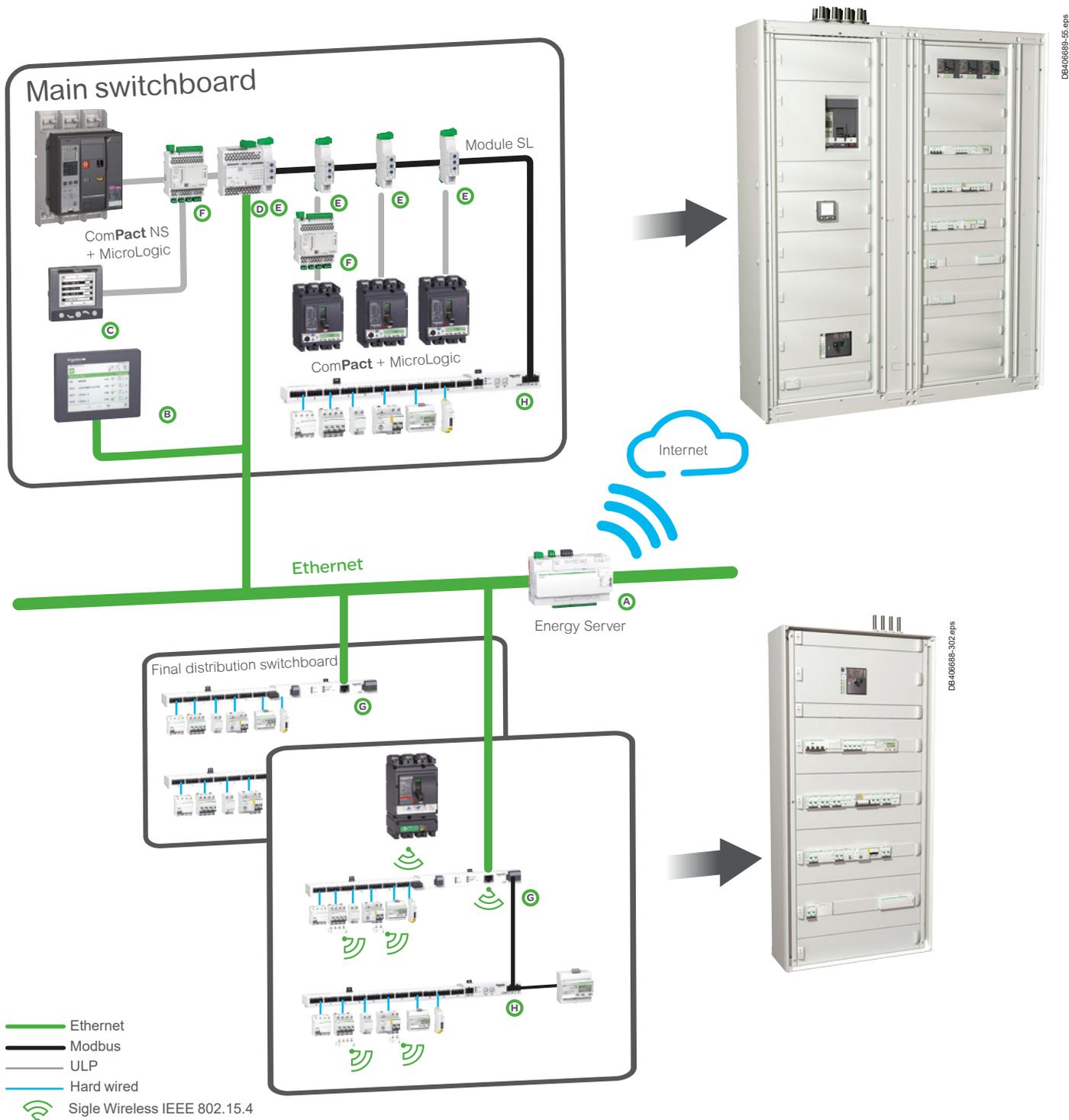
I/O is dedicated to circuit breaker with ULP liaison. It provides the monitoring and control of any application around the circuit breaker (lighting or load control, cooling system, pulse metering acquisition...).

Enerlin'X digital system Overview

Enerlin'X communication system provides access to status, electrical values and devices control using Ethernet and Modbus SL communication protocols.

Ethernet has become the universal link between switchboards, computers and communication devices inside the building. The large amount of information which can be transferred makes the connection of Enerlin'X digital system to hosted web services of Schneider Electric a reality. More advantages are offered to integrators thanks to configuration web pages available remotely or on the local Ethernet network.

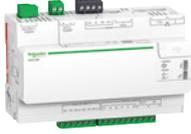
Modbus SL is the most widely used communication protocol in industrial networks. It operates in master-slave mode. The devices (slaves) communicate one after the other with a gateway (master).



Smart Panel integration

Enerlin'X digital system

Overview

Enerlin'X digital devices and displays							
	Name	Function	Port (to device)	(to server)	Inputs	Outputs	Cial. Ref.
A	 Com'X 210	Energy data logger + Ethernet Gateway	Ethernet Modbus Master, Zigbee (to wireless meters)	Ethernet cable + WiFi	64 devices: 6 binary 2 analog 32 Modbus devices + other Ethernet devices (Modbus TCP)	-	EBX210
	Com'X 510 24 V DC + PoE	Energy server + Ethernet Gateway				-	EBX510
B	 FDM128	Ethernet LCD colour touch screen	-	Ethernet		-	LV434128
C	 FDM121	LCD display for circuit breaker	ULP	-	1 circuit breaker	-	TRV00121
D	 IFE Switchboard server	Switchboard server	Modbus Master & ULP	Ethernet	20 circuit breakers	-	LV434002
	IFE interface	Ethernet interface for circuit breakers	ULP	Ethernet	1 circuit breaker	-	LV434001
E	 IFM	Modbus interface for circuit breaker	ULP	Modbus Slave	1 circuit breaker	-	LV434000
F	 I/O	Input/Output application module for circuit breaker	ULP	ULP	6 binary 1 analog (PT100 sensor)	3	LV434063
G	 Acti 9 Smartlink SI B Ethernet wireless	Ethernet server for I/O and Modbus slave devices	Modbus Master & Wireless to PowerTag	Ethernet	14 binary 2 analog	7	A9XMZA08
H	 Acti 9 Smartlink Modbus slave	Modbus interface with Input/Output functions	-	Modbus Slave	22 binary	11	A9XMSB11

D

Ethernet Gateway or Interface: routes an internal traffic (ULP or other protocole) to the Internet, the outgoing messages are coded with Modbus TCP/IP protocol.

Server (Switchboard, Energy): routes the internal traffic to the Internet. Other complementary functions such as data logging and storage. Provides devices status and energy trends on internal web pages...

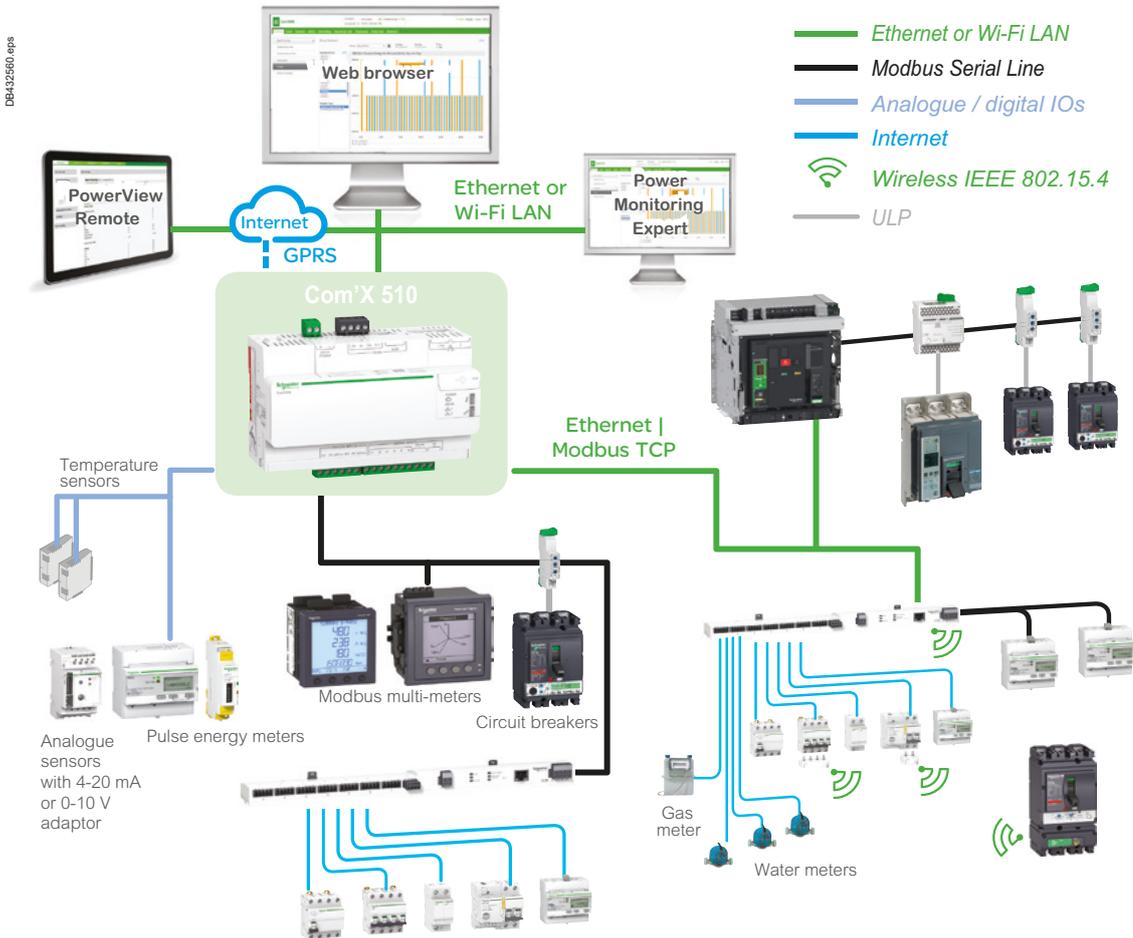
Note: for more information please consult: [Configuration & commissioning guide of connected devices & software - New buildings](#)

Com'X 510

Energy server



Main functions



Data collector

Collects and stores energy data from up to 64 field devices, connected to either:

- ethernet TCP/IP field network
- modbus Serial line network (up to 32 devices)
- embedded digital and analogue inputs.

"Field devices" consist of:

- PowerLogic meters for power and energy monitoring
- MasterPact, PowerPact, or ComPact circuit-breakers for protection and monitoring
- Acti 9 protection devices, meters, remote controlled switches, etc
- water, Air, Gas, Electricity, and Steam consumption meters, from specialized manufacturers, delivering pulses as per standard (see table at end of this document)
- environmental sensors such as temperatures, humidity, and CO2 levels in a building, providing analogue information.

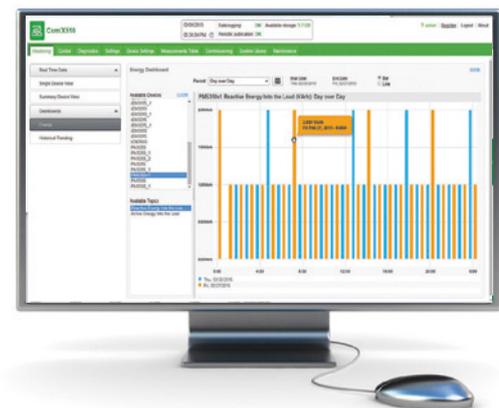
Data logging and storage capabilities include:

- data logging period: configurable from every minute to once a week
- data storage duration: up to 2 years, depending on quantity of collected data
- able to set time and send reset instructions to field devices.

Embedded energy management software

The Com'X provides the end-user with immediate visibility into energy consumption throughout the site. As soon as the Com'X is connected to the Local Area Network (LAN), several web pages are accessible via any standard web browser, (without plug-in or additional components).

These web pages display real-time data as it is collected, in easy to understand tabular and summary formats. In addition, users can get simple analysis of historical data in bar graph or trending formats.



Energy dashboard comparing accumulated over time energy values (partial screen)

Smart Panel integration

Com'X 510

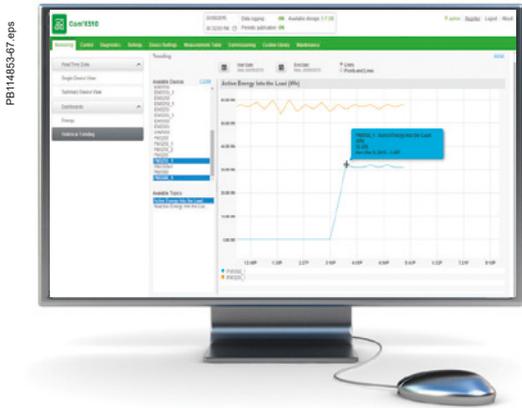
Energy server



Energy Server Com'X 510 data logger



Raw data and measurements from one field device (partial screen)



Historical trending comparing multiple devices or multiple topics (partial screen)

Additional functions

Data publisher

Batches of collected data can also be periodically transmitted to an Internet server, as:

- XML files, for processing by StruXureware™ web services, such as EcoStruxure™ Facility Advisor
- CSV files for viewing in Excel or transformed or uploading to programs such as StruXureware™ EcoStruxure™ Power Monitoring Expert or any compatible software.

Data publishing function supports 4 transfer protocols over Ethernet or Wi-Fi:

- HTTP
- HTTPS
- FTP
- SMTP.

Gateway

If selected by the user, the Com'X510 can make data from connected devices available in real time:

- in Modbus TCP/IP format over Ethernet or Wi-Fi
- for requests by energy management software
- gateway to Zigbee device data by external Modbus TCP/IP clients.

Modbus packets can be sent from managing software to field devices through Modbus serial line or Modbus TCP/IP over Ethernet.



Com'X 510 Commercial reference numbers

Com'X 510 energy server 24 V DC power supplied UL rated	EBX510
Com'X Wi-Fi USB interface	EBXA-USB-WIFI
Com'X GPRS interface SIM card	EBXA-GPRS-SIM
Com'X GPRS interface	EBXA-GPRS
Com'X External GPRS antenna	EBXA-ANT-5M
Com'X Zigbee USB interface	EBXA-USB-Zigbee

Please see your Schneider Electric representative for complete ordering information.

FDM128 Ethernet switchboard display

MicroLogic measurement capabilities come into full play with the FDM128 switchboard display. It connects to Ethernet communication via RJ45 port and displays MicroLogic information. The result is a true integrated unit combining a circuit breaker and a Power Meter. Additional operating assistance functions can also be displayed.

FDM128

The FDM128 is an intelligent Ethernet display. It collects the data from up to 8 devices via Ethernet network.

The FDM128 switchboard display unit can be connected to a MicroLogic COM option (BCM ULP via IFE). It uses the sensors and processing capacity of the MicroLogic control unit. It is easy to use and requires no special software or settings. The FDM128 is a large display, but requires very little depth. The anti-glare graphic screen is backlit for very easy reading even under poor ambient lighting and at sharp angles.

Display of MicroLogic measurements and trips

The FDM128 is intended to display MicroLogic A/E measurements, trips and operating information. It cannot be used to modify the protection settings.

Measurements may be easily accessed via a menu.

Trips are automatically displayed.

A pop-up window displays the time-stamped description of the trip.

Status indications

When the circuit breaker is equipped with the Breaker Status Command Module (BSCM) and NSX cord, the FDM128 display can also be used to view circuit breaker status conditions:

- O/F: ON/OFF
- SDE: Fault-trip indication (overload, short-circuit, ground fault)
- CE, CD cradle management with I/O application module.

Remote control

When the circuit breaker is equipped with the BSCM, NSX cord and Communicating Motor Mechanism (MTc), the FDM128 display can also be used to control (open/close) the circuit breaker.

Main characteristics

- 115.2 x 86.4 mm with 5.7" QVGA display 320 x 240 pixels.
- Color TFT LCD, LED backlight.
- Wide viewing angle: vertical $\pm 80^\circ$, horizontal $\pm 70^\circ$.
- High resolution: excellent reading of graphic symbols.
- Operating temperature range -10°C to $+55^\circ\text{C}$.
- CE / UL / CSA marking (pending).
- 24 V DC power supply, with tolerances 24 V (limit 20.4 - 28.8 V DC).
- Consumption ≤ 6.8 W.

Mounting

The FDM128 is easily installed in a switchboard.

- Standard door hole $\varnothing 22$ mm.

The FDM128 degree of protection is IP65 in front and IP54.

Connection

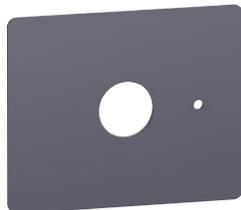
The FDM128 is equipped with:

- a 24 V DC terminal block:
- power supply range of 24 V DC (limit 20.4 - 28.8 V DC). The FDM128 display unit has a 2-point screw connector on the rear panel of the module for this purpose.
- One RJ45 Ethernet jacks.

The MicroLogic connects to the internal communication terminal block on the MasterPact via the breaker ULP cord and Ethernet connection through IFE.



FDM128 display.



Surface mount accessory.



Smart Panel integration

FDM128 Ethernet switchboard display

Navigation

Touch screen is used for intuitive and fast navigation. The user can select the display language (Chinese, English, French, German, Italian, Portuguese, Spanish, etc.).

Screens

Main menu



Quick view



Alarms



Metering



Maintenance



Control

When not in use, the screen is automatically shifted to low back-lighting.

Fast access to essential information

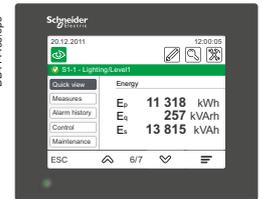
■ "Quick view" provides access to five screens that display a summary of essential operating information (I, U, f, P, E, THD, circuit breaker On / Off).

Access to detailed information

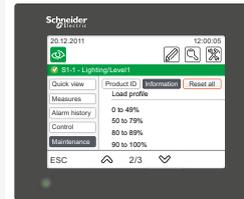
- "Metering" can be used to display the measurement data (I, U-V, f, P, Q, S, E, THD, PF) with the corresponding min/max values.
- Alarms displays the trip history.
- Services provides access to the operation counters, energy and maximeter reset function, maintenance indicators, identification of modules connected to the internal bus and FDM128 internal settings (language, contrast, etc.).



Product identification.



Metering: meter.



Services.

FDM121 switchboard display

MicroLogic measurement capabilities come into full play with the FDM121 switchboard display. It connects to COM option (BCM ULP) via a breaker ULP cord and displays MicroLogic information. The result is a true integrated unit combining a circuit breaker and a Power Meter. Additional operating assistance functions can also be displayed.

FDM121

An FDM121 switchboard display unit can be connected to a ULP IMU using a prefabricated cord to display all measurements, alarms, histories and event tables, maintenance indicators, management of installed devices on a screen. The result is a veritable 96 x 96 mm Power Meter.

The FDM121 display unit requires a 24 V DC power supply.

The FDM121 is a switchboard display unit that can be integrated in the ComPact NSX100 to 630 A, PowerPact H/J/L/P/R, compact NS or MasterPact systems. It uses the sensors and processing capacity of the MicroLogic trip unit. It is easy to use and requires no special software or settings. It is immediately operational when connected to the ComPact NSX by a simple cord.

Also, it provides monitoring and control with the use of the I/O application module, the motor mechanism module, or the Breaker Status module.

The FDM121 is a large display, but requires very little depth. The anti-glare graphic screen is backlit for very easy reading even under poor ambient lighting and at sharp angles.

Display of MicroLogic measurements and alarms

The FDM121 is intended to display MicroLogic 5 / 6 measurements, alarms and operating information. It cannot be used to modify the protection settings.

Measurements may be easily accessed via a menu. All user-defined alarms are automatically displayed. The display mode depends on the priority level selected during alarm set-up:

- high priority: a pop-up window displays the time-stamped description of the alarm and the orange LED flashes
- medium priority: the orange "Alarm" LED goes steady on
- low priority: no display on the screen.

All faults resulting in a trip automatically produce a high-priority alarm, without any special settings required. In all cases, the alarm history is updated. MicroLogic saves the information in its non-volatile memory in the event of an FDM121 power failure.

Status indications and remote control

When the circuit breaker is equipped with the Breaker Status Module, the FDM121 display can also be used to view circuit breaker status conditions:

- O/F: ON/OFF
- SD: trip indication
- SDE: Fault-trip indication (overload, short-circuit, ground fault).

When the circuit breaker system is equipped with the I/O Application module, the FDM121 can monitor and control:

- cradle management
- circuit breaker operation
- light and load control
- custom application.

When the circuit breaker system is equipped with the motor mechanism module, the FDM121 offers remote closing and opening control.

Main characteristics

- 96 x 96 x 30 mm screen requiring 10 mm behind the door (or 20 mm when the 24 V power supply connector is used).
 - White backlighting.
 - Wide viewing angle: vertical $\pm 60^\circ$, horizontal $\pm 30^\circ$.
 - High resolution: excellent reading of graphic symbols.
 - Alarm LED: flashing orange for alarm pick-up, steady orange after operator reset if alarm condition persists.
 - Operating temperature range -10°C to $+55^\circ\text{C}$.
 - CE / UL / CSA marking (pending).
 - 24 V DC power supply, with tolerances 24 V -20 % (19.2 V) to 24 V +10 % (26.4 V).
- When the FDM121 is connected to the communication network, the 24 V DC can be supplied by the communication system wiring system.
- Consumption 40 mA.

Mounting

The FDM121 is easily installed in a switchboard.

- Standard door cut-out 92 x 92 mm.
- Attached using clips.

To avoid a cut-out in the door, an accessory is available for surface mounting by drilling only two 22 mm diameter holes.

The FDM121 degree of protection is IP54 in front. IP54 is maintained after switchboard mounting by using the supplied gasket during installation.

Connection

The FDM121 is equipped with:

- a 24 V DC terminal block:
 - plug-in type with 2 wire inputs per point for easy daisy-chaining
 - power supply range of 24 V DC -20 % (19.2 V) to 24 V DC +10 % (26.4 V).

A 24 V DC type auxiliary power supply must be connected to a single point on the ULP system. The FDM121 display unit has a 2-point screw connector on the rear panel of the module for this purpose. The ULP module to which the auxiliary power supply is connected distributes the supply via the ULP cable to all the ULP modules connected to the system and therefore also to MicroLogic.

D

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FDM121 display.

PB103807-3x2.eps



Surface mount accessory.

PB119235.eps

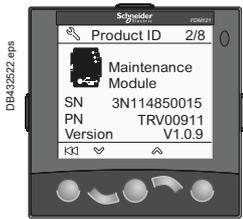


Connection with FDM121 display unit.

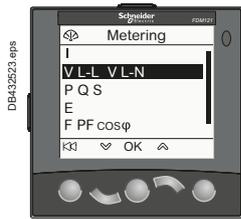
Smart Panel integration FDM121 switchboard display



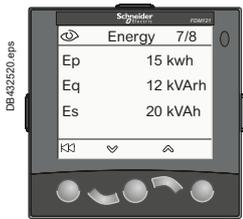
- 1 escape
- 2 down
- 3 ok
- 4 up
- 5 context
- 6 alarm LED



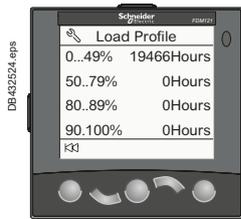
Product identification.



Metering: sub-menu.



Metering: meter.



Services.

■ two RJ45 jacks.

The MicroLogic connects to the internal communication terminal block on the ComPact NSX via the NSX cord. Connection to one of the RJ45 connectors on the FDM121 automatically establishes communication between the MicroLogic and the FDM121 and supplies power to the MicroLogic measurement functions. When the second connector is not used, it must be fitted with a line terminator.

Navigation

Five buttons are used for intuitive and fast navigation.

The "Context" button may be used to select the type of display (digital, bargraph, analogue).

The user can select the display language (Chinese, English, French, German, Italian, Portuguese, Spanish, etc.).

Screens

Main menu

When powered up, the FDM121 screen automatically displays the ON/OFF status of the device.



When not in use, the screen is not backlit. Backlighting can be activated by pressing one of the buttons. It goes off after 3 minutes.

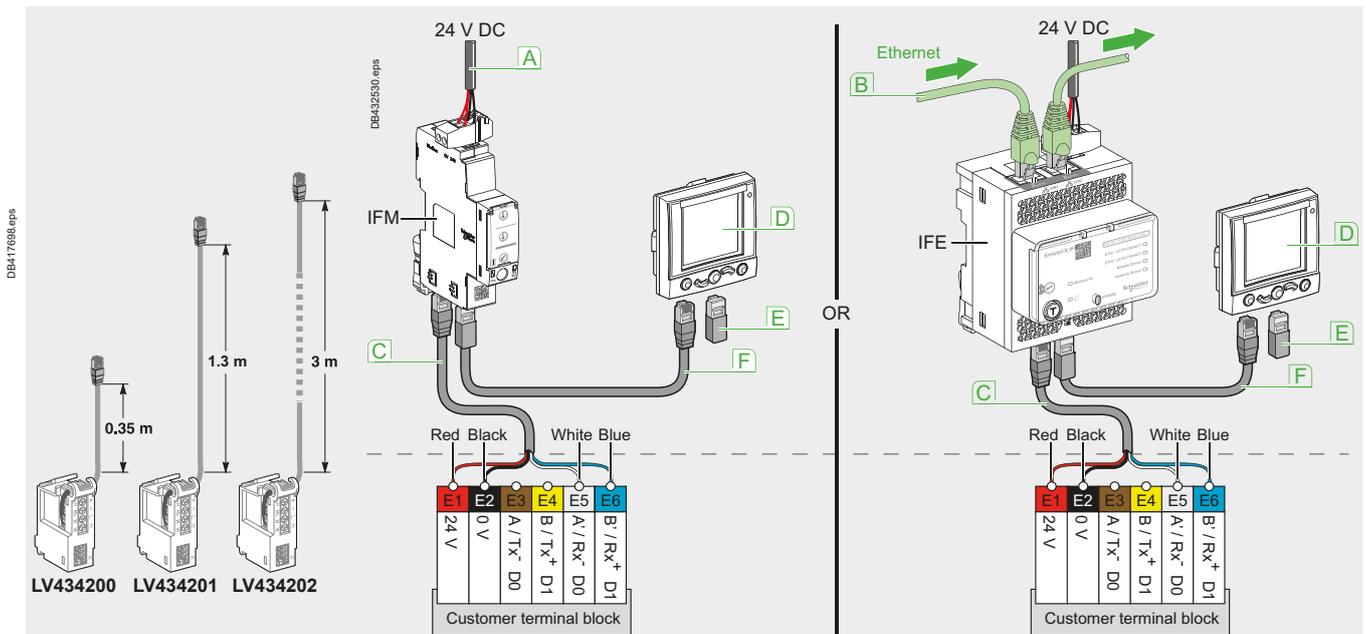
Fast access to essential information

■ "Quick view" provides access to five screens that display a summary of essential operating information (I, U, f, P, E, THD, circuit breaker On / Off).

Access to detailed information

- "Metering" can be used to display the measurement data (I, U-V, f, P, Q, S, E, THD, PF) with the corresponding min/max values.
- Alarms displays active alarms and the alarm history.
- Services provides access to the operation counters, energy and maximeter reset function, maintenance indicators, identification of modules connected to the internal bus and FDM121 internal settings (language, contrast, etc.).

Communication components and FDM121 connections



Connections

- ComPact NSX is connected to the ULP devices (FDM121 display, IFM, IFE or I/O) unit via the NSX cord.
 - cord available in three lengths: 0.35 m, 1.3 m and 3 m.
 - ULP lengths up to 10 m possible using extensions.

- A Modbus network
- B Ethernet network
- C NSX cord

- D FDM121 display
- E ULP termination
- F ULP cable

IFE interface

IFE switchboard server

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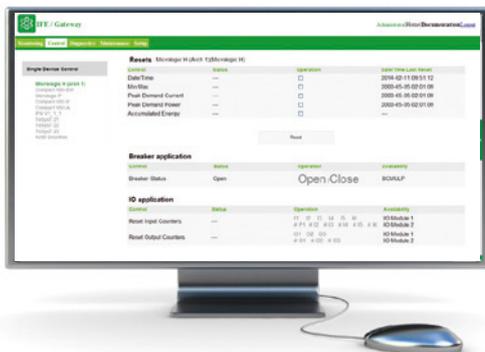
IFE interface, ref.: LV434001

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IFE switchboard server, ref.: LV434002

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Description

The IFE interface and IFE switchboard server enable LV circuit breakers as MasterPact NT/NW, MasterPact MTZ, ComPact NSX or PowerPact to be connected to an Ethernet network.

IFE interface: ref. LV434001

Provides an Ethernet access to a single LV circuit breaker.

Function

Interface - one circuit breaker is connected to the IFE interface via its ULP port.

IFE switchboard server: ref. LV434002

Provides an Ethernet access up to 20 LV circuit breakers.

Functions

- Interface - one circuit breaker is connected to the IFE interface via its ULP port.
- Server: several circuit breakers on a Modbus network are connected via the IFE switchboard server master Modbus port.
- Collects and provides web pages from multiple IP devices (other IFE LV434002, Smartlink Ethernet, PM5000 Ethernet...).

IFE interface, IFE switchboard server features

- Dual 10/100 Mbps Ethernet port for simple daisy chain connection.
- Device profile web service for discovery of the IFE interface, IFE switchboard server on the LAN.
- ULP compliant for localization of the IFE interface in the switchboard.
- Ethernet interface for ComPact, MasterPact and PowerPact circuit breakers.
- Gateway for Modbus-SL connected devices (IFE switchboard server only).
- Embedded set-up web pages.
- Embedded monitoring web pages.
- Embedded control web pages.
- Built-in e-mail alarm notification.
- Automatic recovering of Smartlink I/O configurations, allowing contextual I/O status display on web pages (IFE switchboard server only).
- Internal real-time clock with battery back-up.
- RBAC (Role Base Access Control) for the embedded control web pages
- RSTP (Rapid Scanning Tree Protocol) is a solution to implement redundant Ethernet networks.

Mounting

The IFE interface, IFE switchboard server are DIN rail mounting devices. A stacking accessory enables the user to connect several IFMs (ULP to Modbus interfaces) to an IFE switchboard server without additional wiring.

24 V DC power supply

The IFE interface, IFE switchboard server must always be supplied with 24 V DC. The IFMs stacked to an IFE switchboard server are supplied by the IFE switchboard server, thus it is not necessary to supply them separately. It is recommended to use an UL listed and recognized limited voltage/limited current or a class 2 power supply with a 24 V DC, 3 A maximum.

IFE interface, IFE switchboard server firmware update

The firmware can be updated using:

- FTP
- customer engineering tool
- EcoStruxure Power Commission software.

Required circuit breaker communication modules

The connection to IFE interface or IFE switchboard server requires a communication module embedded into the circuit breaker:

- ComPact NS, PowerPact P, PowerPact R: BCM ULP communication module
- ComPact NSX: NSX cord and/or BSCM module
- MasterPact NT/NW, MasterPact MTZ or ComPact NS, PowerPact P, PowerPact R (Fixed electrically operated): BCM ULP communication module
- drawout MasterPact NT/NW, MasterPact MTZ or a withdrawable ComPact NS, PowerPact P, PowerPact R: BCM ULP and its respective I/O (Input/Output) application module.

All connection configurations for MasterPact NT/NW, MasterPact MTZ, ComPact NS, PowerPact P, PowerPact R require the breaker ULP cord.

The insulated NSX cord is mandatory for system voltages greater than 480 V AC. When the second ULP RJ45 connector is not used, it must be closed with an ULP terminator (TRV00880).

Smart Panel integration

IFE interface

IFE switchboard server

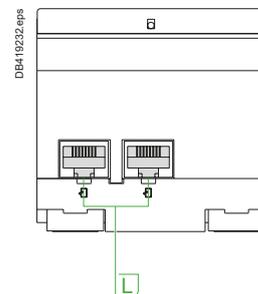
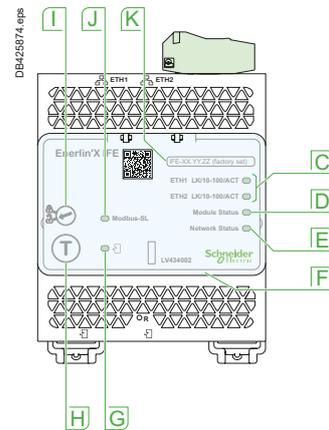
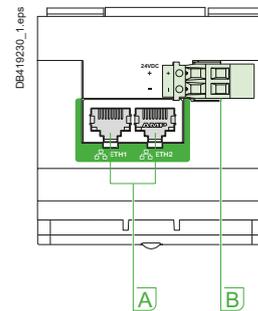
General characteristics

Environmental characteristics	
Conforming to standards	UL 508, UL 60950, IEC 60950, 60947-6-2
Certification	cULus, GOST, FCC, CE
Ambient temperature	-20 to +70°C (-4 to +158 °F)
Relative humidity	5–85 %
Level of pollution	Level 3
Flame resistance	ULV0 conforming to IEC/EN 60068-2-30
Mechanical characteristics	
Shock resistance	1000 m/s ²
Resistance to sinusoidal vibrations	5 Hz < f < 8.4 Hz conforming to IEC/EN 60068-2-6
Electrical characteristics	
Resistance to electromagnetic discharge	Conforming to IEC/EN 61000-4-3
Immunity to radiated fields	10 V/m
Immunity to surges	Conforming to IEC/EN 61000-4-5
Consumption	150 mA at 24 V input
Physical characteristics	
Dimensions	72 x 105 x 71 mm (2.83 x 4.13 x 2.79 in.)
Mounting	DIN rail
Weight	182.5 g (0.41 lb)
Degree of protection of the installed I/O application module	On the front panel (wall mounted enclosure): IP4x Connectors: IP2x Other parts: IP3x
Connections	Screw type terminal blocks
Technical characteristics - 24 V DC power supply	
Power supply type	Regulated switch type
Rated power	72 W
Input voltage	100–120 V AC for single phase 200–500 V AC phase-to-phase
PFC filter	With IEC 61000-3-2
Output voltage	24 V DC
Power supply out current	3 A

Note: it is recommended to use an UL listed/UL listed recognized limited voltage/Limited current or a class 2 power supply with a 24 V DC, 3 A maximum.

IFE interface, IFE switchboard server web page description

Monitoring web page	
Real time data	■
Device logging	■
Control web page	
Single device control	■
Diagnostics web page	
Statistics	■
Device information	■
IMU information	■
Read device registers	■
Communication check	■
Maintenance web page	
Maintenance log	■
Maintenance counters	■
Setup web page	
Device localization/name	■
Ethernet configuration (dual port)	■
IP configuration	■
Modbus TCP/IP filtering	■
Serial port	■
Date and time	■
E-mail server configuration	■
Alarms to be e-mailed	■
Device list	■
Device logging	■
Device log export	■
SNMP parameters	■
Documentation links	■
Preferences	■
Advanced services control	■
User accounts	■
Web page access	■



- A** Ethernet 1 and Ethernet 2 communication port.
- B** 24 Vdc power supply terminal block.
- C** Ethernet communication LEDs:
yellow: 10 Mb
green: 100 Mb.
- D** Module status LED:
steady off: no power
steady green: device operational
steady red: major fault
flashing green: standby
flashing red: minor fault
flashing green/red: self-test.
- E** Network status LED:
steady off: no power/no valid IP address
steady green: connected, valid IP address
steady orange: default IP address
steady red: duplicated IP address
flashing green/red: self-test.
- F** Sealable transparent cover.
- G** ULP status LED.
- H** Test button (accessible closed cover).
- I** Locking pad.
- J** Modbus traffic status LED (LV434002 only).
- K** Device name label.
- L** ULP ports.





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IFM Modbus communication interface.
Ref.: LV434000.

Function

IFM - Modbus communication interface - is required for connection of a **MasterPact** or **ComPact** to a Modbus network as long as this circuit breaker is provided with a ULP (Universal Logic Plug) port. The port is available on respectively a BCM ULP or BSCM embedded module.

The IFM is defined as an IMU (Intelligent Modular Unit) in the ULP connection System documentation.

Once connected, the circuit breaker is considered as a slave by the Modbus master. Its electrical values, alarm status, open/close signals can be monitored or controlled by a Programmable Logic Controller or any other system.

Characteristics

ULP port

2 RJ45 sockets, internal parallel wiring.

- Connection of a single circuit breaker (eventually via its I/O application module).
- A ULP line terminator or an FDM121 display unit must be connected to the second RJ45 ULP socket.

The RJ45 sockets deliver a 24 VDC supply fed from the Modbus socket.

Built-in test function, for checking the correct connection to the circuit breaker and FDM121 display unit.

Modbus slave port

■ Top socket for screw-clamp connector, providing terminals for:

- 24 VDC input supply (0V, +24V)
- Modbus line (D1, D2, Gnd).

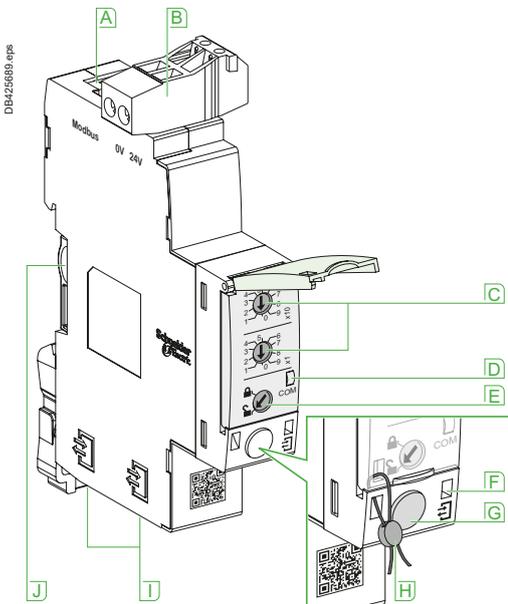
■ Lateral socket, for Din-rail stackable connector.

■ Both top and lateral sockets are internally parallel wired.

■ Multiple IFM can be stacked, thus sharing a common power supply and Modbus line without individual wiring.

■ On the front face:

- Modbus address setting (1 to 99): 2 coded rotary switches
- Modbus locking pad: enables or disable the circuit breaker remote control and modification of IFM parameters.
- Self adjusting communication format (Baud rate, parity).



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- | | |
|-----------------------------------|--|
| A Modbus Serial RJ45 port. | F ULP activity LED. |
| B 0-24 V DC power supply. | G Test button. |
| C Modbus address switches. | H Mechanical lock and locking seal. |
| D Modbus traffic LED. | I ULP RJ45 connectors. |
| E Modbus locking pad. | J Stacking accessory connection. |

Catalog numbers

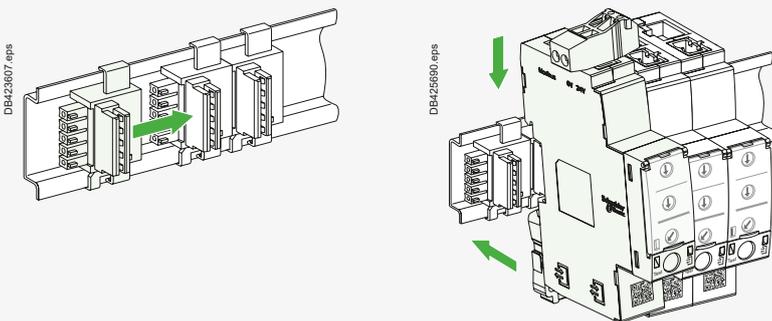
IFM Modbus communication interface		
Type	Set of	Cat. no.
IFM -Modbus communication interface module	-	LV434000
Connector modbus adaptor	-	LV434211
Stacking accessories if more than 1 IFM	10	TRV00217
ULP line terminator	-	TRV00880

Technical characteristics

IFM Modbus communication interface		
Dimensions		18 x 72 x 96 mm
Maximum number of stacked IFM		12
Degree of protection of the installed module	Part projecting beyond the escutcheon	IP4x
	Other module parts	IP3x
	Connectors	IP2x
Operating temperature		-25...+70°C
Power supply voltage		24 V DC -20 %/+10 % (19.2...26.4 V DC)
Consumption	Typical	21 mA/24 V DC at 20°C
	Maximum	30 mA/19.2 V DC at 60°C
Certification		
CE		IEC/EN 60947-1
UL		UL 508 - Industrial Control Equipment
CSA		No. 142-M1987 - Process Control Equipment CAN/CSA C22.2 No. 0-M91 - General requirements - Canadian Electrical Code Part CAN/CSA C22.2 No. 14-05 - Industrial Control Equipment

Simplified IFM installation

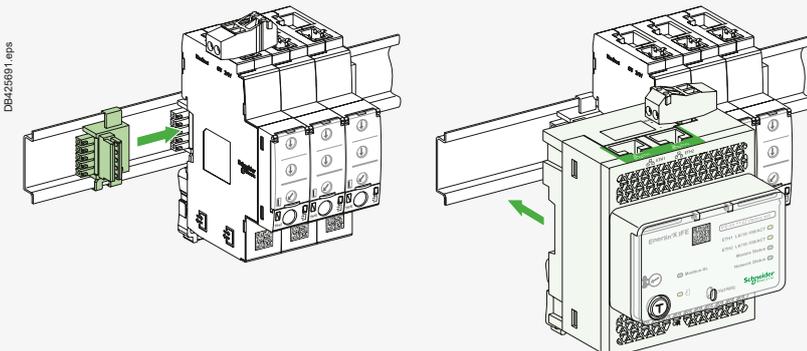
Stacking IFM



Stacking accessories

Up to 12 stacked IFM

Stacking an IFE interface + gateway with IFMs



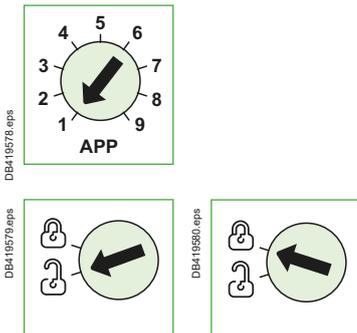
Components

I/O Application module



I/O application module.

D



I/O application module description

Description

The I/O input/output application module for LV breaker is one of the components of ULP architecture. Built in functionalities and applications enhance control and monitoring needs.

ULP system architecture including I/O modules can be built without any restrictions using a wide range of circuit breakers:

- MasterPact MTZ1/MTZ2/MTZ3,
- ComPact NS1600b-3200,
- ComPact NS630b-1600,
- ComPact NSX100-630 A.

The I/O application module is compliant with the ULP system specifications. Two I/O application modules can be connected in the same ULP architecture.

I/O input/output interface for LV breaker resources

The I/O application module resources are the following:

- 6 digital inputs that are self powered for either NO and NC dry contact or pulse counter,
- 3 digital outputs that are bistable relay (5 A maximum),
- 1 analog input for Pt100 temperature sensor.

Pre-defined applications

Pre-defined applications improve the IMU approach (Intelligent Modular Unit) in a simple way.

A 9-position rotary switch on the front of the I/O module allows to select the pre-defined applications. Each position is assigned to a pre-defined application except position 9 which allows the user to define a specific application by means of the customer engineering tool. The switch is set in factory to the pre-defined application 1.

For each application the input/output assignment and the wiring diagram are pre-defined. No additional setting with the customer engineering tool is required. The I/O and other resources not assigned to the pre-defined applications are free for user specific applications.

User applications

The user applications with the corresponding resources are defined by means of EcoStruxure Power Commission engineering tool. They use the resources not assigned to the predefined applications. User applications may be required for:

- Protection improvement,
- Circuit breaker control,
- Motor control,
- Energy management,
- Monitoring.

24 Vdc power supply

The I/O module can be supplied with a 24 Vdc AD power supply or with any other 24 Vdc power supply having the same characteristics.

Mounting

The I/O is a DIN rail mounting device.

Note: The connection of the +/- of the power supply on +/- terminals of the I/O module must be strictly respected. Crossing the polarities may damage the device.

Setting locking pad

The setting locking pad on the front panel of the I/O enables the setting of the I/O by EcoStruxure Power Commission engineering tool.