Customize Circuit Breaker with Accessories

ComPacT NSXm Accessories and Auxiliaries

ComPacT NSX Accessories and Auxiliaries

C

Other Chapters

ComPacT NSXm Accessories and Auxiliaries

Overview

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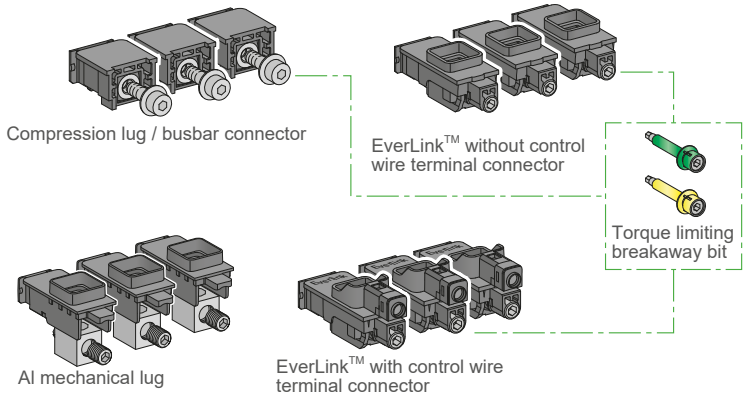

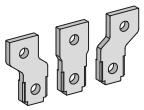

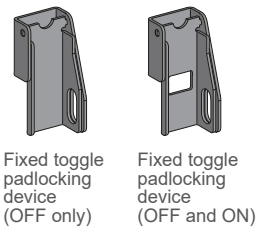

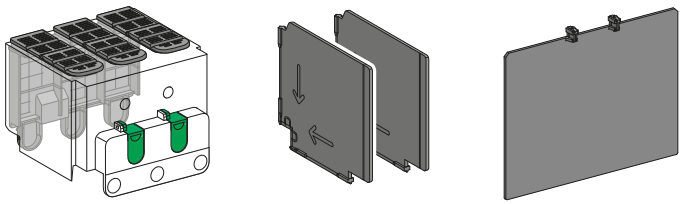

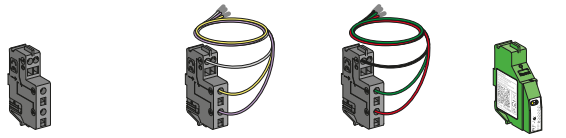

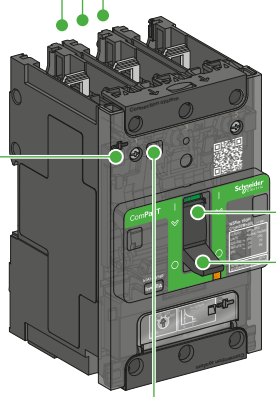

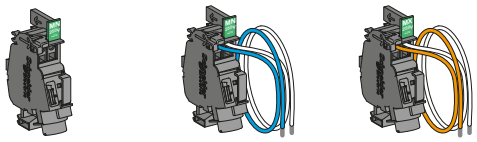

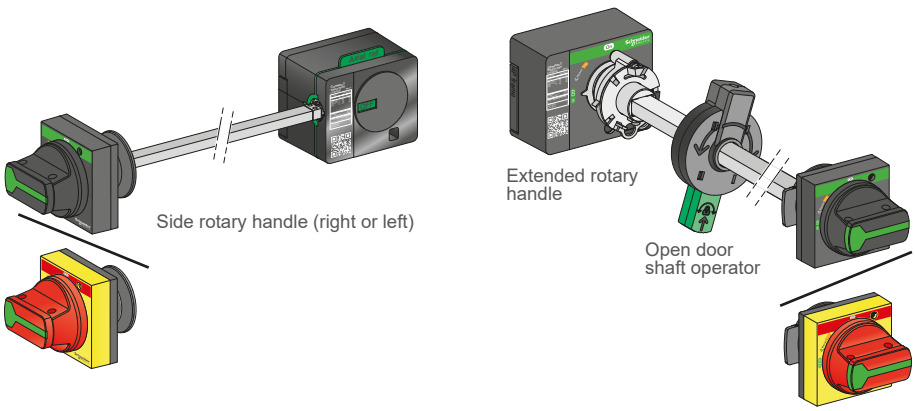

Customize Circuit Breakers with Accessories

ComPacT NSXm Accessories and Auxiliaries

Overview

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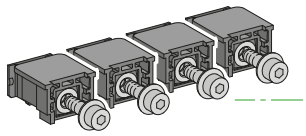
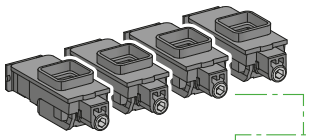
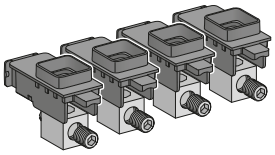


Compression lug / busbar connector

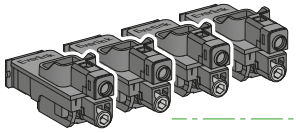


EverLink™ without control wire terminal connector

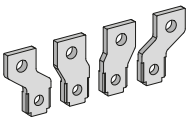
Torque limiting breakaway bit



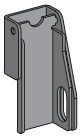
Al mechanical lug



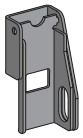
EverLink™ with control wire terminal connector



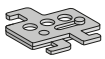
Terminal spreaders



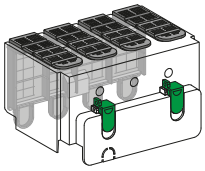
Fixed toggle padlocking device (OFF only)



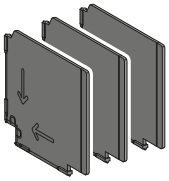
Fixed toggle padlocking device (OFF and ON)



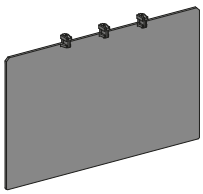
Removable toggle padlocking device (OFF only)



Long terminal shield

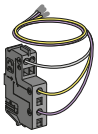


Interphase barriers

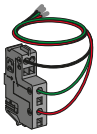


Rear insulation screen

OF or SD auxiliary contact standard

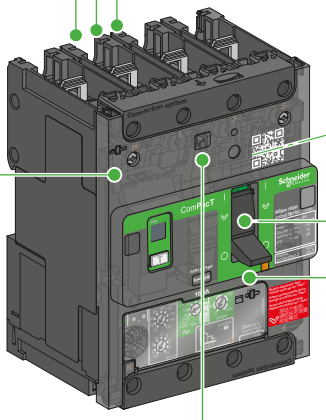


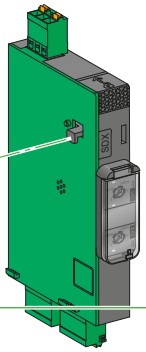
OF auxiliary contact pre-wired



SD auxiliary contact pre-wired

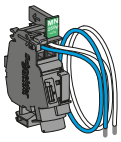
Zigbee contact



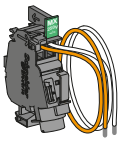


Contacts module SDX

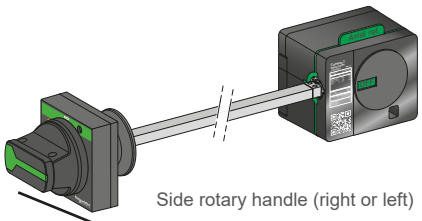
MN or MX voltage releases standard



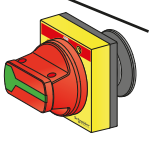
MN voltage releases pre-wired

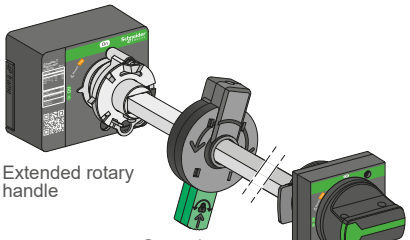


MX voltage releases pre-wired



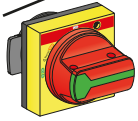
Side rotary handle (right or left)

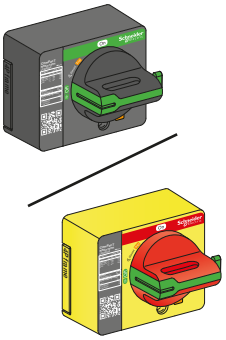




Extended rotary handle

Open door shaft operator





Direct mounted rotary handle

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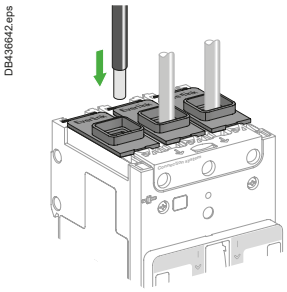
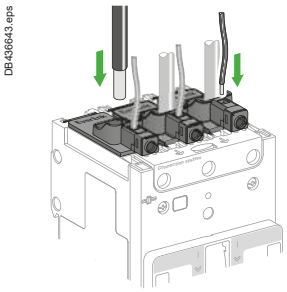
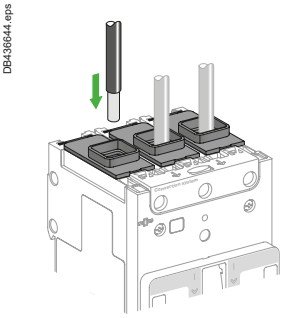
ComPacT NSXm Accessories and Auxiliaries
Power Connection of Fixed Devices

Fixed circuit breakers are designed for standard front connection using cables. Bars or cables with lugs connectors are also available.







Power Connection

Circuit breakers are delivered with EverLink™ lug connectors for bare cables. They may be delivered with connectors for bars or cables with compression lugs. The connectors can be removed for the installation of one of the 4 kinds of connectors available (EverLink™ lug with control wire terminal, EverLink™ lug, compression lugs/busbar, aluminium mechanical lug).
For connection of large cables, a number of solutions with spreaders may be used for both cables with lugs or bars.

Bare Cables

Standard terminal: EverLink™ lug connector
This type of connection uses the EverLink™ system with creep [1] compensation (Schneider Electric patent).
This technique makes it possible to achieve accurate and durable tightening torque, in order to avoid cable creep.
When ordered as spare part, EverLink™ connectors have control wire terminal in order to make some measurment connection (limited to 10 A).

EverLink™ lugs for use with Al or Cu wire		
Wire range		
Solid/stranded	Flexible	Torque
Power connection 15-160 A (Cu), 15-100 A (Al)		
2.5 - 10 mm²	2.5 - 10 mm²	5 N.m ±0.5
16 - 95 mm²	16 - 70 mm²	9 N.m ±0.9
Control wire terminal up to 10 A (Cu)		
1.5 - 6 mm²	0.5 - 6 mm²	1 N.m ±0.1

Aluminium mechanical connectors up to 125 A
The standard EverLink lugs can be removed for the installation of mechanical lugs. Lugs suitable for copper and aluminum conductors are made of tin-plated aluminum. The mechanical lugs are fastened to the terminals with lug mounting screws, inserted from the bottom of the circuit breaker. The lug cover is held in place with built-in snap features. They are sold as field installable kits.

Aluminium mechanical connectors up to 125 A		
Power connection		
Ampere rating	Wire range	
	Solid/stranded	Torque
15-125 A (Cu)	2.5 - 6 mm²	4 N.m ±0.4
15-125 A (Al)	10 - 70 mm²	5.6 N.m ±0.6

[1] Creep: normal crushing phenomenon of conductors, that is accentuated over time.

Bars or Cables with Lugs

Compression lug/busbar connectors

The ComPacT NSXm circuit breakers may be equipped with captive nuts and M6 screws connectors. These are readily field-installable, simply by removing the EverLink lug and replacing with the appropriate terminal nut.
They are also available factory installed. These terminals may be used for:

- Direct connection of insulated bars or cables with compression (crimp) lugs.
- Terminal extensions offering a wide range of connection possibilities.

Compression lug/busbar connectors, 15-160 A	
Power Connection	Torque
⩽ 10 mm²	5 N.m ±0.5
⩾ 16 mm²	9 N.m ±0.9

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

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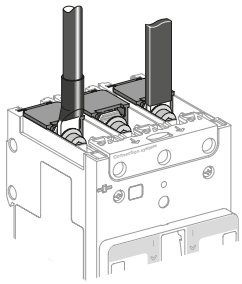

Crimp lugs large size cables

There are two models, for aluminium and for 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.

Crimp lugs for use with ComPacT NSXm					
Copper cables	size	rigid	70 mm²	95 mm²	120 mm²
		flexible	50 mm²	70 mm²	95 mm²
	crimping		hexagonal barrels or punching		
Aluminium cables	size	rigid		95 mm²	120 mm²
	crimping		hexagonal barrels		

Bars

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

Bar and lugs dimensions					
Dimensions	A	B	C	D	E
mm	6.4	⩽ 8	⩽ 20	7	⩾ 17

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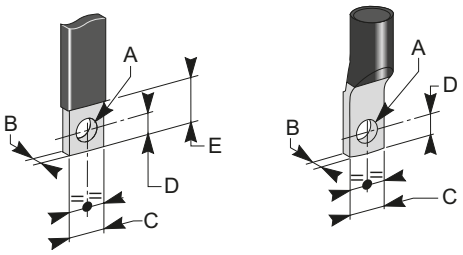

Spreaders

Spreaders may be used to increase the pitch from 27 mm to 35 mm. Bars or cable lugs can be attached to the ends.
They are provided with M8 screws for power connection and interphase barriers (not compatible with long terminal shield). Rear insulation screens may have to be used too depending on the distance between the live uninsulated parts and the grounded metallic back pan.

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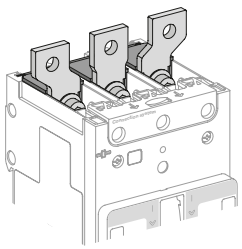

Torque Limiting Breakaway Bits

Torque limiting breakaway bits may be used, particularly in the field, to tighten at the right torque EverLink™, compression lug or busbar power connections.

Throwaway tips			
Circuit breaker application			Qty per kit
Ampere rating	Torque		
16-160 A	5 N.m		6 or 8
16-160 A	9 N.m		6 or 8

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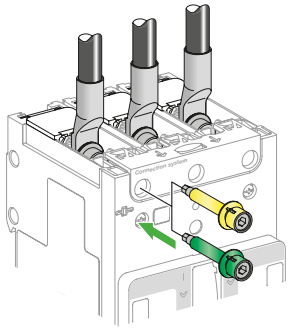
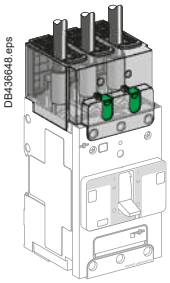
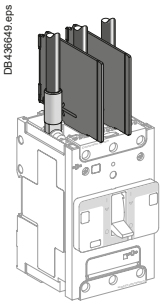


ComPacT NSXm Accessories and Auxiliaries

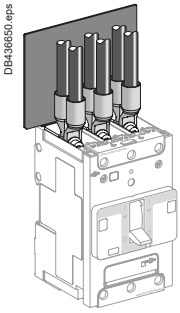
Insulation of Live Parts



Long terminal shields



Interphase barriers



Rear insulating screens

Long Terminal Shields IP40

ComPacT NSXm 3P or 4P can be equiped with long terminal shields. They can be mounted upstream and downstream and are used for protection against direct contact with power circuits. They provide IP40 degree of protection and IK07 mechanical impact protection. Moreover long terminal shields can be mounted after product installation on plate or DIN rail, and can be removed and put in place even if there are auxiliary wires.
They are used for connection with cables or insulated bars.
They are comprised of two parts assembled with 2 locks and/or captive screws, forming an IP40 cover.

- The top part is transparent in order to be able to see the connection through it and 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.

Interphase Barriers

Accessories for maximum insulation at the power-connection points:

- They clip easily onto the circuit breaker
- Not compatible with long terminal shield
- 2 ways mounting: short/long insulation.

Rear Insulating Screens

Accessories providing insulation at the rear of the device.
Their use may be mandatory if no long terminal shield depending of the distance between bare conductors and backplate.
The screen dimensions are shown below.

Circuit breaker		NSXm
3P	W x H x thickness (mm)	110 x 84 x 1
4P	W x H x thickness (mm)	145 x 84 x 1

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).

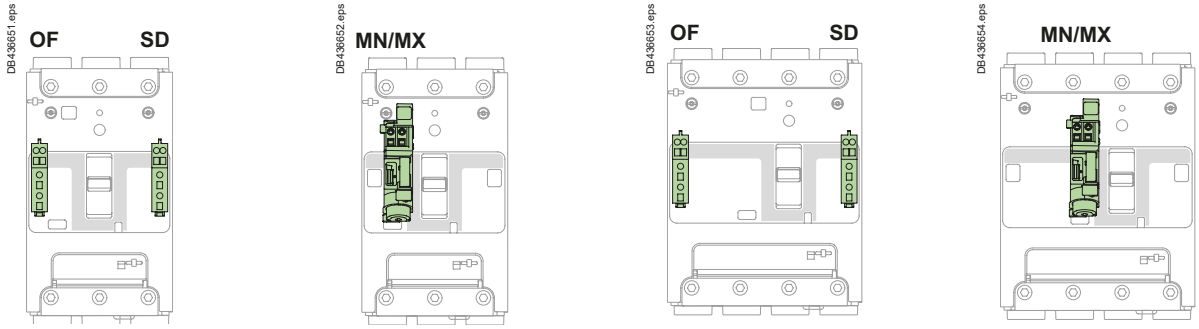
Remote Indications

Circuit breakers with MicroLogic Vigi 4.1 may be equipped with an alarming/fault trip indication module to inform before a 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.

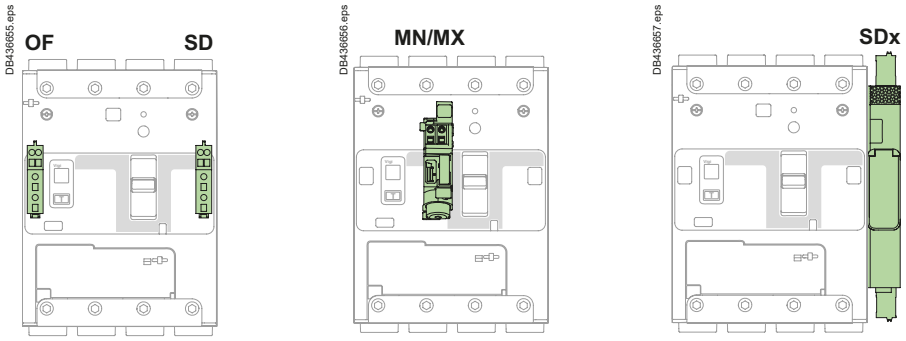
The following drawing indicates auxiliary possibilities depending on the type of device.

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 mm^2 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

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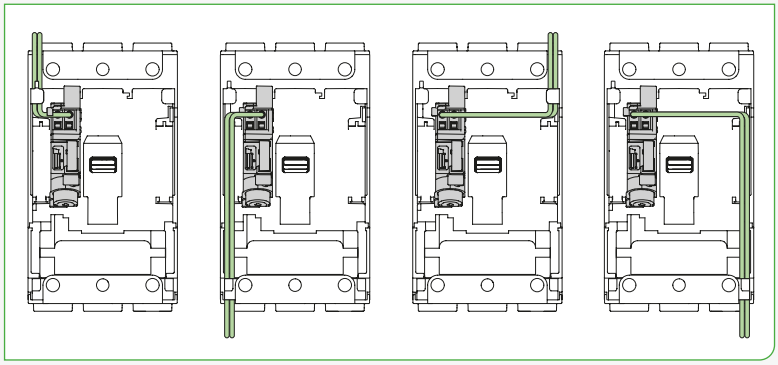


Auxiliary and Alarm Indication Contacts

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 normaly open (NO) contact and a normaly closed (NC) contact.
Terminals are spring type in order to ensure a fast and reliable connection.

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	-	-	-

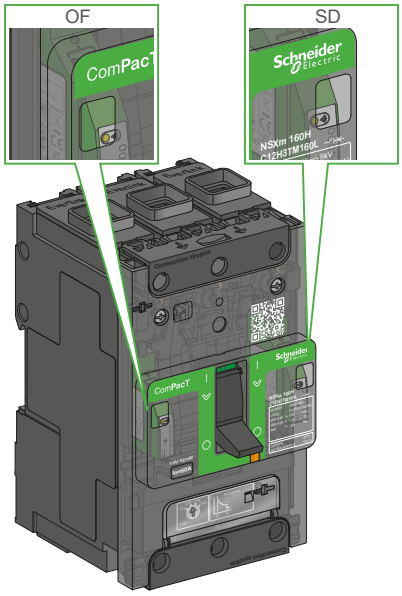
Standards

- 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)

PB119125_L12.eps

C



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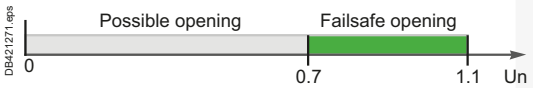
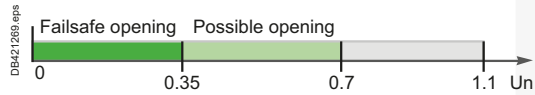
ComPacT NSXm Accessories and Auxiliaries

Voltage Release

MX or MN voltage release

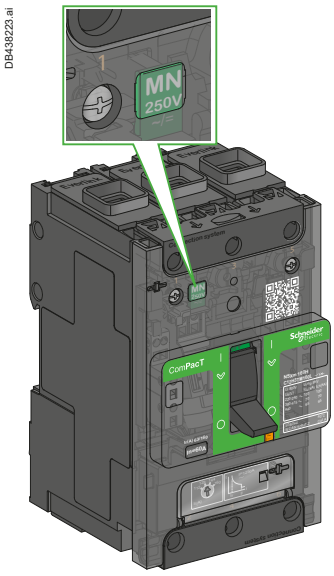


Opening conditions of the MX release



Opening conditions of the MN release

Closing conditions of the MN release



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 (Un).
- 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 ensured.
- 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 Un 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 ensure 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.

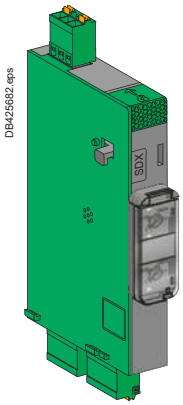
[1] Except for MX 24 V AC/DC (in case of continuous activation, may generate some minor perturbation in sensitive environment).

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 (Ir).
- Overload trip indication (SDT): cricuit breaker has tripped due to an overload fault.
- Earth leakage alarm (SDV80): leakage current is higher than 80 % of the earth leakage trip threshold (IΔn).
- Earth leakage trip indication (SDV): circuit breaker has tripped due to an earth leakage current.

Outputs are automatically reset when the alarm disappears or when the circuit breaker is restarted.



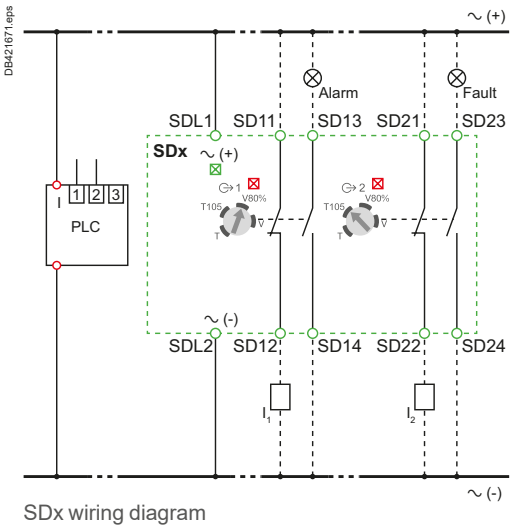
SDx relay module with its terminal block

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



SDx wiring diagram

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 cliped on the right side on the circuit breaker.
Each removable spring terminal can be connected by one 0.5... 1.5 mm² copper wire.

ComPacT NSXm Accessories and Auxiliaries
Rotary Handles

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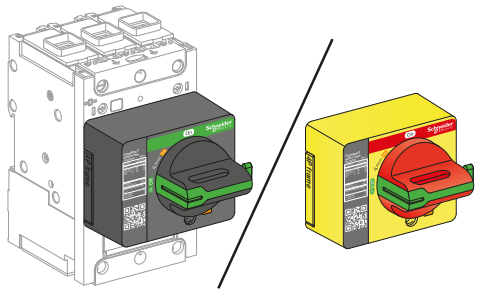

Directly mounted rotary handle

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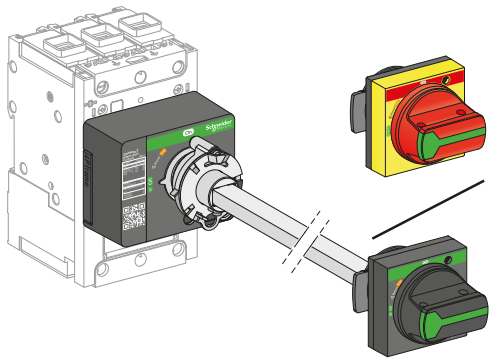

Door-mounted rotary handle

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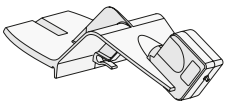


Laser Square tool

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 personel 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.

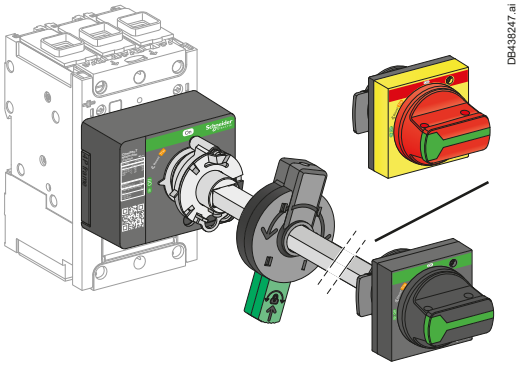
Mechanical door locking when device closed
A standard feature of the extended rotary handle is a locking function, built into the shaft, that disables door opening when the circuit breaker is in the ON or tripped positions.
Door locking can be temporarily disabled with a tool by qualified personnel to 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.

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



Door-mounted rotary handle with open door shaft operator

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.

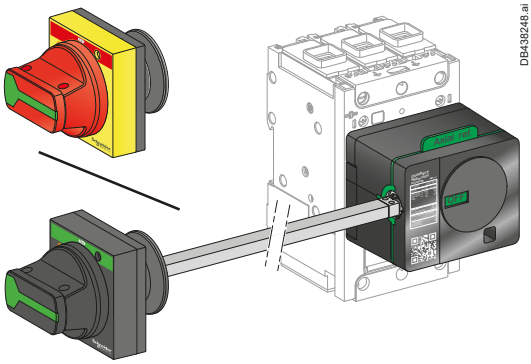
The handle mechanism is fixed with a nut (Ø22 mm) to make assembly easier.

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).



Side mounted rotary handle

ComPacT NSXm Accessories and Auxiliaries

Locks and Sealing Accessories

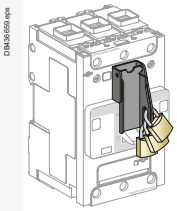
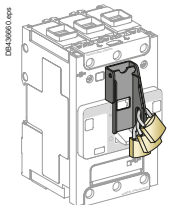
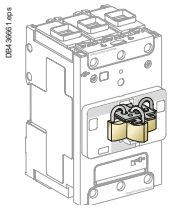
Locks

Padlocking systems can receive up to three padlocks with diameters of 5-8 mm ; padlocks not supplied. Locking in the OFF position isolates 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
	Lock in OFF position	Padlock	Fixed device
Direct rotary handle	Lock in ■ OFF position ■ OFF or ON position [1]	Padlock	-
Extended/side rotary handle	Lock in ■ 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]

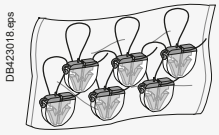
Fixed (OFF only)	Fixed (OFF or ON)	Removable (OFF only)
		

[1] Rotary handle has integrated padlocking capability.

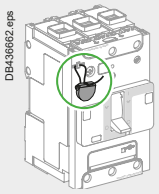
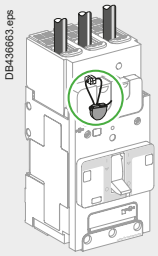
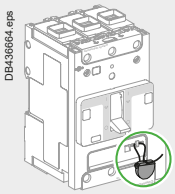
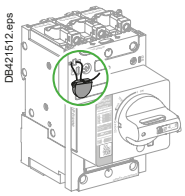
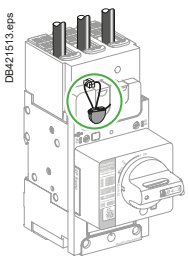
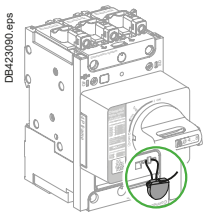
Sealing Accessories

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	■ Front removal ■ Access to auxiliaries.	■ Access to power connections	■ Access to settings and test connector
Toggle			
Rotary handle			

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ComPacT NSX Accessories and Auxiliaries
Overview Fixed Version

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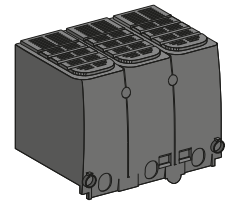
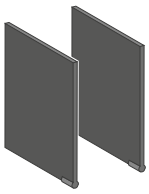
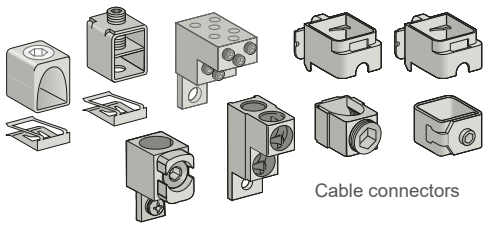
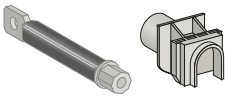
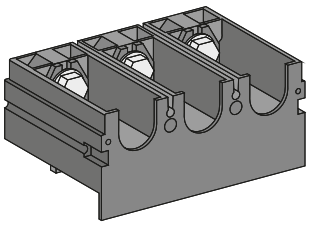
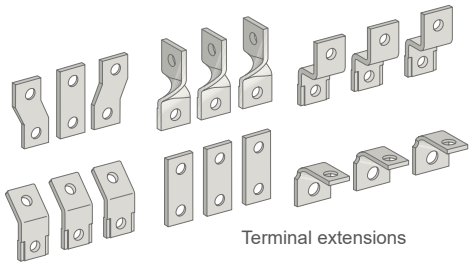

Sealable terminal shields

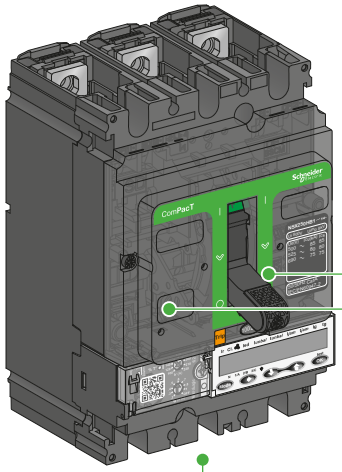

Interphase barriers

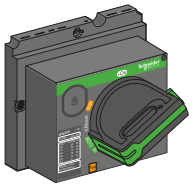

Cable connectors

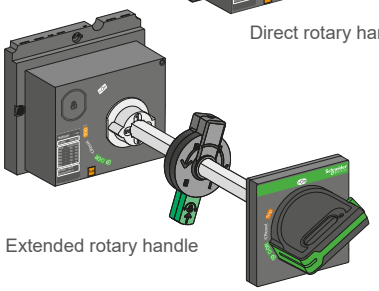

Rear connectors

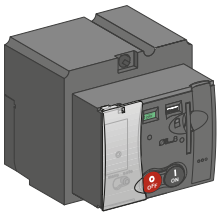

One-piece spreader

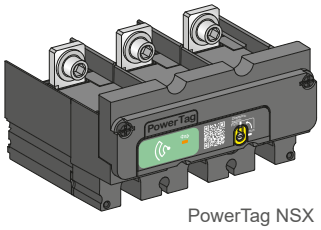

Terminal extensions

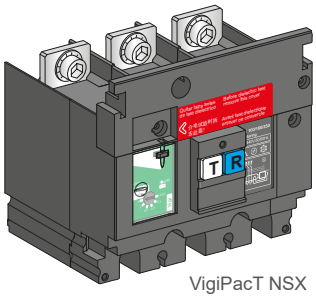


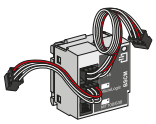

Direct rotary handle

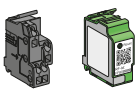

Extended rotary handle


Motor mechanism

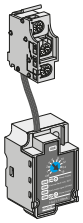

PowerTag NSX

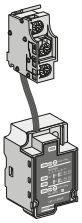

VigiPacT NSX

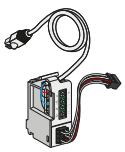

BSCM module


Indication contact


Voltage release


SDTAM module

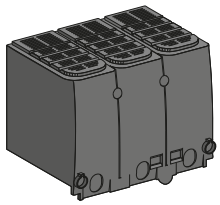

SDx module


NSX cord

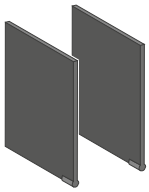
ComPacT NSX Accessories and Auxiliaries

Overview Plug-in and Withdrawable Versions

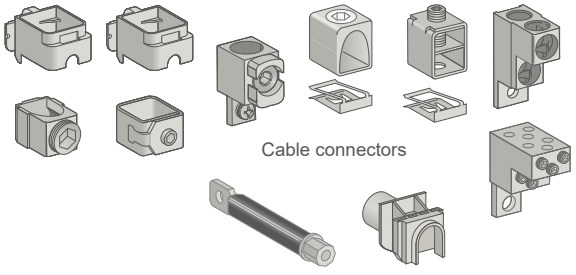
DB438221.ai



Sealable long terminal shields for plug-in base

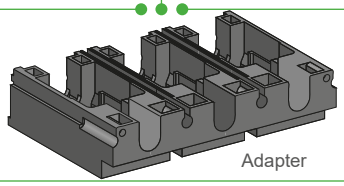


Interphase barriers

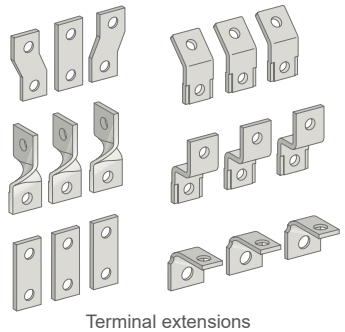


Cable connectors

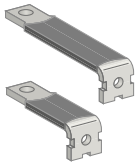
Rear connectors



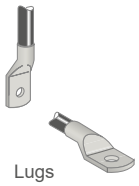
Adapter



Terminal extensions

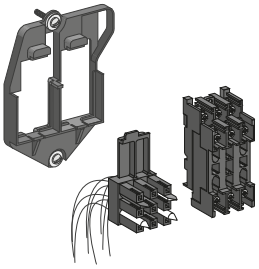


Rear connectors

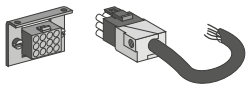


Lugs

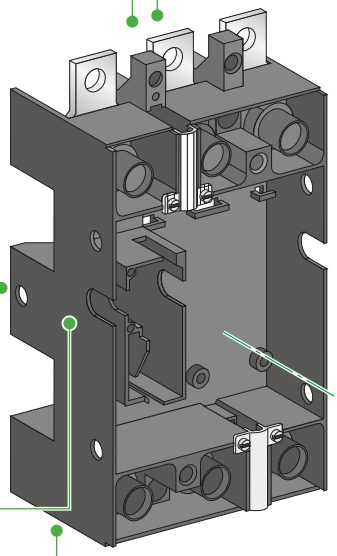
C

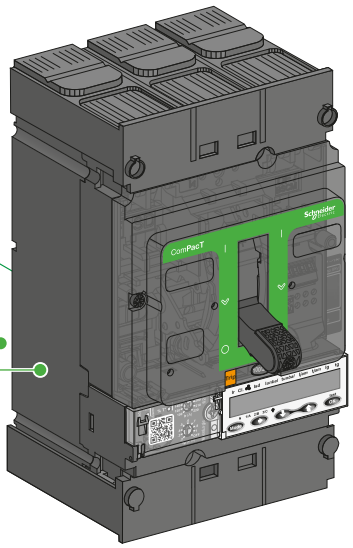


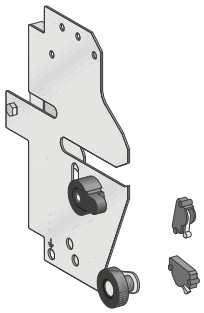
Automatic withdrawable auxiliary connector

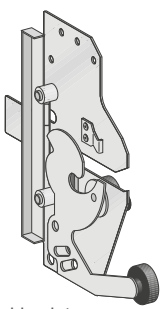


Manual auxiliary connector

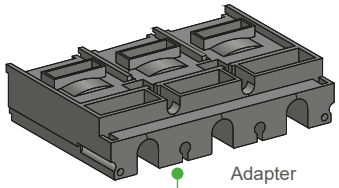






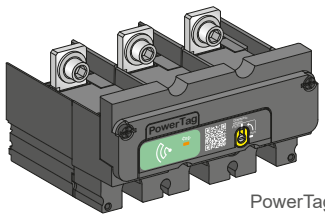


Chassis side plate

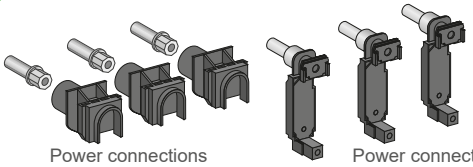


Adapter

[1]

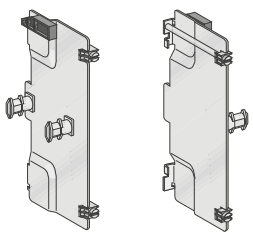


PowerTag NSX



Power connections

Power connections for VigiPacT 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

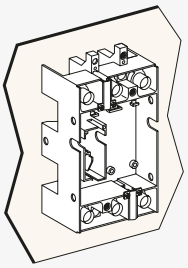
A plug-in configuration is made by adding a "plug-in kit" to a fixed device.
To avoid connecting or disconnecting the power circuits under load conditions, a safety trip causes automatic tripping if the device is ON, before engaging or withdrawing it. The safety trip, supplied with the kit, must be installed 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 to protect against direct contact.

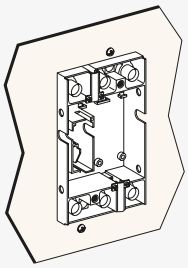
Mounting

DB112206.eps



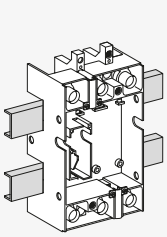
Mounting on a backplate

DB112205.eps



Mounting through a front panel

DB112207.eps



Mounting on rails

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

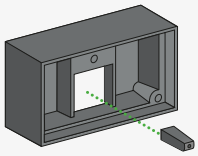
A withdrawable configuration requires two side plates installed on the base and two sides plates mounted on the circuit breaker. Similar to the plug-in version, a safety trip causes automatic tripping if the device is ON, before engaging or withdrawing it, and enables device operation in the disconnected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

Accessories

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

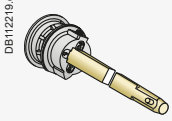
- Auxiliary contacts for installation on the fixed part, indicating the "connected" and "disconnected" positions.
- Locking by 1 to 3 padlocks (shackle diameter 5 to 8 mm), to:
  - prevent insertion for connection
  - lock the circuit breaker in connected or disconnected position.
- Toggle collar for 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

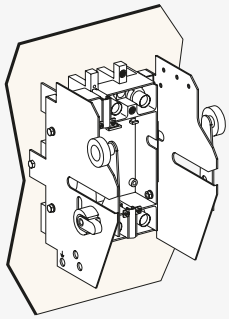
DB112219.eps



Telescopic shaft

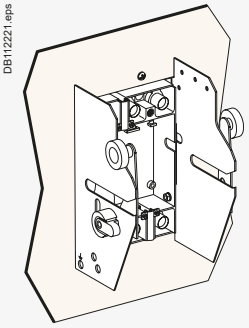
Mounting

DB112220.eps



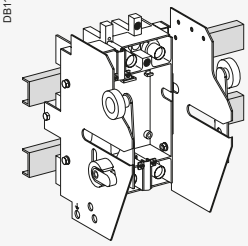
Mounting on a backplate

DB112221.eps



Mounting through a front panel

DB112312.eps

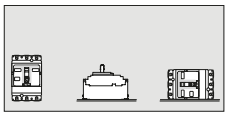


Mounting on rails

PB105122_Q.eps

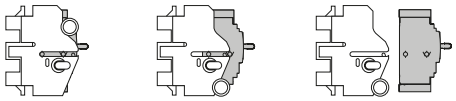
Withdrawable ComPacT NSX250

DB436665.eps



Installation positions

DB436666.eps

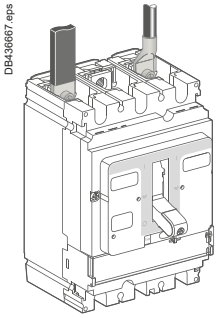


Connected Disconnected Removed

C

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.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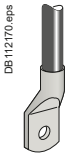
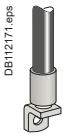
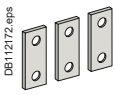
DB112169.eps
Insulated bar


DB112170.eps
Small lug for copper cables


DB112171.eps
Small lug for Al cables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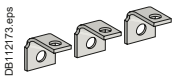
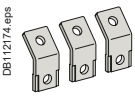
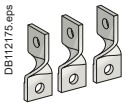
Straight terminal extensions


DB112173.eps
Right-angle terminal extensions


DB112174.eps
45° terminal extensions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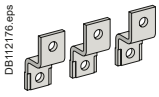
Edgewise terminal extensions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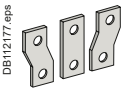
Double-L terminal extensions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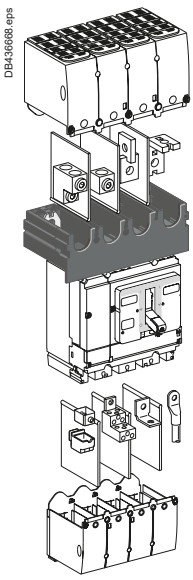
Spreaders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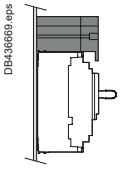
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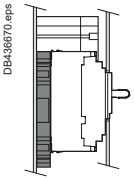
Mounting at the back of a switchboard


DB436670.eps
Mounting behind the front panel with a raiser

C

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 non-insulated bars are used, a complete switchboard type test is mandatory to verify the switchboard configuration.

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 (mm²)	120, 150, 185	240, 300
	crimping	hexagonal barrels or punching	
Aluminium cables	size (mm²)	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	-

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.

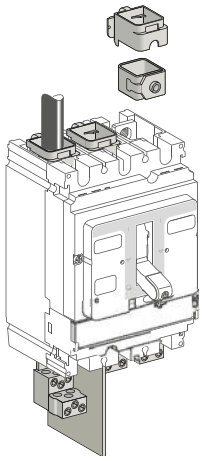
2-cable connectors for ComPacT NSX100 to 250 and 400/630
The connectors are screwed to device terminals or right-angle terminal extensions.

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.

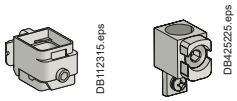
Linergy DX and Linergy DP distribution block for ComPacT NSX100 to 630
Linergy DX and Linergy DP connects directly to device terminals.
It is used to connect up to six or nine flexible or rigid cables with cross-sectional areas not exceeding 10 mm² or 16 mm², to each pole.
Connection is made to spring 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 mm²	◉			
Aluminium connectors	25 to 95 mm²	◉	◉		
	120 to 185 mm²	◉	◉		
	120 to 240 mm²	◉	◉		
	2 cables 50 to 120 mm²	◉	◉		
	2 cables 35 to 240 mm²			◉	◉
	35 to 300 mm²			◉	◉
Distribution connectors	6 cables 35 mm²	◉	◉		
Linergy DX and Linergy DP distribution blocks	6 or 9 cables 10/16 mm²	◉	◉		

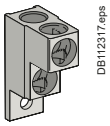


Bare cable

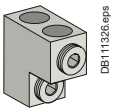


1-cable connector for NSX100 to 250

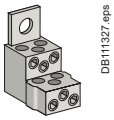
1-cable connector NSX400/630



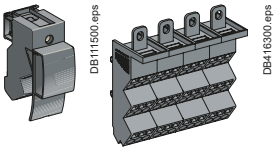
2-cable connector for NSX100 to 250



2-cable connector for NSX400/630



Distribution connector for NSX100 to 250



Linergy DX 100/160 A and Linergy DP 250 A distribution blocks

Rear Connection

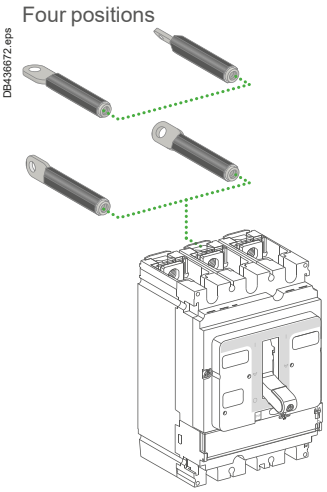
Device mounting on a backplate with suitable holes enables rear connection.

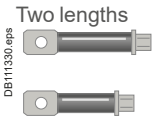
Bars or Cables with Lugs

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

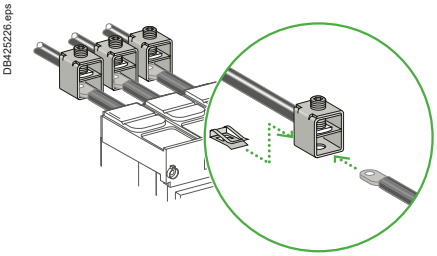
For the connection of bare cables, the 1-cable connectors for ComPacT NSX100 to 250 may be secured to the rear connections using clips.





Cable connector

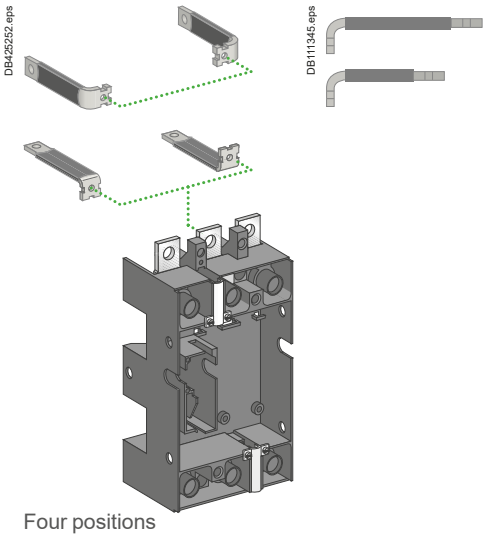
Rear connection



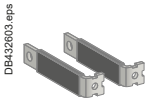
Connection of bare cables to NSX100 to 250 by clips

ComPacT NSX Accessories and Auxiliaries
Connection of Withdrawable and Plug-in Devices

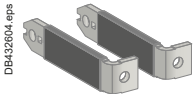
Connection is identical for both withdrawable and plug-in versions. The same accessories as for fixed devices may be used.



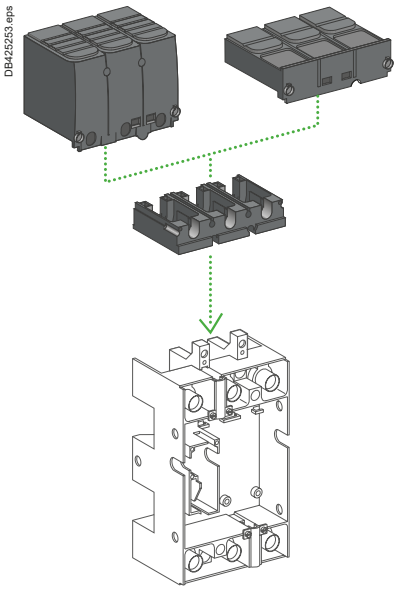
Four positions



Terminal extensions for ComPacT NSX100/160/250

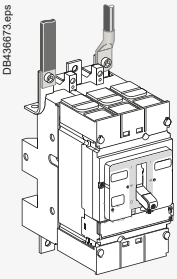


Terminal extensions for ComPacT NSX400/630

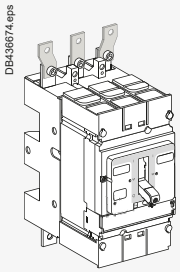


Bars or Cables with Lugs

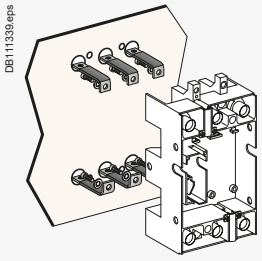
The plug-in base is equipped with terminals which, depending on their orientation, serve for front and rear connection.
For rear connection of a base mounted on a backplate, the terminals must be replaced by insulated, long right-angle terminal extensions.
For ComPacT NSX630 devices, connection most often requires the 52.5 or 70 mm pitch spreaders.



Front connection



Front connection with spreaders

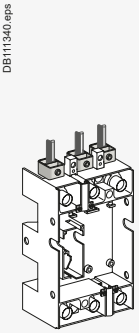


Rear connection of a base mounted on a backplate

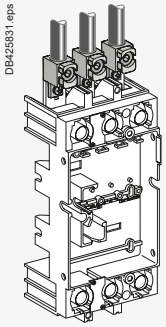
Connection accessories
All accessories for fixed devices (bars, lugs, terminal extensions and spreaders) may be used with the plug-in base.

Bare Cables

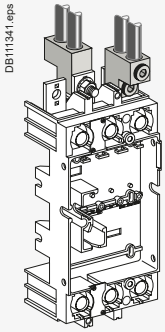
All terminals may be equipped with bare-cable connectors. See the "Connection of fixed devices" section.



With a 100 to 250 A base



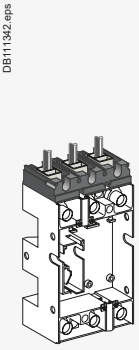
With 240 mm^2 cable connector for NSX100 to 250



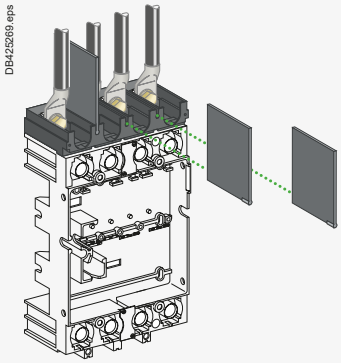
With a 400/630 A base

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

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-measurement 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

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

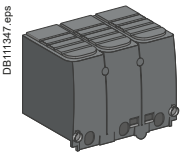
Accessories providing insulation at the rear of the device.

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

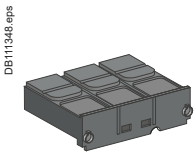
The available screen dimensions are shown below.

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

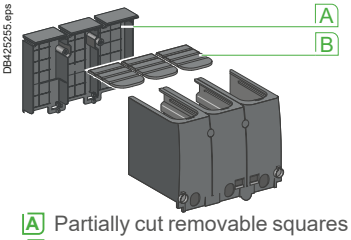
Terminal shields are identical for fixed and plug-in/withdrawable versions and cover all applications up to 1000 V.
They exist for the 100 to 250 A and 400/630 A ratings, in long and short versions.



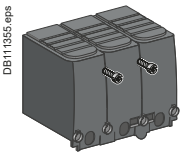
Long terminal shields



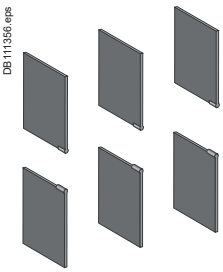
Short terminal shields



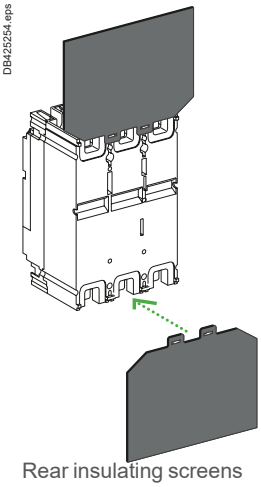
A Partially cut removable squares
B Grids with break marks



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 VigiPacT 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 E/6.2 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

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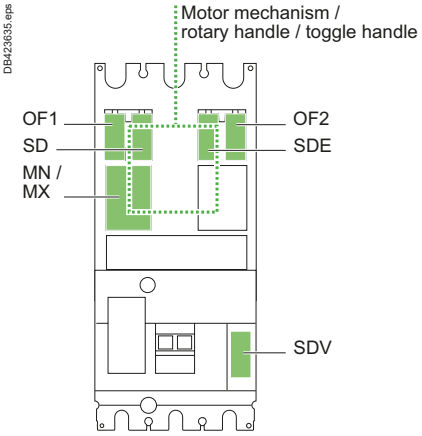

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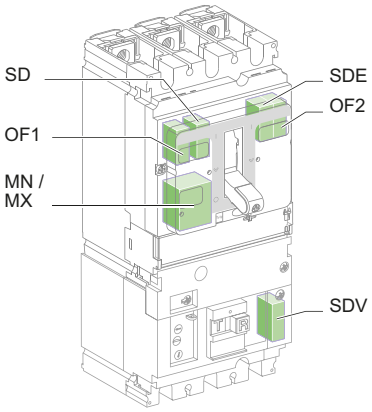

MicroLogic 2/4/5/6/7

Standard

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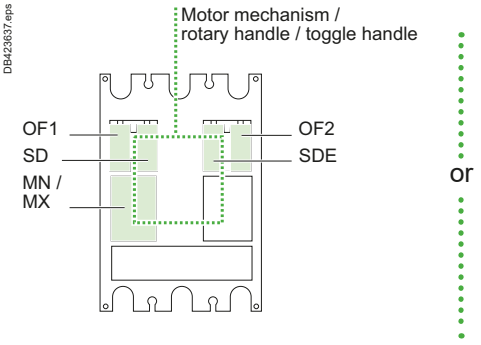

Remote indications via SDx or SDTAM

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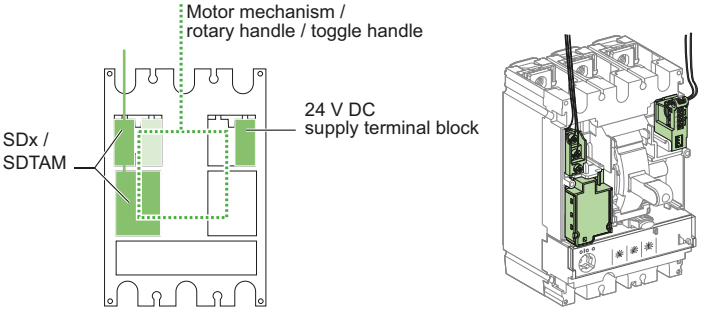


The SDx or SDTAM uses the OF1 and MN/MX slots.
External connection is made via a terminal block in the OF1 slot.
The 24 V DC supply provides for the MicroLogic 5/6/7 display when the device is OFF or under low-load conditions.

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:

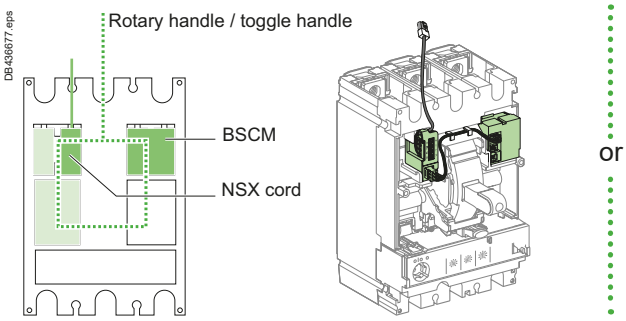
- 1 BSCM module
- 1 NSX cord (internal terminal block) for both communication and 24 V DC supply to the BSCM and the MicroLogic
- 1 communicating motor mechanism connected to the BSCM.

Installation of SDx or SDTAM is compatible with communication.

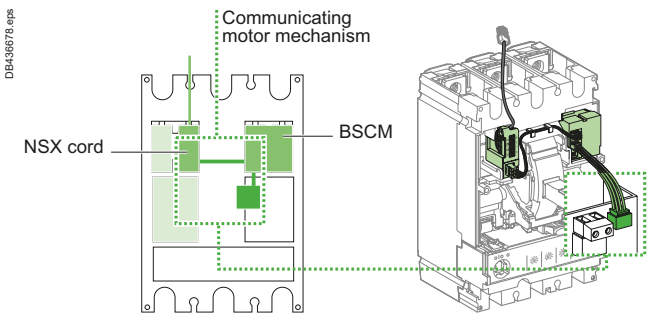
The following table indicates auxiliary possibilities depending on the type of trip unit.

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

Communication of status indications

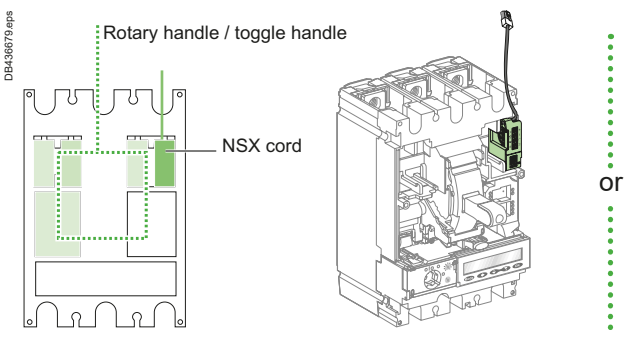


Communication of status indications and controls

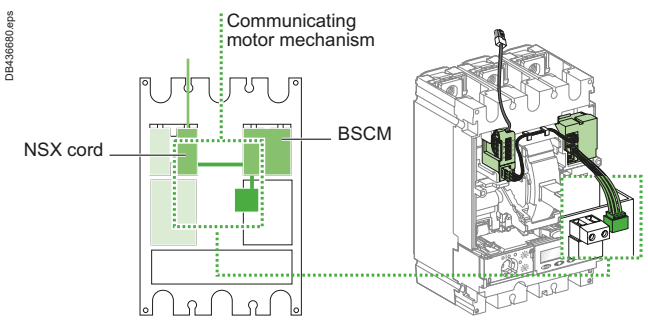


MicroLogic 5/6/7

Communication of measurements with or without FDM121 display



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 VigiPacT 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 E/6.3 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

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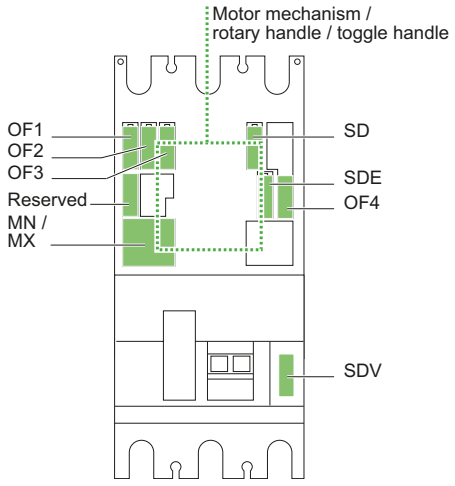

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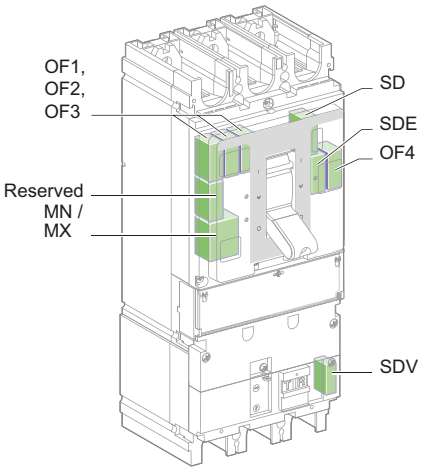
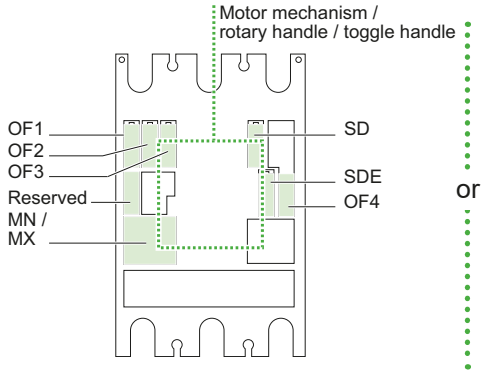


MicroLogic 2/4/5/6/7

Standard

DB423645.eps



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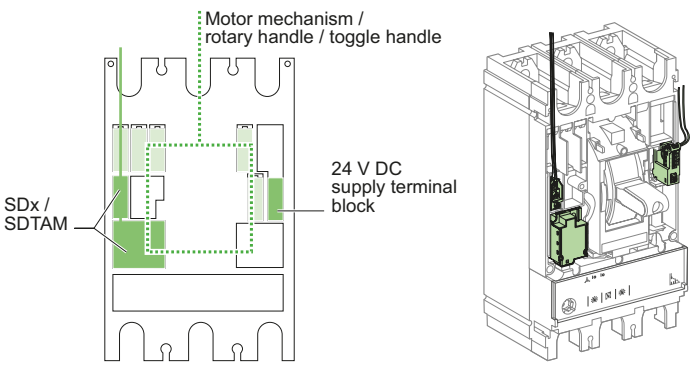


The SDx or SDTAM uses the reserved slot and the MN/MX slots.
External connection is made via a terminal block in the reserved slot.
The 24 V DC supply provides for the MicroLogic 5/6/7 display when the device is OFF or under low-load conditions.

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:

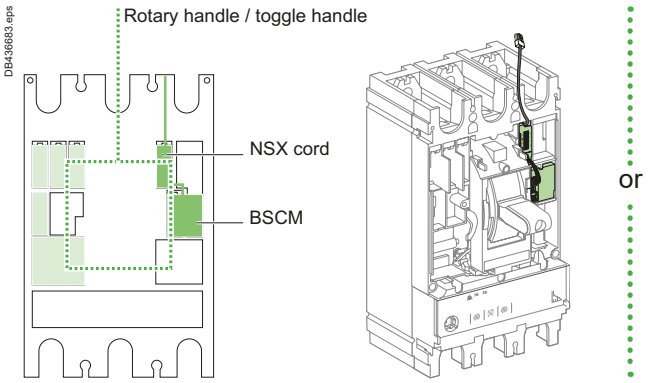
- 1 BSCM module
- 1 NSX cord (internal terminal block) for both communication and 24 V DC supply to the BSCM and the MicroLogic
- 1 communicating motor mechanism connected to the BSCM.

Installation of SDx or SDTAM is compatible with communication.

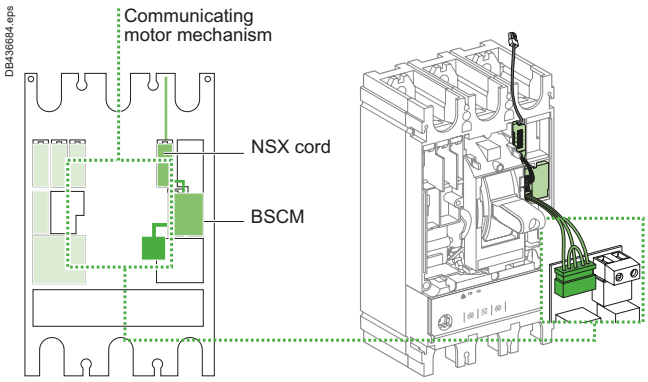
The following table indicates auxiliary possibilities depending on the type of trip unit.

NA, MicroLogic 1.3 M, MicroLogic 2/4

Communication of status indications

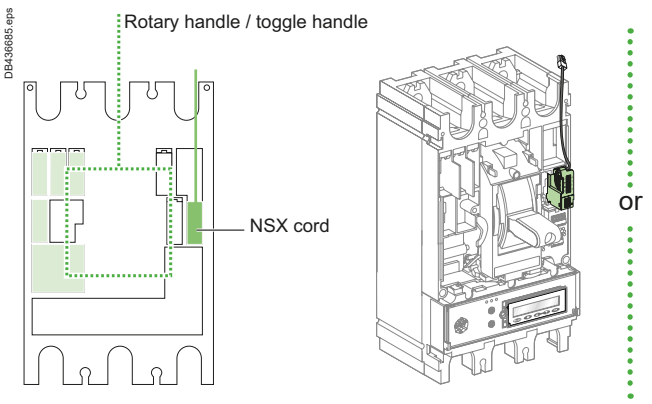


Communication of status indications and controls

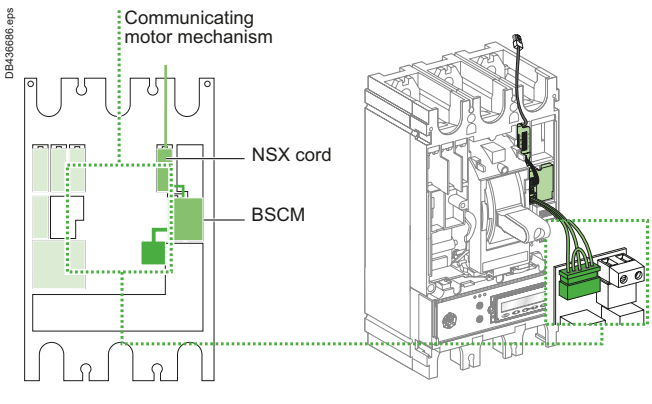


MicroLogic 5/6/7

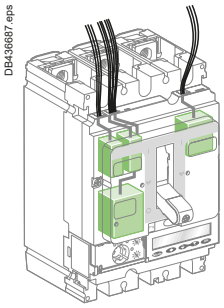
Communication of status indications



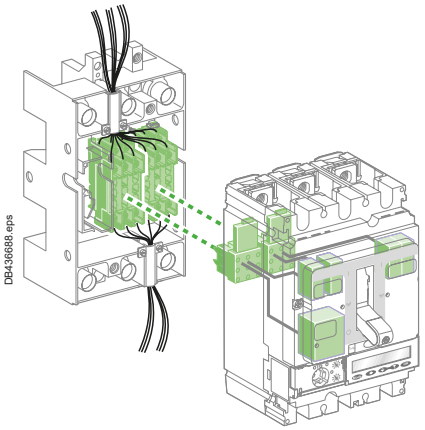
Communication of status indications, controls and measurements with or without FDM121 display



ComPacT NSX Accessories and Auxiliaries
Connection of Electrical Auxiliaries



Fixed ComPacT NSX



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

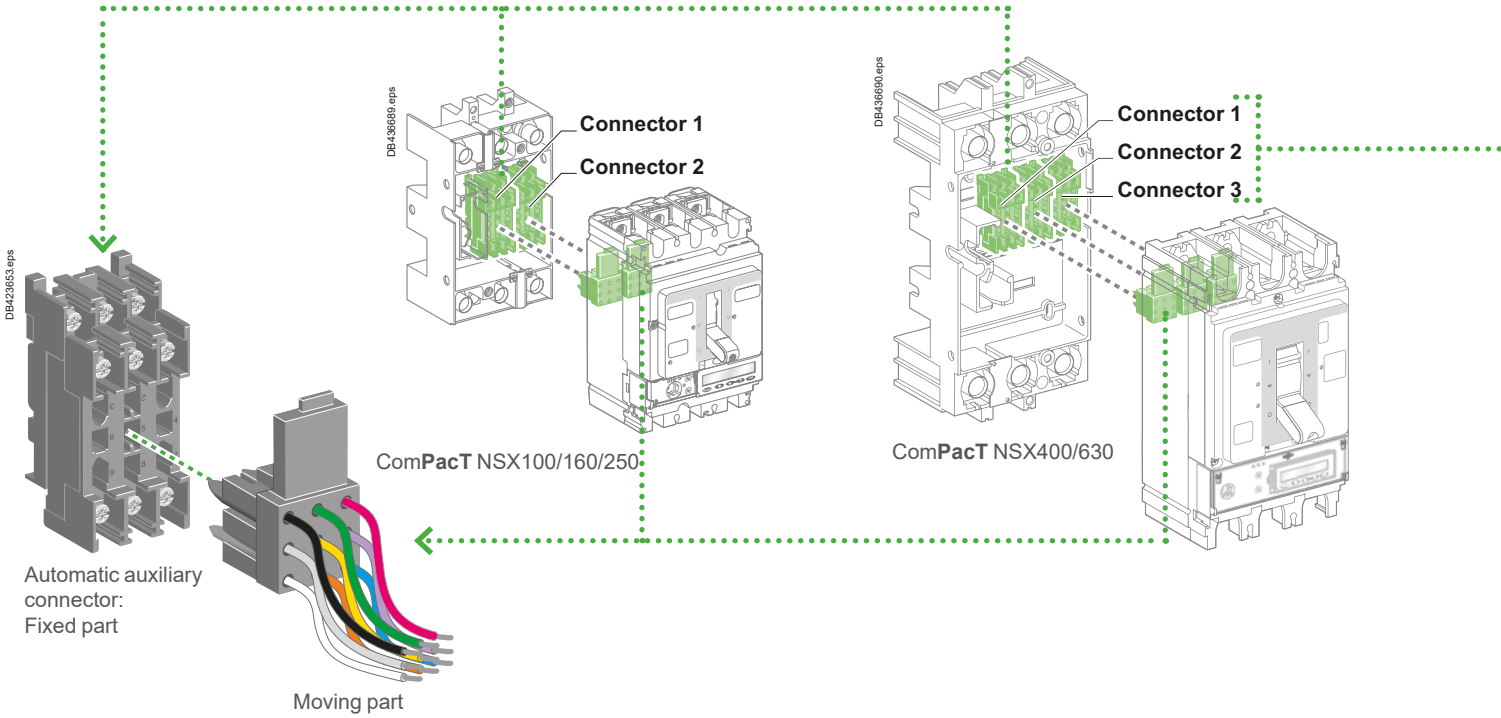
Auxiliary circuits exit the circuit breaker via one to three automatic auxiliary connectors (nine wires each). These are made up of:

- 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.

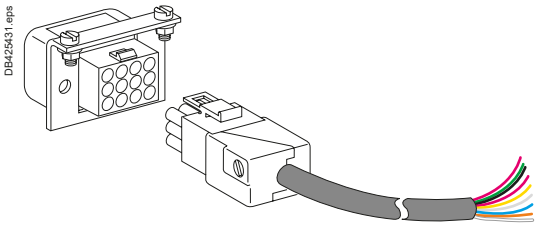
Selection of automatic auxiliary connectors

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



ComPacT NSX Accessories and Auxiliaries

Connection of Electrical Auxiliaries

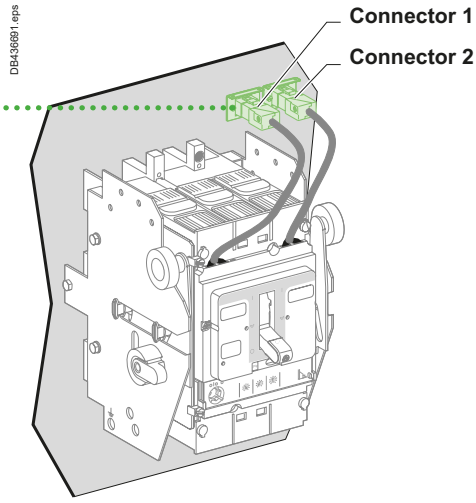


Nine-wire manual auxiliary connector

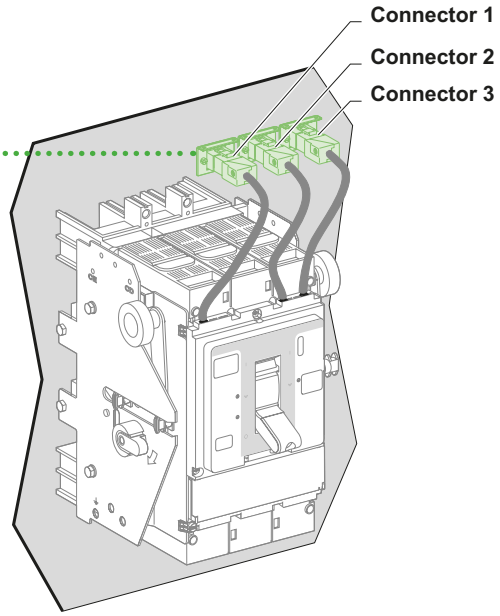
Withdrawable ComPacT NSX

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 SD or SDx/ SDTAM	OF2/SDV [1]/ZSI out [1] SDE NSX cord MT MTc 24 V DC	OF3 OF4 ZSI in ZSI out SDV
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.
Terminals are spring type in order to ensure a fast and reliable connection.

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-energized 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-energized state when the circuit breaker is reset.
- SDV indicates that the circuit breaker has tripped due to an earth fault. It returns to de-energized state when the VigiPacT 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 energize 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 VigiPacT 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			S					OF, SD, SDE, SDV			
Rated thermal current (A)			5					5			
Minimum load			100 mA at 24 V DC					1 mA at 4 V DC			
Utilization cat. (IEC 60947-5-1)			AC12	AC15	DC12	DC13	DC14	AC12	AC15	DC12	DC14
Operational current (A)	24 V	AC/DC	5	5	5	2.5	1	5	3	5	1
	48 V	AC/DC	5	5	2.5	1.2	0.2	5	3	2.5	0.2
	110 V	AC/DC	5	5	0.6	0.35	0.05	5	2.5	0.6	0.05
	220/240 V	AC	5	4	-	-	-	5	2	-	-
	250 V	DC	-	-	0.3	0.03	0.03	5	-	0.3	0.03
	380/440 V	AC	5	2	-	-	-	5	1.5	-	-
	480 V	AC	5	1.5	-	-	-	5	1	-	-
	660/690 V	AC	5	0.1	-	-	-	-	-	-	-

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 memorize 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 memorize 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.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SDx relay module with its terminal block


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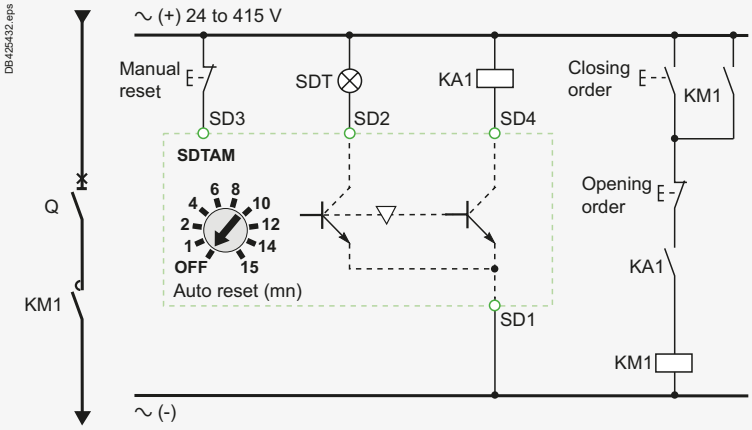
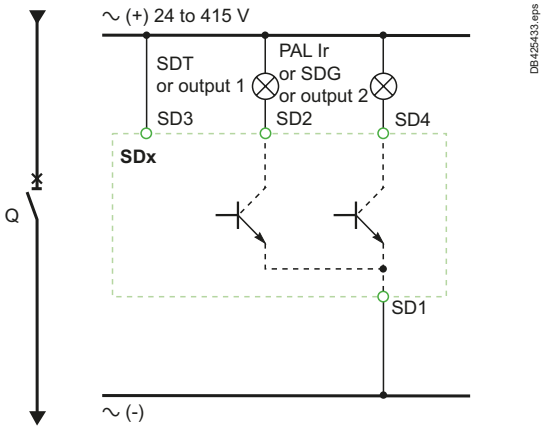
SDTAM relay module with its terminal block



SDTAM wiring diagram with contactor control



SDx wiring diagram

ComPacT NSX Accessories and Auxiliaries
Motor Mechanism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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 reliable 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, Centralized operation, automatic distribution control.
- Normal/standby source changeover or switching to a replacement source for availability and energy cost optimization.
- 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.

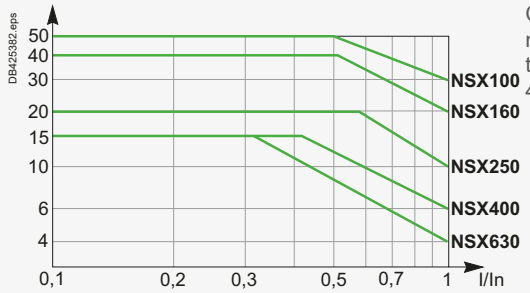
Optional Accessories
- Keylock for locking in OFF position.
- Operations counter for the ComPacT NSX400/630, indicating the number of ON/OFF cycles. Must be installed on the front of the motor-mechanism module.

Characteristics

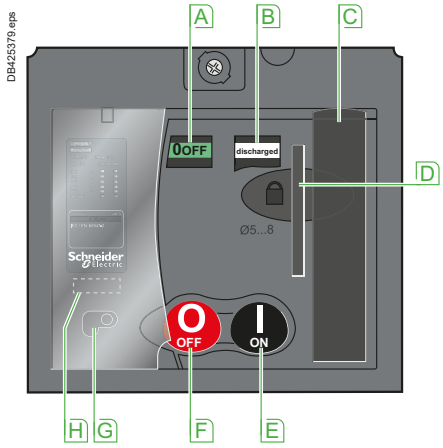
Motor mechanism			MT100 to MT630
Response time (ms)	opening		< 700
	closing		< 80
Operating frequency	cycles/minute max.		4
Control voltage (V)	DC		24/30 - 48/60 - 110/130 - 250
	AC 50/60 Hz		48 (50 Hz) - 110/130 - 220/240 - 380/440
Consumption [1]	DC (W)	opening	≤ 500
		closing	≤ 500
	AC (VA)	opening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

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.
Terminals are spring type in order to ensure a fast and reliable connection.

MN Undervoltage Release

The MN release opens the circuit breaker when its supply voltage drops to a value below 35 % of its rated voltage Un.
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 ⩽ 0.35 x Un.
- If the supply voltage is between 0.35 and 0.7 Un, opening is possible, but not guaranteed. Above 0.7 Un, 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 ⩾ 0.85 x Un. Below this threshold, closing is not ensured.

Characteristics

Power supply	V AC	50/60 Hz: 24 - 48 - 100/130 - 200/240
		50 Hz: 380/415 60 Hz: 208/277
	V DC	12 - 24 - 30 - 48 - 60 - 125 -250
Operating threshold	Opening	0.35 to 0.7 Un
	Closing	0.85 Un
Operating range		0.85 to 1.1 Un
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 ⩾ 0.7 x Un.

Characteristics

Power supply	V AC	50/60 Hz: 24 - 48 - 100/130 - 200/240
		50 Hz: 380/415 60 Hz: 208/277
	V DC	12 - 24 - 30 - 48 - 60 - 125 -250
Operating range		0.7 to 1.1 Un
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 with screwless connections.

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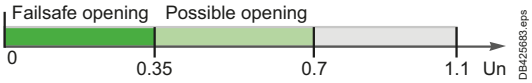
MX or MN voltage release



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Opening conditions of the MN release

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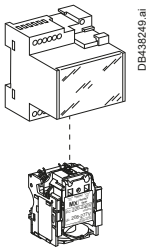
Closing conditions of the MN release



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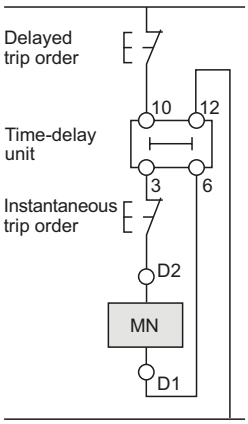
MN release with a time-delay unit



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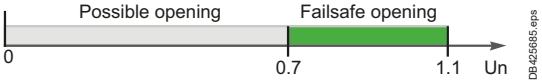
Wiring diagram for emergency-off function with MN + time-delay unit



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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.

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ComPacT NSX with a rotary handle

PB103607-50-Q.eps

ComPacT NSX with an MCC rotary handle

PB103608-50-Q.eps

ComPacT NSX with a CNOMO machine-tool rotary handle

PB105117-Q.eps

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 from 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.

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.

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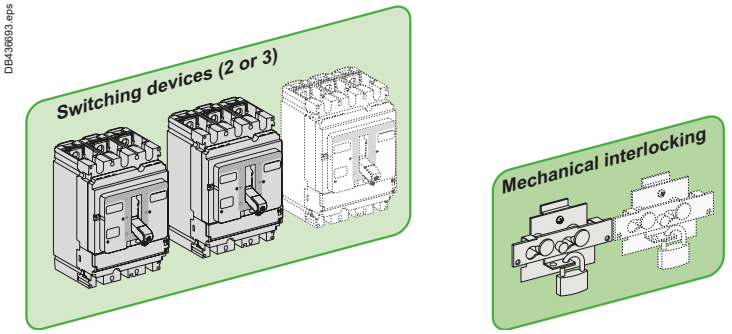
C

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-disconnetors 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

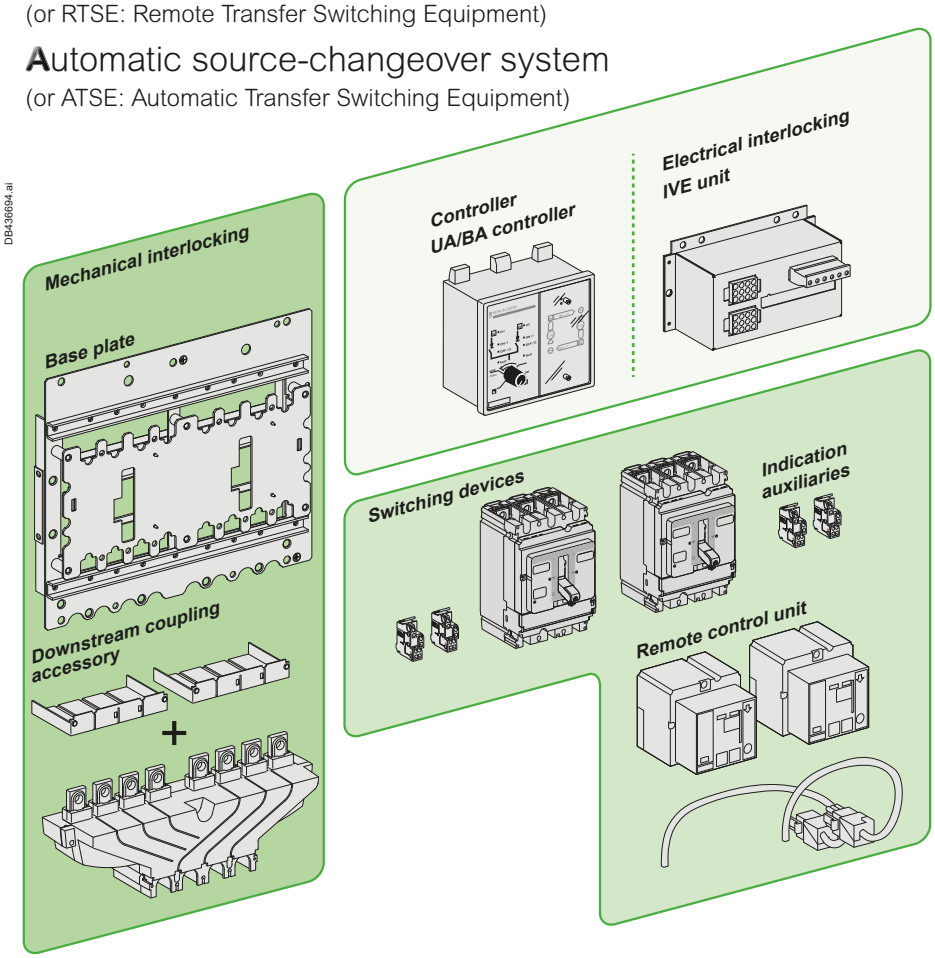
Manual source-changeover system
(or MTSE: Manual Transfer Switching Equipment)



R/A

Remote-operated source-changeover system
(or RTSE: Remote Transfer Switching Equipment)

Automatic source-changeover system
(or ATSE: Automatic Transfer Switching Equipment)



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.
Authorized 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.

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Interlocking of two or three toggle-controlled devices

Interlocking of Two Devices by Rotary Handles

Interlocking system

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

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Interlocking of two devices by rotary handles

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.

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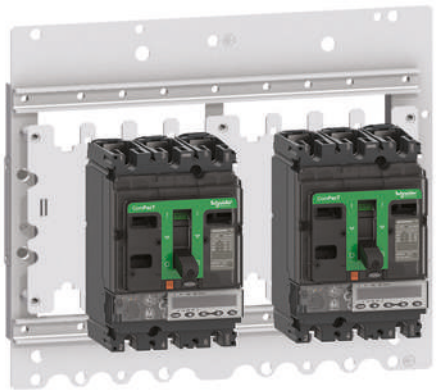

Interlocking on a base plate

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.

> TransferPacT
(source-changeover systems)
LVPED216028EN

ComPacT NSX Accessories and Auxiliaries

Mechanical and Electrical Interlocking for Source-Changeover Systems

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Remote-operated source-changeover system

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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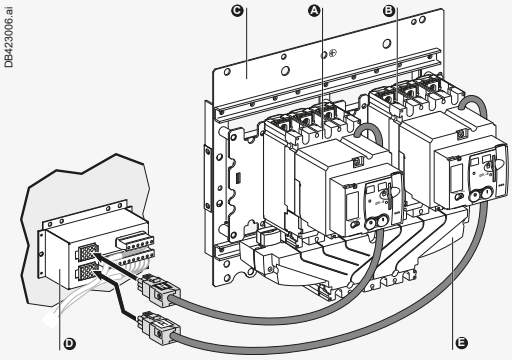

- **A** Circuit breaker QS1 equipped with a motor mechanism and auxiliary contacts, connected to the N source
- **B** Circuit breaker QS2 equipped with a motor mechanism and auxiliary contacts, connected to the R source
- **C** Base plate with mechanical interlocking
- **D** Electrical interlocking unit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

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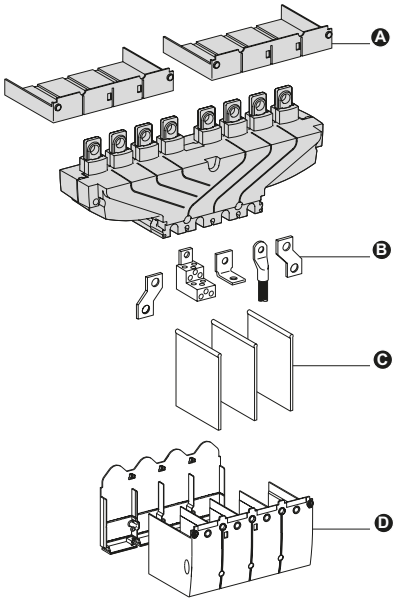

- **A** Short terminal shields
- **B** Terminals
- **C** Interphase barriers
- **D** Long terminal shields

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.

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BA controller

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UA controller

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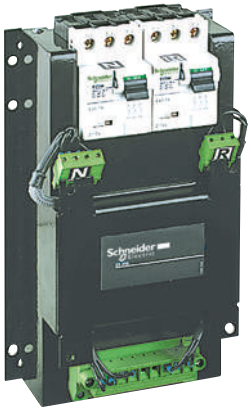

Transfer**PacT** ACP control plate

Functions of the BA and UA Controllers

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

		AC				DC	
Utilization 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 VigiPacT 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, 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.

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PowerLogic PowerTag NSX

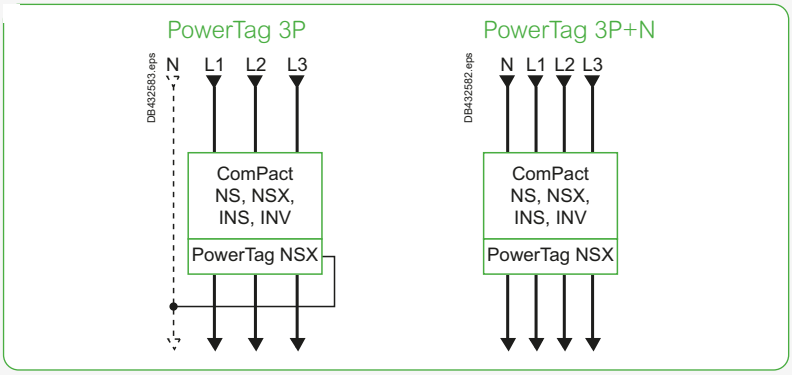
Functions

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 VigiPacT 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 been 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.

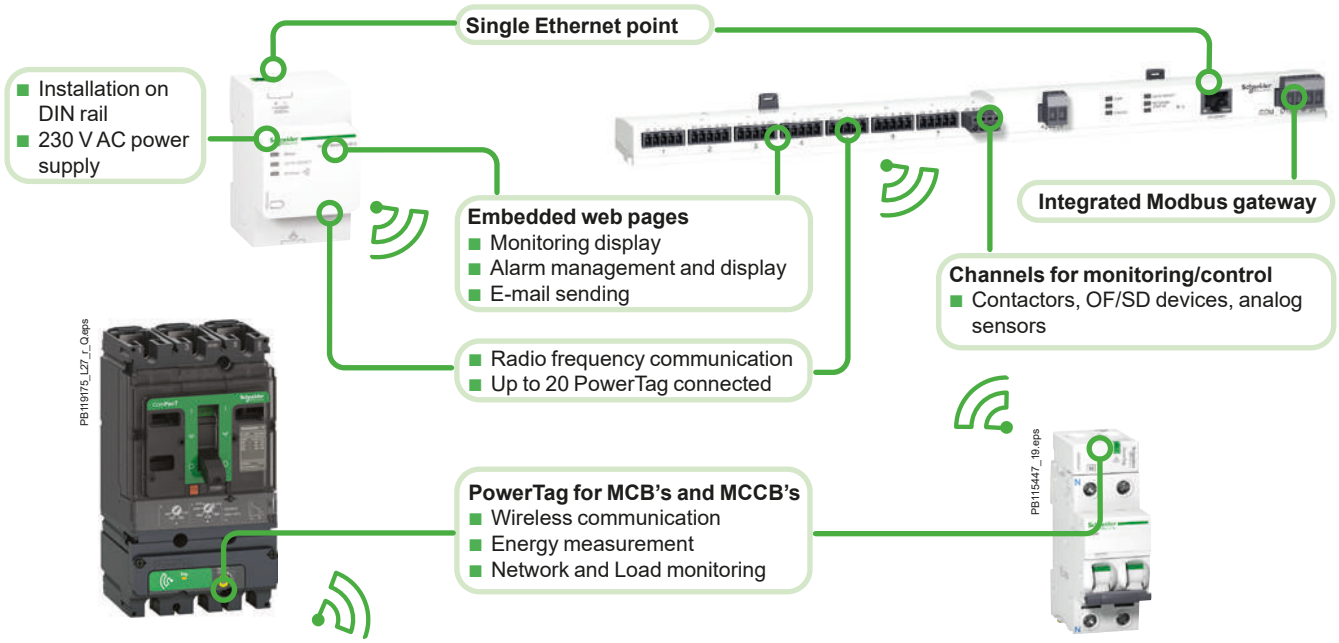
C

ComPacT NSX Accessories and Auxiliaries
Additional Measurement Module: PowerLogic PowerTag NSX

How to Monitor PowerTag NSX Sensors in FDM128 Local Display

Metering and Monitoring
PowerTag Link/PowerTag Link HD (Ethernet)

Metering, Monitoring and Control
Smartlink SI B (Ethernet)



C

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
Overvoltage 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		88 VAR to 416 kVAR/ 221 VAR to 1048 kVAR
Total apparent power	S_A	2		88 VA to 416 kVA/221 VA to 1048 kVA
Active Energy (per phase, total, partial)	E_a	1		0 to 281.10⁹ kWh
Total reactive Energy	E_{rA}	2		0 to 281.10⁹ kVARh
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

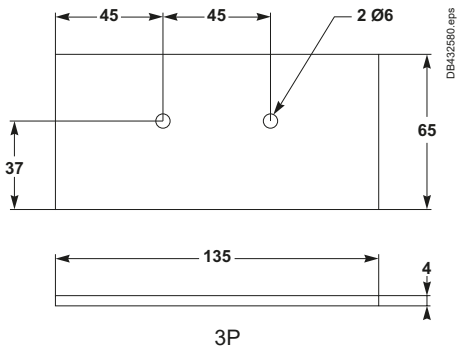
Additional Measurement Module: PowerLogic PowerTag NSX



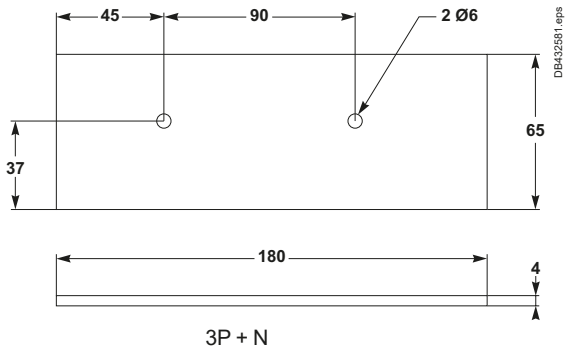

Products (AC network)		Mounting position	250 3P	250 3P+N	630 3P	630 3P+N
ComPacT						
Circuit breakers						
NSX100/160/250 B/F/N/H/S/L/R Fixed	3P	Bottom	☑	-	-	-
	4P	Bottom	-	☑	-	-
NSX400/630 F/N/H/S/L/R Fixed	3P	Bottom	-	-	☑	-
	4P	Bottom	-	-	-	☑
NSX100/160/250 B/F/N/H/S/L/R Plug-In (mounted on the 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:



3P



3P + N

C

ComPacT NSX Accessories and Auxiliaries
Additional Measurement and Indication Modules

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ComPacT NSX with current-transformer module

Current-Transformer Module

This module enables direct connection of a measurement device such as 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 Ue: 530 V.
- Frequencies of measured values: 50...60 Hz.
- Three CTs with 5 A secondary windings for the rated primary current In:
  - 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.

VigiPacT 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 VigiPacT 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.

VigiPacT add-on alarm

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C