

Switchboard Integration

ComPacT NSX & NSXm

Operating and Installation Conditions	E-4
Safety Clearances and Minimum Distances	E-10
Voltage Release Wiring Rules	E-12
Power Loss/Resistance.....	E-13

ComPacT NSX Temperature Derating

Equipped with Thermal-Magnetic Trip Units	E-14
Equipped with Electronic Trip Units.....	E-16

ComPacT NSX Installation in Switchboards

Safety Clearances and Minimum Distances	E-18
Installation Example.....	E-19
Control Wiring.....	E-20

Power Supplies.....E-21

ComPacT NSX Power Loss/ Resistance

Equipped with Thermal-Magnetic Trip Units	E-23
Equipped with Electronic Trip Units.....	E-24

Other Chapters

Select Circuit Breakers and Switch-Disconnectors	A-1
Select Protection	B-1
Customize Circuit Breakers with Accessories.....	C-1
Smart Panel Integration	D-1
Catalog Numbers	F-1
Glossary	G-1
Additional Characteristics.....	H-1

Switchboard Integration

ComPacT NSXm Dimensions and Mounting

Circuit Breaker and Switch-Disconnecter	E-25
---	------

ComPacT NSX Dimensions and Mounting

ComPacT NSX100 to NSX250 Fixed Version, 1P-2P	E-34
ComPacT NSX100 to 630 Fixed Version	E-36
ComPacT NSX100 to 630 VigiPacT Add-on Fixed Version	E-37
ComPacT NSX100 to 630 Plug-in Version	E-38
ComPacT NSX100 to 630 Withdrawable Version	E-40
ComPacT NSX100 to 630 VigiPacT Add-on Plug-in and Withdrawable Versions.....	E-42
Visu Function for ComPacT NSX100 to 250 Fixed Version	E-43
Visu Function for ComPacT NSX400/630 Fixed Version	E-44
Motor Mechanism Module for ComPacT NSX100 to 630	E-45
Direct Rotary Handle for ComPacT NSX100 to 630	E-46
MCC and CNOMO Type Direct Rotary Handles for ComPacT NSX100 to 630 Fixed Version	E-47
Extended Rotary Handle for ComPacT NSX100 to 630	E-48
Indication and Measurement Modules for ComPacT NSX100 to 630 Fixed Version.....	E-49
One-Piece Spreader for ComPacT NSX100 to 250 Fixed Version	E-50
External Modules	E-51
FDM121 Switchboard Display	E-52
FDM128 Switchboard Display	E-53

ComPacT NSX Front-Panel Accessories

ComPacT NSX100 to 630	E-54
-----------------------------	------

ComPacT NSX Front-Panel Cutouts

ComPacT NSX100 to 630 Fixed Version	E-56
ComPacT NSX100 to 630 VigiPacT Add-on Fixed Version	E-58
ComPacT NSX100 to 630 Plug-in and Withdrawable Versions....	E-60
ComPacT NSX100 to 630 VigiPacT Add-on Plug-in and Withdrawable Versions.....	E-61
Visu Function for ComPacT NSX100 to 630 Fixed Version	E-62
Motor Mechanism Module for ComPacT NSX100 to 630 with/without VigiPacT Add-on	E-63
Direct Rotary Handle for ComPacT NSX100 to 630 with/without VigiPacT Add-on	E-64

Other Chapters

Select Circuit Breakers and Switch-Disconnectors	A-1
Select Protection	B-1
Customize Circuit Breakers with Accessories.....	C-1
Smart Panel Integration	D-1
Catalog Numbers	F-1
Glossary	G-1
Additional Characteristics.....	H-1

Switchboard Integration

ComPacT NSX Power Connections

ComPacT NSX100 to 630 with/without VigiPacT Add-on Fixed Version.....	E-66
ComPacT NSX100 to 630 with/without VigiPacT Add-on Plug-in and Withdrawable Versions	E-70
Connection of Insulated Bars or Cables with Lugs to ComPacT NSX100 to 630 with/without VigiPacT Add-on.....	E-74
Connection of Bare Cables to ComPacT NSX100 to 630 with/without VigiPacT Add-on	E-75

ComPacT NSXm

Auxiliaries	E-76
SDx Module for MicroLogic Vigi 4.1 (ELCB).....	E-77
Communication.....	E-78

ComPacT NSX

Fixed Circuit Breakers.....	E-79
Plug-in/Withdrawable Circuit Breakers.....	E-81
Motor Mechanism	E-83
SDx Module with MicroLogic.....	E-85
SDTAM Module with MicroLogic M	E-86
Communication.....	E-87

Other Chapters

Select Circuit Breakers and Switch-Disconnectors	A-1
Select Protection	B-1
Customize Circuit Breakers with Accessories.....	C-1
Smart Panel Integration	D-1
Catalog Numbers	F-1
Glossary	G-1
Additional Characteristics.....	H-1

ComPacT NSX & NSXm

Operating and Installation Conditions

ComPacT NSXm may be mounted vertically, horizontally or flat on their back or on their side without any derating of characteristics.

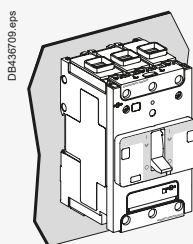


Fixed Circuit Breakers

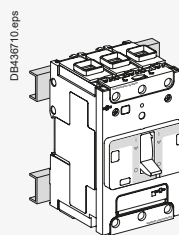
ComPacT NSXm may be mounted vertically, horizontally or flat on their back or on their side without any derating of characteristics.

These devices can be mounted on a DIN rail using the integrated DIN rail mounting feature.

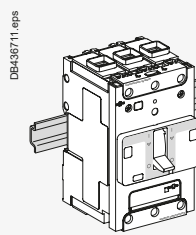
For backplate mounting, the devices are supplied with two mounting screws (M4), washers and nuts. These mounting screws can be inserted through mounting holes molded into the device case and threaded into the mounting enclosure, rails or plate.



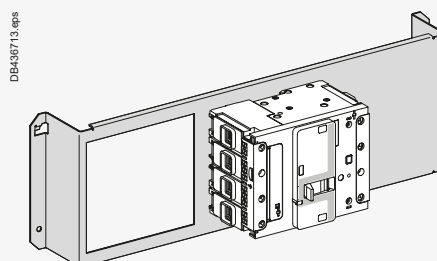
Mounting on a backplate



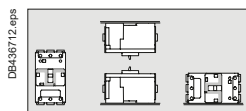
Mounting on rails



Mounting on DIN rail



Mounting on a Prisma mounting plate



Fixed device installation positions



ComPacT NSX & NSXm

Operating and Installation Conditions

ComPacT NSX circuit breakers may be installed horizontally, vertically or flat on their back, without derating performance levels.

There are three installation versions:

- Fixed
- Plug-in (on a base)
- Withdrawable (on a chassis).

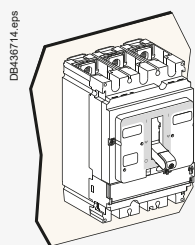
For the last two, components must be added (base, chassis) to the fixed version.

Many connection components are shared by the three versions.

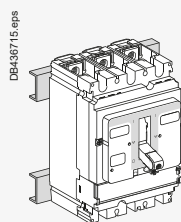
Fixed Circuit Breakers

Fixed circuit breakers are designed for standard connection using bars or cables with lugs. Bare-cable connectors are available for connection to bare copper or aluminium cables.

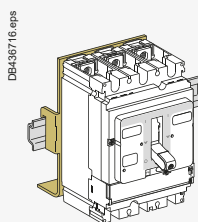
For connection of large cables, a number of solutions with spreaders may be used for both cables with lugs or bare cables.



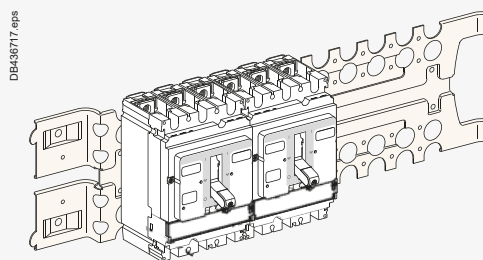
Mounting on a backplate



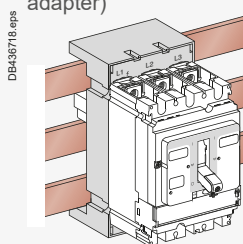
Mounting on rails



Mounting on DIN rail (with adapter)



Mounting on a Prisma mounting plate

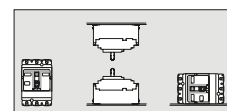


Mounting on busbars with an adapter



Fixed ComPacT NSX250

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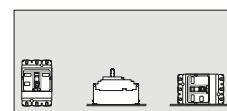
Fixed device installation positions

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Plug-in ComPacT NSX250

PB105121-Q.eps



Withdrawable device installation positions

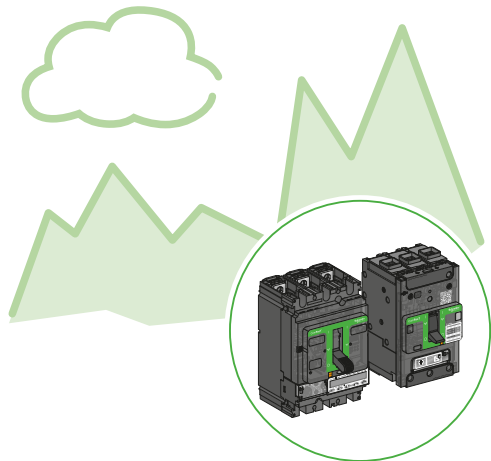
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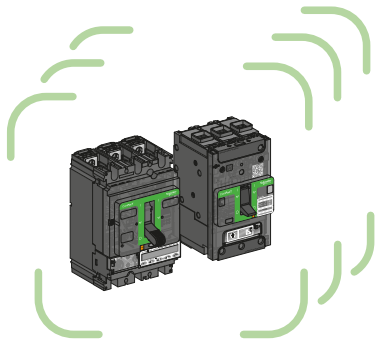
ComPacT NSX & NSXm

Operating and Installation Conditions

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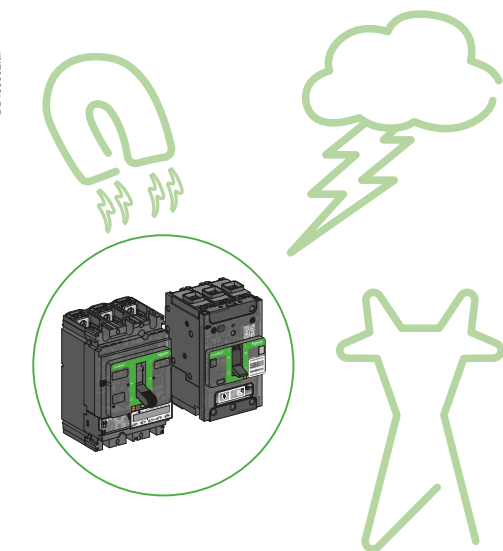


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Altitude Derating

Altitude does not significantly affect the characteristics of ComPacT NSX and NSXm circuit breakers up to 2000 m. Above this altitude, it is necessary to take into account the decrease in the dielectric strength and cooling capacity of air.

The following table gives the corrections to be applied for altitudes above 2000 m. The breaking capacities remain unchanged.

Altitude (m)		2000	3000	4000	5000
Impulse withstand voltage (kV)		8	7.1	6.4	5.6
Insulation voltage (V)	Ui	800	710	635 ^[1]	560
for ELCB ^[3]	Ui	500	445	400	350
Maximum operating voltage (V)	Ue	1000	886	790	696
for NSX400K					
Maximum operational voltage (V)	Ue	690	690	635 ^[1]	560
for ELCB ^[3]	Ue	440	440	400	350
Average current capacity (A)	In x	1.0	0.98 ^[2]	0.96	0.94
at 40 °C					

Vibrations

ComPacT NSX and NSXm devices resist mechanical vibrations.

They meet IEC 60068-2-6:

- 2.0 to 13.2 Hz and amplitude ± 1 mm
- 13.2 to 100 Hz acceleration ± 0.7 g.

Excessive vibration may cause tripping, breaks in connections or damage to mechanical parts.

Electromagnetic Disturbances

ComPacT NSX and NSXm devices are protected against:

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

ComPacT NSX and NSXm devices have successfully passed the electromagnetic-compatibility tests (EMC) defined by the international standards listed [page A-15](#).

These tests ensure that:

- No nuisance tripping occurs
- Tripping times are respected.

^[1] 640 for ComPacT NSX.

^[2] 0.99 for ComPacT NSX.

^[3] Earth Leakage Circuit Breaker.

Switchboard Integration

ComPacT NSX & NSXm

Operating and Installation Conditions

Protection Degree

Protection degree of the product, according to IEC 60529, depends of its configuration:

Colors	Definition
	IP54/65: side/front extended rotary handle
	IP40: front cover, side, back, long terminal shield, direct rotary handle
	IP20: power connection cover
	may be IP20 or less depending of the kind of power connections and cable size used

Power Supply from the Top or Bottom

ComPacT NSXm circuit breakers can be supplied from either the top or the bottom, even when equipped with a MicroLogic Vigi 4.1 with integrated earth leakage protection, without any reduction in performance. This capability facilitates connection when installed in a switchboard.

All connection and insulation accessories can be used on circuit breakers supplied either from the top or bottom.

Power Supply from the Top or Bottom^[1]

ComPacT NSX circuit breakers can be supplied from either the top or the bottom, even when equipped with a VigiPacT add-on, without any reduction in performance. This capability facilitates connection when installed in a switchboard.

All connection and insulation accessories can be used on circuit breakers supplied either from the top or bottom.

^[1] All R, HB1, and HB2 circuit breakers are restricted for use as line-load connection. They can not have power fed into the bottom of the circuit breaker. They will be marked with Line and Load markings.

Weight

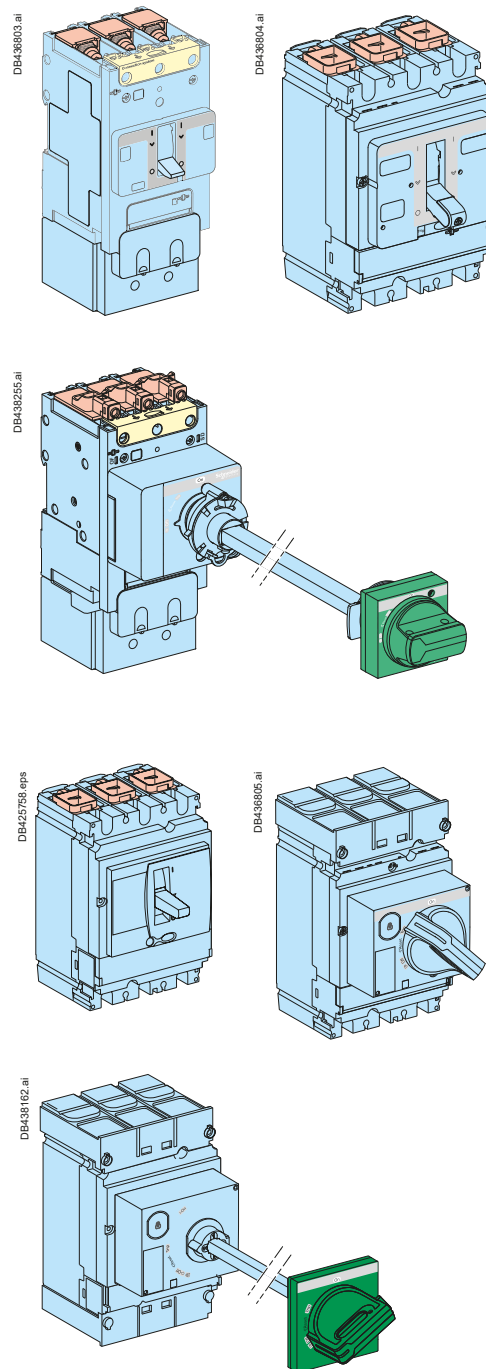
The table below presents the weights (in kg) of the circuit breakers and the main accessories, which must be summed to obtain the total weight of complete configurations. The values are valid for all performance categories.

Type of device		Circuit breakers	Base	Chassis	VigiPacT add-on	Visu module	Motor mech.
NSX100	3P/3D	2.05	0.8	2.2	0.87	2	1.2
	4P/4D	2.4	1.05	2.2	1.13	2.2	1.2
NSX160	3P/3D	2.2	0.8	2.2	0.87	2	1.2
	4P/4D	2.58	1.05	2.2	1.13	2.2	1.2
NSX250	3P/3D	2.4	0.8	2.2	0.87	2	1.2
	4P/4D	2.78	1.05	2.2	1.13	2.2	1.2
NSX400/630	3P/3D	6.19	2.4	2.2	2.8	4.6	2.8
	4P/4D	8.13	2.8	2.2	3	4.9	2.8

Compact™ NSXm Features Integrated Earth Leakage Protection



Compact™ NSXm Circuit Breaker Featuring Insulation Accessories



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ComPacT NSXm

Operating and Installation Conditions

Derating and Correction Factor Depending of Temperature

The overload protection is calibrated at 40 °C in the lab. This means that when the ambient temperature is less or greater than 40 °C, the Ir protection pick-up is slightly modified.

Choosing the Right Rating Depending on the Temperature:

Over the reference temperature of 40 °C, the circuit breaker has to be derated following the table below:

Temperature derating for thermal-magnetic (TM-D) NSXm at In

Temperature °C

40	45	50	55	60	65	70
----	----	----	----	----	----	----

Rating (A) In

16	16	15	15	14	14	13
25	24	24	23	23	22	21
32	31	30	30	29	28	27
40	39	38	37	36	34	33
50	49	48	46	45	44	42
63	61	60	58	56	54	53
80	77	73	70	67	64	60
100	96	94	90	87	83	80
125	120	117	113	109	104	100
160	155	149	144	139	133	126

Temperature derating for NSXm with MicroLogic Vigi 4.1 at In

Temperature °C

40	45	50	55	60	65	70
----	----	----	----	----	----	----

Rating (A) In

25	25	25	25	25	25	25
50	50	50	50	50	50	50
100	100	100	100	100	100	100
160	155	150	145	140	135	130

Switchboard Integration

ComPacT NSXm

Operating and Installation Conditions

Doing the Setting or Calculating the Tripping Time for a Given Temperature:

After having determine the corrected ratio I/I_n , the tripping time at 40 °C is defined with the tripping curves (see pages H-2 to H-3).

To obtain the right setting or the tripping time at a different temperature, the ratio I/I_n has to be corrected with the correction factor below:

Correction factor table for thermal magnetic (TM-D) NSXm to determine setting or tripping time at I_n

Rating (A) I_n	Temperature °C												
	10	15	20	25	30	35	40	45	50	55	60	65	70
16	1.16	1.13	1.11	1.08	1.05	1.03	1.00	0.97	0.94	0.91	0.88	0.85	0.81
25	1.13	1.11	1.09	1.07	1.05	1.02	1.00	0.98	0.95	0.93	0.90	0.88	0.85
32	1.14	1.11	1.09	1.07	1.05	1.02	1.00	0.98	0.95	0.93	0.90	0.87	0.84
40	1.15	1.12	1.10	1.08	1.05	1.03	1.00	0.97	0.95	0.92	0.89	0.86	0.83
50	1.13	1.11	1.09	1.07	1.05	1.02	1.00	0.98	0.95	0.93	0.90	0.87	0.85
63	1.14	1.12	1.10	1.07	1.05	1.02	1.00	0.97	0.95	0.92	0.89	0.86	0.83
80	1.21	1.18	1.14	1.11	1.07	1.04	1.00	0.96	0.92	0.88	0.83	0.80	0.75
100	1.18	1.16	1.12	1.10	1.06	1.04	1.00	0.96	0.94	0.90	0.87	0.83	0.80
125	1.17	1.14	1.11	1.08	1.06	1.03	1.00	0.96	0.93	0.90	0.87	0.84	0.80
160	1.17	1.15	1.12	1.09	1.06	1.03	1.00	0.97	0.93	0.90	0.87	0.83	0.79

Doing the right setting depending of the temperature:

Example: What is the setting to obtain a real I_r of 105 A, taking into account the temperature, for a ComPacT NSXm 125 A?

The necessary dial setting, in amperes, is shown below.

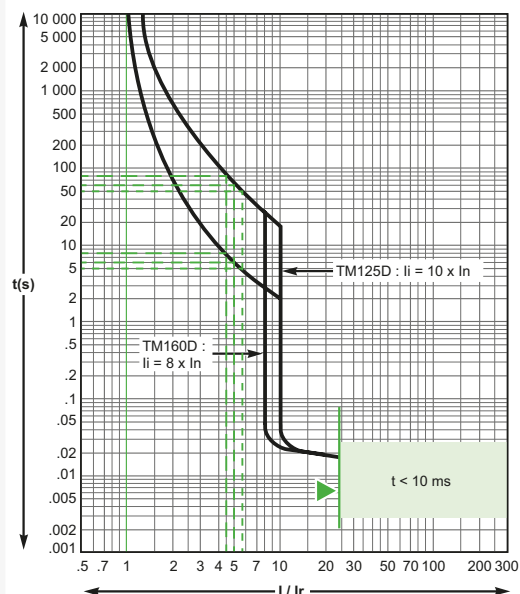
- At 40 °C, $I_r = 105/1 = 105$ A
- At 20 °C, $I_r = 105/1.11 = 95$ A
- At 60 °C, $I_r = 105/0.87 = 121$ A.

Calculating the tripping time at $I_r = I_n$ for a given temperature:

Example: What is the tripping time of a ComPacT NSXm 100A at $I_r = I_n$ for an overload of 500 A?

- At 40 °C, $I/I_r = 5$, tripping time is between 6 and 60 seconds
- At 20 °C, $I/I_r = 5/1.12 = 4.46$, tripping time is between 8 and 80 seconds
- At 60 °C, $I/I_r = 5/0.87 = 5.75$, tripping time is between 5 and 50 seconds

For $I_r = 0.7$ to $0.9 I_n$, additional correction factor need to be applied - please consult us.



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ComPacT NSXm

Safety Clearances and Minimum Distances

General Rules

When installing a circuit breaker, minimum distances (safety clearances) must be maintained between the device and panels, bars and other protection devices installed nearby. These distances, which depend on the ultimate breaking capacity, are defined by tests carried out in accordance with standard IEC 60947-2. If installation conformity is not checked by type tests, it is also necessary to:

- Use insulated bars for circuit-breaker connections
- Segregate the busbars using insulating screens.

For ComPacT NSXm devices, terminal shields and interphase barriers are recommended and may be mandatory depending on the kind of power connections of the device and type of installation.

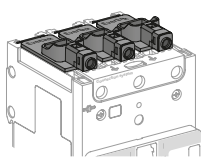
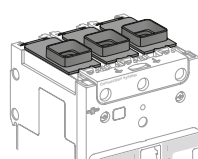
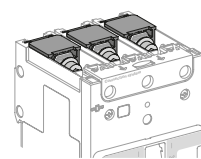
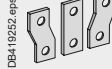
Power Connections

The table below indicates the rules to be respected for ComPacT NSXm devices to ensure insulation of live parts for the various types of connection.

Connection accessories such as crimp lugs, power distribution connectors, and spreaders are supplied with interphase barriers.

Long terminal shields provide a degree of protection of IP40 (ingress) and IK07 (mechanical impact).

ComPacT NSXm: Rules to Be Respected to Ensure Insulation of Live Parts

	EverLink connector with or without control wire terminal	Mechanical lug connector	Compression lug/ busbar connector							
	 DB438721.eps	 DB438722.eps	 DB438723.eps							
Insulation Accessory Options Per Conductor Type										
Type of conductor	No insulating accessory	Interphase barriers	Long terminal shield	No insulating accessory	Interphase barriers	Long terminal shield	No insulating accessory	Interphase barriers	Long terminal shield	
Cables  DB419248.eps	Possible	-	-	Possible	Possible	Possible	-	-	-	
Insulated bars  DB419249.eps	-	-	-	-	-	-	Possible ^[2]	Possible	Possible	
Cables + crimp lugs  DB419250.eps	-	-	-	-	-	-	Forbidden	Mandatory ^[3]	Possible ^[1]	
Cables + crimp lugs with heat-shrinkable sheath  DB419251.eps							Possible ^[2]	Possible	Possible	
Extension terminals: spreader  DB419252.eps	-	-	-	-	-	-	Forbidden	Mandatory ^[4]	-	

^[1] Instead of phase barriers.

^[2] Safety air clearance of 8 mm has to be respected between live parts.

^[3] When > 5 mm clearance between devices Interphase barriers are mandatory otherwise for < 5 mm Long terminal shields are mandatory.

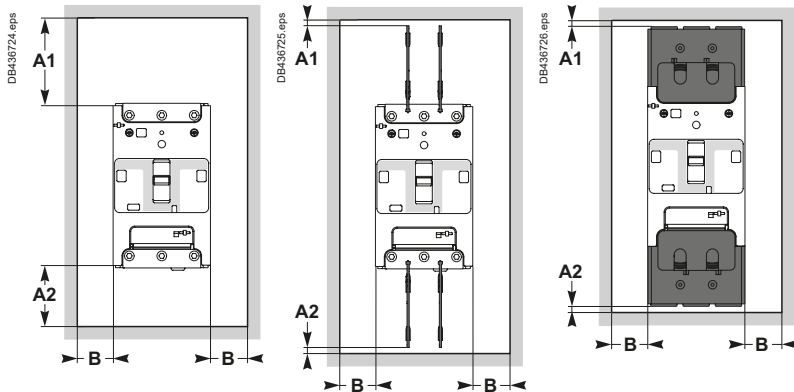
^[4] When > 5 mm clearance between devices Interphase barriers are mandatory otherwise > 5 mm clearance between devices is forbidden.

Note: For uninsulated bar connections, please consult us.

Safety Clearances and Minimum Distances

IEC Standard

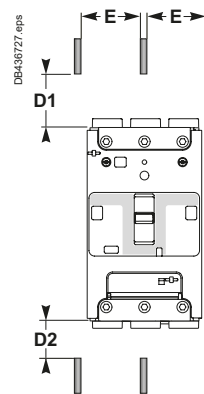
Minimum Safety Clearances



Operating voltage	Clearance (mm)						
	Between devices	Between device and sheet metal					
		Painted sheet metal			Bare sheet metal		
$U \leq 690 \text{ V}$		A1	A2	B	A1	A2	B
for devices equipped with:							
no accessories	0	30 mm	5 mm	0	40 mm	5 mm	5 mm
interphase barriers ^[1]	0	0	0	0	0	0	5 mm
long terminal shields	0	0	0	0	0	0	5 mm

^[1] 20 mm clearance when using spreaders and 5mm clearance when using crimp lugs between devices is mandatory.

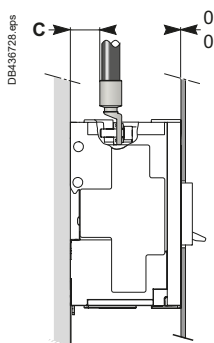
Minimum Safety Clearances to Bare Busbars



Operating voltage	Clearances to live bare busbars ^[2]			
	Spacing $E \leq 60 \text{ mm}$		Spacing $E > 60 \text{ mm}$	
	D1	D2	D1	D2
$U \leq 690 \text{ V}$	200 mm	100 mm	120 mm	60 mm

^[2] These clearances can be reduced for special installations as long as the configuration is checked by tests.

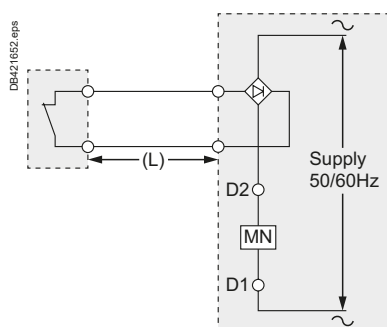
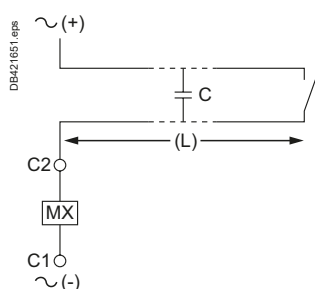
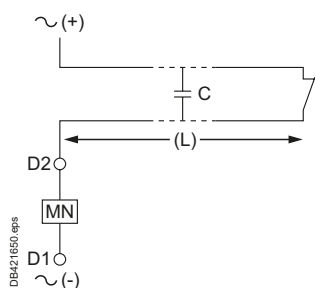
Compression Lug Safety Clearance



An insulating screen or long terminal shield is required if $C < 8 \text{ mm}$.

ComPacT NSXm

Voltage Release Wiring Rules



Shunt Trip (MX) and Undervoltage Release (MN)

Recommended maximum cable lengths

In certain circumstances, high cable capacitance due to an excessive cable length could prevent an undervoltage release MN from dropping out resulting in safety issues. In case of a shunt trip MX, an untimely trip may occur due to capacitive current leak.

To avoid these dysfunction due to cable capacitance C, the maximum cable length (L) is defined by the following table for a 1.5 mm² cable.

Power supply voltage (Un)	Maximum cable length undervoltage trip (MN) ^[1]	Shunt trip (MX) ^[1]
24 V AC	1 243 m	3 653 m
24 V DC	unlimited	> 3653 m
48 V AC	583 m	1 667 m
48 V DC	unlimited	> 1667 m
110...130 V AC	126 m	913 m
110...130 V DC	unlimited	> 913 m
208-240 V AC	109 m	160 m
250 V DC	unlimited	> 160 m
277 V AC	98 m	120 m
380-415 V AC	86 m	80 m
440-480 V AC	56 m	67 m

^[1] Make sure auxiliaries supply voltage is within working range (0.85 Un mini...1.1 Un maxi).

If a longer cable length is required, several solutions are possible to counteract excessive cable capacitance:

- Use DC operated auxiliaries
- Use lower control voltage (make sure auxiliaries supply voltage is within working range: 0.85 Un minimum...1.1 Un maximum)
- If high voltage and long control cables are required for an AC undervoltage release (MN), add a rectifier bridge (ref LV426899 – DIN rail compatible) in the control circuit. It will prevent drop out problems but increase operating time.

Electrical Characteristics of MN/MX

Characteristics			AC	DC
Rated voltage (V)			24, 48, 110...130, 208...240, 277, 380...415, 440...480	24, 48, 125, 250
Power requirements	MX	Pickup (< 50 ms)	< 6 VA	< 10 W
		Seal-in	< 4 VA	< 1 W
	MN		< 7 VA	< 2 W
Clearing time (ms)			< 50	< 50
Operating range			up to 1.1 Un	

Switchboard Integration

ComPacT NSXm

Power Loss/Resistance

ComPacT NSXm thermal power loss values are used to calculate total temperature rise in the switchboard in which the circuit breakers are installed.

The values indicated in the tables below are typical values for a device at full rated load and 50/60 Hz.

Power loss per pole (P/pole) in Watts (W)

The value indicated is the power loss at I_n , 50/60 Hz, for a three-pole or four-pole circuit breaker. Measurement and calculation of power loss are carried out in compliance with the recommendations of Annex G of standard IEC 60947-2.

Resistance per pole (R/pole) in milliohms (mΩ)

The value of the resistance per pole is provided as a general indication for a new device.

The value of the contact resistance is determined on the basis of the measured voltage drop, in accordance with the manufacturer's test procedure.

Note: This measurement is not sufficient to determine the quality of the contacts, i.e. the capacity of the circuit breaker to carry its rated current.

Calculation of total power loss

Total power loss at full rated load and 50/60 Hz is equal to power losses per pole multiplied by the number of poles (3 or 4).

ComPacT NSXm with TM-D

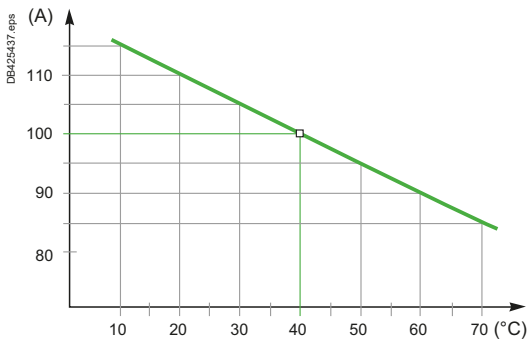
Rating (A)	R total/pole (mΩ)	P/Pole (W)
16	8.87	2.3
25	4.50	2.8
32	3.10	3.3
40	2.30	3.8
50	1.85	4.6
63	1.44	5.7
80	0.90	5.8
100	0.75	7.5
125	0.59	9.3
160	0.53	13.7

ComPacT NSXm with MicroLogic Vigi 4.1

Rating (A)	R total/pole (mΩ)	P/Pole (W)
25	2.44	1.5
50	0.48	1.2
100	0.48	4.8
160	0.48	12.3

ComPacT NSX Temperature Derating Equipped with Thermal-Magnetic Trip Units

When thermal-magnetic trip units are used at ambient temperatures other than 40 °C, the Ir pick-up is modified.



Derating and Correction Factor Depending of Temperature

The overload protection is calibrated at 40 °C in the lab. This means that when the ambient temperature is less or greater than 40 °C, the Ir protection pick-up is slightly modified.

Choosing the Right Rating Depending of the Temperature:

Over the reference temperature of 40 °C, the circuit breaker has to be derated following the table below:

Temperature derating for thermal-magnetic (TM-D) NSX at In

Temperature °C						
40	45	50	55	60	65	70
Rating (A) In						
16	15.6	15.2	14.8	14.5	14	13.8
25	24.5	24	23.5	23	22	21
32	31.3	30.5	30	29.5	29	28.5
40	39	38	37	36	35	34
50	49	48	47	46	45	44
63	61.5	60	58	57	55	54
80	78	76	74	72	70	68
100	97.5	95	92.5	90	87.5	85
125	122	119	116	113	109	106
160	156	152	148	144	140	136
200	195	190	185	180	175	170
250	244	238	231	225	219	213

Doing the Setting or Calculating the Tripping Time for a Given Temperature:

After having determine the corrected ratio I/I_n , the tripping time at 40 °C is defined with the tripping curves (see pages H-5 to H-7).

To obtain the right setting or the tripping time at a different temperature, the ratio I/I_n has to be corrected with the correction factor below:

Correction factor table for thermal magnetic (TM-D) NSX to determine setting or tripping time at In

Rating (A) In	Temperature °C												
	10	15	20	25	30	35	40	45	50	55	60	65	70
16	1.15	1.17	1.13	1.13	1.06	1.04	1.00	0.98	0.95	0.93	0.91	0.88	0.86
25	1.15	1.12	1.10	1.08	1.05	1.02	1.00	0.98	0.96	0.94	0.92	0.88	0.84
32	1.15	1.13	1.10	1.07	1.05	1.03	1.00	0.98	0.95	0.94	0.92	0.91	0.89
40	1.15	1.13	1.10	1.08	1.05	1.03	1.00	0.98	0.95	0.93	0.9	0.88	0.85
50	1.15	1.12	1.10	1.08	1.05	1.02	1.00	0.98	0.96	0.94	0.92	0.90	0.88
63	1.14	1.13	1.10	1.08	1.05	1.03	1.00	0.98	0.95	0.92	0.90	0.87	0.86
80	1.15	1.13	1.10	1.08	1.05	1.03	1.00	0.98	0.95	0.93	0.90	0.88	0.85
100	1.15	1.13	1.10	1.08	1.05	1.03	1.00	0.98	0.95	0.93	0.90	0.88	0.85
125	1.15	1.128	1.10	1.07	1.05	1.02	1.00	0.98	0.95	0.93	0.90	0.87	0.85
160	1.15	1.125	1.10	1.08	1.05	1.03	1.00	0.98	0.95	0.93	0.90	0.88	0.85
200	1.15	1.125	1.10	1.08	1.05	1.03	1.00	0.98	0.95	0.93	0.90	0.88	0.85
250	1.15	1.124	1.11	1.08	1.05	1.02	1.00	1.63	0.95	0.92	0.90	0.88	0.85

For $I_r = 0.7$ to $0.9 I_n$, additional correction factor need to be applied - please consult us.

ComPacT NSX Temperature Derating Equipped with Thermal-Magnetic Trip Units

Example 1. What is the tripping time of a ComPacT NSX100 equipped with a TM100D trip unit set to 100 A, for an overload $I = 500$ A?

The overload I/I_r is calculated as a function of the temperature. Use the above values and the curve on [page H-6](#) (shown on the left) to determine the corresponding time.

- At 40 °C, $I_r = 100$ A, $I/I_r = 5$ and the tripping time is between 6 and 60 seconds.
- At 20 °C, $I_r = 110$ A, $I/I_r = 4.54$ and the tripping time is between 8 and 80 seconds.
- At 60 °C, $I_r = 90$ A, $I/I_r = 5.55$ and the tripping time is between 5 and 50 seconds.

Example 2. What is the setting to obtain a real I_r of 210 A, taking into account the temperature, for a ComPacT NSX250 equipped with a TM250D trip unit?

The necessary dial setting, in amperes, is shown below.

- At 40 °C, $I_r = (210/250) \times 250$ A = 210 A
- At 20 °C, $I_r = (210/277) \times 250$ A = 189.5 A
- At 60 °C, $I_r = (210/225) \times 250$ A = 233 A

Additional Derating Coefficient for an Add-on Module

The values indicated in the previous tables are valid for **fixed** circuit breakers equipped with one of the following modules:

- VigiPacT add-on
- VigiPacT add-on alarm
- Current-transformer module.

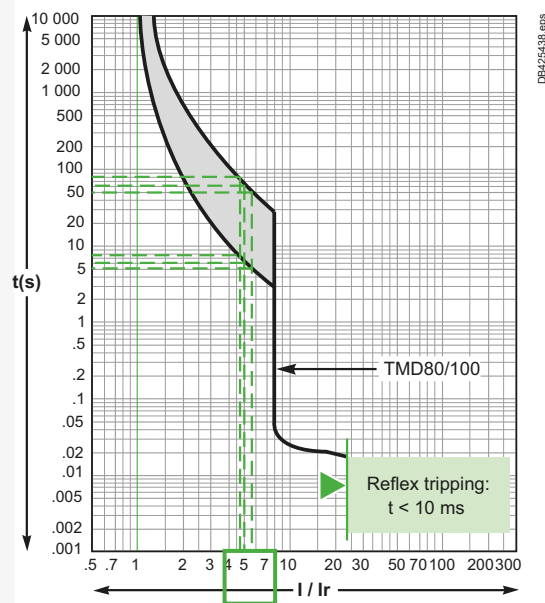
They also apply for **plug-in or withdrawable** circuit breakers equipped with:

- Current-transformer module.

However, for **plug-in or withdrawable** circuit breakers equipped with a VigiPacT add-on or a VigiPacT add-on alarm, the coefficient 0.84 must be applied.

The table below sums up the situation for add-on modules.

Type of device	Circuit breaker	TM-D trip-unit rating	VigiPacT add-on or VigiPacT add-on alarm	Current transformer module, or PowerTag NSX
Fixed	NSX100	16 to 100	1	1
	NSX160 to 250	125 to 160		
	NSX250	200 to 250		
Plug-in or withdrawable	NSX100	16 to 100	0.84	
	NSX160	125 to 160		
	NSX250	200 to 250		



Example 1. Fault $I = 500$ A

I/I_r	4.5	5	5.5
$T^{\circ}\text{C}$	20 °C	40 °C	60 °C
$t_{\text{min.}}$	8 s	6 s	5 s
$t_{\text{max.}}$	80 s	60 s	50 s

Thermal-protection curve with minimum and maximum values

ComPacT NSX Temperature Derating

Equipped with Electronic Trip Units

Changes in temperature do not affect measurements by electronic trip units.

- The built-in CT sensors with Rogowski toroids measure the current.
- The control electronics compare the value of the current to the settings defined For 40 °C.

Because temperature has no effect on the toroid measurements, the tripping thresholds do not need to be modified.

However, the temperature rise caused by the flow of current and the ambient temperature increase the temperature of the device. To avoid reaching the thermal withstand level of the equipment, it is necessary to limit the current flowing through the device, i.e. the maximum I_r setting as a function of the temperature.

ComPacT NSX100/160/250

The table below indicates the maximum long-time (LT) protection setting I_r (A) depending on the ambient temperature.

Type of device	Rating (A)	Temperature (°C)						
		40	45	50	55	60	65	70
NSX100/160								
Fixed, plug-in	100	no derating						
or withdrawable	160	no derating						
NSX250 + MicroLogic 2.2/5.2/6.2								
Fixed	250	250	250	250	245	237	230	225
Plug-in or withdr.	250	250	245	237	230	225	220	215
NSX250 + MicroLogic Vigi 4.2/7.2								
Fixed	250	250	250	245	237	230	225	218
Plug-in or withdr.	250	225	220	215	210	205	198	190

ComPacT NSX400 and 630

The table below indicates the maximum long-time (LT) protection setting I_r (A) depending on the ambient temperature.

Type of device	Rating (A)	Temperature (°C)						
		40	45	50	55	60	65	70
NSX400 + MicroLogic 2.3/5.3/6.3								
Fixed	400	400	400	400	390	380	370	360
Plug-in/withdr.	400	400	390	380	370	360	350	340
NSX400 + MicroLogic Vigi 4.3/ 7.3								
Fixed	400	400	400	390	380	370	360	350
Plug-in/withdr.	400	400	390	380	370	360	350	340
NSX630 + MicroLogic 2.3/5.3/6.3								
Fixed	630	630	615	600	585	570	550	535
Plug-in/withdr.	630	570	550	535	520	505	490	475
NSX630 + MicroLogic Vigi 4.3/7.3								
Fixed	630	570	555	540	530	515	500	485
Plug-in/withdr.	630	480	470	457	445	435	420	405

Example A fixed ComPacT NSX400 equipped with a MicroLogic can have a maximum I_r setting of:

- 400 A up to 50 °C
- 380 A up to 60 °C.

ComPacT NSX Temperature Derating

Equipped with Electronic Trip Units

Additional Derating Coefficient for an Add-on Module

For **fixed** or **plug-in/withdrawable** circuit breakers, the addition of a:

- VigiPacT add-on
- VigiPacT add-on alarm
- Current-transformer module can modify the derating values.
Apply the coefficients shown below.

Derating of a ComPacT NSX equipped with a MicroLogic trip unit

Type of device	Circuit breaker	MicroLogic type	VigiPacT add-on or VigiPacT add-on alarm	PowerTag NSX	Coupling busbar	Current transformer
Fixed	NSX100	2.2/5.2/6.2	1	1	1	1
		4.2/7.2	-		1	
	NSX160	2.2/5.2/6.2	1		1	
		4.2/7.2	-		1	
	NSX250	2.2/5.2/6.2	1		1	
		4.2/7.2	-		0.95	
Plug-in or withdrawable	NSX100	2.2/5.2/6.2	1		-	
		4.2/7.2	-			
	NSX160	2.2/5.2/6.2	1			
		4.2/7.2	-			
	NSX250	2.2/5.2/6.2	0.86			
		4.2/7.2	-			
Fixed	NSX400	2.3/5.3/6.3	0.97	0.97	1	1
		4.3/7.3	-		0.97	
	NSX630	2.3/5.3/6.3	0.9	0.9	1	
		4.3/7.3	-		0.9	
Plug-in or withdrawable	NSX400	2.3/5.3/6.3	0.97	1	-	
		4.3/7.3	-			
	NSX630	2.3/5.3/6.3	0.9			
		4.3/7.3	-			

Note:

- Coupling busbar is forbidden with VigiPacT add-on.
- Current transformer is forbidden with VigiPacT add-on and coupling busbar.
- Coupling busbar is forbidden with withdrawable installation.
- To provide the Visu function, ComPacT NSX circuit breakers, with or without a VigiPacT add-on, are combined with INV switch-disconnectors.
Tripping values for the selected combination are indicated in the ComPacT INS/INV catalog.

ComPacT NSX Installation in Switchboards

Safety Clearances and Minimum Distances

General Rules

When installing a circuit breaker, minimum distances (safety clearances) must be maintained between the device and panels, bars and other protection devices installed nearby. These distances, which depend on the ultimate breaking capacity, are defined by tests carried out in accordance with standard IEC 60947-2.

If installation conformity is not checked by type tests, it is also necessary to:

- Use insulated bars for circuit-breaker connections
- Segregate the busbars using insulating screens.

For ComPacT NSX100 to 630 devices, terminal shields and interphase barriers are recommended and may be mandatory depending on the operating voltage of the device and type of installation (fixed, withdrawable, etc.).

Power Connections

The table below indicates the rules to be respected for ComPacT NSX100 to 630 devices to ensure insulation of live parts for the various types of connection.

- Fixed devices with front connection (FC) or rear connection (RC).
- Plug-in or withdrawable devices.

Connection accessories such as crimp lugs, bare-cable connectors, terminal extensions (straight, right-angle, double-L and 45°) and spreaders are supplied with interphase barriers.

Long terminal shields provide a degree of protection of IP40 (ingress) and IK07 (mechanical impact).

ComPacT NSX100 to 630: Rules to Be Respected to Ensure Insulation of Live Parts

Type of connection	Fixed, front connection			Fixed, rear connection	Plug-in or withdrawable			
Possible, recommended or mandatory accessories:	No insulating accessory	Interphase barriers	Long terminal shields	Short terminal shields	Short terminal shields	Short terminal shields		
With:								
operating voltage	type of conductor							
< 500 V	Insulated bars		Possible	Possible	Possible	Recommended	Recommended	Mandatory
	Extension terminals Cables + crimp lugs		No	Mandatory (supplied)	Possible (instead of ph. barriers)	Recommended	Recommended	Mandatory
	Bare cables + connectors		Possible for cable connectors NSX100 to 250	Possible for cable connectors NSX100 to 250	Possible for cable connectors NSX100 to 250	Recommended	Recommended	Mandatory
≥ 500 V	Insulated bars		No	No	Mandatory (use of short terminal shield possible)	Mandatory [2]	Mandatory [2]	Mandatory [2]
	Extension terminals Cables + crimp lugs		No	No	Mandatory	Mandatory [2]	Mandatory [2]	Mandatory [2]
	Bare cables + connectors		No	No	Mandatory	Mandatory [2]	Mandatory [2]	Mandatory [2]

[1] Long terminal shields, mandatory if the device is fixed through the door, whatever the voltage.

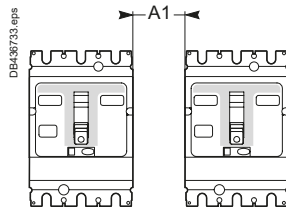
[2] LV433693 (3P) or LV433694 (4P) Short Terminal Shield are mandatory for R/HB1/HB2 400 A and 630 A performance.

ComPacT NSX Installation in Switchboards

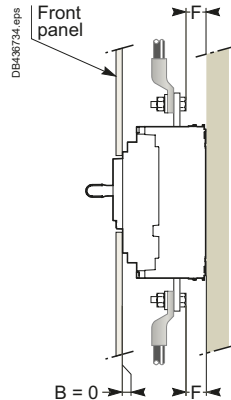
Installation Example

Safety Clearance

Minimum distance between two adjacent circuit breakers



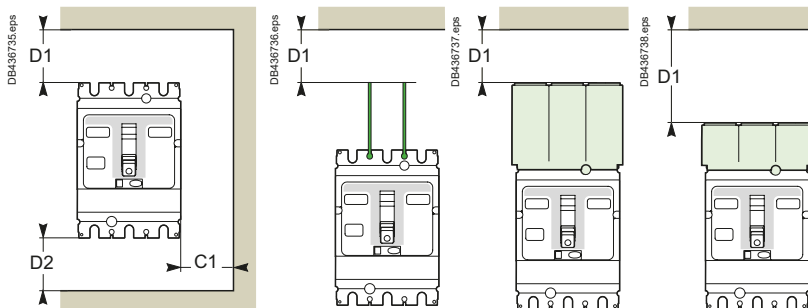
Minimum distance between circuit breaker and front or rear panels



Bare or painted sheetmetal

Note: If $F < 8$ mm: an insulating screen or long terminal shield is mandatory (see page C-23).

Minimum distance between circuit breaker and top, bottom or side panels



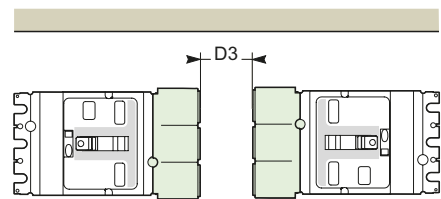
Devices without accessories

Devices with interphase barriers or long or short terminal shields

> ComPacT NSX High Performance User Guide



DOCA0187EN



Short terminal shield rear connected

Minimum safety clearances for ComPacT NSX100 to 630

Operating voltage	Clearance (mm)							
	Between devices		Between device and sheetmetal					
	A1	C1	Painted sheet metal		Bare sheet metal			
			D1	D2	C1	D1	D2	D3
$U \leq 440$ V								
for devices equipped with:								
■ No accessories	0	0	30	30	5	40	40	-
■ Short terminal shields	0	0	30	30	5	40	40	50
■ Interphase barriers	0	0	0	0	5	0	0	-
■ Long terminal shields	0	0	0	0	0	0	0	-
440 V < $U \leq 500$ V								
for devices equipped with:								
■ Short terminal shields	0	0	30	30	10	40	40	50
■ Interphase barriers ^[1]	0	0	0	0	20	10	10	-
■ Long terminal shields ^[2]	0	0	0	0	10	10	10	-
$U > 500$ V								
for devices equipped with:								
■ Short terminal shields	0	10	50	50	20	100	100	50
■ Long terminal shields	0	10	30	30	20	40	40	-

[1] Only for NSX100 to 250.

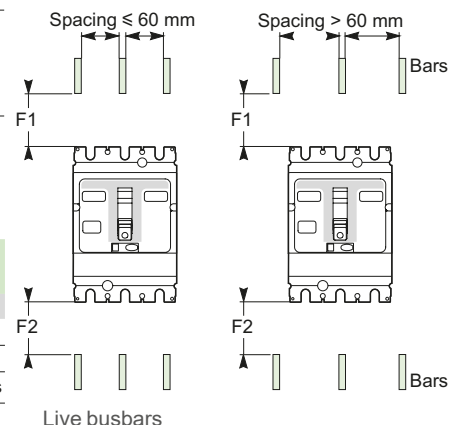
[2] For all cases.

Clearances with Respect to Live Bare Busbars

Minimum clearances for ComPacT NSX100 to 630

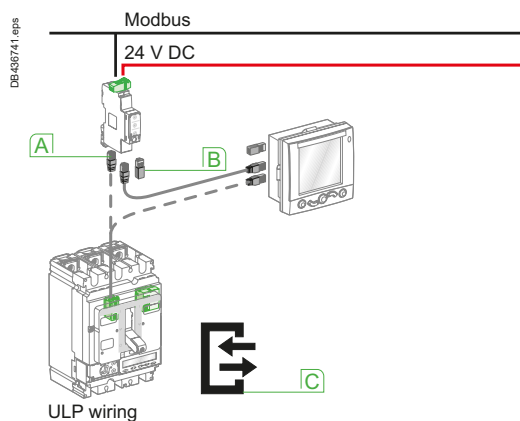
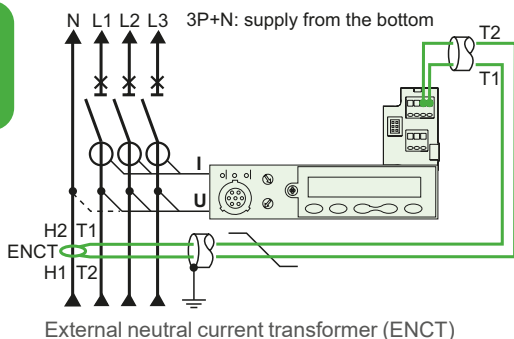
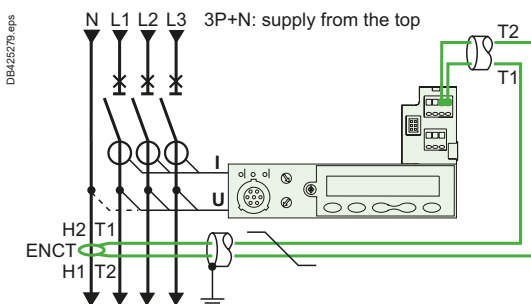
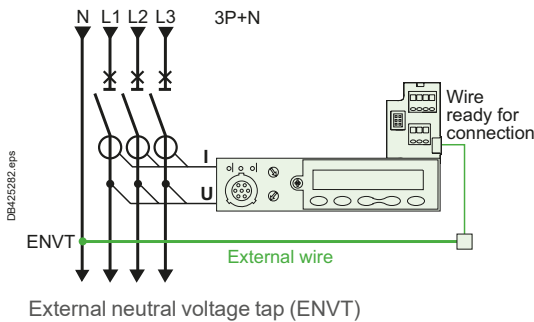
Operating voltage	Clearances with respect to live bare busbars			
	spacing ≤ 60 mm		spacing > 60 mm	
	F1	F2	F1	F2
$U < 440$ V	350	350	80	80
440 V $\leq U \leq 500$ V	350	350	120	120
$U > 500$ V	prohibited: insulating screen required between device and busbars			

These clearances can be reduced for special installations as long as the configuration is checked by tests



ComPacT NSX

Control Wiring



ULP connection system

- A** RJ45
- B** Line terminator
- C** ULP symbol

Remote Tripping by MN or MX Release

Power consumption is approximately:

- 30 VA for pick-up of the MN and MX releases
- 300 VA to 500 VA for the motor mechanism.

The table below indicates the maximum permissible cable length for different supply voltages and cable cross-sectional areas.

Recommended maximum cable lengths (in metres)

Power supply voltage (V DC)		12 V		24 V		48 V	
Cable cross-section (mm ²)		1.5	2.5	1.5	2.5	1.5	2.5
MN	U source 100 %	15	—	160	—	640	—
	U source 85 %	7	—	40	—	160	—
MX	U source 100 %	60	—	240	—	960	—
	U source 85 %	30	—	120	—	480	—
Motor mechanism	U source 100 %	—	—	10	16	65	110
	U source 85 %	—	—	2	4	17	28

Note: The indicated length is that of each of the two wires.

External Neutral Voltage Tap (ENVT)

This connection is required for accurate power measurements on 3-pole circuit breakers equipped with MicroLogic 5/6 E trip units in installations with a distributed neutral. It can be used to measure phase-neutral voltages and calculate power using the 3 wattmeter method.

ComPacT NSX 3-pole circuit breakers come with a wire installed on the device for the connection to the ENVT.

This wire is equipped with a connector for connection to an external wire with the following characteristics:

- Cross-sectional area of 1 mm² to 2.5 mm²
- Maximum length of 10 metres.

External Neutral Current Transformer (ENCT)

This connection is required to protect the neutral on 3-pole circuit breakers equipped with MicroLogic 5/6 E trip units in installations with a distributed neutral. For MicroLogic 6 E, it is required for type G ground-fault protection.

The ENCT is connected in the same way for fixed, plug-in or withdrawable devices:

- Fixed devices are connected via terminals T1 and T2 of the internal terminal block.
 - Plug-in and withdrawable devices are not connected via the auxiliary terminals.
- The wires must be connected/disconnected inside the device via terminals T1 and T2.

The ENCT must be connected to the MicroLogic trip unit by a shielded twisted pair. The shielding should be connected to the switchboard earth only at the CT end, no more than 30 cm from the CT.

- The power connections of the CT to the neutral (H2 and H1) must be made in the same way for power supply from the top or the bottom (see figure). Make sure they are not reversed for devices with power supply from the bottom.
- Cross-sectional area of 0.4 mm² to 1.5 mm²
- Maximum length of 10 metres.

ULP Connection System between MicroLogic, FDM121 Switchboard Display and Modbus Interface

The ULP (Universal Logic Plug) wiring system used by ComPacT NSX for connections through to the Modbus network requires neither tools nor settings. The prefabricated cords are used for both data transfer and distribution of 24 V DC power. Connectors on each component are identified by ULP (Universal Logic Plug) symbols, ensuring total compatibility between each component.

Available cords

All connections are made with prefabricated cords:

- NSX cord for connection of the internal terminal block to the Modbus interface or the FDM121 display via an RJ45 connector. The cord is available in three lengths, 0.35 m, 1.3 m and 3 m
- ULP cords with RJ45 connectors at each end for the other connections between components. The cord is available in six lengths, 0.3 m, 0.6 m, 1 m, 2 m, 3 m and 5 m. For greater distances, two cords can be interconnected using the RJ45 female/female accessory.

Maximum length of 10 m between 2 modules and 30 m in all.

A line terminator must be fitted to all components with an unused RJ45 connector.

External 24 V DC power-supply module (AD)

The external power-supply module makes it possible:

- To use the display even if the circuit breaker is open or not supplied (for the exact conditions of use, see the “electrical diagrams” part of this catalog)
- To display fault currents after tripping
- To modify settings when the circuit breaker is open (OFF position)

An external 24 V DC power supply is required for installation with communication, whatever the type of trip unit.

This module is not designed to power on 24 V DC voltage releases and electric motor mechanism.

This module powers both the control unit and the M2C programmable contacts. We recommended using the AD power supply due to its low stray primary secondary capacitance. Good operation of the MicroLogic control unit in noisy environment is not guaranteed with other power supplies.

If the COM option is used, a second dedicated power supply shall be used.

This module powers both the control unit and the M2C programmable contacts or ESM module.

Characteristics

- Power supply AC-to-DC or DC-to-DC
- Output voltage: 24 V DC $\pm 5\%$.
- Output current: 1 A.
- DIN rail or platine Fixing with Acti9 form factor
- Conducted emissions power line: class B per EN/IEC 61000-6-3

Wiring (See Page E-87)

MicroLogic 5/6/7 not using the Communication function

The external 24 V DC supply is connected via the circuit breaker terminal block. Use of a 24 V DC battery provides backup power for approximate 3 hours (100 mA) in the event of an interruption in the external supply.

MicroLogic 5/6/7 using the Communication function

The external 24 V DC supply is connected via the Modbus interface using a five-pin connector, including two for the power supply. Stacking accessories (see page D-2) can be used to supply a number of interfaces by fast clip-on connection. The 24 V DC power is distributed downstream by the ULP (Universal Logic Plug) communication cords with RJ45 connectors. This system ensures both data transfer and power distribution to the connected modules.

Recommendations for 24 V DC wiring

- Do not connect the positive terminal to earth.
- Do not connect the negative terminal to earth.
- The maximum length for each conductor (+/-) is ten metres.
- For connection distances greater than ten metres, the plus and minus conductors of the 24 V DC supply must be twisted to improve EMC.
- The 24 V DC conductors must cross the power cables perpendicularly. If this is difficult or impossible, the plus and minus conductors must be twisted.

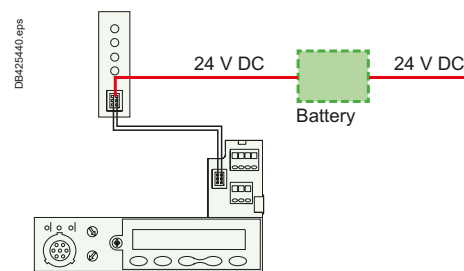
Modbus (See Page E-87)

Each ComPacT NSX circuit breaker equipped with MicroLogic 5/6/7 and an FDM121 display is connected to the Modbus network via the Modbus interface module.

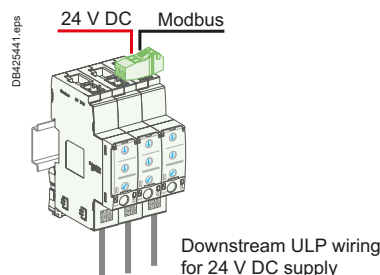
Connection of all the circuit breakers and other Modbus devices in the switchboard to a Modbus bus is made much easier by using a Modbus RJ45 junction block installed in the switchboard.

Recommendations for Modbus wiring

- The shielding may be earthed.
- The conductors must be twisted to improve immunity (EMC).
- The Modbus conductors must cross the power cables perpendicularly.



Power supply, without the Communication function, via the terminal block with a backup battery



Supply, with the Communication function, via the Modbus interface



External 24 V DC power supply module (AD)





ABL8 RPS power supply

24 V DC Universal Phaseo™ ABL8 Power Supplies

The Universal Phaseo ABL8 RPS 24050 and ABL8 RPS 24030 power supplies can be connected phaseto-neutral or phase-to-phase.

They deliver a voltage that is precise to 3%, whatever the load and whatever the value of the AC

supply, within the ranges 85 to 132 V AC and 170 to 550 V AC.

The Universal Phaseo ABL8 powers:

- Circuit breaker communication module and interface
- Programmable MicroLogic.

Characteristics

- Power supply AC-to-DC
- Network frequency: 50/60 Hz ($\pm 5\%$)
- Output voltage: 24 V DC $\pm 3\%$.
- Output current: 3 or 5 A
- DIN rail or platine Fixing
- Conducted emissions power line: class B per EN/IEC 61000-6-3

To assist cooling there must be sufficient clearance around the Universal range Phaseo power supplies:

- 50 mm above and below
- 10 mm on the side.

ABL8RPS●●●●		Module AD
Over Voltage Category	Cat I per VDE 0106-1	Cat IV per IEC 62477-1 (AC model) Cat III per IEC 62477-1 (DC model) Cat III per UL 61010-1
Degree of pollution as per IEC 60664-1	2	3
Input supply voltage AC	100...120 V AC and 200...500 V AC	110-130 or 200-240 V AC
Input supply voltage DC	N/A	24-30 or 48-60 or 100-125 V DC
Dielectric	Input/Output	4 kV rms -1 mn.
		3 kV rms - 1 mn. (110-130 V AC and 200-240 V AC model)
		3 kV rms - 1 mn. (110-125 V DC model)
	Input/Ground	3 kV rms - 1 mn.
	Output /Ground	2 kV rms - 1 mn. (24-30 V DC and 48-60 V DC model)
Temperature	Input/Ground	3 kV rms - 1 mn.
	Output /Ground	1.5 kV rms - 1 mn.
Output current	■ 50 °C	70°C
	■ 60 °C with 80 % of the rated current maximum	
Inrush current for 2 ms	3 A (ABL8RPS24030) 5 A (ABL8RPS24050)	1 A
Ripple	< 30 A	< 20 A
Output voltage limits	200 mV peak-peak	200 mV peak-peak
	24 to 28.8 V DC	22.8 to 25.2 V DC
Protection degree	IP20	IP4x front face/IP2x terminals/IP3x other

Note: For the applications requiring an over voltage category higher than 2, a surge arrester shall be associated to ABL8 RPS power supplies. The iQuick20pr type 2 surge arrester is recommended.

ComPacT NSX Power Loss/ Resistance

Equipped with Thermal-Magnetic Trip Units

ComPacT NSX thermal power loss values are used to calculate total temperature rise in the switchboard in which the circuit breakers are installed.

The values indicated in the tables below are typical values for a device at full rated load and 50/60 Hz.

Power loss per pole (P/pole) in Watts (W)

The value indicated is the power loss at I_n , 50/60 Hz, for a three-pole or four-pole circuit breaker. Measurement and calculation of power loss are carried out in compliance with the recommendations of Annex G of standard IEC 60947-2.

Resistance per pole (R/pole) in milliohms (mΩ)

The value of the resistance per pole is provided as a general indication for a new device.

The value of the contact resistance must be determined on the basis of the measured voltage drop, in accordance with the manufacturer's test procedure (ABT instruction document no. 1 - BEE - 02.2 -A).

Note: This measurement is not sufficient to determine the quality of the contacts, i.e. the capacity of the circuit breaker to carry its rated current.

Additional power loss

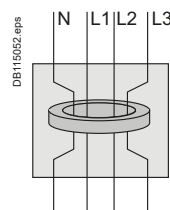
Additional power loss is equal to the sum of the power dissipated by the following:

- VigiPacT add-on: note that the deviation of the N and L3 bars required to pass through the toroid results in higher power losses compared to those of the L1 and L2 bars (diagram opposite). When calculating total power loss, use L1, L2, L3 for a 3P device and N, L1, L2, L3 for a 4P device
- Disconnecting contacts (plug-in and withdrawable devices)
- Transformer module.

Calculation of total power loss

Total power loss at full rated load and 50/60 Hz is equal to the sum of the device and additional power losses per pole multiplied by the number of poles (2, 3 or 4).

If a Vigi is installed, it is necessary to differentiate between N and L3 on one hand and L1 and L2 on the other.



With a VigiPacT add-on, the deviation of the N and L3 bars required to pass through the toroid results in higher power losses compared to those of the L1 and L2 bars

ComPacT NSX100 to 250 Equipped with TM-D and TM-G Trip Units

Type of device		Fixed device		Additional power/pole				
3/4 poles	Rat. (A)	R/pole	P/pole	VigiPacT add-on (N, L3)	VigiPacT add-on (L1, L2)	Plug-in/ withdr.	Transfo. module	PowerTag NSX module
NSX100	16	11.42	2.92	0	0	0	0	0
	25	6.42	4.01	0	0	0.1	0	0
	32	3.94	4.03	0.06	0.03	0.15	0.1	0
	40	3.42	5.47	0.10	0.05	0.2	0.1	0
	50	1.64	4.11	0.15	0.08	0.3	0.1	0.1
	63	2.17	8.61	0.3	0.15	0.4	0.1	0.1
	80	1.37	8.77	0.4	0.2	0.6	0.1	0.1
	100	0.88	8.8	0.7	0.35	1	0.2	0.2
NSX160	80	1.26	8.06	0.4	0.2	0.6	0.1	0.1
	100	0.77	7.7	0.7	0.35	1	0.2	0.2
	125	0.69	10.78	1.1	0.55	1.6	0.3	0.3
	160	0.55	13.95	1.8	0.9	2.6	0.5	0.5
NSX250	125	0.61	9.45	1.1	0.55	1.6	0.3	0.3
	160	0.46	11.78	1.8	0.9	2.6	0.5	0.5
	200	0.39	15.4	2.8	1.4	4	0.8	0.8
	250	0.3	18.75	4.4	2.2	6.3	1.3	1.3

ComPacT NSX100 to 630 Equipped with MA/1.3-M Trip Units

Type of device		Fixed device		Additional power/pole				
3 poles	Rat. (A)	R/pole	P/pole	VigiPacT add-on (N, L3)	VigiPacT add-on (L1, L2)	Plug-in/ withdr.	Transfo. module	PowerTag NSX module
NSX100	2.5	148.42	0.93	0	0	0	0	0
	6.3	99.02	3.93	0	0	0	0	0
	12.5	4.05	0.63	0	0	0	0	0
	25	1.66	1.04	0	0	0.1	0	0
	50	0.67	1.66	0.2	0.1	0.3	0.1	0.1
	100	0.52	5.2	0.7	0.35	1	0.2	0.2
	150	0.38	8.55	1.35	0.68	2.6	0.45	0.5
NSX160	220	0.3	14.52	2.9	1.45	4.89	0.97	1
NSX400	320	0.12	12.29	3.2	1.6	6.14	1.54	1.43
NSX630	500	0.1	25	13.99	7	15	3.75	3.5

ComPacT NSX Power Loss/ Resistance

Equipped with Electronic Trip Units

The values indicated in the table below are typical values for a device at full rated load and 50/60 Hz. The definitions and information are the same as that for circuit breakers equipped with thermal-magnetic trip units.

ComPacT NSX100 to 630 Equipped with MicroLogic Trip Units

Type of device		Fixed device				Additional power (W)/ pole				
3/4 poles	Rating (A)	R/pole (mΩ)		P/Pole (w)		VigiPacT add-on (N/ L3)	VigiPacT add-on (L1/L2)	Plug-In	Transfo Module	PowerTag NSX module
NSX + MicroLogic 2.2/5.2/6.2										
NSX100	<40 A	0.84		1.3		0.1	0.06	0.2	0.1	0
	40 A ≤ 100 A	0.47		4.7		0.7	0.35	1	0.2	0.2
NSX160	<40 A	0.73		1.2		0.4	0.2	0.6	0.1	0
	40 A ≤ 160 A	0.36		9.2		1.8	0.9	2.6	0.5	0.5
NSX250	<40 A	0.27		2.7		1.1	0.55	1.6	0.2	0
	40 A ≤ 250 A	0.28		17.6		4.4	2.2	6.3	1.3	1.3
NSX + MicroLogic 2.3/5.3/6.3										
NSX400	<400 A	0.12		19.2		3.2	1.6	9.6	2.4	2.24
NSX630	<630 A	0.1		39.7		6.5	3.25	19.49	5.95	5.56
NSX + MicroLogic add-on 4.2/7.2		N/L1/L3	L2	N/L1/L3	L2					
NSX100	<100 A	0.58	0.49	5.8	4.9	-	-	1	0.2	0.2
NSX160	<160 A	0.48	0.39	12.3	10.0	-	-	2.6	0.5	0.5
NSX250	<250 A	0.4	0.33	25	20.6	-	-	6.3	1.3	1.3
NSX + MicroLogic add-on 4.3/7.3										
NSX400	<400 A	0.16	0.14	25.6	22.4	-	-	9.6	2.4	2.24
NSX630 ^[1]	<630 A	0.14	0.12	55.6	47.6	-	-	19.49	5.95	5.56

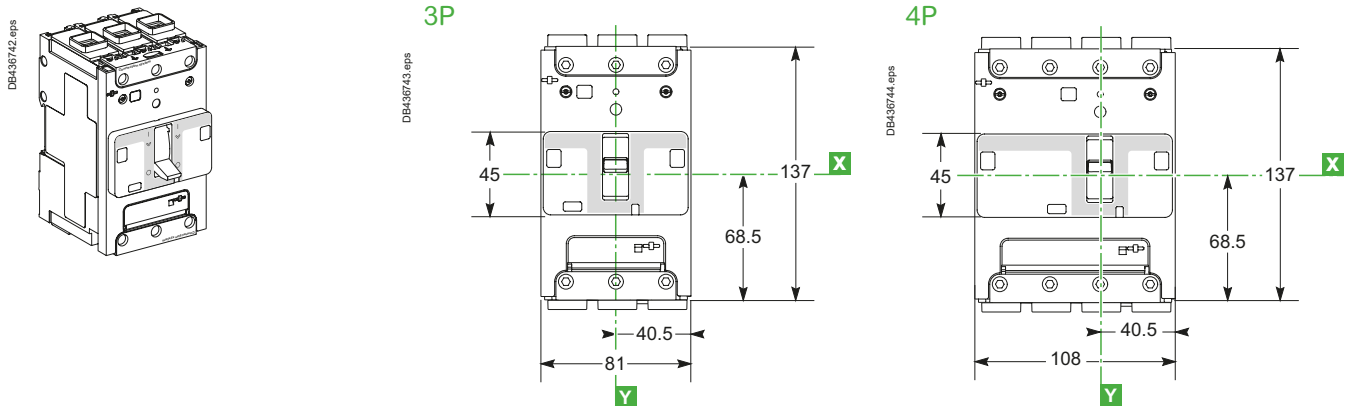
Power loss/resistance values presented above are not contractual.

[1] The power loss values for VigiPacT add-on and withdrawable circuit breakers are given for 570 A.

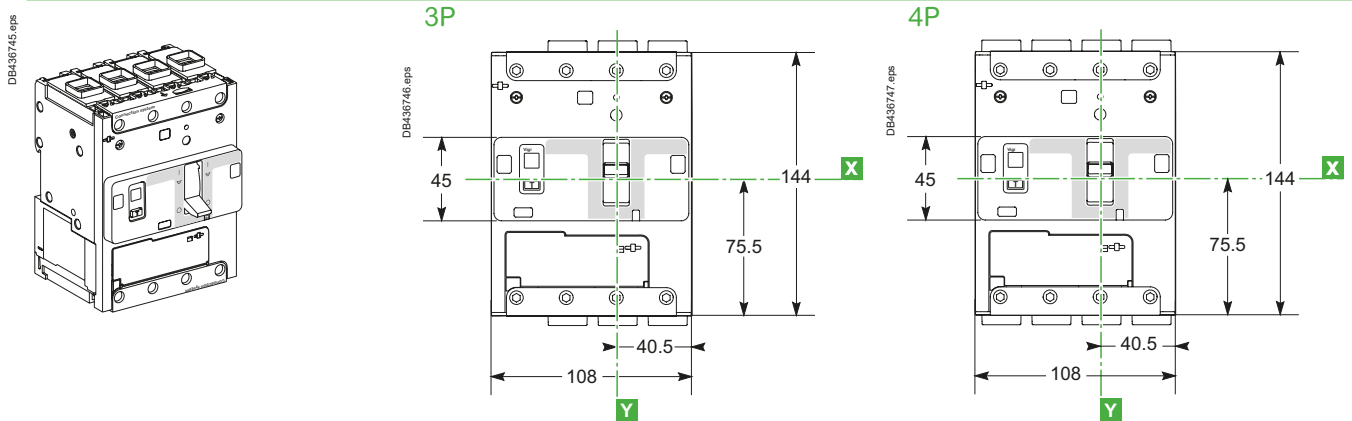
ComPacT NSXm Dimensions and Mounting

Circuit Breaker and Switch-Disconnecter

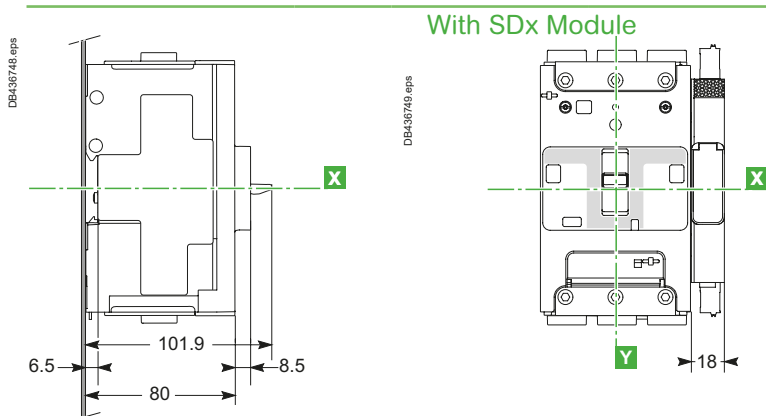
Circuit Breaker



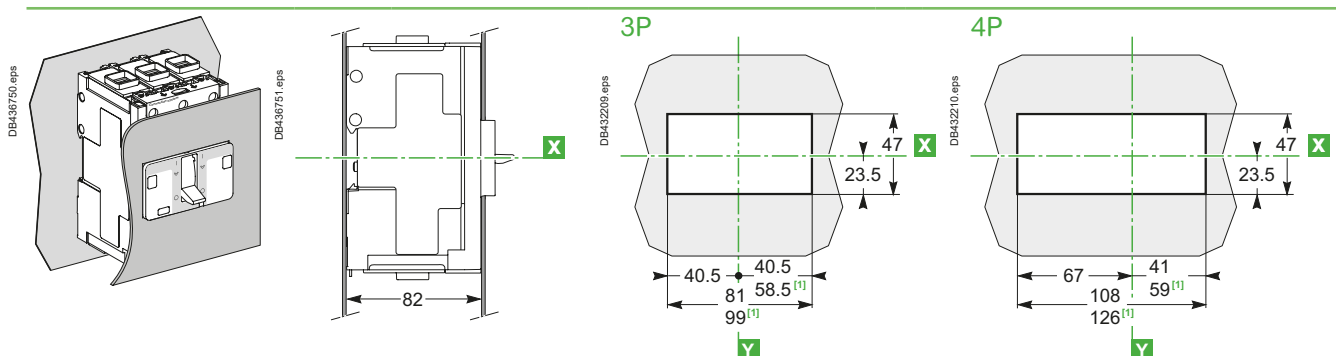
Circuit Breaker with MicroLogic Vigi 4.1



Side View



Front-Panel Cutouts



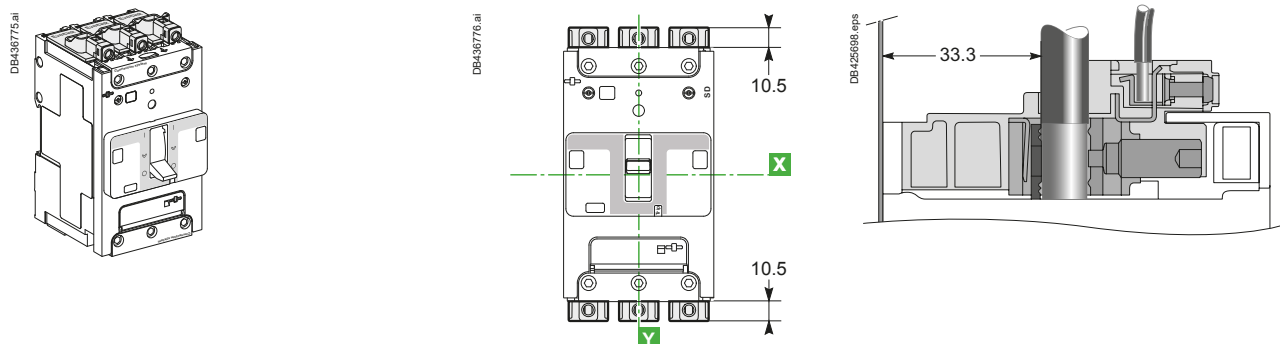
[1] With SDx module.

ComPacT NSXm Dimensions and Mounting

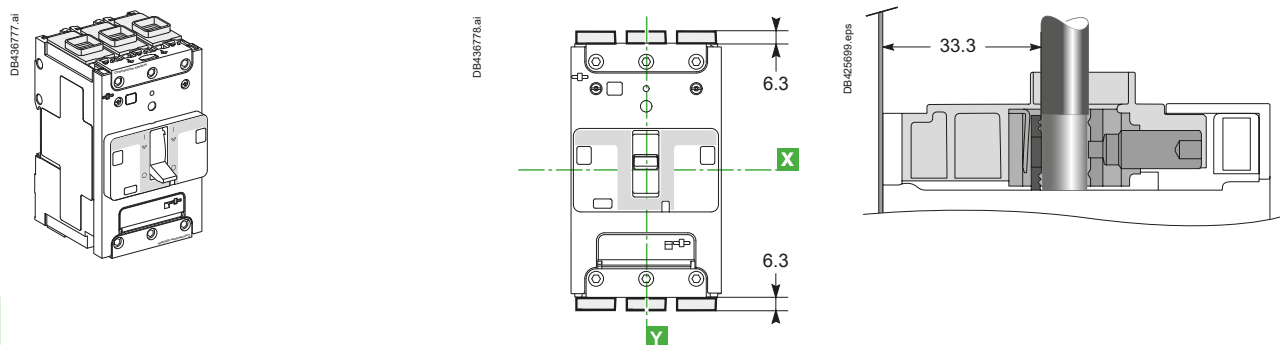
Circuit Breaker and Switch-Disconnecter

Connectors

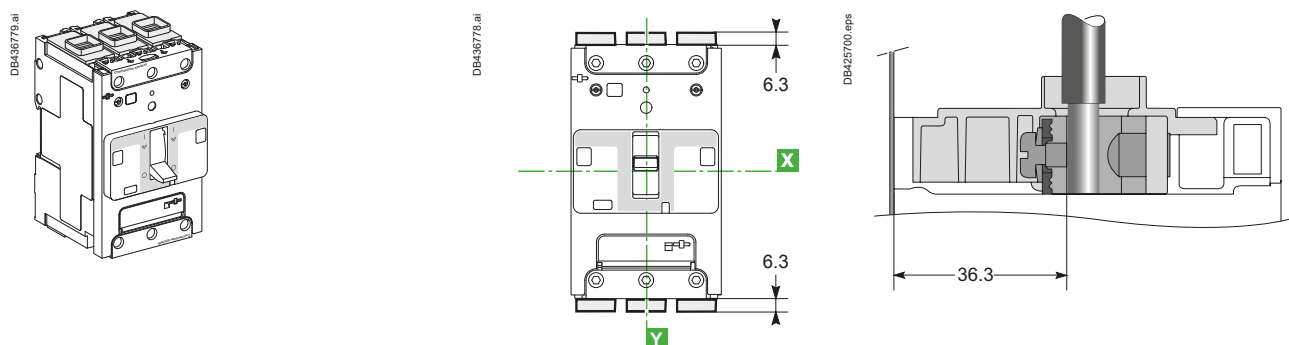
EverLink with Control Wire Terminal Connector



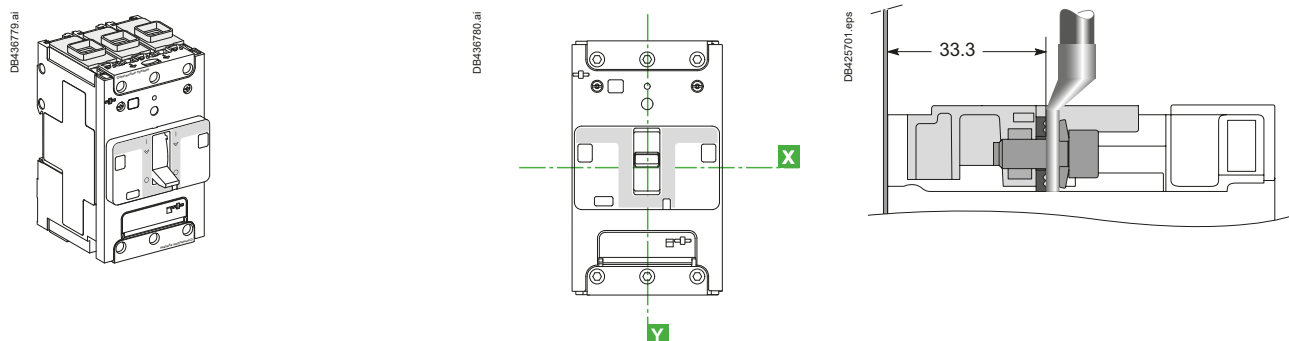
EverLink without Control Wire Terminal Connector



Mechanical Lug Connector



Compression Lug/Busbar Connector

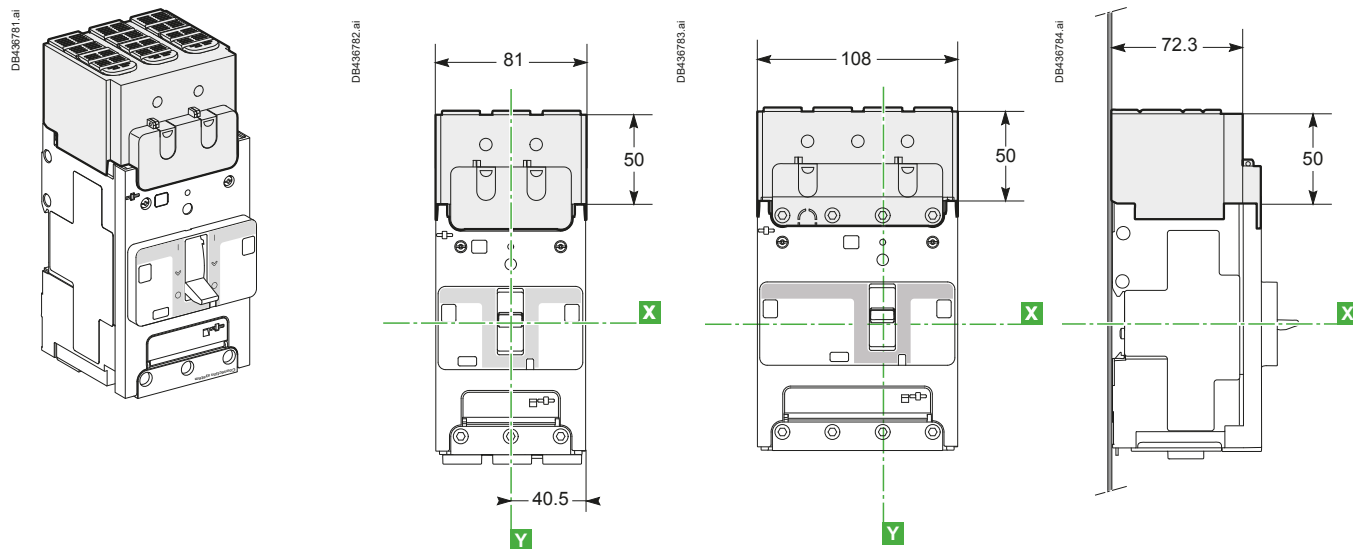


ComPacT NSXm Dimensions and Mounting

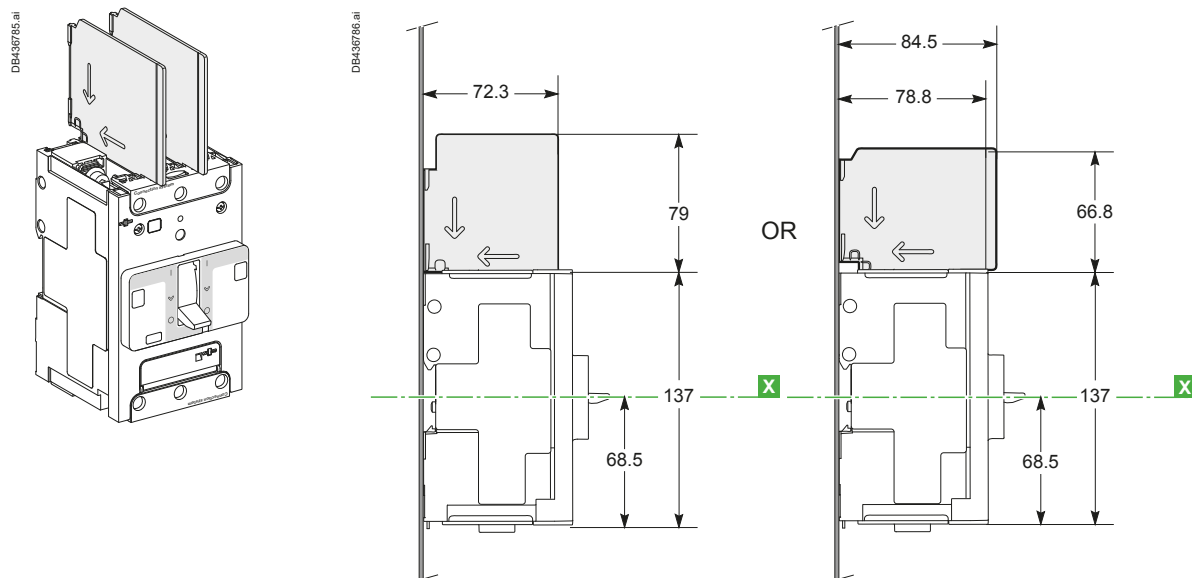
Circuit Breaker and Switch-Disconnecter

Insulation of Live Parts

Long Terminal Shields



Interphase Barriers

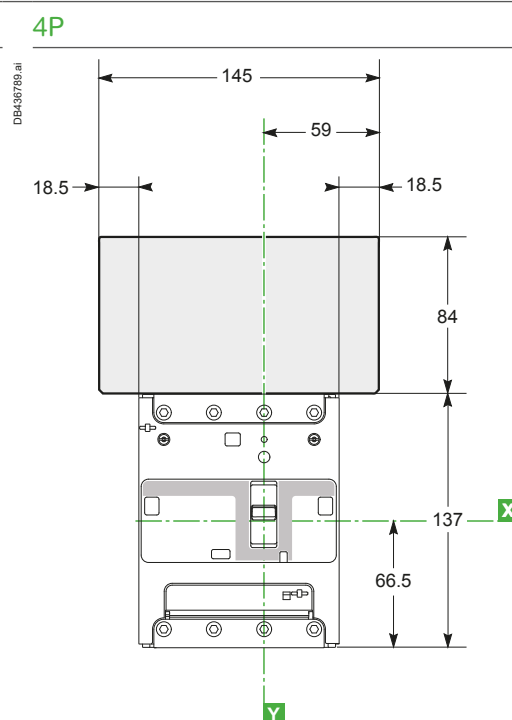
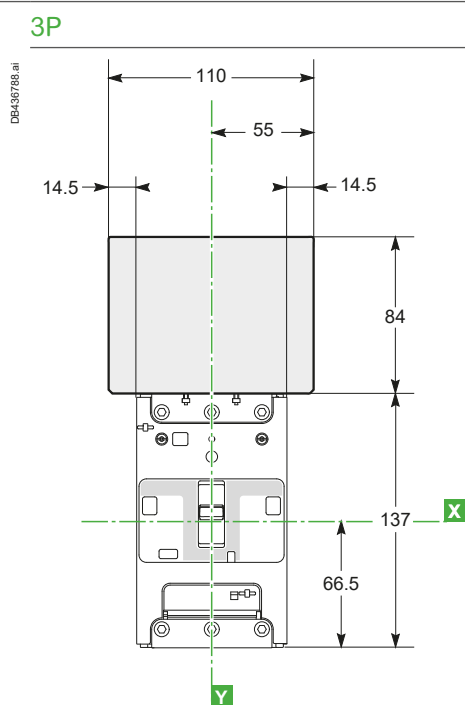
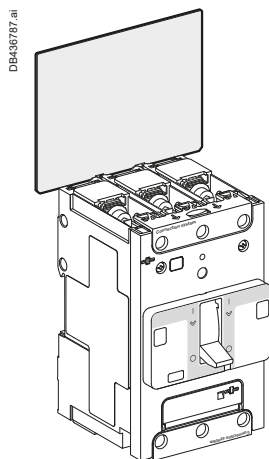


E

ComPacT NSXm Dimensions and Mounting

Circuit Breaker and Switch-Disconnecter

Rear Insulating Screens

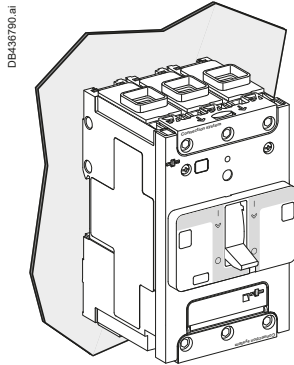


ComPacT NSXm Dimensions and Mounting

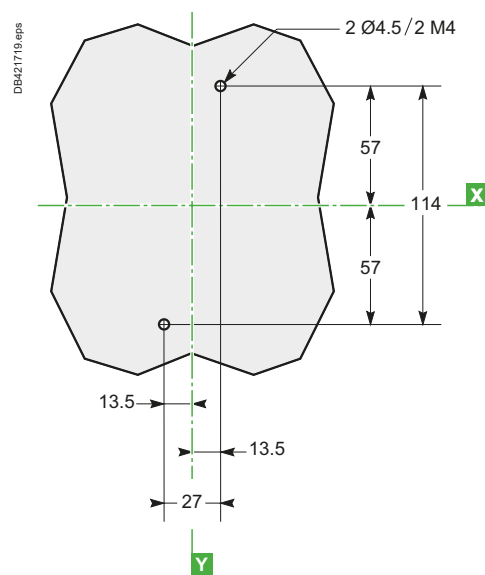
Circuit Breaker and Switch-Disconnecter

Mounting on Backplate

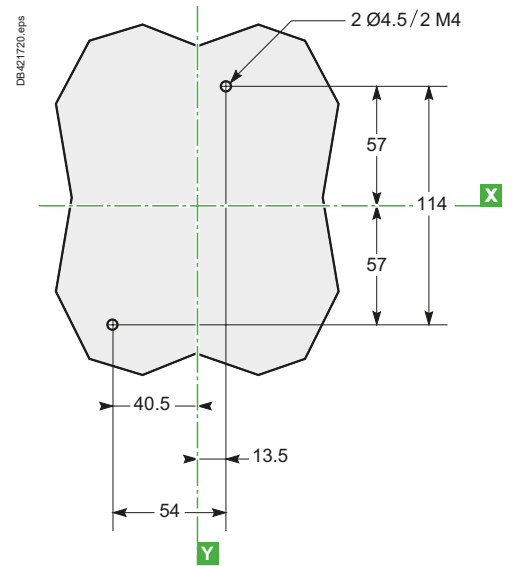
3P/4P



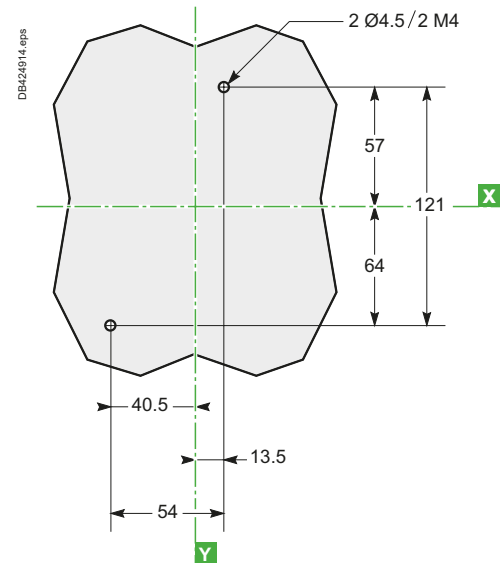
3P



4P



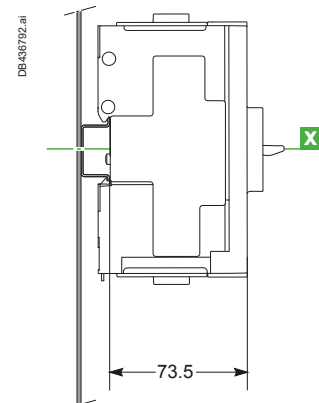
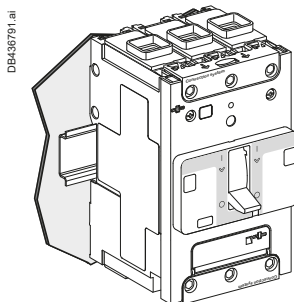
3P/4P Circuit Breaker with MicroLogic Vigi 4.1



E

Mounting on DIN Rail

3P

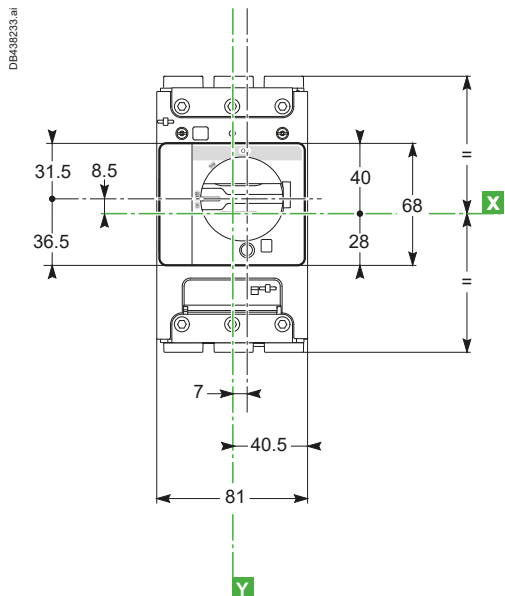


ComPacT NSXm Dimensions and Mounting

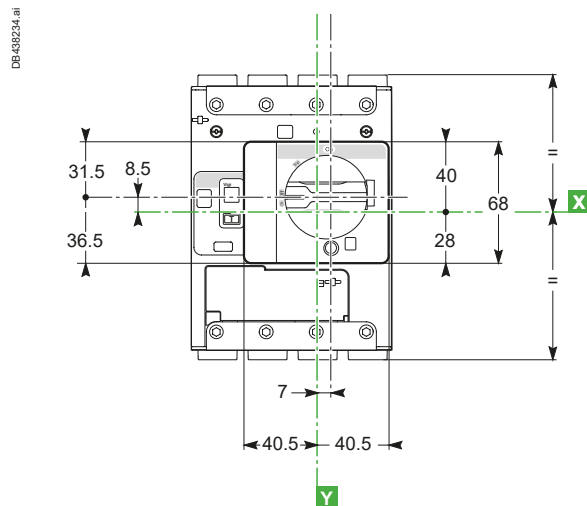
Circuit Breaker and Switch-Disconnecter

Direct Rotary Handle

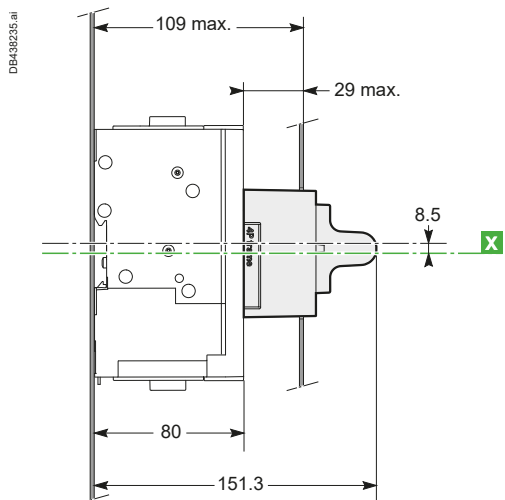
3P



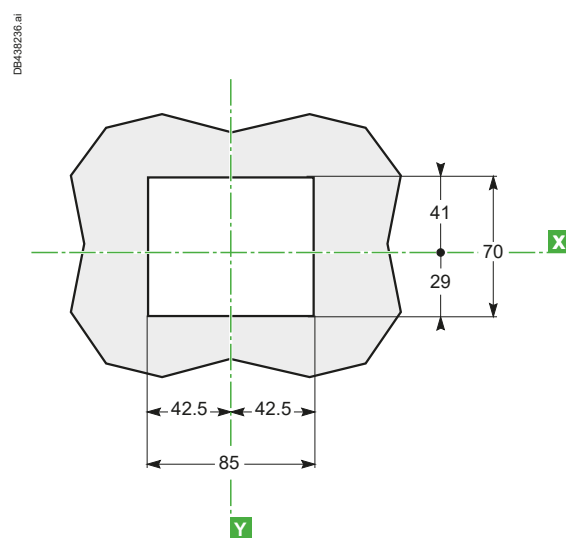
4P



Side View



Door Cutout for 3P/4P

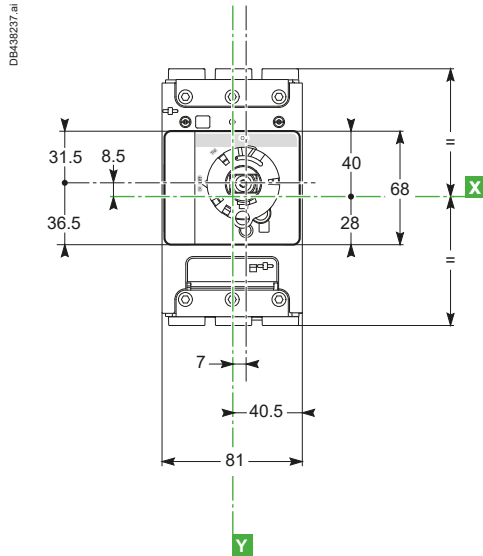


ComPacT NSXm Dimensions and Mounting

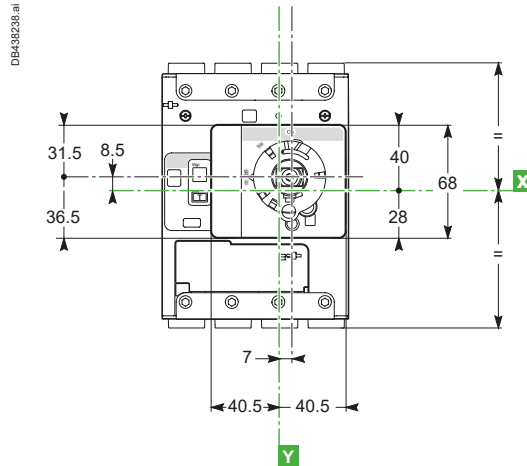
Circuit Breaker and Switch-Disconnecter

Extended Rotary Handle

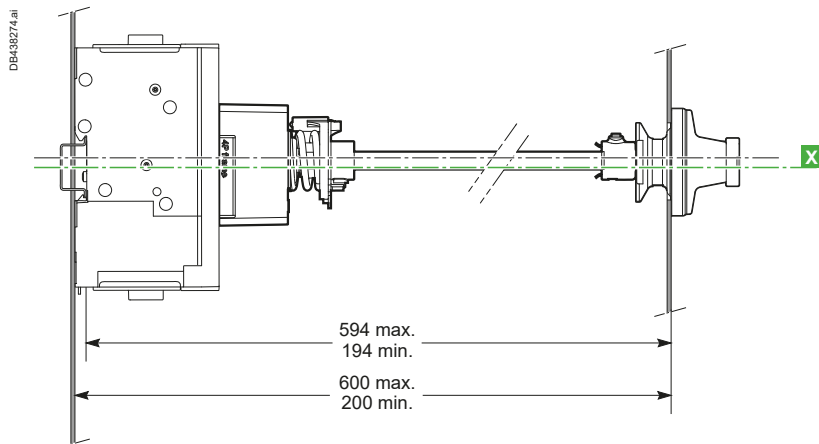
3P



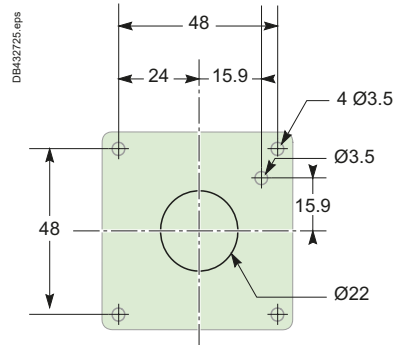
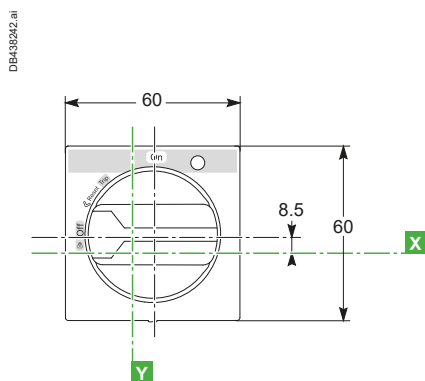
4P



3P/4P



Dimensions and Front-Panel Cutout

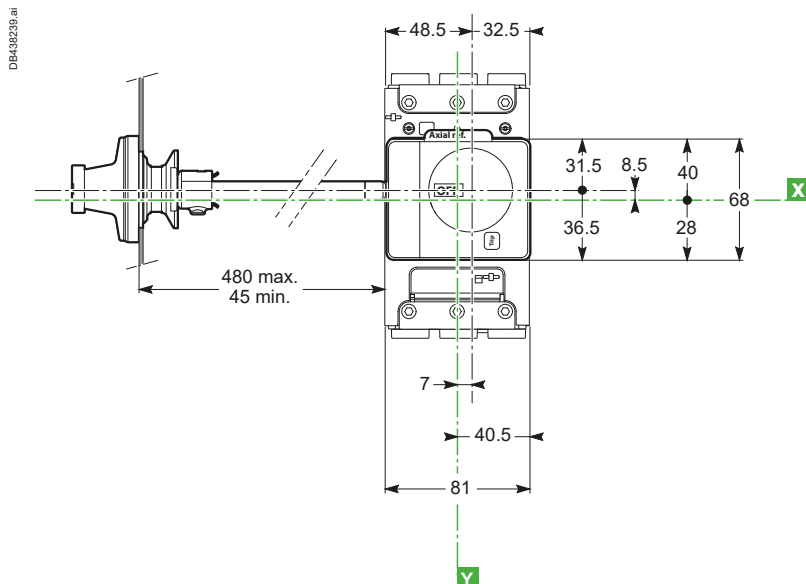


ComPacT NSXm Dimensions and Mounting

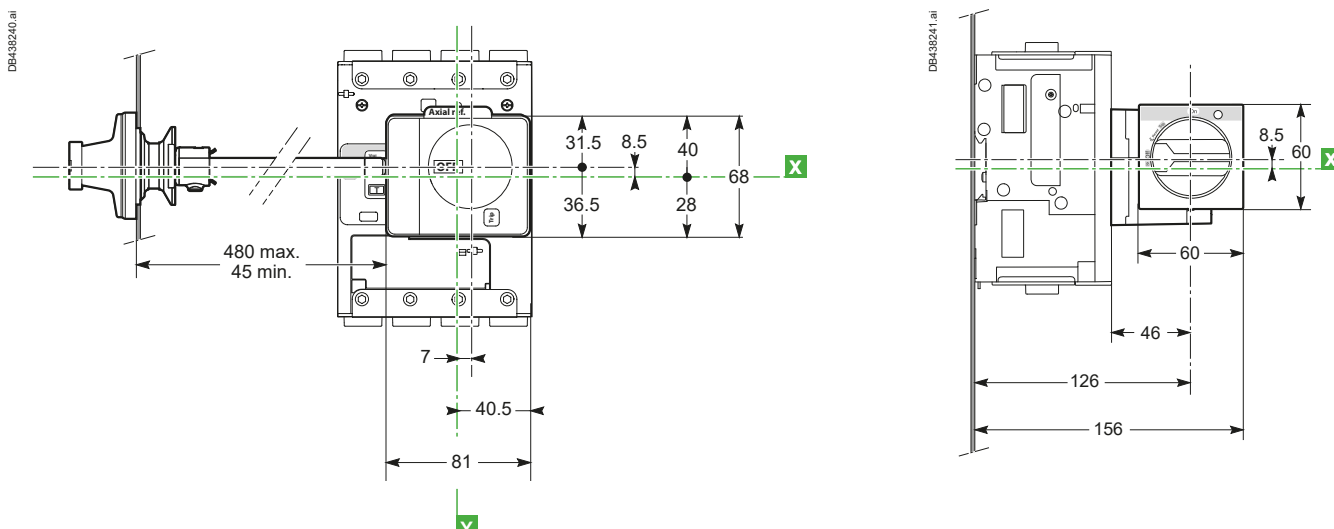
Circuit Breaker and Switch-Disconnecter

Side Rotary Handle

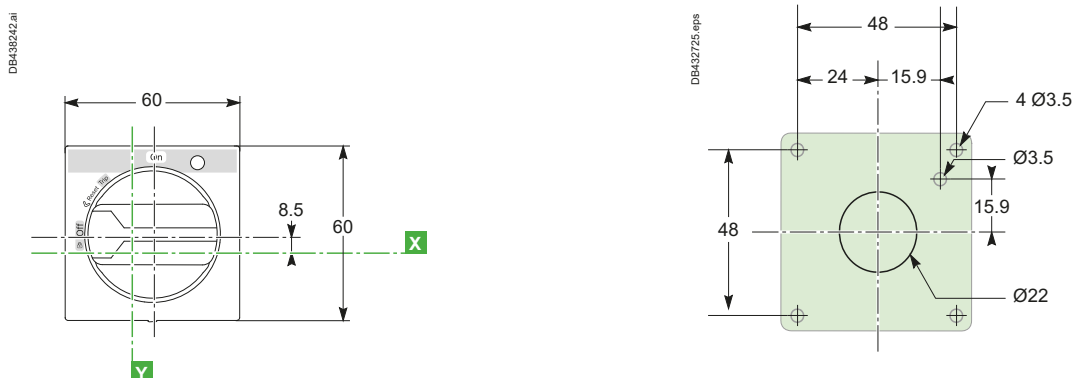
3P - Extended



4P - Extended



Dimensions Side Rotary Handle Cutout



ComPacT NSXm Dimensions and Mounting

Circuit Breaker and Switch-Disconnecter

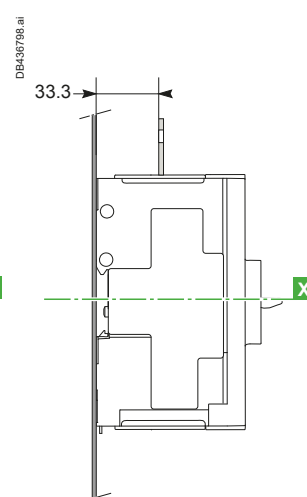
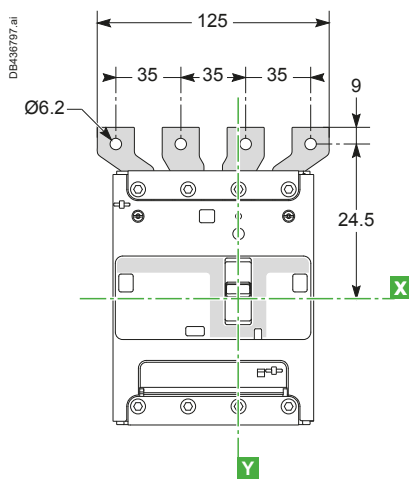
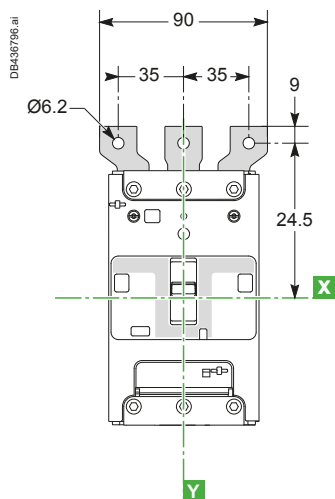
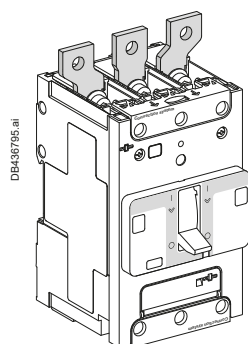
Connection with Accessories

Spreaders

3P

4P

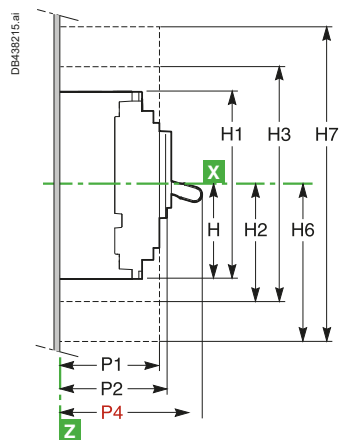
Side View



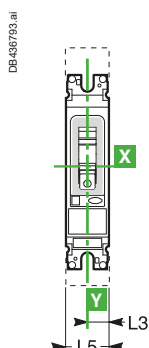
ComPacT NSX Dimensions and Mounting

ComPacT NSX100 to NSX250 Fixed Version, 1P-2P

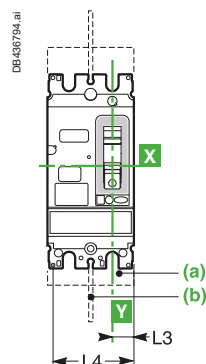
Dimensions



1 pole



2 poles

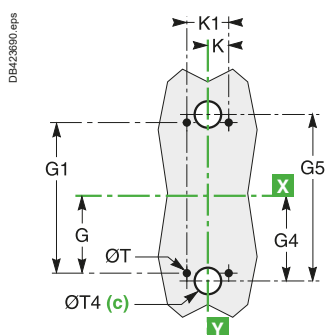


- (a) Short terminal shields.
(b) Interphase barriers.

Mounting

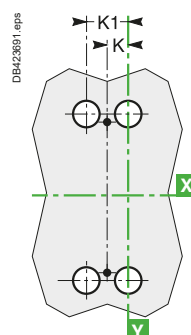
On Backplate

1 pole



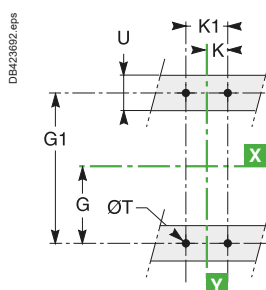
- (c) For rear connection only.

2 poles

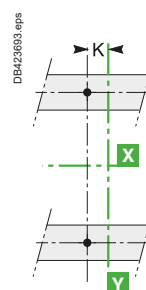


On Rails

1 pole



2 poles

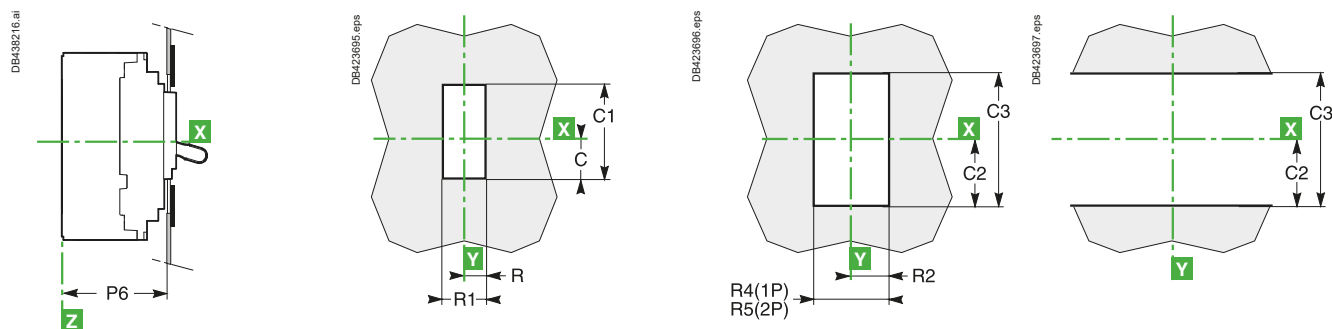


ComPacT NSX Dimensions and Mounting

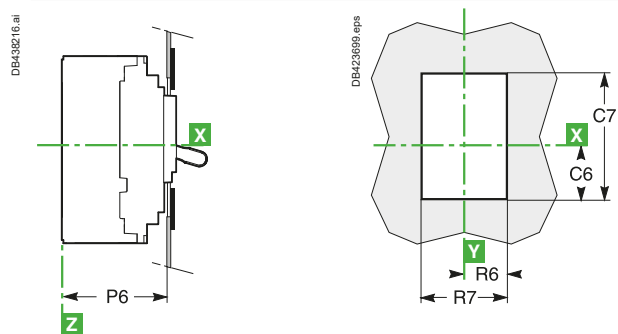
ComPacT NSX100 to NSX250 Fixed Version, 1P-2P

Front-Panel Cutout

On Backplate



With Escutcheon



Dimensions (mm)

Type	C	C1	C2	C3	C6	C7	G	G1	G4	G5	H
NSX100/250	29	76	54	108	43	104	62.5	125	70	140	80.5
Type	H1	H2	H3	H4	H6	H7	K	K1	L3	L4	L5
NSX100/250	161	94	188	160.5	178.5	357	17.5	35	17.5	70	35
Type	P1	P2	P4	P5	P6	R	R1	R2	R4	R5	R6
NSX100/250	81	86	111	83	88	14.5	29	19	38	73	29
Type	R7	ØT	ØT4	U							
NSX100/250	58	6	22	≤ 32							

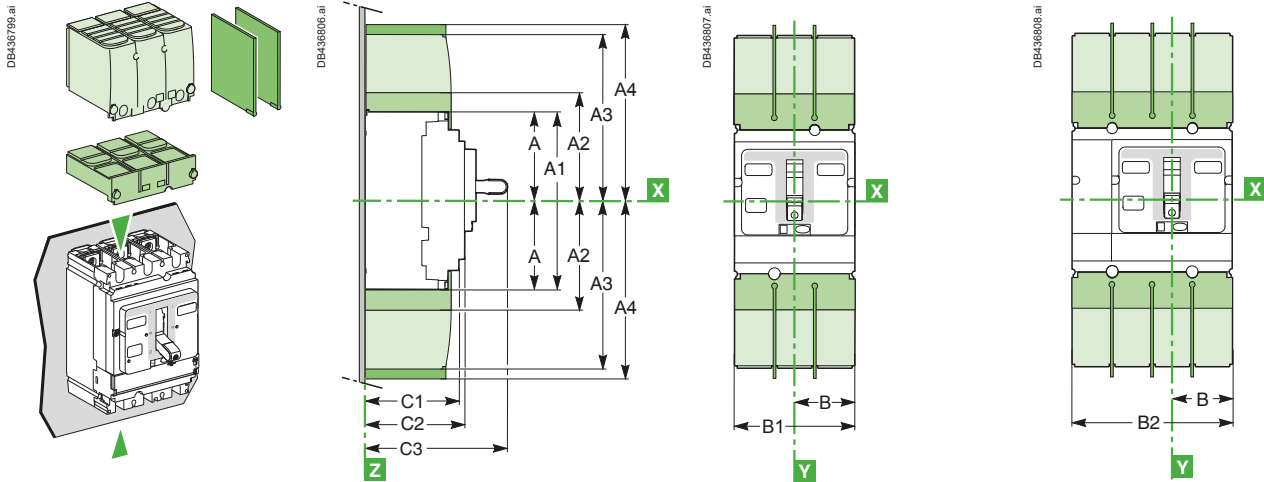
ComPacT NSX Dimensions and Mounting

ComPacT NSX100 to 630 Fixed Version

Dimensions

3P

4P



Interphase barriers. Long terminal shields (also available for NSX400/630 spreaders with 52.5 mm pitch):
Short terminal shields. B1 = 157.5 mm, B2 = 210 mm.

Mounting

NSX100 to 250

NSX400/630 [2]

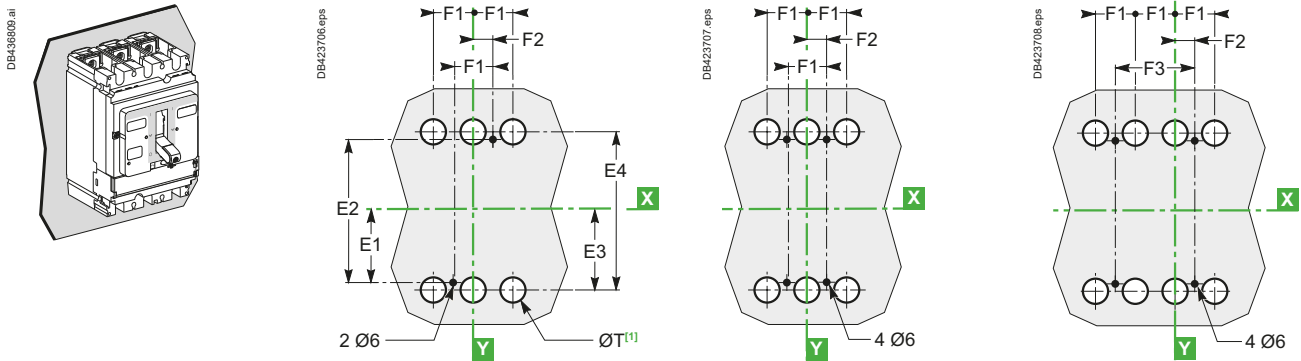
NSX100 to 630 [2]

On Backplate

3P

3P

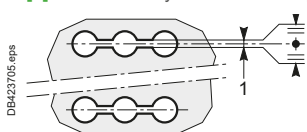
4P



[2] For 630 A only:

[1] The ØT holes are required for rear connection only.

For two-pole circuit breakers, the middle holes are not required.

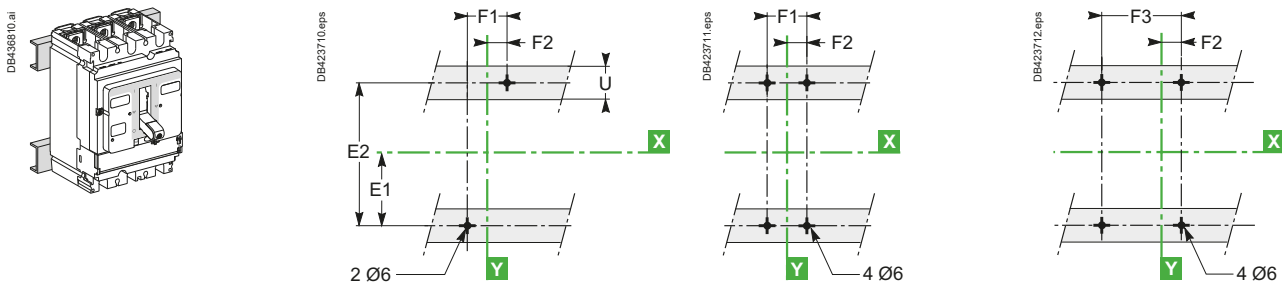


On Rails

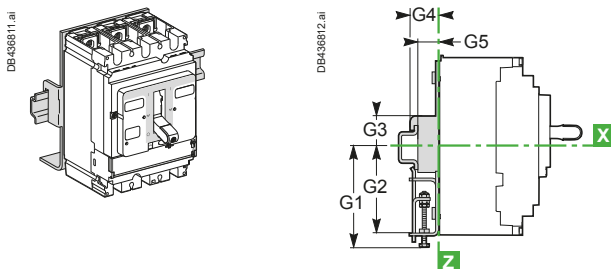
3P

3P

4P



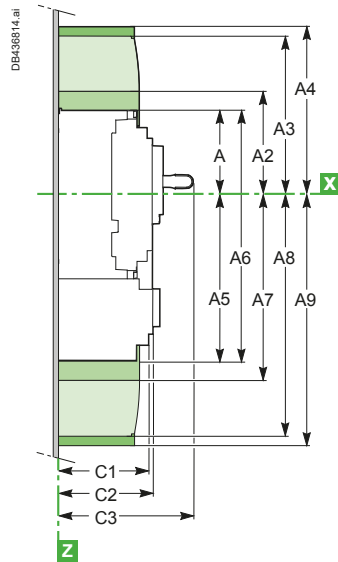
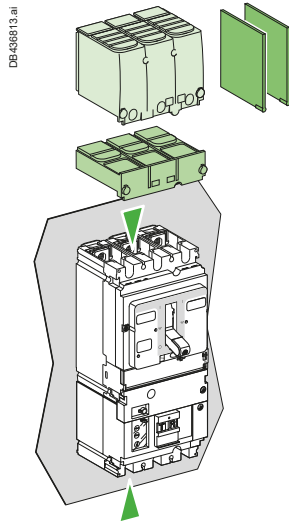
On DIN Rail with Adapter Plate (NSX100 to 250)



ComPacT NSX Dimensions and Mounting

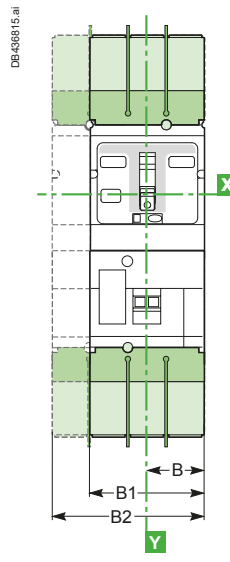
ComPacT NSX100 to 630 VigiPacT Add-on Fixed Version

Dimensions



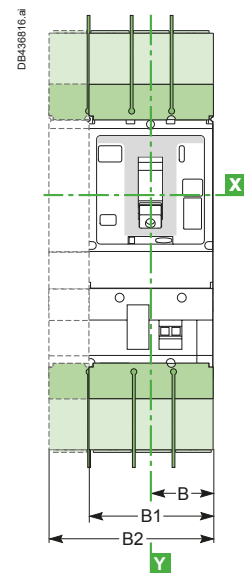
3/4P

NSX100 to 250



3/4P

NSX400/630

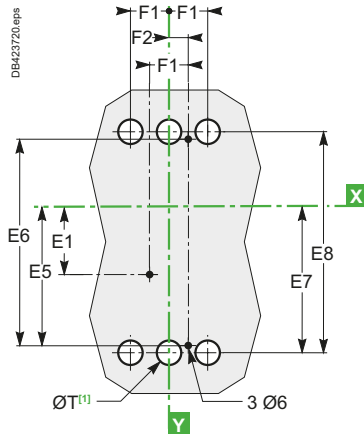
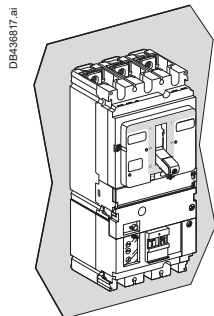


Mounting

On Backplate

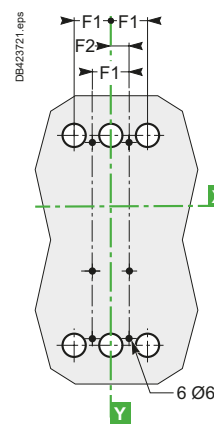
NSX100 to 250

3P



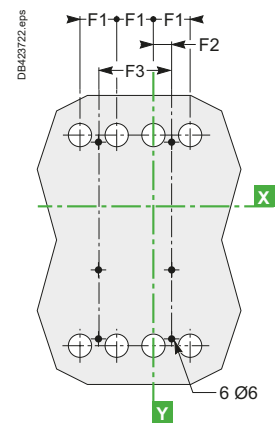
NSX400/630 [2]

3P

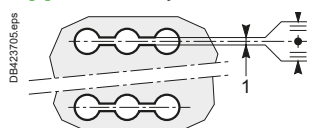


NSX100 to 630 [2]

4P



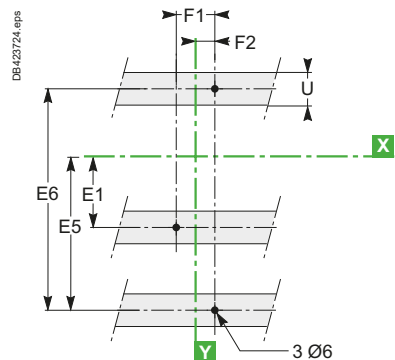
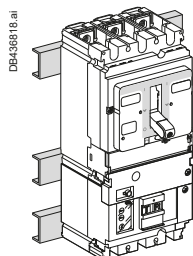
[2] For 630 A only:



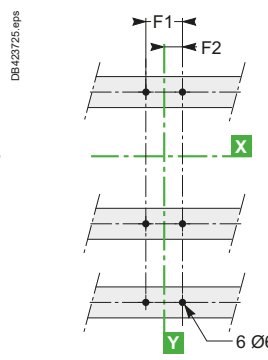
[1] The ØT holes are required for rear connection only.
For two-pole circuit breakers, the middle holes are not required.

On Rails

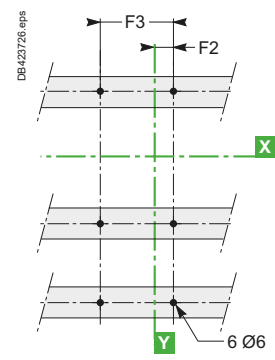
3P



3P



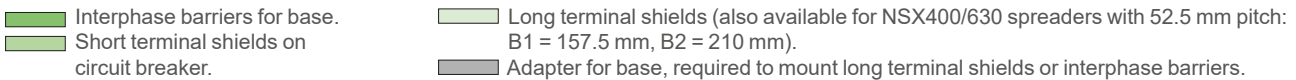
4P



Type	A	A1	A2	A3	A4	A5	A6	A7	A8	A9	B	B1	B2	C1	C2	C3	E1
NSX100/160/250	80.5	161	94	145	178.5	155.5	236	169	220	253.5	52.5	105	140	81	86	126	62.5
NSX400/630	127.5	255	142.5	200	237	227.5	355	242.5	300	337	70	140	185	105	110	168	100
Type	E2	E3	E4	E5	E6	E7	E8	F1	F2	F3	G1	G2	G3	G4	G5	ØT	U
NSX100/160/250	125	70	140	137.5	200	145	215	35	17.5	70	95	75	13.5	23	17.5	24	≤ 32
NSX400/630	200	113.5	227	200	300	213.5	327	45	22.5	90	-	-	-	-	-	32	≤ 35

Switchboard Integration

4P



Through Front Panel (N)

4P

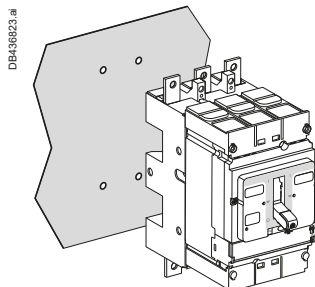


ComPacT NSX Dimensions and Mounting

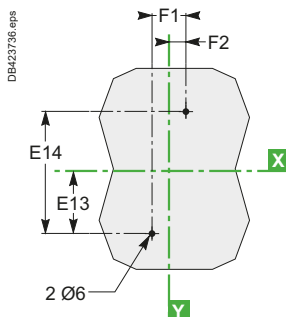
ComPacT NSX100 to 630 Plug-in Version

On Backplate (M)

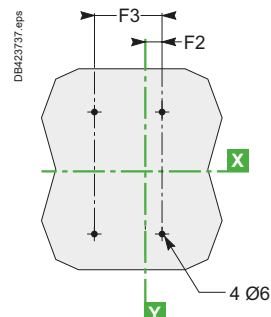
Front connection (an insulating screen is supplied with the base and must be fitted between the base and the backplate)



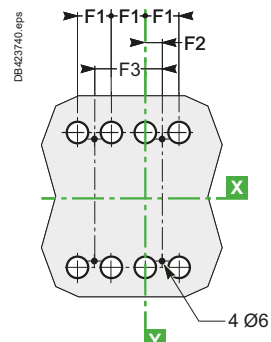
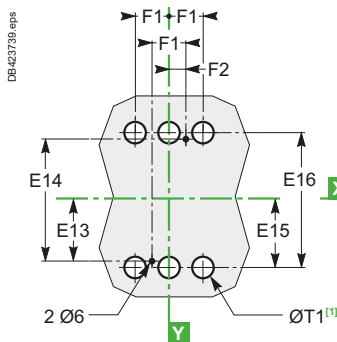
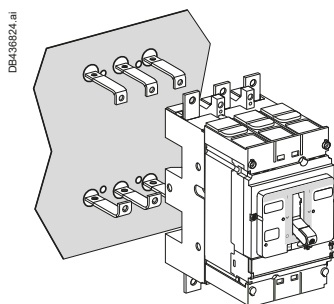
3P



4P

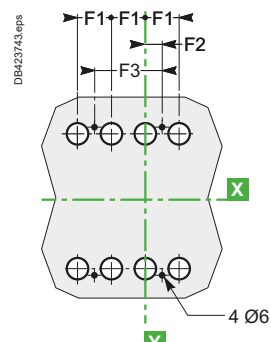
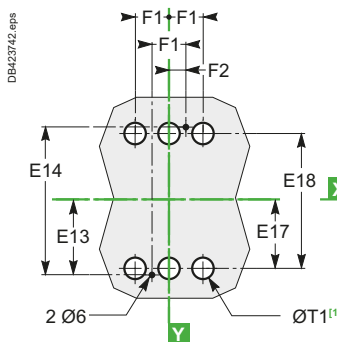
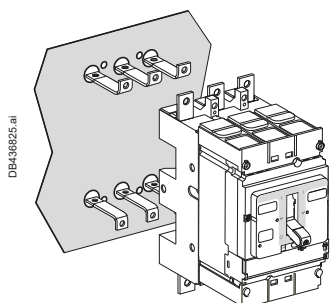


Connection by exterior-mounted rear connectors



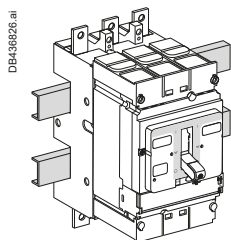
[1] The ØT1 holes are required for rear connection only (for two-pole circuit breakers, the middle holes are not required).

Connection by interior-mounted rear connectors

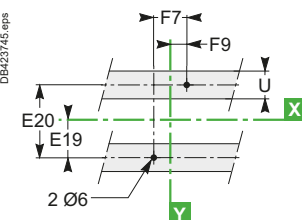


[1] The ØT1 holes are required for rear connection only (for two-pole circuit breakers, the middle holes are not required).

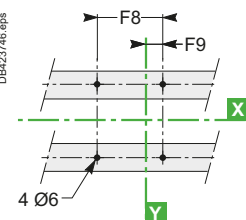
On Rails



3P



4P



Type	A	A1	A2	A10	A11	B	B1	B2	C3	D1	E9	E10	E11	E12	E13	E14	E15
NSX100/160/250	80.5	161	94	175	210	52.5	105	140	126	75	95	190	87	174	77.5	155	79
NSX400/630	127.5	255	142.5	244	281	70	140	185	168	100	150	300	137	274	125	250	126
Type	E16	E17	E18	E19	E20	F1	F2	F3	F4	F5	F6	F7	F8	F9	ØT1	U	
NSX100/160/250	158	61	122	37.5	75	35	17.5	70	54.5	109	144	70	105	35	24	≤ 32	
NSX400/630	252	101	202	75	150	45	22.5	90	71.5	143	188	100	145	50	33	≤ 35	

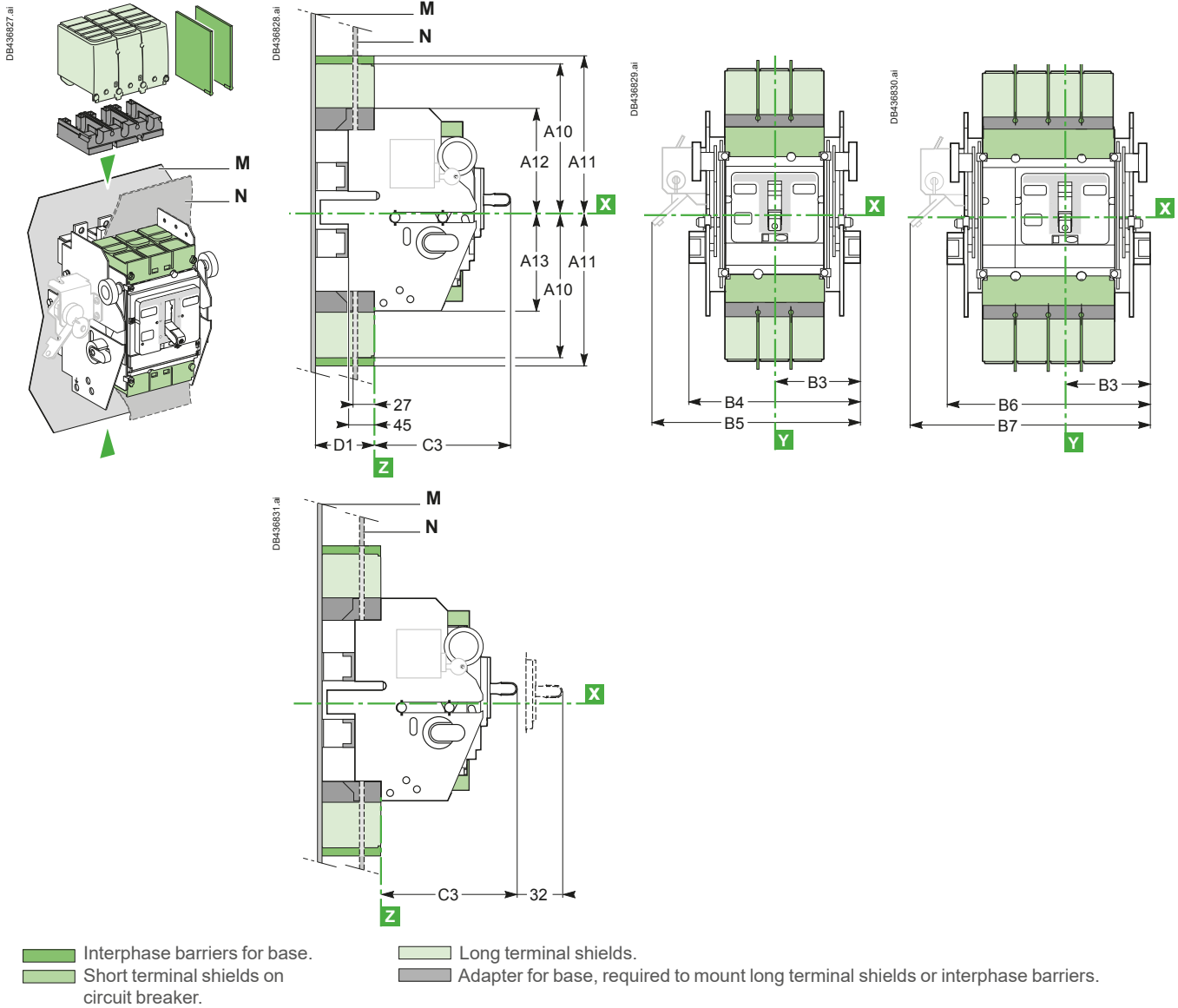
ComPacT NSX Dimensions and Mounting

ComPacT NSX100 to 630 Withdrawable Version

Dimensions

3P

4P



Mounting

Through Front Panel (N)

2/3P

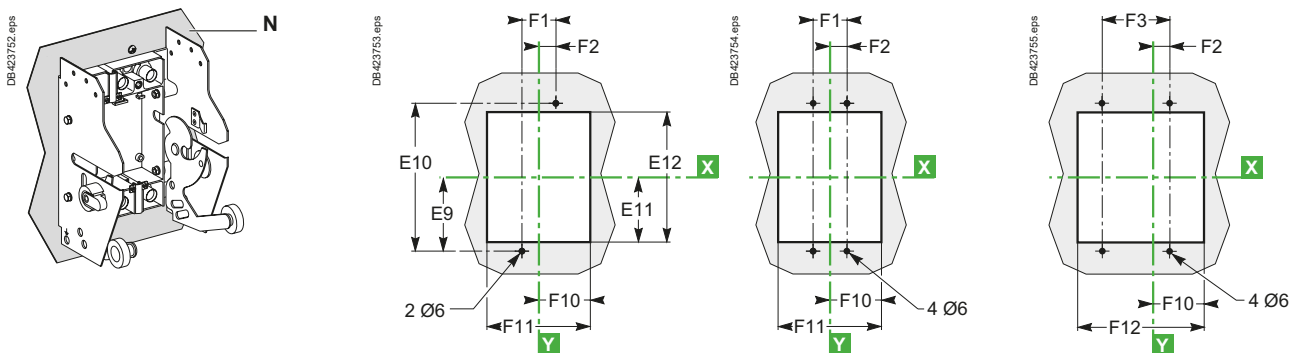
3P

4P

NSX100 to 250

NSX400/630

NSX100 to 630

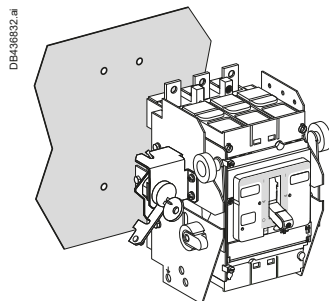


ComPacT NSX Dimensions and Mounting

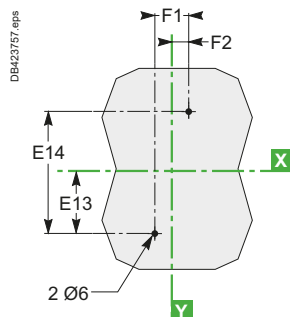
ComPacT NSX100 to 630 Withdrawable Version

On Backplate (M)

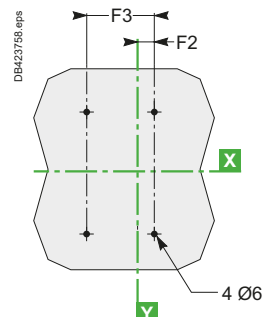
Front connection (an insulating screen is supplied with the base and must be fitted between the base and the backplate)



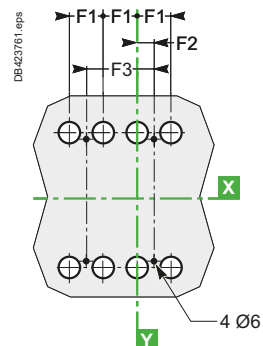
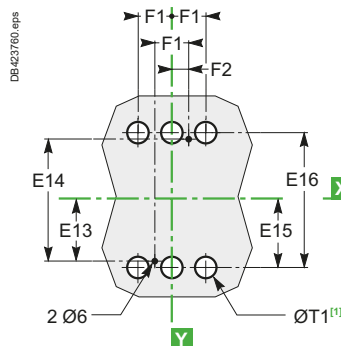
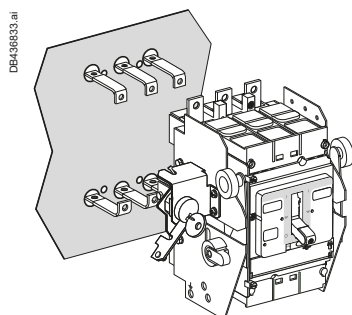
3P



4P

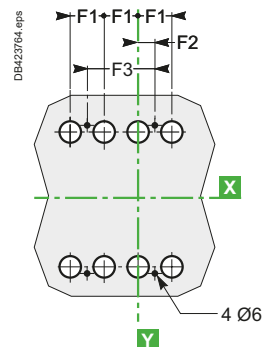
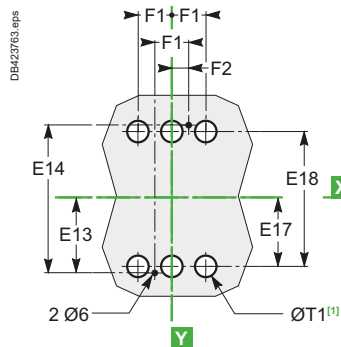
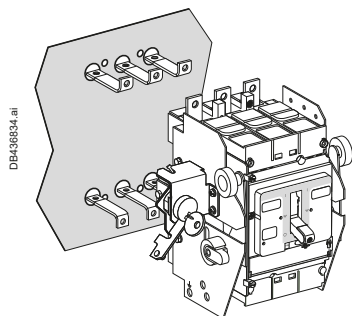


Connection by exterior-mounted rear connectors



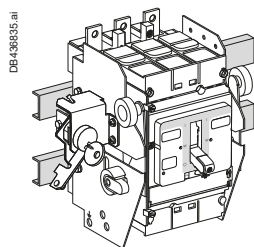
[1] The ØT1 holes are required for rear connection only (for two-pole circuit breakers, the middle holes are not required).

Connection by interior-mounted rear connectors

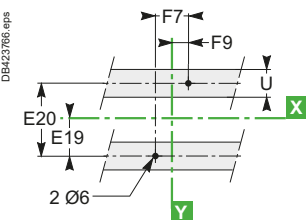


[1] The ØT1 holes are required for rear connection only (for two-pole circuit breakers, the middle holes are not required).

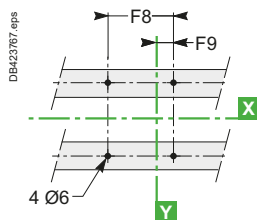
On Rails



3P



4P



Type	A10	A11	A12	A13	B3	B4	B5	B6	B7	C3	D1	E9	E10	E11	E12	E13	E14
NSX100/160/250	175	210	106.5	103.5	92.5	185	216	220	251	126	75	95	190	87	174	77.5	155
NSX400/630	244	281	140	140	110	220	250	265	295	168	100	150	300	137	274	125	250
Type	E15	E16	E17	E18	E19	E20	F1	F2	F3	F7	F8	F9	F10	F11	F12	ØT1	U
NSX100/160/250	79	158	61	122	37.5	75	35	17.5	70	70	105	35	74	148	183	24	≤ 32
NSX400/630	126	252	101	202	75	150	45	22.5	90	100	145	50	91.5	183	228	33	≤ 35

ComPacT NSX Dimensions and Mounting

ComPacT NSX100 to 630 VigiPacT Add-on Plug-in and Withdrawable Versions

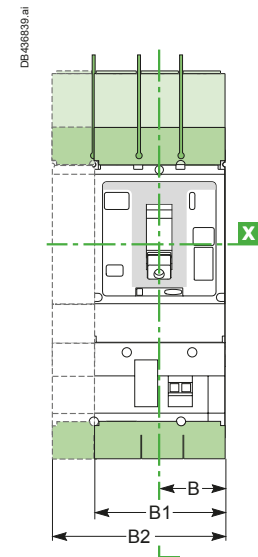
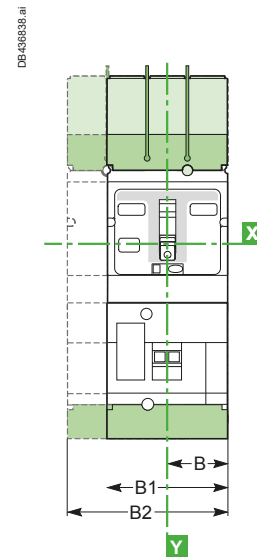
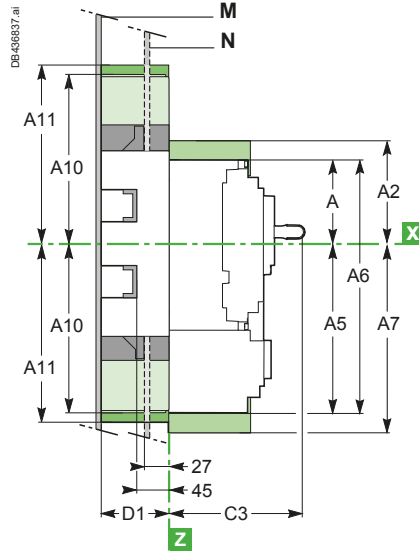
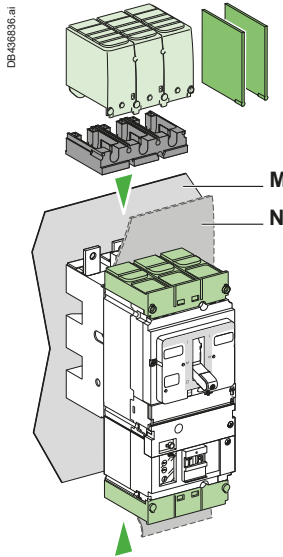
Dimensions - Plug-in Version

NSX100 to 250

3/4P

NSX400/630

3/4P



Interphase barriers for base.
Short terminal shields on circuit breaker.

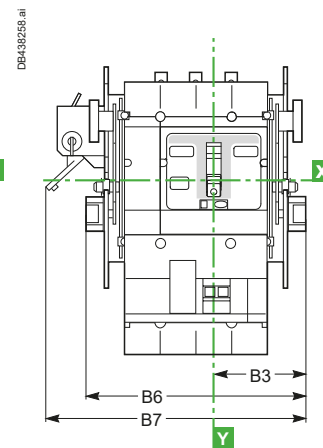
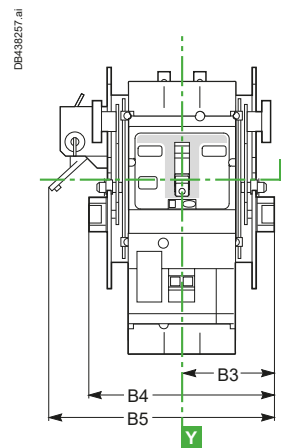
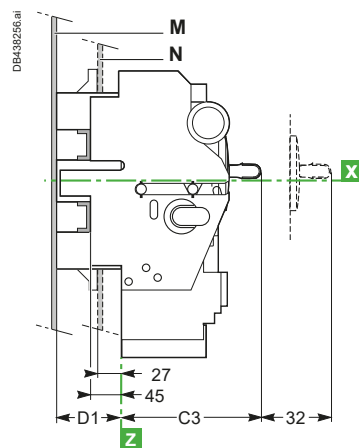
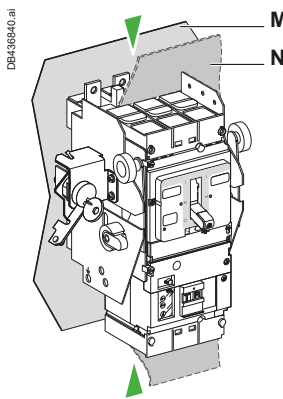
Long terminal shields (also available for NSX400/630 spreaders with 52.5 mm pitch:
B1 = 157.5 mm, B2 = 210 mm).
Adapter for base, required to mount long terminal shields or interphase barriers.

Dimensions - Withdrawable Version

NSX100 to 630

3P

4P



Mounting

Through front panel (N)

See ComPacT NSX100 to 630 plug-in version, [page E-38](#), or withdrawable version, [page E-40](#)

On backplate (M)

See ComPacT NSX100 to 630 plug-in version, [page E-39](#), or withdrawable version, [page E-41](#)

On rails

See ComPacT NSX100 to 630 plug-in version, [page E-39](#), or withdrawable version, [page E-41](#)

Type	A	A2	A5	A6	A7	A10	A11	B	B1	B2	B3	B4	B5	B6	B7	C3	D1
NSX100/160/250	80.5	94	155.5	236	169	175	210	52.5	105	140	92.5	185	216	220	251	126	75
NSX400/630	127.5	142.5	227.5	355	242.5	244	281	70	140	185	110	220	250	265	295	168	100

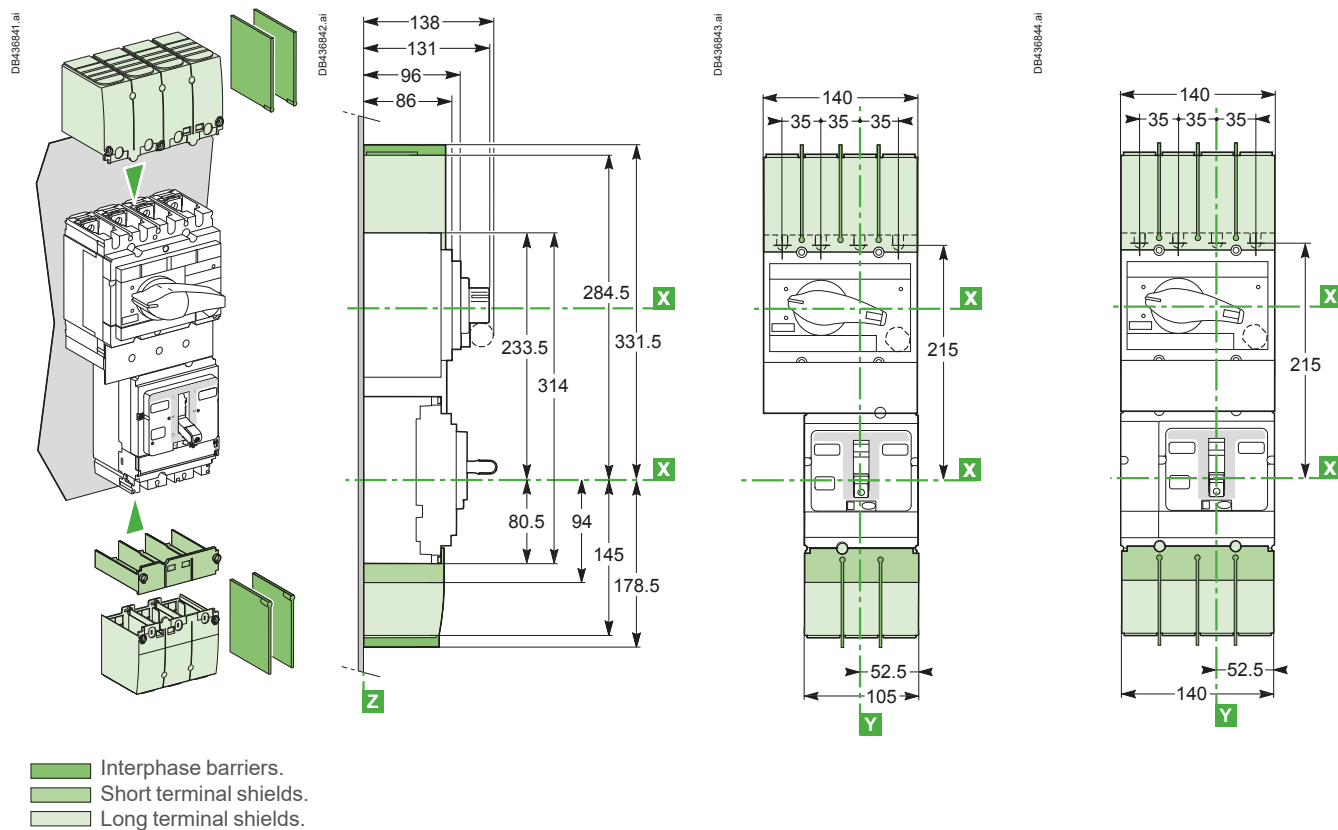
ComPacT NSX Dimensions and Mounting

Visu Function for ComPacT NSX100 to 250 Fixed Version

Dimensions - Combination with ComPacT INV100 to 250

3P

4P

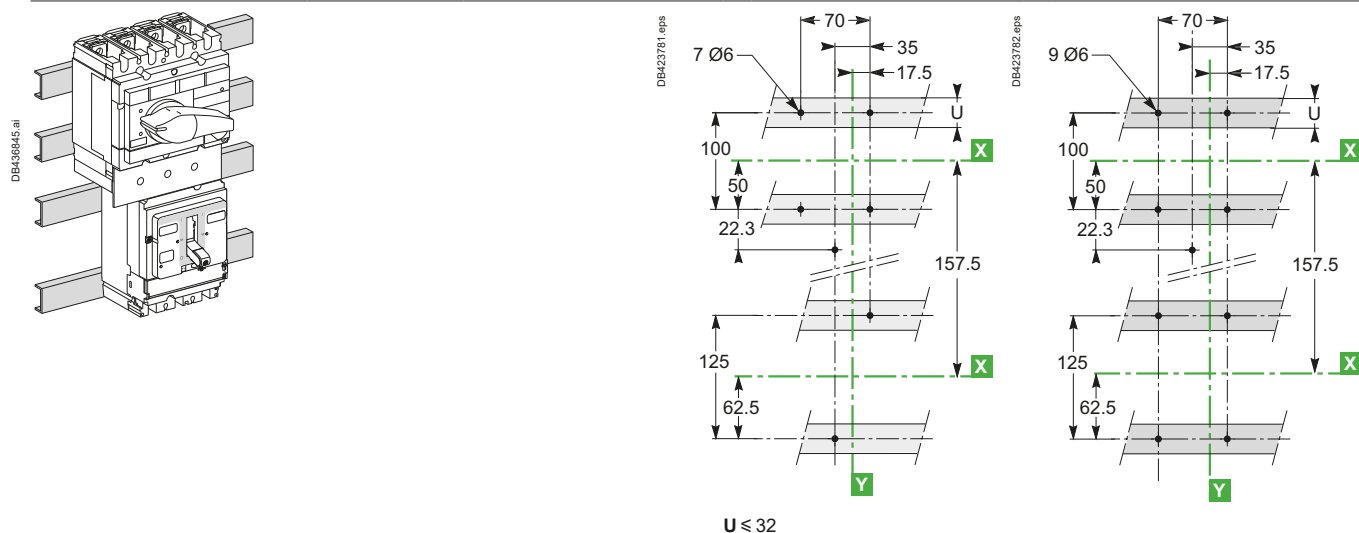


Mounting

On Rails or Backplate

3P

4P



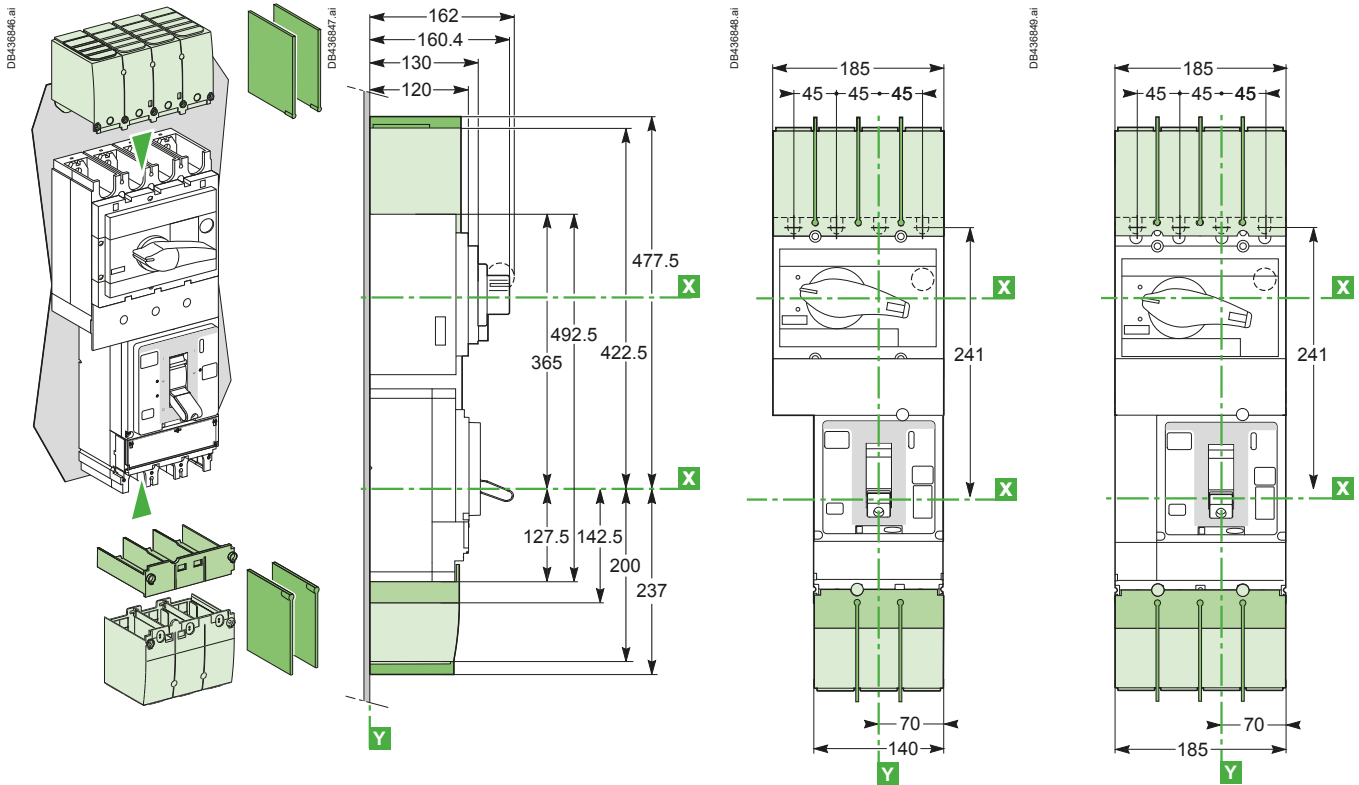
ComPacT NSX Dimensions and Mounting

Visu Function for ComPacT NSX400/630 Fixed Version

Dimensions - Combination with ComPacT INV400 to 630

3P

4P



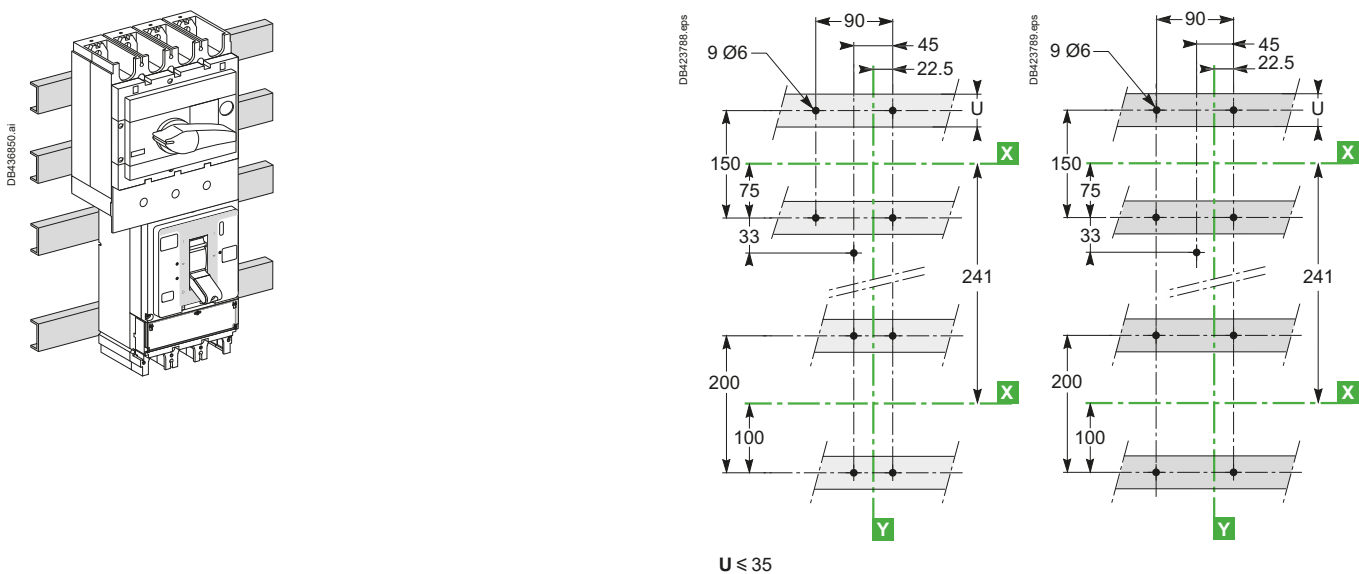
- Interphase barriers for base.
- Short terminal shields.
- Long terminal shields.

Mounting

On Rails or Backplate

3P

4P



ComPacT NSX Dimensions and Mounting

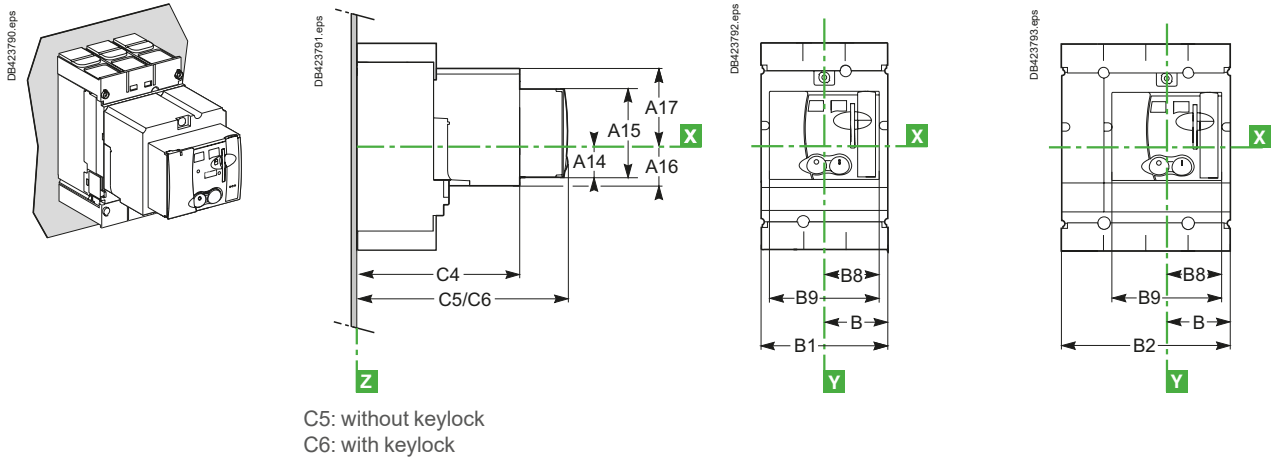
Motor Mechanism Module for ComPacT NSX100 to 630

Dimensions

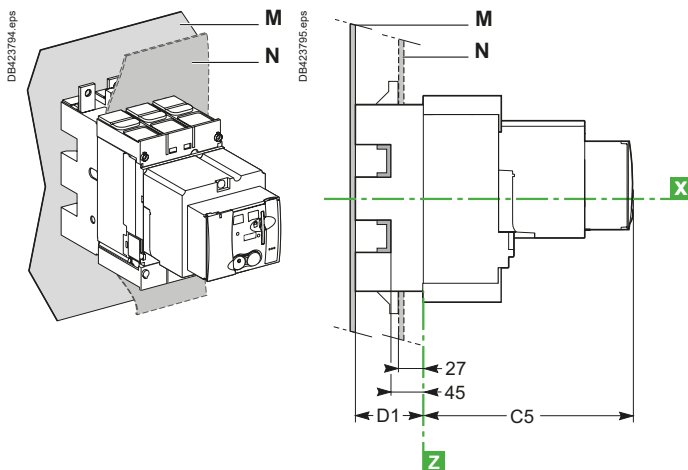
3P

4P

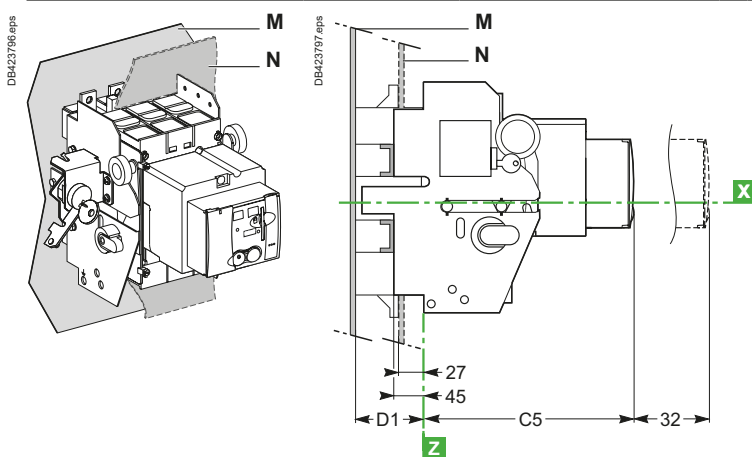
Fixed Circuit Breaker



Plug-in Circuit Breaker



Withdrawable Circuit Breaker



Type	A14	A15	A16	A17	B	B1	B2	B8	B9	C4	C5	C6	D1
NSX100/160/250	27.5	73	34.5	62.5	52.5	105	140	45.5	91	143	182	209.5	75
NSX400/630	40	123	52	100	70	140	185	61.5	123	215	256	258	100

ComPacT NSX Dimensions and Mounting

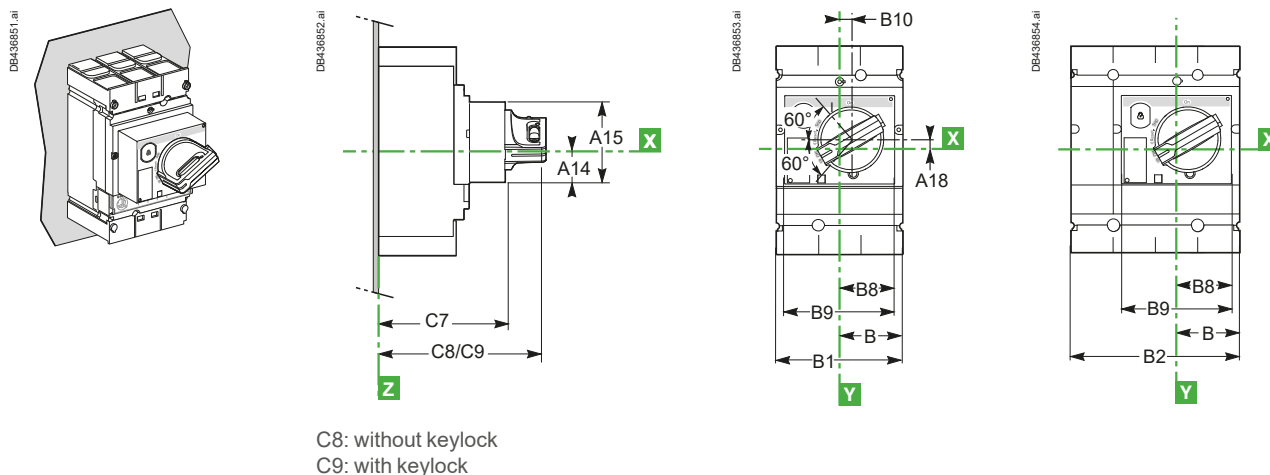
Direct Rotary Handle for ComPacT NSX100 to 630

Dimensions

Fixed Circuit Breaker

3P

4P



Plug-in Circuit Breaker



Withdrawable Circuit Breaker



Type	A14	A15	A18	B	B1	B2	B8	B9	B10	C7	C8	C9	D1
NSX100/160/250	27.5	73	9	52.5	105	140	45.5	91	9.25	121	158.5	167.5	75
NSX400/630	40	123	24.6	70	140	185	61.5	123	5	145	182.5	191.5	100

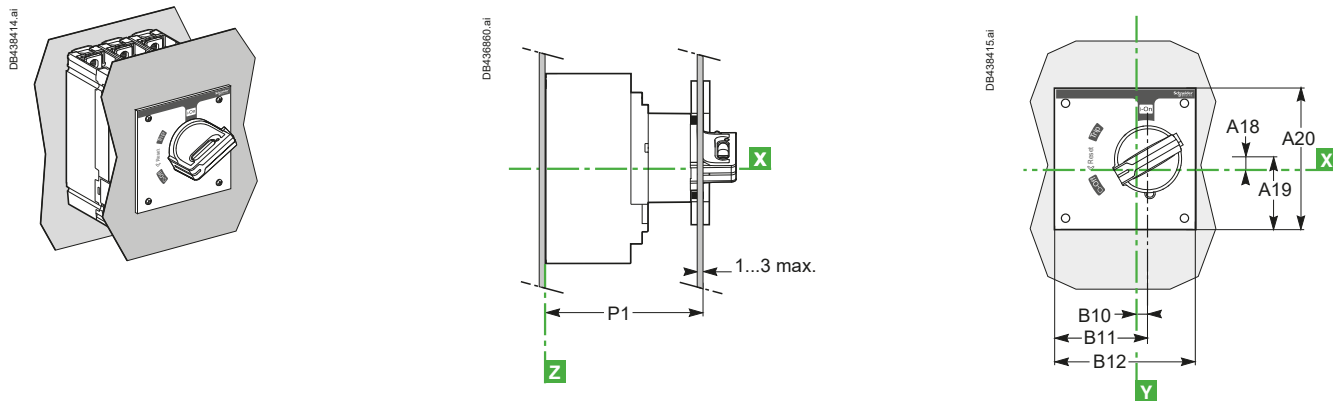
ComPacT NSX Dimensions and Mounting

MCC and CNOMO Type Direct Rotary Handles for ComPacT

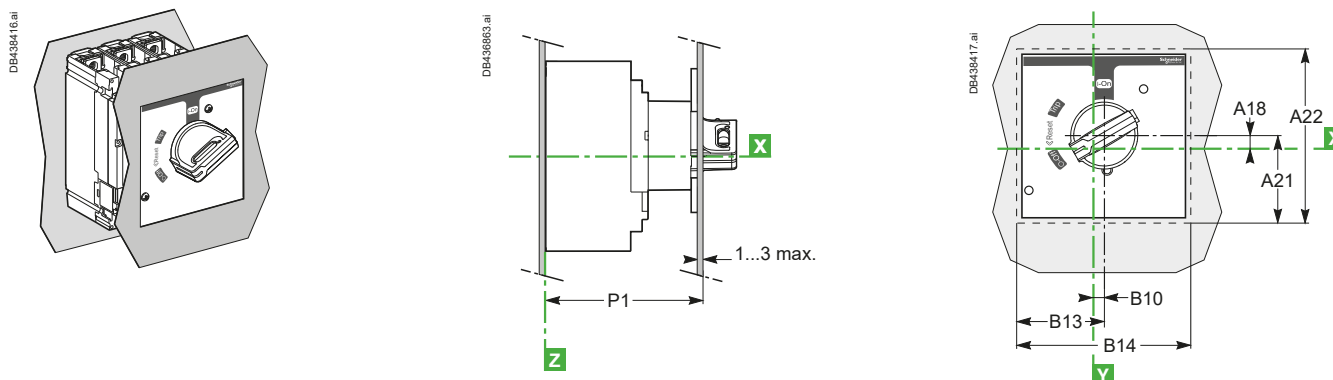
NSX100 to 630 Fixed Version

Dimensions

MCC Type Direct Rotary Handle



CNOMO Type Direct Rotary Handle

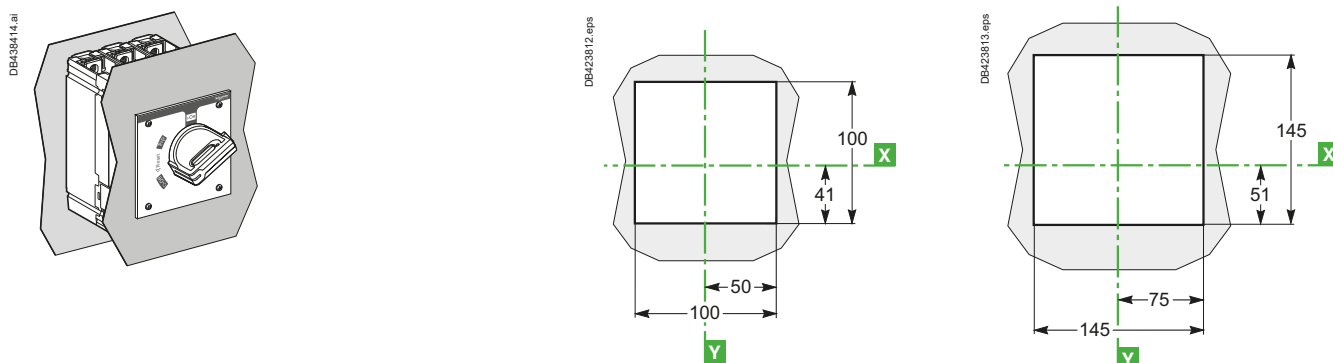


Front-Panel Cutout

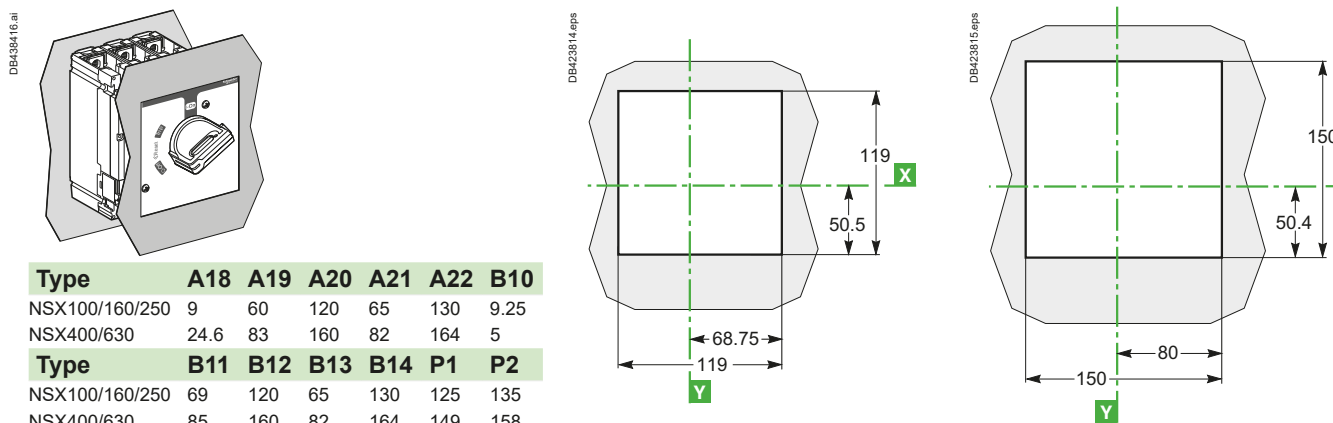
NSX100 to 250

NSX400/630

MCC Type Direct Rotary Handle



CNOMO Type Direct Rotary Handle



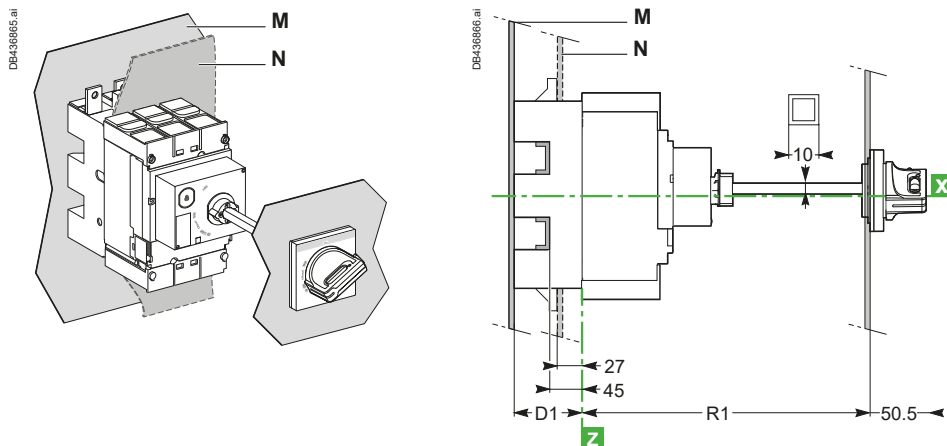
Type	A18	A19	A20	A21	A22	B10
NSX100/160/250	9	60	120	65	130	9.25
NSX400/630	24.6	83	160	82	164	5
Type	B11	B12	B13	B14	P1	P2
NSX100/160/250	69	120	65	130	125	135
NSX400/630	85	160	82	164	149	158

ComPacT NSX Dimensions and Mounting

Extended Rotary Handle for ComPacT NSX100 to 630

Dimensions

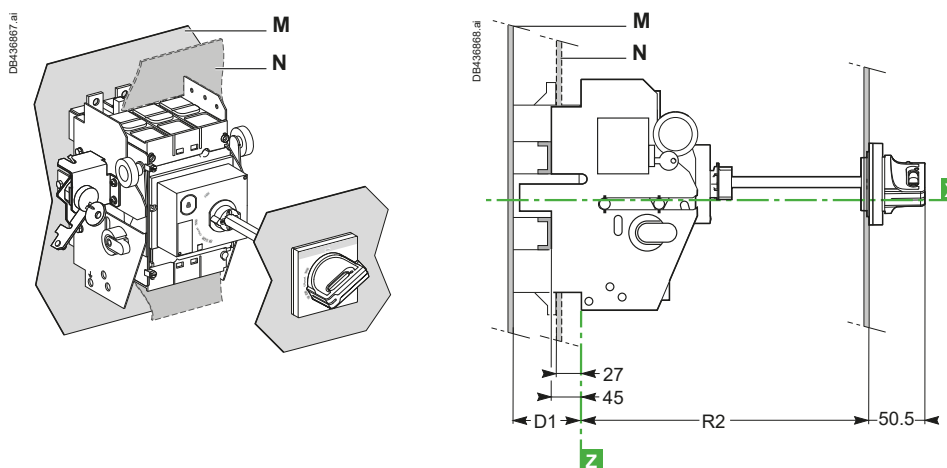
Fixed and Plug-in Circuit Breakers



Cutout for shaft (mm)

Type	R1
NSX100/160/250	min. 171 max. 600
NSX400/630	min. 195 max. 600

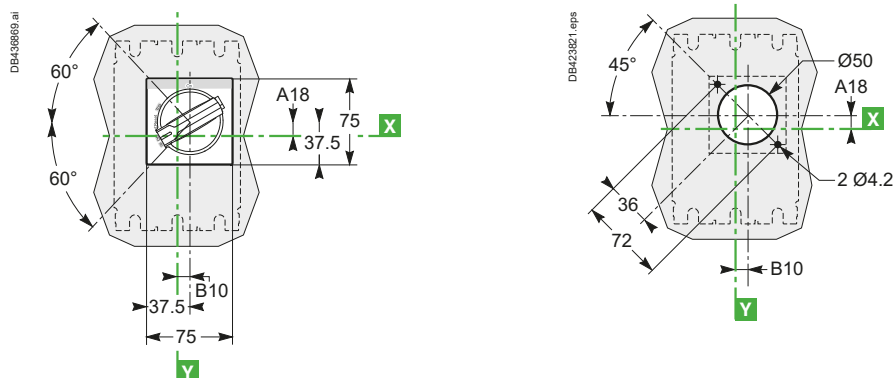
Withdrawable Circuit Breaker



Cutout for shaft (mm)

Type	R2
NSX100/160/250	min. 248 max. 600
NSX400/630	min. 272 max. 600

Dimensions and Front-Panel Cutout

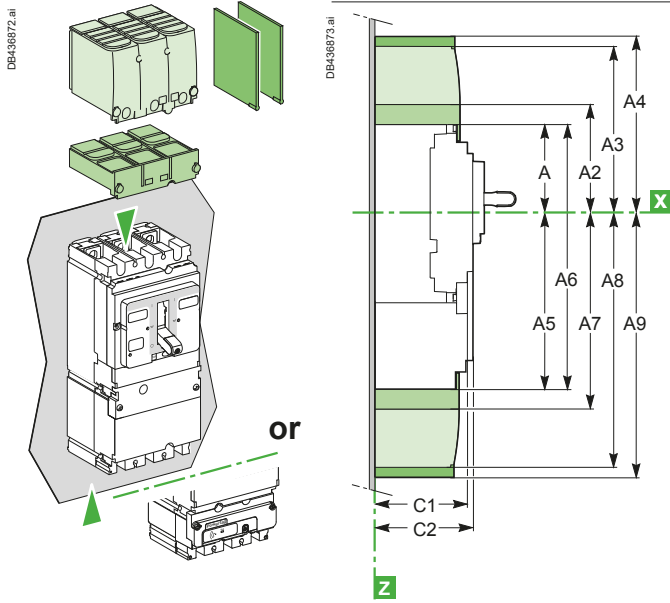


Type	A18	B10	D1
NSX100/160/250	9	9.25	75
NSX400/630	24.6	5	100

ComPacT NSX Dimensions and Mounting

Indication and Measurement Modules for ComPacT NSX100 to 630 Fixed Version

Dimensions of Circuit Breaker with Current-Transformer/PowerLogic PowerTag NSX Module



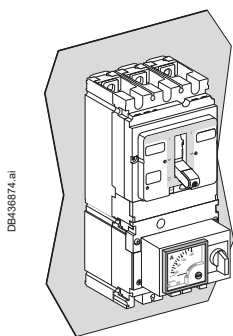
Mounting

On Backplate

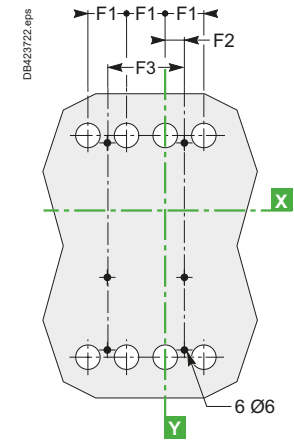
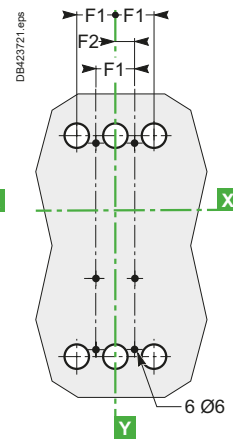
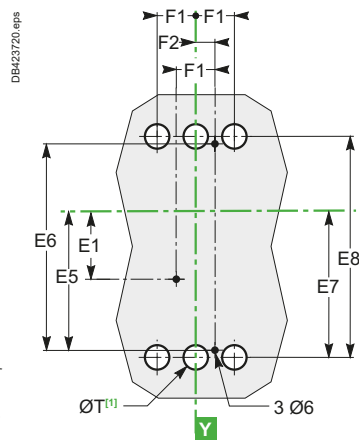
NSX100 to 250 2/3P

NSX400/630 3P

NSX100 to 630 4P



[1] The ØT holes are required for rear connection only. For two-pole circuit breakers, the middle holes are not required.

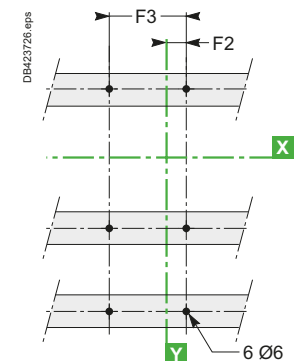
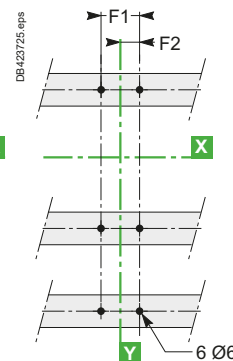
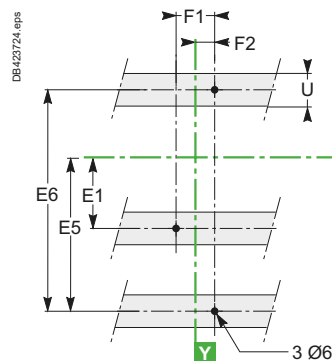
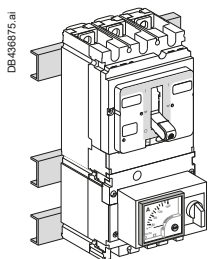


On Rails

2/3P

3P

4P

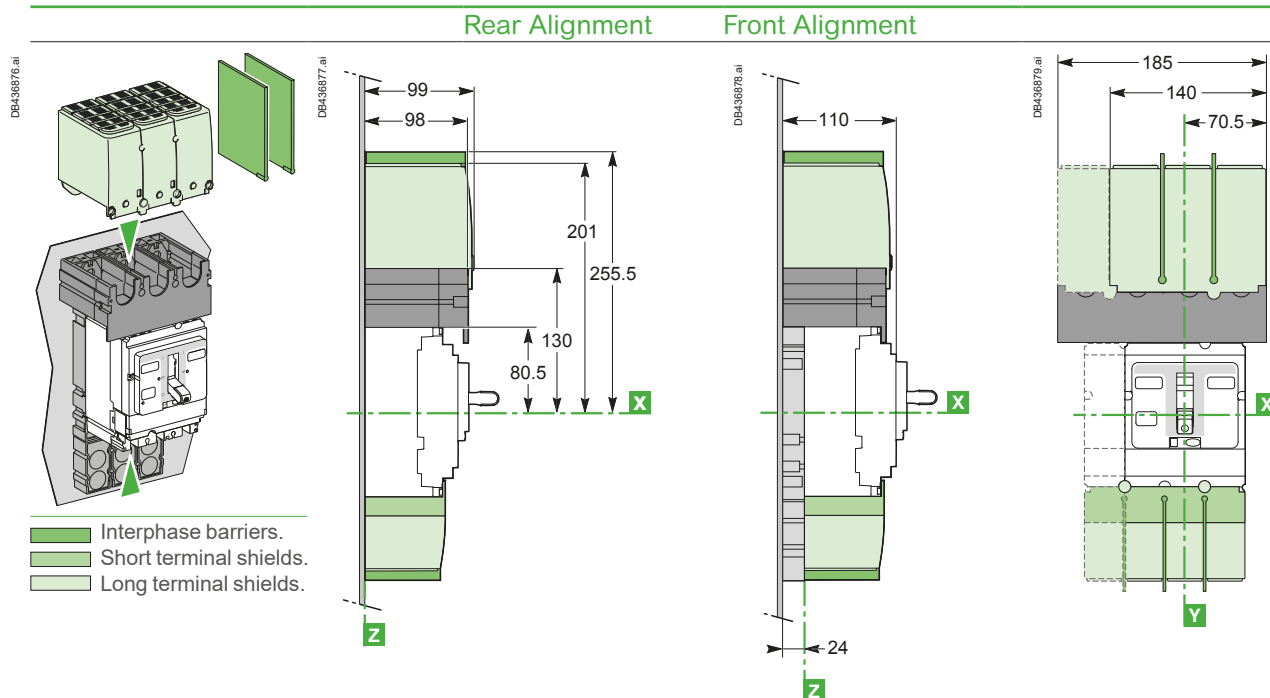


Type	A	A2	A3	A4	A5	A6	A7	A8	A9	C1	C2	C11	E1	E5	E6	E7	E8	F1
NSX100/160/250	80.5	94	145	178.5	155.5	236	169	220	253.5	81	86	137	62.5	137.5	200	145	215	35
NSX400/630	127.5	142.5	200	237	227.5	355	242.5	300	337	95.5	110	162	100	200	300	213.5	327	45
Type	F2	F3	ØT	U	Type	A5	A6	A7	A8	A9	C1	C2	C11	E1	E5	E6	E7	E8
NSX100/160/250	17.5	70	24	≤ 32	NSX100/160/250 with PowerTag NSX	120.5	201	134	185	219.5	102.5	165	110	180				
NSX400/630	22.5	90	32	≤ 35	NSX400/630 with PowerTag NSX	192.5	320	207.5	265	302.5	165	265	178.5	192				

ComPacT NSX Dimensions and Mounting

One-Piece Spreader for ComPacT NSX100 to 250 Fixed Version

Dimensions

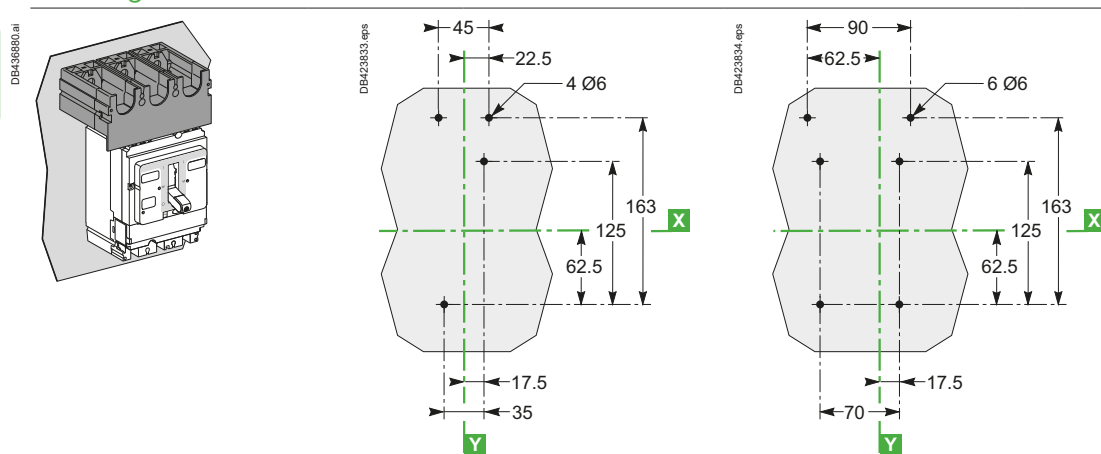


Mounting

Rear Alignment

2/3P

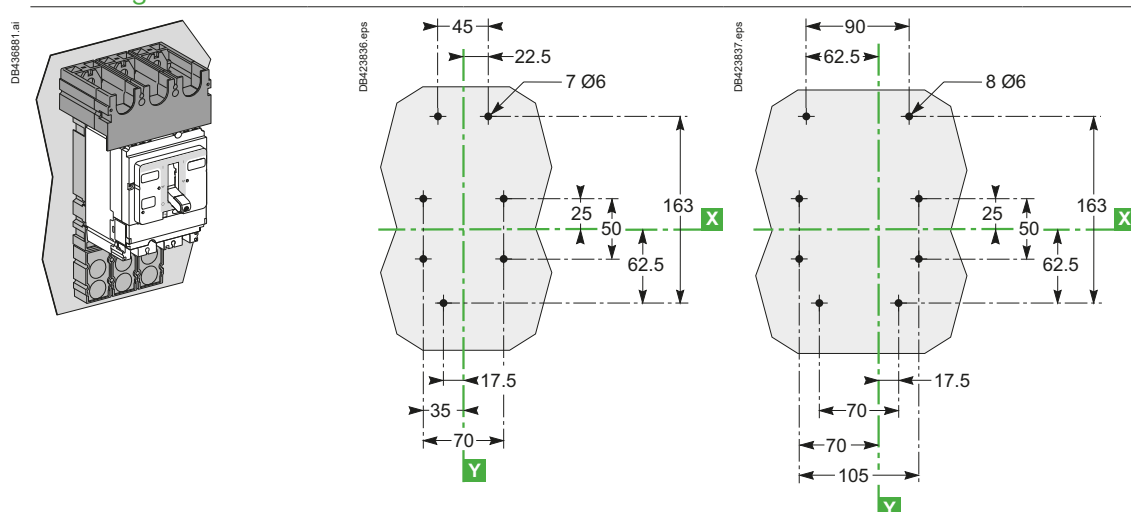
4P



Front Alignment

2/3P

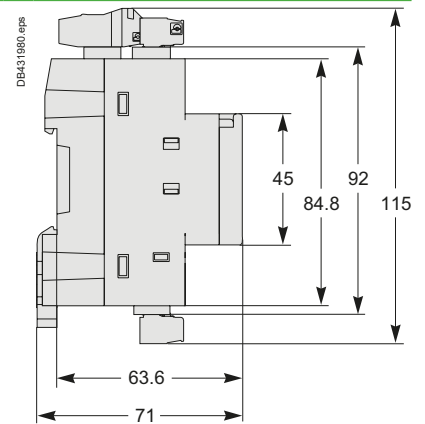
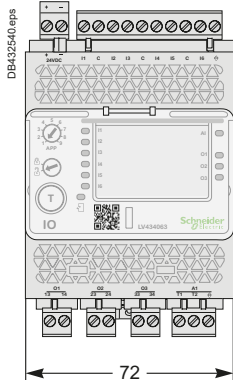
4P



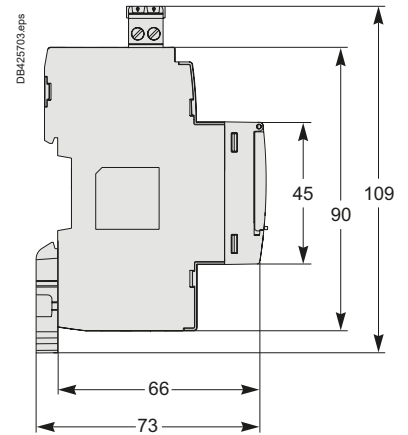
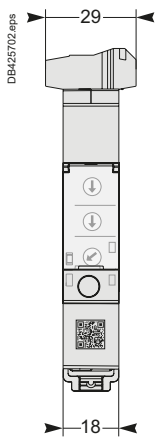
ComPacT NSX Dimensions and Mounting

External Modules

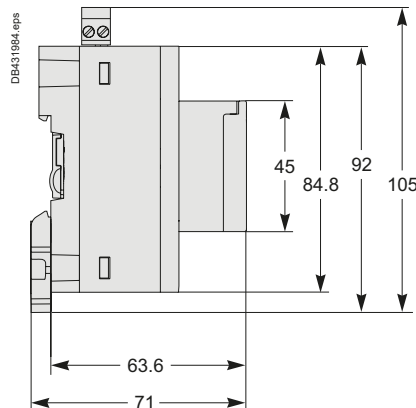
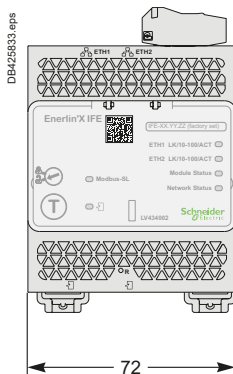
I/O (Input/Output) Application Module



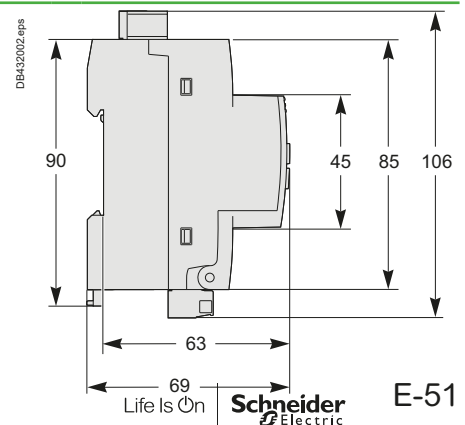
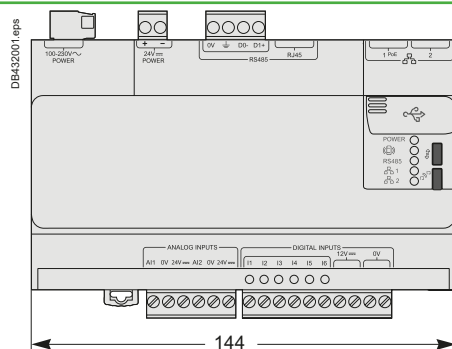
IFM - Modbus-SL Interface



IFE - Ethernet Interface



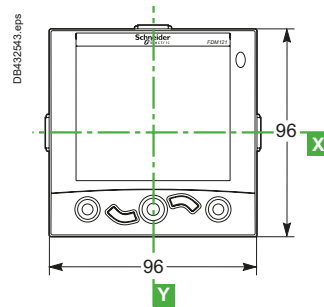
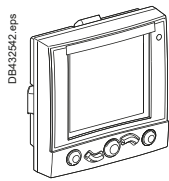
Com'X 500/510



ComPacT NSX Dimensions and Mounting

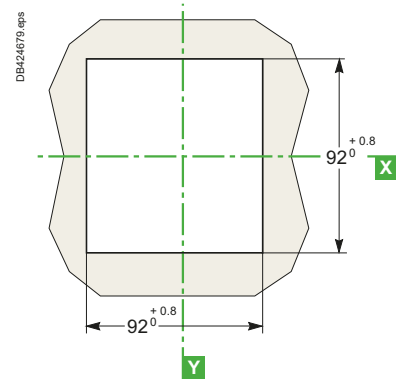
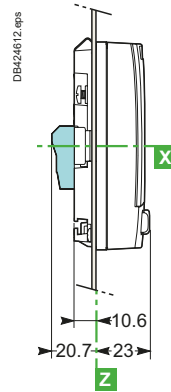
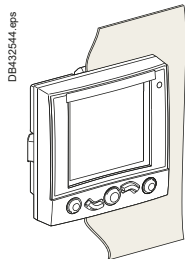
FDM121 Switchboard Display

Dimensions

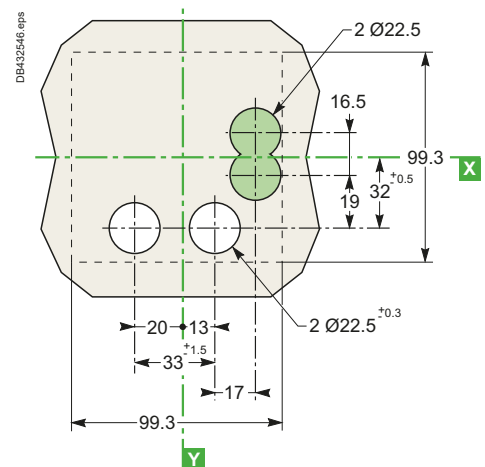
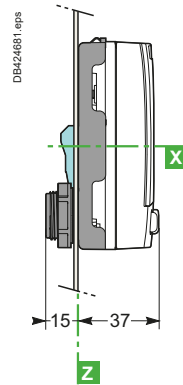
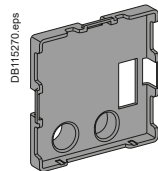
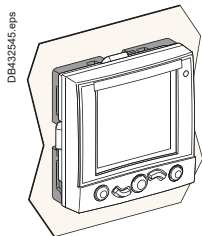


Mounting

Through Panel



On Panel

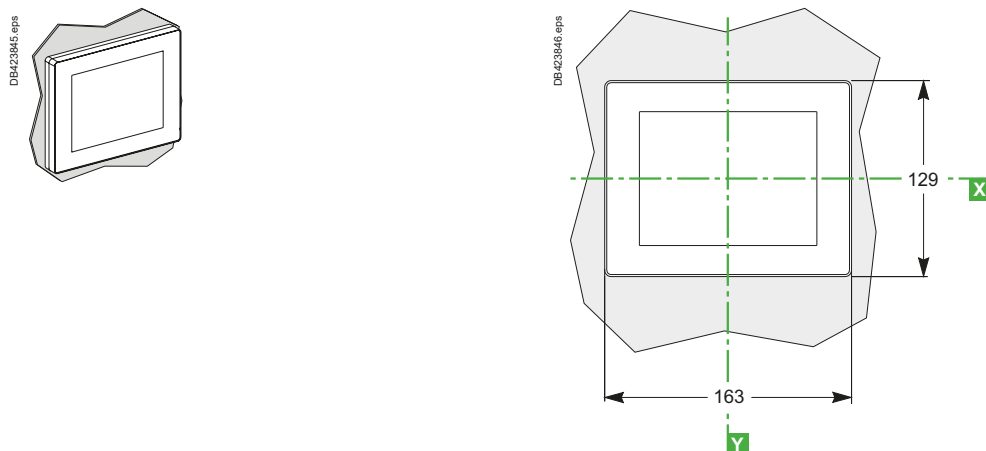


Connector (optional).

ComPacT NSX Dimensions and Mounting

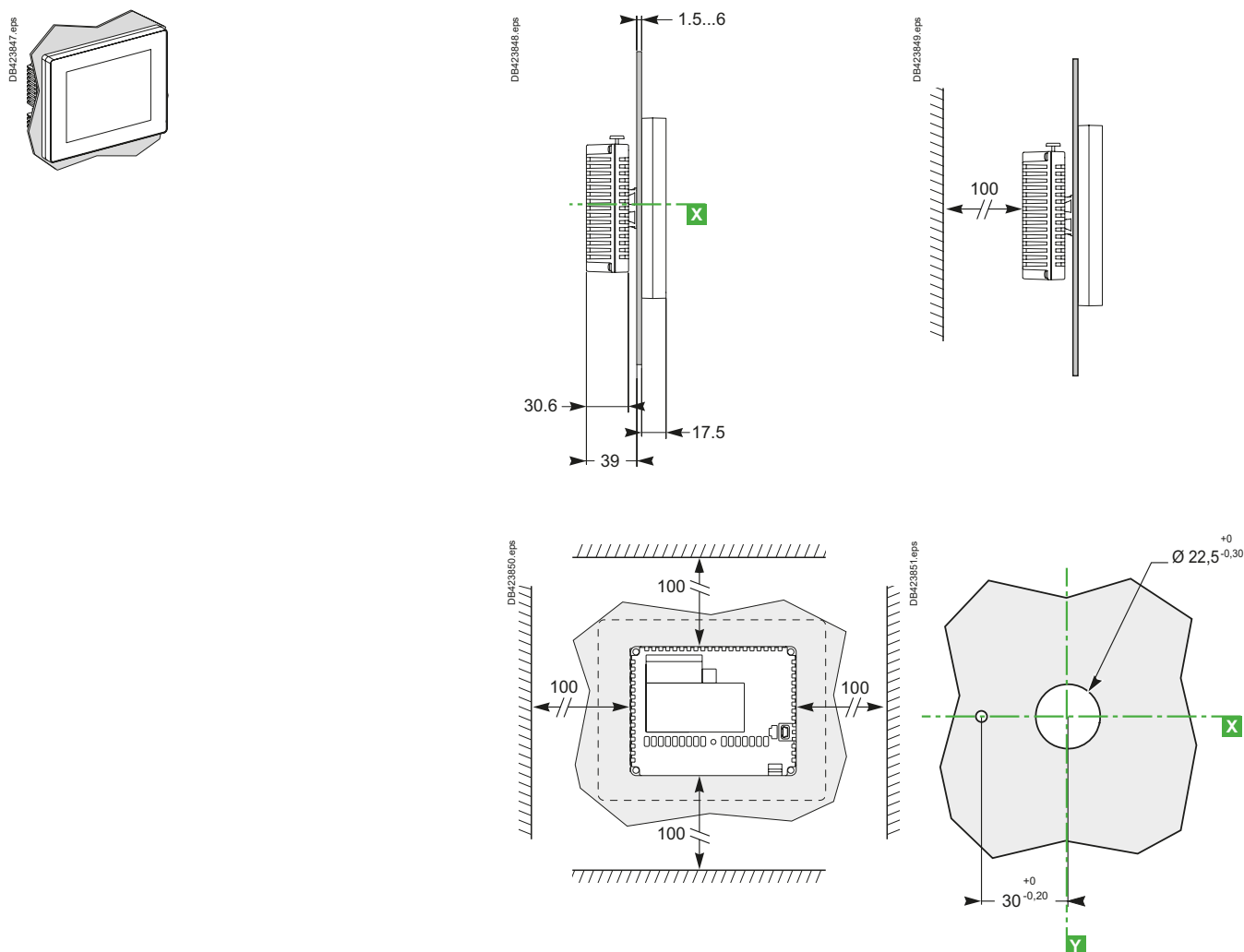
FDM128 Switchboard Display

Dimensions



Mounting

On Panel



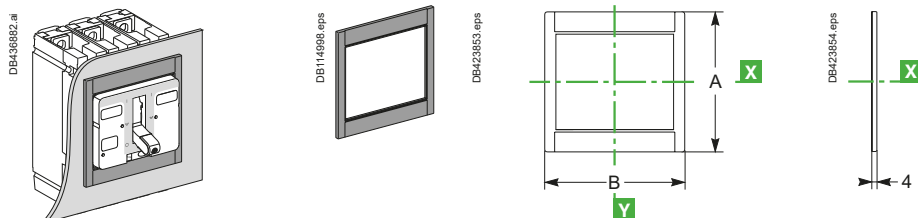
E

ComPacT NSX Front-Panel Accessories

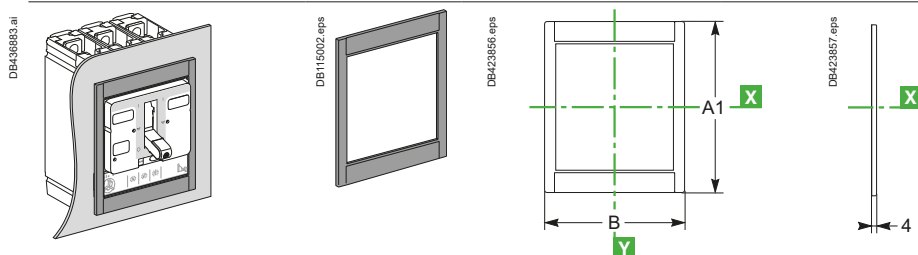
ComPacT NSX100 to 630

IP30 Front-Panel Escutcheons

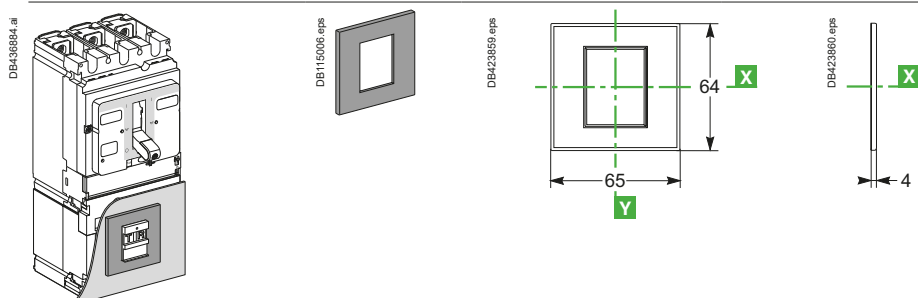
For Toggle, Rotary Handle or Motor Mechanism Module



For Toggle or Rotary Handle with Access to Trip Unit

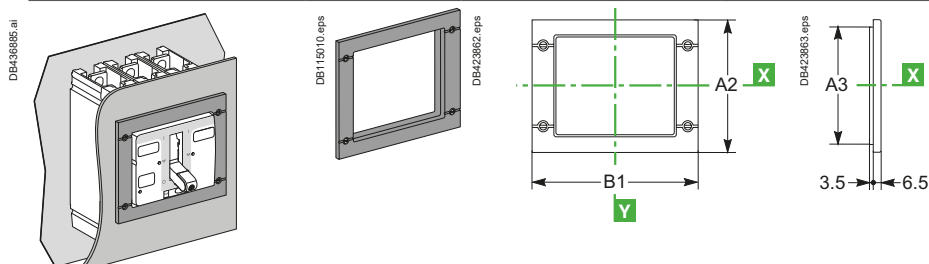


For VigiPacT Add-on

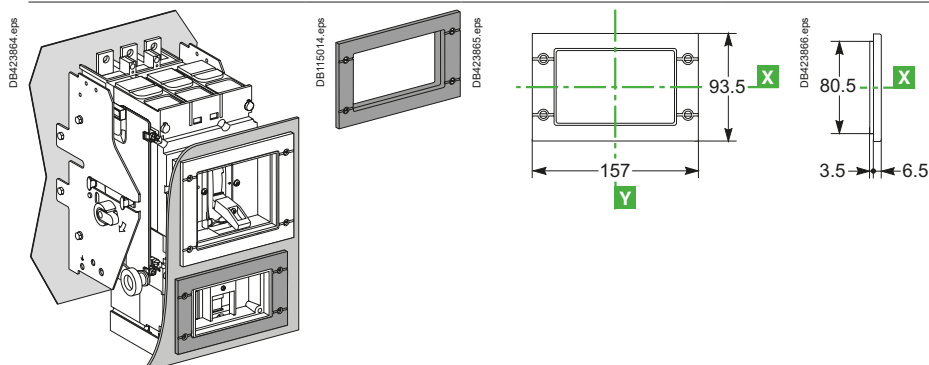


IP40 Front-Panel Escutcheons

For Toggle, Rotary Handle or Motor Mechanism Module and Protection Collar



For VigiPacT Add-on with Protection Collar

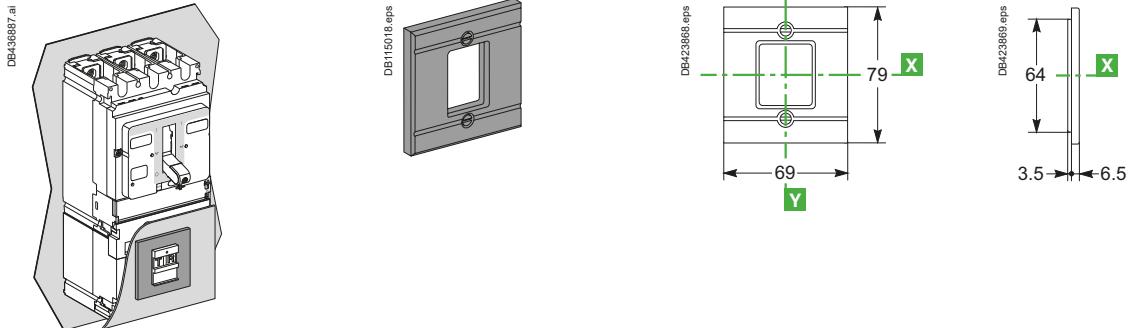


ComPacT NSX Front-Panel Accessories

ComPacT NSX100 to 630

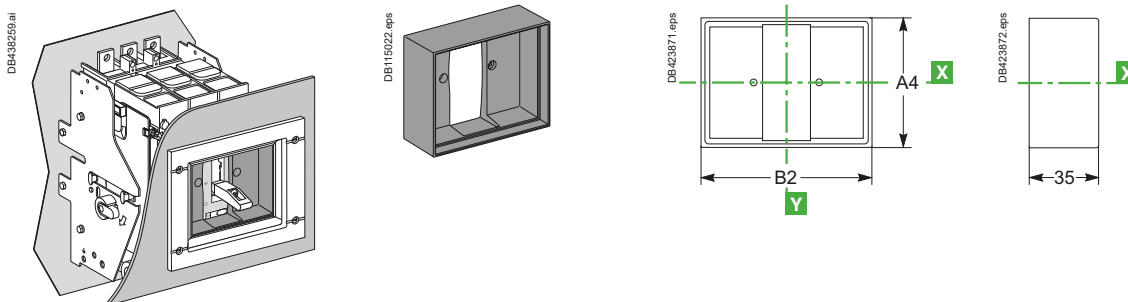
IP40 Front-Panel Escutcheons (Cont.)

For VigiPacT Add-on

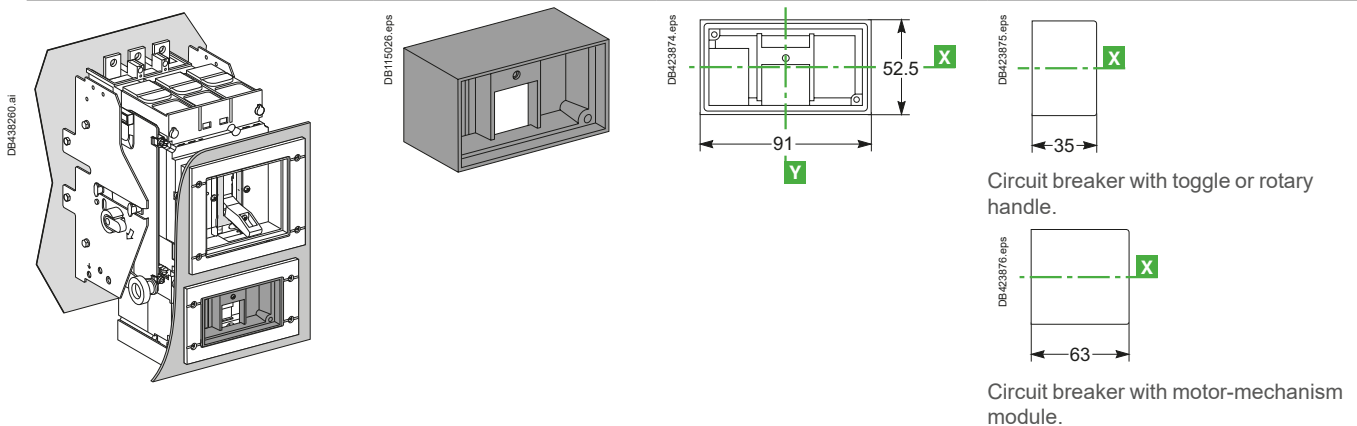


Protection Collars for IP40 Front-Panel Escutcheons

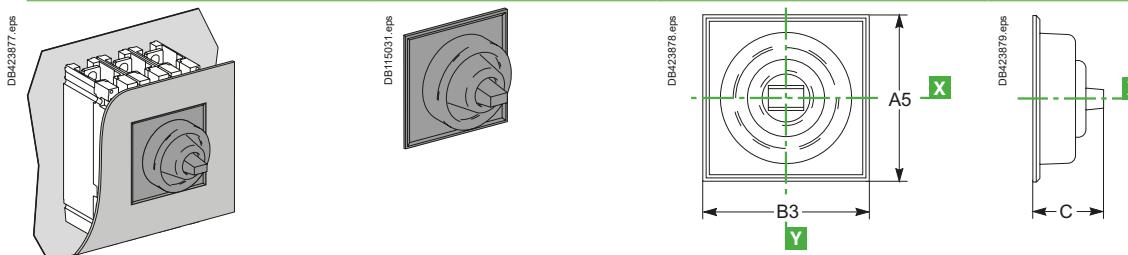
For Toggle



For VigiPacT Add-on



IP43 Toggle Cover



Type	A	A1	A2	A3	A4	A5	B	B1	B2	B3	C
NSX100/160/250	113	138	114	101	73	85	113	157	91	103	40
NSX400/630	163	211	164	151	122.5	138	163	189	122.5	138	60

ComPacT NSX Front-Panel Cutouts

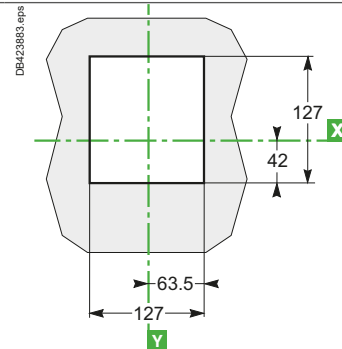
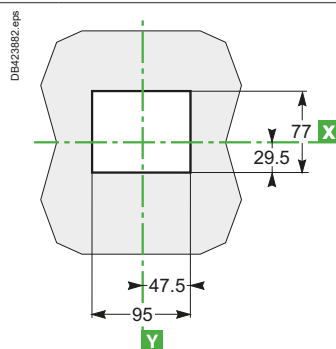
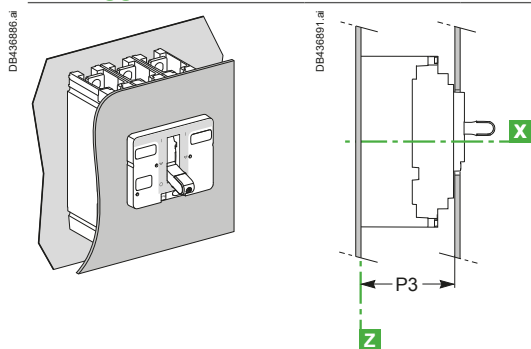
ComPacT NSX100 to 630 Fixed Version

Bare Sheet Metal

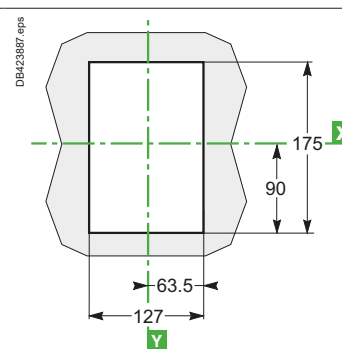
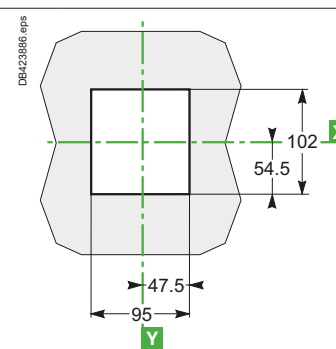
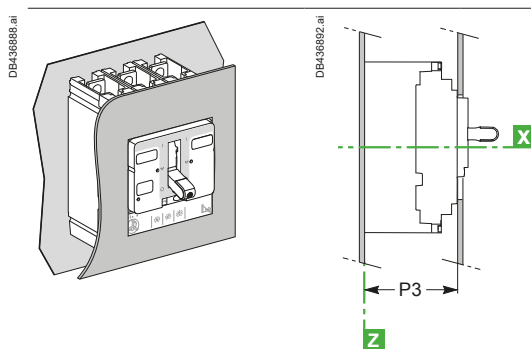
NSX100 to 250

NSX400/630

For Toggle



For Toggle with Access to Trip Unit

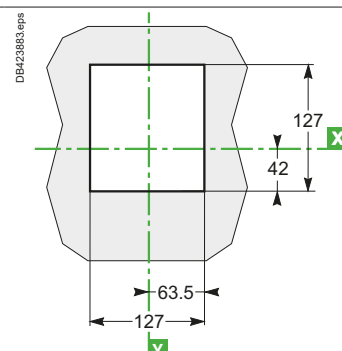
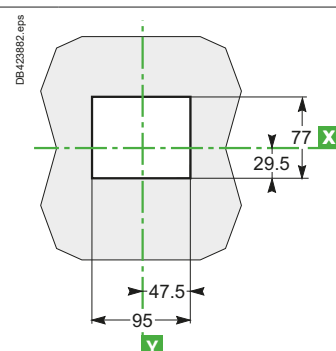
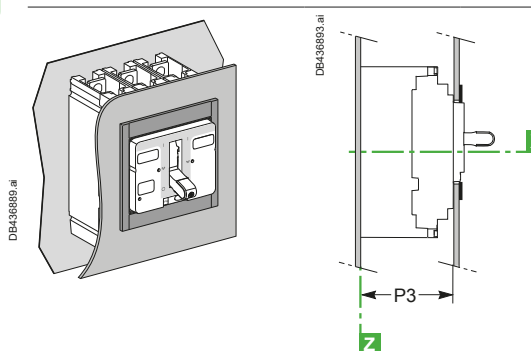


With IP30 Front-Panel Escutcheon

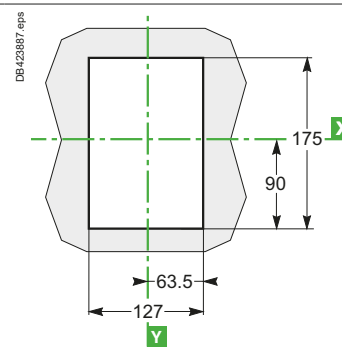
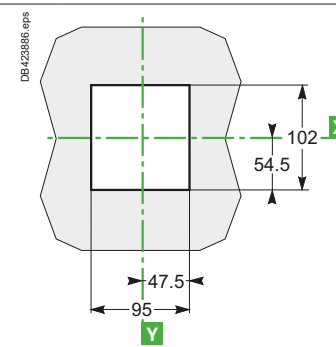
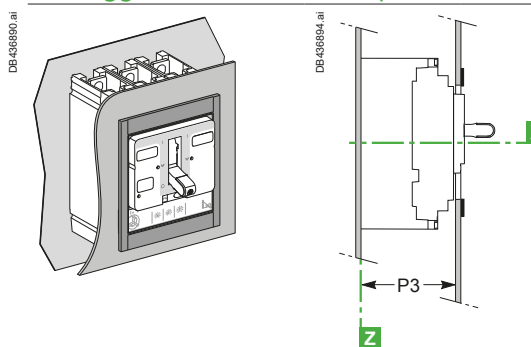
NSX100 to 250

NSX400/630

For Toggle



For Toggle with Access to Trip Unit



ComPacT NSX Front-Panel Cutouts

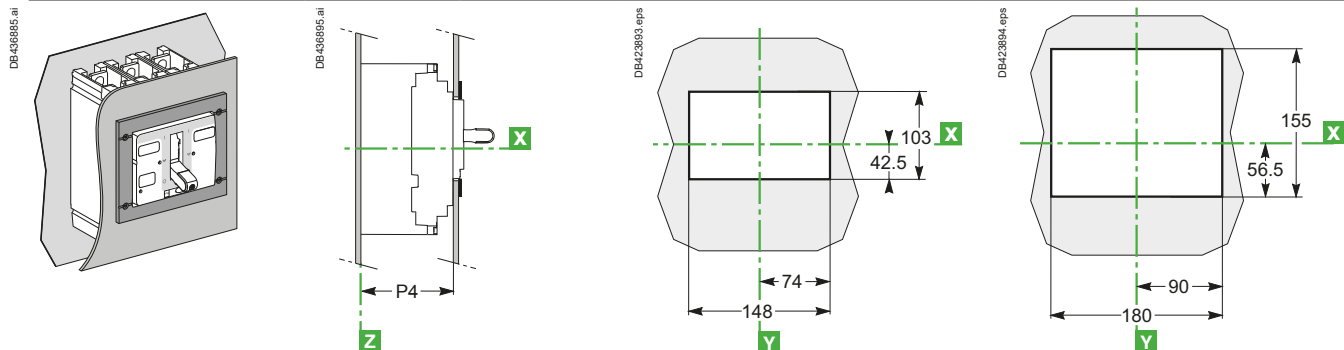
ComPacT NSX100 to 630 Fixed Version

With IP40 Front-Panel Escutcheon

NSX100 to 250

NSX400/630

For Toggle

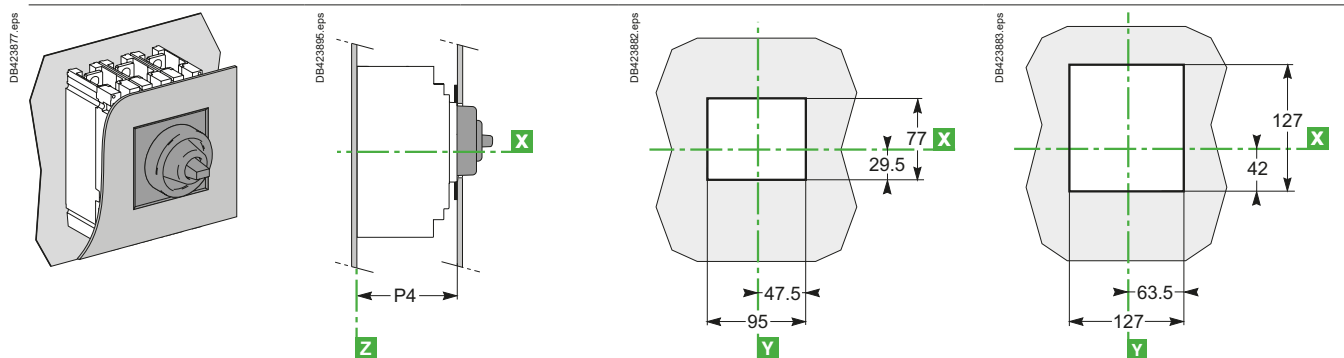


With IP43 Toggle Cover

NSX100 to 250

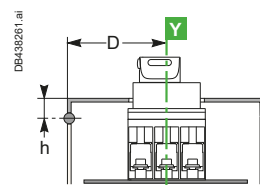
NSX400/630

For Toggle



Type	P3	P4
NSX100/160/250	88	89
NSX400/630	112	113

Note: Door cutout dimensions are given for a device position in the enclosure where $D \leq 100 + (h \times 5)$ with respect to the door hinge.



ComPacT NSX Front-Panel Cutouts

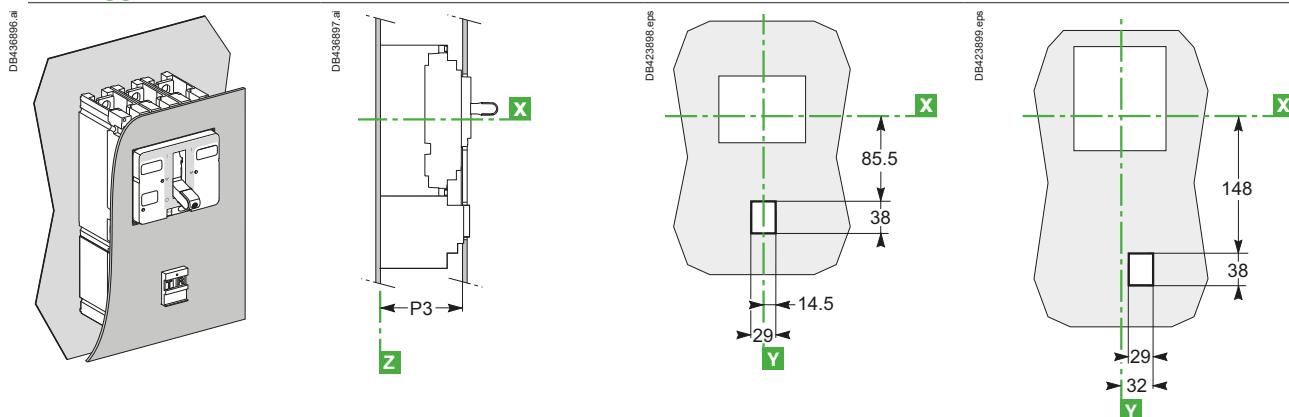
ComPacT NSX100 to 630 VigiPacT Add-on Fixed Version

Bare Sheet Metal

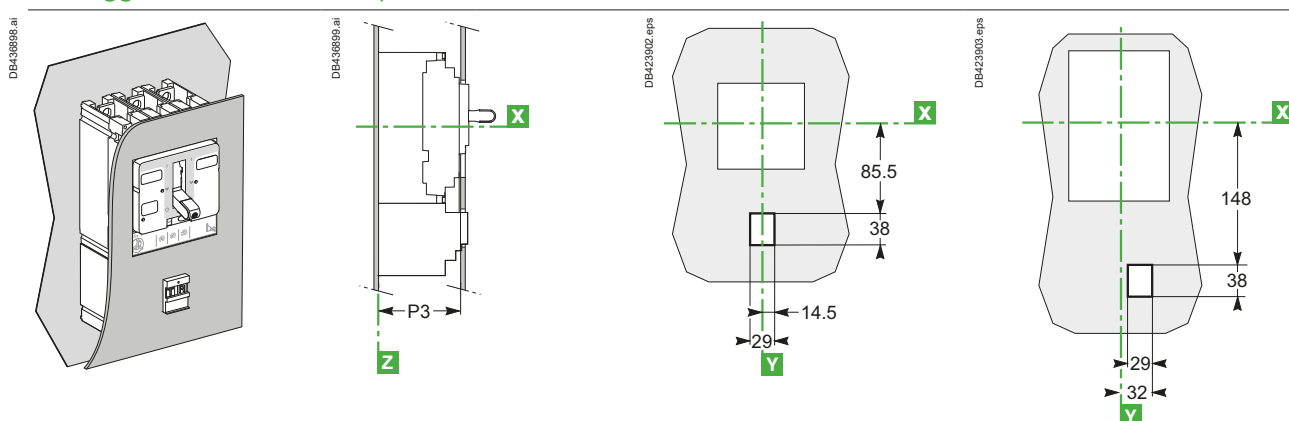
NSX100 to 250

NSX400/630

For Toggle



For Toggle with Access to Trip Unit

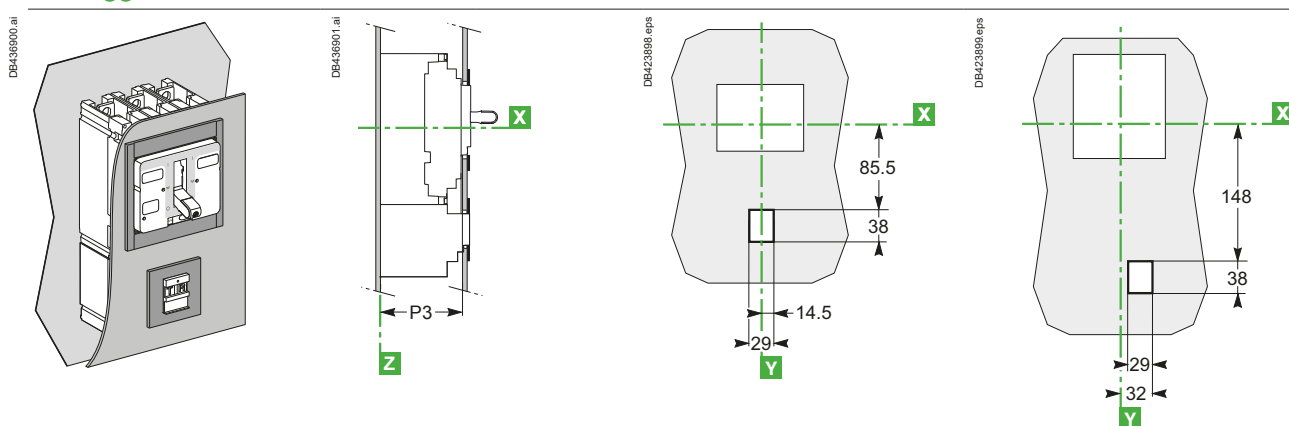


With IP30 Front-Panel Escutcheon

NSX100 to 250

NSX400/630

For Toggle



ComPacT NSX Front-Panel Cutouts

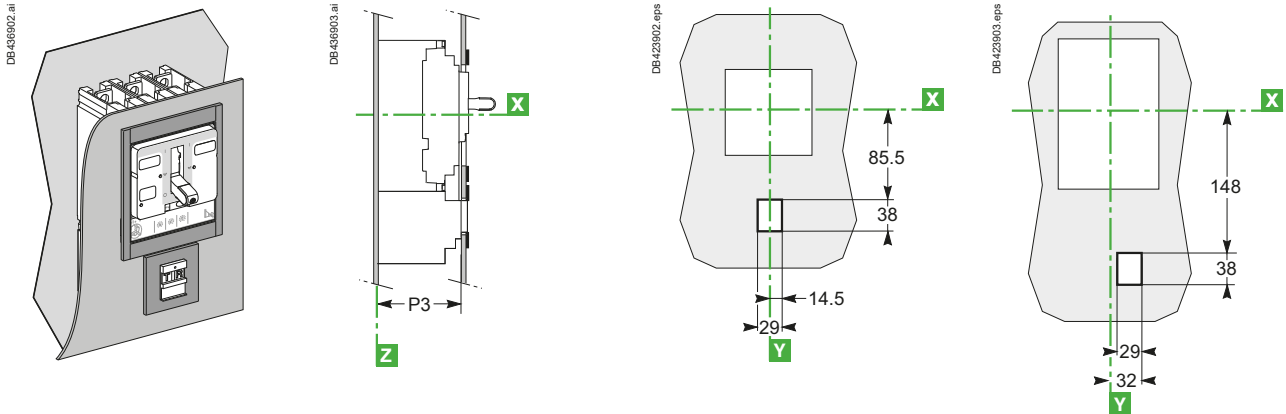
ComPacT NSX100 to 630 VigiPacT Add-on Fixed Version

With IP30 Front-Panel Escutcheon

NSX100 to 250

NSX400/630

For Toggle with Access to Trip Unit

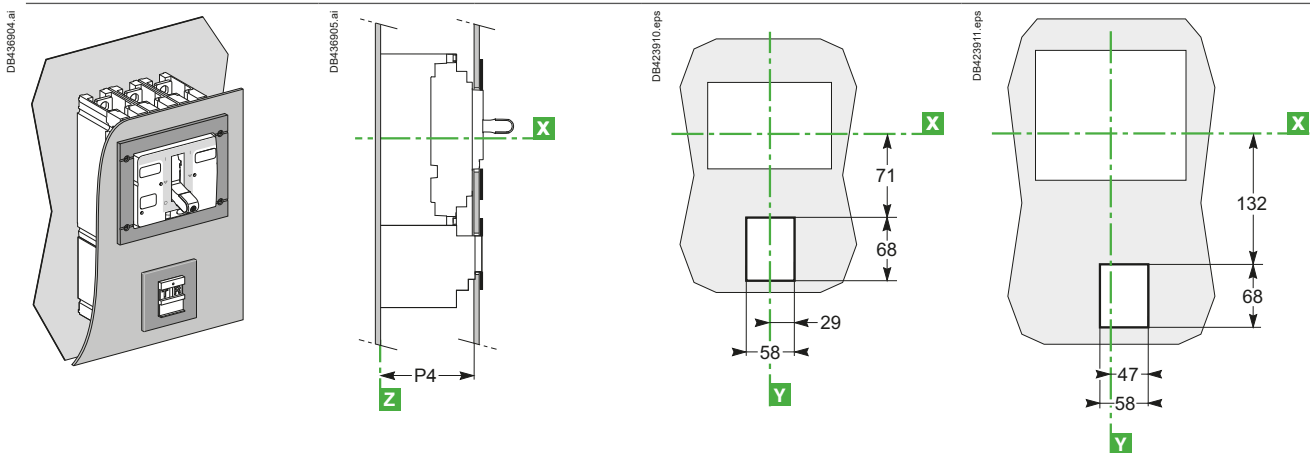


With IP40 Front-Panel Escutcheon

NSX100 to 250

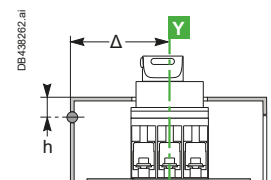
NSX400/630

For Toggle



Type	P3	P4
NSX100/160/250	88	89
NSX400/630	112	113

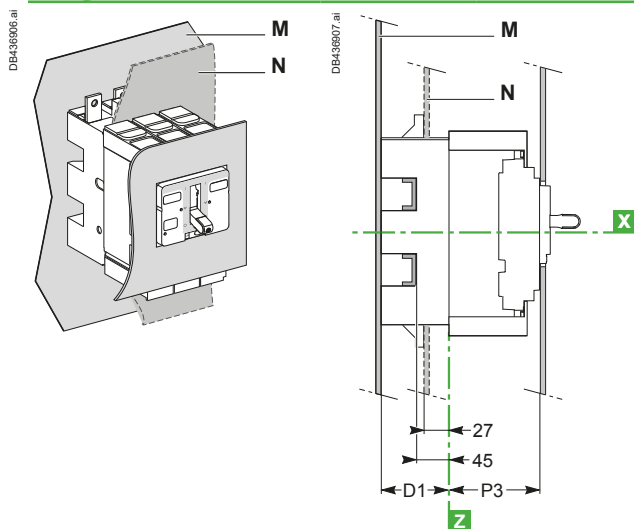
Note: Door cutout dimensions are given for a device position in the enclosure where $\Delta \geq 100 + (h \times 5)$ with respect to the door hinge.



ComPacT NSX Front-Panel Cutouts

ComPacT NSX100 to 630 Plug-in and Withdrawable Versions

Plug-in Version



Bare sheet metal

See ComPacT NSX100 to 630 fixed version, [page E-56](#)

With IP30 front-panel escutcheon

See ComPacT NSX100 to 630 fixed version, [page E-56](#)

With IP40 front-panel escutcheon

See ComPacT NSX100 to 630 fixed version, [page E-57](#)

With toggle cover

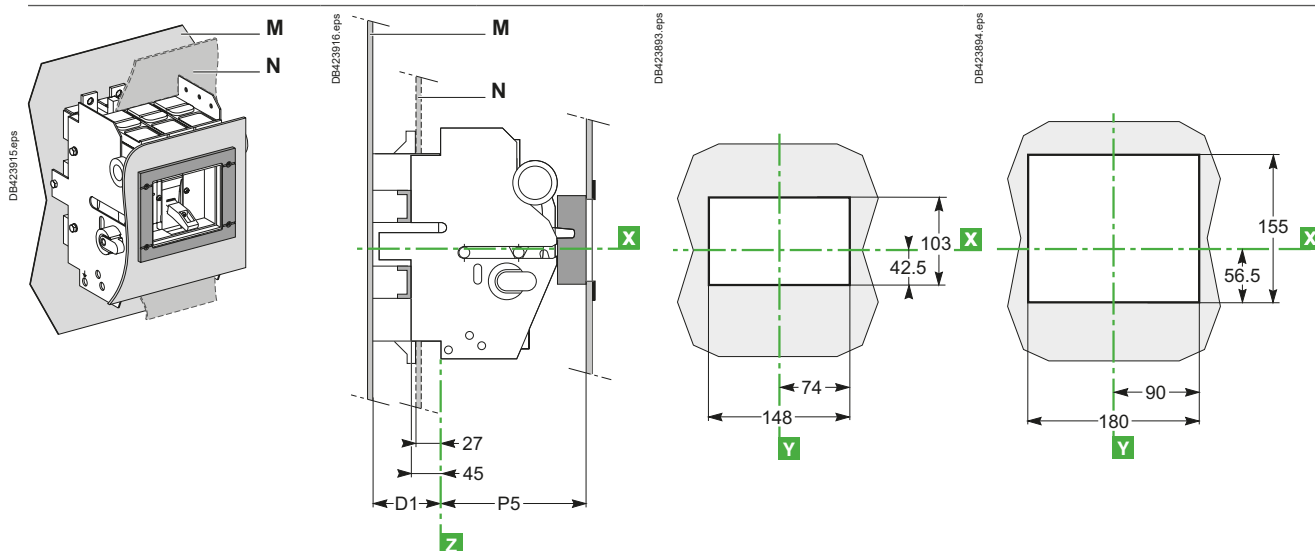
See ComPacT NSX100 to 630 fixed version, [page E-57](#)

Withdrawable Version

NSX100 to 250

NSX400/630

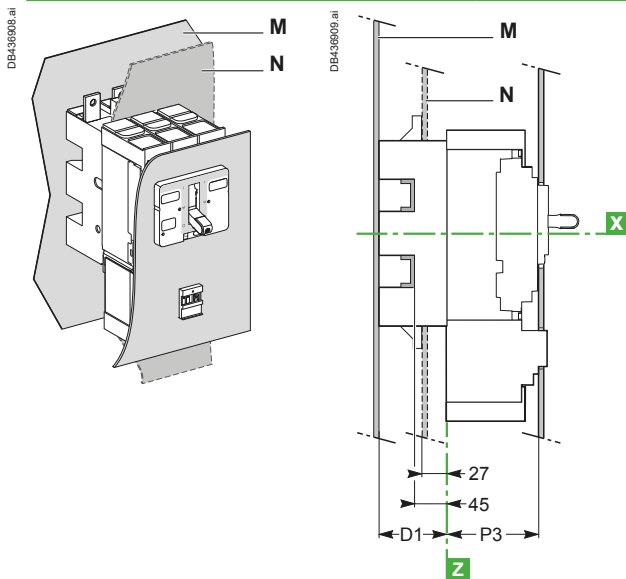
With Protection Collar and IP40 Front-Panel Escutcheon



ComPacT NSX Front-Panel Cutouts

ComPacT NSX100 to 630 VigiPacT Add-on Plug-in and Withdrawable Versions

Plug-in Version



Bare sheet metal

See ComPacT NSX100 to 630 fixed version, [page E-58](#)

With IP30 front-panel escutcheon

See ComPacT NSX100 to 630 fixed version, [page E-58](#)

With IP40 front-panel escutcheon

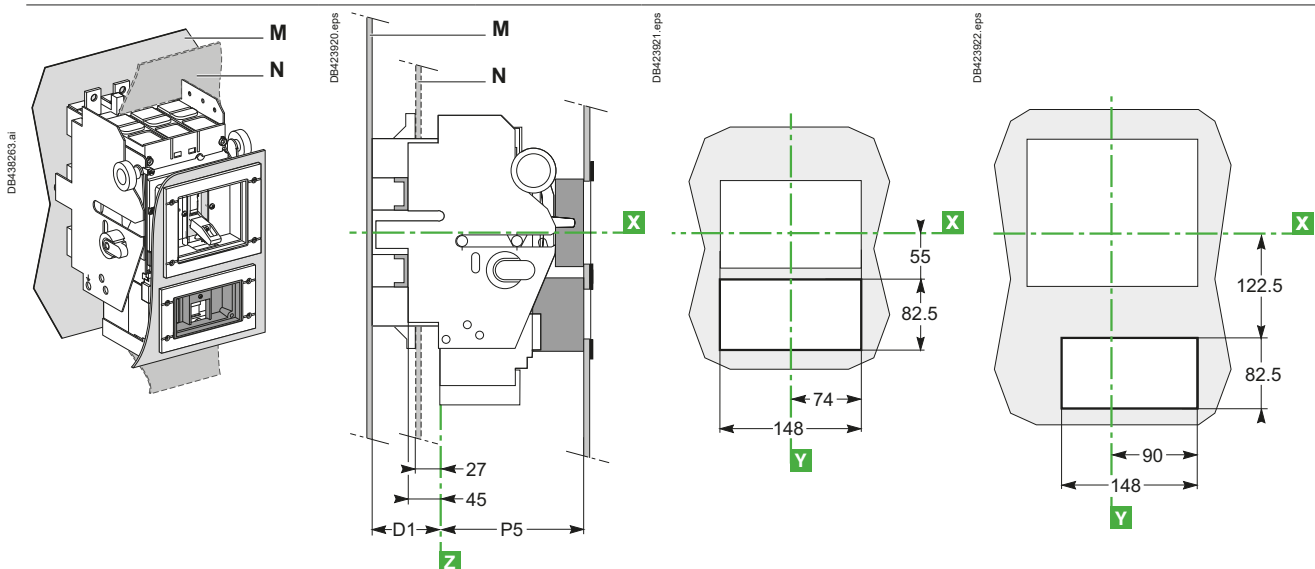
See ComPacT NSX100 to 630 fixed version, [page E-59](#)

Withdrawable Version

NSX100 to 250

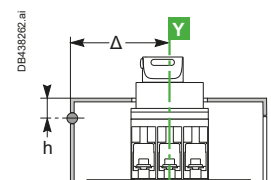
NSX400/630

With Protection Collar and IP40 Front-Panel Escutcheon



Type	D1	P3	P5
NSX100/160/250	75	88	123
NSX400/630	100	112	147

Note: Door cutout dimensions are given for a device position in the enclosure where $\Delta \geq 100 + (h \times 5)$ with respect to the door hinge.

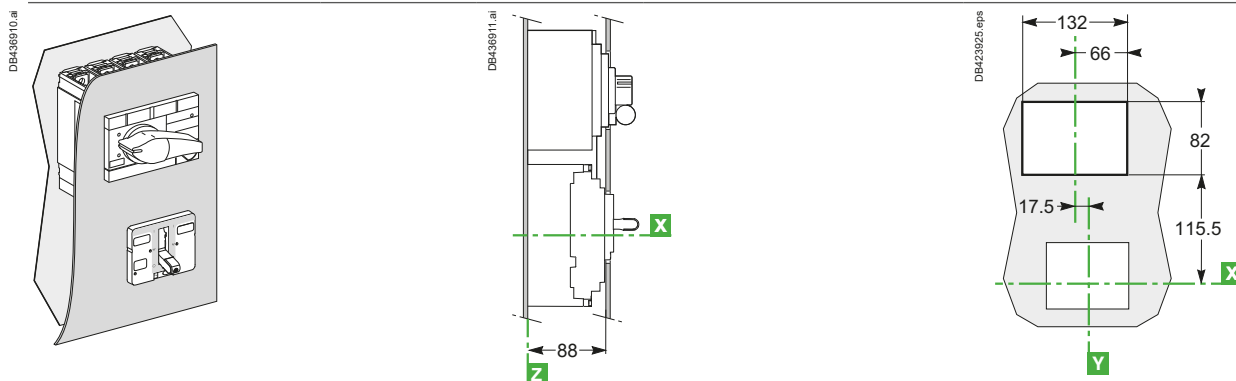


ComPacT NSX Front-Panel Cutouts

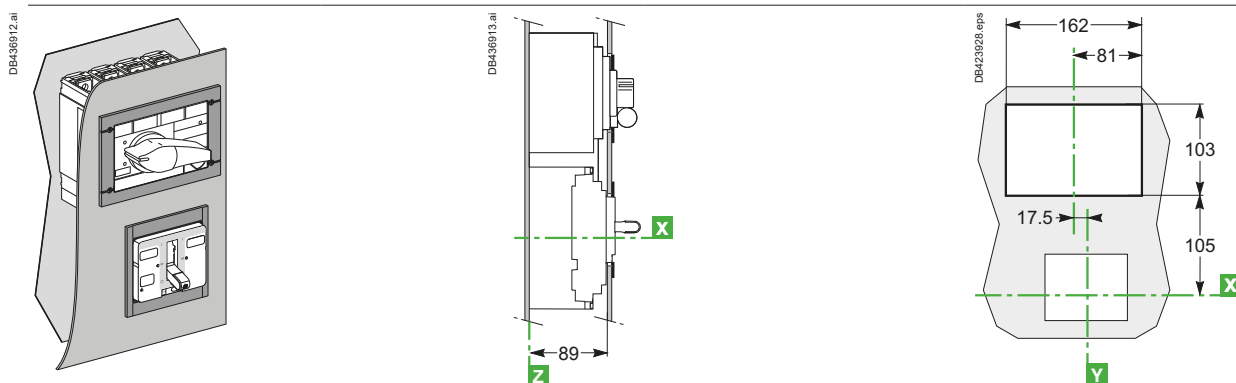
Visu Function for ComPacT NSX100 to 630 Fixed Version

ComPacT NSX100 to 250 with ComPacT INV100 to 250 Visu Function

Bare Sheet Metal

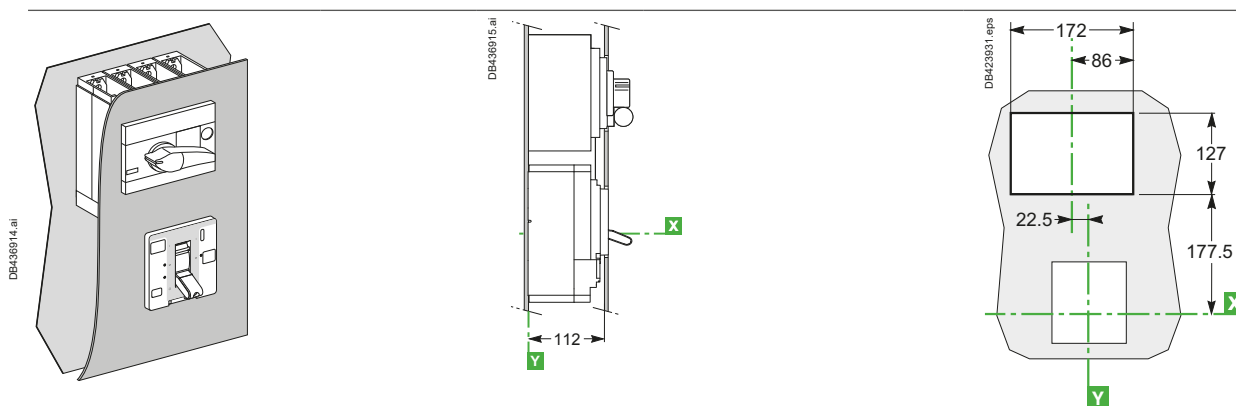


With IP40 Front-Panel Escutcheon

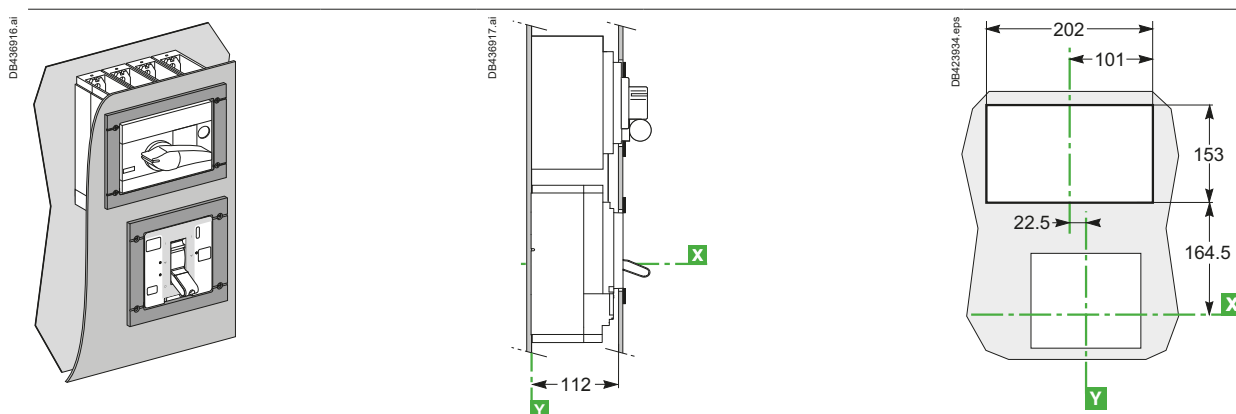


ComPacT NSX400/630 with ComPacT INV400 to 630 Visu Function

Bare Sheet Metal



With IP40 Front-Panel Escutcheon



ComPacT NSX Front-Panel Cutouts

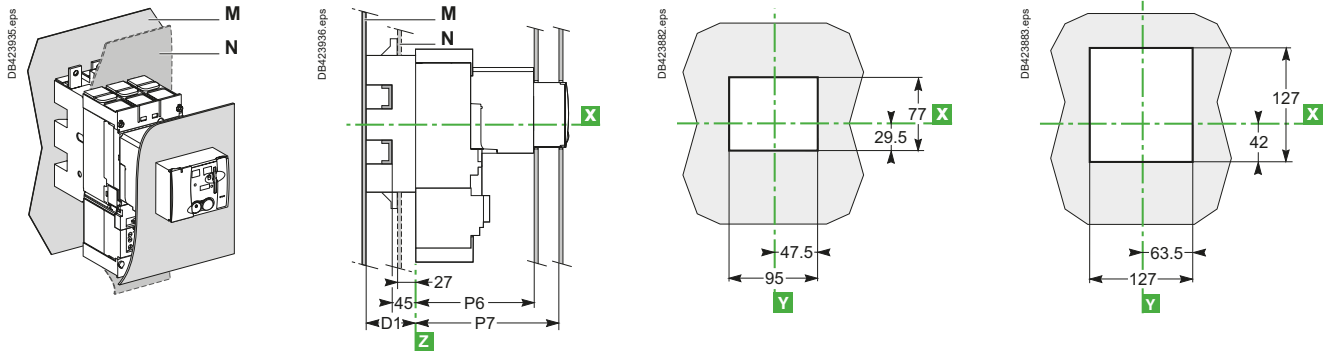
Motor Mechanism Module for ComPacT NSX100 to 630 with/without VigiPacT Add-on

Bare Sheet Metal

NSX100 to 250

NSX400/630

Fixed, Plug-in or Withdrawable Circuit Breaker

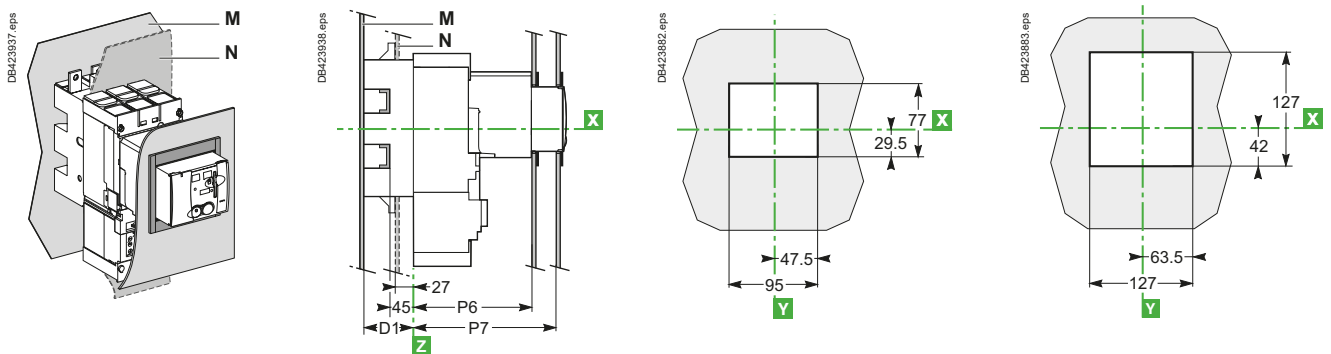


With IP30 Front-Panel Escutcheon

NSX100 to 250

NSX400/630

Fixed, Plug-in or Withdrawable Circuit Breaker

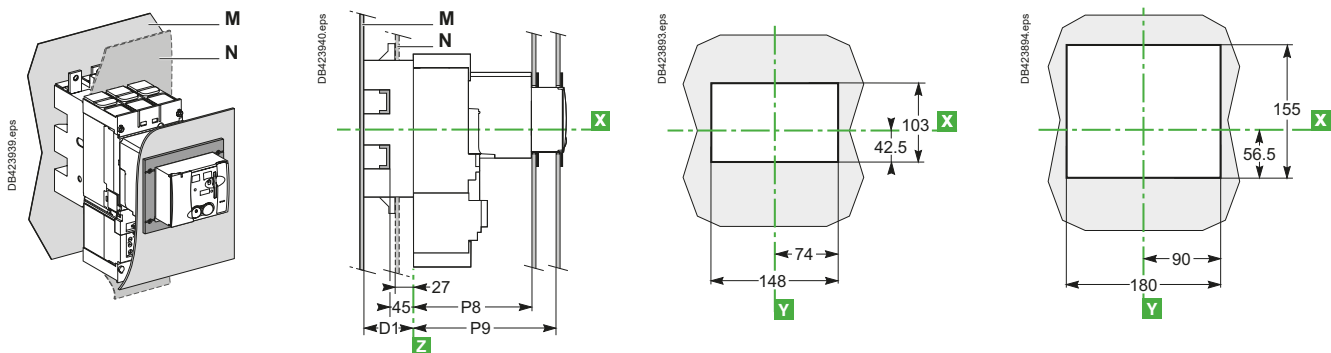


With IP40 Front-Panel Escutcheon

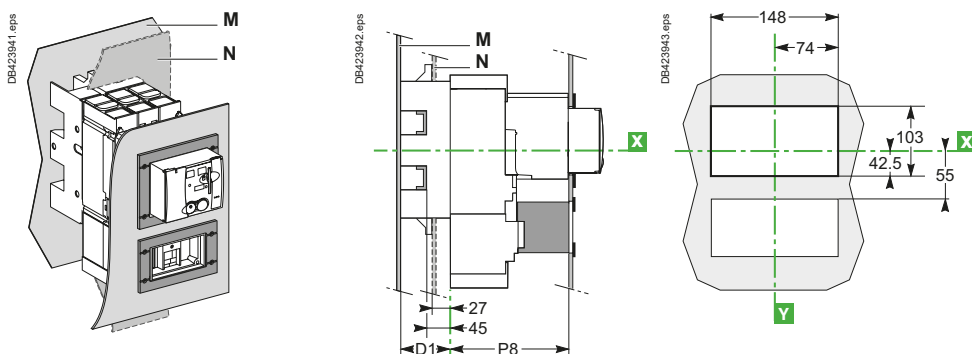
NSX100 to 250

NSX400/630

Fixed, Plug-in or Withdrawable Circuit Breaker without Access to VigiPacT Add-on



Fixed or Plug-in Circuit Breaker with Access to VigiPacT Add-on



Type	D1	P6 ^[1]	P7 ^[2]	P8 ^[1]	P9 ^[2]
NSX100/160/250	75	145	177	146	178

[1] Plug-in version.

[2] Withdrawable version.

ComPacT NSX Front-Panel Cutouts

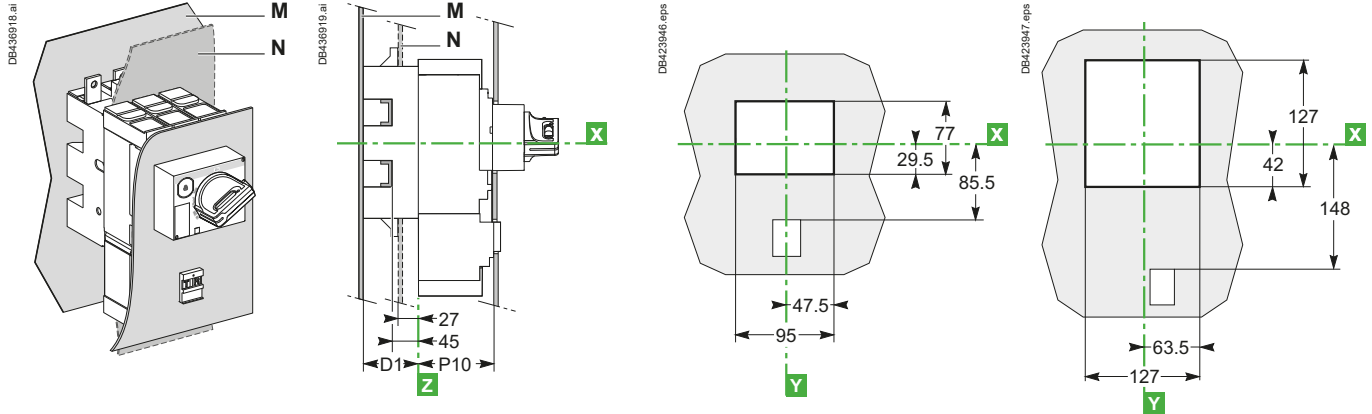
Direct Rotary Handle for ComPacT NSX100 to 630 with/without VigiPacT Add-on

Fixed or Plug-in Circuit Breakers

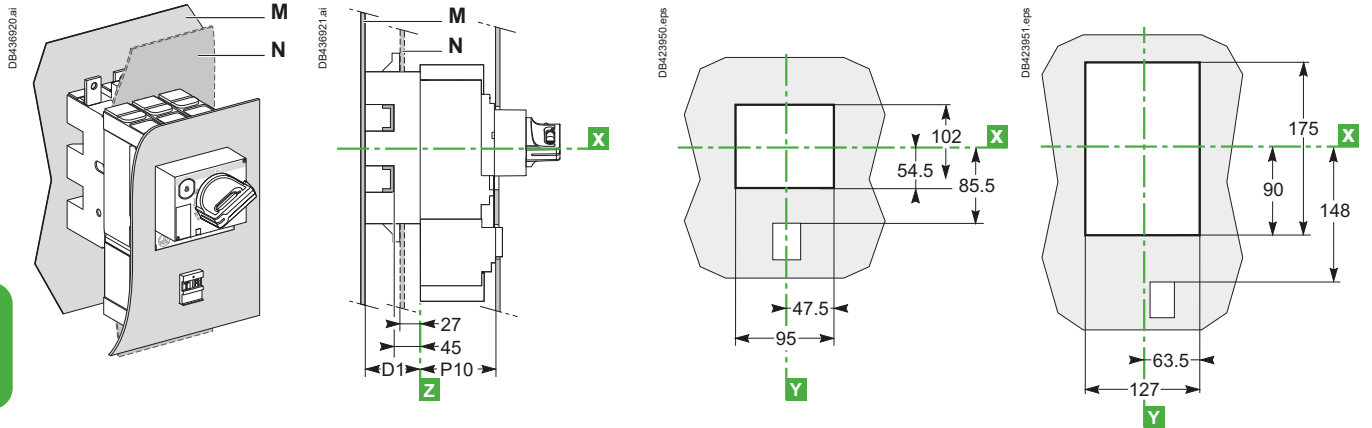
NSX100 to 250

NSX400/630

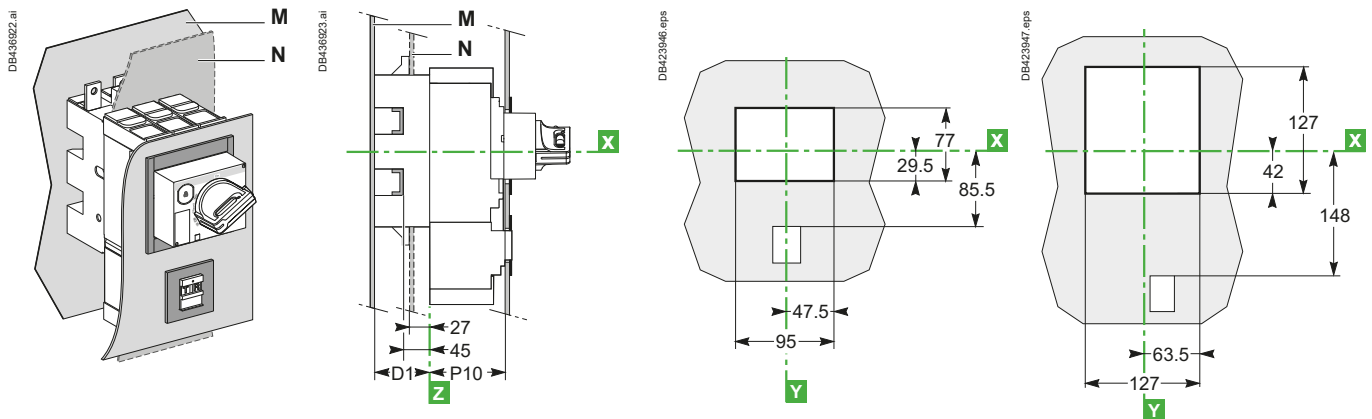
Bare Sheet Metal



Bare Sheet Metal with Access to the Trip Unit



With IP30 Front-Panel Escutcheon



ComPacT NSX Front-Panel Cutouts

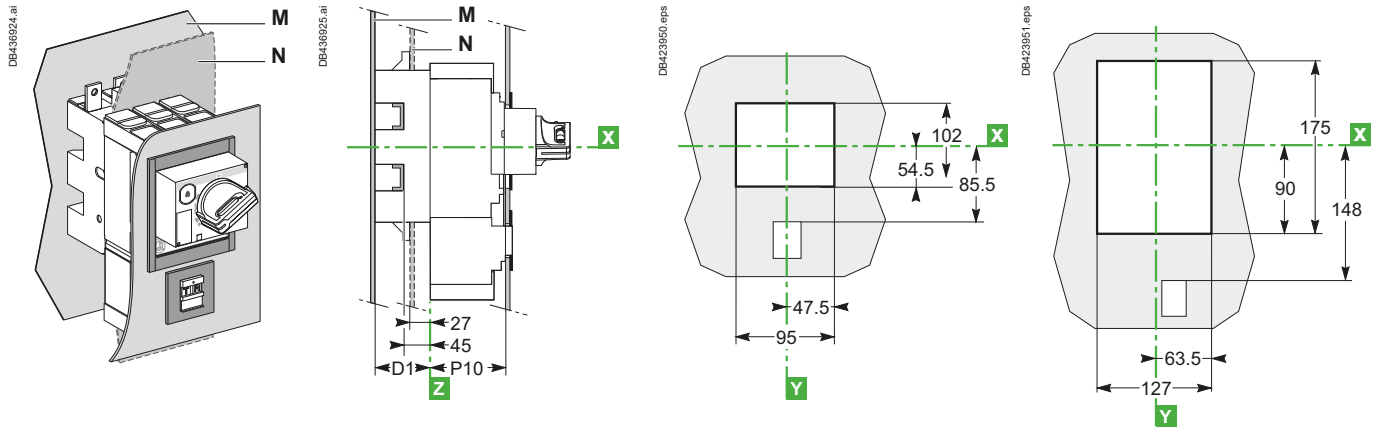
Direct Rotary Handle for ComPacT NSX100 to 630 with/without VigiPacT Add-on

Fixed or Plug-in Circuit Breakers

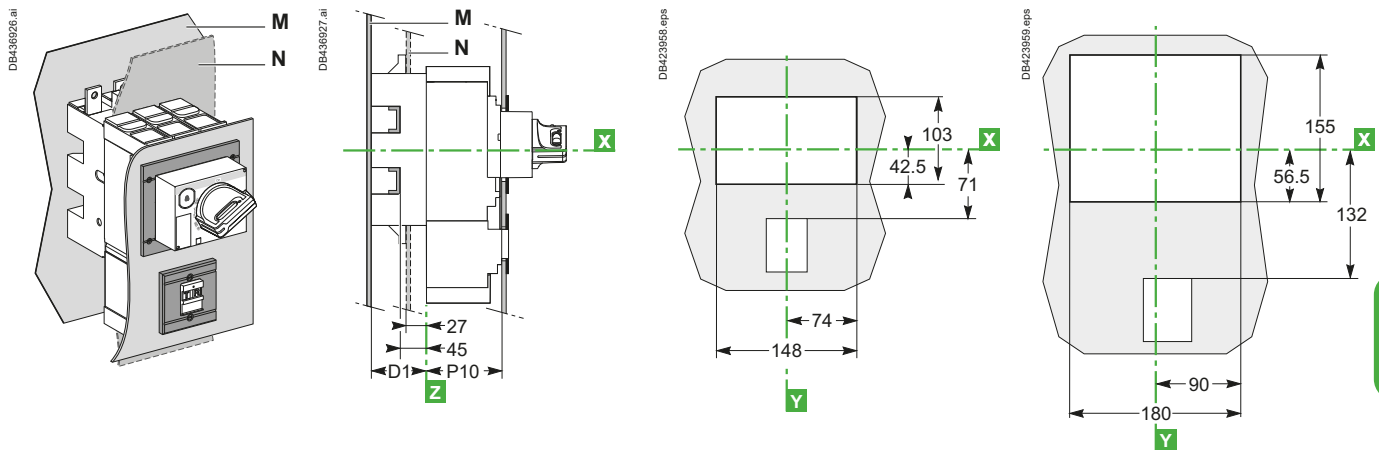
NSX100 to 250

NSX400/630

With IP30 Front-Panel Escutcheon with Access to the Trip Unit



With IP40 Front-Panel Escutcheon

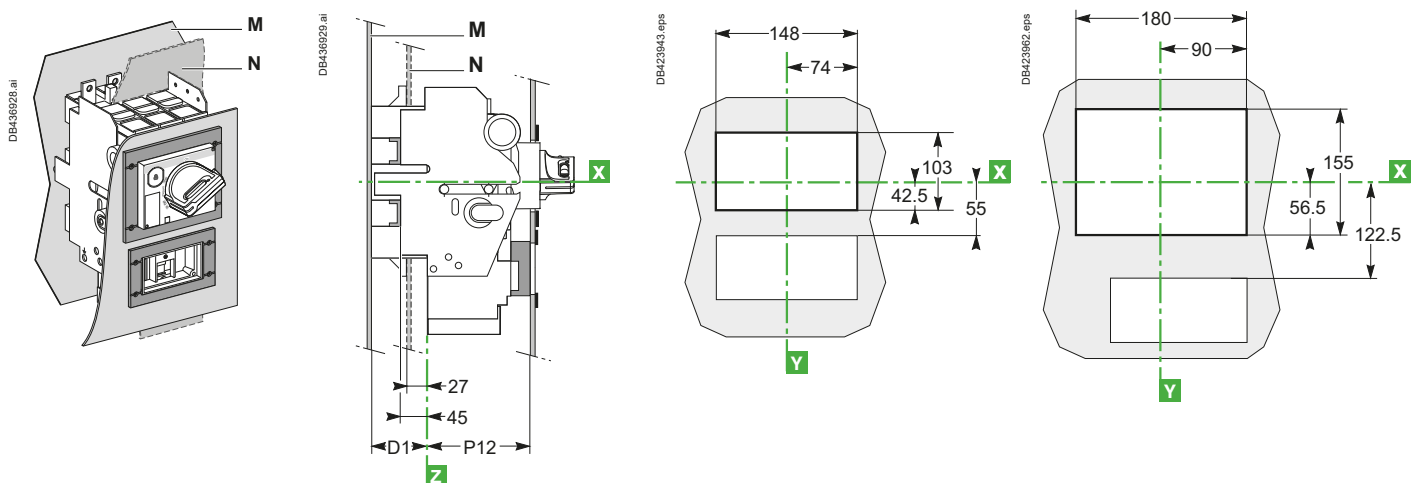


Fixed or Withdrawable Circuit Breakers

NSX100 to 250

NSX400/630

With IP40 Front-Panel Escutcheon

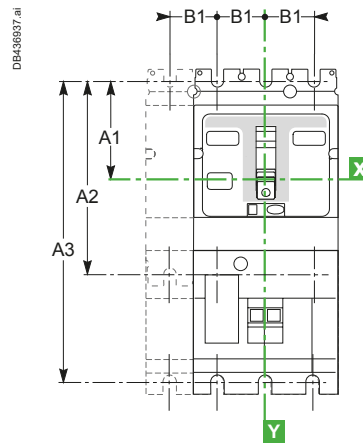
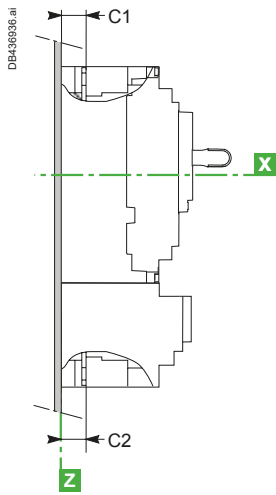


Type	D1	P10	P11	P12
NSX100/160/250	75	89	90	123
NSX400/630	100	112	113	147

ComPacT NSX Power Connections

ComPacT NSX100 to 630 with/without VigiPacT Add-on Fixed Version

Connection Locations



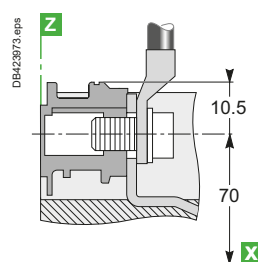
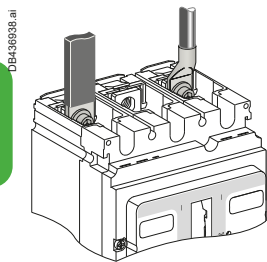
Type	A1	A2	B1	C1	C2
NSX100/160	70	140	35	19.5	19.5
NSX250	70	140	35	21.5	19.5
NSX400/630	113.5	227	45	26	26

Type	A1	A3	B1	C1	C2
NSX100/160 + Vigi	70	215	35	19.5	21.5
NSX250 + Vigi	70	215	35	21.5	21.5
NSX400/630 + Vigi	113.5	327	45	26	26

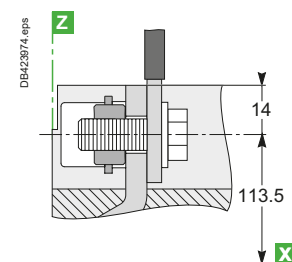
Front Connection without Accessories

NSX100 to 250

NSX400/630



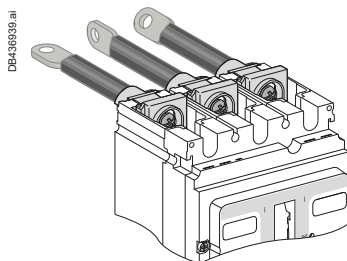
Cables with lugs/bars



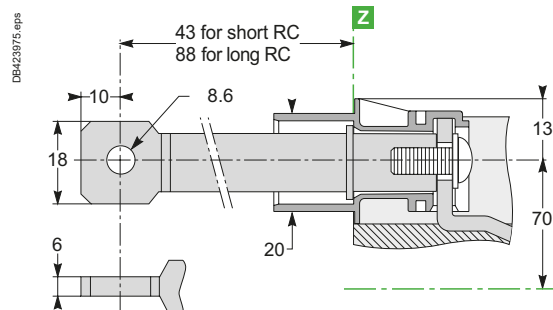
Bars/cables with lugs

Connection with Accessories

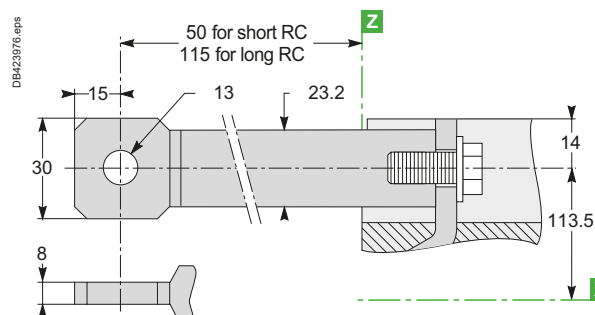
Long and Short Rear Connectors



NSX100 to 250



NSX400/630



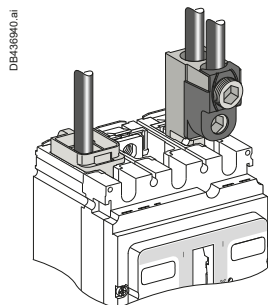
ComPacT NSX Power Connections

ComPacT NSX100 to 630 with/without VigiPacT Add-on Fixed Version

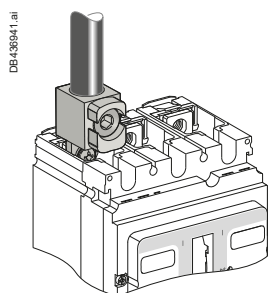
Connection with Accessories

Bare-Cable Connectors

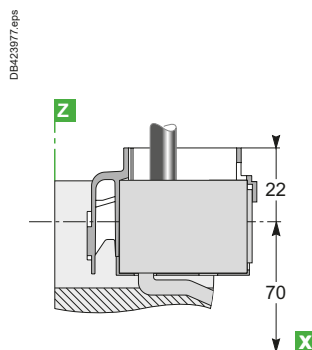
NSX100 to 250



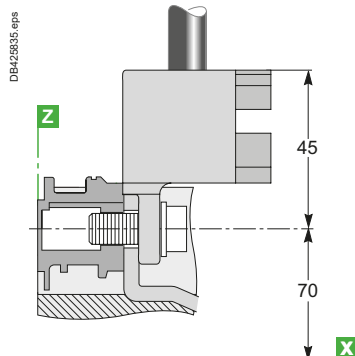
DB438940.ai



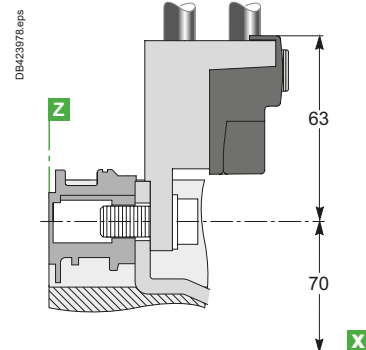
DB438941.ai



DB423977.eps

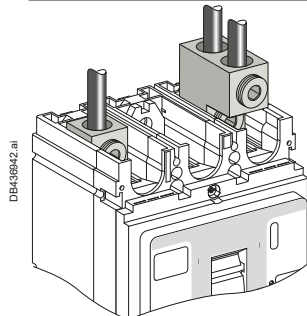


DB423935.eps

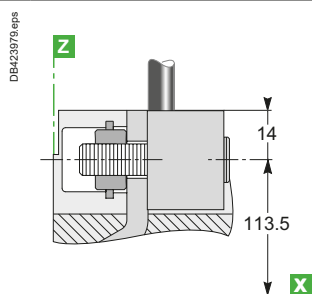


DB423978.eps

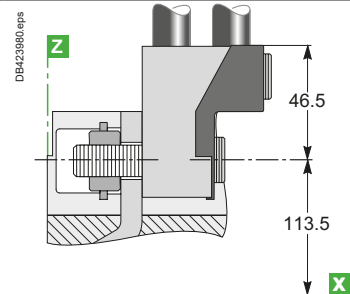
NSX400/630



DB438942.ai

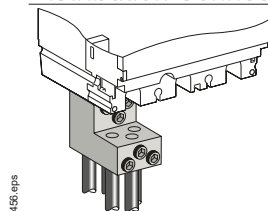


DB423979.eps



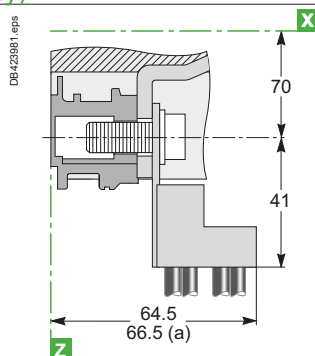
DB423980.eps

Distribution Connectors (for NSX100 to 250 Only)



DB115456.eps

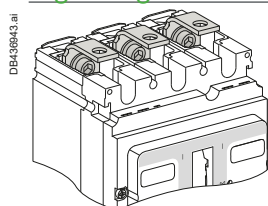
[a] VigiPacT add-on or NSX250



DB423981.eps

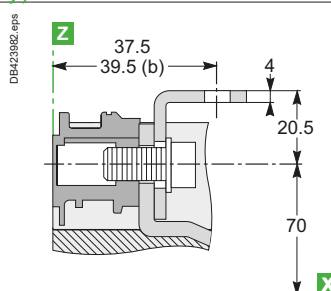
Right-Angle Terminal Extensions (Upstream Only) NSX100 to 250

NSX400/630

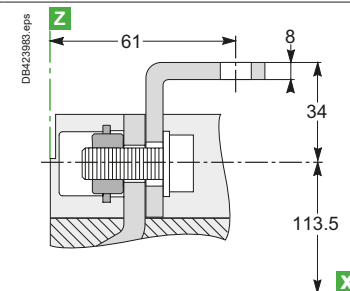


DB438943.ai

[b] NSX250



DB423982.eps



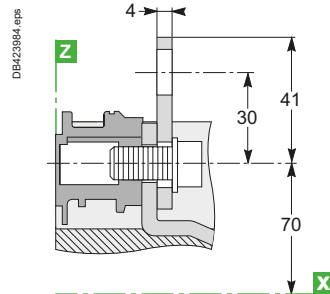
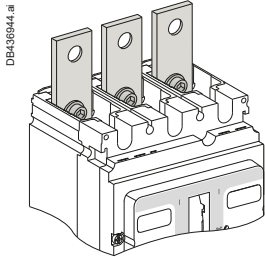
DB423983.eps

ComPacT NSX Power Connections

ComPacT NSX100 to 630 with/without VigiPacT Add-on Fixed Version

Connection with Accessories

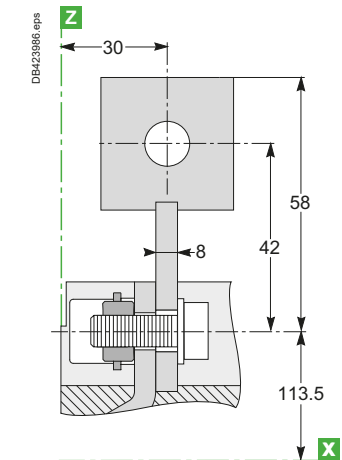
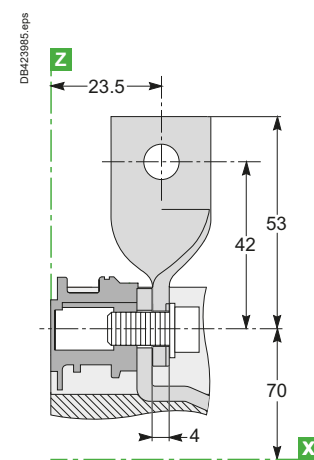
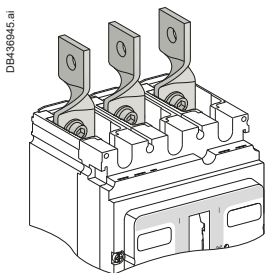
Straight Terminal Extensions (for NSX100 to 250 Only)



Edgewise Terminal Extensions

NSX100 to 250

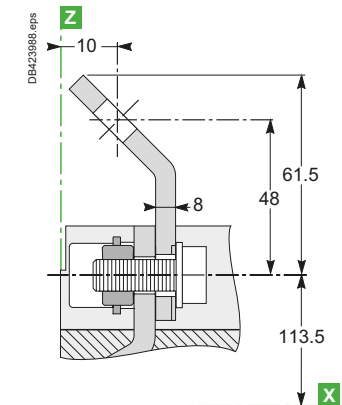
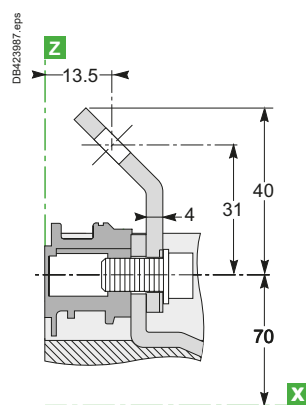
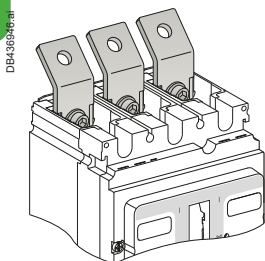
NSX400/630



45° Terminal Extensions

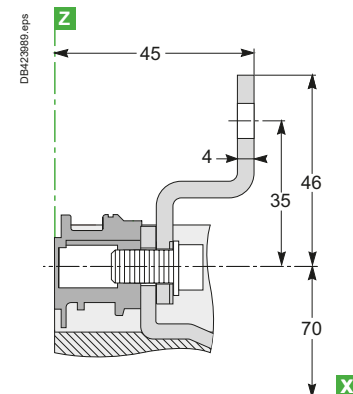
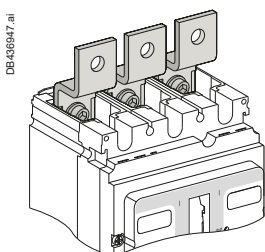
NSX100 to 250

NSX400/630



Double-L Terminal Extensions

NSX100 to 250



ComPacT NSX Power Connections

ComPacT NSX100 to 630 with/without VigiPacT Add-on Fixed Version

Connection with Accessories

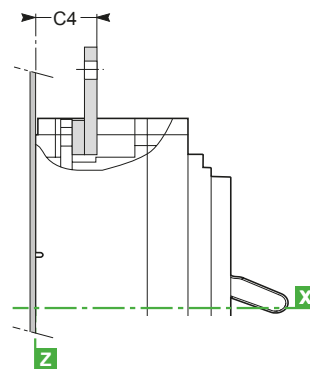
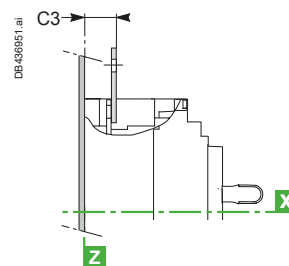
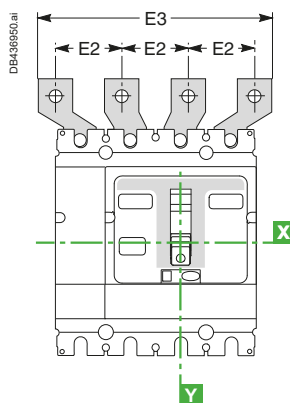
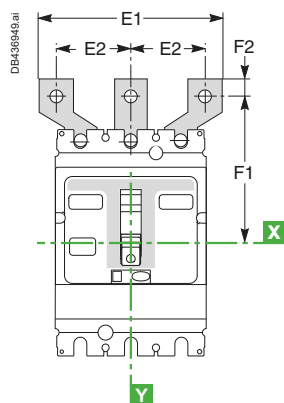
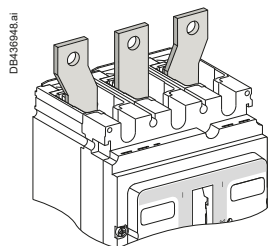
Spreaders

3P

4P

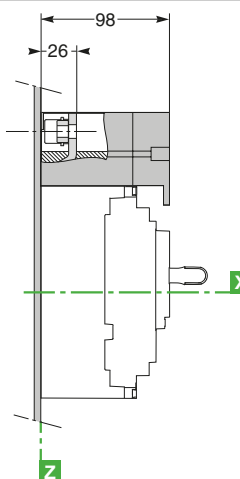
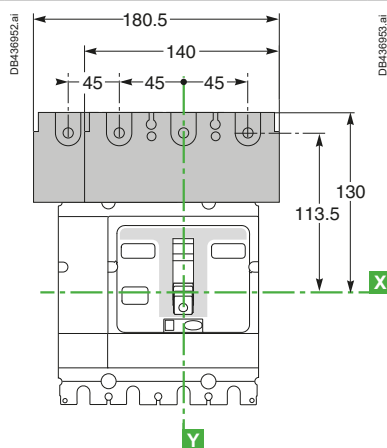
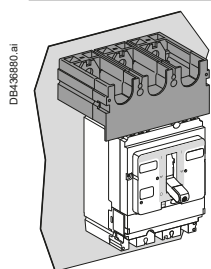
NSX100 to 250

NSX400/630



Type	C3	C4	E1	E2	E3	F1	F2
NSX100/160	23.5	-	114	45	159	100	11
NSX250	25.5	-	114	45	159	100	11
NSX400/630	-	44	135 170	52.5 70	187.5 240	152.5 166	15

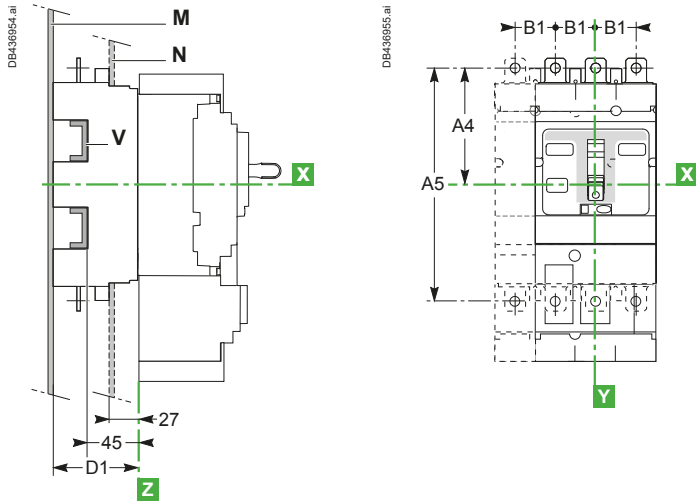
One-Piece Spreader (for NSX100 to 250 Only)



ComPacT NSX Power Connections

ComPacT NSX100 to 630 with/without VigiPacT Add-on Plug-in and Withdrawable Versions

Connection Locations



Type	A4	A5	B1	D1
NSX100 to 250	100	200	35	75
NSX400/630	156.5	313	45	100

Note:

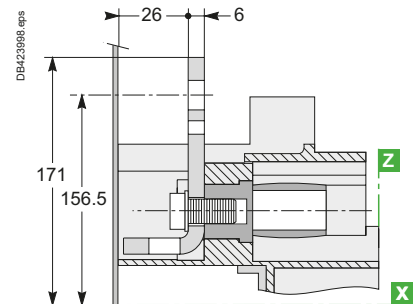
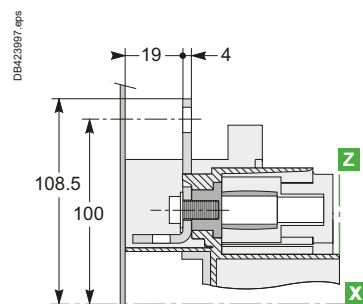
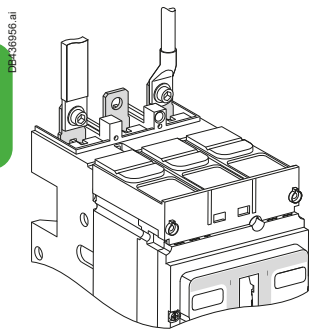
- For mounting on a backplate, the insulating screen supplied with the plug-in base must be installed.
- For withdrawable versions, terminal shields are recommended.

Connection without Accessories

Front Connection: Mounting on Backplate (M) or Rails (V)

NSX100 to 250

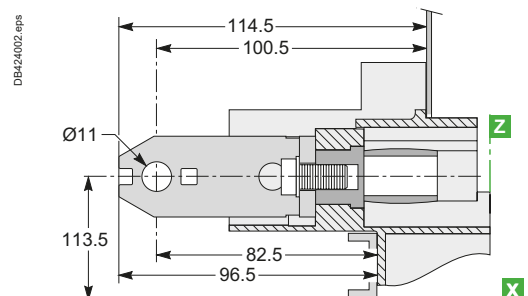
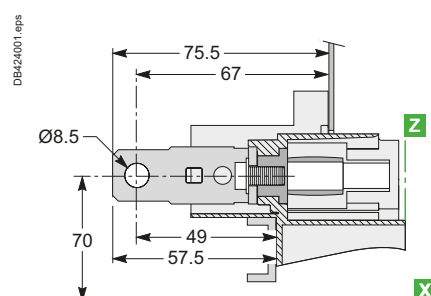
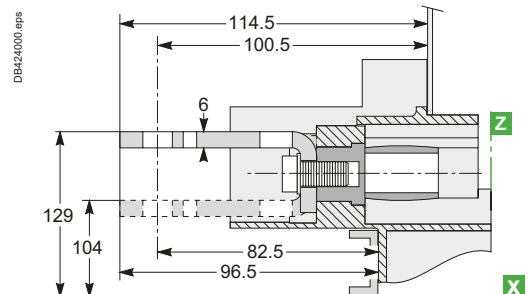
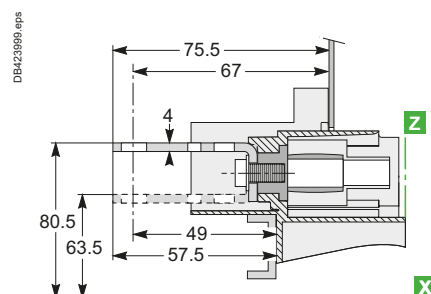
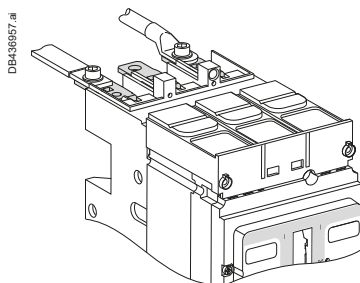
NSX400/630



Rear Connection: Mounting Through Front Panel (N) or on Rails (V)

NSX100 to 250

NSX400/630



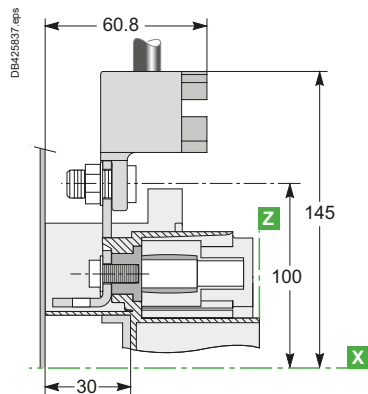
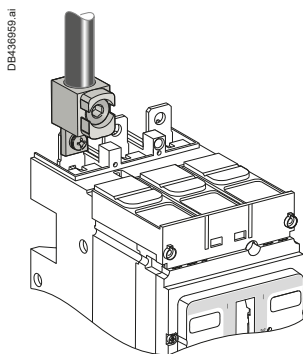
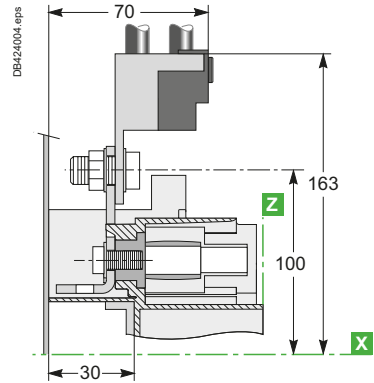
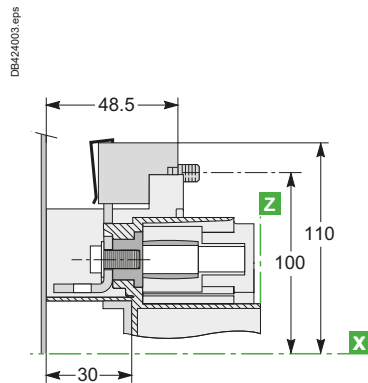
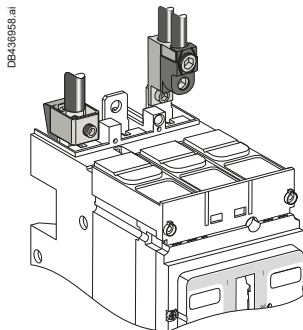
ComPacT NSX Power Connections

ComPacT NSX100 to 630 with/without VigiPacT Add-on Plug-in and Withdrawable Versions

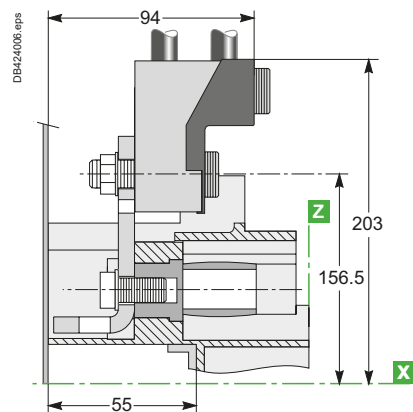
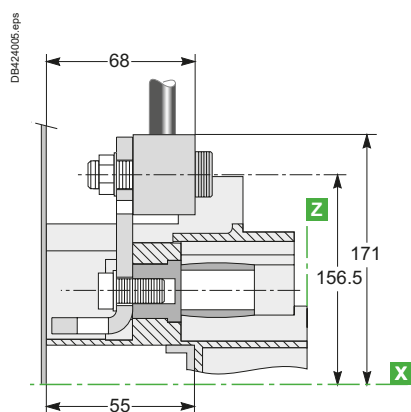
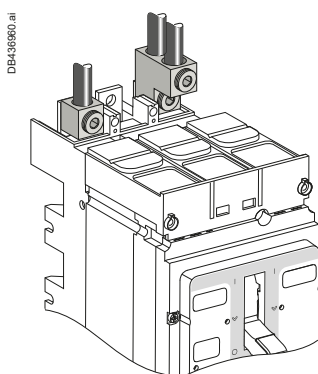
Connection with Accessories

Bare-Cable Connectors: Mounting on Backplate (M) or Rails (V)

NSX100 to 250

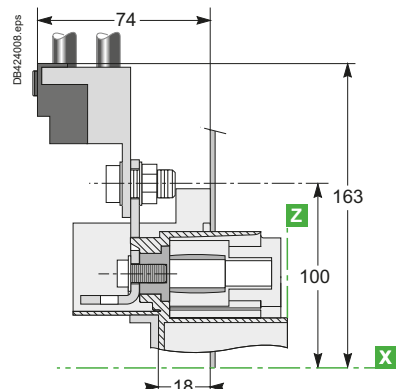
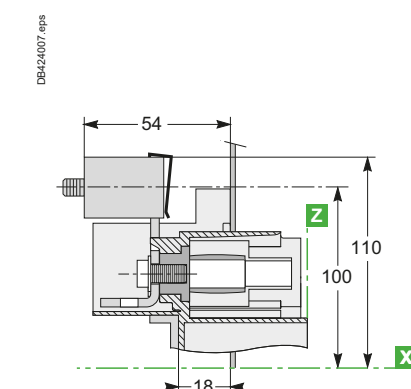
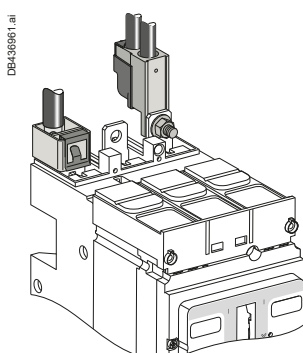


NSX400/630



Bare-Cable Connectors: Mounting Through Front Panel (N) or on Rails (V)

NSX100 to 250

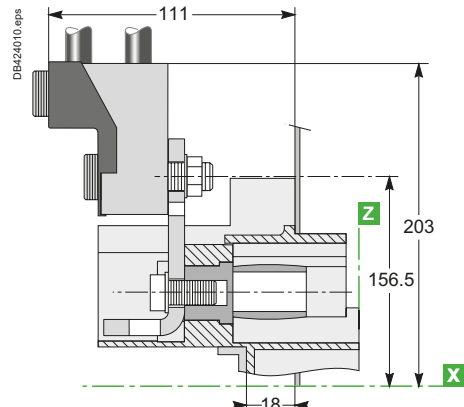
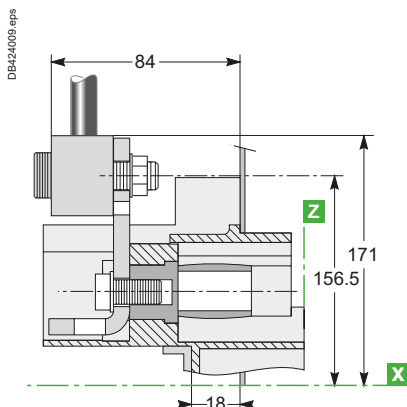
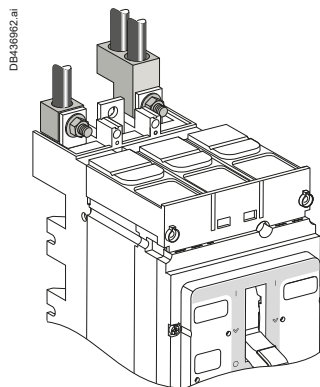


ComPacT NSX Power Connections

ComPacT NSX100 to 630 with/without VigiPacT Add-on Plug-in and Withdrawable Versions

Bare-Cable Connectors: Mounting Through Front Panel (N) or on Rails (V)

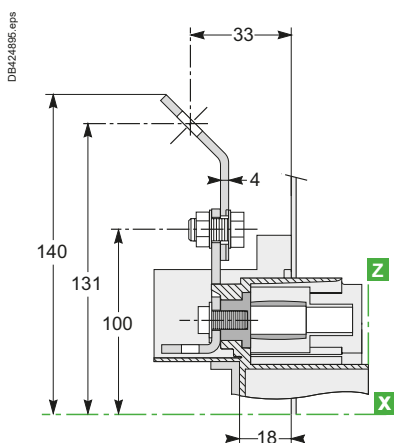
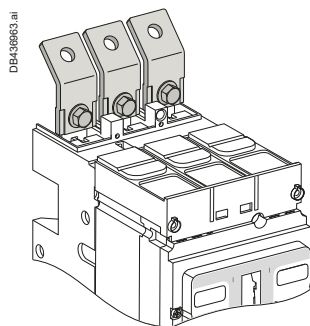
NSX400/630



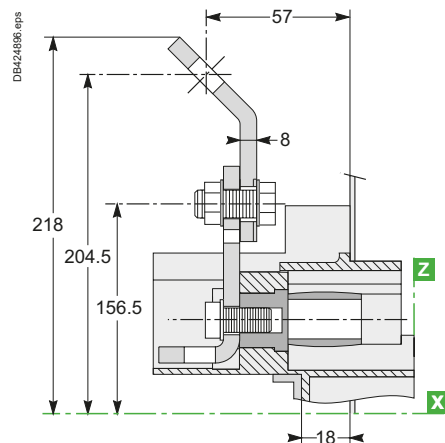
Connection with Accessories

45° Extensions: Mounting Through Front Panel (N) or on Rails (V)

NSX100 to 250

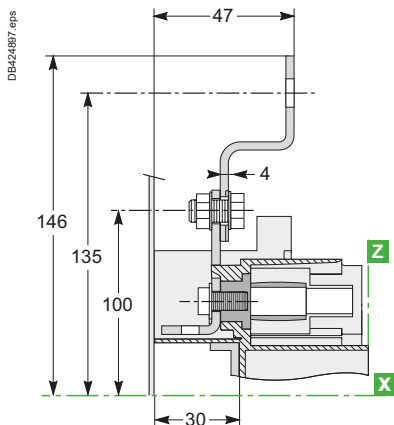
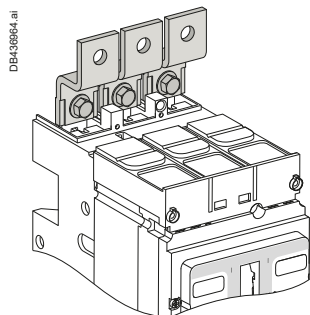


NSX400/630



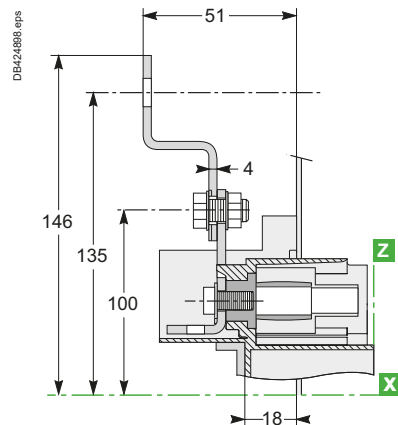
Double-L Extensions: Mounting on Backplate (M) or Rails (V)

NSX100 to 250



Double-L Extensions: Mounting Through Front Panel (N) or on Rails (V)

NSX100 to 250

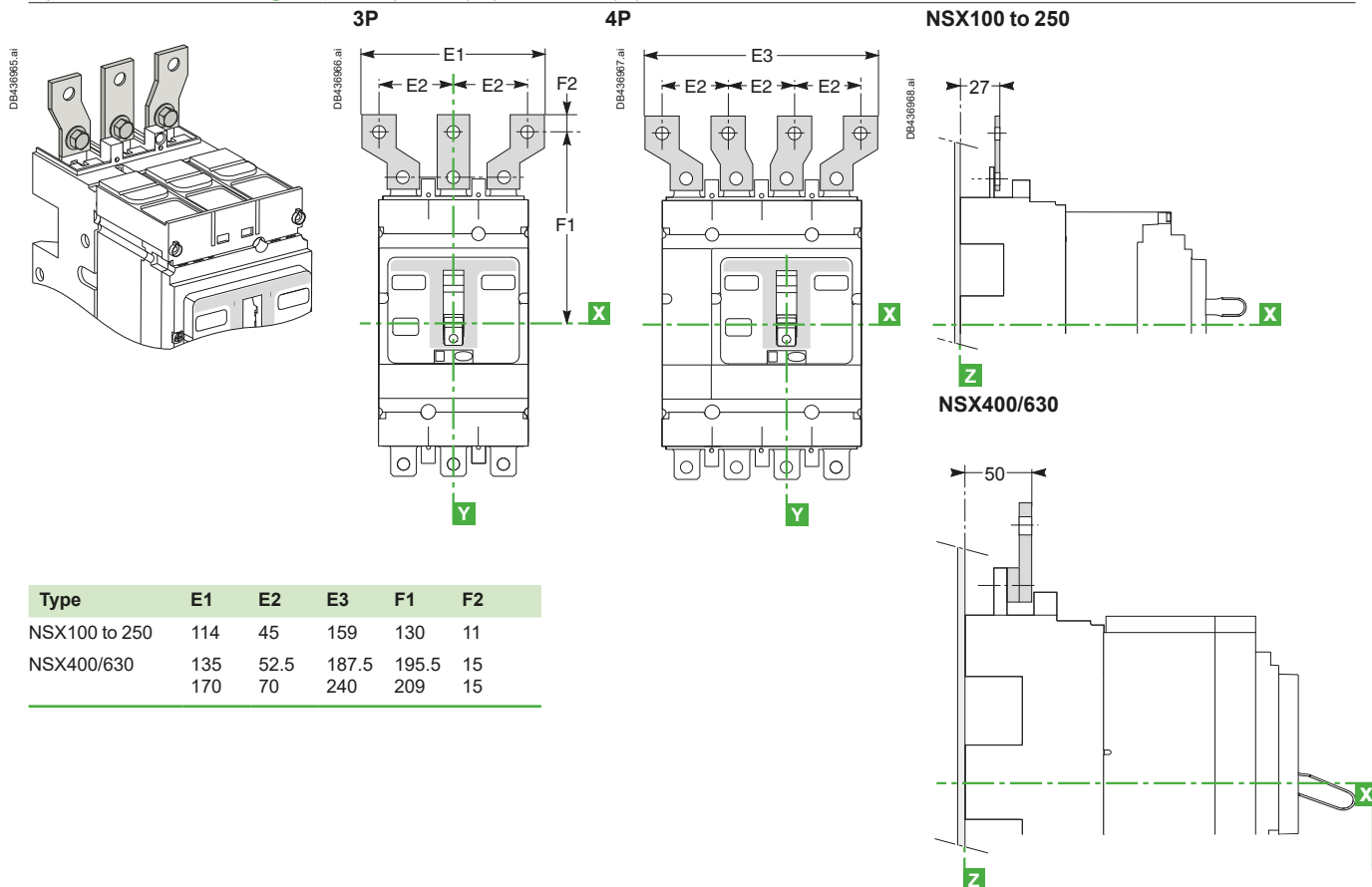


ComPacT NSX Power Connections

ComPacT NSX100 to 630 with/without VigiPacT Add-on Plug-in and Withdrawable Versions

Connection with Accessories

Spreaders: Mounting on Backplate (M) or Rails (V)

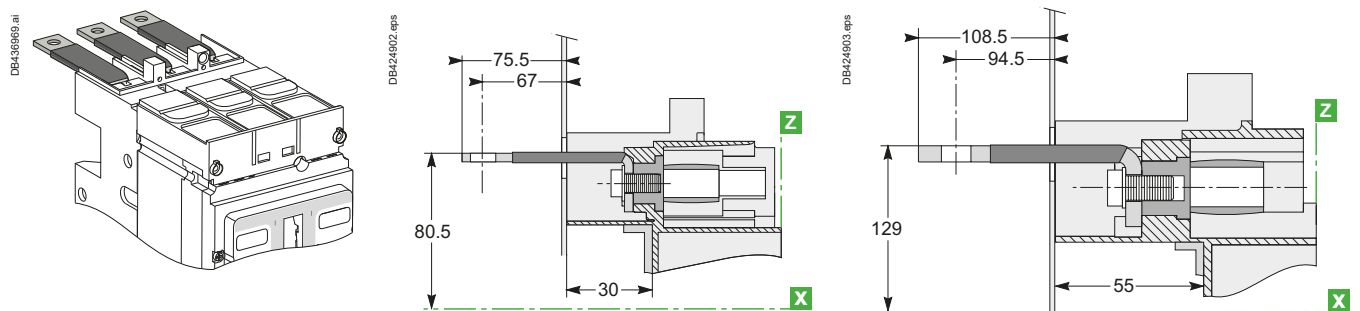


Long Insulated Rear Connectors: Mounting on Backplate (M) or Rails (V)

Exterior-mounted rear connectors

NSX100 to 250

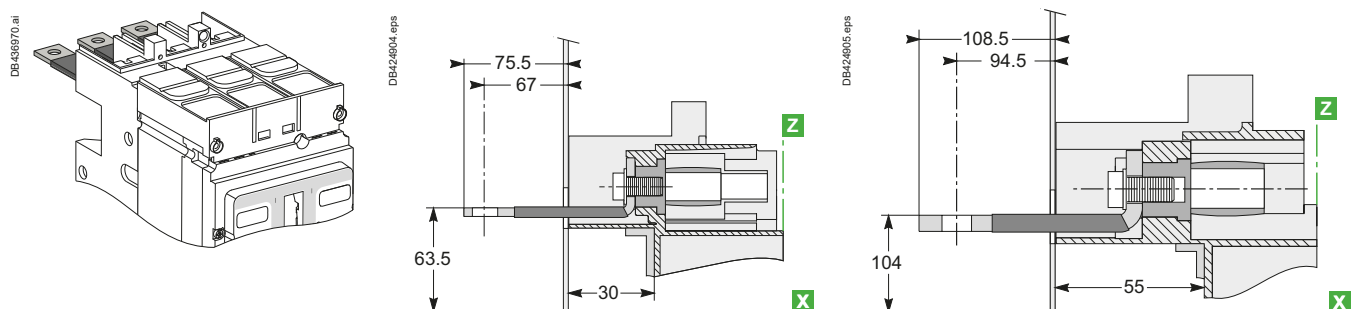
NSX400/630



Interior-mounted rear connectors

NSX100 to 250

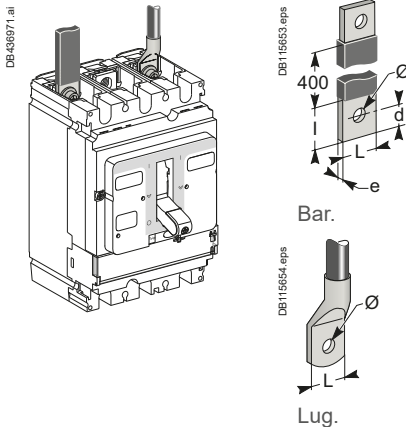
NSX400/630



Long, insulated connectors are mandatory.

ComPacT NSX Power Connections

Connection of Insulated Bars or Cables with Lugs to ComPacT NSX100 to 630 with/without VigiPacT Add-on



Direct Connection for NSX100 to 630

Dimensions		NSX100	NSX160/250	NSX400/630
Bars	L (mm)	≤ 25	≤ 25	≤ 32
	l (mm)	d + 10	d + 10	d + 15
	d (mm)	≤ 10	≤ 10	≤ 15
	e (mm)	≤ 6	≤ 6	3 ≤ e ≤ 10
	Ø (mm)	6.5	8.5	10.5
Lugs	L (mm)	≤ 25	≤ 25	≤ 32
	Ø (mm)	6.5	8.5	10.5
Torque (Nm) ^[1]		10	15	50
Torque (Nm) ^[2]		5/5	5/5	20/11
Torque (Nm) ^[3]		8	8	20

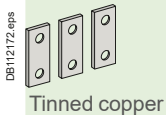
[1] Tightening torque on the circuit breaker for lugs or bars.

[2] Tightening torque on fixed devices for rear connectors/tightening torque on plug-in or withdrawable devices for power connectors.

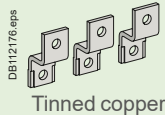
[3] Tightening torque on the plug-in base for terminal extensions.

Accessories for NSX100 to 250

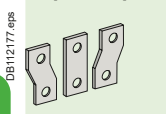
Straight terminal extensions



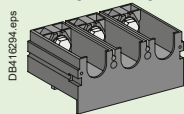
Double-L terminal extensions



Spreaders: separate parts



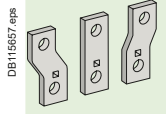
one-piece spreader



For U > 600 V, the mandatory insulation kit is not compatible with spreaders made up of separate parts. The one-piece spreader must be used.

Accessories for NSX400 and 630

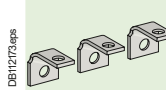
Spreaders made up of separate parts for 52.5 and 70 mm pitch



For U > 600 V, use of the 52.5 mm pitch spreaders requires a specific insulation kit. The 70 mm pitch spreaders may not be used.

Accessories for NSX100 to 630

Right-angle terminal extensions



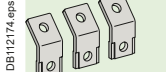
Edgewise terminal extensions



Tinned copper
To be mounted on upstream side.

Tinned copper

45° terminal extensions



Tinned copper

Connection with Accessories for NSX100 to 250 (60228)

Pole pitch			
Without spreaders		35 mm	
With spreaders		45 mm	
Dimensions		With spreaders or terminal extensions	
		NSX100	NSX160/250
Bars	L (mm)	≤ 25	≤ 25
	l (mm)	20 ≤ l ≤ 25	20 ≤ l ≤ 25
	d (mm)	≤ 10	≤ 10
	e (mm)	≤ 6	≤ 6
	Ø (mm)	6.5	8.5
Lugs	L (mm)	≤ 25	≤ 25
	Ø (mm)	6.5	8.5
Torque (Nm) ^[1]		10	15
Torque (Nm) ^[2]		5	5

[1] Tightening torque on the circuit breaker for spreaders or terminal extensions.

[2] Tightening torque on the plug-in base for spreaders or terminal extensions.

Spreaders and straight, right-angle, 45°, double-L and edgewise terminal extensions are supplied with flexible interphase barriers.

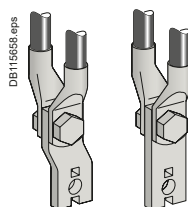
Connection with Accessories for NSX400 and 630 (60228)

Pole pitch			
Without spreaders		45 mm	
With spreaders		52.5 or 70 mm	
Dimensions		With spreaders	With terminal extensions
Bars	L (mm)	≤ 40	≤ 32
	l (mm)	d + 15	30 ≤ l ≤ 34
	d (mm)	≤ 20	≤ 15
	e (mm)	3 ≤ e ≤ 10	3 ≤ e ≤ 10
	Ø (mm)	12.5	10.5
Lugs	L (mm)	≤ 40	≤ 32
	Ø (mm)	12.5	10.5
Torque (Nm) ^[1]		50	50
Torque (Nm) ^[2]		20	20

[1] Tightening torque on the circuit breaker for spreaders or terminal extensions.

[2] Tightening torque on the plug-in base for spreaders or terminal extensions.

Spreaders and right-angle, 45° and edgewise terminal extensions are supplied with flexible interphase barriers.

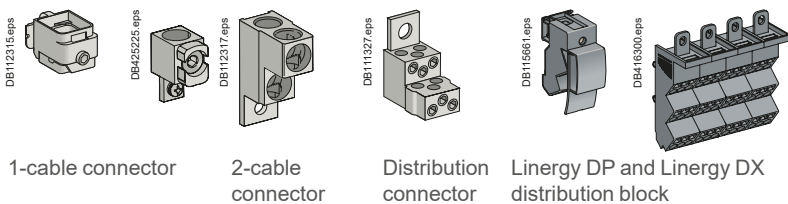


Mounting detail: 2 cables with lugs.

ComPacT NSX Power Connections

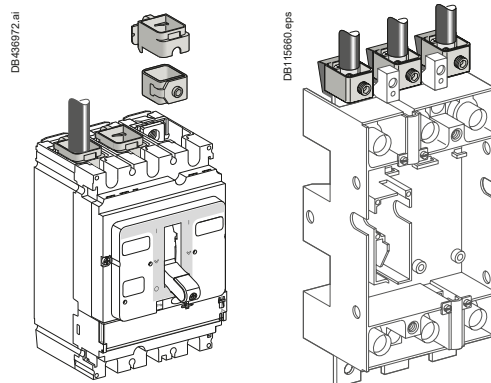
Connection of Bare Cables to ComPacT NSX100 to 630 with/without VigiPacT Add-on

Connection for NSX100 to 250

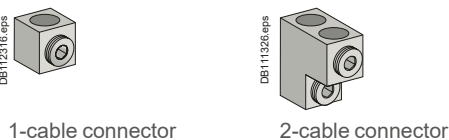


	1-cable connector	Steel ≤ 160 A	Aluminium ≤ 250 A	
L (mm)		25	25	
S (mm²) Cu/Al		1.5 to 95 ^[1]	25 to 50	70 to 95
Torque (Nm)		12	20	26
				31
2-cable connector				
L (mm)		25 or 50		
S (mm²) Cu/Al		2 x 50 to 2 x 120		
Torque (Nm)		22		
6-cable distribution connector (copper or aluminium)				
L (mm)		15 or 30		
S (mm²) Cu/Al		1.5 to 6 ^[1]	8 to 35	
Torque (Nm)		4	6	
Linergy DX and Linergy DP distribution block (6 or 9 cables)				
L (mm)		12	16	
S (mm²) Cu/Al		6 x 4 to 10	3 x 6 to 16	

^[1] For flexible cables from 1.5 to 4 mm², connection with crimped or self-crimping ferrules.



Connection for NSX400 and 630



	1-cable connector	2-cable connector
L (mm)	30	30 or 60
S (mm²) Cu/Al	35 to 300 rigid 240 max. flex.	2 x 35 to 2 x 240 rigid 240 max. flex.
Torque (Nm)	31	31

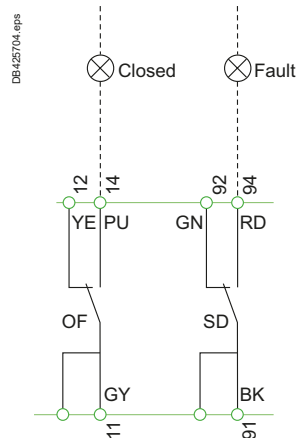
Conductor Materials and Electrodynamic Stresses

ComPacT NSX circuit breakers can be connected indifferently with bare-copper, tinned-copper and tinned-aluminium conductors (flexible or rigid bars, cables). In the event of a short-circuit, thermal and electrodynamic stresses will be exerted on the conductors. They must therefore be correctly sized and held in place by supports.

Electrical connection points on switchgear devices (switch-disconnectors, contactors, circuit breakers, etc.) should not be used for mechanical support. Any partition between upstream and downstream connections of the device must be made of non-magnetic material.

The diagram is shown with circuits de-energized, relays in normal position, and all devices open, connected, and charged. Terminal connections shown as **O** must be connected by the customer.

Indication Contacts



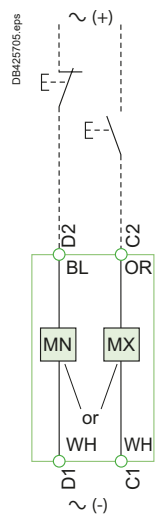
Indication Contacts

OF	Device ON/OFF indication contacts
SD	Trip indication contact

Color Code for Auxiliary Wiring

BK :	Black
GN :	Green
GY :	Grey
RD :	Red
PU :	Purple
YE :	Yellow

Remote Operation



Remote Operation

MN	Undervoltage Release
or	
MX	Shunt trip Release

Color Code for Auxiliary Wiring

BL :	Blue
OR :	Orange
WH :	White

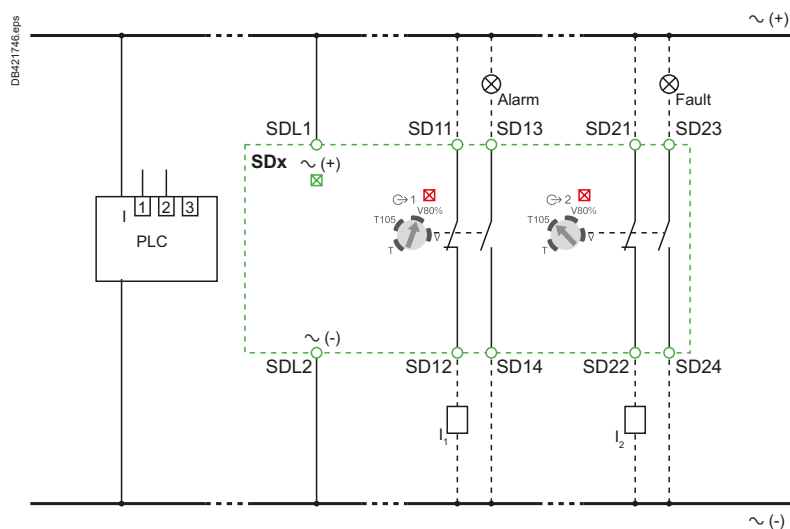
Switchboard Integration

ComPacT NSXm

SDx Module for MicroLogic Vigi 4.1 (ELCB)

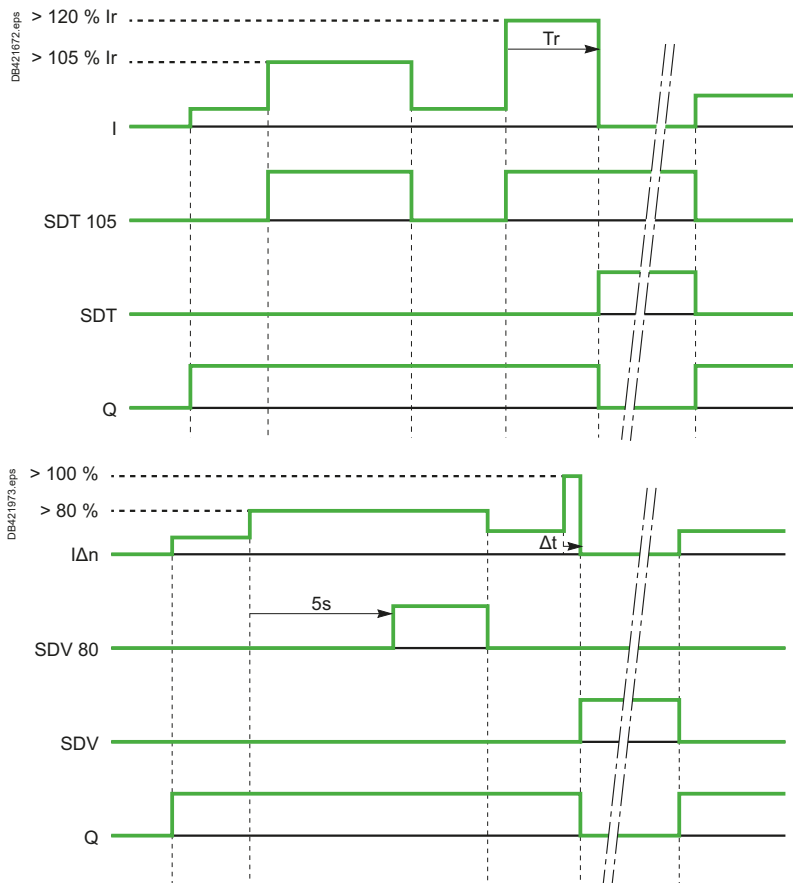
The diagram is shown with circuits de-energized, all devices open, connected and charged and relays in normal position.

Connection



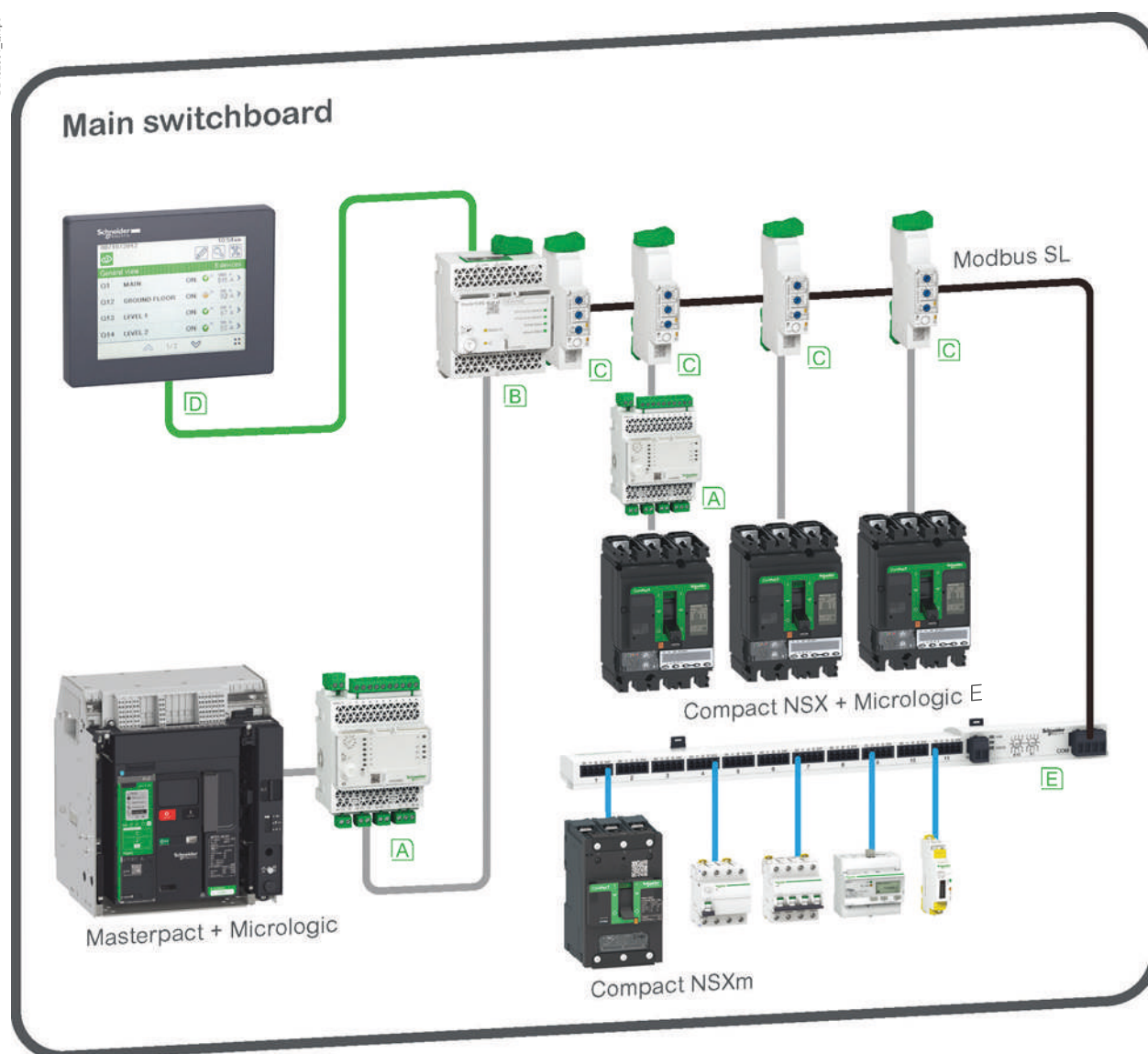
Operation

- I: charge current
 SDT105: overload alarm
 SDT: overload trip indication
 $I_{\Delta n}$: earth leakage current
 SDV80: earth leakage alarm
 SDV: earth leakage trip indication
 Q: circuit breaker



Connection of Circuit Breakers to the Modbus Communication Network

D943261_0.eps



Switchboard Integration

ComPacT NSX

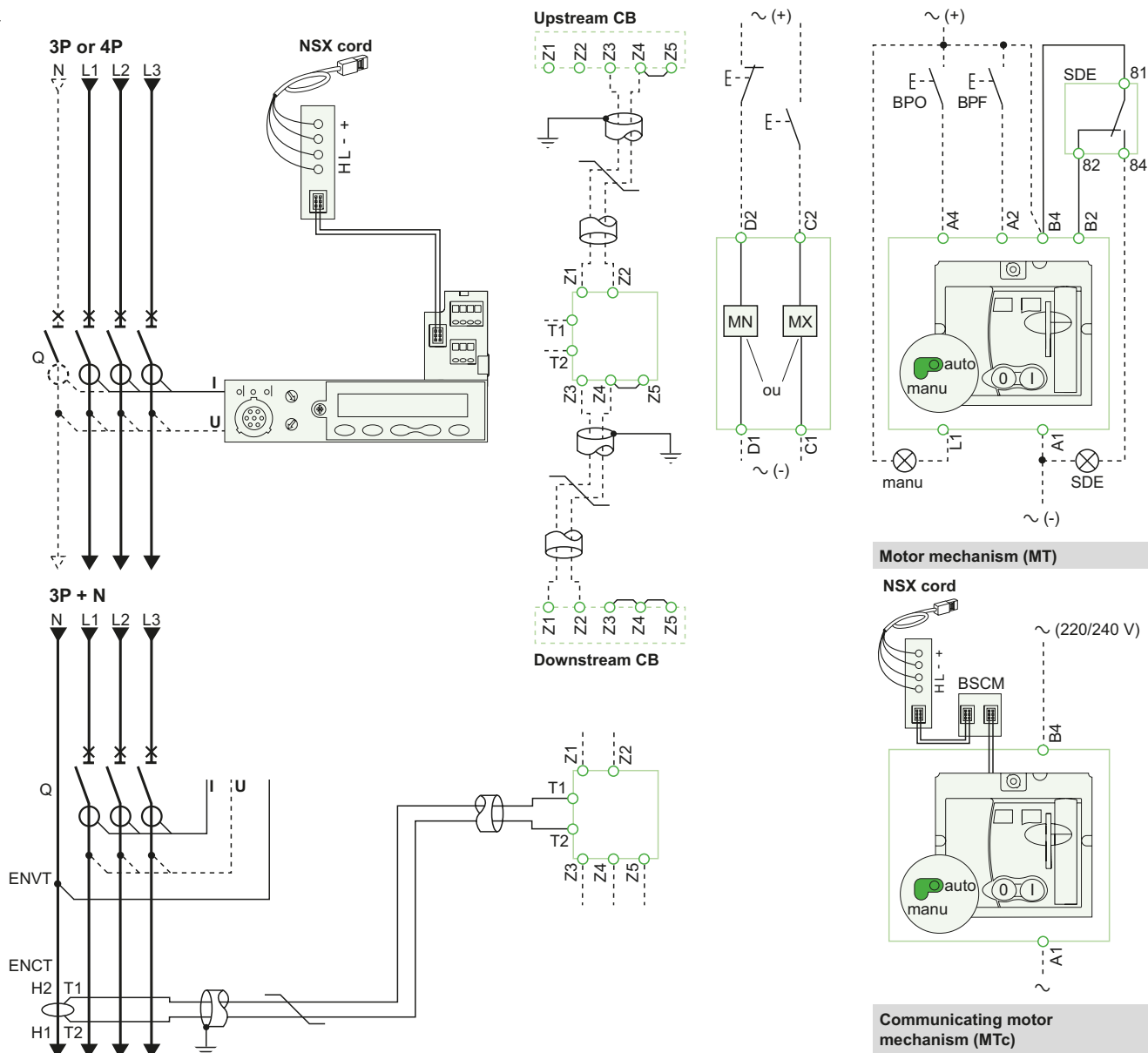
Fixed Circuit Breakers

Power

MicroLogic

Remote Operation

DB425443.eps



MicroLogic E

Communication

H(WH), L(BL): data

- (BK), + (RD): 24 V DC power supply

ZSI (Zone Selective Interlocking)

Z1: ZSI OUT SOURCE

Z2: ZSI OUT

Z3: ZSI IN SOURCE

Z4: ZSI IN ST (short time)

Z5: ZSI IN GF (ground fault)

Note: Z3, Z4, Z5 for NSX400/630 only.

ENCT: external neutral current transformer:

- shielded cable with 1 twisted pair (T1, T2)

- shielding earthed at one end only (CT end).

Connection L = 30 cm max.

- maximum length of 10 metres

- cable size 0.4 to 1.5 mm²

- recommended cable: Belden 8441 or equivalent.

ENV T: external neutral voltage tap for connection to the neutral via a 3P circuit breaker.

Remote operation

MN: undervoltage release

or

MX: shunt release

Motor mechanism (MT)

A4: opening order

A2: closing order

B4, A1: power supply to motor mechanism

L1: manual position (manu)

B2: SDE interlocking (mandatory for correct operation)

BPO: opening pushbutton

BPF: closing pushbutton

Communicating motor mechanism (MTC)

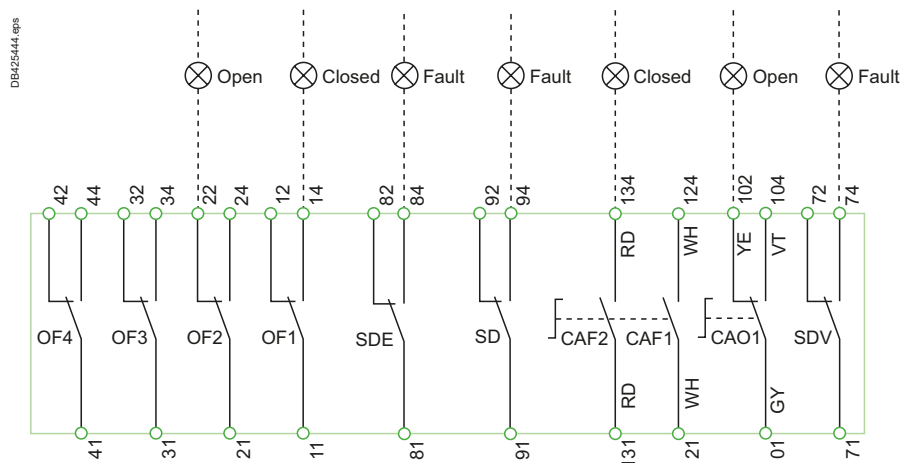
B4, A1: motor mechanism power supply

BSCM: breaker status and control module

ComPacT NSX

Fixed Circuit Breakers

Indication Contacts



The diagram is shown with circuits de-energized, all devices open, connected and charged and relays in normal position. Terminals shown in green ● must be connected by the customer.

Indication Contacts

- OF2/OF1:** device ON/OFF indication contacts
- OF4/OF3:** device ON/OFF indication contacts (NSX400/630)
- SDE:** fault-trip indication contact (short-circuit, overload, ground fault, earth leakage)
- SD:** trip-indication contact
- CAF2/CAF1:** early-make contact (rotary handle only)
- CAO1:** early-break contact (rotary handle only)
- SDV:** earth leakage fault trip indication contact (VigiPacT add-on)

Color Code for Auxiliary Wiring

- | | |
|-------------------|-------------------|
| RD: red | VT: violet |
| WH: white | GY: grey |
| YE: yellow | OR: orange |
| BK: black | BL: blue |
| GN: green | |

ComPacT NSX

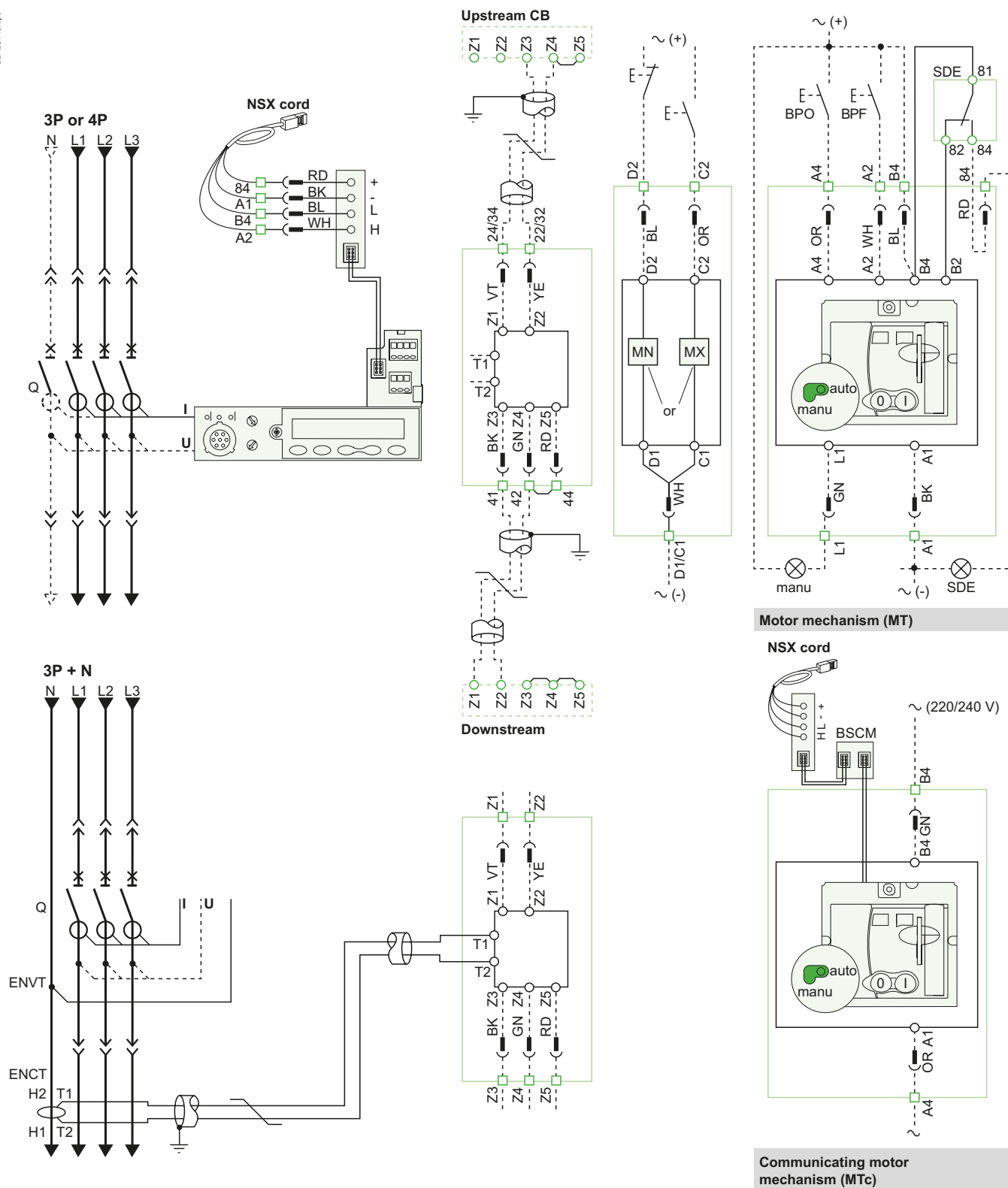
Plug-in/Withdrawable Circuit Breakers

Power

MicroLogic

Remote Operation

DB 425445.eps



E

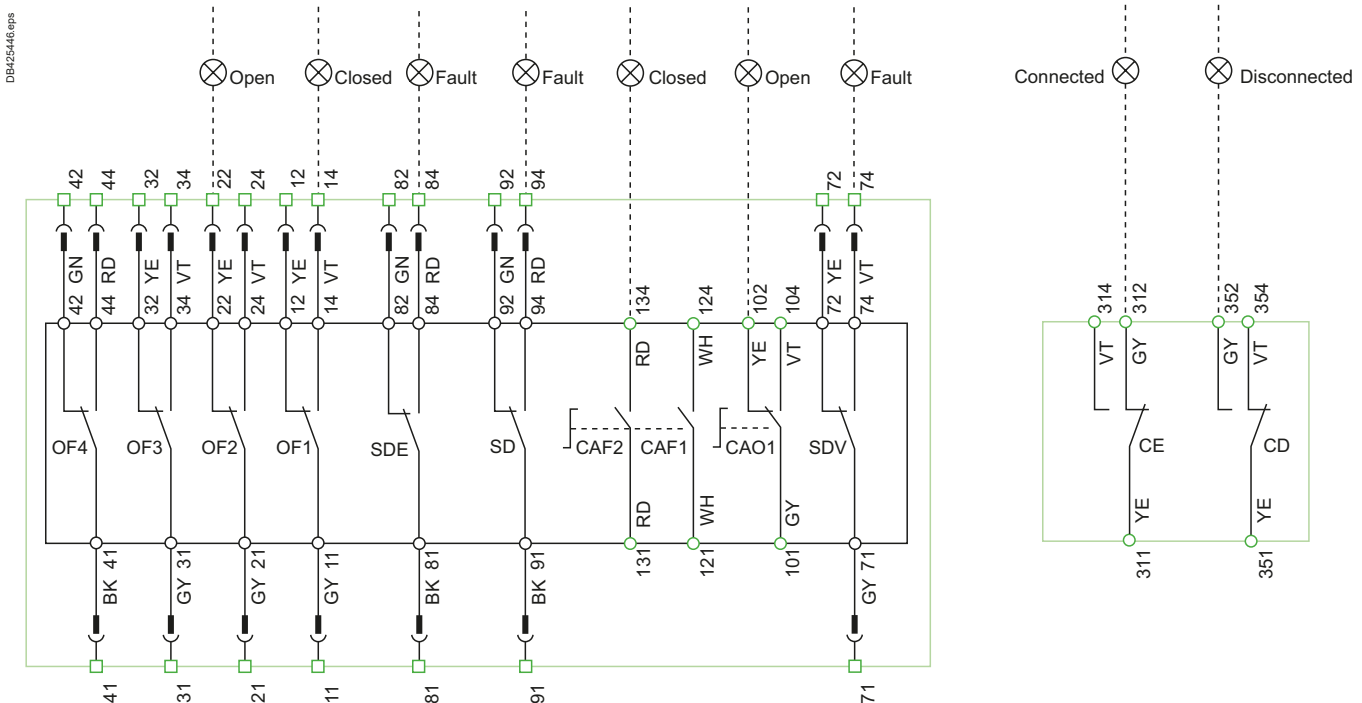
The diagram is shown with circuits de-energized, all devices open, connected and charged and relays in normal position.

ComPacT NSX

Plug-in/Withdrawable Circuit Breakers

Indication Contacts

Carriage Switches



E

MicroLogic E

Communication

H(WH), L(BL): data
- (BK), + (RD): 24 V DC power supply

ZSI (Zone Selective Interlocking)

Z1: ZSI OUT SOURCE

Z2: ZSI OUT

Z3: ZSI IN SOURCE

Z4: ZSI IN ST (short time)

Z5: ZSI IN GF (ground fault)

Note: Z3, Z4, Z5 for NSX400/630 only.

ENCT: external neutral current transformer:

- shielded cable with 1 twisted pair (T1, T2)
- shielding earthed at one end only (CT end).

Connection L = 30 cm max.

- maximum length of 10 metres

- cable size 0.4 to 1.5 mm²

- recommended cable: Belden 8441 or equivalent.

ENV: external neutral voltage tap for connection to the neutral via a 3P circuit breaker.

Color code for auxiliary wiring

RD: red	VT: violet
WH: white	GY: grey
YE: yellow	OR: orange
BK: black	BL: blue
GN: green	

Terminals shown in green must be connected by the customer.

Remote operation

MN: undervoltage release

or

MX: shunt release

Motor mechanism (MT)

A4: opening order

A2: closing order

B4, A1: motor mechanism power supply

L1: manual position (manu)

B2: SDE interlocking (mandatory for automatic or remote recharging)

BPO: opening pushbutton

BPF: closing pushbutton

Communicating motor mechanism (MTc)

B4, A1: motor mechanism power supply

BSCM: breaker status and control module

Indication contacts

OF2/OF1: device ON/OFF indication contacts

OF4/OF3: device ON/OFF indication contacts (NSX400/630)

SDE: fault-trip indication contact

(short-circuit, overload, ground fault, earth leakage)

SD: trip-indication contact

CAF2/CAF1: early-make contact (rotary handle only)

CAO1: early-break contact (rotary handle only)

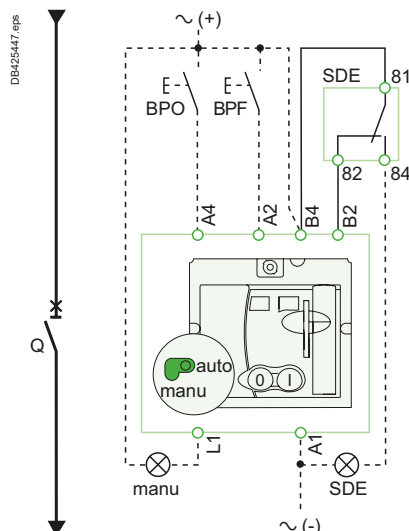
SDV: earth leakage fault trip indication contact (VigiPacT add-on)

The diagram is shown with circuits de-energized, all devices open, connected and charged and relays in normal position.

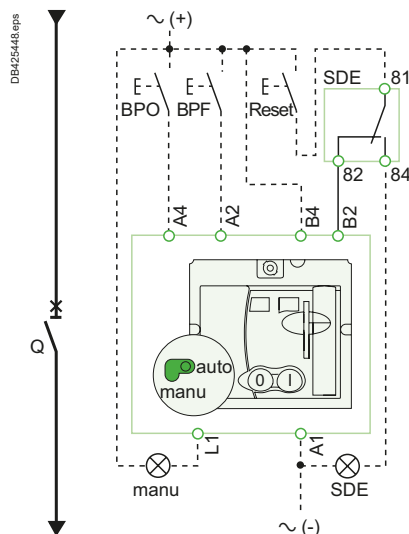
After tripping initiated by the "Push to trip" button or by the undervoltage (MN) release or the shunt (MX) release, device reset can be automatic, remote or manual.

Following tripping due to an electrical fault (with an SDE contact), reset must be carried out manually.

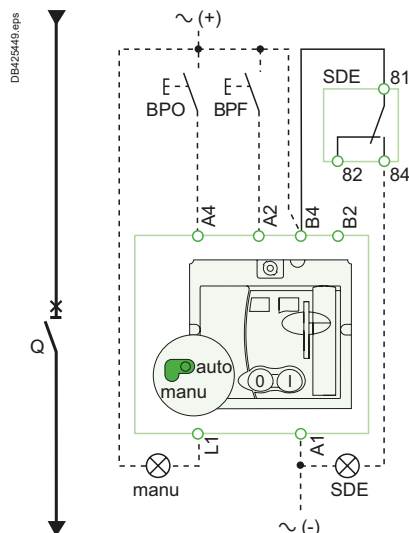
Motor mechanism (MT) with automatic reset



Motor mechanism (MT) with remote reset



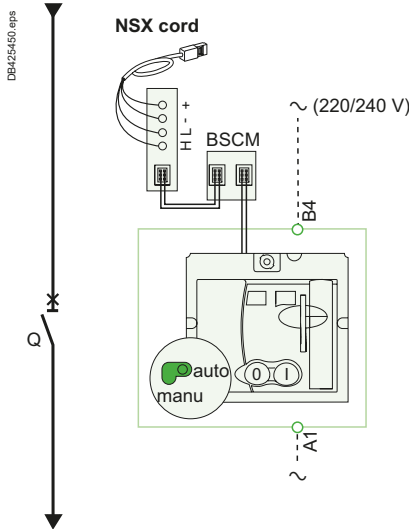
Motor mechanism (MT) with manual reset



Symbols

- Q:** circuit breaker
- A4:** opening order
- A2:** closing order
- B4, A1:** motor mechanism power supply
- L1:** manual position (manu)
- B2:** SDE interlocking (mandatory for correct operation)
- BPO:** opening pushbutton
- BPF:** closing pushbutton
- SDE:** fault-trip indication contact (short-circuit, overload, ground fault, earth leakage)

Communicating motor mechanism (MTc)



Schematic representation of the communicating motor mechanism (MT).

Single-line diagram of communicating motor mechanism

Opening, closing and reset orders are transmitted via the communication network. The "Enable automatic reset" and "Enable reset even if SDE" parameters must be set using the EcoStruxure Power Commission software via the screen by clicking the blue text.

"Auto/manu" is a switch on the front of the motor mechanism.

Symbols

- Q:** circuit breaker
B4, A1: motor mechanism power supply
BSCM: breaker status and control module

Terminals shown in green ○ must be connected by the customer.

Switchboard Integration

ComPacT NSX

SDx Module with MicroLogic

The diagram is shown with circuits de-energized, all devices open, connected and charged and relays in normal position.

Symbols

SD1, SD3: SDx-module power supply

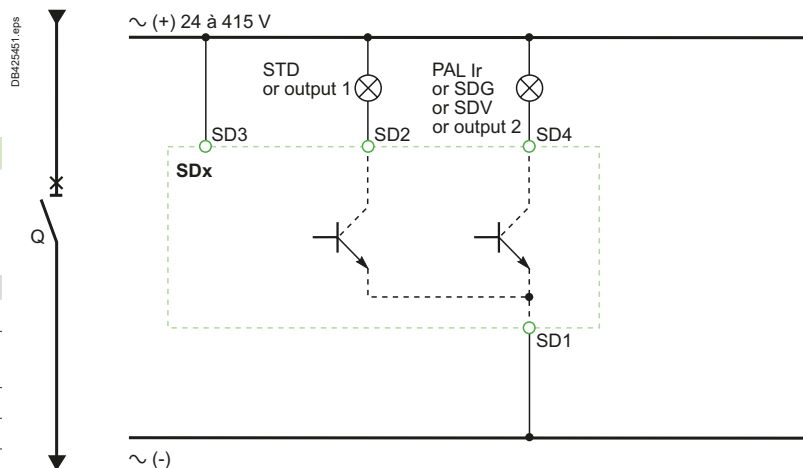
SD2: output 1 (80 mA max.)

SD4: output 2 (80 mA max.)

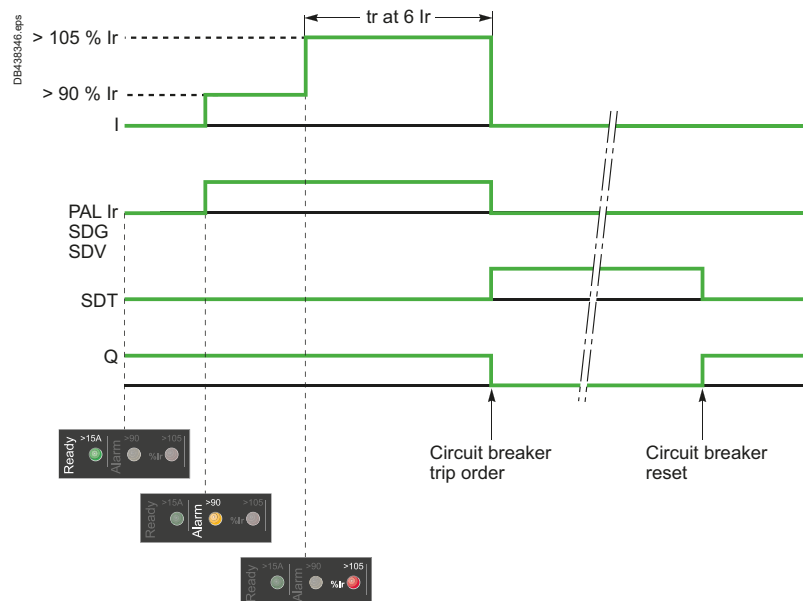
	SD2	SD4
MicroLogic 2	SDT	-
MicroLogic Vigi 4	SDT	SDV
MicroLogic 5	SDT or output 1	PAL Ir or output 2
MicroLogic 6	SDT or output 1	SDG or output 2
MicroLogic Vigi 7	SDT or output 1	SDV or output 2

Terminals shown in green ○ must be connected by the customer.

Connection



Operation



- I:** charge current
- PAL Ir:** thermal overload pre-alarm
- SDG:** ground-fault signal
- SDT:** thermal-fault signal
- SDV:** residual current trip signal
- Q:** circuit breaker

ComPacT NSX

SDTAM Module with MicroLogic M

The diagram is shown with circuits de-energized, all devices open, connected and charged and relays in normal position.

Connection

Symbols

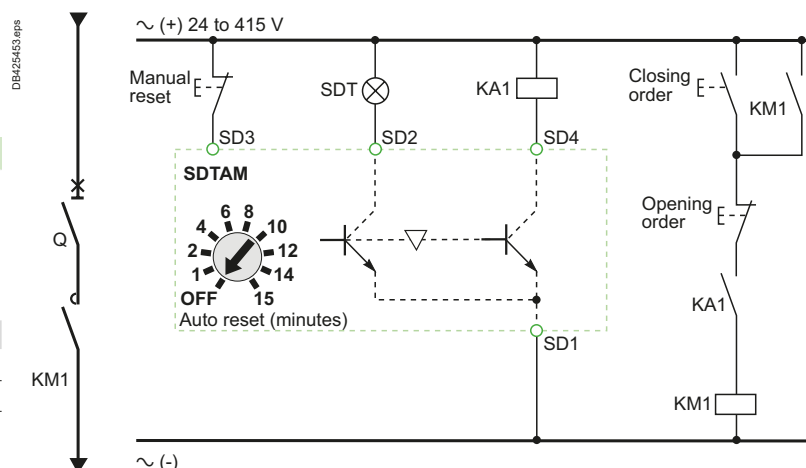
SD1, SD3: SDTAM-module power supply

SD2: thermal-fault signal output (80 mA max.)

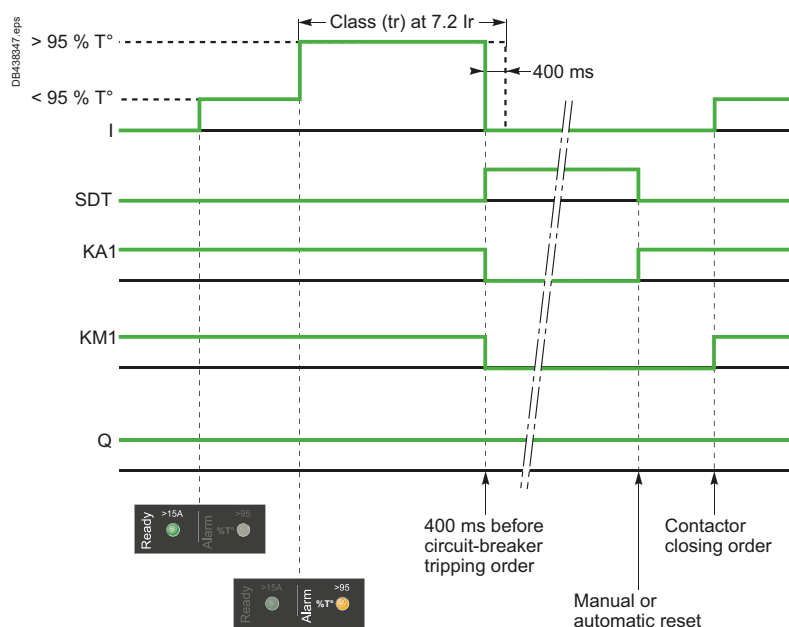
SD4: contactor-control output (80 mA max.)

	SD2	SD4
MicroLogic 2-M	SDT	KA1
MicroLogic 6 E-M	SDT	KA1

Terminals shown in green ○ must be connected by the customer.

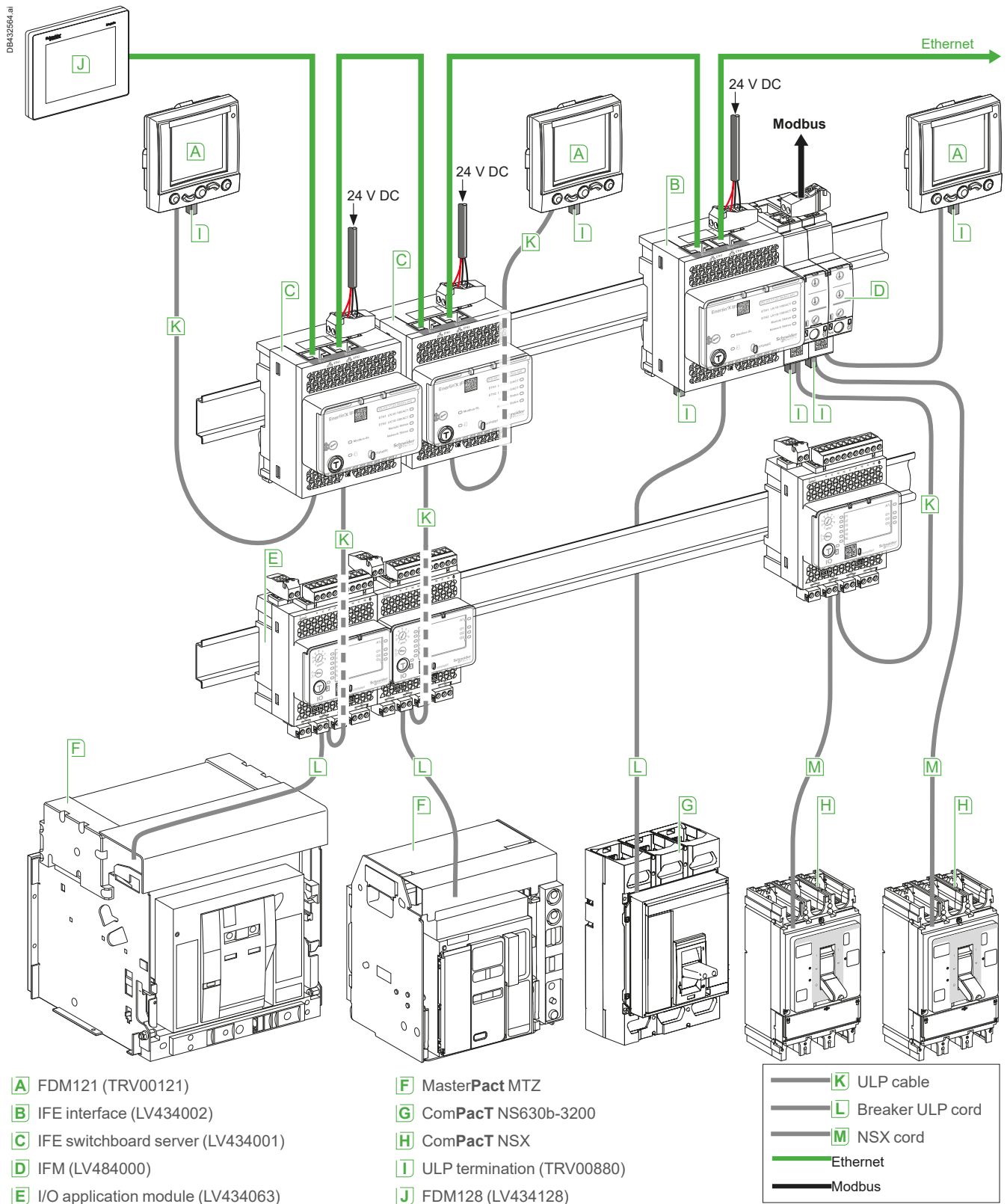


Operation



- I:** charge current
SDT: thermal-fault signal
KA1: auxiliary relay (e.g. RBN or RTBT relay)
KM1: motor contactor
Q: circuit breaker

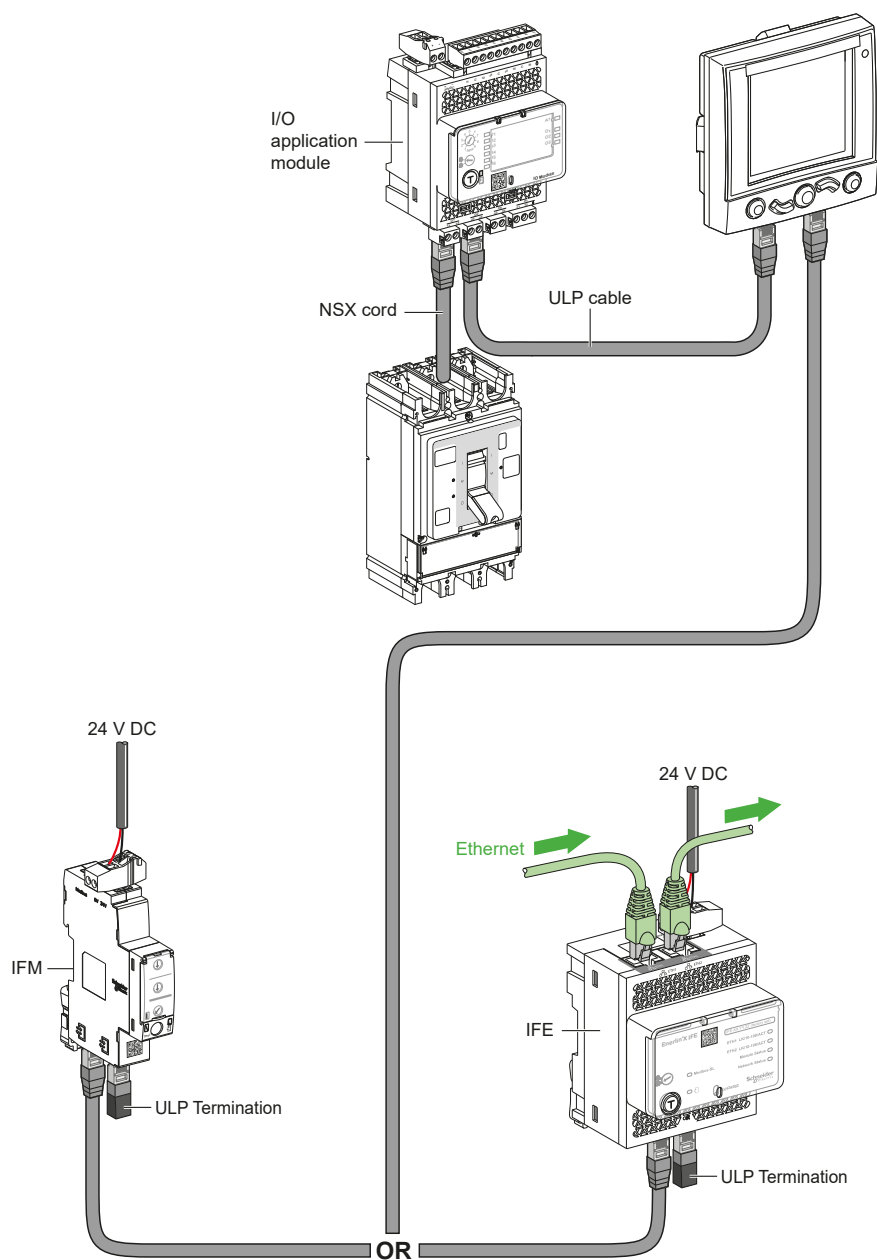
Connection of Circuit Breakers to the Modbus Communication Network



ComPacT NSX

Communication

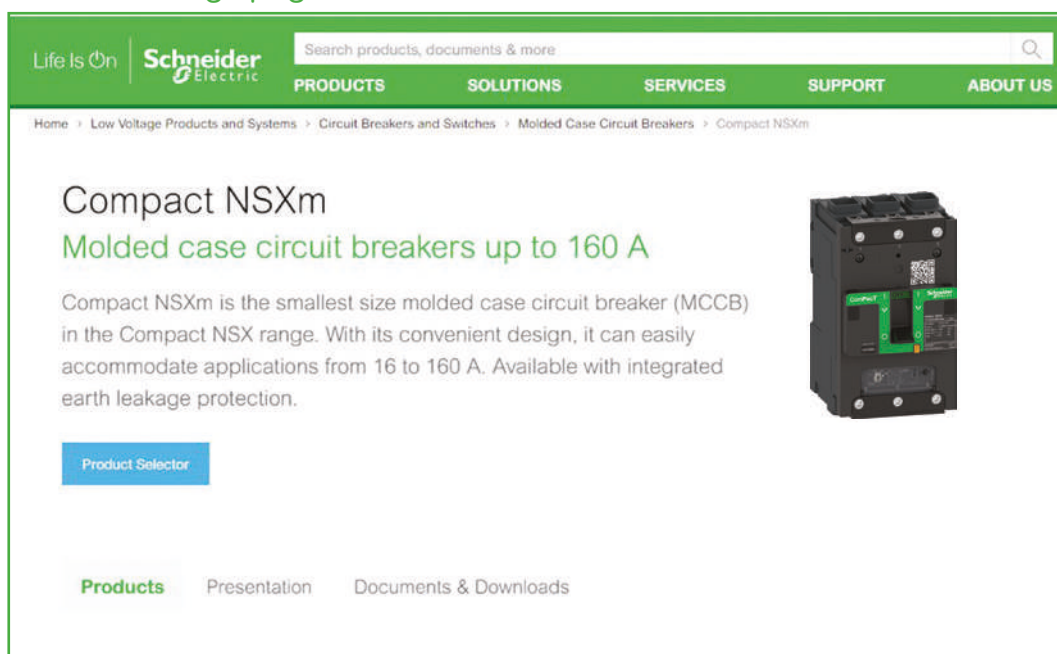
DB4530265.ai



E

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To select your ComPacT NSXm, use the product selector available at <https://www.se.com/ww/en/work/support/product-selector/>.

E

Type (1)	Frame Rating (2)	Breaking Capacity (1)	Num Poles (2)	Trip Unit (2)	Trip Unit Ratings (3)	Suffix (1)
NSX = C	100m = 11	16kA = E	1P = 1	TMD = TM	16 = 016	EverLink = L
NSXm = C	160m = 12	25kA = B	2P = 2	MA = MA	20 = 020	Busbar = B
	100 = 10	36kA = F	3P3D = 3	TMG = MG	25 = 025	Fixed = F
	160 = 16	50kA = N	4P4D = 4	1.3 M = 1M	30 = 030	DC = D
	250 = 25	70kA = H	3P2D = 5	2.2 = 2D	40 = 040	Switch = S
	400 = 40	100kA = S	4P3D = 6	2.3 = 2D	50 = 050	DC PV = DP
	630 = 63	150kA = L		4.1 = 4V	63 = 063	
		...		4.2 = 4V	80 = 080	Acc with ID
				...	100 = 100	change = T
					...	