

FNX Switch-Disconnecter-Fuse Unit

About us

Larsen & Toubro is a technology-driven company that infuses engineering with imagination. The Company offers a wide range of advanced solutions in the field of Engineering, Construction, Electrical & Automation, Machinery and Information Technology.

L&T Switchgear, a part of the Electrical & Automation business, is India's largest manufacturer of low voltage switchgear, with the scale, sophistication and range to meet global benchmarks. With over five decades of experience in this field, the Company today enjoys a leadership position in the Indian market with a growing international presence.

It offers a complete range of products including powergear, controlgear, industrial automation, building electricals & automation, reactive power management, energy meters, and protective relays. These products conform to Indian and International Standards.

L&T now introduces the state-of-the-art FNX range of Switch-Disconnectors-Fuses. These units are safe to use, rate high on aesthetics in energy saving.



Switchgear Factory, Mumbai



Switchgear Factory, Ahmednagar

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FNX SDF Range

FNX SDF units are available in a wide range :



Frames	Ratings
1	32A, 63A
2	100A, 125A
3	125A, 160A
4	200A, 250A
5	315A, 400A
6	630A, 800A

Versions
3 Pole
3 Pole + Neutral
4 Pole

Advantages

The FNX SDF range provides users with a high level of safety. The complete range conforms to IS13947 (Part 3) / IEC60947-3 standards. It also carries the CE marking signifying compliance to stringent European safety norms.

FNX SDF's superior features translate into better safety for the users.

Fuse shrouds / Terminal shrouds provide protection against accidental direct contact. Terminal shrouds also protect against phase to phase short circuit through an external conducting path.

Extended terminal shrouds cover the terminations, including the cable lug and connectors.

Double isolation of fuses when FNX is in OFF position makes replacement of fuses risk-free.

Positive ON / OFF indication ensures that the handle indicates OFF position only when main contacts are actually open.

IP20 protection is provided by using fuse shrouds as standard.

Fuse indicators / fuse monitors provide safe and reliable indications.

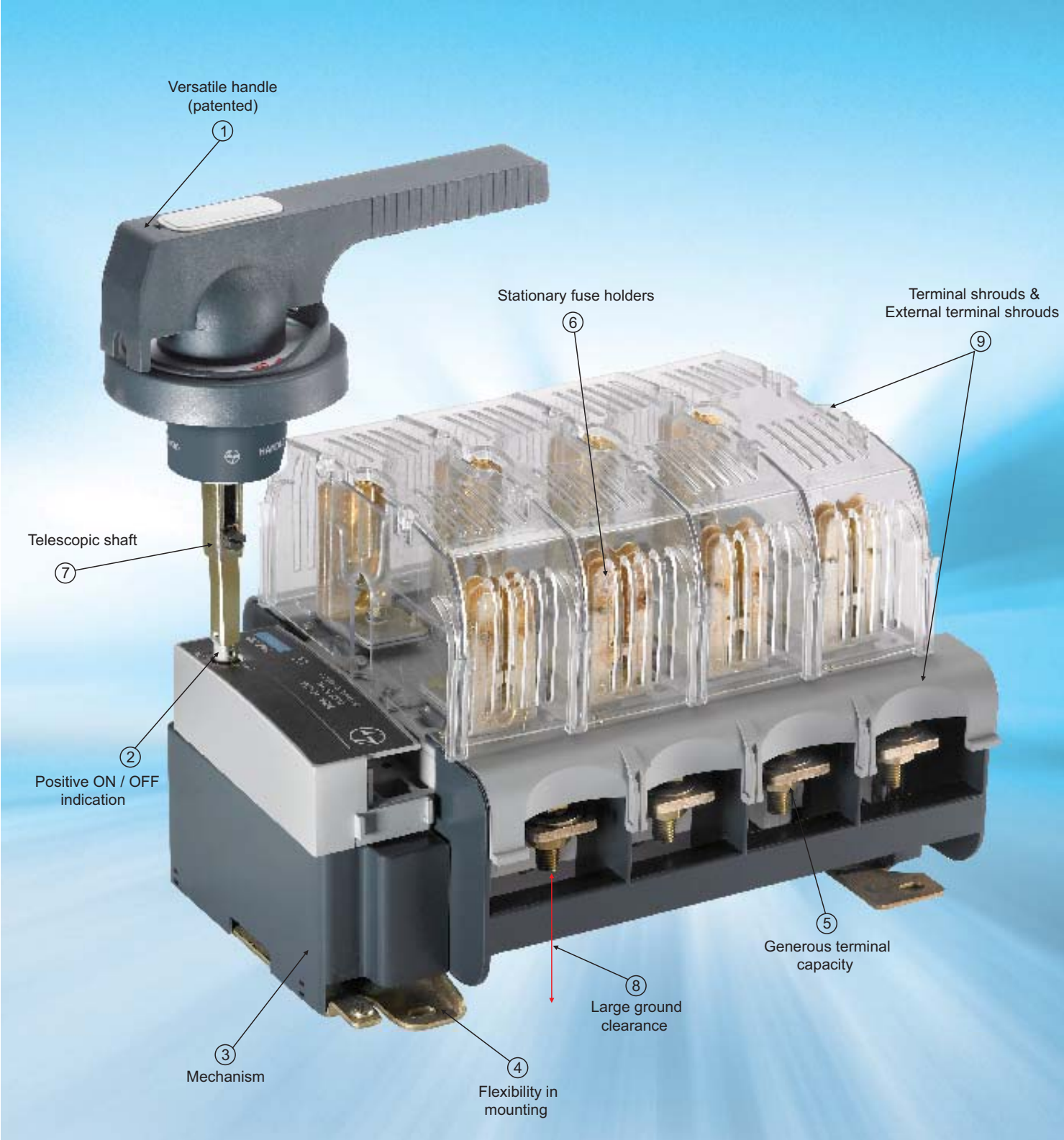
Large ground clearance eliminates possibility of phase to ground flash over.

Built-in padlocking arrangement provided to lock the unit in OFF position prevents inadvertent operation of the unit.

Fuse barriers are provided on the Switch-Disconnect-Fuse units as an additional safety feature to eliminate the possibility of inter-phase short circuit.

Fuse puller facilitates safe removal of fuses.

Superior Features



FNX incorporates state-of-the-art technology and a range with superior design features to deliver key operational advantages.

- ① **Versatile handle (patented)**
The handle coupling has the following user-friendly features:
 - Door interlock (defeatable)
 - Padlock with / without door interlock
 - Choice of operating quadrant
 - Flexibility ($\pm 3\text{mm}$ mismatch operational quadrant)

- ② **Positive ON / OFF indication**
Clear ON-OFF indication is provided on the switch by a red pointer.

- ③ **Mechanism**
The mechanism is front-operated and a quick-make/quick-break one.
The contact closing is spring-assisted and is independent of manual speed of operation.

- ④ **Flexibility in mounting**
The Switch-Disconnect-Fuse unit can be mounted at any angle in a vertical plane.

- ⑤ **Generous terminal capacity**
Terminals are suitable for Al / Cu links / cable lug connections.

- ⑥ **Stationary fuse holders**
Fuses remain stationary during switching operation.

- ⑦ **Telescopic shaft**
Handle depth can be varied and fixed as per requirement during installation.
This is possible because the telescopic shaft can be adjusted for stepless variable depth.

- ⑧ **Large ground clearance**

- ⑨ **Terminal shrouds & External terminal shrouds**
 - **DIN rail mounting**
Ratings upto 125A can be mounted on 35 mm DIN rail for which the DIN rail mounting is available as an accessory

 - **Easy inspection and replacement of contacts**
Contacts can be easily inspected and replaced (if required) during maintenance. This way the electrical life can be equal to its mechanical life

 - **Compact size**
Being extremely compact, it results in saving of valuable panel space.

 - **Easy to operate**
Low operating torque makes it very convenient to operate

Technical Data

Frame Size		Unit	I	I	II	II
Type Designation			FNX 32	FNX 63	FNX 100	FNX 125C
Conformance to Standard			IEC 60947-3, IS/IEC 60947-3			
No. of Poles			3 Pole + Isolable Neutral, 4 Pole			
Thermal current (I_{th}) at 40°C	A		32	63	100	125
Conventional enclosed thermal current (I_{thc})	A		32	63	100	125
Ref. Ambient Temperature	°C		40	40	40	40
Rated Insulation Voltage (U_i)	V		1000	1000	1000	1000
Rated Operational Voltage (U_e)	V		415	415	415	415
Rated Impulse withstand Voltage (U_{imp})	kV		8	8	8	8
Dielectric Strength	kV		6	6	6	6
Rated Operational Current (I_e) at 415V						
AC-21A Utilization Category	A		32	63	100	125
AC-22A Utilization Category	A		32	63	100	125
AC-23A Utilization Category	A		32	63	100	125
Rated Operational Current (I_e) at 690V (AC-23A)	A		32	32	80	-
Breaking Capacity - 436V, AC-23A	A (rms)		256	504	800	1000
Making Capacity - 436V, AC-23A	A (rms)		320	630	1000	1250
Mechanical Endurance (Number of operating cycles)			20,000	20,000	15,000	15,000
Maximum Torque (On terminal bolt)	Nm		4.5	4.5	4.5	4.5
Pollution Degree			III	III	III	III
Terminal Capacity	Main	Sq. mm	35	35	50	-
	Neutral	Sq. mm	35	35	50	-
Terminal Width			16	16	20	20.5
Terminal thickness			1.6	1.6	3	3
Terminal screw	mm		M6 x 12	M6 x 12	M8 x 20	M8 x 20
Weight 3-pole / 4-pole		kg	0.9	0.9	1.7	2.2
Rated Capacitor Power (415V, 50/60 Hz)		kVAr	14	29	45	-
DC Rating at 220 V DC						
No. of poles in series, utilization category at rated current			3, DC-23 A	3, DC-23 A	3, DC-23 A	3, DC-23 A
Suitable L&T fuse						
DIN	Rated fused short circuit current	kA	80*	80*	100	100
	Rating	A/Type/Size	32/HF/14 x 51	63/HF/14 x 51	100/HN/000	125/HN/000
Short circuit making capacity (I_{cm})		A	320	630	1000	1250
Operating torque		Kg-m	0.4	0.4	0.4	0.4
Auxiliary contacts no. of NO + NC (Accessories)			2	2	2	2
Overall dimensions	W	mm	113	113	112	148
	H	mm	108	108	144.5	217
	D	mm	150 + 10	150 + 10	180 + 10	145

* Cylindrical Fuse link

Technical Data

Frame Size		Unit	III	III	IV	IV
Type Designation			FNX 125	FNX 160	FNX 200	FNX 250
Conformance to Standard			IEC 60947-3, IS/IEC 60947-3			
No. of Poles			3 Pole + Isolable Neutral, 4 Pole			
Thermal current (I_{th}) at 40°C	A		125	160	200	250
Conventional enclosed thermal current (I_{the})	A		125	160	200	250
Ref. Ambient Temperature	°C		40	40	40	40
Rated Insulation Voltage (U_i)	V		1000	1000	1000	1000
Rated Operational Voltage (U_e)	V		415	415	415	415
Rated Impulse withstand Voltage (U_{imp})	kV		12	12	12	12
Dielectric Strength	kV		10	10	6	6
Rated Operational Current (I_e) at 415V						
AC-21A Utilization Category	A		125	160	200	250
AC-22A Utilization Category	A		125	160	200	250
AC-23A Utilization Category	A		125	160	200	250
Rated Operational Current (I_e) at 690V (AC-23A)	A		100	125	160	200
Breaking Capacity - 436V, AC-23A	A (rms)		1000	1280	1600	2000
Making Capacity - 436V, AC-23A	A (rms)		1250	1600	2000	2500
Mechanical Endurance (Number of operating cycles)			15,000	15,000	10,000	10,000
Maximum Torque (On terminal bolt)	Nm		9.6	9.6	20	20
Pollution Degree			III	III	III	III
Terminal Capacity	Main	Sq. mm	95	185	240	240
	Neutral	Sq. mm	50	50	120	120
Terminal Width			20	25	30	30
Terminal thickness			3	3	4	3
Terminal screw	mm		M8 x 20	M8 x 20	M10 x 30	M10 x 30
Weight 3-pole / 4-pole	kg		3 / 3.3	3.2 / 3.65	4 / 4.7	5.2 / 6
Rated Capacitor Power (415V, 50/60 Hz)	kVAr		57	57	92	115
DC Rating at 220 V DC						
No. of poles in series, utilization category at rated current			2, DC-23 A	2, DC-23 A	2, DC-23 A	2, DC-22 A
Suitable L&T fuse						
DIN	Rated fused short circuit current	kA	100	100	100	100
	Rating	A/Type/Size	125/HN/00 & 000	160/HN/00 & 000	200/HN/0	250/HN/1
Short circuit making capacity (I_{cm})		A	1250	1600	2000	2500
Operating torque		Kg-m	1.2	1.2	2	2
Auxiliary contacts no. of NO + NC (Accessories)			2	2	2	2
Overall dimensions	W	mm	251	251	299	299
	H	mm	187	187	231	231
	D	mm	180 + 36	180 + 36	216 + 31	216 + 31

Technical Data

Frame Size	Unit	V	V	VI	VI	
Type Designation		FNX 315	FNX 400	FNX 630	FNX 800	
Conformance to Standard		IEC 60947-3, IS/IEC 60947-3				
No. of Poles		3 Pole + Isolable Neutral, 4 Pole				
Thermal current (I_{th}) at 40°C	A	315	400	630	800	
Conventional enclosed thermal current (I_{thc})	A	315	400	630	800	
Ref. Ambient Temperature	°C	40	40	40	40	
Rated Insulation Voltage (U_i)	V	1000	1000	1000	1000	
Rated Operational Voltage (U_e)	V	415	415	415	415	
Rated Impulse withstand Voltage (U_{imp})	kV	12	12	12	12	
Dielectric Strength	kV	6	10	10	10	
Rated Operational Current (I_e) at 415V						
AC-21A Utilization Category	A	315	400	630	800	
AC-22A Utilization Category	A	315	500	630	800	
AC-23A Utilization Category	A	315	400	630	800	
Rated Operational Current (I_e) at 690V (AC-23A)	A	250	315	500	630	
Breaking Capacity - 436V, AC-23A	A (rms)	2520	3200	1600	6400	
Making Capacity - 436V, AC-23A	A (rms)	3150	4000	6300	8000	
Mechanical Endurance (Number of operating cycles)		10,000	10,000	10,000	5000	
Maximum Torque (On terminal bolt)	Nm	20	27	45	45	
Pollution Degree		III	III	III	III	
Terminal Capacity	Main	Sq. mm	400	400	2 x 625	2 x 625
	Neutral	Sq. mm	240	240	400	400
Terminal Width		40	40	60	60	
Terminal thickness		3	5	6	8	
Terminal screw	mm	M10 x 30	M12 x 40	M16 x 50	M16 x 50	
Weight 3-pole / 4-pole	kg	6.5 / 7.5	6.5 / 7.5	12.1 / 14	14.2 / 16.1	
Rated Capacitor Power (415V, 50/60 Hz)	kVAr	145	175	270	270	
DC Rating at 220 V DC						
No. of poles in series, utilization category at rated current		2, DC-22 A	2, DC-22 A	2, DC-22 A	2, DC-22 B	
Suitable L&T fuse						
DIN	Rated fused short circuit current	kA	100	100	100	100
	Rating	A/Type/Size	315/HN/1	400/HN/2	630/HN/3	800/HN/3
Short circuit making capacity (I_{cm})	A	3150	4000	6300	8000	
Operating torque	Kg-m	2.5	2.5	2.5	2.8	
Auxiliary contacts no. of NO + NC (Accessories)		2	2	2	2	
Overall dimensions	W	mm	352	352	428	428
	H	mm	230	230	242	242
	D	mm	250 + 20	250 + 20	270 + 23	270 + 23

Ordering Information

Ordering Information of FNX S-D-F

Type Designation		FNX 32	FNX 63	FNX 100	FNX 125	FNX 160
SDF Interiors : (DIN)	TPN	SK96903	SK96904	SK96906	SK95806	SK95807
	4P	SK96903	SK96904	SK96906	SK95814	SK95815

Type Designation		FNX 200	FNX 250	FNX 315	FNX 400	FNX 630	FNX 800
SDF Interiors : (DIN)	TPN	SK95808	SK95809	SK95810	SK95811	SK95812	SK95813
	4P	SK95816	SK95817	SK95818	SK95819	SK95820	SK95821

Ordering suffix 0000 for all

Ordering Information of FNX S-D-F Spares & Accessories

Description	Type	Cat. No.
Auxiliary contacts (1NO + 1 NC)	FNX 32 / 63	SK91537
	FNX 100	SK91538
	FNX 125 / 160	SK91539
	FNX 200 / 250	SK91540
	FNX 315 / 400 / 630 / 800	SK91541
Handle Assembly	FNX 32 / 63 / 100	SK91524
	FNX 125 / 160 / 200 / 250	SK91525
	FNX 315 / 400 / 630 / 800	SK91526

Description	Type	Cat. No.
DIN Rail Assembly	FNX 32 / 63 / 100	SK91617
Mechanical Interlock kit	FNX 125 / 160 / 200 / 250	SK95232
	FNX 315 / 400 / 630 / 800	SK95545
Fuse pulling handle	FNX 32 / 63	SK91185
	FNX 100 to FNX 800	SK90126
Castell Lock	FNX 32 / 63 / 100	SK91530
	FNX 125 / 160 / 200 / 250	SK91531
	FNX 315 / 400 / 630 / 800	SK91531

Ordering suffix 0000 for all

Spares & Accessories

A wide range of spares and accessories are available for Switch-Disconnecter-Fuse units type FNX:

Extended terminal shroud

Terminals are shrouded for protection against phase to phase short circuit through an external conducting path and against accidental human contact with live terminals.

Mechanical interlock kit

Two Switch-Disconnecter-Fuse units can be interlocked by mechanical interlock kit. After interlocking, the following three positions are possible:

- SDF 1 in ON position SDF 2 in OFF position
- SDF 2 in ON position SDF 1 in OFF position
- Both SDFs in OFF position

Hence two mechanically interlocked SDFs can be used as a changeover switch.



Mechanical interlock kit

Castell interlock

Switch-Disconnecter-Fuse units type FNX can be locked in OFF position with the help of Castell interlock.



Castell interlock

Padlock

Switch-Disconnecter-Fuse units type FNX can be locked in OFF position with the help of the padlock. This can be done with or without defeating door interlock.



Padlock

Auxiliary contacts

1NO + 1NC auxiliary contact is available as an accessory. This can be suitably wired in the control circuit with: (as per AC - 15)

- Rated operational current (I_e) - 4A
- Rated operational voltage (U_e) - 415V



Auxiliary contacts

Moving contacts

Moving contacts are available for range FNX 100 to FNX 800. One set of moving contact spare contains spring, guide and moving contact.

Fuse puller

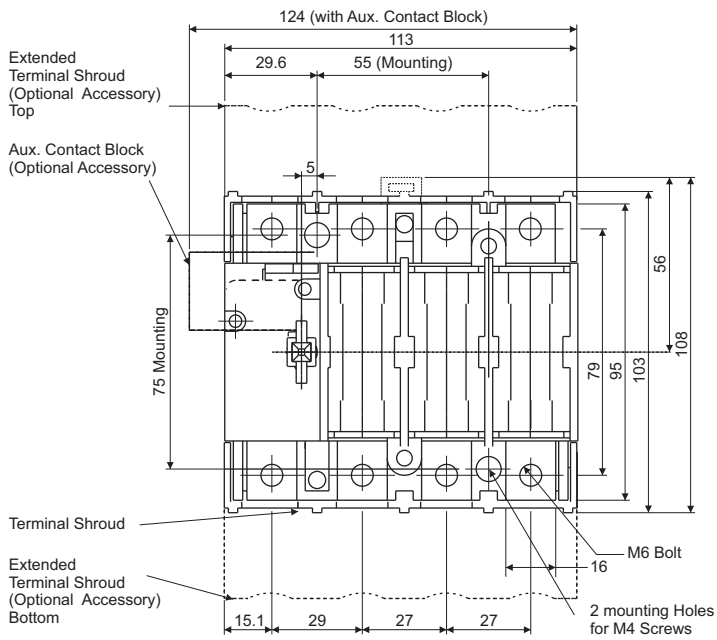
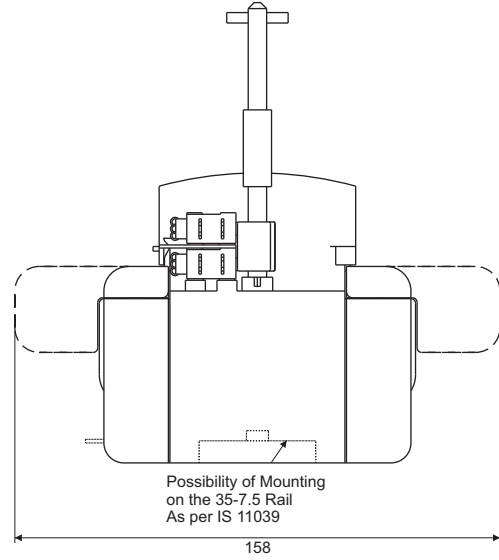
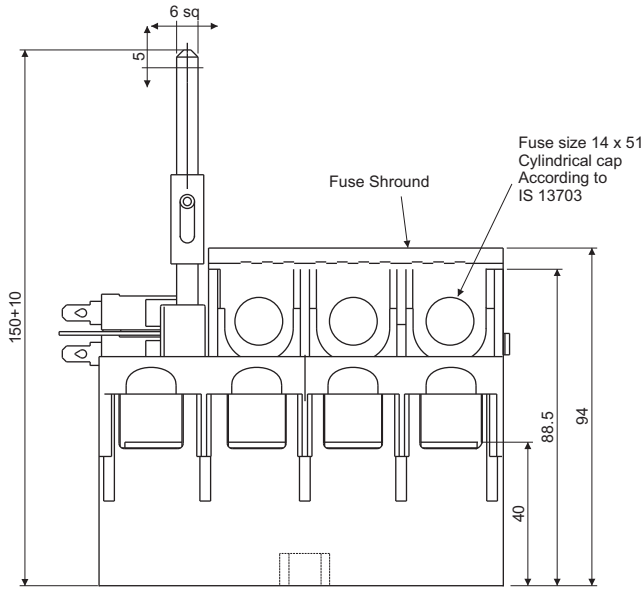
A fuse puller facilitates safe removal of fuses.



Fuse puller

Overall Dimensions

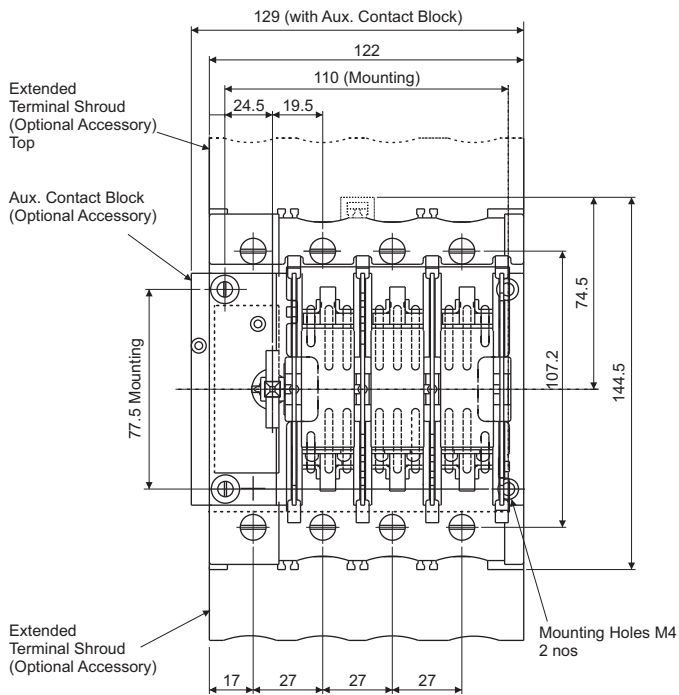
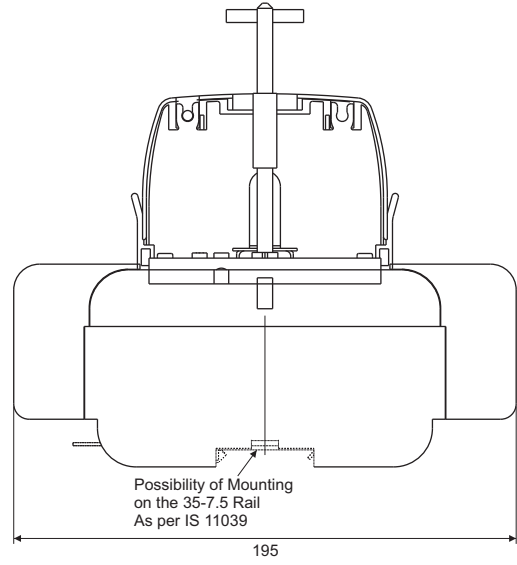
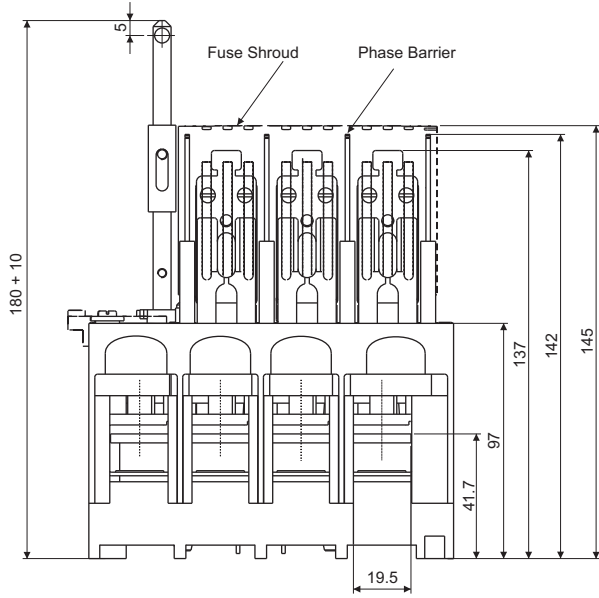
Type FNX 32 / FNX 63



Note : All dimensions are in mm

Overall Dimensions

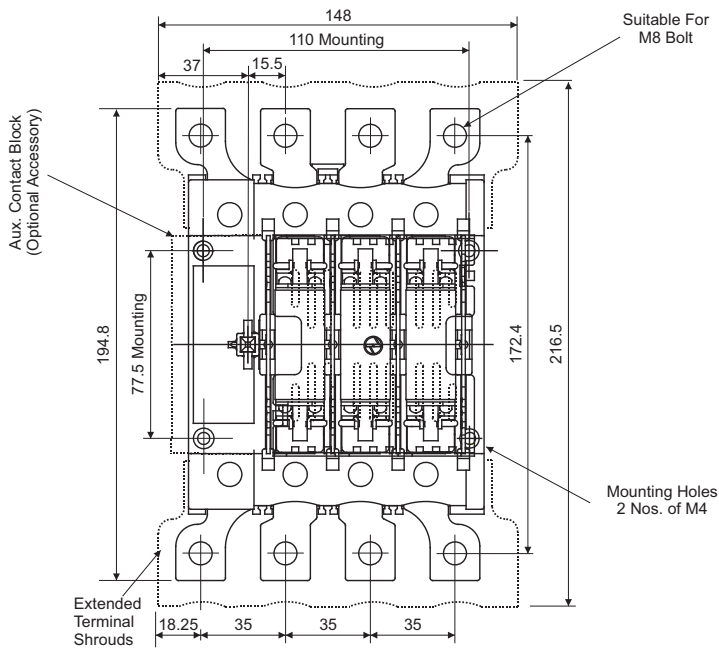
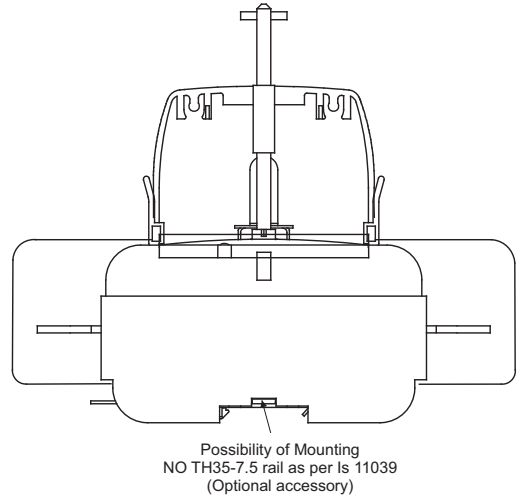
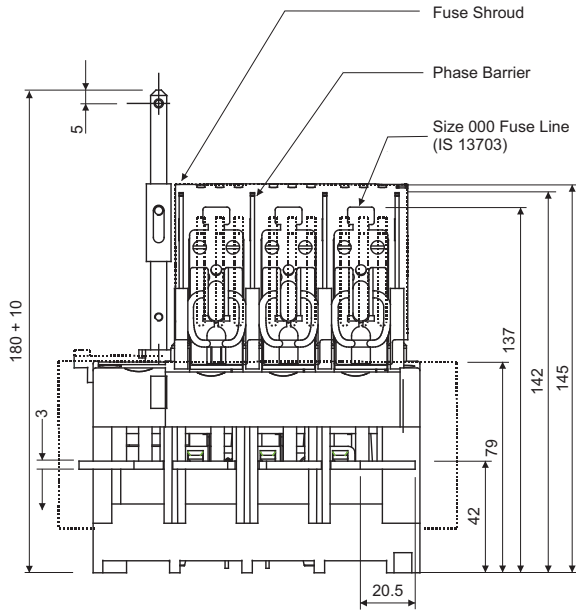
Type FNX 100



Note : All dimensions are in mm

Overall Dimensions

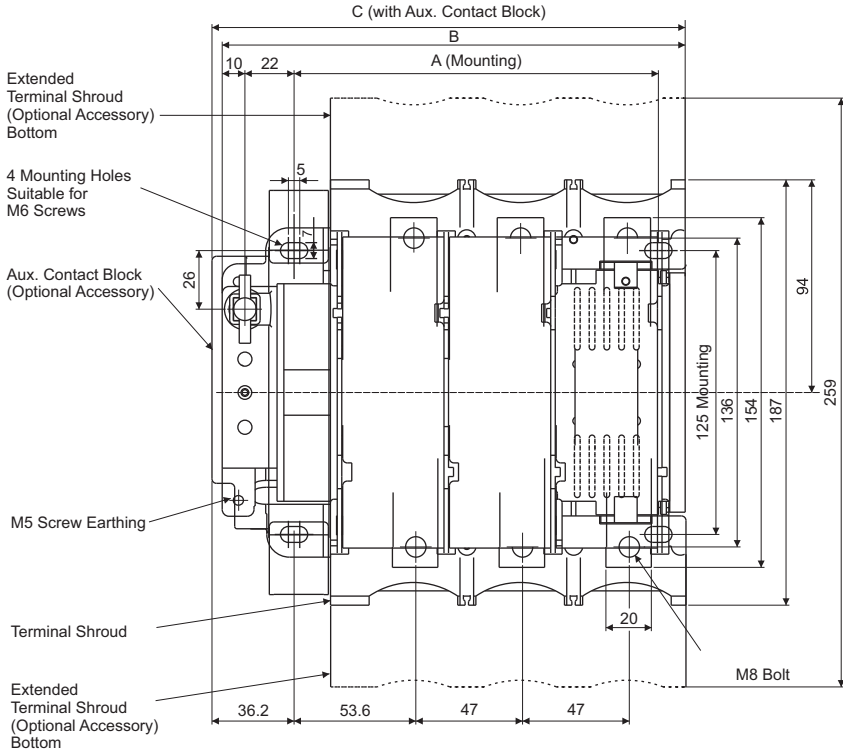
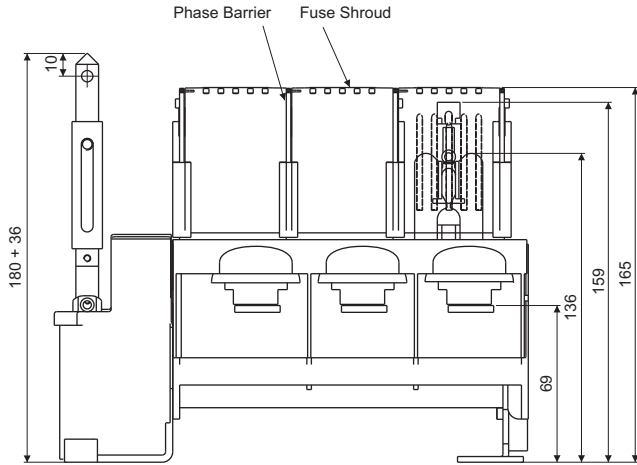
Type FNX 125C (with Extended Terminals)



Note : All dimensions are in mm

Overall Dimensions

Type FNX 125 / FNX 160



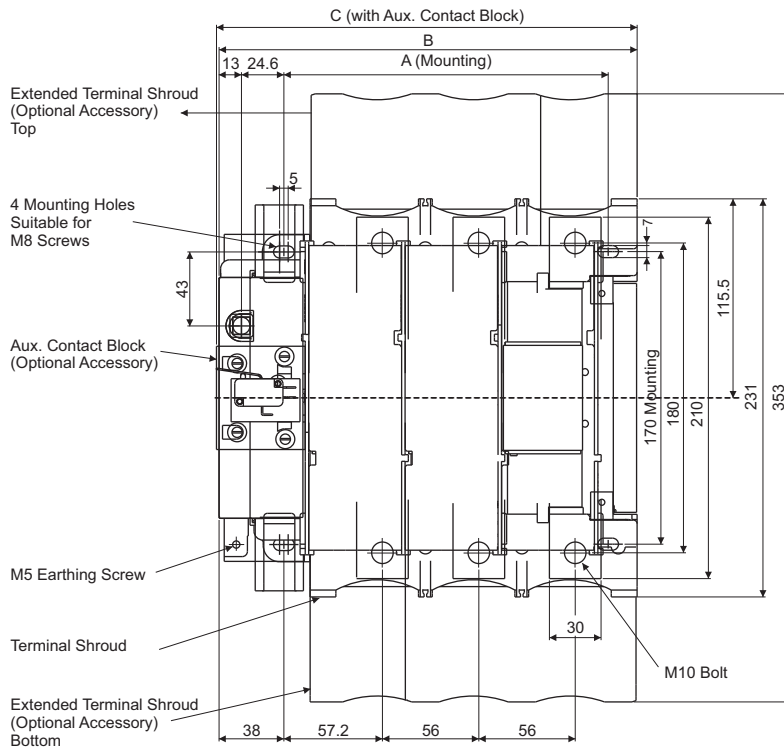
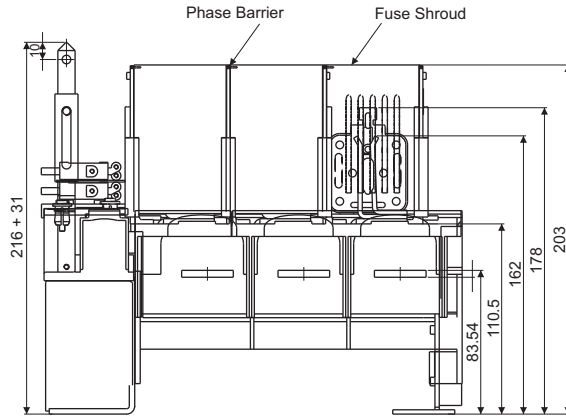
Dimensions according to rating

	A	B	C
3 Pole	160	204	201
4 Pole	207	251	256

Note : All dimensions are in mm

Overall Dimensions

Type FNX 200 / FNX 250



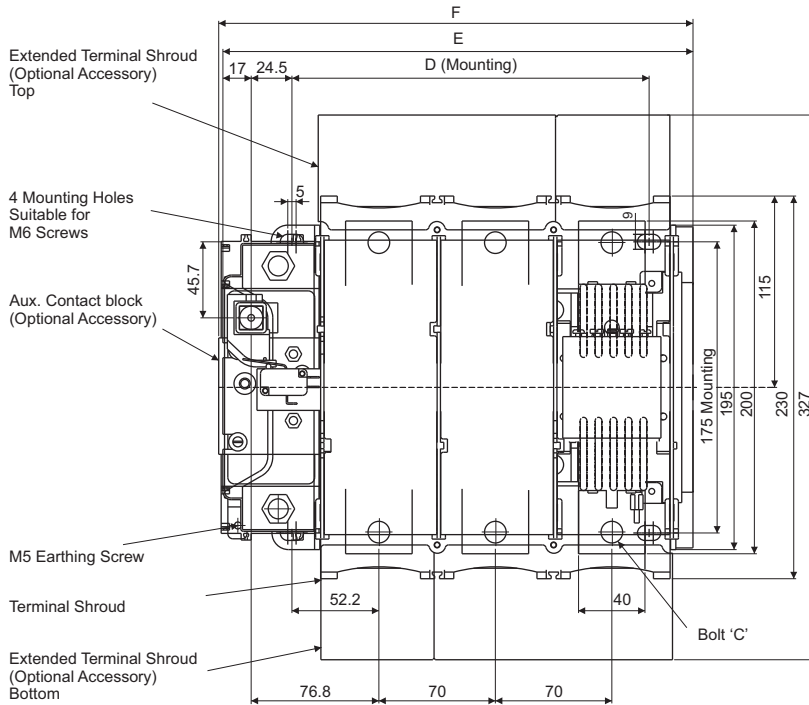
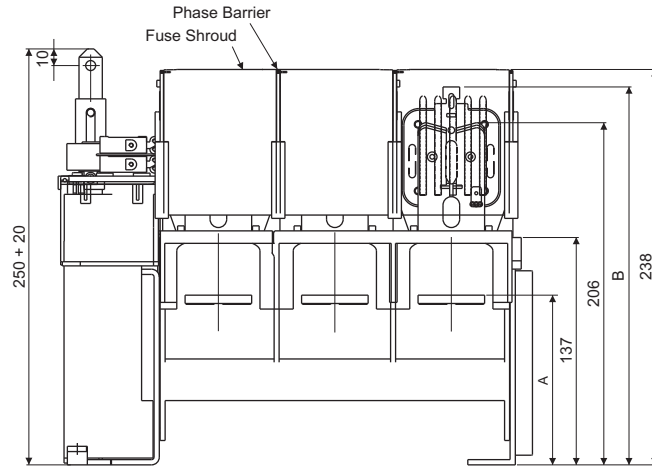
Dimensions according to No. of poles

	A	B	C
3 Pole	188	243	244
4 Pole	244	299	300

Note : All dimensions are in mm

Overall Dimensions

Type FNX 315 / FNX 400



Dimensions according to rating

For 3/4 Pole	A	B	C
FNX 315	103	220	M10
FNX 400	102	228	M12

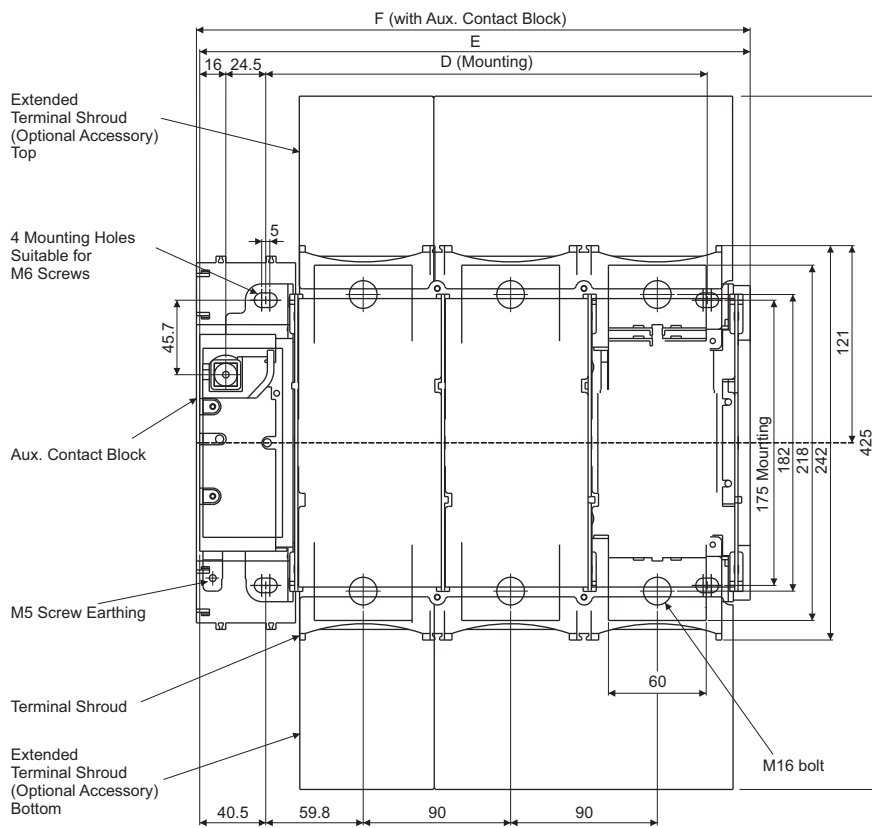
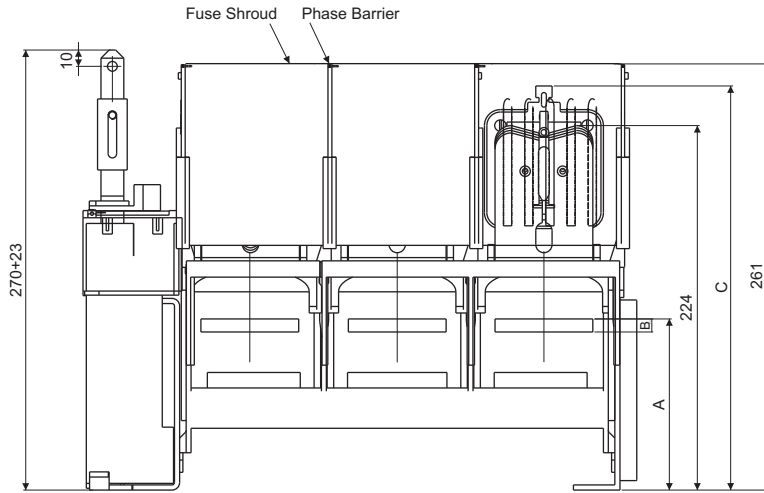
Dimensions according to No. of poles

For FNX 315 / FNX 400	D	E	F
3 Pole	215	282	285
4 Pole	285	352	355

Note : All dimensions are in mm

Overall Dimensions

Type FNX 630 / FNX 800



Dimensions according to rating

For 3/4 Pole	A	B	C
FNX 630	103	6	249
FNX 800	105	8	250.5

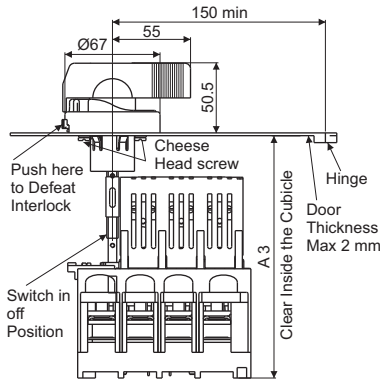
Dimensions according to No. of poles

For FNX 630 / FNX 800	D	E	F
3 Pole	271	338	340
4 Pole	361	428	430

Note : All dimensions are in mm

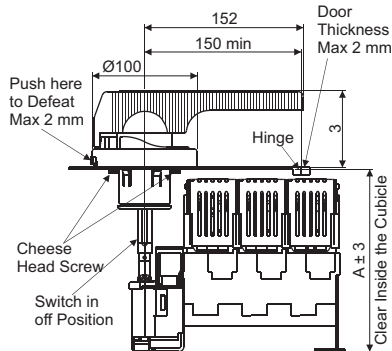
Installation Details

Assembly of handle coupling on door FNX 32 / 63 / 100



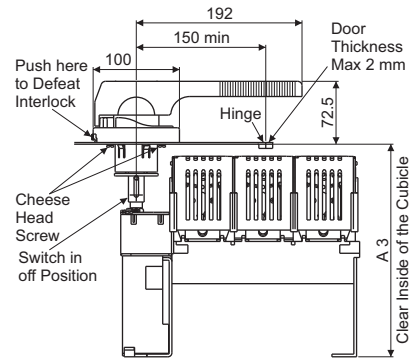
DIM	FNX 32 / FNX 63	FNX 100
A	150 + 10	180 + 10

Assembly of handle coupling on door FNX 125 / 160 / 200 / 250



DIM	FNX 125 / FNX 160	FNX 200 / FNX 250
A	180 + 36	216 + 31

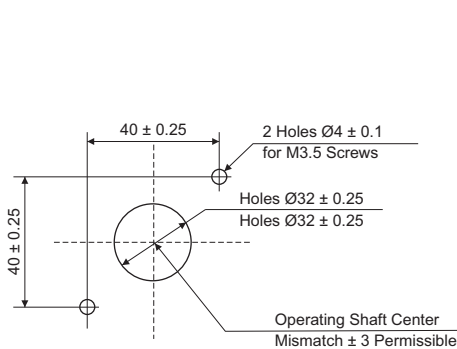
Assembly of handle coupling on door FNX 315 / 400 / 630 / 800



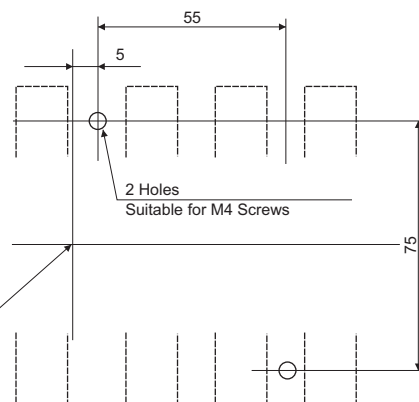
DIM	FNX 135 / FNX 400	FNX 630 / FNX 800
A	250 + 20	270 + 23

Drilling details for FNX 32 / FNX 63

**Drilling details on door
for mounting handle coupling**
As seen from front side of the door



**Drilling details on base plate
for mounting switch**
As seen from front side of the door

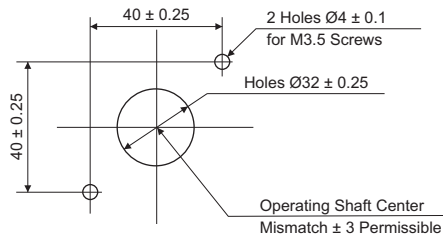


Note : All dimensions are in mm

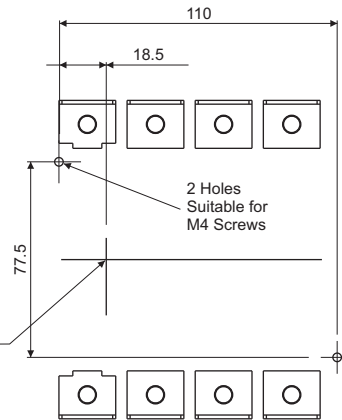
Installation Details

Drilling details for FNX 100

Drilling details on door for mounting handle coupling
As seen from front side of the door

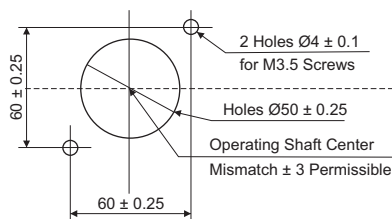


Drilling details on base plate for mounting switch
As seen from front side of the door

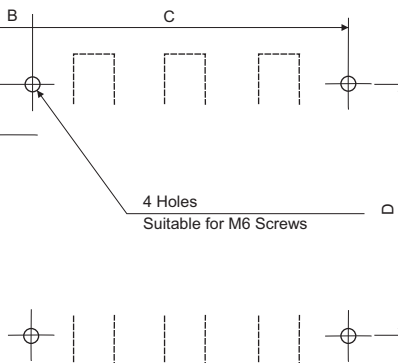


Drilling details for FNX 125 / FNX 160 / FNX 200 / FNX 250

Drilling details on door for mounting handle coupling
As seen from front side of the door



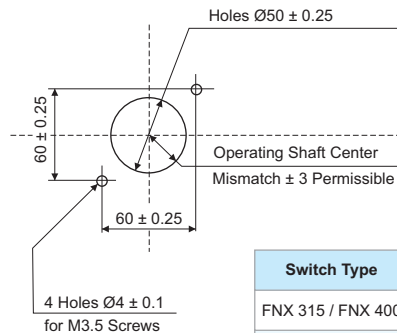
Drilling details on base plate for mounting switch
As seen from front side of the door



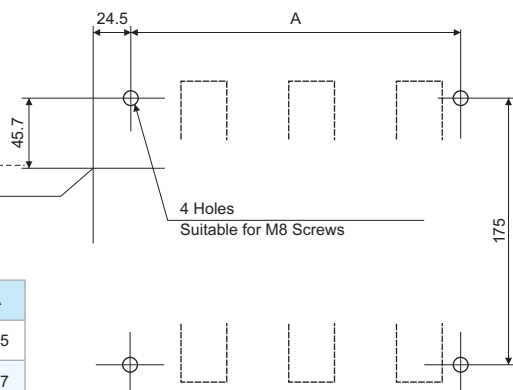
Type	A	B	C	D
FNX 125 / FNX 160	26	22	160	125
FNX 200	43.2	24.7	188	170
FNX 250	43.2	24.7	188	170

Drilling details for FNX 315 / FNX 400 / FNX 630 / FNX 800

Drilling details on door for mounting handle coupling
As seen from front side of the door



Drilling details on base plate for mounting switch
As seen from front side of the door



Switch Type	A
FNX 315 / FNX 400	215
FNX 630 / FNX 800	217

Note : All dimensions are in mm

HRC Fuses - Cylindrical

Fuse Links Type HF

(Fuse links with cylindrical contact caps)

- Conforms to IEC60269 / IS13703
- Low watt loss - Saves power
- Low let through energy
- High breaking capacity - 80kA
- Rated voltage - 415V
- Immediate fault indication through red pop up indicator
- Lower power loss in our fuses result in cooler running of associated products



Ordering Details

Size	Fuse Rating (A)	Cat. Nos.	Rated watt loss
14 x 51	2	SF90144	0.6
	4	SF90145	0.6
	6	SF90146	1.1
	8	SF90147	1.2
	10	SF90148	1.0
	16	SF90150	2.4
	20	SF90151	2.4
	25	SF90152	3.2
	32	SF90142	5.0
	40	SF90143	5.0
	50	SF90158	5.0
	63	SF90159	7.4

Fuse-pulling handle should be used for safe and easy removal of fuse links
Suitable fuse - pulling handle for type HF : SK91185

HRC Fuses - Blade / Knife type

Fuse Links Type HN

(Fuse links with blade contacts)

- Conforms to IEC60269 / IS13703
- Low watt loss - Saves power
- Cooler running of associated products
- Low let through energy
- High breaking capacity - 100kA
- Immediate fault indication
- Rated voltage - 415V



Size of the fuse link	Rating (A)	Cat. Nos.	Rated watt loss	Watt loss limits as per IS 13703
Size 000	63	SF94940	5.3	100 Amp, Fuse-7.5 W
	80	SF94941	6.2	
	100	SF94942	7	
	New 125	SF94946	9.5	
Size 00	63	SF94027	5.7	100 Amp, Fuse-7.5 W
	80	SF94028	6.9	
	100	SF94029	7.5	
	125	SF94030	9.8	
	160	SF94939	12	
Size 0	80	SF94128	8.3	160 Amp, Fuse-16 W
	100	SF94129	9.1	
	125	SF94130	11.3	
	160	SF94131	12.7	
	200	SF94132	14.5	
Size 1	125	SF94230	10.3	250 Amp, Fuse-23 W
	160	SF94231	12.3	
	200	SF94232	14.3	
	250	SF94233	17.3	
	315	SF94234	25.5	
Size 2	200	SF94332	14.1	400 Amp, Fuse-34 W
	250	SF94333	16.9	
	315	SF94334	20.2	
	400	SF94335	24.9	
Size 3	315	SF94434	20.5	630 Amp, Fuse-48 W
	400	SF94435	26.7	
	500	SF94436	36.1	
	630	SF94437	42.2	
	800	SF94938	48	

Fuse-pulling handle should be used for safe and easy removal of fuse links
 Suitable fuse - pulling handle for type HN : SF90126

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Product improvement is a continuous process. For the latest information and special applications, please contact any of our offices listed here.



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