



ABOUT US



Switchgear Factory, Navi Mumbai



Switchgear Factory, Ahmednagar



Switchgear Factory, Vadodara

L&T Electrical & Automation (E&A) is a market leader for electrical distribution, monitoring and control solutions in the low voltage category.

Popular among customers as L&T Switchgear, E&A offers a wide range of low and medium voltage switchgear, motor starters, electrical systems, industrial automation, building electrical solutions, energy management solutions, electrical modernization solutions and metering solutions. It products and solutions cater to key sectors of economy like industries, utilities, infrastructure, building and agriculture.

E&A's manufacturing operations at Navi Mumbai, Ahmednagar, Vadodara, Coimbatore and Mysuru in India adhere to global practices of excellence and receive support from well-equipped in-house design and development centres as well as tooling facilities that contribute to precision in manufacturing.





Standards & Approvals

Switch-Disconnector range comply with following standards

EC 60947-1, EN 60947-1, IS/IEC 60947-1

Low-voltage switchgear and controlgear, Part 1: General Rules

EC 60947-3, EN 60947-3, IS/IEC 60947-3

Low-voltage switchgear and controlgear, Part 3: Switches, disconnectors, switch-disconnectors and fuse combination units



NABL

NABL accreditation is a formal recognition of the technical competence of testing, calibration or medical laboratory for a specific task following ISO/IEC 17025:2005 Standard. Accredited laboratories have the responsibility of satisfying the criteria of laboratory accreditation at all times, which are verified during Surveillance and Reassessment visits by NABL. Further the accredited laboratories should prove their technical competence by satisfactory participation in recognized Proficiency Testing Programmes.

E&A's Switchgear Testing Lab is NABL accredited subject to continued satisfactory compliance to above standard & additional requirements of NABL.

Switch-Disconnector range is tested in E&A's NABL accredited Switchgear Testing Lab.



CE Marking

A CE marking is a European marking of conformity that indicates a product complies with the essential requirements of the applicable European laws or directives with respect to safety, health and environment and consumer protection. Generally, this conformity to the applicable directives is done through self-declaration and is required on products in the countries of the European Economic Area (EEA) to facilitate trade among the member countries. The manufacturer or their authorized representative established in the EEA is responsible for affixing the CE marking to their product. The CE marking provides a means for a manufacturer to demonstrate that a product complies with a common set of laws required by all countries in the EEA to allow free movement of trade within the EEA countries.

E&A's Switch-Disconnector range conform to the Low voltage directive 73/23/EEC as amended by directive 93/68/EEC, provided it is used in the application for which it is made and is installed and maintained in accordance with professional practices with relevant installation standards and operating instructions.

FN & **Line** offers you a unique series of Switch-Disconnector combining compactness with high performance & Customer convenience.

Range covers ratings from 32 A to 2000 A in 6 frame sizes.

Versions



2P FN S-D suitable for open execution

The 2P FN S-D range is available from 32 A to 1000 A, suitable for 220V DC application.

TPN FN S-D suitable for open execution

The TPN FN S-D range is available from 32 A to 1000 A, suitable for 415/690V AC & 440V DC application.





TP & FP **Cline** S-D suitable for open execution

The 3P & 4P C-line S-D range is available from 1000 A to 2000 A, suitable for 690V AC & 440V DC application.

3							
Туре	Frame No.	Ratings (A)					
	Ι	32	63	-			
	II	100	125	-			
FN	III	200	250	-			
	IV	315	400	-			
	V	630	800	1000			
<u>£·line</u>	VI	1000	1250	1600			

S-D Range

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2000

FN S-D Product Features





1. Handle

The FN Switch has a unique operating handle with the following features.

- Door interlock for safety of operating personnel when switch is 'ON'. The interlock can be defeated if required
- Built-in padlocking arrangement to lock the unit in 'OFF' position
- The handle coupling can take a mismatch or \pm 3mm in all directions
- IP54 with extended operating handle

2. Maximum termination capacity

FN switch range provides generous terminal capacity in its compact size, facilitating aluminium termination.

3. Ground clearance

Higher ground clearance between terminals and mounting base plate ensures adequate clearance even after connecting cables. This eliminates the possibility of phase to ground flash over.





4. Positive ON / OFF indication of S-D

The FN Switch indicates true position of contacts. (By a red pointer)

5. Built-in neutral

The FN TPN Switch consists of an integral neutral, making the units suitable for 3 phase, 4 - wire application. FN 32 / 63 has switched neutral while higher ratings have isolable neutral. (For higher ratings switchable neutral kit is available as an accessory)

6. Contact system

Contact system is QUAD BREAK. There are number of parallel moving contacts per pole per break. Hence, better arc quenching & more electrical life of contacts. Each pole has separate bridge carrying the moving contacts, achieving a high order of inter phase separation & avoiding phase-phase flash over.



<u>Pline</u> S-D Product Features



1. Handle

The C-line Switch has a unique flip-able operating handle which enables user to operate the switch with two hands. The handle also offers the following.

Features:

- Door interlock for safety of operating personnel when switch is 'ON'. The interlock can be defeated if required
- Built-in padlocking arrangement to lock the unit in 'OFF' position with 3 padlocks of Ø5 to Ø7
- IP54 with extended type operating handle





2. Terminal shroud

These shrouds provide complete touch proof design and prevent accidental touching of live terminals. They are click fit type. Due to the hinge type terminal shrouds, it can be turned by 90 degree, hence terminals can be inspected without removing these shrouds.



3. Inter-phase barriers

Inter-phase barriers are provided for additional safety to eliminate possibility of inter-phase short-circuit.

4. Positive ON / OFF indication of S-D

The C-line Switch indicates true position of contacts.





5. Depth adjustable operating shaft

The C-line Switch depth can be varied and fixed as per requirement during the installation which is possible due to stepless adjustment of operating shaft.

6. Mechanism and Contact System

Contact system is of double break, knife type having self wiping action with electrodynamic compensation. This ensures reliable performance during normal as well as short circuit fault conditions, offering higher short-time withstand rating.

C-line switch offers high electrical and mechanical life in compact size. The electrical and mechanical life are two times the requirement of the standard.



Universal Mounting

FN & C-line switch range offers a distinctive feature to mount S-D in different quadrants. This feature aids mounting flexibility.

FN S-D operating quadrant chart (Seen from front of the door)

In FN Switch universal mounting is achieved by Type A and Type B handle.

Type A : Supplied as standard with all Switches Type B : Available as an accessory

Sr. No.	Handle (OFF) Position	Operating Quadrant (hand)	Switch Orientation	Door Cut-out	Handle Coupling Type
1				\circ	В
2				$^{\circ}$	A
3				\circ	A
4				$^{\circ}$	В
5				\circ	В
6				$^{\circ}$	Α
7	OFF ON			\circ	Α
8			OR	°⊖₀	В

Note : Arrow (<---) indicates position of Interlock defeat key



C-line S-D Operating Quadrant chart (Seen from front of the door)

Technical Specifications

Frame Size		1 II		III IV				V			VI					
Type Designation	Unit	FN 32	FN 63	FN 100	FN 125	FN 200	FN 250	FN 315	FN 400	FN 630	FN 800	FN 1000	COS SD 1000	COS SD 1250	COS SD 1600	COS SD 2000
Reference standards	-							947- 3, EN 60947- 3, IS/IEC 60947 - 3			1					
No. of poles	-	3P+Neutral	3P+Neutral	3P+Neutral	3P+Neutral	3P+Neutral	3P/4P	3P/4P	3P/4P	3P/4P						
Neutral	-	Switchable	Switchable	Isolable	Isolable	Isolable	Isolable	Isolable	Isolable	Isolable	Isolable	Isolable	-	-	-	-
Rated operational voltage (Ue)	(V AC)	415	415	415	415	415	415	415	415	415	415	415	415	415	415	415
Rated insulation voltage (Ui)	(V AC)	690	690	690	690	690	690	690	690	690	690	690	1000	1000	1000	1000
Rated impulse withstand voltage (imp)	(kV AC)	8	8	8	8	8	8	8	8	8	8	8	12	12	12	12
Rated frequency	(Hz)	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50/60	50/60	50/60	50/60
Service temperature	(°C)	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50						
Pollution degree	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Conventional enclosed thermal current, Ithe at 40 Deg C	(A)	32	63	100	125	200	250	315	400	630	800	1000	1000	1250	1600	2000
Conventional free air thermal current, Ith at 40 Deg C	(A)	32	63	100	125	200	250	315	400	630	800	1000	1000	1250	1600	2000
Rated operational current, le for AC 21A / AC 22A	(A)	32	63	100	125	200	250	315	400	630	800	1000	1000	1250	1600	2000
Rated operational current, le for AC 23A	(A)	32	63	100	125	200	250	315	400	630	800	1000	1000	1250	1250	1250
Rated breaking capacity (436 V, cosØ-0.35)	(A)	256	504	800	1000	1600	2000	2520	3200	5040	6400	8000	8000	10000	10000	10000
Rated making capacity (436 V, cosØ-0.35)	(A)	320	630	1000	1250	2000	2500	3150	4000	6300	8000	10000	10000	12500	12500	12500
Short time withstand, Icw for 1 sec	(kA)	1.5	1.5	4	4	6	8	14	14	20	20	25	50	50	50	50
Rated operational power for AC 23A, cosØ-0.35	(kW)	15	29	47	58	93	117	147	187	294	374	374	467	584	748	934
Capacitor duty - 415 V 50 - 60 Hz	(kvar)	12	23	36	45	72	90	113	144	226	288	288	546	682	874	1092
Mechanical endurance	(operating cycles)	15000	15000	15000	15000	10000	10000	10000	10000	10000	10000	5000	6000	6000	6000	6000
Operating torque	(N-m)	4	4	4	12	20	20	25	25	25	25	30	55	55	55	60
Terminal Capacity																
Terminal capacity (main)	(Sq mm)	35	35	95	95	240	240	400	2 x 400	2 x 625	2 x 625	2 x 625	2 x 5 x 80	2 x 5 x 80	2 x 5 x 100	3 x 5 x 100
Terminal capacity (neutral)	(Sq mm)	35	35	50	50	120	120	240	240	400	400	400	2 x 5 x 80	2 x 5 x 80	2 x 5 x 100	3 x 5 x 100
DC Rating for DC 22B																
Rated operational current, le at 220 V DC (2P in series)	(A)	32	63	100	125	200	250	315	400	630	800	1000	1000	1250	1600	2000
Rated operational current, le at 440 V DC (3P in series)	(A)	32	63	100	125	200	250	315	400	630	800	1000	1000	1250	1600	2000
Rated operational current, le at 750 V DC (2P in series, DC-20B)	(A)	-	-	-	-	-	-	-	-	-	-	-	1000	1250	1600	2000
AC Rating for 690 V AC Operational Voltage																
Rated operational current, le for AC 21A / AC 22B	(A)	32	63	63	100	160	200	250	315	400	800	1000	1000	1250	1250	1250

Spares and Accessories

Wide range of spares & accessories are available for Switch-Disconnector units

Type FN Spares & Accessories



Switched neutral

In FN 32 / 63 Switched-Neutral pole is an integral part of the Switch-Disconnector-Fuse. For higher ratings, a double break, site-fitted switched neutral pole can be provided. This is operated by the main mechanism.

Terminal shroud

The terminals can be shrouded for protection against phase-short circuit through an external conducting path and against accidental human contact with live terminals.





Castell interlock

Switch-Disconnector-Fuse units can be locked on OFF position with help of castell interlock. Castell interlock can also be used to interlock two SDF units. (Different variety of locks are available).

Handle coupling (type A & B)

Irrespective of the switch orientation (vertical or horizontal), operation in any of the four quadrants is possible by selecting right handle coupling (Refer universal mounting table).





Auxiliary contacts

1 NO + 1 NC auxiliary contact is available as an accessory. This can be suitably wired in the control circuit.

- Rated operational current I_e (AC 15) 4 A
- Rated operational voltage U_e 415 V

Type C-line Spares & Accessories



Handle

The C-line S-D has a unique flip-able operating handle which enables user to operate the switch with two hands. Irrespective of the orientation, operation in any of the four quadrants is possible. (refer universal mounting table)

Auxiliary contact kit

It consists of one set of changeover contacts. This kit is pre-wired with terminal blocks and can be fitted at the site without increasing overall dimension



Auxiliary Contact



Castell lock

Accessory to lock the switch in OFF state and using this can have interlocking schemes between multiple switches.

FN S-D suitable for open execution :

Operating Current Rating (A)				125
2P S-D Version	SK904180000	SK904190000	SK904200000	SK904210000
TPN S-D Version	SK955410000	SK955400000	SK955710000	SK954050000

Operating Current Rating (A)	200	250	315	400
2P S-D Version	SK904500000	SK904540000	SK904650000	SK904660000
TPN S-D Version	SK956070000	SK956830000	SK956090000	SK956100000

Operating Current Rating (A)	630	800	1000
2P S-D Version	SK904670000	SK904680000	SK904690000
TPN S-D Version	SK956110000	SK955510000	SK957100000

C-line S-D suitable for open execution :

Operating Current Rating (A)	1000		1600	2000
TP S-D Version	COS1000O03O	COS12500030	COS16000030	COS2000O03O
FP S-D Version	COS10000040	COS12500040	COS16000040	COS20000040













Note : All dimensions are in mm.





Note : All dimensions are in mm.



Switch-Disconnector Type FN32 / FN63 TPN

Switch-Disconnector Type FN100 / FN125 TPN





Note : All dimensions are in mm.



Switch-Disconnector Type FN315 / FN400 TPN







Note : All dimensions are in mm.



Switch-Disconnector Type COS1000/COS1250/COS1600A 3P

Cat No.	Rating	А	В	С	D
COS1000O03O	1000	310	8	56	87
COS1250OO3O	1250	310	8	56	87
COS1600OO3O	1600	330	12	54	85



Switch-Disconnector Type COS2000 3P







Switch-Disconnector Type COS1000/COS1250/COS1600A 4P



M5 Hardware for Earthing Lug (25 Sq. Mm)

Type Designation	Terminal Screws	Tightening Torque
COS-1000	M10 Hexagonal Head Bolt	20 N-m
COS-1250	M10 Hexagonal Head Bolt	20 N-m
COS-1600	M12 Hexagonal Head Bolt	27 N-m

Cat. No.	Rating	А	В	С	D
COS10000040	1000	310	8	56	87
COS12500040	1250	310	8	56	87
COS16000040	1600	330	12	54	85

1000/1250 Terminal Arrangement







Switch-Disconnector Type COS2000 4P 103 8.5 Ф \oplus \oplus Ф $\oplus \oplus$ $\oplus \oplus$ 26.5 32.5 Ф Ф Ф Ф Ф € \oplus ⊕ Panel Door ф ф 465 (With Accessories) E 265 (Mounting) 420 Maximum:312 Minimum:262 0 lΦ ¢ Ф Ð Ф \$ 0 Ф Ф Ф 205 Ф $\oplus \oplus$ 151 \oplus Ð \oplus \oplus \oplus 52.5 192.5 et e 83.5 D 125 317.5 (Mounting) 'n • ٦ 540 M5 Hardware For Earthing Lug (25 Sq. Mm) 4 Nos. Mounting Holes Suitable for M10 Screws Terminal Arrangement Suitable for M12 Hardware Housing Wall ¢ \oplus 110 9 Æ \oplus 40 40

Note : All dimensions are in mm.



Note: 1. Different configurations of busbars can be used maintaining minimum cross section areas as specified in the table 2. 2. Factory supplied bolt length caters to the copper bus bar termination as per standard in case of different

configurations & cross sectional areas. Bolt of higher length may be required.

Termination of 100 mm Bus Bar





Direct Termination of 100 mm Bus Bar Possible in Case of 2000 A.



Note : All dimensions are in mm.



Auxiliary Contact Mounting

Note : All dimensions are in mm.



Mounting Dimensions

A:53.6 B:158.9

B:158.9



Handle Features





Handle Features

Handle Flipping



Notes:

Notes:

Electrical Standard Products (ESP) Offices:

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Product improvement is a continuous process, For the latest information and special application, please contact any of our offices listed here. Product photographs shown for representive purpose only.

L&T SWITCHGEAR

SAFE & SURE

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