



# **C-line**

## **Onload Changeover Switch-Disconnectors**




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Larsen & Toubro is a technology-driven USD 8.5 billion company that infuses engineering with imagination. The Company offers a wide range of advanced solutions in the field of Engineering, Construction, Electrical & Electronics, Machinery and Information Technology.

L&T Switchgear, which forms 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 four decades of experience in this field, the Company today enjoys a leadership position in the Indian market with growing presence in international markets.

It offers a complete range of products including controlgear, powergear, motor starters, energy meters, wires and host of other accessories. Most of our product lines conform to international standards, carry **CE** markings and are **KEMA**  certified.

L&T has been market leader for Switch-Disconnecter Fuse for more than decades. L&T now introduces C-Line the new generation of changeover switch-Disconnectors.

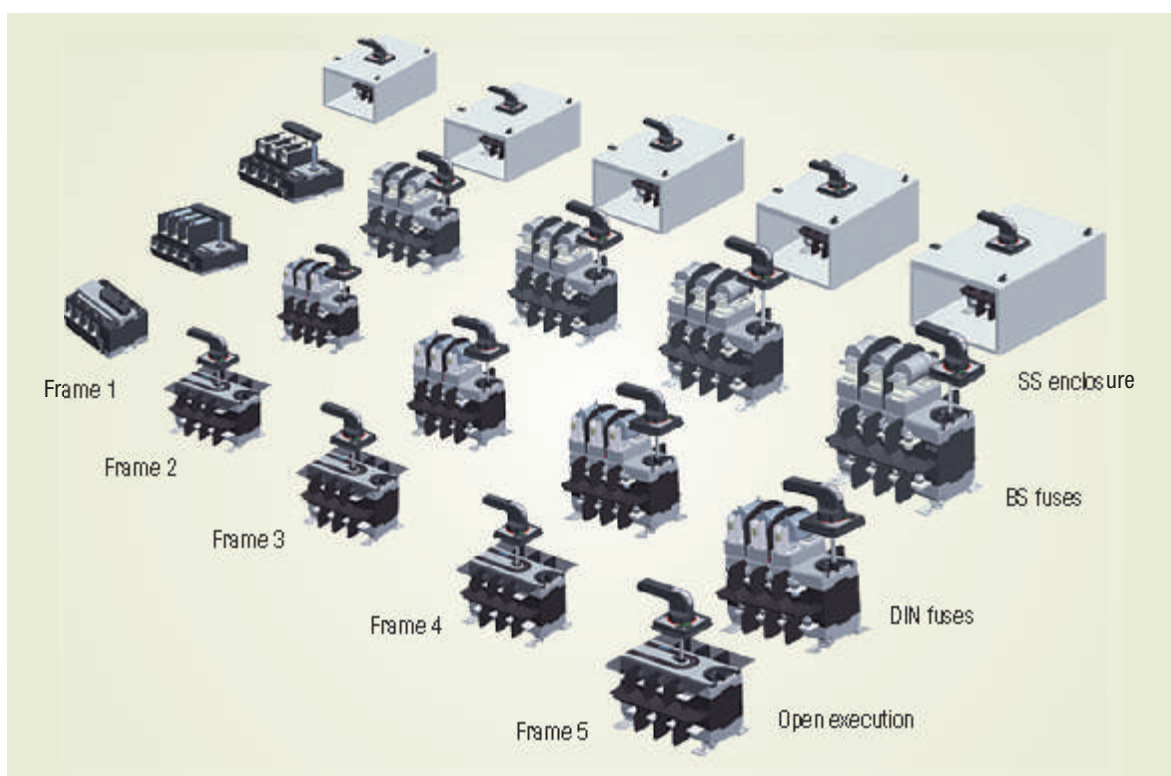


Switchgear Factory, Mumbai

# Changeover Switches

C-Line offers you a unique series of changeover Switches combining compactness with high performance, thus, making C-line a state-of-the-art product in changeover technology.

The C-line range covers ratings from 63 A to 1000 A in 5 frame size. These changeover are available in open execution SS enclosures and fused version (type DIN / BS fuses)



## Basic function of Changeover Switches

Onload Changeover S-D consists of two separate sets of terminals for connecting two incoming supplies and the output terminals need to be joined together to supply the common load. Thus, changeover ensures continuity of supply to the load by alternating between normal and alternate supply.

Manual Onload Changeover S-D has 3 stable positions as dened below

### POSITION I

Switch is in ON position with normal supply available at the outgoing terminals.

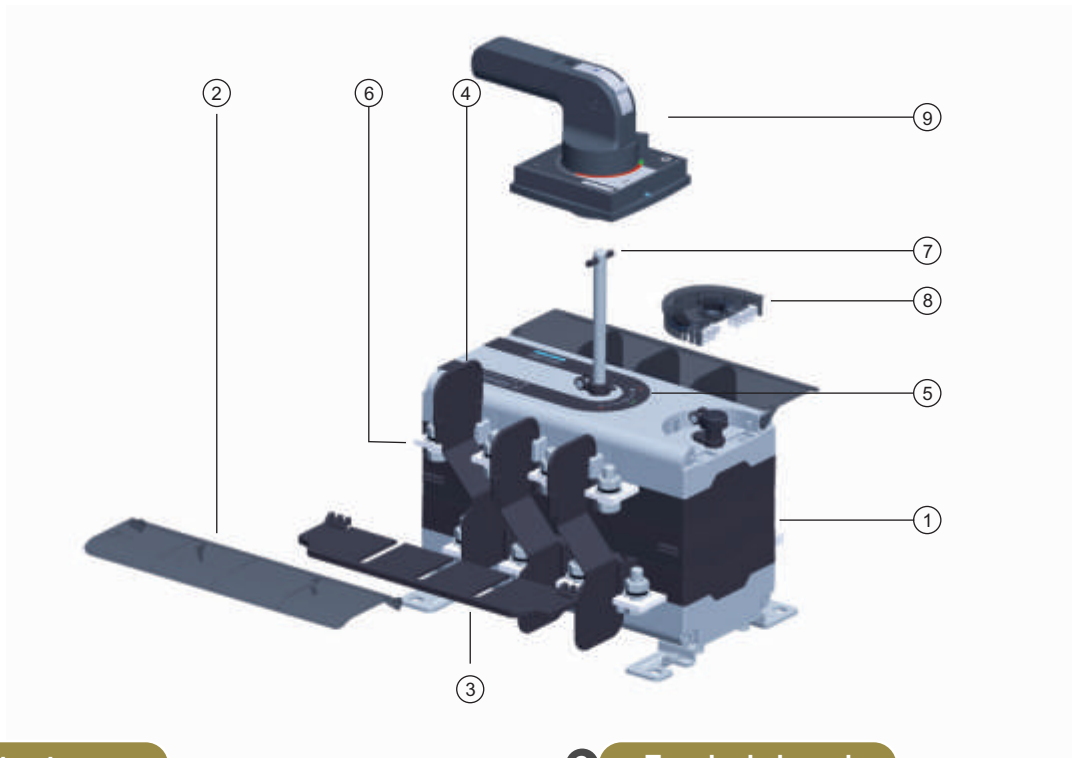
### POSITION 0

Switch is in OFF position and both (normal and alternate supplies) are isolated from the outgoing terminals

### POSITION II

Switch is in ON position with alternate supply available at the outgoing terminals.

# Product Features



## 1 Mechanism

A single, compact and modular mechanism cassette operates two Switch-Disconnectors and provides mechanical interlocking between them. The use of patented, self interlocked and dual dead center mechanism in C-line range provides higher reliability for changeover function.

## 2 Terminal shroud

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

## 3 Source separator

Source separator is used to isolate two incoming supplies and to eliminate possibility of flash over between two supplies due to accidental falling of external objects.

## 4 Inter-phase barriers

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



## 5 Positive on / off indication of S-Ds

Changeover S-D indicates true position of contacts.

## 6 Staggered terminals

The C-line Changeover S-Ds are designed to have staggered terminal arrangement for top and bottom S-Ds. It provides clear access to all terminals from the front, ensuring ease of termination. All terminal joints can be easily inspected without the need of removing termination of top S-D.



## 7 Interchangeable dual shaft position with site convertibility

Patented dual dead center mechanism enables the user to opt between central or side shaft positions for operating handle. This can be easily converted on site as required.

## 8 Auxiliary contact kit

It consists of two auxiliary contacts, each with 1 NO + 1 NC. This kit is pre-wired with terminal blocks and can be fitted at the site without increasing overall dimension.

## 9 Handle

The Changeover Switch has a unique flip-able operating handle for ratings 400 Amp and above which enables user to operate the switch with two hands. The handle also offers the following features:

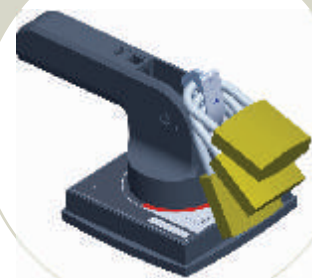
- Provision for providing 3 padlocks in OFF Position
- Defeat feature in both ON states and auto restoration of panel door
- IP54 with all varied depth type operating handle



One hand type handle  
up to 315 A rating



Two hand type for above  
400 A rating



Changeover unit pad  
lockable in OFF state by 3 pad locks

# Superior Performance

## Highest short-time ratings

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

## Highest life

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

## Higher neutral ratings

Four pole configuration is with 100% neutral rating. 150% & 200% neutral ratings are also available.

## Total flexibility of connection

Factory fitted external shorting links can be easily removed and fitted on the other side as required at site. This gives more flexibility at the time of installation.

## Maximum termination capacity

The C-line range provides generous terminal capacity in its compact size facilitating aluminium termination.

## Higher 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 flashover.

## Total safety

C-line Changeover Switch provides complete safety by providing terminal shrouds, source separator and inter-phase barriers



# Product Range

Onload Changeover S-Ds are available from 63 A to 1000 A. The range is covered through 5 frames as shown below.

Frame No.	Ratings (A)		
1*	63	100	
2	125	160	200
3	250	315	
4	400	630	
5	630	800	1000

\*to be introduced soon

## Versions

C-line Changeovers are available with and without fuses, suitable for open execution and in sheet steel (SS) enclosures.

### Changeover S-D suitable for open execution

Changeover S-D, which can be commissioned in panels, are of open execution type and provide IP30 protection from front.

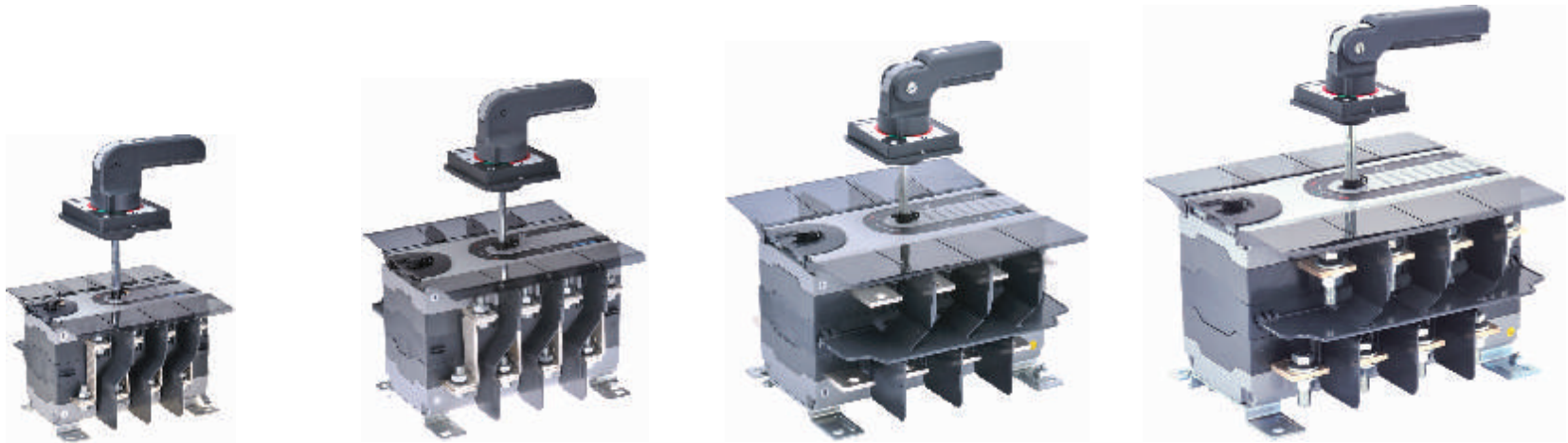
### Onload changeover S-D in SS enclosures

Onload Changeover S-Ds are available in sheet steel enclosure with adequate space for cable terminations so that additional cable entry boxes are not required. Cable gland plates are also provided with the switch. Enclosure provides IP54 protection

### Changeover S-D suitable for HRC fuses

The Changeover S-Ds can be easily converted to fused version at site by using fuse conversion kit. It provides the benefits of overload and short circuit protection through the fastest switching device-fuse, and is suitable for knife type (DIN) and bolted type (DIN) and bolted type (BS) fuse links. Use of L&T HN fuse links reduces watt loss.

# Technical Specifications



			Frame 2			Frame 3		Frame 4		Frame 5			
Rating (A)		Unit	125 A	160 A	200 A	250 A	315 A	400 A	630 A	630 A	800 A	1000 A	
Reference Standards		IEC 60947-3, EN 60947-3, IS 13947 (Part 3)											
Type designation			CO2-125	CO2-160	CO2-200	CO3-250	CO3-315	CO4-400	CO4-630	CO5-630	CO5-800	CO5-1000	
No. of Poles			4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	
Rated operational voltage (U <sub>e</sub> )		(V)	415	415	415	415	415	415	415	415	415	415	
Rated frequency		(Hz)	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	
Rated impulse withstand voltage (U <sub>imp</sub> )		(kV)	12	12	12	12	12	12	12	12	12	12	
Pollution degree			3	3	3	3	3	3	3	3	3	3	
Conventional free air thermal current, I <sub>th</sub> at 40°C		(A)	125	160	200	250	315	400	630	630	800	1000	
Conventional enclosed thermal current, I <sub>the</sub> at 40°C		(A)	125	160	200	250	315	400	630	630	800	1000	
Rated operational current, I <sub>e</sub> AC-21A / AC-22A / AC-23A		(A)	125	160	200	250	315	400	630	630	800	1000	
Rated operational power for AC-23A*		(kW)	65	85	100	132	160	225	315	315	400	450	
Rated breaking capacity for AC-23A		(A)	1000	1280	1600	2000	2520	3200	5040	5040	6400	8000	
Rated making capacity for AC-23A		(A)	1250	1600	2000	2500	3150	4000	6300	6300	8000	10000	
Short time withstand, I <sub>cw</sub>	1 sec	( kA rms )	8	8	10	16	18	22	26	35	50	50	
	0.2 sec	( kA rms )	18	18	18	28	28	35	35	70	85	85	
Short-circuit making capacity, I <sub>cm</sub>		( kA peak)	14	14	17	32	36	46	55	73.5	105	105	
Endurance (category A)	Mechanical	(O-I-O-II-O cycle)	16000	16000	16000	16000	16000	10000	10000	10000	10000	10000	
	Electrical	(O-I-O-II-O cycle)	2000	2000	2000	2000	2000	2000	2000	2000	1000	1000	
Type and size of fuse	DIN		00	00	00	1	1	2	NA	3	3	NA	
	BS		A4	B2	B2	B3	B3	B4		C2	C3		
Rated fused short-circuit current at 415 V, 50/60 Hz	DIN	(kA rms)	100	100	100	100	100	100		100	100		100
	BS	(kA rms)	80	80	80	80	80	80		80	80		80
Termination Capacity													
Maximum Al. cable with lug		(sq mm)	95	95	150	185	240	2 x 300	2 x 300	2 x 400	2 x 400	2 x 400	
Maximum link width		(mm)	30	30	30	40	40	50	50	60	60	60	
Maximum link thickness		(mm)	5	5	6	8	8	8	2 x 8	2 x 10	2 x 10	2 x 10	
Termination tightening torque		(N-m)	10	10	20	20	20	27	27	35	35	35	
Operating torque center / side operating		(N-m)	10 / 13	10 / 13	10 / 13	20 / 25	20 / 25	28 / 32	28 / 32	30 / 40	30 / 40	30 / 40	
Weight (without accessories)		(Kg)	4	4	4.5	6.5	7	14	14.5	20	22	22	

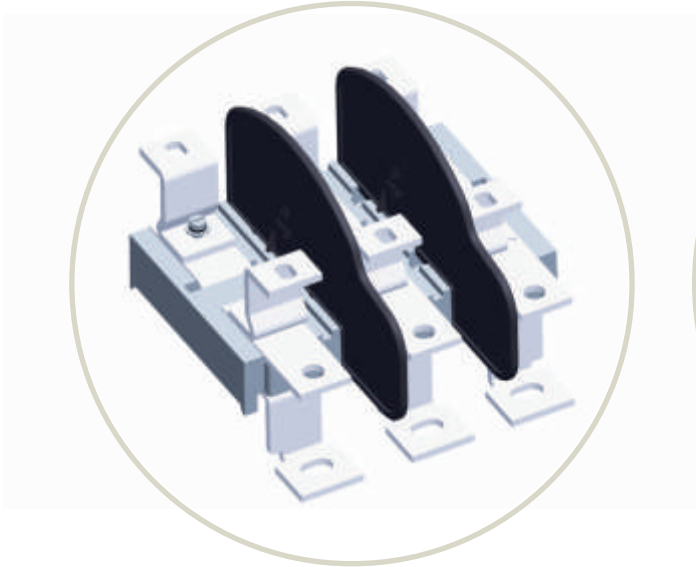
\*These values are for 4 pole squirrel cage induction motors and are provided only for guidance and may vary as per the motor manufacturer.



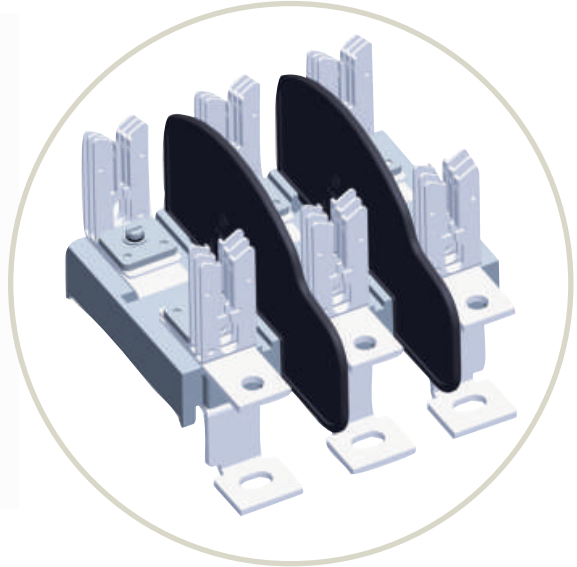
# Accessories

## Fuse conversion kit

Fuse Conversion Kit is available with knife type (DIN) and bolted type (BS) fuse links. Changeover Switch can be converted to fused version at site.



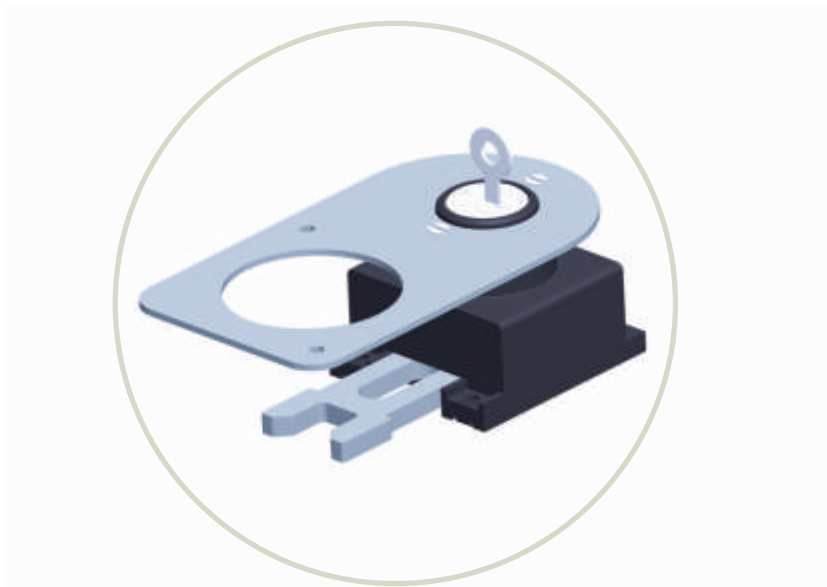
**Fuse Conversion Kit Type BS**



**Fuse Conversion Kit Type DIN**

## Castell lock

Accessory to lock the Changeover Switch in OFF state and using this can have interlocking schemes with MCCB / ACB.



# Ordering Information

## Onload changeover switches

Description	125 A	160 A	200 A	250 A	315 A	400 A	630 A	630 A	800 A	1000 A
Onload Changeover Switch-Disconnecter	CO212500000	CO216000000	CO220000000	CO325000000	CO331500000	CO440000000	CO463000000	CO563000000	CO580000000	CO510000000
Onload Changeover in SS enclosure	CO212500S00	CO216000S00	CO220000S00	CO325000S00	CO331500S00	CO440000S00	CO463000S00	CO563000S00	CO580000S00	CO510000S00

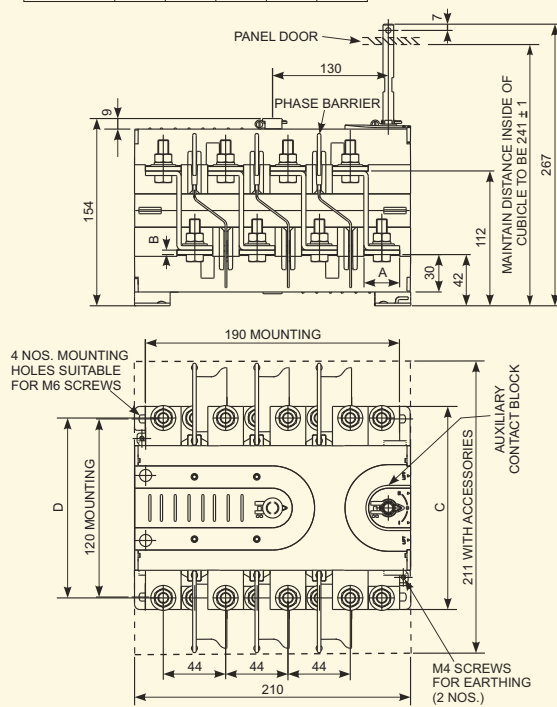
## Spares & accessories

Description	125 A	160 A	200 A	250 A	315 A	400 A	630 A	630A	800A	1000A
Fuse Conversion Kit for DIN type Fuses	CX212500OD0	CX216000OD0	CX220000OD0	CX325000OD0	CX331500OD0	CX440000OD0	NA	CX563000OD0	CX580000OD0	NA
Fuse Conversion Kit for BS type Fuses	CX212500OB0	CX216000OB0	CX220000OO0	CX325000OB0	CX331500OB0	CX440000OB0		CX563000OB0	CX580000OB0	
Operating Handle	CX300010OOO					CX400010OOO		CX500010OOO		
Auxiliary Contact Kit	CX200020OOO		CX300020OOO			CX400020OOO		CX500020OOO		
Castell Lock	CX500040OOO									
External Shorting link	CX216050OOO		CX220500OOO	CX300050OOO		CX400050OOO		CX563050OOO	CX580050OOO	CX510050OOO
Terminal Shroud	CX200060OOO			CX300060OOO		CX400060OOO		CX500060OOO		
Inter-phase Barriers	CX200070OOO			CX300070OOO		CX400070OOO		CX500070OOO		
Phase Barrier for Fused version	CX200080OOO			CX300080OOO		CX400080OOO	NA	CX500080OOO		NA
Source Separator	CX200090OOO			CX300090OOO		CX400090OOO		CX500090OOO		

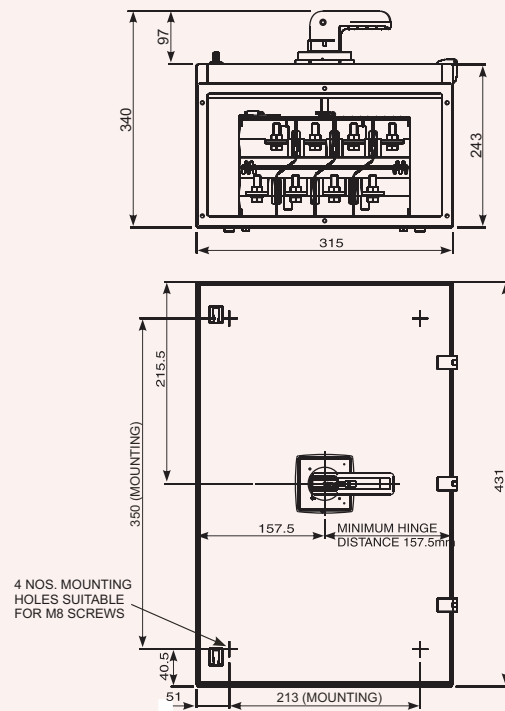
# Overall Dimensions CO2 - 125 / 160 / 200

## Open Execution

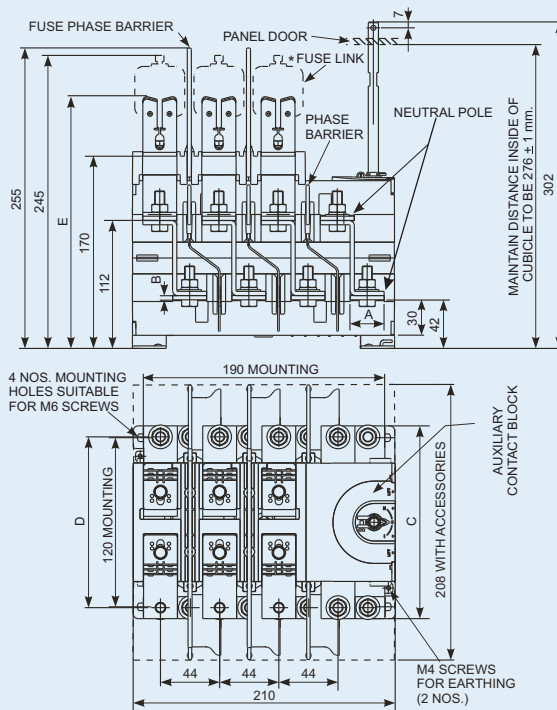
	A	B	C	D	E
CO2-125	22	3	138	121	220
CO2-160	22	3	138	121	203
CO2-200	26	5	150	121	204



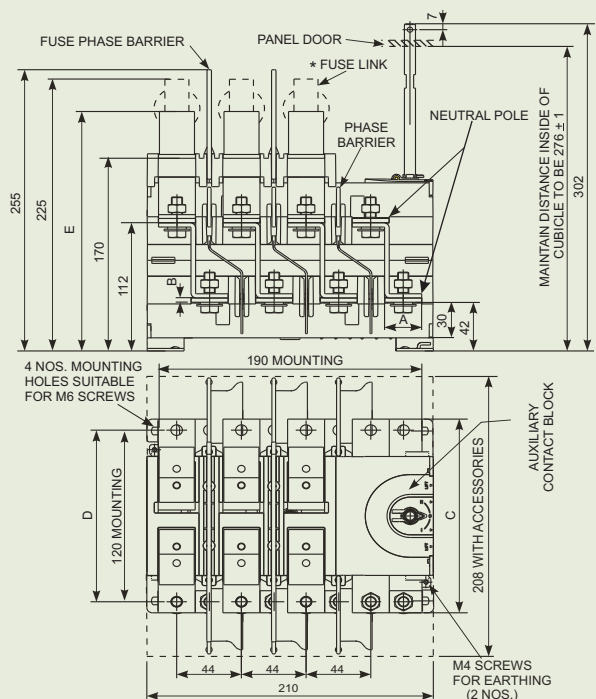
## In SS Enclosure



## For DIN Type Fuses



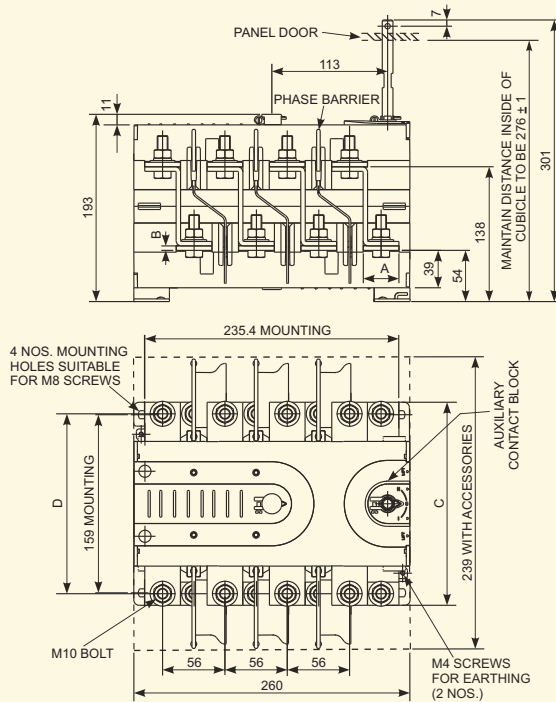
## For BS Type Fuses



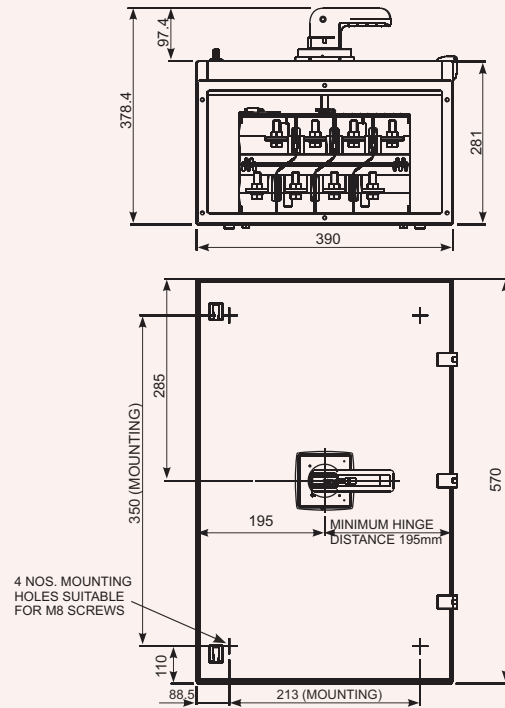
# Overall Dimensions CO3 - 250 / 315

## Open Execution

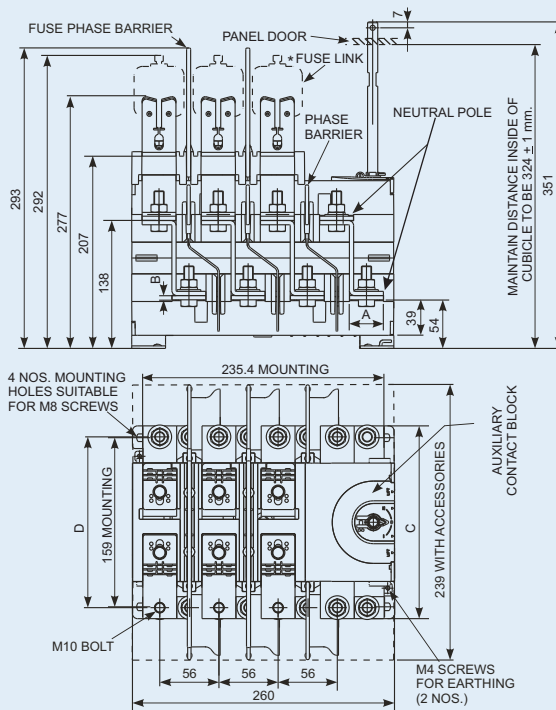
	A	B	C	D
CO3-250	29	4.5	182	156
CO3-315	35	5	198	164



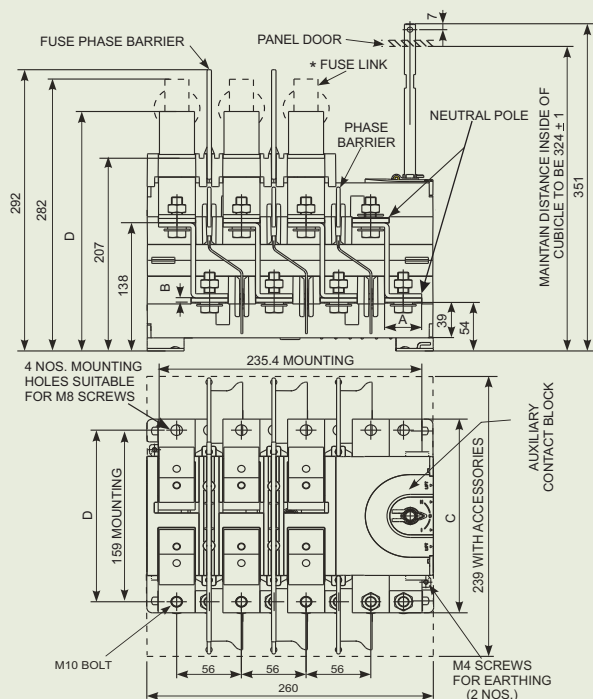
## In SS Enclosure



## For DIN Type Fuses



## For BS Type Fuses

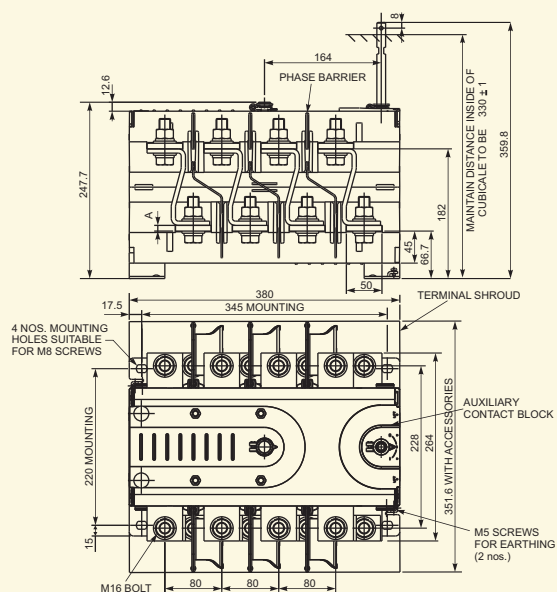




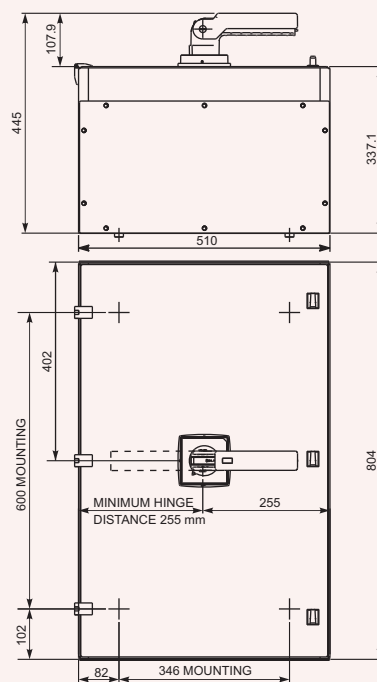
# Overall Dimensions CO5 - 630 / 800 / 1000

## Open Execution

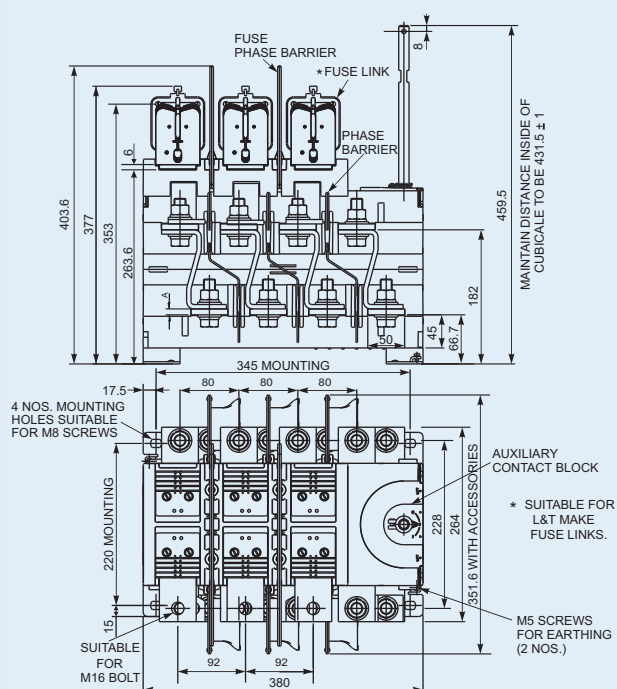
	A
CO5-630	6
CO5-800	8
CO5-1000	8



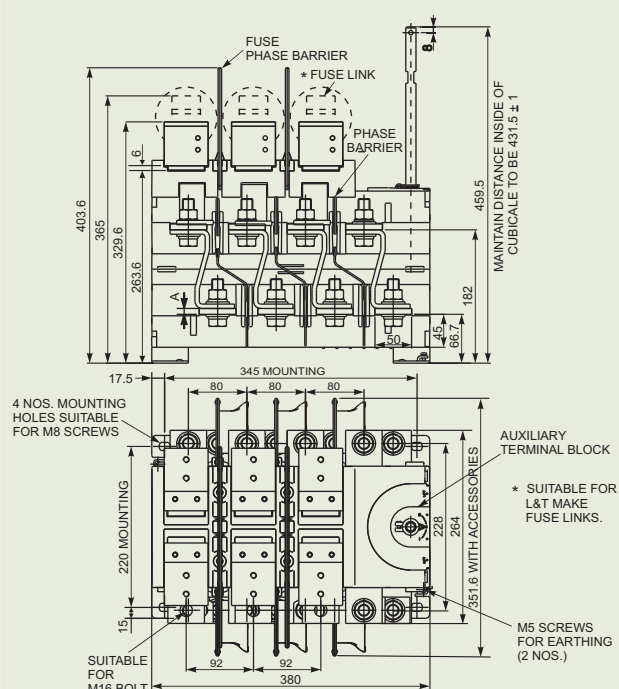
## In SS Enclosure



## For DIN Type Fuses\*



## For BS Type Fuses\*





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