LARSEN & TOUBRO

A Spectrum of Benefits ...

Onload Changeover Switch

L&T SWITCHGEAR
SAFE & SURE

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 seven 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, power quality solutions, energy meters, and protective relays. These products conform to Indian and International Standards.

INDEX

Overview ..... 2 - 5

Product Data ..... 6 - 23

Wiring Diagrams ..... 23 - 26

Characteristic Curves ..... 27 - 30

Dimensions ..... 31 - 47

Standards & Approvals

CO range of Changeover Switches comply with the following standards

- **IEC 60947-1, EN 60947-1, IS/IEC 60947-1**
  Low-voltage switchgear and controlgear, Part 1: General Rules

- **IEC 60947-3, EN 60947-3, IS/IEC 60947-3**
  Low-voltage switchgear and controlgear, Part 3: Switches, disconnectors, switch-disconnectors and fuse combination units

Third party certificates (ERDA / CPRI) available for CO range of changeover switches

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.

L&T's Switchgear Testing Lab is NABL accredited subject to continued satisfactory compliance to above standard & additional requirements of NABL.

The CO range of Changeover switches are tested in L&T'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.

L&T's CO range of Changeover switches 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.

RoHS Compliance

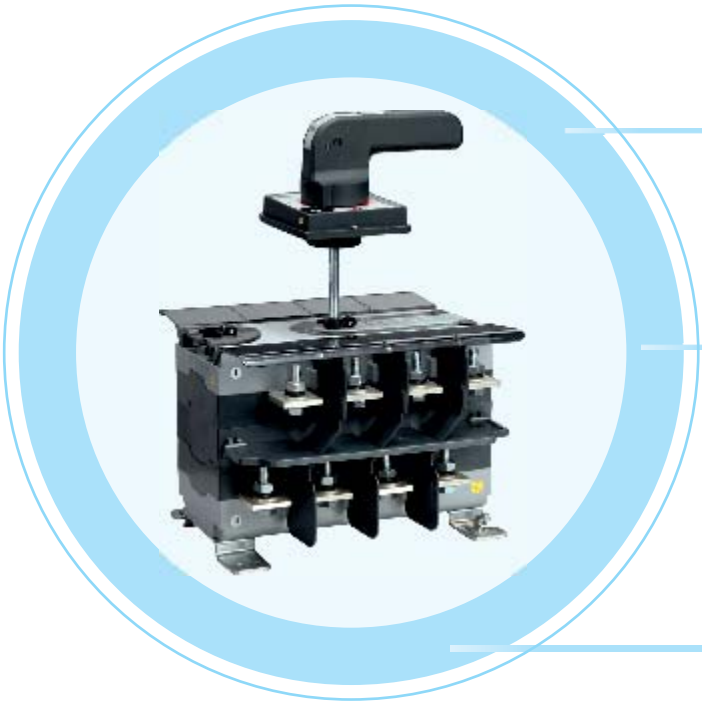
As a green initiatives, Larsen & Toubro understands the requirements of the RoHS directive. The directive restricts the use of hazardous substances in electrical and electronic equipment and bans electrical equipment containing more than permitted levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBS) and polybrominated diphenyl ether (PBDE) flame retardants.

Overview

- Basic Function ---------- 03
- Superior Performance ---------- 04
- Product Range ---------- 05

Changeover Switches

L&T offers you a unique series of Changeover Switches combining compactness with high performance & Customer convenience, thus, making it a state-of-the-art product in changeover technology.
The CO range covers ratings from 63 A to 2000 A in 6 frame sizes. These changeover switches are available in open execution, Sheet steel enclosure, fused version (suitable for DIN type fuse - link) and motorised version.



SS Enclosure inclusive of cable gland box

Field-convertible fuse changeover switch

Motorised changeover switch

Basic function of Changeover Switches

Onload Changeover S-D has 3 stable positions as defined below

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

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

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

Onload Changeover S-D consists of two separate sets of terminals for incoming supplies and a set of output terminals to connect the common load. Thus, changeover switch ensures continuity of supply to the load by alternating between normal and alternate supply.

Superior Performance

Higher short-time withstand Capacity

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.

Higher life

Changeover switch offers high electrical and mechanical life in compact frame sizes. The electrical and mechanical life are two times the requirement of the standard.

Total flexibility of connection

Factory fitted external shorting links can be easily removed and fitted on the other side as required at site (125 A to 2000 A). This gives more flexibility at the time of installation.

Maximum termination capacity

Changeover Switch 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 flash over.

Total safety

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 2000 A. The range is covered through 6 frames as shown below.

Frame No.	Ratings (A)		
I	63	100	
II	125	160	200
III	250	315	
IV	400	630	
V	630	800	1000
VI	1250	1600	2000*

*Available on request.

Versions

Changeover Switches are available in open execution, Sheet steel enclosure, fused version and motorised version.

Changeover S-D suitable for open execution

Changeover S-D, which can be commissioned in panels are of open execution type and provide IP20 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 for open execution 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 cylindrical & knife type (DIN) fuse links. Use of L&T HF & HN fuse links reduces watt loss.

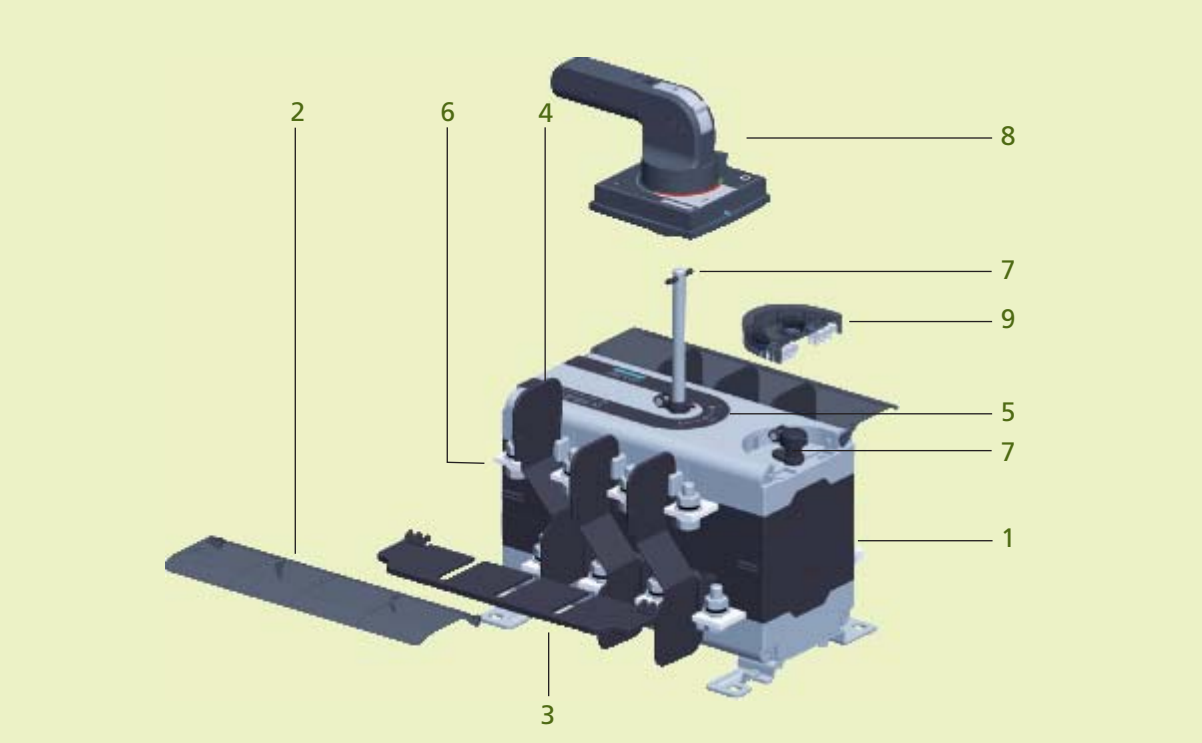
Motorised Changeover S-D

Onload changeover S-Ds are available in motorised version with control voltage 240 V ac. The manual changeover S-Ds can also be easily converted to motorised version at site by using electrically operated mechanism (EOM) kit without changing panel dimension (125 A to 2000 A).

Product Data

- Manual Changeover Product Feature ---------- 07
- Technical Specifications of Manual Changeover ---------- 11
- Motorised Changeover Product Features ------ 13
- Automatic Source Transfer Solution ---------- 15
- ASTS with AST Controller ---------- 16
- ASTS with AuXC 1000L Controller ---------- 18
- Technical Specifications of Motorised Kit ---------- 19
- Universal Mounting for Manual Changeover Range ---------- 21
- Ordering Information ---------- 22

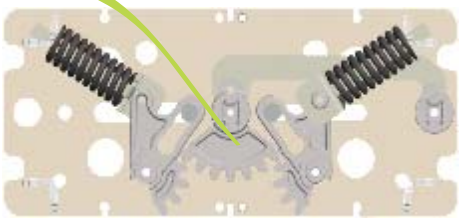
Manual Changeover Product Feature



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 CO range provides higher reliability for changeover function.

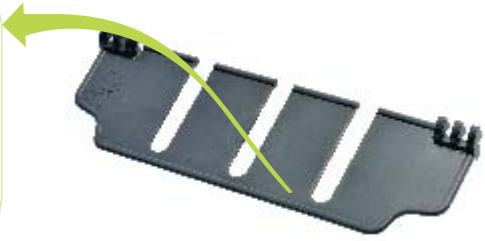


2. Terminal shroud

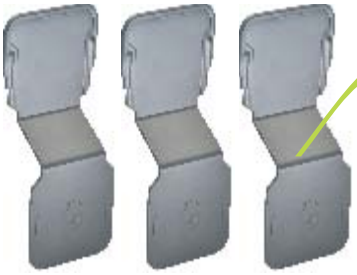
These shrouds provide complete touch proof design and prevent accidental touching of live terminals. They are click fit type. Due to hinge type terminal shrouds, it can be turned by 90 degree, hence terminals can be inspected without removing these shrouds.

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.



Manual Changeover Product Feature

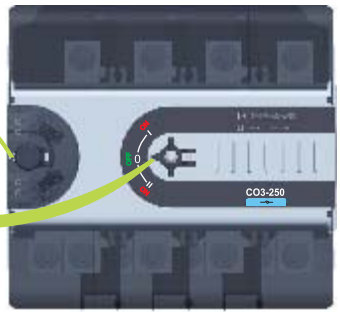


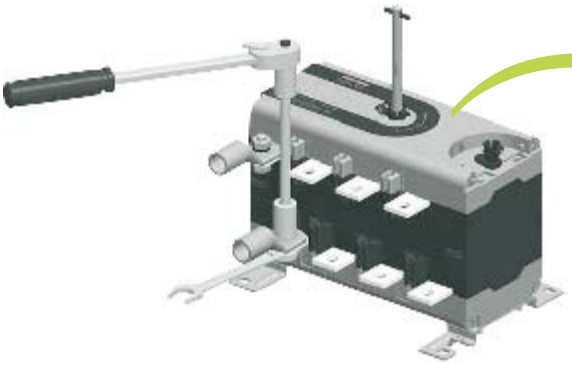
4. Inter-phase barriers

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

5. Positive ON / OFF indication of S-Ds

The Changeover S-D indicates true position of contacts.





6. Staggered terminals

The 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 option between central or side shaft positions for operating handle. This can be easily converted on site as required (125 A to 1000 A).

Manual Changeover Product Feature

8. Handle

The Changeover Switch has a unique flip-able operating handle for ratings 250 Amp and above which enables user to operate the switch with two hands. The handle also offers the following.

features:

- Provision for Padlocking in OFF position with three Padlocks of Ø5 to Ø7
- Defeat feature in both ON states and auto restoration of panel door
- IP54 with extended type operating handle

Two hand type for above 250 A rating

One hand type handle upto 200 A rating

Changeover unit pad lockable in OFF state by 3 pad locks

9. Auxiliary contact kit

It consists two sets of changeover contacts one for each S-D. This kit is pre-wired with terminal blocks and can be fitted at the site without increasing overall dimension.

10. Castell lock

Accessory to lock the Changeover Switch in OFF state and using this can have interlocking schemes between multiple Switches.

Sheet steel enclosure

The Changeover Switches are available in sheet steel enclosure with adequate space for cable terminations so that additional cable entry boxes are not required.

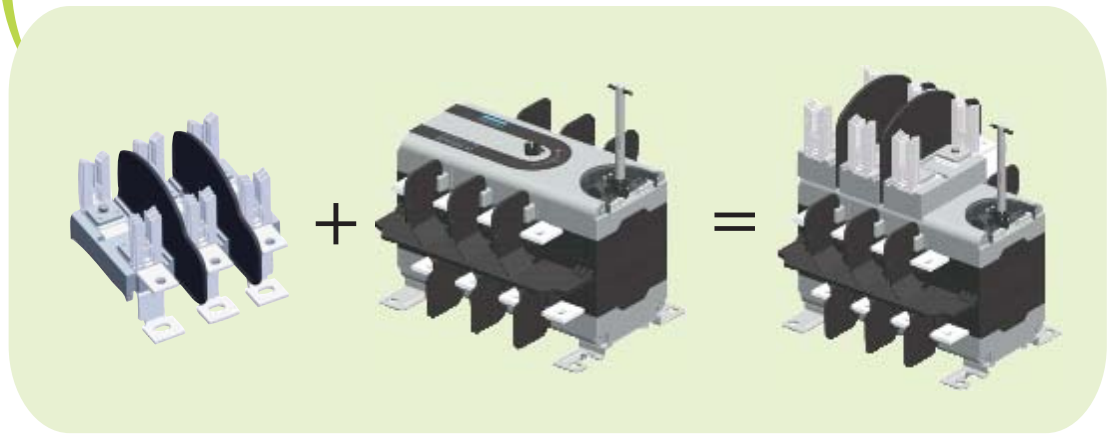
Manual Changeover Product Feature

Changeover Switch with Direct Handle

Compact direct handle 63 A and 100 A changeover switch suitable for double door DB. It occupies only 10 Mod space (45 x 140 cut-out).

Fuse Changeover Switch

The Changeover S-Ds for open execution can be easily converted to fused version at site by using fuse conversion kit with no load line biasing. It provides the benefits of overload and short circuit protection through the fastest switching device-fuse, and is suitable for cylindrical & knife type (DIN) fuse links.



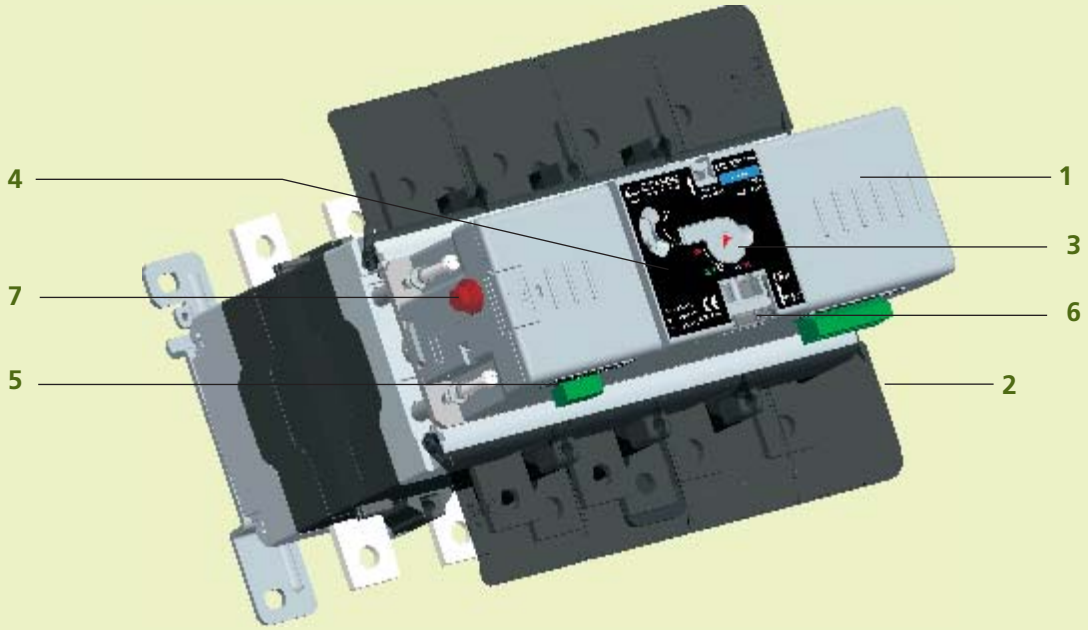
Technical Specifications of Manual Changeover

Rating (A)		Unit	Frame 1		Frame 2	
			63 A	100 A	125 A	160 A
Reference Standards						
Type designation			CO1-63	CO1-100	CO2-125	CO2-160
No. of Poles			4 Pole	4 Pole	4 Pole	4 Pole
Rated operational voltage (U_e)		(V)	415	415	415	415
Rated frequency		(Hz)	50 / 60	50 / 60	50 / 60	50 / 60
Rated impulse withstand voltage (U_{imp})		(kV)	8	8	12	12
Pollution degree			3	3	3	3
Conventional free air thermal current, I_{th} at 40°C		(A)	63	100	125	160
Conventional enclosed thermal current, I_{the} at 40°C		(A)	63	100	125	160
Rated operational current, I_e AC-21A# / AC-22A# / AC-23A		(A)	63	100	125	160
Rated operational power for AC-23A*		(kW)	37	50	65	85
Rated breaking capacity for AC-23A		(A)	504	800	1000	1280
Rated making capacity for AC-23A		(A)	630	1000	1250	1600
Short time withstand, I_{cw}	**1 sec**	**(kA rms)**	**4**	**5**	**8**	**8**
	0.2 sec	**(kA rms)**	**7**	**10**	**18**	**18**
Short-circuit making capacity, I_{cm}		(kA peak)	5.9	7.7	14	14
Endurance (category A)	**Mechanical**	**(O-I-O-II-O cycle)**	**20000**	**20000**	**16000**	**16000**
	Electrical	**(O-I-O-II-O cycle)**	**3000**	**3000**	**2000**	**2000**
Type and size of fuse	DIN/Cylin▲		14 x 51▲	NA	000	00
Rated fused short-circuit current at 415 V, 50/60 Hz	DIN/Cylin▲	(kA rms)	80▲		100	100
Termination Capacity						
Maximum Al. cable with lug		(sq mm)	25	50	95	95
Maximum link width		(mm)	16	22	30	30
Maximum link thickness		(mm)	2	4.7	5	5
Termination tightening torque		(N-m)	4.5	4.5	10	10
Operating torque center / side operating		(N-m)	4.5	4.5	10 / 13	10 / 13
Weight (without accessories)		(Kg)	2	2.5	4	4

* These values are for 4 pole squirrel cage induction motors and are provided only for guidance and may vary as per the motor manufacturer
# Rated operational current, I_e AC-21A / AC-22A
▲ Type cylindrical fuse
$ Claimed Impulse withstand voltage with use of source separator and inter phase barriers

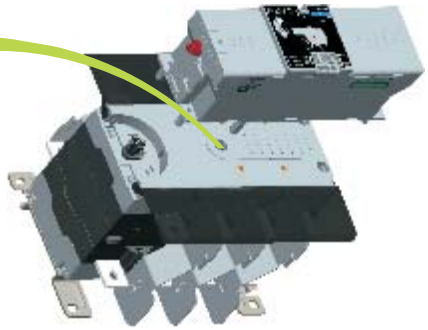
	Frame 3		Frame 4		Frame 5			Frame 6		
200 A[$]	200 A	250 A	315 A	400 A	630 A	630 A	800 A	1000 A	1250 A	1600 A	2000 A
IS / IEC 60947-3, EN 60947-3											
CO2-200	CO2-200	CO3-250	CO3-315	CO4-400	CO4-630	CO5-630	CO5-800	CO5-1000	CO6-1250	CO6-1600	CO6-2000
4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole
415	415	415	415	415	415	415	415	415	415	415	415
50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
12[$]	12	12	12	12	12	12	12	12	12	12	12
3	3	3	3	3	3	3	3	3	3	3	3
200	200	250	315	400	630	630	800	1000	1250	1600	2000
200	200	250	315	400	630	630	800	1000	1250	1600	2000
200	200	250	315	400	630	630	800	1000	1250	1600[#]/1250	2000[#]/1250
85	100	132	160	225	315	315	400	450	710	710	710
1600	1600	2000	2520	3200	5040	5040	6400	8000	10000	10000	10000
2000	2000	2500	3150	4000	6300	6300	8000	10000	12500	12500	12500
8	**10**	**16**	**18**	**22**	**26**	**35**	**50**	**50**	**50**	**50**	**50**
18	**18**	**28**	**28**	**35**	**35**	**70**	**85**	**85**	**85**	**85**	**85**
14	17	32	36	46	55	73.5	105	105	105	105	105
16000	**16000**	**16000**	**16000**	**10000**	**10000**	**10000**	**10000**	**10000**	**10000**	**10000**	**10000**
2000	**2000**	**2000**	**2000**	**2000**	**2000**	**2000**	**1000**	**1000**	**1000**	**1000**	**500**
NA	00	1	1	2	NA	3	3	NA	NA	NA	NA
	100	100	100	100		100	100				
150	150	185	240	2 x 300	2 x 300	2 x 400	2 x 400	2 x 400	2 x 12 x 63	4 x 8 x 50	3 x 10 x 100
30	30	40	40	50	50	60	60	60	80	80	100
5	6	8	8	8	2 x 8	2 x 10	2 x 10	2 x 10	3 x 12	3 x 12	3 x 12
10	20	20	20	27	27	35	35	35	55	55	55
10 / 13	10 / 13	20 / 25	20 / 25	28 / 32	28 / 32	30 / 40	30 / 40	30 / 40	55	55	55
4	4.5	6.5	7	14	14.5	20	22	22	52	57	75

Motorised Changeover Product Features



1. Site mountable

Motorised kit (EOM) can be mounted over the manual changeover switch directly at site without any change in the panel area.



2. Clear termination access

Motorised kit (EOM) fits well within the body of the manual changeover switch, enabling clear access to the terminals even after mounting the motorised kit.

3. Manual override

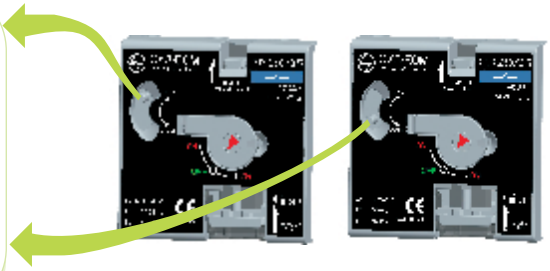
Manual operation of motorised changeover switch is also feasible through the manual override feature.

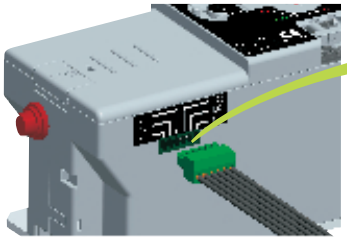
As a safety feature, the control supply of motorised kit (EOM) is automatically cut off during the insertion of handle.

Motorised Changeover Product Features

4. Manual and Auto mode selection

The selector switch enables/disables the control supply to motorised changeover switch. Electrical operation is possible only in auto mode while manual mode allows the user to operate the motorised changeover switch manually using the handle safely by cut-off of control supply to motorised changeover switch.



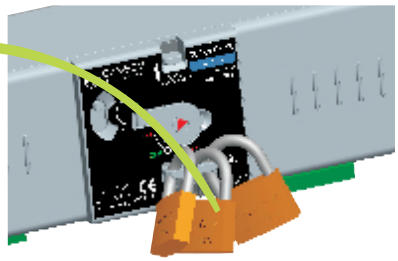


5. Auxiliary contacts

It consists two sets of changeover contacts one for each S-D. It is prewired and prefitted in motorised changeover switch.

6. Pad locking

Provision for padlocking in OFF position with three padlocks of Ø5 to Ø7. Padlocking possible in both auto and manual mode.

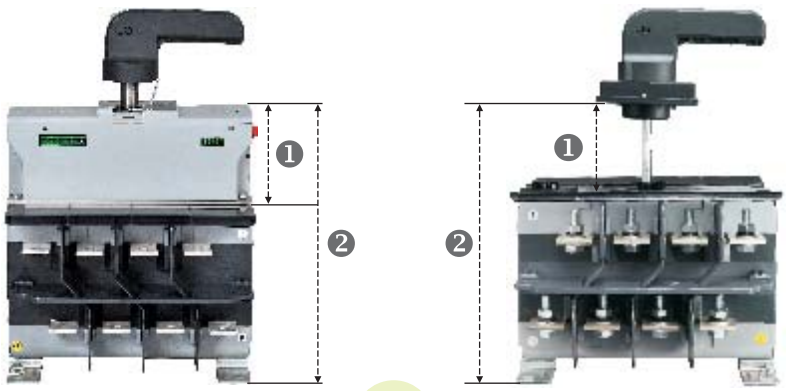


7. Fuse protection

Inbuilt glass fuse of 5 x 20 size protects the motorised kit (EOM) during abnormalities. Also, spare fuse holder has been provided for storage of fuse.

Compact design

No change in H x W x D of motorised changeover switch and manual changeover switch.



Automatic Source Transfer System

Illuminated Push button
assembly with Wire harness

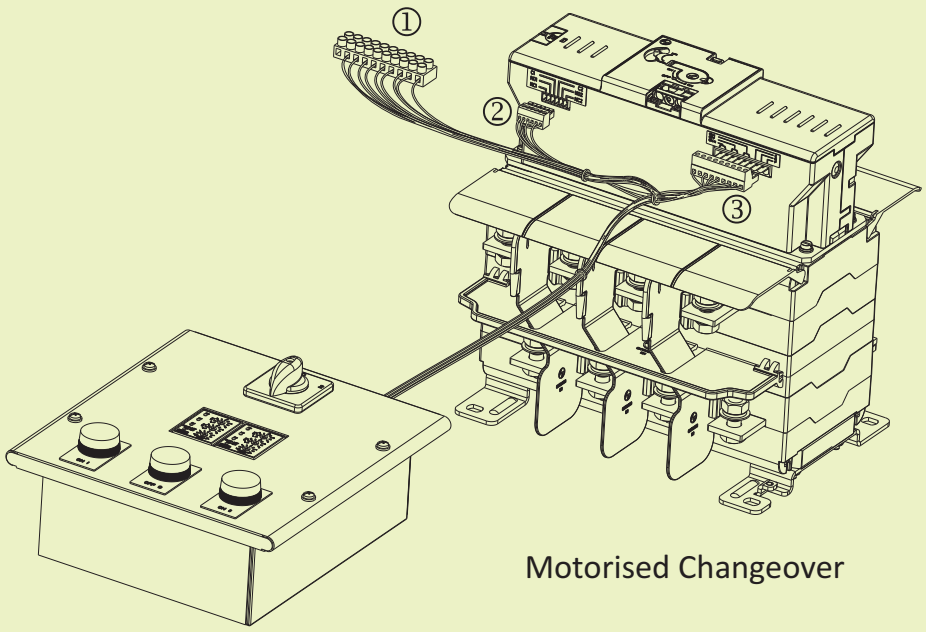
UV/OV based AST Controller with Wire Harness

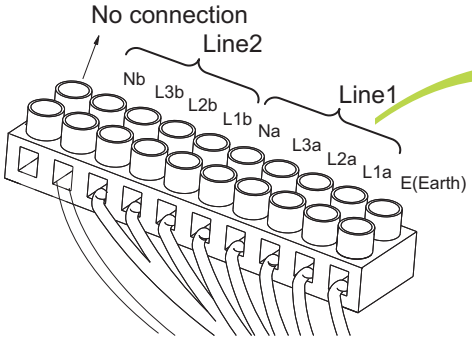
- Option of controlling Motorised Changeover through Illuminated push button or UV/OV relay
- Sensing of three-phase voltage controls
- Protects against under voltage and over voltage
- Option of programing of minimum voltage, maximum voltage and time delay

AuxC-1000L Controller with Wire Harness

- Option of sensing : Three-phase, two-phase or single-phase voltage controls
- Option of Measuring : Phase-phase voltage and/or phase-neutral voltage control
- Protects against under voltage, over voltage, phase loss, asymmetry, under frequency, over frequency, with independent enable and delay voltage thresholds with programmable hysteresis
- RS-232 serial interface for set-up, remote control and supervision
- 6 programmable digital inputs & relay outputs (5NO + 1 C/O)

ASTS with AST Controller



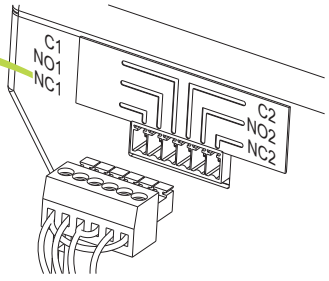


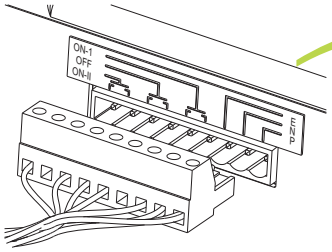
1. Control supply terminal block

Source I & II sensing inputs are to be connected, same is continuously monitored by AST controller

2. Auxiliary contact Set connection

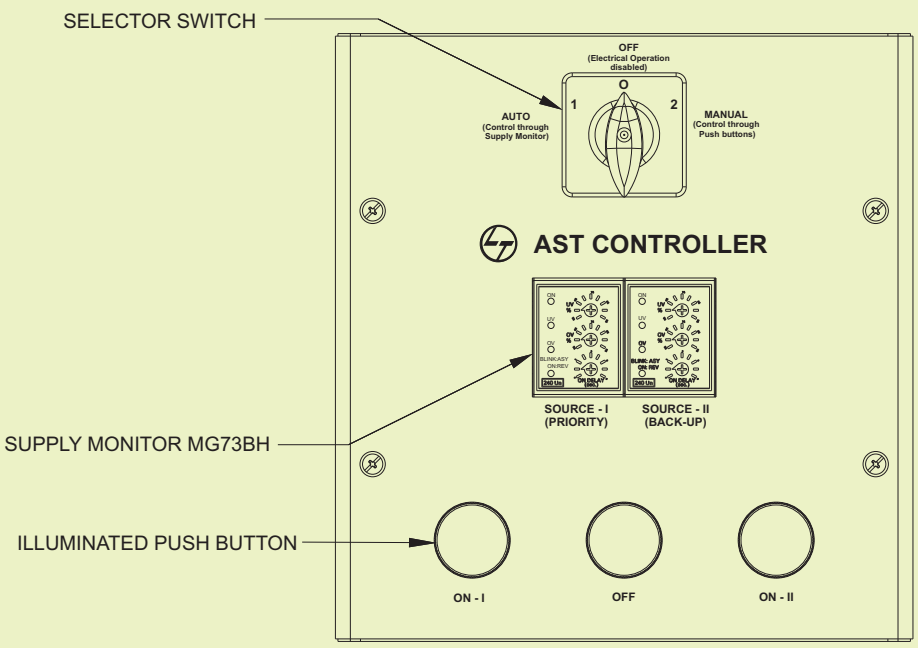
Two sets of pre-wired changeover auxiliary contacts one for each S-D. Same is used for power contact position feedback & status indication





3. Main terminal connection

Control inputs to motorised changeover through AST controller



User Interface

Auto Mode

In auto mode Source-I (priority source) is continuously monitored, in case of Source-I failure AST controller checks for Source-II (back-up source). If it is available then AST controller gives command to motorised changeover to shift on Source-II.

On restoration of Source-I (priority source) motorised changeover moves back to it.

Illumination in the push buttons will be functional indication of the the motorised changeover switch position.

Option of setting over voltage : Recommended setting 110% of the supply voltage

Option of setting under voltage : Recommended setting 85% of the supply voltage

Option of setting time delay : 0 -15 seconds

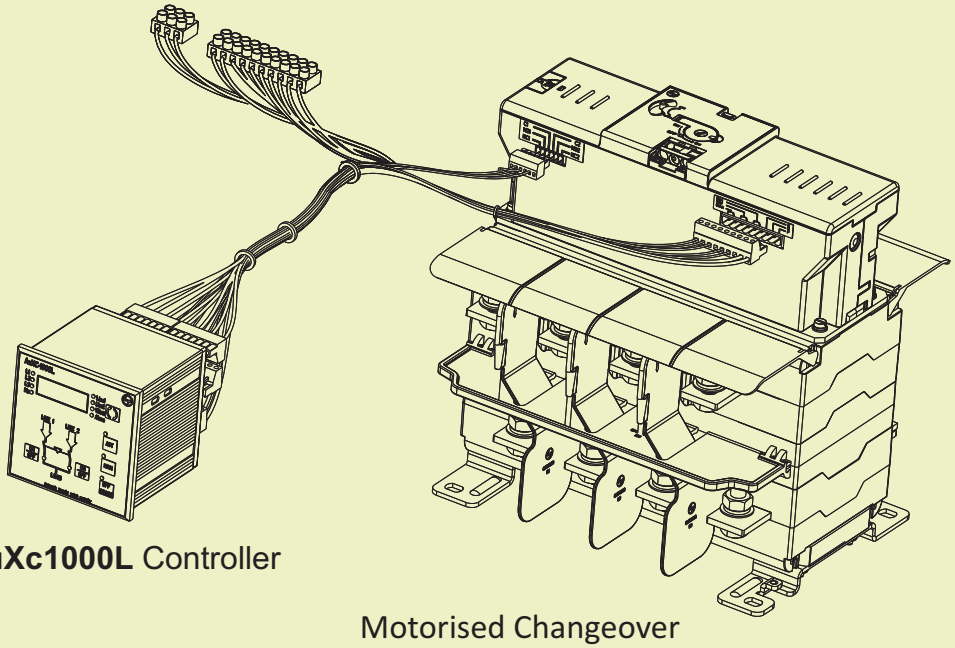
Manual Mode (Electrical)

Control of motorised changeover switch using illuminated push buttons.

Manual Mode (Operating handle)

Manual control using operating handle, as a safety feature the control supply of motorised changeover is automatically cut off during the insertion of handle.

ASTS with AuXC 1000L Controller



AuXc1000L Controller

Motorised Changeover

Auto Mode

In auto mode Source-I (priority source) is continuously monitored, in case Source-I exceeds the set limits, AuXC 1000L controller checks for Source-II (back-up source). If it is available then controller gives command to motorised changeover to shift on Source-II after the set delay time, it also controls the startup and shutdown of the generator set, if any.

When the Source-I (priority source) returns within the set limits, the unit switches over the load again to the priority source and controls the generator set cooling cycle.

Other Benefits & Features in Auto Mode

Protection against UV, OV, phase loss, asymmetry, under frequency and over frequency.

6 programmable digital inputs & relay outputs (5NO + 1C/O)

Measuring and sensing of system variables

DG set start/stop control

Priority source swap

Manual Mode (Electrical)

In manual mode, motorised changeover switch is controlled by pressing the relevant key (F and E keys) for a minimum time of 300ms.
The command is accepted only when 1sec has elapsed from the end of the previous switching.

Manual Mode (Operating handle)

Manual control using operating handle, as a safety feature the control supply of motorised changeover is automatically cut off during the insertion of handle.

Technical Specifications of Motorised Kit

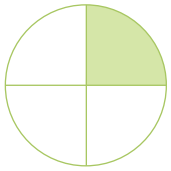
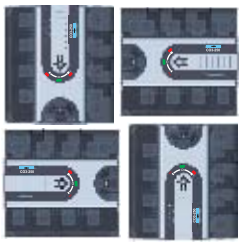
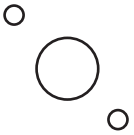
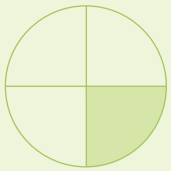
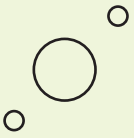
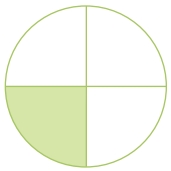
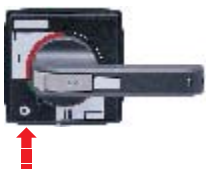
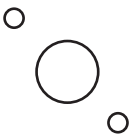
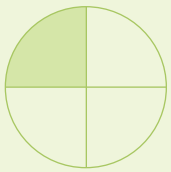
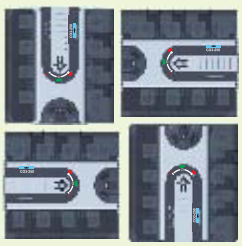
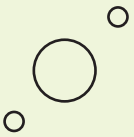
			Frame 2
Rating (A)		**Unit**	**125 to 200**
Reference Standards			
Rated frequency		(Hz)	50
Rated control voltage		(V)	240 V ac
Control voltage range		(%)	85% - 110%
Pollution degree			3
Operating temperature		(°C)	-5 to + 55
Ingress protection (from front)			IP30
Max. current at 240 V ac		(A)	2
Operating time (min)	O-I / I-O	(sec)	0.5
	I-II / II-I	(sec)	1.4
Black out time		(sec)	1.4
Control glass fuse current rating	(240 V ac)	(A)	1.25
Dimensions of motorised kit	Width	(mm)	210
	Height	(mm)	84
	Depth	(mm)	94

Frame 3	Frame 4	Frame 5	Frame 6
250 & 315	400 & 630	630 to 1000	1250 to 2000
IS/IEC 60947-3, IEC 60947- 3, EN60947-3			
50	50	50	50
240 V ac	240 V ac	240 V ac	240 V ac
85% - 110%	85% - 110%	85% - 110%	85% - 110%
3	3	3	3
-5 to + 55	-5 to + 55	-5 to + 55	-5 to + 55
IP30	IP30	IP30	IP30
2	2	2	2
0.6	0.7	0.7	0.7
1.4	1.4	1.4	1.4
1.4	1.4	1.4	1.4
1	1.25	1.25	1.25
260	310	380	274
84	84	84	108
94	94	94	118

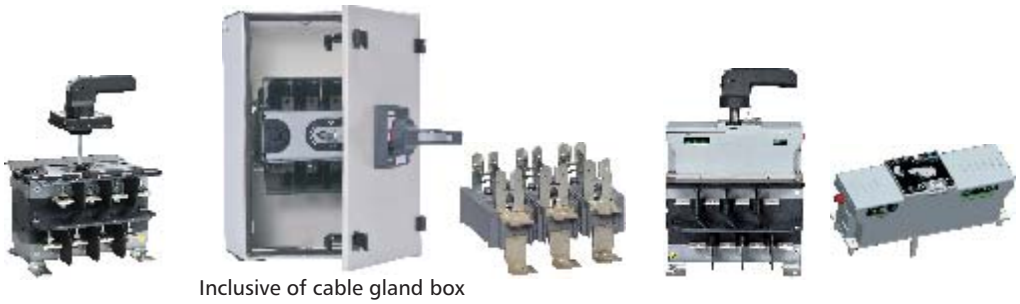
Universal Mounting for Manual Changeover Range

The manual changeover range also offers a distinctive feature to mount CO SD in different quadrants. This feature aids mounting flexibility.

Operating Quadrant chart (Seen from front of the door)

Sr. No.	Operating Quadrant	Handle (OFF) Position	Switch Orientation	Shaft Position	Door Cut-out
1					
2					
3					
4					

Ordering Information



Inclusive of cable gland box

Frame	Rating (A)	Manual open execution version	Manual SS enclosure version	Fuse mountable kit	Motorised Open Execution Version	Motorised Kit (EOM)
Control Voltage		–	–	–	240 V ac	240 V ac
I	63 A	CO10630OOOO	CO10630OSOO	CX10630OOCO	–	–
		CO10630OOOD*				
	100 A	CO11000OOOO	CO11000OSOO	–	–	
		CO11000OOOD*				
II	125 A	CO21250OOOO	CO21250OSOO	CX21250OODO	CK90161BOOO	–
	160 A	CO21600OOOO	CO21600OSOO	CX21600OODO	CK90162BOOO	
	200 A	CO22000OOOA	CO22000OSOO	–	CK90163BOOO	
	200 A	CO22000OOOO	–	CX22000OODO	–	
III	250 A	CO32500OOOO	CO32500OSOO	CX32500OODO	CK90164BOOO	–
	315 A	CO33150OOOO	CO33150OSOO	CX33150OODO	CK90165BOOO	
IV	400 A	CO44000OOOO	CO44000OSOO	CX44000OODO	CK90166BOOO	–
	630 A	CO46300OOOO	CO46300OSOO	–	CK90167BOOO	
V	630 A	CO56300OOOO	–	CX56300OODO	CK90168BOOO	–
	800 A	CO58000OOOO	CO58000OSOO	CX58000OODO	CK90169BOOO	
	1000 A	CO51000OOOO	CO51000OSOO	–	CK90170BOOO	
VI	1250 A	CO61250OOOO ♦	–	–	CK90081BOOO	–
	1600 A	CO61600OOOO ♦	–	–	CK90082BOOO	
	2000 A	CO62000OOOO ♦	–	–	CK90083BOOO	

* Direct Handle Version ♦ Center operation Version

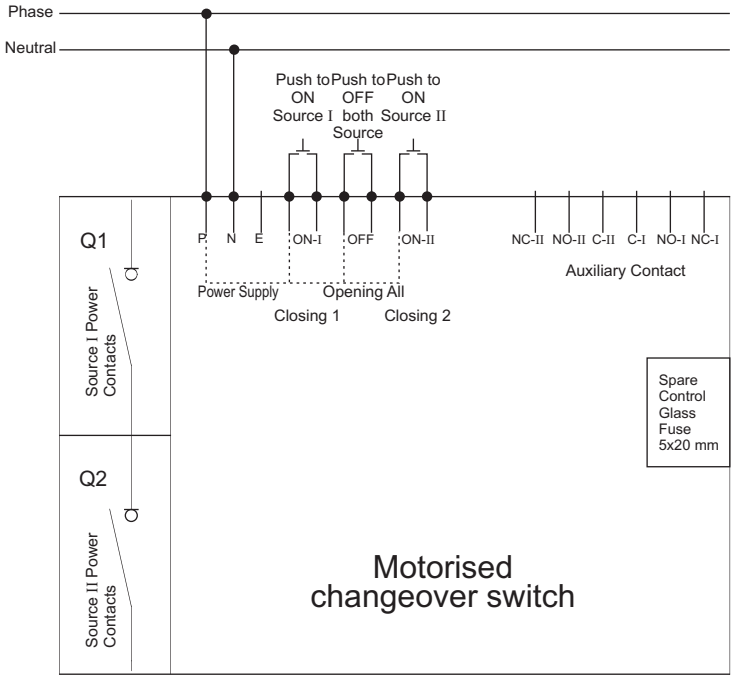
Frame	Rating (A)	Auxiliary contact for manual version (2 sets of changeover contact)	Operating handle suitable for		Operating push button assembly with Wire harness	UV/OV based AST Controller with Wire harness	AuXC 1000L controller with Wire harness
			Manual version	Motorised version	240 V ac	240 V ac	
I	63 A, 100 A	CX10002OOOO	CX10001OOOO	–	–	–	–
II	125 A, 160 A, 200 A	CX20002OOOO	CX30001OOOO	CK90374OOOO	CK90195OOOO	CK90192OOOO	Wire harness CK90099OOOO AuXC 1000L controller ST80024OOOO
III	250 A, 315 A	CX30002OOOO					
IV	400 A, 630 A	CX40002OOOO	CX40001OOOO#	CK90378OOOO#			
V	800 A, 100 0A	CX50002OOOO	CX50001OOOO#				
VI	1250 A, 1600 A, 2000 A	CX60002OOOO	CX60001OOOO#	CK90645OOOO#			

Flip-able Operating Handle

Wiring Diagrams

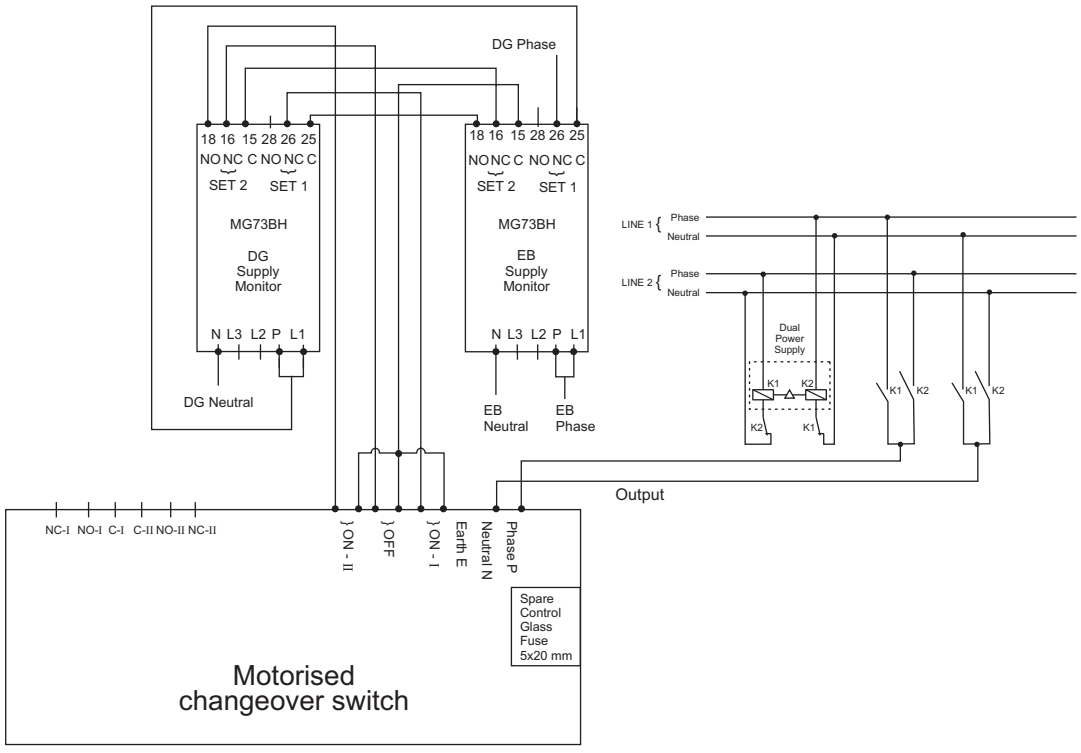
- Motorised Changeover Switch 24
- Motorised Changeover Switch Control through Supply Monitor - MG73BH 24
- Process for parameter setup of AuxC-1000L Controller 25
- Motorised Changeover Switch Control through AuXC-1000L 26
- Motorised Changeover Switch Control through AuXC-1000 26

Motorised Changeover Switch

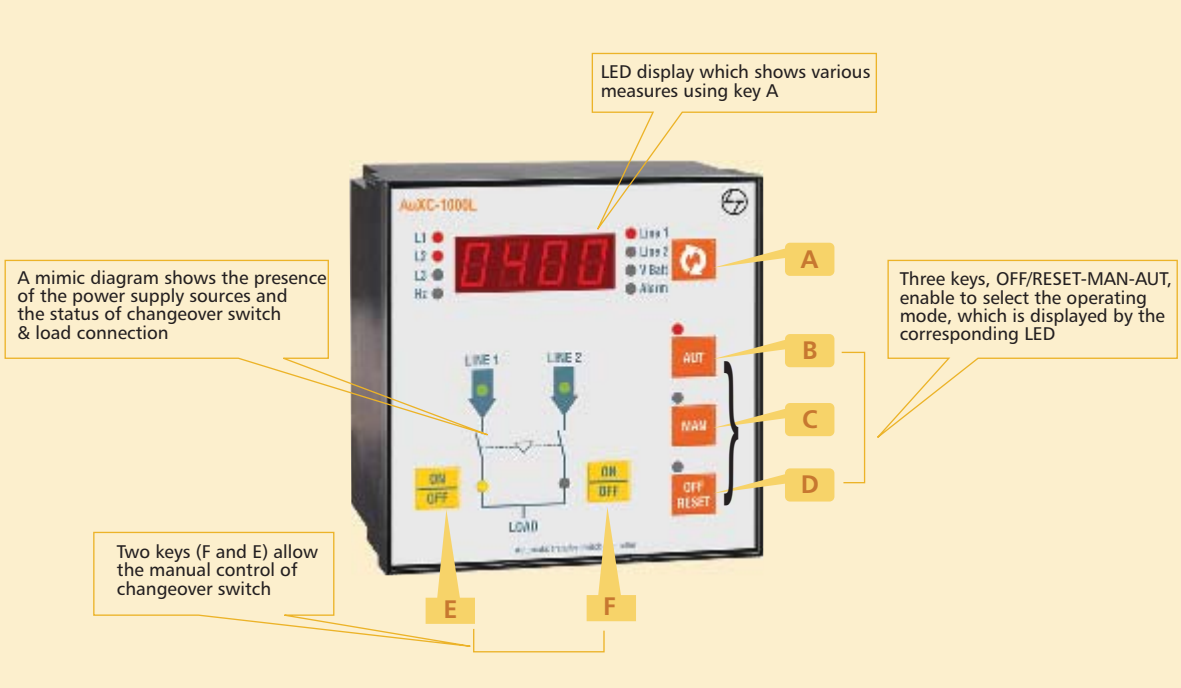


⚠ Do not push source I and source II push button together

Control of Motorised Changeover Switch through Supply Monitor - MG73BH



AuxC-1000L Controller



Process for Parameters Setup

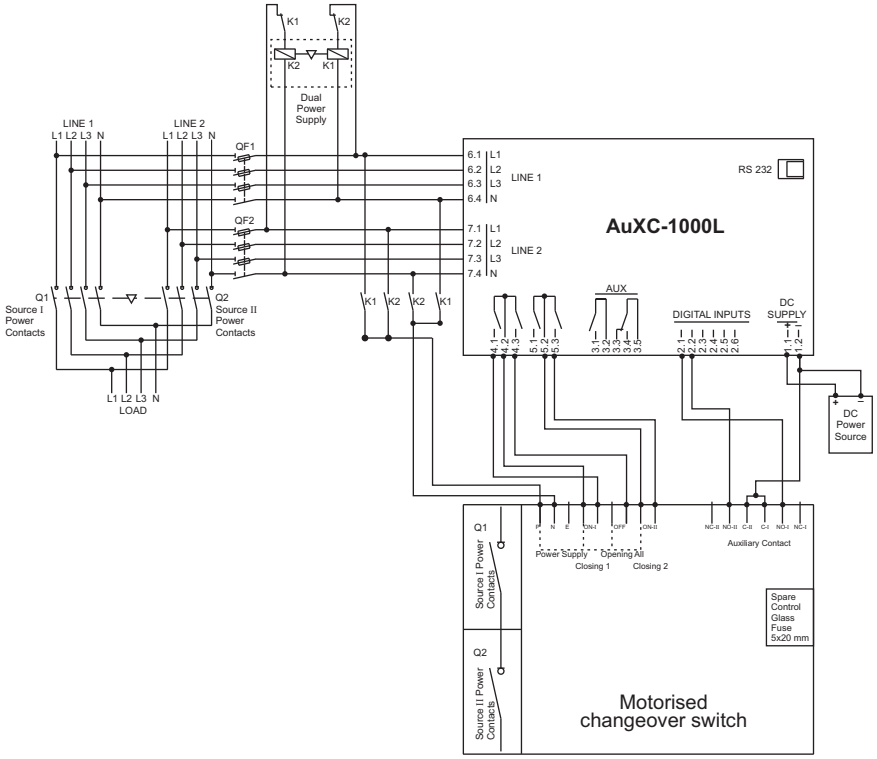
- To access parameter setup, starting with the unit in OFF-RESET mode, press the A and D keys together for five consecutive seconds. MENU SETUP text will appear on the display, wait a few seconds or press key D to access the menu
- The display will show the code of the first parameter P1.01, i.e. menu P1, parameter 01
- Press keys A and B to scroll the parameters of the same menu
- Press keys E and F to browse the different menus
- Press keys C to switch between the code and the value of the parameter
- By moving to another parameter or quitting, the menu the setting will be stored automatically
- Press key D to quit parameters setup
- Press keys E and F simultaneously to go back to the default setting of the parameter
- If no keys are pressed for more than 2 minutes, the unit exits setup automatically without storing the changes

Key parameter to be set as per connection diagram

Connection Terminal	Parameter code	Default Setting	Compatible Setting for Motorised Changeover	Description
2.1	P5.1.1	Fb.1	Fb.1	Line 1 Changeover switch closed (Feedback 1). Auxiliary contact informing the Auxc1000L of the open/closed status of line 1 changeover switch.
2.2	P5.2.1	Fb.2	Fb.2	Line 2 Changeover switch closed (Feedback 2). Auxiliary contact informing the Auxc1000L of the open/closed status of line 2 changeover switch.
4.1	P6.1.1	OP.1	CL.1	Line 1 Changeover switch close control (Close 1). AuXC 1000L internal contact which closes to command the closing of line 1 changeover switch. It is a Pulse which will be released when the operation is completed.
4.3	P6.2.1	CL.1	OP.A	Open control for both lines (Open All). Used to set Motorised Changeover Switch to neutral position, with both lines open.
5.3	P6.4.1	CL.2	CL.2	Line 2 Changeover switch close control (Close 2). AuXC 1000L internal contact which closes to command the closing of line 2 changeover switch. It is a Pulse which will be released when the operation is completed.

Note: Please refer AuXC-1000L product manual for further programing details.

Control of Motorised Changeover Switch through AuXC-1000L



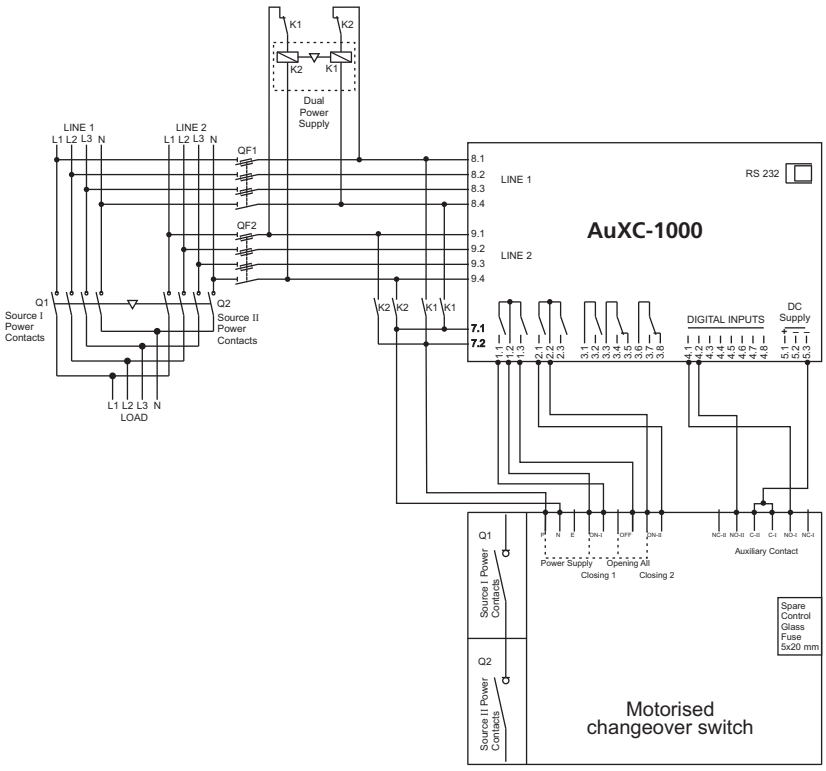
Parameter setting for the wiring diagram in picture.

Terminal	Parameter code	Setting
4.1	P6.1.1	CL.1
4.3	P6.2.1	OP.A
5.3	P6.4.1	CL.2
2.1	P5.1.1	Fb.1
2.2	P5.2.1	Fb.2

	Changeover switch (Q1, Q2)
	Contactors
	Mechanical Interlocking
	HRC Fuse

Note: Please refer AuXC-1000L product manual for programing details.

Control of Motorised Changeover Switch through AuXC-1000



Parameter setting for the wiring diagram in picture.

Terminal	Parameter code	Setting
1.1	P6.01	CL.1
1.3	P6.02	OP.A
2.1	P6.03	CL.2
4.1	P5.01	Fb.1
4.2	P5.02	Fb.2

	Changeover switch (Q1, Q2)
	Contactors
	Mechanical Interlocking
	HRC Fuse

Note: Please refer AuXC-1000 product manual for programing details.

Characteristic Curves

- HRC Fuse-link Details 28
- Time-Current Characteristics of Type HF Fuse-links 29
- Cut-off Current Characteristics of Type HF Fuse-links 29
- Time-Current Characteristics of Type HN Fuse-links 30
- Cut-off Current Characteristics of Type HN Fuse-links 30

HRC Fuse-link Details

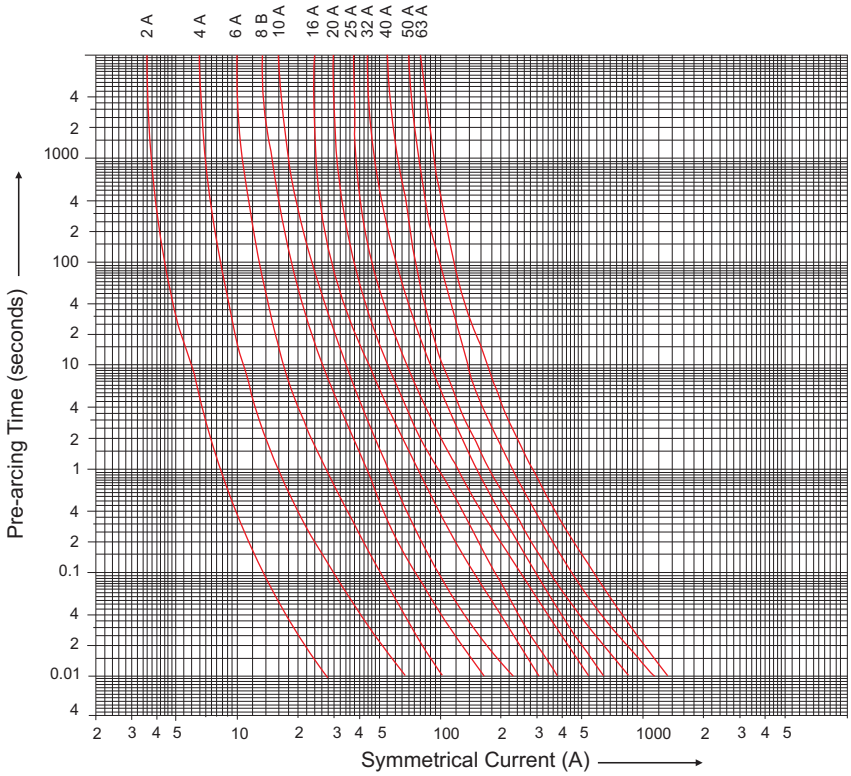
Features

- Conform to IEC 60269-2, IS 13703 part 2
- Range: 2 A to 800 A, 415 V, AC 50 Hz
- Type: HF Cylindrical (2 A to 63 A) & HN DIN (63 A to 800 A)
- High breaking capacity: 80 kA for type HF and 100 kA for type HN

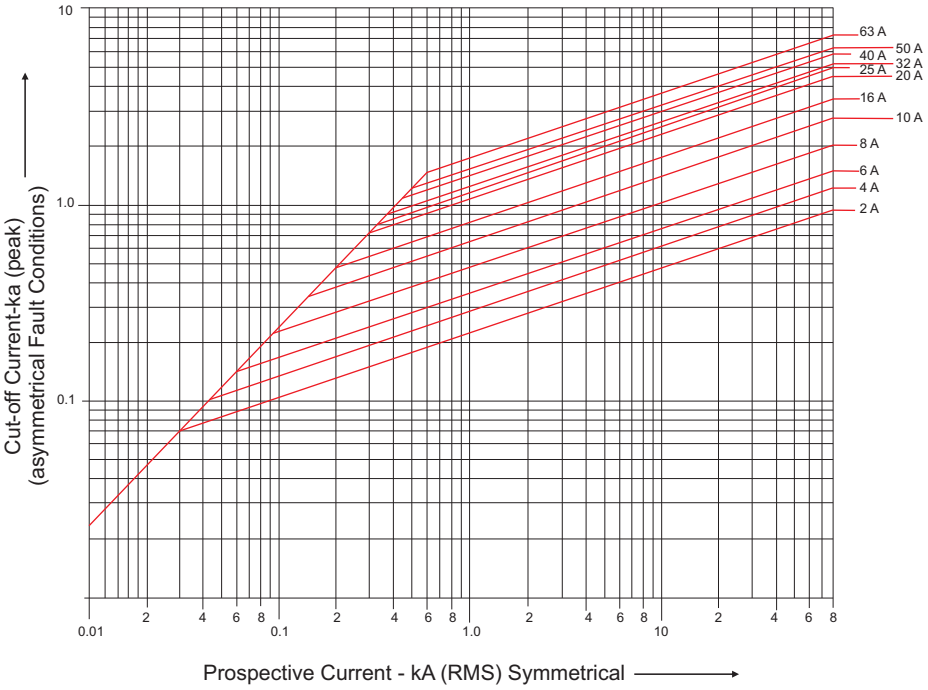
Frame	Rating (A)	Fuse mountable kit	Suitable fuse-link type	Fuse-link Size
I	63	CO Frame 1 63 A	HF	14 x 51 Cylindrical
II	125	CO Frame 2 125 A	HN	Size 000
	160	CO Frame 2 160 A		Size 00
	200	CO Frame 2 200 A		Size 0
III	250	CO Frame 3 250 A		Size 1
	315	CO Frame 3 315 A		Size 1
IV	400	CO Frame 4 400 A		Size 2
V	630	CO Frame 5 630 A		Size 3
	800	CO Frame 5 800 A		Size 3

HRC Fuse-link Type HF

Time-Current Characteristics

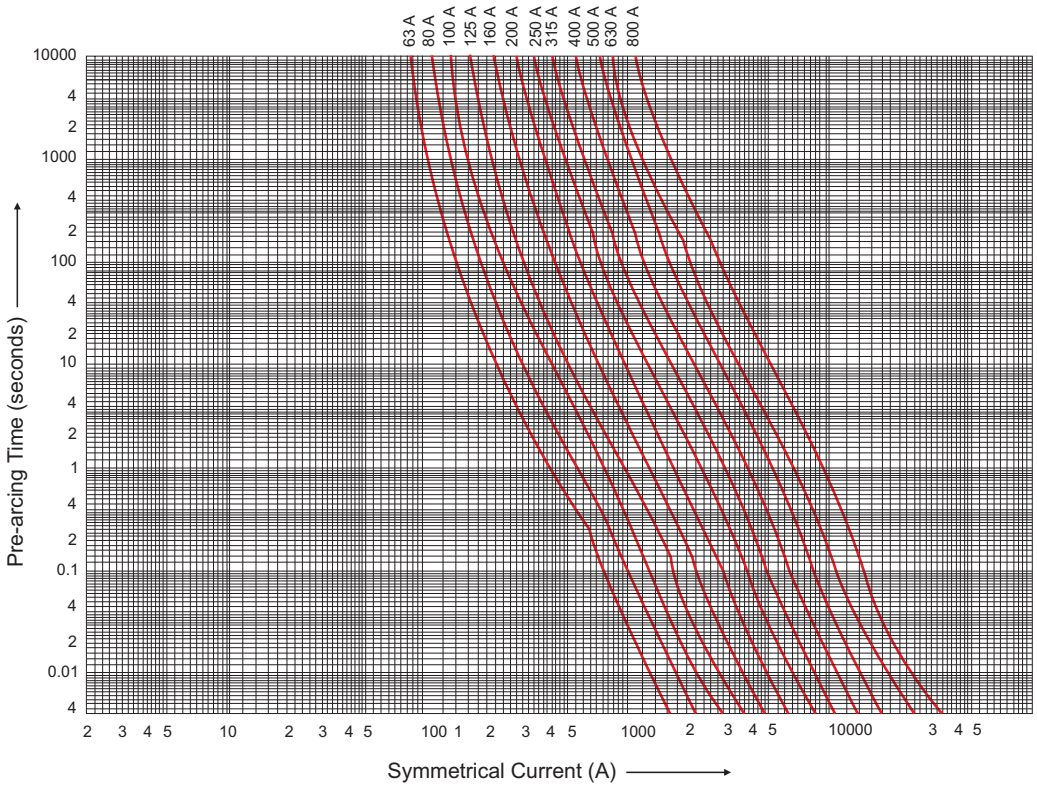


Cut-off Current Characteristics

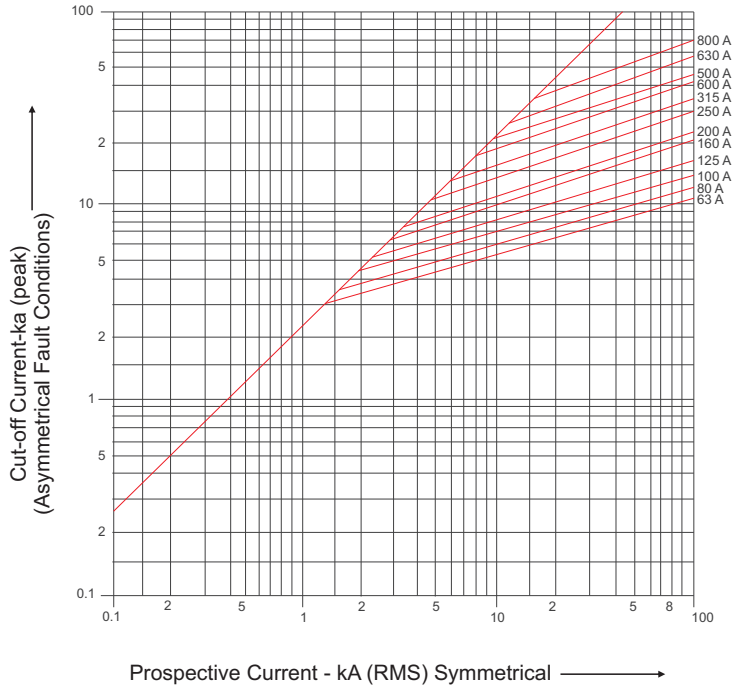


HRC Fuse-link Type HN

Time-Current Characteristics



Cut-off Current Characteristics



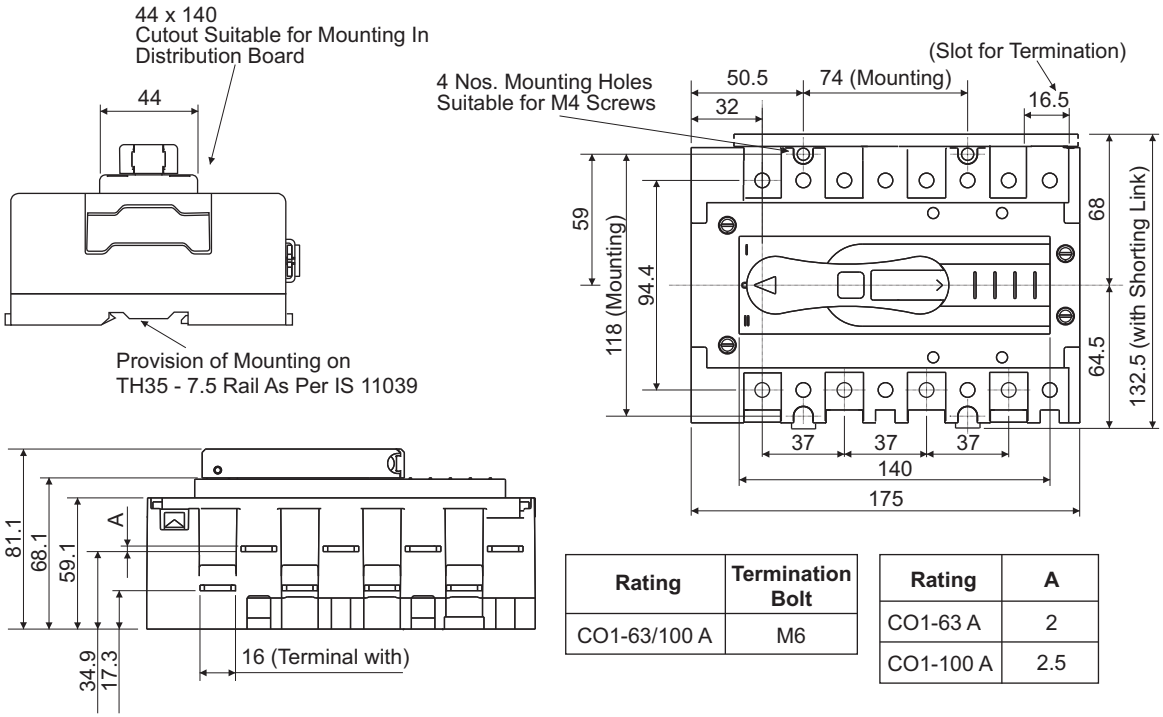
Dimensions

- Dimensions of Open Execution Manual Changeover Switch 32
- Dimensions of Manual Changeover Switch in Sheet Steel Enclosure 38
- Dimensions of Manual Fuse Changeover Switch 41
- Dimensions of Motorised Changeover Switch 44
- Dimensions of Auto Source Transfer Switch Controller : AuXC-1000 & AuXC-1000L 46

Dimensions

CO1-63/100

Open Execution with Direct Handle Manual Changeover Switch

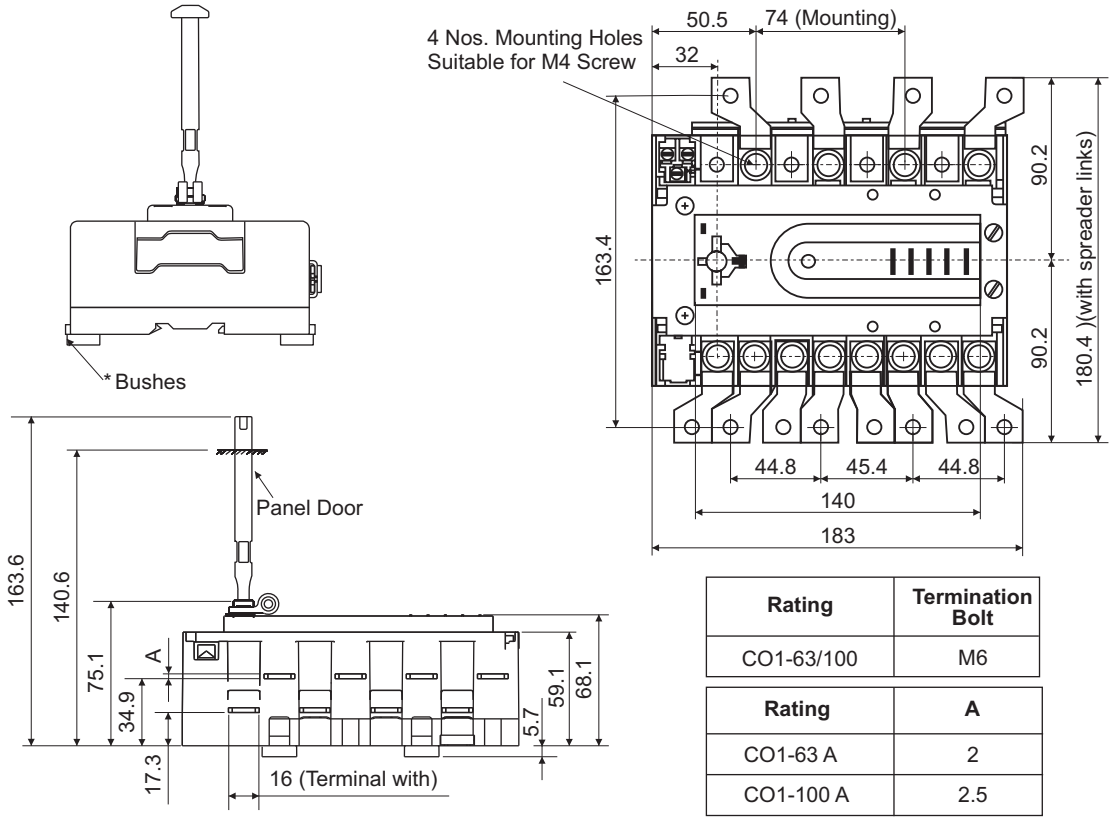


Rating	Termination Bolt
CO1-63/100 A	M6

Rating	A
CO1-63 A	2
CO1-100 A	2.5

CO1-63/100

Open Execution with Extended Handle Manual Changeover Switch



Rating	Termination Bolt
CO1-63/100	M6

Rating	A
CO1-63 A	2
CO1-100 A	2.5

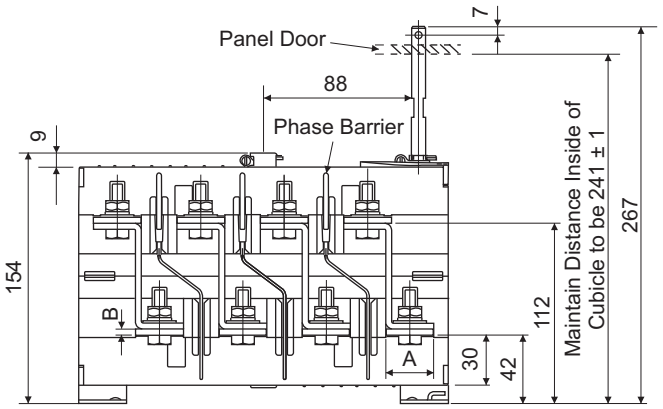
All dimensions are in mm

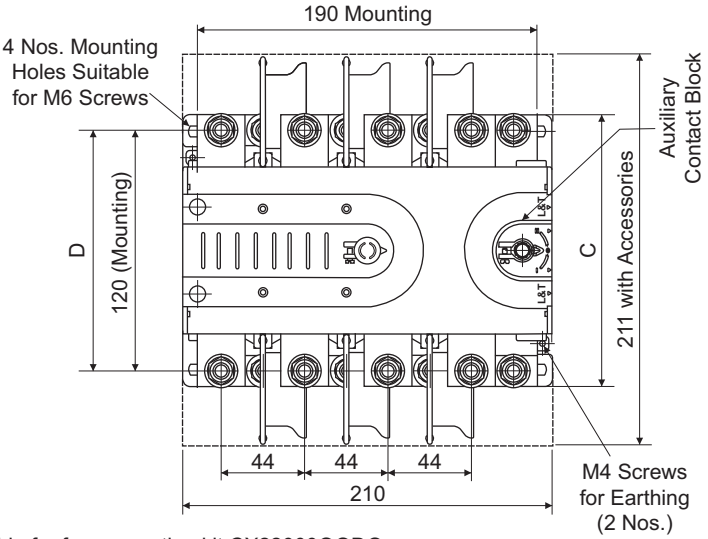
* Assemble bushes for higher ground clearance.

Dimensions

CO2-125/160/200

Open Execution with Extended Handle Manual Changeover Switch





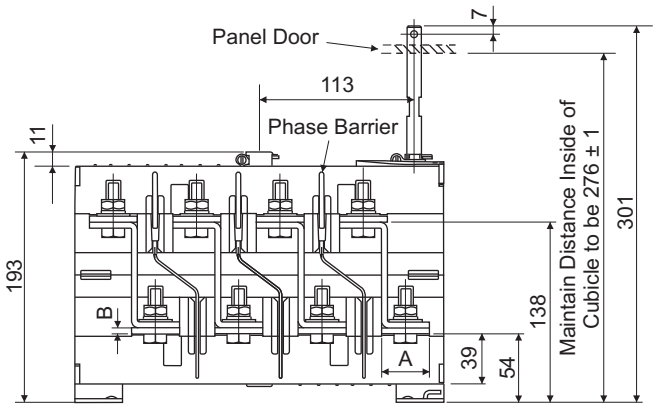
Rating	A	B	C	D
CO2-125	22	3	138	121
CO2-160	22	3	138	121
CO2-200#	22	3	138	121
CO2-200*	26	5	150	121

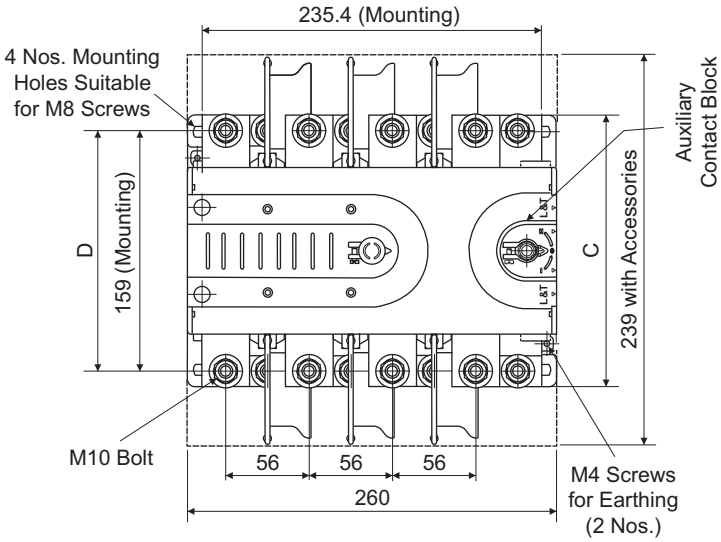
* Cat no. CO22000OOOO is of Interior CO2-200 suitable for fuse mounting kit CX22000OODO

Cat no. CO22000OOOA is of Interior CO2-200 suitable for sheet steel enclosure

CO3-250/315

Open Execution with Extended Handle Manual Changeover Switch





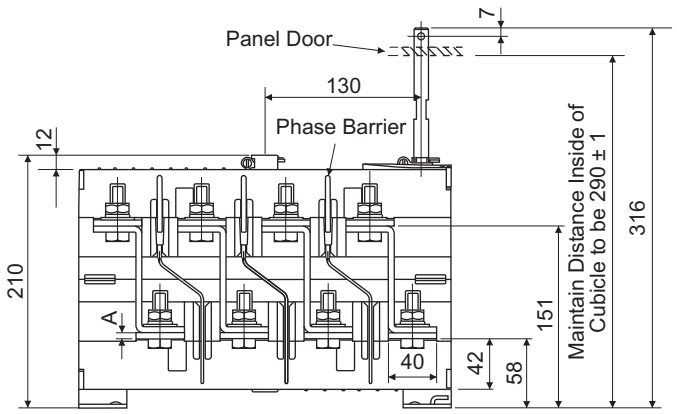
Rating	A	B	C	D
CO3-250	29	4.5	182	156
CO3-315	35	5	198	164

All dimensions are in mm

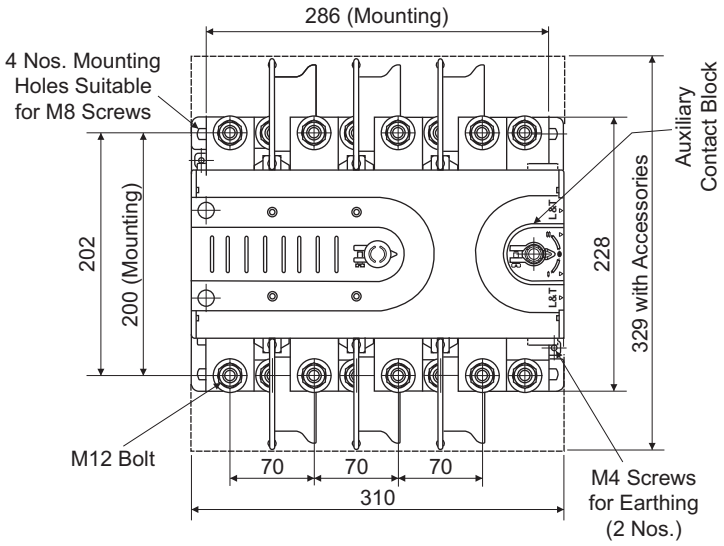
Dimensions

CO4-400/630

Open Execution with Extended Handle Manual Changeover Switch

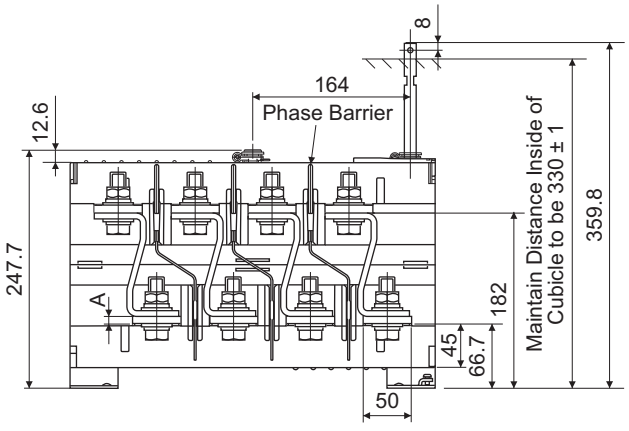


Rating	A
CO4-400	5
CO4-630	6

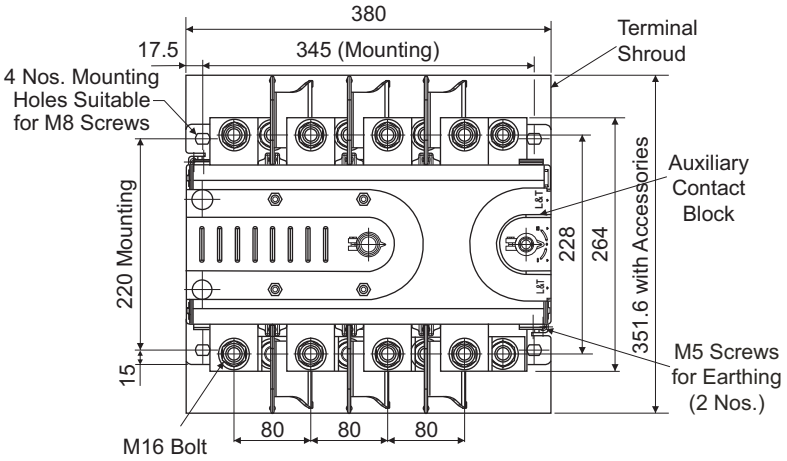


CO5-630/800/1000

Open Execution with Extended Handle Manual Changeover Switch



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

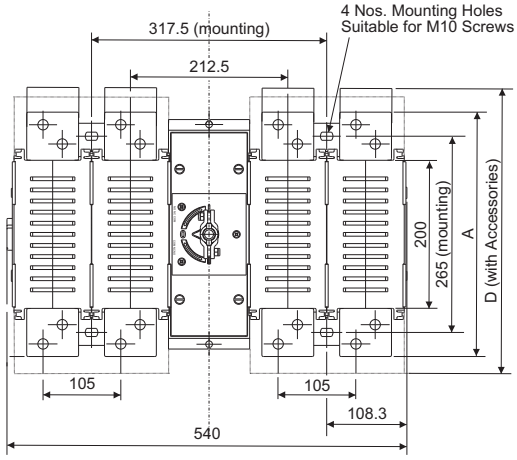


All dimensions are in mm

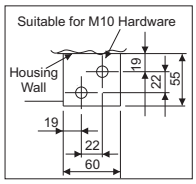
Dimensions

CO6-1250/1600

Open Execution with Extended Handle Manual Changeover Switch with center operation

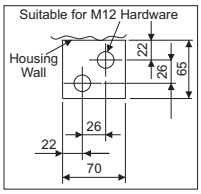


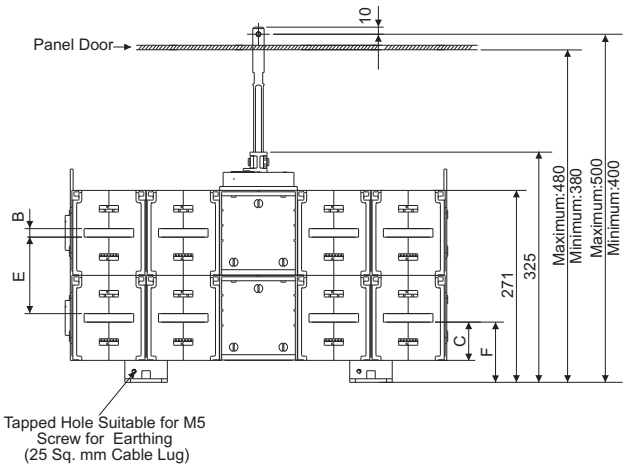
1250A Terminal Arrangement



Type Designation	Terminal Screws	Tightening Torque
CO6-1250	M10 Hexagonal Head Bolt	20 N-m
CO6-1600	M12 Hexagonal Head Bolt	27 N-m

1600A Terminal Arrangement

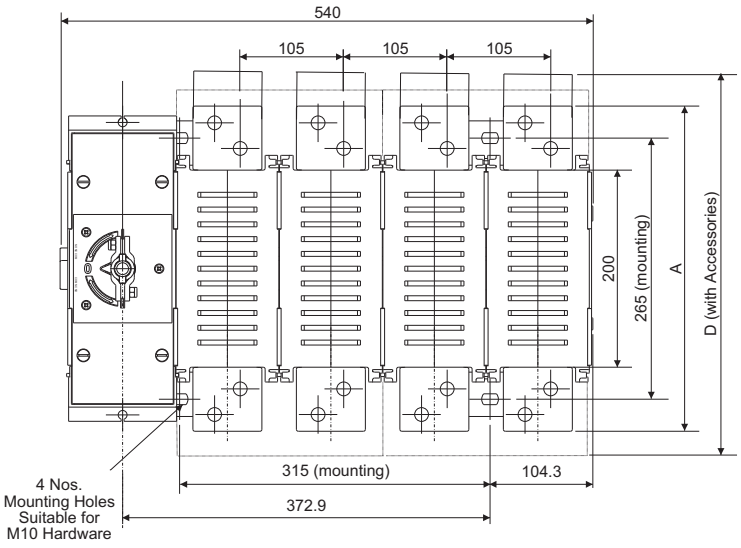


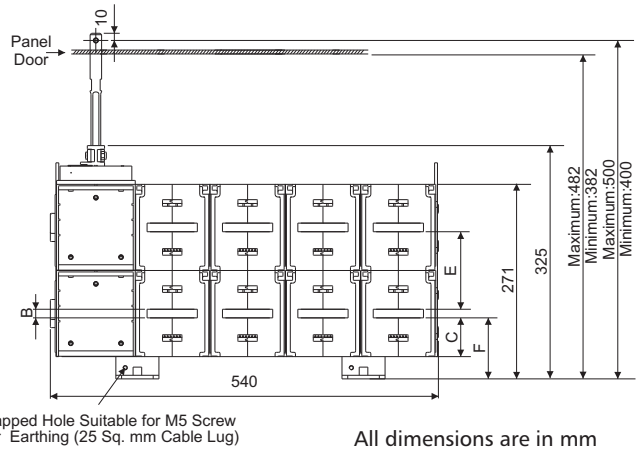


Cat. No.	Rating	A	B	C	D	E	F
CO61250OOOO	CO6-1250	310	8	56	339	112	87
CO61600OOOO	CO6-1600	330	12	54	347	108	85

CO6-1250/1600

Open Execution with Extended Handle Manual Changeover Switch with side operation





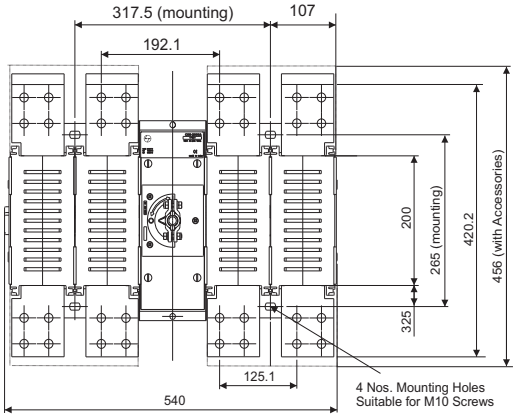
Cat. No.	Rating	A	B	C	D	E	F
CO61250OOSO	CO6-1250	310	8	56	339	112	87
CO61600OOSO	CO6-1600	330	12	54	347	108	85

All dimensions are in mm

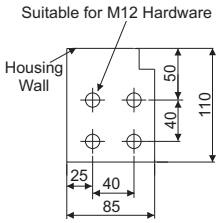
Dimensions

CO6-2000

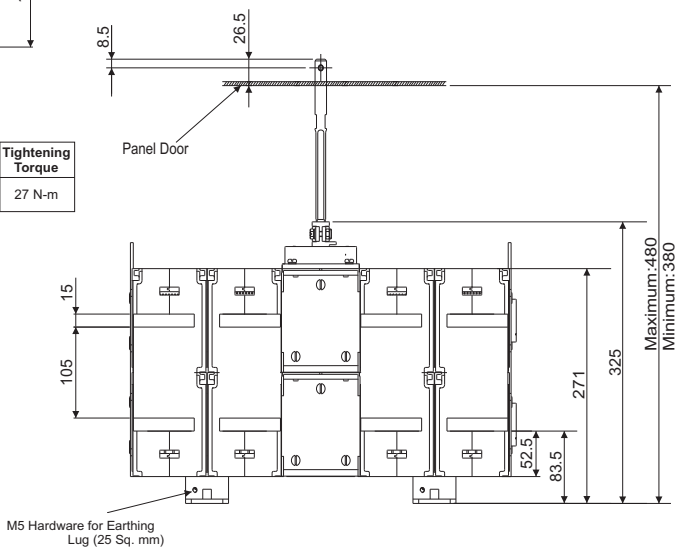
Open Execution with Extended Handle Manual Changeover Switch with center operation



Terminal Arrangement

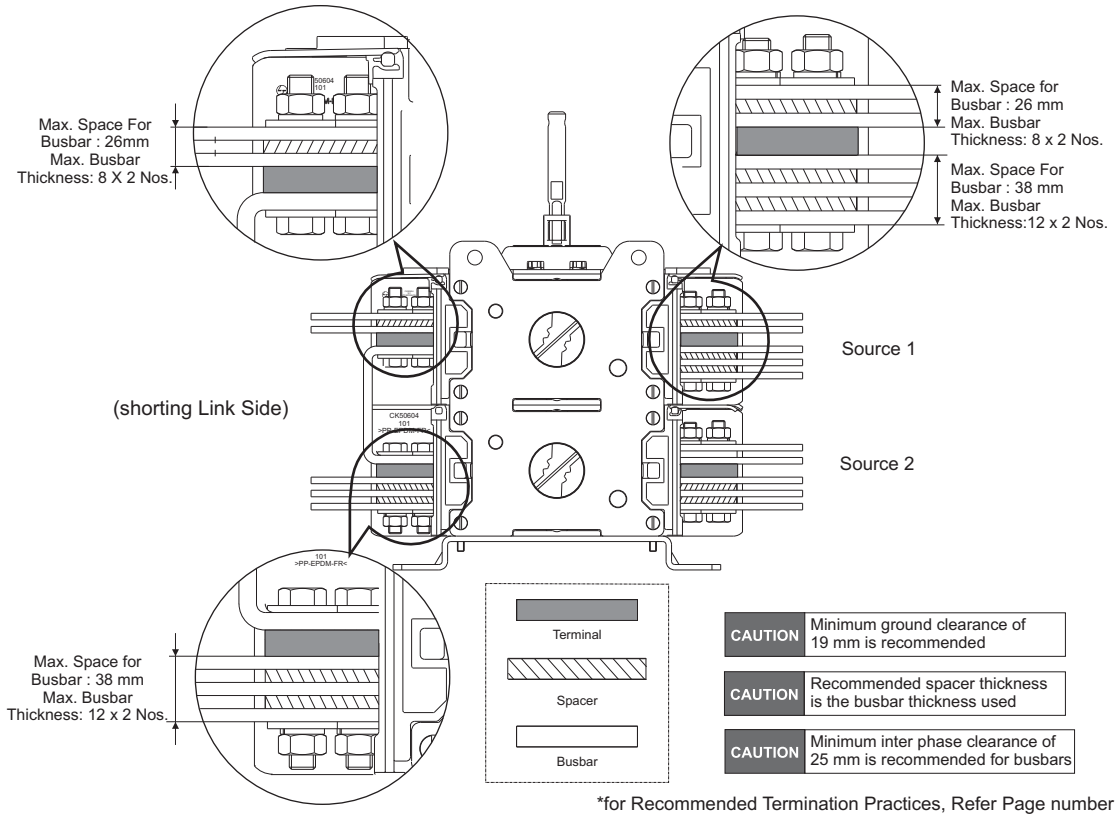


Type Designation	Terminal Screws	Tightening Torque
CO6-2000	M12 Hexagonal Head Bolt	27 N-m



CO6-2000A

Termination of 100 mm Bus Bar

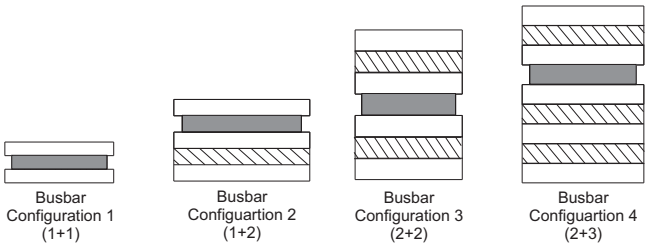


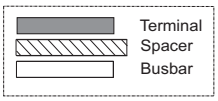
CAUTION	Minimum ground clearance of 19 mm is recommended
CAUTION	Recommended spacer thickness is the busbar thickness used
CAUTION	Minimum inter phase clearance of 25 mm is recommended for busbars

*for Recommended Termination Practices, Refer Page number 34

All dimensions are in mm

Recommended termination practices for busbar width 60-80 mm with diagonal hole configuration





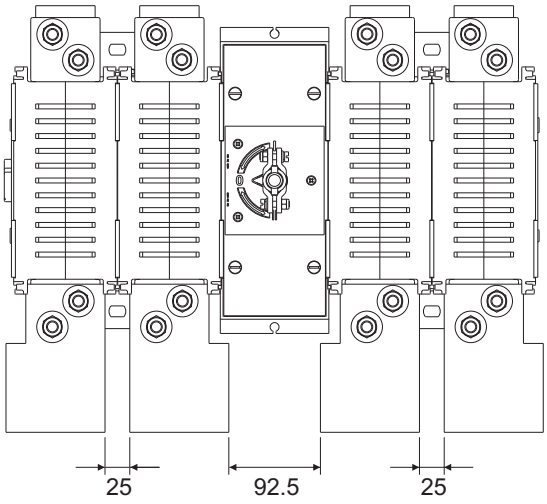
Busbar sizes as per standard

Busbar	1250 A	1600 A	2000 A
Cu	80 x 5 x 2nos	100 x 5 x 2nos	100 x 5 x 3nos
*Al	63 x 12 x 2nos	50 x 8 x 4nos	100 x 10 x 3nos

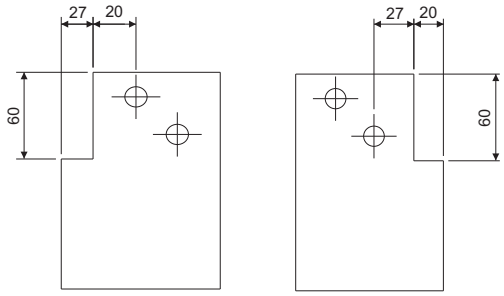
*For Aluminium termination as per standard:
1250A: Factory fitted hardware to be used,
1600/2000A: Bolt length of 85 mm to be used.

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

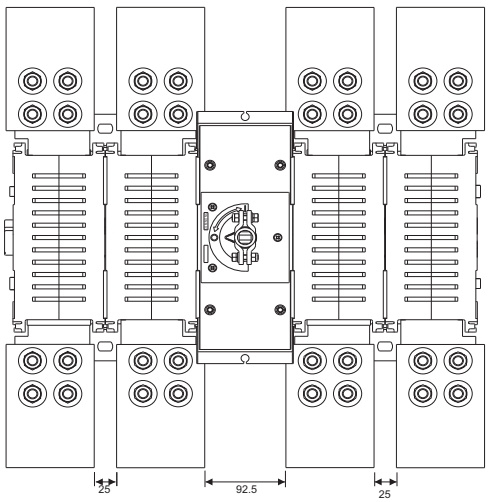
Termination of 100 mm Bus Bar 1600 A



Busbar cut-out dimensions



CO6-2000 A Termination of 100 mm Bus Bar



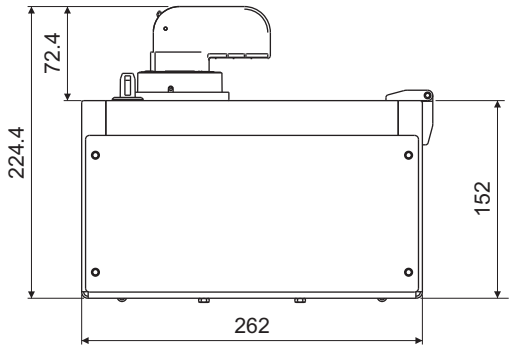
Direct termination of 100 mm bus bar possible in case of 2000 A.

All dimensions are in mm

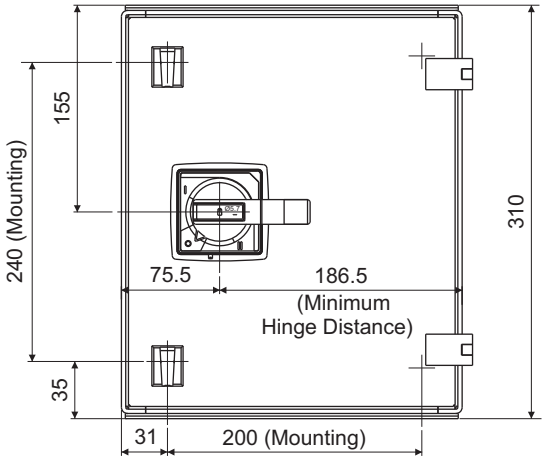
Dimensions

CO1-63/100

Manual Changeover Switch In Sheet Steel Enclosure



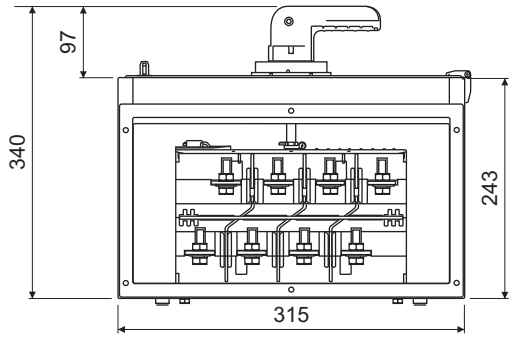
Rating	Termination Bolt
CO1-63/100 A	M6

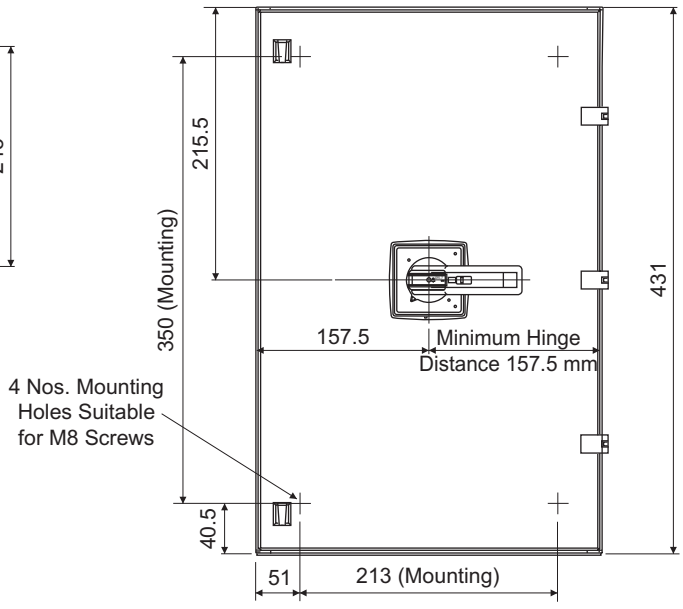


CO2-125/160/200*

Manual Changeover Switch In Sheet Steel Enclosure

*** Cat no. CO22000OOOA is of Interior CO2-200 suitable for sheet steel enclosure**



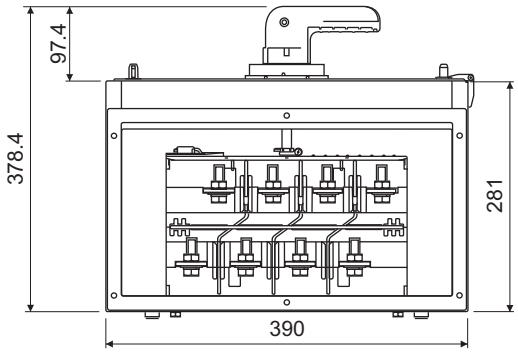


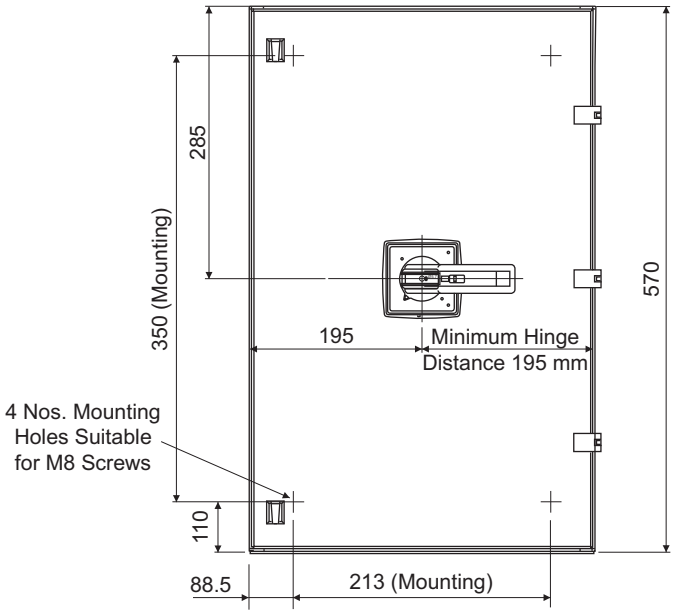
All dimensions are in mm

Dimensions

CO3-250/315

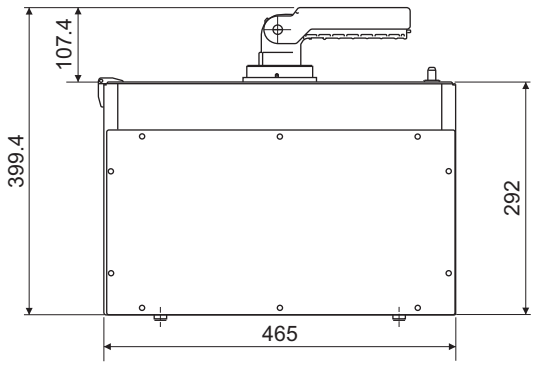
Manual Changeover Switch In Sheet Steel Enclosure

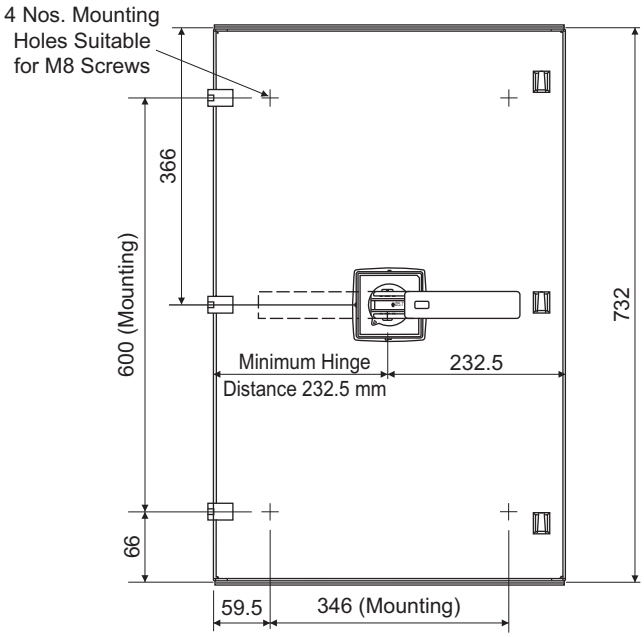




CO4-400/630

Manual Changeover Switch In Sheet Steel Enclosure



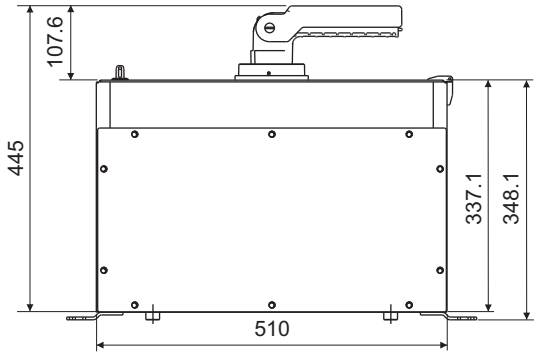


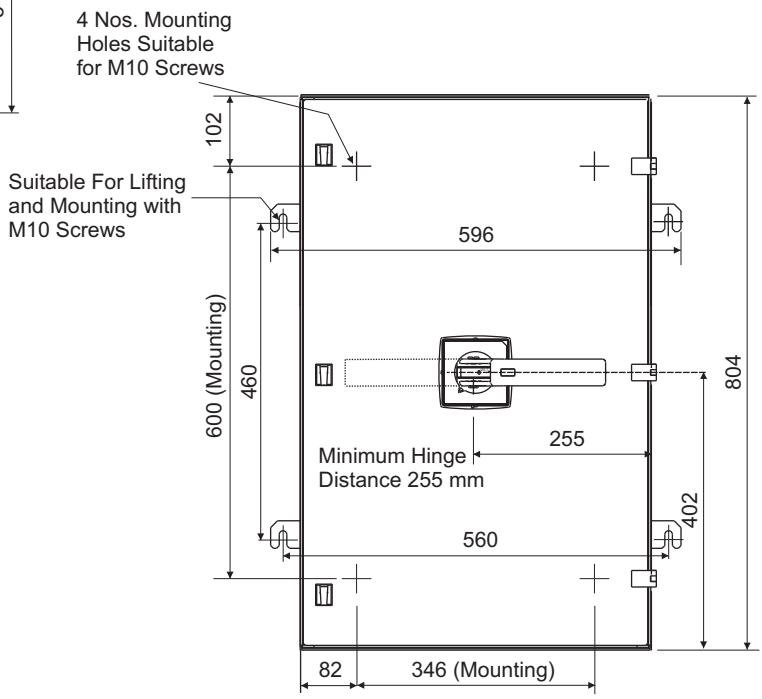
All dimensions are in mm

Dimensions

CO5-800/1000

Manual Changeover Switch In Sheet Steel Enclosure



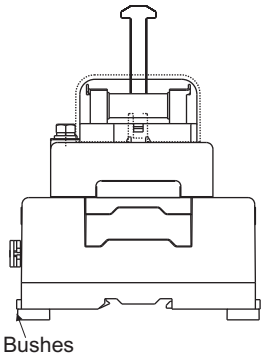


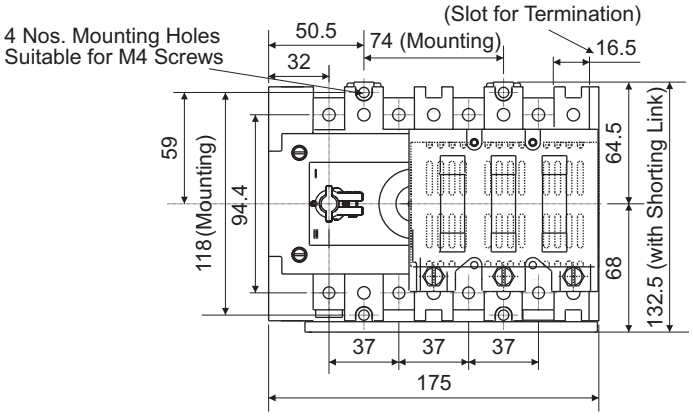
All dimensions are in mm

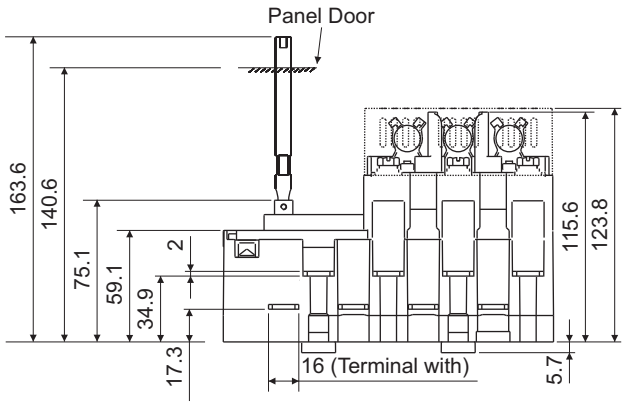
Dimensions

CO1-63

Fuse Changeover Switch (Suitable for Cylindrical Type Fuse Link)





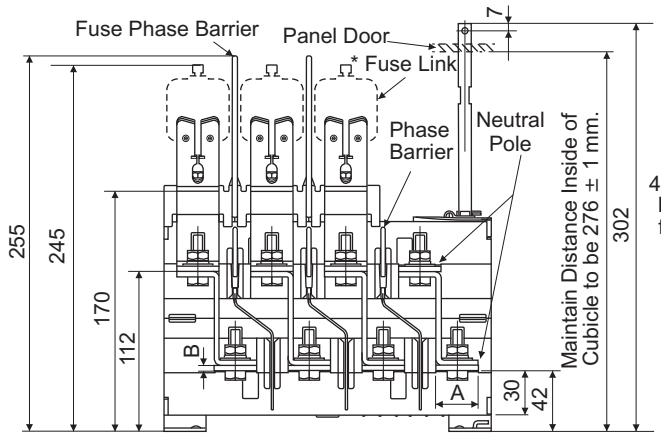


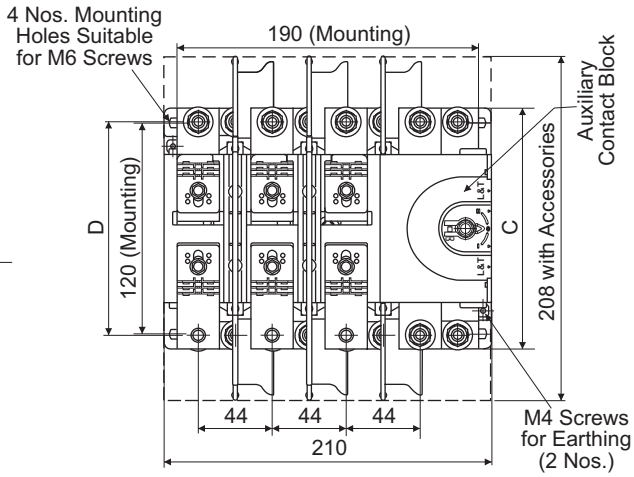
Note: Assemble bushes for higher ground clearance

Rating	Termination Bolt
CO1-63 A	M6

CO2-125/160/200

Fuse Changeover Switch (Suitable for DIN Type Fuse Link)





Rating	A	B	C	D
CO2-125	22	3	138	121
CO2-160	22	3	138	121
CO2-200*	26	5	150	121

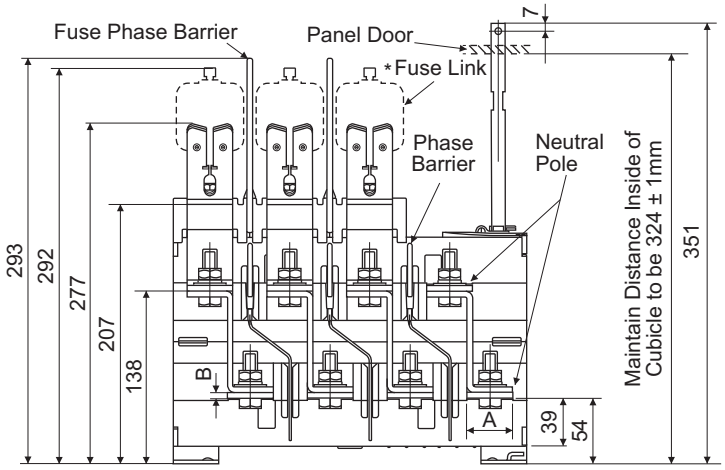
* Cat no. CO22000OOOO is of Interior CO2-200 suitable for fuse mounting kit CX22000OODO

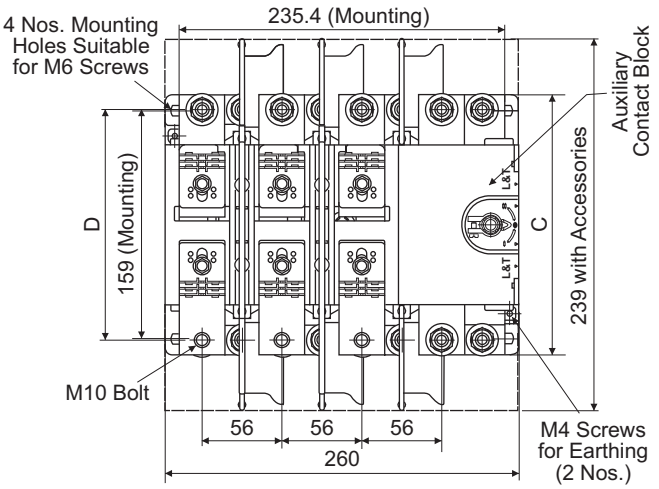
All dimensions are in mm

Dimensions

CO3-250/315

Fuse Changeover Switch (Suitable for DIN Type Fuse Link)

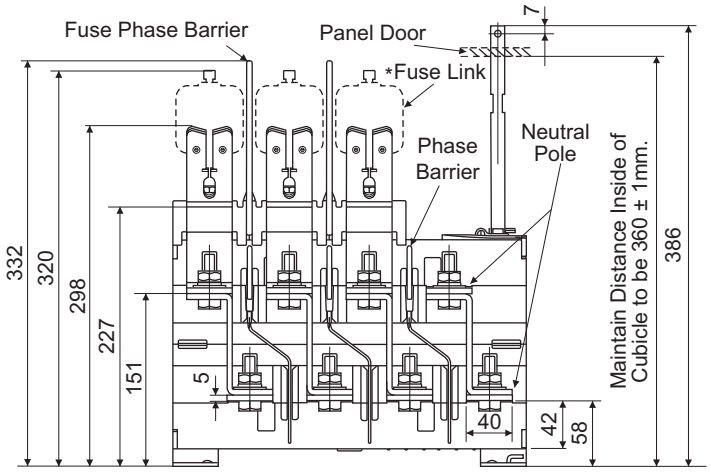


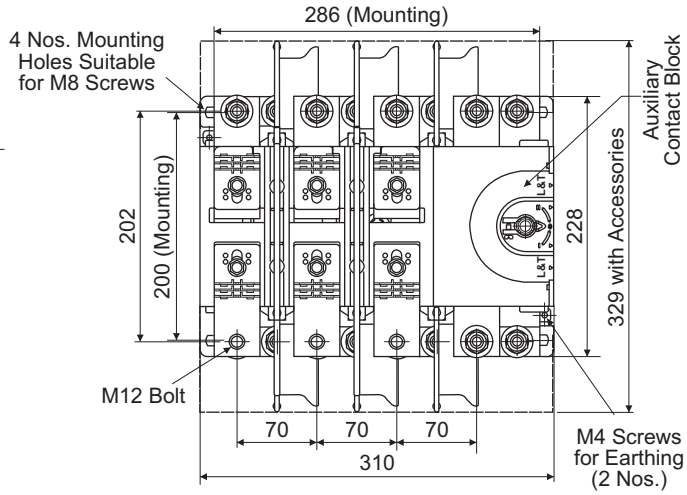


Rating	A	B	C	D
CO3-250	29	4.5	182	156
CO3-315	35	5	198	164

CO4-400

Fuse Changeover Switch (Suitable for DIN Type Fuse Link)



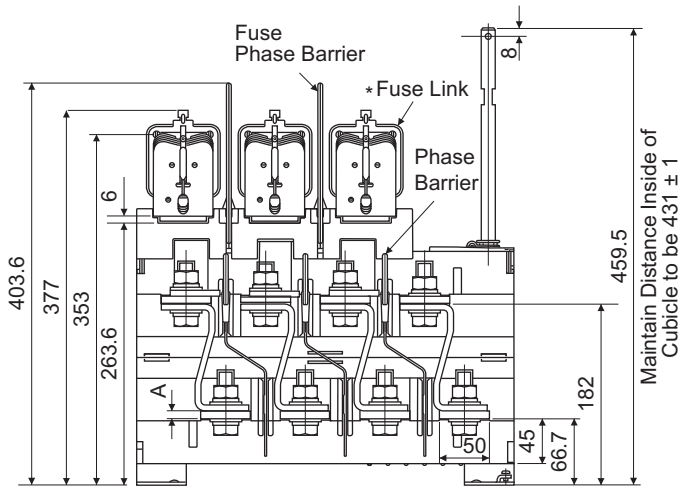


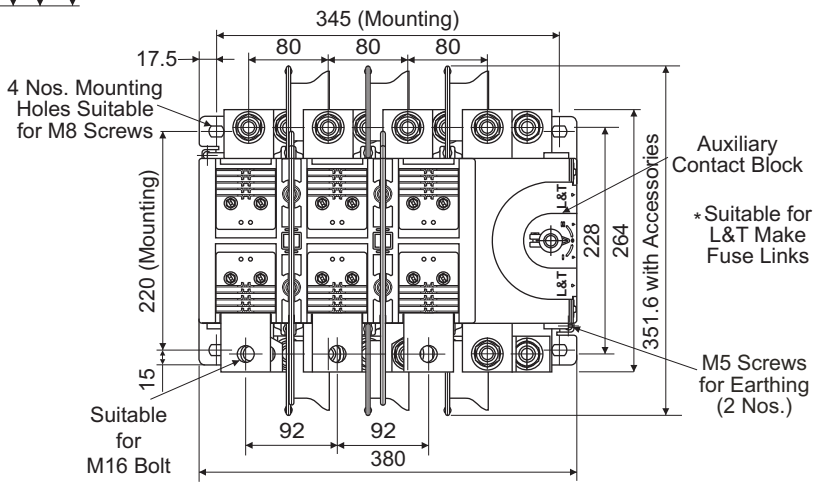
All dimensions are in mm

Dimensions

CO5-630/800

Fuse Changeover Switch (Suitable for DIN Type Fuse Link)



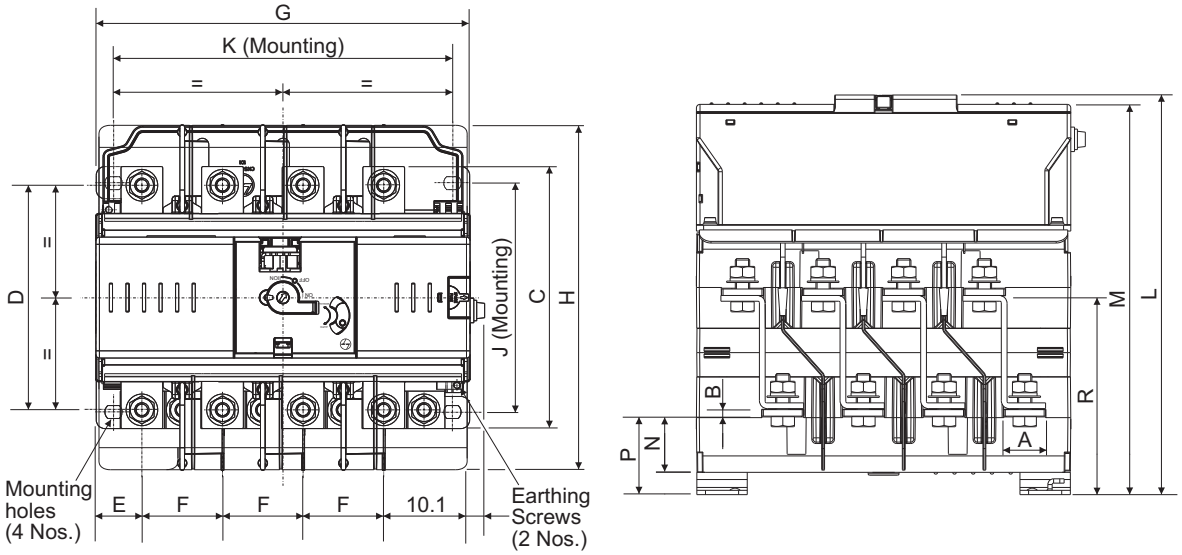


Rating	A
CO5-630	6
CO5-800	8

All dimensions are in mm

Dimensions

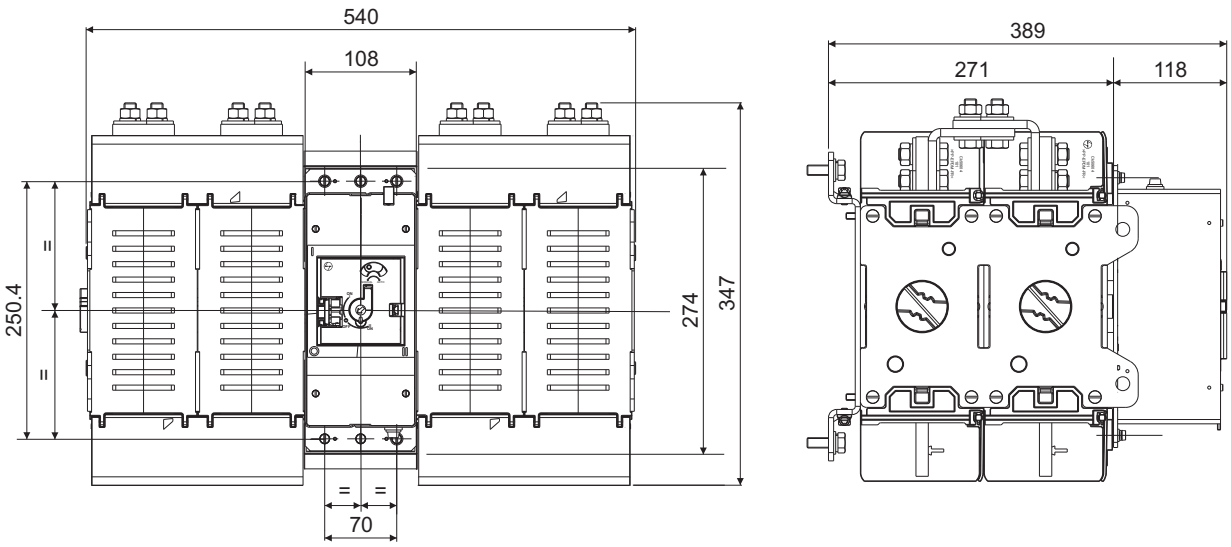
CO2 to CO5 (125-1000A)
Motorised Changeover Switch



Rating (A)	Frame		A	B	C	D	E	F	G	H	J	K
	CO	EOM										
125	CO2	CX2	22	3	138	121	28	44	210	211	120	190
160			22	3	138	121	28	44	210	211	120	190
200			22	3	138	121	28	44	210	211	120	190
250	CO3	CX3	29	4.5	182	156	32	56	260	239	159	235.4
315			35	5	198	164	32	56	260	239	159	235.4
400	CO4	CX4	40	5	228	202	32.3	70	310	329	200	286
630			40	6	228	202	32.3	70	310	329	200	286
630	CO5	CX5	50	6	264	228	-	80	380	351.6	220	345
800			50	8	264	228	-	80	380	351.6	220	345
1000			50	8	264	228	-	80	380	351.6	220	345

Frame		L	M	N	P	R	Mounting Hole Size	Earthing Screw Size
CO	EOM							
CO2	CX2	240.3	234.3	30	42	112	M6	M4
CO3	CX3	277.2	271.2	39	54	138	M8	M4
CO4	CX4	293.7	287.7	42	58	151	M8	M4
CO5	CX5	330.9	324.9	45	66.7	182	M8	M5

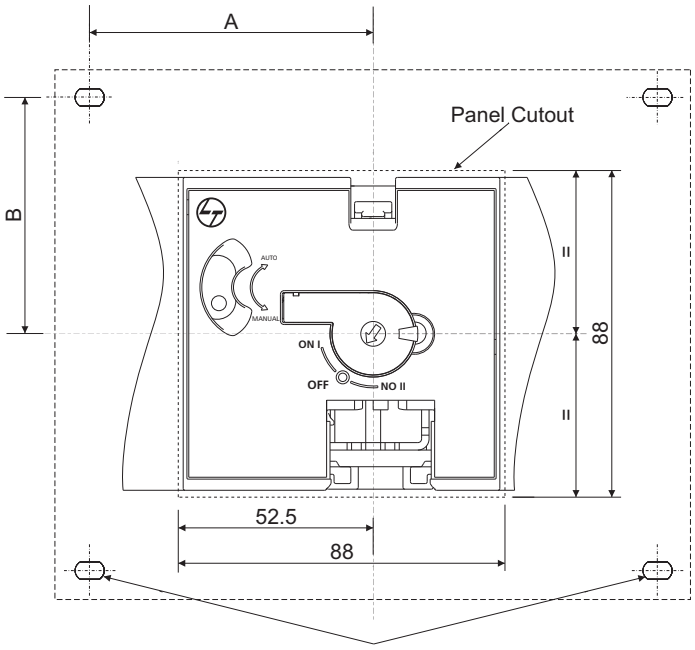
CO6-1250/1600/2000
Motorised Changeover Switch



All dimensions are in mm

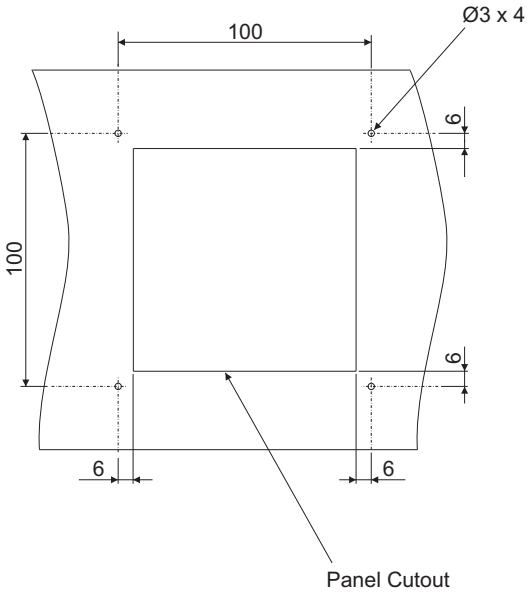
Dimensions

Panel Cutout
Motorised Changeover Switch

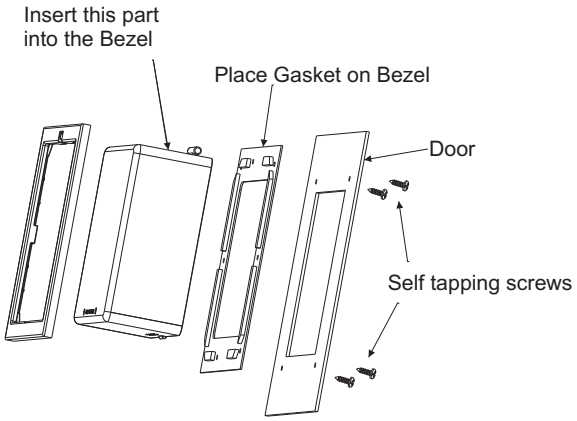


Type	A	B
CO2 with CX2	95	60
CO3 with CX3	117.7	79.5
CO4 with CX4	143	100
CO5 with CX5	172.5	110

Drilling Plan for Mounting Bezel*
Motorised Changeover Switch



Bezel Assembly

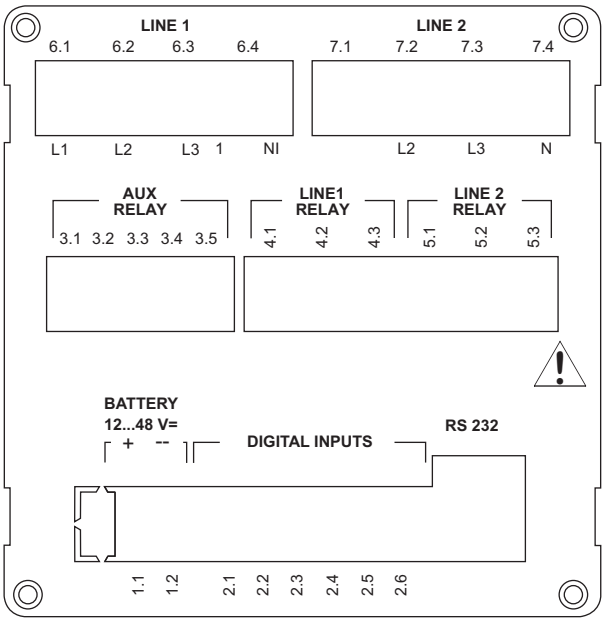


***Available with standard product.**

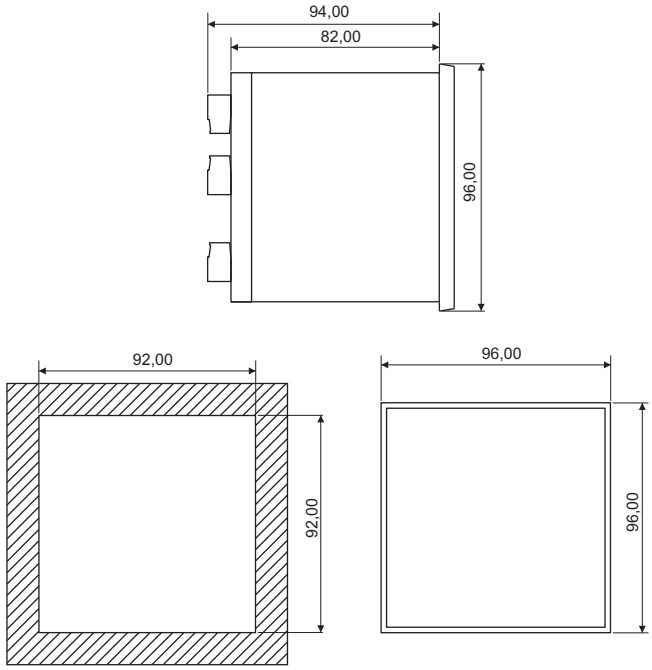
All dimensions are in mm

Dimensions

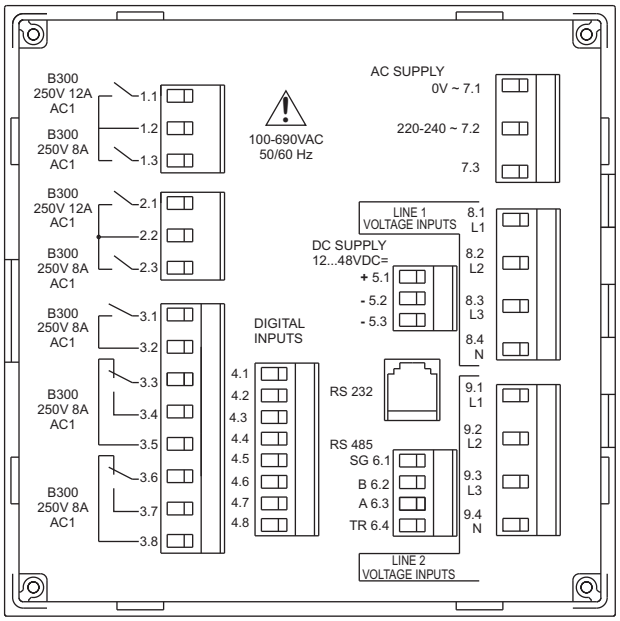
AuXC-1000L
Rear Terminal Connections



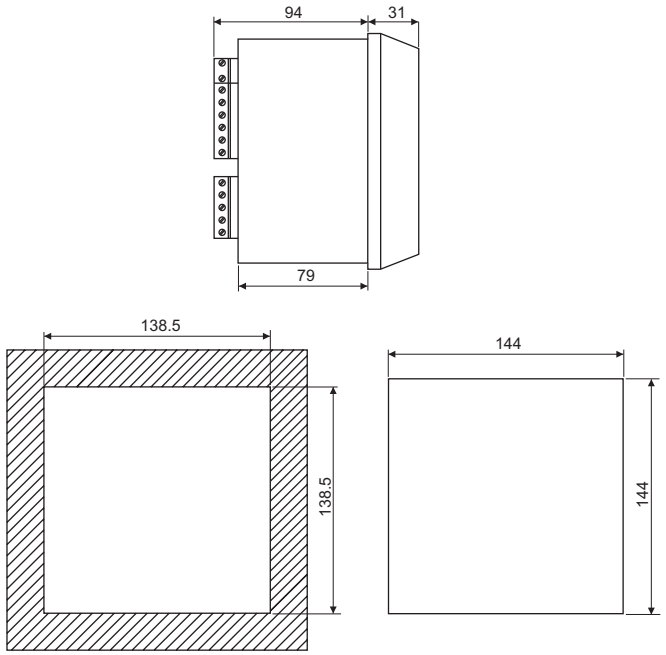
AuXC-1000L
Panel cut-out



AuXC-1000
Rear Terminal Connections



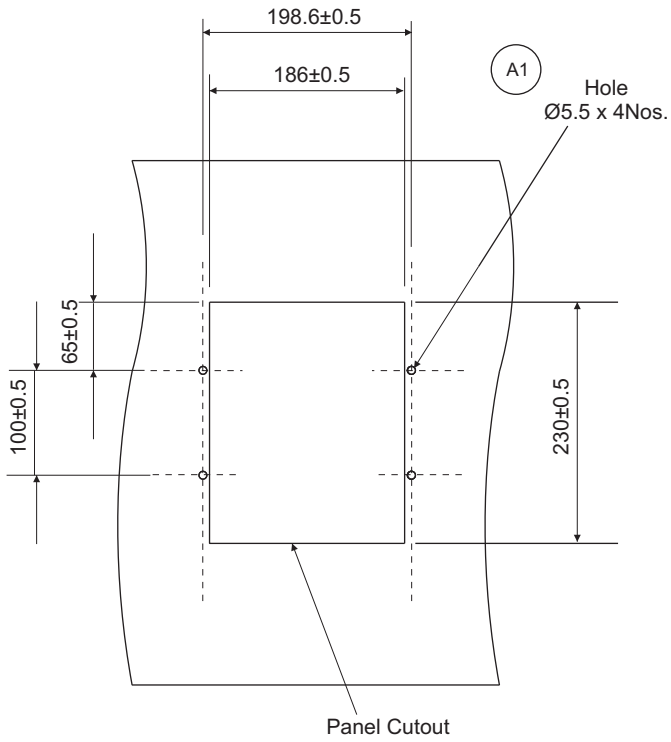
AuXC-1000
Panel cut-out

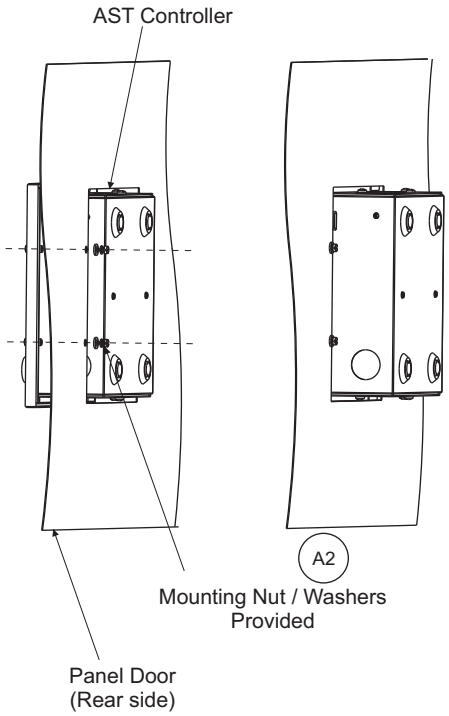


All dimensions are in mm

AST Controller

Panel Cutout & Drill Plan for Flush Mounting





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