Lauritz Knudsen
Electrical & Automation

Onload Changeover Switch

ABOUT US

Lauritz Knudsen Electrical & Automation, formerly known as L&T Switchgear, is a leading player in the electrical industry owing to its 70+ years of strong legacy and commitment to the nation's growth. The brand is dedicated to providing a wide range of electrical and automation products and solutions to vital sectors of the economy, including industries, utilities, infrastructure, buildings, and agriculture. Our extensive portfolio includes low-voltage and medium-voltage switchgear, automation solutions, tailored software, and services.

With manufacturing operations in Ahmednagar, Vadodara, and Coimbatore, we adhere to global standards of excellence. Our operations are supported by well-equipped, in-house design and development centers, as well as tooling facilities, ensuring precision in manufacturing.

We proudly operate six Switchgear Training Centers (STCs) across Pune, Lucknow, Coonoor, Vadodara, Delhi, and Kolkata. These centers offer tailor-made classroom courses and lab learning experiences for technicians, customers, engineers, professionals, and students.

With a deep national presence and one of the largest electrical distribution networks, comprising over 1500 partners across the country, we are committed to driving excellence and delivering superior products and solutions that power India's growth journey.

Content

Changeover Switche Applications

Change-over switches for applications in all walks of life backup power for industrial applications
- Power plants
- Data centers
- Production plants
- Farming facilities

Critical lighting and air conditioning for mass transportation hubs
- Airport runways
- Underground railways
- Car parks

Ensured continuity of public services
- Water pumping stations
- Sewage treatment plants
- Telecommunications

Buildings (back up power, lighting, sprinklers, elevators etc.)
- Hospitals
- Shops and malls
- Hotels and restaurants
- Sport stadiums and arenas
- Private residences

Changeover Switches

As industrial processes and IT applications diversify, ensuring a reliable power supply is increasingly vital for reducing production and maintenance costs. During emergencies, the operational logic of power distribution can become intricate due to the involvement of mechanical devices responsible for functions such as making, breaking, conducting, and isolating power. At times, the need arises to transfer loads from one power supply to another, particularly when energy use is restricted or when the supply source is overloaded

To meet any and all of your change-over, bypass, and transfer needs, we offer a wide variety of switches ranging from 63 to 2000 Amperes. E&A includes switches that allow you to transfer from one source to another manually, remotely, or automatically.

There are two types of transfer systems. They are:

- **Manual Transfer system:** These are generally toggle / knob operated switches which need to be manually switched on so that the load circuit gets transferred from one power source to the other. The manual transfer switches can be used where power outage happens quite rarely, and loss of power does not cause any loss to the appliances or systems used with the electric power supply.
- **Bypass :** Bypass Switches are meant for special application and help to maintain continuity of supply to the load in case of breakdown/maintenance of UPS or Servo stabilizer used in the circuit. These simply 'bypass' the UPS/ Servo stabilizer, in case it needs maintenance or in case of breakdown. The removal of the UPS/ Servo stabilizer is safe as it is now isolated from both input and output side.

1. Open Transition Transfer

- Break before make switching action. In this, the connection to one power source is opened before the connection to the other source is made and during this process of power transfer, the flow of electricity is interrupted. This change-over time can be adjusted by using different time setting in any voltage sensing controller.
- This is the most popular method used in many installations for automatic power transfer. This system is widely used in applications which can accept a small interruption of power from few msec to few seconds.
- It does not require alternate hot source (like a continuous running DG set or an UPS).

- **Automatic Transfer system :** These automatically transfer the power to the load circuit from one power source to the other. Thus, these are more convenient to use as one does not have to manually operate to switch the power source. During normal power interruption, these switching devices will automatically transfer the load circuits to the emergency power source. Once normal power has been restored, the process is automatically reversed. Automatic transfer systems are useful where even a small loss of power can cause a lot of losses in the system. Automatic transfer systems have therefore found their popularity and utility in several industrial and commercial applications where a constant source of power is necessary

2. Closed Transition Transfer

- Make before break switching action for uninterrupted power transfer. This facilitate a seamless transfer of power supply from one source to other by momentarily paralleling both the sources (<100 msec) during the transfer period.

  The transfer switch monitors the phase angle difference between the two sources and when it approaches zero degree, the switch operates.
- This system is used primarily in critical installations like Hospitals, Data Centre etc where even momentary power interruption is not acceptable.
- However, this system necessarily requires alternate hot source (like a continuous running DG set or an UPS) all the time. While the closed transition method is the best to ensure no interruption of power at all, open transition method is more popularly used due to following reasons:

Changeover Switches

- Most power transfer application accepts a momentary interruption in the order of 60 msec to 5 seconds.
- Non-availability of hot sources in most applications.
- Very high prices of close transition auto transfer switches.
- Multiple choices available to the user for open transition power transfer & protection with a combinations of conventional switching, sensing & control devices
- Ease of maintenance

C-line Changeover Switches
Transfer Switch offering much more…

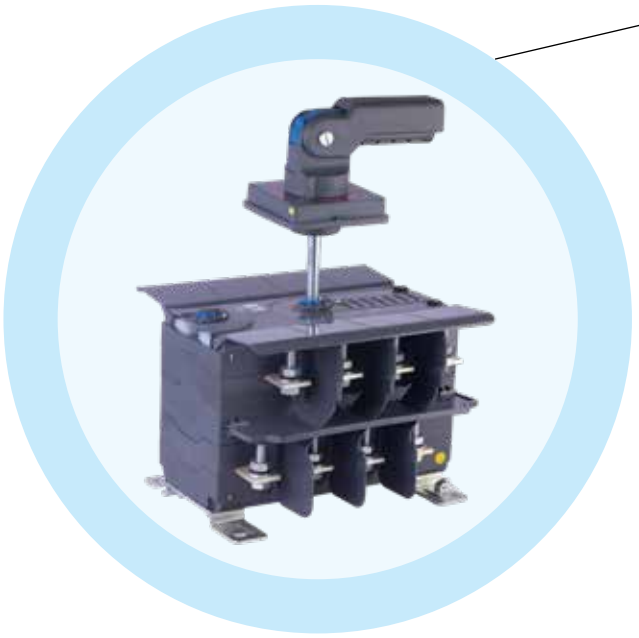
C-LINE ensures a high standard of safety through its dependable switching mechanism, which operates independently of the user's speed of operation. This mechanism incorporates a fail-safe mechanical interlock for all 3 positions in the I-0-II versions. Additionally, the inclusion of I-0-II position indicators directly on the handle and mechanism further enhances operational safety.

C-LINE offers on-load switching and isolation capabilities with its AC-23 and AC-33 characteristics, tested according to standards IEC 60947-3 and IEC 60947-6-1. This enables safe on-load switching for various types of loads. Its onload transfer capabilities eliminate the need to isolate loads before transfer, providing an economical solution. Moreover, it is easy to connect as wide spearhead terminals enable easy termination of Aluminium cables / Busbars and provide better clearances.

Changeover Switches

Electrical & Automation (E&A) 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 C-line 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), motorised version & Enclosed ATS version.



SS Enclosure inclusive of cable gland box

Field-convertible fuse changeover switch

Motorised changeover switch

Enclosed Automatic Transfer Switch

Basic function of Changeover Switches
Onload Changeover S-D has 3 stable positions as defined below

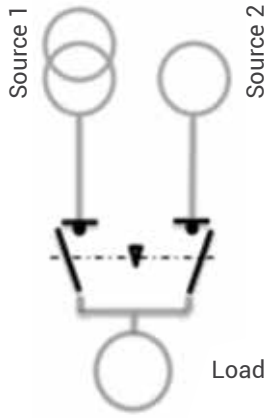
POSITION I	POSITION O	POSITION II
Switch is in ON position with normal supply available at the outgoing terminals.	Switch is in OFF position & outgoing terminals are isolated from both supplies (normal & alternate supplies)	Switch is in ON position with alternate supply available at the outgoing terminals.

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.

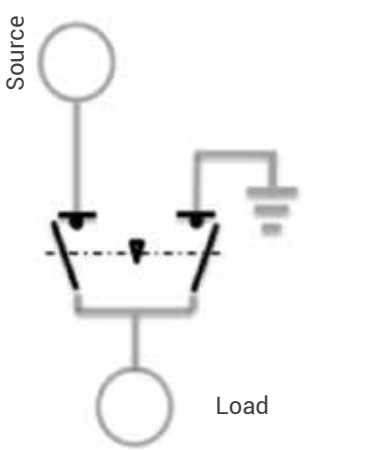
Changeover Switches Application

Application

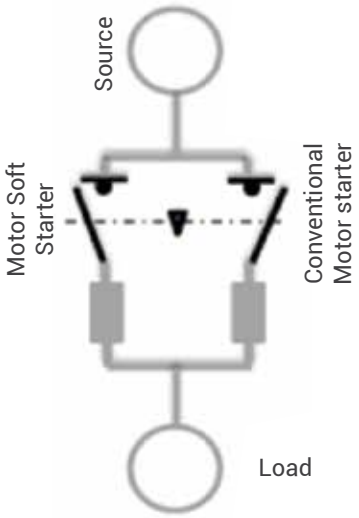
Reliable Changeover between either Primary and back up sources



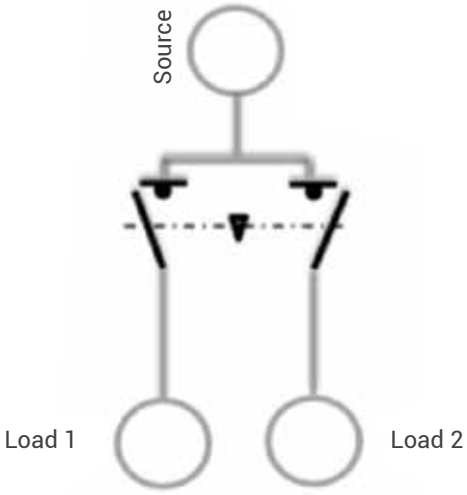
Earthing of equipment such as motors or Signaling electrical lines and isolated load in a fail-safe way

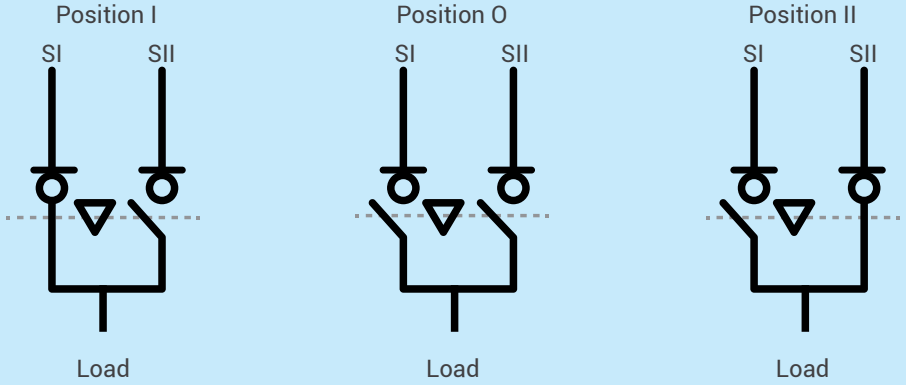


Switching between Soft Starter & Conventional starter connected to same Motor load



Switching of the power supply from one load to another load in order to ensure that they both age at an equal rate





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 shorttime 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. For Frame 1(63A, 100A & 125A), CAT no.s for top and bottom shorting links are available.
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.
Safe and reliable	C-LINE ensures a high standard of safety through its dependable switching mechanism, which operates independently of the user's speed of operation. This mechanism incorporates a fail-safe mechanical interlock for all 3 positions in the I-0-II versions. Additionally, the inclusion of I-0-II position indicators directly on the handle and mechanism further enhances operational safety.
High Performance Level	C-LINE offers on-load switching and isolation capabilities with its AC-23 and AC-33 characteristics, tested according to standards IEC 60947-3 and IEC 60947-6-1. This enables safe on-load switching for various types of loads. Its on-load transfer capabilities eliminate the need to isolate loads before transfer, providing an economical solution.
Quick & Easy Installation Tall	Easy to connect as wide spearhead terminals enable easy termination of Aluminium cables / Busbars and provide better clearances.

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	125
II	125	160	200
III	250	315	
IV	400	630	
V	630	800	1000
VI	1250	1600	2000

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. The smartly engineered enclosure is powder coated with RAL 7035 shade.

- **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 E&A HF & HN fuse links reduces watt loss.

- **Motorised Changeover S-D**

  On load changeover S-Ds are available in motorised version with control voltage 240 V ac. There is no difference in product dimensions of manual and motorised changeover S-Ds (40 A to 2000 A).

- **Enclosed ATS**

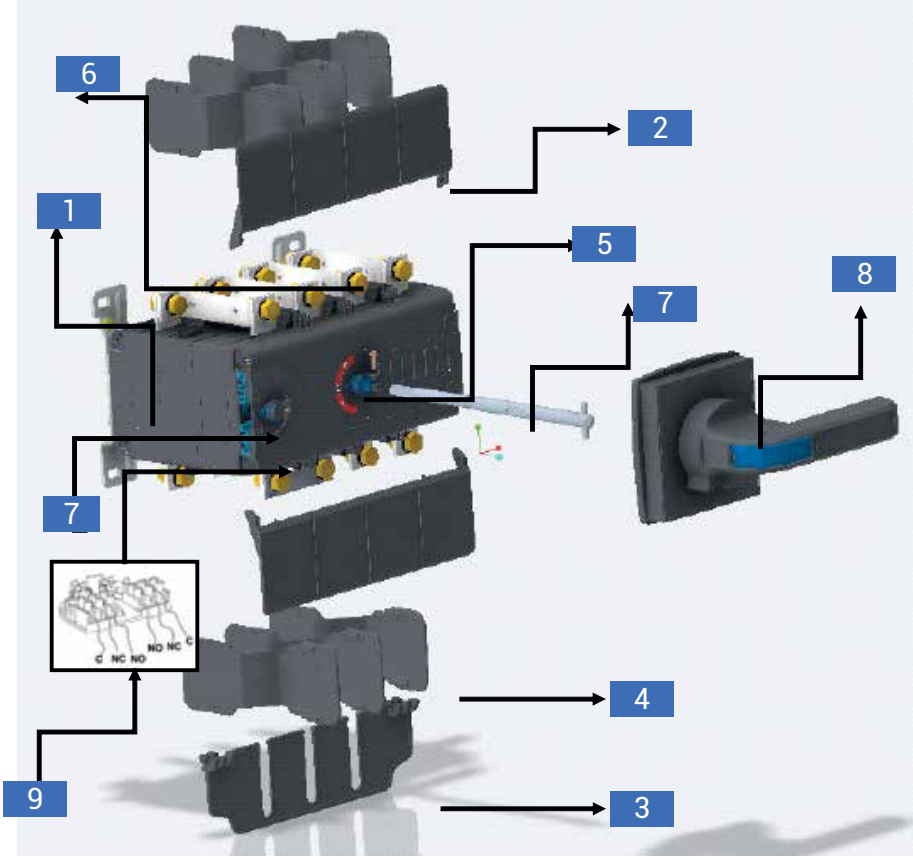
  Enclosed ATS harnesses the power of advanced Power Transfer Controller AuxC 2000 and Motorised Changeover Switch to provide a seamless Automatic Transfer.

- **CZ Bypass:**

  CZ Bypass Switches are easy to install, operate and inspect. Armored with safety featureslike terminal shrouds, phase barriers & door interlock, the CZ Bypass Switches are designed to battle against accidental faults and inadvertent operations. Robust construction allows to withstand higher fault currents without any deterioration.

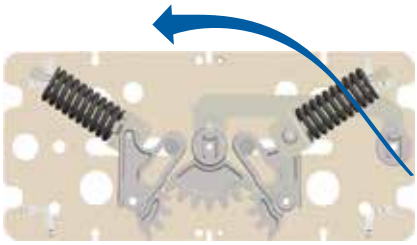
Product Data

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.

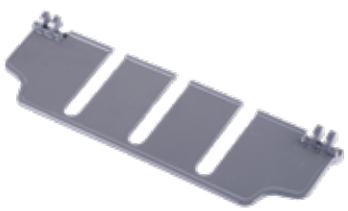


2. Terminal shroud

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.

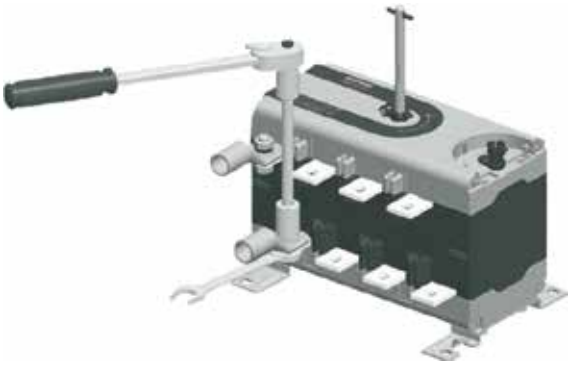
5. Positive ON / OFF indication of S-Ds

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 enter mechanism enables the user to choose between central and side shaft positions for operating handle.

This can be easily converted on site as required (125A to 1000A).

Manual Changeover Product Feature

Interchangeable Shorting link :

Factory fitted external shorting links can be easily removed and fitted on theother side as required at site (125 A to 2000 A). This gives more flexibility at the time of installation. For Frame 1 (63A, 100A & 125A), CAT nos for top and bottom shorting links are available.

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 flip-able handle
250 A & above rating

One hand type handle
upto 200 A rating

Changeover unit
padlockable in OFF state by 3 pad locks

9. Auxiliary contact kit

It consists of two sets changeover contacts one for each S-D. This kit is pre-wired with terminal blocks and is offered as a standard feature with open execution Manual Changeover Switches.

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

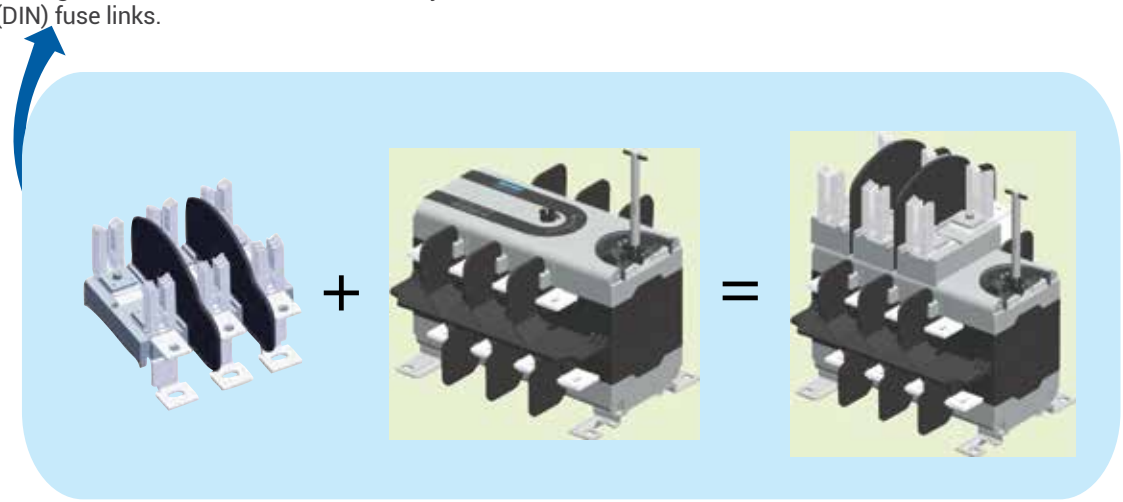
The Changeover Switches are available in sheet steel enclosure with adequate space for cable terminations so that additional cable entry boxes are not required.

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. It can be used either to protect against one supply (line) or protect the load side (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.



Manual Changeover Product Feature

-DC rating
-Performance at 690v
-Different Utilization categories
-Temp derating
-altitude to be mentioned

			Frame 1			Frame 2		
Rating (A)		**Unit**	**63 A**	**100 A**	**125 A**	**125 A**	**160 A**	**200 A$**
Reference Standards								
Type designation			CO1-63	CO1-100	CO1-125	CO1-125	CO1-160	CO2-200
No. of Poles			4 Pole	4 Pole	4 Pole	4 Pole	4 Pole	4 Pole
Rated operational voltage (U_e)		(V)	415	415	415	415	415	415
Rated frequency		(Hz)	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Rated insulation voltage (U_i)		(V)	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage (U_{imo})		(kV)	8	8	8	12	12	12$
Pollution degree			3	3	3	3	3	3
Conventional free air thermal current, I_{th} at 40°C		(A)	63	100	125	125	160	200
Conventional enclosed thermal current, I_{the} at 40°C		(A)	63	100	125	125	160	200
Rated operational current, I_e AC-21A# /AC - 22A# /AC - 23A		(A)	63	100	125	125	160	200
Rated operational power for AC-23A*		(kW)	37	50	65	65	85	85
Rated breaking capacity for AC-23A		(A)	504	800	1000	1000	1280	1600
Rated making capacity for AC-23A		(A)	630	1000	1250	1250	1600	2000
Short time withstand, I_{cw}	1 sec	(kA rms)	4	5	5	8	8	8
	0.2 sec	(kA rms)	7	10	10	18	18	18
Short-circuit making capacity, I_{cm}		(kA peak)	5.9	7.7	7.7	14	14	14
Endurance (category A)	Mechanical	(O-I-O-II-O cycle)	20000	20000	20000	16000	16000	16000
	Electrical	(O-I-O-II-O cycle)	3000	3000	2000	2000	2000	2000
Power loss per pole(W)			1.0	2.2	1.9	2.5	4.1	6.4
Type and size of fuse	DIN/Cylinae	-	14 x 51ae	NA	NA	000	00	NA
Rated fused short-circuit current at 415 V, 50/60 Hz	DIN/Cylinae	(kA rms)	80ae			100	100	
Auxiliary Contact Rating			1.5A/250Vac	1.5A/250Vac	1.5A/250Vac	1.5A/250Vac	1.5A/250Vac	1.5A/250Vac
Termination Capacity								
Maximum Al. cable with lug		(sq mm)	25	50	70	95	95	150
Maximum link width		(mm)	16	22	22	30	30	30
Maximum link thickness		(mm)	2	4.7	4.7	5	5	5
Termination tightening torque		(N-m)	4.5	4.5	4.5	10	10	10
Operating torque center / side operating		(N-m)	4.5	4.5	4.5	10/13	10/13	10/13
Weight (without accessories)		(Kg)	2	2.5	2.7	4	4	4

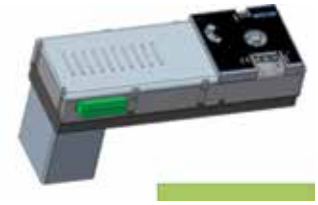
* These values are for 4 pole squirrel cage induction motors and are provided only for guidance and may vary as per the motor manufacturer
# Rated operational current, I, AC-21A/AC-22A
æ Type cylindrical fuse
$ Claimed Impulse withstand voltage with use of source separator and inter phase barriers

Frame 3		Frame 4		Frame 5			Frame 6		
250 A	**315 A**	**400A**	**630 A**	**630 A**	**800 A**	**1000 A**	**1250 A**	**1600 A**	**2000 A**
IS / IEC 60947-3, EN 60947-3									
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
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
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
12	12	12	12	12	12	12	12	12	12
3	3	3	3	3	3	3	3	3	3
250	315	400	630	630	800	1000	1250	1600	2000
250	315	400	630	630	800	1000	1250	1600	2000
250	315	400	630	630	800	1000	1250	1600#/1250	2000#/1250
132	160	225	315	315	400	450	710	710	710
2000	2520	3200	5040	5040	6400	8000	10000	10000	10000
2500	3150	4000	6300	6300	8000	10000	12500	12500	12500
16	18	22	26	35	50	50	50	50	50
28	28	35	35	70	85	85	85	85	85
32	36	46	55	73.5	105	105	105	105	105
16000	16000	10000	10000	10000	10000	10000	10000	10000	10000
2000	2000	2000	2000	2000	1000	1000	1000	1000	500
7.5	10.9	12.8	31.8	23.8	32.6	51.0	39.1	58.9	84
1	1	2	NA	3	3	NA	NA	NA	NA
100	100	100		100	100				
1.5A/250Vac	1.5A/250Vac	6A/250Vac	6A/250Vac	6A/250Vac	6A/250Vac	6A/250Vac	10A/250Vac	10A/250Vac	10A 250Vac
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
40	40	50	50	60	60	60	80	80	100
8	8	8	2 x 8	2 x 10	2 x 10	2 x 10	3 x 12	3 x 12	3 x 12
20	20	27	27	35	35	35	55	55	55
20/25	20/25	28/32	28/32	30/40	30/40	30/40	55	55	55
6.5	7	14	14.5	20	22	22	52	57	75

Altitude derating chart for COS

De-rating at different altitudes for COS							
Altitude	Height	(m)	at 2000	3000	4000	5000	6000
Rated operational voltagev	Ue	(V)	415	374	332	291	249
Rated operational current	Ie	(A)	Ie	0.98Ie	0.96Ie	0.94Ie	0.92Ie
Conventional enclosed thermal current	Ithe	(A)	Ithe	0.91 Ithe	0.81 Ithe	0.76 Ithe	0.7Ithe
Impulse withstand voltage	Uimp	(kV)	8	7.2	6.4	5.6	4.8
Impulse withstand voltage	Uimp	(kV)	12	10.8	9.6	8.4	7.2
Rated insulation voltage	Ui	(V)	690	621	522	483	414
Rated insulation voltage	Ui	(V)	1000	900	800	700	600

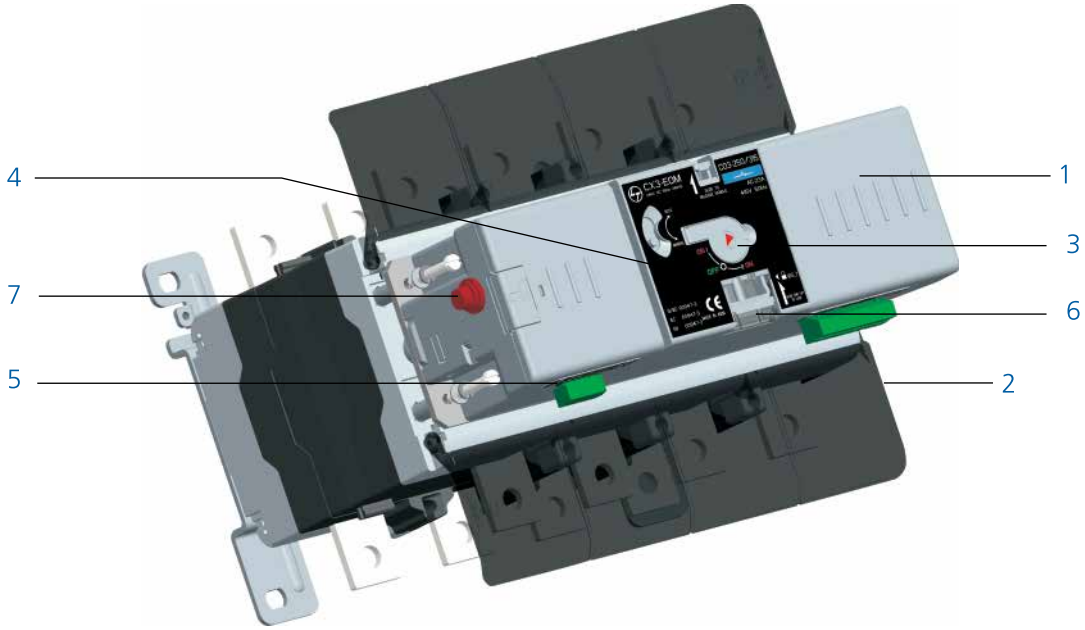
Technical Specifications of Motorised Kit



			Frame 1	Frame 2
Rating (A)		**Unit**	**40 to 125**	**125 to 200**
Reference Standards				
Rated frequency		(Hz)	50	50
Rated control voltage		(V)	240 V ac	240 V ac
Control voltage range		(%)	85%-110%	85%-110%
Pollution degree			3	3
Operating temperature		(°C)	-5 to +55	-5 to +55
Ingress protection (from front)			IP30	IP30
Max. current at 240 V ac		(A)	2	2
Operating time (min)	O-I / I-O	(sec)	< 0.4	0.5
	I-II / II-I	(sec)	<0.75	1.4
Black out time		(sec)	< 0.4	1.4
Control glass fuse current rating	(240 V ac)	(A)	NA	1.25
Dimensions of motorised kit	Width	(mm)	244	210
	Height	(mm)	84	84
	Depth	(mm)	127	94

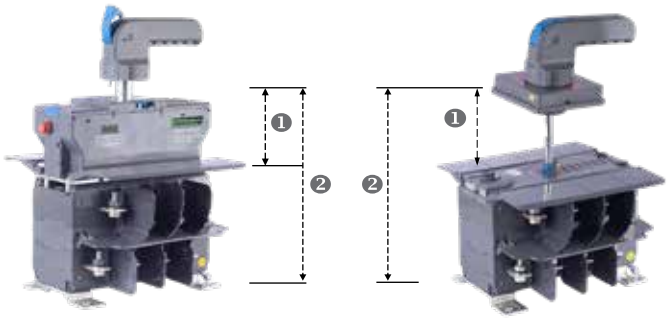
Frame 3	Frame 4	Frame 5	Frame 6
250 to 315	**400 to 630**	**630 to 1000**	**1250 to 2000**
IS/IEC 60947-3, IEC 60947-3, EN60947-3			
50	50	50	50
240 V ac	240 V ac	240 V ac	240 V ac
85%-110%	85%-110%	85%-110%	85%-110%
3	3	3	3
-5 to + 55	-5 to +55	-5 to +55	-5 to +55
IP30	IP30	IP30	IP30
2	2	2	2
0.6	0.7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

Motorised Changeover Product Features



1. Compact design

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



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 by using the handle safely. As a safety feature the control supply of motorised changeover is automatically cut off during the insertion of handle.

5. Auxiliary contacts

It consists of 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 is possible in both auto and manual mode.

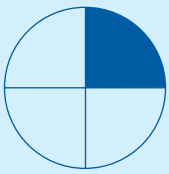
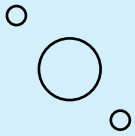
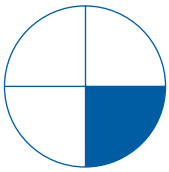
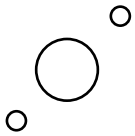
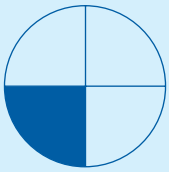
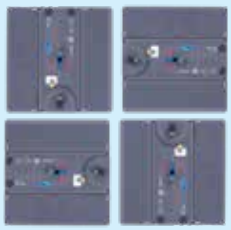
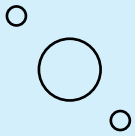
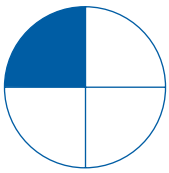
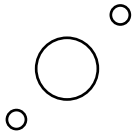
7. Fuse protection

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.

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					

Automatic Source Transfer System

Illuminated Push button assembly with Wire harness

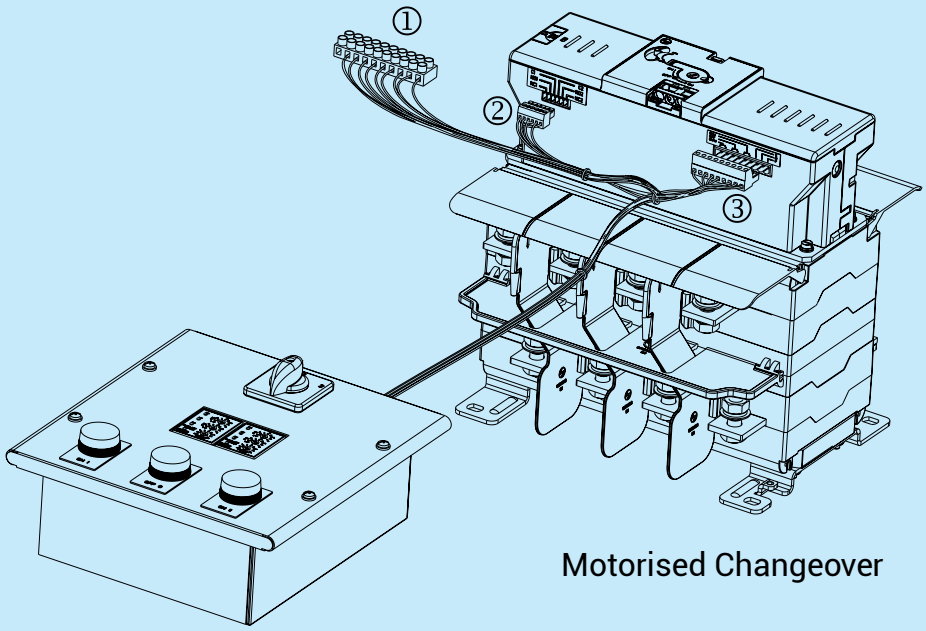
UV/OV based AST Controller with Wire Harness

- 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 programming of minimum voltage, maximum voltage and time delay

AuxC-2000 Controller with Wire Harness

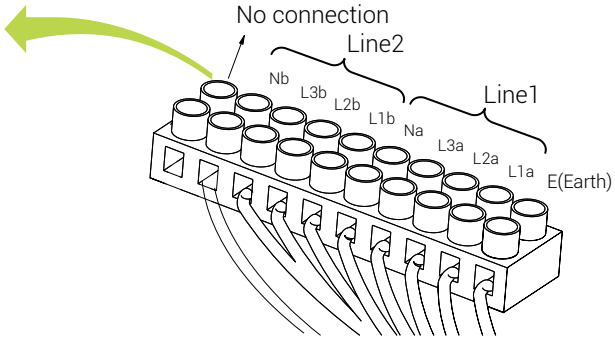
- Option of sensing : Three-phase, two-phase or single-phase voltage controls
- Option of Measuring : Phase-phase voltage and/or phase-neutral voltage control
- Protects against under voltage, over voltage, phase loss, asymmetry, under frequency, over frequency, with independent enable and delay voltage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

ASTS with AST Controller



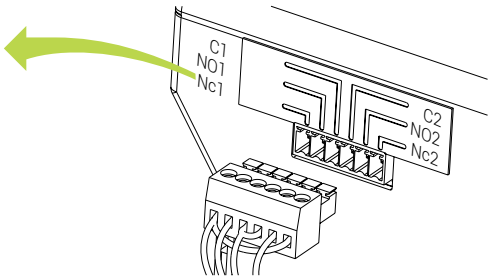
1. Control supply terminal block

Source I & II sensing inputs are to be connected for continuous monitoring by AST controller.



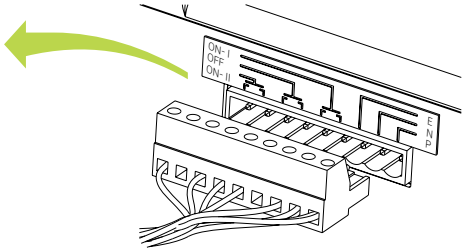
2. Auxiliary contact Set connection

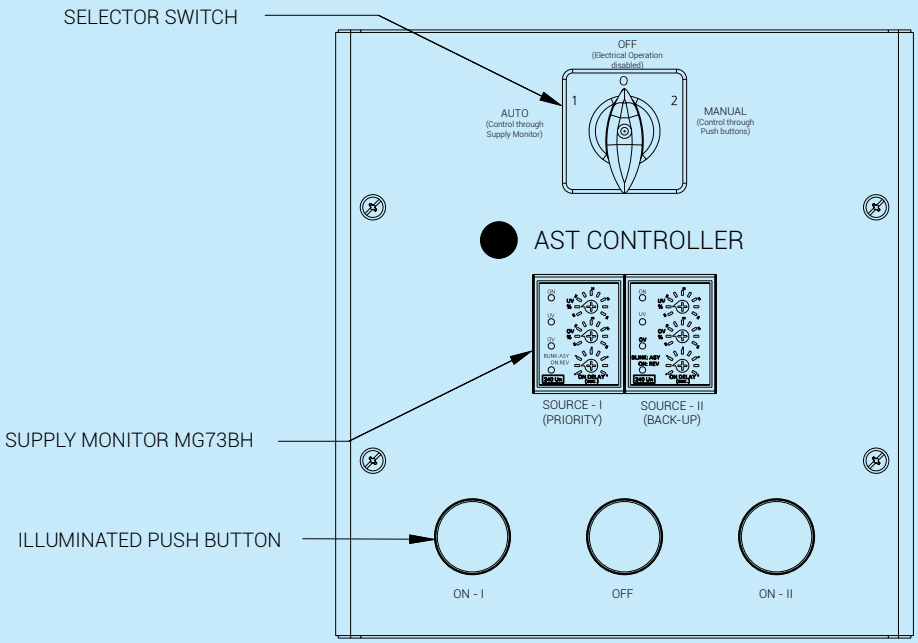
Two sets of pre-wired changeover auxiliary contacts one for each S-D. Same is used for power contact position feedback & status indication



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

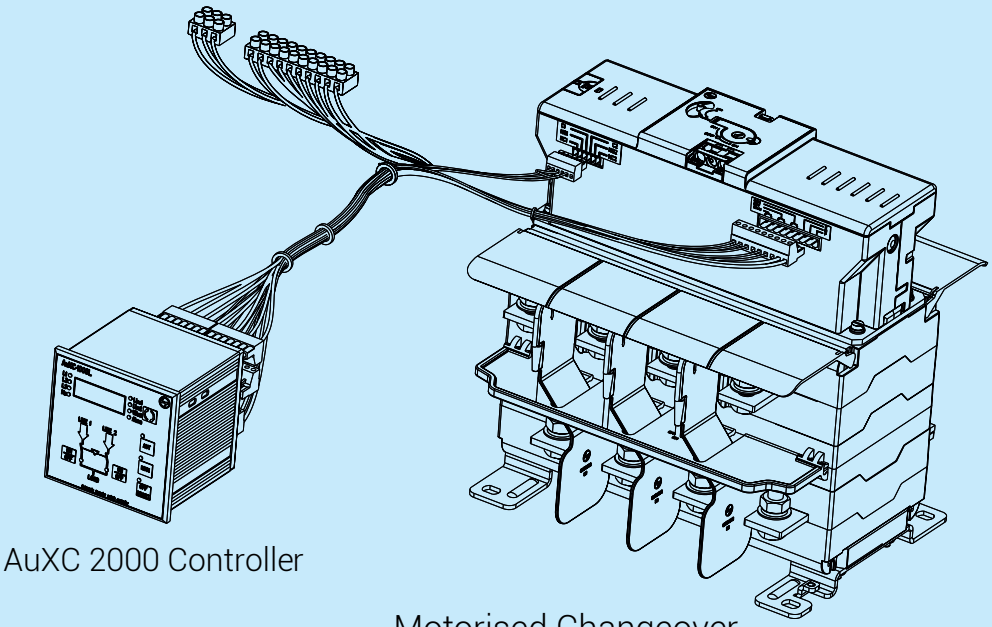
Manual Mode (Electrical)

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 2000 Controller



AuXC 2000 Controller

Motorised Changeover

Modes of Operation

OFF Mode:

In this mode, the automatic control is disabled and the controller does not take any action. All views of the measures and the status of the LEDs remain active.

To access the programming/settings menu, it is mandatory to operate in OFF mode.

Pressing the OFF-RESET button resets the retentive alarms, provided the conditions that generated the alarm have been removed.

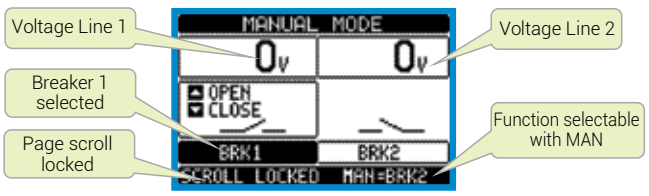
Manual Mode:

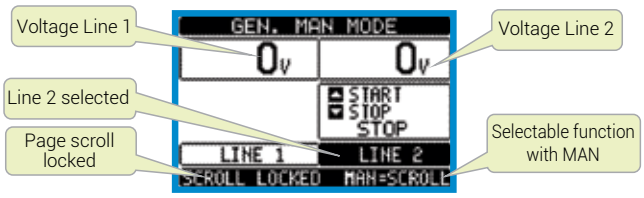
In this mode, the MCO can be manually controlled by the pressing the MAN key.

Closing/opening operation can be achieved by :

- Selecting the switch position
- Pressing the p and q buttons, for a minimum time of 300ms,to confirm the closing or opening operation

The generators can also be controlled manually by moving on the page start/stop groups.



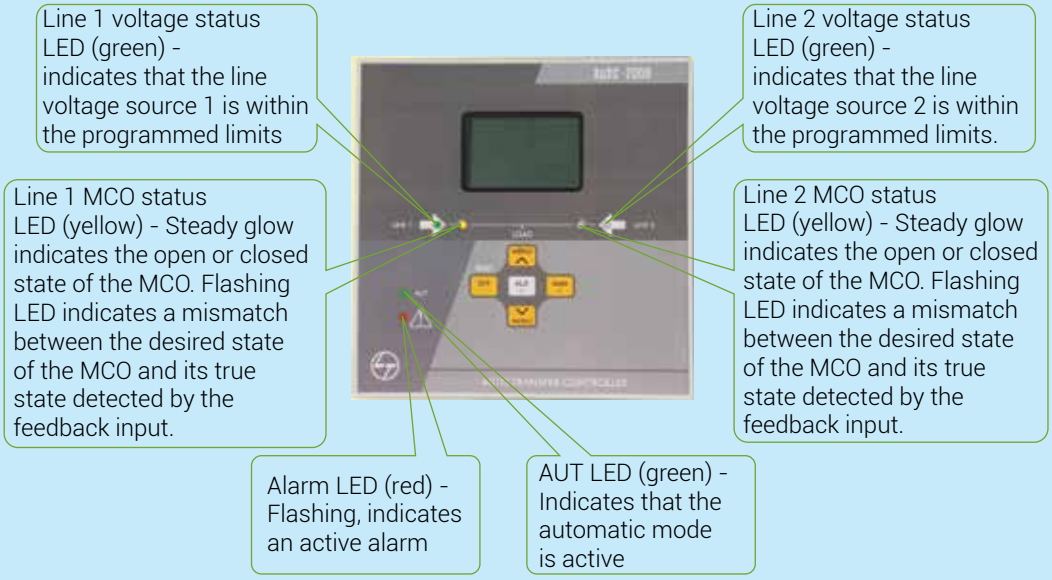


AuxC-2000 Controller

Front buttons functions

▲ and ▼ keys - Used to scroll through the display pages or to select the list of options in a menu. Simultaneously pressing ▼ + ▲ calls up the Main menu with rotating icons

Front LED



Auto Mode:

The AUTO mode is indicated by the green LED for AUT. In automatic mode, the controller automatically gives command for opening & closing of the MCO. When the priority line voltage is out of bounds for a time longer than that specified(line presence green LED turns off), the unit disconnects the load from the priority line and connects it to secondary line considering start-up of generator(if programmed) and interlock time delay. When the priority line returns within the programmed limits, the controller will switch back the load on it.

The cycles of automatic operation vary according to the type of application (utility-utility, utility-generator, generator-generator).

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

Bypass Switches are meant for special application and help to maintain continuity of supply to the load in case of breakdown/ maintenance of UPS or Servo stabilizer used in the circuit.

These simply 'bypass' the UPS/ Servo stabilizer, in case it needs maintenance or in case of breakdown. The removal of the UPS/ Servo stabilizer is safe as it is now isolated from both input and output side.

Available in open version, the CZ Bypass Switches are easy to install, operate and inspect. Armored with safety features like terminal shrouds, phase barriers & door interlock, the CZ Bypass Switches are designed to battle against accidental faults and inadvertent operations. Robust construction allows to withstand higher fault currents without any deterioration.

Time-Saving Convenient solution

No hassle of operating multiple devices for safe and positive isolation on both sides of Servo/UPS.

Designed for Indian ambient conditions

CZ Bypass Switches are rugged and suitable to carry rated current at high temperatures experienced in Indian Sub-Continent. Also, the terminals are designed to accommodate Aluminum cables/bus bars.

Safety guaranteed

There is no benefit of the doubt allowed when it comes to safety. Terminal shrouds protect against accidental human contact with the live terminals, phase barriers stand in line of any phase to phase flashovers and high ground clearance eliminates any possibility of grounding live cables/links

Accessories

a) Auxiliary Contacts

Upto 2nos. 1NO + 1NC can be fitted for ON/OFF status indication. The auxiliary contacts module is front mounted, plug-in type and can be fitted at the site. Auxiliary contacts actuation is from the main mechanism shaft. Addition of auxiliary contacts does not alter over-all dimensions of the switch.

b) Castell Key Lock

The CZ SDs can be interlocked with the help of Castell locks

Contact System & Mechanism

CZ Bypass Switches have modular construction with separate cassettes for mechanism and contact system. Contact system cassette (pole assembly) consists of rotor assembly housing moving contacts, terminals and arc-chutes.

The contact system is double break, knife type having self wiping action. Mechanism is quick make-quick break and multi-cams type for smooth and efficient operation torque transmission. Moreover, the contacts are visible through transparent window section to know actual status of contact system.

For A Sustainable Future

All the materials used for components, welding and plating on metallic components are RoHS compliant. Material used for packaging is recyclable.

Salient Features

Suitable for Aluminum Termination

Entire range is suitable for Aluminum cable/link termination as per the size prescribed by the standards

Mounting flexibility

Suitable for mounting in horizontal as well as vertical orientation. Also, the shaft is 'cut-able' and can be adjusted to suit different panel depth requirements

Phase Barriers

Easy to fit and long phase barriers for complete isolation between phases

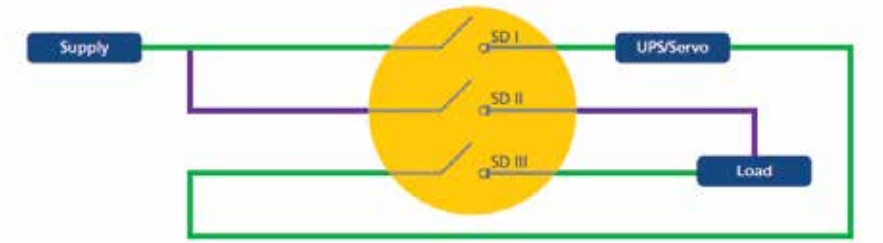
Safety interlock and padlocking

Door interlock is provided in ON position with defeat feature Also, Bypass Switch can be padlocked in OFF position; upto 3 padlocks can be fitted

Finger proof protection (Ip30)

Terminal Shrouds provide protection against accidental contact with live terminals. As it is swivellable, there is no need to remove during termination/inspection

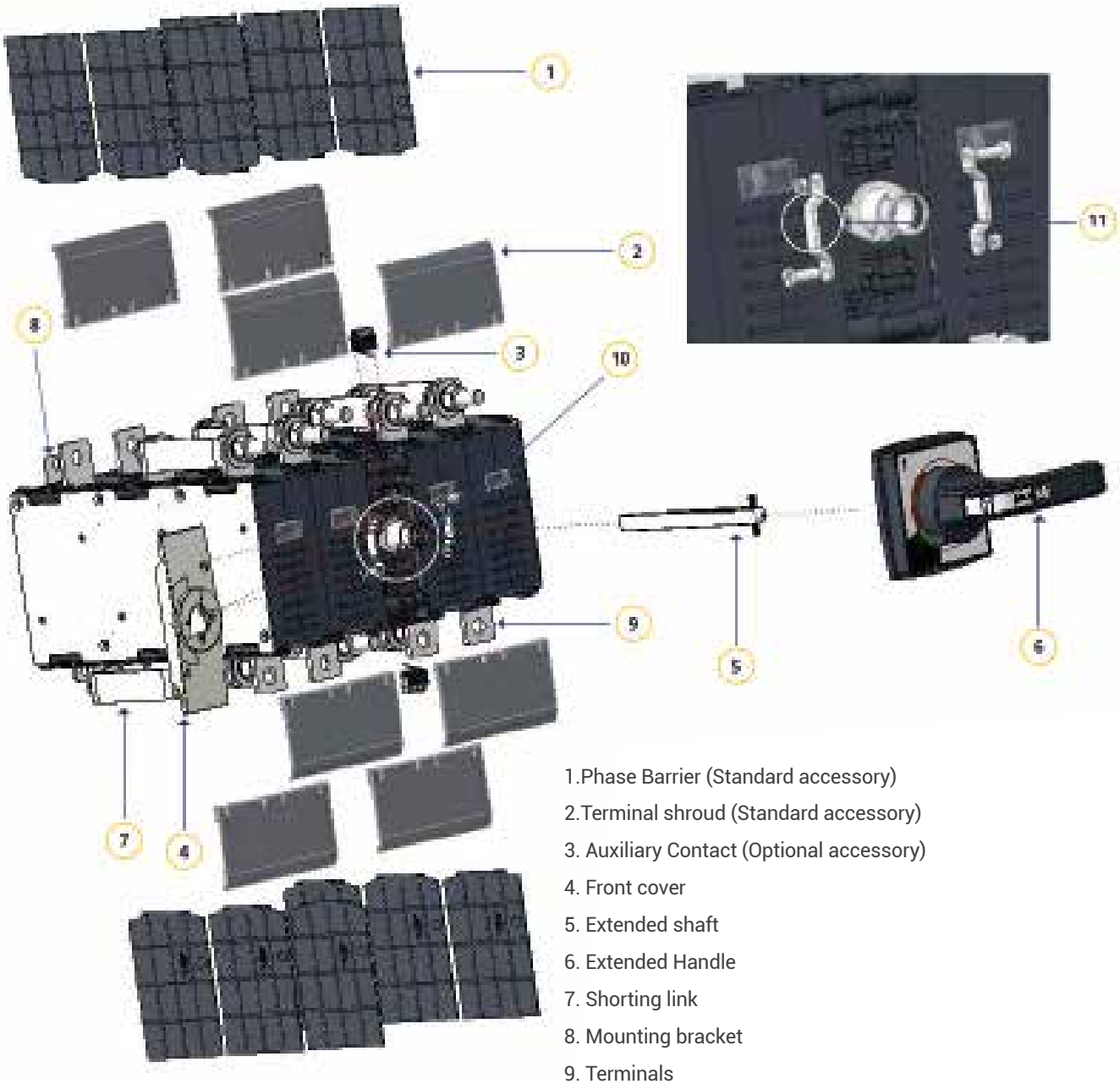
Working Principle



Normal Mode(Green Path) : SD I and SD III are closed, SD II is open, the load is fed through UPS or Servostabilizer

Bypass Mode(Purple Path): SD I and SD III are open, UPS and Servo can be taken out for maintenance in this mode. SD II is closed and the load is fed directly from supply 'bypassing' the UPS or Servo

Detailed View



1.Phase Barrier (Standard accessory)
2.Terminal shroud (Standard accessory)
3. Auxiliary Contact (Optional accessory)
4. Front cover
5. Extended shaft
6. Extended Handle
7. Shorting link
8. Mounting bracket
9. Terminals
10. Shaft locking arrangement
11. Detailed view of shaft locking arrangement

Ordering Information

Model	Frame Size	Current Rating(A)	Voltage	No. of poles	Handle type	Mechanism Position	CAT no.
CZ	1	125A	440 Vac	4P	Extended	Middle	CK908130000
	1	160A	440 Vac	4P	Extended	Middle	CK908140000
	1	200A	440 Vac	4P	Extended	Middle	CK908150000
	1	250A	440 Vac	4P	Extended	Middle	CK908160000
	1	315A	440 Vac	4P	Extended	Middle	CK908170000
	2	315A	440 Vac	4P	Extended	Middle	CK908750000
	2	400A	440 Vac	4P	Extended	Middle	CK908760000
	2	630A	440 Vac	4P	Extended	Middle	CK908770000
CZ Auxiliary Contact Kit (1 C/O contact)	1&2	125A to 630A	-	-	-	-	CZ

CZ Bypass Switches Technical Specifications

			125A
Model			**CZ-1**
No. of Poles			4
Conventional enclosed thermal current (Ithe)	40 C	A	125
	50 C	A	125
Rated Operational Voltage (Ue, Max)		Vac	440
Rated Impulse withstand voltage (Uimp)		kV	12
Rated Insulation Voltage (Ui)		Vac	1250
Rated Operational Current (Ie)	AC-23A at 440Vac	A	125
Rated Operational Current Per Pole in series; DC-21B	220Vdc	A	125/1
	440Vdc	A	125/2
Rated Short Time Withstand Current (Icw, rms)	1 Sec	KA	8
	0.15 sec	kA	15
	0.25 Sec	kA	15
Rated Short Circuit Making Capacity (Icm, Peak)		kA	30
Rated Conditional Short-Circuit Current (Icm, Peak)		kA	100
Rated Breaking Capacity	AC-23A at 440 Vac	KA	1.0
Rated Operational Power, AC-23A	At 415V	kW	75
Power Loss/Pole		W	1.8
Operational Performance capability	Electrical	No of operations	2000
	Mechanical	No of operations	20000
Operating Torque		N-m	18
Maximum Termination Capcity	Lug Size	mm2	2X185
	Al Link Size	mm2	2X35X10
Terminal Bolt size			M10
Terminal Tightening Torque		N-m	20
Weight	4P switch	kg	7.5

160A	200A	250A	315A	315A	400A	630A
CZ-1	CZ-1	CZ-1	CZ-1	CZ-2	CZ-2	CZ-2
4	4	4	4	4	4	4
160	200	250	315	315	400	630
160	200	250	315	315	400	630
440	440	440	440	440	440	440
12	12	12	12	12	12	12
1250	1250	1250	1250	1250	1250	1250
160	200	250	315	315	400	630
160/1	200/1	250/1	315/1	315/1	400/1	630/1
160/2	200/2	250/2	315/2	315/2	400/2	630/2
8	8	8	10	16	16	20
15	15	15	15	31	31	38
15	15	15	15	24	24	36
30	30	30	30	45	45	45
100	100	100	100	100	100	100
1.3	1.6	2.0	2.5	2.5	3.2	5.0
90	110	132	160	160	200	355
2.9	4.6	7.1	11.33	7.5	12.2	23.8
2000	2000	2000	2000	2000	2000	2000
20000	20000	20000	20000	20000	20000	20000
18	18	18	18	36	36	40
2X185	2X185	2X185	2X240	2X300	2X300	2X300
2X35X10	2X35X10	2X35X10	2X35X10	2X50X12	2X50X12	2X50X12
M10	M10	M10	M12	M12	M12	M12
20	20	20	20	27	27	27
7.5	7.5	7.5	7.5	18.6	18.6	

Enclosed Automatic Transfer Switch

Rapid industrialization and urbanization are leading to ever-rising demand for reliable electricity.

Technological advancement and changing lifestyles have given rise to many applications which demand 24 X7 uninterruptible power supply. In some industries, power outages for even short duration may lead to considerable commercial losses.

E&A's Enclosed Automatic Transfer Switch(ATS) constantly monitors the incoming power sources and seamlessly switches the load to the 'back-up' supply when it senses variation or abnormality in the main supply. Once main supply is restored, the load is automatically shifted to the main supply.

Option of priority source selection and swapping gives additional flexibility to suit different site requirements.

These switches are very convenient to use as one does not have to manually operate the switch.

The typical applications are in critical processes in various industries and also in growing residential, commercial & infrastructure segments.

Enclosed Automatic Transfer Switch(ATS):

E&A's C-Line Motorised Changeover switch alongwith AuxC 2000 controller is completely pre-programmed and pre-wired Automatic Source Transfer Solution.

What's more is that the complete ensemble is mounted in a smart engineered SS enclosure providing a ready, convenient -to-use solution.

Automatic Solution | Pre-wired | Flexible Settings