



*L&T Electrical & Automation*



# **CZ BYPASS SWITCHES**

Superior Performance with Convenience

**Switchgear Factory,  
Ahmednagar**



**Switchgear Factory,  
Navi Mumbai**



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

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

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



**Switchgear Factory,  
Vadodara**

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## Introduction

### 125A to 630A

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**

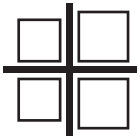
All the materials used for components, welding and plating on metallic components are RoHS compliant. Material used for packaging is recyclable.

## 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

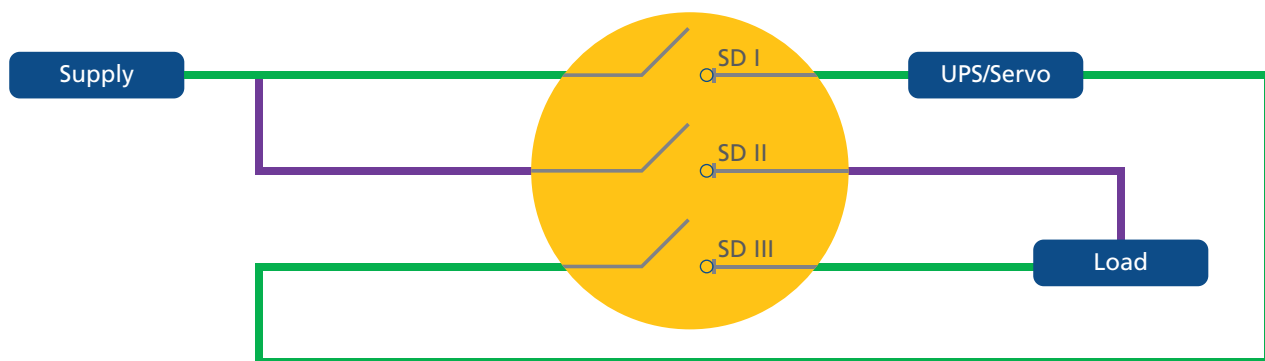
Door interlock is provided in ON position with defeat feature  
Also, Bypass Switch can be padlocked in OFF position; upto 3 padlocks can be fitted



### 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

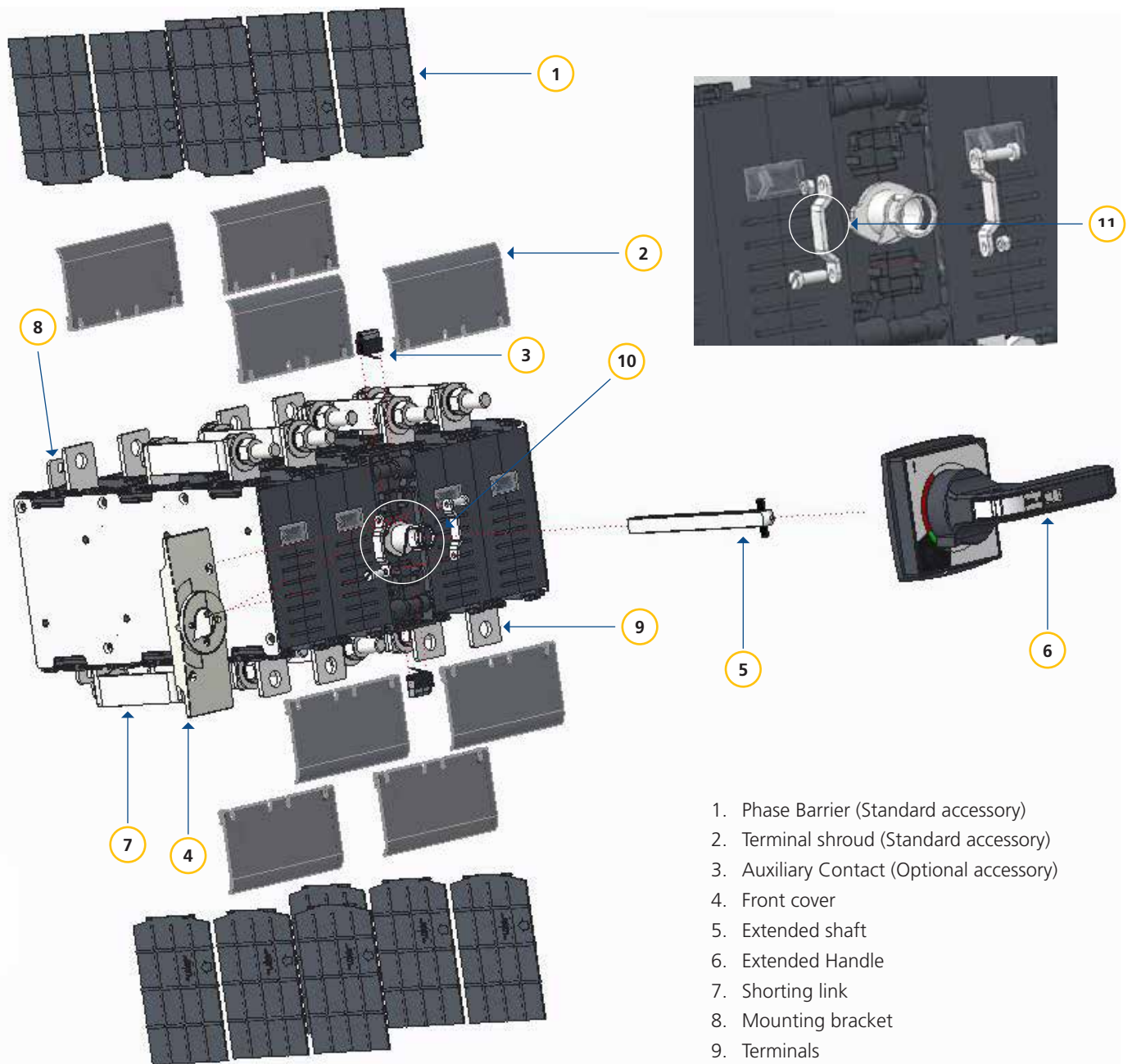
## Working Principle



**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
<b>CZ Auxiliary Contact Kit (1 C/O contact)</b>	1 & 2	125A to 630A	-	-	-	-	CK908050000

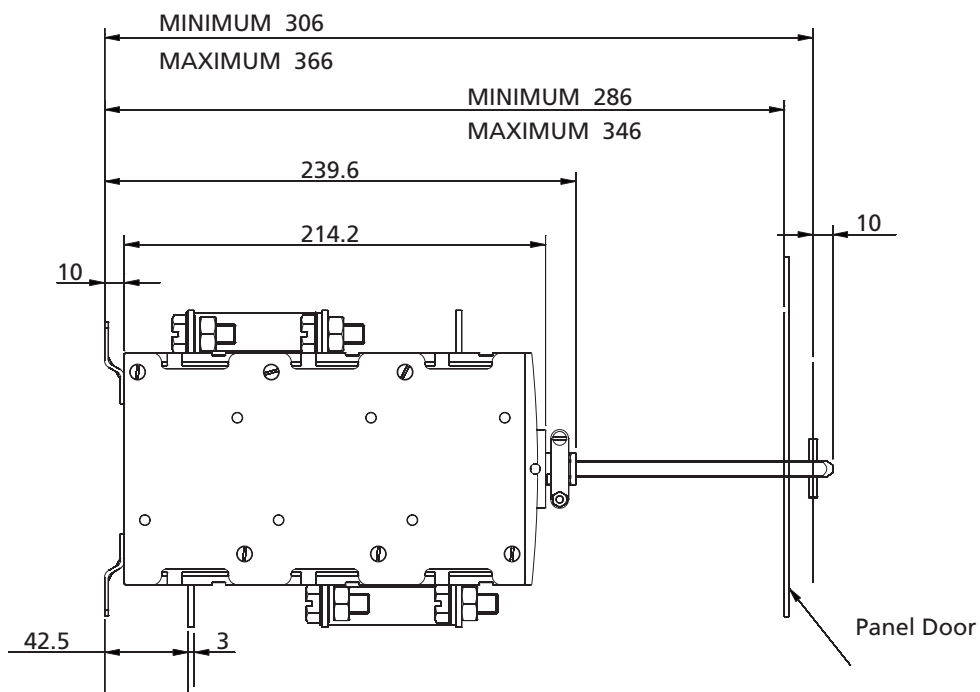
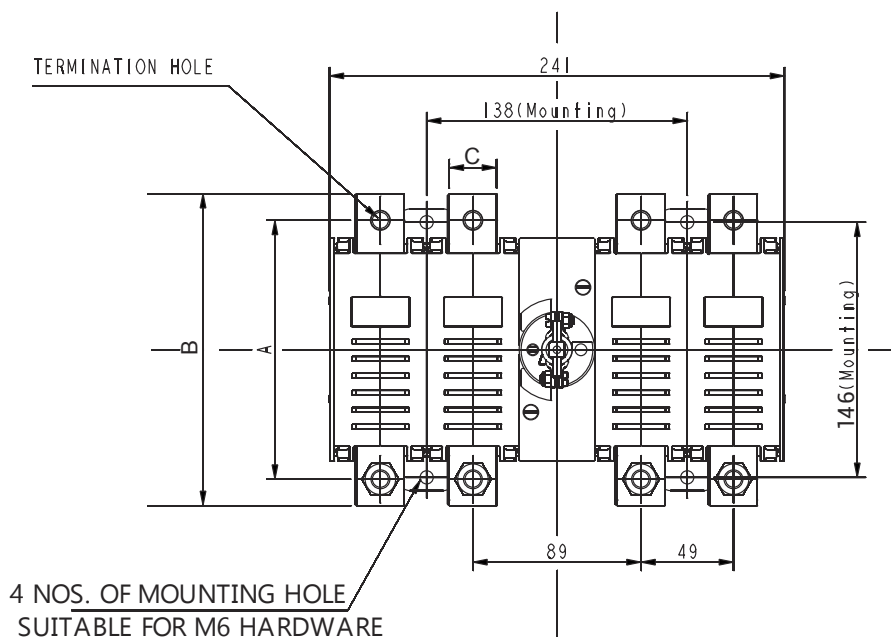
## CZ Bypass Switches Technical Specifications

			125A	160A	
<b>Model</b>			CZ-1	CZ-1	
No. of Poles			4	4	
Conventional enclosed thermal current (I <sub>the</sub> )	40°C	A	125	160	
	50°C	A	125	160	
Rated Operational Voltage(U <sub>e</sub> , Max)		Vac	440	440	
Rated Impulse withstand voltage (U <sub>imp</sub> )		kV	12	12	
Rated Insulation Voltage (U <sub>i</sub> )		Vac	1250	1250	
Rated Operational Current (I <sub>e</sub> )		AC-23A at 440Vac	A	125	160
Rated Operational Current Per Pole in series; DC-21B	220Vdc	A	125/1	160/1	
	440Vdc	A	125/2	160/2	
Rated Short Time Withstand Current (I <sub>cw</sub> , rms)	1 Sec	kA	8	8	
	0.15 sec	kA	15	15	
	0.25 Sec	kA	15	15	
Rated Short Circuit Making Capacity (I <sub>cm</sub> , Peak)		kA	30	30	
Rated Conditional Short-Circuit Current (I <sub>cm</sub> , Peak)		kA	100	100	
Rated Breaking Capacity		AC-23A at 440 Vac	kA	1.0	1.3
Rated Operational Power, AC-23A		At 415V	kW	75	90
Power Loss/Pole		W	1.8	2.9	
Operational Performance capability	Electrical	No of operations	2000	2000	
	Mechanical	No of operations	20000	20000	
Operating Torque		N-m	18	18	
Maximum Termination Capacity	Lug Size	mm <sup>2</sup>	2X185	2X185	
	Al Link Size	mm <sup>2</sup>	2X35X10	2X35X10	
Terminal Bolt size			M10	M10	
Terminal Tightening Torque		N-m	20	20	
Weight		4P switch	kg	7.5	7.5



200A	250A	315A	315A	400A	630A
CZ-1	CZ-1	CZ-1	CZ-2	CZ-2	CZ-2
4	4	4	4	4	4
200	250	315	315	400	630
200	250	315	315	400	630
440	440	440	440	440	440
12	12	12	12	12	12
1250	1250	1250	1250	1250	1250
200	250	315	315	400	630
200/1	250/1	315/1	315/1	400/1	630/1
200/2	250/2	315/2	315/2	315/2	630/2
8	8	10	16	16	20
15	15	15	31	31	38
15	15	15	24	24	36
30	30	30	45	45	45
100	100	100	100	100	100
1.6	2.0	2.5	2.5	3.2	5.0
110	132	160	160	200	355
4.6	7.1	11.33	7.5	12.2	23.8
2000	2000	2000	2000	2000	2000
20000	20000	20000	20000	20000	20000
18	18	18	36	36	40
2X185	2X185	2X240	2X300	2X300	2X300
2X35X10	2X35X10	2X35X10	2X50X12	2X50X12	2X50X12
M10	M10	M12	M12	M12	M12
20	20	20	27	27	27
7.5	7.5	7.5	18.6	18.6	20.1

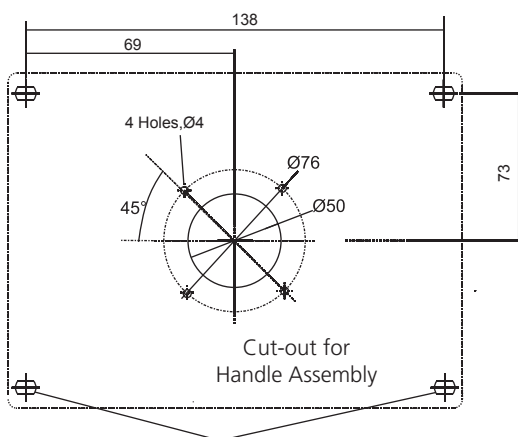
## Overall Dimensions - BYPASS SWITCH CZ1 125/160/200/250/315A



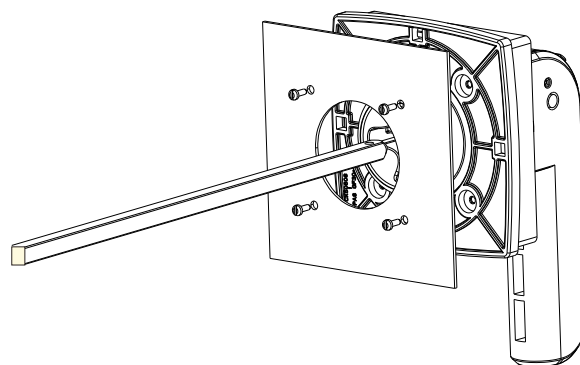
Rating(A)	A	B	C	Termination Hardware
125/250	137	161	25	M10
315	150	180	35	M12

## Overall Dimensions - BYPASS SWITCH CZ1 125/160 /200/315A

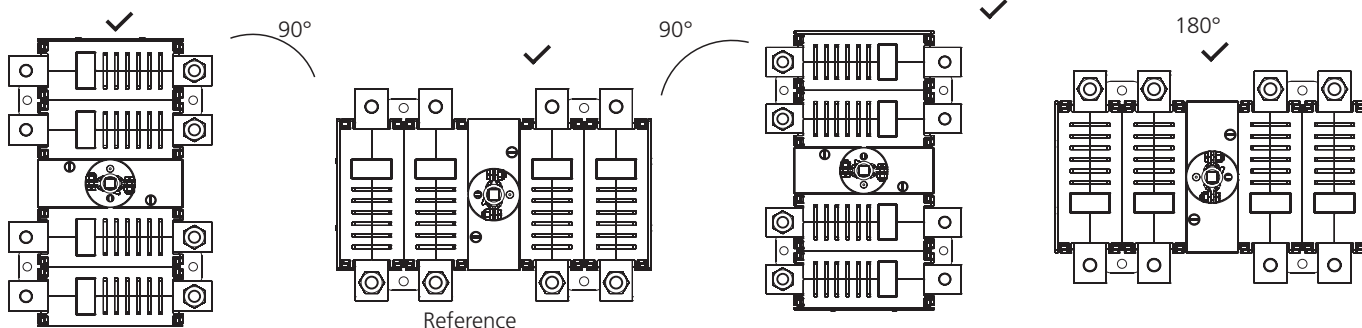
### Panel Cutout



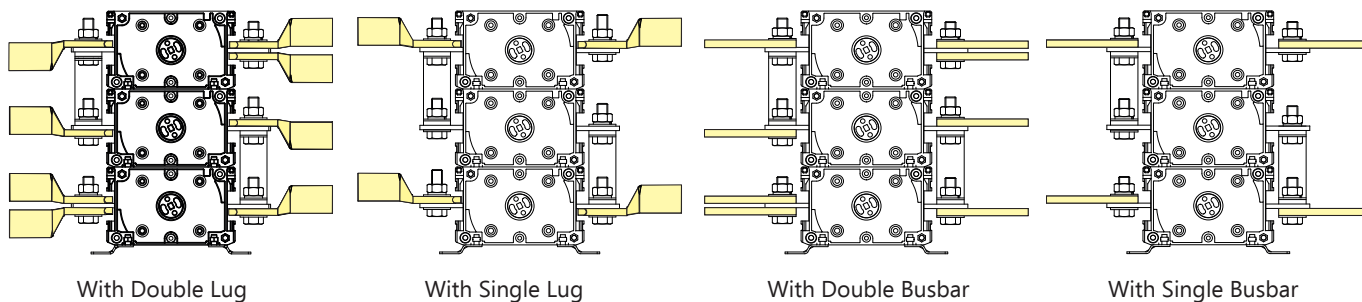
Bypass Switch Mounting Holes



### Mounting Orientation



### RECOMMENDED TERMINATION ARRANGEMENTS:



With Double Lug

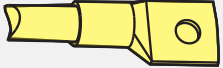

With Single Lug

With Double Busbar

With Single Busbar

## Accessories & Features - BYPASS SWITCH CZ1 125/160 /200/315A

### Termination Capacity

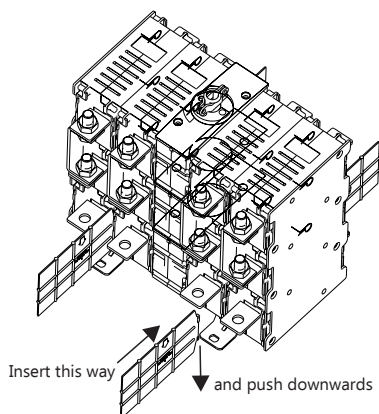
		125/160/200/250A	315A
 	<b>TERMINATION CAPACITY AS PER STANDARD</b>	CABLE WITH LUG 185 mm <sup>2</sup>	240 mm <sup>2</sup>
	<b>MAXIMUM TERMINATION CAPACITY</b>	CABLE WITH LUG	2X185 mm <sup>2</sup>
BUSBAR		2X35mmX10mm	2X35mmX10mm
<b>TIGHTENING TORQUE</b>		MAX 20 N-m AT TERMINATION	MAX 20 N-m AT TERMINATION

Note: For Aluminum cable, Tin plated lugs are recommended.

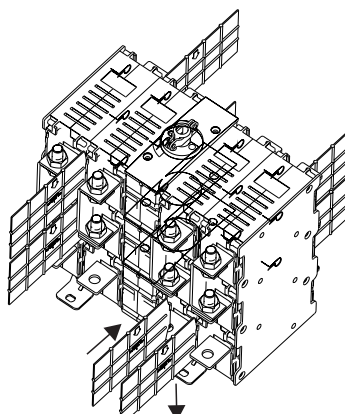
Termination bolt head should be on bottom side as shown in figures

\*:Higher length (M10 x 40 for 250A; M12 x 40 for 315A) of termination bolt required to connect 2 busbar of 10mm.

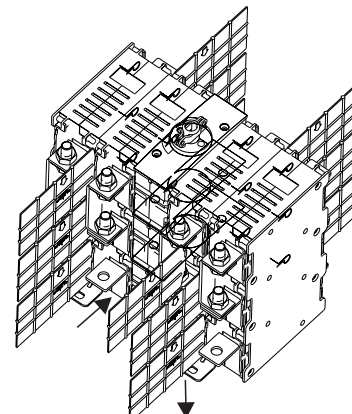
### Phase Barrier fitment



Step 1- for insertion in stage I

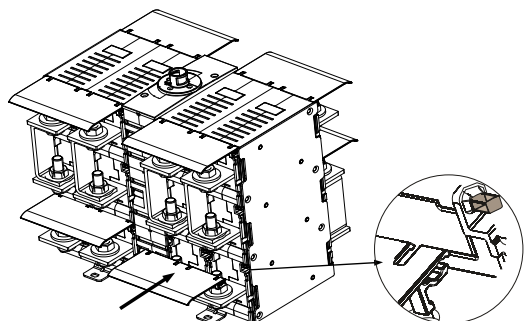


Step 2- for insertion in stage II

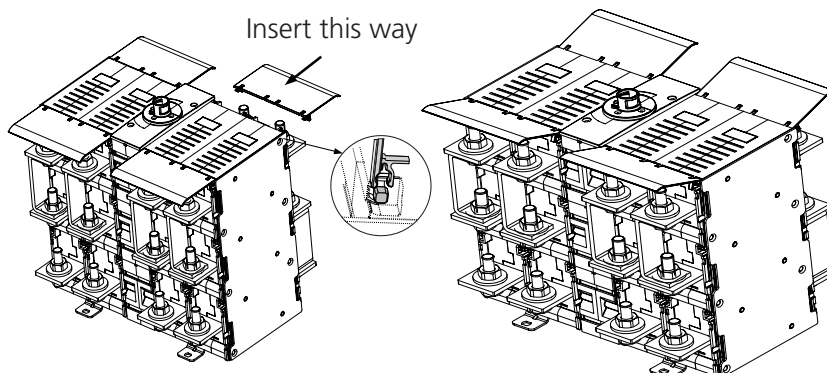


Step 3- for insertion in stage III

### Source Separator fitment



### Terminal Shroud fitment



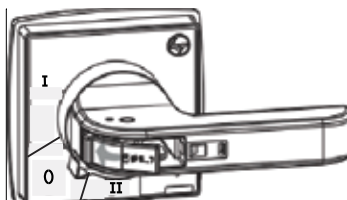
Swivelling Terminal Shrouds with locking at 0° and 90° angles

Note: It is recommended to use Phase barrier, Source separator & Terminal shrouds

### Handle Features - Padlock

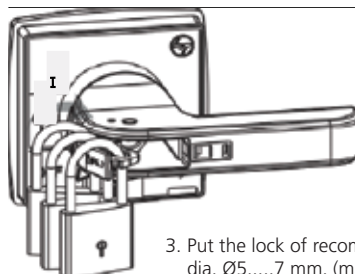
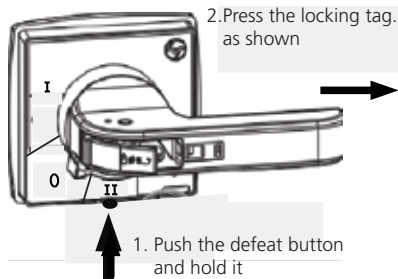
(For direct and extended handle)

Padlock without Door Interlock



1. Press the locking tag as shown.

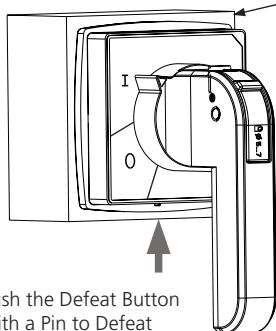
Padlock with Door Interlock



3. Put the lock of recommended dia. Ø5.....7 mm. (max 3 Nos.)

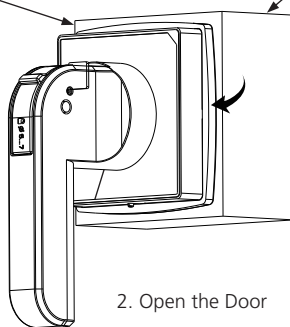
### Handle Feature - Interlock Defeat in on State

Defeat in On State

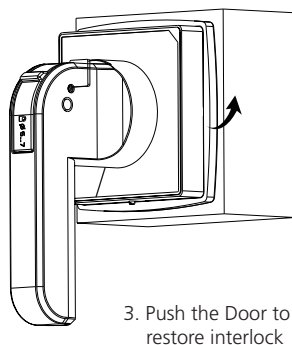


Panel Door

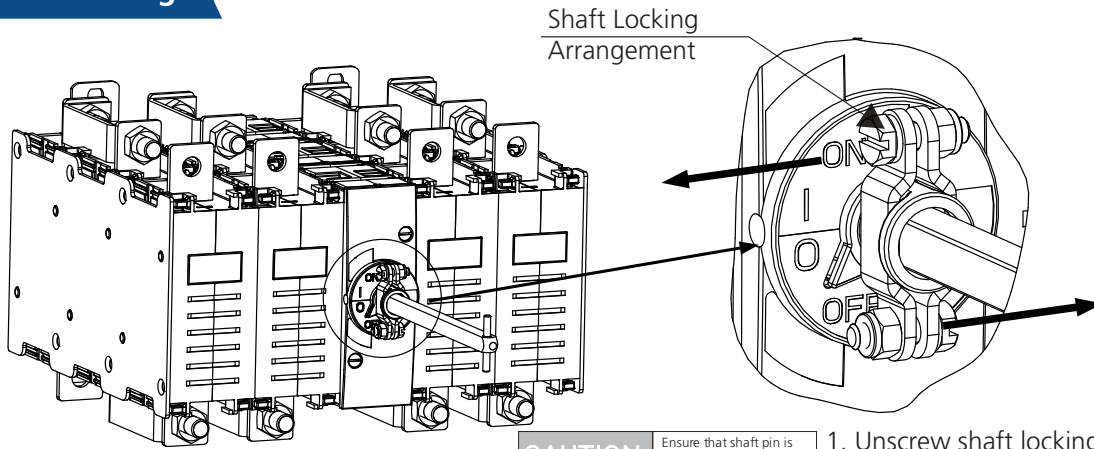
Enclosure or Panel



Auto Restoration



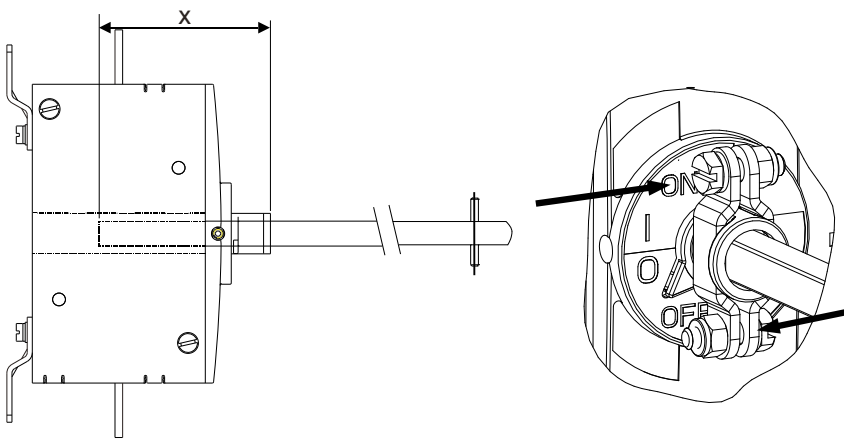
### Shaft Locking



**CAUTION** Ensure that shaft pin is vertical for any mounting orientation of the switch

1. Unscrew shaft locking arrangement and insert shaft as per required length.

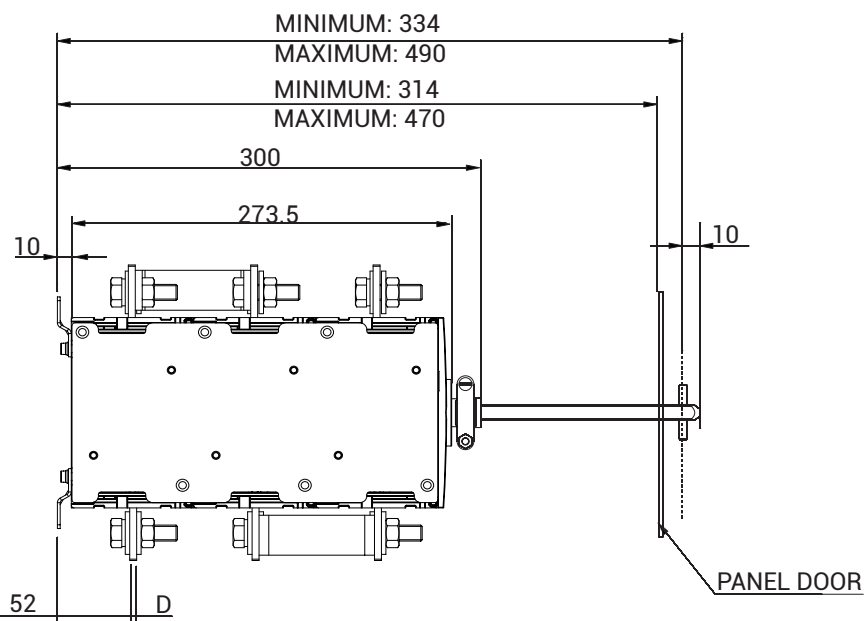
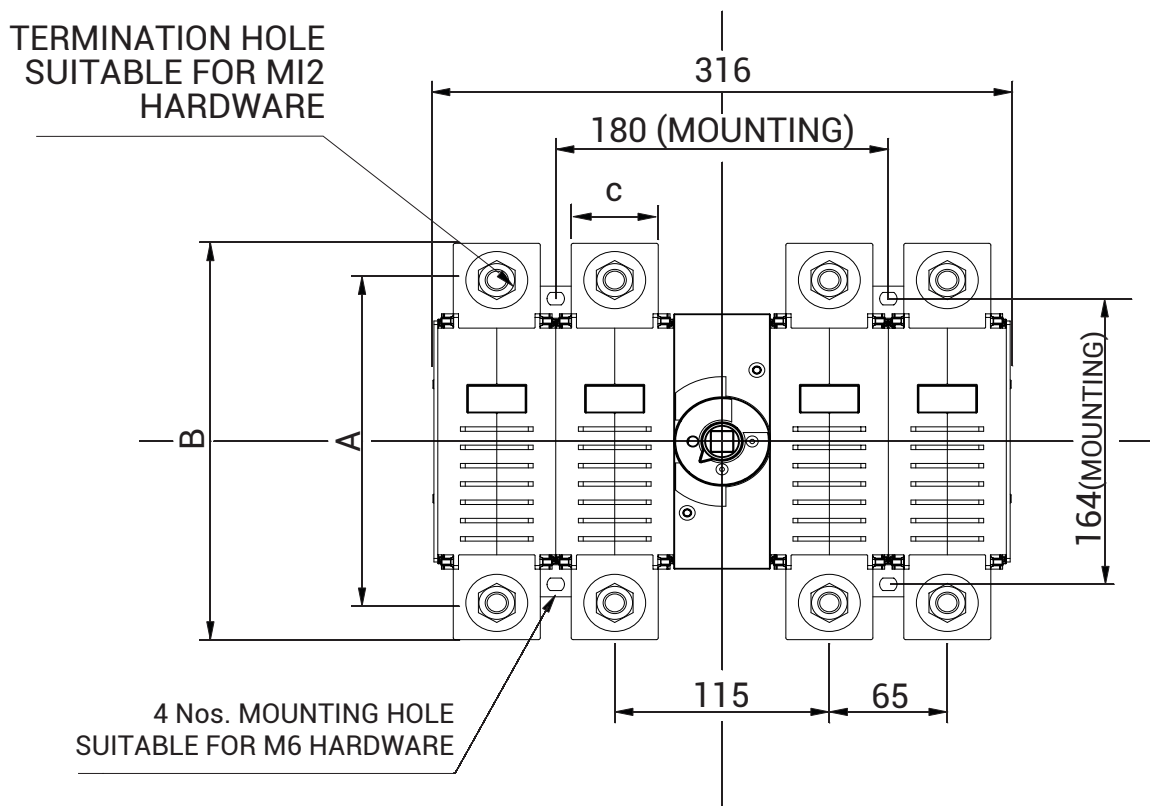
### Shaft Adjustability



2. Adjust/Cut the shaft as per panel requirement. (Min. Engagement Length,  $X=55\text{mm}$  Inside Mechanism)

3. Tighten the Nut-Bolts. (Tighten Torque:  $1.6\text{ N}\cdot\text{m}$ )

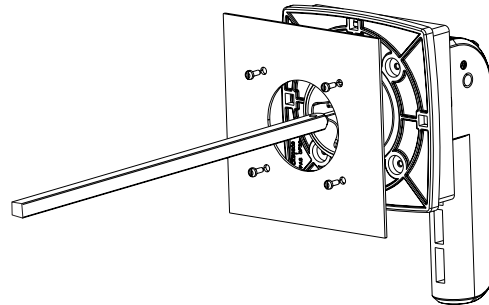
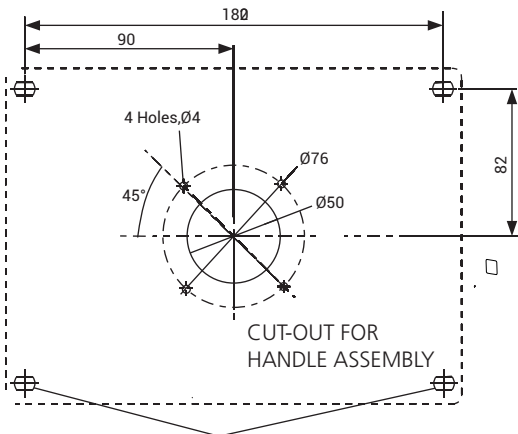
## Overall Dimensions - BYPASS SWITCH CZ2 315/400/630A



Rating(A)	A	B	C	D
315/400	181	206	32	4
630	184	222	45	5

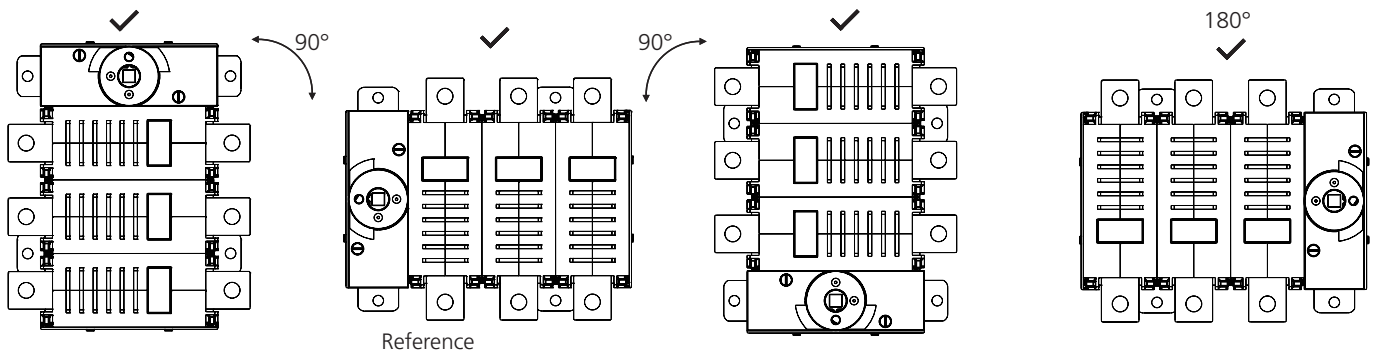
## Overall Dimensions - BYPASS SWITCH CZ2 315/400/630A

### Panel Cutout

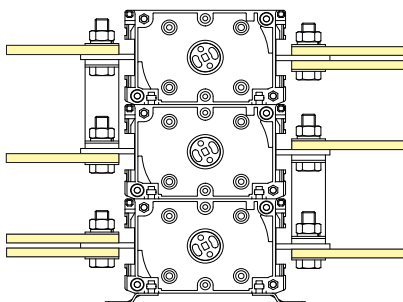


Bypass Switch Mounting Holes

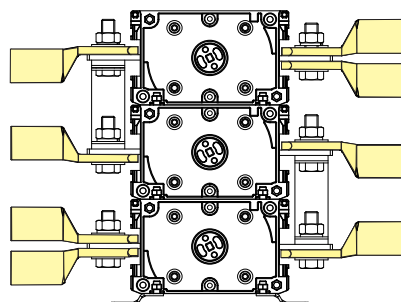
### Mounting Orientation



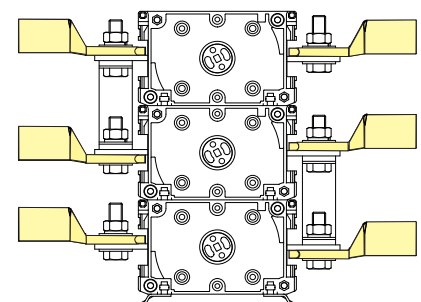
### Recommended Termination Arrangements:



With Double Link





With Double Lugs



With Single Lug

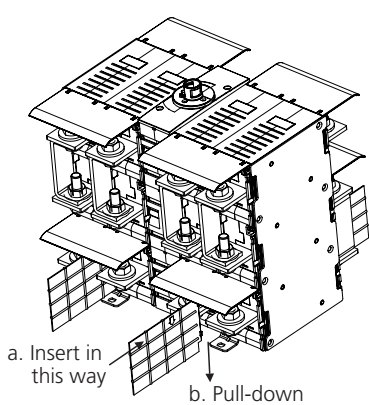


**TERMINATION CAPACITY**

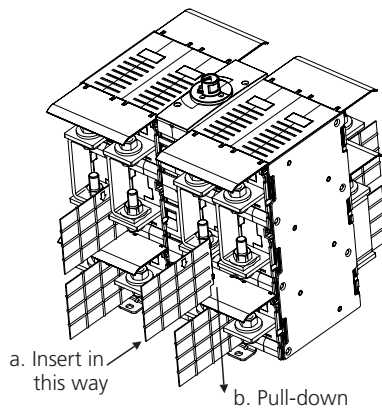
			315/400A	630A
	<b>TERMINATION CAPACITY AS PER STANDARD</b>	CABLE WITH LUG	2 X 150 mm <sup>2</sup>	2X300 mm <sup>2</sup>
		BUSBAR	2 X 25mm X 10mm	2 X 30mm X 12mm
	<b>MAXIMUM TERMINATION CAPACITY</b>	CABLE WITH LUG	2X300 mm <sup>2</sup>	2X300 mm <sup>2</sup>
		BUSBAR	2 X 50mm X 12mm	2 X 50mm X 12mm
<b>TIGHTENING TORQUE</b>			MAX 27 N-m AT TERMINATION	MAX 27 N-m AT TERMINATION

Note: For Aluminum cable, Tin plated lugs are recommended.  
 Termination bolt head should be on bottom side as shown in figures

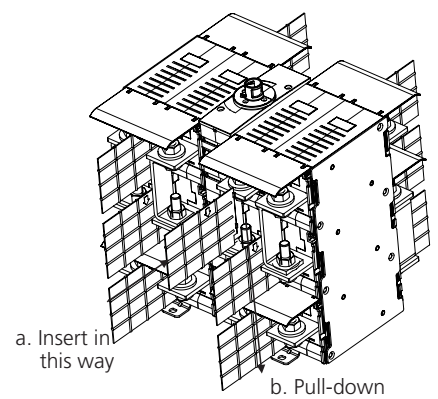
**Phase Barrier Fitment**



Step.1 - Insertion in stage-I



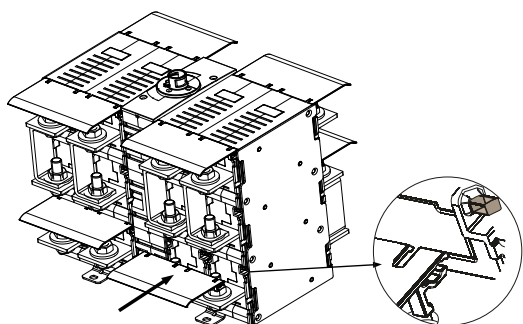
Step.2 - Insertion in stage-II



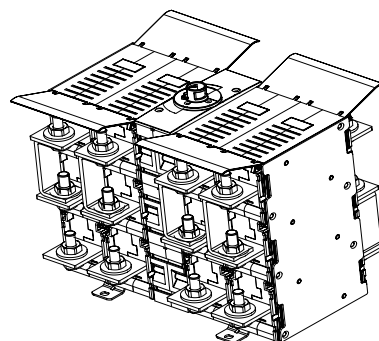
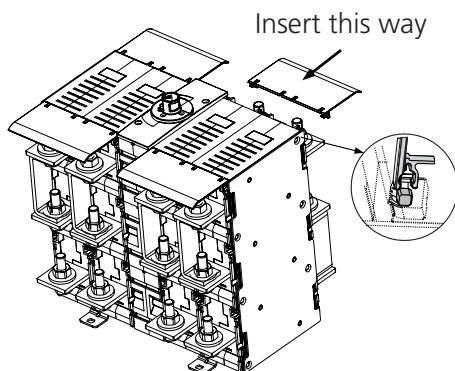
Step.3 - Insertion in stage-III

## Overall Dimensions - BYPASS SWITCH 315/400/630A

### Source Separator Fitment



### Terminal Shroud Fitment

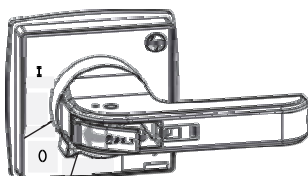


Swivelling Terminal Shrouds  
with locking at 0° and 90° angles

### Handle Features - Padlock

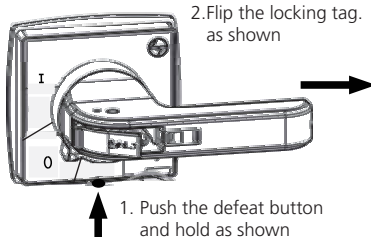
(For direct and extended handle)

Padlock without  
Door Interlock

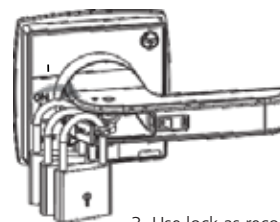


1. Flip the locking tag as shown.

Padlock with Door Interlock



1. Push the defeat button  
and hold as shown

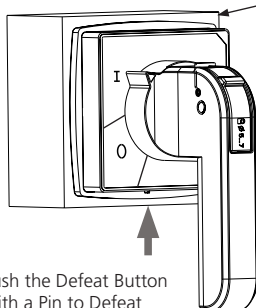


3. Use lock as recommended  
Ø5.....7 mm. (max 3 Nos.)

### Handle Feature - Interlock Defeat in on State

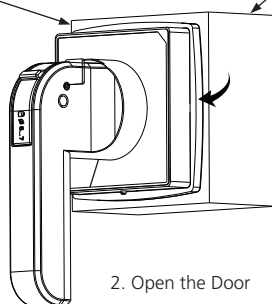
(For extended handle only)

Defeat in On State



1. Push the Defeat Button  
with a Pin to Defeat

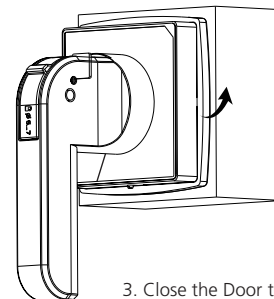
Panel Door



2. Open the Door

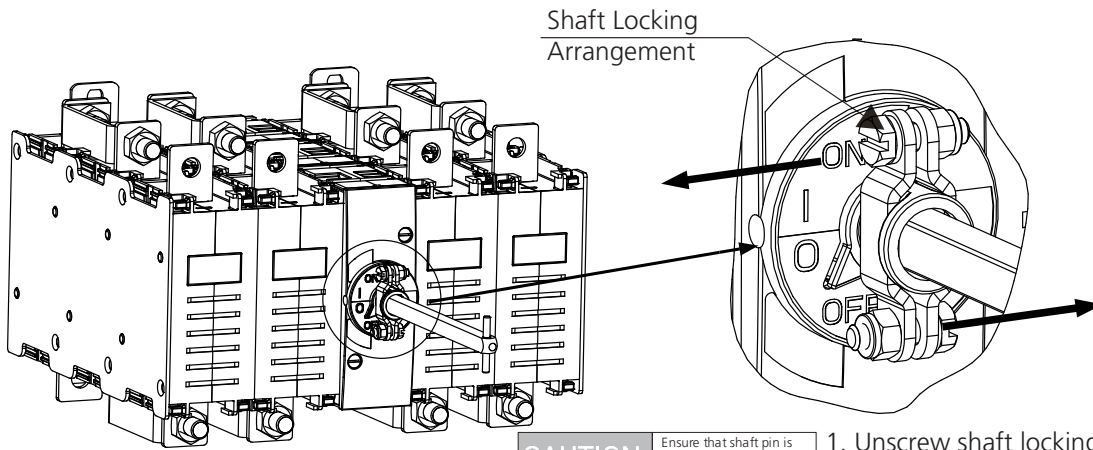
Enclosure or Panel

Auto Restoration



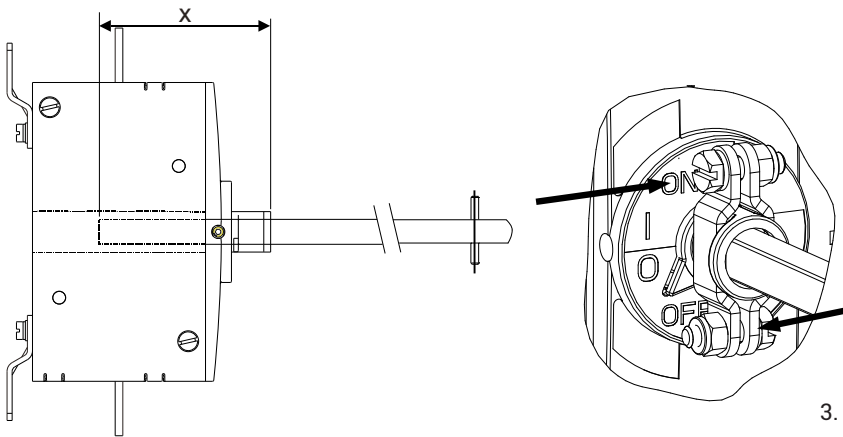
3. Close the Door to  
restore interlock

Shaft locking and adjustability



**CAUTION** Ensure that shaft pin is vertical for any mounting orientation of the switch

1. Unscrew shaft locking arrangement and insert shaft as per required length.



2. Adjust/Cut the shaft as per panel requirement. (Min. Engagement Length, X=60mm Inside Mechanism)

3. Tighten the Nut-Bolts. (Tighten Torque:1.6 N-m)

## Electrical Standard Products (ESP) Offices:

### HEAD OFFICE

L&T Electrical & Automation  
TC-II, Tower B, Prima Bay,  
Gate No. 5, Saki Vihar Road, Powai,  
**MUMBAI - 400072.**  
Tel: 022-67052874 / 2737 / 1156  
e-mail: cic@Lntebg.com

### BRANCH OFFICES

L&T Electrical & Automation  
C-201, The First Commercial Complex,  
B/S Keshavbaug Party Plot, Vastrapur,  
**Ahmedabad - 380015**  
Toll Free: 1800 233 5858 / 1800 200 5858  
e-mail: CIC@Lntebg.com

L&T Electrical & Automation  
Wework Central, #36 Infantry Road,  
**Bengaluru - 560 001**  
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