Shihlin Electric

AUTOMATIC TRANSFER SWITCHES

SHIHLIN ELECTRIC & ENGINEERING

Contents

Overview

XSTN is a three position automatic transfer switch. It can switch between two different power source immediately (or delay by a set of time) when receiving a switching signal, or it can switch to a neutral position where no power source is connected.

It is used in an emergency power supply system with operation voltage of AC380/400/415V, 50/60 Hz, and current of 16-5000A.

The product is comply with IEC60947-6-1.

Feature

- Reliable mechanical interlock: Unique structure, ensuring only one set of power source can be input at a time.
- Superior arc suppression performance: Eliminated all kinds of abnormal arc and shorten the duration, reduce contact consumption.
- Multi-piece main arc contact: Increase surface contact area and contact pressure, avoiding overheating or contact melting, increase contact lifespan.
- Simple structure with small volume: Reliable to use, low failure rate, easy installation, use and maintenance
- Fast switching time: Prompt switching time between main power source and backup power source. Switching time can also be set by user.

Type Designation

Model	Type	Frame Size	Design	Pole	Controller	Rated Current			Add-on
XST	N	63 125 250 500 800 1250 2500 5000	H	2 3 4	K5: XST-5 K6: XST-6	16 20 25 32 40 50 63 80 100	125 160 200 225 250 350 400 500 630	800 1000 1250 1600 2000 2500 3200 4000 5000	Blank: none H: communication + current monitor

Note:

1. 2 pole only suitable for frame size below 500AF(including)
2. Add-on can only be choose for XST-6 type

ATS Specification

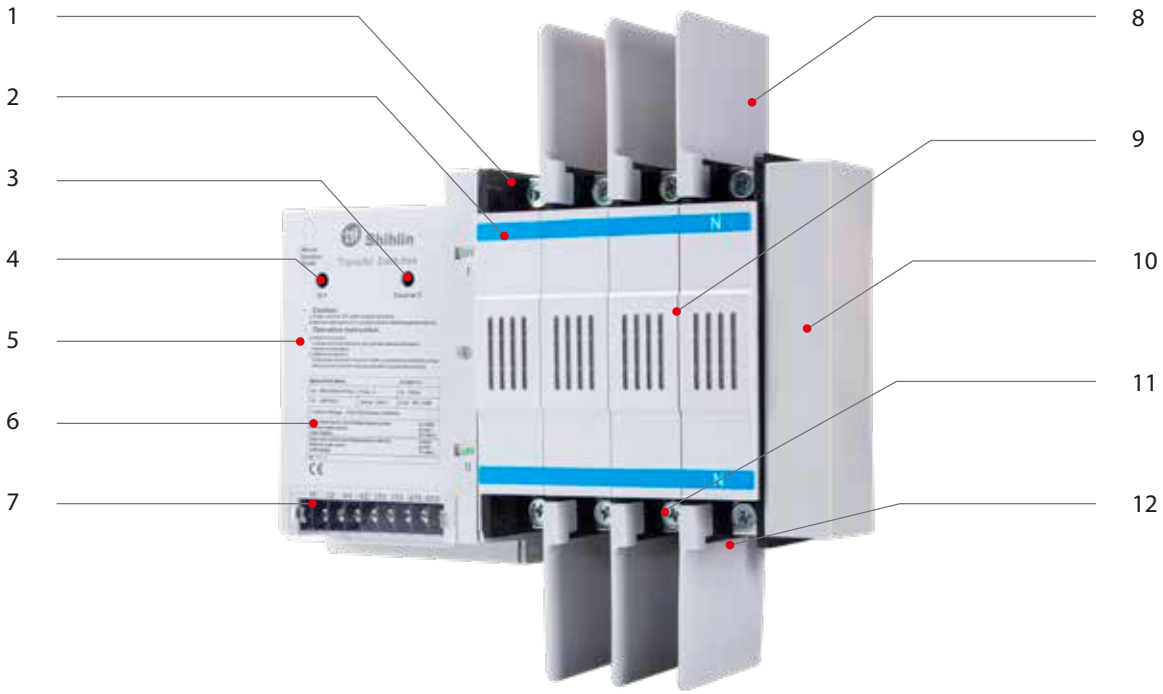
Frame Size		63			125			250			500		
Insulation Voltage, Ui		AC800V											
Rated Impulse Withstand Voltage, Uimp		12kV											
Rated Voltage, Ue		2P: AC220 / 230 / 240V 3/4P: AC380 / 400 / 415V											
Control Voltage , Us		AC220 / 230 / 240V, 50/60Hz											
Rated Current, In (A)		16, 20 , 25, 32, 40, 50, 63			80, 100, 125			160, 200, 225, 250			350, 400, 500		
Pole		2	3	4	2	3	4	2	3	4	2	3	4
Operation current (A)	AC220 / 230 / 240V	3	3	4	3	3	4	5	5	5	5	5	6
Tripping current (A)	AC220 / 230 / 240V	1									1.4		
Rated condition short circuit current (fuse)		100kA			100kA			120kA			120kA		
Rated condition short circuit current (breaker)		50kA			50kA			65kA			65kA		
Making and Breaking Capacity		AC-33B: Making & Breaking: 10Ie, cosφ=0.35 (Ie≤100A, cosφ=0.45) DC-33B: Making & Breaking: 4Ie, L/R=2.5ms											
Switching time	I -> II	≤1s											
	II -> I												
Endurance		Electrical: 6000 Mechanical: 20000											
Switching frequency		120 times / hr											
Auxiliary switch		2NO2NC on both source AC110V, 5A AC220V, 3A DC220V, 0.2A											

ATS Specification

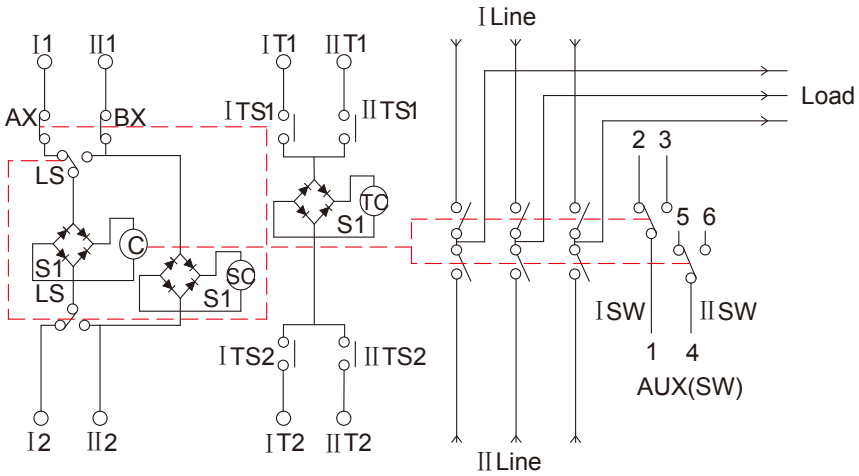
Frame Size		800		1250		2500		5000	
Insulation Voltage, Ui		AC800V							
Rated Impulse Withstand Voltage, Uimp		12kV		8kV					
Rated Voltage, Ue		3/4P: AC380 / 400 / 415V							
Control Voltage , Us		AC220 / 230 / 240V, 50/60Hz							
Rated Current, In (A)		630, 800		1000, 1250		1600, 2000, 2500		3200, 4000, 5000	
Pole		3	4	3	4	3	4	3	4
Operation current (A)	AC220 / 230 / 240V	6	6	6	8	10	12	18	20
Tripping current (A)	AC220 / 230 / 240V	2							
Rated condition short circuit current (fuse)		120kA		120kA		–		120kA	
Rated condition short circuit current (breaker)		50kA		50kA		50kA		–	
Making and Breaking Capacity		AC-33A: Making & Breaking: 10Ie, cosφ=0.35 (Ie≤100A, cosφ=0.45) (5000A) AC-33B: Making & Breaking: 10Ie, cosφ=0.35 (Ie≤100A, cosφ=0.45) DC-33B: Making & Breaking: 4Ie, L/R=2.5ms							
Switching time	I -> II	≤1s							
	II -> I								
Endurance		Electrical: 6000 Mechanical: 20000 (10000 for 1250AF and above)							
Switching frequency		120 times / hr							
Auxiliary switch		2NO2NC on both source AC110V, 5A AC220V, 3A DC220V, 0.2A							

Appearance

1. Source I terminal
2. Power indicator
3. Selection button
4. Tripping button
5. Manual operation handle axis
6. Nameplate
7. Control circuit terminal
8. Insulation barrier
9. Arc chamber cover
10. Auxiliary contact cover
11. Source II terminal
12. Load terminal (under Source II terminal)



Internal Wiring Diagram



C = Coil
SC = Selection coil
TC = Selection coil
S1 = Rectifier
LS = Line switch

ITS1, ITS2 = Source I breaking terminal
IITS1, IITS2 = Source II breaking terminal
AX, BX = Control
Auxiliary switch

I1--I2 = Source I making terminal
II1--II2 = Source II making terminal
IT1--IT2 = Source I tripping terminal
IIT1--IIT2 = Source II tripping terminal

I1	I2	II1	II2	IT1	IT2	IIT1	IIT2

◇ I1/ I2: Transferring to position I input signal terminal.
◇ II1/ II2: Transferring to position II input signal terminal.
◇ IT1/ IT2: Position I transferring to position 0 input signal terminal.
◇ IIT1/ IIT2: Position II transferring to position 0 input signal terminal.
◆ Rated voltage AC220V/230V/240V.

ATS Specification

XST-5 and XST-6 controllers are usable with the XSTN series three-section PC-class 2P/3P/4P dual power transfer switch, with frame size from 63AF to 5000AF with the functions of automatic transfer in case of occurrence of power faults such as under-voltage, over-voltage fault, under-frequency fault, over-frequency fault, unbalance phase voltage fault and inverse sequence fault. Current measurement or communication function can be add-on for current measurement and remote communication purpose to ease up management.

Model Description

XST - □ / □ / □

Product	Type	Poles	Optional functions
XST	5: Standard	2 : 2P 3 : 3P 4 : 4P	Null: without accessory
	6: Multifunction		Null: without accessory H: Current measurement + communication

Note:
1. The current measurement should be equipped with different current transformer according to different rated current of product.
2. 2P/4P can be shared, 3P does not.

Working Conditions

Controller	XST-5	XST-6
Rated operation voltage (V)	AC380/220、AC400/230、AC415/240	
Rated operation frequency (Hz)	50/60	
Operation voltage (V)	165~300(Phase voltage)	
Operation temperature (°C)	-25~60	

XST-5 controller

XST-6 controller

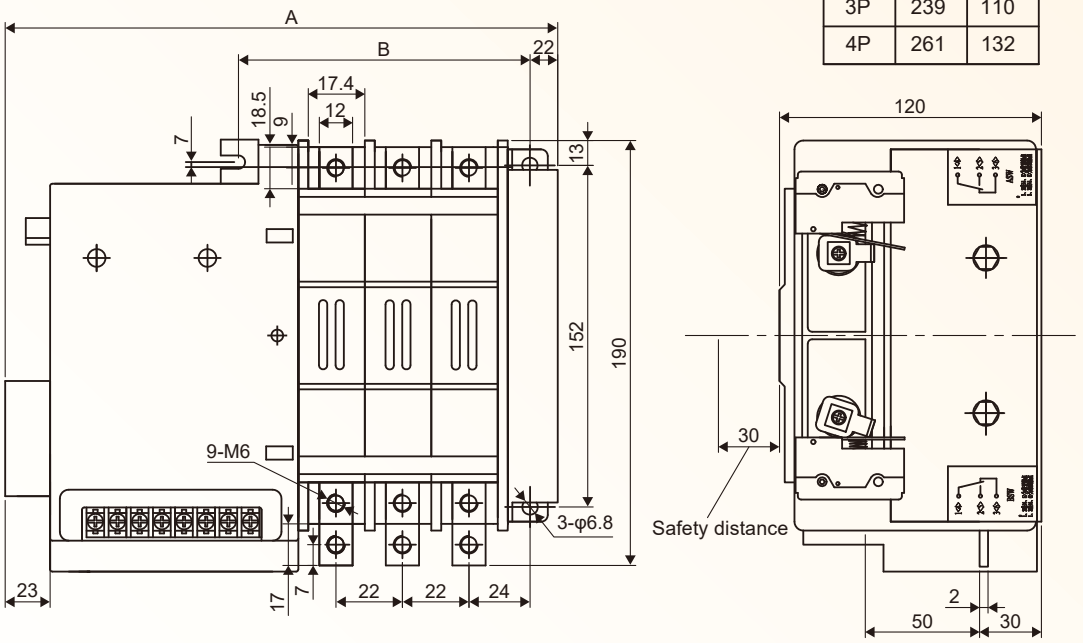
Function List

Main functions			XST-6	XST-5
Power supply type		Mains - Mains	■	■
		Mains - Generator	■	■
Operation mode		Automatic	■	■
		Manual	■	■
Work mode (Automatic)		Automatic Back	■	■
		Manual Back	■	■
Function	Monitor	Voltage	■	■
		Voltage unbalance	■	
		Phase sequence	■	
		Frequency	■	
		Current	□	
	Transfer	Voltage-loss (open-phase)	■	■
		Under-voltage	■	■
		Over-voltage	■	■
		Under-frequency	■	
		Over-frequency	■	
		Voltage unbalance	■	
		Inverse sequence	■	
	Delay Time	Switch delay T1	■	■
		0 position stay delay T2	■	*
		Back switch delay T3	■	■
		R-power available delayT4	■	*
		Generator stop delay T5	■	*
	Input	Remote Control to I	■	
		Remote Control to II	■	
		Remote Control to O	■	
		Fire control	■	■
	Output	Generator control	■	■
		Load control	■	
		Programmable output	■	■
	Other	Switching record	■	
		Fault record	■	
		Alarm	■	■
		Communication	□	
		System time	■	
		Password	■	

■: Standard function □: Optional function *: fixed time

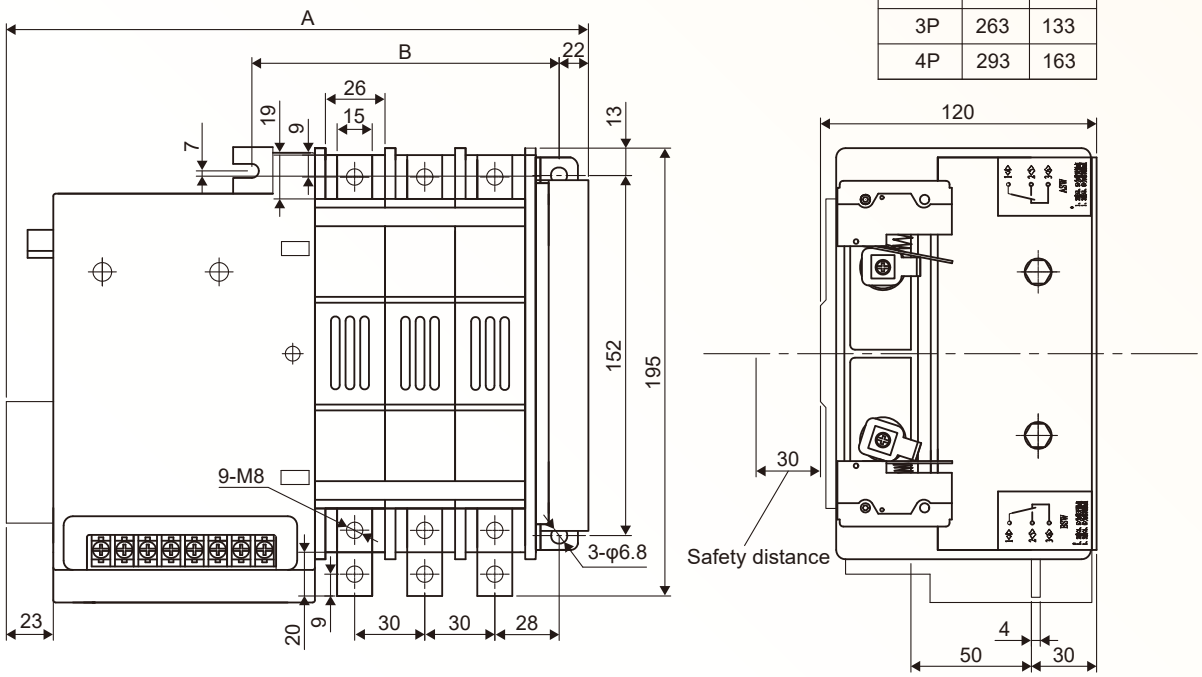
Dimension

16-63A	A	B
2P	217	88
3P	239	110
4P	261	132



XSTN 16-63A

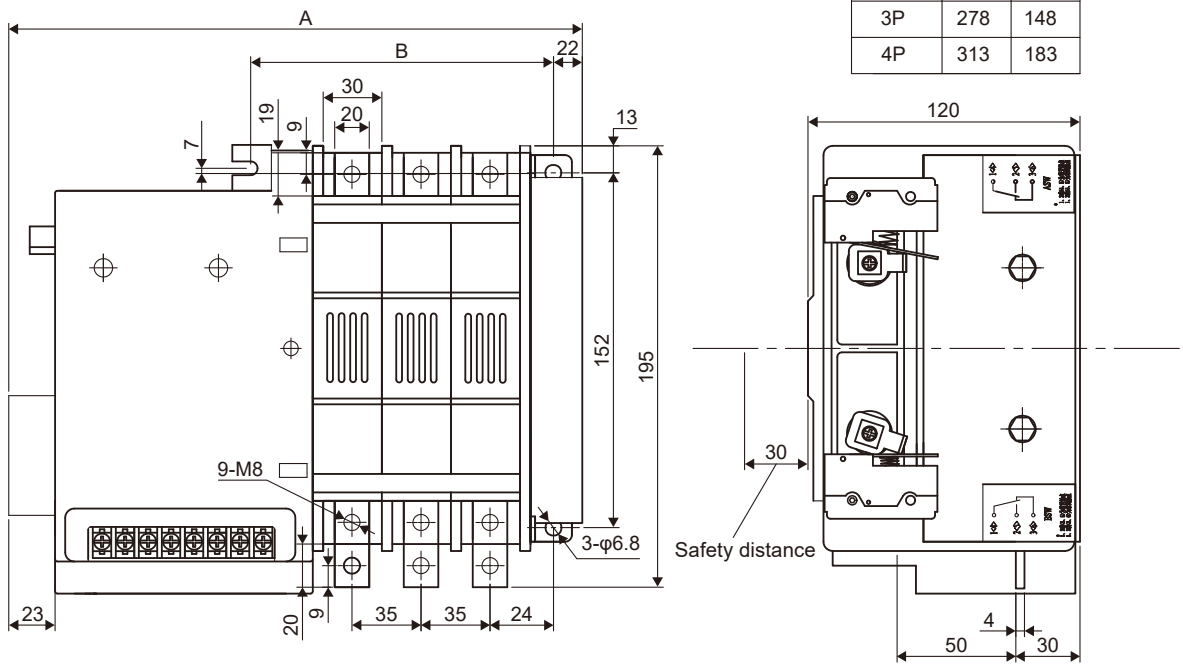
80-125A	A	B
2P	233	103
3P	263	133
4P	293	163



XSTN 80-125A

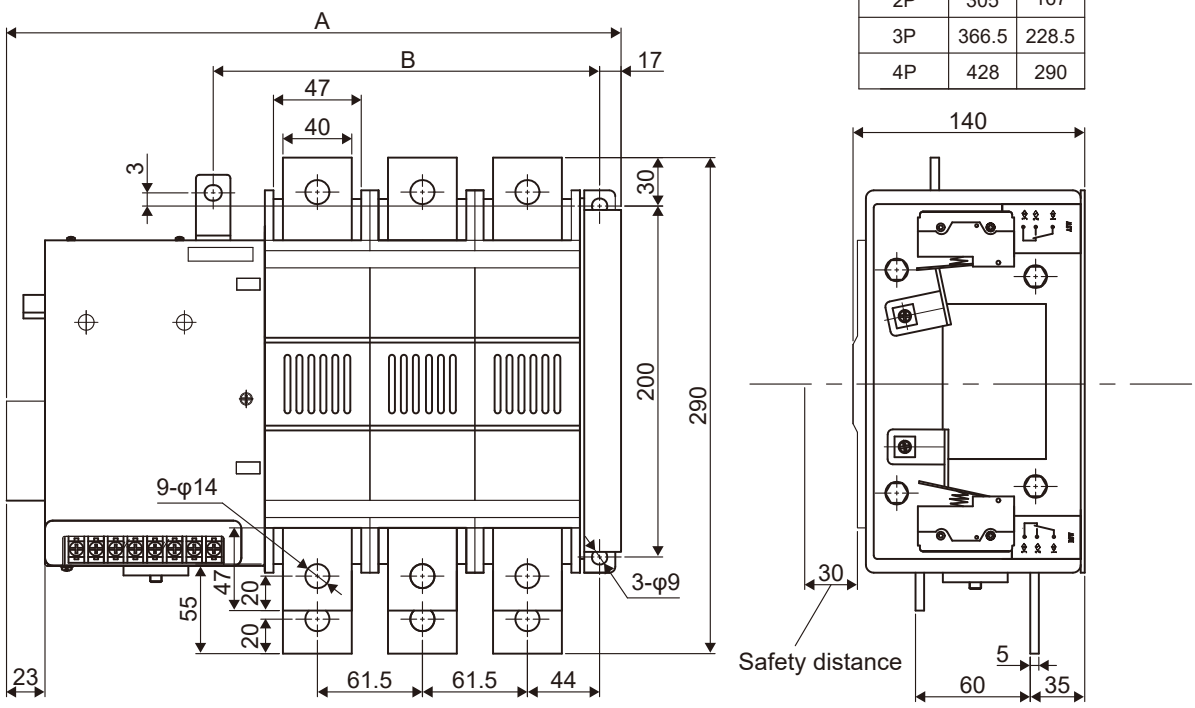
Dimension

160-250A	A	B
2P	243	113
3P	278	148
4P	313	183



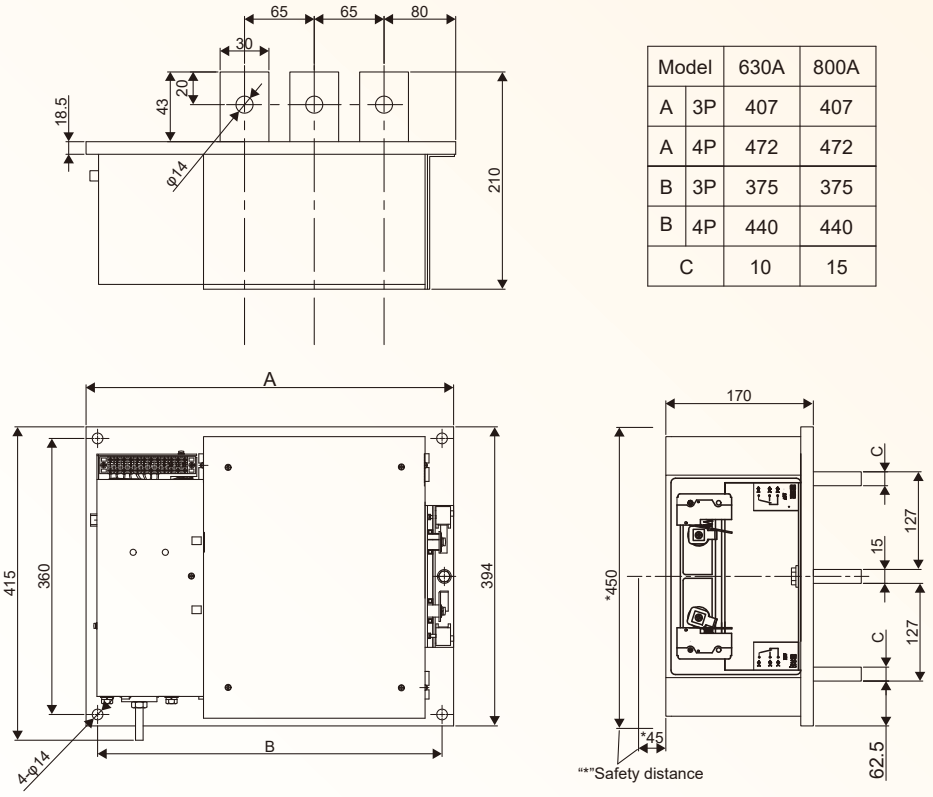
XSTN 160-250A

350-500A	A	B
2P	305	167
3P	366.5	228.5
4P	428	290



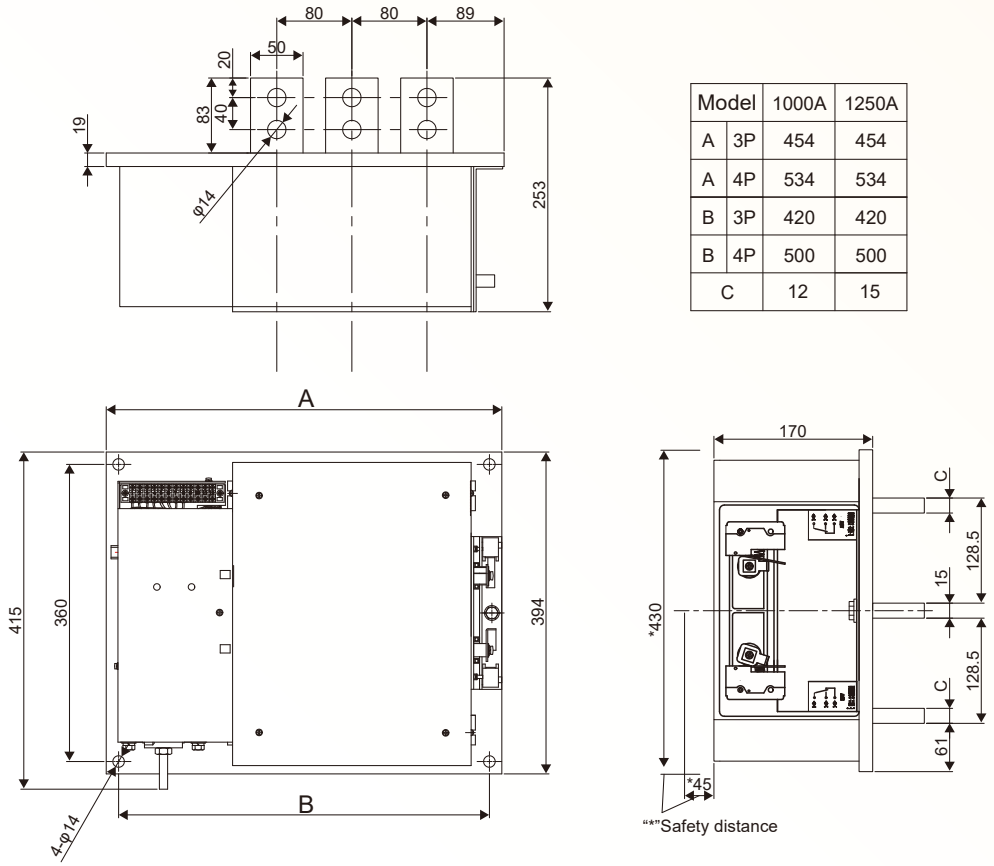
XSTN 350-500A

Dimension



Model		630A	800A
A	3P	407	407
A	4P	472	472
B	3P	375	375
B	4P	440	440
C		10	15

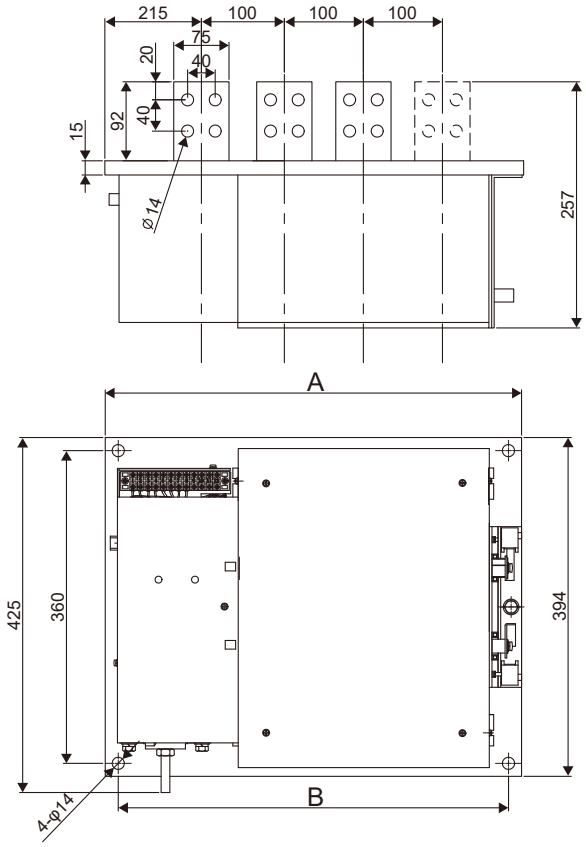
XSTN 630-800A



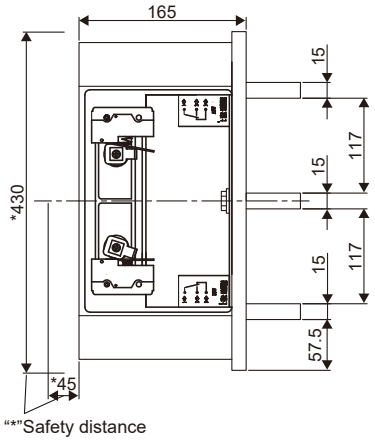
Model		1000A	1250A
A	3P	454	454
A	4P	534	534
B	3P	420	420
B	4P	500	500
C		12	15

XSTN 1000-1250A

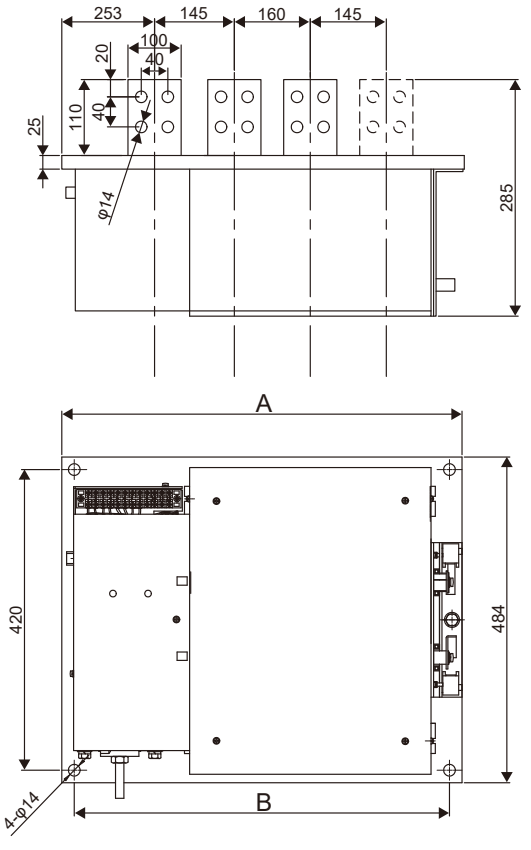
Dimension



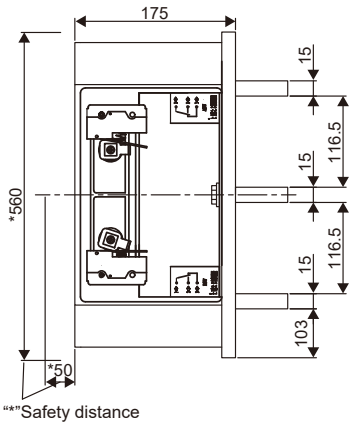
Model	A	B
3P	515	480
4P	615	580



XSTN 1600A

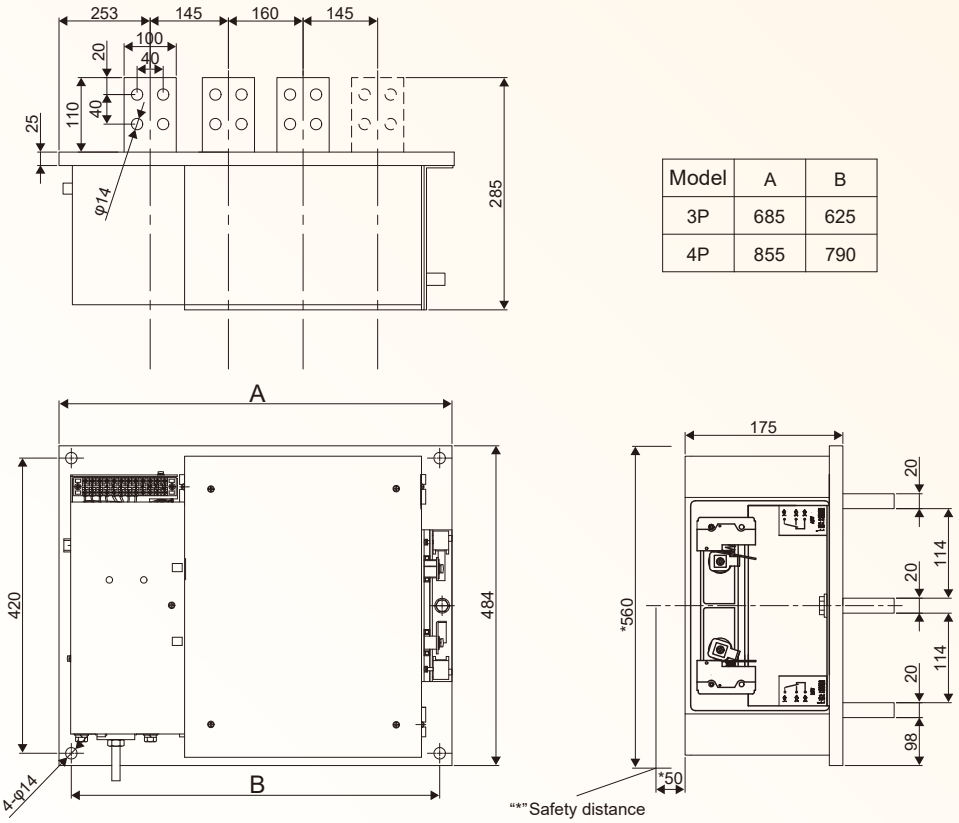


Model	A	B
3P	685	625
4P	855	790



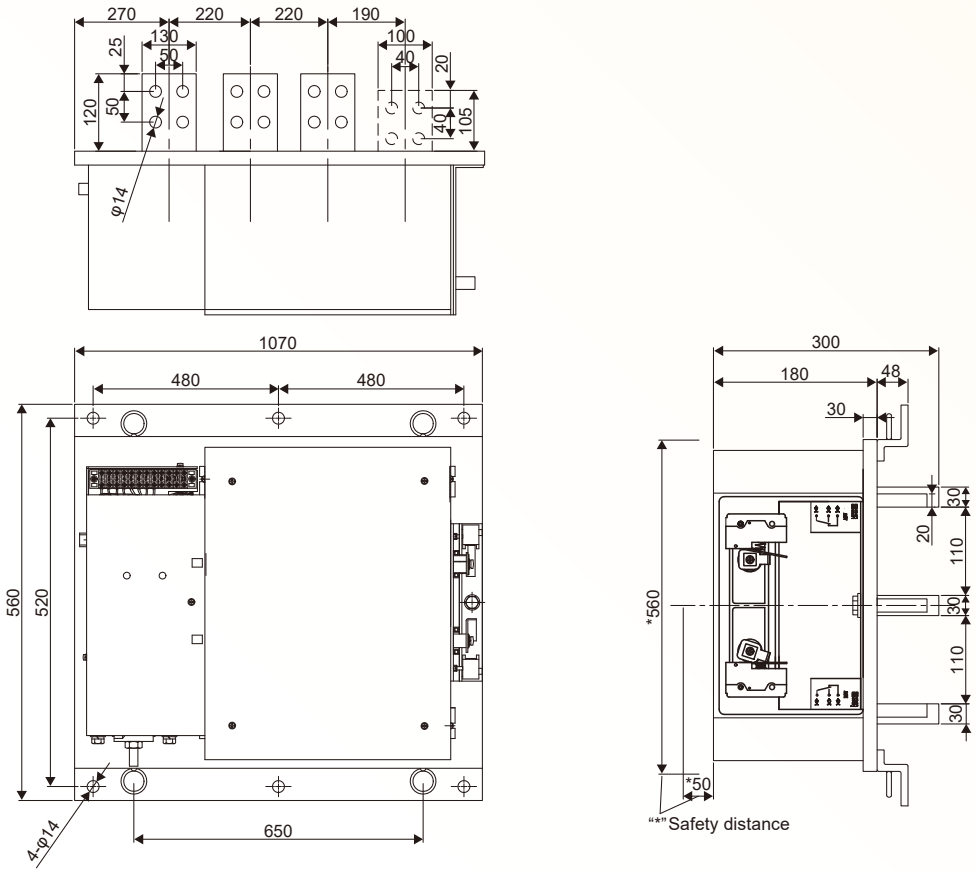
XSTN 2000A

Dimension



Model	A	B
3P	685	625
4P	855	790

XSTN 2500A



XSTN 3200-5000A

Installation Precautions

1. Altitude below 2000m
2. Ambient temperature: -25°C ~ +60°C, cannot exceed average of 35°C in 24 hours.
3. Atmospheric conditions: Relative humidity could not exceed 50% when the surrounding temperature is +55°C. For lower temperature, the relative humidity can be higher.
4. Pollution Degree: 3
5. Installation category: III
6. Installation conditions: Vertical or horizontal install in panel.

Maintenance, checking and storing

1. Before maintenance and checking, the power must be cut-off and only be done by professional personnel.
2. To ensure the breaker is at good condition, the first maintenance and checking should be done within half year after installation and must be done once a year after it. In harsh installation environment, the frequency of maintenance and checking should increase.
3. Breaker should be installed in environment listed above and should have dustproof, waterproof and anti-bump measures.
4. Maintenance checking items include:
   a. Cleaning dust and dirt in time to avoid product malfunction.
   b. Check the electrical contact parts for deformation, clean the metal particles and burning marks on contact surface and surrounding.
   c. Rust, acidification and dust on contact surface may cause poor conduction, please manual operating several times, measure contact resistance if needed.
   d. If the breaker is slightly damp or not being use for a long time, it must be dry before use. After cleaning the dust and dirt, use a 500V mega-ohm meter to measure between terminals, electrical contact parts and floor, the insulation resistance should be > 10MΩ in order to be use.
5. Other checking method is listed in table 1.

Maintenance, checking and storing

Table 1: Checking and trouble shooting

Checking items	Check point	Trouble shooting
Visual inspection	1. Whether the main circuit connecting wires have obvious discoloration. 2. Whether there is dust or metal particles on contact surface and surrounding.	1. Cut-off all power and check with a multimeter. 2. The silver plating layer on the contact surface is discolored due to oxidation, but does not affect performance . 3. Clean the dust or metal particles on contact surface and surrounding.
Manual operation checking	Manually operate the handle 3 to 5 times to make sure the mechanism is flexible and smooth.	If the mechanism is being stuck, put 2 to 3 drops of ISO No.8 oil or few drops of No. 3 white lithium base oil on places such as operation axis, sliding bar and other moving parts, then try another 3 to 5 times.
Electric operation checking	Following the operation procedure of secondary wiring circuit or controller, repeat 3 electrical operations and see if the product is working normally.	Frequently electric operation failure reason: 1. Internal coil being burned. 2. Insufficient battery capacity when using DC operation. 3. Wiring length for secondary wiring circuit is too long or wire cross section to small, causing circuit voltage to drop. 4. Loose wiring of internal control switch or switching failure. 5. Loose wiring of secondary wiring circuit, relay contact failure or controller failure.
Temperature rise checking	If there are any abnormal temperature rising, locate the position. Cut off all the power and use a multimeter to check and compare.	Frequently temperature rise reason: 1. Looseness of wiring screw. 2. Contact wear or burned, resulting in reduced contact pressure. 3. Dirt on the surface of the contact. 4. Looseness of contact movement mechanism.

If the trouble shooting listed above does not work, please contact our company.

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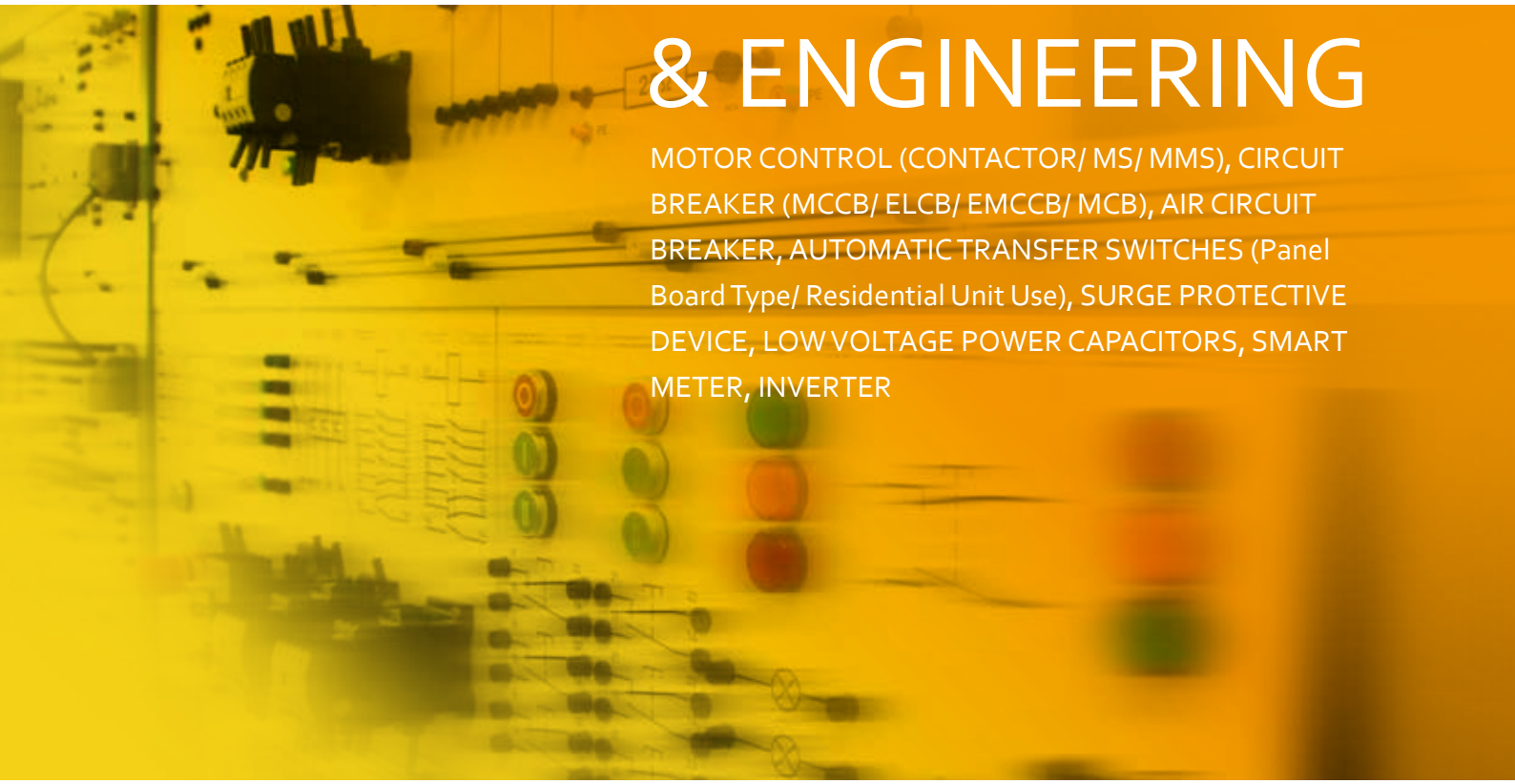

& ENGINEERING

MOTOR CONTROL (CONTACTOR/ MS/ MMS), CIRCUIT BREAKER (MCCB/ ELCB/ EMCCB/ MCB), AIR CIRCUIT BREAKER, AUTOMATIC TRANSFER SWITCHES (Panel Board Type/ Residential Unit Use), SURGE PROTECTIVE DEVICE, LOW VOLTAGE POWER CAPACITORS, SMART METER, INVERTER

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