



Shihlin Electric

XSTNA SERIES

DUAL POWER AUTOMATIC TRANSFER SWITCHES

User Manual

XSTNA-125H | XSTNA-250H | XSTNA-630H

Shihlin Electric Co., Ltd.

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Safety Information

DANGER: Installation, wiring, inspection, and maintenance must be performed by qualified personnel. Disconnect Source I, Source II, and any auxiliary power supply, then verify that all circuits are de-energized before touching terminals or internal parts.

WARNING: Ground the product securely. Follow the incoming-line markings and terminal definitions in this manual. Incorrect wiring may cause equipment damage, electric shock, fire, or an unintended transfer operation.

IMPORTANT: For a D-type controller, terminals 401-402 are a voltage-free fire-linkage input. Do not apply an external voltage directly. If the fire control equipment provides a powered output, use an interposing relay and connect only its normally open dry contact to terminals 401-402.

General Precautions

- Read this manual before installation, operation, inspection, or maintenance.
- Confirm that the model, rated current, pole configuration, and control voltage match the order and the application.
- Keep the product dry and clean. Prevent conductive dust, condensation, corrosive gas, and foreign objects from entering the mechanism.
- Set the selector to MANUAL before operating the handle manually. Do not interfere with the mechanism during an automatic transfer.
- After a fire-linkage operation, remove the fire signal before restoring normal operation. For a D-type controller, cycle the MANUAL/AUTO selector once to restore the operating mode.

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1. Product Overview

The XSTNA Series is PC-class, three-position automatic transfer switching equipment (ATSE) for AC 50 Hz power systems with a rated operating voltage of 400 V and rated current from 16 A to 630 A. When either power source becomes abnormal, the switch transfers the load between the two sources to maintain reliable and safe power supply.

The switch has three operating positions: Source I ON, Source II ON, and OFF (both sources open). It is intended for fire-protection interlocking and for infrequent switching in power distribution systems.

Typical applications include hospitals, shopping malls, banks, chemical and metallurgical facilities, high-rise buildings, military facilities, and other locations where power continuity is important.

COMPLIANCE: The product is designed in accordance with GB/T 14048.11 and IEC 60947-6-1, Low-voltage switchgear and controlgear - Part 6-1: Multiple function equipment - Transfer switching equipment.

2. Normal Working Conditions

Condition	Requirement
Ambient temperature	-5 °C to +40 °C; the 24-hour average shall not exceed +35 °C.
Relative humidity	Not more than 50% at +40 °C. Higher humidity is permitted at lower temperatures, for example up to 90% at +25 °C. Provide suitable protection against condensation caused by temperature changes.
Altitude	Not more than 2,000 m above sea level.
Pollution degree	Degree 3 at the installation site.
Utilization category	AC-33iB.
Electromagnetic environment	Environment A. In Environment B, harmful electromagnetic interference may occur; the user shall provide suitable protective measures.

3. Transportation and Storage Conditions

- Protect the product from rain and snow during transportation.
- Storage temperature: -25 °C to +55 °C.
- Storage relative humidity: not more than 95% at +25 °C.

4. Product Model Designation

XST NA - 125 H / 3 B - 125 [F] [S]

Code	Meaning
XST	Series designation
NA	Integral three-position construction
125 / 250 / 630	Frame size
H	Structural design code
3 / 4	Number of poles: 3P or 4P
B / D	Controller type
16-630	Rated current, A
Blank / F	Power-source arrangement: blank = mains-to-mains; F = mains-to-generator
Blank / S	Transfer mode: blank = automatic transfer with automatic return; S = automatic transfer without automatic return

5. Product Functions

5.1 B-Type Controller

- Local indication of Source I/II availability and switch closing status.
- Remote output for Source I/II availability and switch closing status.
- Three-phase sampling for Source I and single-phase sampling for Source II.
- Phase-loss detection for Source I phases A/B/C/N and Source II phases A/N.
- Automatic transfer with automatic return.
- Powered 24 V DC fire-linkage input for forced transfer to OFF, with one normally open dry-contact feedback output.
- Generator start control output.

5.2 D-Type Controller

- Local and remote indication of Source I/II availability and switch closing status.
- Three-phase sampling for both Source I and Source II.
- Automatic transfer with automatic return (default), or automatic transfer without automatic return.
- Voltage-free fire-linkage input for forced transfer to OFF, with one normally open dry-contact feedback output.
- Generator start control output.
- 24 V DC auxiliary power input.
- RS485 communication using the Modbus-RTU protocol.

5.3 Controller Function Comparison

Item	B Type	D Type
Rated control supply	230 V AC, 50/60 Hz	230 V AC, 50/60 Hz
Auxiliary supply	Not required	24 V DC
Voltage measurement range	Not available	40-300 V
Operating positions	Source I ON / Source II ON / OFF	Source I ON / Source II ON / OFF
Operating modes	Manual / Automatic	Manual / Automatic / Remote
Display	LED status indication	LED status indication
Transfer mode	Automatic transfer with automatic return	Automatic transfer with automatic return (default), or without automatic return
Undervoltage transfer value	Not adjustable	165-217 V, adjustable
Overvoltage transfer value	Not adjustable	243-298 V, adjustable
Transfer delay	Not adjustable	0-180 s, continuously adjustable
Return delay	Not adjustable	0-180 s, continuously adjustable
Phase-loss detection	Source I: 3-phase; Source II: single-phase	Three-phase (A/B/C)
Generator control	One relay dry-contact output	One relay dry-contact output
Fire-linkage control	Powered 24 V DC input; NO dry-contact feedback	Voltage-free input; NO dry-contact feedback
RS485 communication	No	Yes

6. Main Technical Specifications

Parameter	XSTNA-125H	XSTNA-250H	XSTNA-630H
Poles	3P / 4P	3P / 4P	3P / 4P
Rated current, I_n	16, 20, 25, 32, 40, 50, 63, 80, 100, 125 A	125, 160, 200, 225, 250 A	315, 350, 400, 500, 630 A
Rated operating voltage, U_e	400 V AC, 50 Hz	400 V AC, 50 Hz	400 V AC, 50 Hz
Rated insulation voltage, U_i	800 V AC	1,000 V AC	690 V AC
Rated impulse withstand voltage, U_{imp}	8 kV	12 kV	8 kV
Contact transfer time	0.58 s $\pm$ 20%	0.56 s $\pm$ 20%	0.9 s $\pm$ 10%
Total transfer operating time	1.4 s $\pm$ 20%	1.3 s $\pm$ 20%	1.8 s $\pm$ 10%

7. Construction, Dimensions, and Operating Sequence

7.1 Construction

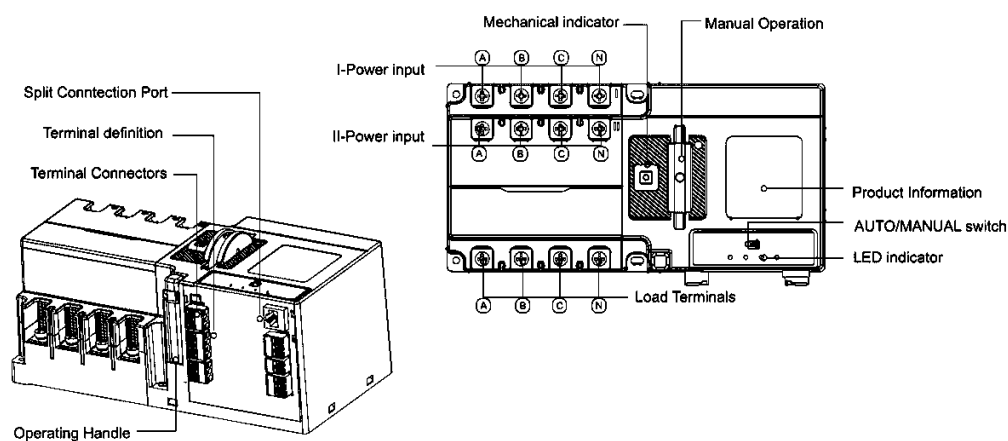


Figure 1. XSTNA switch construction and component identification

7.2 Outline and Installation Dimensions

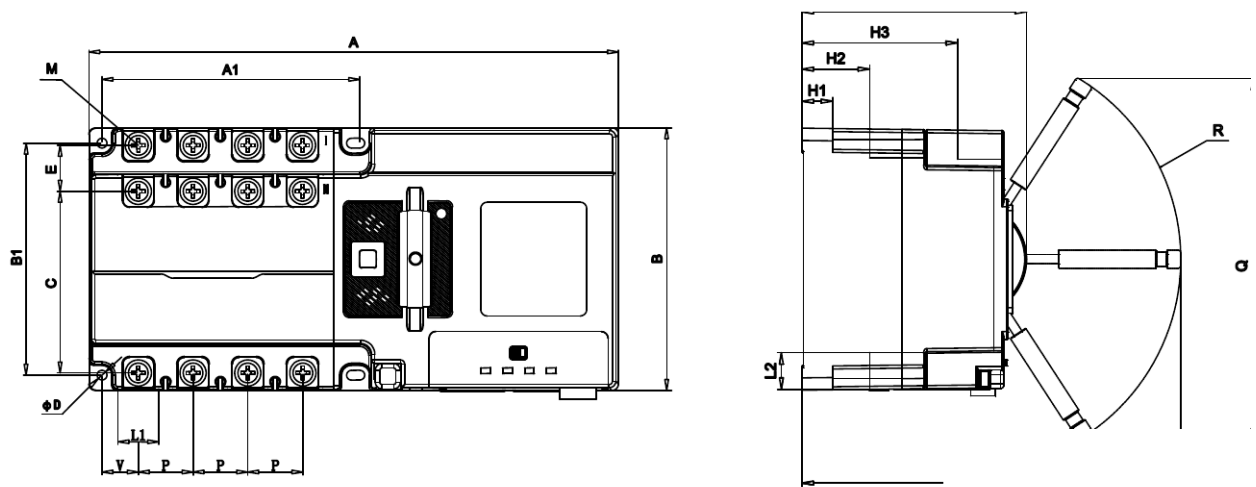


Figure 2. XSTNA-125H outline and installation dimensions

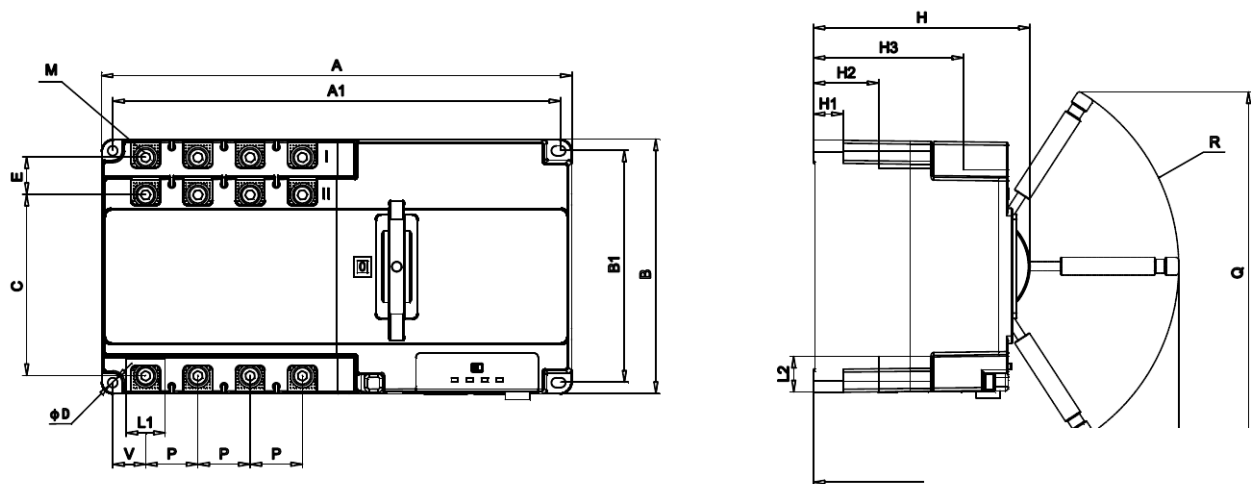


Figure 3. XSTNA-250H / XSTNA-630H outline and installation dimensions

In	A	B	H	A1	B1
125	242	120	115	116	106
250	315	170	146	298.5	155
630 / 3P	417	225	204	387	203
630 / 4P	475	225	204	445	203

Dimension Tables (mm)

In	H1	H2	H3	L1	L2	C	E	V	P	D	M
125	15.5	33	82.2	18.5	19	83	21	16.6	25	Ø4.5	M6
250	20	44	101	26	24	121	25	22	35	Ø6.3	M8
630 / 3P	16.5	62	130	48	32.6	173	27	45.5	58	Ø8.5	M10
630 / 4P	16.5	62	130	48	32.6	173	27	45.5	58	Ø8.5	M10

In	G	R	Q
125	196	106	194
250	246	137	235
630 / 3P	342	203	300
630 / 4P	342	203	300

NOTE: The 3P and 4P versions of the 125 and 250 frame sizes have the same overall dimensions.

7.3 Operating Sequence

The following sequences show the normal automatic operating logic. Source I is the preferred source unless otherwise stated. Transfer and return operations pass through the OFF position.

7.3.1 Mains-to-Mains: Automatic Transfer with Automatic Return

A-9-001 Source I priority

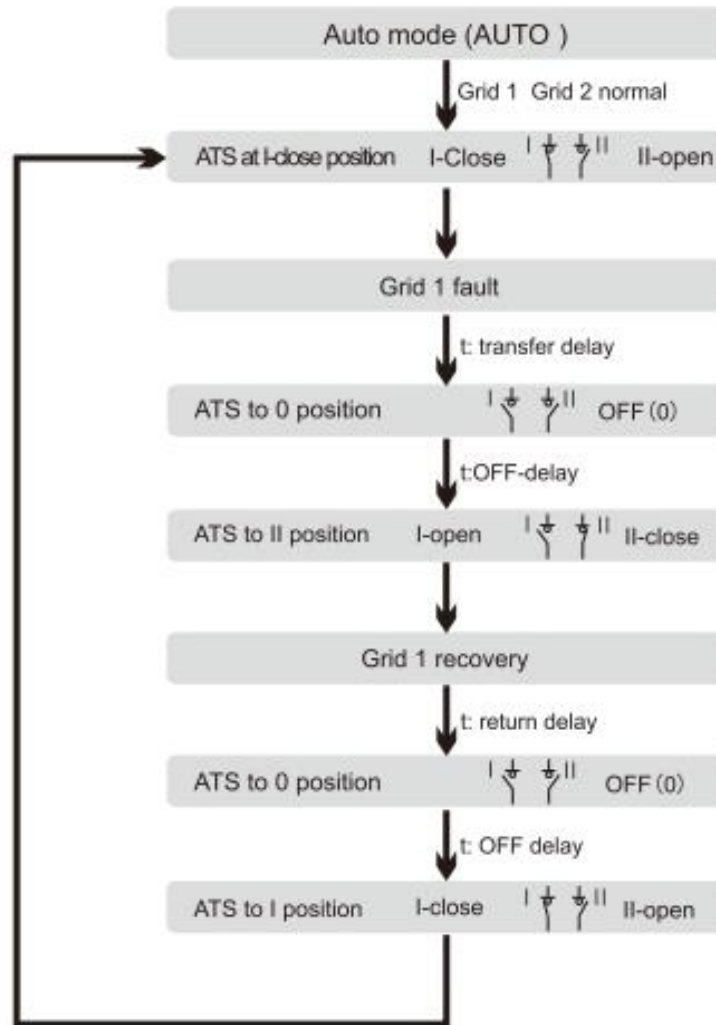


Figure 4. Source I priority; automatic transfer and automatic return

7.3.2 Mains-to-Mains: Automatic Transfer without Automatic Return

A-9-000 No source priority

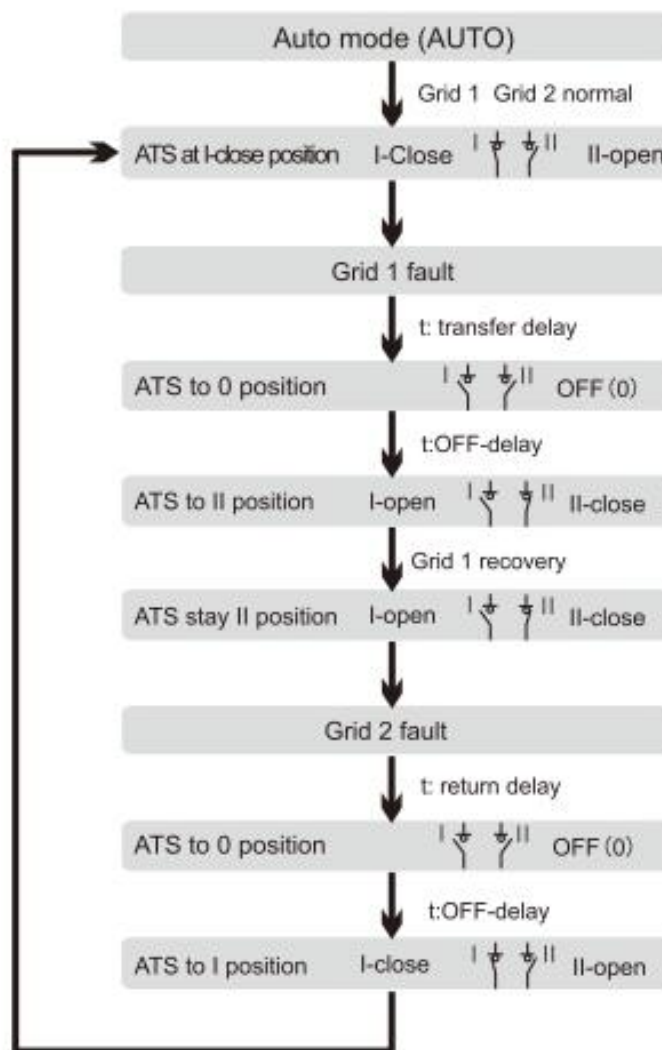


Figure 5. No source priority; the switch remains on Source II after Source I recovers

7.3.3 Mains-to-Generator: Automatic Transfer with Automatic Return

b-3-001 Source I priority

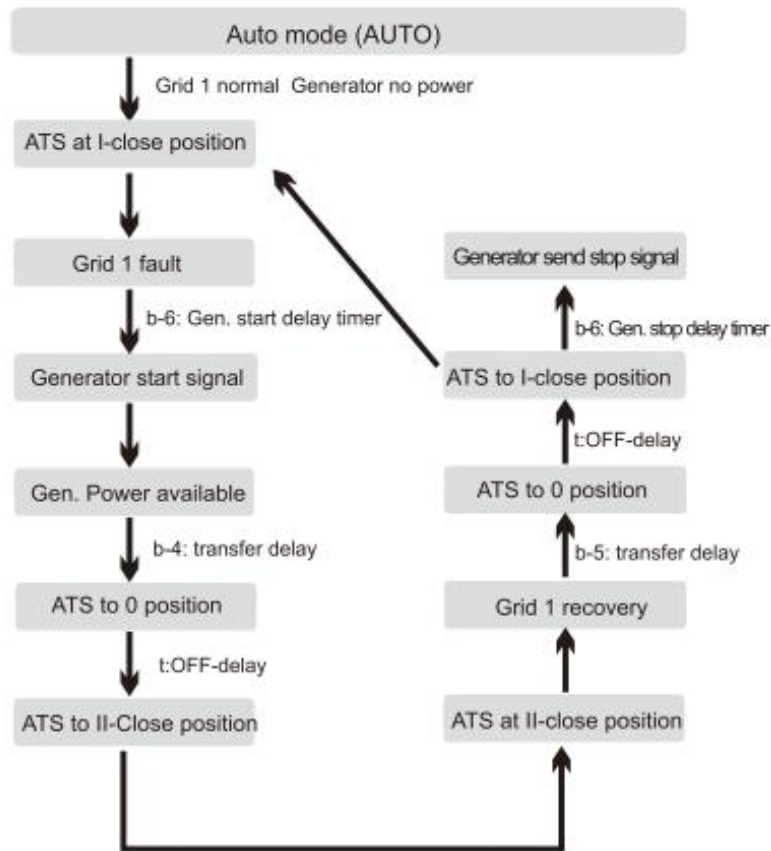


Figure 6. Source I priority; generator start and stop sequence

SOURCE IDENTIFICATION: For mains-to-mains operation, Grid 1 connects to Source I and Grid 2 connects to Source II. For mains-to-generator operation, the mains supply connects to Source I and the generator connects to Source II.

8. Terminal Definitions

Wire the control terminals only after isolating all power sources. Terminal ratings and signal types must be observed exactly.

Terminal	Function	Signal	Rating / Note
101	Source I indicator common neutral / neutral input for 3P models	Input/common	230 V AC circuit
102	Source I available indication	Active output	230 V AC, 0.5 A max.
103	Source I ON indication	Active output	230 V AC, 0.5 A max.
201	Source II indicator common neutral / neutral input for 3P models	Input/common	230 V AC circuit
202	Source II available indication	Active output	230 V AC, 0.5 A max.
203	Source II ON indication	Active output	230 V AC, 0.5 A max.
301	Auxiliary power positive	Input	+24 V DC; D type only
302	Auxiliary power negative	Input	0 V DC; D type only
401-402	Fire-linkage forced-OFF command	Input	B type: powered 24 V DC, non-polarized; D type: voltage-free NO contact
403-404	Fire-linkage operation feedback	Output	Normally open relay dry contact
501	Generator control normally open contact	Output	Relay dry contact, 0.5 A max.
502	Generator control common contact	Output	Relay dry contact, 0.5 A max.
503	Generator control normally closed contact	Output	Relay dry contact, 0.5 A max.
601	RS485 A+	Communication	D type only
602	RS485 B-	Communication	D type only
603	RS485 GND	Communication	D type only



8.1 Terminal Wiring Instructions

8.1.1 Source Status Outputs: 101-103 and 201-203

Terminals 101-103 provide external indication for Source I; terminals 201-203 provide the same functions for Source II. The outputs are active 230 V AC signals rated at 0.5 A maximum. For 3P products, connect the neutral conductor to terminal 101 for Source I and terminal 201 for Source II.

8.1.2 Auxiliary Power Input: 301-302

Connect 24 V DC auxiliary power to a D-type controller when generator start delay is required in mains-to-generator mode. Without the auxiliary supply, the generator start delay is 0 s. The auxiliary input may be omitted when this delay function is not required.

8.1.3 Fire-Linkage Input and Feedback: 401-404

Connect a normally open fire-linkage command to terminals 401-402. For a B-type controller, the input is powered 24 V DC and is non-polarized. For a D-type controller, the input is voltage-free. When the external contact closes, the controller immediately transfers the switch to OFF, disconnecting the load, and terminals 403-404 close to return a feedback signal to the fire control center.

WARNING: Never apply an external voltage directly to D-type terminals 401-402. If the fire system provides a powered signal, use an interposing relay and connect its normally open dry contact to the controller.

After a fire-linkage operation, the automatic transfer switch remains inhibited. Remove the fire signal before restoring service. On a D-type controller, cycle the MANUAL/AUTO selector once to return to normal operation.

8.1.4 Generator Start Control: 501-503

The generator start output is one 0.5 A relay changeover dry contact: terminal 502 is common, terminal 501 is normally open, and terminal 503 is normally closed.

In mains-to-generator mode with the controller in AUTO, when Source I is normal, terminals 502-501 are closed and 502-503 are open. If Source I fails while Source II is unavailable, the contacts change after the generator start delay: 502-503 close and 502-501 open, issuing the generator start command. After generator voltage becomes available, the switch transfers the load to Source II.

When Source I recovers, the switch returns to Source I after the return delay. After Source I closes, the contacts change after the generator stop delay: 502-501 close and 502-503 open, issuing the generator stop command.

8.1.5 RS485 Communication: 601-603

The D-type controller supports Modbus-RTU communication. Connect 601 to A+, 602 to B-, and 603 to GND. Refer to the separately supplied communication protocol for register definitions and detailed settings.

9. Factory Settings

Common operating parameters are set before shipment. Unless otherwise specified in the order, the default values are as follows:

Parameter	B Type	D Type
Power-source mode	Mains-to-mains	Mains-to-mains
Operating mode	Automatic transfer with automatic return	Automatic transfer with automatic return
Source I undervoltage transfer	Not adjustable	176 V
Source II undervoltage transfer	Not adjustable	176 V
Undervoltage return differential	Not adjustable	20 V
Source I overvoltage transfer	Not adjustable	264 V
Source II overvoltage transfer	Not adjustable	264 V
Overvoltage return differential	Not adjustable	20 V
Transfer delay	Not adjustable	0 s
Return delay	Not adjustable	0 s
Generator start delay	0 s	5 s
Generator stop / cool-down delay	0 s	5 s
Fire-linkage control	24 V DC input; dry-contact output	Voltage-free input; dry-contact output
RS485 communication	Not available	Baud rate: 9,600 bit/s

PARAMETER CONTROL: Settings shall be changed only by authorized personnel who understand the power-system operating sequence and protection requirements.



10. Use and Maintenance

10.1 Working Voltage

The switch rated operating voltage is 400 V AC. The controller rated operating voltage is 230 V AC. Confirm that the product rating matches the system before energizing.

10.2 Wiring

1. Follow the incoming-line markings strictly.
2. For a 3P product, connect the neutral conductor to the specified neutral terminal.
3. Connect fire-linkage and generator-control circuits as required by the application.
4. Confirm that the product is securely grounded before energizing.

10.3 Inspection and Maintenance

1. Inspect the product periodically during service.
2. Operate one manual or automatic transfer during routine inspection to confirm that the mechanism and indications function normally.
3. Remove dust and foreign material regularly to maintain insulation performance.
4. For a product kept out of service for an extended period, protect it from moisture and dust. Test the product according to this manual before returning it to service.

MAINTENANCE SAFETY: Before inspection or maintenance, isolate both power sources and the auxiliary supply, lock out the circuits, and verify that the equipment is de-energized.

11. Unpacking Inspection Precautions

After receiving the product, open the package and complete the following checks:

1. Confirm that the product nameplate matches the order requirements.
2. Inspect the switch for physical damage caused by transportation or handling.
3. Read this manual before installation, operation, inspection, or maintenance.

If any discrepancy or damage is found, contact Shihlin Electric or the local distributor promptly.



12. After-Sales Service

This product is manufactured under a controlled quality management system. Under the specified storage and operating conditions, the warranty period is 12 months from the date the product is put into service, but not more than 18 months from the shipment date.

During the warranty period, if the product is damaged or cannot operate normally because of a confirmed product-quality issue, Shihlin Electric will repair or replace it without charge, subject to the applicable sales and warranty terms.

12.1 Chargeable Service Exclusions

- Incorrect application, unauthorized modification, or unauthorized disassembly.
- Damage caused by dropping the product or by improper installation.
- Operation beyond the specified ratings or environmental limits.
- Damage caused by force majeure or external events, including earthquake, fire, lightning, abnormal voltage, other natural disasters, or consequential events.