3SERIES
MORE VALUE FOR PRICE!

HDQ3S automatic transfer switch equipment

User Manual

Himel

□ Before installing or using the product, please read the instruction manual carefully and keep it in a safe place.

Security notification

Before installing, operating, running, maintaining and checking, please be sure to read this manual carefully and install and use the product accurately according to the contents of the manual.

Danger.

- **It is strictly prohibited to operate the automatic transfer switch with wet hands.**
- **It is strictly prohibited to touch the conductive parts during use.**
- **When maintaining and servicing, make sure that the product is not electrically charged.**
- **It is strictly prohibited to test the product by short-circuiting.**
- **The manual operating handle must be removed during ATSE automatic operation.**

Caution.

- **Installation, maintenance and repair shall be carried out by professionally qualified personnel.**
- **The product should be installed, commissioned and used in accordance with the product manual.**
- **Before use, please make sure that the working voltage, rated current, frequency and characteristics of the product meet the working requirements.**
- **When installing, it is necessary to pay attention to differentiate the position of the common inlet terminal, the spare inlet terminal and the outlet terminal, otherwise it may lead to short-circuit accidents.**
- **When installing, it must be noted that the phase sequence of the common backup power supply must be the same, otherwise it may lead to the reversal**

of the lower end load motor.

- **Regardless of three-pole or four-pole ATSE products, the neutral line must be connected to the N pole of the incoming line, and the N pole is strictly prohibited from being shared, otherwise it will cause the leakage protection product to operate;**
- **In order to prevent short circuit between phases, phase barriers should be installed on the copper bars at the incoming and outgoing wire ends for isolation (2P products do not require phase barriers);**
- **The undervoltage under working conditions is not less than 184V P-type controller (phase voltage), otherwise the product may not be able to convert normally;**
- **Do not operate manually in the automatic state, otherwise the automatic transfer switch will be reset to its original position.**
- **When ATSE is operated manually, it must enter the manual mode (the automatic manual button is in the O position) and the matching handle should be used. Manual operation can achieve common closing, backup closing, and double opening;**
- **If you need to test the insulation resistance or power frequency withstand voltage of ATSE, you must first disconnect the electronic components (including the controller) between the current loops, otherwise the product performance will be damaged;**
- **Please dispose of the product waste properly when the product is scrapped, thank you for your cooperation.**

1 Get to know HDQ3S automatic transfer switch electrical appliances

1.1 packing list

Serial number	Name	Unit	Quantity
1	Automatic transfer switch electrical products	tower	1
2	Handle	Only	1
3	mounting screws, nuts, flat washers	bag	1
4	safety warning instructions	open	1
5	interphase partitions	piece	2P none, 3P/4P 6 pieces
6	Wiring Terminals	Only	Six-pin terminal 1; three-pin terminal 1 (G type controller)

Users must check whether the product is intact after opening the box, whether the exposed metal is rusty, whether there are defects in the product due to poor transportation and storage, if any of the above phenomena, the product can not be used, please contact the supplier in time to solve the problem.

1.2 Recognize product structures, nameplates, and

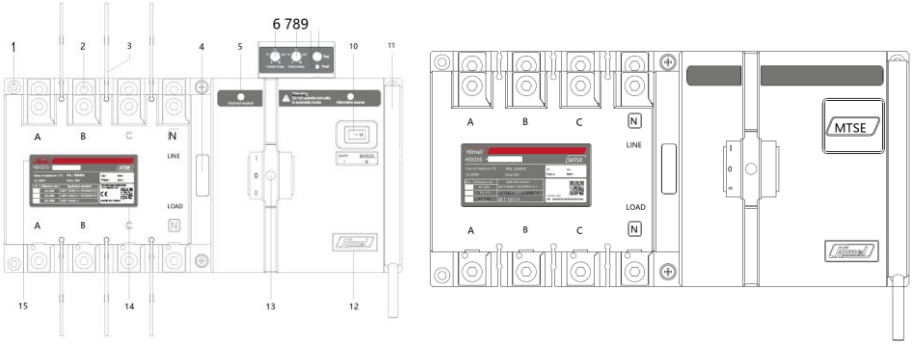


Fig. 1 Schematic diagram of the product, the

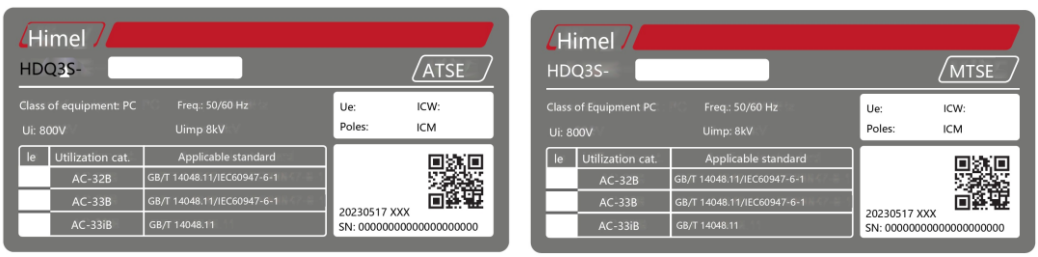


Figure 2 Product nameplate

Description:1-Mounting hole 2-Power supply end 3-Interphase partition 4-Conversion position indicator window 5-Power status indicator 6-Conversion delay knob 7-Return delay knob 8-Power failure indicator 9-Test button 10-Automatic/manual button 11-Operating handle 12-Company logo 13-Operating handle hole 14-Quadrature code of the official website 15-Product model no

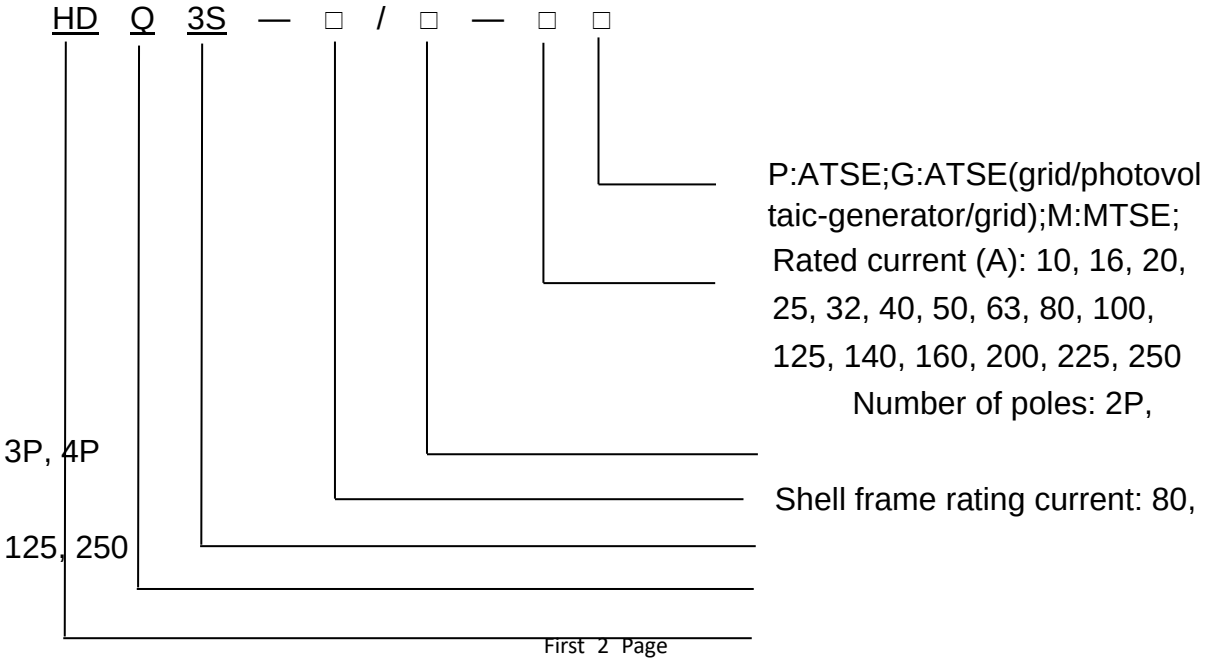
Note: 5/6/7/8/9/10 is suitable for ATSE, and P-type controller is only 5/10

1.3 product characteristics

HDQ3S series automatic transfer switch electrical appliances comply with GB/T 14048.11 and IEC 60947-6-1. They are mainly used in power supply systems with AC 50Hz/60Hz, rated operating voltage 400V/230V, and rated operating current 10~250A. (repair)/manually complete the switching between the normal power supply and the backup power supply.

a) Main contact three positions (common, standby, double points), manual double points to facilitate power outage maintenance of the lower circuits, and at the same time in line with the functional requirements of the manual transfer switch electrical equipment.
b) P-type controller has auto-turn-on and self-reset functions, phase failure and voltage loss protection;
c) The G-type controller also has the functions of voltage loss conversion and grid/photovoltaic-grid/generator conversion;
d) The usage category complies with AC-33iB and has AC-33B parameters;
e) This product adopts the design structure of upper inlet (power inlet on both sides) and lower outlet (load outlet on one side).

1.4 Product type and meaning



1.5 Main technical parameters

The main technical parameters are shown in Table 2.

Table 2 The main technical parameters

Model / parameters	HDQ3S-80		HDQ3S-125		HDQ3S-250	
Rated current Ie (A)	10，16，20，25，32，40	50，63，80	50，63	80，100，125	80，100，125，140	160，200，225，250
Utilization category	AC-33B AC-33iB AC-32B	- AC-33iB AC-32B	AC-33B AC-33iB AC-32B	- AC-33iB AC-32B	AC-33B AC-33iB AC-32B	- AC-33iB AC-32B
Poles	2P/3P/4P					
Rated short-time withstand current Icw (kA)	5 @30ms		10 @30ms		10 @200ms	
Rated short-circuit making capacity Icm (kA)	7.65		17		17	
Rated operation voltage Ue (V)	400±20% (230±20% for 2P) [1)]					
Frequency (Hz)	50/60[2)]					
Rated insulation voltage Ui (V)	800V					
Rated impulse withstands voltage Uimp (kV)	8 (2.5 for control circuit)					
Class of equipment	PC					
Standard	GB/T 14048.11 IEC 60947-6-1					
Operating transfer time (s) [3)]	1.5s±10%（P） 2.0±0.15s（G）					
Contact transfer time (s)[4)]	0.5s±0.15s					
Voltage supply deviation[5)]	±10%					

EMC Level[6)]	Environment B
IP Degree	IP30 (IP00 for Wiring terminal)

Note: 1) 3) 4) 5) 6) parameters are only applicable to ATSE;

2) P-type controllerIn 60Hz condition product can be used. But all indicate accuracy will be impact approx. 20%.

2 Storage and transportation

a) During transportation and installation, it should be handled with care and should not be turned upside down to avoid severe collision and vibration. The free fall height during transportation should not exceed 400mm;

b) Shall not be subject to direct attack by rain, snow or long-term direct radiation from the sun;

c) The ambient temperature is between -25℃ and +70℃, and the relative air humidity does not exceed 90%.

3 Installation

3.1 normal conditions of use and installation

a) The ambient air temperature does not exceed +50℃, and its average temperature within 24 hours does not exceed +35℃.
   The lower limit of ambient air temperature is -5°C; and
b) The altitude of the installation site does not exceed 2000m;
c) (a) At a maximum temperature of +50 °C, the relative humidity of the air shall not exceed 50 per cent, at lower temperatures higher relative humidity may be permitted, e.g. up to 90 per cent at +20 °C, and special measures shall be taken for occasional condensation due to temperature changes.
d) Pollution class 3, with conductive pollution, or where dry non-conductive pollution becomes conductive as a result of condensation.
e) Installation category IV, power inlet end horizontal.
f) Environmental Category B, in places where there is no rain or snow, and where there is no obvious vibration.

3.2 Outline and installation dimensions

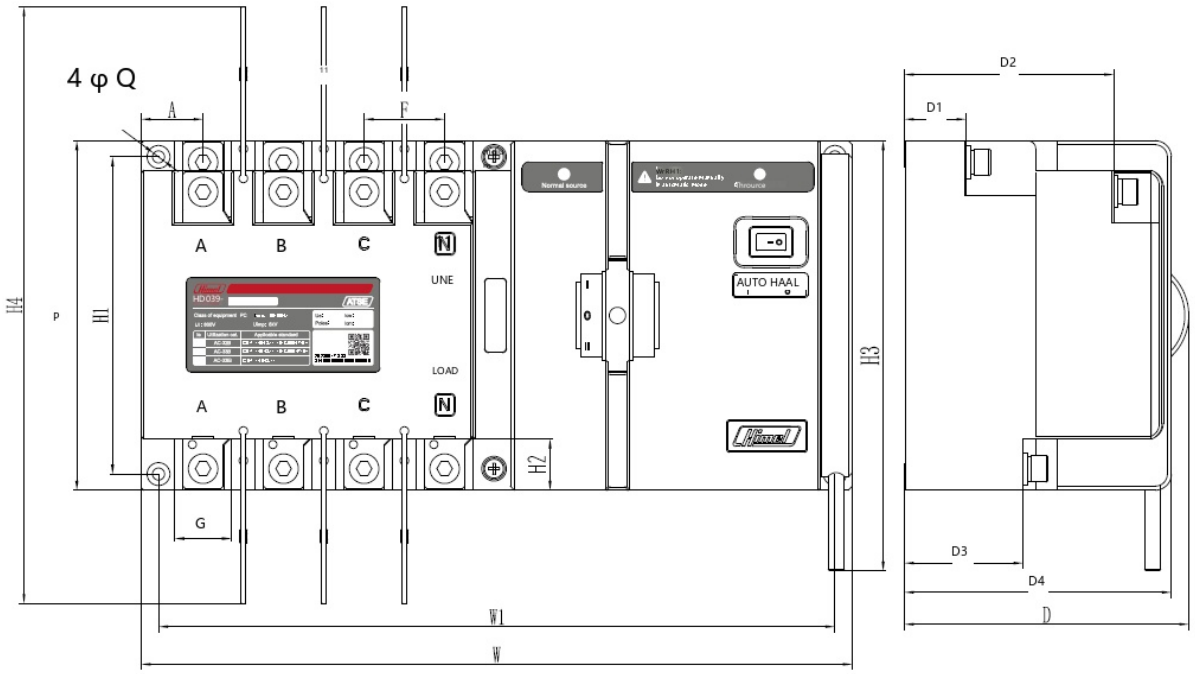


Figure 3 HDQ3S80-250/2P, 3P, 4P body appearance

Table 3 Dimensions of the switch

Model / Specifications	W	W1	H	H1	A	F	G	H2	H3	H4	D	D1	D2	D3	D4	Q
HDQ3S-80	245	232	120	97	21	25	17	15.5	155	132	100	24.5	63.5	40	91	4.5
HDQ3S-125	265	252	130	118	23	30	21.5	19	160	158	106	23	78	44.5	99.5	4.5
HDQ3S-250	340	325	170	155	31.5	40	30.5	25	210	219	137	27	97	54.5	122.5	5.5
HDQ3S-80(G)	245	232	145	97	21	25	17	15.5	155	132	100	24.5	63.5	40	91	4.5
HDQ3S-125(G)	265	252	155	118	23	30	21.5	19	160	158	106	23	78	44.5	99.5	4.5
HDQ3S-250(G)	340	325	195	155	31.5	40	30.5	25	210	219	137	27	97	54.5	122.5	5.5

3.3 product wiring diagram

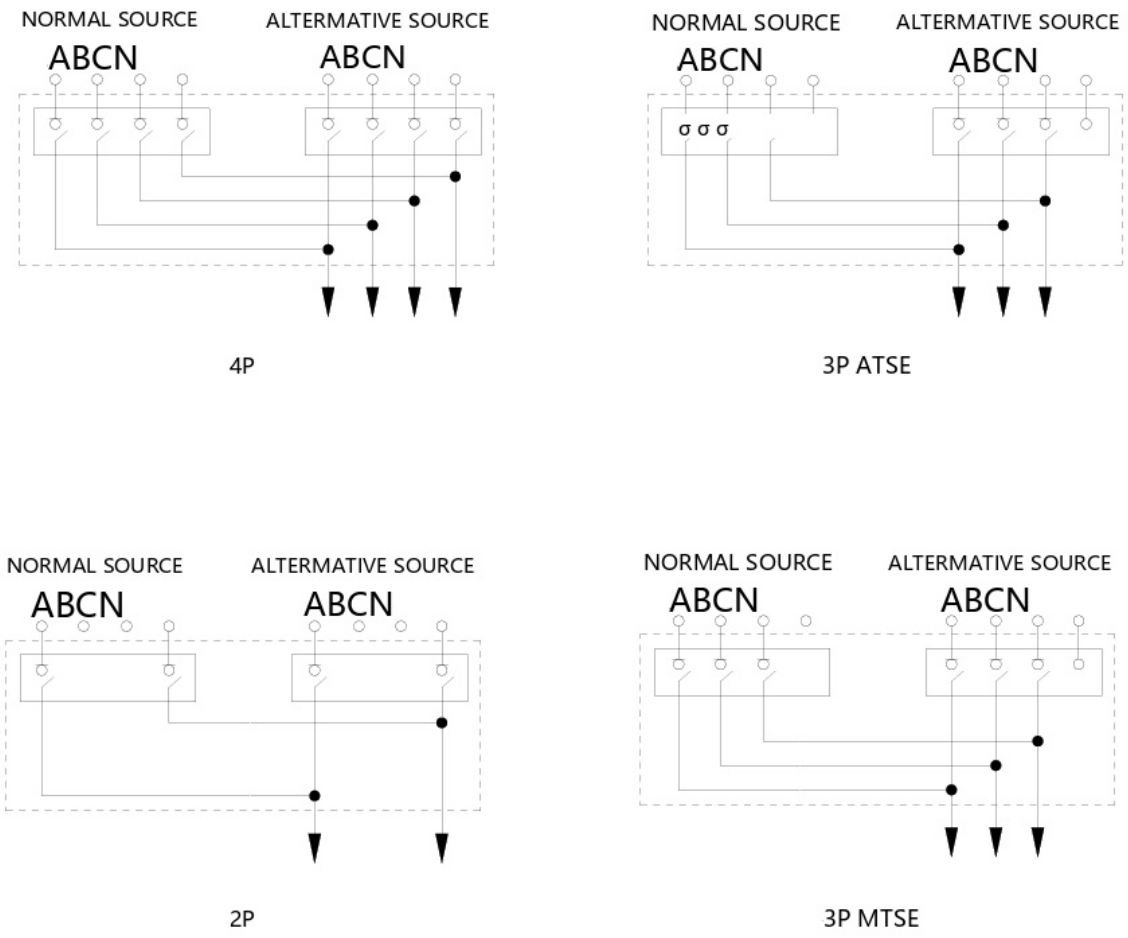
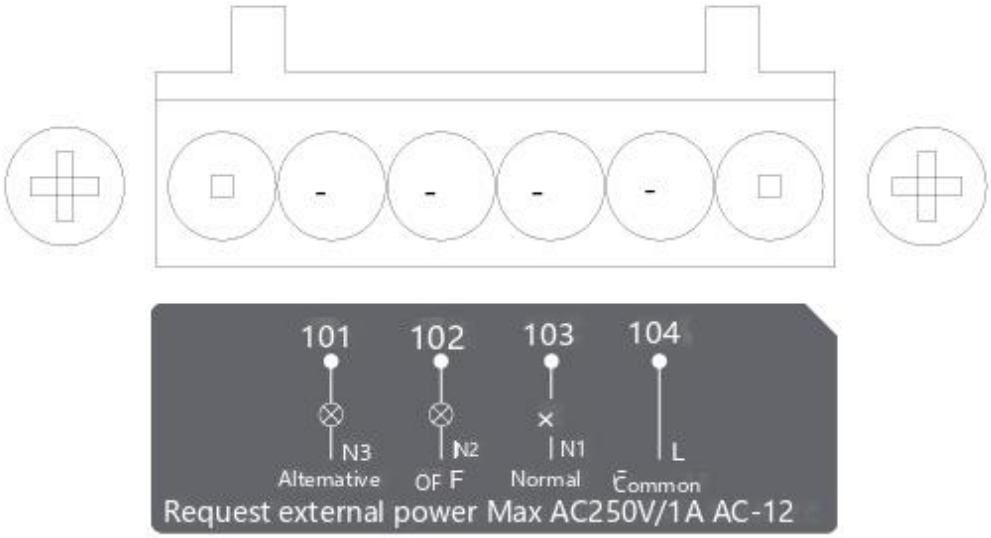


Fig. 4 Product wiring diagram



101. 104 Alternative source ON indication
102. 104 OFF indication
103. 104 Normal source ON indication

Fig. 5 Wiring diagram of secondary terminals

3.4 user installation instructions

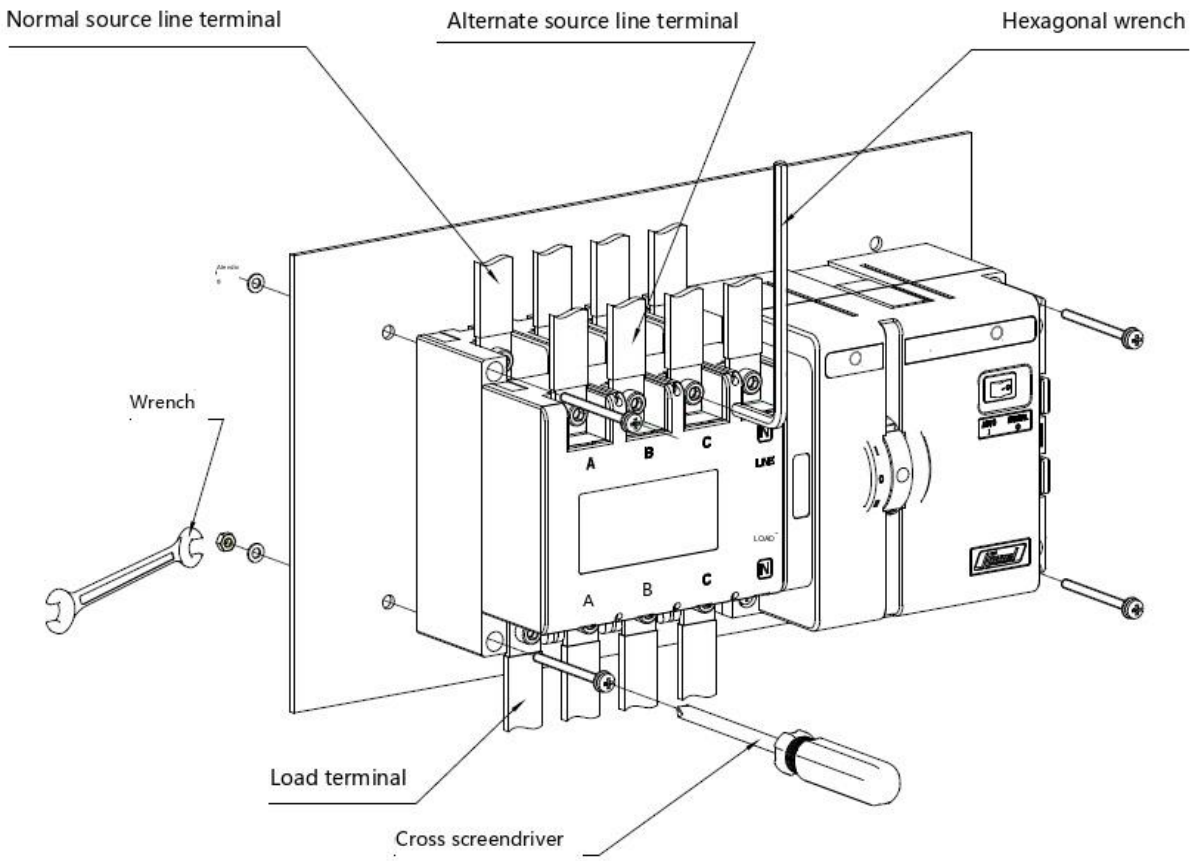


Figure 6 HDQ3S80~250 common power supply, backup power supply, outlet side wiring and product installation

Table 4 Torque table

Shell holder	Cross recessed mounting screws		Hexagon socket head cap screws	
	Specifications	TorqueN.m	Specifications	TorqueN.m
80	M4X50	1.2	M6X16	6～7
125				
250	M5X55	2	M8X20	9.5～10.5

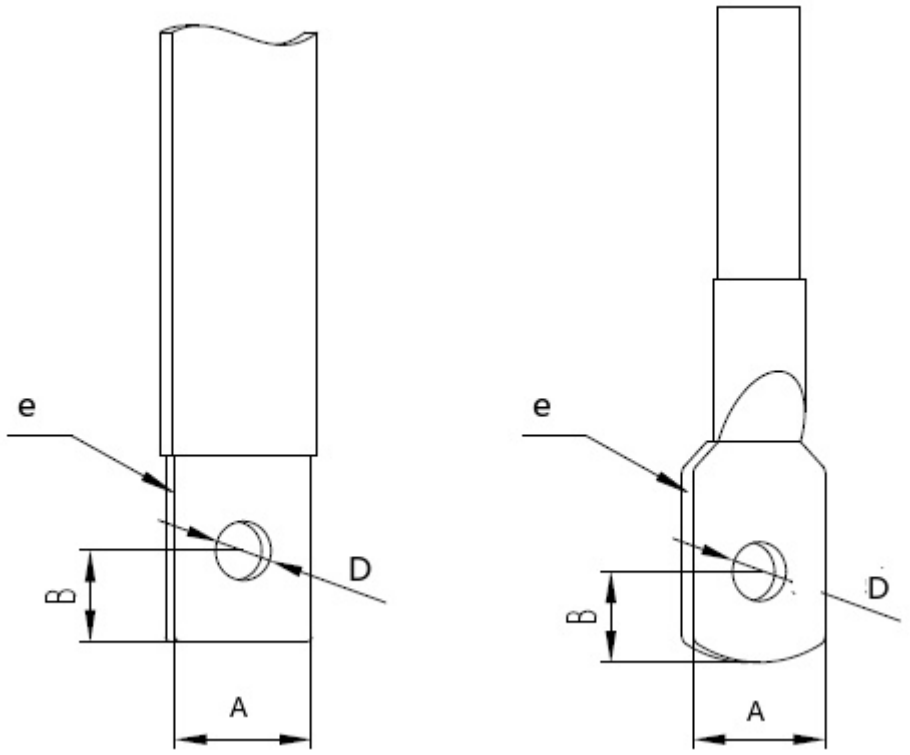


Figure 7 Schematic diagram of copper rows and conductor specifications, the

Table 5: Connection wire cross-sectional area (mm 2)

Rated current value A	10	16/25	25	32	40/50	63	80	100	125/140	160	200/225	250
Wire cross-sectional area mm ^{2}	1.5	2.5	4	6	10	16	25	35	50	70	95	120

Table 6: Recommended copper bar and wire specifications (mm)

odel Specifications	A	B	e	φD
HDQ3S-80	15	9	≥2	6.5
HDQ3S-125	20	11	≥2.5	6.5
HDQ3S-250	30	15	≥4	8.5

3.5 safe distance

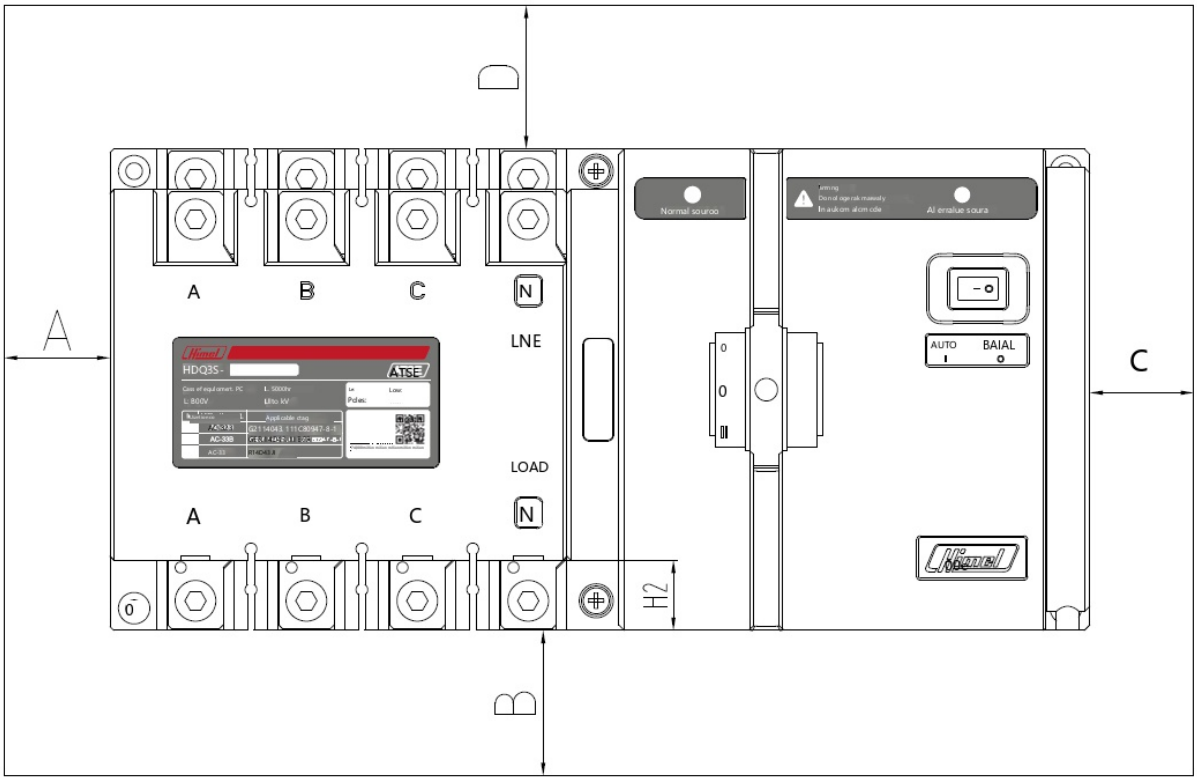
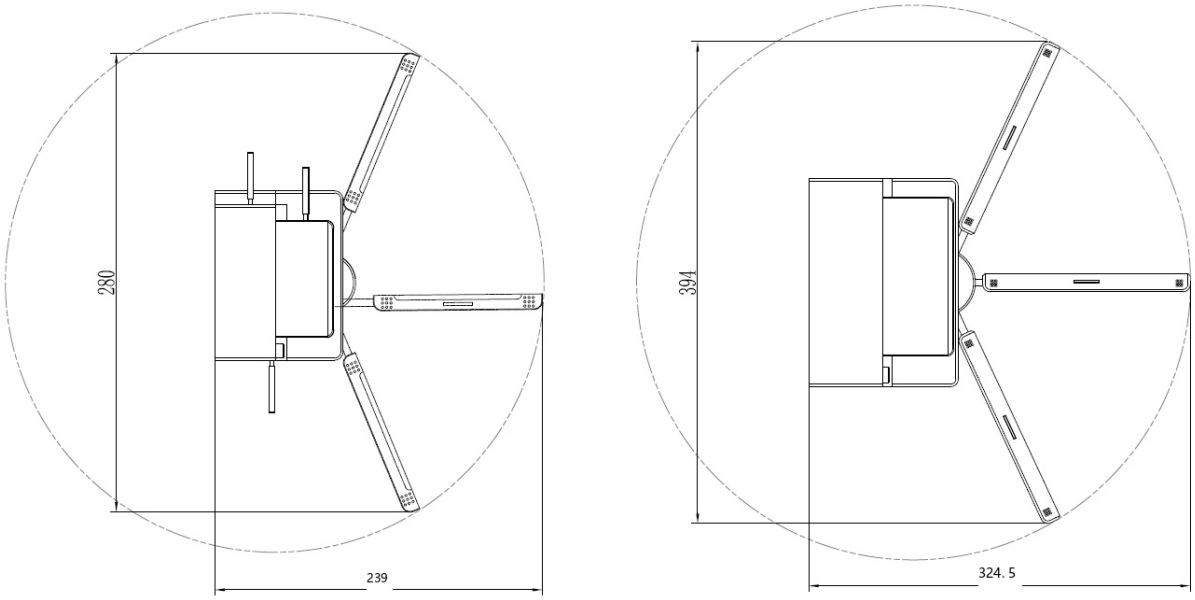


Figure 8 Schematic diagram of safety distances



HDQ3S-80/125 HDQ3S-250

Figure 9 Handle range of motion

Note:There must be no obstructions within the operating range of the handle

Table 7 Safety distances

Safety distance(mm)	A	B	C	D
Insulation	0	50	0	50
metals/electrically charged conductors	0	60	0	60

4 use and commissioning

4.1.1 Description of the automatic switch changeover action process (P type controller)

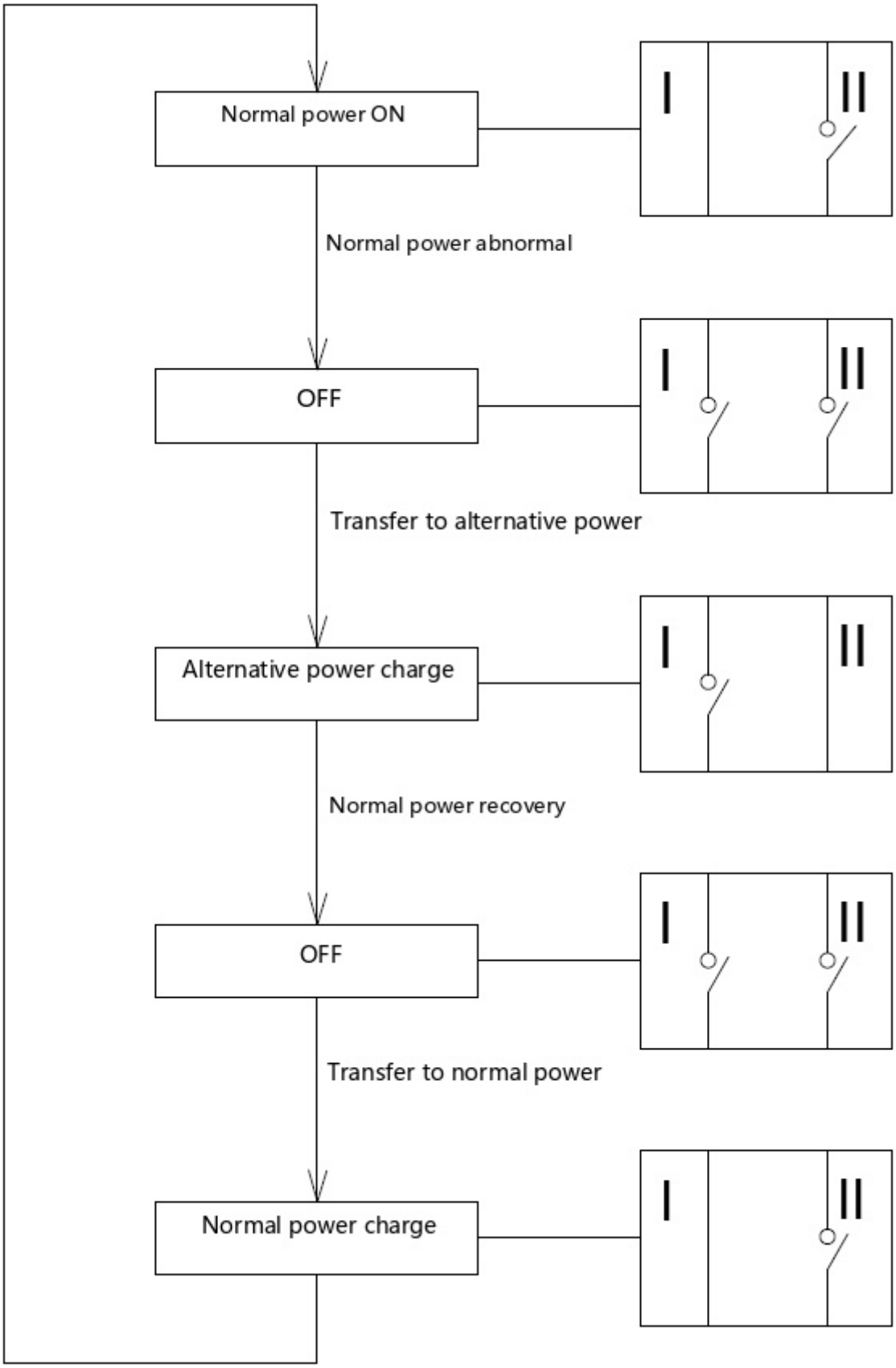
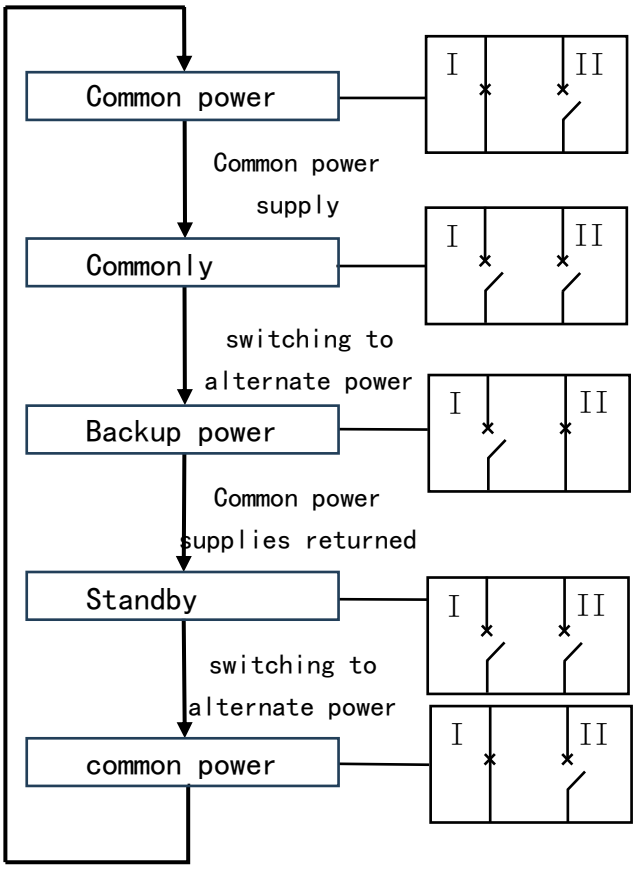


Figure 10 ATSE P-type controller action flow diagram

4.1.2 Description of G type controller



T1: Conversion delay, common power supply abnormality to I disconnect time.
T2: Return delay, the time from when the common power supply returns to normal to II disconnection.
T3: Generator start-up delay time, common power supply abnormality to output generator start-up signal time.
T4: Generator stop delay time, after returning to the usual power supply to stop outputting generator start signal time.
I: Common power supply.
Ⅱ:Standby power.
Note:T3 and T4 are fixed for 15s±1s.

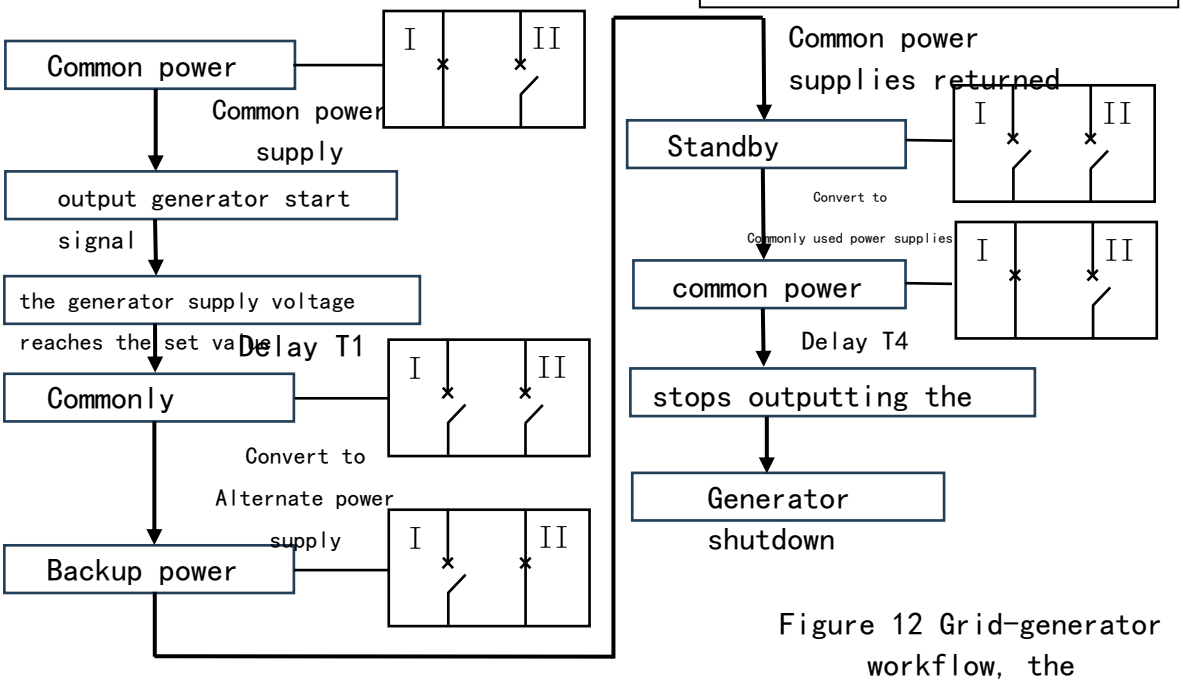


Figure 12 Grid-generator workflow, the

Under working conditions, if the undervoltage is less than 178V G-type controller (phase voltage), the product will trigger undervoltage protection.
If the overvoltage is greater than 280V G-type controller (phase voltage) under working conditions, the product will trigger overvoltage protection.
Conversion delay adjustable range: 0s ~ 30s
Return delay adjustable range: 0s ~ 30s

4.2 Mode of operation

a) Automatic operation: Automatic conversion mode controlled by the controller. The controller automatically detects voltage loss and phase loss of the two power supplies (G-type controller will be additional) to realize automatic switching of the power supply.

b) Manual operation: Pull the handle to switch to manual mode, click the [Auto Manual Button] button on the switch panel to switch to manual mode (the automatic manual button is in the O position), then take out the pull handle on the body and insert it into the handle of the body Turn the handle, press the handle to the bottom, and turn it to the required power position. After manual operation, be sure to remove the operating handle and return it to its original position.

Note: MTSE has no switching button and can only be operated manually.

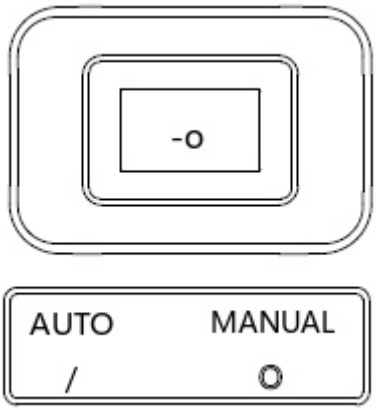
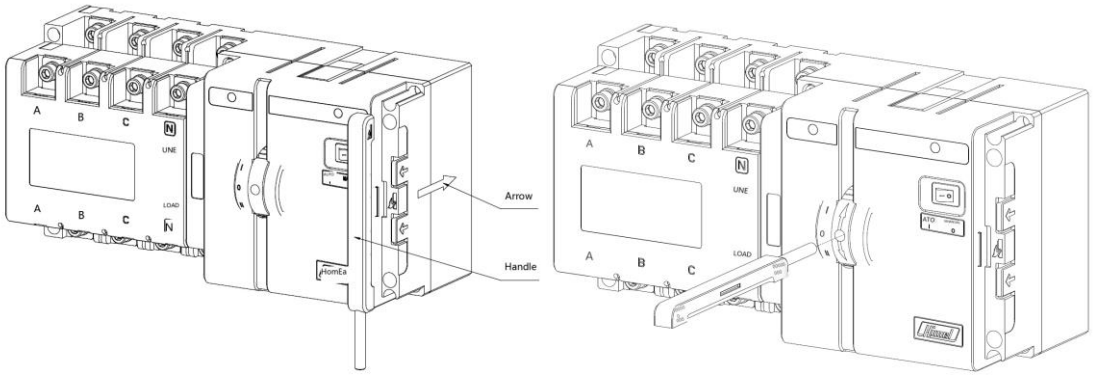


Figure 13 Schematic diagram of the automatic/manual buttons

4.3 Handles and instructions for installation and use



Automatic transfer switch electrical installation and commissioning, the handle according to the above figure If you need to manually split and close the product, the handle is inserted in the direction shown in the above figure

Snap the product in the direction shown by the arrow. Handle Wheel, split the product back and forth in the direction of the arrow shown on the handle wheel.

Figure 14 Handle and mounting instructions for use, the

4.4 Manual installation instructions (only applicable to MTSE and need to be purchased separately)

4.4.1 Packing list

Model No	HDQ3S-80	HDQ3S-125	HDQ3S-250
mounting screws (Flat washers combination screws)	Self-tapping screw ST2.9x30mm-2	Triple combination screws M4X25 mm -2	Triple combination screws M4X30 mm -2
	Self-tapping screws ST2.9x45 mm -2	Triple combination screws M4X55 mm -2	Triple combination screws M4X65 mm -2
locking screws	Slotted hexagonal bolt M5x8mm-1		
Directly hand-operated	80 shell holder	125 shell holder	250 shell holder
Square axes	150mm or 300mm		
Out-of-cabinet hand manipulation	Length 95mm		

4.4.1 Manual installation

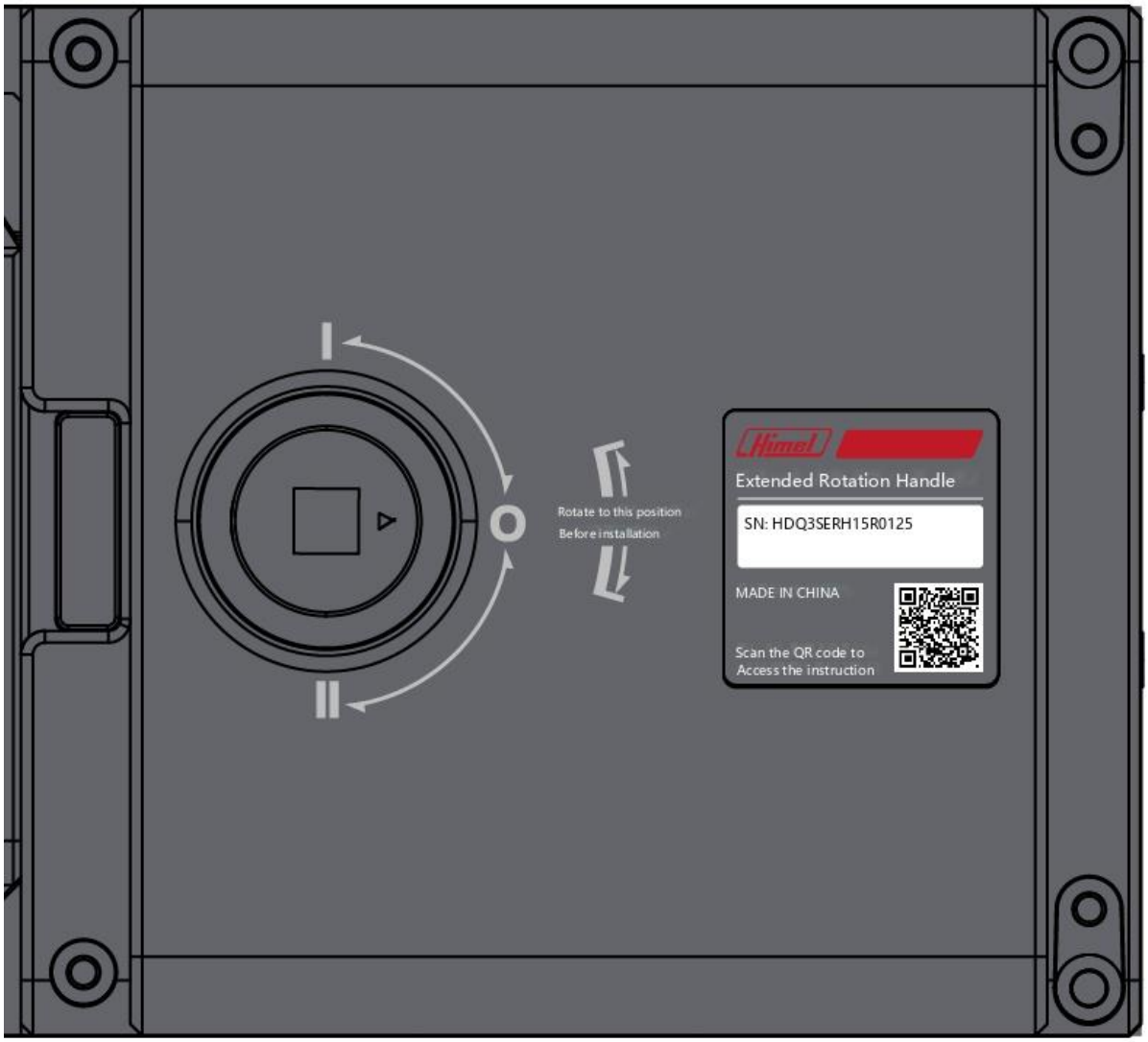


Fig. 15 Direct hand-operated front view

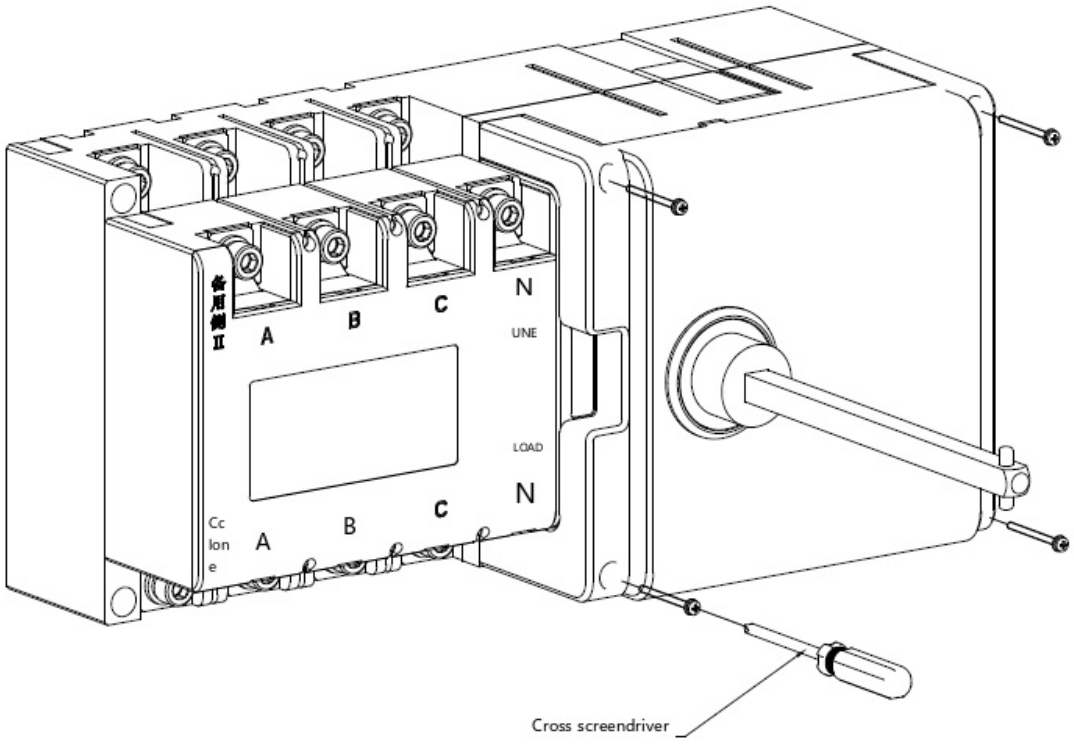


Figure 16 Screw Installation Indication Diagram

Unscrew the four fixing screws on the cover of the unit (cover mounting screws of the dual power supply unit) and align the direct manual with the four screw holes in the cover. Rotate the rotary axis so that the triangular marking is horizontally aligned with the right side of the marking indicating the double points, then fasten the direct manipulator and tighten the mounting screws through the screw holes to complete the mounting of the direct manipulator.

Loosen the screws on the top of the spindle and insert the square shaft into the spindle. Tighten the screws on the spindle to secure the square shaft after it is fully inserted.

In the cabinet door corresponding position to open the handle mounting holes, hole position and size see Figure (), the handle in accordance with the direction of the double copy on the installation.

When the dual power supply is in double points position will handle counterclockwise rotation (90 ± 5 °) immediately complete the common side of the closing, the same when the dual power supply is in double points position will handle

clockwise rotation (90 ± 5 °) immediately complete the standby side of the closing. Split operation is the opposite.

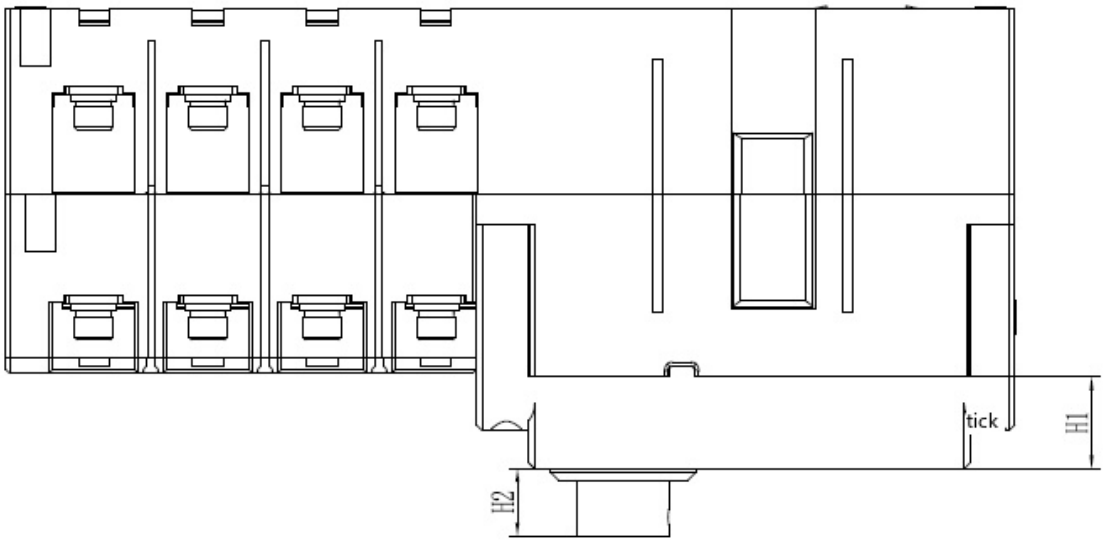
Dual-power hand-operated accessories are designed with a limit, do not rotate vigorously to avoid damage to the equipment when operating according to the instructions for closing and splitting.

Table 8 Recommended torque for use with hand-operated installations

Force value (N.m)	HDQ3S-80	HDQ3S-125	HDQ3S-250
mounting screws	0.6-0.9	1.2-1.7	1.2-1.7
operating forces	To be measured	To be measured	To be measured

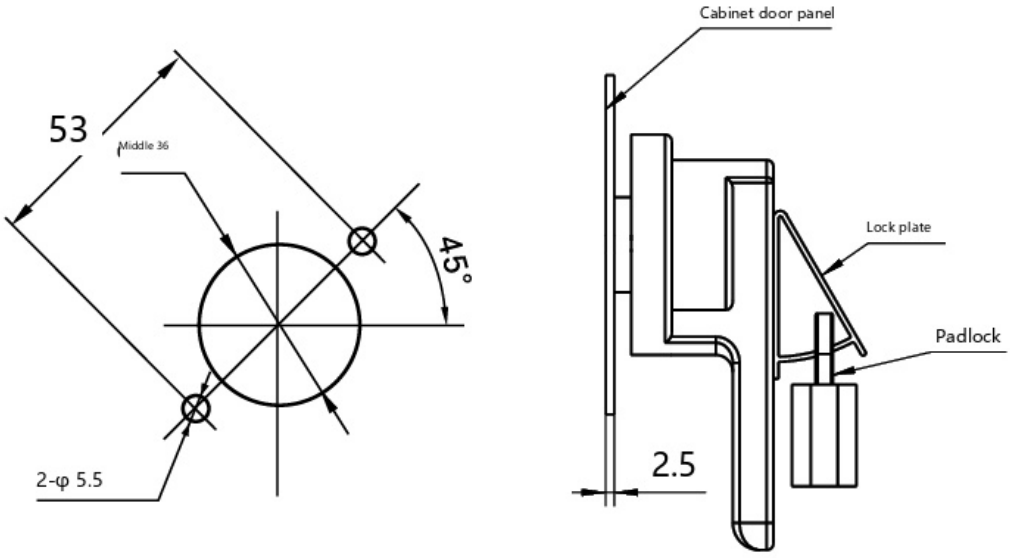
Note: The mounting method of 80 shell holder is self-tapping screws, repeated disassembly or improper rotating torque will lead to damage to the mounting holes. (It is recommended that the number of 80-shell frame replacement handlers does not exceed 1)

4.4.3 hand-operated dimensions



Manual size (mm)	HDQ3S-80	HDQ3S-125	HDQ3S-250
H1	24	22	28.5
H2	18		

4.4.4 Description of handle openings and functions



Door interlocks: Doors may be opened only in the double-parting position

Handle padlock: Dual power three positions can be completed mechanical padlock.

Note: Mechanical padlock this product is not configured, customers need to purchase separately.

4.4 Indicator light display instructions (ATSE only)

See Table 9 for a description of the indicator displays.

Table 9 Description of indicator displays

1 Commonly used power supplies	Bright: Commonly used power supply is normal Off: Common power supply ABCN loses voltage and lacks phase.	**2 Alternate power supply**	Always on:Standby power is normal Off: backup power supply AN loses voltage and lacks phase	3 Power status indication	Flashing:Abnormal status of common or standby power supply. Out: Power supply is normal

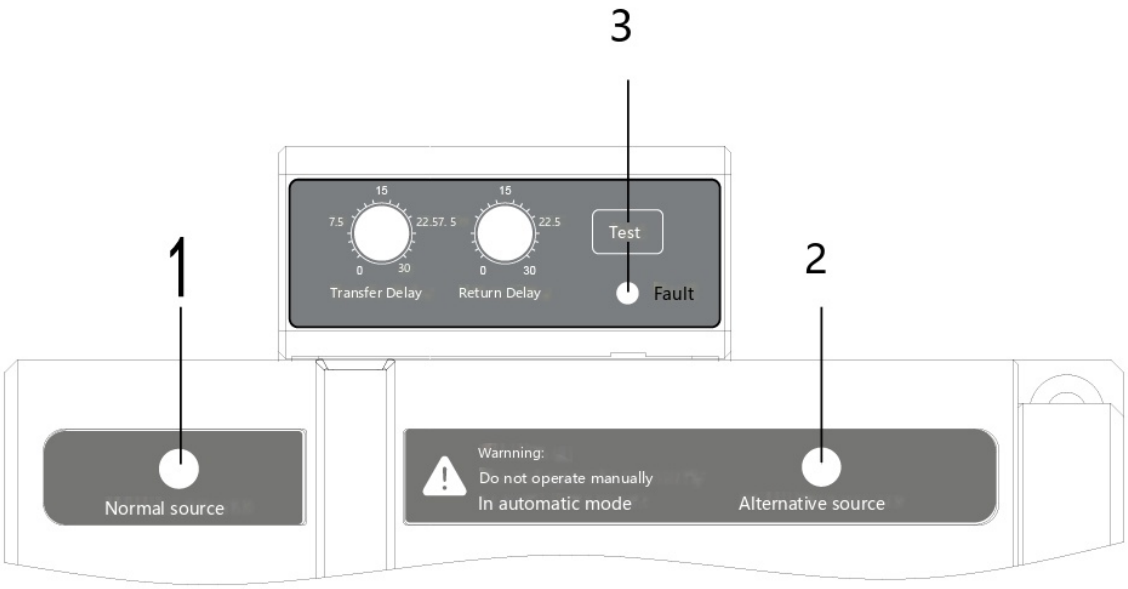


Figure 17 Indicator light position diagram

4.5 precautions for use

In addition to the "Danger" and "Caution" items on the front page, the following should be noted.

a) This product can operate reliably at rated voltage (80%~120%) Ue. When installing and wiring the product, the incoming and outgoing terminals and N-phase should be strictly distinguished, and the neutral wire must not be shared;

b) It is strictly prohibited to use this product under conditions beyond normal use conditions, such as continuous moisture or condensation without corresponding preventive measures. There are flammable or corrosive dusts, the expected short-circuit current is out of range, the voltage is extremely high or low, the current exceeds the rated current, the altitude is extremely high, etc.;

c) This product adopts plastic shell insulation design structure and has no grounding requirements.

d) If the protective appliance is disconnected due to line or load fault, the fault should be eliminated first and then the load can be energized.

e) During the use of the product, general inspections should be carried out regularly (such as every three months of operation), and the power supply should be manually switched once to check whether the product is normal.

5 Failure Analysis

Common failures of automatic transfer switch appliances are analyzed in Table 10.

Table 10 Failure analysis

Failure phenomena	cause analysis	Methods of elimination
Product does not switch over automatically (in case of malfunction, commissioning)	1、 Faulty connection of the power cord to the switch body; and 2、 Automatic manual button in manual state ; 3、 The product's on-site undervoltage exceeds 20% (phase voltage). (P type controller only) 4、 The N-pole incoming terminal of the 3P product is not connected.	1、 Check that the power cables are connected and the bolts are tightened. 2、 Check that the automatic manual button is in the automatic state ;Check that the automatic manual button is in the automatic state. 3、 Maintaining on-site power grid conditions 4、 Connect to N pole.
Function errors happen	5、 Loose or detached connecting wires between the backpack and the motherboard.	5、 Reinstallation of the wiring.

6 The Company undertakes that

Under the premise that the user complies with the conditions of use and storage and the seal of the product is intact, the company is responsible for repairing or replacing the product without charge if the product is damaged or cannot be used normally due to manufacturing quality problems within thirty-six months from the date of production. If the warranty period is exceeded, the product will be repaired for a fee. However, even within the warranty period, repairs will be compensated if the damage is caused by any of the following.

a) Due to improper use, maintenance and storage;

b) Self-modification and improper maintenance;

c) Damaged due to falling or installation process after purchase;

d) Force majeure such as earthquakes, fires, lightning strikes, abnormal voltages and secondary disasters.

If you have any questions, please contact your dealer or our customer service department.