

HSQ6

Series Automatic Transfer Switching Equipment



1、Application

HSQ6III Series Automatic Transfer Switching Equipment (referred to as the device hereinafter) is kind of PC grade three sectional type automatic transfer switching apparatus, mainly used in AC 50 Hz 3-phase 4-line dual power supply grid with rated voltage 400V and rated working current up to 1600A for changeover between two power supplies when one power supply fails in order to guarantee reliability and safety of power supply.

The device has three working positions of "Usual power supply", "Disconnected" and "Backup power power". With higher sectional making capacity, the device satisfies changeover of both common load and high reactance great motor load. In a fact, the device is widely applied in power consuming fields such as industry, commerce, civil housing and so on.

The device complies with GB/T14048.11 - 2008 "Low Voltage Switchgear and Controlgear Part 6 - 1: Transfer Switchgear of Multi-functional Apparatus".

2、Descriptions

Integrated with switch and logic controller as a whole, the HSQ6III Series Automatic Transfer Switching Equipment is really an electro-mechanical automatic transfer switch with various functions such as voltage detection, frequency detection, communicative interface, electric and mechanical interlocking for the realization of automatic control, motor-driven remote control and manual emergency control.

Operation is realized by a gearbox in which there is a motor managed as per various logic orders from a logic control board. The motor charges switch spring to release accelerate mechanism instantaneously so that the device energizes disconnecting circuit or changeover circuit in a quick speed. Safety isolation is thus realized through a apparently visual gap. In this way, electric and mechanical properties are greatly enhanced.

There is a metal enclosed case for its control part. For switching part, the outer case is made from glass fiber unsaturated polyester resin with stronger dielectric property, protective capacity and reliable safety.

Consequently, the device is eye appealed, novel, simple, compact and full functioned. Actually, it is the best choice in same kind of product.

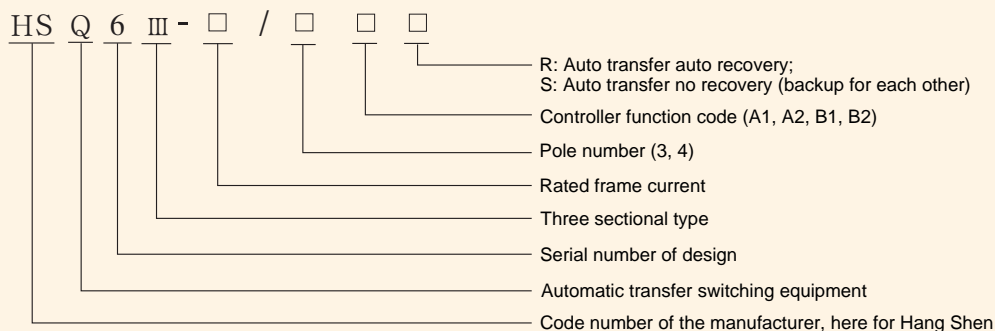
3、Normal working, installation and transportation conditions

- Air ambient temperature not over +40℃ nor lower than -5℃ with an average temperature within 14 hours not higher than +35℃.
- Altitude of installation site not over 2000 meters above sea level.
- The relative humidity is not over 50% at maximum ambient temperature +40℃. Higher humidity is allowed at lower temperature. The minimum temperature in the wettest month is not over +25℃, and the monthly maximum relative humidity of this month is not over 90%. Allowance should be paid to condensation happened on product surface due to temperature fluctuation. Installation should be made at a site without impulse vibration nor rain and snow affected.
- Apparatus grade: PC
- Transmitting grade of EMC equipment: Environment B
- In transportation, the device should be handled with care. Putting upside down is not unacceptable.

4、Features

- With double row composite contacts, embedded structure, micro-motor energy pre-charge and micro-electronics control technique, zero flashover is basically realized (without arc extinguishing cover).
- With reliable mechanical interlocking and electric interlocking, and an independent load disconnecter for executing component, it works safely and reliably.
- With zero position passing technology, forced to make zero position when in emergency is feasible (to turn off two power supplies simultaneously) so it satisfies fire extinguishing interacting requirement.
- Transfer of load disconnecter is done by a single motor, so it makes transfer operations reliably and smoothly at a small impact force and without any noise.
- The current passes only in an instant time when the load disconnecter is transferred by a controller driven motor. No working current at all when in stability work so it saves energy apparently.
- With mechanical interlocking device, the load disconnecter secures usual power supply and backup power supply reliably without interference to each other.
- With apparent ON and OFF position indication, the three positions of "Usual power supply", "Disconnected" and "Backup power supply" are indicated remarkably. So, it is good at safety performance, high in automatic level and strong in reliability. The product works in zero potential status actually. The control circuit is connected in plug-in terminal mode and easy to install.
- Operation may be done both manually and automatically. In automatic operation mode, manual operation is prohibited. If you want manual operation, the changeover switch button should be put at manual position.

5、Type designation



6、Controller

Table1 Classification of controller

Item	Type A Controller		Type B Controller	
	A1 (grid-gird)	A2 (grid-generator)	B1 (grid-gird)	B2 (grid-generator)
Auto-transfer ³	Auto transfer & auto recovery, auto-transfer & no auto recovery (Backup for each other)		Auto transfer & auto recovery, auto-transfer & no auto recovery (Backup for each other)	
Usual power detection	Usual power 3-phase detection			
Backup power detection	Backup power 3-phase detection			
Forced transfer	Forced operation to usual power, forced operation to backup power,forced operation to OFF			
Manual transfer	Manual operation to usual power, manual operation to backup power manual operation to OFF			
Generator control	- -	Generator start and stop	- -	Generator start and stop
Fire signal	DC24V fire signal to disconnect the device			
Fire feed back	A group of normally open contacts			
Communication ¹	(Optional communication module)for remote regulation, remote measurement, remote control and remote communication. RS485 interface, Modbus-RTU protocol,Baud rate:1200, 2400, 9600, 19200, 38400bps			
Position indication	Local position indication(AC230V output for opening and closing indication of usual power and backup power)			
Feedback signal	- -	- -	Usual and backup power's undervoltage feedback (no powercontact) Usual and backup power's position feedback (no powercontact) Usual and backup power's failure feedback (no powercontact)	Usual and backup power's undervoltage feedback (no powercontact) Usual and backup power's position feedback (no powercontact) Usual and backup power's failure feedback (no powercontact)
Display mode ¹	Mechanical indication: On/Off status and operating mode set at the manufacturer and cannot be modified by customers. LED: On/Off status, operating status, parameter set etc. indicated separately. LCD: On/Off status, usual or backup power status, parameter set and operating record indicated separately.			
Undervoltage detection	Undervoltage may be detected at any phase as per undervoltage setting value.			
Overvoltage detection	Overvoltage may be detected at any phase as per overvoltage setting value.			
Voltage loss (phase off) detection	Voltage loss may be detected at any phase as per voltage loss setting value.			
Parameter setting ² Indicated separately	Undervoltage setting(U1=164V) ² , Overvoltage setting(U2=264V) ² , Voltage loss (≤ 70V) ² , Transfer delay(t1=2s) ² , Recovery delay(t2=2s) ² Oil motor starting delay(t3=5s) ² , Oil motor stopping delay(t4=60s) ²			

Note: 1. This function is optional. If necessary, it should be noted when ordering.

2. Default value is set when delivery from the manufacturer.

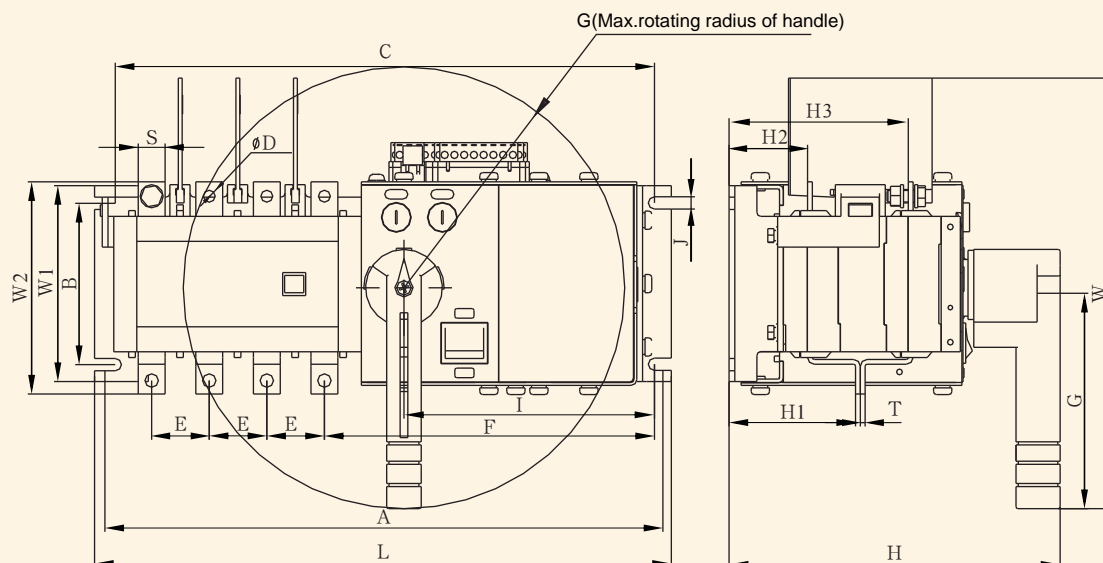
3. When delivery, the apparatus is set at auto transfer and auto recovery as a default value. If auto transfer no recovery is needed, it should be noted when ordering.

7、Main technical parameters

Frame level		100	160	250	630	1600
Rated working current Ie(A)		25,32,40,50,63,80,100	100,125,140,160	160,200,225,250	250,315,350,400,500,630	800,1000,1250,1600
Rated working voltage Ue(V)		400 / 50Hz				
Rated insulating voltage Ui(V)		690			1000	
Rated impulse withstand voltage Uimp(kV)		6			12	
Pole number		3、4				
Application category		AC－33iB				
Rated limit short circuit current Iq(kA)		50kA	50kA	50kA	50kA	50kA
Short circuit protecting device(SCPD)		RT16－100A	RT16－160A	RT16－250A	NGT3－630A	STF5－1600A
Transfer operating time (s)		3	1.5	1.5	1.5	2.5
Rated voltage of control power Us(V)		230 / 50Hz				
Operating cycle	Mechanical	8500	7000	7000	4000	3000
	Electrical	1500	1000	1000	1000	1000
	Total	10000	8000	8000	5000	4000

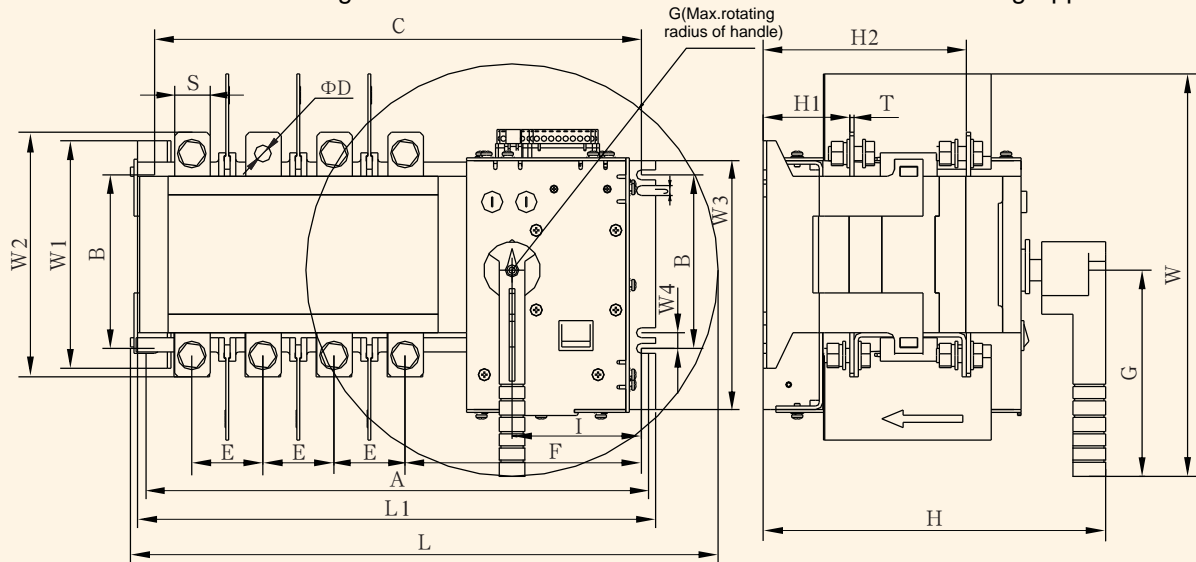
8、Overalls and installation dimensions

8.1 Installation dimension figures of HSQ6 -100 Automatic Transfer Switching Apparatus



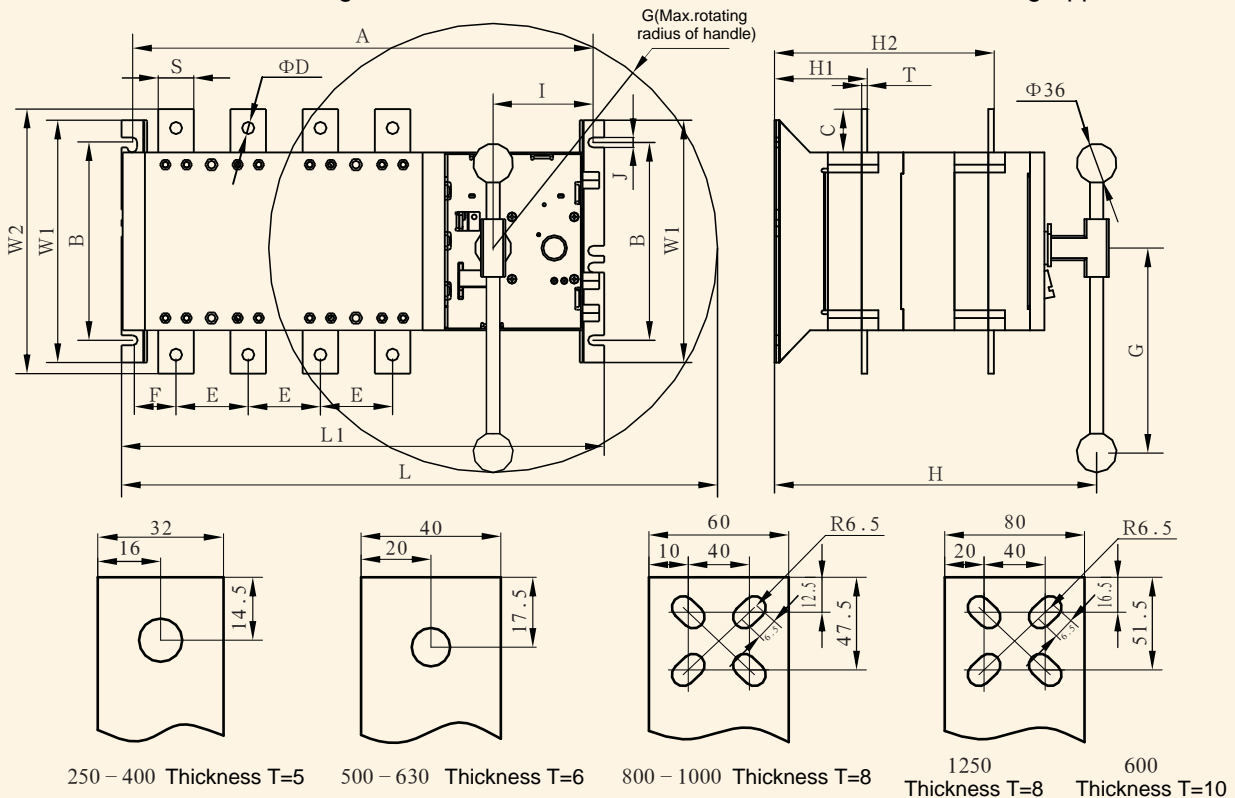
Spec	Overall dimensions			Installation dimensions			Other dimensions												
I _n	L	W	H	A	B	D	W1	W2	H1	H2	H3	C	E	F	G	I	J	S	T
100A / 3	290	225	173	281	84	6	102	110	66	41	93	271	30	172	115	131	6.5	14	2.5
100A / 4	300	225	173	291	84	6	102	110	66	41	93	281	30	172	115	131	6.5	14	2.5

8.2 Installation dimension figures of HSQ6 -160 ~250 Automatic Transfer Switching Apparatus



Spec	Overall dimensions			Installation dimensions			Other dimensions																
In	L	W	H	A	B	D	L1	W1	W2	W3	W4	H1	H2	C	E	F	G	I	J	S	T		
160A / 3	354	260	225	288	100	9	300	124	134	155	11	52	124	277.5	36	154	145	88	6.5	20	3.5		
160A / 4	354	260	225	288	100	9	300	124	134	155	11	52	124	277.5	36	154	145	88	6.5	20	3.5		
250A / 3	415	275	225	354	122	11	367	160	159	167	11	54	128	343	50	165	145	89	7	25	3.5		
250A / 4	415	275	225	354	122	11	367	160	159	167	11	54	128	343	50	165	145	89	7	25	3.5		

8.3 Installation dimension figures of HSQ6 -400 ~1600 Automatic Transfer Switching Apparatus



250 - 400 Thickness T=5

500 - 630 Thickness T=6

800 - 1000 Thickness T=8

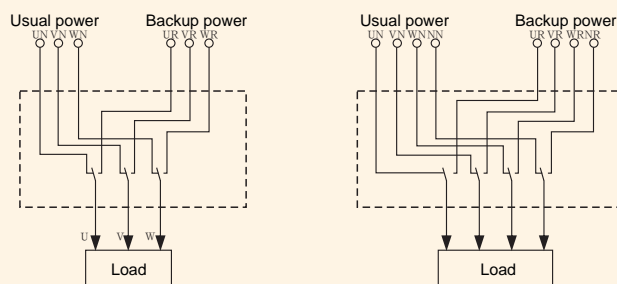
1250 Thickness T=8

600 Thickness T=10

Spec	Overall dimensions			Installation dimensions			Other dimensions										
I _n	L	H	A	B	D	L1	W1	W2	H1	H2	C	E	F	G	I	J	S
400A / 3	530	286	354	179	11	372	222	234	83	193	37	65	38	245	92	9	32
400A / 4	590	286	414	179	11	432	222	234	83	193	37	65	38	245	92	9	32
630A / 3	530	286	354	179	12	372	222	250	83	193	45	65	38	245	92	9	40
630A / 4	590	286	414	179	12	432	222	250	83	193	45	65	38	245	92	9	40
800 - 1000A / 3	785	365	497	220	13	520	250	328	109	245	64	120	60	360	85	11	60
800 - 1000A / 4	1080	365	611	220	13	634	250	328	109	245	64	120	60	540	85	11	60
1250 - 1600A / 3	785	365	497	220	13	520	250	336	109	245	68	120	60	360	85	11	80
1250 - 1600A / 4	1080	365	611	220	13	634	250	336	109	245	68	120	60	540	85	11	80

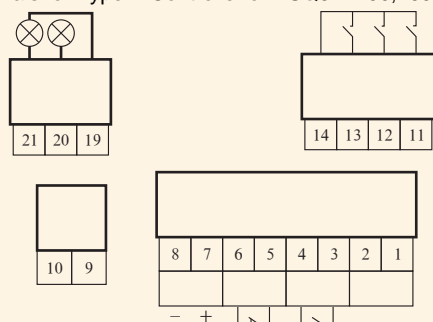
9、Electric wiring diagram

9.1 Wiring diagrams for primary circuit



9.2 Wiring diagrams for secondary circuit

9.2.1 Wiring terminals for Type A Controller of HSQ6III-100, 160, 250

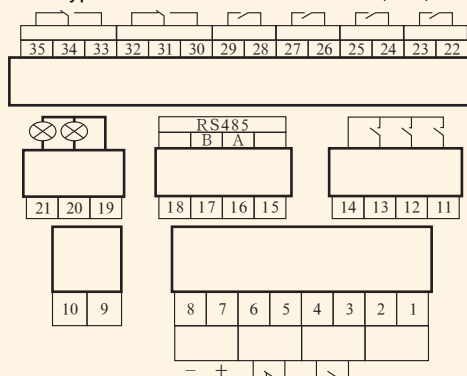


Note:

- 3, 4 Fire feed-back
- 5, 6 Generator start & stop
- 7, 8 DC 24V fire signal
- 9 N line for usual power
- 10 N line for Backup power
- 11 Forced dual power off
- 12 Forced closing of usual power
- 13 Forced closing of Backup power
- 14 Common terminal
- 19 Common N line
- 20 Usual power closing indication
- 21 Backup power closing

- Note 1. Generator start/stop and unload signal terminals only for grid-generator apparatus and no such terminals for grid-grid apparatus.
2. Wiring terminals 9 and 10 are only valid for 3-pole switches. It is no need for 4-pole switches.
3. Terminals 11-14 and terminals 19-21 are active contacts, **and power is absolutely prohibited to be introduced through.**
4. If signals for forced closing of usual power (backup closing, dual power off) need to be kept for a long time, a apparatus pushbutton with self-locking facility is necessary.

9.2.2 Wiring terminals for Type B Controller of HSQ6 -100, 160, 250



Note:

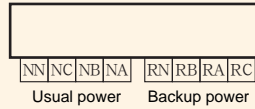
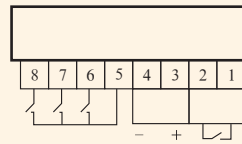
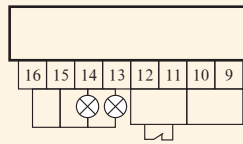
- 3, 4 Fire feed-back
- 5, 6 Generator start & stop
- 7, 8 DC 24V fire signal
- 9 N line for usual power
- 10 N line for backup power
- 11 Forced dual power off
- 12 Forced closing for usual power
- 13 Forced closing for backup power
- 14 Common terminal
- 19 Common N line
- 20 Usual power closing indication
- 21 Backup power closing indication
- 22, 23 Voltage of usual power
- 24, 25 Voltage of backup power
- 26, 27 Fault of usual power
- 28, 29 Fault of backup power
- 30, 31, 32 Usual power position
- 33, 34, 35 Backup power position

- Note: 1. Generator start/stop and unload signal terminals only for grid-generator apparatus and no such terminals for grid-grid apparatus.
2. Wiring terminals 9 and 10 are only valid for 3-pole switches. It is no need for 4-pole switches.
3. RS485 communication function is an auxiliary one. It is not standard configuration for B Type Controller.
4. Terminals 11-14 and terminals 19-21 are active contacts, **and power is strictly prohibited to be introduced through.**
5. Terminals 22-35 are inactive contact outputs.
6. If signals for forced closing of usual power (backup closing, dual power off) need to be kept for a long time, a apparatus pushbutton with self-locking facility is necessary.

9.2.3 Wiring terminals for Type A Controller of HSQ6 -630, 1600

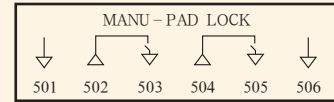
Note:

- 1, 2 Fire feed back
- 3, 4 Fire signal DC 24V
- 5 Common terminal
- 6 Forced to open dual power
- 7 Forced closing usual power
- 8 Forced closing backup power
- 9,10 DC 12V output
- 11,12 Generator start and stop
- 13 Backup power closing indication
- 14 Usual power closing indication
- 15,16 Common N line



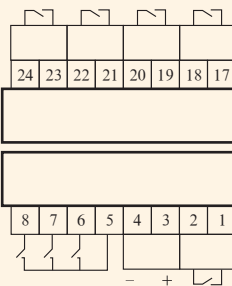
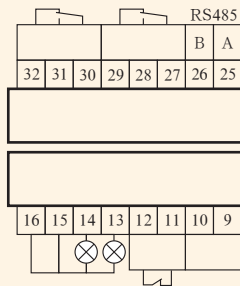
Auxiliary terminals for key and padlock (inactive)

This terminal group is located at other side

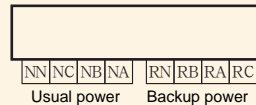


- Note: 1. Terminals 5-8 and terminals 13-16 are active contacts, and power is strictly prohibited to be introduced through.
- 2. Usual power, backup power and sampling line are wired to the correspondent phases on main busbar.

9.2.4 Wiring terminals for Type B Controller of HSQ6 -630, 1600



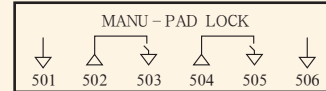
- 9,10 DC 12V output
- 11,12 Generator start and stop
- 13 Backup power closing indication
- 14 Usual power closing indication
- 15,16 Common N line



- 17, 18 Usual power fault
- 19, 20 Backup power fault
- 21, 22 Usual power undervoltage
- 23, 24 Backup power undervoltage
- 25, 26 RS 485 interface
- 27, 28, 29 Backup power position
- 30, 31, 32 Usual power position

Auxiliary terminals for key and padlock (inactive)

This terminal group is located at other side



Note:

- 1, 2 Fire feed back
- 3, 4 Fire signal DC 24V
- 5 Common terminal
- 6 Forced to open dual power
- 7 Forced closing usual power
- 8 Forced closing backup power

- Note: 1. Terminals 5-8 and terminals 13-16 are active contacts, and power is strictly prohibited to be introduced through.
- 2. Terminals 17-24 and 27-32 are inactive contact outputs.
- 3. Usual power, backup power and sampling line are wired to the correspondent phases on main busbar.

10、Information given on ordering

HSQ6 (3-position in PC grade) Ordering Sheet

Client	Quantity	Date	Remark
Pole number	<input type="checkbox"/> 3-pole <input type="checkbox"/> 4-pole		
Frame level	Rated current		
HSQ6Ⅲ - 100	<input type="checkbox"/> 25A <input type="checkbox"/> 32A <input type="checkbox"/> 40A <input type="checkbox"/> 50A <input type="checkbox"/> 63A <input type="checkbox"/> 80A <input type="checkbox"/> 100A		
HSQ6Ⅲ - 160	<input type="checkbox"/> 100A <input type="checkbox"/> 125A <input type="checkbox"/> 140A <input type="checkbox"/> 160A		
HSQ6Ⅲ - 250	<input type="checkbox"/> 160A <input type="checkbox"/> 200A <input type="checkbox"/> 225A <input type="checkbox"/> 250A		
HSQ6Ⅲ - 630	<input type="checkbox"/> 250A <input type="checkbox"/> 315A <input type="checkbox"/> 350A <input type="checkbox"/> 400A <input type="checkbox"/> 500A <input type="checkbox"/> 630A		
HSQ6Ⅲ - 1600	<input type="checkbox"/> 800A <input type="checkbox"/> 1000A <input type="checkbox"/> 1250A <input type="checkbox"/> 1600A		
Controller	Category	Optional functions	
	<input type="checkbox"/> grid-grid(A1)		
	<input type="checkbox"/> grid-generator(A2)		
	<input type="checkbox"/> grid-grid (B1)		
	<input type="checkbox"/> grid-generator(B2)	<input type="checkbox"/> Communication	RS485 Interface, MODBUS communication protocol

