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A u t o m a t i c T r a n s f e r S w i t c h

AOERMAN

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AMQ5 Series
Automatic Transfer Switch


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Seeking practice and innovation

Ten years' experience has created aoerman fighting spirits for refinements
Ten years' insistence has achieved aoerman service thought for perfection.

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Company Profile

Shanghai Aoerman Electric Co., Ltd. stands out among others in the fierce market competition attribute to its concepts of revitalizing national industry as its own duty, keeping pace with the times, strengthening corporate brand by modern science and technology, winning the market by quality, meeting and maintaining the interests of consumers. In this way, we have gone through difficult and brilliant years in our indomitable struggle.

With the strategic principle of creating excellence with good quality, the company specialized in the production of ATS series, MCCB series, alarm and control system for electric fire prevention, and other low-voltage electrical products of various specifications, enough to meet the changing needs of the domestic and foreign markets.

The company has strong technical force, advanced equipment and sufficient funds. The company also attaches great importance to investment in scientific research and technological innovation. It adopts computer optimization design to speed up product development and quality improvement. With the continuous improvement of product quality, we will further expand the domestic and foreign markets by virtue of high quality, integrity management and excellent after-sales service.

The company is willing to closely cooperate with the majority of customers to create a brilliant future.

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AMQ5

Automatic Transfer Switch

Overview

As the society advances, safety of power supply has become the increasing need of people. Many occasions require two circuits of power supply to guarantee reliable power supply, which demands a product that makes reliable switching between two circuits of power supply. AMQ5 series automatic transfer switch is developed as the times require.

Scope of Application

AMQ5 series automatic transfer switch equipment (ATSE) integrates the switch with logic control, is a new type automatic transfer switch that can really realize the electromechanicat integration.It is applicable for industrial and enterprise distribution systems of rated insulation voltage up to 690V, rated frequency 50Hz, rated voltage up to 400V and rated current from 16A to 3200A; used for automatic transfer between the normal power and reserve power in power supply system or used for automatic transfer and isolation between two load equipment, etc.; the products are widely applied to the important locations such as hospital, emporium, bank, high-rise building, coal mine, telecom, iron mine, highway, airport,industrial assembly line, military facilities and so on where the power failure is not allowed.

Through control circuit board, the switch sends out various logic commands to control the motor,motor rotates and drives the operating mechanism of energy storage and instantaneous release of spring after speed-down by gear case, thus to make/break the circuit or transfer the circuits, realizing secure isolation through these obvious states.

The switch can realize operations such as grid-grid, grid-generator, fire control, remote disconnection, control, emergency manual operation, etc.; and has functions of electric mechanical interlocking, generator and so on. With elegant shape, novel pattern, small size, complete functions, it really is the best choice among the similar products.

Up to the Standards

IEC60947-6-1

Normal Service Conditions

Ambient air temperature should be within -5℃~+40℃, average temperature within 24h should not exceed +35℃.

Altitude of installation site should not exceed 2000m.

Relative humidity should not exceed 50% at +40℃, higher relative humidity is allowed at lower temperature condition. The average maximum relative humidity of the dampest month is 90% when the monthly average minimum temperature is 25℃. The dew on the product surface caused by the temperature change should be considered.

Class of pollution: III.

The operating site should be no strong vibration or impact, no corrosive or other harmful gas that would destroy the insulation, no heavy dust, conductive particle or explosive hazard or strong electromagnetic interference.

Model Definition

AM Q 5 -□ /□□□□□□

- X: Fire control Y: Remote disconnection W: Passive contact
- XF: Fire control feedback signal
- R: Auto-input auto-restoring
- S: Auto-input non-restoring
- A: Grid - grid
- B: Grid-generator
- C: End type
- E: Terminal type
- I: Integrated switching equipment
- IF: Split type external LCD controller
- 3: 3-pole
- 4: 4-pole
- Rated current
- Frame current
- Design No.
- Automatic transfer switch
- Enterprise code

Note: type IF: rated current 16-800A;

Product Features

Reliable and secure interlocking function.

Function of making and breaking the main and secondary circuits reliably.The switch body has self-locking function.

The switch has safe insulation isolation.

Simple structure, heavy current, and integrated ATS.

The switching equipment with controller can switch among various protection functions manually or automatically.

EPS fire power source of DC24V, remote disconnection, passive contact.

Advantages of small size, high breaking, short flashover, compact structure and beautiful appearance.

Good anti-corrosion performance and reliable power supply.

No-noise running, energy saving, simple installation, easy operation and high stability.

Electrical class: PC level.

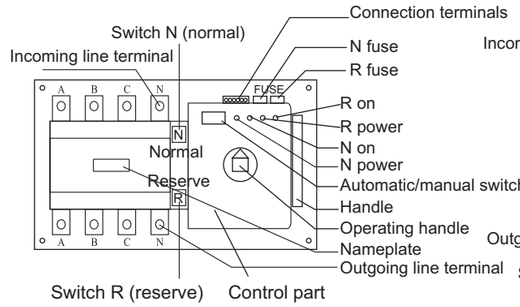
Main Technical Parameters

Spec. & Model / Technical Parameters	AMQ5-100	AMQ5-160	AMQ5-250	AMQ5-400	AMQ5-630	AMQ5-800
Rated operating current Ie(A)	16、20、25、32、40、50、63、80、100	125、140、160	125、140、160、180、200 225、250	315、350、400	500、630	700、800
Rated operating voltage Ue(V)	400V					
Rated insulation voltage Ui(V)	690V					
Switch pole number	3Pole、4Pole					
Rated impulse withstand voltage KV	4KV		4KV	8KV	12KV	12KV
Rated short-time withs-tand current Icw RMS	5KA		10KA	10KA	16KA	16KA
Rated short-circuit making capacity Icm PEAK	7. 65KA		17KA	17KA	32KA	32KA
Minimum switching time (S)	1-3. 5S					
Auxiliary contact capacity	220V/5A					
Use category	AC-32B					
ATSE level	PC ATSE					
Controller operating voltage / frequency	220V(230V)/50Hz					
Electrical operating life	1000				500	
Mechanical life	5000				3000	

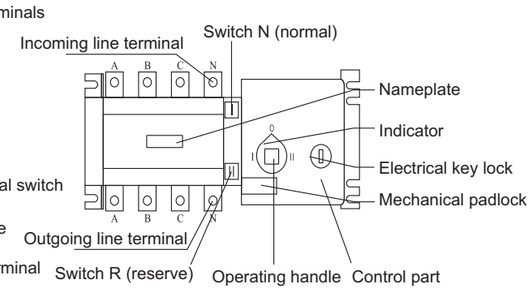
Spec. & Model / Technical Parameters	AMQ5-1250	AMQ5-1600	AMQ5-2000	AMQ5-2500	AMQ5-3200
Rated operating current Ie(A)	1000、1250	1600	2000	2500	3200
Rated operating voltage Ue(V)	400V				
Rated insulation voltage Ui(V)	1000V				
Switch pole number	3Pole、4Pole				
Rated impulse withstand voltage KV	12KV				
Rated short-time withs-tand current Icw RMS	50KA				
Rated short-circuit making capacity Icm PEAK	32KA				
Minimum switching time (S)	1. 2S		2. 4S		
Auxiliary contact capacity	220V/5A				
Use category	AC-32B				
ATSE level	PC ATSE				
Controller operating voltage / frequency	220V(230V)/50Hz				
Electrical operating life	500				
Mechanical life	2500				

AMQ5 Automatic Transfer Switch

Structure and Characteristics



(16-800A)



(1000-3200A)

1. 16-800A:

N: normal power; R: reserve power.

When selecting the manual state, it is able to control “ON” and “OFF” of two switches manually, in this case, and the automatic transfer function is not available.

When selecting the automatic state, it enters automatic control state according to serving power of the time.

When selecting handle pulling, just press the manual/automatic switch on the controller panel to manual state. Now the handle can pull two switches to “ON” or “OFF”.

Indicator: manual/automatic switch,N power indicator, normal power closing indicator (N on), R power indicator, reserve power closing indicator (R on).

2. 1000-3200A:

Electric key lock: used to control the power supply of control circuit inside the switch, when the electrolock is opened, the switch can realize automatic operation, forced “0” setting and remote control; when it is closed, the switch can only be manually operated.

Operating handle: when operating with the operating handle, the electrolock should be closed first.

Mechanical padlock: this padlock mechanism is specially designed for overhaul, set the switch at gear “0” before overhaul, pull up the padlock mechanism, lock up with the padlock, preventing from any accident (the inner control power will be cut off when pulling up the padlock, and the switch will be kept from automatic operation or handle operation).

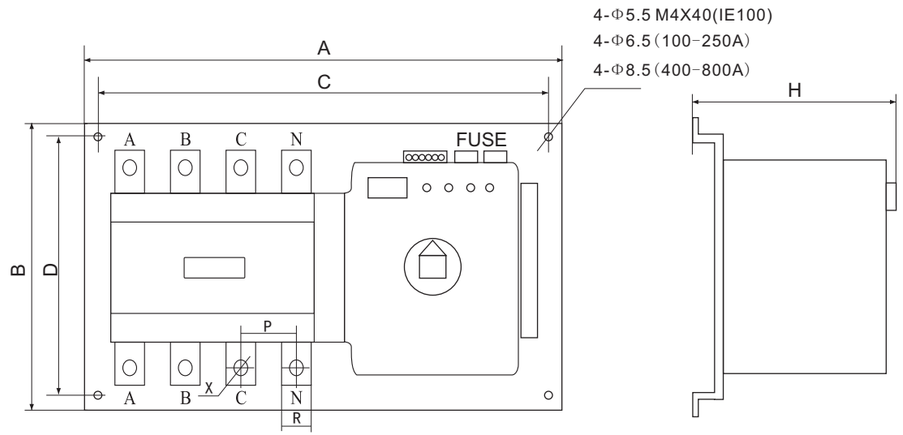
Indicator: it indicates three states (N, O, R) of switch, “N” means that the normal power is switched on, “R” means that the reserve power is switched on, “O” means that the normal power (N) and reserve power (R) are all switched off.

Characteristics

1. Auto-input auto-restoring: when the normal power is failed (or has open-phase), the switch will transfer to the reserve power automatically, and will switch back again automatically once the normal power returns to regular.
2. Auto-input non-restoring: It will transfer to the reserve power automatically when there is something wrong with the normal power, and will not switch back when the normal power returns to regular until the reserve power is failed, then it will switch back to the normal power.

3. Generator: when the normal power is failed (or has open-phase), it sends out generator starting signal to start the generator automatically, and the switch will transfer to the generator power automatically, and will switch back again automatically once the normal power returns to regular. Meanwhile, it sends out the turning off signal to shut down the generator automatically.
4. Remote control: i.e. long distance operating control. The normal power can be put into operation by activating the button “N”; and the reserve power can be put into operation by activating the button “R”.

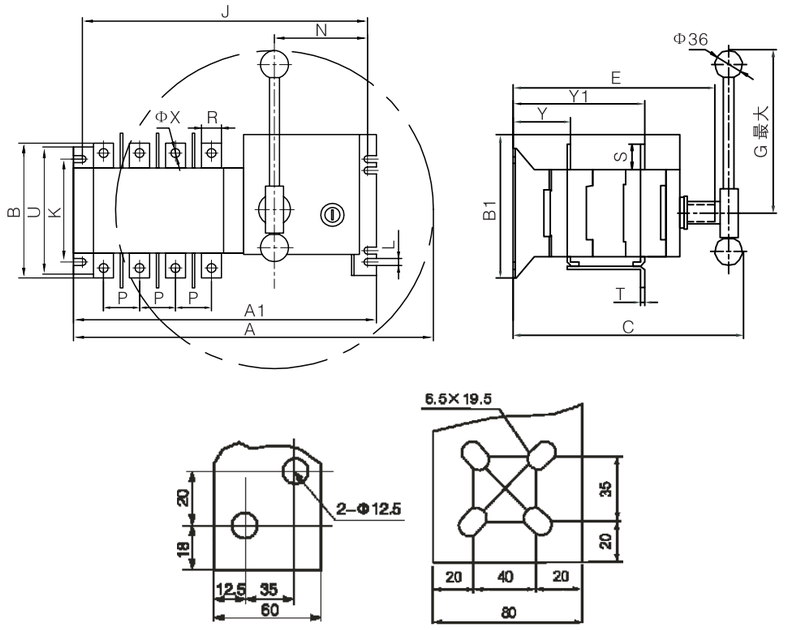
Outline and installation dimensions (16-800A)



Unit: mm

Spec. \ Size	A (L) 3P/4P	B (W)	C (L) 3P/4P	D (W)	H (H) 3P/4P	P	R	X
AMQ5-100 (E)	205	115	193	95	120	24. 5	14	M6
AMQ5-100 (C)	255	155	235	135	140	25. 5	14	M6
AMQ5-100	275	165	255	145	145	30	16	M8
AMQ5-125	275	165	255	145	145	30	16	M8
AMQ5-160	275	165	255	145	145	30	16	M8
AMQ5-250	315	185	295	165	175	35	22. 5	M8
AMQ5-400	415	245	395	225	220	50	34	ϕ11
AMQ5-630	515	285	495	265	255	70	40	ϕ17
AMQ5-800	515	285	495	265	255	70	40	ϕ17

Outline and installation dimensions (1000-1600A)



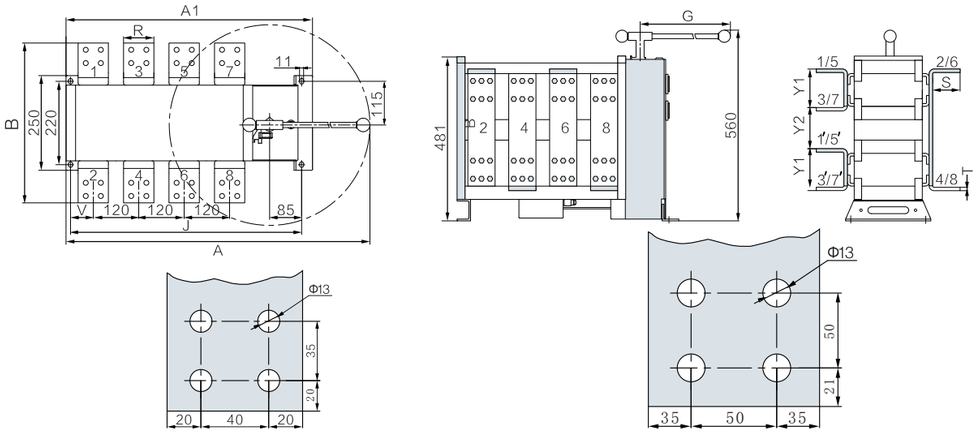
installation diagram 1000A　　installation diagram 1250A-1600A

Unit: mm

Spec.	Size							installation									connecting terminal		
	A	A1	B	B1	C	E	G	J	K	L	N	P	R	S	T	U	ϕX	Y	Y1
AMQ5-1000/3	670	515	312	250	363	335	443	495	220	11	87	121	60	55	8	250	12. 5	109	254
AMQ5-1000/4	760	633	312	250	363	335	443	613	220	11	87	121	60	55	8	250	12. 5	109	254
AMQ5-1250/3	670	515	338	250	363	335	443	495	220	11	87	121	80	69	8	250	13	109	254
AMQ5-1250/4	760	633	338	250	363	335	443	613	220	11	87	121	80	69	8	250	13	109	254
AMQ5-1600/3	670	515	338	250	363	335	443	495	220	11	87	121	80	69	10	250	13	110	255
AMQ5-1600/4	760	633	338	250	363	335	443	613	220	11	87	121	80	69	10	250	13	110	255

Spec.	Size				installation				connecting terminal	
	A	A1	B	G	J	R	S	T	Y1	Y2
AMQ5-2000/3	700	515	422	447	524	80	81	10	116	118
AMQ5-2500/3	700	515	432	447	524	80	81	15	121	113
AMQ5-3200/3	700	515	442	447	524	120	81	15	126	108

Outline and installation dimensions (2000-3200A)



installation diagram 2000A-2500A

installation diagram 3200A

Unit: mm

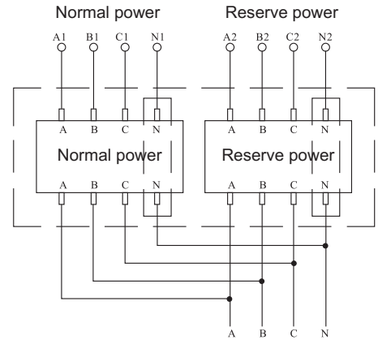
Spec.	Size				installation				connecting terminal	
	A	A1	B	G	J	R	S	T	Y1	Y2
AMQ5-2000/4	800	633	422	447	524	80	81	10	116	118
AMQ5-2500/4	800	633	432	447	524	80	81	15	121	113
AMQ5-3200/4	800	633	442	447	524	80	81	20	126	108

Instructions for Use

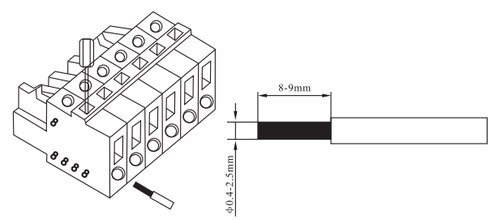
1. Don’t ask laypeople for installation; don’t disassemble without our permission, so as not to damage the switch.
2. Please read this operating manual carefully before installing, preventing improper use.
3. Rated voltage of the control source inside the switch is 220V, is power supplied by A1.N1 of normal power and A2.N2 of reserve power, and type IE is power supplied by C1.N1 of normal power and C2.N2 of reserve power. The switch can work normally only when the rated control voltage is within 85%-110%.
4. The power supply at the incoming side of switch should have overvoltage protection, preventing from damage of internal circuit board or control motor caused by overvoltage.
5. The outgoing side of switch should have short-circuit protection, preventing the switch body from burnt due to too heavy current at short circuit.
6. Before using and installing, please set the manual / automatic switch on the control panel in the manual state (16-800A), close the electric key lock and set the switch at gear “0”.
7. When wiring switch, please measure and distinguish the A.B.C.N of power incoming line, and connect to corresponding pole of the switch.
8. After the switch is put into operation normally, please take down the handle and the electric key (1000-3200A) and keep separately, preventing any unexpected accident.

Installation and wiring

Main circuit wiring

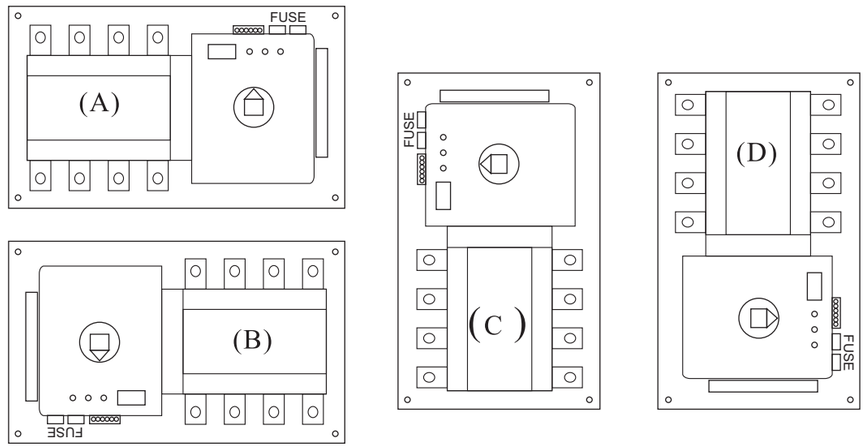


Terminal wiring



Use a small slotted screwdriver with downward force, embed the conductor as shown in the diagram

Corrector installation methods



A, B and C are right (A is the best), (D) is incorrect.

Instructions for commissioning

1. Operate the switch with operating handle for three times, the switch should operate flexibly.
2. Connect wires according to the wiring diagram. Measure the voltage of A1.N1 and C1.N1 of type IE again to make sure it is in the range of 85%-110% of rated control voltage.Set the manual/automatic switch on the controller panel in automatic state (16-800A), open the electric key lock (1000-3200A) and put through the two circuits of power supply, now the switch should transfer to the normal power; and the switch should transfer to reserve power automatically when the normal power is disconnected; then put through the normal power again, the switch should switch back to the normal power.

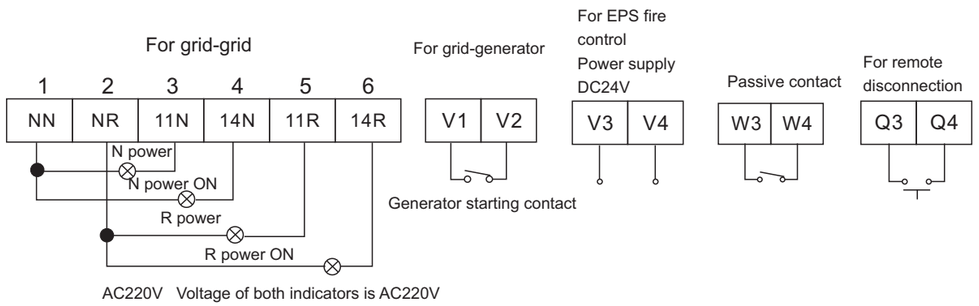
3. Commissioning (1000-3200A) of forced “0”: under any condition, activate the self-locking button of forced “0”, the switch should transfer to gear “0”.
4. Remote control commissioning (1000-3200A): activate the button “N”, the switch should transfer to the normal power; activate the button “R”, the switch should transfer to the reserve power.
5. After finishing commissioning, please turn off the power supply first, then transfer the switch to gear “0” with handle.

Operation and wiring (16-800A)

The incoming/outgoing lines and the neutral line of normal power and reserve power should be connected well according to the actual design of the circuit. In order to ensure safe use, the bottom plate of the switching equipment must be reliably grounded. When it isa three-pole switch, connect the normal power and reserve power (zero line) to the N (zero line) terminal of switching equipment and connect firmly to the neutral line of the power grid. The cross-sectional area of the cable should be ⩾ 2.5mm2, otherwise it will not work normally. The operating handle of switching equipmentthat is on the side of the controllercan be used as for emergency situation. But the button of manual “0”/automatic “I” on controller panel should be set to “0” before using the handle.

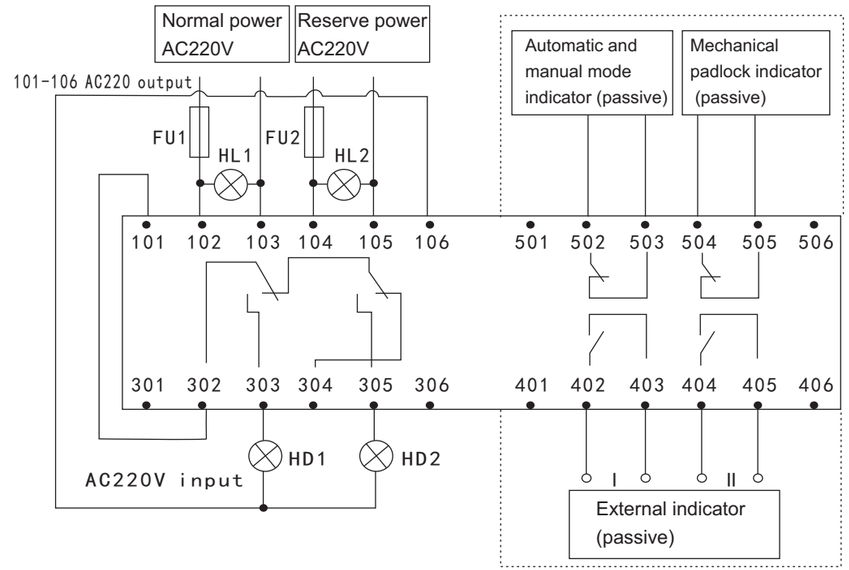
When the line is connected, the manual/automatic switch (red) on controller panel is in automatic position “I”, the switching equipment is in automatic operation, and it can start workingwhen the whole machine is powered on. When the voltage of normal power is regular, regardless of whether the R is in "ON" or "OFF" state, the switching equipmentwill conduct R OFF and N ON. When the normal power fails and there is voltage loss, the switching equipment will conduct N OFF and R ON.

The user can easily observe the operation by the external indicator light of the terminal. See the figure below for wiring

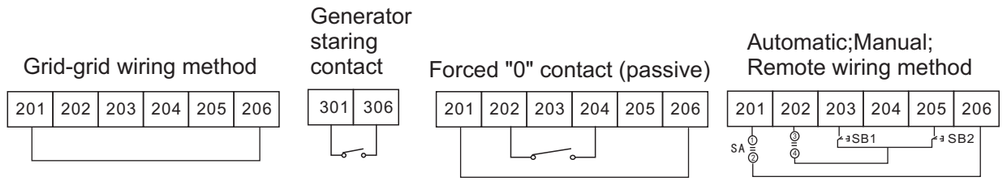


AC220V Voltage of both indicators is AC220V

Grid - grid, generator, forced "0", remote control wiring diagram (1000-3200A)



Quick wiring diagram (1000-3200A)



HL1: Power-on indicator of normal power;

HL2: Power-on indicator of reserve power;

HD1: Switch-in indicator of normal power;

HD2: Switch-in indicator of reserve power;

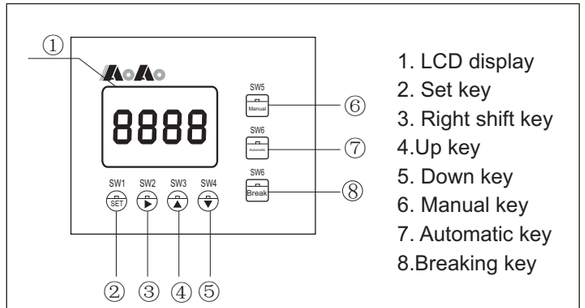
101~106, 201~206, 301~306 switch terminals;

401~406, 501~506 switch terminals optional;

SA: automatic / manual selection function;

SB1, SB2: normal power, reserve power, manual input button (passive contact);

Controller panel description (Type IF 16-800A)



Controller of Automatic Transfer Switch

LCD display of controller

NA, NB and NC are normal power indicators; RA, RB and RC are reserve power indicators. Indicator on means normal, indicator off (flicker) means under-voltage or open-phase.

Control mode of controller

Manual key: select normal power or reserve power manually;

Automatic key: enter automatic control state according to serving power of the time.

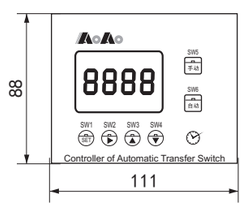
Press (SET), (SHIFT), (UP) and (DOWN) to set the parameters, and press , and to enter password. If haven't entered into the parameter setting or password input state, the system would not give any response by pressing any one key of , and . When the new circuit board is energized for the first time, it will produce the following defaults automatically:

Default password: 9999

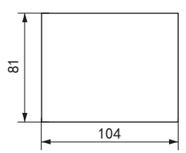
Default switching time:

A-type N-->R 3s, R-->N 3s; B-type N-->R 15s, R-->N 3s

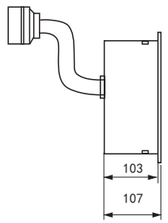
Outline and installation dimensions of controller



Overall dimension of controller



Mounting hole size of controller 104×81mm



Controller height

Controller function (Type IF 16-800A)

When the system is powered on, the MCUwill detect whether the normal power (NA, NB, NC) has power, phase loss or undervoltage. If all is normal, the system load will be switched to the normal power for power supply. If any abnormal, the corresponding measures as follows.

In automatic state, when the normal power and the reserve power are all regular, the normal power will be put into operation, and the reserve power will not be started. The system load will be powered by the normal power.

When the normal powerbecomes abnormal, the MCU will detect the current preset working state (manual, automatic, auto-restoring, non-restoring) and detect whether the reserve power is in good condition and determine whether to switch and start the reserve power to feed the system loads. See the table below:

Current power supply of loads		Current preset state of system				Current power supply is failed, whether the other one is normal or not	System treatment when the power supply is failed			Treatment of the system when the reserve power supplies power normally, while the normal power gets regular		
		Manual		Automatic			No switching	Switch to				
Normal	Reserve	Normal	Reserve	Auto-restoring	Non-restoring			Normal	Reserve	R is normal or not	No switching	Switch to
●		●				Normal	●					
				●		Abnormal	●					
●					●	Normal			●			
						Abnormal	●					
	●		●			Normal	●				●	
						Abnormal	●					
	●			●		Normal		●		Normal		Normal
						Abnormal	●			Abnormal	●	
	●				●	Normal		●			●	
						Abnormal	●					
Breaking	When the system load is in state "OFF", the system will keep breaking no matter the two circuits of power supply are in "Manual" or " Automatic". The loads will be powered on only by operating the key SW5 (manual) or SW6 (automatic) to transfer the system into non-breaking state (manual -- normal power -- reserve power or automatic -- auto-restoring -- non-restoring).											

When conducting withstand voltage test, pull out the controller plug first to protect the controller from being broken down. And fully screw in the connector plug again after the test.

Controller parameters setting(Type IF 16-800A)

Click (SET) to enter setting state. You can modify the following parameters after entering password correctly:

N-->R switching time

R-->N switching time

After setting auto-restoring/non-restoring (displayed FF F0 at 88 88 means set to non-restoring, FF F1 means set to auto-restoring), press (▶) again, the system saves the parameters setting. [In the process of setting parameters, the system does not respond to manual, automatic button or automatic switching of working mode]

The following example assumes that the password 9999, N-->R time is 4s and modified to 12s, R-->N time is originally 2s, then it is modified to 8s, auto-restoring/non-restoring is originally non-restoring, and it is modified to auto-restoring.

The flowchart as follows:

Click(SET) to enter parameter setting,

1. Prompt for password

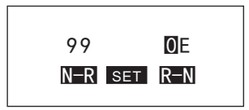
2. Click(▶), the first digit of password becomes 0 and flickers

3. Press(▲)or(▼)to enter the first digit of password

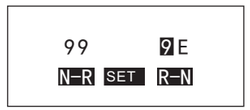
4. Press(▶) to shift, the second digit becomes 0 and flickers

5. Press (▲)or(▼) to enter the second digit of password

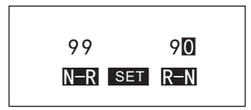
6. Press (▶) to shift, the third digit becomes 0 and flickers



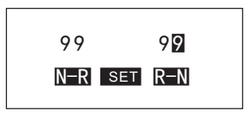
7. Press (▲)or(▼) to enter the third digit of password



8. Press (▶) to shift, the fourth digit becomes 0 and flickers

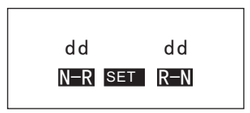


9. Press (▲) or (▼) to enter the fourth digit of password

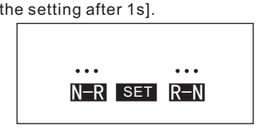


10. Press(▶) to shift, the fourth digit does not flicker, the password input is completed.

11. Wait for 1s until the system displays dddd, indicating that the password is correct.



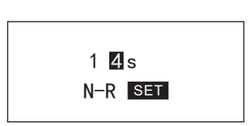
12. [The system displays...,indicating that the password is incorrect, the system will not respond to any operation, and automatically exit the setting after 1s].



13. If the password is entered correctly, the system displays entering N-->R time setting automatically after 1s display of dddd (the system will not respond to any operation during this period) and displays the original N-->R time, and the high-order flickers

14. Press (▲) or (▼) to modify

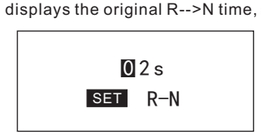
15. Press (▶) to shift



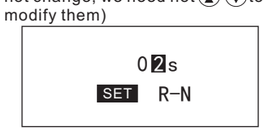
16. Press (▲) or (▼) to modify

17. Press(▶) to confirm, the low-order does not flicker

18. The system displays entering R-->N time setting automatically after 1s (the system will not respond to any operation during this period) and displays the original R-->N time, and the high-order flickers



19. Press(▶) to shift (as the median and high-order in this example do not change, we need not (▲)(▼)to modify them)



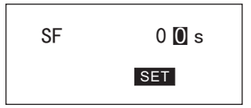
20. Press(▲)or(▼) to modify

21. Press(▶) to confirm, the low-order does not flicker

22. Press(▶) to confirm

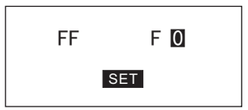
23. Press(▶) to confirm

24. Press(▶) to confirm



25. Press(▶) to confirm

26. The system displays original setting value of auto-restoring/non-restoring after 1s (the system will not respond to any operation during this period)



27. Press(▲) or (▼) to modify, it only switches between 0 and 1 here.

Note: 0 means non-restoring,
1 means auto-restoring

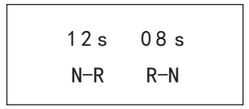
28. Press(▶) to confirm, it does not flicker

29. At this moment, only the SET is flickering, indicating that the setting is modified and the input is completed. The system will savethe new parameters into the EEPROM automatically by pressing(▶)

30. Save correctly

31. Error indication when writing E^2ROM (such as EEPROM is not soldered or is damaged, etc.)

32. Automatically switch to normal work display after 1s



Note: [In the setting process, press to shift directly if a digit does not need to be modified]

Warranty Period and After-sale Service

The product is manufactured under a perfect quality control system. For the sake of smooth operation, please refer to the warranty period and after-sale service hereinafter:

The product left unused for long term should be protected from moisture or dust, and should be well debugged according to the abovementioned content before putting into operation.

Warranty period: On the premiseofabiding by the storage and operation stipulations, the products enjoy “three-guarantee” service for 12 months (but not exceed 18months since the delivery date). During the “three-guarantee” period, users should debug, use and maintain the product according to the operation instructions strictly, and we will provide free maintenance and even replacement for fault product with intact seal caused by manufacturing problem in this period.

However, we would require paid maintenance or replacement for fault causes as follows even within the warranty period.

Wrong operation, unauthorized modification or unreasonable maintenance, etc.

Operated beyond the standard specifications.

After purchased, the product is damaged due to falling or installation, etc.

After purchased, the product is damaged due to falling or installation, etc.

After-sale service

Please contact with the supplier or our after-sale service department if there is something wrong with the product.

Repair or replacement in warranty period: We will provide free maintenance and even replacement for fault product caused by manufacturing problem.

Repair or replacement out of the warranty period: Provide paid maintenance for that can maintain the function; or provide replacement at user’s charge.

Order Guide

Please specify the following information in the order:

Product name, model, specification, rated current, number of poles (three or four poles); switching equipment structure (integrated or split); control type (grid-grid or grid-generator, end type, terminal type); switching method (auto-input auto-restoring or auto-input non-restoring);

Accessory code (X: fire control; Y: remote disconnection, W: passive contact; XF: fire control feedback signal)

Special specifications are available at request, please specify in the order.

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AMQ5 IE

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AMQ5 IF

AMQ5 Z

AMQ5 D

AMQ5 W

AMQ5 M

AMQ5 M

AMQ5 Q