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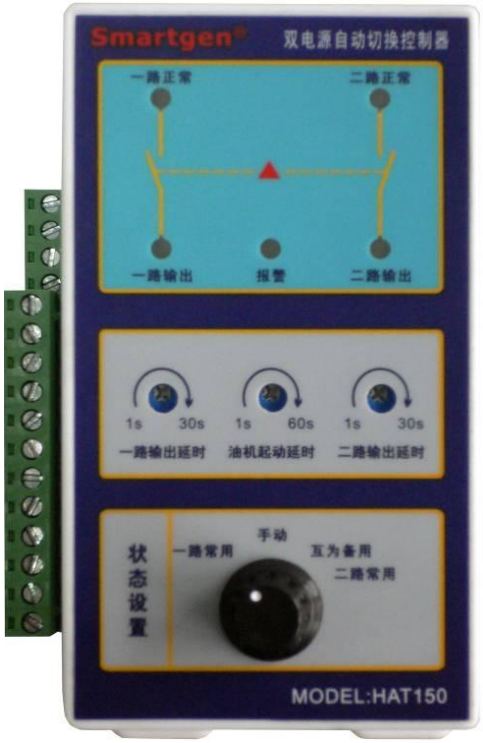
HAT150 ATS Controller

USER MANUAL



Smartgen Technology

CONTENT

1 SUMMARY

HAT150 ATS controller is an automatic control module using microprocessor as core. It can accurately detect 2-way 3-phase/single phase voltage and judge voltage abnormal (such as, loss of power, over voltage, under voltage and lack of phase), then control ATS after delay. After abnormal delay of #I power, the controller will send signal to start the genset.

2 PERFORMANCE AND CHARACTERISTICS

HAT150 controller can detect 2-way 3-phase/single phase voltage (2-way mains and 2-way gens or 1-way mains and 1-way gens) and control ATS.

- Can achieve PC programming control, voltage abnormal delay, genset stop delay, voltage calibration and so on which all operated on graphic interface. During computer programming, the base plate of the controller must be opened, and then use SG72 interface module (USB to LINK) to program via testing software of PC;
- Normal delay of #I power or #II power can be set. Start delay of genset can be set;
- Abnormal delay of #I power or #II power can be set. Stop delay of genset can be set;
- “#I Priority”, “Manual”, “Mutual Backup”, “#II Priority” can be set through panel knobs. Ensure “#I Power Priority”, “#II Power Priority” or “No Priority” and maintenance;
- Isolated design of 2-way Neutral;
- Closing time of switch is 5 seconds. If detecting closing signal during this period, disconnect at once;
- With re-closing function. This can make open/close breaker enabled even when the positions of operating mechanism and switch are inconsistent.
- When 2-way power and volts are abnormal at the same time, if voltage of A phase is normal, ATS will automatically transfer to Breaking (Middle) Position;
- With fire reset interface. When the input port is enabled, ATS will automatically transfer to Breaking (OFF) Position;
- LED can display working modes of the switch clearly;
- Strong anti-electromagnetic interference ability, can be used under complex electromagnetic interference environment;
- Modular configuration design, flame-resisting ABS plastic shell, inserted type terminals connection with compact structure and easy installation.

3 SPECIFICATION

Item	Contents
Operating Voltage	AC power A1N1/A2N2 supply AC (160-280)V
Power Consumption	Under rated voltage, power consumption is not more than 2VA
AC Voltage	3-phase AC 380V Measurement Accuracy of voltage: 2%。
Rated Frequency	50Hz/60Hz
Close/Open Relay Output	7A 250VAC passive normally open
Start Relay Output	7A 250VAC passive normally close
LO/NO Relay Output	7A 250VAC
Case Dimensions	87mm x 151mm x 114mm
Panel Cutout	43.5mm x 135mm
Operation Condition	Temperature：(-30~+70)℃ Humidity：(20~95)%RH
Storage Condition	Temperature：(-30~+80)℃
Weight	0.5Kg

4 SETTING PARAMETERS

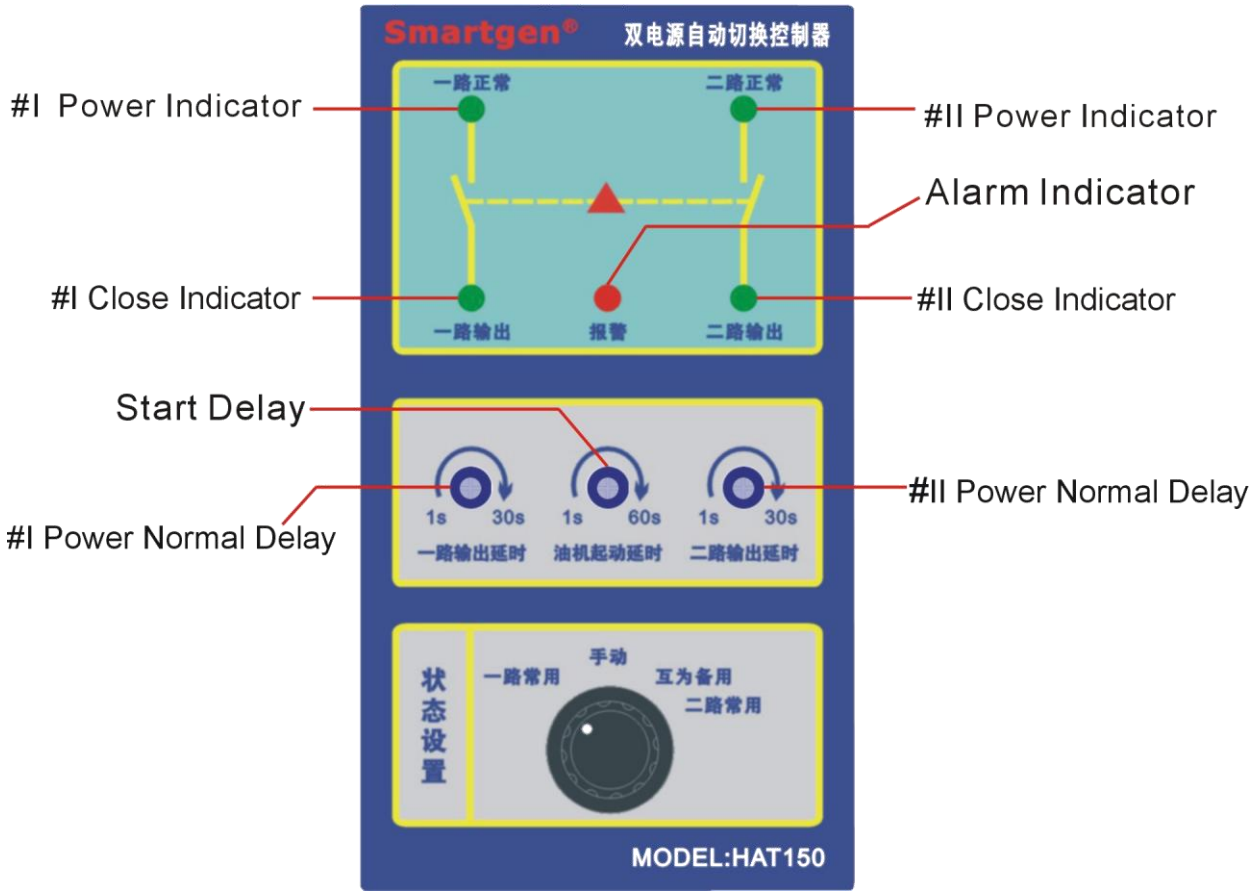
Items	Description	Range	Default	Note
Normal Delay of #I Volt	Time for confirming #I volt is normal	(1-30)s	-	Can be set via panel potentiometer
Normal Delay of #II Volt	Time for confirming #II volt is normal	(1-30)s	-	Can be set via panel potentiometer
Start Delay of Genset	Time for confirming engine cranking	(1-60)s	-	Can be set via panel potentiometer
Volt Upper Limit	If over the limit, volt is abnormal.	(50-300)V	264V (phase volt)	Can only be set via PC
Volt Lower Limit	If below the limit, volt is abnormal.	(50-300)V	172V (phase volt)	Can only be set via PC
Transfer Rest Delay	Time between closing and open breaker.	(1-20)s	1s	Can only be set via PC
Abnormal Delay of #I Volt	Time for confirming #I volt is abnormal.	(1-30)s	5s	Can only be set via PC
Abnormal Delay of #II Volt	Time for confirming #II volt is abnormal.	(1-30)s	5s	Can only be set via PC

Stop Delay Of Genset	Stop delay will begin when #I voltage is normal. Once the delay is over, start signal is closed.	(1-60)s	60s	Can only be set via PC
AC Options	Set the detected voltage as 3 phase 4 wires or Single phase 2 wires	3P4W; 1P2W	3P4W	Can only be set via PC

Note: 1. only when A phase voltage of #I or #II is normal, above delays are enabled.

2. When setting AC option as single phase 2 wires via PC, controller should be used in single phase 2 wires input.

5 PANEL DESCRIPTION



6 PANEL OPERATION

6.1 Delay Adjustment

Adjusting “#I output delay” potentiometer can adjust normal delay of #I power;

Adjusting “#II output delay” potentiometer can adjust normal delay of #II power;

Adjusting “genset start delay” potentiometer can adjust start signal delay when #I power is abnormal;

6.2 Control setting

Auto/ Manual Operation

When controller is working, status of panel knob can be described as following:

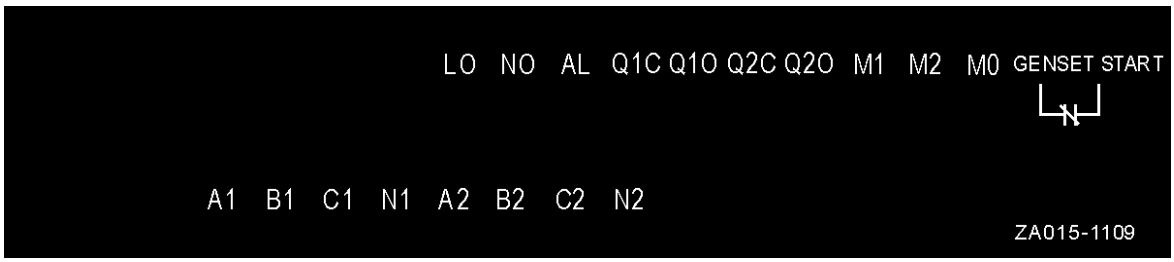
Position	Auto/Manual	Power Priority
#I Priority	Auto	#I Power Priority
Manual	Manual	/
Mutual Backup	Auto	No Priority
#II Priority	Manual	#II Power Priority

Note: When controller in Manual mode, switch must be switched by human.

When controller is working, panel indicators can be described as following:

Indicators	Description
#I Power🟢	Lamp illuminates: #I power normal; Lamp flashes: #I power abnormal; Lamp off: #I loss of power;
#II Power🟢	Lamp illuminates: #II power normal; Lamp flashes: #II power abnormal; Lamp off: #II loss of power;
#I Power Supply🟢	Lamp illuminates: #I power has taken load;
#II Power Supply🟢	Lamp illuminates: #II power has taken load;
Alarming🔴	Lamp illuminates: #I or #II failed to close breaker; Lamp flashes: auxiliary alarm input (Fire Reset enabled);
Note 1: Turning the knob to Manual position can remove alarms. **Note 2:** Power abnormal includes under voltage, over voltage and lack of phase.	

6.3 Terminals Description



The fuctions of terminals are as following:

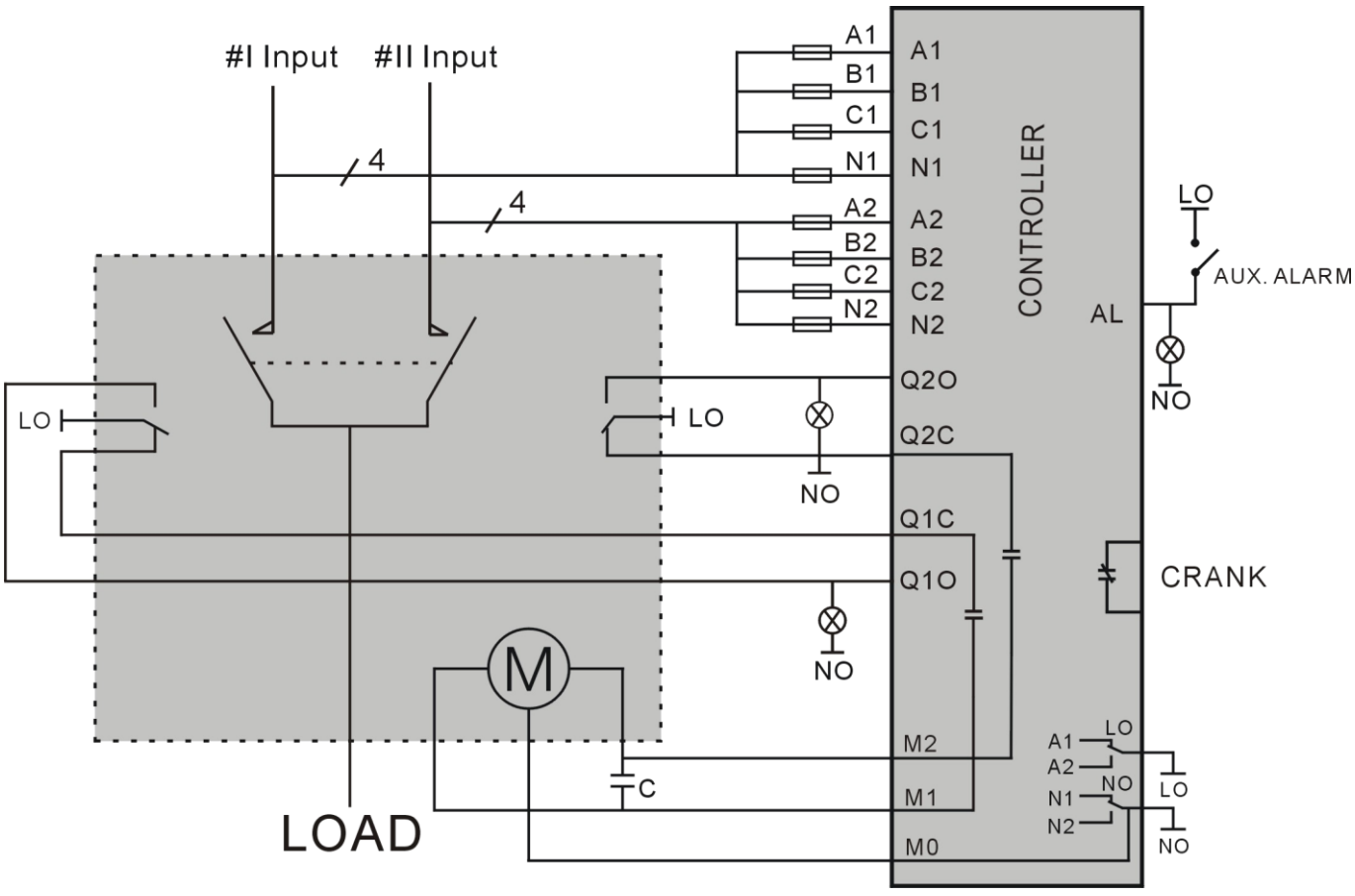
- Terminal A1, B1, C1, N1: Connect to A, B, C, N of #1 power (as for single phase 2 wires, terminal A1 and N1connect to A, N of #I power separately).
- Terminal A2, B2, C2, N2: Connect to A, B, C, N of #II power (as for single phase 2 wires, terminal A2 and N2 connect to A, N of #II power separately).

- Terminal LO, NO: the output voltage from phase A and phase N switching, which can act as power supply for ATS switching.
- Terminal Q1O: connect to auxiliary normally open contact of #I power, AC voltage input (rated 220VAC), power supply voltage.
- Terminal Q2O: connect to auxiliary normally open contact of #II power, AC voltage input (rated 220VAC), power supply voltage.
- Terminal Q1C, Q2C, M1, M2, M0: terminal function varies from ATS switch types with different connections. Please refer to Typical Application.

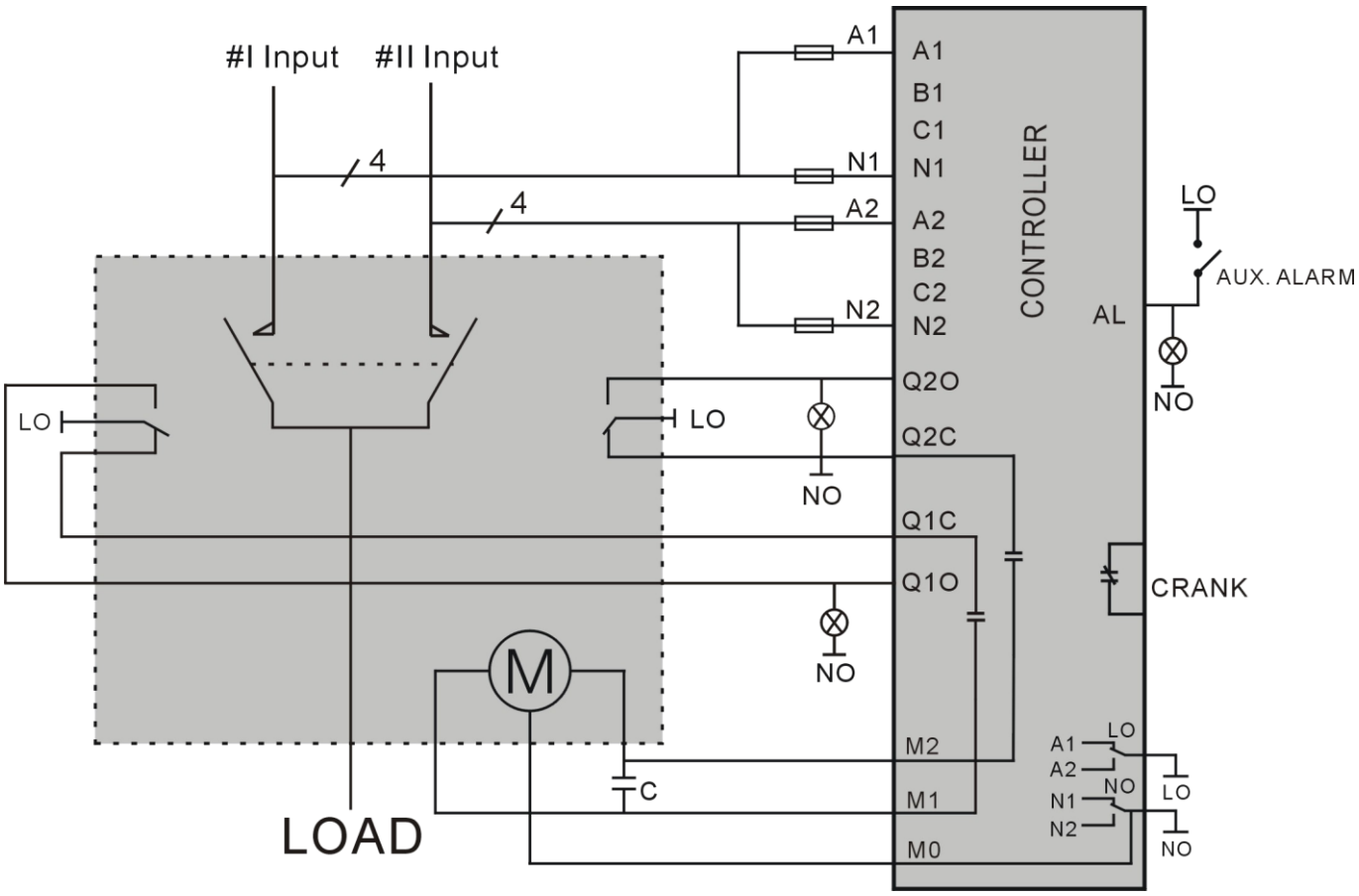
  Note: Q1C, M1 is #I close relay; Q2C, M2 is #II close relay; M0 has connected to NO internally.
- Terminal AL: Auxiliary alarm, switch failure or fire reset input. It can control ATS to switch to Breaking (OFF) position, AC voltage input (rated 220VAC), power supply voltage.
- Start Terminal: normally close contact. It is a start signal output of genset

7 TYPICAL APPLICATION

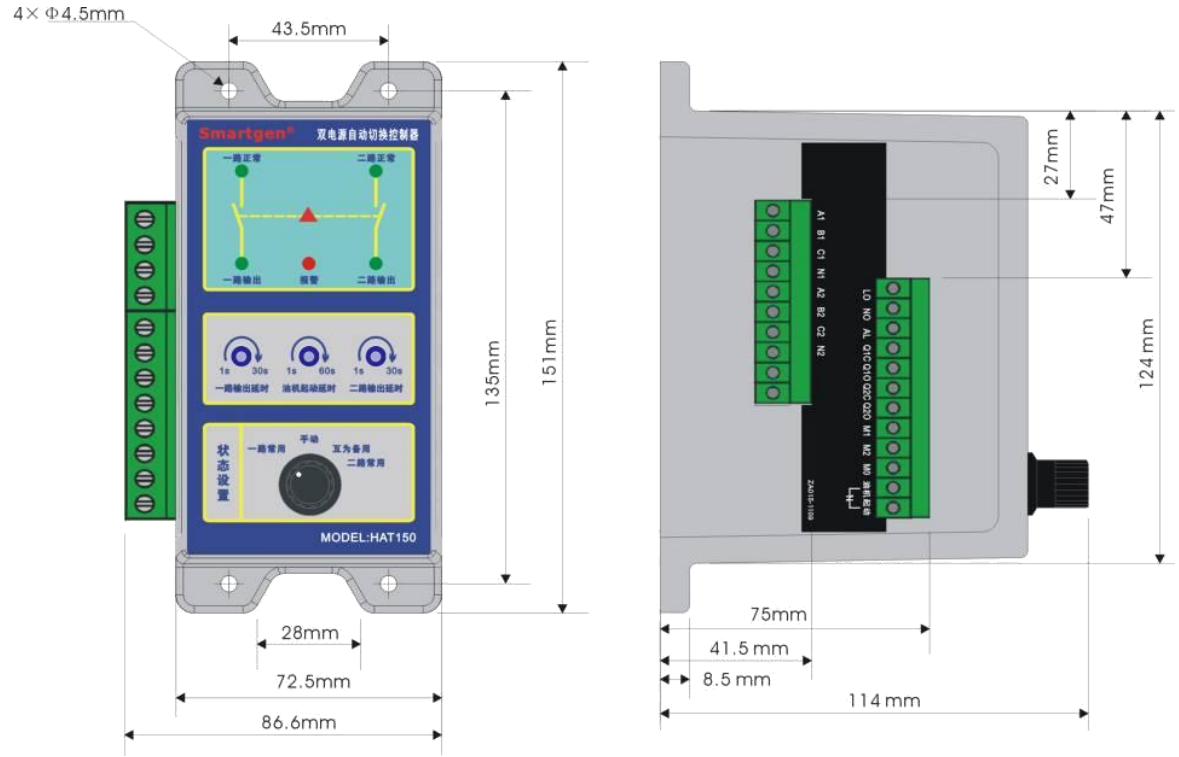
3 phase 4 wires



Single phase 2 wires



8 OVERALL DIMENSIONS AND INSTALATION



9 FAULT FINDING

Fault	Remedy
Controller inoperative	Check connections of #I and #II power; Check FU1 or FU2 fuse (in the inner of controller, 10A).
Switch not activate	Check ATS; Check the connections between controller and ATS.
#I or #II power Lamp flashes	Check whether 3-phase voltage is normal or not.
#I or #II power lamp illuminates but switch not transfer (Auto Mode)	Set controller as manual mode or disconnect controller, remove trip status of the switch; Check the delay of the potentiometer, shorten the delay time.
Alarm lamp flashes	Set controller as manual mode or disconnect controller, remove trip status of the switch;
Genset failed to start	Only when #I voltage is abnormal, start signal of genset outputs; Check the delay of the potentiometer, shorten the delay time.
Genset failed to stop when switch has transferred	Set controller as manual mode or disconnect controller, check if auxiliary contact is reliably connected.