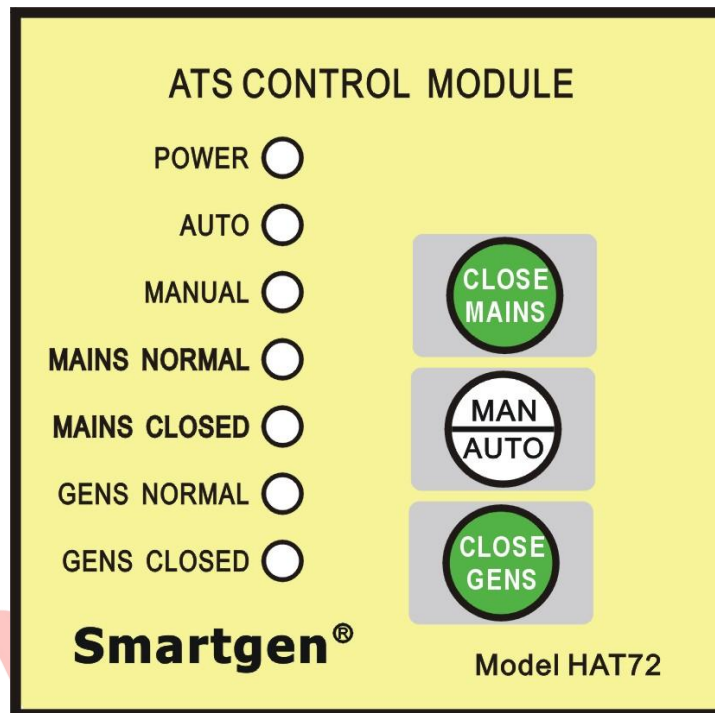




SmartGen[®]
ideas for power

HAT72 ATS CONTROLLER

USER MANUAL



ZHENGZHOU SMARTGEN TECHNOLOGY CO.,LTD



Chinese trademark

SmartGen[®] English trademark

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If colors of actual products are different from those mentioned within this manual, please take the actual product as the standard.

Software Version

Version	Date	Note
1.0	2007-12-01	Original release.
1.1	2015-03-11	Modify some details.
1.2	2015-04-21	Modify some details.

Clarification of notation used within this publication.

SIGN	INSTRUCTION
 NOTE	Highlights an essential element of a procedure to ensure correctness.
 Caution!	Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment.
 Warning!	Indicates error operation may cause death, serious injury and significant property damage.

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1 OVERVIEW

HAT72 is an Automatic Transfer Switch Control Module for 1 way mains/generator , which features 8-Bit microprocessor control. The module is used to monitor two ways of single-phase supply. Once mains supply failure (under voltage, over voltage, under frequency, over frequency) is detected, the module will control ATS to switch after delay. The controller can send out signal of starting the generator after mains failure delay.

2 PERFORMANCE AND CHARACTERISTICS

- ◆ Suitable for 1 way mains and 1 way generator ATS control;
- ◆ Widely power supply range: DC (8-35)V; fit with different voltage environments of start battery;
- ◆ Mains or generate normal delay can be set; genset start delay can be set;
- ◆ Mains abnormal delay can be set; genset stop delay can be set;
- ◆ 7 LEDs display the status of operation and alarm;
- ◆ Transfer relay (CLOSE MAINS, CLOSE GENS) output contact rating: 16A AC250V, passive contact, directly drive the switch to transfer;
- ◆ Start relay (GENS START) output contact rating: 5A AC250V, passive contact;
- ◆ Close output can be set to continuous close or pulse close; when pulse close is initiated, close delay can be set.
- ◆ Providing PC programming port which all delays, power thresholds needed by ATS can be set via PC;
- ◆ Built-in never halted watch dog to ensure smooth program execution;
- ◆ Modular design, self extinguishing ABS plastic shell, pluggable terminal, built-in mounting , compact structure with easy installation.

3 TECHNICAL PARAMETERS

◆ DC power: (8-35)V

AC sampling input: single-phase AC(30-277)V (+20%) 50/60Hz

ATS switch output: 16A AC250V, relay passive contact;

Genset start output: 5A AC250V, relay passive contact;

2 close input ports: active when connected to B-;

Consumption: standby(12V:0.12W, 24V:0.24W), working(12V:1.5W, 24V:1.6W)

Working conditions:

Temperature: -30~+70°C Humidity: 20~95%

Case dimensions: 72*72*52mm Cut out: 67*67mm

Weight: 0.2kg

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4 DISPLAY PANEL AND OPERATING INSTRUCTIONS

◎ PUSH BUTTON

Symbol	Define	Description
Close Mains	Mains close button	At MAN state, push this button, ATS will turn to the mains
MAN/AUTO	MAN/AUTO state switch button	Switch the state to MAN or AUTO
Close Gens	Generator close button	At MAN state, push this button, ATS will turn to the Generator

◎ LED

Symbol	Define	Description
Power	Power led	Lighten when DC supply
Auto	Auto state led	Lighten when Module at auto state
Manual	Man state led	Lighten when Module at man state
Mains Normal	Mains normal led	Lighten when mains is normal; Flicker when mains is abnormal; Die when mains is lost.
Mains Closed	Mains closed led	Lighten when mains load
Gens Normal	Generator normal led	Lighten when Generator is normal; Flicker when Generator is abnormal; Die when mains is lost.
Gens Closed	Generator closed led	Lighten when Generator load

◎ Operating

Module has two states: MAN state and AUTO state: the state can be switch by MAN/AUTO button, the state can be display by Auto state led and Man state led.

◆ MAN state

When Man state led is lighten, the module is at man state. Here, push (CLOSE Mains) button, the relay of close mains will output, push (CLOSE Gens) button, the relay of close Generator will output.

At this state, the relay of start generator is unable.

◆ AUTO state

- When Auto state led is lighten, the module is at auto state. When mains is normal,

ATS will turn to the mains after the Mains Normal delay time. When mains is abnormal (under voltage, over voltage, lost voltage), after the Mains Abnormal delay time and Start generator time the relay of start generator will output and the generator will start. If the Generator is normal, ATS will turn to the Generator after the Gens Normal delay time.

- When mains is normal, ATS will turn to the mains after the Mains Normal delay time.
- When mains is normal, the relay of start generator will be unable and the generator will stop after the Stop generator time.

© **Parameters table (only adjust via PC)**

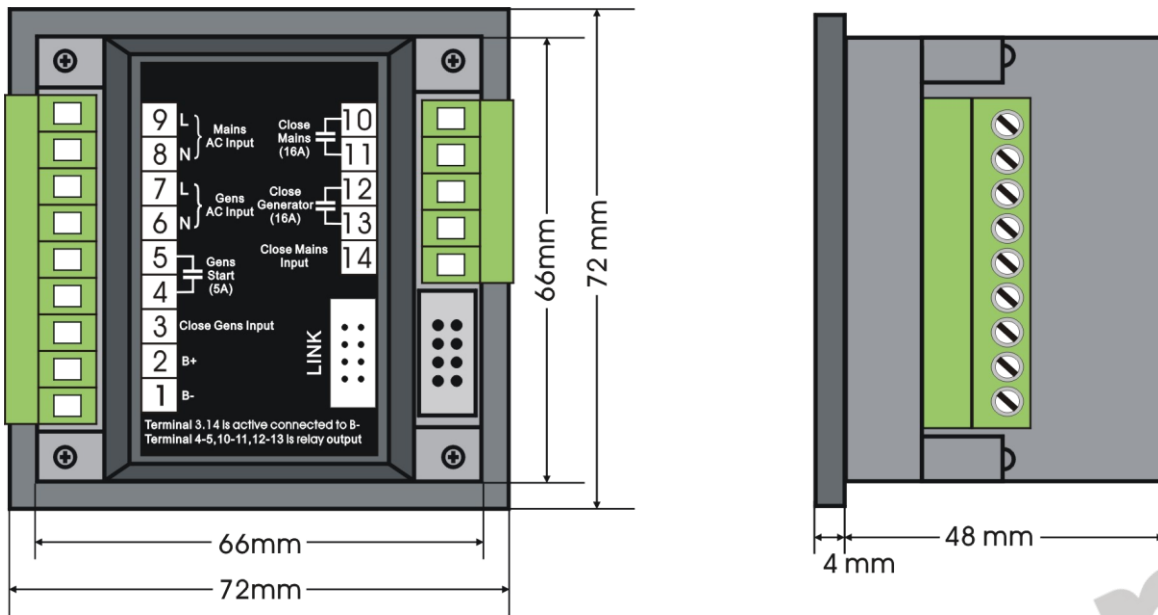
Parameter	Description	Range(Default)
Mains normal delay	It is the delay of Mains power from abnormal to normal.	0-3600s (10)
Gens normal delay	It is the delay of Mains power from abnormal to normal.	0-3600s (10)
Mains abnormal delay	It is the delay of Mains power from normal to abnormal.	0-3600s (5)
Start GENS Delay	It is the delay from Mains power is abnormal to send out start generator signal.	0-3600s (1)
Stop GENS Delay	It is the delay from Mains power is normal to send out stop generator signal.	0-3600s (5)
ATS close time	Breaker close pulse. If it is set to zero, the output will held.	0-20.0s (5.0)
Transfer rest time		0-3600s (1)
Exceed Convert Time	After the module has received a close state input, the breaker close output continue to held until the delay is expended.	0-5.0s (0)
Mains over voltage	The setting are used to configure the Mains power over voltage point	0-360V (276)
Mains under voltage	The setting are used to configure the Mains power under voltage point	0-360V (184)
Gens over voltage	The setting are used to configure the Gens power over voltage point	0-360V (264)
Gens under	The setting are used to configure the Gens	0-360V (192)

voltage	power under voltage point	
Frequency upper limit	When the frequency of Gens power is over than the point, over frequency is active.	40-75Hz(55.0)
Frequency lower limit	When the frequency of Gens power is low than the point, low frequency is active.	0-60Hz(45)
Yes or No close input is connect		(Yes)

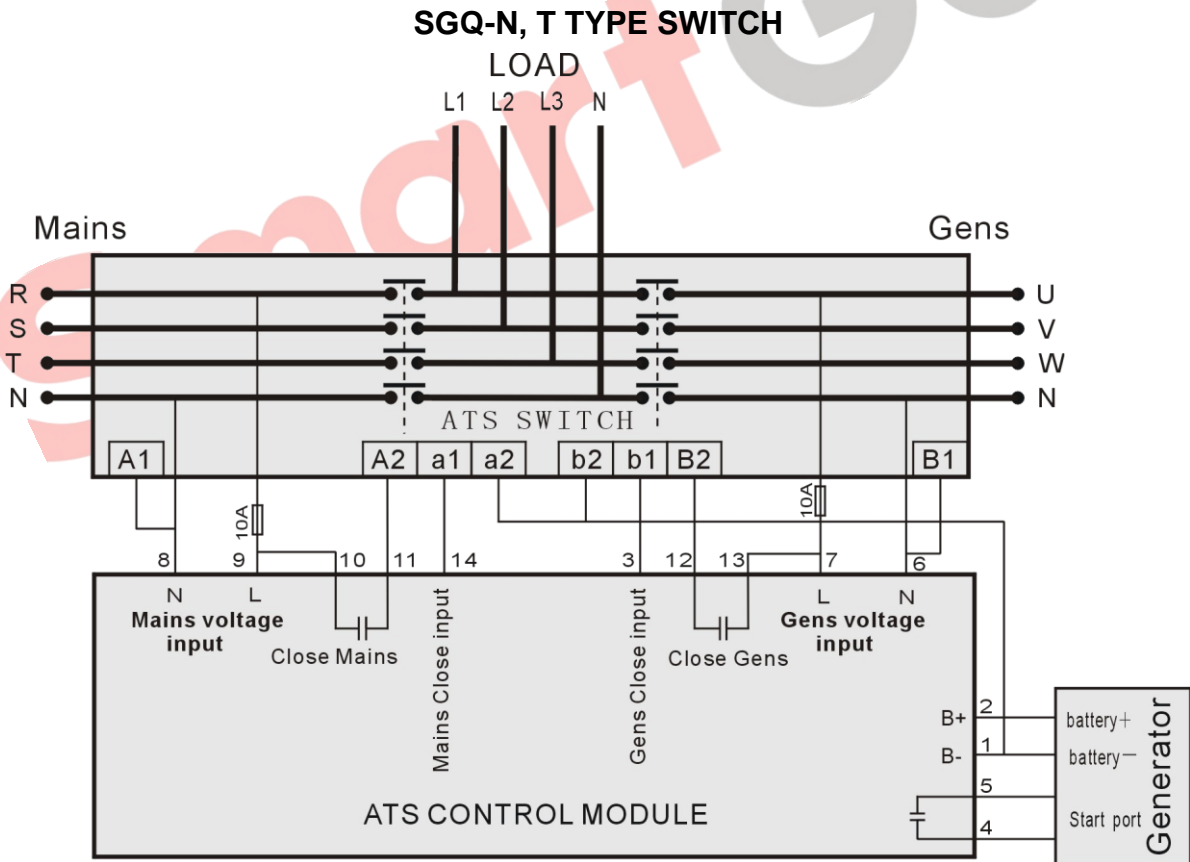
5 TERMINAL

- ◆ Terminal 1 (B-): connect to the cathode of battery
- ◆ Terminal 2 (B+): connect to the anode of battery
- ◆ Terminal 3(Close Generator Input): Generator supply closed auxiliary input, connect to (B-) is active
- ◆ Terminal 4、 5 (Generator Start Output): output of Relay of start generator (volts free ,5A250V)
- ◆ Terminal 6、 7 (Generator AC Input): Generator AC Input
- ◆ Terminal 8、 9 (Mains AC Input): Mains AC Input
- ◆ Terminal 10、 11 (Close Mains Output): output of Relay of close mains (volts free ,16A250V)
- ◆ Terminal 12、 13 (Close Generator Output): output of Relay of close generator (volts free ,16A250V)
- ◆ Terminal 14(Close Mains Input): Mains supply closed auxiliary input, connect to (B-) is active
- ◆ Terminal (LINK): connect to PC by SG72

6 CASE DIMENSIONS(cutout:67*67mm)



7 TYPICAL CONNECTIONS



SGQ-M TYPE SWITCH

