HAT310

ATS CONTROLLER

USER MANUAL

SMARTGEN (ZHENGZHOU) TECHNOLOGY CO.,LTD.

Chinese trademark

SmartGen English trademark

SmartGen —make your generator ***smart***
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Table 1 Software Version

Date	Version	Content
2017-06-21	1.0	Original release
2021-03-03	1.3	Update the company address, contact information and manual format; Modify the wiring method of A1、A2、B1 and B2 for SGQ-N/T switch in Figure 4.

CONTENTS

1. OVERVIEW

HAT310 ATS Controller is suitable for 2-stage of PC, and ATS of CC class (close signal is constant output). It can accurately detect 3-phase 4-wire mains voltage and generator single phase voltage. When mains under voltage and loss of phase occurred, HAT310 will control ATS transfer after delay. If mains are unavailable, the controller has the function to initiate signals to start gen-set.

2. PERFORMANCE AND CHARACTERISTICS

HAT310 controller can detect 3-phase 4-wire mains voltage/generator single phase voltage and control ATS.

Main characteristics are as follows,

1) With aotomatic charge and automatic recorvery function.
2) With under volatge and loss of phase detection function.
3) LED indicators on the pannal can show working status of controller clearly.
4) Applicable for 2 isolated neutral line.
5) Mains normal delay configured via potentiometer (range: 1~60s), and generator normal delay via potentiometer (range: 1~60s)
6) Mians is unavailable, if any phase voltage belows minimum working voltage or phase loss occurred gen-set will be started.
7) Output contact capacity of mains and generator transfer relay is 16A AC250V, which can directly used to drive switch conversion.
8) Output contact capacity of GENS START relay is 16A AC250V, it is volt free normally-open/normally-closed contect.
9) Strong anti-electromagnetic interference performance enable controller to use in the enviroment with strong electromagnetic interfrence.
10) Modular design, self extinguishing ABS plastic shell, pluggable terminal, compact structure;
11) Two installation ways: internal 35mm slideway and internal screw mounting.

3. SPECIFICATION

Table 2 Technical Parameters

Items	Contents
Operating Voltage	AC power A1N1/A2N2 supply. Rated AC240V (range: AC160~280V)
Power Consumption	Under rated voltage, power consumption of voltage circuit is not more than 2W
AC Voltage Input: 3-phase 4-wire Single-phase 2-wire	 AC160V – AC280V (ph-N) AC160V – AC280V (ph-N)
AC Frequency	50/60Hz
Gens-set Starter Relay	16A 250V AC Volts free output (Normally close)
Mains Close Relay	16A 250V AC AC Supply output (Normally open)
Gen Close Relay	16A 250V AC AC Supply output (Normally open)
Case Dimensions	110mmx77.5mmx58mm
Screw Mounting Dimensions	65mmx65.1mm
Working Conditions	Temperature: (-25~+70)°C; Humidity: (20~93)%RH
Storage Condition	Temperature: (-25~+70)°C
Insulation Strength	Apply AC1.5kV voltage between high voltage terminal and low voltage terminal; The leakage current is not more than 3mA within 1min.
Weight	0.2kg

4. PANEL DESCRIPTION

4.1 FRONT PANEL

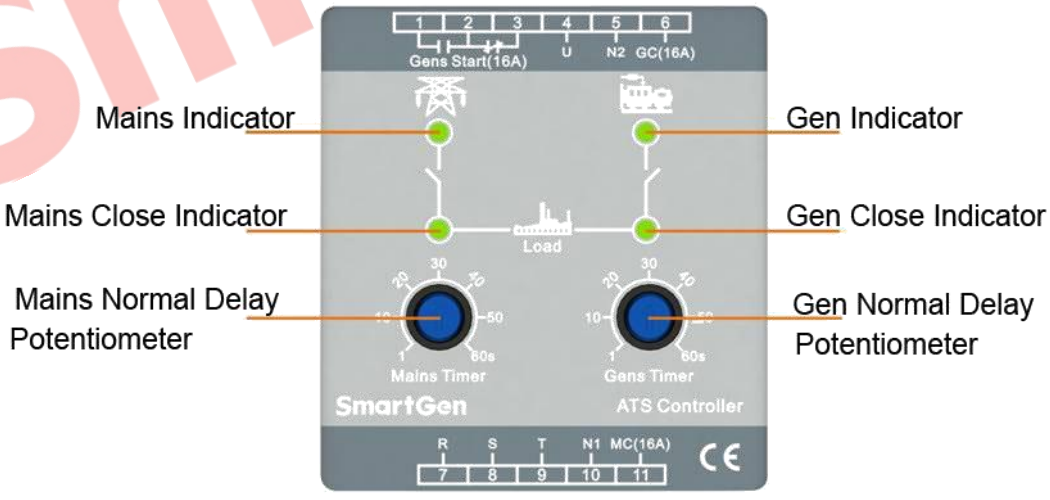


Fig.1 – HAT310 Front Panel

4.2 POTENTIOMETER FUNCTION DESCRIPTION

Table 3 Potentiometer Function Description

Potentiometer	Description
Mains normal delay potentiometer	Rotate potentiometer knob to adjust mains normal delay value (range: 1~60s), factory default: 5s;
Generator normal delay potentiometer	Rotate potentiometer knob to adjust gen normal delay value (range: 1~60s), factory default: 5s;

4.3 INDICATOR DESCRIPTION

Table 4 Indicator Description

Indicators	Description
Mains power indicator	Lamp illuminates: mains power available; Lamp off: mains power unavailable (one phase voltage under 160V or loss of phase);
Gen power indicator	Lamp illuminates: generator power available; Lamp off: generator without power supply;
Mains close indicator	Lamp illuminates: mains provide power for the load.
Gen close indicator	Lamp illuminates: generator provides power for the load.

4.4 OPERATION

4.4.1 MAINS CLOSE

When mains power is available, its indicator on the panel of controller is illuminate, and mains close relay is connecting after the delay. Then gen-set starter relay coil power-on and mains close indicator is illuminate.

4.4.2 GEN CLOSE

When mains is unavailable or any phase voltage is under 160V or loss of phase, both mains close indicator lamp and mains indicator lamp are off. Mains close relay is disconnect and engine starter relay coil is power-off. This moment if genset is available, gen power indicator is illuminate and gen close relay is connecting after the delay, and then gen close indicator is illuminate.

5. CONNECTION

Controller front panel drawing is as follows,

Fig.2 – Controller Front Panel

Table 5 Terminal Connection Description

Terminal	Item	Function		Remark
1	Gens Start	NO	Gen-set start signals output	Volts free normally open (NO)/normally close (NC) output, rated 16A.
2		COM		
3		NC		
4	U	Gen-set AC power supply A phase		Generator AC power supply single phase voltage input.
5	N2	Gen-set AC power supply N phase		
6	GC	Gen close output		When close, it will output U-phase voltage with rated 16A
7	R	Mains AC power supply A-phase		Mains AC power supply 3-phase 4-wire voltage input.
8	S	Mains AC power supply B-phase		
9	T	Mains AC power supply C-phase		
10	N1	Mains AC power supply N-phase		
11	MC	Mains close output		When close, it will output R-phase voltage with rated 16A.

NOTE: See Typical Application for more details.

6. TYPICAL APPLICATION

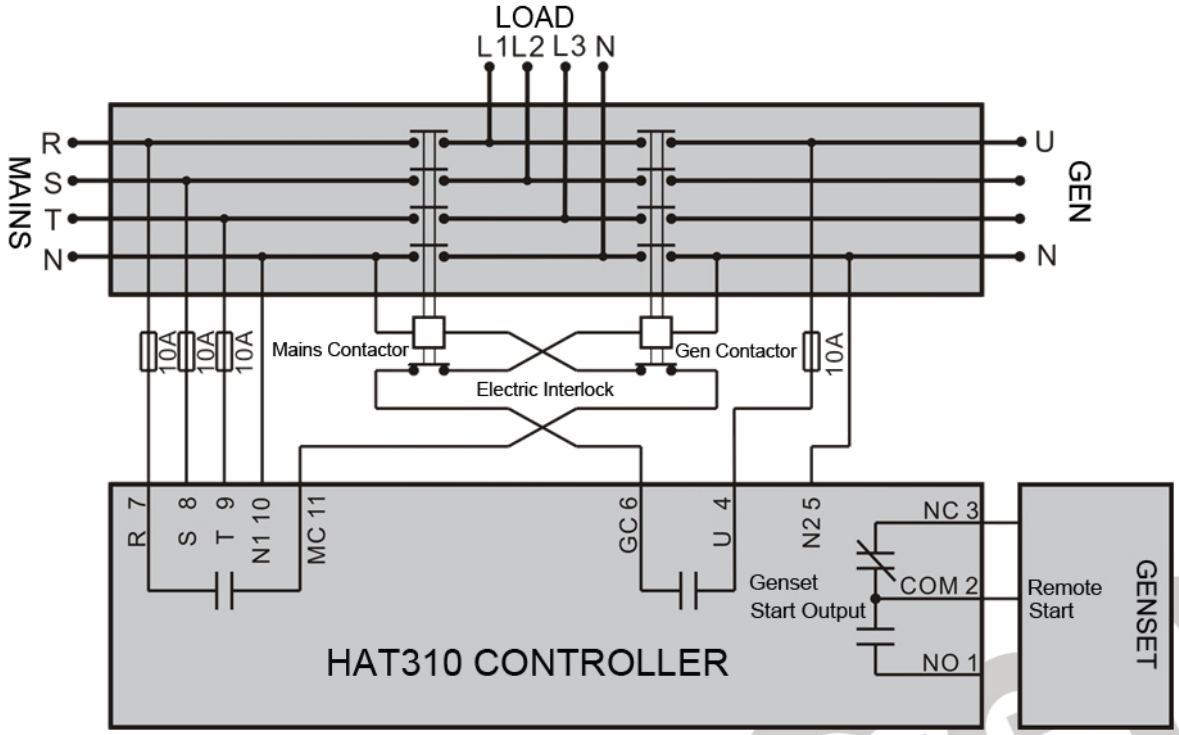


Fig.3 - Contactor Application

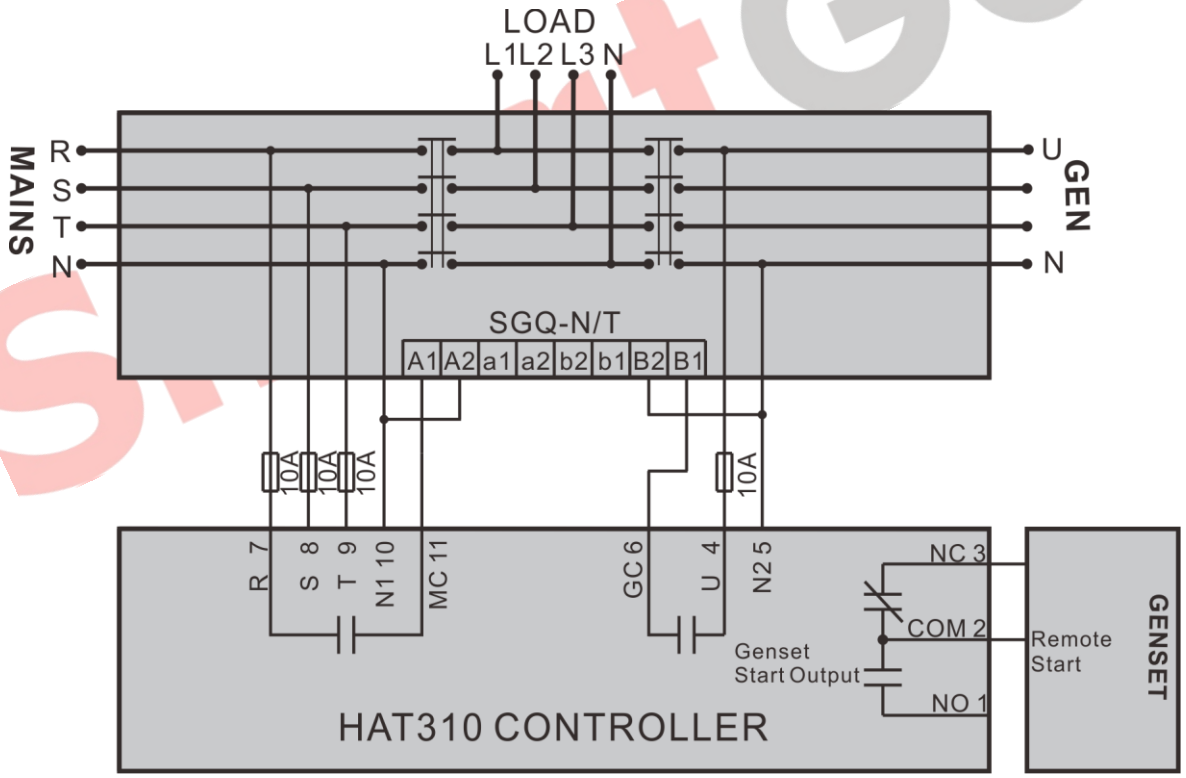


Fig.4 - SGQ-N/T Application

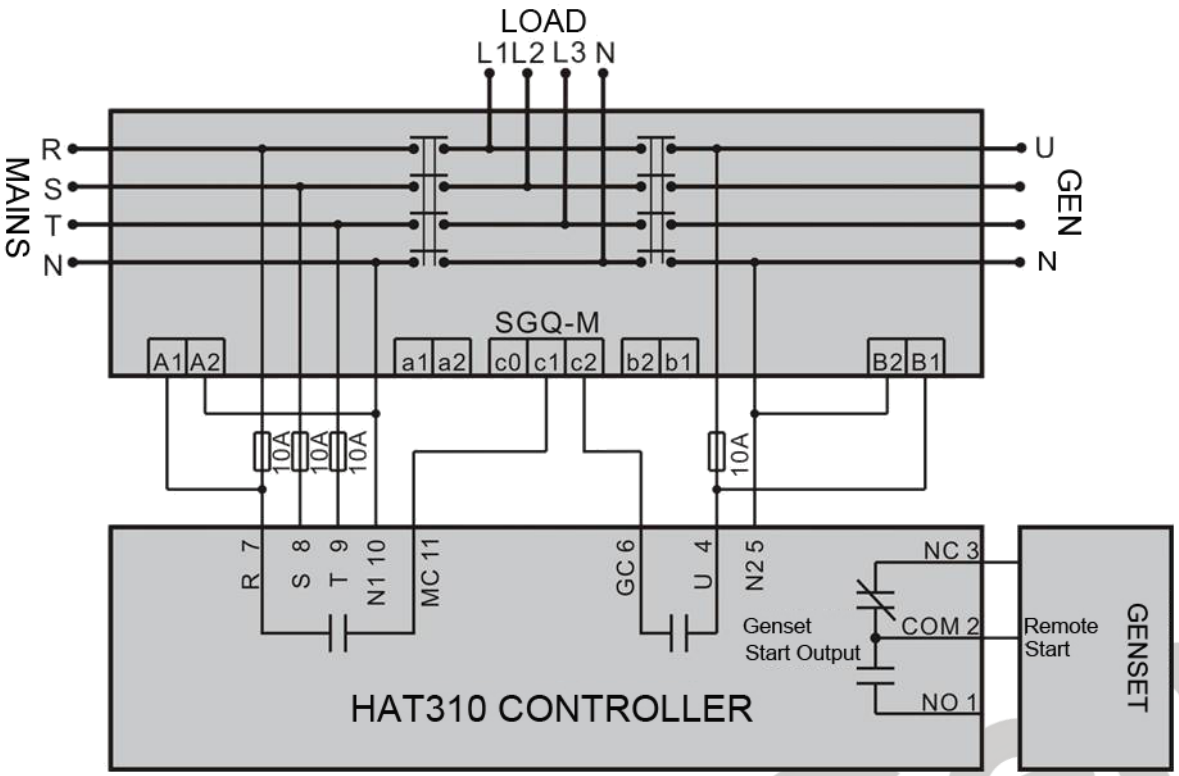


Fig.5 - SGQ-M Application

NOTE: Above applications can be referenced when wire connecting. Actual wire connection should according to ATS wiring instructions. Choose fuse capacity based on the local actual power consumption instead of the fuse capacity in the above drawings.

7. CASE DIMENSION AND PANEL CUTOUT

7.1 CASE DIMENSION

Unit: mm

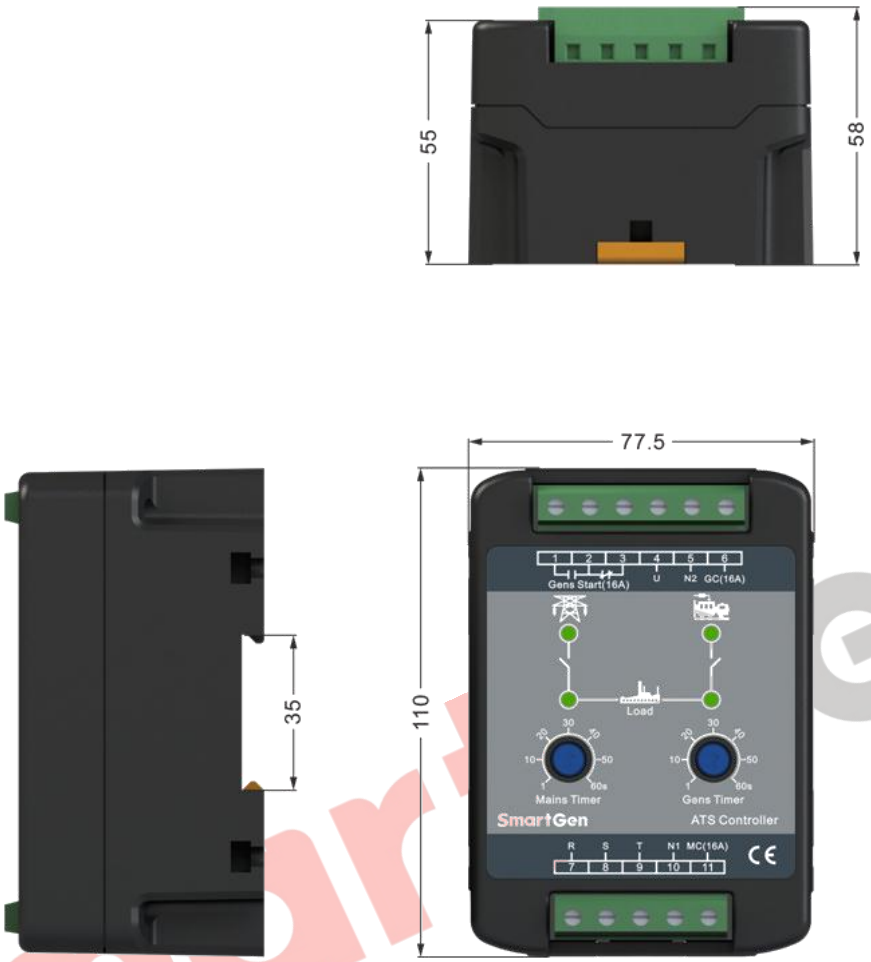
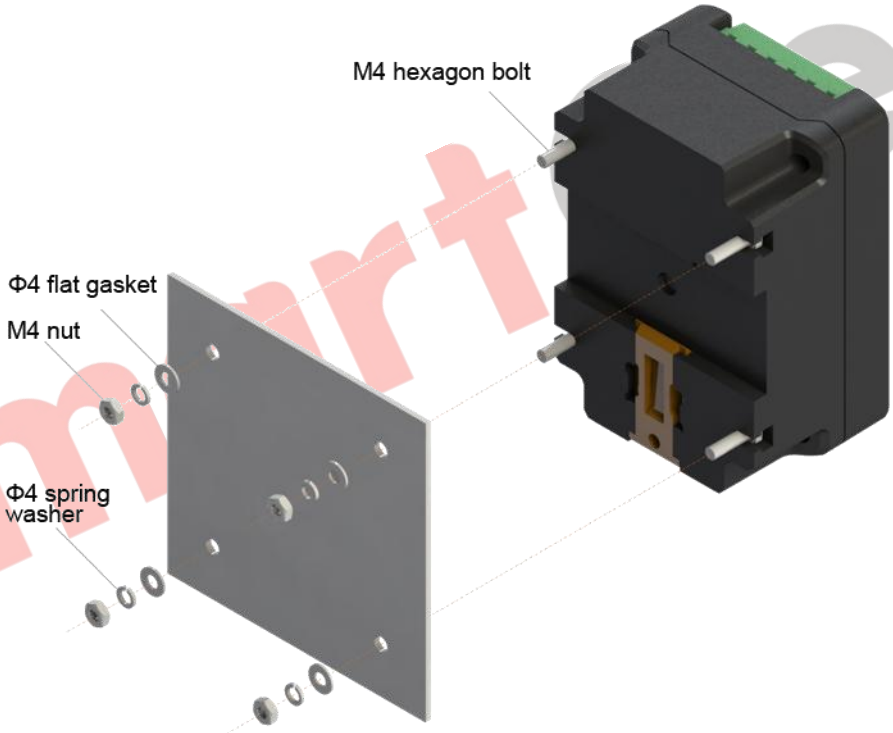


Fig.6 – Overall Dimensions

7.2 INSTALLATION METHOD AND INSTALLATION DIMENSIONS

The controller has two installation ways: internal 35mm slideway and internal screw mounting. Panel built-in and internal screw mounting are as below:

a) 35mm Sideway Installation



b)Screw Installation

Fig.7 – Installation Method

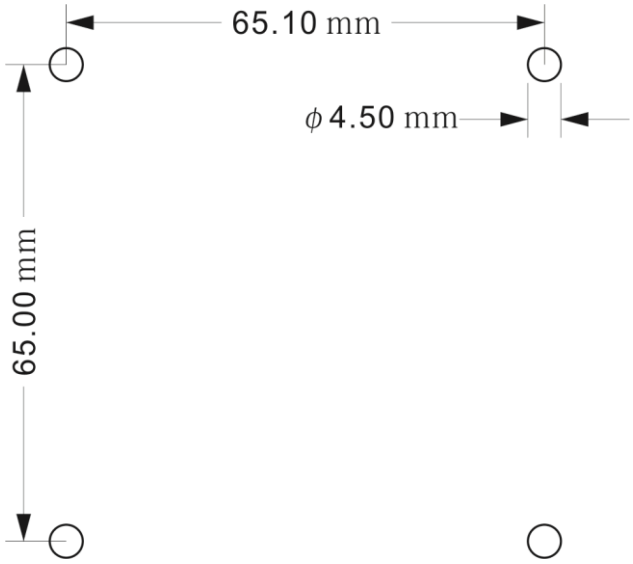


Fig. 8 - Screw Mounting Dimensions

8. TROUBLESHOOTING

Symptom	Possible Remedy
Controller inoperative	Check mains and generator wire connections and voltage.
Controller is normal but switch is not activate	Check ATS; Check the connections between controller and ATS.