

SmartGen

MAKING CONTROL SMARTER

HAT320

ATS CONTROLLER

USER MANUAL



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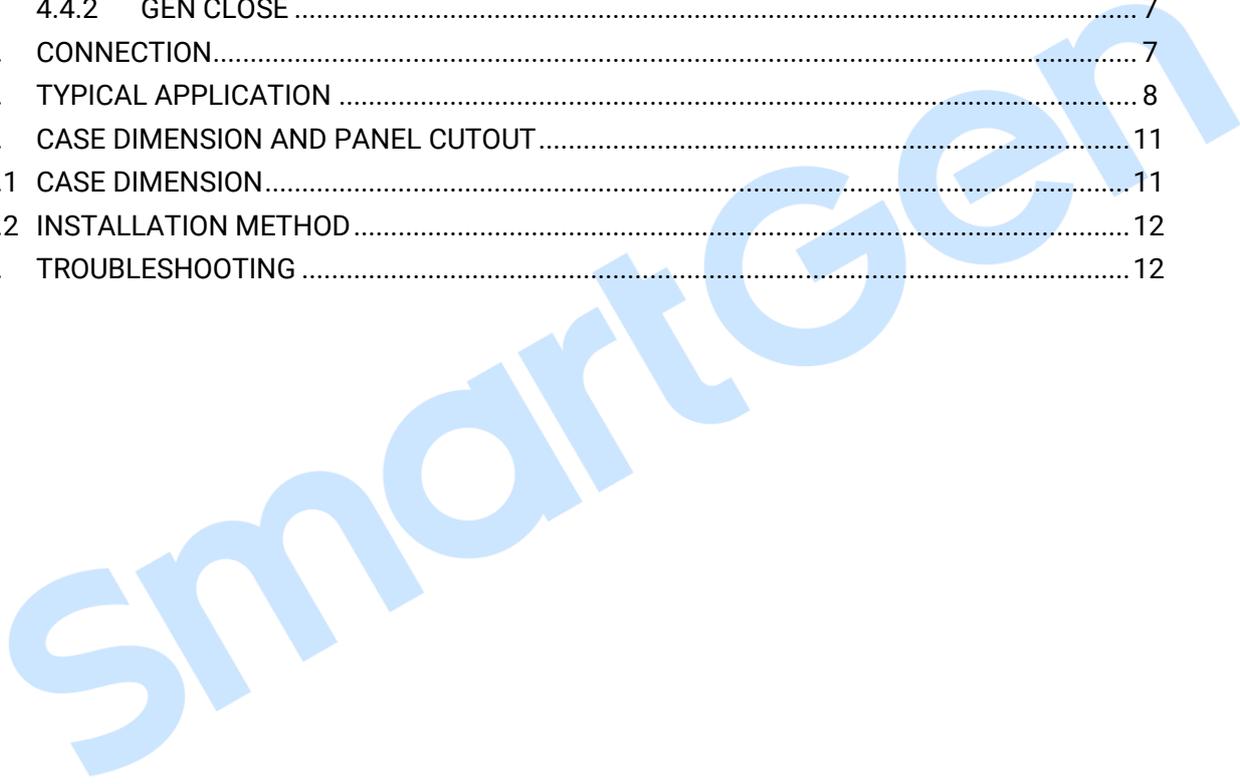
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Table 1 Software Version

Date	Version	Content
2024-11-01	1.0	Original release

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1. OVERVIEW

HAT320 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 occur, HAT320 will control ATS transfer after delay. The controller can initiate signals to start genset if mains unavailable.

2. PERFORMANCE AND CHARACTERISTICS

HAT320 controller can detect 3-phase 4-wire mains voltage/generator single phase voltage and control ATS.

Main characteristics are as follows:

- 1) With automatic transfer and restore function.
- 2) With under voltage and loss of phase detection function.
- 3) LED indicators on the panel 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) Mains is unavailable, if any phase voltage belows minimum working voltage or phase loss occurred genset 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 contact.
- 9) Strong anti-electromagnetic interference performance enable controller to use in the environment with strong electromagnetic interference.
- 10) Modular design, self extinguishing ABS plastic shell, pluggable terminal, compact structure.
- 11) Internal 35mm guide rail mounting.

3. SPECIFICATION

Table 2 Technical Parameters

Items	Contents
Operating Voltage	AC power A1N1/A2N2 supply. Rated AC220V (range: AC175~280V)
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	AC175V - AC280V (ph-N) AC175V - AC280V (ph-N)
AC Frequency	50Hz/60Hz
Gens-set Starter Relay	16A 250VAC Volts free output (Normally close)
Mains Close Relay	16A 250VAC Active supply output (Normally open)
Gen Close Relay	16A 250VAC Active supply output (Normally open)
Case Dimensions	92mmx76.42mmx59mm
Working Temperature	(-25~+70)°C
Working Humidity	(20~93)%RH
Storage Temperature	(-25~+70)°C
Insulation Strength	Apply AC2.2kV 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

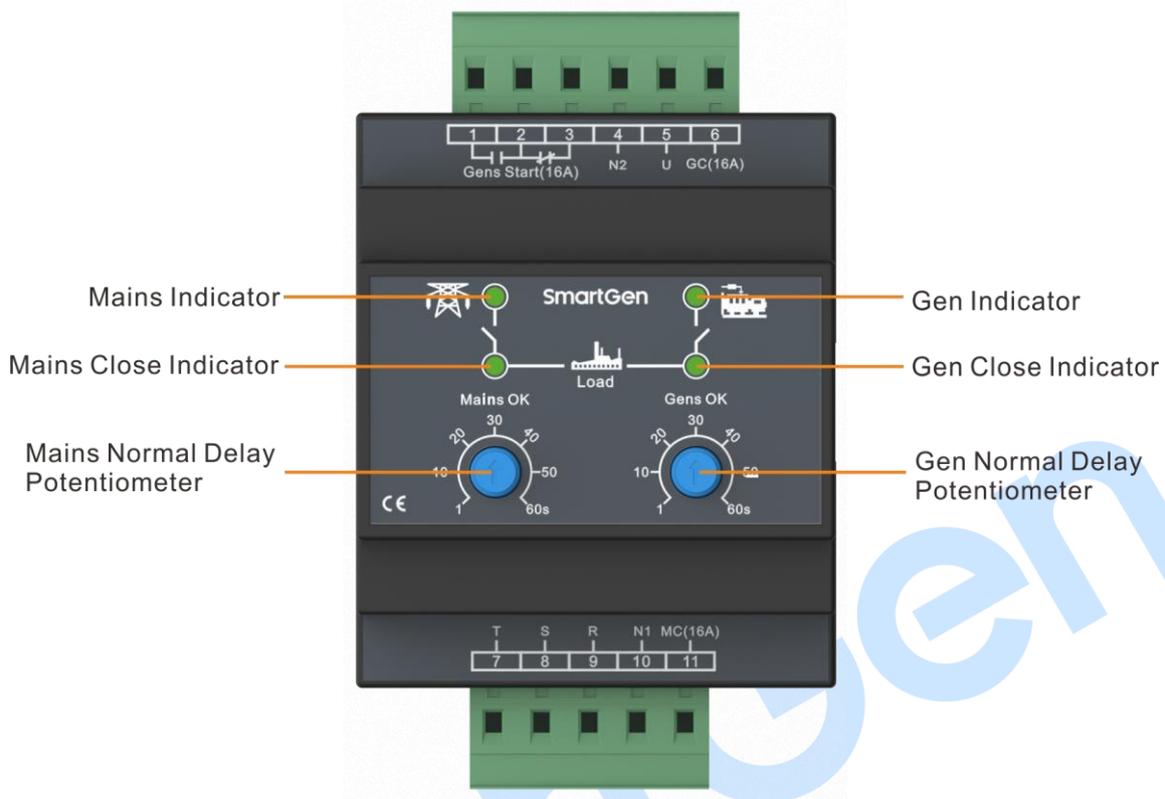


Fig.1 HAT320 Front Panel

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.
Gen 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 indicator	Light on: mains power available; Light off: mains power unavailable (one phase voltage under 150V or loss of phase).
Gen indicator	Light on: generator power available; Light off: generator without power supply.
Mains close indicator	Light on: mains provide power for the load.
Gen close indicator	Light on: 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 illuminated, and mains close relay is connecting after the delay. Then genset starter relay coil is powered on and mains close indicator is illuminated.

4.4.2 GEN CLOSE

When mains power is unavailable or any phase voltage is under 150V or loss of phase, both mains close indicator and mains indicator are off. Mains close relay is disconnected and engine starter relay coil is power-off. If genset is available at this moment, gen power indicator is illuminated and gen close relay is connecting after the delay, and then gen close indicator is illuminated.

5. CONNECTION



Fig.2 Controller Front Panel

Table 5 Terminal Connection Description

Terminal	Item	Function	Remark
1	Gens Start	NO	Volts free normally open (NO)/normally close (NC) output, rated 16A.
2		COM	
3		NC	
4	N2	Genset AC power supply N phase	Generator AC power supply single phase voltage input.
5	U	Genset AC power supply A phase	
6	GC	Gen close output	When close, it will output U-phase voltage with rated 16A, rated voltage 220V.
7	T	Mains AC power supply C-phase	Mains AC power supply 3-phase 4-wire voltage input.
8	S	Mains AC power supply B-phase	
9	R	Mains AC power supply A-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, rated voltage 220V.

NOTE: See Typical Application for more details.

6. TYPICAL APPLICATION

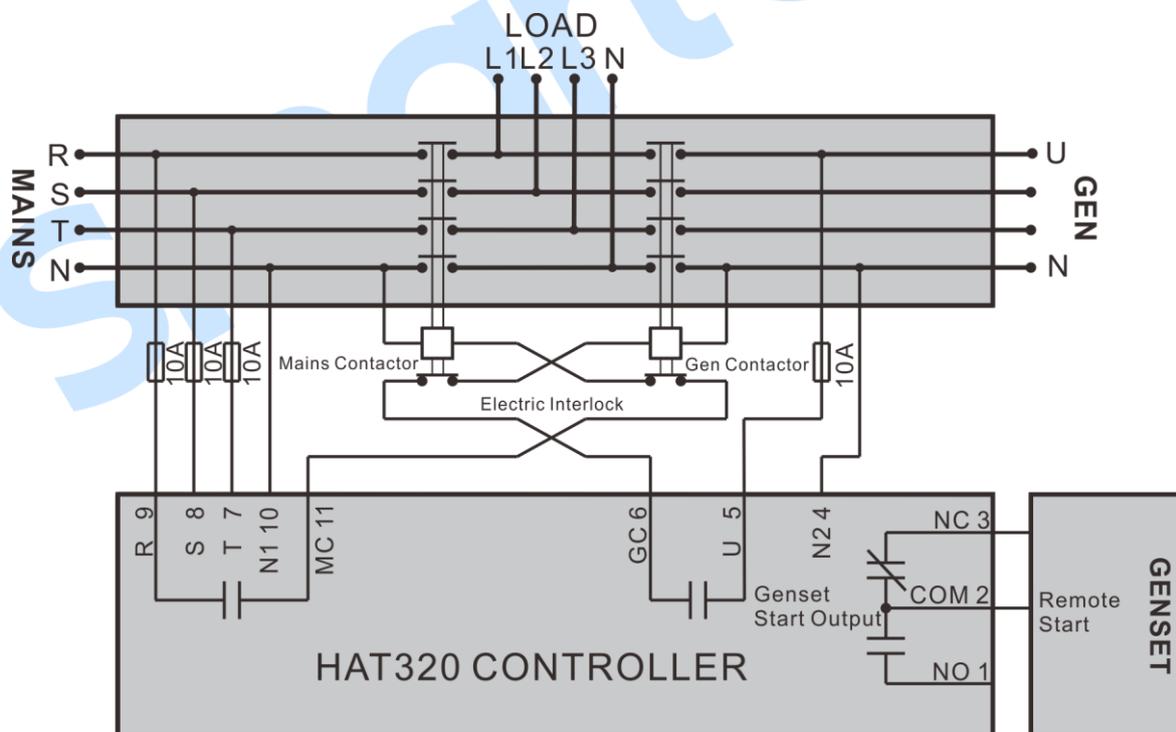


Fig.3 Contactor Application

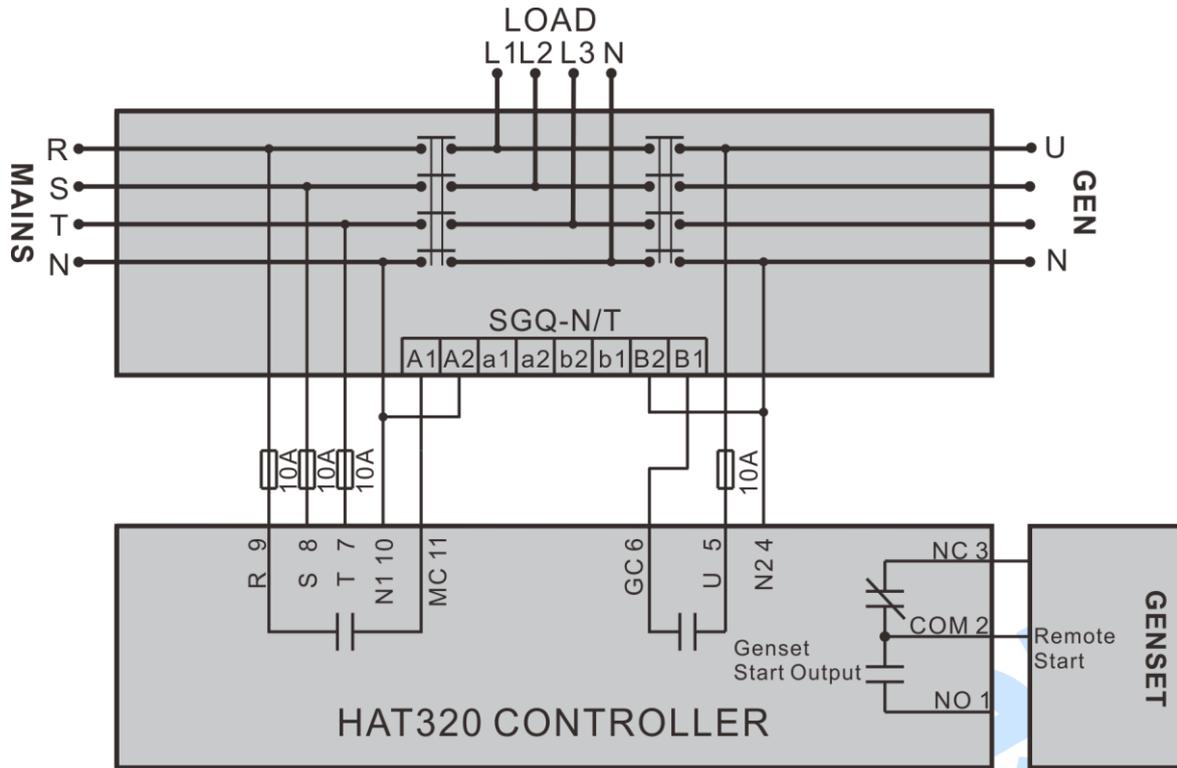


Fig.4 SGQ-N/T Application

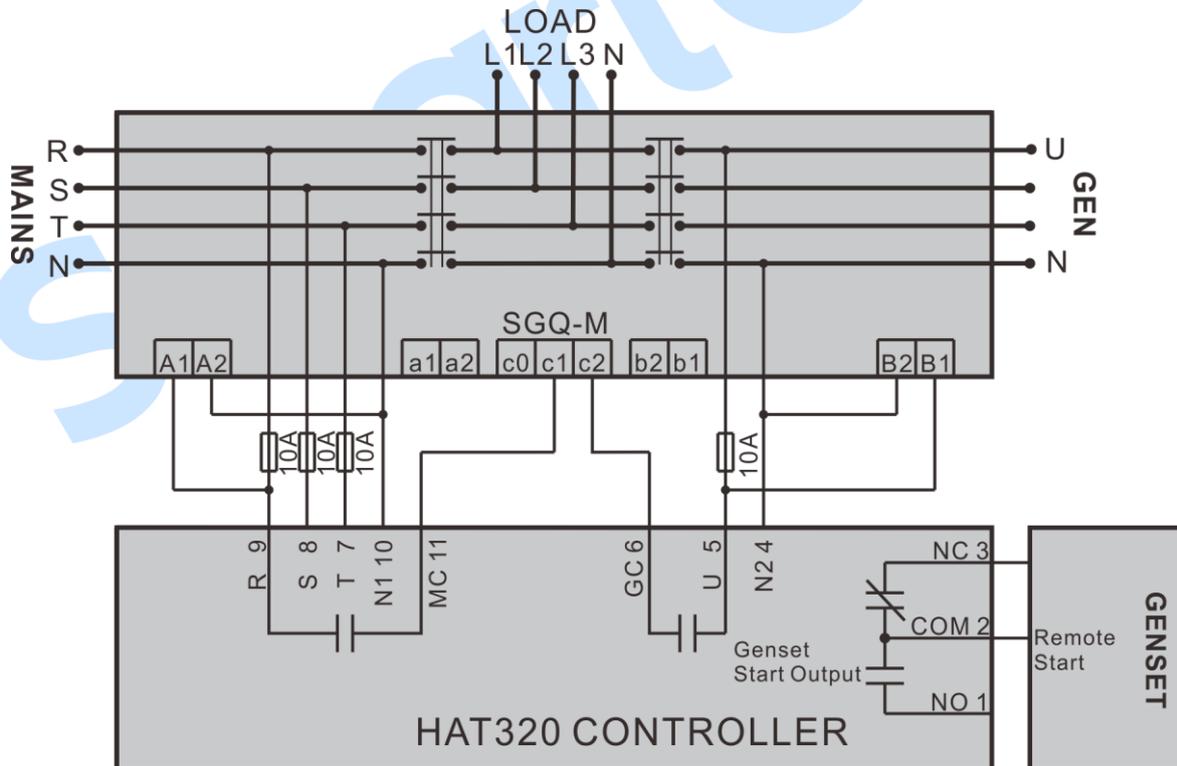


Fig.5 SGQ-M Application

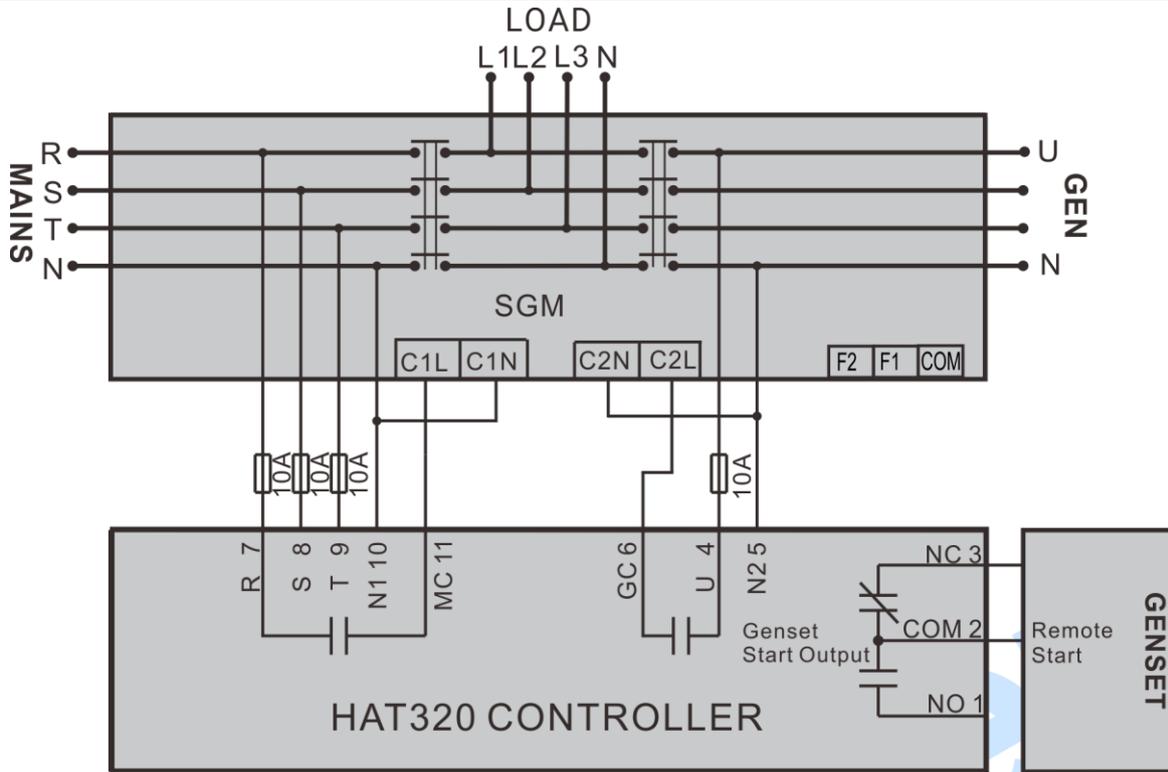


Fig.6 SGM Application

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

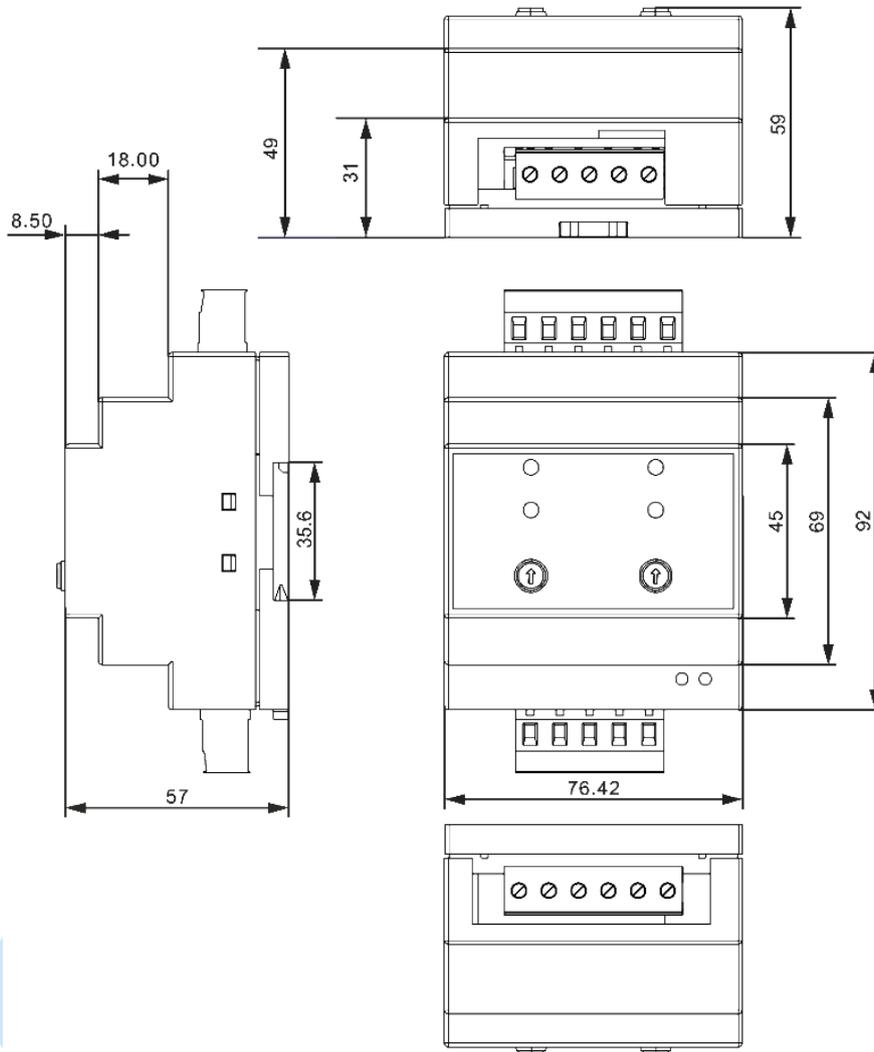


Fig.7 Overall Dimensions

7.2 INSTALLATION METHOD

The figure of internal 35mm guide rail mounting is below:

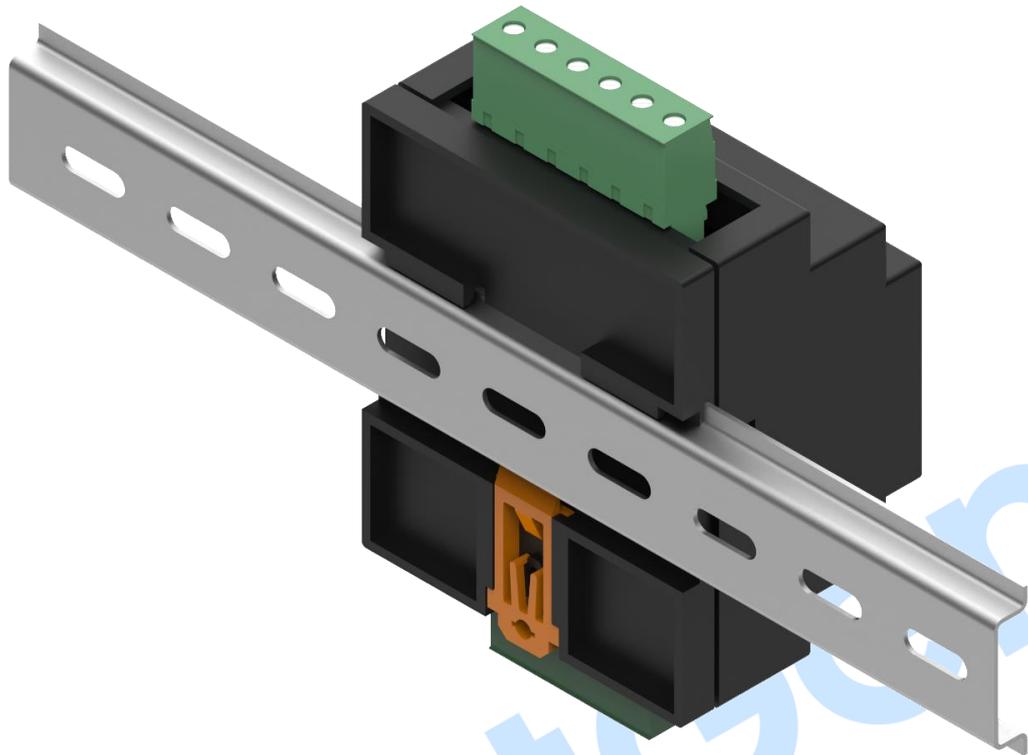


Fig.8 35mm Guide Rail Installation

8. TROUBLESHOOTING

Table 6 Troubleshooting

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