SmartGen HAT560NB

SmartGen HAT560NB ATS Controller User Manual

1. Introduction

The SmartGen HAT560NB ATS Controller is an intelligent dual-supply module designed for Automatic Transfer Systems (ATS). It integrates digital, intelligent, and networked functionalities to provide precise voltage measurement and control for various power supply configurations. This controller is suitable for specialized ATS, Contactor ATS, and Air Break ATS applications, offering a compact structure, advanced circuitry, and high reliability. It is engineered to reduce operational errors through automatic measurement and control, making it an ideal solution for managing power transfer between different sources like mains and generators.

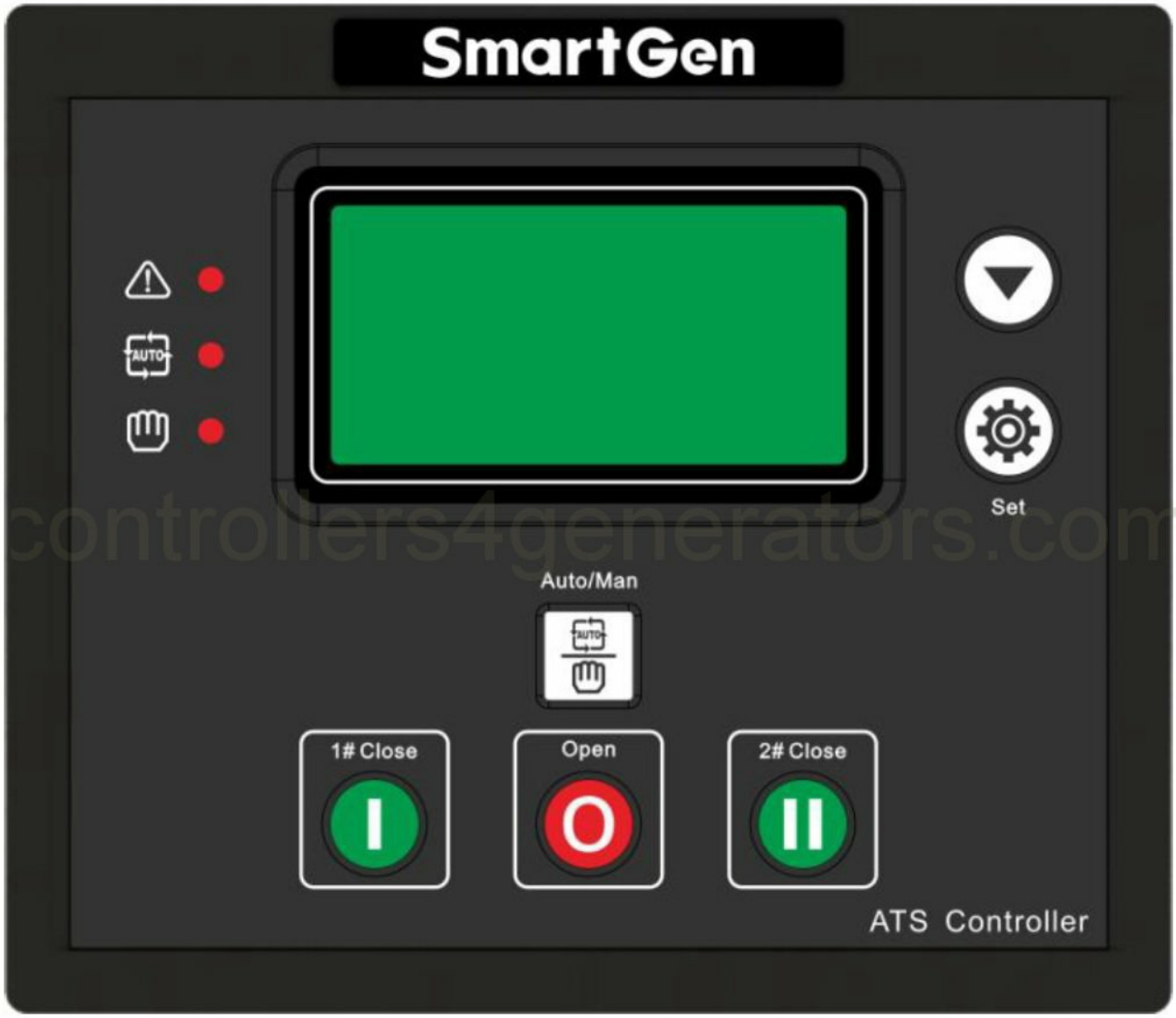


Figure 1: Front view of the SmartGen HAT560NB ATS Controller, showing the LCD display and operational buttons.

2. Features and Characteristics

The HAT560NB controller incorporates a powerful microprocessor for accurate monitoring and control. Key features include:

- System type configuration: Mains (1#) & Generator (2#), Generator (1#) & Mains (2#), Mains (1#) & Mains (2#), Generator (1#) & Generator (2#).
- 132x64 LCD with backlight, offering optional Chinese and English display with push-button operation.
- Measurement and display of 2-way 3-phase voltage and frequency.
- Protection against over/under voltage, loss of phase, reverse phase sequence, and over/under frequency.
- Automatic and Manual operating modes. Manual mode allows forced switch closure or opening.
- All parameters are configurable on-site, secured by two different passwords for authorized access.
- Genset commissioning can be set to On-load or Off-load mode.
- Automatic re-closing function for the ATS Controller.

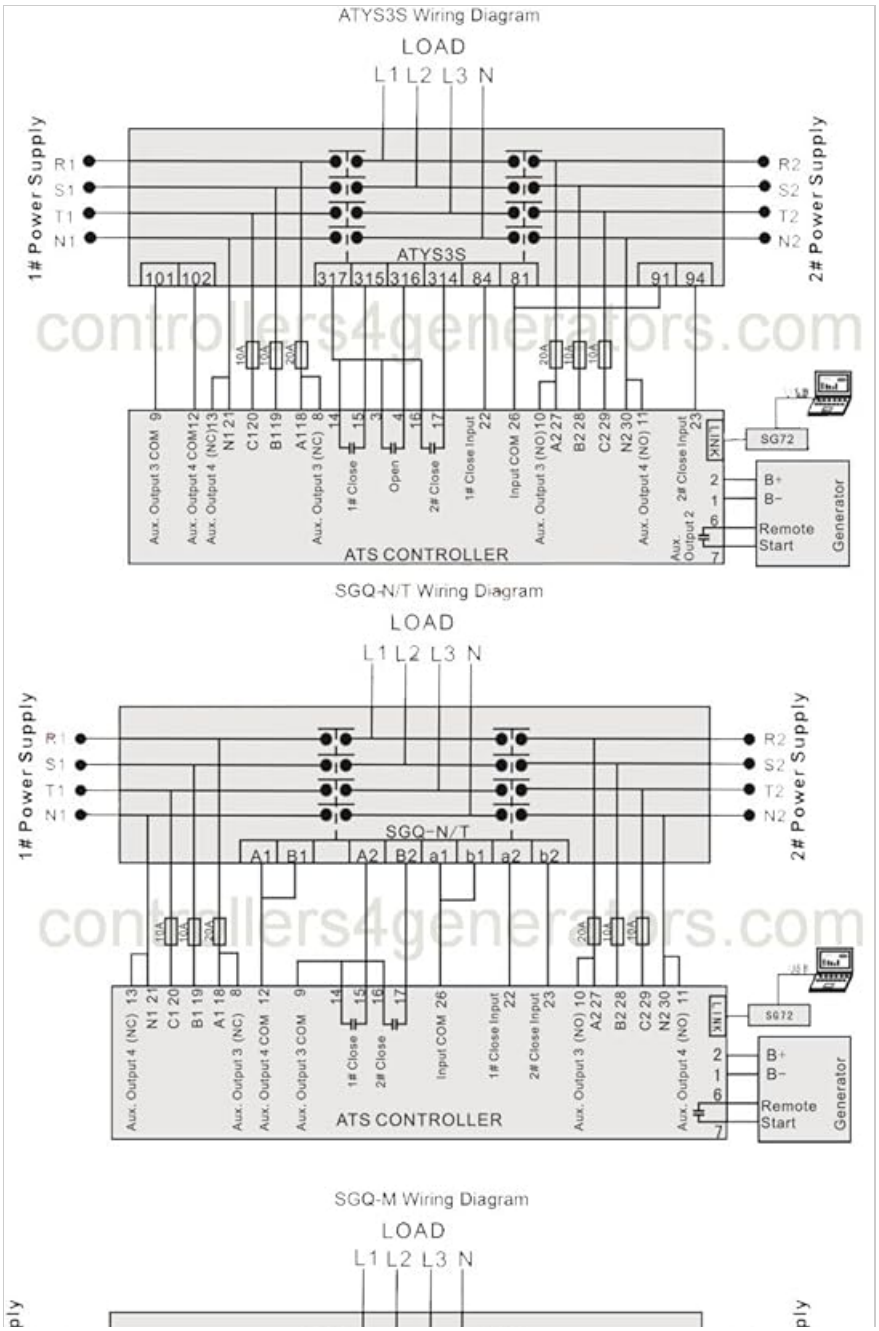
- Configurable closing output signal as either on intervals or continuous output.
- Applicable for ATS with one neutral position, two neutral positions, and non-position types.
- Monitors 1-3 phase AC mains voltages.
- Manages changeover of both generator and mains contactors.
- Sends remote start commands to the generating set.
- Compatible with various contactors and changeover switch types.

3. Setup and Installation

Proper installation is crucial for the safe and reliable operation of the HAT560NB controller. Ensure all power is disconnected before beginning installation. Refer to the wiring diagrams and terminal descriptions for correct connections.

3.1 Wiring Diagrams

The HAT560NB controller supports various wiring configurations depending on the ATS type. Below are typical wiring diagrams for different setups. Always consult a qualified electrician for installation.



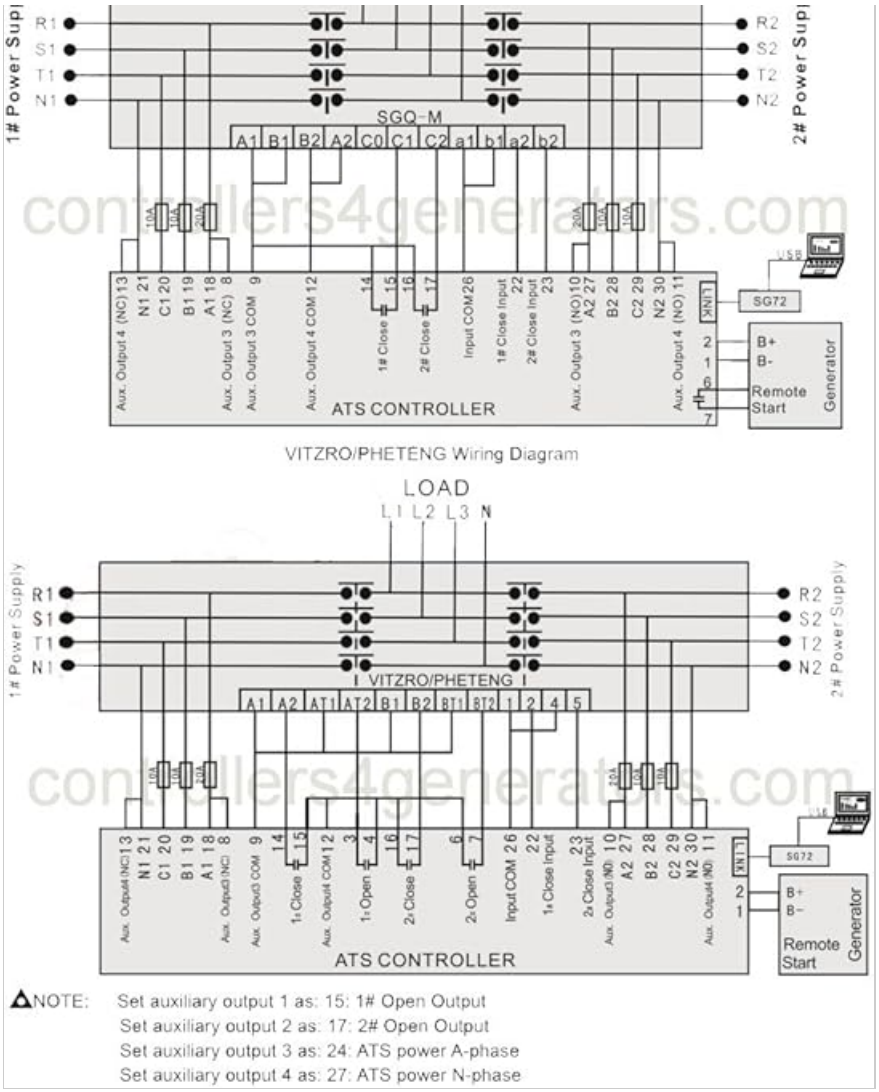
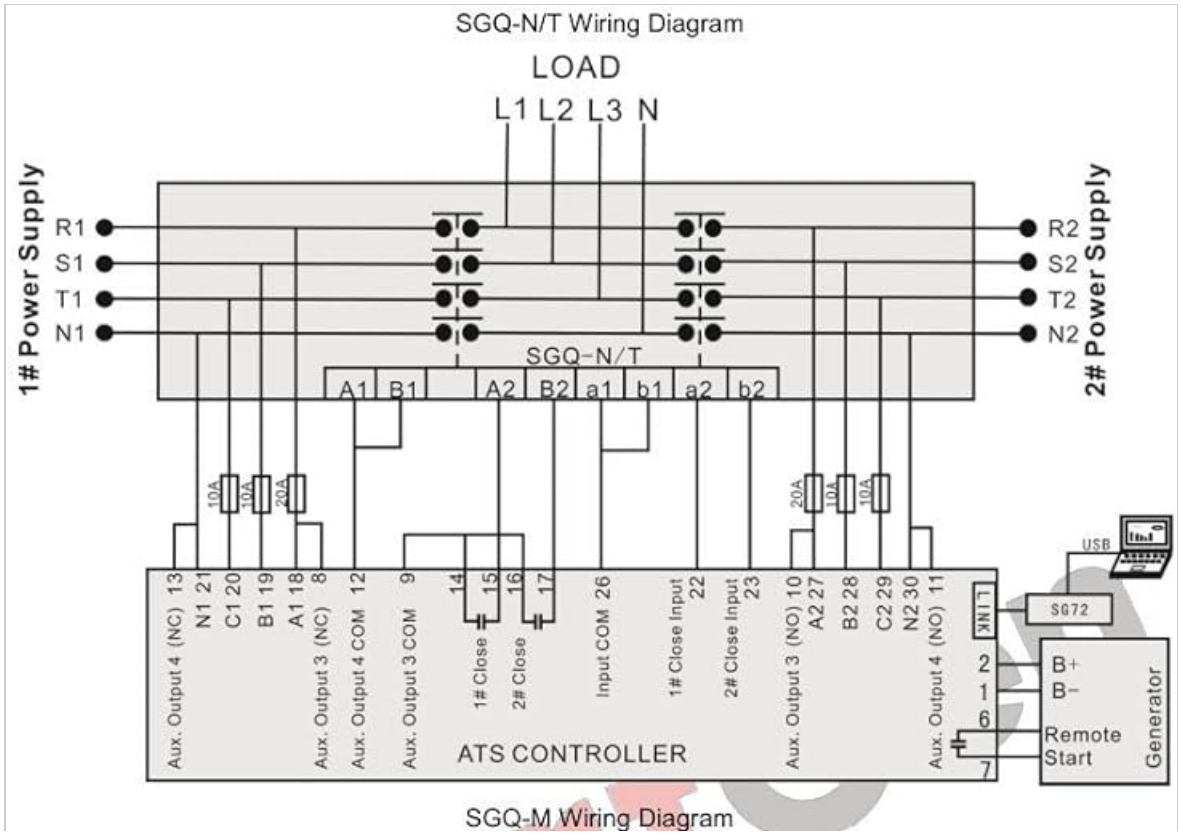


Figure 2: Comprehensive wiring diagrams illustrating connections for ATYS3S, SGQ-N/T, SGQ-M, and VITZRO/PHETENG ATS controller types. These diagrams show connections for 1# and 2# power supplies, load, and remote start signals.



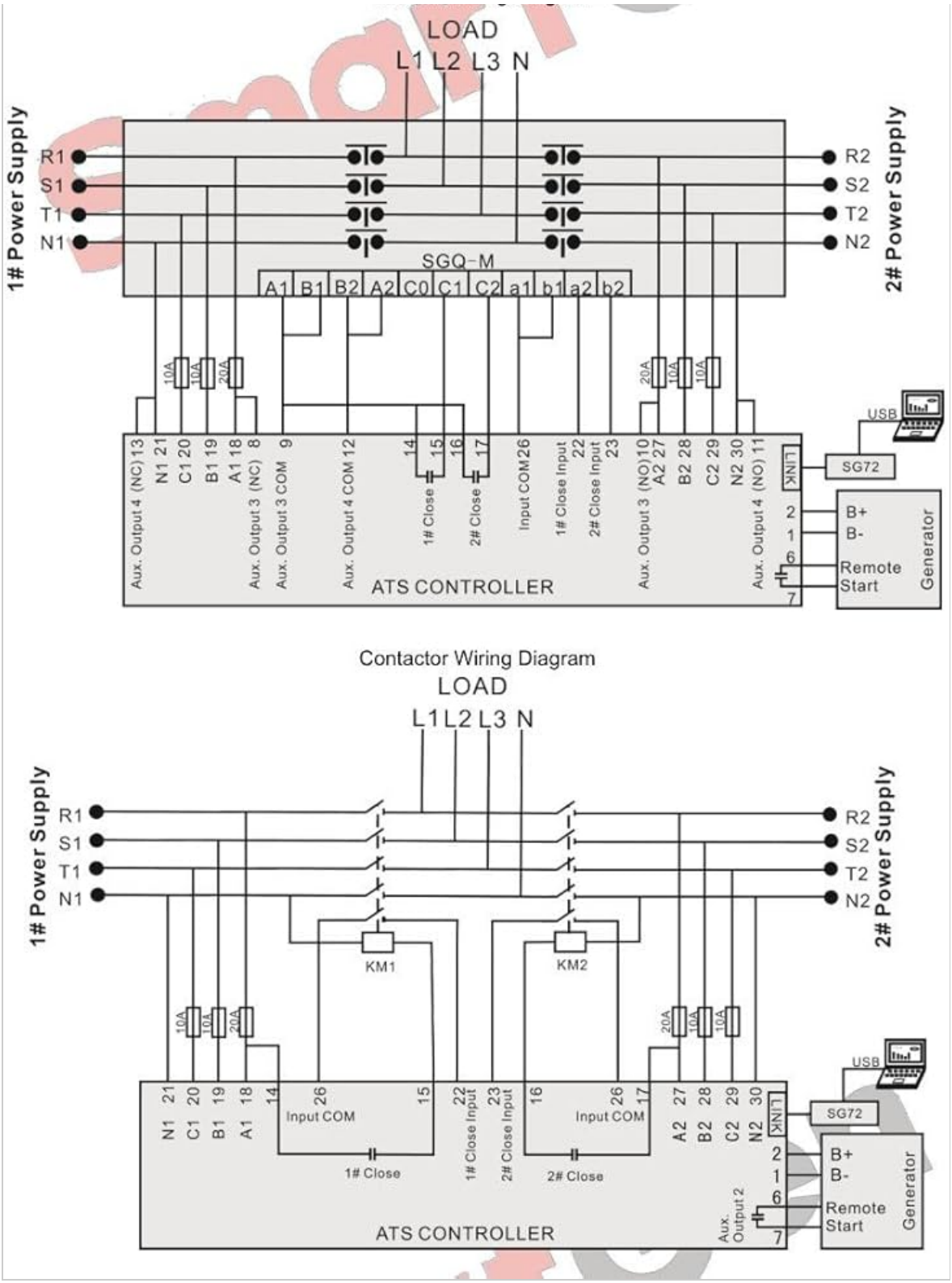


Figure 3: Additional wiring diagrams focusing on SGQ-N/T, SGQ-M, and Contactor ATS configurations, detailing input and output connections for the controller.

3.2 Connecting Terminals

The controller features clearly labeled terminals for power input, auxiliary outputs, and control signals. Ensure each wire is securely connected to its designated terminal.

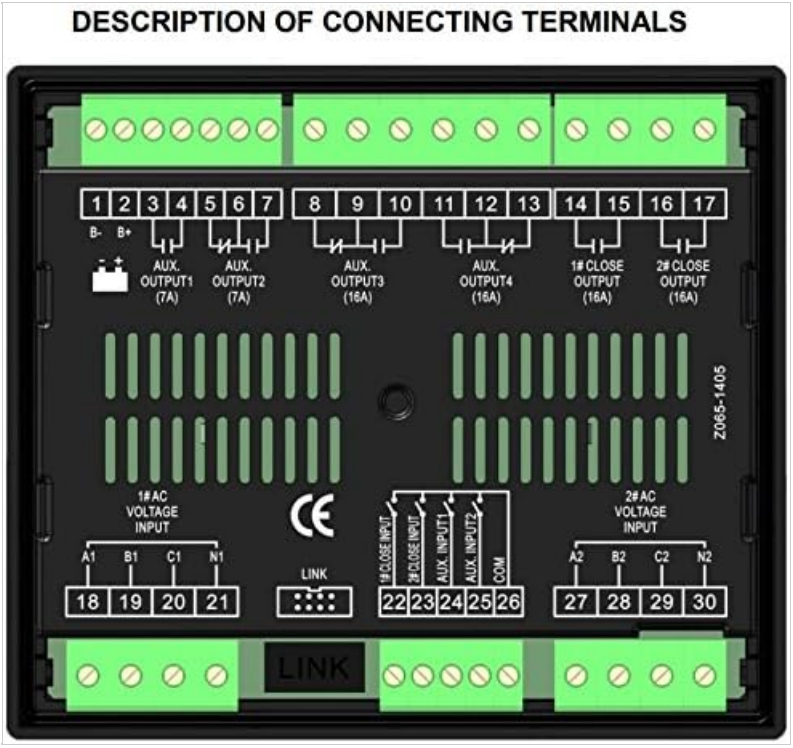


Figure 4: Rear view of the HAT560NB controller, displaying the layout and labeling of all connecting terminals, including power inputs, auxiliary outputs, and communication ports.

4. Operating Instructions

The HAT560NB controller offers both automatic and manual operation modes, accessible via its front panel buttons and LCD display.

4.1 Power On and Initial Display

Upon powering on, the LCD will display system information, including voltage and frequency readings for both power sources. The backlight ensures visibility in various lighting conditions.

4.2 Mode Selection

- **Automatic Mode:** The controller automatically monitors the power sources and initiates transfer based on pre-set parameters and detected abnormalities (e.g., over/under voltage, frequency deviations, phase loss).
- **Manual Mode:** Allows the user to manually control the opening or closing of the transfer switches. This mode is typically used for testing or specific operational requirements.

4.3 Parameter Setting

All operational parameters can be configured directly on the unit using the push-buttons and LCD interface. Access to parameter settings is protected by a two-level password system to prevent unauthorized changes. Refer to the detailed programming guide (not included in this manual) for specific parameter definitions and adjustment procedures.

5. Maintenance

Regular maintenance ensures the longevity and reliable performance of your HAT560NB ATS Controller.

- **Cleaning:** Keep the controller's exterior clean and free from dust and debris. Use a soft, dry cloth. Avoid

abrasive cleaners or solvents.

- **Connection Checks:** Periodically inspect all wiring connections to ensure they are secure and free from corrosion. Loose connections can lead to intermittent operation or system failures.
- **Environmental Conditions:** Ensure the operating environment remains within the specified temperature and humidity ranges to prevent damage to internal components.

For any internal maintenance or repairs, contact qualified service personnel.

6. Troubleshooting

This section provides guidance on common issues you might encounter with the HAT560NB controller.

Problem	Possible Cause	Solution
Controller not powering on	No DC power supply; Incorrect wiring	Check DC 8.0V-35.0V power supply connections; Verify wiring according to diagrams.
ATS not transferring automatically	Automatic mode not selected; Fault detected on active power source (e.g., over/under voltage, frequency); Incorrect parameters	Ensure controller is in Automatic mode; Check power source status; Verify parameter settings.
Display shows error for voltage/frequency	Actual power source issue; Sensor/input wiring problem	Check the actual voltage and frequency of the power source; Inspect AC voltage input wiring.
Buttons unresponsive	Temporary software glitch; Hardware issue	Restart the controller by cycling power; If issue persists, contact support.

7. Specifications

The following table details the technical specifications for the SmartGen HAT560NB ATS Controller.

Figure 5: Detailed specifications table for the HAT560N series ATS Controller, including operating voltage, power consumption, AC voltage input ranges, rated frequency, relay outputs, communication, dimensions, and environmental conditions.

Item	Specification
Operating Voltage	DC 8.0V-35.0V (continuous power supply)
AC Voltage Input	AC170V-270V (during AC power L1N1/L2N2 supply)
Power Consumption	<3W (Standby mode: <2W)
Rated Frequency	50/60Hz
Close Relay Output	16A AC250V (Volts free output)
Auxiliary Relay Output 1	7A AC250V (Volts free output)
Auxiliary Relay Output 2	7A AC250V (Volts free output)
Auxiliary Relay Output 3	16A AC250V (Volts free output)
Auxiliary Relay Output 4	16A AC250V (Volts free output)
Digital Input	GND connect is active
Communication	LINK interface, MODBUS Protocol
Case Dimensions	139mm x 120mm x 48mm (5.47 x 4.72 x 1.89 inches)
Panel Cutout	130mm x 111mm
Working Conditions	Temperature: (-25~+70)°C, Humidity: (20~93)%RH
Storage Condition	Temperature: (-25~+70)°C
Protection Level	IP55 Gasket
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	0.62kg (1.63 pounds)