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LIHUA TT91-1

LIHUA AVR TT91-1 Automatic Voltage Regulator User Manual

For 8KW, 10KW, and 15KW Single-Phase Generators

1. INTRODUCTION

This manual provides essential information for the proper installation, operation, maintenance, and troubleshooting of your LIHUA AVR TT91-1 Automatic Voltage Regulator. The TT91-1 is designed to maintain a stable voltage output for single-phase generators, specifically compatible with 8KW, 10KW, and 15KW models, including those utilizing GX620, GX630, GX690, 2V78, and 2V77 engines. Please read this manual thoroughly before installation and use to ensure safe and efficient operation.

2. PRODUCT OVERVIEW

The LIHUA AVR TT91-1 is a critical component for generator systems, ensuring consistent voltage delivery. It features an 8-wire configuration for straightforward integration into compatible generator setups. Its robust design is intended for durability and reliable performance in various applications.



Figure 2.1: Top view of the LIHUA AVR TT91-1, showing the main circuit board, capacitors, heat sinks, and the attached 8-wire harness with connectors.



Figure 2.2: Side view of the AVR unit, displaying the manufacturing date and the model number "TT91-1" printed on the casing.



Figure 2.3: Close-up of the 8-wire harness connectors, illustrating the distinct white and blue connector types for proper connection.



Figure 2.4: Bottom view of the AVR casing, featuring the embossed "LiHua" brand logo, indicating authenticity.

3. SAFETY INFORMATION

Always observe the following safety precautions when working with electrical components and generators:

- **Disconnect Power:** Ensure the generator is completely shut down and disconnected from any power source before attempting installation, maintenance, or repair.
- **Qualified Personnel:** Installation and service should only be performed by qualified technicians familiar with generator electrical systems.
- **Proper Tools:** Use insulated tools to prevent electrical shock.
- **Environmental Conditions:** Do not operate the AVR in wet or damp conditions. Ensure adequate ventilation.
- **Inspect for Damage:** Before installation, inspect the AVR for any visible damage. Do not install a damaged unit.

4. INSTALLATION

The LIHUA AVR TT91-1 is designed for direct replacement or new installation in compatible single-phase generators. Refer to your generator's specific service manual for detailed wiring diagrams and mounting instructions.

1. **Preparation:** Ensure the generator is turned off, cooled down, and the battery is disconnected to prevent accidental startup or electrical shock.
2. **Locate Old AVR (if replacing):** Identify the existing AVR unit on your generator. Note its mounting position and wiring connections.
3. **Remove Old AVR:** Carefully disconnect all wires from the old AVR. Pay attention to the color coding and connector types. Remove any mounting hardware.
4. **Mount New AVR:** Secure the LIHUA AVR TT91-1 in the designated location using appropriate mounting hardware. Ensure it is firmly attached and not subject to excessive vibration.
5. **Connect Wiring:** The TT91-1 features an 8-wire harness. Connect these wires to the corresponding terminals on your generator. The harness typically includes:
 - **Excitation Wires:** Typically two wires (often blue or yellow) connecting to the exciter winding.
 - **Sensing Wires:** Two wires (often white or red) for voltage feedback from the generator output.

- **Auxiliary Power Wires:** Two wires (often black or brown) providing power to the AVR.
- **Ground/Neutral Wires:** One or two wires (often green or black) for grounding or neutral connection.

Important: Always match the wire functions and colors according to your specific generator's wiring diagram. Incorrect wiring can cause damage to the AVR or generator.

6. **Verify Connections:** Double-check all connections for tightness and correctness. Ensure no wires are pinched or exposed.
7. **Final Checks:** Reconnect the generator battery and perform any pre-start checks as per your generator's manual.

5. OPERATION

Once installed, the LIHUA AVR TT91-1 operates automatically to regulate the generator's output voltage. Upon starting the generator, the AVR senses the output voltage and adjusts the excitation current to the generator's field winding, maintaining a stable voltage level under varying loads.

- **Initial Startup:** After installation, start the generator and monitor the voltage output using a voltmeter. The voltage should stabilize at the rated output (e.g., 120V or 240V, depending on your generator configuration).
- **Load Application:** Gradually apply electrical loads to the generator. The AVR should maintain a consistent voltage output, compensating for changes in load.
- **Voltage Adjustment (if applicable):** Some AVRs may have a small voltage adjustment potentiometer. If your TT91-1 has one, make minor adjustments only if necessary and with a voltmeter connected to the output. Refer to your generator's manual for specific adjustment procedures.

6. MAINTENANCE

The LIHUA AVR TT91-1 is designed for minimal maintenance. However, periodic checks can help ensure its longevity and reliable performance:

- **Visual Inspection:** Periodically inspect the AVR and its wiring for any signs of damage, corrosion, loose connections, or overheating.
- **Cleanliness:** Keep the AVR free from dust, dirt, and moisture. Use a soft, dry cloth to clean the exterior. Do not use solvents or abrasive cleaners.
- **Ventilation:** Ensure that the area around the AVR is clear to allow for proper airflow and cooling.
- **Connection Integrity:** Check that all wire connections remain secure and free from vibration.

7. TROUBLESHOOTING

If you experience issues with your generator's voltage output, consider the following troubleshooting steps. Always ensure the generator is safely shut down before performing any inspections or repairs.

Problem	Possible Cause	Solution
No Voltage Output	<ul style="list-style-type: none"> Loose or incorrect wiring connections. Blown fuse in the excitation circuit. Faulty AVR unit. Generator field winding issue. 	<ul style="list-style-type: none"> Check all 8-wire connections for tightness and correct polarity. Inspect and replace any blown fuses. Test the AVR (if possible, with specialized equipment) or replace it if suspected faulty. Consult a generator technician for winding inspection.
Unstable or Fluctuating Voltage	<ul style="list-style-type: none"> Loose sensing wires. Overload on the generator. Engine speed fluctuations. Faulty AVR. 	<ul style="list-style-type: none"> Verify sensing wire connections. Reduce the electrical load. Check and adjust generator engine speed. Consider AVR replacement.
Overvoltage or Undervoltage	<ul style="list-style-type: none"> Incorrect voltage adjustment. Faulty AVR. 	<ul style="list-style-type: none"> If equipped, carefully adjust the voltage potentiometer while monitoring output. Replace the AVR if adjustment does not resolve the issue.

If these steps do not resolve the issue, it is recommended to consult a qualified generator service technician.

8. SPECIFICATIONS

Model:	TT91-1
Compatibility:	Single-phase generators, 8KW, 10KW, 15KW. Compatible with GX620, GX630, GX690, 2V78, 2V77 engines.
Wiring:	8-wire configuration
Function:	Automatic Voltage Regulation
Item Weight:	Approximately 14.1 ounces (0.4 kg)
Package Dimensions:	Approximately 0.39 x 0.39 x 0.39 inches (1 x 1 x 1 cm) <i>(Note: These dimensions appear to be placeholder values and may not reflect the actual product size.)</i>
Manufacturer:	RFLCZKLA

9. WARRANTY AND SUPPORT

For warranty information or technical support regarding your LIHUA AVR TT91-1, please refer to the documentation provided at the point of purchase or contact the seller directly. Keep your purchase receipt as proof of purchase.