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› Greluma DC 12V Programmable Temperature Controller User Manual

Greluma ZL498LUM

Greluma DC 12V Programmable Temperature Controller User Manual

Model: ZL498LUM

1. INTRODUCTION

The Greluma DC 12V Programmable Temperature Controller is a versatile device designed for precise temperature monitoring and control. It features a dual-color LED display for simultaneous viewing of measured and set temperatures, and a waterproof NTC 10K sensor for reliable readings in various environments. This controller supports both heating and cooling modes, making it suitable for a wide range of applications.

Applications: This electronic thermostat can be widely used in smart home and industrial appliances, household appliances, automatic irrigation systems, office machinery, audio equipment, automotive applications, aquariums, and more.

Wide Application



Household Appliances



Aquarium



Automobiles



Automatic irrigation

Figure 1: The Greluma DC 12V Programmable Temperature Controller is suitable for a wide range of applications, including household appliances, aquariums, automobiles, and automatic irrigation systems.

2. SAFETY INFORMATION

- Ensure the power supply matches the device's voltage requirements (DC 12V).
- Do not expose the main control unit to water or excessive humidity, despite the waterproof probe.
- All wiring should be performed by a qualified individual to prevent electrical hazards.
- Disconnect power before making any connections or performing maintenance.
- Keep the device out of reach of children.

3. PRODUCT FEATURES

- **Wide Temperature Range:** Measures from -50°C to 110°C (-58°F to 230°F).
- **Dual-Color LED Display:** Simultaneously displays measured temperature (red) and set temperature (blue).
- **Waterproof NTC Probe:** Equipped with a 10K 0.5% NTC waterproof sensor for reliable outdoor or submerged use.
- **High Accuracy:** Control precision of 0.1°C and reaction precision of 0.1°C.
- **High Temperature Protection:** Includes protection mechanisms for safe operation.
- **Cooling/Heating Modes:** Configurable for both temperature control applications.

4. PRODUCT OVERVIEW

The Greluma temperature controller consists of the main module with an LED display and control buttons, and an external NTC waterproof sensor probe.



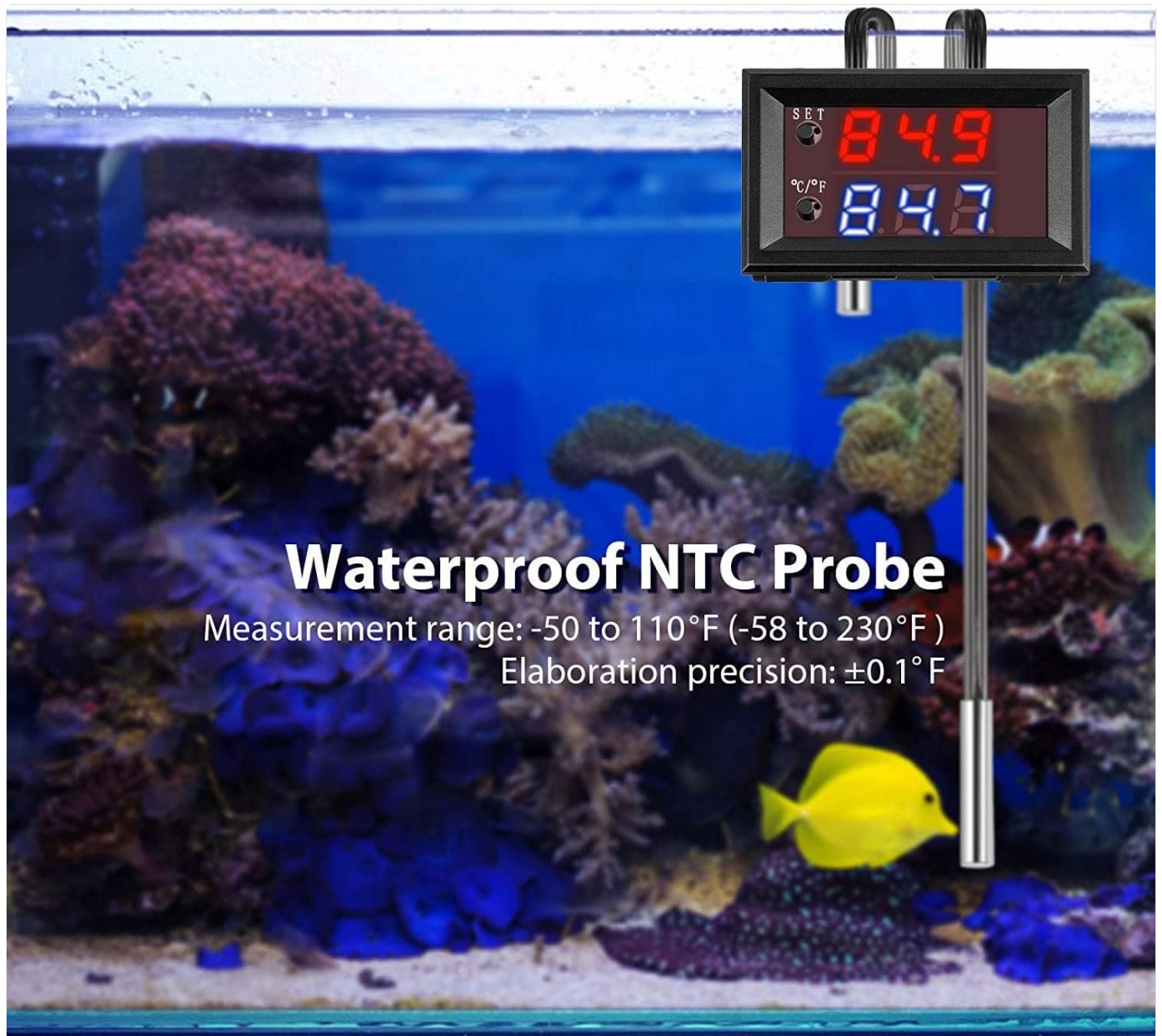
Figure 2: The Greluma DC 12V Programmable Temperature Controller, showing the main unit with its dual LED display and the attached NTC waterproof sensor probe.

FRONT



BACK

Figure 3: Front and back views of the controller module, illustrating the display and control buttons on the front, and the relay and wiring terminals on the back.



Waterproof NTC Probe

Measurement range: -50 to 110°F (-58 to 230°F)
Elaboration precision: $\pm 0.1^\circ\text{F}$

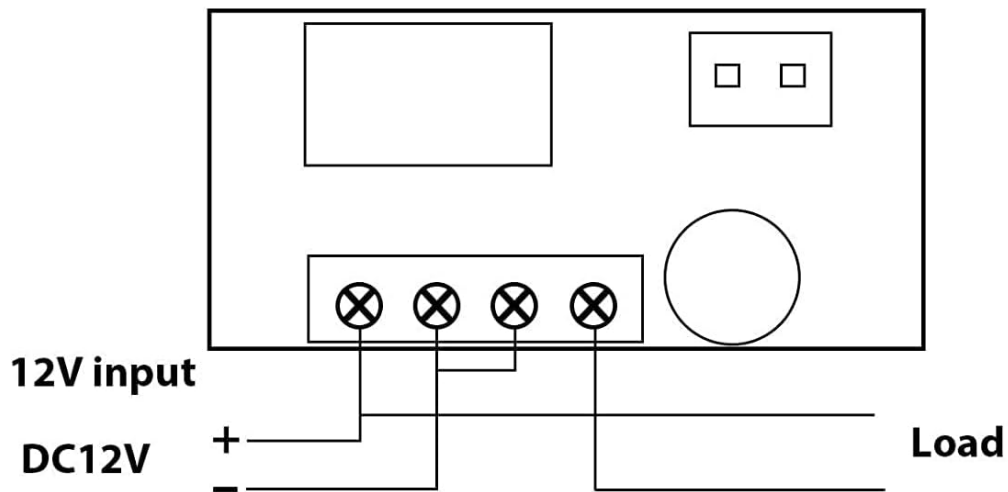
Figure 4: The waterproof NTC sensor probe, shown submerged in an aquarium, highlighting its ability to measure temperature in liquid environments.

5. SETUP

5.1 Wiring Diagram

Proper wiring is crucial for the safe and correct operation of the temperature controller. Refer to the diagrams below for connection instructions.

Temperature Control and Load the 12V Cases Wiring Way



Load and Temperature Control Different Power Wiring Diagram

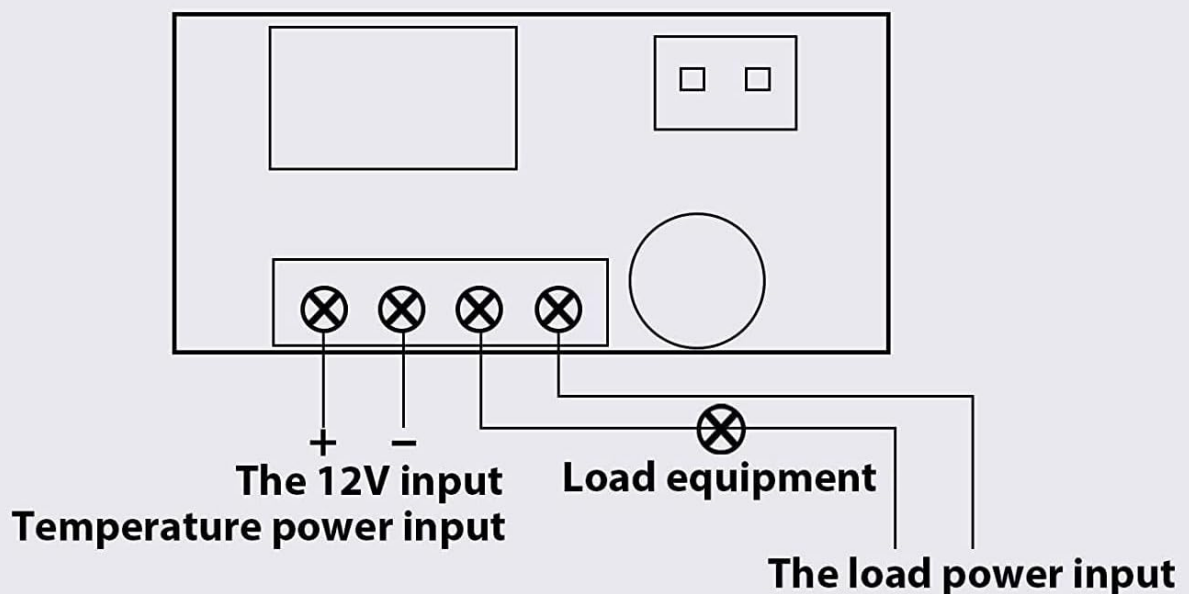


Figure 5: Wiring diagrams for the Greluma temperature controller. The top diagram shows basic 12V input and load connection. The bottom diagram illustrates separate power inputs for the temperature control module and the load equipment, providing more flexibility for higher power loads.

Wiring Notes:

- Ensure the DC 12V input is connected to the correct positive (+) and negative (-) terminals.
- Connect the load (heating or cooling device) to the relay output terminals. The relay acts as a switch.
- For high-power loads, it is recommended to use the "Load and Temperature Control Different Power Wiring Diagram" to ensure stable operation and prevent damage to the controller.
- The NTC sensor probe should be connected to its dedicated input terminals.

6. OPERATING INSTRUCTIONS

6.1 LED Display Indicators

The dual-color LED display provides real-time information:

- **Red LED:** Displays the currently measured temperature.
- **Blue LED:** Displays the set target temperature.
- **"LLL":** Indicates that the sensor is open or disconnected.
- **"HHH":** Indicates that the measured temperature is outside the operational range (-50°C to 110°C). Ensure the environment or medium being measured is within this range.
- **"---":** Indicates that the module is protected due to high temperature.



Figure 6: The dual-color LED display showing the detecting temperature in red and the setting temperature in blue.

6.2 Setting the Temperature

1. Press and hold the **SET** button for five seconds to enter the main configuration menu.
2. Use the **STC(+)** and **C/F(-)** buttons to navigate through parameters P0 to P8.
3. Once you have selected the desired parameter (e.g., P0 for heating/cooling mode), press the **STC** button. The LED

display will flash.

- 4. Use the **STC(+)** and **C/F(-)** buttons to adjust the setting value.
- 5. Wait for 3 seconds after setting the value; the module will automatically save the parameters and exit the setting mode.

6.3 Programmable Thermostat Parameters

The following table details the programmable parameters (P0-P8) and their factory default settings:

Code	Description	Setting Range	Factory Setting
P0	Heating/Cooling Mode	H (Heating) / C (Cooling)	C
P1	Hysteresis (Return Difference)	0.1 - 30	2
P2	Set Maximum Limit	+110	110
P3	Set Minimum Limit	-50	-50
P4	Temperature Correction	-15 - +15	0
P5	Delayed Start Time	0 - 10	0
P6	High Temperature Alarm	-50 - +110	OFF
P7	Temperature Unit	CS (°C) / FH (°F)	CS
P8	Factory Reset	ON / OFF	OFF

7. MAINTENANCE

- Regularly inspect all wiring connections to ensure they are secure and free from corrosion.
- Keep the main control unit clean and free of dust. Use a soft, dry cloth for cleaning.
- Periodically check the NTC sensor probe for any physical damage or buildup that might affect its accuracy. Clean the probe gently if necessary.
- Do not use abrasive cleaners or solvents on any part of the device.

8. TROUBLESHOOTING

- **Display shows "LLL":** This indicates an open circuit or disconnected sensor. Check the sensor's connection to the module. If the connection is secure, the sensor might be faulty and require replacement.
- **Display shows "HHH":** The measured temperature is outside the operational range (-50°C to 110°C). Ensure the environment or medium being measured is within this range.
- **Display shows "---":** The module has entered high-temperature protection mode. Allow the device to cool down. Check for proper ventilation around the module.
- **Inaccurate Temperature Readings:**
 - Verify the sensor is properly immersed or positioned in the area where temperature needs to be measured.
 - Check for any physical damage to the sensor cable.

- Use the P4 (Temperature Correction) parameter to calibrate the reading if a known offset is observed.
- **Controller not switching load:**
 - Check the wiring connections to the load and power supply.
 - Ensure the set temperature and hysteresis (P1) are configured correctly for your desired heating or cooling operation.
 - Verify the P0 parameter is set to the correct mode (H for heating, C for cooling).

9. SPECIFICATIONS

Parameter	Value
Model Number	ZL498LUM
Input Voltage	DC 12V
Temperature Measurement Range	-50°C to 110°C (-58°F to 230°F)
Resolution	0.1°C (for -9.9 to 99.9°C), 1°C (for other temperatures)
Refresh Rate	0.5 seconds
Control Precision	0.1°C
Reaction Precision	0.1°C
Sensor Type	NTC 10K 0.5% Waterproof Sensor
Display Type	Dual-Color LED (Red for measured, Blue for set)
Dimensions (L x W x H)	4.8 x 2.9 x 3.2 cm (1.89 x 1.14 x 1.26 inches)
Weight	30 grams

Size Information



Figure 7: Detailed dimensions of the Greluma DC 12V Programmable Temperature Controller module.

10. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the product packaging or contact Greluma customer service directly. Keep your purchase receipt for warranty claims.

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