RUIZHI XH-W3001

RUIZHI XH-W3001 Digital Temperature Controller User Manual

Model: XH-W3001 | Brand: RUIZHI

1. Product Overview

The RUIZHI XH-W3001 is a digital temperature controller designed for precise temperature regulation in various environments. It features an ABS flame-retardant shell for enhanced durability and safety. The device offers a wide temperature control range, making it suitable for diverse applications requiring accurate temperature monitoring and control. It is equipped with a waterproof probe for reliable performance in liquid or humid conditions.

Figure 1: RUIZHI XH-W3001 Digital Temperature Controller. This image shows the front view of the controller with its digital LED display, 'Up' and 'Down' buttons, and connected power and probe wires.

2. Key Features

- **Durable Construction:** Made from high-quality ABS flame-retardant material for high mechanical strength and long service life.
- **Wide Temperature Range:** Controls temperatures from -50°C to 110°C.
- **High Precision:** Temperature control accuracy of 0.1°C.
- **Power Specifications:** Operates on 24V DC input with a maximum output power of 240W (10A).
- **User-Friendly Display:** Clear LED screen for easy reading of temperature values.
- **Waterproof Probe:** Includes a 1-meter NTC10K stainless steel waterproof probe, resistant to rust.
- **Dual Operating Modes:** Supports both heating (start temperature lower than stop temperature) and cooling (start temperature higher than stop temperature) modes.
- **Easy Installation:** Features fixed screw holes for straightforward mounting and integration.

3. Specifications

Parameter	Value
Main Material	ABS
Input Voltage	24 V DC
Max Output Current	10 A
Temperature Measurement Range	-50 °C to 110 °C
Temperature Regulation Accuracy	0.1 °C
Load Power	240 W
Measurement Input	NTC10K 1m Waterproof Probe
Installation Hole Distance	7.3 cm
Hole Diameter	4 mm
Package Dimensions	13.8 x 11.9 x 4 cm
Weight	50 grams
Controller Type	Push-button
Special Features	Digital display, waterproof probe
Color	White
Connectivity Technology	Wired
Power Source	External DC Power Supply

Figure 2: Product dimensions of the XH-W3001 controller. The image illustrates the physical measurements of the device, including its length (59mm / 2.32 inches), width (44mm / 1.73 inches), and height (31mm / 1.22 inches).

4. Setup and Wiring

Proper wiring is crucial for the safe and correct operation of the XH-W3001 temperature controller. Please follow the diagram below carefully.

Figure 3: Wiring diagram for the XH-W3001. This diagram shows how to connect the power supply (e.g., 24V DC battery), the load (e.g., light bulb), and the temperature detection probe to the controller.

Wiring Instructions:

1. **Power Input:** Connect your 24V DC power supply to the designated input terminals. Ensure correct polarity (+ and -).
2. **Load Output:** Connect the device you wish to control (e.g., heater, fan) to the output terminals. The controller provides a direct output.
3. **Temperature Probe:** Insert the NTC10K waterproof probe into the probe input port. The probe is used to detect the current temperature.

Important Note:

- The XH-W3001 provides a direct output. To prevent potential short circuits or ignition, do not power on the device if the output terminal is not connected to a load.
- Ensure all connections are secure and insulated to prevent electrical hazards.

5. Operating Instructions

The XH-W3001 controller allows you to set both a start temperature and a stop temperature to manage your heating or cooling applications.

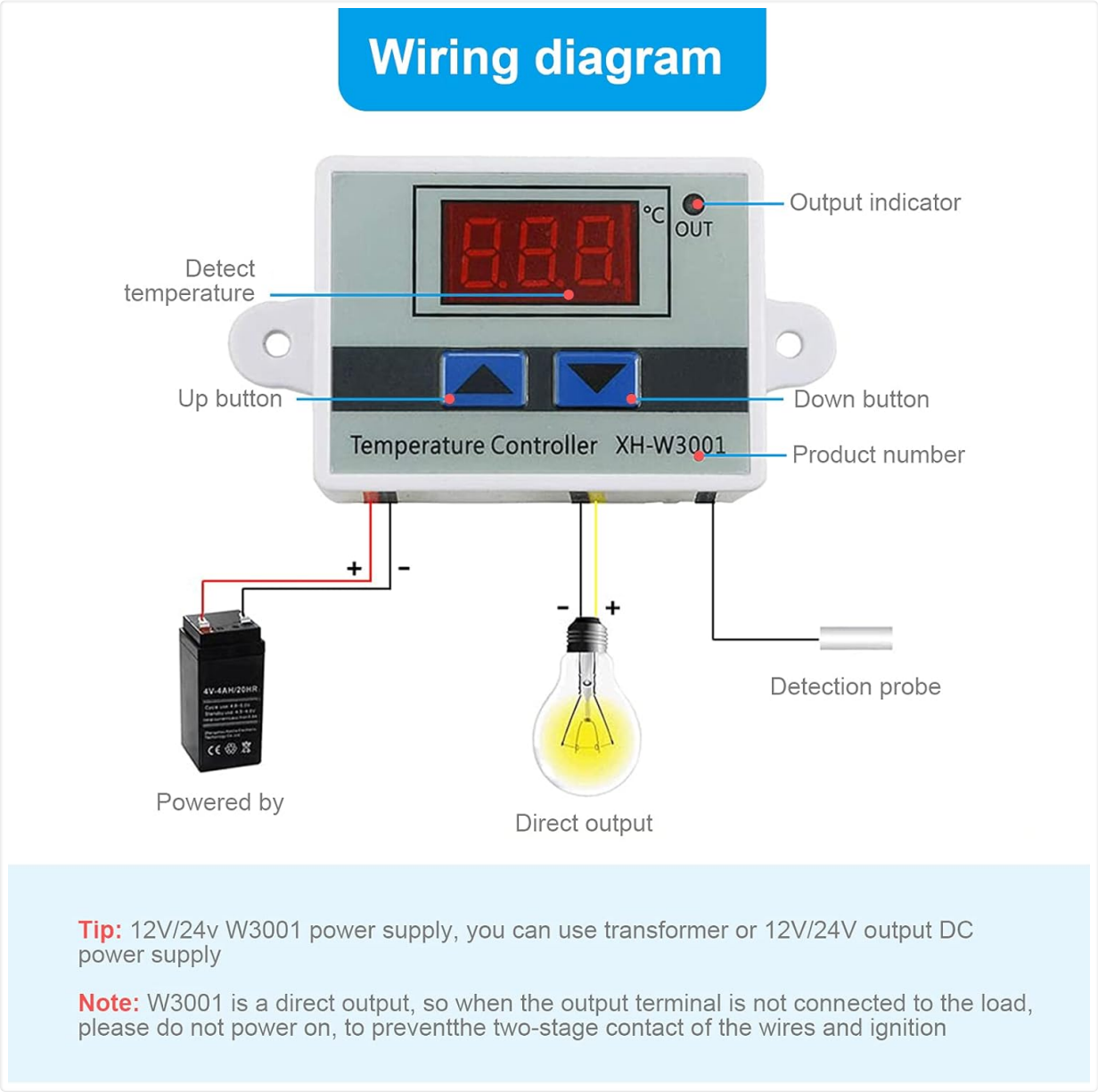

Figure 4: Setting temperatures on the XH-W3001. This image illustrates the display and buttons used for adjusting the start and stop temperature settings.

5.1. Setting the Start Temperature

1. Press the **Up** button once. The display will show the current start temperature.
2. Press and hold the **Up** button for approximately 3 seconds. The start temperature number on the display will begin to flash.
3. Use the **Up** and **Down** buttons to adjust the value to your desired start temperature.
4. The setting will automatically save after a few seconds of inactivity, or you can press both**Up** and **Down** buttons simultaneously to confirm.

5.2. Setting the Stop Temperature

1. Press the **Down** button once. The display will show the current stop temperature.
2. Press and hold the **Down** button for approximately 3 seconds. The stop temperature number on the display will begin to flash.
3. Use the **Up** and **Down** buttons to adjust the value to your desired stop temperature.

4. The setting will automatically save after a few seconds of inactivity, or you can press both **Up** and **Down** buttons simultaneously to confirm.

5.3. Operating Modes

- **Heating Mode:** To operate in heating mode, set the start temperature to be *lower* than the stop temperature. The controller will activate the load when the temperature drops below the start temperature and deactivate it when it reaches the stop temperature.
- **Cooling Mode:** To operate in cooling mode, set the start temperature to be *higher* than the stop temperature. The controller will activate the load when the temperature rises above the start temperature and deactivate it when it drops to the stop temperature.

6. Maintenance

To ensure the longevity and optimal performance of your RUIZHI XH-W3001 temperature controller, follow these maintenance guidelines:

- **Cleaning:** Keep the device clean and free from dust and debris. Use a soft, dry cloth for cleaning. Do not use abrasive cleaners or solvents.
- **Environmental Conditions:** Avoid exposing the controller to extreme temperatures, high humidity, or corrosive environments beyond its specified operating range.
- **Connection Checks:** Periodically inspect all electrical connections to ensure they are secure and free from corrosion or damage.
- **Probe Inspection:** Regularly check the waterproof temperature probe for any signs of physical damage, kinks in the cable, or corrosion. Replace if necessary to maintain accuracy.

7. Troubleshooting

If you encounter issues with your XH-W3001 controller, refer to the following troubleshooting tips:

- **Display Not Working:**
  - Check the power supply connections. Ensure the 24V DC input is correctly connected and providing power.
  - Verify the power source is functional.
- **Incorrect Temperature Readings:**
  - Ensure the temperature probe is correctly inserted and securely connected to the controller.
  - Check the probe for any physical damage or corrosion.
  - Make sure the probe is properly positioned in the environment or medium where temperature is to be measured.
- **Controller Not Activating Load:**
  - Verify the load (e.g., heater, fan) is correctly wired to the output terminals and is functional.
  - Check that the load's power consumption does not exceed the controller's maximum output of 240W (10A).
  - Review your set start and stop temperatures to ensure they are configured correctly for the desired heating or cooling mode.
  - Confirm the current temperature is within the range that should trigger the load according to your settings.

- **Device Overheating:**
  - Ensure there is adequate ventilation around the controller.
  - Verify that the connected load is within the specified power limits.

8. Applications

The RUIZHI XH-W3001 Digital Temperature Controller is versatile and can be used in a wide range of applications requiring precise temperature control:

Figure 5: Diverse applications of the XH-W3001. This image illustrates the controller's use in incubation rooms, aquaculture, aquariums, greenhouses, and animal feeding systems.

- Incubation areas (e.g., egg incubators)
- HVAC systems
- Dehumidifiers
- Testing and laboratory equipment
- Appliance control boxes
- Air conditioning systems
- Temperature protection systems
- Cooling systems for weather station cabinets

- Aquaculture and aquarium temperature regulation
- Greenhouse climate control
- Animal feeding and breeding systems

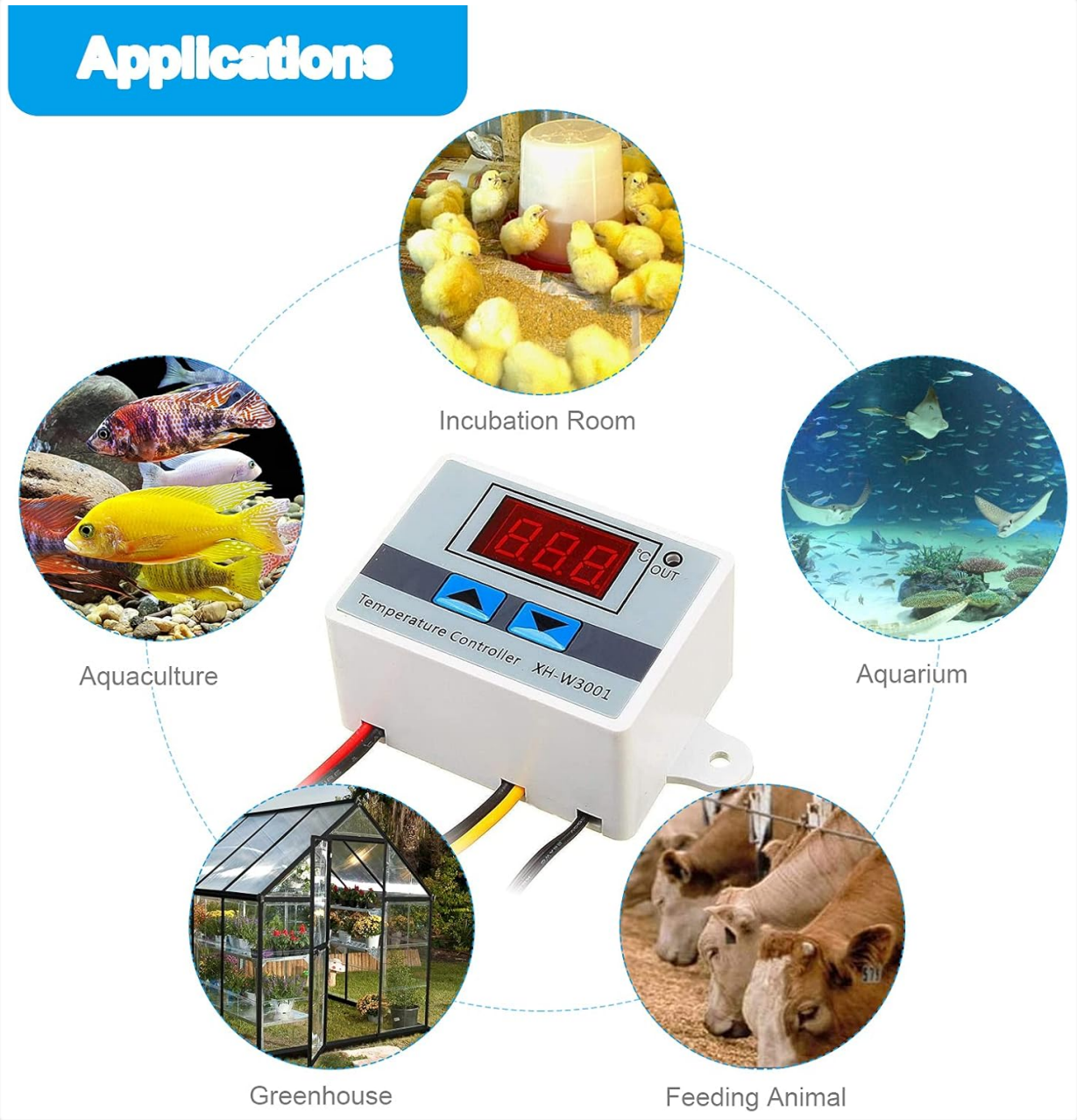

Figure 6: XH-W3001 in industrial settings. This image shows the temperature controller integrated into control cabinet cooling systems and various other industrial cabinets.

9. Warranty Information

This product is covered by a standard manufacturer's warranty. For specific details regarding warranty terms, duration, and claims process, please refer to the documentation provided at the time of purchase or contact your retailer. Keep your proof of purchase for warranty validation.

10. Customer Support

Should you require technical assistance, have questions about product functionality, or need support, please contact your point of purchase or the manufacturer directly. When contacting support, please provide the following information:

- Product Model: XH-W3001
- Date of Purchase
- Description of the issue