Yuecoom BEM-TC9A

Yuecoom Digital PID Temperature Controller BEM-TC9A User Manual

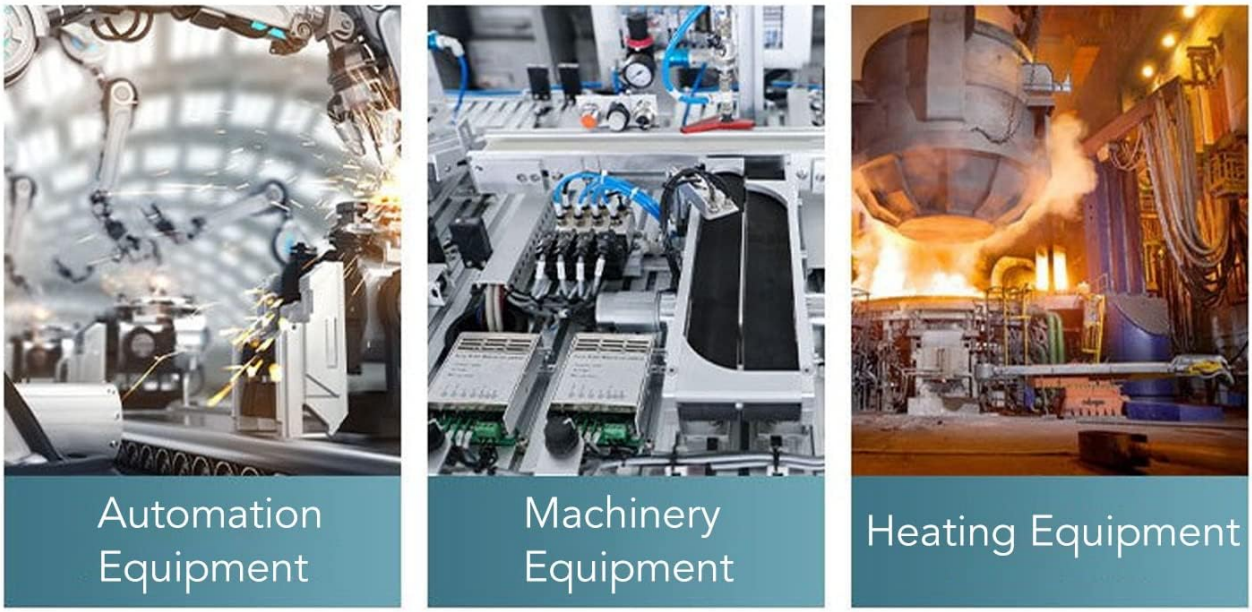
Model: BEM-TC9A

1. Introduction

This manual provides instructions for the installation, operation, and maintenance of the Yuecoom Digital PID Temperature Controller, model BEM-TC9A. This intelligent thermostat is designed for precise temperature control in various industrial and scientific applications, including machine tool equipment, heating equipment, plastic machinery, boiler equipment, and automation systems.

Applicable Scenes

Applicable to machine tool equipment, heating equipment, plastic machinery, boiler equipment, temperature control equipment, automation equipment, etc



The Yuecoom BEM-TC9A controller is suitable for a wide range of industrial applications requiring precise temperature management.

2. Safety Information

Please read and understand all safety warnings and instructions before installing or operating this device. Failure to do so may result in injury, damage to the device, or improper operation.

- **Electrical Safety:** Ensure all power connections are made by qualified personnel. Disconnect power before wiring or performing maintenance. The rated voltage is 100-240VAC.
- **Proper Installation:** Install the controller in an environment free from excessive vibration, moisture, dust, corrosive gases, and direct sunlight.
- **Grounding:** Ensure the device is properly grounded to prevent electrical shock.
- **Handling:** Handle the device with care to avoid physical damage.

3. Product Overview

The BEM-TC9A is a digital PID temperature controller featuring a dual 7-segment LED display for clear indication of Process Value (PV) and Set Value (SV). It offers precise temperature control with various control modes and alarm outputs.

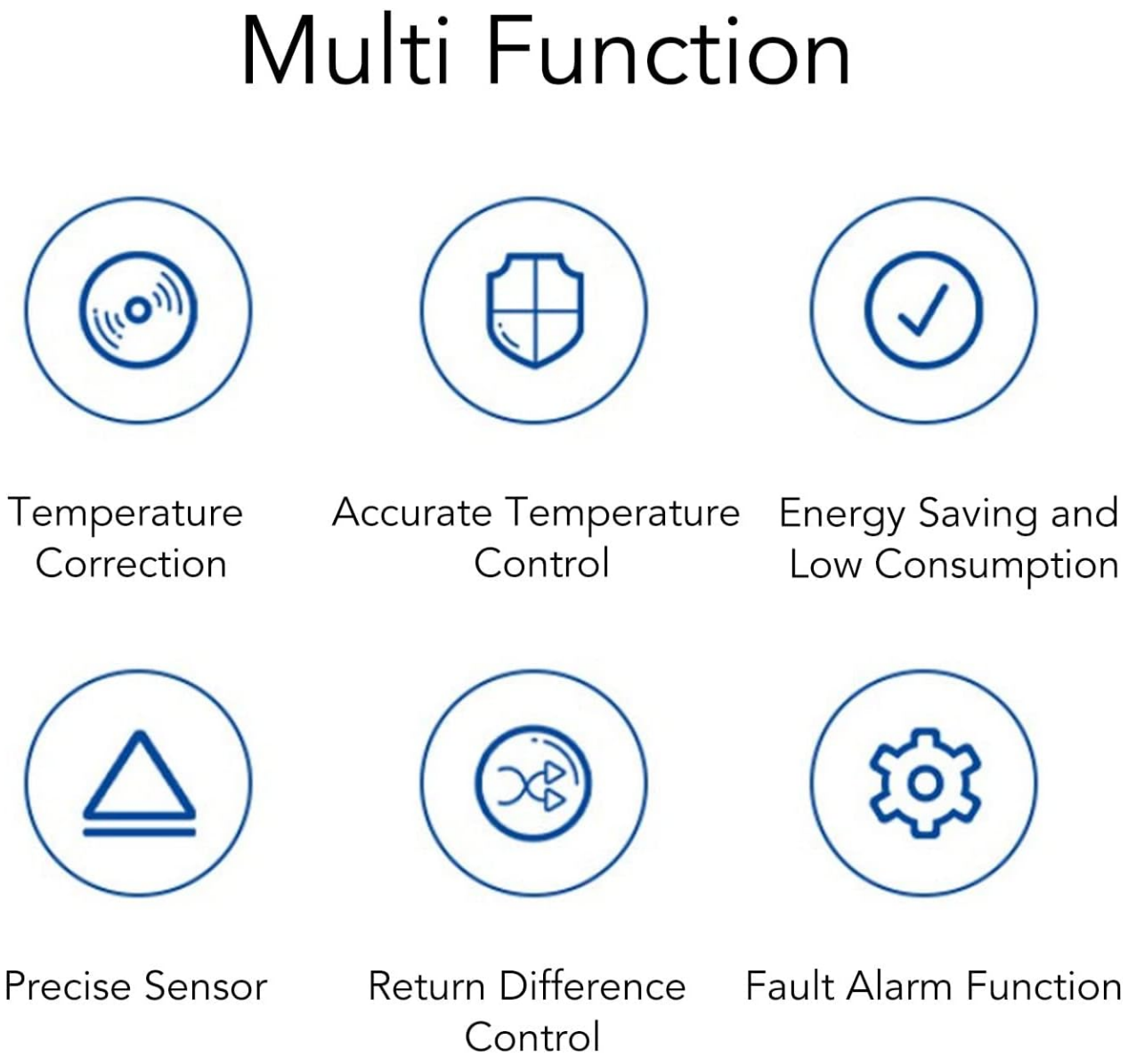
Key Features:

- **Precise Temperature Control:** Utilizes an advanced PID algorithm for accurate temperature restoration

with minimal delay and overshoot.

- **High Sensitivity and Accuracy:** Provides reliable and precise temperature measurements.
- **Intuitive LED Display:** Red display for PV (Process Variable) and green for SV (Set Value) for easy monitoring.
- **Reliable Performance:** High wiring density circuit board ensures stable operation.
- **Dual Control Options:** Supports various defrosting management methods and dual control of temperature and time.
- **Multi-Functionality:** Includes temperature correction, accurate temperature control, energy saving, precise sensor input, return difference control, and fault alarm function.

The BEM-TC9A controller features a clear dual LED display for process and set values.

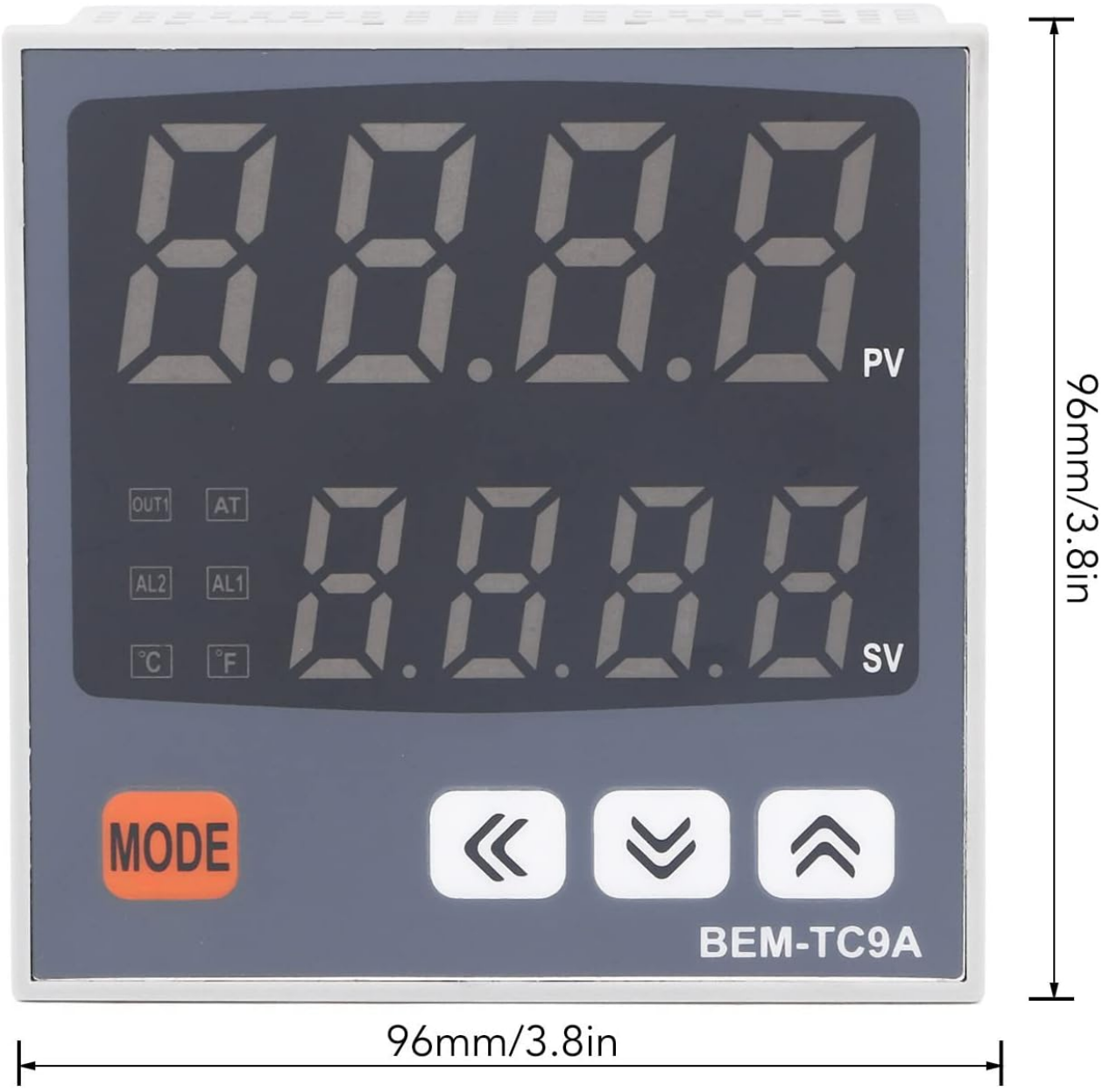


Overview of the multi-functional capabilities of the BEM-TC9A controller.

4. Specifications

Parameter	Value
Item Type	PID Temperature Controller
Material	PC
Allowable Voltage Range	90%-110% of rated voltage
Output Current	4-20MA
Rated Voltage	100-240VAC
Display Mode	7 segment LED (PV: red, SV: green)
Control Accuracy	1-100℃, 0.1-50.0℃
Control Mode	ON OFF, P, PI, PD, PID control
Alarm Output	AL1, AL2 Relay: 250VAC 1A 1a

Size	Approx. 96x96mm / 3.8x3.8in
Item Weight	8.4 ounces (0.24 Kilograms)



Physical dimensions of the BEM-TC9A controller.

5. Setup and Installation

Proper installation is crucial for the accurate and safe operation of the temperature controller. It is recommended that installation be performed by a qualified technician.

5.1 Mounting

- The BEM-TC9A is designed for panel mounting.
- Cut a square opening of approximately 92x92mm (3.6x3.6in) in the control panel.
- Insert the controller into the opening and secure it using the provided mounting brackets.

5.2 Wiring

Refer to the wiring diagram provided with your specific unit for detailed connection instructions. General wiring

considerations include:

- **Power Supply:** Connect the 100-240VAC power supply to the designated terminals. Ensure correct polarity and proper grounding.
- **Sensor Input:** Connect your temperature sensor (e.g., thermocouple, RTD) to the sensor input terminals. Ensure the sensor type matches the controller's configuration.
- **Output Connections:** Connect your heating/cooling elements or other controlled devices to the output terminals (e.g., OUT1, AL1, AL2). The controller provides 4-20mA output and relay outputs for alarms.
- **Isolation:** Keep power lines, sensor lines, and output lines separate to minimize electrical interference.

6. Operating Instructions

The BEM-TC9A controller is operated via its front panel buttons and monitored through its dual LED display.

The control buttons on the BEM-TC9A for setting parameters and navigating menus.

6.1 Display Overview

- **PV (Process Value - Red Display):** Shows the current measured temperature.
- **SV (Set Value - Green Display):** Shows the desired target temperature.
- **Indicators:** OUT1 (output status), AT (auto-tuning), AL1/AL2 (alarm status), °C/°F (temperature unit).

6.2 Basic Operation

1. **Power On:** Once wired correctly, apply power to the controller. The display will light up.
2. **Setting the Set Value (SV):**
    - Press the **MODE** button briefly to enter the SV setting mode. The SV display will flash.
    - Use the **Up (▲)** and **Down (▼)** arrow buttons to adjust the SV to your desired temperature.
    - Press the **MODE** button again to confirm the setting and exit SV setting mode.
3. **Accessing Parameters:** Press and hold the **MODE** button for several seconds to enter the parameter setting menu. Use the **MODE** button to cycle through parameters and the arrow buttons to adjust values. Refer to the detailed parameter list in the full user manual for specific functions (e.g., control mode, alarm settings, sensor type).

6.3 Control Modes

The controller supports various control modes, including ON/OFF, P (Proportional), PI (Proportional-Integral), PD (Proportional-Derivative), and PID (Proportional-Integral-Derivative) control. The appropriate mode should be selected based on the application requirements and system dynamics.

- **ON/OFF Control:** Simple switching of output when temperature crosses the set point.
- **PID Control:** Advanced control algorithm for precise and stable temperature regulation, minimizing overshoot and oscillations.

Auto-tuning (AT) functionality can be used to automatically calculate optimal PID parameters for your specific system. Consult the full manual for auto-tuning procedures.

7. Maintenance

Regular maintenance ensures the longevity and reliable performance of your temperature controller.

- **Cleaning:** Periodically wipe the front panel with a soft, dry cloth. Do not use abrasive cleaners or solvents.
- **Inspection:** Regularly check all wiring connections for tightness and signs of wear or corrosion.
- **Environment:** Ensure the operating environment remains within specified conditions (temperature, humidity, absence of corrosive substances).

8. Troubleshooting

If you encounter issues with your BEM-TC9A controller, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
No power/Display off	No power supply, incorrect wiring, blown fuse	Check power connections, verify voltage, inspect fuse.
Incorrect temperature reading (PV)	Sensor faulty, incorrect sensor type setting, loose sensor connection	Check sensor wiring, replace sensor if necessary, verify sensor type in parameters.
Output not activating	SV not reached, control mode incorrect, output wiring fault, alarm active	Verify SV and PV, check control mode settings, inspect output wiring, check alarm status.

Temperature oscillates excessively	PID parameters not tuned correctly	Perform auto-tuning or manually adjust PID parameters.

For issues not listed here or if problems persist, please contact customer support.

9. Warranty and Support

Yuecoom products are manufactured to high-quality standards. For warranty information and technical support, please refer to the documentation included with your purchase or contact your seller. Keep your purchase receipt for warranty claims.