Yudian AI-518D2

Yudian AI-518D2 PID Temperature Controller User Manual

1. Introduction

This manual provides comprehensive instructions for the installation, operation, and maintenance of the Yudian AI-518D2 High Precision PID Temperature Controller. The AI-518D2 is designed for accurate temperature regulation in various industrial and laboratory applications. Please read this manual thoroughly before operating the device to ensure proper function and safety.

2. Safety Information

- Ensure all wiring is performed by qualified personnel in accordance with local electrical codes.
- Disconnect power before performing any installation, wiring, or maintenance.
- Do not operate the controller in environments exceeding its specified temperature and humidity limits.
- Avoid exposing the device to corrosive gases, strong vibrations, or direct sunlight.
- Verify correct sensor type and wiring before operation to prevent damage or inaccurate readings.

3. Product Overview

The Yudian AI-518D2 features a clear digital display for process value (PV) and set value (SV), along with intuitive control buttons and indicator lights.

Figure 3.1: Front view of the Yudian AI-518D2 PID Temperature Controller. This model features a gray casing with red LED displays for Process Value (PV) and Set Value (SV). Below the displays are indicator lights for various statuses and control buttons including A/M (Auto/Manual), RUN, STOP, and navigation arrows.

Figure 3.2: Angled front view of the Yudian AI-518D2 PID Temperature Controller. This variant shows a black casing with red PV and green SV LED displays, providing a clear visual distinction between the current and target temperatures.

3.1. Front Panel Components

- **PV Display (Red LED):** Shows the current process value (e.g., actual temperature).
- **SV Display (Red/Green LED):** Shows the set value (target temperature).
- **Indicator Lights:**

- **MAN:** Manual control mode active.
- **PRO:** Program mode active.
- **MO:** Monitoring mode.
- **COM:** Communication active.
- **OP1/OP2:** Output 1/Output 2 active.
- **AL1/AL2:** Alarm 1/Alarm 2 active.
- **AUT:** Auto-tuning active.
- **AUX:** Auxiliary function active.

- **Control Buttons:**
  - **(Cycle/Menu):** Used to cycle through parameters or enter menu settings.
  - **(Up Arrow):** Increases values or navigates up in menus.
  - **(Down Arrow):** Decreases values or navigates down in menus.
  - **A/M (Auto/Manual):** Toggles between automatic and manual control modes.
  - **RUN:** Starts the control process.
  - **STOP:** Stops the control process.

4. Setup

4.1. Installation

1. **Mounting:** Install the controller into a panel cutout of appropriate dimensions. Secure it using the provided mounting brackets.
2. **Wiring:** Connect the power supply, temperature sensor (e.g., thermocouple, RTD), and control outputs (e.g., SSR, relay) to the corresponding terminals on the rear of the controller. Refer to the wiring diagram provided with your specific unit for exact terminal assignments. Ensure all connections are secure and correct polarity is observed.
3. **Grounding:** Properly ground the controller to prevent electrical interference and ensure safety.

4.2. Initial Power-On

1. After completing all wiring, apply power to the controller.
2. The display will typically show a self-test sequence, then the current process value (PV) and a default set value (SV).

4.3. Basic Configuration

Access the parameter settings by pressing the **Cycle/Menu** button. Use the **Up** and **Down** arrows to navigate through parameters and adjust values. Press **Cycle/Menu** again to confirm and move to the next parameter or exit the menu.

- **Input Type:** Configure the controller to match your specific temperature sensor (e.g., K-type thermocouple, Pt100 RTD).
- **Temperature Unit:** Select between Celsius (°C) and Fahrenheit (°F).
- **Control Mode:** Select PID control or ON/OFF control as required for your application.

5. Operating Instructions

5.1. Setting the Set Value (SV)

1. In normal operating mode, the SV display shows the current target temperature.
2. To adjust the SV, press the **Up** or **Down** arrow buttons. The SV display will flash, indicating it is ready for adjustment.
3. Use the **Up** or **Down** arrows to change the value.
4. The new SV will be automatically saved after a few seconds of inactivity or by pressing the **Cycle/Menu** button.

5.2. Run/Stop Function

- Press the **RUN** button to initiate the temperature control process. The controller will begin to regulate the temperature towards the set value.
- Press the **STOP** button to halt the control process. Outputs will typically turn off, and the controller will cease active regulation.

5.3. Auto/Manual Mode (A/M)

- Press the **A/M** button to switch between Automatic (PID) and Manual control modes.
- In **Automatic Mode**, the controller automatically adjusts the output based on PID algorithms to maintain the SV. The **MAN** indicator will be off.
- In **Manual Mode**, the output power can be manually adjusted using the**Up** and **Down** arrows. The **MAN** indicator will be lit.

5.4. Alarm Indicators

The **AL1** and **AL2** indicators illuminate when the process value (PV) exceeds or falls below the configured alarm limits. Refer to the detailed parameter settings in the full product manual for alarm configuration.

6. Maintenance

6.1. Cleaning

- Regularly clean the front panel with a soft, dry cloth.
- Do not use abrasive cleaners, solvents, or water directly on the unit.

6.2. Storage

Store the controller in a dry, dust-free environment within its specified temperature and humidity ranges when not in use for extended periods.

6.3. Calibration

Periodic calibration may be required to maintain accuracy. Refer to the full technical manual or contact Yudian support for calibration procedures.

7. Troubleshooting

Problem	Possible Cause	Solution
No display/No power	No power supply; Incorrect wiring; Blown fuse	Check power connections; Verify wiring; Replace fuse if necessary (by qualified personnel).

Problem	Possible Cause	Solution
PV display shows 'HHHH' or 'LLLL'	Sensor open circuit; Sensor short circuit; Sensor out of range; Incorrect input type setting	Check sensor wiring and connection; Replace faulty sensor; Verify input type setting matches sensor.
Temperature unstable/Poor control	Incorrect PID parameters; Sensor not properly installed; Load too large/small	Perform auto-tuning; Adjust PID parameters manually; Ensure sensor is in good thermal contact; Verify load suitability.
Output not activating	Controller in STOP mode; Manual mode with 0% output; Faulty output device; Wiring error	Press RUN; Switch to Auto mode or increase manual output; Check external output device (e.g., SSR, relay); Verify output wiring.

If the problem persists after attempting these solutions, please contact technical support.

8. Specifications

- **Model:** AI-518D2
- **Type:** High Precision PID Temperature Controller
- **Material:** ABS
- **Origin:** Mainland China
- **Display:** Dual LED (PV, SV)
- **Control Method:** PID, ON/OFF
- **Input Types:** Configurable (e.g., Thermocouple, RTD) - *Refer to specific model documentation for full list.*
- **Output Types:** Configurable (e.g., Relay, SSR, Analog) - *Refer to specific model documentation for full list.*
- **Power Supply:** *Specific voltage and frequency details are not provided in the product data. Refer to the product label or full technical manual.*

9. Warranty and Support

For warranty information, please refer to the documentation provided at the time of purchase or contact your seller. For technical support, troubleshooting beyond this manual, or inquiries regarding spare parts, please contact the manufacturer, Yudian, or your authorized distributor. Ensure you have your product model number (AI-518D2) and purchase details available when seeking support.