

AI-7482

Generic AI-7482 PID Temperature Controller User Manual

Model: AI-7482

1. INTRODUCTION

This manual provides essential information for the proper installation, operation, and maintenance of the Generic AI-7482 PID Temperature Controller. The AI-7482 is designed for precise temperature regulation in various industrial and scientific applications, including ovens and other heating/cooling systems. Please read this manual thoroughly before using the device to ensure safe and efficient operation.

2. PRODUCT OVERVIEW

The AI-7482 is a compact and versatile PID temperature controller featuring a dual-row LED display for process value (PV) and set value (SV). It supports various sensor inputs and offers multiple output functions, including relay and SSR drive, along with alarm and soak timer capabilities.

2.1 Key Features

- Selectable sensor input (Thermocouple: J, K, R, S, N, T, B; RTD: Pt-100).
- Programmable control action: PID control or ON-OFF.
- Programmable Input Signal Conditioning (Digital Filter & Zero Offset).
- Programmable Lower and Higher Setpoint Limits.
- Program lock function to prevent unauthorized tampering.
- Selectable Control Output (Relay or SSR Drive).
- Selectable Alarm/Soak Timer Output (except 48x48 size).
- Alarm Acknowledge function and Alarm Inhibit function.
- Programmable soak timer with four different start modes.
- Battery Backup for Soak Timer.

2.2 Front Panel Display and Controls

The front panel features a dual LED display and control buttons for setting parameters and monitoring the process.



Figure 1: Front view of the AI-7482 PID Temperature Controller. The top display shows the Process Value (PV) in white, and the bottom display shows the Set Value (SV) in green. Control buttons for SET, AT, RESET, and START are located below the display.

3. SETUP AND INSTALLATION

3.1 Mounting

The AI-7482 controller is designed for panel mounting. Ensure adequate space for ventilation and wiring connections. The dimensions are 48 mm (Height) x 48 mm (Width) x 78 mm (Depth).

3.2 Wiring Connections

Refer to the wiring diagram below for proper electrical connections. Ensure all connections are secure and comply with local electrical codes. Disconnect power before making any wiring changes.

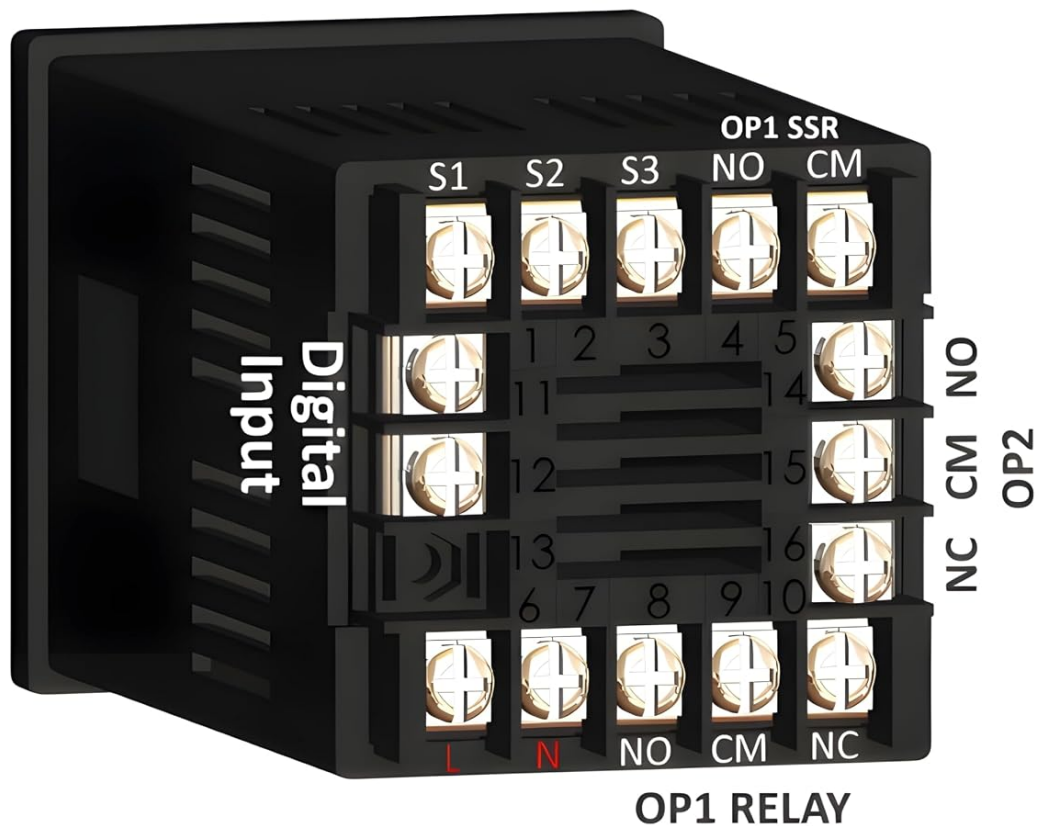


Figure 2: Rear view and wiring diagram of the AI-7482 PID Temperature Controller. This diagram illustrates connections for digital input, OP1 SSR, OP1 Relay (NO, CM, NC), and OP2 (NC, CM, NO), as well as power input (L, N).

- **Power Supply:** Connect 90 - 270 VAC/DC to the designated power terminals (L and N).
- **Sensor Input:** Connect your chosen temperature sensor (Thermocouple or RTD) to the appropriate input terminals (S1, S2, S3). Ensure correct polarity for thermocouples.
- **Control Output 1 (OP1):** Connect your heating/cooling element via the Relay (NO, CM, NC) or SSR Drive (OP1 SSR) terminals as configured.
- **Control Output 2 (OP2):** This output can be configured for alarm or soak timer functions. Connect external devices as required to the NC, CM, NO terminals.
- **Digital Input:** Use for external control signals if applicable.

3.3 Initial Configuration

Upon first power-up, the controller may require initial parameter settings. Refer to the detailed programming guide (not included in this general manual) for specific parameter adjustments such as sensor type, control mode (PID/ON-OFF), and alarm settings.

4. OPERATING INSTRUCTIONS

4.1 Basic Operation

- **Power On:** Apply power to the controller. The display will show the current process value (PV) and the set value (SV).
- **Setting the Set Value (SV):** Press the **SET** button to enter the set value adjustment mode. Use the **Up** and **Down** arrow buttons to change the SV. Press **SET** again to confirm and exit.
- **Monitoring:** The top display continuously shows the actual temperature (PV), while the bottom display shows the target temperature (SV).

4.2 PID Control and Auto-Tuning (AT)

For optimal temperature stability, the AI-7482 can operate in PID control mode. The Auto-Tuning (AT) function helps the controller automatically determine the best PID parameters for your system.

- **Initiating Auto-Tuning:** Press and hold the **AT** button (or follow specific menu navigation as per the detailed programming guide) to start the auto-tuning process. The controller will cycle the output to analyze the system's thermal characteristics.
- **Completion:** Once auto-tuning is complete, the controller will automatically save the calculated PID parameters and resume normal operation.

4.3 Soak Timer Function

The soak timer allows for a controlled period where the temperature is held at the set value. This is useful for processes requiring specific dwell times.

- **Configuration:** The soak timer parameters (duration, start mode) are configured through the controller's menu. Refer to the detailed programming guide for setup.
- **Activation:** The soak timer can be activated manually or automatically based on the configured start mode.
- **Battery Backup:** The soak timer has a battery backup to retain settings during power interruptions.

4.4 Alarm Functions

The controller supports various alarm types (Low, High, Band, Low Deviation, High Deviation) to alert users to process excursions.

- **Setting Alarms:** Alarm types and setpoints are configured in the parameter menu.
- **Alarm Acknowledge:** The alarm acknowledge function allows silencing an active alarm.
- **Alarm Inhibit:** This function can temporarily disable alarms during specific operational phases.

5. MAINTENANCE

The AI-7482 PID Temperature Controller is designed for reliable operation with minimal maintenance. Follow these guidelines to ensure its longevity:

- **Cleaning:** Gently wipe the front panel with a soft, dry cloth. Do not use abrasive cleaners, solvents, or excessive moisture, as these can damage the display or internal components.
- **Environmental Conditions:** Ensure the operating environment remains within the specified temperature (0-50°C) and humidity (95% RH non-condensing) ranges. Avoid exposure to direct sunlight, excessive dust, corrosive gases, or strong vibrations.
- **Connections:** Periodically check all wiring connections for tightness and signs of wear or corrosion. Ensure power is disconnected before inspecting connections.

6. TROUBLESHOOTING

If you encounter issues with your AI-7482 controller, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
No display/No power	No power supply; Incorrect wiring; Blown fuse.	Check power connections; Verify supply voltage (90-270 VAC/DC); Inspect wiring for shorts or breaks; Check internal fuse if accessible (consult service personnel).
Incorrect temperature reading (PV)	Sensor not connected; Incorrect sensor type selected; Damaged sensor; Sensor wiring error.	Ensure sensor is properly connected; Verify sensor type setting matches installed sensor; Replace faulty sensor; Check sensor wiring for polarity and continuity.
Output not activating/deactivating	Incorrect output wiring; Output mode misconfigured; Set value not reached; Faulty relay/SSR.	Check output wiring (Relay/SSR); Verify control mode (PID/ON-OFF) and output settings; Adjust SV; Test output components (consult service personnel).
Temperature overshoots/undershoots	PID parameters not optimized; ON-OFF control with large hysteresis.	Perform Auto-Tuning (AT) to optimize PID parameters; If using ON-OFF, adjust hysteresis or consider switching to PID control.

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

7. TECHNICAL SPECIFICATIONS

Feature	Specification
Model	AI-7482
Display	Dual Row LED (PV: 0.36" White, SV: 0.24" Pure Green), 4 Digits
Indication	Output Status
Sensor Input	T/C: J, K, R, S, N, T, B; RTD: Pt-100
Resolution	T/C: 1°C; Pt-100: 1°C / 0.1°C
Sampling Rate	250 msec
Accuracy	0.3% FS
Output 1 (Relay)	5A @ 250 VAC / 30 VDC
Output 1 (SSR Drive)	12 VDC @ 30mA
Output 2 Function	Alarm (Low/High/Band/Low Deviation/High Deviation) / Soak Timer (Heater off/Alarm/Both)
Supply Voltage	90 - 270 VAC/DC (24 VDC available on request)
Operating Temperature	0 - 50°C
Storage Temperature	-20° to 75°C
Humidity	95% RH (Non-condensing)

Feature	Specification
Dimensions (H x W x D)	48 x 48 x 78 mm
Material	Plastic
Country of Origin	India

8. WARRANTY AND SUPPORT

This product is manufactured by SYSTEM CONTROLS. For warranty information, please refer to the documentation provided at the time of purchase or contact the manufacturer directly. Extended warranty options may be available from third-party providers.

Technical Support

For technical assistance, inquiries, or service requests, please contact the manufacturer:

- **Manufacturer:** SYSTEM CONTROLS
- **Address:** 27, Hareram industrial Estate, I.B.Patel Road, Opp. Shanta ind.est. Goregaon East, Mumbai 400063, India.
- **Contact No.:** 9324466415

© 2026 Generic. All rights reserved. Information in this manual is subject to change without notice.

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question

