

MULTISPAN UTC-421G

MULTISPAN UTC-421G Programmable Temperature Controller

User Manual

1. INTRODUCTION

This manual provides essential information for the proper installation, operation, and maintenance of the MULTISPAN UTC-421G Programmable Temperature Controller. The UTC-421G is a versatile device featuring a double 4+4 digit, 7-segment LED display, universal input (TC/RTD), and configurable control actions including PID, ON-OFF, and auto/self-tuning. It offers three programmable outputs (Relay or SSR) and a soak timer facility. Please read this manual thoroughly before using the product to ensure safe and efficient operation.

2. SAFETY INSTRUCTIONS

Observe the following safety precautions to prevent damage to the device or injury to personnel:

- Ensure all wiring is performed by qualified personnel and complies with local electrical codes.
- Disconnect power before making any connections or performing maintenance.
- Do not operate the device in environments exceeding its specified temperature and humidity limits.
- Avoid exposing the device to corrosive gases, excessive dust, or strong vibrations.
- Verify correct input and output connections to prevent damage to the controller and connected equipment.
- The device is designed for industrial control applications. Do not use it for critical safety applications without additional safety measures.

3. PRODUCT OVERVIEW

The MULTISPAN UTC-421G is a compact and robust temperature controller designed for precise thermal management in various industrial processes.



Figure 1: Front view of the MULTISPAN UTC-421G Temperature Controller. This image shows the dual LED display and control buttons.

3.1. Key Features

- **Input:** J/K/PT-100 2 Wire or 3 Wire (Configurable).
- **Ranges:** J (0°C to 600°C, 0.0°C to 400.0°C), K (0°C to 1200°C, 0.0°C to 500.0°C), PT-100 2 Wire or 3 Wire (-99°C to 400°C, -99.9°C to 400.0°C).
- **Output:** 1 Relay 1C/O 5A, 230V AC (Resistive Load) & SSR Drive O/P 24V DC, 20mA (Parallel to Relay) (1 set Point).
- **Control Action:** PID / ON-OFF (Configurable).
- **Accuracy:** $\pm 0.5\%$ of Full Scale Deflection (FSD).
- **Supply:** 100-270V AC (SMPS), 50/60Hz.
- **Display:** Double 4+4 Digit, 7 Segment LED Display.
- **Additional Features:** Auto/Self-tuning, Soak Timer facility.

3.2. Dimensions and Panel Cutout

- **Dimensions (HxWxD):** 48x48x95mm.
- **Panel Cutout:** 45x45mm.

4. INSTALLATION

4.1. Mounting

The UTC-421G is designed for panel mounting. Create a panel cutout of 45x45mm. Insert the controller from the front of the panel and secure it using the provided mounting clips from the rear. Ensure a snug fit to prevent dust and moisture ingress.

4.2. Wiring

Refer to the wiring diagram provided with the product for specific terminal connections. General wiring guidelines are as follows:

- **Power Supply:** Connect 100-270V AC, 50/60Hz to the designated power terminals.
- **Input Sensor:** Connect your J-type, K-type thermocouple, or PT-100 RTD sensor to the input terminals. Ensure correct polarity for thermocouples and proper 2-wire or 3-wire connection for RTDs as per the sensor type.
- **Relay Output:** Connect the load to the relay output terminals. The relay is rated for 1C/O 5A, 230V AC (resistive load).
- **SSR Drive Output:** If using an Solid State Relay (SSR), connect its input to the 24V DC, 20mA SSR drive output terminals. This output operates in parallel with the main relay.

Caution: Incorrect wiring can damage the controller and connected equipment. Always double-check connections before applying power.

5. SETUP AND CONFIGURATION

5.1. Initial Power-Up

Upon applying power, the controller will perform a self-test and then display the current process value (PV) and setpoint (SV).

5.2. Input Type Configuration

The controller supports universal input. Access the configuration menu to select the appropriate sensor type (J, K, or PT-100) and its corresponding range. Refer to the detailed programming guide for specific menu navigation steps.

5.3. Control Action Selection

The UTC-421G can operate in either PID or ON-OFF control mode. Select the desired mode from the configuration menu:

- **ON-OFF Control:** Simple control where the output switches fully ON or OFF based on the setpoint and a defined hysteresis.
- **PID Control:** Proportional-Integral-Derivative control for more precise and stable temperature regulation, minimizing overshoot and undershoot.

6. OPERATING INSTRUCTIONS

6.1. Setting the Setpoint (SV)

To change the desired temperature setpoint:

1. Press the 'SET' button (or equivalent, refer to product specific button layout).
2. The Setpoint Value (SV) display will flash.
3. Use the Up/Down arrow buttons to adjust the value.
4. Press 'SET' again to confirm and save the new setpoint.

6.2. Auto-Tuning Function

For optimal PID control, the auto-tuning function automatically calculates and sets the PID parameters (P, I, D values). This process typically involves the controller cycling the output to observe the system's response.

1. Ensure the system is at ambient temperature or a stable starting point.
2. Set the desired temperature setpoint.
3. Initiate auto-tuning from the menu (refer to the detailed programming guide for specific steps).
4. The controller will display an indicator (e.g., 'AT' or 'TUN') during the tuning process.
5. Once complete, the controller will revert to normal operation with optimized PID parameters.

6.3. Soak Timer Facility

The soak timer allows the system to maintain the setpoint for a specified duration after reaching it. This is useful for processes requiring a holding period at a target temperature. Configure the soak time and enable the feature through the controller's menu settings.

7. MAINTENANCE

The MULTISPAN UTC-421G is designed for reliable operation with minimal maintenance. However, periodic checks can extend its lifespan and ensure continued accuracy.

- **Cleaning:** Gently wipe the front panel with a soft, dry cloth. Do not use abrasive cleaners or solvents.
- **Connections:** Periodically check all wiring connections for tightness and signs of corrosion.
- **Environment:** Ensure the operating environment remains within specified limits (temperature, humidity, dust).
- **Sensor Inspection:** Inspect the temperature sensor and its wiring for any physical damage or degradation. Replace if necessary.

Warning: Do not attempt to open the controller casing. There are no user-serviceable parts inside. Refer all internal servicing to qualified technicians.

8. TROUBLESHOOTING

This section provides solutions to common issues encountered during the operation of the UTC-421G.

Problem	Possible Cause	Solution
No display/Power off	No power supply; Incorrect wiring; Blown fuse	Check power connections (100-270V AC); Verify wiring; Check external fuse if applicable.
Inaccurate temperature reading	Incorrect sensor type selected; Faulty sensor; Loose sensor connection; Sensor placed incorrectly	Verify sensor type in settings; Check sensor for damage; Ensure secure sensor wiring; Reposition sensor for better measurement.
Output not switching	Setpoint not reached; Control mode incorrect; Faulty relay/SSR; Wiring issue	Check setpoint and process value; Verify PID/ON-OFF mode; Test relay/SSR; Inspect output wiring.
Temperature overshoot/undershoot in PID mode	PID parameters not tuned; System disturbance	Perform auto-tuning; Manually adjust PID parameters if necessary; Identify and mitigate system disturbances.

9. TECHNICAL SPECIFICATIONS

Parameter	Specification
Model Number	UTC-421G
Input Type	J/K/PT-100 (2 or 3 Wire), Configurable
Input Range (J)	0°C to 600°C, 0.0°C to 400.0°C
Input Range (K)	0°C to 1200°C, 0.0°C to 500.0°C
Input Range (PT-100)	-99°C to 400°C, -99.9°C to 400.0°C
Output	1 Relay 1C/O 5A, 230V AC (Resistive Load) & SSR Drive O/P 24V DC, 20mA (Parallel to Relay)
Control Action	PID / ON-OFF (Configurable)
Accuracy	±0.5% of FSD
Supply Voltage	100-270V AC (SMPS), 50/60Hz
Dimensions (HxWxD)	48mm x 48mm x 95mm
Panel Cutout	45mm x 45mm
Display Type	Double 4+4 Digit, 7 Segment LED
Material	Plastic
Included Components	Controller, User Manual, Mounting Clips, Brand Box

10. WARRANTY AND SUPPORT

MULTISPAN products are manufactured under strict quality control standards. For warranty information, technical support, or service inquiries, please contact your authorized MULTISPAN distributor or visit the official MULTISPAN website. Keep your purchase receipt as proof of purchase for warranty claims. Extended warranty options may be available through third-party providers. Please refer to the specific terms and conditions of any extended warranty plan purchased.

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

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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