AUTONICS TK4S-B4SN

AUTONICS TK4S-B4SN Temperature Controller User Manual

Model: TK4S-B4SN

1. Introduction

This manual provides essential information for the safe and effective operation of the AUTONICS TK4S-B4SN Temperature Controller. The TK4S-B4SN is a high-performance 1/16 DIN temperature controller designed for precise temperature regulation in various industrial applications. It features dual alarm outputs, RS485 communication, SSRP voltage output, and relay contact output, operating on 100-240VAC power.

2. Safety Information

Please read all safety warnings and instructions carefully before installation and operation to prevent accidents and ensure proper device function.

- **Electrical Hazard:** Ensure power is disconnected before wiring or maintenance. Only qualified personnel should perform electrical work.
- **Proper Grounding:** Always ensure the device is properly grounded to prevent electric shock.
- **Operating Environment:** Do not install the device in locations with excessive vibration, dust, humidity, or corrosive gases.
- **Power Supply:** Use the specified power supply voltage (100-240VAC). Incorrect voltage can damage the device.
- **Terminal Connections:** Double-check all terminal connections for correct polarity and secure fastening to prevent malfunction or damage.

3. Product Overview

The AUTONICS TK4S-B4SN is a compact and versatile temperature controller. It features a clear display for process value (PV) and set value (SV), along with various indicators for output status and alarm conditions.

3.1 Front Panel



This image depicts the front panel of the TK4S-B4SN, highlighting the digital display for process and set values, along with the function and arrow buttons for navigation and parameter adjustment.

3.2 Rear Panel and Terminals

This image illustrates the rear panel of the TK4S-B4SN, detailing the terminal block for connecting power, temperature sensor, SSRP voltage output, relay contact output, and RS485 communication.

4. Setup and Installation

4.1 Mounting

The TK4S-B4SN is a 1/16 DIN size controller designed for panel mounting. Ensure adequate space for ventilation and wiring connections. Cut a panel opening of 45x45 mm (1.77x1.77 inches) and secure the controller using the provided mounting brackets.

4.2 Wiring

Refer to the wiring diagram on the side of the unit or in the full technical manual for precise connections. Ensure all connections are secure and correct before applying power.

- **Power Supply:** Connect 100-240VAC to the designated power terminals.
- **Sensor Input:** Connect your temperature sensor (e.g., thermocouple, RTD) to the input terminals. Ensure correct polarity for thermocouples.
- **Output 1 (SSRP Voltage):** Connect to a Solid State Relay (SSR) for heating/cooling control.
- **Output 2 (Relay Contact):** Connect to external devices for alarm or secondary control.
- **RS485 Communication:** Connect A and B terminals to your RS485 network for data communication.

5. Operating Instructions

5.1 Initial Power-Up

After wiring, apply power. The controller will perform a self-test and then display the current process value (PV) and set value (SV).

5.2 Setting the Temperature (SV)

1. Press the **MODE** button briefly to enter SV setting mode. The SV display will blink.
2. Use the **UP** and **DOWN** arrow buttons to adjust the set value.
3. Press **MODE** again to confirm the setting and return to normal operation.

5.3 Parameter Settings

Advanced parameters such as PID constants, alarm limits, and communication settings can be accessed through the parameter menu. Refer to the detailed technical manual for a complete list of parameters and their functions.

- **Alarm Functions:** The TK4S-B4SN features two independent alarm outputs. These can be configured for various alarm types (e.g., high limit, low limit, deviation).

- **Control Output:** The SSRP voltage output is suitable for driving SSRs, providing precise control. The relay contact output can be used for secondary control or alarm signaling.
- **RS485 Communication:** Allows for remote monitoring and control of the temperature controller via a Modbus RTU protocol.

6. Maintenance

The AUTONICS TK4S-B4SN is designed for reliable operation with minimal maintenance. However, regular checks can extend its lifespan and ensure optimal performance.

- **Cleaning:** Periodically clean the front panel with a soft, dry cloth. Do not use abrasive cleaners or solvents.
- **Terminal Inspection:** Annually inspect wiring terminals for loose connections or signs of corrosion. Tighten as necessary.
- **Environmental Check:** Ensure the operating environment remains within specified conditions (temperature, humidity, absence of corrosive gases).

7. Troubleshooting

This section provides solutions to common issues. For problems not listed here, contact technical support.

Problem	Possible Cause	Solution
No display/Power off	No power supply or incorrect wiring.	Check power connections (100-240VAC) and ensure power is supplied.
PV display shows 'HHHH' or 'LLLL'	Sensor open circuit or short circuit, or out of range.	Check sensor wiring and ensure the sensor is correctly connected and within its operating range.
Output not activating	Incorrect set value, output parameter settings, or faulty external device.	Verify SV, check output mode settings (e.g., heating/cooling), and test the external SSR/relay.
Temperature unstable	PID parameters not tuned correctly for the process.	Perform auto-tuning or manually adjust PID parameters.

8. Specifications

- **Model:** TK4S-B4SN
- **Input:** Universal (Thermocouple, RTD)
- **Control Method:** PID auto-tuning, ON/OFF
- **Output 1:** SSRP Voltage Output (12VDC ±2V, 20mA max.)
- **Output 2:** Relay Contact Output (250VAC 3A resistive load)
- **Alarm Outputs:** 2 (Relay Contact)
- **Communication:** RS485 (Modbus RTU)
- **Power Supply:** 100-240VAC ~ 50/60Hz
- **Power Consumption:** Max. 11VA
- **Display Method:** 4-digit 7-segment LED

- **Control Accuracy:** ±0.3% F.S. (for RTD), ±0.5% F.S. (for Thermocouple)
- **Sampling Cycle:** 50ms
- **Insulation Resistance:** Min. 100MΩ (at 500VDC)
- **Dielectric Strength:** 2,000VAC 50/60Hz for 1 min
- **Ambient Temperature:** -10 to 50°C (14 to 122°F)
- **Ambient Humidity:** 35 to 85% RH (non-condensing)
- **Weight:** Approximately 1 pound (0.45 kg)
- **Manufacturer:** AUTONICS USA

9. Warranty and Support

AUTONICS products are manufactured under strict quality control. This product is covered by a standard manufacturer's warranty against defects in materials and workmanship. For specific warranty terms, duration, and conditions, please refer to the official AUTONICS website or contact your local distributor.

For technical assistance, troubleshooting beyond this manual, or service inquiries, please contact AUTONICS customer support or an authorized service center. Have your model number (TK4S-B4SN) and purchase information ready when contacting support.

AUTONICS USA Contact Information: Please visit the official AUTONICS USA website for the most current contact details, technical documentation, and support resources.

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