RKC REX-C100

RKC REX-C100 Temperature Controller Instruction Manual

Model: REX-C100FK02-M-AN

1. Introduction

This manual provides detailed instructions for the installation, operation, maintenance, and troubleshooting of the RKC REX-C100 Temperature Controller. Please read this manual thoroughly before using the device to ensure proper and safe operation.

2. Product Overview

The RKC REX-C100 is a high-performance digital temperature controller designed for precise temperature regulation in various industrial and laboratory applications. It features a clear display for process value (PV) and set value (SV), along with indicator lights for output and alarm states.

Figure 1: Front Panel of the RKC REX-C100 Temperature Controller. This image displays the controller's front face, featuring two digital displays for Process Value (PV) and Set Value (SV), indicator LEDs for OUT1, AT, ALM1, and ALM2, and control buttons for SET, Up, Down, and Left/Right navigation.

2.1 Key Features

- Dual digital display for Process Value (PV) and Set Value (SV).
- Multiple control modes (e.g., PID, ON/OFF).
- Alarm functions (ALM1, ALM2).
- Auto-tuning (AT) capability.
- Compact design for panel mounting.

3. Safety Information

Warning: **Improper installation or operation can lead to electric shock, fire, or damage to the device. Always follow safety guidelines.**

- Ensure power is disconnected before installation or maintenance.
- Only qualified personnel should perform wiring and installation.
- Verify correct voltage and current ratings before connecting power.

- Do not operate the controller in environments with flammable gases or corrosive substances.

4. Setup and Installation

4.1 Panel Mounting

1. Cut a panel opening of the specified dimensions (refer to specifications section).
2. Insert the controller into the opening from the front.
3. Secure the controller using the provided mounting brackets from the rear.

4.2 Wiring Diagram

Refer to the wiring diagram printed on the side of the controller or in the full technical datasheet for specific terminal connections. Ensure all connections are secure and correctly polarized.

- **Power Supply:** Connect to terminals 1 and 2 (AC 100-240V).
- **Input Sensor:** Connect the thermocouple or RTD sensor to the designated input terminals (e.g., terminals 9 and 10 for K-type thermocouple).
- **Main Output (OUT1):** Connect the heating/cooling element to the output terminals (e.g., terminals 4 and 5 for relay output).
- **Alarm Outputs (ALM1, ALM2):** Connect alarm devices to the respective alarm output terminals.

5. Operating Instructions

5.1 Power On

Once wired correctly, apply power to the controller. The PV (Process Value) display will show the current temperature, and the SV (Set Value) display will show the target temperature.

5.2 Setting the Target Temperature (SV)

1. Press the **SET** button once. The SV display will begin to flash.
2. Use the **Up** (▲) and **Down** (▼) arrow buttons to adjust the desired temperature.
3. Use the **Left/Right** (◀) arrow button to shift the digit for faster adjustment.
4. Press the **SET** button again to confirm and save the new SV. The display will stop flashing.

5.3 Parameter Settings

To access advanced parameters (e.g., PID constants, alarm types, input sensor type), press and hold the **SET** button for approximately 3-5 seconds until the first parameter code appears on the PV display.

- Use the **Up** and **Down** buttons to navigate through parameters.
- Press **SET** to view or edit a parameter's value.
- Adjust the value using the arrow buttons.
- Press **SET** to save the value and return to the parameter list.
- To exit parameter settings, press and hold **SET** for 3-5 seconds, or wait for a timeout.

5.4 Auto-Tuning (AT) Function

The auto-tuning function automatically calculates optimal PID parameters for your specific system. To activate AT:

1. Set the desired SV.

2. Press and hold the **AT** button (or access via parameter settings, depending on model variant) until the AT indicator light illuminates.
3. The controller will cycle the output to determine the system's characteristics. This process may take some time.
4. Once complete, the AT indicator will turn off, and the new PID parameters will be saved.

6. Maintenance

6.1 Cleaning

Periodically clean the front panel with a soft, dry cloth. Do not use abrasive cleaners or solvents, as they may damage the display or casing.

6.2 Inspection

Regularly inspect wiring connections for looseness or signs of damage. Ensure proper ventilation around the controller to prevent overheating.

6.3 Sensor Calibration

If temperature readings appear inaccurate, the input sensor may require calibration or replacement. Refer to the sensor manufacturer's guidelines for calibration procedures.

7. Troubleshooting

Problem	Possible Cause	Solution
No display/Power off	No power supply; Incorrect wiring.	Check power connections and voltage. Verify wiring according to the diagram.
PV display shows "HHHH" or "LLLL"	Sensor open circuit (HHHH); Sensor short circuit or reverse connection (LLLL).	Check sensor wiring and ensure it is connected correctly. Replace faulty sensor if necessary.
Temperature unstable/Overshoot	PID parameters not optimized; Incorrect control mode.	Perform auto-tuning (AT). Adjust PID parameters manually if AT is insufficient. Ensure correct control mode (e.g., PID vs. ON/OFF).
Output (OUT1) not activating	Wiring error; Output setting incorrect; Temperature not reaching set point.	Verify output wiring. Check output type parameter. Ensure SV is set correctly and PV is below SV (for heating).

8. Specifications

- **Model:** REX-C100FK02-M-AN
- **Display:** Dual line, 4-digit LED (PV, SV)
- **Input:** K-type Thermocouple (default), configurable for other types (J, E, T, R, S, B, WRe3-25, PT100)
- **Output:** Relay output (REX-C100FK02-M-AN variant)
- **Control Method:** PID control, ON/OFF control
- **Alarm Output:** 2-way alarm (ALM1, ALM2)

- **Power Supply:** AC 100-240V, 50/60Hz
- **Panel Cutout Dimensions:** 45 x 45 mm (approx. 1.77 x 1.77 inches)
- **Operating Temperature:** 0-50°C (32-122°F)
- **Operating Humidity:** 30-85% RH (non-condensing)

9. Warranty Information

This product is covered by a standard manufacturer's warranty against defects in materials and workmanship. The warranty period typically begins from the date of purchase. Please retain your proof of purchase for warranty claims. For specific warranty terms and conditions, refer to the documentation provided with your purchase or contact RKC customer support.

10. Customer Support

For technical assistance, troubleshooting beyond this manual, or warranty inquiries, please contact your authorized RKC distributor or visit the official RKC website. When contacting support, please have your product model number (REX-C100FK02-M-AN) and purchase details ready.
RKC Official Website: www.rkcinst.co.jp/english/