1. OUTLINE

SB1 is a 1-channel type temperature controller with built-in SSR designed for flexible heating up to 31 units of SB1 by communication. The setting data can be monitored or set by using the display and the operation keys.

2. MOUNTING

2.1 Mounting Cautions

- To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.
- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock to operating personnel.
- For proper operation of this instrument, provide adequate ventilation for heat dissipation. Do not connect wires to unused terminals as this will interfere with proper operation of the equipment.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or cracks may result.
- This instrument is designed to be used under the following environmental conditions:
  - Temperature: -10°C to +60°C
  - Humidity: 10% to 90% non-condensing

2.2 Dimensions

Panel mounting type

Pipe wrapping type

Pipe hanging type

DIN rail mounting type

2.3 Panel Mounting Procedures

1. Mount the instrument in the panel according to the following conditions:
   - Ensure that the width of the panel is at least 200 mm or more.

2. Mounting space of SB1

For pipe hanging type, allow sufficient space (200 mm or more) between the instruments for heat radiating. Do not exceed the angle of 30°.

SHIPPING

- Fasten the SB1 controllers in parallel. When mounting the instruments vertically, allow 20° to 30° (diagonally) between the instruments.

SAFETY PRECAUTIONS

- This instrument is not intended for use in locations subject to flammable or explosive gases.
- This instrument is designed for installation in an enclosed instrumentation panel.
- All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock to operating personnel.
- This instrument is designed to be used under the following environmental conditions:
  - Temperature: -10°C to +60°C
  - Humidity: 10% to 90% non-condensing

PRODUCT CHECK

1. Product check

2. Safety precautions

WARNING

- To prevent injury to persons, damage to the instrument and the equipment, a suitable external protection device shall be required.
- All wiring must be completed before power is turned on to prevent electric shock.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Do not touch high-voltage connections such as power supply terminals, etc., to avoid electric shock.

CAUTION

- This product is intended for use with intrinsic safety, limit and measuring equipment.
- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference in which case the user may be required to take adequate measures.
- This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the input and the earth for input signal and the input for power supply source of power and load.
- Be sure to provide an adequate surge arrestor circuit, respectively for the following input/output signals in the building longer than 30 meters:
  - Input signals (0 to 5 V DC, 0 to 10 V DC)
  - Output signals (0 to 5 V DC, 0 to 10 V DC)

- This instrument is designed for installation in an enclosed instrumentation panel at high altitude and pressure levels. The instrument must be installed in the instrumentation panel to avoid electric shock to operating personnel.
- All precautions described in this manual shall be observed to avoid damage to the instrument or equipment.
- If the installation is used in a manner not specified by the manufacturer, the protection provided by this instrument is not guaranteed.
- All wiring must be completed in accordance with local codes and regulations.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology, and related industries.
- The figures, diagrams and numeric values used in the manual are only for explanation purpose. RKC is not responsible for any injury caused by a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by others.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty, expressed or implied, to the accuracy of information contained herein.

- This manual is subject to change without prior notice.

SPIRAL HEATING COVER

- The back side and the heat radiating cover of the SB1 will be at a high temperature when the power is turned off. Do not touch the surfaces to avoid being burned.
3.2 Protective Earth (PE) Terminal

- Ground to other devices to the location where you ground the instrument.
- Avoid sharing earth lines with electric motors, machinery, or other equipment that uses large amount of electricity.
- In the event of failure, be careful to earth each point and not to create an earth loop.
- Use wire of at least 2.0 mm² for earth lines.

3.2 Terminal Configuration

Each connector should be connected or removed in parallel. Connecting or removing the connector forcibly in an inappropriate angle may cause damage or failure.


- Power supply/Event input/output/Communication connector [CN1] (plug side)
  - Use a commercial power supply with a total output of 100 to 240 V AC.
  - Do not connect a power supply with a lower voltage, as it may cause a problem.
  - Use the connector below (sold separately) for the input/output connector (plug side).
  - Use a 2-terminal power supply.

- Measured input/Control output connector [CN2] (lower-side)
  - The pin of the same number at A and B of the connector is connected internally.
  - Maximum allowable current of the Power connector is 15 A.
  - Communication and Digital Event cannot be selected at the same time.

4. SPECIFICATIONS

- Measured input
  - Number of inputs: 1 point
  - Type: K (JIS-1602-1985) 0 to 800 °C, 0 to 999 °F
  - RTD input
    - 1 point or less per wire
  - Input impedance: 250 ± 0.25 (0°C) ± 0.6°F
  - Measured input range: 400 to 800°C (722 to 1472°F)
  - Input temperature coefficient: 0.02%/°C (0°C to 100°C), 0.1%/°C (100°C to 800°C)

- Digital input (optional)
  - Number of inputs: 1 point
  - Input type: Triac output (control output)
  - Measured input/Control output terminal
    - Power consumption: 250 V A.C. (0°C to 100°C)
    - Electrical life: 1000 times or more (Potted: 1000 times or more)
  - Relay contact output (high speed)
    - Mechanical life: 20 million times or more (Switching: 300000 times or more)

5. MODEL CODE

- SB1 0000-0000-0000
  - [1] (2) (3) (4)
  - [1] (Control Method)
    - [1] On/off control with AT (Reverse action)
    - [1] PID control
  - [2] Measured input and Range
    - K04: Thermocouple K 0 to 800 °C, 0 to 1472 °F
    - J04: Thermocouple J 0 to 800 °C, 0 to 1472 °F
    - DB4: RTD Pt100 0 to 400 °C, 0 to 800 °F
  - [3] Control output
    - T: Digital output
      - 4: Supplies voltage
      - 100 to 240 V AC
    - N: Digital output
      - 1: Quick start code

- Optional (Solidly)

- [1] Control Method
  - On/off control with AT (Reverse action)
  - PID control
- [2] Measured input and Range
  - K04: Thermocouple K 0 to 800 °C, 0 to 1472 °F
  - J04: Thermocouple J 0 to 800 °C, 0 to 1472 °F
  - DB4: RTD Pt100 0 to 400 °C, 0 to 800 °F
- [3] Control output
  - T: Digital output
    - 4: Supplies voltage
    - 100 to 240 V AC
  - N: Digital output
    - 1: Quick start code