**Autonics**

**DUAL INDICATOR TEMPERATURE CONTROLLER**

**TCN4 SERIES**

**MANUAL**

Thank you very much for selecting Autonics products. For your safety, please read the following before using.

### Caution for your safety

1. Please keep these instructions and review them before using this unit.
2. Observe the caution that follow; Product may be damaged, or injury may result if instructions are not followed.
3. The following is an explanation of the symbols used in the operation manual:*Caution: Injury or danger may occur under special conditions.

### Warning

1. In case of using this unit with machinery (Ex: nuclear power control, medical equipment, etc.) which may cause damages to human life or property, it is required to install fail-safe device. It may cause a fire, human injury or property damage.
2. Insert the unit on a panel. It may cause electric shock.
3. Mechanical: Min. 5,000,000 operations, Electrical: Min. 300,000 operations (250VAC 1A resistive load) It may cause a fire or injury.
4. Do not disassemble the case. Please contact us if it is required. It may cause a fire or injury.
5. Strictly observe the caution that follow; equipment is used in the specified range. It may cause a fire or injury.

### Input sensor and temperature range

<table>
<thead>
<tr>
<th>Sensor Type</th>
<th>Display Temperature (°C)</th>
<th>Voltage Range (mV)</th>
<th>Nominal Voltage (mV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTD (Pt100)</td>
<td>-50 to 500</td>
<td>±0.80/0.50</td>
<td>80/50</td>
</tr>
<tr>
<td></td>
<td>-100 to 500</td>
<td>±0.60/0.40</td>
<td>60/40</td>
</tr>
<tr>
<td></td>
<td>-150 to 500</td>
<td>±0.30/0.20</td>
<td>30/20</td>
</tr>
<tr>
<td></td>
<td>-200 to 500</td>
<td>±0.10/0.05</td>
<td>10/0.5</td>
</tr>
</tbody>
</table>

### Installation

1. Insert product into a panel. Fasten bracket by pushing with tools as shown above.

### Ordering information

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>DC power (V)</th>
<th>AC power (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCN4H</td>
<td>DUAL INDICATOR TEMPERATURE CONTROLLER</td>
<td>100-240</td>
<td>24-48</td>
</tr>
<tr>
<td>TCN4M</td>
<td>DUAL INDICATOR TEMPERATURE CONTROLLER</td>
<td>100-240</td>
<td>24-48</td>
</tr>
<tr>
<td>TCN4S</td>
<td>DUAL INDICATOR TEMPERATURE CONTROLLER</td>
<td>100-240</td>
<td>24-48</td>
</tr>
</tbody>
</table>

### Flow chart for setting group

1. All Parameter
2. When connect wire, AWG 20 (0.50mm²) strength.
3. Please observe the rated specifications.
4. Do not use beyond of the rated switching capacity of relay contact.
5. Do not inflow dust or wire dregs into the unit.
6. Please wire properly after checking the terminal polarity when connecting temperature sensor. It may cause a fire or malfunction.
7. Do not use this unit in place where there are flammable or explosive gas, humidity, direct ray of the light, radiant heat, vibration and impact etc.
8. Do not use this unit with machinery (Ex: nuclear power control, medical equipment, etc.) which may cause damages to human life or property, it is required to install fail-safe device. It may cause a fire, human injury or property damage.

### Parts description

1. RUN mode: Set temperature (SV) display
2. Parameter setting mode: Parameter setting value display
3. Manual reset
4. Auto tuning lamp
5. LBA detection
6. IN-T
7. IN-B
8. OUT
9. DI-T
10. DI-K

### Specification

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>100-240VAC 50/60Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>Max. 5VA</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-50 to 150°C</td>
</tr>
<tr>
<td>Resolution</td>
<td>±0.1°C</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.5% ±1°C</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>±1°C</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 to 50°C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>5 to 95%</td>
</tr>
<tr>
<td>Noise immunity</td>
<td>±2KV R-phase and S-phase</td>
</tr>
</tbody>
</table>

### Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>Width (W)</th>
<th>Height (H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCN4H</td>
<td>76.0mm</td>
<td>96.0mm</td>
</tr>
<tr>
<td>TCN4M</td>
<td>76.0mm</td>
<td>96.0mm</td>
</tr>
<tr>
<td>TCN4S</td>
<td>76.0mm</td>
<td>96.0mm</td>
</tr>
</tbody>
</table>

Please observe the cautions that follow; equipment is used in the specified range. It may cause a fire or injury.
### Functions

1. **Auto-tuning**
   - This function maximizes the control output's thermal characteristics and the thermal response rate, and determines the necessary PID time constants. (When tuning type 'A' is set on 'A', it is displayed.)
   - The result of the tuning is displayed on the screen.

2. **PID output adjustment**
   - This function allows the user to change the PID parameters according to the process under control. The parameter values are initialized.

3. **Control output**
   - This function allows the user to change the control output type and cycle control from the control output screen.

4. **Manual reset**
   - This function is used when there is an alarm. The alarm is automatically reset after the display is off.

5. **Control output LBA**
   - This function is used when the control output is applied as SSR. It is displayed in the control output list screen.

6. **Alarm (Deviation) temperature**
   - If deviation between PV and SV is over 10℃, the alarm output will be ON. If deviation between PV and SV is lower than 10℃, the alarm output will be OFF.

7. **Alarm (Absolute) temperature**
   - If PV is equal to or higher than 110℃, the alarm output will be ON. If PV is lower than 110℃, the alarm output will be OFF.

8. **Input correction**
   - When PV and SV are equal, reset value is 50.0%. After control is stable, PV is lower than SV, reset value is over 50.0% or PV is higher than SV, reset value is below 50.0%.

9. **LBA monitoring time**
   - This parameter is displayed in the control output setting screen.

### 3. SSRP voltage output function

- **Alarm latch**
  - This function is used when an alarm occurs. It is displayed when selecting control output [A] or [B].

- **Alarm release**
  - This function is used when the alarm is released. It is displayed when selecting control output [A] or [B].

### 4. Alarm operation

- **Alarm output hysteresis**
  - This parameter is displayed in the control output setting screen.

- **PV 90℃**
  - This parameter is displayed in the control output setting screen.

- **SV 100℃**
  - This parameter is displayed in the control output setting screen.

### Temperature controller

- **Temperature range**
  - This parameter is displayed in the control output setting screen.

- **Temperature control output**
  - This parameter is displayed in the control output setting screen.

### 5. Digital input key

- **Set value**
  - This parameter is displayed in the control output setting screen.

- **PV 90℃**
  - This parameter is displayed in the control output setting screen.

- **SV 100℃**
  - This parameter is displayed in the control output setting screen.

### Caution for using

1. **Connection of PT100 sensor**
   - It is recommended to use the power line and signal line of the same thickness as the line. It might cause the deviation of temperature if the resistance of line is different.

2. **Cable input signal**
   - Use shielded cable for PT100 sensor.

3. **Digital input key**
   - Digital input key [A] and Digital input key [B] are used for enabling or disabling the alarm output. It is displayed in the control output setting screen.

### Major product

- **PID controller**
  - It is used for controlling processes such as temperature, pressure, flow, and level.

- **PID controller with alarm**
  - It is used for controlling processes such as temperature, pressure, flow, and level with alarm functions.

- **PID controller with communication**
  - It is used for controlling processes such as temperature, pressure, flow, and level with communication functions.