Standard PID temperature controller

**Features**

- Super high-speed sampling cycle (10 times faster compared to existing models)
  - 50ms sampling cycle and ±0.3% display-accuracy.
- Improved visibility with wide display part and high luminance LED
- High performance controlling with heating/cooling control and automatic/manual control modes
- Communication function supported
  - RS485 (Modbus RTU type)
- PC parameter setting via USB cable and RS485 communication (Modbus RTU)
  - DAQMaster – PC loader program supported
  - Dedicated USB cable – sold separately (SCM-US)
- SSR output/Current output selectable
- SSRF output (standard/phase/cycle/control selectable)
- Heater burn-out alarm (C.T input) (except TK4SP)
- Multi SV setting function (Max. 4) – selectable via digital input terminals
- Mounting space saving with compact design
  - downsized by approx. 38% (60mm) in depth compared to existing models
- Multi input / Multi range

⚠️ Please read "Caution for your safety" in operation manual before using.

**User manual**

- Please refer to TK series user manual for more detailed information and instructions.
- Visit our website (www.autonics.com) to download user manual and PC loader program.
- Function setting, Control method, parameter group and PC loader program explanations available.

**S/W – PC Loader Program (DAQ Master)**

- DAQ Master is a comprehensive device management program for Autonics TK series providing GUI control for easy and convenient management of parameters and multiple device data monitoring.
- Visit our website (www.autonics.com) to download user manual and PC loader program.

<table>
<thead>
<tr>
<th>Item</th>
<th>Recommended specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>IBM PC compatible computer with Intel Pentium III or above</td>
</tr>
<tr>
<td>Operating system</td>
<td>Windows 98/NT/XP/Vista/Windows 7</td>
</tr>
<tr>
<td>RAM</td>
<td>Over 256MB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>Over 1GB of available space</td>
</tr>
<tr>
<td>VGA</td>
<td>Over 1024 x 768</td>
</tr>
<tr>
<td>Others</td>
<td>RS-232 serial port, USB to 232</td>
</tr>
</tbody>
</table>
Standard PID temperature controller

Ordering information

<table>
<thead>
<tr>
<th>TK</th>
<th>4</th>
<th>S</th>
<th>-</th>
<th>1</th>
<th>4</th>
<th>R</th>
<th>R</th>
</tr>
</thead>
</table>

- **OUT2 Control output (※3)**
- **OUT1 Control output(※2)**
- **Power supply**
- **Option output (※1)**
- **Size**
- **Digit**

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Heating</th>
<th>Cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>TK</td>
<td>N</td>
<td>R</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Relay output</td>
<td>Current output + SSR drive output</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>Relay output</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>SSRP output</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Current output + SSR drive output</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>100~240VAC 50/60Hz</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SP</th>
<th>SM</th>
<th>SW</th>
<th>SH</th>
<th>HL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALAR1M output</td>
<td>ALAR1M output</td>
<td>ALAR1M + ALAR2M output</td>
<td>ALAR1M + PV transmission output</td>
<td>ALAR1M + ALAR2M + PV transmission output</td>
</tr>
<tr>
<td>ALAR1M output</td>
<td>ALAR1M + RS485 Communication output</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALAR1M + PV transmission output</td>
<td>ALAR1M + ALAR2M + RS485 Communication output</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>R</td>
<td>T</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SP</th>
<th>S</th>
<th>M</th>
<th>W</th>
<th>H</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN W48 x H48mm (plug type) (※4)</td>
<td>DIN W48 x H48mm (Terminal block type)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>W</td>
<td>H</td>
<td>L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIN W72 x H72mm</td>
<td>DIN W96 x H48mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>H</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIN W96 x H48mm</td>
<td>DIN W48 x H96mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>4</td>
<td>9999(4 Digit Type)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(※1) In case of SP series, option control output selection and digital input will be limited due to number of terminals.
(※2) "S" represents SSRP drive voltage output support model which SSR standard cycle/phase control are available.
"C" represents both current and SSR(standard) output support model.
(※3) Select R or C type in case of using heating & cooling control. Select N type in case of using standard control.

Specifications

<table>
<thead>
<tr>
<th>Series</th>
<th>TK4S</th>
<th>TK4SP</th>
<th>TK4M</th>
<th>TK4W</th>
<th>TK4H</th>
<th>TK4L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>100~240VAC 50/60Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowable voltage range</td>
<td>90 ~ 110% of rated voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>Max. 8VA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display method</td>
<td>7 Segment (Red). Other display part (Green, Yellow, Red) LED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Character size</td>
<td>PV(W × H) 7.0 × 14.0mm 9.5 × 20.0mm 8.5 × 17.0mm 7.0 × 14.6mm 11.0 × 22.0mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SV(W × H) 5.0 × 10.0mm 7.5 × 15.0mm 6.0 × 12.0mm 6.0 × 12.0mm 7.0 × 14.0mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input type</td>
<td>RTD JPT 100Ω, DPT 100Ω, DPT 50Ω, CU 100Ω, CU 50Ω, Nikel 120Ω (6 types)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog</td>
<td>Voltage: 0<del>100mV, 0</del>5V, 0<del>10V (4 types) / Current: 0</del>20mA, 4~20mA (2 types)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display accuracy</td>
<td>RTD (※1) At room temperature(23℃±5℃): (PV ± 0.3% or ± 1℃, select the bigger one) ± 1Digit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Out of range of room temperature: (PV ± 0.5% or ± 2℃, select the bigger one) ± 1Digit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In case of TK4SP series, ± 1℃ will be added.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Analog</td>
<td>At room temperature(23℃±5℃): ± 0.3% F.S ± 1Digit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Out of range of room temperature: ± 0.5% F.S ± 1Digit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CT input</td>
<td>± 5% F.S ± 1Digit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(※1) At room temperature(23℃±5℃) |
- TC K, J, T, N, E type, below -100℃ / TC L, U, PLII type: (PV ± 0.3% or ± 2℃, select the bigger one) ± 1Digit |
- TC C, G type / TC R, S type, below 200℃: (PV ± 0.3% or ± 5℃, select the bigger one) ± 1Digit |
- TC B type, below 400℃: There is no accuracy standards. |
- Out of range of room temperature |
- TC R, S, B, C, G: (PV ± 0.5% or ± 5℃, select the bigger one) ± 1Digit |
- Others: Below -100℃: Within ± 5℃ |
- In case of TK4SP series, ± 1℃ will be added. |
### Specifications

<table>
<thead>
<tr>
<th>Series</th>
<th>TK4S</th>
<th>TK4SP</th>
<th>TK4M</th>
<th>TK4W</th>
<th>TK4H</th>
<th>TK4L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control output</td>
<td>Relay</td>
<td>250VAC 3A 1a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SSR</td>
<td>DC4<del>20mA or DC0</del>20mA (Load 500Ω Max.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarm output</td>
<td>Relay</td>
<td>AL1, AL2 Relay: 250VAC 3A 1a (TK4SP: AL1 only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transmission</td>
<td>DC4~20mA (Load 500Ω Max., Accuracy: ±0.3% F·S)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communication</td>
<td>RS485 communication output (Modbus RTU)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option output</td>
<td>CT</td>
<td>0.0~50.0A (Primary heater current value measuring range) *CT ratio = 1000:1 (except TK4SP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Digital input</td>
<td>ON~OFF, P, PI, PD, PID control mode</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hysteresis</td>
<td>0.1<del>999.9°C (0.1</del>999.9%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proportional band(P)</td>
<td>0~9999 sec.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Integral time(I)</td>
<td>0~9999 sec.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Derivative time(D)</td>
<td>0~9999 sec.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control period(T)</td>
<td>0.1~120.0 sec (*Relay output and SSR drive output only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manual reset value</td>
<td>0.0~100.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sampling period</td>
<td>50ms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>2000VAC 50/60Hz for 1min. (between power source terminal and input terminal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>0.75mm amplitude at frequency of 5~55Hz (for 1min.) in each X, Y, Z direction for 2 hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relay life cycle</td>
<td>Mechanical</td>
<td>OUT1/2: Over 5,000,000 times, AL1/2: Over 20,000,000 times (TK4H/W/L: Over 5,000,000 times)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electrical</td>
<td>OUT1/2: Over 200,000 times, AL1/2: Over 100,000 times (TK4H/W/L: Over 200,000 times)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>Over 100MΩ (500VDC megger)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise resistance</td>
<td>Square shaped noise by noise simulator (pulse width 1μs) ±2kV R-phase, S-phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory retention</td>
<td>Approx. 10years (When using non-volatile semiconductor memory type)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-10~50°C (at non-freezing status)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20~60°C (at non-freezing status)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>35~85%RH (at non-dew status)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td>IP65 (Front panel) *TK4SP: IP50 (Front panel)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation type</td>
<td>(※2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit weight</td>
<td>Approx. 105g</td>
<td>Approx. 85g</td>
<td>Approx. 140g</td>
<td>Approx. 141g</td>
<td>Approx. 141g</td>
<td>Approx. 198g</td>
</tr>
</tbody>
</table>

(※2) □ represents that this unit is double or reinforced insulated.

### Connections

*Please check the polarity when connecting temperature sensor or analog input properly.

#### TK4S

- **Digital Input**
  - DI 1

- **OUT1**
  - Relay: 250VAC 3A 1a
  - Resistive Load
  - DC4~20mA

- **OUT2**
  - Relay: 250VAC 3A 1a
  - Resistive Load
  - 0.0~50.0A

- **Transistor Output**
  - RS485A

- **Current Transformer**
  - 0.0~50.0A

- **RTD TC**
  - SENSOR

- **SSR**
  - 11VDC±2V

- **Current**
  - DC0~20mA

Load 500Ω Max.

---

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Autonics
**Connections**

*Please check the polarity when connecting temperature sensor or analog input properly.*

- **TK4SP**

![Diagram of TK4SP connections]

- **TK4M**

![Diagram of TK4M connections]

- **TK4H / TK4W / TK4L**

![Diagram of TK4H/TK4W/TK4L connections]

*Digital input is not electrically insulated from internal circuits, so it should be insulated when connecting other circuits. (Photocoupler, Relay, Independent switch)*

---

**Autonics**

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Standard PID temperature controller

- **TK4L**
  - Bracket

- **Panel cut-out**

- **Terminal cover (Sold separately): RSA-COVER (48 × 48mm size)**

- **Product mounting**
  - TK4S/SP (48 × 48mm) series
  - Other series

- *Insert product into a panel, fasten bracket by pushing with tools as shown above.*

- **Accessories [Sold separately]**
  - Communication converter [SCM-381(RS485 TO RS232)]
  - Communication converter [SCM-US481(USB TO RS485)]
  - Converter Cable [SCM-US (Serial TO USB)]

---

*Autonics*
TK Series

Parts description

1. PV display part: It shows current temperature (PV) in RUN mode and parameters in Setting mode.
2. SV display part: It shows setting temperature value (SV) to control in RUN mode and each parameter setting value in Setting mode.
3. Temperature Unit (°C/°F/%) Indicator: It shows current temperature unit.
4. Manual Control Indicator: It will be ON in case of selecting manual control mode.
5. Multi SV Indicator: One of SV1~3 lamp will be ON in case of selecting multi SV function.
6. Auto-Tuning Indicator: It will be flickering every 1 sec during Auto-tuning.
7. Alarm output indicator: It will be ON when each alarm output is ON.
8. Control output (Heating, Cooling) Indicator: It will be ON when control output is ON.
   * In case of SSRP output support model, it will be ON when MV is over 5.0%
   * In case of selecting current output (4~20mA DC, 0~20mA DC)
   - Manual control mode: It will be always ON except MV is 0.0%.
   - Auto control mode: It will be ON when MV is over 3.0%, and OFF when MV is below 2.0%.
9. [key]: Used when switching auto control mode ↔ manual control mode
   * In case of TK4S/SP model(48X48), [key] will be used for the same function
     (auto control mode ↔ manual control mode switching).
10. [key]: Used when entering into parameter setting mode and moving parameters.
11. [key]: Used when entering into set value change mode and Digit moving.
12. [key]: Used when entering into set value change mode and changing set value (Digit).
13. Input selection switch: Used when switching sensor input (TC, RTD) ↔ analog input (mV, V, mA).
14. PC loader port: It is serial communication PC loader port for PC parameter setting and monitoring used
    when connecting dedicated loader cable (SCM-US).

Flow chart for SV setting

1. Press any key among [2] in RUN mode to enter into SV setting mode. Last DIGIT (10^0 DIGIT) on SV display part will be flickering.
2. Press [key] to move DIGIT. (10^0~10^1~10^2~10^3~10^4)
3. Set the number 0~1~2~3~4~5~6~7~8~9~0 for each digit with [2] key and set the SV using [2] keys.
4. Press [key] to save the setting value. If there is no additional key operations in 3 sec., changed SV will be automatically saved.
Flow chart for setting group

*Set Parameter 3 group \( PR_3 \) → Set Parameter 4 group \( PR_4 \) → Set Parameter 5 group \( PR_5 \) → Set Parameter 2 group \( PR_2 \) → Set Parameter 1 group \( PR_1 \) → Set SV group \( SV \) in order.

- Press any key among \( K \), \( S \), \( R \) once.
- Press \( PASS \) (※1) \( MODE \) 2 sec. \( A \):/ \( M \) (※2)
  - When PW is valid,
  - When PW is valid, set the setting value
  - Set the setting value

※1: \( PASS \) parameter will be displayed only when password is set. It is not displayed when purchasing the unit since default password is set to 0000.

- If password is not valid, the screen will be shifted to password code required window.
- Press any key among \( K \), \( S \), \( R \) to return to password entering window. Press \( MODE \) key to return to RUN mode.
- In case you forget password, contact Autonics A/S center after checking password code.

※2: In case of TK4S/SP model, \( A \):/ \( M \) key function will be replaced by \( MODE \) key.

*Each parameter holds its own Memory Address for communication function.

- Press \( MODE \) key over 2 sec in RUN mode to enter into setting mode.
- Press \( MODE \) key for 1.5 sec while in setting mode to move to other parameter group.
- Press \( MODE \) key over 3 sec while in setting mode to return to RUN mode.
- Press \( MODE \) key at the lowest level of parameter to move parameter group screen and move to other parameter group.
- If there is no additional key operation within 30 sec after entering into setting mode, it will be automatically returned to RUN mode and previous setting value will be remained.
- If selecting standard user level, shaded parameters are shown only. Rest parameters will be shown when selecting high user level.(User level can be set in Parameter Setting Group 5.)
## Flow chart for 1 setting group

- **Press** MODE for 3 sec.
- **PASS** Output code when PW value is unequal in SV display.
- **Press** MODE for 2 sec.
- **Password entry**
- ** parameter 1 group**
- ** parameter 2 group**
- ** parameter 3 group**

### Controls
- **Run mode**
- **Stop**
- **Multi SV Number**
- **Heater Current Monitoring**
- **Alarm output1 low-limit set value**
- **Alarm output1 high-limit set value**
- **Alarm output2 low-limit set value**
- **Alarm output2 high-limit set value**
- **SV-0 set value**
- **SV-1 set value**
- **SV-2 set value**
- **SV-3 set value**

### Key Presses
- Press any key among **1**, **2**, **3**.
- After entering setting mode, press **1** key anytime for 3 sec. to return to Run mode.
- After entering setting mode, press **2** key anytime for 1.5 sec. to go to the concerned group name.
- : This parameter may or may not appear, depending on the model and related parameter settings.
- If you press the **MODE** key after changing the setting value of the parameter the setting value will be stored.

### Displays
- Display 5u0 through 5u3, depending on the preset number of multi SVs.(#5u).
- Displayed only with current transformer(CT) input models.(Expect for TK4SP)
- Displayed only when alarm output1 operation mode(AL - 1) is set to low—limit alarm for offset/absolute value or high/low—limit alarm/reverse alarm for offset value.
- Sets the heater burnout SV for a current transformer(with option inputs) when Alarm output 1 operation mode(AL - 1) is in heater burnout alarm(HbR).
- Does not display if alarm output 1’s operation mode(AL - 1) is set to qFF, SbR or LbR.

### Setting range
- Deviation alarm (-F.S – F.S).
- Absolute alarm (Within display range), Unit(°C/°F)
- Displayed only with option output models that support alarm output2.
- (Active/inactive conditions and the same as alarm output1 with the exception for HBA)

### Setting range
- L - 5u - H - 5u. Within L—SC—H—SC, unit(°C/°F)
- Display 5u0 through 5u3, depending on the preset number of multi SVs(#5u).
TK Series

Flow chart for 2 setting group

(1) Press any key among [ ] anytime for 3 sec. to return to Run mode.
After entering setting mode, press [ ] key anytime for 1.5 sec. to go to the concerned group name.
This parameter may or may not appear, depending on the model and related parameter settings.
If you press the [ ] key after changing the setting value of the parameter the setting value will be stored.

Parameter 2 group

Parameter 3 group

Parameter 4 group

Auto-Tuning RUN/STOP

Heating Proportional Band

Setting range: 000.1 ~ 999.9°C / °F, %
Displayed only when control output operation mode(a°Fb) is set to heating(HERE) or heating and cooling(H+C).

Cooling Proportional Band

Setting range: 000.1 ~ 999.9°C / °F, %
Displayed only when control output operation mode(a°Fb) is set to cooling(Cool) or heating and cooling(H+C).

Heating Integral Time

Setting range: 0001 ~ 9999 sec.
Displayed only when control output operation mode(a°Fb) is set to heating(HERE) or heating and cooling(H+C).

Cooling Integral Time

Setting range: 0001 ~ 9999 sec.
Displayed only when control output operation mode(a°Fb) is set to heating(HERE) or heating and cooling(H+C).

Heating derivate Time

Setting range: 0001 ~ 9999 sec.
Displayed only when control output operation mode(a°Fb) is set to heating(HERE) or heating and cooling(H+C).

Cooling derivate Time

Setting range: 0001 ~ 9999 sec.
Displayed only when control output operation mode(a°Fb) is set to heating(HERE) or heating and cooling(H+C).

Dead Band

Setting range: P/P, P/ONOFF, ONOFF/P control: ±significant proportion – 0.0 – +significant proportion
Displayed only when control output operation mode(a°Fb) is set to heating and cooling(H+C).

Manual Reset

Setting range: 000.0 ~ 100.0%
Displayed only under proportional control(H+P or C+P = 00).
Does not display if control output operation mode(a°Fb) is set to heating and cooling(H+C).

Heating Hysteresis

Setting range: 001 ~ 100 Digit [001.1 ~ 100.0]
Displayed only when control output operation mode(a°Fb) is set to heating(HERE) or heating and cooling(H+C).

Heating OFF Offset

Setting range: 000 ~ 100 Digit [000.0 ~ 100.0]
Displayed only when temperature control type (C−Nd) is set to ON/OFF control.

Cooling Hysteresis

Setting range: 001 ~ 100 Digit [001.1 ~ 100.0]
Displayed only when control output operation mode(a°Fb) is set to cooling(Cool) or heating and cooling(H+C).

Cooling OFF Offset

Setting range: 000 ~ 100 Digit [000.0 ~ 100.0]
Displayed only when control output operation mode(a°Fb) is set to cooling(Cool) or heating and cooling(H+C).
Standard PID temperature controller

Flow chart for 3 setting group

Parameter 3 group
Input type

Parameter 4 group
Sensor temperature unit

Parameter 5 group
Analog low–limit input value

Setting range: Min. Range ~ H + G ~ F. S10% Digit

Setting range: L + G + F. S10% Digit ~ Max. Range

Decimal Point

Low Scaling

High Scaling

Display Unit

*Displayed only when input type [n x b] is set to temperature sensor input.

*Displayed only when input type [n x b] is set to analog input.

*Input selection switch is initially set to TC; therefore, only the temperature input type is displayed.

*If you press the [M] key after changing the setting value of the parameter the setting value will be stored.

*After entering setting mode, press [M] key anytime for 3 sec. to return to Run mode.

*After entering setting mode, press [M] key anytime for 1.5 sec. to go to the concerned group name.

*This parameter may or may not appear, depending on the model and related parameter settings.

( #1) [M] : Press any key among [M] [M] [M].

(A) Counter
(B) Timer
(C) Temp. controller
(D) Power controller
(E) Panel meter
(F) Tacho/ Speed/ Pulse meter
(G) Display unit
(H) Sensor controller
(I) Switching power supply
(J) Proximity sensor
(K) Photo electric sensor
(L) Pressure sensor
(M) Rotary encoder
(N) Stepping motor & Driver & Controller
(O) Graphic panel
(P) Field network device
(Q) Production stoppage models & replacement

Autonics
H–28
**TK Series**

- **Input bias**
  - Setting range: -999 ~ 0999\(^{\circ}\)C / 199.9

- **Moving Average Digital Filter**
  - Setting range: 0.000 ~ 000.1

- **SV Low Limit**
  - Setting range: Low limit input (L = 5\(^{\circ}\)C) ~ H = 5\(^{\circ}\)C

- **SV High Limit**
  - Setting range: L = 5\(^{\circ}\)C ~ High limit input (H = 5\(^{\circ}\)C)

- **Control output operation mode**
  - *Standard type*
  - *Heating & cooling control model*

- **Temperature control type**
  - *Standard control*

- **Auto-tuning mode**
  - *Displayed only when temperature control type (C-\(\tilde{\eta}\)d) is set to PID control.*

- **OUT1(SSR/CUR) output**
  - *Displayed only when OUT1 control output of model is current output.*

- **OUT1 SSR output type**
  - *Displayed only when OUT1 control output of model is SSR output type.*
  - *24VDC/AC power supply Model is held in 'Stand' mode.*

- **OUT1 Current output range**
  - *Displayed only when OUT1 control output of model is current output and set to 'Cur' in 'Out1' mode.*

- **OUT2(SSR/CUR) output**
  - *Displayed only when OUT2 control output of model is current output.*

- **OUT2 Current output range**
  - *Displayed only when OUT2 control output of model is current output and set to 'Cur' in 'Out2' mode.*

- **Heating control time**
  - Setting range: 000.1 ~ 120.0sec.
  - *Displayed only when temperature control method (C-\(\tilde{\eta}\)d) is set to PID control.*
  - *Not Displayed when output method is set to CYCLE, RHASE.*

*NOTES:

1. In case that OUT1,OUT2 output is relay output type, Out 1, Out 1r, Out 2, Out 2r, Out 2r parameter are not displayed.
2. In case that OUT1,OUT2 output is SSR + SSR output type, when OUT1,OUT2 output is set to SSR, output method of Out 1r, Out 2r is held in Stand and parameter is not displayed.
3. In case that OUT1, output is SSRP output type and OUT2 output is SSR + SSR:
   - Out 1, Out 2 parameter are not displayed.
   - Out 1r can set to Stand, CYCL, PHAS.
   - When Out 2r is set to SSR, it is held in Stand and parameter is not displayed.
**Flow chart for 4 setting group**

1. **Parameter 4 group**
   - **PR4**

2. **Parameter 5 group**
   - **PR5**

3. **Parameter 1 group**
   - **PR1**

**Alarm output1 operation mode**

- **AL-1**
- **duCC**
- **JJdu**
- **......**
- **off**

**Alarm output1 option**

- **AL**
- **AL-A**
- **AL-B**
- **AL-C**
- **AL-d**

*Displayed only if alarm output 1's operating mode (AL-1) is not set to off.*

**Alarm output1 hysteresis**

- **AHY**
- Setting range: 001 ~ 100Digit (000.1 ~ 100.0)

*Displayed if alarm output1’s operating mode(AL-1) is set to high-limit, low-limit high/low-limit or reverse alarm for offset/absolute value.*

**Alarm 1 NO/NC**

- **Ain**
- **n0**
- **nc**

**Alarm 1 ON Delay Time**

- **Aon**
- Setting range: 0000 ~ 3600sec.

*Displayed only when alarm output 1’s operating mode (AL-1) is not set to off.*

**Alarm 2 OFF Delay Time**

- **Aof**
- Setting range: 0000 ~ 3600sec.

**Alarm output2 operation mode**

- **AL-2**
- **JJdu**
- **duCC**

**Alarm output2 option**

- **AL**
- **AL-A**
- **AL-B**
- **AL-C**
- **AL-d**

*Displayed only if alarm output2's operating mode(AL-2) is not set to off.*

**Alarm output2 hysteresis**

- **ARHY**
- Setting range: 001 ~ 100Digit(000.1 ~ 100.0)

*Displayed if alarm output2’s operating mode(AL-2) is set to high-limit, low-limit, high/low-limit or reverse alarm for offset/absolute value.*

**Alarm 2 NO/NC**

- **A2n**
- **n0**
- **nc**

**Alarm 2 ON Delay Time**

- **A2on**
- Setting range: 0000 ~ 3600sec.

*Displayed only if alarm output2’s operating mode(AL-2) is not set to off.*

**Alarm 2 OFF Delay Time**

- **A2of**
- Setting range: 0000 ~ 3600sec.
TK Series

Flow chart for 5 setting group

(=1) S : Press any key among 5 6 7
※ After entering setting mode, press 8 9 0 key anytime for 3 sec. to return to Run mode.
※ After entering setting mode, press 1 2 3 key anytime for 1.5 sec. to go to the concerned group name.
※ YYYY : This parameter may or may not appear, depending on the model and related parameter settings.
※ If you press the 10 key after changing the setting value of the parameter the setting value will be stored.
Standard PID temperature controller

Digital Input 1

```
DI1 - I
```

Digital Input 2

```
DI2 - I
```

Initial Manual MV

```
In
```

Preset Manual MV

```
Pm
```

Error MV

```
Err
```

Stop MV

```
St
```

Stop Alarm Output

```
StAls
```

User Level

```
User
```

SV setting group lock

```
LCS
```

Parameter group 1 lock

```
LCP1
```

Parameter group 2 lock

```
LCP2
```

Parameter group 3 lock

```
LCP3
```

Parameter group 4 lock

```
LCP4
```

Parameter group 5 lock

```
LCP5
```

Password setting

```
Pwd
```

Setting range: 0000 (Password function Off), 0002 ~ 9999

*Except for TK4N, SP model.

*Except for TK4N, SP, S.M model.

Setting range: 000.0 ~ 100.0% (Standard control), -100.0 ~ 100.0% (Heating & cooling control)
## Input sensor and range

<table>
<thead>
<tr>
<th>Input sensor</th>
<th>Dot</th>
<th>Display</th>
<th>Input range(℃)</th>
<th>Input range(°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K(CA)</td>
<td>1</td>
<td>LCRH</td>
<td>-200 ~ 1350</td>
<td>-328 ~ 2463</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>LCRL</td>
<td>-199.9 ~ 999.9</td>
<td>-199.9 ~ 999.9</td>
</tr>
<tr>
<td>J(IC)</td>
<td>1</td>
<td>LICL</td>
<td>-200 ~ 800</td>
<td>-328 ~ 1472</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>LICL</td>
<td>-199.9 ~ 800.0</td>
<td>-199.9 ~ 999.9</td>
</tr>
<tr>
<td>E(CR)</td>
<td>1</td>
<td>LCEH</td>
<td>-200 ~ 800</td>
<td>-328 ~ 1472</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>LCEL</td>
<td>-199.9 ~ 800.0</td>
<td>-199.9 ~ 999.9</td>
</tr>
<tr>
<td>T(CC)</td>
<td>1</td>
<td>LCECH</td>
<td>-200 ~ 400</td>
<td>-328 ~ 752</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>LCECL</td>
<td>-199.9 ~ 400.0</td>
<td>-199.9 ~ 752.0</td>
</tr>
<tr>
<td>B(PR)</td>
<td>1</td>
<td>BPR</td>
<td>0 ~ 1800</td>
<td>32 ~ 3272</td>
</tr>
<tr>
<td>R(PR)</td>
<td>1</td>
<td>RPR</td>
<td>0 ~ 1750</td>
<td>32 ~ 3182</td>
</tr>
<tr>
<td>S(PR)</td>
<td>1</td>
<td>SPR</td>
<td>0 ~ 1750</td>
<td>32 ~ 3182</td>
</tr>
<tr>
<td>N(NN)</td>
<td>1</td>
<td>NNN</td>
<td>-200 ~ 1300</td>
<td>-328 ~ 2372</td>
</tr>
<tr>
<td>C(TT)</td>
<td>1</td>
<td>CTT</td>
<td>0 ~ 2300</td>
<td>32 ~ 4172</td>
</tr>
<tr>
<td>G(TT)</td>
<td>1</td>
<td>GTT</td>
<td>0 ~ 2300</td>
<td>32 ~ 4172</td>
</tr>
<tr>
<td>L(IC)</td>
<td>1</td>
<td>LICL</td>
<td>-200 ~ 900</td>
<td>-328 ~ 1652</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>LICL</td>
<td>-199.9 ~ 900.0</td>
<td>-199.9 ~ 999.9</td>
</tr>
<tr>
<td>U(CC)</td>
<td>1</td>
<td>UCCH</td>
<td>-200 ~ 400</td>
<td>-328 ~ 752</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>UCCL</td>
<td>-199.9 ~ 400.0</td>
<td>-199.9 ~ 752.0</td>
</tr>
<tr>
<td>Platinel II</td>
<td>1</td>
<td>PLL</td>
<td>0 ~ 1390</td>
<td>32 ~ 2534</td>
</tr>
</tbody>
</table>

### RTD

<table>
<thead>
<tr>
<th>JIS Standards</th>
<th>JPt 100Ω</th>
<th>JPt 100Ω</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>JPt5</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>JPt5LN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIN Standards</th>
<th>DPlt 50Ω</th>
<th>DPlt 100Ω</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.1</td>
<td>DPlt5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DPlt5LN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nickel 120Ω</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n2 i2</td>
</tr>
</tbody>
</table>

### Analog

<table>
<thead>
<tr>
<th>Voltage</th>
<th>A u1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ~ 10V</td>
<td></td>
</tr>
<tr>
<td>0 ~ 5V</td>
<td></td>
</tr>
<tr>
<td>1 ~ 5V</td>
<td></td>
</tr>
<tr>
<td>0 ~ 100mV</td>
<td>A u2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current</th>
<th>A AR1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ~ 20mA</td>
<td></td>
</tr>
<tr>
<td>4 ~ 20mA</td>
<td></td>
</tr>
</tbody>
</table>

(※1) Same as existing W5 (TT) type sensor  (※2) Same as existing W(TT) type sensor

(Display point will be changed according to decimal point position.)
### Alarm output operation mode

<table>
<thead>
<tr>
<th>Mode</th>
<th>Alarm output operation</th>
<th>Description (Default Deviation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td></td>
<td>■ No alarm output</td>
</tr>
<tr>
<td>dUCU</td>
<td>OFF H ON SV 100°C PV 110°C</td>
<td>■ Deviation high–limit alarm (Temperature, analog: +F·S) If PV/SV deviation is occurring higher than set value of deviation temperature, alarm output will be ON. Deviation temperature is set in RL 1H / RL 2H.</td>
</tr>
<tr>
<td></td>
<td>ON H OFF SV 90°C PV 100°C</td>
<td>High deviation: Set as 10°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High deviation: Set as −10°C</td>
</tr>
<tr>
<td>JdUC</td>
<td>ON H OFF SV 90°C PV 100°C</td>
<td>■ Deviation low–limit alarm (Temperature, analog: +F·S) If PV/SV deviation is occurring lower than set value of deviation temperature, alarm output will be ON. Deviation temperature is set in RL 1L / RL 2L.</td>
</tr>
<tr>
<td></td>
<td>ON H SV 100°C PV 120°C</td>
<td>Lower deviation: Set as 10°C, High deviation: Set as 20°C</td>
</tr>
<tr>
<td>dUCU</td>
<td>OFF H ON SV 90°C PV 100°C</td>
<td>■ Deviation high / low–limit reverse alarm (Temperature: 0, analog: 0) If PV/SV deviation is occurring higher or lower than set value of deviation temperature, alarm output will be ON. High–limit deviation temperature is set in RL 1H / RL 2H. Low–limit deviation temperature is set in RL 1L / RL 2L.</td>
</tr>
<tr>
<td></td>
<td>ON H SV 120°C PV 100°C</td>
<td>Lower deviation: Set as 10°C, High deviation: Set as 20°C</td>
</tr>
<tr>
<td>puCU</td>
<td>OFF H ON SV 90°C PV 100°C</td>
<td>■ Absolute value high–limit alarm (Temperature: +H–5C, analog: +H–5C; Select the higher one.) If PV is higher than absolute value of alarm temperature, alarm output will be ON. Absolute alarm value is set in RL 1H / RL 2H.</td>
</tr>
<tr>
<td></td>
<td>ON H OFF SV 100°C PV 110°C</td>
<td>Absolute–value Alarm: Set as 90°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Absolute–value Alarm: Set as 110°C</td>
</tr>
<tr>
<td>JpCu</td>
<td>ON H OFF SV 90°C PV 100°C</td>
<td>■ Absolute value low–limit alarm (Temperature: −L–5C, analog: −L–5C; Select the lower one.) If PV is lower than absolute value of alarm temperature, alarm output will be ON. Absolute alarm value is set in RL 1L / RL 2L.</td>
</tr>
<tr>
<td></td>
<td>ON H SV 120°C PV 100°C</td>
<td>Absolute–value Alarm: Set as 90°C</td>
</tr>
</tbody>
</table>

- **LbA**: It will be ON when it detects loop break. ■ Loop Break Alarm
- **SbA**: It will be ON when it detects sensor disconnection. ■ Sensor Break Alarm
- **HbA**: It will be ON when it detects heater break using CT. ■ Heater Break Alarm

### Optional alarm output selection [RL # \( \text{A} \) ]

<table>
<thead>
<tr>
<th>Display</th>
<th>Alarm mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RL -A</td>
<td>General alarm</td>
<td>When PV reaches alarm temp. (deviation), Aux output will be ON.</td>
</tr>
<tr>
<td>RL -b</td>
<td>Latch</td>
<td>When PV reaches alarm temp. (deviation), Aux output will be ON and retained.</td>
</tr>
<tr>
<td>RL -c</td>
<td>Standby</td>
<td>When PV reaches alarm temp. (deviation) for the second time, Aux output will be ON. (No output will be ON for initial operation.)</td>
</tr>
<tr>
<td>RL -d</td>
<td>Latch &amp; Standby</td>
<td>Latch and Standby mode applied together.</td>
</tr>
</tbody>
</table>
# Front Panel Display when power is ON

When power is supplied, whole display part will be flickering for 1 sec. Afterwards, model name and input sensor type will be flickering twice and then enter into RUN mode.

![Display Diagram](image)

1. Whole display part  
2. Model type display  
3. Input sensor type display  
4. Run mode

## Factory Default

### SV setting group \([S_u]\)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Factory Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>(S_u)</td>
<td>0</td>
</tr>
</tbody>
</table>

### Parameter 1 setting group \([P_{AR\;1}]\)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Factory Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>(r\cdot5)</td>
<td>(r\cdot0)</td>
</tr>
<tr>
<td>(S_u\cdot0)</td>
<td>(S\cdot0)</td>
</tr>
<tr>
<td>(C\cdotR)</td>
<td>(C\cdot0)</td>
</tr>
</tbody>
</table>

### Parameter 2 setting group \([P_{AR\;2}]\)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Factory Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>(R\cdot0)</td>
<td>(H\cdot0)</td>
</tr>
<tr>
<td>(P\cdot0)</td>
<td>(C\cdot0)</td>
</tr>
<tr>
<td>(H\cdot0)</td>
<td>(C\cdot0)</td>
</tr>
<tr>
<td>(C\cdot1)</td>
<td>(R\cdot5)</td>
</tr>
</tbody>
</table>

### Parameter 3 setting group \([P_{AR\;3}]\)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Factory Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>(L\cdot0)</td>
<td>(L\cdot5)</td>
</tr>
<tr>
<td>(L\cdot5)</td>
<td>(H\cdot5)</td>
</tr>
</tbody>
</table>

### Parameter 4 setting group \([P_{AR\;4}]\)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Factory Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>(R\cdot0)</td>
<td>(B\cdot0)</td>
</tr>
<tr>
<td>(R\cdot0)</td>
<td>(B\cdot0)</td>
</tr>
</tbody>
</table>

### Parameter 5 setting group \([P_{AR\;5}]\)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Factory Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>(d\cdot0)</td>
<td>(d\cdot0)</td>
</tr>
<tr>
<td>(d\cdot0)</td>
<td>(d\cdot0)</td>
</tr>
</tbody>
</table>

---

**Password input Parameter**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Factory Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>(PR5)</td>
<td>0000</td>
</tr>
</tbody>
</table>

---

**Autonics**

H-35
Function

Control output operation mode \(\alpha-F_b\)
- Control output modes for general temperature control include heating, cooling, and heating and cooling.
- Heating control and cooling control are mutually opposing operations with inverse outputs.
- The PID time constant varies based on the controlled objects during PID control.

Heating control \(\text{H}_\text{EAT}\)
- Heating control mode: the output will be provided in order to supply power to the load (heater) if PV (Present Value) falls below SV (Setting Value).

Cooling control \(\text{C}_{\text{o}OL}\)
- Cooling control mode: the output will be provided in order to supply power to the load (cooler) if PV (Present Value) rises above SV (Setting Value).

Heating and Cooling Control \(\text{H}-\text{C}\)
- Heating and cooling control mode: heating and cooling with a single temperature controller when it is difficult to control subject temperature with only heating or cooling.
- Heating and cooling control mode controls the object using different PID time constants for each heating and cooling.
- It is also possible to set heating and cooling control in both PID control or ON/OFF control mode. Heating/cooling output can be selected among Relay output, SSR output and current output depending on model types chosen according to your application environment. (Note that only standard SSR control is available for SSR output in OUT2.)

Auto-tuning \(\alpha-b\)
In PID control, auto-tuning processes the control subject’s thermal characteristics and thermal response rate, and then determines the necessary PID time constant. Application of the PID time constant realizes fast response and high precision temperature control.
- Auto-tuning automatically stores PID time constants upon termination. These PID time constants can then be modified by the user to suit their usage environment.
- When auto-tuning is in progress, the AT lamp located on the front of the controller flashes in 1-second intervals. When auto-tuning finishes, the AT lamp automatically goes off and the auto-tuning parameter will return to OFF.

Control Output (OUT1/OUT2) Selection \(\alpha\text{UT} / \alpha\text{UT}^2\)
- In case of selecting the Models with current control output, both current and SSR outputs are available. You can therefore choose the right output type depending on application environments.
- OUT1: Selects OUT1 control output.
- OUT2: Selects OUT2 control output.

For more information, refer to user manual.
Proper usage

Simple "error" diagnosis

- In case, the load (Heater etc) is not operated, please check operation of the out lamp located in front panel of the unit. If lamp does not operate, please check the parameter of all programmed mode. If lamp is operating, please check the output (Relay, Driving voltage of SSR, DC4~20mA current) after separating output line from the unit.
- When it displays "oPEn" during operation. This is a warning that external sensor is cut off. Please turn off power and check the state of sensor. If sensor is not cut off, disconnect sensor line from terminal block and +, - together. When you turn on power it can check room temperature. If this unit cannot indicate room temperature, this unit itself is faulty. Please remove this unit from equipment and service or replace. (When the input mode is thermocouple, it is available to indicate room temperature.)
- In case of indicating "Error" in display This Error message is indicated in case of damaging inner chip program data by outer strong noise. In this case, please send the unit to our after service center after removing the unit from system. Noise protection is designed in this unit, but it does not stand up strong noise continuously. If bigger noise than specified (Max. 2kV) flows in the unit, it can be damaged.

Caution for using

- Please use the terminal (M3.5, Max. 7.2mm) when connecting the AC power source.
- A" mark indicated on the diagram of this unit means caution—refer to accompanying documents.
- In case of cleaning the unit, please keep as following Cautions:
  1. Clean dust with a dry tissue.
  2. Be sure to use alcohol to clean the unit, do not use acid, chromic acid, solvent, etc.
  3. Be sure to clean the unit after turning off the power and then turn on the power after passing 30 minute after cleaning.
- If this unit is used in a manner not to be specified by the manufacture, it can be injury to a person or damage to property.
- Be sure that metal dust and wire-dregs do not flow in the unit, because of malfunction damage of the unit or the cause of a fire.
- Service life for the relay of the unit is indicated in this manual, life cycle is different according to the load capacity and switching times, therefore please use the unit after checking the load capacity and switching times.
- Connect wires correctly after checking polarity of terminals.
- Do not use this unit as following place.
  1. A place where dust, corrosive gas, oil, moisture are occurred.
  2. A place where there are high humidity or freezing place.
  3. A place where sunshine, radiant heat is occurred.
  4. A place where vibration, shock is occurred.
- If the equipment is used in a manner not specified by the manufacture the protection provided by the equipment may be impaired.
- Please install power switch or circuit-breaker in order to cut power supply off.
- A switch or circuit-breaker meeting the relevant requirements of IEC947-1 and IEC947-3 shall be included in equipment when the temperature controller.
- The switch or circuit-breaker should be installed near by users.
- Installation environment
  1. It shall be used indoor
  2. Altitude Max. 2000m
  3. Pollution Degree 2
  4. Installation Category II.
- Be sure to power turn off when changing thermocouple to analog signal and change DIN switch setting. Then, power turn ON and change 2 setting group.
- This SSRP of this controller are insulate from internal power.
- Do not connect power line to sensor connecting part. The inner circuit may be damaged.