The KP2000 series is a 96x96mm digital program controller with the indicating accuracy of ±0.1%, the control cycle of approximately 0.1 seconds and maximum 30 program patterns (maximum 19 steps/pattern).

The configuration of highly functional system is enabled by various options including 2 transmission signal outputs, 2 communications ports and arbitrarily-allocation of digital inputs/outputs.

**FEATURES**

- **Large easy-to-view 5-digit display**
  Process value (PV) and set value (SV) are displayed by large easy-to-view 5-digit display indicators. The resolution of 0.1°C is enabled for more than 1000°C.

- **Outstanding controllability**
  Two types of PID algorithms, the position-type PID algorithm and the speed-type PID algorithm, have been installed. You can select the optimum PID algorithm for an object controlled.

- **Program pattern**
  Settings of maximum 19 steps per pattern and maximum 30 sets of patterns are enabled. Repeating of a whole program pattern, linking of program patterns and repeating of a specific step in a program pattern are enabled, too.

- **Versatile control functions provided**
  Versatile control functions, such as the automatic PID system, which executes control by PID parameters preset at every SV sections, and selection of the 2-output control system from PID system and split system for 2-output types, are available.

- **Communications 2-port type provided**
  Models with 2 communications ports are available. In addition, speeding up and highly-functionalization of communications have been realized. For example, you can use 1 port for high order communications with a personal computer and another port for the communications remote (digital remote) function. The communications protocol can be arbitrarily selected from [MODBUS] and [PRIVATE].

- **Transmission signal 2-output type provided**
  2 types of transmission signal output, the high-precision type (0.1% of full scale) and the general type (0.3% of full scale), are available. Transmission signal 2-output types with these 2 transmission signal outputs and models with transmitter power supply are available.

- **DI/DO arbitrarily-allocation**
  When the digital input (DI) or the digital output (DO) is added, arbitrarily-allocation for assigning functions to those DI/DO's is enabled. It is the function enabling allocations such as [External drive input] to DI1 to DI3 and [Pattern selecting input] to DI4 to DI6.

- **Output up to 8 points of time signals enabled**
  With the 8 digital outputs type added, up to 8 points of time signals can be outputted by allocating time signal TS1 to TS8.

- **Heater disconnection alarm**
  The heater disconnection alarm can be added to ON-OFF pulse output types or SSR drive pulse types only.

  By connecting the designated CT externally, the current value of heater is measured and can be indicated on the operation screen.

- **Conforming to international safety standards and European directives (CE)**
  The controller is conformity with European directives (CE), and is UL and c-UL approved.

- **Conforming to RoHS**
  The controller is an environmental consideration product which does not contain directed hazardous substances such as lead, etc.
MODELS

Input signal
0: Universal input
4: 4-wire resistance thermometer

Control mode (Output No. 1)
1: ON-OFF pulse type PID
2: ON-OFF servo type PID
3: Current output type PID
5: SSR drive pulse type PID
6: Voltage output type PID
8: ON-OFF servo type PID

Control mode (Output No. 2)*
0: None
1: ON-OFF pulse type PID
3: Current output type PID
5: SSR drive pulse type PID
6: Voltage output type PID

1st zone*
0: None
9: Heater disconnection alarm
P: 6 Digital inputs
M: 4 Digital inputs + Heater disconnection alarm
T: 6 Digital outputs
N: 4 Digital outputs + Heater disconnection alarm

2nd zone*
0: None
1:Transmission signal output (high-precision type: 2 - 20mA)
2: Transmission signal output (high-precision type: 0 - 1V)
4: Transmission signal output (high-precision type: Others)
J: Transmission signal output (General type: 4 - 20mA)
K: Transmission signal output (General type: 0 - 1V)
L: Transmission signal output (General type: 0 - 10V)
9: Heater disconnection alarm
P: 6 Digital inputs
M: 4 Digital inputs + Heater disconnection alarm
T: 6 Digital outputs
N: 4 Digital outputs + Heater disconnection alarm

2nd PLUS zone*
0: None
J: 2nd transmission signal output (General type: 4-20mA)
K: 2nd transmission signal output (General type: 0-1mA)
L: 2nd transmission signal output (General type: 0-10V)
H: Transmitter power supply

3rd zone
0: None
R: Communications 1 port (RS232C) + 3 Digital inputs
A: Communications 1 port (RS422A) + 1 Digital input
S: Communications 1 port (RS485) + 3 Digital inputs
B: Communications 2 ports (RS232C) + 1 Digital input
C: Communications 2 ports (RS232C) + 1 Digital input
D: Communications 2 ports (RS422A) + 1 Digital input
E: Communications 2 ports (RS485) + 1 Digital input
F: Communications 2 ports (RS485) + 1 Digital input
G: Communications 2 ports (RS485) + 1 Digital input
H: Communications 2 ports (RS485) + 1 Digital input
9: Heater disconnection alarm
P: 6 Digital inputs
M: 4 Digital inputs + Heater disconnection alarm
T: 6 Digital outputs
N: 4 Digital inputs + Heater disconnection alarm
U: 8 Digital inputs
V: 6 Digital inputs + Heater disconnection alarm
W: 8 Digital outputs
X: 6 Digital outputs + Heater disconnection alarm
Y: 3 Digital inputs + 5 Digital outputs
Z: 4 Digital inputs + 4 Digital outputs

Case color
G: Gray
B: Black

Panel sealing and terminal cover*
0: None
1: Terminal cover
2: IP54 panel sealing
3: IP54 panel sealing + Terminal cover

Power supply voltage
A: 100 to 240V (AC)
D: 24VAC/24VDC

Option
*1 The control mode (Output No. 1) can be selected from 1, 3, 5 or 6 only.
*2 Only available to the unit having output No. 1 or No.2 of or 5.
*3 Multiple selection in different option zone is not available.
*4 It can be selected when the 2nd zone is 0, 1, 2, 3, 4, J, K or L only.
*5 It can be selected when the 2nd zone is 1, 2, 3 or 4 only.

MEASUREMENT RANGES

Universal input

<table>
<thead>
<tr>
<th>Measuring ranges</th>
<th>Scale ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>0.0 to 1820°C</td>
</tr>
<tr>
<td>R</td>
<td>0.0 to 1760°C</td>
</tr>
<tr>
<td>S</td>
<td>0.0 to 1200°C</td>
</tr>
<tr>
<td>K</td>
<td>-200.0 to 1370°C</td>
</tr>
<tr>
<td>E</td>
<td>-200.0 to 300°C</td>
</tr>
<tr>
<td>J</td>
<td>-200.0 to 1000°C</td>
</tr>
<tr>
<td>T</td>
<td>-200.0 to 200°C</td>
</tr>
<tr>
<td>WRe5-WRe26</td>
<td>0.0 to 2310°C</td>
</tr>
<tr>
<td>W-Re26</td>
<td>0.0 to 2310°C</td>
</tr>
<tr>
<td>NiMo-Ni</td>
<td>-50.0 to 1410°C</td>
</tr>
<tr>
<td>CR-AuFe</td>
<td>0.0 to 280.0K</td>
</tr>
<tr>
<td>N</td>
<td>0.0 to 1300°C</td>
</tr>
<tr>
<td>PR5-20</td>
<td>0.0 to 1880°C</td>
</tr>
<tr>
<td>Platinel II</td>
<td>0.0 to 1390°C</td>
</tr>
<tr>
<td>U</td>
<td>-200.0 to 400°C</td>
</tr>
<tr>
<td>10mV</td>
<td>-10.0 to 10mV</td>
</tr>
<tr>
<td>20mV</td>
<td>-20.0 to 20mV</td>
</tr>
<tr>
<td>50mV</td>
<td>-50.0 to 50mV</td>
</tr>
<tr>
<td>100mV</td>
<td>-100.0 to 100mV</td>
</tr>
<tr>
<td>5V</td>
<td>-5.0 to 5V</td>
</tr>
<tr>
<td>10V</td>
<td>-10.0 to 0 V</td>
</tr>
</tbody>
</table>

DC current

20mA 0 to 20mA

Resistance thermometer

<table>
<thead>
<tr>
<th>Measuring ranges</th>
<th>Scale ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP100</td>
<td>-200.0 to 649°C</td>
</tr>
<tr>
<td>JP50</td>
<td>-200.0 to 649°C</td>
</tr>
<tr>
<td>Pt100</td>
<td>-200.0 to 850°C</td>
</tr>
<tr>
<td>Pt50</td>
<td>-200.0 to 649°C</td>
</tr>
<tr>
<td>Pt-Co</td>
<td>4.0 to 374OK</td>
</tr>
</tbody>
</table>

4-wire resistance thermometer

<table>
<thead>
<tr>
<th>Measuring ranges</th>
<th>Scale ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP100</td>
<td>-200.0 to 649°C</td>
</tr>
<tr>
<td>Old Pt100</td>
<td>-200.0 to 600°C</td>
</tr>
<tr>
<td>JP50</td>
<td>-200.0 to 649°C</td>
</tr>
<tr>
<td>Pt100</td>
<td>-200.0 to 850°C</td>
</tr>
</tbody>
</table>

[Standards]
W-Re5-W-Re26, W-Re26, NiMo-Ni, Platinel
II: CR-AuFe, PRh40-PRh20, ASTM Vol. 14.03
U.L:DIN43710-1985
JP100: JIS C 1604 -1981
JP50: JIS C 1604 -1981

Note: For options common to 1st zone, 2nd zone and 3rd zone, assign them in the order of [9], [P] and [M] from 3rd zone first.
### NAMES OF VARIOUS PARTS

#### Display

1. Operation status (RUN) indication
   - Lights in operation.
2. Operation stop (STOP) indication
   - Lights in the state of operation stop.
3. RESET indication
   - Lights when operation is cancelled and returns to the start point.
4. Constant value operation (CONST) indication
   - Light in constant value operation.
5. Pattern No. (PTN) indication
6. Alarm-standby (WAIT) indication
   - Lights in alarm-standby status or when alarm is cancelled.
   - Blinks when standby time alarm is activated.
7. Program remote (REM) indication
   - Lights when operation is executed by digital input.
8. Executing step number (STP) indication
   - The step No. being executed is indicated.
   - (Blinks in real temperature compensation operation.)
9. Error (ERR) indication
   - Lights when sampling of input is abnormal.
10. Auto-tuning operation (AT) indication
    - Lights in auto-tuning operation.
11. Manual operation (MAN1/MAN2) indication
    - Lights when the output No. 1 or No. 2 is in manual output operation.
12. Function (FNC) operation indication
    - Lights when the function key is operated.
13. Process value (PV) indication
14. Time signal (TS1 to TS8) indication
15. Alarm activation (AL1 to 4) indication

#### Function keys

13. FNC key
   - With the operation screen displayed, pressing it puts the controller in the operation key mode. With the settings screen displayed, pressing it puts the controller in the setting key mode and it operates to move the cursor backwards.
14. RUN key
   - In the operation key mode, it operates as RUN key. With the settings screen displayed, pressing it puts the controller in the setting key mode and it is used for switching between the operation screen and the mode screen of Mode 0, or for switching from the settings screen to the mode screen.
15. STOP key
   - In the operation key mode, it operates as STOP key. With the settings screen displayed, pressing it puts the controller in the setting key mode and it is used to switch the settings screen.
16. ADV (Advance) key
   - In the operation key mode, it operates as ADV key. With the settings screen displayed, pressing it puts the controller in the setting key mode and it is used for moving the cursor and for selecting a parameter.
17. RESET key
   - In the operation key mode, it operates as RESET key. With the settings screen displayed, pressing it puts the controller in the setting key mode and it is used for changing a setting value (or selecting a parameter) in descending order.
18. PTN (Pattern) key
   - In the operation key mode, it operates as PTN key. With the settings screen displayed, pressing it puts the controller in the setting key mode and it is used for changing a setting value (or selecting a parameter) in ascending order.
19. A/M (Auto/Manual) key
   - In the operation key mode, it operates as A/M key. With the settings screen displayed, pressing it puts the controller in the setting key mode and it is used for registering the settings.
20. Engineering port

#### Lower display

23. A wide variety of operation screens are prepared and arbitrarily-selection is enabled.
   - On the whole program pattern display screen, the simultaneous display of the shape of whole program pattern and the progressed pattern position has been realized.

- [Output screen](#)
- [Time screen](#)
- [Pattern screen](#)
### INPUT SPECIFICATIONS

**Input signal:**
- DC voltage: ±10mV, ±20mV, ±50mV, ±100mV, ±5V, ±10V
- DC current: 0 to 20 mA
- Resistance thermometer: Pt100, JPt100, Old Pt100, JPt50, Pt-Co

**Measuring range:**
- Thermocouple: 28 ranges
- DC voltage: 6 ranges
- DC current: 1 range
- Resistance thermometer: 14 ranges

**Accuracy:** ± 0.1% of measurement range ± 1 digit

**Reference junction compensation accuracy:**
- K, E, J, T, N, Platinel II: ±0.5°C or a value equivalent to ±20μV, whichever is greater
- Others: ±1.0°C or a value equivalent to ±40μV, whichever is greater

**Resolution:** Approximately 1/30000

**Sampling rate:** Approximately 0.1 seconds

**Burnout:** Upscale burnout is only enabled in thermocouple, DC voltage (±50mV or less) and resistance thermometer (3-wire type). For the burnout, the output value of Output No. 1 can be set arbitrarily, the output value of Output No. 2 is fixed at 0% and the high limit alarm is set at ON (for the upscale burnout), (The burnout is disabled in DC voltage (±100mV or more), DC current, resistance temperature (4-wire type).

**Input impedance:**
- Thermocouple: 1MΩ or more
- DC voltage: 1MΩ or more
- DC current: Approximately 250Ω

**Allowable signal source resistance:**
- Thermocouple: 100Ω or less
- DC voltage: 1000Ω or less
- DC current: 300Ω or less

**Allowable wire resistance (resistance thermometer):**
- 5Ω or less (Same resistance for all wires)

**Rated current (resistance thermometer):**
- Approximately 1mA

**Maximum allowable input:**
- Thermocouple: ±20V or less
- DC voltage: ±20V or less
- DC current: ±30mA or less ±7.5V or less
- Resistance thermometer: 500Ω or less, ±5V or less

**Maximum common mode voltage:**
- 30VAC

**Common mode rejection ratio:**
- 130dB or more (50/60Hz)

**Normal mode rejection ratio:**
- 50dB or more (50/60Hz)

### DISPLAY SPECIFICATIONS

**Display element:** Upper display LED
**Display content:**
- Upper display: PV 5-digit, SV 5-digit, status indications, etc.
- Lower display: MV, output status, setting screens, etc.

### CONTROL SPECIFICATIONS

**Control cycle:** Approximately 0.1 seconds

**Output type:**
- ON-OFF pulse type
- ON-OFF servo type
- Current output type
- SSR drive pulse type

**ON-OFF pulse type:**
- Output signal: ON-OFF pulse conductive signal
- Contact capacity: Resistive load 100 to 240VAC 30VDC 5A or less
- Inductive load 100 to 240VAC 30VDC 2.5A or less
- Smallest load 5VDC 10mA or more

**ON-OFF servo type:**
- Output signal ON-OFF servo conductive signal
- Contact capacity of standard load: Resistive load 100 to 240VAC 30VDC 5A or less
- Inductive load 100 to 240VAC 30VDC 2.5A or less
- Smallest load 5VDC 10mA or more

**Current output type:**
- Output signal: 4 to 20mA
- Load resistance 750Ω or less

**SSR drive pulse type:**
- Output signal: ON-OFF pulse voltage signal
- Output voltage: ON voltage 12VDC ± 2%
- OFF voltage 0.8VDC or less
- Load current: 20mA or less
- Pulse width: 1 to 180 seconds

**Voltage output type:**
- Output signal: 0 to 10V
- Output impedance: Approx 10Ω
- Load resistance: 50kΩ or more

**Output limiter:**
- 0 to 100.0%
- Rate-of-change limiter for output:
  - 0.1 to 100.0%
- Output preset:
  - With P action (Settings of I and D = 0), Output at PV = SV -100.0 to 100.0%
  - Output No. 2 is 0%

**Output deadband:**
- In case of 2-position control (Setting of P = 0), Setting range 0.1 to 9.9%

**Control action:**
- With direct/reverse selection
- Output at PV abnormality:
  - Over-range, under-range, abnormal internal data

**Manual output operation:**
- Output by manual setting
  - -5.0 to 105.0%
  - MAN → AUTO Balanceless bumpless
  - AUTO → MAN Keeping output at AUTO

### SETTING SPECIFICATIONS

**Number of patterns:** 30 patterns
**Pattern repetition:** ... Maximum 9999 times

**Number of steps:**
- 19 steps/pattern
- 0.1 to 100.0%
- %, 1 to 9999 seconds
- 0 to 9999 seconds
- A.R.W. (Anti reset windup)
- High limit → 0 to 100.0%
- Low limit → -100 to 0.0%

**Control relations:**
- PID 8 types
- P 0 to 999.9%
- I →∞, 1 to 9999 seconds
- D 0 to 9999 seconds

**Output relations:**
- Output deadband
- Output preset
- Output limiter 8 types
- Rate-of-change limiter for output 8 types

**Alarm relations:**
- Alarm value 4 points 8 types, alarm types, alarm deadband, alarm delay
**ALARM SPECIFICATIONS**

Number of alarm points: 4 points

Alarm types: Absolute value alarm, deviation alarm, absolute value deviation alarm, setting value alarm, output value alarm, FAIL, timer

Output signal: Relay output signal (a contact) 1 common terminal for AL1 and AL2, 1 common terminal for AL3 and AL4

Contact capacity
- Resistance load 100 to 240VAC 30VDC 3A or less
- Inductive load 100 to 240VAC 30VDC 1.5A or less
- Smallest load 5VDC 10mA or more

**GENERAL SPECIFICATIONS**

Rated power voltage:
- General power supply specifications 100 to 240VAC
- 24V Power supply specifications 24VAC/24VDC

Rated power supply frequency:
- General power supply specifications 50/60Hz
- 24V Power supply specification 50/60Hz (24VAC)

Maximum power consumption:
- General power supply specifications Without options 100VAC 10VA
- With options 100VAC 15VA
- 240VAC 20VA
- 24V Power supply specifications Without options 24VAC 10VA
- With options 24VAC 15VA
- 24VDC 10W

Working temperature range: -10 to 50°C
Working humidity range: 10 to 90%RH

Power failure countermeasures:
- Settings stored in EEPROM (Rewrite count: One million times or less) and stored by a lithium battery for 5 years or more
- Terminal screws: M3.5
- Insulation resistance: Between primary terminals and secondary terminals 20MΩ or more (500VDC)
- Between primary terminals and ground terminal 20MΩ or more (500VDC)
- Between secondary terminals and primary terminals 20MΩ or more (500VDC)

Withstand voltage:
- Between primary terminals and secondary terminals 1500VAC (For 1 minute)
- Between primary terminals and ground terminal 1500VAC (For 1 minute)
- Between secondary terminals and ground terminal 500VAC (For 1 minute)
- *Primary terminal: Terminals for power supply (100 to 240VAC), control output and alarm output

Casing: Fire-retardant polycarbonate
Color: Gray or black
Mounting: Panel mounting
External dimensions: 96 (H) x 96 (W) x 127 (D) mm
- The depth from the front panel is 120mm.

Weight:
- Without options Approximately 450g
- With options Approximately 580g

**SAFETY STANDARD**

CE:
- EN61326: 1997 +A1+A2+A3
- EN61010-1: 2001 (Overvoltage category II, pollution degree 2)
- *Under the test conditions of EMC directives, there may be variation of indication value or output value which is equivalent to maximum ±10% or maximum ±2mV, whichever is greater...

UL:
- UL61010-1 2nd edition
- c-UL: CAN/CSA C22.2 No.61010-1-04

**REFERENCE OPERATING CONDITIONS**

Ambient temperature: 23°C ±2°C
Ambient humidity: 55%RH ±5% (No dew condensation)

Power voltage:
- General power supply specifications 100VAC ±1%
- 24V power supply specifications 24VDC ±1%

Power supply frequency:
- General power supply specifications 50/60Hz ±0.5%
- 24V power supply specifications DC

Mounting angle:
- Forward or backward ±3°, lateral ±3°

Installation height:
- Altitude 2000m or below

Vibration:
- 0m/s²

Shock:
- 0m/s²

Mounting condition:
- Single-unit panel mounting (Space above, below, right and left of unit is needed.)

Wind:
- None

External noise:
- None

Warm up time: 30 minutes or longer

**NORMAL OPERATING CONDITIONS**

Ambient temperature: -10°C to 50°C (-10°C to 40°C for closed mounting)
Ambient humidity: 10 to 90%RH (no dew condensation)

Power voltage:
- General power supply specifications 90 to 264VAC
- 24V Power supply specifications 21.6 to 26.4VDC/AC

Power supply frequency:
- General power supply specifications 50/60Hz ±2%
- 24V Power supply specifications DC, 50/60Hz ±2%

Mounting angle:
- Forward or backward ±10°, lateral ±10°

Installation height:
- Altitude 2000m or below

Vibration:
- 2m/s²

Shock:
- 0m/s²

Mounting condition:
- Single-unit panel mounting (Space above and below of the unit is needed.)

External noise:
- None

Rate of ambient temperature change: 10°C/hour or less

**TRANSPORT CONDITIONS**

Ambient temperature: -20°C to 60°C
Ambient humidity: 5 to 90%RH (no dew condensation)

Vibration: 4.9m/s² (10 to 60Hz)
Shock: 392m/s²

Under the condition that the unit is packed for shipment by the factory

**STORAGE CONDITIONS**

Ambient temperature: -20°C to 60°C

For long term storage, the temperature should be 10°C to 30°C.

Ambient humidity: 5 to 90%RH (no dew condensation)

Vibration: 0m/s²

Shock: 0m/s²

Under the condition that the unit is packed for shipment by the factory
OPTIONS

Transmission signal output
Output a signal corresponding to set value (SV), process value (PV), manipulated value (MV), etc.
Number of output: 1 point
Output signal:
- 4 - 20mA (Load resistance 400Ω or less)
- 0 - 1V
  (Output resistance Approx.100, Load resistance 50Ω or more)
- 0 - 10V
  (Output resistance Approx.100, Load resistance 50Ω or more)
Output accuracy:
- General type ±0.1% of full scale
- High-precision type ±0.05% of full scale
Output resolution:
- General type Approx. 1/30000
- High-precision type Approx. 1/15000

Communications interface
With RS232C, RS422A or RS485, the setting and measured values of the controller can be transmitted to a master CPU and various parameters can be set by the master CPU.
Number of communications port: 2 ports
Communications type: RS232C, RS422A, RS485
Protocol: MODBUS (RTU), MODBUS (ASCII), PRIVATE

Heater disconnection alarm
It is the function for detecting heater disconnection by CT input.
Measurement range: 10 to 100A AC (50/60Hz)
Accuracy rating:
- ±0.5% of full scale ± 1 digit
Designated CT: Use [CTL-12-S36-8] made by URD Co., Ltd.

Panel sealing
By mounting the controller to a panel, it has the panel sealing equivalent to [IP54] compliance.

Terminal cover
It covers the terminals for safe. The cover is transparent.

2-output type
2 kinds of output with direct and reverse actions are outputted and simultaneous control of heating/cooling is enabled.
Control period: Approx. 0.1 seconds
Output type:
- ON-OFF pulse type
- Current output type, Voltage output type, SSR drive pulse type
Any combinations of these types are enabled.
Control system: PID system

Digital input (DI)
The following switching is enabled by digital input signal.
Input signal:
- No-voltage contact, open-collector signal
External contact capacity: 5VDC 2mA
Functions:
1. Selection of pattern No. (6 points)
2. Manual output operation/automatic output operation (2 points)
3. Holding of PV
4. Run/stop
5. Advance
6. Reset
7. Wait
8. Fast
9. Start/reset of timer (4 points)
10. Alarm output cancellation
11. Preset manual/Automatic output operation

Digital output (DO)
Time signal or status signal can be outputted externally open-collector signal.
Output signal: Open-collector signal
Capacity: 24VDC, Maximum 50mA
Functions:
1. Time signal (Maximum 8 points)
2. Run/stop
3. Advance
4. Reset
5. Wait
6. End

DETAILED SPECIFICATIONS OF ACCURACY RATING

<table>
<thead>
<tr>
<th>Input type</th>
<th>Accuracy rating</th>
<th>Exceptional specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>±0.1%±1digit</td>
<td>Less than 400°C: Not specified / 400°C to less than 800°C: ±0.2%±1digit / 0°C to less than 400°C: ±0.2%±1digit</td>
</tr>
<tr>
<td>R, S</td>
<td></td>
<td>-200°C to less than 0°C: ±0.2%±1digit or the value equivalent to ±80μV, whichever is greater</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>-270°C to less than 0°C: ±0.2%±1digit or the value equivalent to ±80μV, whichever is greater</td>
</tr>
<tr>
<td>K</td>
<td></td>
<td>-200°C to less than 0°C: ±0.2%±1digit or the value equivalent to ±80μV, whichever is greater</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>-270°C to less than 0°C: ±0.2%±1digit or the value equivalent to ±40μV, whichever is greater</td>
</tr>
<tr>
<td>J</td>
<td></td>
<td>-200°C to less than 0°C: ±0.2%±1digit or the value equivalent to ±40μV, whichever is greater</td>
</tr>
<tr>
<td>T</td>
<td></td>
<td>-200°C to less than 0°C: ±0.2%±1digit or the value equivalent to ±40μV, whichever is greater</td>
</tr>
<tr>
<td>U</td>
<td></td>
<td>0°C to less than 400°C: ±0.3%±1digit</td>
</tr>
<tr>
<td>L</td>
<td></td>
<td>0°C to less than 400°C: ±0.3%±1digit</td>
</tr>
<tr>
<td>WRe5-WRe26</td>
<td></td>
<td>0°C to less than 400°C: ±0.3%±1digit</td>
</tr>
<tr>
<td>W-Re26</td>
<td></td>
<td>0°C to less than 400°C: ±0.3%±1digit</td>
</tr>
<tr>
<td>NiMo-Ni</td>
<td></td>
<td>0°C to less than 400°C: ±0.3%±1digit</td>
</tr>
<tr>
<td>PlatineI</td>
<td></td>
<td>0°C to less than 400°C: ±0.3%±1digit</td>
</tr>
<tr>
<td>CR-AuFe</td>
<td>±0.2%±1digit</td>
<td>0K to less than 200K: ±0.5%±1digit / 20K to less than 50K: ±0.3%±1digit</td>
</tr>
<tr>
<td>PR5-20</td>
<td></td>
<td>0°C to less than 100°C: Not specified / 100°C to less than 200°C: ±0.5%±1digit</td>
</tr>
<tr>
<td>PR40-PtRh20</td>
<td>±0.2%±1digit</td>
<td>0°C to less than 100°C: ±0.5%±1digit / 200°C to less than 400°C: ±0.8%±1digit</td>
</tr>
<tr>
<td>DC voltage / DC current</td>
<td>±0.1%±1digit</td>
<td>For the measuring range of [-100°C to 100°C] only: ±0.15%±1digit</td>
</tr>
<tr>
<td>Resistance thermometer</td>
<td>±0.1%±1digit</td>
<td>4K to less than 20K: ±5%±1digit / 20K to less than 50K: ±3%±1digit</td>
</tr>
</tbody>
</table>

The above ratings are the measurement range conversion accuracies under the reference operating conditions.
For thermocouple inputs, the reference junction compensation accuracy is added.

WRe5-WRe26, W-Re26, NiMo-Ni, PlatineI, CR-AuFe, PR40-PtRh20 - ASTM Vol.14.03
U. L. - DIN43710-1985
Pt100 - IEC751 (1995), JIS C 1604-1987
JP100 - JIS C 1604-1981, JIS C 1606-1986
JP50 - JIS C 1604-1981
WRe5-WRe26, W-Re26, NiMo-Ni, PlatineI, CR-AuFe, PR40-PtRh20 - ASTM Vol.14.03
 TERMINAL ARRANGEMENT

Option terminals

Options common to each zone

<table>
<thead>
<tr>
<th>9</th>
<th>P</th>
<th>M</th>
<th>T</th>
<th>N</th>
<th>1st - 2nd - 3rd zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>DI</td>
<td>CT</td>
<td>DO</td>
<td>CT</td>
<td></td>
</tr>
<tr>
<td>CT</td>
<td>DI</td>
<td>CT</td>
<td>DO</td>
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<td>DI</td>
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<tr>
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<td>DI</td>
<td>DO</td>
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</tr>
<tr>
<td>COM</td>
<td>COM</td>
<td>COM</td>
<td>COM</td>
<td>COM</td>
<td></td>
</tr>
</tbody>
</table>

9: Heater disconnection alarm  P: 6 Digital inputs
M: 4 Digital inputs + Heater disconnection alarm
T: 6 Digital outputs  N: 4 Digital inputs + Heater disconnection alarm

Transmission signal output (2nd zone)

<table>
<thead>
<tr>
<th>1/2/3/4</th>
<th>J/K/L</th>
<th>H</th>
<th>J/K/L</th>
<th>1/2/3/4</th>
<th>J/K/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
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<tr>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

1/2/3/4: High-precision type  J/K/L: General type  H: Transmitter power supply

Communications interface + Digital input (3rd zone)

<table>
<thead>
<tr>
<th>R</th>
<th>A</th>
<th>S</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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</thead>
<tbody>
<tr>
<td>RD</td>
<td>RDA</td>
<td>SA</td>
<td>RD1</td>
<td>RD1</td>
<td>RD1</td>
<td>SA1</td>
<td>SA1</td>
<td>SA1</td>
</tr>
<tr>
<td>SD</td>
<td>RDB</td>
<td>SB</td>
<td>SD1</td>
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<tr>
<td>SG</td>
<td>SDA</td>
<td>SG</td>
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<td>SG1</td>
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</tr>
<tr>
<td>DI</td>
<td>SDIB</td>
<td>DI</td>
<td>RD2</td>
<td>RDA2</td>
<td>SA2</td>
<td>RD2</td>
<td>RDA2</td>
<td>SA2</td>
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<td>DI</td>
<td>SG</td>
<td>DI</td>
<td>SD2</td>
<td>RDB2</td>
<td>SB2</td>
<td>SD2</td>
<td>RDB2</td>
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<tr>
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<td>DI</td>
<td>DI</td>
<td>SG2</td>
<td>SDA2</td>
<td>SG2</td>
<td>SG2</td>
<td>SDA2</td>
<td>SG2</td>
</tr>
<tr>
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<td>COM</td>
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</tr>
</tbody>
</table>

R: Communications RS232C + 3 Digital inputs  A: Communications RS422A + 1 Digital input
S: Communications RS485 + 3 Digital inputs  B: Communications RS232C + Communications RS485 + 1 Digital input
C: Communications RS232C + Communications RS422A + 1 Digital input  D: Communications RS232C + Communications RS485 + 1 Digital input
E: Communications RS485 + Communications RS232C + 1 Digital input  F: Communications RS485 + Communications RS422A + 1 Digital input
G: Communications RS485 + Communications RS485 + 1 Digital input

Based on combination with other options, assign the zone in the above order.
● Option terminals (continued)

Digital input/output + Heater disconnection alarm (3rd zone)

<table>
<thead>
<tr>
<th></th>
<th>U</th>
<th>V</th>
<th>W</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI</td>
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<td>DO</td>
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</tr>
<tr>
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<td>CT</td>
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<tr>
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<td>COM</td>
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<td></td>
</tr>
</tbody>
</table>

U: 8 Digital inputs  
V: 6 Digital inputs + Heater disconnection alarm  
W: 8 Digital outputs  
X: 6 Digital outputs + Heater disconnection alarm  
Y: 3 Digital inputs + 5 Digital outputs  
Z: 4 Digital inputs + 4 Digital outputs

● ABOUT CRIMP STYLE TERMINALS

- Ring type
  - 7 or less
  - 8 X 9 or less
  - (in pressed condition)

- Spade type
  - 7 or less
  - 8 X 9 or less
  - (in pressed condition)

*Use terminal with insulation

■ EXTERNAL DIMENSIONS

- Mounting metal
- Terminal cover
- 96 x 96
- 91 x 91
- 147

● PANEL CUTOUT

- 120
- 92
- 20

- N: Number of mounted instruments

Unit: mm

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