The KP1000 series is a 96x96mm digital program controller with the indicating accuracy of ±0.1%, the control cycle of approximately 0.1 seconds and maximum 19 program patterns (maximum 19 steps/pattern).

Various functions including the whole program pattern display screen and universal input are provided as standard.

**FEATURES**

- **Large easy-to-view 5-digit display**
  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.

- **Operability inheriting previous models**
  The controller inherits the settings screen which has been familiarized for long time. You can set up it with operation which is not different from previous models. The performance of touching-keys has been improved and the outstanding operability has been realized.

- **Easily identifiable pattern progress display**
  By selecting the whole program pattern display screen in the operation screen, the shape of whole program pattern and the progressed pattern position are identifiable at a glance.

- **Universal input**
  Various measurement ranges of DC voltage (up to maximum 10V) inputs, DC current input, thermocouple inputs and resistance thermometer inputs have been built-in.

- **2 colors of casing available**
  You can select the color of casing from 2 colors of gray with OA equipment feeling and black with high-class feeling.

- **High-precision transmission signal output**
  The high-precision (0.1% of full scale) analog transmission signal output can be added.

- **24V power supply voltage type provided**
  The power supply voltage 24V (AC/DC) type, which is advantageous in respect of safe, is available.

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

- **Program pattern**
  Settings of maximum 19 steps per pattern and maximum 19 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.
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 (Standard load specification)
  - 3: Current output type PID
  - 5: SSR drive pulse type PID
  - 6: Voltage output type PID
  - 8: ON-OFF servo type PID (Very light load specification)

- **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

- **Communications interface (1st zone)**
  - 0: None
  - R: RS232C
  - A: RS422A
  - S: RS485

- **Time signal outputs**
  - T: 5 Time signal outputs
  - N: 4 Status signal + End signal outputs
  - D: 4 External drive inputs
  - P: Pattern selection input
  - M: 4 Time signal + End signal outputs

- **Transmission signal output (2nd zone)**
  - 0: None
  - 1: 4-20mA
  - 2: 0-1V
  - 3: 0-10V
  - 4: Other

- **External drive input (3rd zone)**
  - 0: None
  - 5: 4 Time signal outputs + End signal + 3 External drive inputs
  - 6: 5 Time signal outputs + 3 External drive inputs
  - 7: 4 Status signal outputs + 4 External drive inputs
  - 8: 3 External drive inputs + Pattern selection input
  - T: 5 Time signal outputs
  - N: 4 Status signal outputs + End signal outputs
  - D: 4 External drive inputs
  - P: Pattern selection input
  - M: 4 Time signal + End signal outputs

- **Case color**
  - Gray
  - Black

- **Panel sealing and terminal cover**
  - 0: None
  - 1: Terminal cover
  - 2: IP54 panel sealing + No terminal cover
  - 3: IP54 panel sealing + Terminal cover

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

---

MEASURING 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 1820.0°C</td>
</tr>
<tr>
<td>R</td>
<td>0.0 to 1760.0°C</td>
</tr>
<tr>
<td>S</td>
<td>0.0 to 1760.0°C</td>
</tr>
<tr>
<td>K</td>
<td>-200.0 to 1370.0°C</td>
</tr>
<tr>
<td>E</td>
<td>0.0 to 700.0°C</td>
</tr>
<tr>
<td>J</td>
<td>-270.0 to 1000.0°C</td>
</tr>
<tr>
<td>T</td>
<td>-40.0 to 200.0°C</td>
</tr>
<tr>
<td>WRe5-WRe26</td>
<td>0.0 to 2310.0°C</td>
</tr>
<tr>
<td>W-WRe26</td>
<td>0.0 to 2310.0°C</td>
</tr>
<tr>
<td>NiMo-Ni</td>
<td>-50.0 to 1410.0°C</td>
</tr>
<tr>
<td>CR-AuFe</td>
<td>0.0 to 280.0°C</td>
</tr>
<tr>
<td>Pt100</td>
<td>0.0 to 1300.0°C</td>
</tr>
<tr>
<td>PtRh40-PtRh20</td>
<td>0.0 to 1800.0°C</td>
</tr>
<tr>
<td>Platinum II</td>
<td>0.0 to 1390.0°C</td>
</tr>
<tr>
<td>U</td>
<td>0.0 to 800.0°C</td>
</tr>
<tr>
<td>L</td>
<td>-200.0 to 900.0°C</td>
</tr>
<tr>
<td>10mV</td>
<td>-10 to 10mV</td>
</tr>
<tr>
<td>20mV</td>
<td>-20 to 20mV</td>
</tr>
<tr>
<td>50mV</td>
<td>-50 to 50mV</td>
</tr>
<tr>
<td>100mV</td>
<td>-100 to 1000mV</td>
</tr>
<tr>
<td>5V</td>
<td>-5 to 5V</td>
</tr>
<tr>
<td>10V</td>
<td>-10 to 0V</td>
</tr>
</tbody>
</table>

### DC current

<table>
<thead>
<tr>
<th>DC current</th>
<th>Scale ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>20mA</td>
<td>0.0 to 20mA</td>
</tr>
</tbody>
</table>

### Resistance thermometer

#### JP100

<table>
<thead>
<tr>
<th>Resistance thermometer</th>
<th>Scale ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP100</td>
<td>-200.0 to 649.0°C</td>
</tr>
<tr>
<td>Old Pt100</td>
<td>-200.0 to 649.0°C</td>
</tr>
<tr>
<td>JP50</td>
<td>-200.0 to 649.0°C</td>
</tr>
<tr>
<td>Pt100</td>
<td>-200.0 to 649.0°C</td>
</tr>
</tbody>
</table>

#### JP50

<table>
<thead>
<tr>
<th>Resistance thermometer</th>
<th>Scale ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP50</td>
<td>-200.0 to 649.0°C</td>
</tr>
<tr>
<td>Pt-Co</td>
<td>4.0 to 374.0K</td>
</tr>
</tbody>
</table>

#### Pt-Co

<table>
<thead>
<tr>
<th>Resistance thermometer</th>
<th>Scale ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt-Co</td>
<td>-200.0 to 649.0°C</td>
</tr>
</tbody>
</table>

---

*Option

**Note:** For options common to 1st zone, 2nd zone and 3rd zone, assign them in the order of [T], [N], [D], [P] and [M] from 3rd zone first.

**Standards**

- WRe5-WRe26, W-WRe26, NiMo-Ni, Platinum II, CR-AuFe, PtRh40-PtRh20: ASTM Vol. 14.03
- DIN 43710-1985
- Pt100, JEC751 (1995), JSC 1604 -1997
- JP50, JSC 1804 -1981
### NAMES OF VARIOUS PARTS

<table>
<thead>
<tr>
<th>Display</th>
<th>Function keys</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Operation status (RUN) indication</td>
<td>13. FNC key</td>
</tr>
<tr>
<td>Lights in operation.</td>
<td>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.</td>
</tr>
<tr>
<td>2. Operation stop (STOP) indication</td>
<td>14. RUN key</td>
</tr>
<tr>
<td>Lights in the state of operation stop.</td>
<td>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.</td>
</tr>
<tr>
<td>3. RESET indication</td>
<td>15. STOP key</td>
</tr>
<tr>
<td>Lights when operation is cancelled and returns to the start point.</td>
<td>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 for moving the cursor and for selecting a parameter.</td>
</tr>
<tr>
<td>4. Constant value operation (CONST) indication</td>
<td>16. ADV (Advance) key</td>
</tr>
<tr>
<td>Light in constant value operation.</td>
<td>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 selecting a parameter.</td>
</tr>
<tr>
<td>5. Pattern No. (PTN) indication</td>
<td>17. RESET key</td>
</tr>
<tr>
<td>Lights when operation is executed by external drive input.</td>
<td>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.</td>
</tr>
<tr>
<td>6. Alarm-standby (WAIT) indication</td>
<td>18. PTN (Pattern) key</td>
</tr>
<tr>
<td>Lights in alarm-standby status or when alarm is cancelled. Blinks when standby time alarm is activated.</td>
<td>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.</td>
</tr>
<tr>
<td>7. Program remote (REM) indication</td>
<td>19. A/M (Auto/Manual) key</td>
</tr>
<tr>
<td>Lights when operation is executed by external drive input.</td>
<td>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.</td>
</tr>
<tr>
<td>8. Executing step number (STP) indication</td>
<td>20. Process value (PV) indication</td>
</tr>
<tr>
<td>The step No. being executed is indicated. (Blinks in real temperature compensation operation.)</td>
<td></td>
</tr>
<tr>
<td>9. Error (ERR) indication</td>
<td>21. Set value (SV) indication</td>
</tr>
<tr>
<td>Lights when sampling of input is abnormal.</td>
<td></td>
</tr>
<tr>
<td>10. Auto-tuning operation (AT) indication</td>
<td>22. Time signal (TS1 to TS5) indication</td>
</tr>
<tr>
<td>Lights in auto-tuning operation.</td>
<td>Alarm activation (AL1 to 4) indication</td>
</tr>
<tr>
<td>11. Manual operation (MAN1/MAN2) indication</td>
<td></td>
</tr>
<tr>
<td>Lights when the output No. 1 or No. 2 is in manual output operation.</td>
<td></td>
</tr>
<tr>
<td>12. Function (FNC) operation indication</td>
<td>23. A wide variety of operation screens are prepared and arbitrarily-selection is enabled.</td>
</tr>
<tr>
<td>Lights when the function key is operated.</td>
<td>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.</td>
</tr>
<tr>
<td>13. FNC key</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
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<tr>
<td>14. RUN key</td>
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<td>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.</td>
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<td>15. STOP key</td>
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<td>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 for moving the cursor and for selecting a parameter.</td>
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<td></td>
</tr>
<tr>
<td>20. Process value (PV) indication</td>
<td></td>
</tr>
<tr>
<td>21. Set value (SV) indication</td>
<td></td>
</tr>
<tr>
<td>22. Time signal (TS1 to TS5) indication</td>
<td></td>
</tr>
<tr>
<td>23. A wide variety of operation screens are prepared and arbitrarily-selection is enabled.</td>
<td>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.</td>
</tr>
</tbody>
</table>

---

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.
### Input Specifications

**Input signal:**
- Thermocouple: B, R, S, K, E, J, T, N, WR6-WR626, W-WR626, Ni-Ni, CR-AuFe, PR5-20, PtRh40-PtRh20, Platine II UI L
- DC voltage: ±0.1 mV, ±0.2 mV, ±0.5 mV, ±1.0 mV, ±5 V, ±10 V
- DC current: 0 to 20 mA

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

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

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

**Resolution:** Approximately 1/30000

**Sampling rate:** Approximately 0.1 seconds

**Burnout:**
- Upscale burnout is only enabled in thermocouple, DC voltage (±0.5 mV 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 (±100 mV or more), DC current, resistance temperature (4-wire type).

**Input impedance:**
- Thermocouple: 1 MD or more
- DC voltage: 1 MD or more
- DC current: Approximately 2500 Ω

**Allowable signal source resistance:**
- Thermocouple: 1000 Ω or less
- DC voltage (mV): 1000 Ω or less
- DC voltage (V): 3000 Ω or less

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

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

**Maximum allowable input:**
- Thermocouple: ±20 V or less
- DC voltage: ±20 V or less
- DC current: ±30 mA or less, ±7.5 V or less
- Resistance thermometer: 5000 Ω or less, ±5 V or less

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

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

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

### Display Specifications

**Display element:**
- Upper display: LED
- Lower display: LCD (with backlight) 108 x 24 dots

**Display content:**
- Upper display: PV 5-digit, SV 5-digit, status indications, etc.
- Lower display: MV, output status, settings screen, etc

### Control Specifications

**Control cycle:** Approximately 0.1 seconds

**Output type:**
- ON-OFF pulse type
- ON-OFF servo type
- Current 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
- Contact protection: Small CR element built-in

**ON-OFF servo type:**
- Output signal: ON-OFF servo conductive signal
- Contact capacity of standard load:
  - Resistive load 100 to 240VAC 30VDC 20 mA or less
  - Inductive load 100 to 240VAC 30VDC 2.5A or less
  - Smallest load 5VDC 1 mA or more

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

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

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

**Output limiter:**
- Range: -5.0 to 105.0%
- 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 fixed at 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%
- AUTO → AUTO Balanceless bumpy
- AUTO → MAN Keeping output at AUTO

### Setting Specifications

**Number of patterns:** 19 patterns

**Number of steps:** 19 steps/pattern

**Control relations:**
- PID 8 types
- Step repetition: Maximum 999 times

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

**A.R.W. (Anti reset windup):**
- High limit: 0 to 100.0%
- Low limit: -100 to 0.0%

**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 delay
**ALARM SPECIFICATIONS**

Number of alarm points: 4 points

Alarm types: Absolute value alarm, deviation alarm

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
  - 240VAC 15VA
  - With options 100VAC 15VA
  - 240VAC 20VA
- 24V Power supply specifications
  - Without options 24VAC 10VA
  - 24VDC 5W
  - 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 ground terminal 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)

Casing: Fire-retardant polycarbonate

Color: Gray or black

Mounting: Panel mounting

External dimensions: 96 (H) x 96 (W) x 127 (D) mm

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.)

Exterior 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.100Ω, Load resistance 50kΩ or more)
  - 0 - 10V (Output resistance Approx.100Ω, Load resistance 50kΩ or more)
  - Output accuracy: ±0.1% of full scale
  - Output resolution: Approximately 1/30000

- **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 points: 1 point
  - Communications type: RS232C, RS422A, RS485
  - Communication speed: 2400/4800/9600/19200/38400 bps
  - Protocol: MODBUS (RTU), MODBUS (ASCII), PRIVATE

- **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

- **External drive input**
  - Operation by external contact signal input is enabled.
  - Input signal: No-voltage contact, open-collector signal
  - Functions: 1. Run/Stop
  - 2. Advance
  - 3. Reset
  - 4. Wait

- **Pattern Selecting input**
  - Selection of pattern No. by external contact signal input is enabled.
  - Input signal: No-voltage contact, open-collector signal
  - Function: Pattern No. selection 5 points

- **Status signal output**
  - Current operation status can be outputted.
  - Output signal: Open-collector signal
  - Functions: 1. Run/Stop
  - 2. Advance
  - 3. Reset
  - 4. Wait

- **Time signal output**
  - Time signal can be outputted for each preset pattern/step.
  - Output signal: Open-collector signal
  - Function: Time signal 5 points

- **End signal output**
  - Program operation end status can be outputted.
  - Output signal: Open-collector signal
  - Function: End

**DETAILED SPECIFICATIONS OF ACCURACY RATING**

<table>
<thead>
<tr>
<th>Thermocouple</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% ±1 digit</td>
</tr>
<tr>
<td>R, S</td>
<td></td>
<td>0°C to less than 400°C: ±0.2% ±1 digit</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>-200°C to less than 0°C: ±0.2% ±1digit or the value equivalent to ±60µV, whichever is greater</td>
</tr>
<tr>
<td>K</td>
<td></td>
<td>-270°C to less than 0°C: ±0.2% ±1digit or the value equivalent to ±60µV, whichever is greater</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>-200°C to less than 0°C: ±0.2% ±1digit or the value equivalent to ±60µV, whichever is greater</td>
</tr>
<tr>
<td>J</td>
<td></td>
<td>-270°C to less than 0°C: ±0.2% ±1digit or the value equivalent to ±40 µV, 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>-200°C to less than 0°C: ±0.2% ±1digit</td>
</tr>
<tr>
<td>L</td>
<td></td>
<td>0°C to less than 400°C: ±0.3% ±1 digit</td>
</tr>
<tr>
<td>WRe5-WRe26</td>
<td>±0.2%±1digit</td>
<td>0K to less than 200K: ±0.5% ±1 digit / 20K to less than 50K: ±0.3% ±1 digit</td>
</tr>
<tr>
<td>W-WRe26</td>
<td></td>
<td>0°C to less than 100°C: Not specified / 100°C to less than 200°C: ±0.5% ±1 digit</td>
</tr>
<tr>
<td>NiMo-Ni</td>
<td></td>
<td>0°C to less than 400°C: ±1.5% ±1digit / 400°C to less than 800°C: ±0.8% ±1 digit</td>
</tr>
<tr>
<td>PlatineII</td>
<td></td>
<td>0°C to less than 400°C: ±0.3% ±1 digit</td>
</tr>
<tr>
<td>CR-AuFe</td>
<td></td>
<td>0K to less than 200K: ±0.5% ±1 digit / 20K to less than 50K: ±0.3% ±1 digit</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% ±1 digit</td>
</tr>
<tr>
<td>PPh40-PPh20</td>
<td></td>
<td>0°C to less than 400°C: ±1.5% ±1digit / 400°C to less than 800°C: ±0.8% ±1 digit</td>
</tr>
<tr>
<td>DC voltage / DC current</td>
<td>±0.1%±1digit</td>
<td></td>
</tr>
<tr>
<td>Resistance thermometer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pt100</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>Old Pt100</td>
<td></td>
<td>4K to less than 20K: ±0.5% ±1digit / 20K to less than 50K: ±0.3% ±1digit</td>
</tr>
<tr>
<td>JPt100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JPt50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pt-Co</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The above ratings are the measurement range conversion accuracies under the reference operating conditions.

---

6
## TERMINAL ARRANGEMENT

### Option terminals

Options common to each zone

<table>
<thead>
<tr>
<th></th>
<th>T</th>
<th>N</th>
<th>D</th>
<th>P</th>
<th>M</th>
<th>1st</th>
<th>2nd</th>
<th>3rd zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS1</td>
<td>RUN/STOP</td>
<td></td>
<td></td>
<td>PTN10</td>
<td>TS1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS2</td>
<td>ADV</td>
<td></td>
<td>WAIT</td>
<td>PTN8</td>
<td>TS2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS3</td>
<td>RESET</td>
<td></td>
<td>RESET</td>
<td>PTN4</td>
<td>TS3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS4</td>
<td>WAIT</td>
<td>ADV</td>
<td>PTN2</td>
<td>TS4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS5</td>
<td>END</td>
<td>RUN/STOP</td>
<td>PTN1</td>
<td>END</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM</td>
<td>COM</td>
<td>COM</td>
<td>COM</td>
<td>COM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on combination with other options assign the zone in the above order.

- T: 5 Time signal outputs
- D: 4 External drive inputs
- N: 4 Status signal + End signal outputs
- P: Pattern selecting input
- M: Time signal + End signal output

### Communications interface (1st zone)

<table>
<thead>
<tr>
<th></th>
<th>R</th>
<th>A</th>
<th>S</th>
<th></th>
<th>1, 2, 3, 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD</td>
<td>RDA</td>
<td>SA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>RDB</td>
<td>SB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG</td>
<td>SDA</td>
<td>SG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG</td>
<td>SDB</td>
<td>SG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R: RS232C</td>
<td>A: RS422A</td>
<td>S: RS485</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Transmission signal output (2nd zone)

### External drive input (3rd zone)

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS1</td>
<td>TS1</td>
<td>RUN/STOP</td>
<td>PTN10</td>
<td></td>
</tr>
<tr>
<td>TS2</td>
<td>TS2</td>
<td>ADV</td>
<td>PTN8</td>
<td></td>
</tr>
<tr>
<td>TS3</td>
<td>TS3</td>
<td>RESET</td>
<td>PTN4</td>
<td></td>
</tr>
<tr>
<td>TS4</td>
<td>TS4</td>
<td>WAIT</td>
<td>PTN2</td>
<td></td>
</tr>
<tr>
<td>END</td>
<td>TS5</td>
<td>WAIT</td>
<td>PTN1</td>
<td></td>
</tr>
<tr>
<td>RESET</td>
<td>RESET</td>
<td>RESET</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADV</td>
<td>ADV</td>
<td>ADV</td>
<td>ADV</td>
<td></td>
</tr>
<tr>
<td>RUN/STOP</td>
<td>RUN/STOP</td>
<td>RUN/STOP</td>
<td>RUN/STOP</td>
<td></td>
</tr>
<tr>
<td>COM</td>
<td>COM</td>
<td>COM</td>
<td>COM</td>
<td></td>
</tr>
</tbody>
</table>

- 5: 4 Time signal + End signal outputs + 3 External drive inputs
- 6: 5 Time signal outputs + 3 External drive inputs
- 7: 4 Status signal outputs + 4 External drive inputs
- 8: 3 External drive inputs + Pattern selecting input
ABOUT CRIMP STYLE TERMINALS

- **Ring type**
  - 7 or less
  - Ø3.7 or less
  - 7 or less
  - (in pressed condition)

- **Spade type**
  - 7 or less
  - Ø3.7 or less
  - 7 or less
  - (in pressed condition)

*Use terminal with insulation

EXTERNAL DIMENSIONS

- **Panel cutout**
- **Closed mounting panel dimensions**

Terminal cover

Mounting metal

N: Number of mounted instruments

Unit: mm

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