Digital Temperature Controller
RB series
(RB100/400/500/700/900)

Installation Manual

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In order to achieve maximum performance and ensure proper operation of the instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference. This manual describes mounting, wiring, parts descriptions, etc.

For detailed handling procedures and key operations, refer to separate **RB series Instruction Manual (IMR02C15-E□)**.
The manual can be downloaded from the official RKC website:
https://www.rkcinst.com/english/manual_load.htm.

■ Product Check

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Mounting bracket (with screw) . . . . 2 *
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* RB900 Waterproof/Dustproof type: 4

■ Safety Precautions

NOTICE

1. MOUNTING

⚠ **WARNING**

To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.
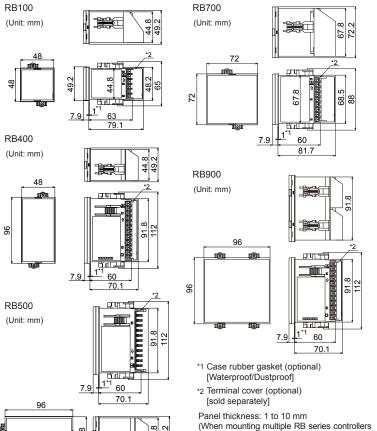
1.1 Mounting Cautions

(1) This instrument is intended to be used under the following environmental conditions.
(IEC 61010-1) [OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2]

(2) Use this instrument within the following environment conditions:
● Allowable ambient temperature: 0 to 50 ℃
● Allowable ambient humidity: 10 to 90 %RH
  (Absolute humidity: MAX. W. C 29.3 g/m³ dry air at 101.3 kPa)
● Installation environment conditions: Indoor use, Altitude up to 2000 m

(3) Avoid the following conditions when selecting the mounting location:
● Rapid changes in ambient temperature which may cause condensation.
● Corrosive or inflammable gases.
● Direct vibration or shock to the mainframe.
● Water, oil, chemicals, vapor or steam splashes.
● Excessive dust, salt or iron particles.
● Excessive induction noise, static electricity, magnetic fields or noise.
● Direct air flow from an air conditioner.
● Exposure to direct sunlight.
● Excessive heat accumulation.

(4) Mount this instrument in the panel considering the following conditions:
● Provide adequate ventilation space so that heat does not build up.
● Ensure at least 50 mm space on top and bottom of the instrument for maintenance and environmental reasons.
● Do not mount this instrument directly above the equipment that generates large amount of heat (heaters, transformers, semi-conductor functional devices, large-wattage resistors.)
● If the ambient temperature rises above 50 ℃, cool this instrument with a forced air fan, cooler, etc. Cooled air should not blow directly on this instrument.
● In order to improve safety and the immunity to withstand noise, mount this instrument as far away as possible from high voltage equipment, power lines, and rotating machinery.
  High voltage equipment: Do not mount within the same panel.
  Power lines: Separate at least 200 mm.
  Rotating machinery: Separate as far as possible.
● The view angle of this controller is 30° to the upper side and the lower side from the center of the display.

(5) In case this instrument is connected to a supply by means of a permanent connection, a switch or circuit-breaker shall be included in the installation. This shall be in close proximity to the equipment and within easy reach of the operator. It shall be marked as the disconnecting device for the equipment.
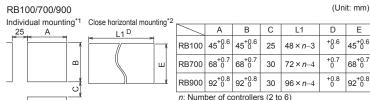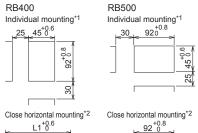
1.2 Dimensions

RB100 (Unit: mm)

48, 48, 49.2, 44.8, 48.2, 65, 7.9, 63, 79.1, *2

RB400 (Unit: mm)

48, 96, 44.8, 49.2, 91.8, 112, 7.9, 60, 70.1, *2, *1

RB500 (Unit: mm)

96, 91.8, 112, 7.9, 60, 70.1, 48, 44.8, 49.2, *2, *1

RB700 (Unit: mm)

72, 72, 67.8, 72.2, 67.8, 68.5, 88, 7.9, 60, 81.7, *2

RB900 (Unit: mm)

91.8, 96, 91.8, 112, 7.9, 60, 70.1, *2, *1

*1 Case rubber gasket (optional) [Waterproof/Dustproof]
*2 Terminal cover (optional) [sold separately]

Panel thickness: 1 to 10 mm
(When mounting multiple RB series controllers close together, the panel strength should be checked to ensure proper support.)

● Panel cutout

(Unit: mm)

RB100/700/900

Individual mounting*1   Close horizontal mounting*2

	A	B	C	L1	D	E
RB100	$45^{+0.6}_{0}$	$45^{+0.6}_{0}$	25	$48 \times n{-}3$	$^{+0.6}_{0}$	$45^{+0.6}_{0}$
RB700	$68^{+0.7}_{0}$	$68^{+0.7}_{0}$	30	$72 \times n{-}4$	$^{+0.7}_{0}$	$68^{+0.7}_{0}$
RB900	$92^{+0.8}_{0}$	$92^{+0.8}_{0}$	30	$96 \times n{-}4$	$^{+0.8}_{0}$	$92^{+0.8}_{0}$

n: Number of controllers (2 to 6)

RB400 Individual mounting*1   **RB500** Individual mounting*1

*1 To keep the instrument as waterproof as possible, make sure that the panel surface has no burr or distortion where the hole is to be cut out.

*2 Remove the case rubber gasket. When the RB series is mounted closely protection will be compromised and they will not meet IP66 (NEMA4X) standards.

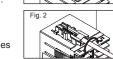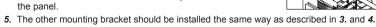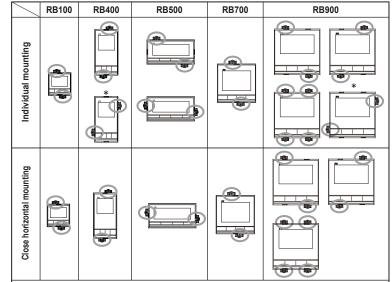Close horizontal mounting*2   Close horizontal mounting*2

L1 = 48 × n - 3   L1 = 48 × n - 3
n: Number of controllers (2 to 6)

1.3 Procedures of Mounting and Removing

■ Mounting procedures

1. Prepare the panel cutout as specified in **1.2 Dimensions.**
2. Insert the instrument through the panel cutout.
3. Insert the mounting bracket into the mounting groove of the instrument (Fig. 1). Do not push the bracket forcibly forward.
4. Tighten up the screw for the mounting bracket with a Phillips screwdriver so that the mounting bracket is firmly secured in place (Fig. 2). Give the screw another turn when the tip of the screw touches the panel.
5. The other mounting bracket should be installed the same way as described in **3.** and **4.**

Fig. 1

Fig. 2

The front of the instrument conforms to **IP66 (NEMA4X)** [Specify when ordering] when mounted on the panel. Checked and confirmed its compliance through the internal test at RKC. For effective Waterproof/Dustproof, the gasket must be securely placed between the instrument and the panel without any gap. If the gasket is damaged, please contact RKC sales office or the agent.
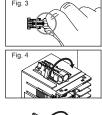
● The mounting position of the mounting bracket

RB100	RB400	RB500	RB700	RB900

Individual mounting / Close horizontal mounting

If only two mounting brackets are used on the Waterproof/Dustproof type controller as shown in the figure (marked*), sufficient Waterproof/Dustproof performance cannot be obtained.

■ Removal procedures

1. Turn the power OFF.
2. Remove the wiring.
3. Loosen the screw of the mounting bracket.
4. Hold the rear of the mounting bracket (Fig. 3), and lift up one side to remove it from the case (Fig. 4).
5. The other mounting bracket should be removed in the same way as described in **3.** and **4.**
6. Pull out the instrument from the mounting cutout while holding the front panel frame of this instrument.

Fig. 3

Fig. 4

Use long-nose pliers to remove the mounting brackets from the instrument that is installed in a narrow place or installed tightly in a vertical position.
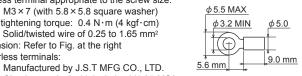
2. WIRING

⚠ **WARNING**

To prevent electric shock or instrument failure, do not turn on the power until all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.

2.1 Wiring Cautions

● For thermocouple input, use the appropriate compensation wire.
● For RTD input, use low resistance lead wire with no difference in resistance between the three lead wires.
● Signal connected to Voltage input and Current input shall be low voltage defined as "SELV" circuit per IEC 60950-1.
● To avoid noise induction, keep input signal wire away from instrument power line, load lines and power lines of other electric equipment.
● If there is electrical noise in the vicinity of the instrument that could affect operation, use a noise filter.
  − Shorten the distance between the twisted power supply wire pitches to achieve the most effective noise reduction.
  − Always install the noise filter on a grounded panel. Minimize the wiring distance between the noise filter output and the instrument power supply terminals to achieve the most effective noise reduction.
  − Do not connect fuses or switches to the noise filter output wiring as this will reduce the effectiveness of the noise filter.
● Allow approximately 5 seconds for contact output when the instrument is turned on. Use a delay relay when the output line is used for an external interlock circuit.
● Power supply wiring must be twisted and have a low voltage drop.
● This instrument is not provided with an overcurrent protection device. For safety install an overcurrent protection device (such as a fuse) with adequate breaking capacity close to the instrument.
  − Fuse type: Time-lag fuse (Approved fuse according IEC 60127-2 and/or UL 248-14)
  − Fuse rating: Rated current: 1.0 A
● For the current input specification, a shunt resistor of 250 Ω ±0.02 % (Temperature characteristics: ±10 ppm/℃, Specified voltage: 0.25 W or more) must be connected between the input terminals.
● For an instrument with 24 V power supply input, supply power from a "SELV" circuit defined as IEC 60950-1.
● A suitable power supply should be considered in end-use equipment. The power supply must be in compliance with a limited-energy circuits (maximum available current of 8 A).
● Use the solderless terminal appropriate to the screw size.
Screw size: M3 × 7 (with 5.8 × 5.8 square washer)
Recommended tightening torque: 0.4 N·m (4 kgf·cm)
Applicable wire: Solid/twisted wire of 0.25 to 1.65 mm²
Specified dimension: Refer to Fig. at the right
Specified solderless terminals:
  Manufactured by J.S.T MFG CO., LTD.
  Circular terminal with isolation V1.25-MS3
  (M3 screw, width 5.5 mm, hole diameter 3.2 mm)

φ5.5 MAX, φ3.2 MIN, φ5.0, 5.6 mm, 9.0 mm

● Make sure that during field wiring parts of conductors cannot come into contact with adjacent conductive parts.

When tightening a screw of the instrument, make sure to fit the screwdriver properly into the screw head mounted tilted or flat as shown in the right figure. Tightening the screw with excessive torque may damage the screw thread.
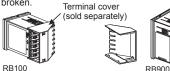
Tilted terminal   Flat terminal

If specified terminal lugs other than those in not recommended dimensions are used, terminal screws may not be tightened. In such a case, bend each solderless terminal lug in advance and then conduct wiring. If the terminal screw is forcibly tightened, it may be damaged.

Up to two solderless terminal lugs can be connected to one terminal screw. However, in this case, reinforced insulation cannot be used.
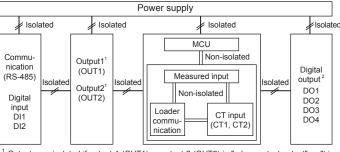
Caution for the terminal cover usage:
If each solderless terminal lug touches the terminal cover, remove each projection (marked *A) from the terminal cover by manually bending it in front and in rear until broken.

Terminal cover (sold separately)
RB100   RB900

* The same type of the terminal cover for RB900 can be used on RB400/500.
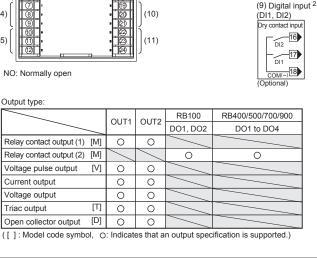
For isolated device input/output blocks, refer to the following:

Power supply

Communication (RS-485) / Digital input DI1 DI2 / Output1 (OUT1) / Output2 (OUT2) / Loader communication / MCU / Non-isolated / Measured input / Non-isolated / CT input (CT1, CT2) / Digital output DO1 DO2 DO3 DO4

[1] Outputs are isolated if output 1 (OUT1) or output 2 (OUT2) is "relay contact output" or "triac trigger output." If both relay contact output" or " triac trigger output," outputs are not isolated.
[2] Outputs of DO1/DO2 and DO3/DO4 are isolated. DO1 and DO2 or DO3 and DO4 use the same common terminal (No. 9 for DO1/DO2, and No. 21 for DO3/DO4) and are not isolated.

2.2 Terminal Configuration

📖 To prevent malfunctioning, do not connect wires to unused terminals.

(RB100) (6)
(RB500)
(RB400)
(RB700) — (16)
(RB900)

NO: Normally open

Output type:
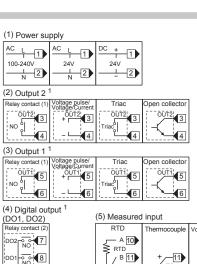
		OUT1	OUT2	RB100 DO1, DO2	RB400/500/700/900 DO1 to DO4
Relay contact output (1)	[M]	○	○		
Relay contact output (2)	[M]			○	○
Voltage pulse output	[V]	○	○		
Current output		○	○		
Voltage output		○	○		
Triac output	[T]	○	○		
Open collector output	[D]	○	○		

([ ] : Model code symbol, ○: Indicates that an output specification is supported.)

(1) Power supply
(2) Output 2 [1]
(3) Output 1 [1]
(4) Digital output [1] (DO1, DO2)
(5) Measured input
(6) Communication and Digital input (DI1, DI2) [2]
(7) CT input (CT1, CT2)
(8) Communication
(9) Digital input [2] (DI1, DI2)
(10) Digital output [1] (DO3, DO4)
(11) CT input (CT1, CT2)
(12) Digital output [1] (DO3, DO4)
(13) Digital output [1] (DO1, DO2)
(14) CT input (CT1, CT2)
(15) Measured input
(16) Digital input [2] (DI1, DI2)
(17) Communication

[1] Output assignment
Output 1 (OUT1):
- PID control: OUT1 is dedicated to control output
- Heat/Cool PID control:
  OUT1 can be used only as the heat-side output
Output 2 (OUT2):
- PID control: OUT2 can be used as the transmission output (Specify when ordering)
- Heat/Cool PID control:
  OUT2 corresponds to the cool-side output
- Specify when Event 3 output (Only RB100)
Digital output (DO1 to DO4 [RB100: DO1, DO2]):
- Output of the Event function can be allocated to DO1 to DO4.
[2] Digital input assignment
The following functions can be assigned as digital input. (Specify when ordering)
SV selection, Auto(AUTO)/Manual(MAN) transfer, RUN/STOP transfer, Interlock release

Maximum number of digital outputs (DO) by combinations of output (OUT1 and OUT2) of RB400/500/700/900:

		No OUT2 output	M, T, D	V (10 mA)	V (20 mA)	Current output	Voltage output
OUT1*	M, T, D	4	4	4	4	4	4
	V (Load: 10 mA)	4	4	4	4	2	2
	V (Load: 20 mA)	4	4	4	2	2	2
	Current output	4	4	2	2	2	2
	Voltage output	4	4	2	2	2	2

(▢: It represents selection of digital outputs DO3 and DO4 is not available.)

* When the instrument has two digital outputs (DO1 and DO2) and no OUT2 output, "V" type output (load: 40 mA) can be specified for OUT1.

3. SPECIFICATIONS

Measured input
Number of input: 1 point
TC input: K, J, T, S, R, E, B, N (JIS C1602-1995), PLII (NBS), W5Re/W26Re (ASTM-E988-96)
  Input impedance: 1 MΩ or more
  Influence of external resistance: Approx. 0.25 μ V/Ω
RTD input: Pt100 (JIS C1604-1997), JPt100 (JIS C1604-1997, JIS C1604-1981 of Pt100)
  Influence of input lead: Approx. 0.02 %/Ω of span (10 Ω or less per wire)
Voltage input: 0 to 1 V DC, 0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC
  Input impedance: 1 MΩ or more
Current input: 0 to 20 mA DC, 4 to 20 mA DC
  Input impedance: Approx. 250 Ω
  (Connect a 250 Ω resister to the input terminals)
Input accuracy:

Input type	Input range	Accuracy
K, J, T, E	Less than -100 °C	±(2.0 °C + 1 digit)
	-100 °C or more, Less than +500 °C	±(1.0 °C + 1 digit)
*1	+500 °C or more	±(0.2 % of Reading + 1 digit)
N, R, S, PLII, W5Re/W26Re	Less than 0 °C	±(4 °C + 1 digit)
	0 °C or more, Less than 1000 °C	±(2 °C + 1 digit)
*2	1000 °C or more	±(0.2 % of Reading + 1 digit)
B	Less than 400 °C	±(70 °C + 1 digit)
	400 °C or more, Less than 1000 °C	±(2 °C + 1 digit)
*2	1000 °C or more	±(0.2 % of Reading + 1 digit)
Pt100, JPt100	Less than 200 °C	±(0.4 °C + 1 digit)
	200 °C or more	±(0.2 % of Reading + 1 digit)
Voltage/Current input		±(0.2 % of span + 1 digit)

*1: Accuracy is not guaranteed for less than -100 °C
*2: Accuracy is not guaranteed for less than 400 °C for Input type R, S, B, and W5Re/W26Re.

Sampling cycle: 250 ms
Sensor current: Approx. 200 μA (Only RTD)
Action at input break: Upscale or downscale (TC)
  Upscale (RTD)
  Downscale or Indicates the value near 0 (Voltage/Current input)
Action at input short circuit: Downscale (RTD)
PV bias: -1999 to +9999 °C or -199.9 to +999.9 °C (TC/RTD)
  -Input span to + Input span (Voltage/Current input)
First order lag digital filter: 0 to 100 seconds (0: filter OFF)

Current transformer (CT) input [Optional]
Number of inputs: 2 points
Input range: 0.0 to 0.1 Arms
Measurement current range:
  CTL-6-P-N: 0.0 to 30.0 A
  CTL-12-S56-10L-N: 0.0 to 100.0 A
Sampling cycle: 1 second

Digital input (DI) [Optional]
Number of inputs: 2 points (DI1, DI2) Isolated input
Dry contact input: Open state: 500 kΩ or more
  Close state: 10 Ω or less
  Voltage at open: Approx. 5 V DC
  Contact current: 3.3 mA or less
Capture judgment time: Approx. 250 ms

Output
Number of outputs: 6 points (RB100: 4 points)
Relay contact output (1):
  Contact type: 1a contact
  Contact rating (Resistive load): 250 V AC 3 A, 30 V DC 1 A
  Electrical life: 100,000 times or more (Rated load)
  Mechanical life: 20 million times or more (Switching: 360 times/min [no-load])
Relay contact output (2):
  Contact type: 1a contact
  Contact rating (Resistive load): 250 V AC 1 A, 30 V DC 0.5 A
  Electrical life: 150,000 times or more (Rated load)
  Mechanical life: 20 million times or more (Switching: 360 times/min [no-load])
Voltage pulse output:
  Output voltage (Rating): 0/12 V DC
  ON voltage: 10 V to 13 V (at 20 mA)
  OFF voltage: 0.5 V or less
  Allowable load resistance: 600 Ω or more (20 mA or less)
  Not using OUT2: 40 mA or less
Current output:
  Output current (Rating): 0 to 20 mA DC, 4 to 20 mA DC
  Allowable load resistance: 500 Ω or less
  Output impedance: 1 MΩ or more
Voltage output:
  Output voltage (Rating): 0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC
  Allowable load resistance: 1 kΩ or more
  Output impedance: 0.1 Ω or less
Triac output:
  Output method: AC output (Zero-cross method)
  Allowable load current: 0.5 A (Ambient temperature 40 °C or less)
  Ambient temperature 50 °C: 0.3 A
  Load voltage: 75 to 250 V AC
  Minimum load current: 30 mA
  ON voltage: 1.6 V or less (at maximum load current)
Open collector output:
  Output method: Sink type
  Allowable load current: 100 mA
  Load voltage: 30 V DC or less
  Minimum load current: 0.5 mA
  ON voltage: 2 V or less (at maximum load current)
  Leakage current at OFF: 0.1 mA or less

Control
Control type: PID control (Reverse/Direct action)
  Heat/Cool PID control
  P, PI, PD, or ON/OFF action is available
Additional function: Autotuning, Startup tuning, Fine tuning

Loader communication
Connection method: Connection with a loader communication cable for our USB converter COM-K2 (sold separately).
Synchronous method: Start/Stop synchronous type
Communication speed: 9600 bps
Data bit configuration: Start bit: 1
  Data bit: 8
  Parity bit: Without
  Stop bit: 1
  · Data bit configuration is fixed to the above value.
  · Address is fixed at 0.
Protocol: Based on ANSI X3.28-1976 subcategory 2.5, A4
Maximum connections: One controller (Only COM-K2)

Communication [Optional]
Interface: Based on RS-485 EIA standard
Protocol: RKC communication (Based on ANSI X3.28-1976 subcategory 2.5, A4)
  Modbus-RTU

General specifications
Power supply voltage: 90 to 264 V AC
  [Including power supply voltage variation] (Rating 100 to 240 V AC), 50/60 Hz
  21.6 to 26.4 V AC [Including power supply voltage variation] (Rating 24 V AC)
  21.6 to 26.4 V DC [Including power supply voltage variation] (Rating 24 V DC)
Power consumption (at maximum load):
  RB100: 5.5 VA (at 100 V AC) 4.7 VA (at 24 V AC)
    8.5 VA (at 240 V AC) 108 mA (at 24 V DC)
  RB400/500: 5.8 VA (at 100 V AC) 5.8 VA (at 24 V AC)
    8.7 VA (at 240 V AC) 141 mA (at 24 V DC)
  RB700: 6.0 VA (at 100 V AC) 5.8 VA (at 24 V AC)
    8.7 VA (at 240 V AC) 147 mA (at 24 V DC)
  RB900: 6.2 VA (at 100 V AC) 6.0 VA (at 24 V AC)
    9.0 VA (at 240 V AC) 147 mA (at 24 V DC)
Rush current: 5.6 A or less (at 100 V AC)
  13.3 A or less (at 240 V AC)
  16.3 A or less (at 24 V AC)
  11.5 A or less (at 24 V DC)
Memory backup: Backed up by non-volatile memory
  Number of writing: Approx. 1,000,000 times
  Data storage period: Approx. 10 years
Allowable ambient temperature: 0 to 50 °C
Allowable ambient humidity: 10 to 90 %RH
  Absolute humidity: MAX.W.C 29.3 g/m³ dry air at 101.3 kPa
Installation environment conditions: Indoor use
  Altitude up to 2000 m
Material: Front panel, Case: PC *
  Terminal block: PPE *
  Panel sheet: Polyester
  * Flame retardancy: UL94V-1
Weight: RB100: Approx. 120 g RB700: Approx. 200 g
  RB400: Approx. 185 g RB900: Approx. 250 g
  RB500: Approx. 190 g

Standard
Safety standards: UL: UL61010-1
  cUL: CAN/CSA-C22.2 No.61010-1
CE marking: LVD: EN61010-1
  OVERVOLTAGE II, POLLUTION DEGREE 2, Class II (Reinforced insulation)
  EMC: EN61326-1
RCM: EN55011
Panel sealing: NEMA 4X (NEMA250) IP66 (IEC60529) [Front panel (if specified in the model code)]

4. MODEL CODE

■ Suffix code

RB100 / RB400 / RB500 / RB700 / RB900
▢▢▢–▢▢–▢ * ▢▢–▢▢/▢▢/Y
(1) (2) (3)(4)(5) (6)(7) (8)(9) (10)(11)(12)

(1) Control Method
F: PID control with AT (Reverse action)
D: PID control with AT (Direct action)
G: Heat/Cool PID control with AT
A: Heat/Cool PID control with AT (for Extruder [air cooling])
W: Heat/Cool PID control with AT (for Extruder [water cooling])

(2) Measured input and Range
▢▢▢: Refer to input range code table.

(3) Output 1 (OUT1)
[PID control: Control output Heat/Cool PID control: Heat output]
M: Relay contact output
V: Voltage pulse output (0/12 V DC)
4: Voltage output (0 to 5 V DC)
5: Voltage output (0 to 10 V DC)
6: Voltage output (1 to 5 V DC)
7: Current output (0 to 20 mA DC)
8: Current output (4 to 20 mA DC)
T: Triac output
D: Open collector output

(4) Output 2 (OUT2)
[PID control: Event 3 output (Only RB100), Transmission output Heat/Cool PID control: Cool output]
N: None
P: Relay contact output (Event 3 output)
R: Current output (0 to 20 mA DC)
S: Current output (4 to 20 mA DC)
X: Voltage output (0 to 5 V DC)
Y: Voltage output (0 to 10 V DC)
Z: Voltage output (1 to 5 V DC)
[Transmission output]
M: Relay contact output
V: Voltage pulse output (0/12 V DC)
4: Voltage output (0 to 5 V DC)
5: Voltage output (0 to 10 V DC)
6: Voltage output (1 to 5 V DC)
7: Current output (0 to 20 mA DC)
8: Current output (4 to 20 mA DC)
T: Triac output
D: Open collector output
[Cool output]

(5) Power supply voltage
3: 24 V AC/DC
4: 100 to 240 V AC

(6) Digital output (DO1 to DO4)
N: None
1: 1 point (DO1)
2: 2 points (DO1, DO2)
4: 4 points (DO1 to DO4) [Only RB400/500/700/900]

(7) Current transformer (CT) input
N: None
P: CTL-6-P-N (1 point)
S: CTL-12-S56-10L-N (1 point)
T: CTL-6-P-N (2 points)
U: CTL-12-S56-10L-N (2 points)

(8) Communication function/Digital input (DI)
N: None
5: RS-485 (RKC communication)
6: RS-485 (Modbus)
A: Digital input (2 points)
B: RS-485 (RKC communication) + Digital input (2 points) *
C: RS-485 (Modbus) + Digital input (2 points) *
* Only RB400/500/700/900

Input range code table

Type	Code	Range
K	K01	0 to 200 °C
	K02	0 to 400 °C
	K03	0 to 600 °C
	K04	0 to 800 °C
	K05	0 to 1000 °C
	K06	0 to 1200 °C
	K41	-200 to +1372 °C
	K43	-199.9 to +400.0 °C
	K09	0.0 to 400.0 °C
	K10	0.0 to 800.0 °C
	KA1	0 to 800 °F
	KA2	0 to 1600 °F
	KC7	-328 to +2501 °F
	KC8	-100.0 to +752.0 °F
J	J01	0 to 200 °C
	J02	0 to 400 °C
	J03	0 to 600 °C
	J04	0 to 800 °C
	J05	0 to 1000 °C
	J06	0 to 1200 °C
	J15	-200 to +1200 °C
	J07	-199.9 to +300.0 °C
	JA1	0 to 800 °F
	JA2	0 to 1600 °F
	JB9	-328 to +2192 °F
	JC8	-199.9 to +550.0 °F
T	T02	-199.9 to +100.0 °C
	T03	-199.9 to +200.0 °C
	T05	-199.9 to +300.0 °C
	T06	0.0 to 200.0 °C
	TC7	0.0 to 600.0 °F
	TC8	-199.9 to +300.0 °F
	TC9	-328 to +752 °F

Type	Code	Range
S	S02	0 to 1769 °C
	SA2	0 to 3216 °F
R	R02	0 to 1769 °C
	RA2	0 to 3216 °F
E	E01	0 to 800 °C
	E02	0 to 1000 °C
	EA1	0 to 1600 °F
	EA2	0 to 1832 °F
B	B01	400 to 1800 °C
	B02	0 to 1820 °C
	BA1	800 to 3200 °F
	BA2	0 to 3308 °F
N	N01	0 to 1200 °C
	N02	0 to 1300 °C
	NA1	0 to 2300 °F
	NA2	0 to 2372 °F
PL II	A01	0 to 1300 °C
	A02	0 to 1390 °C
	AA1	0 to 2400 °F
	AA2	0 to 2534 °F
W5Re/ W26Re	W01	0 to 2000 °C
	W02	0 to 2320 °C
	WA4	0 to 4208 °F
Pt100	D01	-199.9 to +649.0 °C
	D02	-199.9 to +200.0 °C
	D03	-100.0 to +50.0 °C
	D04	-100.0 to +100.0 °C
	D05	-100.0 to +200.0 °C
	D07	0.0 to 50.0 °C
	D08	0.0 to 100.0 °C
	D09	0.0 to 200.0 °C
	D10	0.0 to 500.0 °C

Type	Code	Range
Pt100	DA2	-199.9 to +400.0 °F
	DA3	-199.9 to +200.0 °F
	DA4	-199.9 to +100.0 °F
	DA5	-199.9 to +300.0 °F
	DA6	0.0 to 100.0 °F
	DA7	0.0 to 200.0 °F
	DA8	0.0 to 400.0 °F
	DA9	0.0 to 500.0 °F
	DB2	-199.9 to +900.0 °F
JPt100	P01	-199.9 to +649.0 °C
	P02	-199.9 to +200.0 °C
	P03	-100.0 to +50.0 °C
	P04	-100.0 to +100.0 °C
	P05	-100.0 to +200.0 °C
	P06	0.0 to 50.0 °C
	P07	0.0 to 100.0 °C
	P08	0.0 to 200.0 °C
	P09	0.0 to 500.0 °C
	P10	0.0 to 500.0 °C

Type	Code	Range
0 to 1 V DC	301	Programmable range -1999 to +9999 (The digital point position is selectable) Factory set value: 0.0 to 100.0 (%)
0 to 5 V DC	401	
0 to 10 V DC	501	
1 to 5 V DC	601	
0 to 20 mA DC	701	
4 to 20 mA DC	801	

(9) Waterproof/Dustproof
N: None
1: Waterproof/Dustproof (NEMA 4X, IP66)

(10) Case color
N: White
A: Black

(11) Quick start code
N: None (No need to specify initial setting code)
1: Specify quick start code (Refer to ■Quick start code)

(12) Instrument specification
/Y: Version symbol

■ Quick start code (Initial setting code)

▢▢▢▢–▢
(A) (B) (C) (D) (E)

(A) DO1 (Event function 1)
(B) DO2 (Event function 2)
(C) DO3 (Event function 3) [1]
(D) DO4 (Event function 4) [2]
N: None
A: Deviation high
B: Deviation low
C: Deviation high/low
D: Band
E: Deviation high with hold action
F: Deviation low with hold action
G: Deviation high/low with hold action
H: Process high
J: Process low
K: Process high with hold action
L: Process low with hold action
Q: Deviation high with re-hold action
R: Deviation low with re-hold action
T: Deviation high/low with re-hold action
U: Band (High/Low individual setting)
V: SV high
W: SV low
X: Deviation high/low (High/Low individual setting)
Y: Deviation high/low with hold action (High/Low individual setting)
Z: Deviation high/low with re-hold action (High/Low individual setting)
1: Heater break alarm (HBA)
2: Control loop break alarm (LBA)
3: FAIL
4: Monitor during RUN
5: Output of the communication monitoring result

(E) Digital input (DI) function assignment
N: None
1: SV1 to SV4 select
2: SV1 to SV2 select + RUN/STOP transfer
3: SV1 to SV2 select + AUTO/MAN transfer
4: SV1 to SV2 select + Interlock release
5: RUN/STOP transfer + AUTO/MAN transfer
6: RUN/STOP transfer + Interlock release
7: AUTO/MAN transfer + Interlock release

[1] In case of RB100, this code is selectable when "P" is specified for "(4) output 2 (OUT2)."
[2] In case of RB100, this code must be "N: None."

Optional (Sold separately)
Terminal cover [RB100: KCA100-517 RB400/500/900: KFB400-58 RB700: KCA700-53] . . . 1
Front cover [RB100: KRB100-36 RB400/500: KRB400-36 RB900: KRB900-36] 1