

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 your new 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:
http://www.rkcinst.com/english/manual_load.htm.

Product Check

Installation Manual (this manual)	1
Quick Operation Manual (IMR02C39-E□)	1
Parameter List (IMR02C40-E□)	1
Communication Quick Instruction Manual (IMR02C41-E□) [For RB series with Communication]	1
Mounting bracket (with screw)	2*
Case rubber packing (Optional) [Waterproof/Dustproof]	1
* RB900 Waterproof/Dustproof type: 4	

Optional (Sold separately)

Terminal cover	1
[RB100: KCA100-517 RB400/500/900: KFB400-58<1> RB700: KCA700-53]	
Front cover	1
[RB100: KRB100-36 RB400/500: KRB400-36 RB900: KRB900-36]	

Safety Precautions

WARNING

- An external protection device must be installed if failure of this instrument could result in damage to the instrument, equipment or injury to personnel.
- All wiring must be completed before power is turned on to prevent electric shock, fire or damage to instrument and equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and equipment.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.
- RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.

CAUTION

- This product is intended for use with industrial machines, test and measuring equipment. (It is not designed for use with medical equipment and nuclear energy.)
- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take additional measures.
- This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the wire for the input signal and the wires for instrument power supply, source of power and loads.
- Be sure to provide an appropriate surge control circuit respectively for the following:
 - If input/output or signal lines within the building are longer than 30 meters.
 - If input/output or signal lines leave the building, regardless the length.
- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock by operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- All wiring must be in accordance with local codes and regulations.
- To prevent instrument damage or failure, protect the power line and the input/output lines from high currents with a protection device such as fuse, circuit breaker, etc.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dispensation.
- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.
- When high alarm with hold action/re-hold action is used for Event function, alarm does not turn on while hold action is in operation. Take measures to prevent overheating which may occur if the control device fails.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for purpose of illustration.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.

- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.
- No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.

1. MOUNTING

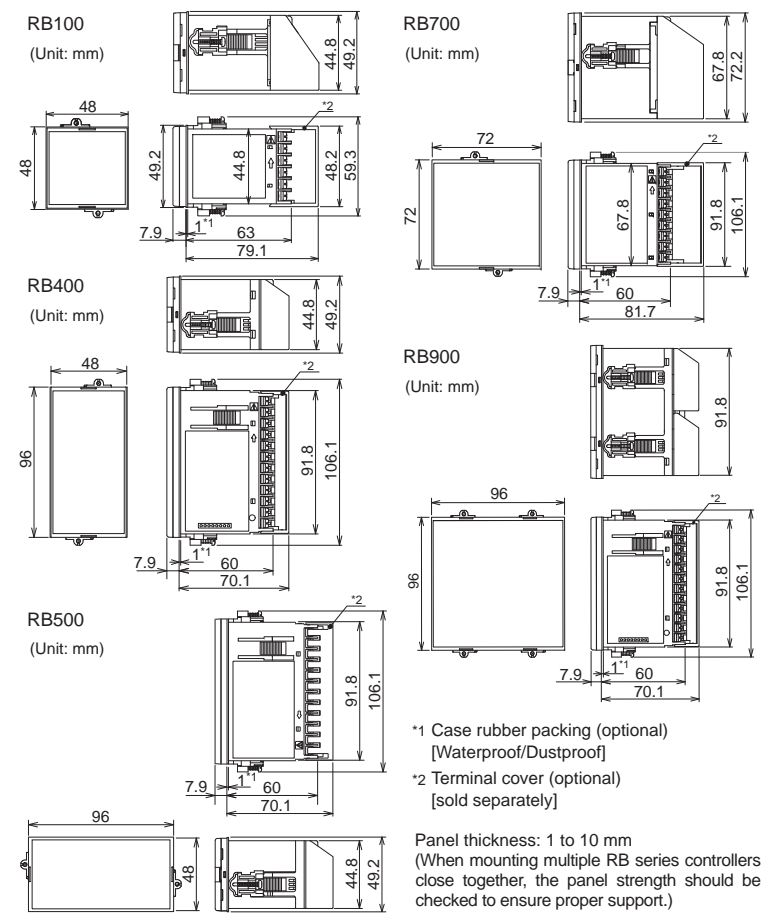
WARNING

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

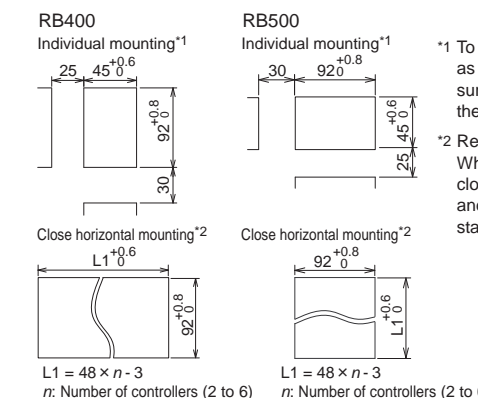
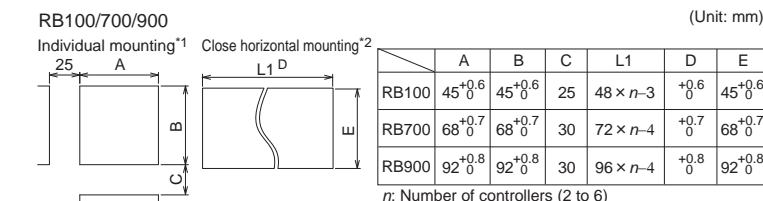
1.1 Mounting Cautions

- (1) This instrument is intended to be used under the following environmental conditions. (IEC61010-1) [OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2]
 - (2) Use this instrument within the following environment conditions:
 - 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
 - (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 equipment that generates large amount of heat (heaters, transformers, semi-conductor functional devices, large-wattage resistors.)
 - If the ambient temperature rises above 50 °C, 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.
- (5) If this instrument is permanently connected to equipment, it is important to include a switch or circuit-breaker into the installation. This should be in close proximity to the equipment and within easy reach of the operator. It should be marked as the disconnecting device for the equipment.

1.2 Dimensions



Panel cutout

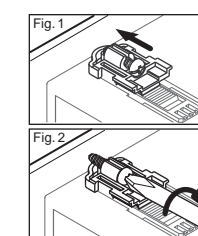


- *1 To keep the instrument as waterproof as possible, make sure that the panel surface has no burr or distortion where the hole is to be cut out.
- *2 Remove the case rubber packing. When the RB series is mounted closely protection will be compromised and they will not meet IP66 (NEMA4X) standards.

1.3 Procedures of Mounting and Removing

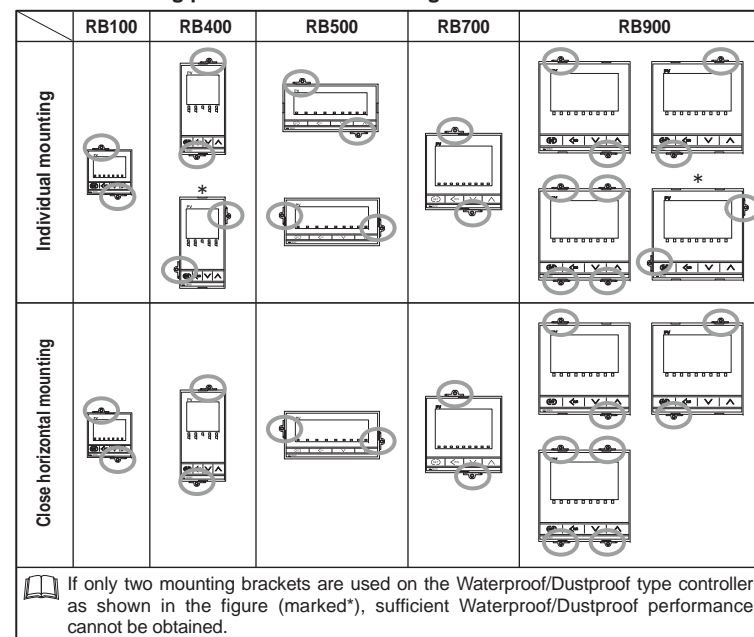
Mounting procedures

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.
4. Push the mounting bracket forward until the bracket is firmly secured to the panel. (Fig. 1)
5. Only turn one full revolution after the screw touches the panel. (Fig. 2)
6. The other mounting bracket should be installed the same way described in 3. to 5.



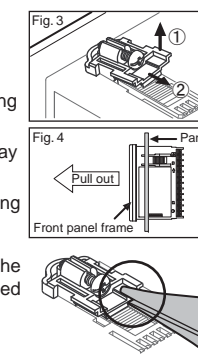
The front of the instrument conforms to **IP66 (NEMA4X)** [Specify when ordering] when mounted on the panel. For effective Waterproof/Dustproof, the gasket must be securely placed between instrument and panel without any gap. If gasket is damaged, please contact RKC sales office or the agent.

The mounting position of the mounting bracket



Removal procedures

1. Turn the power OFF.
2. Remove the wiring.
3. Loosen the screw of the mounting bracket.
4. Lift the latch of the mounting bracket (①), then pull the mounting bracket (②), to remove it from the case. (Fig. 3)
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. 4)



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

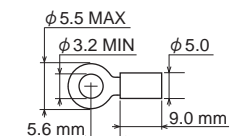
2. WIRING

WARNING

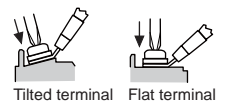
To prevent electric shock or instrument failure, do not turn on the power until all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.

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.
- 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 furnished with a power supply switch or fuse. If a fuse or power supply switch is required, install close to the instrument.
 - Recommended fuse rating: Rated voltage 250 V, Rated current 1 A
 - Fuse type: Time-lag fuse
- For the current input specification, a shunt resistor of 250 Ω ±0.02 % (Temperature characteristics: ±10 ppm/°C, Specified voltage: 0.25 W or more) must be connected between the input terminals.
- For an instrument with 24 V power supply, supply power from a SELV circuit.
- 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)



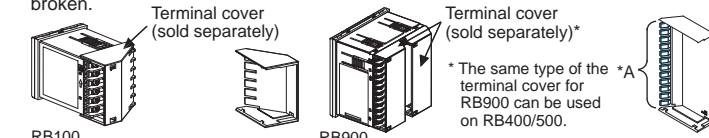
- Make sure that the any wiring such as solderless terminal is not in contact with the adjoining terminals.
- When tightening a screw of the instrument, make sure to fit the screwdriver properly into the screw head mounted tilted or flat as shown in the right figure. Tightening the screw with excessive torque may damage the screw thread.



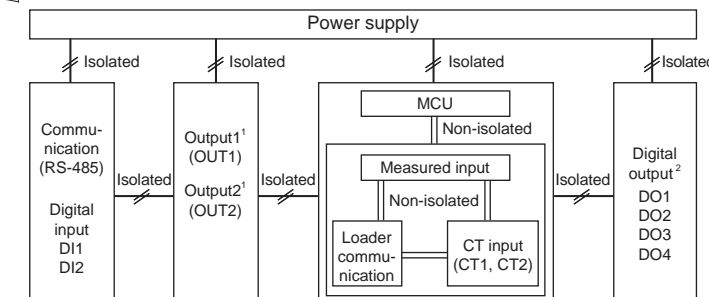
- If specified terminal lugs other than those in not recommended dimensions are used, terminal screws may not be tightened. In such a case, bend each solderless terminal lug in advance and then conduct wiring. If the terminal screw is forcibly tightened, it may be damaged.

- 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.



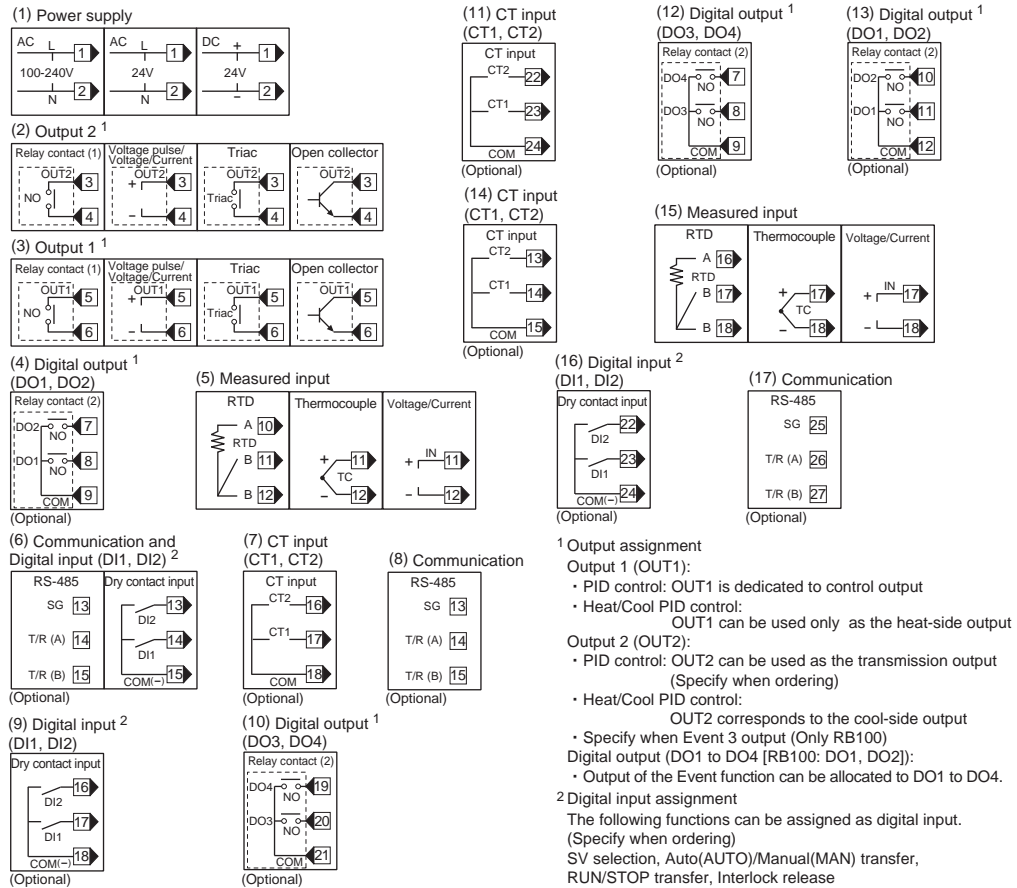
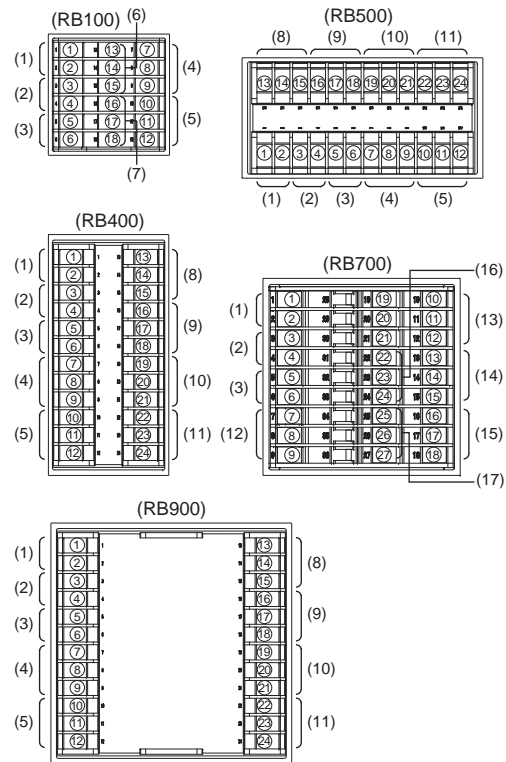
- For isolated device input/output blocks, refer to the following:



¹ Outputs are isolated if output 1 (OUT1) or output 2 (OUT2) is "relay contact output" or "triac trigger output." If both outputs are "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.



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.

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

	OUT2 (Including transmission output)					
	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
	V (Load: 10 mA)	4	4	4	4	2
	V (Load: 20 mA)	4	4	4	2	2
	Current output	4	4	2	2	2
	Voltage output	4	4	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 μV/Ω
 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
Current input: 0 to 20 mA DC, 4 to 20 mA DC
 Input impedance: Approx. 250 Ω
 (Connect a 250 Ω resistor to the input terminals)

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)
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)
B	Less than 400 °C	±(70 °C + 1 digit)
	400 °C or more, Less than 1000 °C	±(2 °C + 1 digit)
Pt100, JPt100	1000 °C or more	±(0.2 % of Reading + 1 digit)
	Less than 200 °C	±(0.4 °C + 1 digit)
Voltage/Current input	200 °C or more	±(0.2 % of span + 1 digit)

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)
 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)
 B: Less than 400 °C ±(70 °C + 1 digit)
 400 °C or more, Less than 1000 °C ±(2 °C + 1 digit)
 Pt100, JPt100: Less than 200 °C ±(0.4 °C + 1 digit)
 200 °C or more ±(0.2 % of span + 1 digit)

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: CTL-6-P-N: 0.0 to 30.0 A
 CTL-12-S56-10L-N: 0.0 to 100.0 A
 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-K (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-K)

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: 6.0 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) 141 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

□□□□-□□□□ * □□□□/□□□□/□□□□/□□□□

(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)

(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

(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)

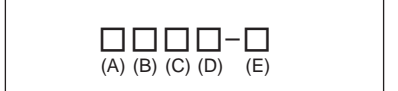
(12) Instrument specification
 /Y: Version symbol

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
E	E01	0 to 800 °C
	E02	0 to 1000 °C
	E03	0 to 1600 °C
	E04	0 to 1832 °C
	B01	400 to 1800 °C
	B02	0 to 1820 °C
	BA1	0 to 800 °F
	BA2	0 to 1600 °F
	KG7	-328 to +2192 °F
	KG8	-100.0 to +752.0 °F
N	N01	0 to 200 °C
	N02	0 to 400 °C
	NA1	0 to 2300 °C
	NA2	0 to 2372 °C
	AO1	0 to 1300 °C
	AO2	0 to 1390 °C
	AA1	0 to 2400 °C
	AA2	0 to 2534 °C
	J06	-200 to +1200 °C
	J07	-199.9 to +300.0 °C
W5Re/W26Re	WA1	0 to 800 °F
	JA1	0 to 1600 °F
	JB9	-328 to +2192 °F
	JC8	-199.9 to +550.0 °F
	T02	-199.9 to +100.0 °C
	T03	-100.0 to +200.0 °C
	T05	-199.9 to +300.0 °C
	T06	0.0 to 400.0 °C
	TC7	0.0 to 600.0 °F
	TC8	-199.9 to +300.0 °F
Pt100	DO1	-199.9 to +649.0 °C
	DO2	-199.9 to +200.0 °C
	DO3	-100.0 to +50.0 °C
	DO4	-100.0 to +100.0 °C
	DO5	-100.0 to +200.0 °C
	DO6	0.0 to 50.0 °C
	DO7	0.0 to 100.0 °C
	TC9	0.0 to 200.0 °C
	DO9	0.0 to 300.0 °C
	DO10	0.0 to 500.0 °C

Type	Code	Range
Pt100	0 to 1 V DC	301 Programmable range
	0 to 5 V DC	401 -1999 to +9999
	0 to 10 V DC	501 (The digital point position is selectable)
	1 to 5 V DC	601
0 to 20 mA DC	701	
4 to 20 mA DC	801 Factory set value: 0.0 to 100.0 (%)	

■ Quick start code (Initial setting code)



(A) DO1 (Event function 1) (C) DO3 (Event function 3) ¹
 (B) DO2 (Event function 2) (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

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."

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