# Digital Temperature Controller **RB SERIES**











RKC INSTRUMENT INC.

## **Digital Temperature Controller**

## **B**SERIES





## Panel space saving : 60mm depth

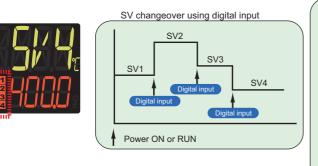
The RB Series has very short depth

The series was designed with a mounting bracket that allows close horizontal mounting of as many as six units.



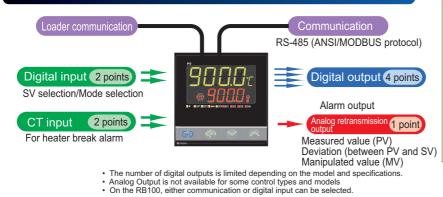
## Store up to 4 Set Values

Set value changeover is also possible by digital input.



### Ramp-to-setpoint (Down) SV2 SV3 SV1 SV4 Repeat Power ON or RUN

## Numerous inputs and outputs



## **Reinforced Insulation**

**RB900** 

(SV

(ARW

Reinforced insulation retains its insulating ability even when basic insulation breaks down. The power circuits in our instruments are designed with reinforced insulation and will save costs by eliminating the need for additional safety measures to prevent break-down shock

<Requirements for electrical equipment according to safety standards>

The safety standards on electrical equipment (JISC 1010-1 and IEC 61010-1) require that the secondary side of the equipment which may be touched by the operator should be double insulated or reinforcement insulated\* from high voltage that would result in electric shock.

Insulation safeguarding personnel from electric shock which is equal to double insulation or higher is called "reinforced insulation".

Simple program control using a timer function / setting change proportion limiter

1888.

15mm

**RB40** 

So bright and so large it is easy to read

10mm

RB400 PV display CB400 PV display

(Actual size)

from a greater distance.

Easy-to-read with large

11-segment LCD display

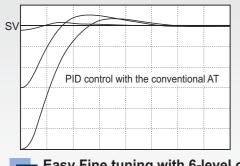
## **High Performance Budget Friendly Temperature Controller**

Save space and save money with a new series that gives outstanding control capability and comprehensive functions incorporated into a slim body case.

#### Calculates optimum PID values to stabilize control faster than ever

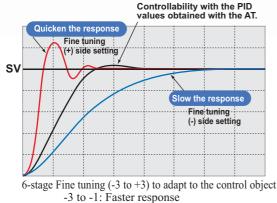
The improved autotuning algorithm calculates optimum PID values that shortens the time to reach stable control at the set value as well as eliminating overshoot/ undershoot. The new PID algorithm also suppress overshoot/undershoot against external disturbance.

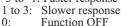
S٧



Easy Fine tuning with 6-level of control response adjustment

After the PID values have been autotuned, the Fine tuning (FT) function allows the operator to adjust the control response speed with a 6-level adjustment parameter (-3 to +3) without changing PID value.



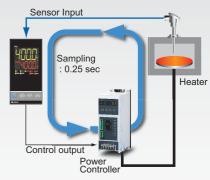


0.

PID control with the improved AT

## Sampling 0.25sec

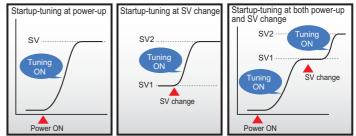
The RB high performance controller provides precise control by sampling every 0.25 seconds



## Startup tuning

Startup tuning eliminates time required for conventional autotuning as it calculates optimum PID values by temperature characteristics at start up. It is useful in applications which require a long time for conventional autotuning.

The timing of activation of start-up tuning can be selected from at power-up, at setpoint change, and at power-up/setpoint change. It is also settable to Only-once or always-ON.

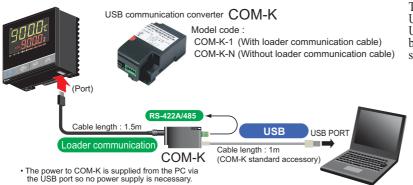


Startup tuning function can be set ON/OFF.

· Heater power needs to be turned on simultaneously with or before turning on power to the temperature controller.

· If startup tuning does not calculate suitable PID values due to characteristics of application, use Autotuning function

## Easy parameter setup via USB loader port (Loader communication)



The RB series has a standard loader port to connect to a PC USB port via COM-K (USB communication converter). Using Win-UCI software on the PC, parameter settings can be easily saved on the PC in CSV format, and the same parameter settings are easily copied to other controllers.





		Control mothed	DID control (With outsturing)				
Input	a) Temperature input group Thermocouple : K, J, E, T, R, S, B, N (JIS/IEC) PLII (NBS), W5Re/W26Re (ASTM) RTD : Pt100 (JIS/IEC), JPt100 (JIS)	Control method	PID control (With autotuning) • P, PI, PD, ON/OFF control selectable • Direct action/Reverse action is selectable Heat/Cool type PID control (With autotuning)				
	<ul> <li>3-wire system</li> <li>b) Voltage/Current input group</li> <li>Voltage input (Input impedance : Approx.1MΩ)</li> <li>0 to 1V DC, 0 to 5V DC, 1 to 5V DC, 0 to 10V DC</li> <li>Current input (Input impedance : 250Ω)</li> <li>4 to 20mA, 0 to 20mA</li> <li>For current input, connect is a 250Ω shunt resistor to the input terminals. Model code : KD100-55</li> <li>Inputs is selectable within each group.</li> </ul>	Startup tuning	The condition to activate Startup Tuning is selectable among a) to g) a) At power-on and stop-to-run, one-time tuning b) At SV change, one-time tuning c) At power-on, stop-to-run and SV change, one-time tuni d) At every power-on and stop-to-run e) At every SV change f) At every power-on, stop-to-run and SV change g) Function off				
Input break action	Thermocouple input : Up-scale/Down-scale (Selectable)         RTD input :       Up-scale         Voltage input :       Value around 0V         Current input :       Value around 0mA	Fine tuning	Setting range : -3 to +3 (6 levels, OFF when set to 0.) -3 to -1 : Faster response 1 to 3 : Slower response				
Input short action	Down-scale (RTD input)	Sotting range	OFF : Function OFF a) Proportional band :				
Sampling time	0.25sec	Setting range	Temperature input : 1(0.1) to span (°C,°F)				
Influence of external resistance Influence of lead	0.25μV/Ω (Thermocouple input) 0.02% of reading/Ω (RTD input)		<ul> <li>When 0.1°C (°F) resolution, within 999.9°C (°F)</li> <li>Voltage/Current input : 0.1 to 100.0% of span</li> </ul>				
resistance	<ul> <li>Maximum 10Ω per wire</li> </ul>		(ON/OFF control when P = 0) • Differential gap at ON/OFF control				
PV bias	Temperature input : -1999(-199.9) to +9999(999/9)°C Voltage/Current input : -span to +span 0.1 to 100.0 sec. (OFF when 0 is set.)		(High/Low individual setting) : Temperature input : 0(0.0) to 100 (100.0) (°C,°F) Voltage/Current input : 0.0 to 10.0% of span				
			<ul> <li>b) Integral time : 1 to 3600 sec (PD control when I = 0)</li> <li>c) Derivative time : 1 to 3600 sec (PI control when D = 0)</li> </ul>				
Display method	PV : 11 segment (4 digits), SV : 7 segments (4 digits)		<ul> <li>d) Cool side proportional band :</li> <li>1 to 1000% of heat side proportional band</li> <li>* Invalidity when P=0.</li> </ul>				
Perform			* Only cooling side ON/OFF control is not available. e) Anti-Reset Windup(ARW) :				
Measuring accuracy			1 to 100% of heat side proportional band (Integral action is OFF when ARW = 0)				
Influence of ambient	See measuring accuracy code table Temperature input : ±0.06°C/°C [at 5 to 40°C]		f) Deadband/Overlap				
temperature Close horizontal	Voltage/Current input group : ±0.06% of span/°C [at 5 to 40°C] ±2°C (3.6°F) [Less than -100°C (-146°F) input : ±3.5°C (6.3°F)]		<ul> <li>Temperature input: -10 (-10.0) to 10 (10.0) °C (°F)</li> <li>Voltage/Current input: -10.0 to +10.0% of span</li> <li>Minus setting: Overlap</li> <li>g) Derivative time action select</li> <li>0 : PV derivative, 1 : Deviation derivative</li> <li>h) Output limiter</li> <li>PID control: -5.0 to +105.0%</li> </ul>				
mounting error Insulation resistance	More than 20M $\Omega$ (500V DC) between measured terminals and ground More than 20M $\Omega$ (500V DC) between power terminals and ground						
Dielectric voltage	1000V AC for 1 minute between measured terminals and ground 1500V AC for 1 minute between power terminals and ground		(High/Low individual setting) Heat/Cool type PID control : 0.0 to 105.0% (Only limiter high)				
Setting	g		(Heat side/Cool side individual setting) i) Proportional cycle time : 0.1sec, 0.25sec, 0.5sec, 1 to 100 sec				
SV limiter Ramp-to-setpoint	Scaling low to scaling high (High/Low individual setting 1(0.1) to span per Time (Time : 1 minute/1 hour (Selectable)	Manual output	<ul> <li>j) Heat/Cool PID control selection : Air cooling, Water cooling, Linear</li> <li>a) Output range PID control : Output limiter low to Output limiter high Heat/Cool type PID control : -(Cool side output limiter high) to</li> </ul>				
SV step function	Up/Down individual setting Number of SV : 4 points (Default : 1 point) SV selecting method : Front key, Communication, Digital input (External contact input)						
Timer function	Timer setting : 0 min 01 sec to 99 min 59 sec or 0 hr 01 min to 99 hr 59 min (selectable) Function		(Heat side output limiter high) b) Auto/Manual transfer action selection With bumpless/Without bumpless (Selectable)				
	1: Control starts after the timer time elapses.     2: Control is performed during the timer time and stops after the timer time elapses.	Control output	a) Relay contact output, Form a contact, 250V AC 3A (Resistive load) • Electric life : 1,000,000 cycles or more				
	3:Link function from SV1 to SV4 (After the timer time elapses, control is continued using SV4.) 4:Link function from SV1 to SV4 (After the timer time elapses, control is stopped.)		<ul> <li>b) Voltage pulse output, 0/12V DC (Load resistance : more than 600Ω <less 20ma="" than=""></less></li> <li>• When out2 is no use, load resistance is more than</li> </ul>				
Setting data lock	Repeat : 0 to 9999 (Continuous when when 9999 is set.) Lock level : 1 to 10 level (0 : No lock)		<ul> <li>300Ω <less 10ma="" than="">.</less></li> <li>See page 7 "Maximum number of digital outputs (DO) by combinations of output (OUT1 and OUT2)</li> <li>c) Current output, 4 to 20mA DC, 0 to 20mA DC</li> </ul>				
Loader o	communication		<ul> <li>(Load resistance : less than 500Ω)</li> <li>d) SSR (Triac) output Rated current : 0.5A (Ambient temperature : Less than 40°C)</li> <li>e) Voltage output, 0 to 5V DC, 1 to 5V DC, 0 to 10V DC</li> </ul>				
			(Load resistance : More than $1k\Omega$ )				
	ANSI X3.28 sub-category 2.5A4 (RKC standard) 9600bps		(Output impedance : Less than 0.1Ω) f) Open collector output (Sink type) Load current : Less than 100mA				
speed Maximum	1 unit		Load current : Less than ToomA Load voltage : Less than 30V DC				

#### Loader communication

Protocol	ANSI X3.28 sub-category 2.5A4 (RKC standard)
Communication speed	9600bps
Maximum connection	1 unit

#### • Measuring accuracy table

- modeling declaraby table								
Input Type	Range	Accuracy						
	Lower than -100°C (-148°F)	± (2.0°C [3.6°F] + 1 digit)						
K, J, T, E	-100 to 500°C (-148 to 932°F)	± (1.0°C [1.8°F] + 1 digit)						
	500°C (932°F) or higher	± (0.2% of Reading + 1 digit)						
N, R, S, PLII <sup>*2</sup>	Lower than 0°C (32°F)	± (4.0°C [7.2°F] + 1 digit)						
W5Re/W26Re	0 to 1000°C (32 to 1832°F)	± (2.0°C [3.6°F] + 1 digit)						
WJINE/ WZUINE	1000°C (1832°F) or higher	± (0.2% of Reading + 1 digit)						
	Lower than 400°C (752°F)	± (70°C [126°F]) + 1 digit)						
В	400 to 1000°C (752 to 1832°F)	± (2°C [3.6°F] + 1 digit)						
	1000°C (1832°F) or higher	± (0.2% of Reading + 1 digit)						
D1400 ID1400	Lower than 200°C (392°F)	± (0.4°C[0.7°F] + 1 digit)						
Pt100, JPt100	200°C (392°F) or higher	± (0.2% of Reading + 1 digit)						
Voltage/Current	-span to +span	± (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 (752°F) for Input Type R, S, B, and W5Re/W26Re.



#### General Specifications

Supply voltage

Event (A	larm) (Optional)							
Number of events	Up to 4 points (RB100 : Up to 3 points, Heat/Cool type : Up to 2 points) See page 7 "Maximum number of digital outputs (DO) by combinations of output (OUT1 and OUT2)							
Event type	Process high, Process low, Deviation high, Deviation low, Deviation high/low <sup>1</sup> , Band, Set value high, Set value low, LBA (Control loop break alarm), Heater break alarm (HBA), Output of the communication monitoring result, RUN status monitor *1: Two types of alarm settings are field-selectable. 1. Independent high and low settings. 2. Common high/low setting (Factory setting, unless specified in alarm code when ordering)							
Other functions	<ul> <li>a) Hold/Re-hold action</li> <li>Hold action is activated at power-on and stop-to-run. Re-hold action is activated at power-on, stop-to-run, and the control set value change.</li> <li>b) Alarm output ON/OFF at stop mode is selectable.</li> <li>c) Energized/de-energized action is configurable.</li> <li>d) Differential gap : 0 (0.0) to span</li> <li>d) Delay timer : 0 to 600 sec</li> <li>e) Interlock (latch) function is configurable.</li> </ul>							
Loop break alarm (LBA)	LBA time : 0 to 7200 sec LBA deadband : 0 to input span • Loop break alarm is not available with heat/Cool PID control type.							
Heater break alarm (HBA)	Number of alarms CT Type and input range       2 points (1 point per CT input) CTL-6-P-N : 0 to 30A         Display range Display accuracy Whichever is larger)       0.0 to 100.0A         Delay times       0 to 255 times         • Heater break alarm is available for time proportioning output only.							
Output	Relay contact output, Form a contact, 250V AC 1A, 30V DC 0.5A (Resistive load)							
Analog Re	etransmission Output (AO) (Optional)							

1 point Measured value (PV), Set value (SV)

 Output type
 Measured value (PV), Set value (SV) Manipulated value (MV)

 • Selectable

 Output signal
 4 to 20mA DC, 0 to 20mA DC (Load resistance : Less than 600Ω)

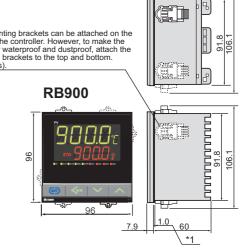
 0 to 1V DC, 0 to 5V DC, 1 to 5V DC, 0 to 10V DC (Load resistance : More than 1kΩ)

 Output resolution
 Approx. more than 1/2000

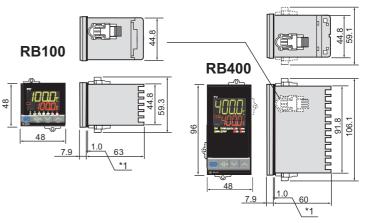
3	
	Rating : 100 to 240V AC
	b) 24V AČ ±10% (50/60Hz, Selectable)
	Rating : 24V AC
	c) 24V DC ±10%
	Rating : 24V DC
Power consumption	a) 100 to 240V AC type
	RB900 : 9.0VA (240V), 6.2VA (100V) RB400 : 8.7VA (240V), 6.0VA (100V)
	RB100 : 8.5VA (240V), 5.5VA (100V)
	b) 24V AC type
	RB900 : 6.0VA, RB400 : 5.8VA, RB100 : 4.7VA
	c) 24V DC type
	RB900 : 147mA, RB400 : 141mA, RB100 : 108mA
Rush current	a) 100 to 240V AC type
	Less than 13.3A (240V), Less than 5.6A (100V)
	b) 24V AC type
	Less than 16.3A
	c) 24V DC type
	Less than 11.5A
Power failure	A power failure of 20msec or less will not affect the
	control action.
	<ul> <li>RB100, 24V AC/DC type : 10msec or less</li> </ul>
Memory backup	Backed up by Nonvolatile memory
, , , , , , , , , , , , , , , , , , , ,	<ul> <li>Data retaining period : Approx. 10 years</li> </ul>
	<ul> <li>Number of writing : Approx. 1,000,000 times.</li> </ul>
	(Depending on storage and operating conditions.)
Ambient temperature	0 to 50°C (32 to 122°F)
Ambient humidity	10 to 90%RH (Non condensing)
, , , , , , , , , , , , , , , , , , ,	Absolute humidity : MAX.W.C29.3g/m3 dry air at 101.3kPa
External dimensions	RB900: 48 x 96 x 60mm
(W x H x D)	RB400: 96 x 96 x 60mm
(** * 11 × D)	RB100: 48 x 48 x 63mm
Weight	RB900: Approx.250g, RB400: Approx. 185g,
weight	RB100: Approx. 120g
Compliance with	UL,cUL,CE,C-Tick
standards	
5101100105	

a) 90 to 264V AC (50/60Hz, Selectable)

### External Dimensions



· If you specified the waterproof and dustproof structure, four mounting brackets are included with the RB900 as accessories.



\*1 : Case rubber packing (optional) [Waterproof/dustproof]

The mounting brack sides of the controll controller waterproc mounting brackets t (4 places).

#### Communications (Optional)

Number of outputs Output type

Communication method	RS-485
Communication speed	2400bps, 4800bps, 9600bps, 19200bps
Protocol	a) ANSI X3.28 sub-category 2.5A4 (RKC standard) b) MODBUS-RTU
Bit format	a) RKC standard protocol Start bit : 1 Data bit : 7 or 8 Parity bit : 1 (odd or even) or none Stop bit : 1 or 2 b) MODBUS protocol Start bit : 1 Data bit : 8 Parity bit : 1 (odd or even) or none Stop bit : 1 or 2
Maximum connection	31 units
Terminating resisto	r External installation is necessary (120Ω 1/2W)
Buffer mode	Correspond (Mode in which writing to EEPROM is not performed for setting changes)

#### Waterproof/Dustproof

NEMA4X, IP66
• Waterproof/Dustproof protection only effective from the front in panel mounted installation.

(Optional)

## Model and Suffix Codes

		1 2 3 4 5 6 7	8	0 1	1	12
	Specifications	48 x 48mm (1/16 DIN) RB100 48 x 96mm (1/8 DIN) RB400 96 x 96mm (1/4 DIN) RB900		ם/נ		/Y
1	Control Method	PID control with AT (Reverse action)       F         PID control with AT (Direct action)       D         Heat/Cool PID control with AT       G         Heat/Cool PID control with AT for extruder (Air cooling type)       A         Heat/Cool PID control with AT for extruder (Water cooling type)       W				
2	Input and range	See Input range Code Table				
3	Output 1 (OUT1) Control output	See Output 1 Code Table				
4	Output 2 (OUT2) *1,*2 (Control output or analog retransmission output (AO)					
	(Control output or analog retransmission output (AO)					
5	Power Supply	24V AC/DC 3 100 to 240V AC 4				
6	*3 Digital output (DO)					
Ī	CT input	Not supplied         N           For CTL-6-P-N (0 to 30A) 1 point         • When digital output code is "N", cannot be specified.         P           For CTL-12-S56-10L-N (0 to 100A) 1 point         • When digital output code is "N", cannot be specified.         S           For CTL-6-P-N (0 to 30A) 2 point         • When digital output code is "N", cannot be specified.         S           For CTL-6-P-N (0 to 30A) 2 point         • When digital output code is "N", cannot be specified.         T           For CTL-12-S56-10L-N (0 to 100A) 2 point         • When digital output code is "N", cannot be specified.         U				
8	Communication/Digital input (DI)	Not supplied RS-485 (ANSI/RKC standard protocol) DI 2 points RS-485 (ANSI/RKC standard protocol) + DI 2 points RS-485 (ANSI/RKC standard protocol) + DI 2 points Available for RB400/900 only RS-485 (MODBUS protocol) + DI 2 points Available for RB400/900 only	N 5 6 A B C			
9	Waterproof/Dustproof	Not supplied Waterproof/Dustproof protection	N			
10	Case color	White case Black case		N A		
1	Quick start code	No quick start code (Default setting)			N	
	Instrument version	Specify quick start code (DO type)			1	
W	Instrument version	Version symbol				Y

\*1 When control method is selected for PID control (Code : F, D), output 2 is available for analog retransmissin output.
\*2 On the RB100, the event 3 output function can be specified for output 2.
\*3 The number of DO points is limited in some combinations of OUT1 and OUT2 (control output) types.

#### Input Range Code Table

Temperature Input Group (Field-programmable)

Temperature input eroup (Their programmable)										<u>Be cano</u>	10	luge oroup
Thermoc	ouple				RTD	RTD			(Field-programmable)			
Input	Code	Range	Input	Code	Range	9	Input	Code	Range	Input	Code	Range
1	K 01	0 to 200°C	S 2	S 02	0 to	1769°C		D 01	-199.9 to +649.0°C	0 to 1V DC	3 01	
	K ¦02	0 to 400°C	(JIS/IEC)	S¦A2	0 to	3216°F		D \ 02	-199.9 to +200.0°C	0 to 5V DC	4 \ 01	-1999 to +9999
	K 03	0 to 600°C	2	B \ 01	400 to	1800°C		D 03	-100.0 to +50.0°C	0 to 10V DC	5 01	(Programmable)
	K 04	0 to 800°C	в	B 102	0 to	1820°C		D 04	-100.0 to +100.0°C	1 to 5V DC	6 01	, , ,
	K ¦05	0 to 1000°C	(JIS/IEC)	B A1	800 to	3200°F		D \ 05	-100.0 to +200.0°C	0 to 20mA DC	7 01	Factory set value
K	K 06	0 to 1200°C	(JIS/IEC)	B A2	0 to	3308°F		D 06	0.0 to 50.0°C	4 to 20mA DC	8 01	: 0.0 to 100.0
(JIS/IEC)	K 41	-200 to +1372°C	1	E ! 01	0 to	800°C		D 07	0.0 to 100.0°C	• For current	innut co	nnect is a 250 $\Omega$
(	K 09	0.0 to 400.0°C	E	E 02	0 to	1000℃		D 08	0.0 to 200.0°C			input terminals.
	K ¦10	0.0 to 800.0°C	(JIS/IEC)	E A1	0 to	1600°F	Pt100	D ¦09	0.0 to 300.0°C	Model code		
	K 43	-199.9 to +400.0°C		E ¦A2	0 to	1832°F	(JIS/IEC)	D 10		Model oode	. 110 100	00
	K A1	0 to 800°F		N 01	0 to	1200°C	(010/120)	D A2	-199.9 to +400.0°F			
	K ¦A2	0 to 1600°F	N	N 02	0 to	1300°C		D ¦A3				
	K 'C7	-328 to +2501°F	(JIS/IEC)	N ¦A1	0 to	2300°F		D A4				
		-100.0 to +752.0°F		N <u>'</u> A2	0 to	2372°F		D A5				
1	J ¦01	0 to 200°C	1	T 02	-199.9 to +			D A6				
	J ¦02	0 to 400°C		T ¦03	-100.0 to +			D A7				
	J 03	0 to 600°C	Т	T ¦05	-199.9 to +			D A8				
	J 04	0 to 800°C	(JIS/IEC)	T 06		400.0°C		D A9				
J	J ¦05	0 to 1000°C	(	T C7		600.0°F		D B2				
(JIS/IEC)	J 06	0 to 1200°C		T C8		·300.0°F		P ! 01	-199.9 to +649.0°C			
( ,	J 15	-200 to +1200°C		T \C9	-328 to	+752°F		P 02	-199.9 to +200.0°C			
		-199.9 to +300.0°C	W5Re/W26Re	W 01	0 to	2000°C		P 03	-100.0 to +50.0°C			
	J ¦A1	0 to 800°F		W ¦ 02	0 to	2320°C	IDIAOO	P 04				
	J A2	0 to 1600°F	(ASTM)	W ¦A4	0 to	4208°F	JPt100	P 105				
	J B9	-328 to +2192°F		A 01	0 to	1300°C	(JIS)	P 06	0.0 to 50.0°C			
		-199.9 to +550.0°F	PLII	A 02	0 to	1390°C		P 07	0.0 to 100.0°C			
$R^2$		0 to 1769°C	(NBS)	A A1	0 to	2400°F		P 08	0.0 to 200.0°C			
(JIS/IEC)	R A2	0 to 3216°F	. ,	A 'A2	0 to	2534°F		P 09 P 10				
*1 : Accurac	y is not gu	aranteed for less than	-100°C (-146°	°F).				P ¦ 10	0.0 to 500.0°C			

\*1 : Accuracy is not guaranteed for less than -100°C (-146°F) . \*2 : Accuracy is not guaranteed for less than 400°C (752°F) for Input Type R, S, B, and W5Re/W26Re. 

#### Output 1 Code Table Output 2 Code Table

Output Type	Code		Output Type			Output Type	Code	Remarks
Relay contact output	М	Re	alay contact output	(Cool side output)	М	Relay contact output (Event 3 [DO3] output)	Р	Only RB100
Voltage pulse output	V	Vol	Itage pulse output			0 to 20mA DC (Analog retransmission output [AO])		Only PID control
0 to 5V DC	4	0 to	o 5V DC	(Cool side output)	4	4 to 20mA DC (Analog retransmission output [AO])	S	Only PID control
0 to 10V DC	5	0 to	o 10V DC	(Cool side output)	5	0 to 5V DC (Analog retransmission output [AO])	Х	Only PID control
1 to 5V DC	6	1 to		(Cool side output)		0 to 10V DC (Analog retransmission output [AO])		Only PID control
0 to 20mA DC	7	0 to		(Cool side output)		1 to 5V DC (Analog retransmission output [AO])	Z	Only PID control
4 to 20mA DC	8	4 to	o 20mA DC	(Cool side output)	8			
Triac output	Т			(Cool side output)				
Open collector output	D	Ор	en collector output	(Cool side output)	D			

#### Maximum number of digital outputs (DO) by combinations of output (OUT1 and OUT2)

			OUT2 (Including transmission output)						
		No OUT2 output	M, T, D	V (10 mA)	V (20 mA)	Current output	Voltage output		
*1	M, T, D	4	4	4	4	4	4	1,	
	V (Load: 10 mA)	4	4	4	4	2	2	1	
OUT1	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		

DC Current • Voltage Group

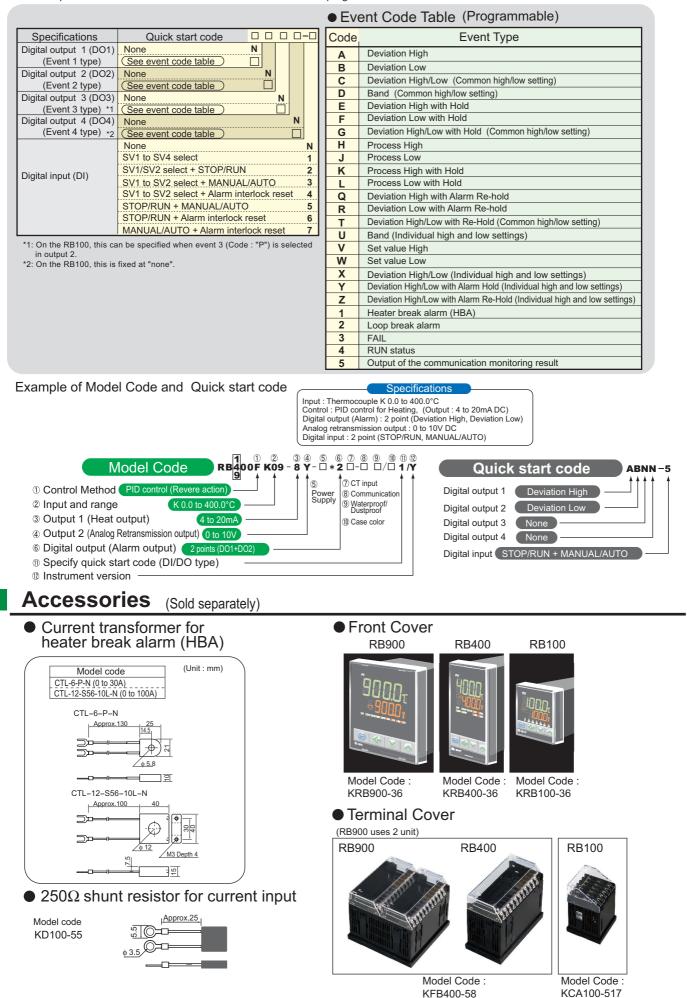
leiu-programmable)									
Input	Co	bde	Range						
to 1V DC	3	01							
to 5V DC	4	01	-1999 to +9999						
to 10V DC	5	01	(Programmable)						
to 5V DC	6	01							
to 20mA DC	7	01	Factory set value : 0.0 to 100.0						
to 20mA DC	8	01	: 0.0 10 100.0						

(\_\_\_\_\_: Represents selection of digital outputs -DO3 and DO4 are not available.)

\*1 When the instrument has two digital outputs (DO1 and DO2) and no OUT2 output, "V" type output (load: 40mA) can be specified for OUT1.

#### Quick start code

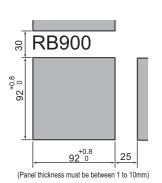
Quick start code tells the factory to ship with each parameter preset to the values detailed as specified by the customer.
 Quick start code is not necessarily specified when ordering, unless the preset is requested.
 These parameters are software selectable items and can be re-programmed in the field via the manual.

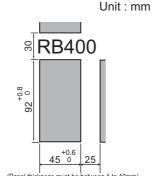


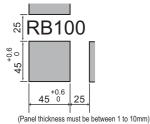
7

## **Rear Terminals**

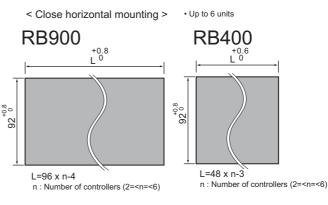
RB900	RB400				(*) Optional
		No Contents		No Contents	
Image: Constraint of the second sec	Image: Constraint of the second sec	$\begin{array}{c c} 1 & L & + \\ 100 \text{ to } 240V & 24V \text{ AC} & 24V \text{ DC} \\ 2 &N & \\ 3 & & \\ 3 & & \\ \end{array}$	Power supply Control output 1, 2 (OUT1,2) or	13 - SG 14 - T/R(A) 15 - T/R(B)	(*) Communication RS-485
0         5         17         0           0         6         18         0           0         7         19         0           0         8         20         0	5         17         0           6         18         0           0         7         19         0           7         8         20         0	$\begin{array}{c c} & NO_{1}^{O} & Triac_{1}^{O} & (OU12) \\ \hline 4 & (1) & (2) & (3) & (4) \\ \hline 5 & NO_{0}^{O} & Triac_{1}^{O} & (AO) \\ \hline 6 & (1) & (2) & (3) & (4) \\ \hline \end{array}$	Analog retransmission output (AO) (1) Relay contact output (2) Voltage pulse / Current/Voltage (3) SSR (Triac) (4) Open collector	$ \begin{array}{c} 16 & -0^{(2)} & (D \ 2) \\ 17 & -0^{(1)} & (D \ 1) \\ 18 & -0^{(2)} & (D \ 1) \end{array} $	(*) Digital input (DI 1, 2)
Image: Second	Image: Second state	7 -000 8 -000 9 COM	(*) Digital output 1, 2 (DO1,2) Relay contact output	19 -0.00000000000000000000000000000000000	(*) Digital output 3, 4 (DO3,4) Relay contact output
Use a solderless terminal for screw size width 5.8mm or less.	а M3,	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Measuring input (1) Thermocouple (2) RTD (3) Voltage/Current	22 23 <sup>CT2</sup> 24	(*) CT1,CT2 input
RB100 (*) Optional					
0 1 0 13 0 7 No	Contents	No	Contents	No	Contents
Image: Constraint of the state of	$\begin{array}{c c} -L & -+ \\ AC & 24V DC \\ -N & \end{array} \\ \hline \begin{array}{c} \\ - \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $				Digital output 1 2
• Use a solderless terminal for screw size M3, width 5.8mm or less.	(4) (AO) Analog retransi output, Digital o (1) Relay contact	t output a / Current/Voltage	CT1,CT2 inpu	(*) 10 $A_{11}$ 11 $-+_{B_{1}}$ 12 $(1)^{-}_{(1)}$ $B_{(2)}$	(1) Thermocouple (2) RTD (3) Voltage/Current
Close horizontal mounting > · Up to 6 units					







(Panel thickness must be between 1 to 10mm)



**RB100** -0.6 0

+0.6

· Waterproof/dustproof is not available for close horizontal mounting.

+0.6 L 0

L=48 x n-3 n : Number of controllers (2=<n=<6)

