DIGITAL CONTROLLER

CB100 INSTRUCTION MANUAL

IMCB01-E7

Thank you purchasing the RKC instrument. In order to achieve maximum performance and ensure proper operation of your new instrument, carefully read all the instructions in this manual.
Please place this manual in a convenient location for easy reference.

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 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 adequate 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.
- All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action. The power must be turned off before repairing work for input break and output failure including replacement of sensor, contactor or SSR, and all wiring must be completed before power is turned on again.
- To prevent instrument damage of 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.
- Do not connect modular connectors to telephone line.

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.
- 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. PRODUCT CHECK

Check whether the delivered product is as specified by referring to the following model code list.

CB100 □□□□-□□ * □□ - □□/□/Y
①② ③ ④⑤ ⑥⑦ ⑧⑨ ⑩

① Control action
F: PID action with autotuning (Reverse action)
D: PID action with autotuning (Direct action)
W: Heat/cool PID action with autotuning (Water cooling) *1
A: Heat/cool PID action with autotuning (Air cooling) *1

② Input type, ③ Range code: See "8. INPUT RANGE TABLE."

④ First control output [OUT1] (Heat-side)
M: Relay contact T: Triac V: Voltage pulse
8: Current (4 to 20 mA DC) G: Trigger (for triac driving)

⑤ Second control output [OUT2] (Cool-side)
No symbol: When control action is F or D. M: Relay contact
T: Triac V: Voltage pulse 8: Current (4 to 20 mA DC)

⑥ Alarm 1 [ALM1] , ⑦ Alarm 2 [ALM2]

N:	No alarm	H:	Process high alarm
A:	Deviation high alarm	J:	Process low alarm
B:	Deviation low alarm	K:	Process high alarm with hold action
C:	Deviation high/low alarm	L:	Process low alarm with hold action
D:	Band alarm	P:	Heater break alarm (CTL-6) *2
E:	Deviation high alarm with hold action	S:	Heater break alarm (CTL-12) *2
		R:	Control loop break alarm *3
F:	Deviation low alarm with hold action	V:	SV high alarm
		W:	SV low alarm
G:	Deviation high/low alarm with hold action		

⑧ Communication function
N: No communication function 5: RS-485 (2-wire system)

⑨ Waterproof/dustproof
N: No waterproof/dustproof 1: Waterproof/dustproof

⑩ Case color
N: Off-white A: Off-black

*1 No self-tuning function is provided in the W or A control action type.
*2 Heater break alarm can not be specified in case of ALM1. Also, it isn't possible to specify when control output is current output.
*3 As control loop break alarm, only either the alarm 1 or alarm 2 is selected.

<Accessories>

• Mounting frame:	1 piece
• Instruction manual [IMCB01-E7]:	1 copy
• Mounting screws:	2 pieces

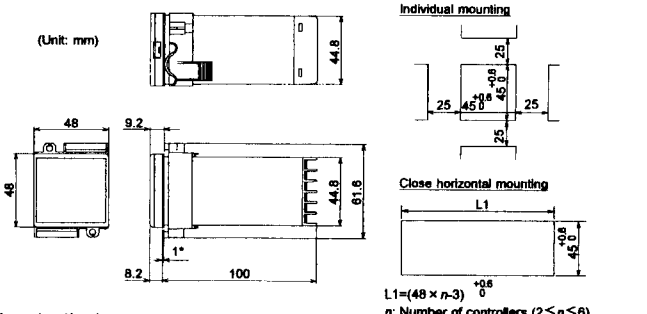
2. MOUNTING

2.1 Mounting Cautions

(1) This instrument is intended to be used under the following environmental conditions. **(IEC61010-1)**
• OVERVOLTAGE CATEGORY II • POLLUTION DEGREE 2

(2) Avoid the following when selecting the mounting location.
- Ambient temperature of less than 0 °C or more than 50 °C.
- Ambient humidity of less than 45 % or more than 85 % RH.
- 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.

2.2 Dimensions



*Rubber (option)

- For mounting of the instrument, panel thickness must be between 1 to10 mm. (When mounting multiple instruments close together, the panel strength should be checked to ensure proper support.)
- Waterproof and dustproof are not effective when instruments are closely spaced.
- Weight: 170 g

2.3 Mounting Procedures

(1) Prepare the panel cutout as specified in 2.2 Dimensions.
(2) Insert the instrument through the panel cutout .
(3) Insert the mounting frame into the mounting from the rear of the instrument.
(4) Push the mounting frame forward until the frame is firmly secured to the panel. (Fig.1)

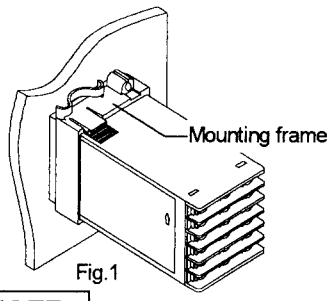


Fig.1

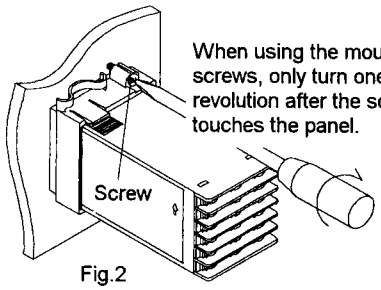


Fig.2

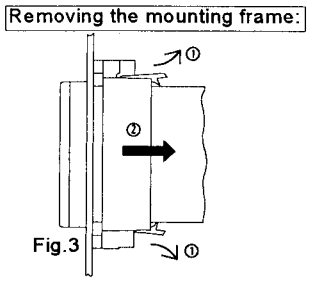


Fig.3

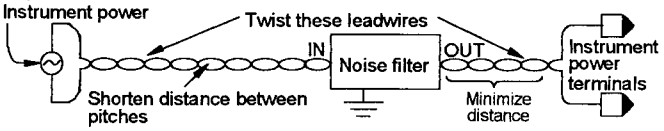
NOTE

- The waterproof/dustproof option on the front of the instrument conforms to **IP66** when mounted on the panel. For effective waterproof/dustproof, the gasket must be securely placed between instrument and panel without any gap.
- If the gasket is damaged, contact your nearest RKC agent or sales office.
- The instrument can also be mounted by tightening screws (Fig.2). After inserting the mounting frame into the instrument according to the above procedures (Fig.1), fix the instrument to the panel by using the two screws. When tightening each screw, tighten it only one turn just after it touches the panel. Use the attached screws.
- If the hook in the mounting frame is disengaged from the case, the mounting frame can be removed (Fig.3). If the instrument is fixed to the panel by tightening the screws, first loosen the screw.

3. WIRING

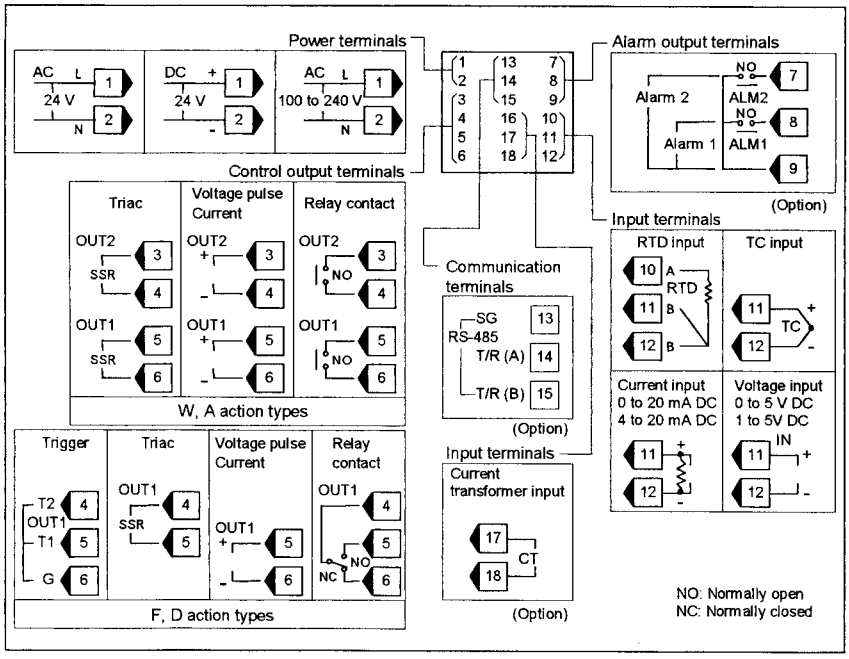
3.1 Wiring Cautions

- 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.



- Power supply wiring must be twisted and have a low voltage drop.
- About four seconds are required as preparation time for contact output every time the instrument is turned on. Use a delay relay when the output line, is used for an external interlock circuit.
- This instrument is not furnished with a power supply switch or fuses. Therefore, if a fuse or power supply switch is required, install close to the instrument.
  - Fuse type: Time-lag fuse - Recommended fuse rating: Rated voltage 250 V Rated current: 1 A
- For the current input specification, a resistor of 250 Ω (±0.02 % ±10 ppm, 0.25 W or more) must be connected between the input terminals. This resistor must be provided by the customer.
- Do not excessively tighten the terminal screws. In addition, use the solderless terminal appropriate to the screw size.
  - Screw size: M3 x 6 - Recommended tightening torque: 0.4 N·m [4 kgf·cm]
- For an instrument with 24 V power supply, supply power from a SELV circuit.

3.2 Terminal Configuration



■ Specifications

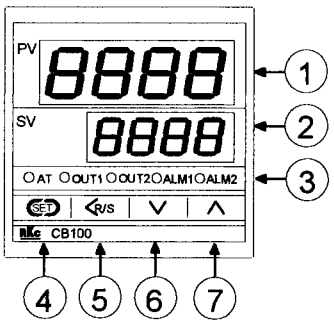
Power supply voltage:
85 to 264 V AC (Power supply voltage range)
50/60 Hz, Rating: 100 to 240 V AC
21.6 to 26.4 V AC (Power supply voltage range)
50/60 Hz, Rating: 24 V AC
21.6 to 26.4 V DC (Power supply voltage range)
Rating: 24 V DC

Power consumption:
7 VA max. (at 100 V AC) 10 VA max. (at 240 V AC)
5 VA max. (at 24 V AC) 160 mA max. (at 24 V DC)

Alarm output rated:
Relay contact output: 250 V AC, 1 A (Resistive load)

Control output rated:
Relay contact output: 250 V AC, 3 A (Resistive load)
Voltage pulse output: 0/12 V DC (Load resistance 600 Ω or more)
Current output: 4 to 20 mA DC (Load resistance 600 Ω or less)
Trigger output (for triac driving):
Zero cross method for medium capacity triac driving (100 A or less)
Load voltage used: 100 V AC line, 200 V AC line
Load used: Resistive load
Triac output: 0.5 A (Ambient temperature 40 °C or less)

4. NAME OF PARTS



①**Measured value (PV) display [Green]**
Displays PV or various parameter symbols.

②**Set value (SV) display [Orange]**
Displays SV or various parameter set values (or CT input value).

③**Indication lamps**

- **Autotuning (AT) lamp [Green]**
  Flashes during autotuning execution.
- **Control output lamps [Green] (OUT1, OUT2)**
  OUT1: Lights when control output is turned on.**
  OUT2: Lights when cool-side control output is turned on.**

** Lamp indication becomes as follows for current output.

For an output of less than 0 %: Extinguished

For an output of more than 100 %: Lit

For an output of more than 0 % but less than 100 %: Dimly lit.

- **Alarm output lamps [Red] (ALM1, ALM2)**
  ALM1: Lights when alarm 1 output is turned on.
  ALM2: Lights when alarm 2 output is turned on.

④ **Set key**
Used for parameter calling up and set value registration.

⑤ **Shift & R/S key**

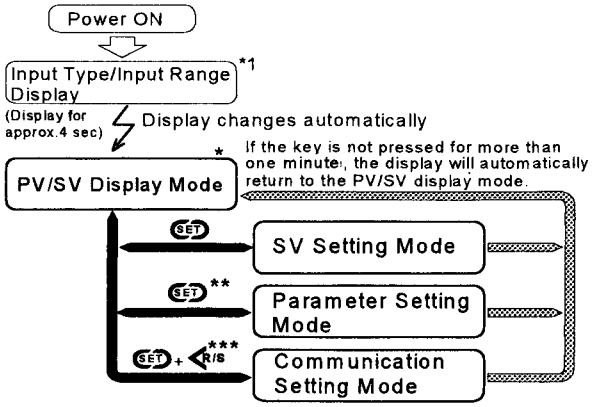
- Shift digits when settings are changed.
- Select the RUN/STOP function.

⑥ **DOWN key**
Decrease numerals.

⑦ **UP key**
Increase numerals.

5. SETTING

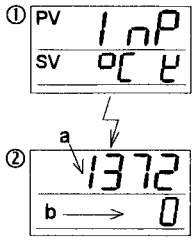
5.1 Calling Up Procedure of Each Mode



* The **RUN/STOP** function can be selected. The **RUN/STOP** function can be selected every time the **<R/S** key is pressed for one secnd.
** Press the **SET** key for more than two seconds.
***Press the **<R/S** key while pressing the **SET** key.

For detail for the protocol, identifier, or communication setting mode, see Communication Instruction Manual (IMCB03-E□).

***1 Input Type/Input Range Display**
This instrument immediately confirms input type and range following power on.
Example: For a controller with the K thermocouple input type and range from 0 to 1372 °C.



①Input type display
InP : Input symbol
°C : Engineering unit (°F : °F)
[Voltage/current input: No display]
: Input type symbol (See **Table**)

②Input range display
a: Input range high
b: Input range low

Input Type Symbol Table

Symbol															
Input type	Thermocouple (TC)											RTD		Voltage (Current)
	K	J	R	S	B *	E	T	N	PL II	W5Re/ W26Re *	U	L	JPt 100	Pt 100	

*This input type is not displayed in the Z-1021 specification.

5.2 Detail of Each Mode

■ PV/SV display mode

The controller will display the measured value (PV) and the set value (SV). The controller can be switched to RUN or STOP mode.

■ SV setting mode

This is the mode used to set the set value (SV). Factory set value: 0 °C [°F] or 0.0 °C [°F]

■ Parameter setting mode

This is the mode used to set the various parameters such as alarms, PID constants, etc.
The following parameter symbols are displayed one by one every time the **SET** key is pressed.

#1: Factory set value

Symbol	Name	Setting range	Description	#1
CT1	Current transformer input 1 (CT1)	0.0 to 100.0 A [Only display]	Display input value from the current transformer. [Displayed only when the instrument has the heater break alarm]	
AL1	Alarm 1 (ALM1)	For temperature input: Deviation alarm, Process alarm, SV alarm: -1999 to +9999 °C [°F] or -199.9 to +999.9 ° C [°F]	Set the alarm 1 set value and alarm 2 set value.	Temperature input: 50 (50.0)
AL2	Alarm 2 (ALM2)	For voltage/current inputs: Deviation alarm: -span to +span (Within 9999) Process alarm, SV alarm: Same as input range	Alarm differential gap: Temperature input: 2 or 2.0 °C [°F] Voltage/current inputs: 0.2% of span	Voltage/ current inputs: 5.0
HbA1	Heater break alarm 1 (HBA)	0.0 to 100.0 A See *1.	Alarm value is set by referring to input value from the current transformer (CT). Used only for single-phase.	0.0

#1: Factory set value

Symbol	Name	Setting range	Description	#1
LbA	Control loop break alarm (LBA)	0.1 to 200.0 minutes See *2.	Set control loop break alarm set value.	8.0
Lbd	LBA deadband (LBD)	Temperature input: 0 to 9999 °C [°F] Voltage/current inputs: 0 to 100 % of span	Set the area of not outputting LBA. No LBA deadband functions with 0 set. Differential gap : Temperature input: 0.8 °C [°F] Voltage/current inputs: 0.8 % of span	0
AtU	Autotuning (AT)	0: AT end or cancel 1: AT start or execution	Turns the autotuning ON/OFF.	0
StU	Self-tuning (ST)	0: Self-tuning OFF 1: Self-tuning ON	Turns the self-tuning ON/OFF.	0
P	Proportional band (P)	Temperature input: 1 (0.1) to span or 9999 (999.9) °C [°F] Voltage/current inputs: 0.1 to 100.0 % of span	Set when PI,PD or PID control is performed. For heat/cool PID action: Proportional band setting on the heat-side. ON/OFF action control when set to 0 (0.0). ON/OFF action differential gap: Temperature input: 2 (0.2) °C [°F] Voltage/current inputs: 0.2 % of span	Temperature input: 30 (30.0) Voltage/ current inputs: 3.0
I	Integral time (I)	1 to 3600 seconds (0: PD action)	Set the time of integral action which eliminates the offset occurring in proportional control.	240
d	Derivative time (D)	1 to 3600 seconds (0: PI action)	Set the time of derivative action which prevents ripples by predicting output changes and thus improves control stability.	60
Ar	Anti-reset windup (ARW)	1 to 100 % of heat-side proportional band. (0: Integral action OFF)	Overshooting and undershooting are restricted by the integral effect.	100
T	Heat-side proportioning cycle (T)	1 to 100 seconds (Not displayed if the control output is current output.)	Set control output cycle. For heat/cool PID action: Heat-side proportioning cycle	See *3.
Pc	Cool-side proportional band (Pc)	1 to 1000 % of heat-side proportional band.	Set cool-side proportional band when heat/cool PID action.	100
db	Deadband (db)	Temperature input: -10 to +10 °C [°F] or -10.0 to +10.0 °C [°F] Voltage/current inputs: -10.0 to +10.0 % of span	Set control action deadband between heat-side and cool-side proportional bands. Minus (-) setting results in overlap.	0 or 0.0
t	Cool-side proportioning cycle (t)	1 to 100 seconds (Not displayed if the control output is current output.)	Set control cool-side output cycle for heat/cool PID action.	See *4.
Pb	PV bias (Pb)	Temperature input: -1999 to +9999 °C [°F] or -199.9 to +999.9 °C [°F] Voltage/current inputs: -span to +span	Sensor correction is made by adding bias value to measured value (PV).	0 or 0.0
LCK	Set data lock function (LCK)	See *5.	Performs set data change enable/disable.	0000

NOTE Some parameter symbols may not be displayed depending on the specification.

***1 Precautions for heater break alarm (HBA) setting**

- Displayed only for when HBA is selected as alarm 2.
- HBA is not available on a current output.
- Set HBA set value to a value about 85 % of current transformer input value (CT). However, when power supply variations are large, set the HBA to a slightly smaller value.
  In addition, when two or more heaters are connected in parallel, set the HBA to a slightly larger value so that it is activated even with only one heater is broken (However, within the value of CT).
- When the HBA set value is set to 0.0 or the current transformer is not connected, the HBA is turned on.

***2 Precautions for control loop break alarm (LBA) setting**

- Displayed only for when LBA is selected as alarm 1 or alarm 2.
- No control loop break alarm can be used at heat/cool PID control action.
- When AT function is turned on, the LBA function can not activated.
- The LBA function is activated when control output reaches 0 % or 100 %. The time required for the LBA output to turn on includes both the time from the initial occurrence of loop failure and the LBA setting time. We recommend that the set value of LBA be twice the value of the integral time (I).
- If LBA setting time does not match the controlled object requirements, the LBA selling time should be lengthened.
  If setting time is not correct, the LBA will malfunction by turning on or off at inappropriate times or not turning on at all.

***3** Relay contact output: 20 sec, Voltage pulse output/Trigger output for triac driving/Triac output: 2 sec

***4** Relay contact output: 20 sec
Voltage pulse output/Triac output: 2 sec

***5 Details of set data lock level selection**

Setting	Details of lock levels
0000	SV and parameter can be set.
0001	Only SV and alarms (ALM1, ALM2) can be set.
0010	Only setting items other than alarms (ALM1, ALM2) can be set.
0011	Only SV can be set.
0100	Only setting items other than SV can be set.
0101	Only alarms (ALM1, ALM2) can be set.
0110	Only setting items other than SV and alarms (ALM1, ALM2) can be set.
0111	SV and parameter cannot be set.

- Each locked setting item can only be monitored.
- Each alarm setting item [HBA, LBA, LBD] can be locked when any of 0001, 0011, 0101 and 0111 is set.

5.3 Parameter Setting Procedure

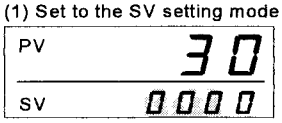
⚠ Key operational cautions

- When the set value is changed, it is not automatically stored. To store it, press the **SET** key.
- When the set data is locked, the digits on the SV display are brightly lit and the set value cannot be changed.

■ Setting set value (SV)

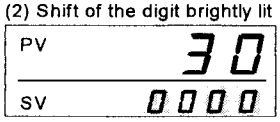
Example: Following is an example of set value (SV) to 200 °C

(1) Set to the SV setting mode



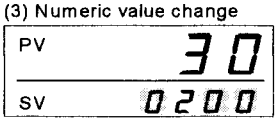
Press the **SET** key to enter the SV setting mode. The digit which light brightly is settable.

(2) Shift of the digit brightly lit



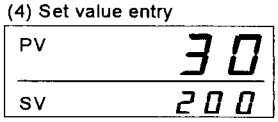
Press the **<R/S** key to shift the digit which lights brightly up to the hundreds digit.

(3) Numeric value change



Press the **UP** key to set 2. Pressing the **UP** key increase numerals, and pressing the **DOWN** key decrease numerals.

(4) Set value entry



After finishing the setting, press the **SET** key. All of the set value digits light brightly and as a result the instrument returns to the PV/SV display mode.

■ Setting parameters other than set value (SV)

The setting procedures are the same as those of example (2) to (4) in the above "**■ Setting set value (SV)**". Pressing the **SET** key after the setting end shifts to the next parameter. When no parameter setting is required, return the instrument to the PV/SV display mode.

6. OPERATIONS

6.1 Operation Procedures

CAUTIONS

- All mounting and wiring must be completed before the power is turned on.
  - Upscale *1: TC input , RTD input (Downscale when the input is shorted.)
  - Downscale *1: TC input (To be specified when ordering), Voltage input (Current input) *2
  - *1 Alarm output ON (However, for the W or A control action type, the control output on both heat-side and cool-side is turned off.)
  - *2 For 0 to 5 V DC or 0 to 20 mA DC, both control and alarm outputs are indefinite.
- A power failure of 20 ms or less will not affect the control action. When a power failure of more than 20 ms occurs, the instrument assumes that the power has been turned off. When power returns, the controller will retain the conditions that existed prior to shut down.
- The alarm hold action is activated when not only the power is turned on, but also the SV is changed.

(1) Prior to starting operation, check that the mounting and wiring have been finished, and that the SV and various parameters have been set.

(2) A power supply switch is not furnished with this instrument. If is ready to operate as soon as the power is turned on. Prior to factory shipment, the instrument is set to "RUN (operation start)."

NOTE

This instrument holds the conditions that exist just before the power is turned on. For example, if the power is turned off in STOP mode, the instrument starts in STOP mode when the power is turned on again.

■ RUN/STOP

If the instrument is switched to operation stop (STOP), its display, output, etc. become as follows.

- Display: The PV display shows STOP (STOP).
- Output: Control output OFF, Alarm output OFF
- Autotuning: AT canceled (The PID constants are not updated.)

■ RUN/STOP display (Z-1018 specification)

When operation is changed to the STOP mode by RUN/STOP selection, a parameter symbol to indicate the STOP mode is displayed on the SV display. Pressing the SET key with the STOP mode displayed can also check and change the set value (SV).

6.2 Set Data Lock (LCK) Function

The set data lock function permits locking of critical parameters and prevents unauthorized personnel from changing parameters.

6.3 Autotuning (AT) Function

The AT function automatically measures, computes and sets the optimum PID and LBA constants.

■ Requirements for AT start

Start AT when all the following conditions are satisfied:

- Prior to starting the AT function, end all the parameter settings other than PID and LBA.
- Confirm the LCK function has not been engaged.

■ Requirements for AT suspension

The AT function is suspended if any of the following conditions is established:

- When the SV is changed.
- When the PV bias value is changed.
- When the RUN/STOP is changed to the STOP mode.
- When the PV becomes abnormal when burnout.
- When the power is turned off.
- When a power failure longer than 20 ms occurs.
- When the AT function does not end in about nine hours after autotuning started.

NOTE

- If the AT is canceled, the controller immediately changes to PID control. The PID and LBA constants will be the same as before AT was activated.
- When AT is competed, the controller immediately changes to PID control. If the control system does not allow the AT cycling process, do not use AT and set each PID constant to meet the needs of the application.

6.4 Self-tuning (ST) Function

The ST function is used to automatically calculate and set adaptive PID constants anytime the power is turned on, the SV is changed or the controller detects unstable control conditions.

CAUTION

- **The ST function should be turned off when the controlled system is affected by rippling that occurs due to periodic external disturbances.**
- **The power to the controlled system must be turned on before the power to the instrument is turned on or SV is changed. This is required when ST function is on.**
- **To activate the ST function, the following parameters must not be set to zero: P≠0, I≠0, D≠0, ARW≠0.**
- **When the AT function is activated, the ST function can not be turned on.**
- **When the ST function is activated, the PID and ARW settings cannot be changed, only monitored.**

7. ERROR DISPLAYS

■ Error display

Err	**RAM failure** (Incorrect set data write, etc.)	Please contact your nearest RKC sales office or agent.

■ Overscale and Underscale

Measured value (PV) is flashing	PV is outside of input range.	**⚠ WARNING** To prevent electric shock, always turn off the power before replacing the sensor. Check the sensor or input lead
0000 flashing	Overscale - PV is above the high input display range limit.	
uuuu flashing	Underscale - PV is below the low input display range limit.	

8. INPUT RANGE TABLE

Input type			Model code
K	0 to 200	°C	K 01
	0 to 400	°C	K 02
	0 to 600	°C	K 03
	0 to 800	°C	K 04
	0 to 1000	°C	K 05
	0 to 1200	°C	K 06
	0 to 1372	°C	K 07
	0 to 100	°C	K 13
	0 to 300	°C	K 14
	0 to 450	°C	K 17
	0 to 500	°C	K 20
	0 to 800	°F	K A1
	0 to 1600	°F	K A2
	0 to 2502	°F	K A3
	20 to 70	°F	K A9
J	0 to 200	°C	J 01
	0 to 400	°C	J 02
	0 to 600	°C	J 03
	0 to 800	°C	J 04
	0 to 1000	°C	J 05
	0 to 1200	°C	J 06
	0 to 450	°C	J 10

Input type			Model code
J	0 to 800	°F	J A1
	0 to 1600	°F	J A2
	0 to 2192	°F	J A3
	0 to 400	°F	J A6
	0 to 300	°F	J A7
R	*1 0 to 1600	°C	R 01
	*1 0 to 1769	°C	R 02
	*1 0 to 1350	°C	R 04
	*1 0 to 3200	°F	R A1
	*1 0 to 3216	°F	R A2
S	*1 0 to 1600	°C	S 01
	*1 0 to 1769	°C	S 02
	*1 0 to 3200	°F	S A1
	*1 0 to 3216	°F	S A2
B (*3)	*1 0 to 1820	°C	B 02
	800 to 3200	°F	B A1
	*1 0 to 3308	°F	B A2
E	0 to 800	°C	E 01
	0 to 1000	°C	E 02
	0 to 1600	°F	E A1
	0 to 1832	°F	E A2

Input type			Model code
N	0 to 1200	°C	N 01
	0 to 1300	°C	N 02
	0 to 2300	°F	N A1
	0 to 2372	°F	N A2
T	*2 -199.9 to +400.0	°C	T 01
	*2 -199.9 to +100.0	°C	T 02
	-100.0 to +200.0	°C	T 03
	0.0 to 350.0	°C	T 04
	*2 -199.9 to +752.0	°F	T A1
	-100.0 to +200.0	°F	T A2
	-100.0 to +400.0	°F	T A3
	0.0 to 450.0	°F	T A4
	0.0 to 752.0	°F	T A5
W5Re/W26Re (*3)	0 to 2000	°C	W 01
	0 to 2320	°C	W 02
	0 to 4000	°F	W A1
PL II	0 to 1300	°C	A 01
	0 to 1390	°C	A 02
	0 to 1200	°C	A 03
	0 to 2400	°F	A A1
	0 to 2534	°F	A A2
U	*2 -199.9 to +600.0	°C	U 01

Input type			Model code
U	*2 -199.9 to +100.0	°C	U 02
	0.0 to 400.0	°C	U 03
	*2 -199.9 to +999.9	°F	U A1
	-100.0 to +200.0	°F	U A2
	0.0 to 999.9	°F	U A3
L	0 to 400	°C	L 01
	0 to 800	°C	L 02
	0 to 800	°F	L A1
	0 to 1600	°F	L A2
Pt100	-199.9 to +649.0	°C	D 01
	-199.9 to +200.0	°C	D 02
	-100.0 to + 50.0	°C	D 03
	-100.0 to +100.0	°C	D 04
	-100.0 to +200.0	°C	D 05
	0.0 to 50.0	°C	D 06
	0.0 to 100.0	°C	D 07
	0.0 to 200.0	°C	D 08
	0.0 to 300.0	°C	D 09
	0.0 to 500.0	°C	D 10
	-199.9 to +999.9	°F	D A1
	-199.9 to +400.0	°F	D A2
	-199.9 to +200.0	°F	D A3

Input type			Model code
Pt100	-100.0 to +100.0	°F	D A4
	-100.0 to +300.0	°F	D A5
	0.0 to 100.0	°F	D A6
	0.0 to 200.0	°F	D A7
	0.0 to 400.0	°F	D A8
	0.0 to 500.0	°F	D A9
JPt100	-199.9 to +649.0	°C	P 01
	-199.9 to +200.0	°C	P 02
	-100.0 to + 50.0	°C	P 03
	-100.0 to +100.0	°C	P 04
	-100.0 to +200.0	°C	P 05
	0.0 to 50.0	°C	P 06
	0.0 to 100.0	°C	P 07
	0.0 to 200.0	°C	P 08
	0.0 to 300.0	°C	P 09
	0.0 to 500.0	°C	P 10
0 to 5 V DC			4 01
0 to 10 V DC **	0.0 to 100.0		5 01
1 to 5 V DC			6 01
0 to 20 mA DC			7 01
4 to 20 mA DC			8 01

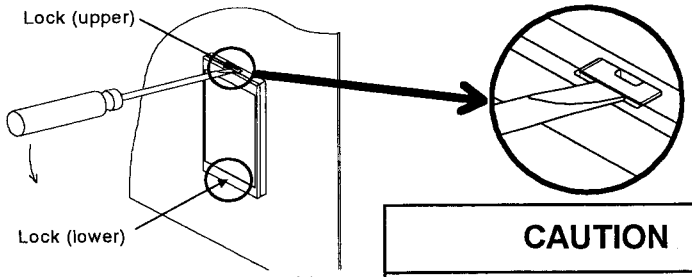
**Z-1010 specification

*1 0 to 399°C /0 to 799°F: Accuracy is not guaranteed.
*2 -199.9 to -100.0°C /-199.9 to -158.0°F: Accuracy is not guaranteed.
*3 This input type can not be selected in the Z-1021 specification.

9. REMOVING THE INTERNAL ASSEMBLY

⚠ WARNING

- To prevent electric shock or instrument failure, only qualified personnel should be allowed to remove the internal assembly.
- To prevent electric shock or instrument failure, the power must be turned off before removing internal assembly.
- To prevent injury or instrument failure, do not touch the printed wiring boards when removing the internal assembly.



Unlock using such an screwdriver. Gently press down on handle for the upper lock and lift up for the lower lock.

CAUTION

Apply pressure very carefully when removing internal assembly to avoid damage to the frame.

NOTE

Recommended tool: Blade screwdriver
(Recommended blade width: 6mm or less)

To conform to **IEC6010-1** requirements for protection from electric shock, the internal assembly of this instrument can only be removed with an appropriate tool.

The first edition: MAR 1998
The seventh edition: JUL. 2001

RKC RKC INSTRUMENT INC.
HEADQUARTERS : 16-6, KUGAHARA 5 CHOME OHTA-KU TOKYO 146-8515 JAPAN
PHONE: 03-3751-9799 (+81 3 3751 9799)
FAX: 03-3751-8585 (+81 3 3751 8585)
E-mail: info@rkcinst.co.jp

AUG. 2001. 3,000(P)