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For detailed usage, refer to the Instruction Manual for the BCS2, BCR2, and BCD2. Please download the full Instruction Manual from Shinko website.  
<https://shinko-technos.co.jp/e/> → Support & Downloads → Downloads → Manuals

Thank you for purchasing our BCS2, BCR2, BCD2, Digital Indicating Controller. This manual contains instructions for the mounting, functions, operations and notes when operating the BCS2, BCR2, and BCD2. To ensure safe and correct use, thoroughly read and understand this manual before using this instrument. To prevent accidents arising from the misuse of this instrument, please ensure the operator receives this manual.

**Safety Precautions** (Be sure to read these precautions before using our products.)

The safety precautions are classified into 2 categories: "Warning" and "Caution".

⚠ Warning: Procedures which may lead to dangerous conditions and cause death or serious injury, if not carried out properly.

⚠ Caution: Procedures which may lead to dangerous conditions and cause superficial to medium injury or physical damage or may degrade or damage the product, if not carried out properly.

**Warning**

- To prevent an electric shock or fire, only Shinko or other qualified service personnel may handle the inner assembly.
- To prevent an electric shock, fire or damage to the instrument, parts replacement may only be undertaken by Shinko or other qualified service personnel.

**SAFETY PRECAUTIONS**

- To ensure safe and correct use, thoroughly read and understand this manual before using this instrument.
- This instrument is intended to be used for industrial machinery, machine tools and measuring equipment. Verify correct usage after purpose-of-use consultation with our agency or main office. (Never use this instrument for medical purposes with which human lives are involved.)
- This instrument is designed to be installed through the control panel indoors.
- External protection devices such as protective equipment against excessive temperature rise, etc. must be installed, as malfunction of this product could result in serious damage to the system or injury to personnel. Proper periodic maintenance is also required.
- This instrument must be used under the conditions and environment described in this manual. Shinko Technos Co., Ltd. does not accept liability for any injury, loss of life or damage occurring due to the instrument being used under conditions not otherwise stated in this manual.

**Warning on Model Label****Caution**

Failure to handle this instrument properly may result in minor or moderate injury or property damage due to fire, malfunction, malfunction, or electric shock. Please read this manual before using the product to ensure that you fully understand the product.

**Caution for Mounting**

This instrument is intended to be used under the following environmental conditions (IEC61010-1): Overvoltage category II, Pollution degree 2  
 Ensure the mounting location corresponds to the following conditions:

- A minimum of dust, and an absence of corrosive gases
- No flammable, explosive gases
- No mechanical vibrations or shocks
- No exposure to direct sunlight, an ambient temperature of -10 to 55°C (14 to 131°F) (No icing)
- An ambient non-condensing humidity of 35 to 85%RH (Non-condensing)
- No large capacity electromagnetic switches or cables through which large current is flowing
- No water, oil or chemicals or where the vapors of these substances can come into direct contact with the unit
- Take note that the ambient temperature of this unit – not the ambient temperature of the control panel – must not exceed 55°C (131°F) if mounted through the face of a control panel, otherwise the life of electronic components (especially electrolytic capacitors) may be shortened.

**Caution with respect to Export Trade Control Ordinance**

To avoid this instrument from being used as a component in, or as being utilized in the manufacture of weapons of mass destruction (i.e. military applications, military equipment, etc.), please investigate the end users and the final use of this instrument. In the case of resale, ensure that this instrument is not illegally exported.

**Compliance with Safety Standards****Caution**

- Always install the recommended fuse described in this manual externally.
- If the instrument is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired.
- Use a device with reinforced insulation or double insulation for the external circuit connected to this product.
- When using this product as a UL certified product, use a power supply conforming to Class 2 or LIM for the external circuit connected to the product.

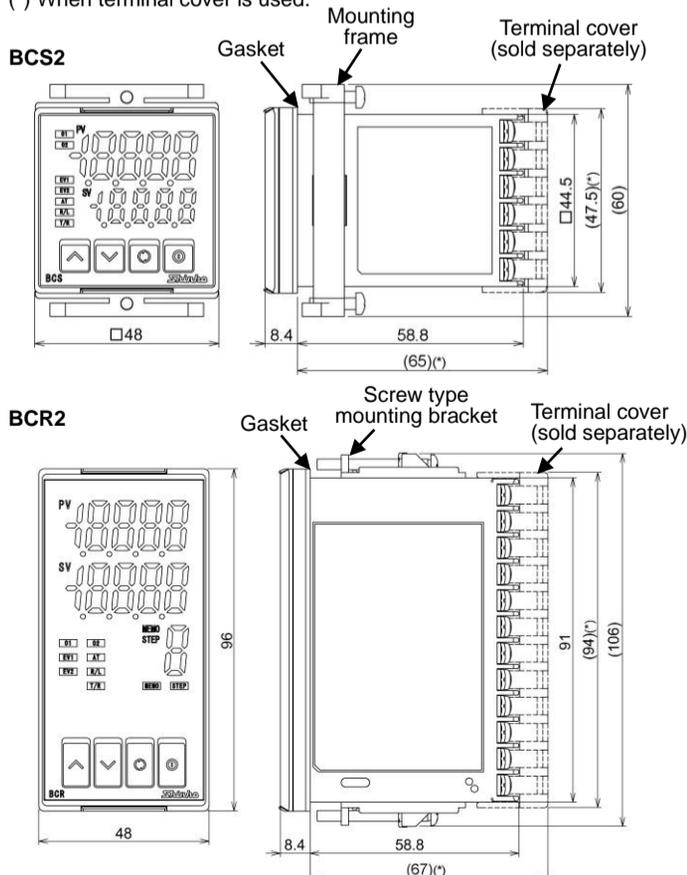
**Specifications**

Power supply voltage	100 to 240 V AC 50/60Hz, Allowable fluctuation: 85 to 264 V AC 24 V AC/DC 50/60Hz, Allowable fluctuation: 20 to 28 V AC/DC
Base accuracy (At ambient temperature 23°C, for a single unit mounting)	Thermocouple: Within $\pm 0.2\%$ of each input span $\pm 1$ digit. However, R, S inputs, 0 to 200°C (32 to 392°F): Within $\pm 6^\circ\text{C}$ (12°F) B input, 0 to 300°C (32 to 572°F): Accuracy is not guaranteed. K, J, E, T, N inputs, Less than 0°C (32°F): Within $\pm 0.4\%$ of input span $\pm 1$ digit RTD: Within $\pm 0.1\%$ of each input span $\pm 1$ digit Direct current, voltage inputs: Within $\pm 0.2\%$ of each input span $\pm 1$ digit
Input sampling period	125 ms
Power consumption	100 to 240 V AC: Approx. 8 VA max. (11 VA max. if all options added) 24 V AC: Approx. 5 VA max. (8 VA max. if all options are added) 24 V DC: Approx. 5 W max. (8 W max. if all options are added)
Ambient temperature/Humidity	-10 to 55°C, 35 to 85%RH (No icing, Non-condensing)
Altitude	2,000 m or less
Weight	BCS2: Approx. 110g, BCR2: Approx. 160g, BCD2: Approx. 220g
Accessories	Mounting frame: 1 piece (BCS2) Screw type mounting bracket: 1 piece (BCR2, BCD2) Instruction manual excerpt: 1 copy

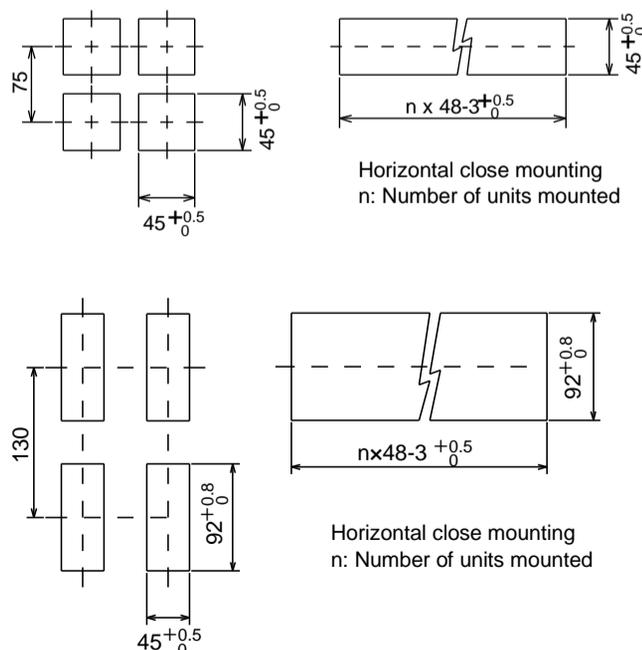
Control output (OUT1)	Relay contact 1a, Control capacity: 3 A 250 V AC (resistive load) 1 A 250 V AC (inductive load $\cos\phi=0.4$ ) Electric life: 100,000 cycles, Minimum applicable load: 10 mA 5 V DC Non-contact voltage (for SSR drive): 12 V DC $\pm 15\%$ Max 40 mA (short circuit protected) Direct current: 4 to 20 mA DC (Resolution: 12000) Load resistance: Max. 550 $\Omega$
EVT output	Relay contact 1a, Control capacity: 3 A 250 V AC (resistive load) 1 A 250 V AC (inductive load $\cos\phi=0.4$ ) Electric life: 100,000 cycles, Minimum applicable load: 10 mA 5 V DC
Control output (OUT2) (DS, DA, EV2 options)	Relay contact 1a, Control capacity: 3 A 250 V AC (resistive load) 1 A 250 V AC (inductive load $\cos\phi=0.4$ ) Electric life: 100,000 cycles (If EV2 option is ordered, and 019 is selected from Event Output EV2 allocation.) Non-contact voltage (for SSR drive): 12 V DC $\pm 15\%$ Max 40 mA (short circuit protected) Direct current: 4 to 20 mA DC (Resolution: 12000) Load resistance: Max 550 $\Omega$

**Dimensions** (Scale: mm)

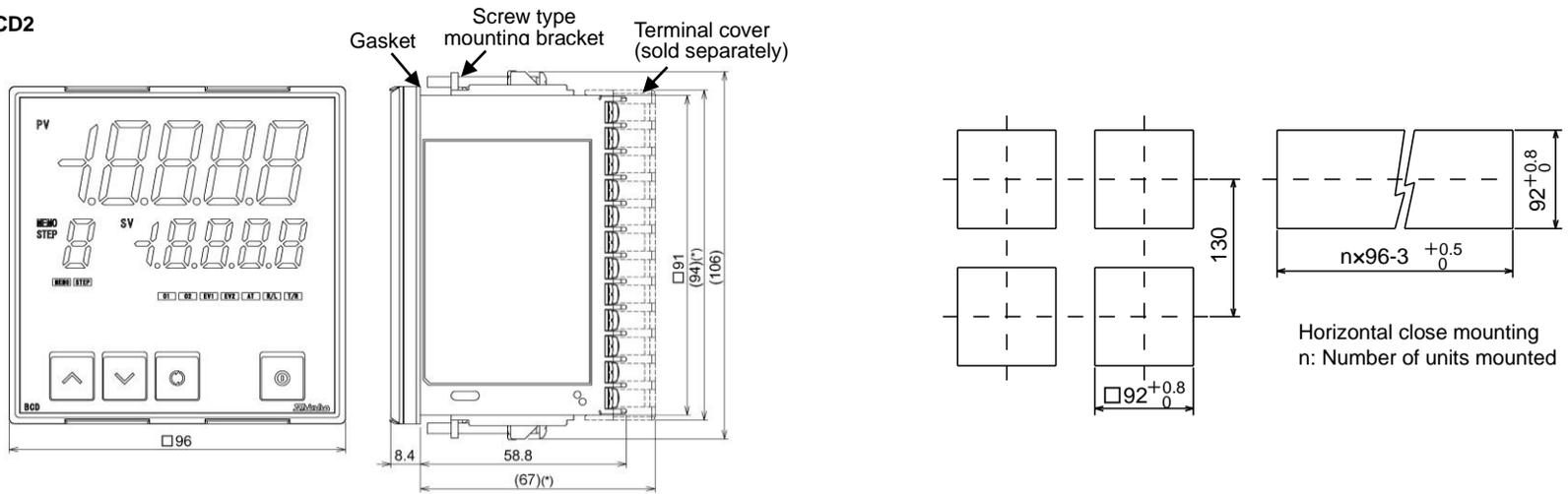
(\*) When terminal cover is used.

**Panel Cutout** (Scale: mm)**Caution**

If horizontal close mounting is used for the unit, IP66 specification (Drip-proof/Dust-proof) may be compromised, and all warranties will be invalidated.

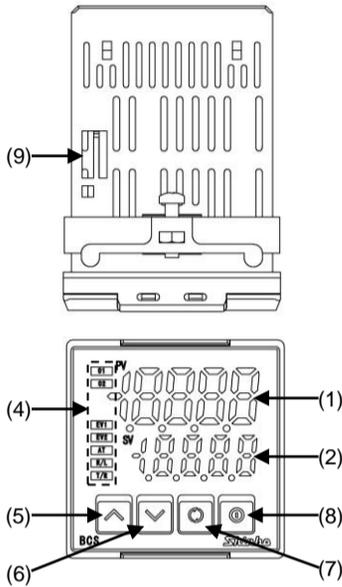


**BCD2**

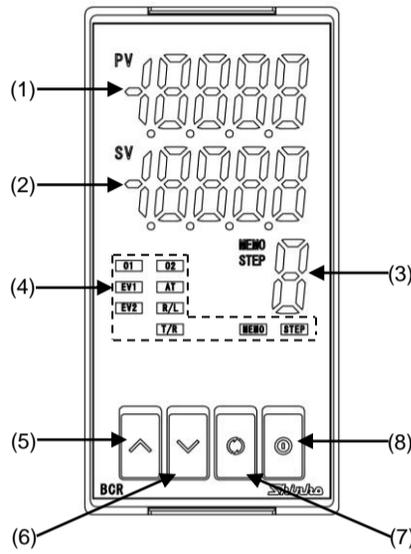


**Names and Functions of Controller**

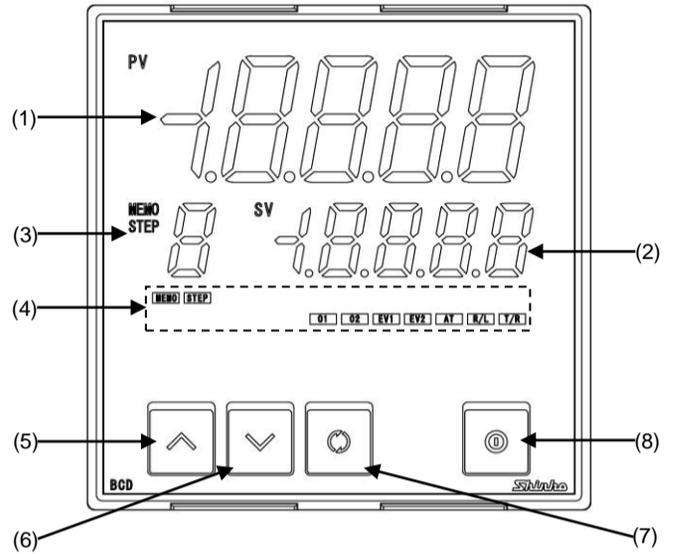
**BCS2**



**BCR2**



**BCD2**



**Displays**

(1)	PV Display	Indicates the PV (process variable), or setting characters in setting mode.
(2)	SV Display	Indicates the SV (desired value) or set data in setting mode. In Monitor mode, indicates MV (manipulated variable), remaining time (Program control), step number (Program control) (*) or Set value memory number (Fixed value control) (*). (*) For BCS2 only
(3)	MEMO/STEP Display	Indicates Set value memory number or step number (Program control). (For BCR2, BCD2)

**Action Indicators**

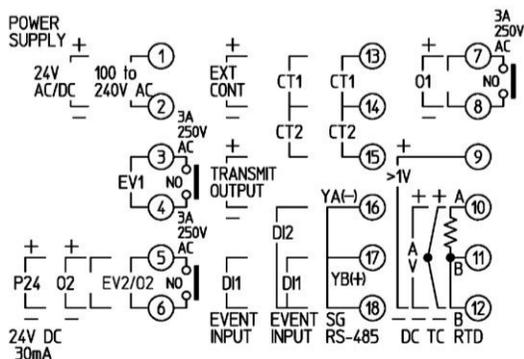
(4)	O1	Lit when control output OUT1 is ON. For direct current output type, flashes corresponding to the MV in 125 ms cycles.
	O2	Lit when control output OUT2 (EV2, DS, DA or EV2+D□ option) is ON. For direct current output type, flashes corresponding to the MV in 125 ms cycles.
	EV1	Lit when Event output 1 is ON.
	EV2	Lit when Event output 2 (EV2 or EV2+D□ option) is ON.
	AT	Flashes while AT or Auto-reset is performing.
	R/L	Lit while in Remote action (EIT option).
	T/R	Lit during Serial communication (C5W or C5 option) TX (transmitting) output.
	MEMO	Lit when Set value memory number is indicated. (For BCR2, BCD2)
	STEP	Lit when Step number (Program control) is indicated. (For BCR2, BCD2)

**Keys, Connector**

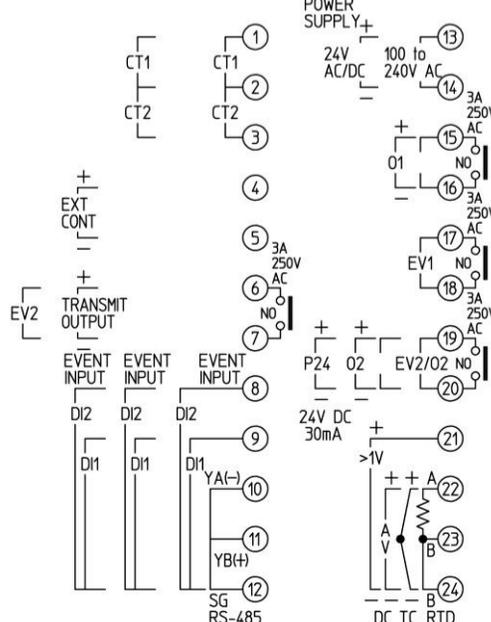
(5)	UP key	Increases the numeric value. If this key is pressed for 1 sec during Program control, the unit proceeds to the next step. (Advance function)
(6)	DOWN key	Decreases the numeric value.
(7)	MODE key	Selects a setting mode, and registers the set data. If the MODE key is pressed in RUN mode for 3 sec, the unit moves to Monitor mode.
(8)	OUT/OFF key	By pressing this key for 1 sec, one of the following items selected in [OUT/OFF key function] is indicated. • Control output OFF function: Turns control output ON or OFF. • Auto/Manual control: Switches the Auto/Manual control. • Program control: Starts or stops the Program control.
(9)	Console connector	By connecting to the tool cable (CMD-001, sold separately), the following operations can be conducted from an external computer using the Console software SWC-BCx01M. • Reading and setting of SV, PID and various set values • Reading of PV and action status • Function change. (Console connector is located on the top of the BCS2, BCR2, and BCD2 case.)

**Terminal Arrangement**

**BCS2**



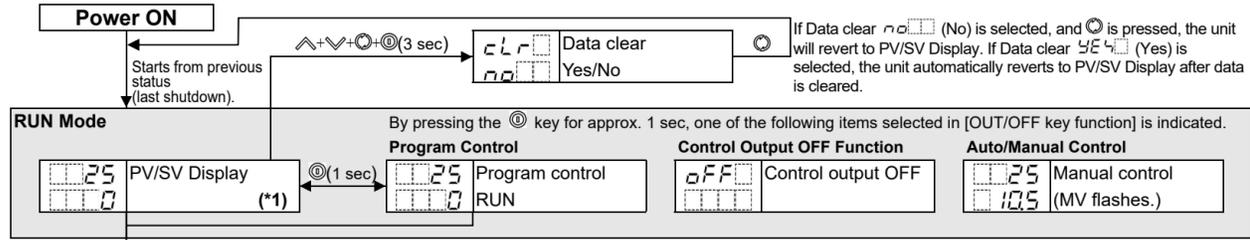
**BCR2, BCD2**



POWER SUPPLY	Supply voltage 100 to 240 V AC or 24V AC/DC (For 24 V DC, ensure polarity is correct.)
EV1	Event output EV1
EV2	Event output EV2 (EV2, EV2+D□ options)
O2	Control output OUT2 (EV2, DS, DA, EV2+D□ options)
P24	24 V DC Insulated power output (P24 option)
O1	Control output OUT1
TC	Thermocouple input
RTD	RTD input
DC	DC voltage, current input
CT1	CT input 1 (C5W, EIW, W options)
CT2	CT input 2 (C5W, EIW, W options)
RS-485	Serial communication RS-485 (C5W, C5 options)
EVENT INPUT	Event input DI1 (C5W, EIW, EIT, EI options) (C5W: For BCR2, BCD2) Event input DI2 (C5W, EIW, EIT, EI options) (C5W, EIT: For BCR2, BCD2)
EXT CONT	External setting input (EIT option)
TRANSMIT OUTPUT	Transmission output (EIT option)

**Caution**  
Do not pull or bend the lead wire on the terminal side when wiring or after wiring, as it could cause malfunction.

# Key Operation Flowchart

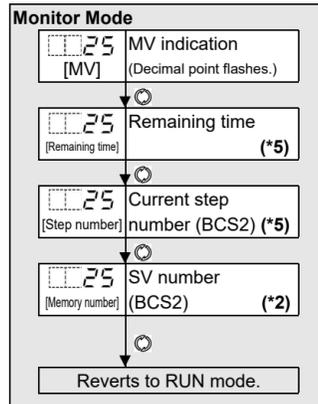
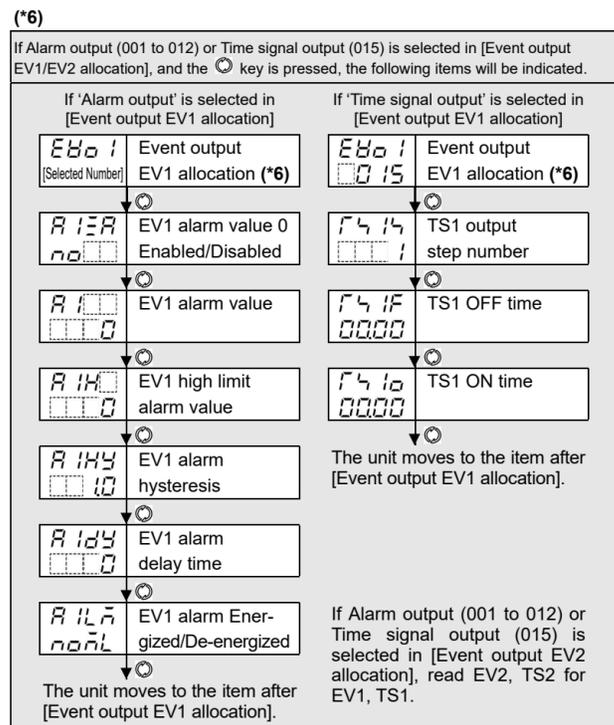
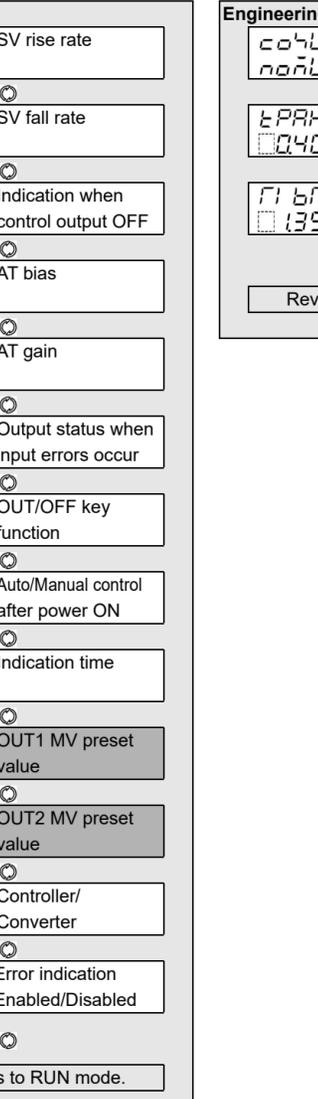
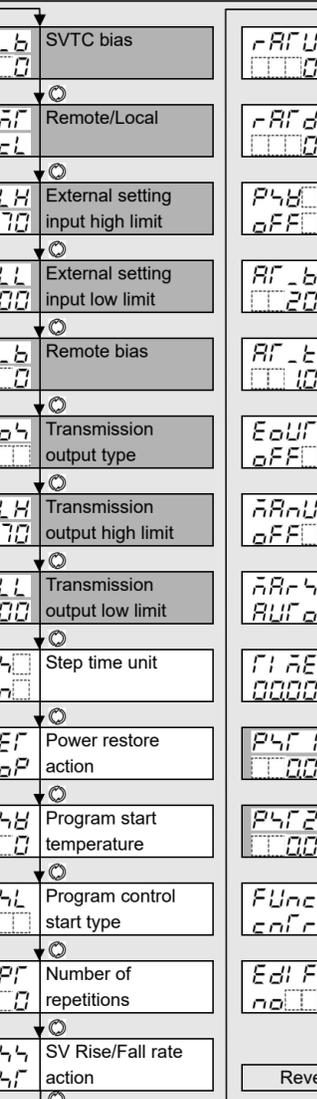
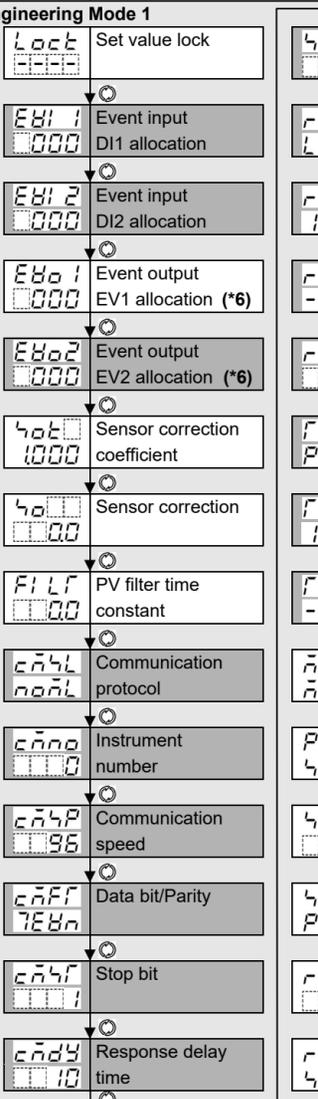
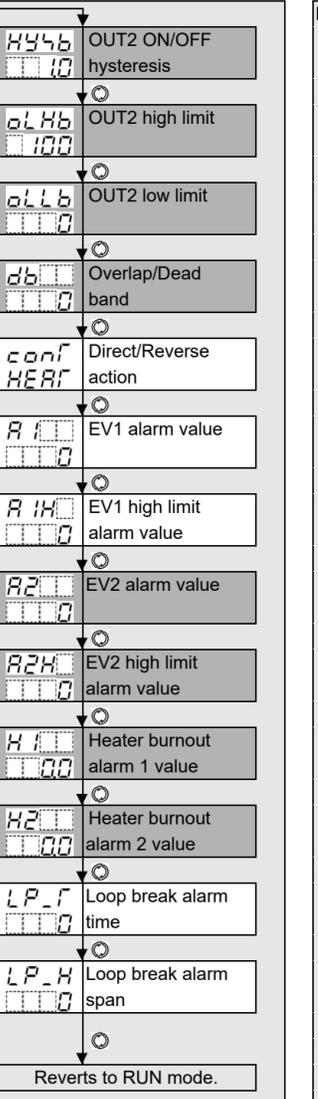
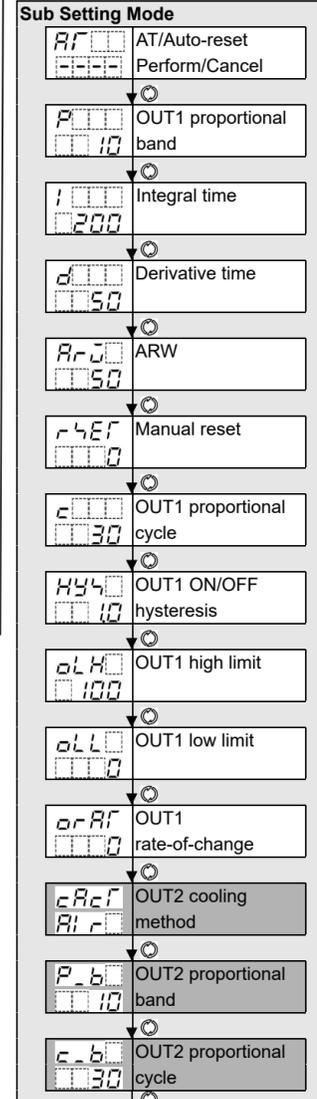
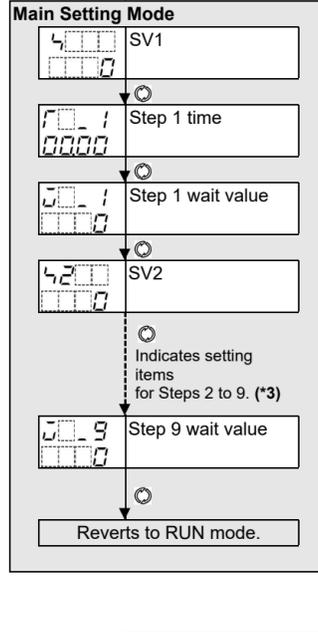
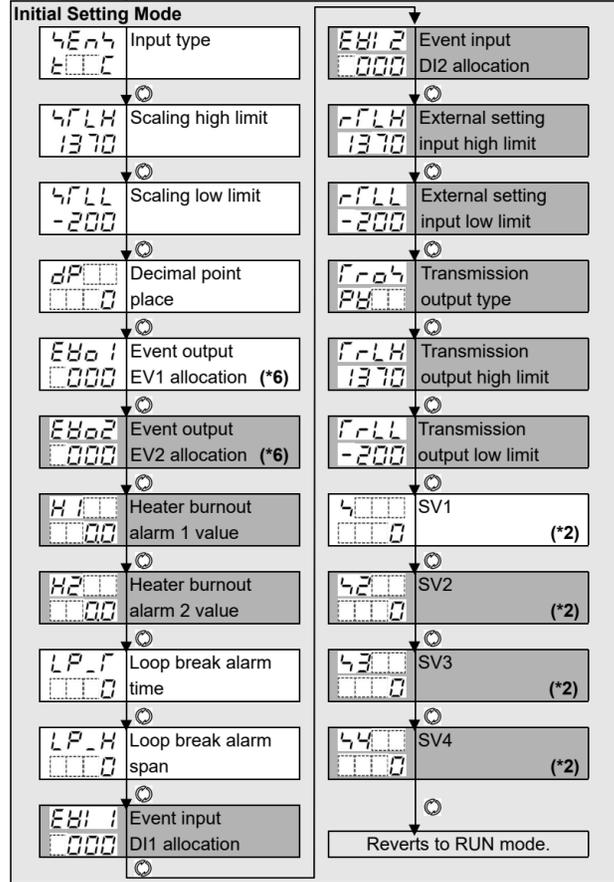


## About Setting Item

- Upper left: PV Display: Indicates setting characters.
- Lower left: SV Display: Indicates factory default.
- Right side: Indicates the setting item.
- This setting item is optional, and appears only when the option is ordered.
- (\*)1 If 'Program control' is selected in [OUT/OFF key function], the unit enters Standby mode (Program control waiting).
- (\*)2 Not available if 'Program control' is selected in [OUT/OFF key function].
- (\*)3 If the option is ordered, and if 'Set value memory' is selected in [Event input DI1/DI2 allocation], setting items SV2 to SV4 are available. If 'Program control' is selected in [OUT/OFF key function], SV2 to SV9, Steps 1 to 9 wait value are available.
- (\*)4 The unit cannot proceed to Monitor mode if it is in Standby of Program control.
- (\*)5 Available only when 'Program control' is selected in [OUT/OFF key function].

## Key Operation

- $\Delta + \nabla + \odot + \text{key}$  (3 sec): Press and hold  $\Delta$ ,  $\nabla$ ,  $\odot$ ,  $\text{key}$  (in that order) for approx. 3 sec.
- $\nabla + \odot$  (3 sec): Press and hold the  $\nabla$ ,  $\odot$  keys (in that order) together for approx. 3 sec.
- $\Delta + \odot$ : Press and hold the  $\Delta$ ,  $\odot$  keys (in that order) together.
- $\Delta + \nabla$  (3 sec): Press and hold the  $\Delta$ ,  $\nabla$  keys (in that order) together for approx. 3 sec.
- $\Delta + \nabla + \odot$  (5 sec): Press and hold the  $\Delta$ ,  $\nabla$  and  $\odot$  keys (in that order) together for approx. 5 sec.
- Set (or select) each item with the  $\Delta$  or  $\nabla$  key, and register the value with the  $\odot$  key
- $\nabla + \odot$ : If the  $\nabla$  key is pressed, the unit proceeds to the next item, illustrated by an arrow. Pressing  $\odot$  key moves back to the previous item.
- To revert to RUN mode, press and hold the  $\odot$  key for approx. 3 sec while in any mode.
- To revert to RUN mode, press and hold the  $\odot$  key for approx. 3 sec while in any mode. If 'Control output OFF function' is selected in [OUT/OFF key function], the unit will enter Control output OFF status. If 'Auto/Manual control' is selected, the unit will enter Manual control status. If 'Program control' is selected, the unit will enter Program control RUN or Standby mode.



Input type K -200 to 1370 °C J -200.0 to 400.0 °C J -200 to 1000 °C R 0 to 1760 °C S 0 to 1760 °C B 0 to 1820 °C E -200 to 800 °C T -200.0 to 850.0 °C N -200 to 1300 °C PL-PL II 0 to 1390 °C C(W/Re5-26) 0 to 2315 °C Pt100 -200.0 to 850.0 °C JPt100 -200.0 to 500.0 °C Pt100 -200 to 850 °C JPt100 -200 to 500 °C K -328 to 2498 °F J -328 to 1832 °F R 32 to 3200 °F S 32 to 3200 °F B 32 to 3308 °F E -328 to 1472 °F	T -328.0 to 752.0 °F N -328 to 2372 °F PL-PL II 32 to 2534 °F C(W/Re5-26) 32 to 4199 °F Pt100 -328.0 to 1562.0 °F Pt100 -328 to 1562 °F JPt100 -328 to 932 °F JPt100 -328 to 932 °F 4 to 20 mA -2000 to 10000 0 to 20 mA -2000 to 10000 0 to 1 V -2000 to 10000 0 to 5 V -2000 to 10000 1 to 5 V -2000 to 10000 0 to 10 V -2000 to 10000 Decimal point place 000 No decimal point 001 1 digit after decimal point 002 2 digits after decimal point 003 3 digits after decimal point Event output EV1/EV2 allocation 000 No event 001 High limit alarm 002 Low limit alarm	003 H/L limits alarm 004 H/L limits independent 005 H/L limit range alarm 006 H/L limit range independent 007 Process high alarm 008 Process low alarm 009 High limit with standby 010 Low limit with standby 011 H/L limits with standby 012 H/L limits with standby independent 013 Heater burnout alarm output 014 Loop break alarm output 015 Time signal output 016 Output during AT 017 Pattern end output 018 Output by communication command 019 Heating/Cooling control relay contact output (for EV2 only) EV1/EV2 alarm value 0 Disabled/Enabled	no Disabled ye Enabled EV1/EV2 alarm Energized/De-energized no Energized re De-energized Event input DI1/DI2 allocation 000 No event 001 Set value memory 002 Control ON/OFF 003 Direct/Reverse action 004 Preset output 1 ON/OFF 005 Preset output 2 ON/OFF 006 Auto/Manual control 007 Remote/Local 008 Program control Run/Stop 009 Program control Holding/Not holding 010 Program control Advance function 011 Integral action Holding Transmission output	PH PV transmission 48 SV transmission 88 MV transmission db DV transmission AT/Auto-reset Perform/Cancel AT/Auto-reset Cancel AT Perform AT on startup Perform Auto-reset Perform OUT2 cooling method R Air cooling o Oil cooling w Water cooling Direct/Reverse action HER Reverse action c Direct action Set value lock Lock 1 Lock 2 Lock 3 Lock 4 Lock 5	Communication protocol no Shinko protocol na Modbus ASCII ra Modbus RTU Jn Shinko protocol (JC command allocation) Jna Modbus ASCII (JC command allocation) Jnr Modbus RTU (JC command allocation) Communication speed 96 9600 bps 192 19200 bps 384 38400 bps Data bit/Parity 8 No bits/No parity 7 7 bits/No parity 8E 8 bits/Even 7E 7 bits/Even 8O 8 bits/Odd 7O 7 bits/Odd Stop bit 1 1 bit	2 bits Remote/Local Local Remote Step time unit Hours:Minutes Minutes:Seconds Power restore action Stop Continue (resume) Suspend (on hold) Program control start type PV start PVR start SV start SV Rise/Fall rate action SV start PV start Indication when control output OFF OFF indication No indication PV indication	PV + Any Alarm active Output status when input errors occur Output OFF Output ON OUT/OFF key function Control output OFF Auto/Manual control Program control Auto/Manual control after power ON Automatic control Manual control Controller/Converter function Controller Converter Error indication Enabled/Disabled Control method Usual PID 2DOF PID
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