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*Digital Controller*

***CB103/CB403  
CB903***


***Initial Setting Manual***


Thank you for purchasing the **RKC** product.

Before operating this instrument, please carefully read this manual and fully understand its contents.

And always keep it around you to make it available easily anytime.

## SYMBOL

 : If there are possible dangers such as electric shock, fire (burns), etc. which may result in operator's loss of life or injury, precautions to avoid such dangers are described.

 : In case instrument damages may be caused if operating procedures are not strictly followed, precautions to avoid such damages are described.



: This mark is used when great care is needed especially for safety.



: This mark is used when careful operation or handling is especially needed.



: This mark is used when a supplemental description of operation or handling is needed.



: This mark is used when detailed or related information needs to be referred to.



### WARNING

- If failure or error of this instrument could result in a critical accident of the system, install an external protection circuit to prevent such an accident.
- Do not turn on the power supply until all of the wiring is completed. Otherwise electric shock, fire or malfunction may result.
- Use this instrument within the scope of its specifications. Otherwise fire or malfunction may result.
- Do not use this instrument in the places subject to flammable or explosive gas.
- Do not touch high-voltage blocks such as power supply terminals, etc. Otherwise electric shock may result.
- Never disassemble, repair or modify the instrument. This may cause electric shock, fire or malfunction.

## CAUTION

- This is a Class A instrument. In a domestic environment this instrument may cause radio interference, in which case the user is required to take adequate measures.
- This instrument is protected from electric shock by reinforced insulation. So please arrange reinforced insulation to the wire for input signal against the wires for instrument power supply, source of power and loads as far as possible.
- This instrument is manufactured on the assumption that it is used in the condition of being mounted on the instrumentation panel. Therefore, take the necessary measures on the equipment side mounted with this instrument so that the operator or other personnel are not accessible to high-voltage blocks in this instrument such as power supply terminals, etc.
- Always observe precautions described in this manual. Otherwise serious injury or accident may result.
- Conduct all of the wiring in accordance with the local codes and regulations.
- Install a protection device such as a fuse, etc. in the power supply, input or output line, if necessary.
- Do not allow metal fragments or lead wire scraps to fall inside this instrument. This may cause electric shock, fire or malfunction.
- Firmly tighten each terminal screw at the specified torque. Otherwise electric shock or fire may result.
- Do not place any obstacle around this instrument in order not to impede radiation of heat. And do not close ventilation holes.
- Do not connect wires to unused terminals.
- Before cleaning the instrument, always turn off the power supply.
- Remove stains from this instrument using a soft, dry cloth. Do not use a volatile solvent such as thinner in order to avoid deformation or discoloration.
- Do not rub nor strike the display unit of this instrument with a hard object.

## NOTICE

- This manual is written for **RKC** service engineers or qualified technicians. This manual is also prepared especially for readers who already have a fundamental knowledge of electricity, control, computer and communication.
- This manual is subject to change without prior notice.
- Examples of figures, diagrams and numeric values used in this manual are for a better understanding of the text, but not for assuring the resultant operation.
- This manual may not be reproduced or copied in whole or in part without **RKC's** prior consent.
- **RKC** assumes no responsibility for any of the following damage which the user or third party may suffer.
  - Damage incurred as a result of using this product.
  - Damage caused by product failure which cannot be predicted by **RKC**.
  - Other indirect damage.
- In order to use this instrument continuously and safely, periodic maintenance is required. Some of components and parts used in this instrument have a limited service life, or deteriorate over time.
- This manual is carefully prepared. However, if any mistake or omission is found, please contact **RKC**.

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# 1. TRANSFER TO MODE

Initialization is to set parameters relating to instrument specifications (input type, input range, alarm type, etc.) and those relating to instrument characteristics (setting limiter, alarm differential gap, etc.).

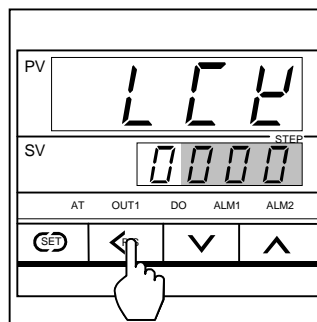
## 1.1 Transfer to Initialization Mode

 The  section in each picture is dimly lit.

1. Turn on the power to this instrument. Thus, the input type, input range and PV/SV display mode change in this order.
2. Press the SET key for two seconds with the instrument set to PV/SV display mode to change the instrument to parameter setting mode.

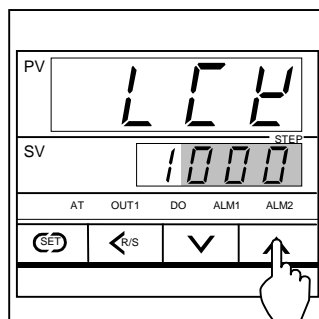
 For details on parameter setting mode, see the instruction manual for **CB103/CB403/CB903 (IMCB11-E□)**.

3. Press the SET key to change to the set data lock function display (*LCK*).
4. Press the <R/S key to light brightly the thousands digit on the set value (SV) display unit.



Set data lock function display

5. Press the UP key to change 0 to 1 in the thousands digit.

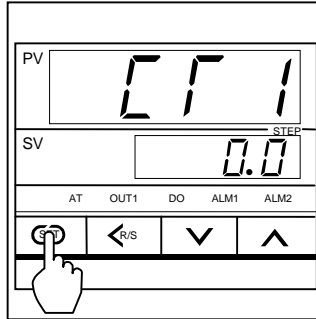


Set data lock function display

Set value
0 : Initialization mode locked
1 : Initialization mode unlocked

Continued on the next page.

6. Press the SET key to change to the next parameter. Thus, the data in initialization mode is unlocked.

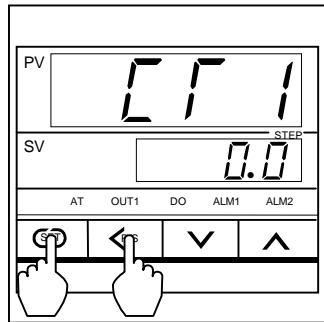


CT1 input value display

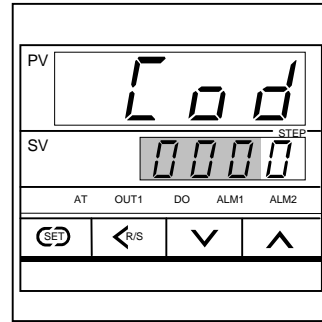


The parameter to be displayed varies depending on the specification.

7. Press the <R/S key while pressing the SET key for two seconds to change the instrument to initialization mode. Thus, the symbol (Cod) for selecting the initialize code is displayed first.






CT1 input value display




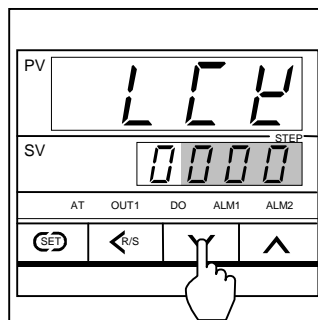
Initialize code selection display of initialization mode

## 1.2 End of Initialization Mode

 If the setting is changed, always check all of the set values (SV setting mode, parameter setting mode).

 The  section in each picture is dimly lit.

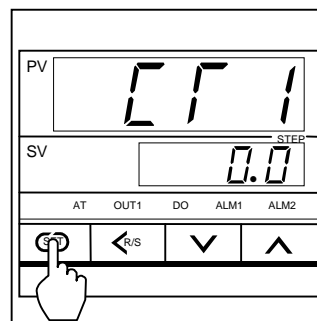
1. Transfer to Initialize code selection after each parameter is set.
2. Press the <R/S key while pressing the SET key for two seconds in the Initialize code selection state to transfer to PV/SV display mode.
3. Press the SET key for two seconds in the PV/SV display mode state to transfer to parameter setting mode.
4. Press the SET key to transfer to the set data lock function display (*LCK*).
5. Press the <R/S key to brightly light the thousands digit on the set value (SV) display unit.  
 See 4. on P. 1.
6. Press the DOWN key to set the numeric value corresponding to the thousands digit to 0 from 1.




Set data lock function display

Set value
0 : Initialization mode locked
1 : Initialization mode unlocked

7. Press the SET key to transfer to the next parameter. As a result, the Initialization mode lock state setting becomes effective.




CT1 input value display

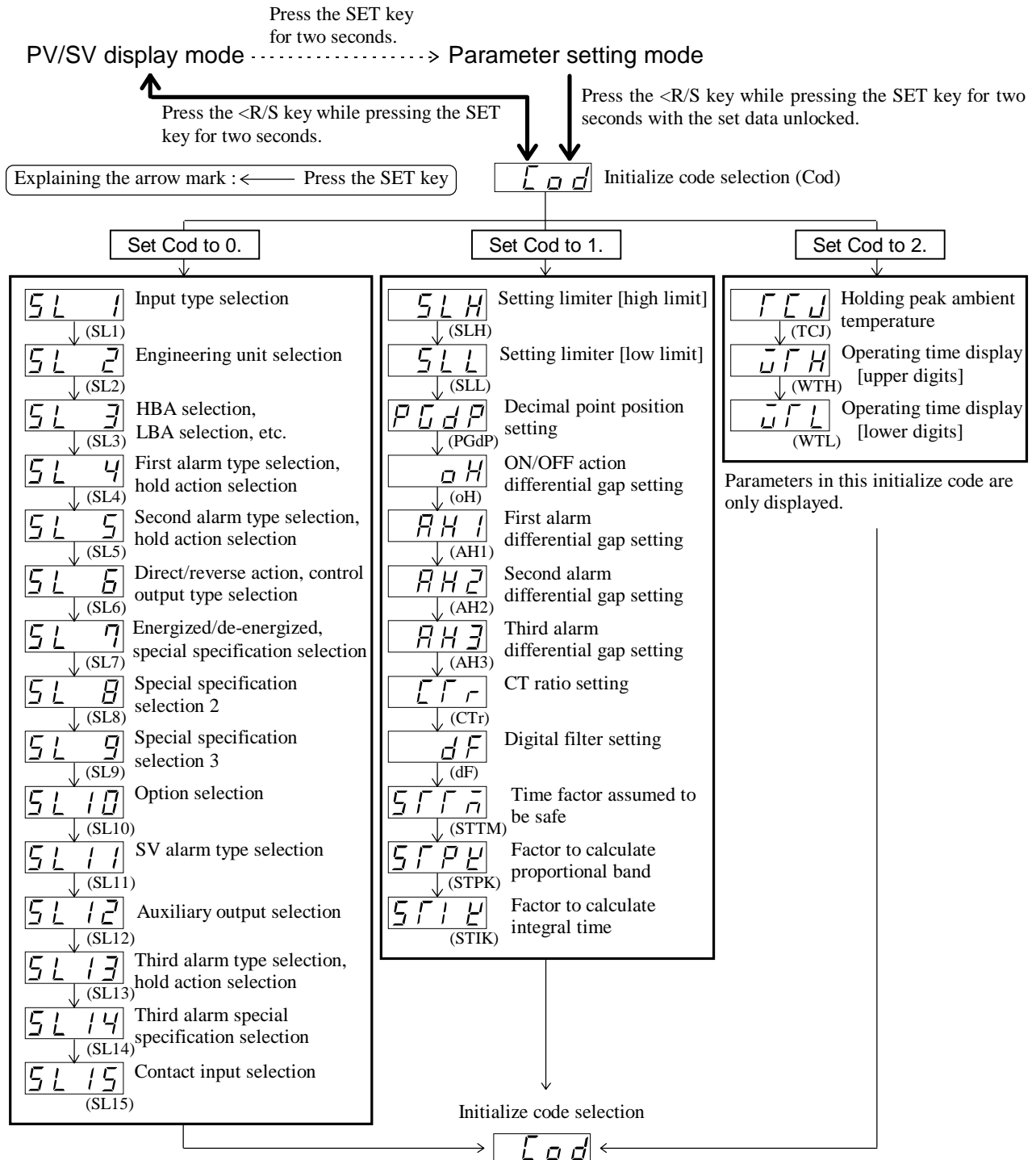
 The parameter to be displayed varies depending on the specification.

# 2. SETTING

## 2.1 Display Flowcharts in Initialization Mode

If the instrument is changed to initialization mode, the symbol (Cod) for selecting the initialize code is displayed first. Initializing items are classified into 3 initialize code groups in initialization mode.



 There are parameters which are not displayed depending on the specification.



## 2.2 Procedure for Setting Each Parameter

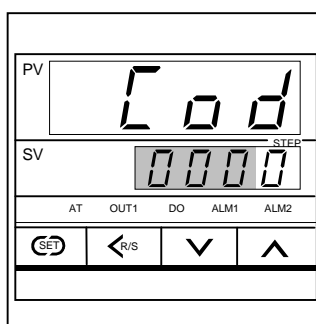
### [Example of changing the setting]

When the display unit shows *SLI* (Input type selection) in initialize code 0, the following procedure is for changing the input type from K to J.

 The  section in each picture is dimly lit.

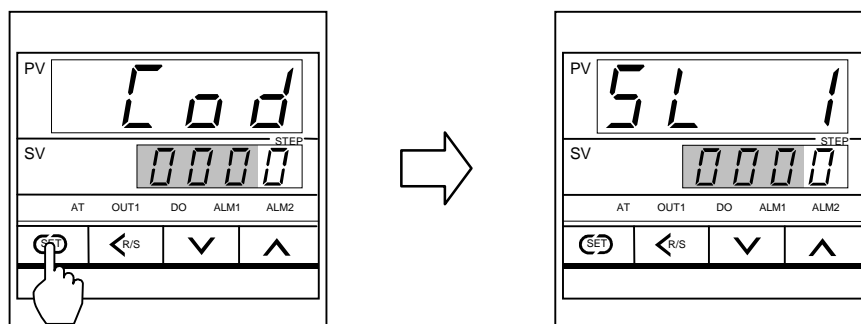
1. Change the instrument to the initialize code selection display.

 See 1.1 Transfer to Initialization Mode on page 1.



Initialize code selection display

2. As *SLI* belongs to the group of initialize code 0, do not change the initialize code (the units digit) but press the SET key to change to *SLI*.

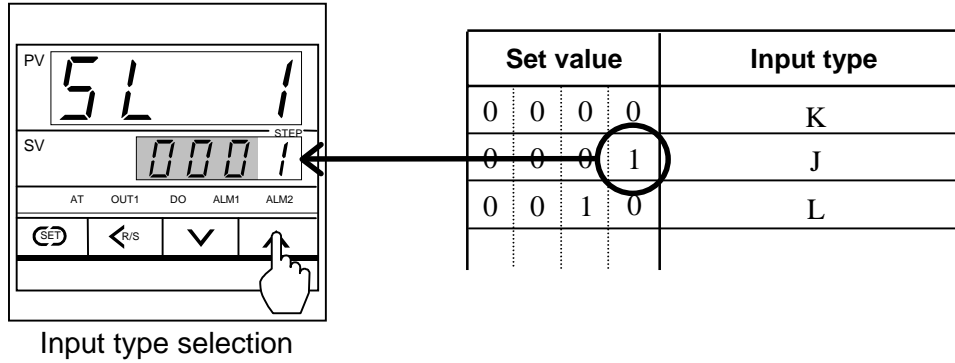


Initialize code selection display

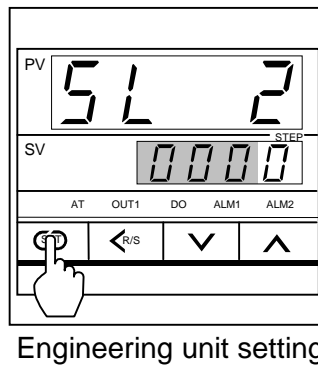
Input type selection



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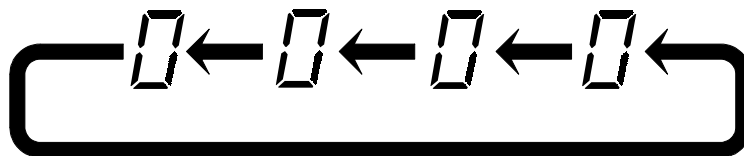
3. Press the UP key to enter 1 in the units digit of the set value (SV) display unit.



4. Press the SET key to change to the next parameter. Thus, the set value is registered.



-  If the initialize code is set to 1 or 2, enter 1 or 2 in the units digits of the set value (SV) display unit by pressing UP or DOWN key.
-  If the set value corresponds to any digit other than the units digit, press the shift key to move the brightly lit digit. The brightly lit digit moves as follows every time the shift key is pressed.



## 2.3 List of Parameters in Initialize Code 0 (Cod = 0)

### (1) SL1 (Input type selection)



Conduct the setting so that it matches the instrument specification (input type). If the setting is changed, always check all of the set values (SV setting mode, parameter setting mode).

Factory set value varies depending on the input type.

Set value	Input type	
0 0 0 0	K	TC input *1
0 0 0 1	J	
0 0 1 0	L	
0 0 1 1	E	
0 1 0 0	N	
0 1 1 1	R	
1 0 0 0	S	
1 0 0 1	B	
1 0 1 0	W5Re/W26Re	
1 0 1 1	PL II	
0 1 0 1	T	
0 1 1 0	U	
1 1 0 0	Pt100 $\Omega$ (JIS/IEC)	RTD input *1
1 1 0 1	JPt100 $\Omega$ (JIS)	
1 1 1 0	0 to 5 V DC	Voltage input *1
1 1 1 1	1 to 5 V DC	
1 1 1 0	0 to 20 mA DC	Current input *1, *2
1 1 1 1	4 to 20 mA DC	

\*1 No input type (TC/RTD input to voltage/current input or voltage/current input to TC/RTD input) cannot be changed.

\*2 For the current input specification, a resistor of 250  $\Omega$  must be connected between the input terminals.

### (2) SL2 (Engineering unit selection)



Any digits other than the unit digit are not used. As malfunction may result, do not change any of other digits.

Factory set value varies depending on the instrument specification.

Set value	Description
0	$^{\circ}\text{C}$
1	$^{\circ}\text{F}$
0 0 0	000 $\square$ Fixed

**(3) SL3 (Heater break alarm [HBA], control loop break alarm [LBA], special specification, or control loop break alarm [LBA] output selection )**



Cannot be used the heater break alarm (HBA) for the following instruments.

- Instrument without the second alarm (ALM2) output.
- Instrument of the process alarm, deviation alarm, band alarm, SV alarm or control loop break alarm (LBA) is used as the second alarm (ALM2).
- Instrument whose control output is the current output type.



Cannot be used the control loop break alarm (LBA) for the following instruments.

- Instrument without both the first alarm (ALM1) output and the second alarm (ALM2) output.
- Instrument of the process alarm, deviation alarm or band alarm is used as the first alarm (ALM1).
- Instrument of the process alarm, deviation alarm, band alarm or heater break alarm (HBA) is used as the second alarm (ALM2).



Cannot be output the control loop break alarm (LBA) from the first alarm (ALM1) for the following instruments.

- Instrument without the first alarm (ALM1) output.
- Instrument of the process alarm, deviation alarm, band alarm or SV alarm is used as the first alarm (ALM1).



Cannot be output the control loop break alarm (LBA) from the second alarm (ALM2) for the following instruments.

- Instrument without the second alarm (ALM2) output.
- Instrument of the process alarm, deviation alarm, band alarm, SV alarm or heater break alarm (HBA) is used as the second alarm (ALM2).
- Instrument with the Z-168 specification.

Factory set value varies depending on the instrument specification.

Set value		Description	
	0	Heater break alarm (HBA) not provided	Heater break alarm (HBA) selection
	1	Heater break alarm (HBA) provided	
	0	Control loop break alarm (LBA) not provided	Control loop break alarm (LBA) selection
	1	Control loop break alarm (LBA) provided	
0		Z-132 specification not provided *1	Special specification selection
1		Z-132 specification provided *2	
0		LBA is output from first alarm	Selection of control loop break alarm (LBA) output terminals
1		LBA is output from second alarm	

\*1 Normal HBA action.

\*2 HBA occurs three seconds after the heater bleak or welding.

**(4) SL4 (First alarm [ALM1] type selection, hold action selection)**

The following instrument is set to 0000.

- Instrument without the first alarm (ALM1) output.
- Instrument of the SV alarm or control loop break alarm (LBA) is used as the first alarm (ALM1).

Factory set value varies depending on the instrument specification.

Set value			Description	
0	0	0	First alarm (ALM1) not provided	First alarm (ALM1) type selection
0	0	1	Deviation high alarm	
0	1	0	Deviation high/low alarm	
0	1	1	Process high alarm	
1	0	1	Deviation low alarm	
1	1	0	Band alarm	
1	1	1	Process low alarm	
0			Without alarm hold action	First alarm (ALM1) hold action selection
1			With alarm hold action	

**(5) SL5 (Second alarm [ALM2] type selection, hold action selection)**

The following instrument is set to 0000.

- Instrument without the second alarm (ALM2) output.
- Instrument of the SV alarm, heater break alarm (HBA) or control loop break alarm (LBA) is used as the second alarm (ALM2).
- Instrument with the Z-168 specification.

Factory set value varies depending on the instrument specification.

Set value			Description	
0	0	0	Second alarm (ALM2) not	Second alarm (ALM2) type selection
0	0	1	Deviation high alarm	
0	1	0	Deviation high/low alarm	
0	1	1	Process high alarm	
1	0	1	Deviation low alarm	
1	1	0	Band alarm	
1	1	1	Process low alarm	
0			Without alarm hold action	Second alarm (ALM2) hold action selection
1			With alarm hold action	

**(6) SL6 (Direct/reverse action selection, control output type selection)**

Conduct setting so as to meet the instrument specification. An incorrect setting may cause a malfunction.



The tens and thousands digits are not used. As malfunction may result, do not change these digits.

Factory set value varies depending on the instrument specification.

Set value			Description	
		0	Direct action (D type) *1	Direct/reverse action selection
		1	Reverse action (F type) *2	
0			Time proportioning output (M, V, G, T output) *3	Control output type selection
1			Continuous output (Current output : 4 to 20 mA DC)	
0	0		"0□0□" Fixed	

\*1 D type: PID action with autotuning (Direct action)

\*2 F type: PID action with autotuning (Reverse action)

\*3 M output: Relay contact output                      G output: Trigger output for triac driving  
 V output: Voltage pulse output                      T output: Triac output

**(7) SL7 (Energized/de-energized selection, special specification selection 1)**

The following instrument is set to 0000.

- Instrument without both the first alarm (ALM1) output and the second alarm (ALM2) output.

Factory set value varies depending on the instrument specification.

Set value			Description	
		0	First alarm energized alarm	First alarm energized/ de-energized alarm selection
		1	First alarm de-energized alarm	
	0		Second alarm energized alarm	Second alarm energized/ de-energized alarm selection
	1		Second alarm de-energized alarm	
0			First alarm Z-124 specification not provided *1	First alarm special specification selection
1			First alarm Z-124 specification provided	
0			Second alarm Z-124 specification not provided *1	Second alarm special specification selection
1			Second alarm Z-124 specification provided *2	

\*1 The alarm output is forcibly turned on when the burnout function is activated.

\*2 No alarm action is taken by the burnout function. (Same as the normal alarm action.)

**(8) SL8 (Special specification selection 2)**

Any digits other than the tens digit are not used. As malfunction may result, do not change any of other digits.

Factory set value varies depending on the instrument specification.

Set value		Description	
	0	Z-185 specification not provided *1	Special specification selection
	1	Z-185 specification provided *2	
0	0	00□0	Fixed

\*1 Normal control in the direct or reverse action is performed even if the burnout function is activated or not.

\*2 The control output is forcibly turned off when the burnout function is activated.

**(9) SL9 (Special specification selection 3)**

Any item set in the Z-168 specification has priority over that set in SL3 (heater break alarm selection).



Any digits other than the units digit are not used. As malfunction may result, do not change any of other digits.

Factory set value varies depending on the instrument specification.

Set value		Description	
	0	Z-168 specification not provided *1	Special specification selection
	1	Z-168 specification provided *2	
	0	Z-1018 specification not provided	Display selection when operation stops (STOP).
	1	Z-1018 specification provided *3	
0	0	000□	Fixed

\*1 It becomes the item set in SL3 (heater break alarm selection).

\*2 Heater break alarm for three-phase heater.

\*3 When operation is changed to the STOP state by RUN/STOP selection, a parameter symbol to indicate the STOP state is displayed on the SV display unit.

**(10) SL10 (Option selection)**

The tens and hundreds digits are not used. As malfunction may result, do not change these digits.

Factory set value varies depending on the instrument specification.

Set value		Description	
	0	RUN/STOP function not provided	RUN/STOP function selection
	1	RUN/STOP function provided	
0	0	□00□ Fixed	
0		Self-tuning not provided	Self-tuning function selection
1		Self-tuning provided	

**(11) SL11 (SV alarm type selection)**

The following instrument always set it to 0 : First alarm, SV alarm not provided.

- Instrument without the first alarm (ALM1) output.
- Instrument of the process alarm, deviation alarm, band alarm or control loop break alarm (LBA) is used as the first alarm (ALM1).



The following instrument always set it to 0 : second alarm, SV alarm not provided.

- Instrument without the second alarm (ALM2) output.
- Instrument of the process alarm, deviation alarm, band alarm, heater break alarm (HBA) or control loop break alarm (LBA) is used as the second alarm (ALM2).
- Instrument with the Z-168 specification.



The following conditions must be satisfied in order to effectuate SV alarm.

- SL4 (First alarm [ALM1] type selection, hold action selection) should be set to 0000.  
The content of the SL4 setting has priority over that of the SL11 setting.
- SL5 (Second alarm [ALM2] type selection, hold action selection) should be set to 0000.  
The content of the SL5 setting has priority over that of the SL11 setting.

Factory set value varies depending on the instrument specification.

Set value		Description	
	0	First alarm, SV alarm not provided	First alarm, SV alarm selection
	1	First alarm, SV alarm provided	
	0	First alarm, SV high alarm	First alarm, SV alarm type selection
	1	First alarm, SV low alarm	
0		Second alarm, SV alarm not provided	Second alarm, SV alarm selection
1		Second alarm, SV alarm provided	
0		Second alarm, SV high alarm	Second alarm, SV alarm type selection
1		Second alarm, SV low alarm	

**(12) SL12 (Auxiliary output selection)**

The auxiliary output can not be used following instruments.

- Instrument of the control output type is Trigger output for triac driving.



The hundreds digits is not used. As malfunction may result, do not change this digit.

Factory set value varies depending on the instrument specification.

Set value			Description	
	0	0	Auxiliary output not provided	Auxiliary output selection
	0	1	Third alarm (ALM3)	
	1	0	Analog output	
	1	1	RUN/STOP state output	
0			<input type="checkbox"/> 0 <input type="checkbox"/> Fixed	
0			Output relay ON at RUN state (Close)	Output direction at RUN/STOP state
1			Output relay ON at STOP state (Close)	

**(13) SL13 (Third alarm [ALM3] type selection, hold action selection)**

The following instrument is set to 0000.

- Instrument of the third alarm (ALM3) is not selected in SL12 (Auxiliary output selection).

Factory set value varies depending on the instrument specification.

Set value			Description	
	0	0	Third alarm (ALM3) not provided	Third alarm (ALM3) type selection
	0	1	Deviation high alarm	
	0	0	Deviation high/low alarm	
	0	1	Process high alarm	
	1	0	Deviation low alarm	
	1	1	Band alarm	
	1	1	Process low alarm	
0			Without alarm hold action	Third alarm (ALM3) hold action selection
1			With alarm hold action	

**(14) SL14 (Third alarm [ALM3] special specification selection)**



The following instrument is set to 0000.

- Instrument of the third alarm (ALM3) are not selected in SL12 (Auxiliary output selection).



The tens and thousands digits are not used. As malfunction may result, do not change these digit.

Factory set value varies depending on the instrument specification.

Set value		Description	
	0	Third alarm energized alarm	Third alarm energized/ de-energized alarm selection
	1	Third alarm de-energized alarm	
0		Third alarm Z-124 specification not provided	Third alarm special specification selection
1		Third alarm Z-124 specification provided	
0	0	0□0□ Fixed	

\*1 The alarm output is forcibly turned on when the burnout function is activated.

\*2 No alarm action is taken by the burnout function. (Same as the normal alarm action.)

**(15) SL15 (Contact input selection)**




The hundreds digits is not used. As malfunction may result, do not change this digit.

Factory set value varies depending on the instrument specification.

Set value		Description	
	0	Contact input not provided	Contact input selection
	1	Contact input provided	
	0	RUN/STOP	Contact input type selection
	1	STEP	
0		□0□□ Fixed	
0		Contact close : RUN	Action selection at change the contact input
1		Contact close : STOP	
		Contact open : STOP	
		Contact open : RUN	

## 2.4 List of Parameters in Initialize Code 1 (Cod = 1)

### (1) SLH (Setting limiter [high limit])

 Set the limiter by referring to **Input range table** (P.17).

#### ■ Setting method

Press the <R/S key to move the digit, then enter the high limit of the set value (SV) by pressing the UP or DOWN key. The set value (SV) display unit shows the numeric value.

Factory set value varies depending on the instrument specification.


	Input type	Setting range
Thermocouple input (TC)	K	SLL to 1372 °C (SLL to 2502 °F)
	J	SLL to 1200 °C (SLL to 2192 °F)
	R	SLL to 1769 °C (SLL to 3216 °F)
	S	SLL to 1769 °C (SLL to 3216 °F)
	B	SLL to 1820 °C (SLL to 3308 °F)
	E	SLL to 1000 °C (SLL to 1832 °F)
	N	SLL to 1300 °C (SLL to 2372 °F)
	T	SLL to 400.0 °C (SLL to 752.0 °F)
	W5Re/W26Re	SLL to 2320 °C (SLL to 4208 °F)
	PL II	SLL to 1390 °C (SLL to 2534 °F)
	U	SLL to 600.0 °C (SLL to 999.9 °F)
RTD input	Pt100 Ω (JIS/IEC) *1	SLL to 649.0 °C (SLL to 999.9 °F)
	JPt100 Ω (JIS)	SLL to 649.0 °C (SLL to 999.9 °F)
Voltage input	0 to 5 V DC	SLL to 9999 (programmable scale)
	1 to 5 V DC	
Current input	0 to 20 mA DC *2	SLL to 9999 (programmable scale)
	4 to 20 mA DC *2	

SLL : Setting limiter [low limit]

\*1 IEC (International Electrotechnical Commission) is equivalent to JIS, DIN and ANSI.

\*2 For the current input specification, a resistor of 250 Ω must be connected between the input terminals.

**(2) SLL (Setting limiter [low limit])**

 Set the limiter by referring to **Input range table** (P.17).

**■ Setting method**

Press the <R/S key to move the digit, then enter the high limit of the set value (SV) by pressing the UP or DOWN key. The set value (SV) display unit shows the numeric value.

Factory set value varies depending on the instrument specification.

Input type		Setting range
Thermocouple input (TC)	K	0 to SLH °C (0 to SLH °F)
	J	0 to SLH °C (0 to SLH °F)
	R	0 to SLH °C (0 to SLH °F)
	S	0 to SLH °C (0 to SLH °F)
	B	0 to SLH °C (0 to SLH °F)
	E	0 to SLH °C (0 to SLH °F)
	N	0 to SLH °C (0 to SLH °F)
	T	-199.9 to SLH °C (-199.9 to SLH °F)
	W5Re/W26Re	0 to SLH °C (0 to SLH °F)
	PL II	0 to SLH °C (0 to SLH °F)
	U	-199.9 to SLH °C (-199.9 to SLH °F)
L	0 to SLH °C (0 to SLH °F)	
RTD input	Pt100 Ω (JIS/IEC) *1	-199.9 to SLH °C (-199.9 to SLH °F)
	JPt100 Ω (JIS)	-199.9 to SLH °C (-199.9 to SLH °F)
Voltage input	0 to 5 V DC	-1999 to SLH (programmable scale)
	1 to 5 V DC	
Current input	0 to 20 mA DC *2	-1999 to SLH (programmable scale)
	4 to 20 mA DC *2	

SLH : Setting limiter [high limit]

\*1 IEC (International Electrotechnical Commission) is equivalent to JIS, DIN and ANSI.

\*2 For the current input specification, a resistor of 250 Ω must be connected between the input terminals.

## ■ Input range table

### ① Thermocouple input (TC)

Type	Input range	Type	Input range
K	0 to 200 °C	B	400 to 1800 °C
K	0 to 400 °C	B	0 to 1820 °C *1
K	0 to 600 °C	B	800 to 3200 °F
K	0 to 800 °C	B	0 to 3308 °F *1
K	0 to 1000 °C	E	0 to 800 °C
K	0 to 1200 °C	E	0 to 1000 °C
K	0 to 1372 °C	E	0 to 1600 °F
K	0 to 100 °C	E	0 to 1832 °F
K	0 to 300 °C	N	0 to 1200 °C
K	0 to 450 °C	N	0 to 1300 °C
K	0 to 500 °C	N	0 to 2300 °F
K	0 to 800 °F	N	0 to 2372 °F
K	0 to 1600 °F	T	-199.9 to +400.0 °C *2
K	0 to 2502 °F	T	-199.9 to +100.0 °C *2
K	20 to 70 °F	T	-100.0 to +200.0 °C
J	0 to 200 °C	T	0.0 to 350.0 °C
J	0 to 400 °C	T	-199.9 to +752.0 °F *2
J	0 to 600 °C	T	-100.0 to +200.0 °F
J	0 to 800 °C	T	-100.0 to +400.0 °F
J	0 to 1000 °C	T	0.0 to 450.0 °F
J	0 to 1200 °C	T	0.0 to 752.0 °F
J	0 to 450 °C	W5Re/W26Re	0 to 2000 °C
J	0 to 800 °F	W5Re/W26Re	0 to 2320 °C
J	0 to 1600 °F	W5Re/W26Re	0 to 4000 °F
J	0 to 2192 °F	PL II	0 to 1300 °C
J	0 to 400 °F	PL II	0 to 1390 °C
J	0 to 300 °F	PL II	0 to 1200 °C
R	0 to 1600 °C *1	PL II	0 to 2400 °F
R	0 to 1769 °C *1	PL II	0 to 2534 °F
R	0 to 1350 °C *1	U	-199.9 to +600.0 °C *2
R	0 to 3200 °F *1	U	-199.9 to +100.0 °C *2
R	0 to 3216 °F *1	U	0.0 to 400.0 °C
S	0 to 1600 °C *1	U	-199.9 to +999.9 °F *2
S	0 to 1769 °C *1	U	-100.0 to +200.0 °F
S	0 to 3200 °F *1	U	0.0 to 999.9 °F
S	0 to 3216 °F *1	Continued on the next page.	

Type	Input range
L	0 to 400 °C
L	0 to 800 °C
L	0 to 800 °F
L	0 to 1600 °F

\*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.

### ② RTD input

Type	Input range
Pt100 (JIS/IEC)	-199.9 to +649.0 °C
Pt100 (JIS/IEC)	-199.9 to +200.0 °C
Pt100 (JIS/IEC)	-100.0 to +50.0 °C
Pt100 (JIS/IEC)	-100.0 to +100.0 °C
Pt100 (JIS/IEC)	-100.0 to +200.0 °C
Pt100 (JIS/IEC)	0.0 to 50.0 °C
Pt100 (JIS/IEC)	0.0 to 100.0 °C
Pt100 (JIS/IEC)	0.0 to 200.0 °C
Pt100 (JIS/IEC)	0.0 to 300.0 °C
Pt100 (JIS/IEC)	0.0 to 500.0 °C
Pt100 (JIS/IEC)	-199.9 to +999.9 °F
Pt100 (JIS/IEC)	-199.9 to +400.0 °F
Pt100 (JIS/IEC)	-199.9 to +200.0 °F
Pt100 (JIS/IEC)	-100.0 to +100.0 °F
Pt100 (JIS/IEC)	-100.0 to +300.0 °F
Pt100 (JIS/IEC)	0.0 to 100.0 °F
Pt100 (JIS/IEC)	0.0 to 200.0 °F
Pt100 (JIS/IEC)	0.0 to 400.0 °F
Pt100 (JIS/IEC)	0.0 to 500.0 °F
JPt100 (JIS)	-199.9 to +649.0 °C
JPt100 (JIS)	-199.9 to +200.0 °C
JPt100 (JIS)	-100.0 to +50.0 °C
JPt100 (JIS)	-100.0 to +100.0 °C
JPt100 (JIS)	-100.0 to +200.0 °C
JPt100 (JIS)	0.0 to 50.0 °C
JPt100 (JIS)	0.0 to 100.0 °C
JPt100 (JIS)	0.0 to 200.0 °C
JPt100 (JIS)	0.0 to 300.0 °C
JPt100 (JIS)	0.0 to 500.0 °C

**③ Voltage input**

Type	Input range
0 to 5 V DC	0.0 to 100.0 %
1 to 5 V DC	

**④ Current input**

Type	Input range
0 to 20 mA DC	0.0 to 100.0 %
4 to 20 mA DC	



For the current input specification, a resistor of 250  $\Omega$  must be connected between the input terminals.

**(3) PGdP (Decimal point position setting)**



The decimal point position setting is displayed only for voltage or current input.



Any digits other than the units digit are not used. As malfunction may result, do not change any of these digits.

Factory set value: 0001

Set value			Description	
0			No digit below decimal point	Decimal point position setting
1			1 digit below decimal point	
2			2 digit below decimal point	
3			3 digit below decimal point	
0	0	0	000□ Fixed	

**(4) oH (ON/OFF action differential gap setting)**

**[Setting range]**

TC and RTD inputs : 0 to 100 °C [°F] or 0.0 to 100.0 °C [°F]

Voltage and current inputs : 0.0 to 10.0 % of span

**[Factory set value]**

TC and RTD inputs : 2 °C [°F] or 2.0 °C [°F]

Voltage and current inputs : 0.2 %

**(5) AH1 (First alarm [ALM1] differential gap setting)**



Not displayed when there is no first alarm (ALM1).

**[Setting range]**

TC and RTD inputs : 0 to 100 °C [°F] or 0.0 to 100.0 °C [°F]

Voltage and current inputs : 0.0 to 10.0 % of span

**[Factory set value]**

TC and RTD inputs : 2 °C [°F] or 2.0 °C [°F]

Voltage and current inputs : 0.2 %

**(6) AH2 (Second alarm [ALM2] differential gap setting)**

Not displayed when there is no second alarm (ALM2).

**[Setting range]**

TC and RTD inputs : 0 to 100 °C [°F] or 0.0 to 100.0 °C [°F]

Voltage and current inputs : 0.0 to 10.0 % of span

**[Factory set value]**

TC and RTD inputs : 2 °C [°F] or 2.0 °C [°F]

Voltage and current inputs : 0.2 %

**(7) AH3 (Third alarm [ALM3] differential gap setting)**

Not displayed when the third alarm (ALM3) are not selected in SL12 (Auxiliary output selection).

**[Setting range]**

TC and RTD inputs : 0 to 100 °C [°F] or 0.0 to 100.0 °C [°F]

Voltage and current inputs : 0.0 to 10.0 % of span

**[Factory set value]**

TC and RTD inputs : 2 °C [°F] or 2.0 °C [°F]

Voltage and current inputs : 0.2 %

**(8) CTr (CT ratio setting)**

Set the number of times that a wire is wound on to the hole of a CT.



Not displayed when there is no heater break alarm (HBA).

Setting range : 0 to 9999

Factory set value : CTL-6-P-N : 800  
CTL-12-S56-10L-N : 1000

### **(9) dF (Digital filter setting)**

Setting range : 0 to 100 sec (If 0 is set, the PV digital filter is turned off.)

Factory set value : 1

### **(10) STTM (Time factor assumed to be safe)**

\*Displayed when the self-tuning is provided.

This is the factor to adjust the reference time of establishing the stabilized state of a measured value. The larger the set value, the longer the time until the measured value is stabilized.



As this factor is so adjusted that the self-tuning result optimum to most controlled-objects is obtained, do not change it.

Setting range : 0 to 200

Factory set value : 100

### **(11) STPK (Factor to calculate proportional band)**

\*Displayed when the self-tuning is provided.

This is the factor to adjust the proportional band to be calculated by the self-tuning function. The larger the set value, the larger the proportional band thus calculated.



As this factor is so adjusted that the self-tuning result optimum to most controlled-objects is obtained, do not change it.

Setting range : 0 to 200

Factory set value : 67

### **(12) STIK (Factor to calculate integral time)**

\*Displayed when the self-tuning is provided.

This is the factor to adjust the integral and derivative times to be calculated by the self-tuning function. The larger the set value, the larger the integral and derivative times thus calculated.



As this factor is so adjusted that the self-tuning result optimum to most controlled-objects is obtained, do not change it.

Setting range : 0 to 200

Factory set value : 16

## 2.5 List of Parameters in Initialize Code 2 (Cod = 2)

Parameters in initialize code 2 are only displayed.

### (1) TCJ (Holding peak ambient temperature)

The maximum ambient temperature on the rear terminal board of the instrument is stored and displayed on the set value (SV) display unit. Displayed when input type is TC input.

Display range : -10 to +100 °C

Display resolution : 1 °C

### (2) WTH (Operating time [upper digits] )

The integrated value (upper 2 digits) of power on time is shown on the set value (SV) display unit. If the total operating time exceeds 100,000 hours, the integrated operating time is reset.

Display range: 0 to 10 (Operating time from 0 to 100000 hours can be displayed for both the upper and lower digits.)

Display resolution: 10,000 hours

### (3) WTL (Operating time [lower digits] )

The integrated value (lower 4 digits) of power on time is shown on the set value (SV) display unit. If the total operating time exceeds 9,999 hours, these digits move to the operating time display unit [upper digits] (WTH).


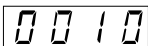
Display range: 0000 to 9999

Display resolution: 1 hour



#### [Example: When the integrated value of operating time equals to 100,000 hours.]

The upper 2 digits of 100,000 hours are shown on the operating time display unit [upper digits] (WTH) and the lower 4 digits are shown on the operating time display unit [lower digits].

Operating time display unit (upper digits)

PV   
SV 

Operating time display unit (lower digits)

PV   
SV 



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