REX - C100	REX - C700
REX - C400	REX - C900
REX - C410	

INITIAL SETTING MANUAL

RKC   **RKC INSTRUMENT INC.**

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This is a manual for the initial setting of the REX-C100, -C400, -C410, -C700, & -C900. Do not touch or adjust parts other than those covered in this manual. The instrument was manufactured and delivered under close quality control by us. However, is some subject troubled or noted, your kindly announce and advice to our business department, nearest business office also agent where you bought is very much appreciated.
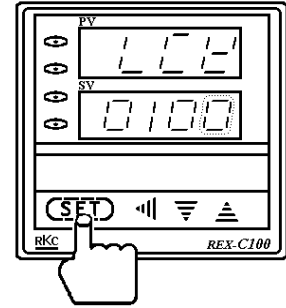

CONTENTS

1.   Initial set mode changing

1.1   Entering the initial set mode

(1)   Press the (**SET**) key to display the set data locking parameter symbol (*L C H*) on the measured-value (PV) display unit. At this time, the least significant digit on the set-value (SV) display unit lights brightly. The digit which lights brightly is settable.

(2)   Press the ◄‖ key to shift the digit which lights brightly up to the hundreds digit. The digit which lights brightly shifts as follows every time the ◄‖ key is pressed.
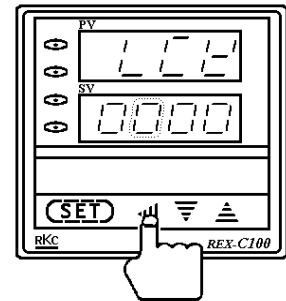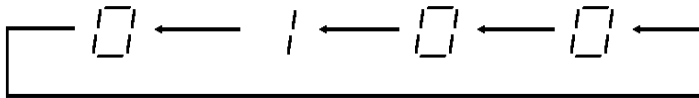
(3)   Press the ▼ key to set "*0*". Pressing the ▲ key increments numerals, and pressing the ▼ key decrements numerals.

0000   :   No initial set mode locked
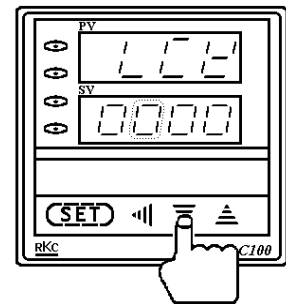
(4)   Hold both the ◄‖ (A) and (**SET**) (B) keys simultaneously until *S L 1* appears.
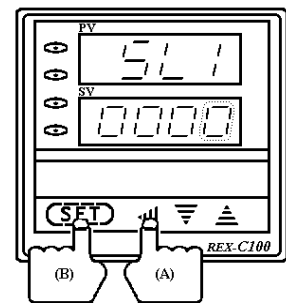
Cautions

1.   In order to enter the initial set mode, always set the data locking (*L C H*) to "*0000*". Any setting other than "*0000*" cannot enter the initial set mode.

2.   If the controller is set to the initial set mode, all outputs are turned OFF.

3.   An example of the REX-C900 is described here, but the same procedure applies to other controllers (REX-C100, -C400, -C410, and -C700).

Initial set status

1.2 Exiting the initial set mode

(1) Exits from the initial set mode

Keep pressing both the ◁‖ key (A) and ⟨**SET**⟩ (B) keys simultaneously for more than 5 seconds can enter the PV/SV display mode.
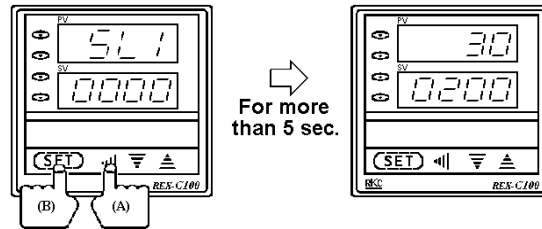
※ Even if the controller exits from the initial set mode at any point, the setting mode so far set becomes valid.

(2) Locks the initial set mode (Change the content of set data lock setting)

1. Press the ⟨**SET**⟩ key to enter the parameter setting mode.
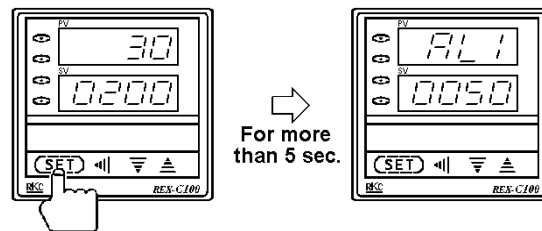
2. Press the ⟨**SET**⟩ key by required number of times to show "_ _ _ _" on the measured-value (PV) display unit.
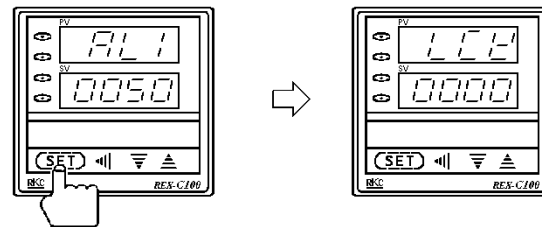
3. Press the ◁‖ key and ▲ keys to set "_ _ _ _". Press the ⟨**SET**⟩ key to register "_ _ _ _".
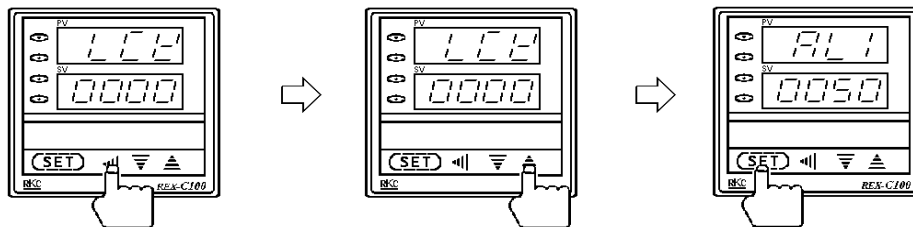
Caution

If the controller exits from the initial set mode, confirm that set data lock setting is set to "_ _ _ _".

< Each status when power failure occurs in the initial set mode >
- Setting prior to power failure is valid
- Instantaneous power failure (within 20 msec.) does not exert bad influence on the instrument.
- If long power failure occurs, the instrument exits from its initial set mode. After power recovery, the instrument is set to the PV/SV display mode. The measured-value (PV) at this time shows that at the time of power recovery, and the set-value (SV) is the same as that before power failure.

2.1   Description of each parameter

"$5L\ 1$" appears on the display, and every press of the (**SET**) key advances the parameter symbol as shown in the following table. After one cycle, the display shows "$5L\ 1$".

MEASURED-VALUE (PV) DISPLAY UNIT	SETTING DESCRIPTION
$5L\ 1$	Input type selection
$5L\ 2$	Engineering unit selection (°C, °F)
$5L\ 3$	Heater break alarm (HBA) selection Control loop break alarm (LBA) selection Special specification [Z-132] selection Selection of control loop break alarm output terminals
$5L\ 4$	First alarm (ALM1) type selection First alarm (ALM1) hold action selection
$5L\ 5$	Second alarm (ALM2) type selection Second alarm (ALM2) hold action selection
$5L\ 6$	Direct / reverse action selection Control action type selection Control output type selection (Heating / cooling side)
$5L\ 7$	Energize / de-energize alarm selection Special specification [Z-124] selection
$5L\ 8$	"$5L\ 8$" cannot be set.
Pb	PV bias setting
cH	Differential gap setting of ON / OFF action
$AH\ 1$	Differential gap setting of first alarm (ALM1) ＊ No display appears when no first alarm (ALM1) function is provided.
$AH2$	Differential gap setting of second alarm (ALM2) ＊ No display appears when no second alarm (ALM2) function is provided.
$5L\ H$	High-limit setting for set-value (SV)
$5L\ L$	Low-limit setting for set-value (SV)

(**SET**)

2.2   Each parameter setting

☉   Method of setting

(2)   Press the (**SET**) key to display the input type selection parameter
symbol (⁵i₋ ₁) on the measured-value (PV) display unit.
At this time, the least significant digit on the set-value (SV)
display unit lights brightly. The digit which lights brightly is
settable.
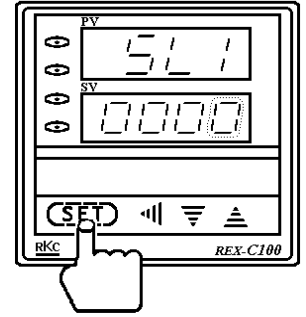
(3)   Press the ◄ⁱⁱ key to shift the digit which lights brightly up to
the tens digit. The digit which lights brightly shifts as follows
every time the ◄ⁱⁱ key is pressed.

$$\overset{\longleftarrow}{} \;\; \square \longleftarrow \square \longleftarrow \square \longleftarrow \square \underset{\longrightarrow}{}$$
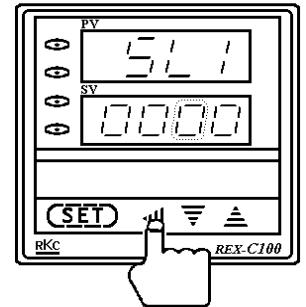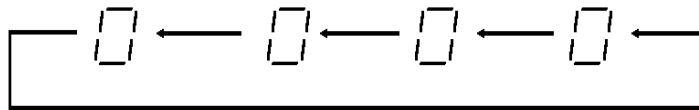
(4)   Press the ≜ key to set " ⁱ ". Pressing the ≜ key increments
numerals, and pressing the ≡ key decrements numerals.

_∪_∪ ⁱ_∪   :   Thermocouple type L
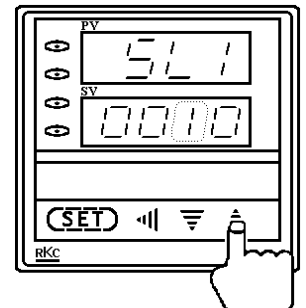
(5)   After finishing the setting, press the (**SET**) key to
register (shifts to next parameter).
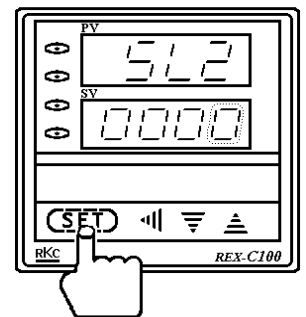
Cautions

1.   If no key operation is performed for more than 60 sec. during setting or when any
parameter other than
"⁵i₋ ₁" is displayed, the display returns to "⁵i₋ ₁".

2.   An example of the REX-C900 is described here, but the same procedure applies to other controllers
(REX-C100, -C400, -C410, and -C700).

(1) Input type selection ($5\dot{u}\ 1$)

Set-value (SV) display unit

VALUE				INPUT TYPE		HARDWARE
0	0	0	0	TC	K	a
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		PLII	
0	1	0	1		T	b
0	1	1	0		U	
1	1	0	0	RTD	Pt100 Ω (JIS / IEC)	c
1	1	0	1		J Pt100 Ω (JIS)	
1	1	1	0	Voltage	0 to 5 V DC	d
1	1	1	1		1 to 5 V DC	
1	1	1	0	Current	0 to 20 mA DC	e
1	1	1	1		4 to 20 mA DC	

Cautions

1. Conduct setting so as to meet the instrument specification (input type).
   Setting change between different symbols may cause malfunction, but the setting can be changed when hardware types have the same symbol. However, when the setting is changed, always reset "$5\dot{u}\ \dot{H}$" and "$5\dot{u}\ L$". (See page 14).

2. "$5\dot{u}\ 1$" setting displays are only "0" and "1".

(2) **Engineering unit and cooling type selection** ($\boxed{5 L \quad 2}$)

Set-value (SV) display unit

$\boxed{0}$	$\boxed{0}$		

VALUE				DESCRIPTION		
			0	°C		Engineering unit
			1	°F		selection
		0		Air-cooling (Type A)	�х 1	Cooling type
		1		Water-cooling (Type W)	�х 2	selection
0	0			Fixed		

✱ 1   Type A : Heating / cooling PID action (Air-cooling)
✱ 2   Type W : Heating / cooling PID action (Water-cooling)

Cautions

1.   For the voltage and current input types, the engineering unit setting of °C or °F is ignored.

2.   When control action is of the type D (PID action [direct action] or type F (PID action [reverse action]), "Cooling type selection" setting is ignored.

3.   Do not set the upper 2 digits to numeric values other than " 00 " since they are not used.

4.   " $5L \ 2$ " setting displays are only " 0 " and " 1 ".

(3) **Selection of break alarm (HBA, LBA) etc.** (⁵ᵢ₋ ᶾⁱ)

Set-value (SV) display unit

VALUE				DESCRIPTION	
			0	Without HBA function	Heater break alarm (HBA)
			1	With HBA function	selection
		0		Without LBA function	Control loop break alarm
		1		With LBA function	(LBA) selection
	0			Without Z-132 specification	Special specification
	1			With Z-132 specification ✳	[Z-132] selection
0				First alarm side	Selection of control loop
1				Second alarm side	break alarm output terminals

✳ Z-132 specification : Heater break alarm output is delayed.

Cautions

1. "With HBA function" setting is ignored for the following instruments :
  • Instrument with deviation or process alarm as the second alarm (ALM2)
  • Instrument with control loop break alarm (LBA)
  • Instrument whose control output is the current output type

2. "With LBA function" setting is ignored for the following instruments :
  • Instrument with deviation or process alarm as the first alarm (ALM1) and second alarm (ALM2)
  • Instrument with heater break alarm (HBA)
  • Instrument whose control action is type W (Heating / cooling PID action [Water-cooling]) or type A (Heating / cooling PID action [Air-cooling]).

3. For the instrument without heater break alarm (HBA), "With Z-132 specification" setting is ignored.

4. " ⁵ᵢ₋ ᶾⁱ " setting displays are only " *0* "and " *1* ".

(4)   First-alarm (ALM1) type selection ($\boxed{5l\_4}$)

Set-value (SV) display unit

VALUE			DESCRIPTION		
0	*0*	*0*	No first alarm		First alarm (ALM1) type selection (See page 10)
0	*0*	*1*	High alarm	Deviation alarm	
1	*0*	*1*	Low alarm		
0	*1*	*0*	High / Low alarm		
1	*1*	*0*	Band alarm		
0	*1*	*1*	High alarm	Process alarm	
1	*1*	*1*	Low alarm		
0				Without alarm hold action	First alarm (ALM1)
1				With alarm hold action	hold action selection

Cautions

1.   The following instrument is set to " *0000* ".
     •   Instrument without the first alarm (ALM1).
     •   Instrument which outputs control loop break alarm (LBA) from the first alarm side. [$\boxed{5l\_3}$
            setting details : For " *00 10* "]

2.   " $\boxed{5l\_4}$ " setting displays are only " *0* " and " *1* ".

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(5) **Second-alarm (ALM2) type selection** (5L 5)

Set-value (SV) display unit

VALUE			DESCRIPTION		
0	0	0	No second alarm		Second alarm (ALM2) type selection (See page 10)
0	0	1	High alarm	Deviation alarm	
1	0	1	Low alarm		
0	1	0	High / Low alarm		
1	1	0	Band alarm		
0	1	1	High alarm	Process alarm	
1	1	1	Low alarm		
0			Without alarm hold action		Second alarm (ALM2) hold action selection
1			With alarm hold action		

- Instrument without the second alarm (ALM2).
- Instrument with the heater break alarm (HBA).

Cautions

1. The following instrument is set to " 0000 ".
   - Instrument without the second alarm (ALM2).
   - Instrument with the heater break alarm (HBA).
   - Instrument which outputs control loop break alarm (LBA) from the second alarm side. [5L 3 setting details : For " 000 00 "]

2. " 5L 5 " setting displays are only " 0 " and " 1 ".

ALARM TYPES

[✦ : Set-value (SV)   △ : Alarm set-value   � : Alarm status (ALM1 or ALM2 LED lighting)]

< DEVIATION ALARM >

High alarm   ①

low   ✦   △   high   ※1

High alarm   ②

low   △   ✦   high   ※2

Low alarm   ①

low   ✦   △   high   ※1

Low alarm   ②

low   △   ✦   high   ※2

High / Low alarm

low   ✦   △   high   ※3

Band alarm

low   ✦   △   high   ※3

< PROCESS ALARM >

High alarm

low   △   high

Low alarm

low   △   high
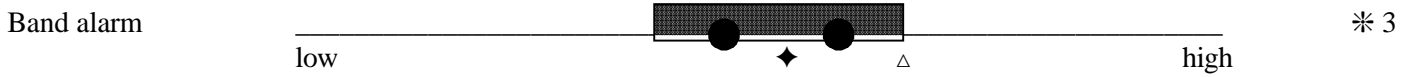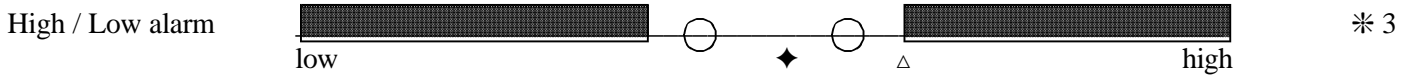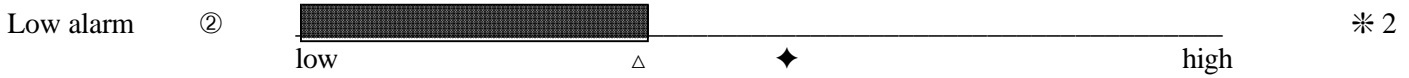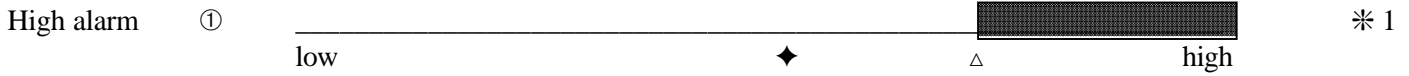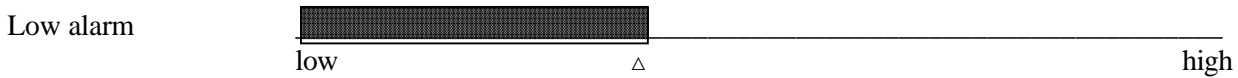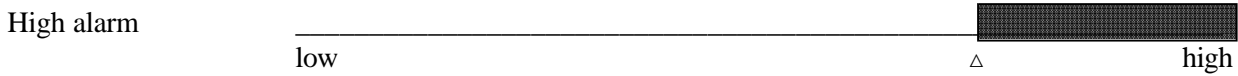
※1   Alarm status where the alarm set-value is set to plus (+) side for the set-value (SV).
※2   Alarm status where the alarm set-value is set to minus (-) side for the set-value (SV).
※3   Status when alarm is activated at 2 equal deviation points from the set-value (SV) with the alarm set-value (absolute deviation) is set.

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(6) **Control-output selection etc.** ($\boxed{5}_{i \_} \boxed{5}$)

Set-value (SV) display unit

VALUE				DESCRIPTION	
			$\boxed{0}$	Direct action (Type D)	Direct / reverse action
			1	Reverse action (Type F, A, W)	selection
		$\boxed{0}$		PID action (Type D, F) ✳1	Control action
		1		Heating / cooling PID action (Type A, W) ✳1	type selection
	$\boxed{0}$			Time proportional output (M, V, G output) ✳2	Control output type
	1			Continuous output (Current 4 to 20 mA DC)	selection (Heating side)
$\boxed{0}$				Time proportional output (M, V output) ✳2	Control output type
1				Continuous output (Current 4 to 20 mA DC)	selection (Cooling side)

  ✳1 Type D : PID action [Direct action]
       Type F : PID action [Reverse action]
       Type A : Heating / cooling PID action [Air-cooling]
       Type W : Heating / cooling PID action [Water-cooling]

  ✳2 M output : Relay contact   G output :   Trigger (For triac driving)
       V output : Voltage pulse

Cautions

1.   Conduct setting so as to meet the instrument specification. An incorrect setting may cause a malfunction.
2.   When control action is of the type D or F, "Control output type selection (Cooling side)" setting is ignored.
3.   For the REX-C100, always set the control action type selection to PID action.
4.   " $\boxed{5}_{i\_}\boxed{5}$ " setting displays are only " $\boxed{0}$ "and " 1 ".

(7) **Energize / de-energize alarm selection etc.** ($5L\ 7$)

Set-value (SV) display unit

VALUE				DESCRIPTION	
			0	Energize alarm	Energize / de-energize alarm selection
			1	De-energize alarm	(First alarm side)
		0		Energize alarm	Energize / de-energize alarm selection
		1		De-energize alarm	(Second alarm side)
	0			Without Z-124 specification	Special specification [Z-124] selection
	1			With Z-124 specification ＊	(First alarm side)
0				Without Z-124 specification	Special specification [Z-124] selection
1				With Z-124 specification ＊	(Second alarm side)

＊ Z-124 specification : No alarm action caused by burnout is performed.

Cautions

1. Instrument without the first alarm (ALM1) and second alarm (ALM2) is set to " 0000 ".
 - Instrument without the first alarm (ALM1).
   [$5L\ 4$ setting details : For " 0000 "]
 - Instrument without the second alarm (ALM2).
   [$5L\ 5$ setting details : For " 0000 "]

2. " $5L\ 7$ " setting displays are only " 0 "and " 1 ".

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(8)   **PV bias setting** (𝒫𝒷)

Set-value (SV) display unit

(Setting range)

(1)   TC and RTD inputs
   •   For a resolution of 1°C [°F]   :   -1999 to 9999°C [°F]
   •   For a resolution of 0.1°C [°F]   :   -199.9 to +999.9°C [°F]
(2)   Voltage and current inputs   :   -199.9 to +200.0%

(9)   **Differential gap setting of ON / OFF action** [𝗈𝗇𝗈𝖿]

Set-value (SV) display unit

(Setting range)

(1)   TC and RTD inputs   :   0 to 100 or 0.0 to 100.0
(2)   Voltage and current inputs   :   0.0 to 10.0

(10)   **Differential gap setting of first alarm (ALM1)** [𝖠𝗁-1]

Set-value (SV) display unit

(Setting range)

(1)   TC and RTD inputs   :   0 to 100 or 0.0 to 100.0
(2)   Voltage and current inputs   :   0.0 to 10.0

Caution

No display appears when no alarm function is provided.
[𝖲𝖫 𝟦 setting : "0000"].

(11)   **Differential gap setting of second alarm (ALM2)** [𝖠𝗁-2]

Set-value (SV) display unit

(Setting range)

(1)   TC and RTD inputs   :   0 to 100 or 0.0 to 100.0
(2)   Voltage and current inputs   :   0.0 to 10.0

Caution -   No display appears when no alarm function is provided.

[𝖲𝖫 𝟧 setting : "0000"].

(12) High-limit setting for set-value (SV) [5L H]

Set-value (SV) display unit

	INPUT TYPE	RANGE	
TC	K	0 to 1372°C	0 to 2502°F
	J	0 to 1200°C	0 to 2192°F
	L	0 to 800°C	0 to 1600°F
	E	0 to 1000°C	0 to 1832°F
	N	0 to 1300°C	0 to 2372°F
	R, S	0 to 1769°C	0 to 3216°F
	B	0 to 1820°C	0 to 3308°F
	W5Re / W26Re	0 to 2320°C	0 to 4000°F
	PLII	0 to 1390°C	0 to 2534°F
	T	-199.9 to +400.0°C	-199.9 to +752.0°F
	U	-199.9 to +600.0°C	-199.9 to +999.9°F
RTD	Pt100Ω (JIS / IEC) J Pt100Ω (JIS)	-199.9 to +649.0°C	
	Pt100Ω (Conforming to JIS / IEC)	-199.9 to +999.9°F	
Voltage	0 to 5V DC 1 to 5V DC	0.0 to 100.0% (Fixed)	
Current	0 to 20mA DC 0 to 20mA DC	0.0 to 100.0% (Fixed)	

＊1   IEC (International Electrotechnical Commission) is equivalent to JIS, DIN and ANSI.
＊2   Limit setting becomes 5L H ≥ 5L L .

Caution : Prior to conducting limiter setting change, see "Input range table" on page 16.

(13) Low-limit setting for set-value (SV) [5L L]

Set-value (SV) display unit

(Setting range)
See the above table.
Limit setting becomes 5L H ≥ 5L L .

Caution : Prior to conducting limiter setting change, see "Input range table" on page 16.

When changing the high-limit [5L H] and the low-limit [5L L] limiter settings, always set the set-value (SV) within the limiter range.   High-limit setting ≥ set-value (SV) ≥ low-limit setting

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2.3 Each Parameter checks

(1) When all the settings are finished, press the (**SET**) key to check each parameter.
(2) When the contents of the initial setting are changed, change the model code plate stuck to inside of the controller and outside of the case by referring to the following table.
(3) After each parameter has been checked, return the controller to the control mode by referring to "1.2 Exiting the initial set mode" (P.2).

	MODEL CODE								DESCRIPTION
REX-	C100 C400 C410 C700 C900	G	G	G	G	G	G	G	48 x 48 mm 96 x 48 mm 48 x 96 mm 72 x 72 mm 96 x 96 mm
Control action	F D W A								PID action (Reverse action) PID action (Direct action) Heating / Cooling PID action (Water-cooling) ★ Heating / Cooling PID action (Air-cooling) ★
Input type		G							See page 16. Input Range Table "MODEL CODE"
Input range			G						See page 16. Input Range Table "MODEL CODE"
First control output [OUT(1)] (Heating side)				M V 8 G					Relay contact Voltage pulse Current 4 to 20mA DC Trigger (for triac driving)
Second control output [OUT(2)] (Cooling side)					None M V 8				No second control output (Control action : D, F) Relay contact ★ Voltage pulse ★ Current 4 to 20mA DC ★
First alarm (ALM1)						N A B C D E F G H J K L R			No first alarm (ALM1) Deviation high alarm (without hold action) Deviation low alarm (without hold action) Deviation high / low alarm (without hold action) Band alarm Deviation high alarm (with hold action) Deviation low alarm (with hold action) Deviation high / low alarm (with hold action) Process high alarm (without hold action) Process low alarm (without hold action) Process high alarm (with hold action) Process low alarm (with hold action) Control loop break alarm
Second alarm (ALM2)							N A B C D E F G H J K L P S		No second alarm (ALM2) Deviation high alarm (without hold action) Deviation low alarm (without hold action) Deviation high / low alarm (without hold action) Band alarm Deviation high alarm (with hold action) Deviation low alarm (with hold action) Deviation high / low alarm (with hold action) Process high alarm (without hold action) Process low alarm (without hold action) Process high alarm (with hold action) Process low alarm (with hold action) Heater break alarm (CTL-6) Heater break alarm (CTL-12)

※ For the REX-C100, the content marked with ★ cannot be selection.
※ When control output is trigger output for triac driving, only the first alarm is available (For the REX-C100).

INPUT RANGE TABLE

THERMOCOUPLE

INPUT TYPE	INPUT RANGE	MODEL CODE
K (JIS / IEC)	0 to 200°C	K 01
	0 to 400°C	02
	0 to 600°C	03
	0 to 800°C	04
	0 to 1000°C	05
	0 to 1200°C	06
	0 to 1372°C	07
	0 to 800°F	A1
	0 to 1600°F	A2
	0 to 2502°F	A3
	✳	ZZ
J (JIS / IEC)	0 to 200°C	J 01
	0 to 400°C	02
	0 to 600°C	03
	0 to 800°C	04
	0 to 1000°C	05
	0 to 1200°C	06
	0 to 800°F	A1
	0 to 1600°F	A2
	0 to 2192°F	A3
	✳	ZZ
R (JIS / IEC)	0 to 1600°C	R 01
	0 to 1769°C	02
	0 to 3200°F	A1
	0 to 3216°F	A2
	✳	ZZ
S (JIS / IEC)	0 to 1600°C	S 01
	0 to 1769°C	02
	0 to 3200°F	A1
	0 to 3216°F	A2
	✳	ZZ
B (JIS / IEC)	400 to 1800°C	B 01
	0 to 1820°C	02
	800 to 3200°F	A1
	0 to 3308°F	A2
	✳	ZZ
E (JIS / IEC)	0 to 800°C	E 01
	0 to 1000°C	02
	0 to 1600°F	A1
	0 to 1832°F	A2
	✳	ZZ
N (NBS)	0 to 1200°C	N 01
	0 to 1300°C	02
	0 to 2300°F	A1
	0 to 2372°F	A2
	✳	ZZ
T (JIS / IEC)	-199.9 to +400.0°C	T 01
	-199.9 to +100.0°C	02
	-100.0 to +200.0°C	03
	0.0 to 350.0°C	04
	-199.9 to +752.0°F	A1
	-100.0 to +200.0°F	A2
	-100.0 to +400.0°F	A3
	0.0 to 450.0°F	A4
	0.0 to 752.0°F	A5
	✳	ZZ
W5Re / W26Re (ASTM)	0 to 2000°C	W 01
	0 to 2320°C	02
	0 to 4000°F	A1
	✳	ZZ

THERMOCOUPLE (continued)

INPUT TYPE	INPUT RANGE	MODEL CODE
PLII (NBS)	0 to 1300°C	A 01
	0 to 1390°C	02
	0 to 2400°F	A1
	0 to 2534°F	A2
	✳	ZZ
U (DIN)	-199.9 to +600°C	U 01
	-199.9 to +100.0°C	02
	0.0 to 400.0°C	03
	-199.9 to +999.9°F	A1
	-100.0 to +200.0°F	A2
	0.0 to 999.9°F	A3
	✳	ZZ
L (DIN)	0 to 400°C	L 01
	0 to 800°C	02
	0 to 800°F	A1
	0 to 1600°F	A2
	✳	ZZ

RTD

INPUT TYPE	INPUT RANGE	MODEL CODE
Pt100 (JIS / IEC) / Pt100 (Conforming to JIS / IEC)	-199.9 to +649.0°C	D 01
	-199.9 to +200.0°C	02
	-100.0 to +50.0°C	03
	-100.0 to +100.0°C	04
	-100.0 to +200.0°C	05
	0.0 to 50.0°C	06
	0.0 to 100.0°C	07
	0.0 to 200.0°C	08
	0.0 to 300.0°C	09
	0.0 to 500.0°C	10
	-199.9 to +999.9°F	A1
	-199.9 to +400.0°F	A2
	-199.9 to +200.0°F	A3
	-100.0 to +100.0°F	A4
	-100.0 to +300.0°F	A5
	0.0 to 100.0°F	A6
	0.0 to 200.0°F	A7
	0.0 to 400.0°F	A8
	0.0 to 500.0°F	A9
	✳	ZZ
J Pt100 (JIS) / 5V	-199.9 to +649.0°C	P 01
	-199.9 to +200.0°C	02
	-100.0 to +50.0°C	03
	-100.0 to +100.0°C	04
	-100.0 to +200.0°C	05
	0.0 to 50.0°C	06
	0.0 to 100.0°C	07
	0.0 to 200.0°C	08
	0.0 to 300.0°C	09
	0.0 to 500.0°F	10
	✳	ZZ

VOLTAGE CURRENT MAGNET

INPUT TYPE	INPUT RANGE		MODEL CODE
0 to 5V	0.0 to 100.0%	4	01
1 to 5V	0.0 to 100.0%	6	01
0 to 20mA	0.0 to 100.0%	7	01
4 to 20mA	0.0 to 100.0%	8	01
Special input	0.0 to 100.0%	9	01

100.0%

✳ When the range is specified separately, the "MODEL CODE" becomes "**G**ZZ"

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