

REX-C100

REX-C700

REX-C400

REX-C900

REX-C410

INITIAL SETTING MANUAL

RKC[®] RKC INSTRUMENT INC.

IMNZC01-E2

This is a manual for the initial setting of 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, if 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.

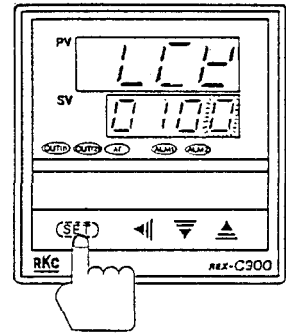
CONTENTS

	Page
1. Initial set mode changing	
1.1 Entering the initial set mode -----	1
1.2 Exiting the initial set mode -----	2
2. Setting	
2.1 Description of each parameter -----	3
2.2 Each parameter setting -----	4
(1) Input type selection [SL 1] -----	5
(2) Engineering unit and cooling type selection [SL 2] -----	6
(3) Selection of break alarm (HBA, LBA) etc. [SL 3] -----	7
(4) First alarm (ALM1) type selection [SL 4] -----	8
(5) Second alarm (ALM2) type selection [SL 5] -----	9
(6) Control output selection etc. [SL 6] -----	11
(7) Energize/de-energize alarm selection etc. [SL 7] -----	12
(8) PV bias setting [PB] -----	13
(9) Differential gap setting of ON/OFF action [DH] -----	13
(10) Differential gap setting of first alarm (ALM1) [RH 1] -----	13
(11) Differential gap setting of second alarm (ALM2) [RH 2] -----	13
(12) High-limit setting for set-value (SV) [SLH] -----	14
(13) Low-limit setting for set-value (SV) [SLL] -----	14
2.3 Each parameter checks -----	15

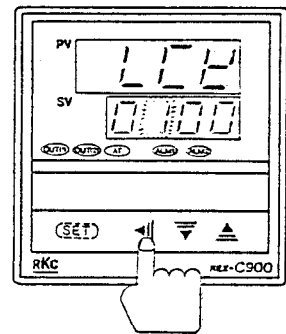
1. Initial set mode changing

1.1 Entering the initial set mode

- (1) Press the (SET) key to display the set data locking parameter symbol (LCK) 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.

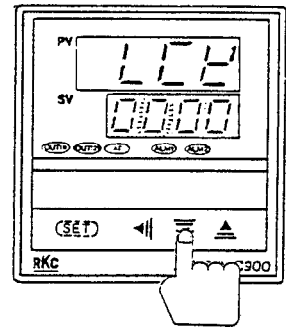


- (2) Press the \leftarrow key to shift the digit which lights brightly up to the hundreds digit. The digit which lights brightly shifts as follows every time the \leftarrow key is pressed.

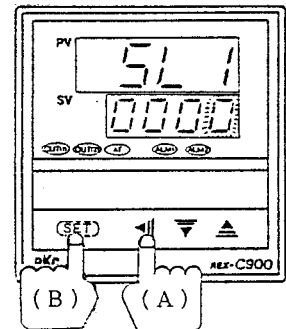


- (3) Press the ∇ key to set "0". Pressing the \blacktriangle key increments numerals, and pressing the ∇ key decrements numerals.

0000 : No initial set mode locked.



- (4) Keep pressing both the \leftarrow (A) and (SET) (B) keys simultaneously for more than 5 sec. can enter the initial set mode.



Initial set status

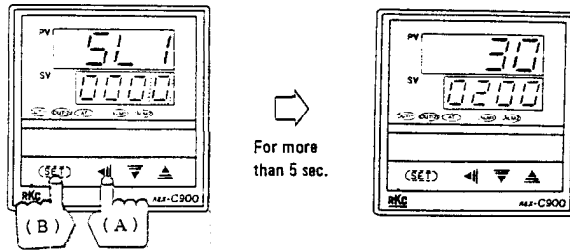
Cautions

1. In order to enter the initial set mode, always set the set data locking (LCK) 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).

1.2 Exiting the initial set mode

(1) Exits from the initial set mode

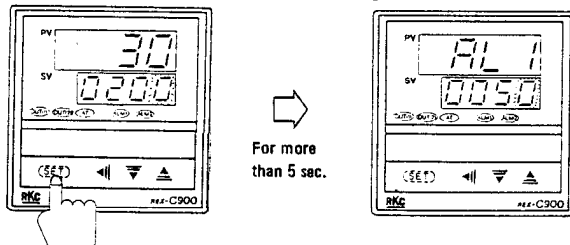
Keep pressing both the ◀ key (A) and (SET) (B) keys simultaneously for more than 5 sec. can enter the PV/SV display mode.



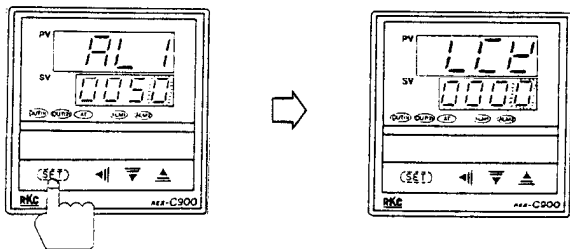
※ Even if the controller exits from the initial set mode at any point, the setting mode so far set becomes valid.

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

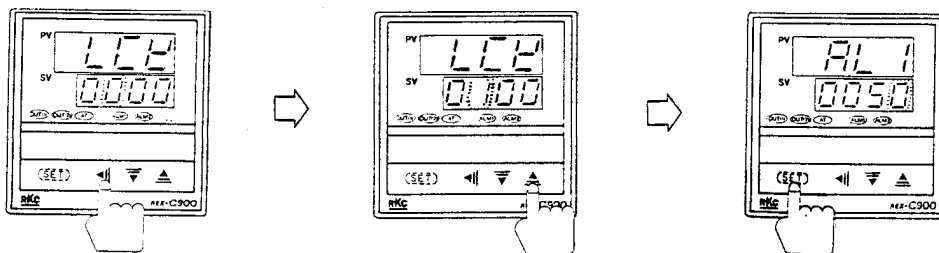
① Press the (SET) key to enter the parameter setting mode.



② Press the (SET) key by required number of times to show "LCE" on the measured-value (PV) display unit.



③ Press the ◀ and ▲ keys to set "0 100". Press the (SET) key to register "0 100".



Caution

If the controller exits from the initial set mode, confirm that set data lock setting is set to "0 100".

— (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. Setting

2.1 Description of each parameter

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

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

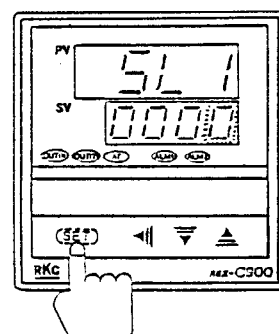
SET

2.2 Each parameter setting

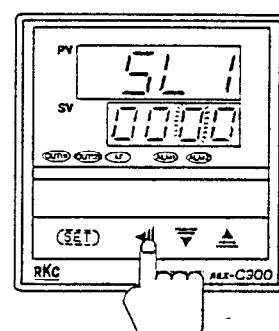
◎ Method of setting

Example of changing the input thermocouple type from K to L in the setting procedure "Input type selection" (SL 1).

- ① Press the (SET) key to display the input type selection parameter symbol (SL 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.

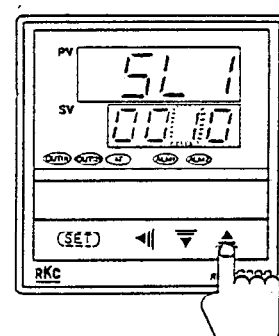


- ② Press the <|| key to shift the digit which lights brightly up to the tens digit. The digit which lights brightly shifts as follows every time the <|| key is pressed.

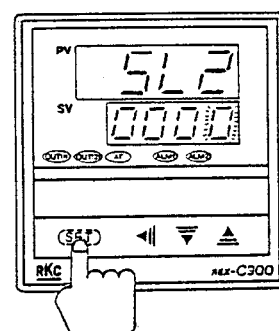


- ③ Press the ▲ key to set "1". Pressing the ▲ key increments numerals, and pressing the ▼ key decrements numerals.

00 10 : Thermocouple type L



- ④ 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 "SL 1" is displayed, the display returns to "SL 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 [SL I]

Set-value (SV) display unit

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VALUE	INPUT TYPE	HARDWARE	
□ □ □ □	K	a	
□ □ □ 1	J		
□ □ 1 □	L		
□ □ 1 1	E		
□ 1 □ □	N		
□ 1 1 1	R		
1 □ □ □	S		
1 □ □ 1	B		
1 □ 1 □	W5Re/W26Re		
1 □ 1 1	PLII		
□ 1 □ 1	T		b
□ 1 1 □	U		
1 1 □ □	RTD	c	
1 1 □ 1			Pt100Ω(JIS/IEC) JPt100Ω(JIS)
1 1 1 □	Voltage	d	
1 1 1 1			0 to 5V DC 1 to 5V DC
1 1 1 □	Current	e	
1 1 1 1			0 to 20mA DC 4 to 20mA DC

Cautions

- 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 "SLH" and "SLL" (See page 14).
- "SL I" setting displays are only "□" and "1".

(2) Engineering unit and cooling type selection [SL2]

Set-value (SV) display unit

□	□		
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VALUE			DESCRIPTION	
		□	°C	Engineering unit selection
		/	°F	
	□		Air-cooling (Type A) ※1	Cooling type selection
	/		Water-cooling (Type W) ※2	
□	□		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 “□□” since they are not used.
4. “SL2” setting displays are only “□” and “/” .

(3) Selection of break alarm (HBA, LBA) etc. [5L3]

Set-value (SV) display unit

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VALUE				DESCRIPTION	
			□	Without HBA function	Heater break alarm (HBA) selection
			/	With HBA function	
			□	Without LBA function	Control loop break alarm (LBA) selection
			/	With LBA function	
	/			Fixed	
□				First alarm side	Selection of control loop break alarm output terminals
/				Second alarm side	

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 the type W (Heating/cooling PID action [Water-cooling]) or type A (Heating/cooling PID action [Air-cooling]).
3. "5L3" setting displays are only "□" and "/".

(4) First alarm (ALM1) type selection [5L4]

Set-value (SV) display unit

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VALUE				DESCRIPTION	
□	□	□	□	No first alarm	First alarm (ALM1) type selection (See page 10)
□	□	/	/	High alarm	
/	□	/	/	Low alarm	
□	/	□	□	High/Low alarm	
/	/	□	□	Band alarm	
□	/	/	/	High alarm	
/	/	/	/	Low alarm	
□				Without alarm hold action	
/				With alarm hold action	

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. [5L3 setting details : For "0010"]
2. "5L4" setting displays are only "□" and "/".

(5) Second alarm (ALM2) type selection [5L5]

Set-value (SV) display unit

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

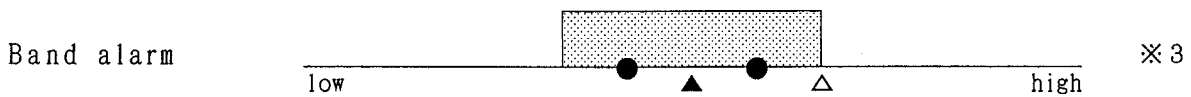
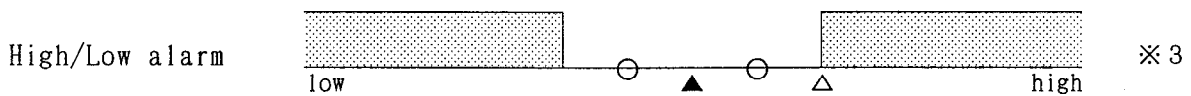
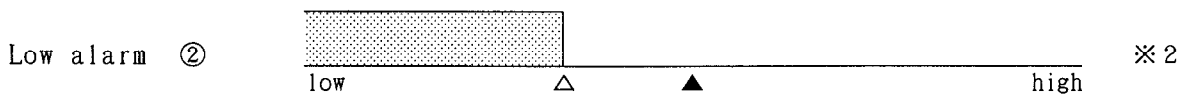
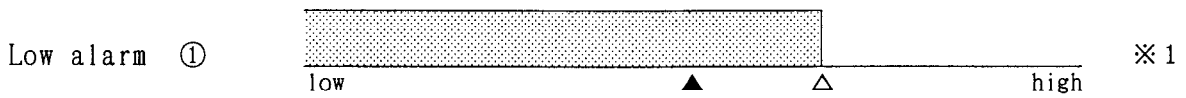
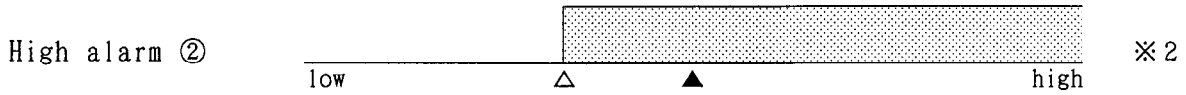
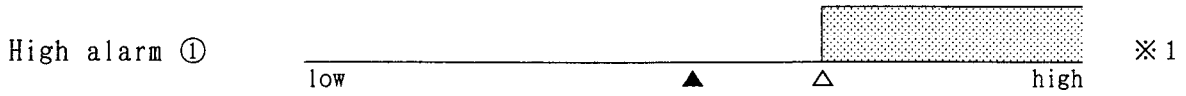
Cautions

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. [5L3 setting details: For "10 10"]
2. "5L5" setting displays are only "0" and "1".

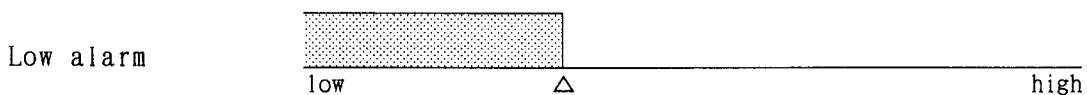
ALARM TYPES

(▲ : Set-value (SV) △ : Alarm set-value  : Alarm status (ALM1 or ALM2 LED lighting))

< DEVIATION ALARM >



< PROCESS ALARM >



- ※ 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.

(6) Control output selection etc. [5L5]

Set-value (SV) display unit

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VALUE			DESCRIPTION
		□/	Direct action (Type D)
		/	Reverse action (Type F,A,W)
	□		PID action (Type D,F) ※1
	/		Heating/cooling PID action (Type A,W) ※1
□			Time proportional output (M,V,G output) ※2
/			Continuous output (Current 4 to 20mA DC)
□			Time proportional output (M,V output) ※2
/			Continuous output (Current 4 to 20mA DC)

- ※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. "5L5" setting displays are only "□" and "/".

(7) Energize/de-energize alarm selection etc. [5L7]

Set-value (SV) display unit

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

※ 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).
(5L4 setting details : For "0000")
 - Instrument without the second alarm (ALM2).
(5L5 setting details : For "0000")
2. "5L7" setting displays are only "□" and "/" .

(8) PV bias setting [*Pb*]

Set-value (SV) display unit

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<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 [*GH*]

Set-value (SV) display unit

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<Setting range>

① TC and RTD inputs : 0 to 100 or 0.0 to 100.0

② Voltage and current inputs : -199.9 to +200.0

(10) Differential gap setting of first alarm (ALM1) [*AH1*]

Set-value (SV) display unit

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<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.

(*SL4* setting : "0000").

(11) Differential gap setting of second alarm (ALM2) [*AH2*]

Set-value (SV) display unit

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<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.

(*SL5* setting : "0000").

(12) High-limit setting for set-value (SV) [*SLH*]

Set-value (SV) display unit

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INPUT TYPE		RANGE
T C	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	
R T D	Pt 100Ω (JIS/IEC) J Pt 100Ω (JIS)	-199.9 to +649.0°C
	Pt 100Ω (Conforming to JIS/IEC)	-199.9 to +999.9°F
	0 to 5 V DC 1 to 5 V DC	0.0 to 100.0% (Fixed)
Current	0 to 20 mA DC 4 to 20 mA DC	0.0 to 100.0% (Fixed)

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

※2 Limit setting becomes $SLH \geq SLL$.

Caution

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

(13) Low-limit setting for set-value (SV) [*SLL*]

Set-value (SV) display unit

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<Setting range>

See the above table.

Limit setting becomes $SLH \geq SLL$.

Caution

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

When changing the high-limit (*SLH*) and the low-limit (*SLL*) limiter settings, always set the set-value (SV) within the limiter range.

High-limit setting \geq set-value (SV) \geq low-limit setting

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 the 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						48×48 mm	
	C400						96×48 mm	
	C410	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	* <input type="checkbox"/>	48×96 mm
	C700							72×72 mm
	C900							96×96 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		<input type="checkbox"/>						See page 16. INPUT RANGE TABLE "MODEL CODE"
Input range			<input type="checkbox"/>					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 20 mA 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 20 mA 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 R			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) Control loop break alarm

※ 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

INPUT TYPE		INPUT RANGE					
THERMOCOUPLE	K (JIS/IEC)	KO1	0to 200°C	KO2	0to 400°C	KO3	0to 600°C
		KO4	0to 800°C	KO5	0to1000°C	KO6	0to1200°C
		KO7	0to1372°C	K13	0to 100°C	K14	0to 300°C
		KA1	0to 800°F	KA2	0to1600°F	KA3	0to2502°F
		KA9	20to 70°F				
	J (JIS/IEC)	JO1	0to 200°C	JO2	0to 400°C	JO3	0to 600°C
		JO4	0to 800°C	JO5	0to1000°C	JO6	0to1200°C
		JA1	0to 800°F	JA2	0to1600°F	JA3	0to2192°F
	R # (JIS/IEC)	RO1	0to1600°C	RO2	0to1769°C		
		RA1	0to3200°F	RA2	0to3216°F		
	S # (JIS/IEC)	SO1	0to1600°C	SO2	0to1769°C		
		SA1	0to3200°F	SA2	0to3216°F		
B # (JIS/IEC)	BO1	400to1800°C	BO2	0to1820°C			
	BA1	800to3200°F	BA2	0to3308°F			
E (JIS/IEC)	EO1	0to 800°C	EO2	0to1000°C			
	EA1	0to1600°F	EA2	0to1832°F			
N (NBS)	NO1	0to1200°C	NO2	0to1300°C			
	NA1	0to2300°F	NA2	0to2372°F			
T (JIS/IEC)	TO1	-199.9to400.0°C	TO2	-199.9to100.0°C	TO3	-100.0to200.0°C	
	TO4	0.0to350.0°C					
	TA1	-199.9to752.0°F	TA2	-100.0to200.0°F	TA3	-100.0to400.0°F	
	TA4	0.0to450.0°F	TA5	0.0to752.0°F			
W5Re/W26Re (ASTM)	WO1	0to2000°C	WO2	0to2320°C			
	WA1	0to4000°F					
PLII (NBS)	AO1	0to1300°C	AO2	0to1390°C	AO3	0to1200°C	
	AA1	0to2400°F	AA2	0to2534°F			
U (DIN)	UO1	-199.9to600.0°C	UO2	-199.9to100.0°C	UO3	0.0to400.0°C	
	UA1	-199.9to999.9°F	UA2	-100.0to200.0°F	UA3	0.0to999.9°F	
L (DIN)	LO1	0to 400°C	LO2	0to 800°C			
	LA1	0to 800°F	LA2	0to1600°F			
R T D	Pt100 (JIS/IEC)	DO1	-199.9to649.0°C	DO2	-199.9to200.0°C	DO3	-100.0to 50.0°C
		DO4	-100.0to100.0°C	DO5	-100.0to200.0°C	DO6	0.0to 50.0°C
		DO7	0.0to100.0°C	DO8	0.0to200.0°C	DO9	0.0to300.0°C
		D10	0.0to500.0°C				
	Pt100 (Conforming to JIS/IEC)	DA1	-199.9to999.9°F	DA2	-199.9to400.0°F	DA3	-199.9to200.0°F
		DA4	-100.0to100.0°F	DA5	-100.0to300.0°F	DA6	0.0to100.0°F
		DA7	0.0to200.0°F	DA8	0.0to400.0°F	DA9	0.0to500.0°F
	JPt100 (JIS)	PO1	-199.9to649.0°C	PO2	-199.9to200.0°C	PO3	-100.0to 50.0°C
		PO4	-100.0to100.0°C	PO5	-100.0to200.0°C	PO6	0.0to 50.0°C
		PO7	0.0to100.0°C	PO8	0.0to200.0°C	PO9	0.0to300.0°C
	P10	0.0to500.0°C					
VOLTAGE CURRENT	0 to 5V	401	0.0to100.0%				
	1 to 5V	601	0.0to100.0%				
	0 to 20mA	701	0.0to100.0%				
	4 to 20mA	801	0.0to100.0%				
	(Special input)	901	0.0to100.0%				

Accuracy in the range of 0 to 399°C (0 to 799°F): Not guaranteed.

RKC. RKC INSTRUMENT INC.
(RIKA KOGYO CO.,LTD)

HEAD OFFICE: 16-6, KUGAHARA 5-CHOME, OHTA-KU TOKYO 146 JAPAN
PHONE: 03-3751-9799(+81 3 3751 9799)
TELEX : 0246-8818 RKCTOK J
CABLE : RKCRIKAROL
FAX : 03-3751-8585(+81 3 3751 8585)