

REX - AD410A

INSTRUCTION MANUAL

IM41AD01-E2

Thank you for purchasing our "REX-AD410A". This manual describes how to use "REX-AD410A". Prior to using the indicator, please carefully read this manual and fully understand the contents. Keep this manual safely for future reference as required.

- The contents of this manual may subject to change without prior notice.
- The contents of this manual are copy righted; all rights are reserved by RKC INSTRUMENT INC. It is prohibited to reprint or reproduce the whole or a part of this manual without the prior of RKC INSTRUMENT INC.
- "REX-AD410A" and this manual are manufactured and prepared under strict quality control before delivery. However, if any problems arise, please contact us directly or your nearest our sales agent.
- RKC assumes no responsibility for any of the following damages which the user or third party may suffer.
 - ① Damage incurred as a result of using this product.
 - ② Damage caused by product failure which cannot be predicted by RKC.
 - ③ Other indirect damages.

▶ INSTRUMENT SAFETY CAUTIONS ◀

- This instrument is designed to be mounted on instrumentation panels. It is therefore manufactured as part of the final product to facilitate wiring. This means that unauthorized personnel can easily access the high-voltage sections in this instrument such as power terminals, etc.
Therefore, when this instrument is installed on the final product, the user should take the necessary measures for the final product to ensure that unauthorized personnel cannot access the high-voltage sections, etc.
- In order to use this instrument correctly and safely, always observe the cautions described in this manual when performing operations and maintenance.
RKC assumes no responsibility for any injury or accident resulting from not following these cautions.
- This instrument is intended to be used under the following environmental conditions. (IEC1010)
[OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2]
- To the instrument with power supply of 24V, please be sure to supply the power from SELV circuit.
- The cleaning shall be done after the confirmation that the power supply to the instrument is off.
- The stains on the surface of the display shall be wiped off by a soft cloth or tissue paper.

- The surface of the display is easy to be injured. So, please be careful not to rub it with a hard material or to hit it.
- The stains on the housing shall be wiped off by the cloth which is dipped into the neutral cleanser diluted by water and wrung tightly, and finish it by a dried cloth.

WARNING

- **Wiring precautions**
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.
In order to prevent instrument damage or failure, protect the power line and the input/output lines from high currents by using fuses with appropriate ratings.
- **Power supply**
In order to prevent instrument damage or failure, power of the specified rating.
In order to prevent electric shock or instrument failure, do not turn on the power supply until all of the wiring is completed.
- **Never use the instrument near inflammable gases.**
In order to prevent fire, explosion or instrument damage, never use this instrument at a location where inflammable or explosive gases or vapour exist.
- **Never touch the inside of the instrument.**
In order to prevent electric shock or burns, never touch the inside of the instrument.
Only RKC service engineers can touch the inside of the instrument to check the circuit or to replace parts. High voltage and high temperature sections inside the instrument are extremely dangerous.
- **Never modify the instrument.**
In order to prevent accident or instrument failure, never modify the instrument.
- **Maintenance**
In order to prevent electric shock, burns or instrument failure, only RKC service engineers may replace parts.
In order to use this instrument continuously and safely, conduct periodic maintenance. Some parts used in this instrument have a limited service life and may deteriorate with time.

CE CONFORMED INSTRUMENT CAUTIONS

- 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.
- EN55022, EN50082-2 and EN61010-1 are applicable to this instrument.

WARNING

This is a Class A (EN55022) instrument. In a domestic environment this product may cause radio interference, in which case the user is required to take adequate measures.

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▶ MARKING CAUTIONS ◀

For safe operation of "REX-AD410A", the following "Signal Words and Symbol Marks" are used in this manual.

< Signal Words >

WARNING

Where there are possible dangers such as electric shock, fire (burns), etc. which could cause loss of life or injury, precautions to avoid such dangers are described.

CAUTION

These describe precautions to be taken if unit damage may result if operating procedures are not strictly followed.

NOTE

Extra notes or precautions are added to operating procedures and explanations.

< Symbol Marks >

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

* : This mark is used to add extra notes, precautions or supplementary explanations to table and figures.

1. PRODUCT CHECK

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

■ Model code

REX-AD410A - □ * □ - □ - □ - □ / C E
① ② ③ ④ ⑤

① Power Supply

3: 24 V AC/DC 4: 100 to 240 V AC/DC

② Output

N: No output 4: With output 4-point
1: With output 1-point 5: With output 5-point
2: With output 2-point 6: With output 6-point
3: With output 3-point

③ Contact Input

N: No contact input 2: With contact input 2-point
*If "With contact input 2-point" is selected, the communication function becomes RS-485.

④ Analog Output/Power supply output for LED Drive

N: No output P: Power supply output for LED drive
1: 0 to 10 mV DC 5: 0 to 10 V DC
2: 0 to 100 mV DC 6: 1 to 5 V DC
3: 0 to 1 V DC 7: 0 to 20 mA DC
4: 0 to 5 V DC 8: 4 to 20 mA DC

⑤ Communication function

N: No function 5: RS-485 (2-wire system)
4: RS-422A (4-wire system)

Confirm that power voltage is also the same as that specified when ordering.

■ Accessories

- Mounting brackets (2 pieces)
- Instruction manual [IM41AD01-E2] (1 copy)

■ Option

External resistor (One piece)
Shunt resistor for current input : 250 Ω (± 0.02 % ± 10 ppm, 0.25 W or more)

2. MOUNTING



WARNING

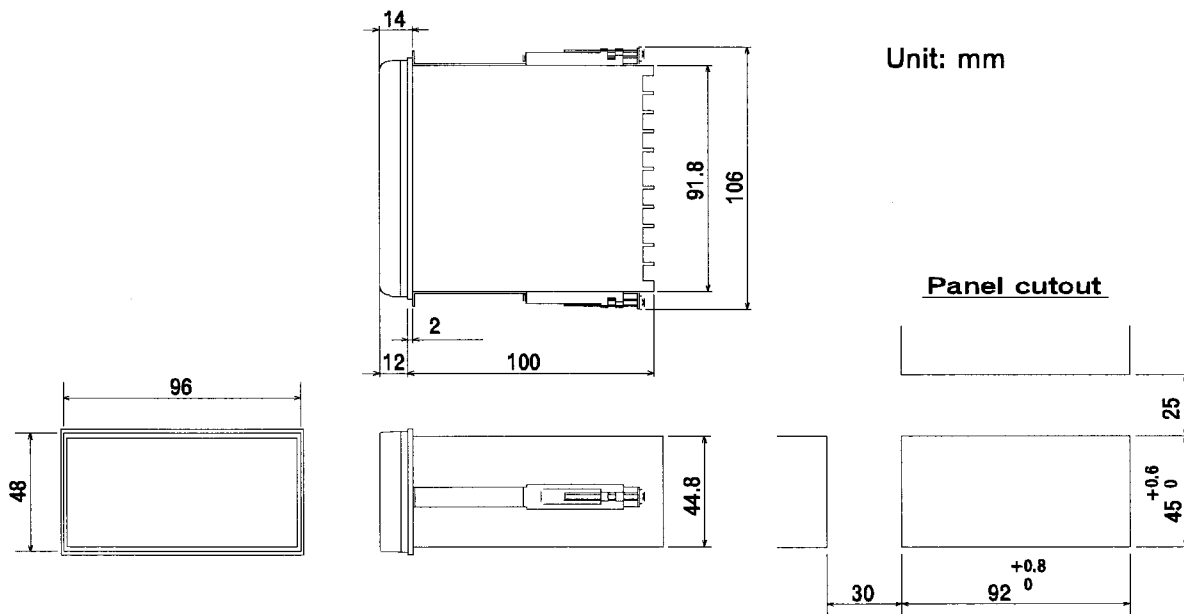
In order to prevent electric shock and instrument failure, do not turn on the power supply until all of the wiring is completed.

■ Cautions for mounting ⚠

Avoid the following when selecting the mounting location.

- Ambient temperature of less than 0 °C (32 °F) or more than 50 °C (122 °F).
- Ambient humidity of less than 45 % or more than 85 % RH .
- Rapid changes in ambient temperature which may cause condensation.
- Corrosive or inflammable gases.
- Direct vibration or shock to the mainframe.
- Water, oil, chemicals, vapor or steam splashes.
- Excessive dust, salt or iron particles.
- Excessive induction noise, static electricity, magnetic fields or noise.
- Direct air flow from an air conditioner.
- Should be used indoors where the system is not exposed to direct sunlight.
- Heat to be accumulated radiation heat.

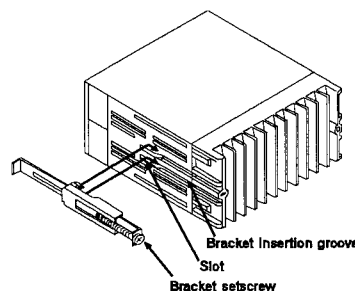
■ Dimensions



■ Mounting procedures

- ① Make a rectangular cutout corresponding to the number of indicators to be mounted on panel by referring to the panel cutout dimensions.
- ② Insert the indicators into the panel from the panel front.
- ③ Insert an upper mounting bracket along the bracket insertion groove from the back, and then engage a projection at the bracket end with a recess at the groove front and also insert metal fitting legs into slots.
- ④ Tighten a bracket setscrew from the rear of the bracket with Phillips screwdriver.
Do not overtighten the bracket setscrew.
Recommended tighten torque : 0.3 N·m or less
(3 kgf·cm or less)
- ⑤ Set the other mounting bracket in the same way as in ③ and ④.

*This indicator is provided with a waterproof and dustproof rubber packing. For details of replacing the packing due to deterioration, see " 9. Replacing the waterproof and dust-proof rubber packing ".



NOTE

The front of this indicator conforms to IP54 with the indicator mounted on a control panel.

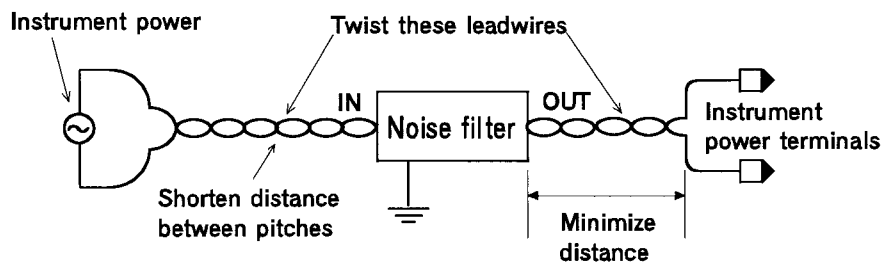
3. WIRING

⚠ WARNING

- In order to prevent electric shock and instrument failure, do not turn on the power supply until all of the wiring is completed.
- In 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.
- In order to prevent instrument damage or failure, protect power line and input/output lines from high currents by using fuses with appropriate ratings.

■ Cautions for wiring ⚠

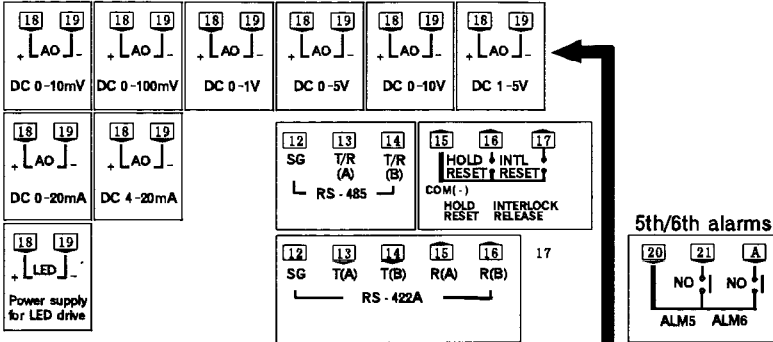
- (1) For thermocouple input, use the specified compensation wire.
- (2) For RTD input, use leads with low resistance and having no resistance differences among the 3 leads.
- (3) Conduct input signal wiring away from instrument power, electric equipment power and load lines to avoid noise induction.
- (4) Conduct instrument power wiring so as not to be influenced by noise from the electric equipment power.
If the instrument may be affected by external noise, a noise filter should be used.
 - ① To obtain a satisfactory noise filter effect, select the most suitable type after due consideration of instrument power supply voltage and filter frequency characteristics.
 - ② Shorten the distance between twisted power supply wire pitches. The shorter the distance between the pitches, the more effective for noise reduction.
 - ③ Install the noise filter on the panel which is always grounded and minimize the wiring distance between the noise filter output side and the instrument power terminals.



- ④ Do not install fuses and/or switches on the filter output signal since this may lessen filter effect.
- (5) For wiring, use wires conforming to the domestic standard of each country.
- (6) About 5 to 6 sec. are required as the preparation time of contact output during power-ON.
Use a delay relay when the output line, is used for an external interlock circuit.
- (7) When connecting wires, note that the power, input/MCU and output circuits are isolated independently, while the inside of the input and output circuits are not isolated.
- (8) This instrument has no power supply switch nor fuses. Therefore, install them separately close to the instrument, if required.
[Recommended fuse rating : Rated voltage ; 250 V Rated current ; 1 A Type ; Time-lag fuse]
- (9) This instrument is intended to be used under the following environmental conditions. (IEC1010)
[OVERVOLTAGE CATEGORY II , POLLUTION DEGREE 2]

Terminal configuration

Continuous voltage/current output

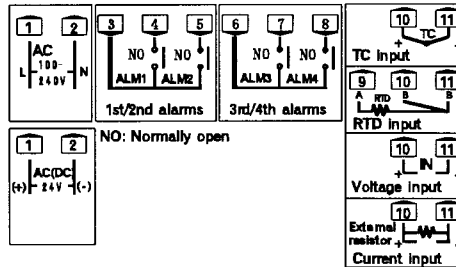
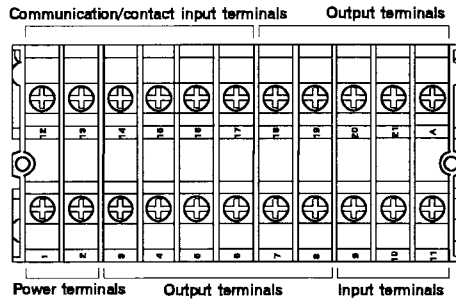


- Alarm output rated (Relay contact output)
250 V AC, 0.5 A (Resistive load)
- Analog output
 - 0 to 10 mV DC (Load resistance 20 k Ω or more)
 - 0 to 100 mV DC (Load resistance 20 k Ω or more)
 - 0 to 1 V DC (Load resistance 1 k Ω or more)
 - 0 to 5 V DC (Load resistance 1 k Ω or more)
 - 0 to 10 V DC (Load resistance 1 k Ω or more)
 - 1 to 5 V DC (Load resistance 1 k Ω or more)
 - 0 to 20 mA DC (Load resistance 600 Ω or less)
 - 4 to 20 mA DC (Load resistance 600 Ω or less)

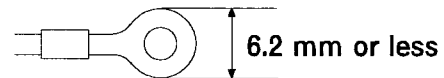
- Power supply :
100 to 240 V AC
(50/60 Hz common)
Power consumption;
9 VA max.(at 240 V AC)
7 VA max.(at 100 V AC)

- Power supply :
24 V AC
(50/60 Hz common)
Power consumption;
7 VA max.(at 24 V AC)

- Power supply :
24 V DC
Power consumption;
220 mA max.
(at 24 V DC)



- Solderless terminal
Therefore, use the solderless terminal suitable for a screw of M3.

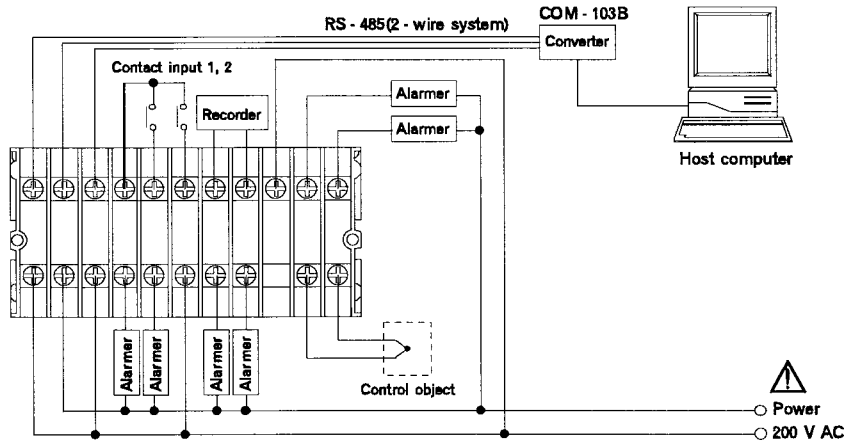


- Recommended tighten torque :
0.4 N·m (4 kgf·cm)
[Maximum allowance tighten torque :
1.0 N·m (10 kgf·cm)]

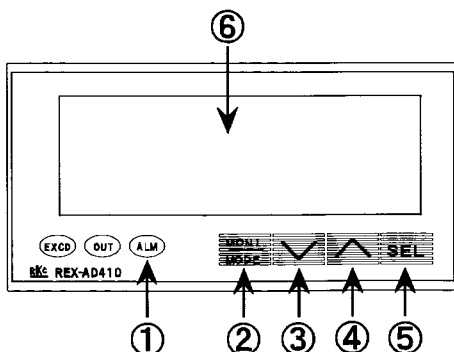
NOTE

Terminals which are not used according to the controller type are all removed.

Wiring example



4. NAME OF PARTS



- ① Alarm [ALM] indicator lamp (Red)
- ② **MONI/MODE** key
- ③ **DOWN** key
- ④ **UP** key
- ⑤ **SEL** key
- ⑥ Measured value (PV) display unit (Red)

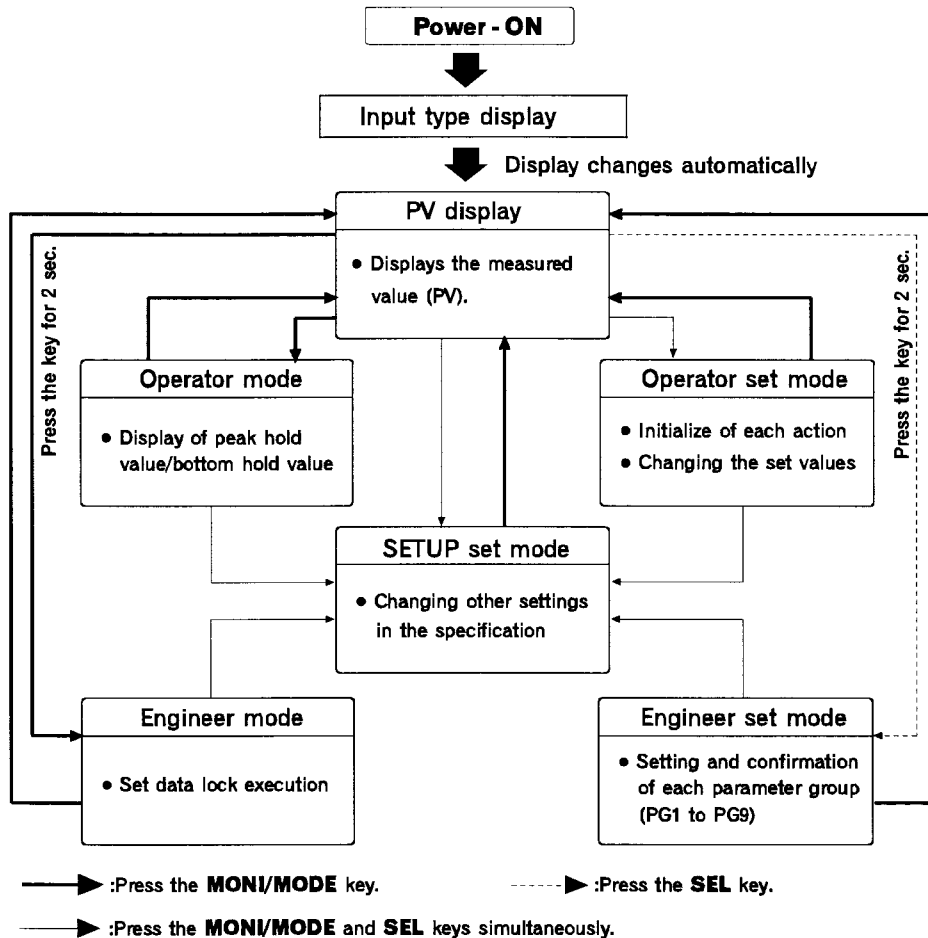
*No **EXCD** and **OUT** lamp is used.

5. OPERATION

5.1 Calling procedure in each mode

Broadly, the following six statuses are available for this instrument.

- PV display mode : Displays measured value (PV)
- SETUP set mode : Mode to select input or output function
- Operator mode : Mode to confirm peak hold value and bottom hold value
- Operator set mode : Mode to reset hold, to release interlock or to change alarm set value
- Engineer mode : Mode to lock setting
- Engineer set mode : Mode to set or confirm various parameters



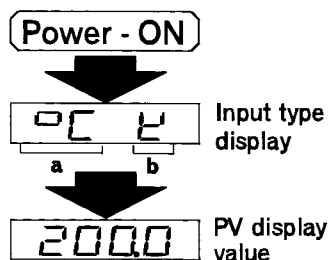
* The SETUP set mode accesses parameters which are not usually changed.

⚠ Key operational cautions

- For this instrument, even if the setting is changed, it is not registered. Pressing the **SEL** key after the setting is changed registers the setting approx. 2 sec later.
- This instrument returns to the PV display value if key operation is not performed for more than 1 minute.

■ Input type display

For this instrument, the input type can be confirmed just after the power is turned on.



Input type display (Display for approx. 4 sec)

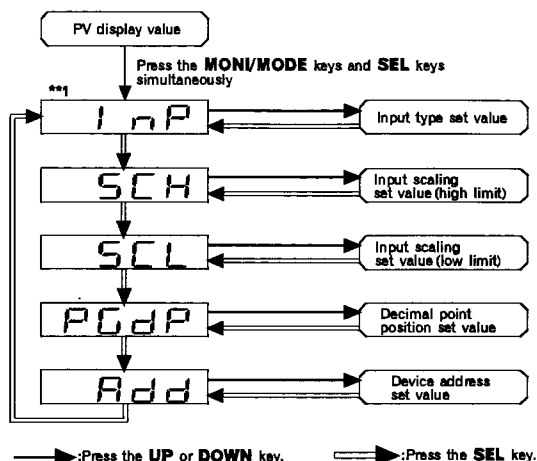
a: Unit


Display	0C	0F	None
Unit	°C	°F	%

b: Input type

Display	K	J	L	E	N	T	U	R	S	B	WSRe/W26Re	P	JP	PT	V
Input type	TC											RTD		Voltage	
	K	J	L	E	N	T	U	R	S	B	WSRe/W26Re	P	JP		PT

5.2 SETUP set mode



 **Always set the input type.**

****1 Always set the input type (InP).**

*B: Decimal point position

- 0: No digit below decimal point
- 1: 1 digit below decimal point
- 2: 2 digit below decimal point
- 3: 3 digit below decimal point

Symbol	Name	Setting range	Description	Initial value prior to shipment
InP (InP)	Input type selection	0 to 37 See "*A" .	Selects the input type. If the input type is changed, all the data is defaulted.	0
SCH (SCH)	Scaling high limit setting	Scaling low limit to 9999	Sets the high limit of input scaling.	999.9
SCL (SCL)	Scaling low limit setting	- 1999 to Scaling high limit	Sets the low limit of input scaling.	- 999.9
PGdP (PGdP)	Decimal point position selection	0 to 3 See "*B" .	Sets the decimal point position on the voltage/current input scale. * Display only for voltage input.	1
Add (Add)	Device address setting	0 to 99	Sets the communication device address of this instrument. * Displayed when the instrument has the communication function.	0

*A:

Group	Input type	Input select		
Temperature input	TC	K (K)	- 199.9 to +999.9 °C - 200 to +1372 °C	0 1
		J (J)	- 199.9 to +999.9 °C - 200 to +1200 °C	2 3
		T (T)	- 199.9 to +400.0 °C	4
		R (R)	0 to 1769 °C	5
		S (S)	0 to 1769 °C	6
		B (B) *1	0 to 1820 °C	7
		E (E)	- 200 to 1000 °C	8
		N (N)	0 to 1300 °C	9
		PLII (P)	0 to 1390 °C	10
		W5Re/W26Re (W)	0 to 2320 °C	11
		U (U)	0 to 600 °C	12
		L (L)	0 to 900 °C	13
		K (K)	- 199.9 to +999.9 °F - 330 to +2500 °F	14 15
		J (J)	- 199.9 to +999.9 °F - 330 to +2192 °F	16 17
	T (T)	- 199.9 to +752.0 °F	18	
	R (R)	0 to 3216 °F	19	
	S (S)	0 to 3216 °F	20	
	B (B) *1	0 to 3308 °F	21	
	E (E)	- 330 to +1832 °F	22	
	N (N) *2	0 to 2372 °F	23	
	PLII (P) *2	0 to 2534 °F	24	
	W5Re/W26Re (W) *2	0 to 4208 °F	25	
	U (U)	0 to 1100 °F	26	
	L (L)	0 to 1600 °F	27	

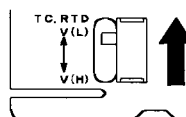
Group	Input type	Input select			
RTD	JPt100 Ω	- 199.9 to +510.0 °C 28			
	Pt100 Ω	- 199.9 to +660.0 °C 29			
	JPt100 Ω	- 199.9 to +950.0 °F 30			
	Pt100 Ω	- 199.9 to +999.9 °F 31			
Voltage input	Voltage *3 (Low type)	mV, V (H)	0 to 10 mV DC 0 to 100 mV DC 0 to 1 V DC	32 33 34	
		Voltage *4 (High type)	V (H)	0 to 5 V DV 1 to 5 V DC 0 to 10 V DC	35 36 37
			Current input	mA (I)	0 to 20 mA DC 4 to 20 mA DC

*3 If the voltage (high) input is used, change the switch in the mainframe.

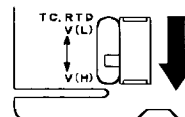
*4 If a current input of 0 to 20 mA is used, select a voltage (high) input 0 to 5 V, and if a current input of 4 to 20 mA is used, select a voltage (high) input of 1 to 5 V. In either case, connect an external resistor 250 Ω (± 0.02% ± 10 ppm, 0.25 W or more).

● Switch selection

Always turn OFF the power, then pull out the internal chassis.



For TC (thermocouple),
RTD (resistance temperature
detector), voltage (low)
input

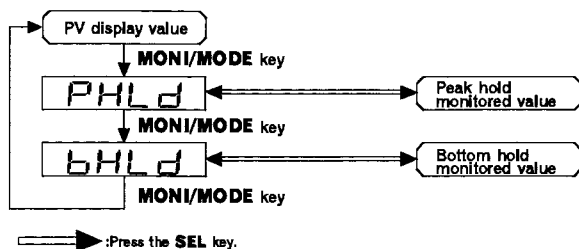


For voltage (high) input

CAUTION

No data is backed up when the power supply is turned off during setting change.

5.3 Operator mode



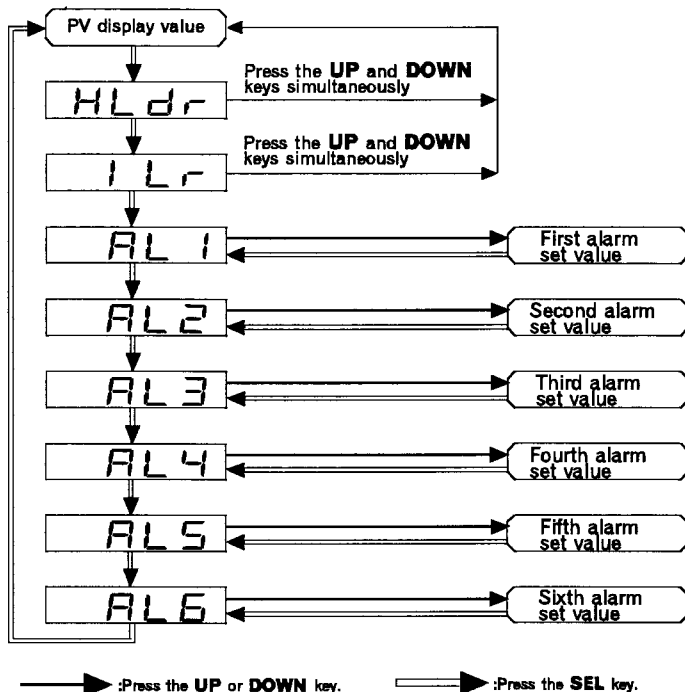
Peak hold value (PHLd) display

Displays the maximum input value.
Display range : -1999 to +9999

Bottom hold value (bHLd) display

Displays the minimum input value.
Display range : -1999 to +9999

5.4 Operator set mode

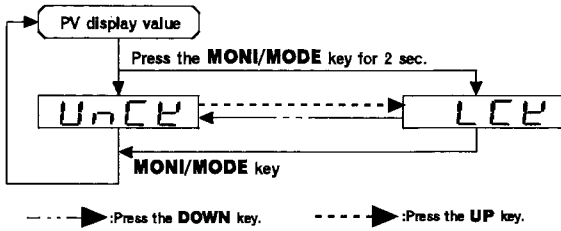


- *1 Displayed when "Interlock function provided" is selected for the first to sixth alarm.
- *2 Displayed when any item other than "No alarm provided" is selected for the first alarm.
- *3 Displayed when any item other than "No alarm provided" is selected for the second alarm.
- *4 Displayed when any item other than "No alarm provided" is selected for the third alarm.
- *5 Displayed when any item other than "No alarm provided" is selected for the fourth alarm.
- *6 Displayed when any item other than "No alarm provided" is selected for the fifth alarm.
- *7 Displayed when any item other than "No alarm provided" is selected for the sixth alarm.

Symbol	Name	Setting range	Description	Initial value prior to shipment
HLdr (HLdr)	Hold reset		Simultaneously pressing the UP and DOWN keys while the hold reset characters are displayed executes the hold reset function.	
ILr (ILr)	Interlock release *1		Simultaneously pressing the UP and DOWN keys while the interlock release characters are displayed releases the alarm interlock function.	
AL1 (AL1)	First alarm set value *2	Scaling low limit to scaling high limit (The decimal point position is the same as that of PV.)	Sets the alarm set value of the first alarm. See "**A".	999.9
AL2 (AL2)	Second alarm set value *3		Sets the alarm set value of the second alarm. See "**A".	-199.9
AL3 (AL3)	Third alarm set value *4		Sets the alarm set value of the third alarm. See "**A".	999.9
AL4 (AL4)	Fourth alarm set value *5		Sets the alarm set value of the fourth alarm. See "**A".	-199.9
AL5 (AL5)	Fifth alarm set value *6		Sets the alarm set value of the fifth alarm. See "**A".	999.9
AL6 (AL6)	Sixth alarm set value *7		Sets the alarm set value of the sixth alarm. See "**A".	-199.9

*A Pressing the **SEL** key after the set value is changed by pressing the **UP** or **DOWN** key establishes the set value.

5.5 Engineer mode

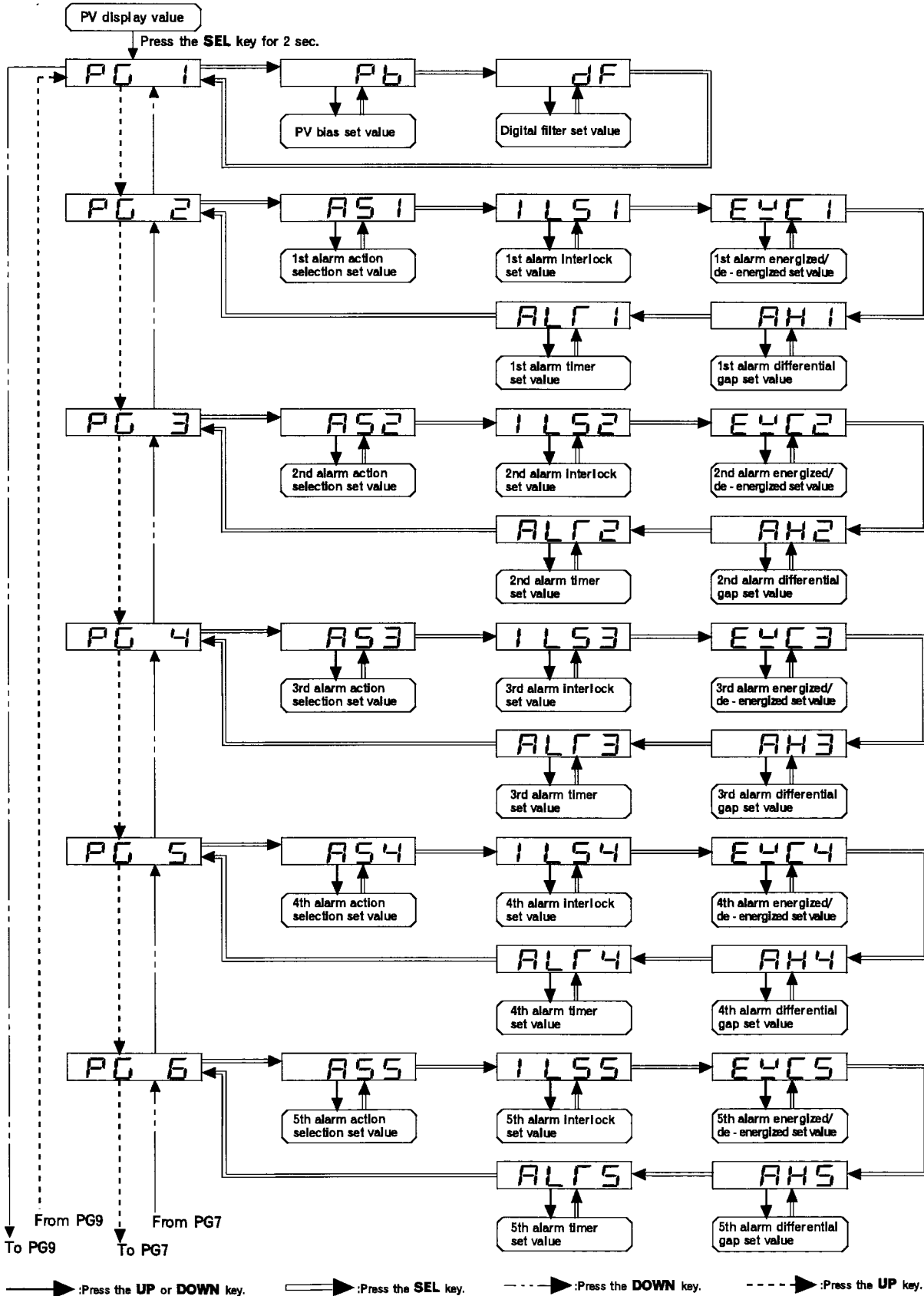


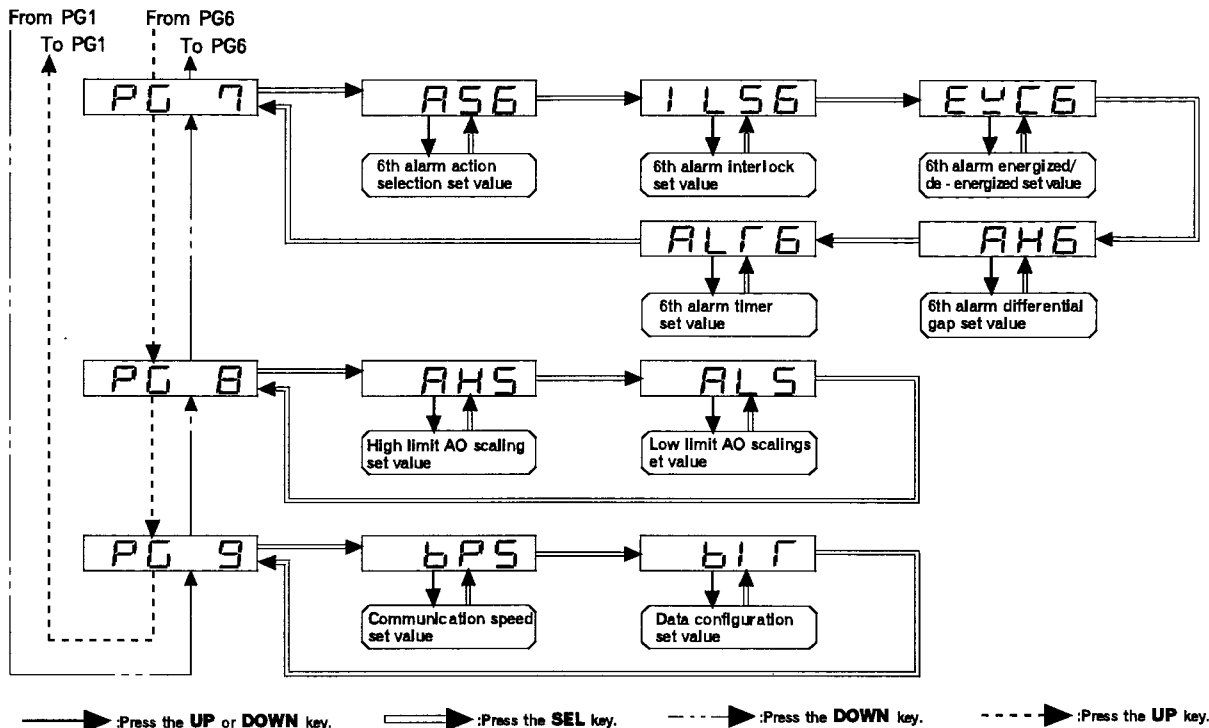
Set data unlock (Unck)/lock (Lck) transfer

Select whether the set data lock function is invalid (unlock) or valid.

*Any mode other than PV display, engineer mode is not displayed when the set data is locked. In addition, after locking the set data, only the engineer mode can be changed.

5.6 Engineer set mode





Symbol	Name	Setting range	Description	Initial value prior to shipment
PG 1 (PG 1)	Parameter group 1		The first characters of parameter group (PG 1). They are also displayed first when the instrument is set to engineer set mode.	
Pb (Pb)	PV bias	See "*1".	Sensor correction is made by adding bias value to measured value (PV).	0 (0.0)
dF (dF)	Digital filter	0:OFF 1 to 100 sec	This is first order lag digital filter by software to reduce noise in measured value (PV).	0
PG 2 (PG 2)	Parameter group 2		The first characters of parameter group (PG 2).	
AS1 (AS1) *6	First alarm action selection	See "*2".	Selects first alarm action.	1
ILS1 (ILS1) *6	First alarm interlock	0:Not provided 1:Provided	Sets the presence or absence of the interlock function.	0
EXC1 (EXC1) *6	First alarm energized/de-energized	0:Energized action 1:De-energized action	Selects whether first alarm is set to energized or de-energized.	0
AH1 (AH1) *6	First alarm differential gap	See "*3".	Sets first alarm differential gap.	2 (2.0)
ALT1 (ALT1) *6	First alarm timer setting	0 to 600 sec	Sets time until alarm is turned ON after measured value (PV) enters first alarm area.	0
PG 3 (PG 3)	Parameter group 3		The first characters of parameter group (PG 3).	
AS2 (AS2) *7	Second alarm action selection	See "*2".	Selects second alarm action.	2
ILS2 (ILS2) *7	Second alarm interlock	0:Not provided 1:Provided	Sets the presence or absence of the interlock function.	0
EXC2 (EXC2) *7	Second alarm energized/de-energized	0:Energized action 1:De-energized action	Selects whether second alarm is set to energized or de-energized.	0

(Continued on the next page)

Symbol	Name	Setting range	Description	Initial value prior to shipment
<i>AH2</i> (AH2) *7	Second alarm differential gap	See "**3".	Sets second alarm differential gap.	2 (2.0)
<i>ALT2</i> (ALT2) *7	Second alarm timer setting	0 to 600 sec	Sets time until alarm is turned ON after measured value (PV) enters second alarm area.	0
<i>PG 4</i> (PG 4)	Parameter group 4		The first characters of parameter group (PG 4).	
<i>AS3</i> (AS3) *8	Third alarm action selection	See "**2".	Selects third alarm action.	1
<i>ILS3</i> (ILS3) *8	Third alarm interlock	0:Not provided 1:Provided	Sets the presence or absence of the interlock function.	0
<i>EXC3</i> (EXC3)*8	Third alarm energized/de-energized	0:Energized action 1:De-energized action	Selects whether third alarm is set to energized or de-energized.	0
<i>AH3</i> (AH3) *8	Third alarm differential gap	See "**3".	Sets third alarm differential gap.	2 (2.0)
<i>ALT3</i> (ALT3) *8	Third alarm timer setting	0 to 600 sec	Sets time until alarm is turned ON after measured value (PV) enters third alarm area.	0
<i>PG 5</i> (PG 5)	Parameter group 5		The first characters of parameter group (PG 5).	
<i>AS4</i> (AS4) *9	Fourth alarm action selection	See "**2".	Selects fourth alarm action.	2
<i>ILS4</i> (ILS4) *9	Fourth alarm interlock	0:Not provided 1:Provided	Sets the presence or absence of the interlock function.	0
<i>EXC4</i> (EXC4) *9	Fourth alarm energized/de-energized	0:Energized action 1:De-energized action	Selects whether fourth alarm is set to energized or de-energized.	0
<i>AH4</i> (AH4) *9	Fourth alarm differential gap	See "**3".	Sets fourth alarm differential gap.	2 (2.0)
<i>ALT4</i> (ALT4) *9	Fourth alarm timer setting	0 to 600 sec	Sets time until alarm is turned ON after measured value (PV) enters fourth alarm area.	0
<i>PG 6</i> (PG 6)	Parameter group 6		The first characters of parameter group (PG 6).	
<i>AS5</i> (AS5) *10	Fifth alarm action selection	See "**2".	Selects fifth alarm action.	1
<i>ILS5</i> (ILS5) *10	Fifth alarm interlock	0:Not provided 1:Provided	Sets the presence or absence of the interlock function.	0
<i>EXC5</i> (EXC5) *10	Fifth alarm energized/de-energized	0:Energized action 1:De-energized action	Selects whether fifth alarm is set to energized or de-energized.	0
<i>AH5</i> (AH5) *10	Fifth alarm differential gap	See "**3".	Sets fifth alarm differential gap.	2 (2.0)
<i>ALT5</i> (ALT5) *10	Fifth alarm timer setting	0 to 600 sec	Sets time until alarm is turned ON after measured value (PV) enters fifth alarm area.	0
<i>PG 7</i> (PG 7)	Parameter group 7		The first characters of parameter group (PG 7).	
<i>AS6</i> (AS6) *11	Sixth alarm action selection	See "**2".	Selects sixth alarm action.	2
<i>ILS6</i> (ILS6) *11	Sixth alarm interlock	0:Not provided 1:Provided	Sets the presence or absence of the interlock function.	0

AO = Analog output

(Continued on the next page)

Symbol	Name	Setting range	Description	Initial value prior to shipment
<i>EXC5</i> (EXC5) *11	Sixth alarm energized/de-energized	0:Energized action 1:De-energized action	Selects whether sixth alarm is set to energized or de-energized.	0
<i>AH6</i> (AH6) *11	Sixth alarm differential gap	See "**3".	Sets sixth alarm differential gap.	2.0
<i>ALT6</i> (ALT6) *11	Sixth alarm timer setting	0 to 600 sec	Sets time until alarm is turned ON after measured value (PV) enters sixth alarm area.	0
<i>PG 8</i> (PG 8)	Parameter group 8		The first characters of parameter group (PG 8).	
<i>AHS</i> (AHS) *12	High limit AO scaling set value	AO scaling (low limit) to scaling high limit	Sets high limit of the analog output range.	999.9
<i>ALS</i> (ALS) *12	Low limit AO scaling set value	Scaling low limit to AO scaling (high limit)	Sets low limit of the analog output range.	-199.9
<i>PG 9</i> (PG 9)	Parameter group 9		The first characters of parameter group (PG 9).	
<i>bPS</i> (bPS) *13	Communication speed	See "**4".	Selects communication speed.	3
<i>bIT</i> (bIT) *13	Communication bit	See "**5".	Selects data bit configuration during communication.	0

*1 Temperature input : -199.9 (-1999) to +999.9 (+9999) °C [°F]
Voltage input : -1999 to +9999 (The decimal point position is the same as that of PV.)

*2 0: Alarm OFF 1: Process high alarm 2: Process low alarm
3: Process high alarm (With hold action) 4: Process low alarm (With hold action)

*3 Temperature input : 0 (0.0) to 100 (100.0)°C [°F]
Voltage input : 0.0 to 10.0 % of span

*4 0: 1200 bps 1: 2400 bps 2: 4800 bps 3: 9600 bps 4: 19200 bps

Setting	Parity bit	Data bit (bit)	Stop bit (bit)
0	None	8	1
1	None	8	2
2	Even	7	1
3	Even	7	2
4	Odd	7	1
5	Odd	7	2

- *6 Not displayed when there is no first alarm. *10 Not displayed when there is no fifth alarm.
*7 Not displayed when there is no second alarm. *11 Not displayed when there is no sixth alarm.
*8 Not displayed when there is no third alarm. *12 Not displayed when there is no analog output.
*9 Not displayed when there is no fourth alarm. *13 Not displayed when there is no communication function.

6. OPERATING PRECAUTIONS

- Turn on the power after connecting all of the input signal wires, otherwise the instrument judges that an input wire break has occurred.
 - Thermocouple input Upscale or Downscale (To be specified when ordering)
 - Resistance temperature detector input Upscale
 - Voltage (low) input Upscale or Downscale (To be specified when ordering)
 - Voltage (high) input Downscale
 - Current input Downscale
- No influence is exerted upon the instrument for power failure of 20 ms or less.

7. DESCRIPTION OF EACH FUNCTIONS

■ Hold function

● Peak hold

When a PV value larger than the present PV value is input from the time the hold reset function is executed, this function is used to hold the former PV value.

● Bottom hold

When a PV value smaller than the present PV value is input from the time the hold reset function is executed, this function is used to hold the former PV value.

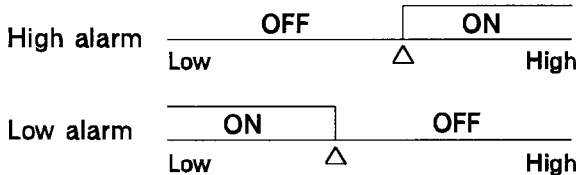
* Each hold action is activated from the time when the power is turned on.

* The hold reset function can be executed by contact input (terminal Nos. 15 and 16).

■ Alarm (ALM) function

Each alarm action is as follows.

● Process alarm (△: Alarm setting)



■ Alarm timer function

This function is used to set the time until the alarm is turned on after the measured value enters the alarm zone.

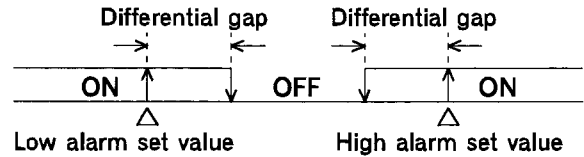
■ Alarm interlock function

This function is used to keep the alarm state even if the measured value leaves the alarm zone after entering it.

* The alarm interlock can be released by contact input (terminal Nos. 15 and 17).

■ Alarm differential gap

This function can be used to set the alarm differential gap.



■ Alarm hold action

This hold action is used to make alarm invalid until the input value exits once from the alarm region by ignoring the alarm state even if the input value is in the alarm state when the power is turned on.

■ Set data lock function

This instrument is provided with the set data lock function to prevent the set value from being changed by the front key. Use this function to prevent the operator from misoperation after completing the settings.

* Keeping the **MONI/MODE** key pressed for 2sec moves the instrument to engineer mode. In this mode, press the **UP** or **DOWN** key to select the lock/unlock state.

■ External contact input

● Hold reset

The value being held can be reset by turning on the hold reset contact input (terminal Nos. 15 and 16).

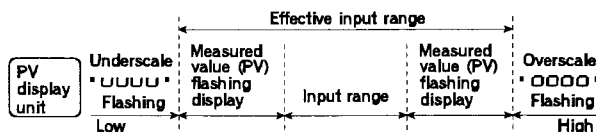
● Interlock release

The alarm interlock state can be released by turning on the interlock release contact input (terminal Nos. 15 and 17).

8. DISPLAY AT ERROR OCCURRENCE

■ Overscale & Underscale

Measured value (PV) (Flashing)	Measured value exceeds the input range.	WARNING In order to prevent electric shock, prior to replacing the sensor, always turn OFF the power.
0000 (Flashing)	Overscale (Measured value exceeds the high input display range limit)	
UUUU (Flashing)	Underscale (Measured value below the low input display range limit)	



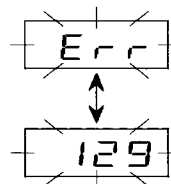
■ Self-diagnostic function

If an error is detected during self-diagnosis, "Err" and the details of the error are displayed alternately on the display unit.

Error code	Details	Measures
1	Adjusted data destroyed	Turn OFF the power once. If error occurs after the power is turned ON again, contact your nearest RKC sale office or agent from which you bought the instrument.
2 or 4	RAM error	
128	Input error	

[Example]

If the adjusted data is destroyed and an input error occurs simultaneously.



Blinking "Err" and "129" display alternately on the PV display unit.

"129": No. obtained by adding No. corresponding to 1 (adjusted data destroyed) to 128 (input error).

9. REPLACING THE WATERPROOF AND DUSTPROOF RUBBER PACKING

WARNING

- In order to prevent electric shock and instrument failure, always turn off the power supply before replacing the rubber packing.
- In order to prevent electric shock and instrument failure, always turn off the power supply before pulling out the internal chassis.
- In order to prevent injury or instrument failure, do not touch the internal printed circuit board.

If the waterproof and dustproof rubber packing deteriorates, contact your nearest RKC sales office or agent from which you bought the instrument.

Type	Parts code	Remarks
REX - AD410A	KF400N-32	For the board
	KD400-35	For the case

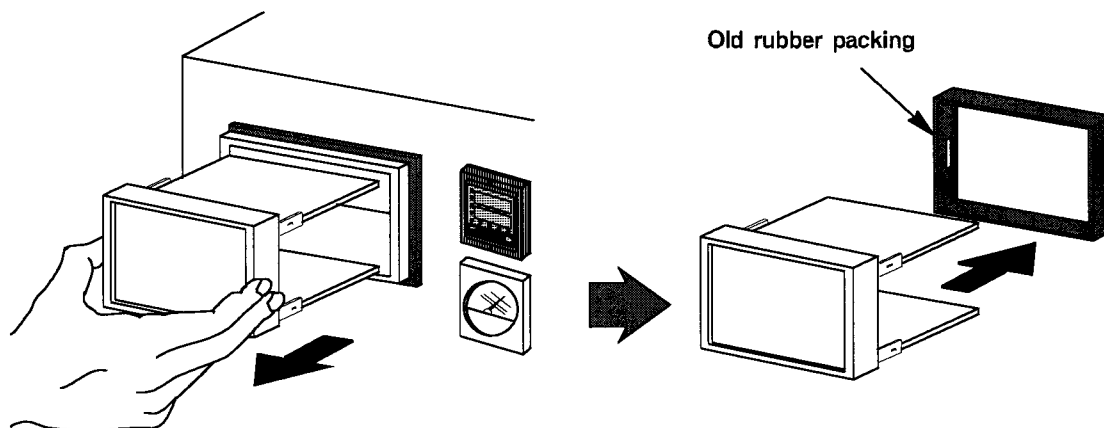
■ Replacement of dustproof and waterproof rubber packing

CAUTION

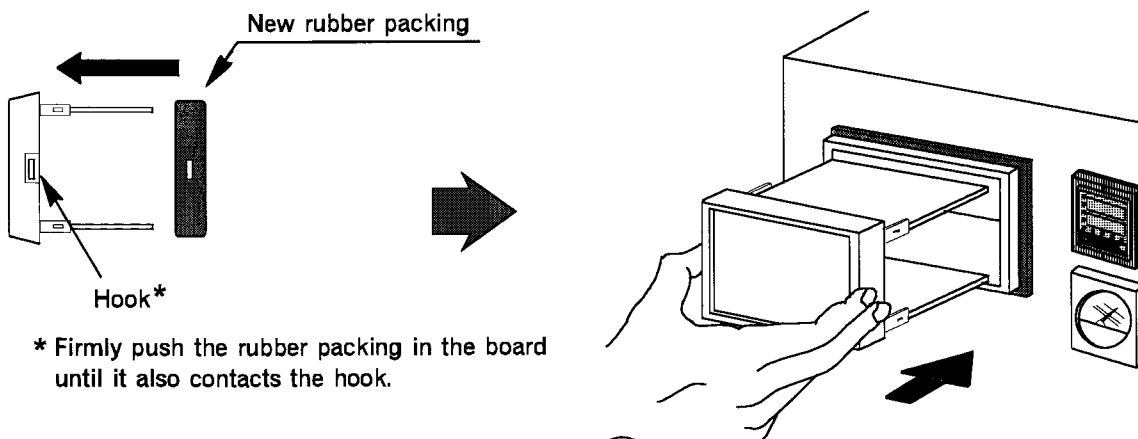
Prior to replacing the rubber packing, first confirm that no water remains, then turn on the power supply. If the water remains, shorting may result.

[For the board]

- ① Pull the internal assembly out of the case, then remove the old rubber packing.

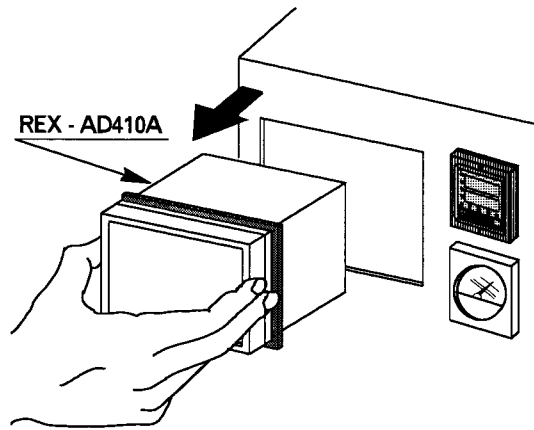


- ② Replace the old rubber packing with a new one, then put the internal chassis in the case.

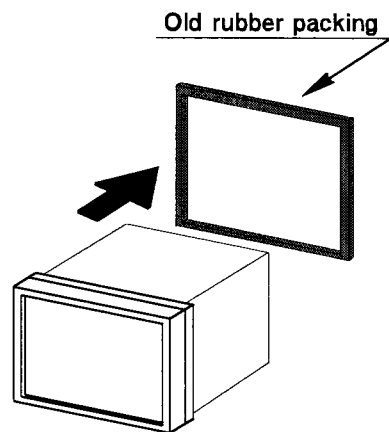


[For the case]

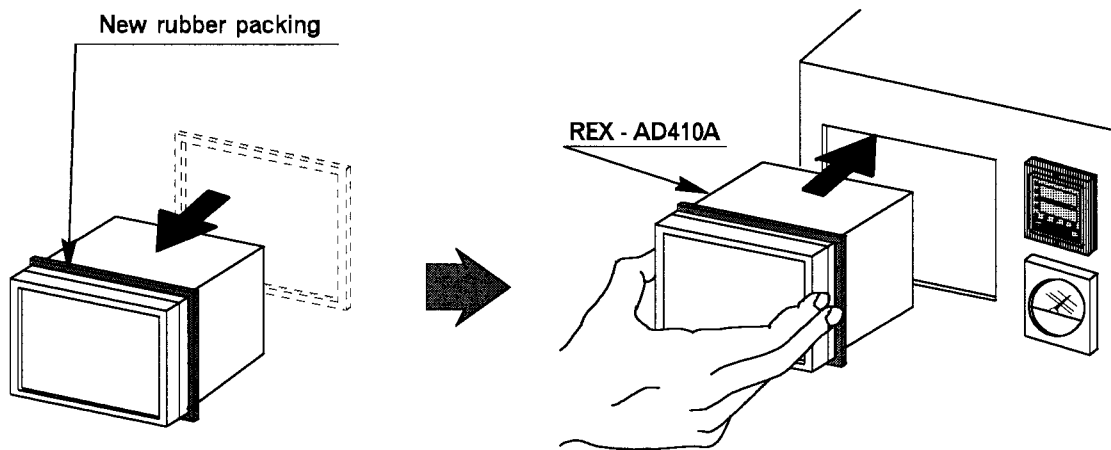
- ① Disconnect the wiring from the rear terminal board and also remove the mounting bracket from the instrument case, then remove the instrument from the panel.



- ② Remove the old packing from this instrument.



- ③ Firmly push the new rubber packing into the instrument, then re-mount the instrument in the panel.



⚠ WARNING

- In order to prevent electric shock and instrument failure, always turn off the power supply before pulling out the internal chassis.
- In order to prevent injury or instrument failure, do not touch the internal printed circuit board.

10.1 Prior to connecting external resistor (shunt resistor for current input)

If the current input specification is selected, it becomes necessary to change voltage input and also to connect an external resistor (shunt resistor for current input [250 $\Omega \pm 0.02\% \pm 10$ ppm, 0.25 W or more]). If a current input of 0 to 20 mA is used, select a voltage (high) input of 0 to 5 V, or if a current input of 4 to 20 mA is used, select a

voltage (high) input of 1 to 5 V.

In either case, connect an external resistor (shunt resistor for current input [250 $\Omega \pm 0.02\% \pm 10$ ppm, 0.25 W or more]) between the input terminals at the rear of the case.

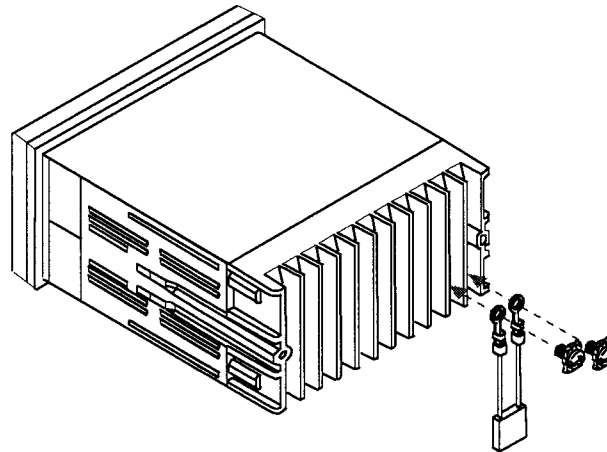
The setting procedure for current input is described in the following.

10.2 Setting procedure

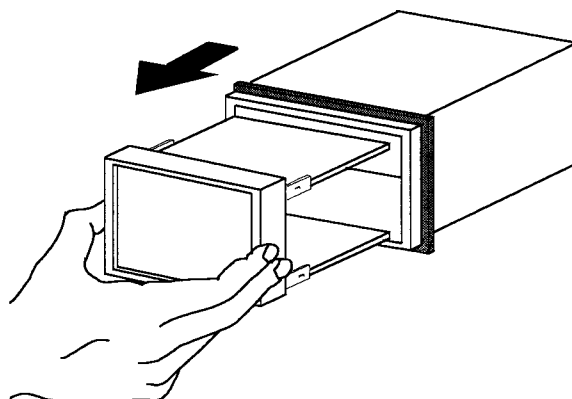
[Example] When changing to a current input of 0 to 20 mA

- (1) In order to prevent electric shock, always turn off the power supply. ⚠

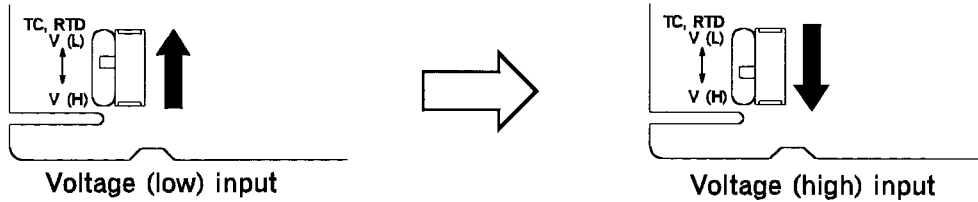
Next, connect the external resistor between the Nos. 10 and 11 input terminals at the rear of the case.
(Recommended tighten torque : 0.3 N·m or less [3 kgf·cm or less])



- (2) Remove the internal assembly from the case by pressing the latch located as the left of the front panel and pulling it forward.

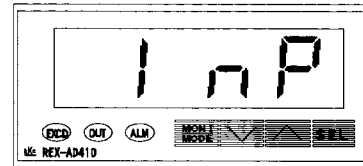


(3) Change voltage (low) input to voltage (high) input by the internal switch.

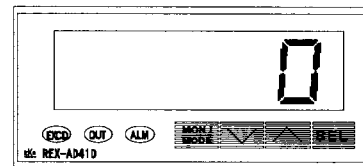


(4) Put the internal chassis into the case, then turn ON the power. As a result, the input type and range are displayed. (See "5.OPERATION" on page 6.)

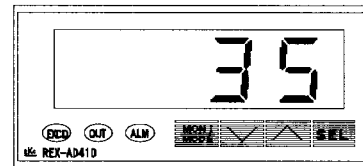
(5) Next, simultaneously press the **MONI/MODE** and **SEL** keys to call up SETUP set mode. First, "Input type selection (I n P)" is displayed.



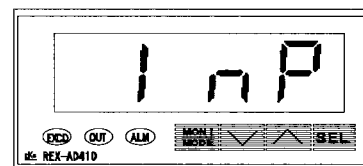
(6) Press the **UP** or **DOWN** key to set the instrument to the input type state.



(7) Press the **UP** key to set a voltage input (high) of 0 to 5 V (input selection : 35). For details on input selection, see page 7. Keeping pressing the **UP** key to increase the numeric value displayed on the display unit.



(8) After the numeric value is set, this setting becomes valid if **SEL** key is pressed. "Input type selection (I n P)" is displayed.



(9) After the setting is finished, press the **MONI/MODE** key to set the instrument to the PV display state.



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