azbil

Universal Alarm Indicator

Model: PCA13

User's Manual

Azbil Corporation

CM2-PCA100-2001
4th edition

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Introduction

Correct installation, operation and periodic maintenance are essential to ensure safe operations, as is a thorough knowledge of operation, maintenance and safety instructions provided in this manual.

Inspection

On delivery, check that the model PCA13 specifications agree with your order and check for any damage that may have occurred during transportation. This instrument has been tested under stringent quality control. If you find any damage, or have any quality or specification questions, please tell us the model name and the product number immediately.

- Please verify that all of the following have been delivered to you:
  (1)model PCA13 main unit(2) Unit labels(3) User's Manual

Symbols

To ensure user safety, this manual uses the following symbols:

⚠ WARNING
This indicates a safety instruction that must be observed in order to avoid death or serious injury.

⚠ CAUTION
This indicates a safety instruction that must be observed in order to avoid minor injury or physical damage.

Safety Instructions

Limited Liability Disclaimer

This product(s) has been designed, developed and manufactured for general-purpose application in machines and equipment. Accordingly when used in applications where plant/worker protection is paramount, special care should be taken to implement a fail-safe and/or redundant design concept-from controllers to integrated systems- as well as periodic maintenance program.

⚠ WARNINGS

Failure to observe these warnings could result in electrical shocks, fire functional problems or personal injury.

- Make sure that the power is off when installing removing or wiring controllers.
- Do not touch power supply terminals or other parts with live currents. Be sure to ground all earth terminals before connecting external control circuits or systems.
- Follow standard wiring procedures and use the wires specified in instruction manuals.
- Operate controllers under the environmental conditions specified in specification sheets or instruction manuals (ambient temperature, humidity, vibration and shock) and at the specified supply voltage.
- Always provide proper ventilation.
- Do not disassemble controllers or touch internal parts.
- Be careful not to expose high-temperature parts to cooling fins or other parts that may overheat, either during operation or when power has recently been turned off.
- Do not touch moving parts like those in recorders while the product is operating

Do not use sharp objects to press buttons.

Please observe the following safety rules in order to use this instrument correctly and safely.

⚠ CAUTION

- The model PCA13 has no power switch. It will start operating as soon as it is connected to the power supply. Allow as least 15 minutes warm-up time is specified to ensure accurate data acquisition. After turning off, also allow a warm-up interval before use.
- If the model PCA13 is to be installed in a cabinet, ensure sufficient ventilation so that the temperature in the cabinet does not exceed 50°C.
- Do not use the model PCA13 under any of the following environmental conditions.
  - Direct exposure to rain, condensation or leakages. High humidity.
  - High temperature, direct sunlight dusty air or highly corrosive gas concentrations.
  - Heavy external noise, radio waves, or static electricity.

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Chapter 1 : Standard Specifications

1-1 : General Specifications

Thermometer Unit

Input Sensor

3-wire resistance thermometer bulb (RTD) Pt100

Thermocouple (T/C)R,K,J,T, and B sensors

Temperature measurement range:

Pt.100 :	-199.9 to +649.9°C;	-327.8 to +999.9°F
R sensor :	0 to +1749°C;	+32 to +3180°F
K sensor :	-199 to +1349°C;	-326 to +2460°F
J sensor :	-199 to + 399°C;	-326 to +1650°F
T sensor :	-199 to +399°C;	-326 to +750°F
B sensor :	+600 to +1799°C;	+1112 to +3270°F

Temperature in °F is calculated for display in °C.

(Data in °F) = (Data in °C) * 9/5+32

Therefore,1 digit is skipped for display in °F.

Measurement accuracy

RTD: ±(0.2% of rate + 0.3°C)

± (0.2% of rate +0.6°F)

Temperature coefficient +200 ppm/°C

T/C: ± (0.3% of rate + 1°C)

± (0.3% of rate + 2°C)

Temperature coefficient + 300 ppm/°C (0 to 50°C)

Reference contact compensation ±1°C, ±2°F

Display for negative temperature input

(-)display

Display of open input

RTD: Flashing “0000”

T/C: Flashing “0000”

Out-of-range display

Flashing “-0000” or “0000”

Pt100: -200.0°C or below, 650.0°C or above
-328.0°F or below, 999.9°F or above

R sensor: -100.0°C or below, 1800°C or above
-148°F or below, 3272°F or above

K sensor: -200°C or below, 1400°C or above
-328°F or below, 2552°F or above

J sensor: -200°C or below, 950°C or above
-328°F or below, 1742°F or above

T sensor: -200°C or below, 450°C or above
-328°F or below, 842°F or above

B Sensor: -20°C or below, 1800°C or above
-4°F or below, 3272°F or above

External resistance

RTD: 5Ω max. per lead wire

T/C: 500Ω max.

Overloading

RTD: ± 10V DC Ω

T/C: ±100V DC Ω

Receiver Unit

Input:	1 to 5V DC or 4 to 20mA DC
Display:	0 to 9999, (-) display for negative scaling
Measurement accuracy:	± (0.1% of rate + 5 digits)
Input resistance:	+1 MΩ at 1 to 5V DC
	12.5Ω at 4 to 20mA DC
Overloading:	± 250V DC at 1 to 5V DC
	+ 150mA DC at 4 to 20mA DC
Out of range display:	Flashing “0000”
Offset function:	Changes the display value to the offset value allowing input below the offset.
Decimal Point:	Set to any position using the front switches.

Analog output Unit

Output:	4 to 20 mA DC (step output)
	An analog value(4 to 20mA DC) is output that corresponds to the value displayed on the thermometer and the receiver units.
Tolerance:	0.5% of span for the display, at 23°C ± 2°C
Resolution:	1/2000 step output
Output impedance:	5M Ω min.
Allowable load resistance:	0 to 600Ω
Output Cycle:	Same as display cycle

Loop check function unit

Output setting method:	In 0.1%steps within a range of 0 to 100%, using the setting switch on the front panel.
	The displayed values are E00.0 to E99.9 and E100.
Output:	4 to 20 mA DC (step output)
	The output is 4mA at 0%,12mA at 50%,and 20mA at 100%.
Tolerance:	0.5% of span for the display, at 23°C ±2°C
Output impedance:	5MΩ min.
Allowable load resistance:	0 to 600Ω
Output cycle:	100 ms

Alarm Output

Comparison length:	4 digits (numerical value) 1 digit (polarity)
	Setting range:-9999 to +9999
Comparison method:	Independent setting of 2 points, high/low limit comparison, or comparison OFF
	CPU comparison judgement method.
	The comparison setting remains unchanged even if the range is changed.
Setting method:	Using front switches
Comparison conditions:	High limit comparison:
	Measurement value ≥ High limit value
	Low limit comparison:
	Measurement value ≤ Low limit value
	Comparison OFF: No comparison executed
Alarm output:	Relay contact output
	AL1 and AL2 share a “a” contact (COM).

Contact capacity: 125V AC 0.5 A (Resistance load)
250V AC 0.1A (Resistance load)

Comparison display: ALARM display; 2 points
High or low limit judgement displayed using red LEDs

Hysteresis Width: 1 to temperature range or scaling value
Set using a front switch
The current hysteresis width is rewritten to 1 when the input sensor and the scaling value are changed.

Output delay: ON delay: 0 to 100s, resolution:1s
Set using a front switch.
The output delay setting remains unchanged even if the range is changed.

Common Specifications

Range selection: Sensor or receiver input or loop check function selected using DIP switches.

Table 1-1 Range selection

Number	Range	Number	Range
0	No function	8	R Sensor °F
1	Pt100 °C	9	K Sensor °F
2	R sensor °C	A	J sensor °F
3	K sensor °C	B	T sensor °F
4	J sensor °C	C	B sensor °F
5	T sensor °C	D	Receiver input
6	B Sensor °C	E	Loop check function
7	Pt100 °F	F	No function

Display: 7-segment red LED or green LED

Character height: About 15 mm
Zero suppress function provided.

Sampling Cycle: 2.5 times/s

Display cycle: F: 400 ms
M: 800 MS (average of 2 samplings is displayed)
S: 2s (average of 5 samplings is displayed)

Input format: Single-ended, floating input

AD conversion: Dual slope integration method

Noise elimination rate: Normal mode (NMR): 50 db min.
Common mode (CMR): 110db min.

Noise entering power line:1000 V

Hold:	This function retains the measured value and the comparison output. Set at the terminal board. Not isolated from the input circuits.
Reset:	This function resets the comparison output. Set at the terminal board. Not isolated from the input circuits.
Dielectric strength:	Input terminal / relay terminal: 1000V AC for 1 minute Input terminal, relay terminal/case: 1500V AC for 1 minute Power terminal/relay terminal: 1500V AC for 1 minute Power terminal/GND, case: 2100V DC for 1 minute Input terminal/analog output terminals: 500V AC for 1 minute
Insulation resistance:	100MΩmin. at 500V DC
Power Supply:	90 to 132V AC or 180 to 264V AC, 50/60Hz
Power dissipation:	About 5VA
Operating ambient temperature:	0 to 50oC
Storage temperature:	-20 to + 70oC
Weight:	About 500g
Mounting:	Fasten to the back of the panel using the special mounting fixtures.

Unit Labels (Accessory)

Unit labels are included with the original shipment. Attach the appropriate label to the indent at the lower right-hand side of the front panel.

1-2 : External dimensions and panel cut-outs

Exterior view

[Unit: mm]

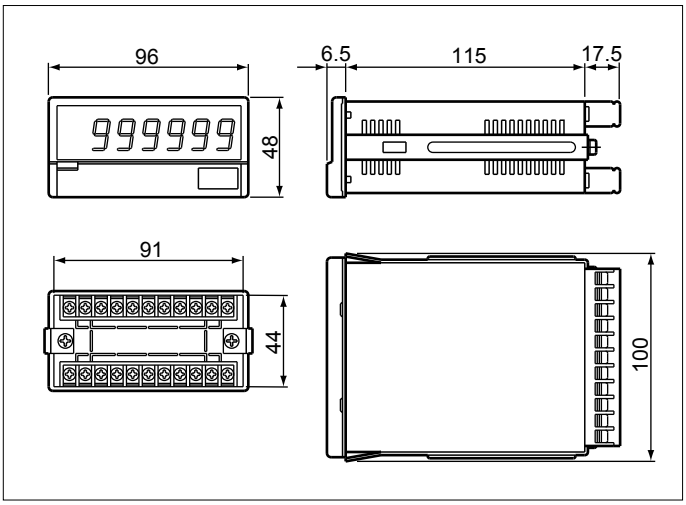
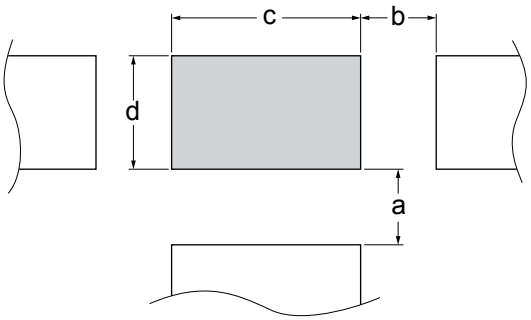


Figure 1-1 Exterior View of model PCA13

Panel Cut-Outs



a: 10 mm min

b: 18 mm min

c: $92^{+0.8}_{0}$ mm

d: $45^{+0.6}_{0}$ mm [Unit: mm]

Figure 1-2 Panel cut-outs

Chapter 2 : Installing and Removing the Front Panel

2-1 : Procedure

- Required tool: Phillips-head (+) screwdriver

Remove the mounts form both sides of the main unit, insert the main unit from the front of the panel, and fasten in place with the screws.

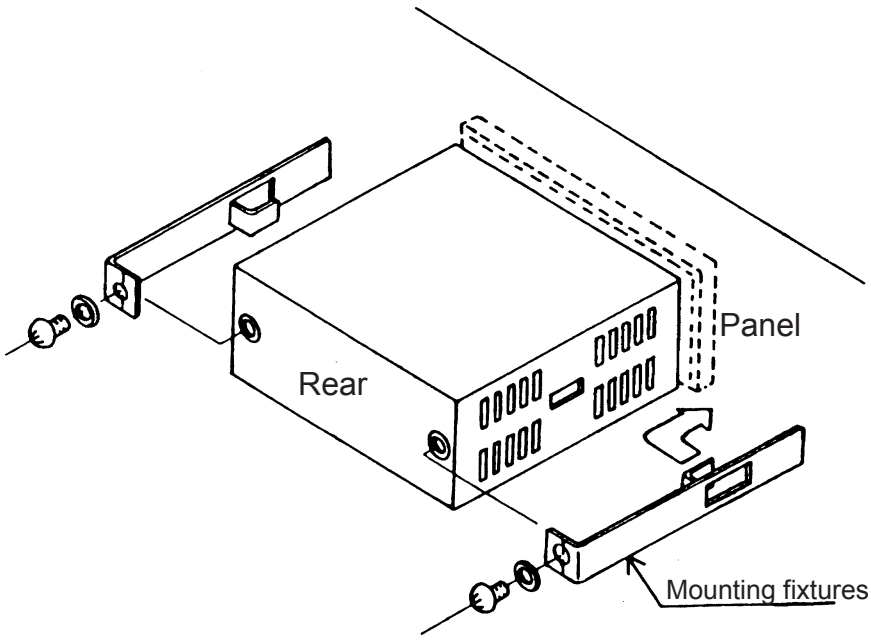


Figure 2-1 Example of installation

Panel cut outs: Refer to the preceding page

Allowable panel thickness: 0.6 to 6 mm

Tightening torque: 0.25 to 0.39 N•m (2.5 to 4 kgf•cm)

⚠ CAUTION
Be careful: the case may be deformed by excessively tightening screws

2-2 : Removing the front panel

Required tool: flathead (-)screwdriver

⚠ CAUTION

Remove the front panel by inserting a regular screwdriver into the indents parts at the bottom.

Be careful: the front panel may be damaged by excessive force

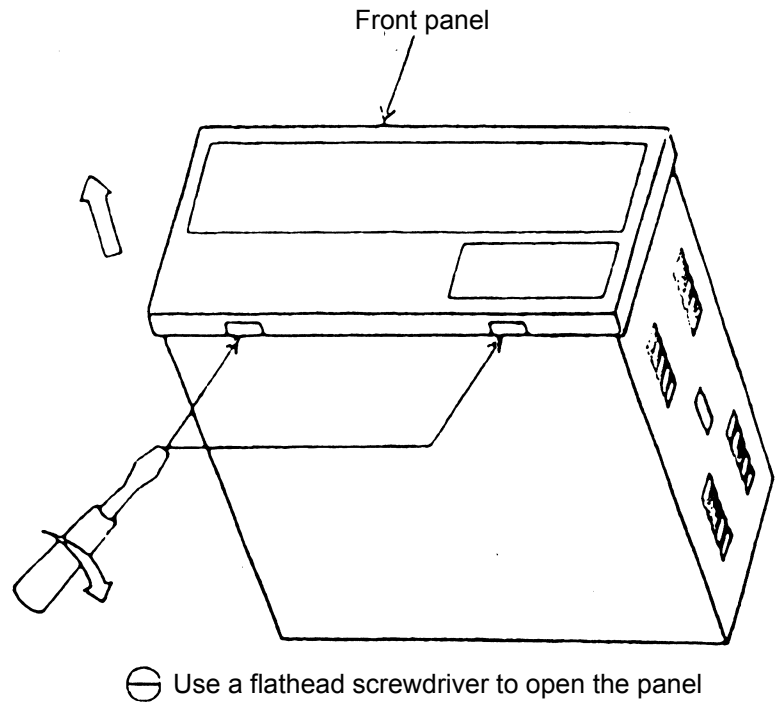


Figure 2-2 Removing the front panel

Chapter 3 : Functions

3-1 : Scaling

Thermometer

The 4m A and 20m A points for the analog output can be set anywhere within the range allowed by the display.

Example1: K sensor (Range 3)

Scale settings: Full Scale: 1000°C Offset: 0°C

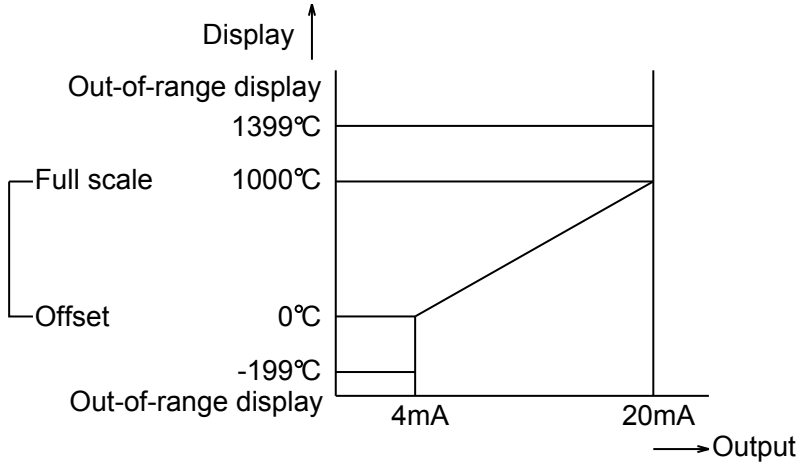


Figure 3-1 Thermometer - Example1

Example2: K Sensor (Range 3)

Scale settings: Full scale: 0°C Offset: 500°C

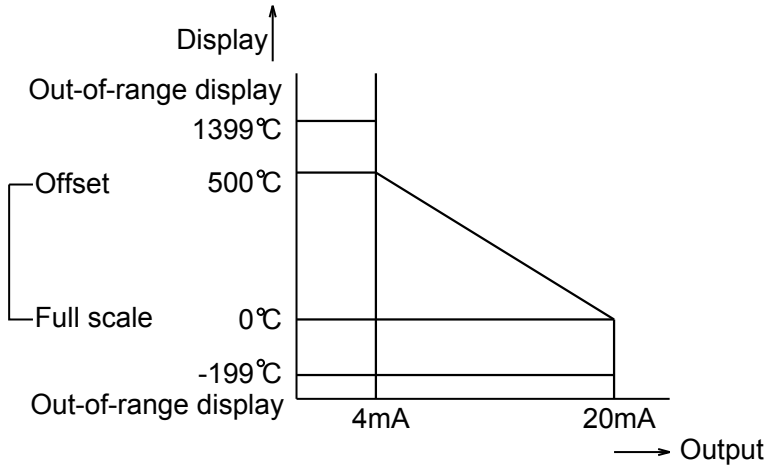


Figure 3-2 Thermometer - Example 2

Receiver

Set the 4mA and 20mA points for the analog output and display at the same time.

Example 1: Receiver 1-5V (Range D)

Scale settings: Full Scale: 6000 Offset: 1000

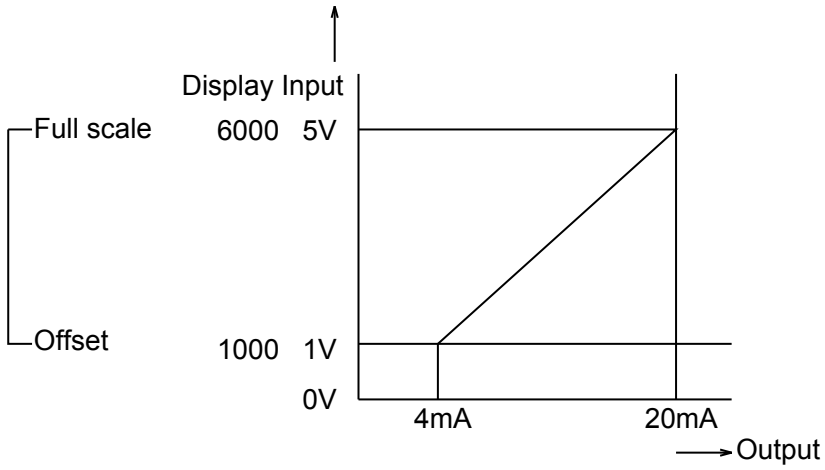


Figure 3-3 Receive - Example 1

Example 2: Receiver 1-5V (Range D)

Scale settings: Full Scale: 1000 Offset: 5000

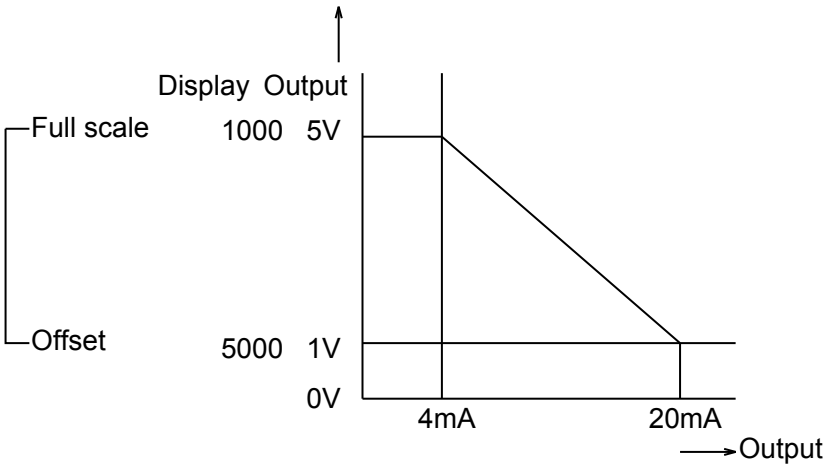


Figure 3-4 Receiver - Example 2

- Refer to page 4 to 4 for the scaling setting procedure.

Decimal Point setting

The decimal point position can be set for the receiver range (range D)

- Refer to page 4 to4 for the decimal point setting procedure.

Alarm output

An alarm output can be set for the thermometer and receiver range (range 1-D) display.

High and low limit comparisons, or comparison OFF can be independently set for AL1and AL2.

- Comparison conditions:

  High limit comparison: Measured value ≥ High limit value

  Low limit comparison: Measured value ≤ Low limit value

  Comparison OFF: No comparison is executed.

- Outputs an alarm generated by the relay contact point and at the same time, AL1 or AL2 will illuminate.
- The valid setting range is -9999 to + 9999. Setting a value outside the scaling range causes an alarm to output for out-of-range value.
- Refer to page 4 to 6 for the alarm output setting procedure.

Hysteresis width

The valid range for hysteresis width setting is 1 to full scale.

- When "1" is set for hysteresis width, high limit comparison is set for AL1, and low limit comparison is set for AL2:

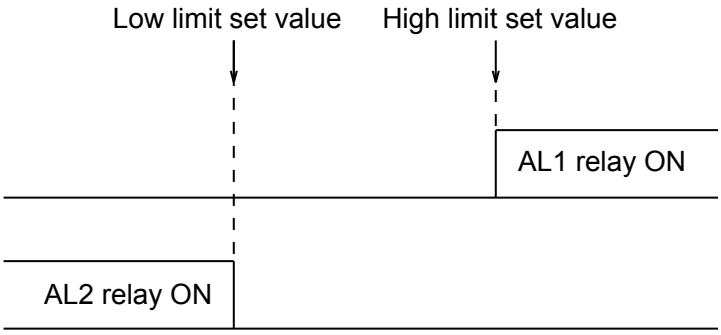


Figure 3-5 Hysteresis width 1

- When "2 or more" is set for hysteresis width, high limit comparison is set for AL1, and low limit comparison is set for AL2:

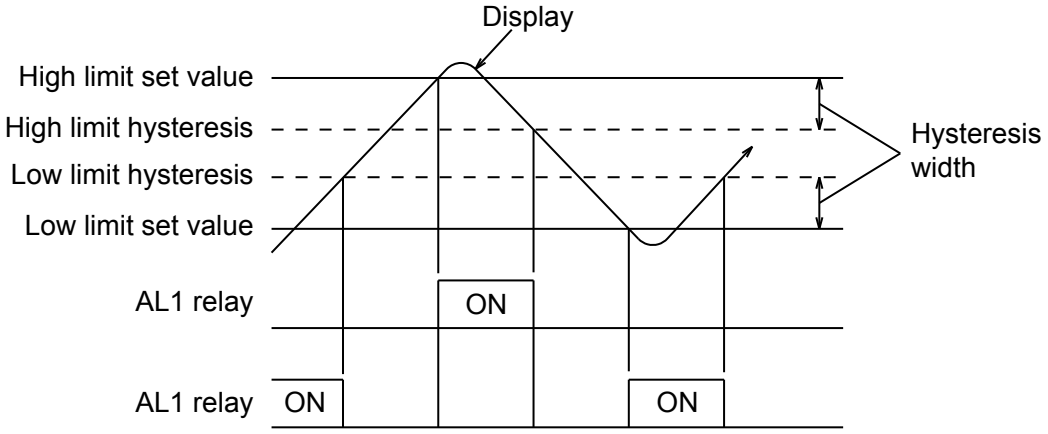


Figure 3-6 Hysteresis width 2

- The hysteresis width is automatically rewritten to "1" when the range is changed.
- Refer to page 4 to 7 for the hysteresis width setting procedure.

Output delay

This is an ON delay function. If the displayed value exceeds high or low limits, an alarm is output after the delay time has elapsed.

The valid setting range is 0 to + 100s (1-second resolution).

- Refer to page 4 to 8 for the output delay setting procedure.

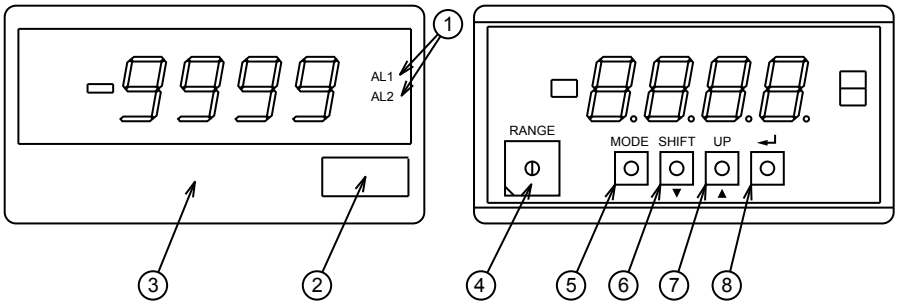
Display Cycle

One of three cycles (400ms,800ms, and 2s) can be selected

- Refer to page 4 to 9 for the display cycle setting procedure.

Chapter 4 : Setting Procedures

Nomenclature



Appearance with front panel Appearance without front panel

Table 4-1 Parts name

Name	Function
① Alarm Display:	Alarm output monitor
② Unit:	Attach the unit label here
③ Front Panel:	Remove this panel to access operating switches, such as for range setting
④ RANGE switch:	Use this switch for selecting input and function
⑤ MODE switch:	Use this switch to change from measurement mode to setup mode
⑥ SHIFT switch ▼ Switch	Use this switch to select the setup mode and also to choose the number of digits you want for display of numerical values.Use this switch to decrease the count when the loop check function is active
⑦ UP switch: ▲ Switch	Use this switch to increment the numerical value when in the set up mode and to configure several other functions. Use this switch to increase the count when the loop check function is active
⑧ ↵ Switch:	Use this switch to save settings

Range switch functions

Table 4-2 Range switch function

Number	Range		Number	Range	
0	---		8	R sensor	°F
1	Pt100Ω	°C	9	K Sensor	°F
2	R Sensor	°C	A	J Sensor	°F
3	K Sensor	°C	B	T Sensor	°F
4	J Sensor	°C	C	B Sensor	°F
5	T Sensor	°C	D	Receiver Input	
6	B Sensor	°C	E	Loop Check Function	
7	Pt 100Ω	°C	F	---	

LED state

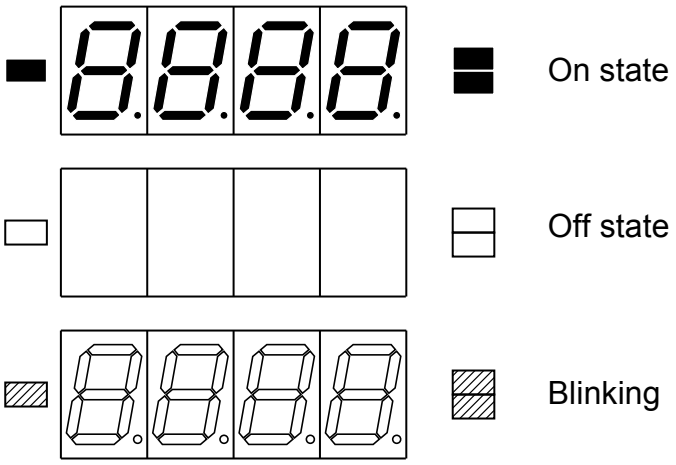


Figure 4-1 LED state

Explanation of setting modes

Table 4-3 Explanation of setting modes

Name	Display	Range	Function
Mode 1 Scaling		1 to D	Used to set output scaling factor. Also, to set the decimal point position (when range D is selected).
Mode 2 Alarm output		1 to D	Used to set the comparison conditions for AL1And AL2, as well as the comparison values.
Mode 3 Hysteresis		1 to D	Used to set the hysteresis width for alarm output comparison values.
Mode 4 Output delay		1 to D	Used to set the output delay for alarm output.
Mode 5 Display cycle		1 to D	Used to set the display cycle.

Changing Modes

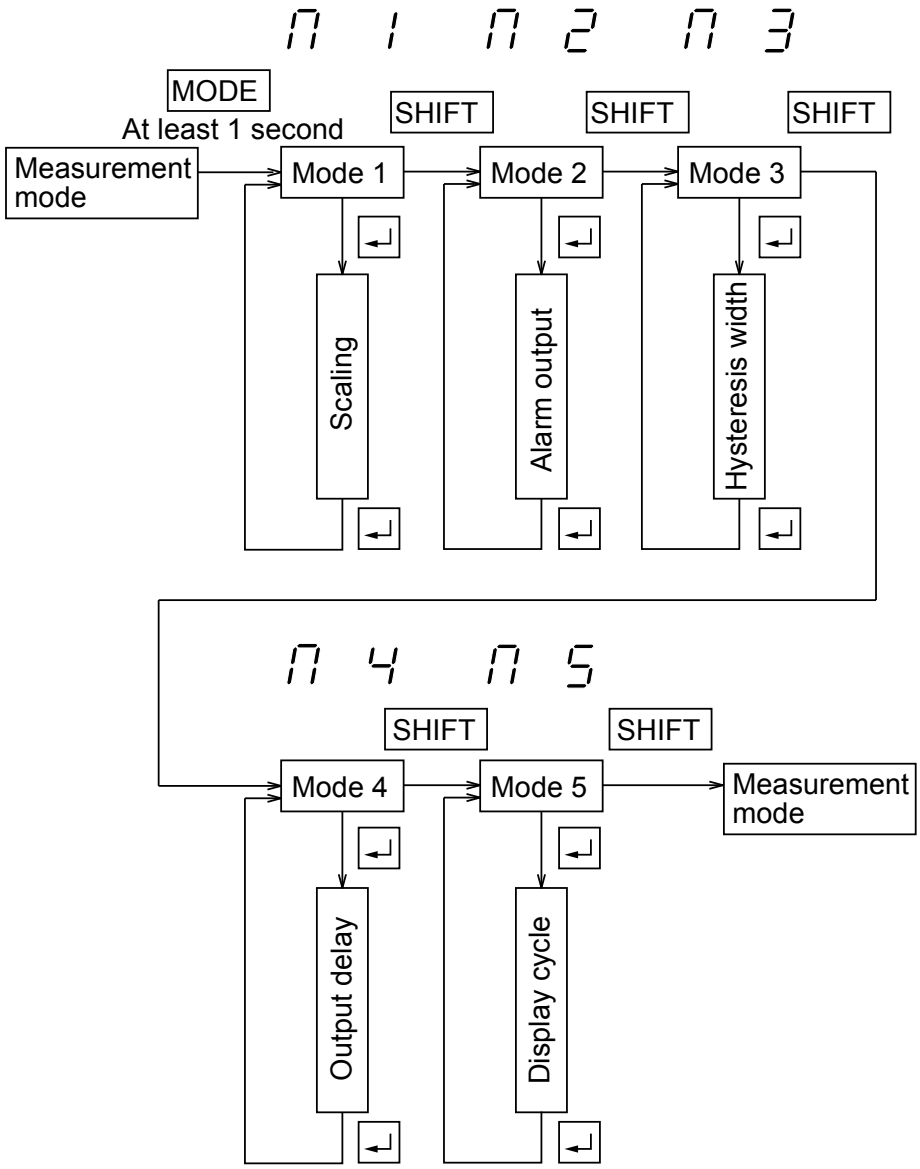


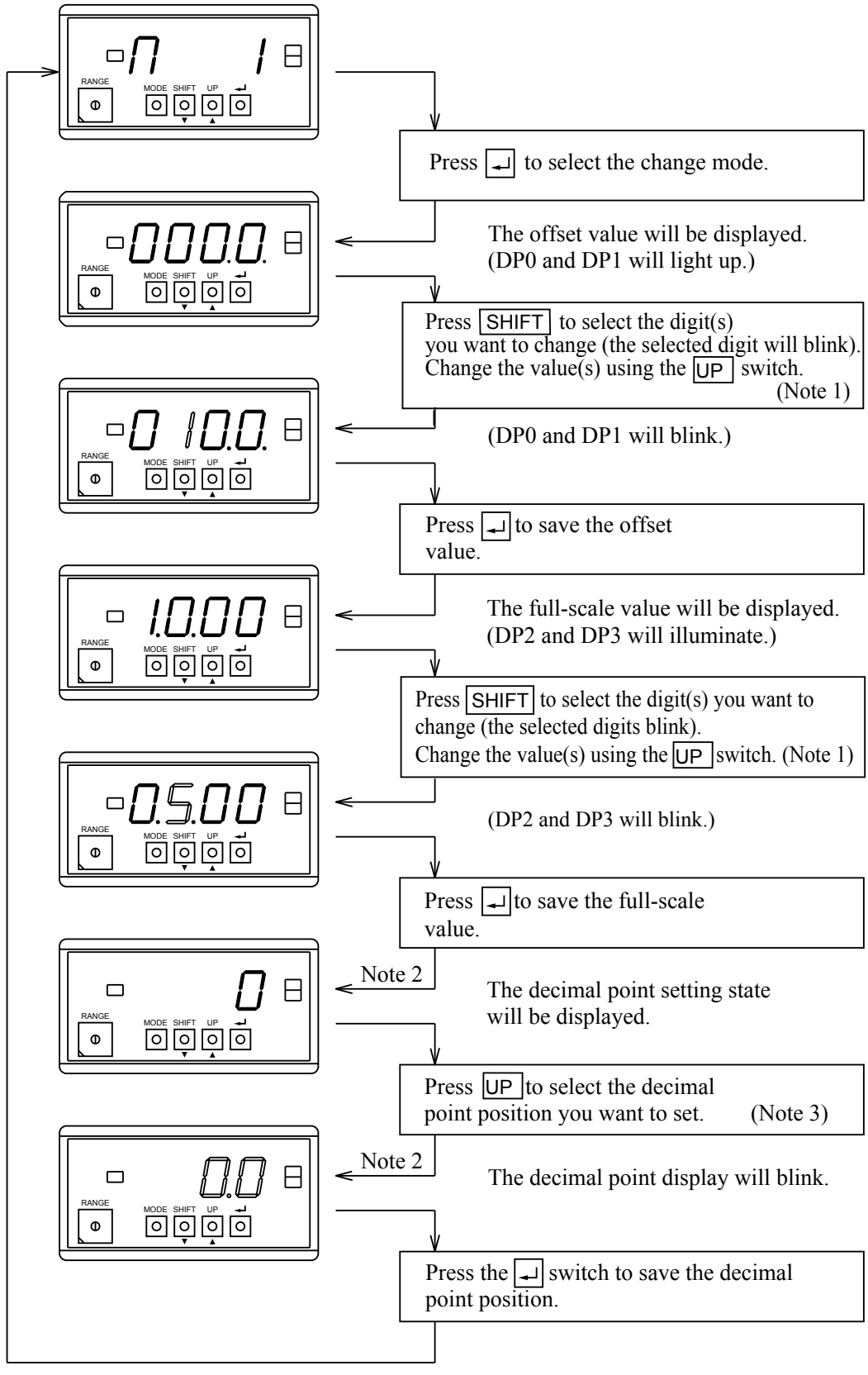
Figure 4-2 Changing modes

- The model PCA13 has no setting mode for ranges “0”, “E”, and “F”
- If you press MODE during any setting mode, the model PCA13 will immediately return to the measurement mode.
- During setting, if no switches are operated for about 5 minutes, the model PCA13 will automatically return to the measurement mode.
- Do not change the range while the setting mode is selected.
- The model PCA13 cannot change to any setting mode while in HOLD status. Release the HOLD before setting
- When range “0” or “F” is selected, “----” will be displayed.
- After entering a setting mode, the model PCA13 retains the pertaining alarm and analog output.
- When the range is changed it sometimes takes 5 to 6 seconds for the new setting to be reflected in the display, depending on the currently-selected display cycle.

Setting Modes

Mode 1 (Scaling)

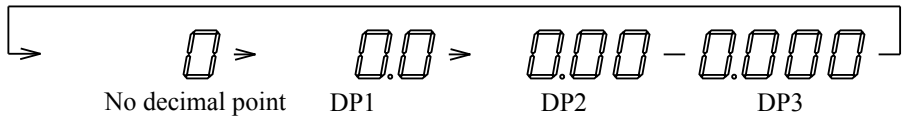
Set the scale to 10.0 to 50.0 for input range D



~Note *1) Change the polarity during the setting of the highest digit*

~Note *2) The decimal point position can be set only when range D is selected. Skip this step when any other range is selected.*

~Note *3)*

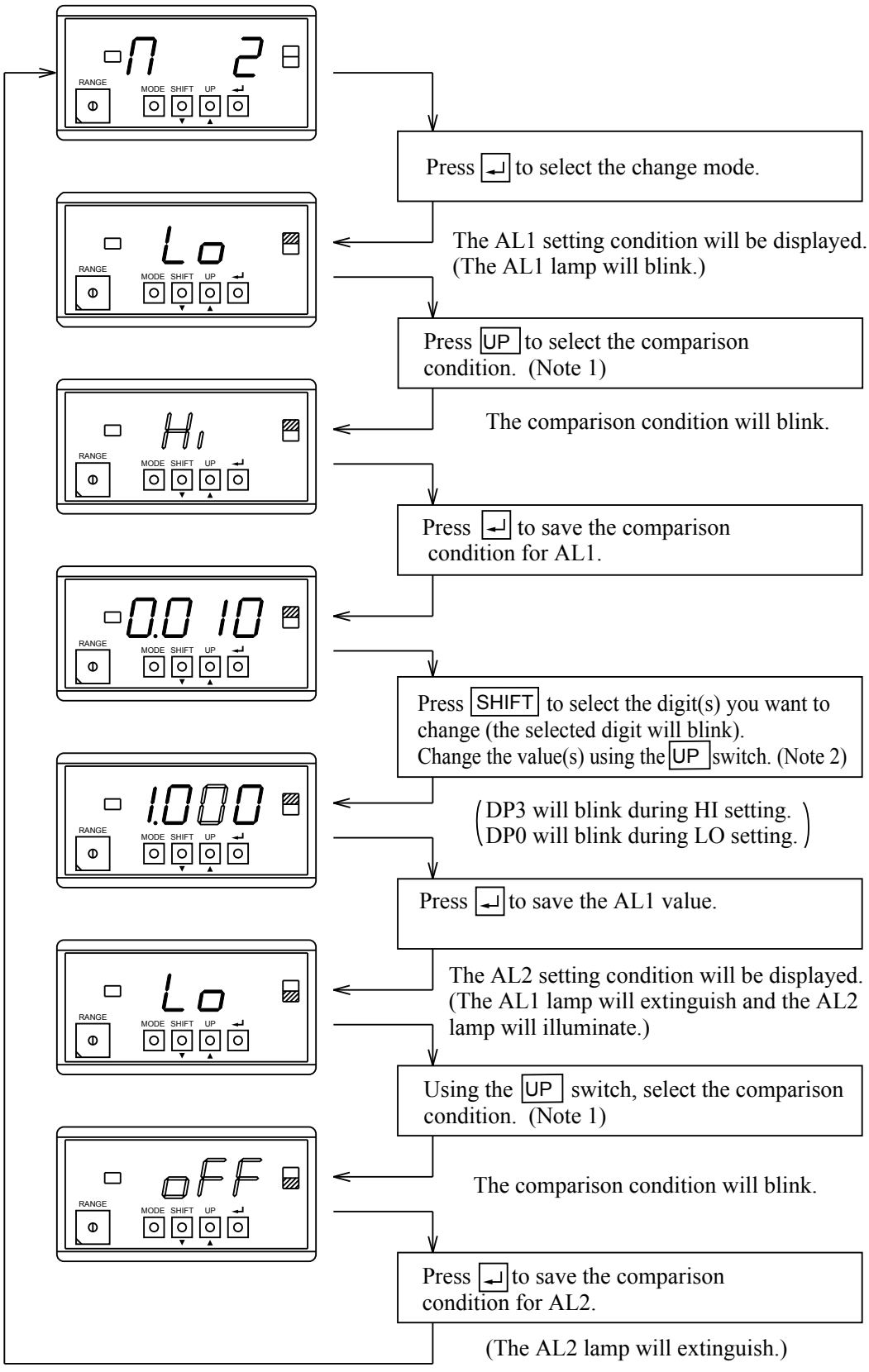


~Note *4) You must set a value range within the display range, otherwise the model PCA13 will not proceed to the next operation. Correct the setting first.*

Mode 2 (Alarm output)

Set the alarm output

Set “HI” and “1000” for AL1 and “off” for AL2.



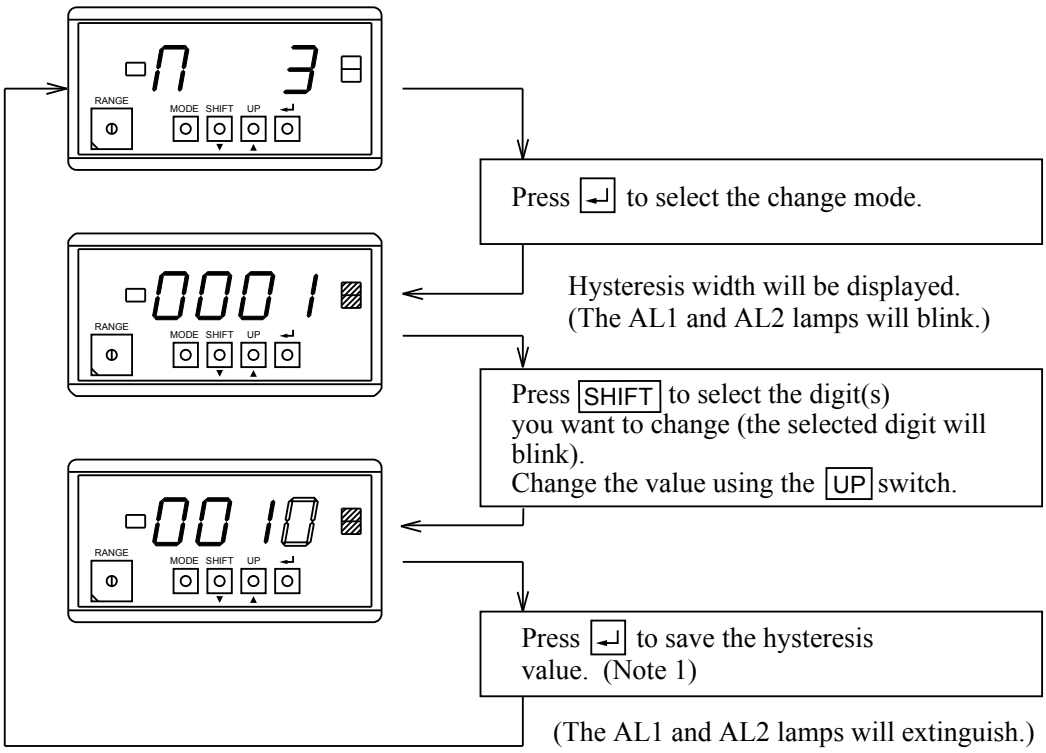
~Note *1)*

~Note *2) Polarity is always the highest digit*

~Note *3) When alarm output OFF is selected do not set alarm values.*

Mode 3 (Hysteresis width)

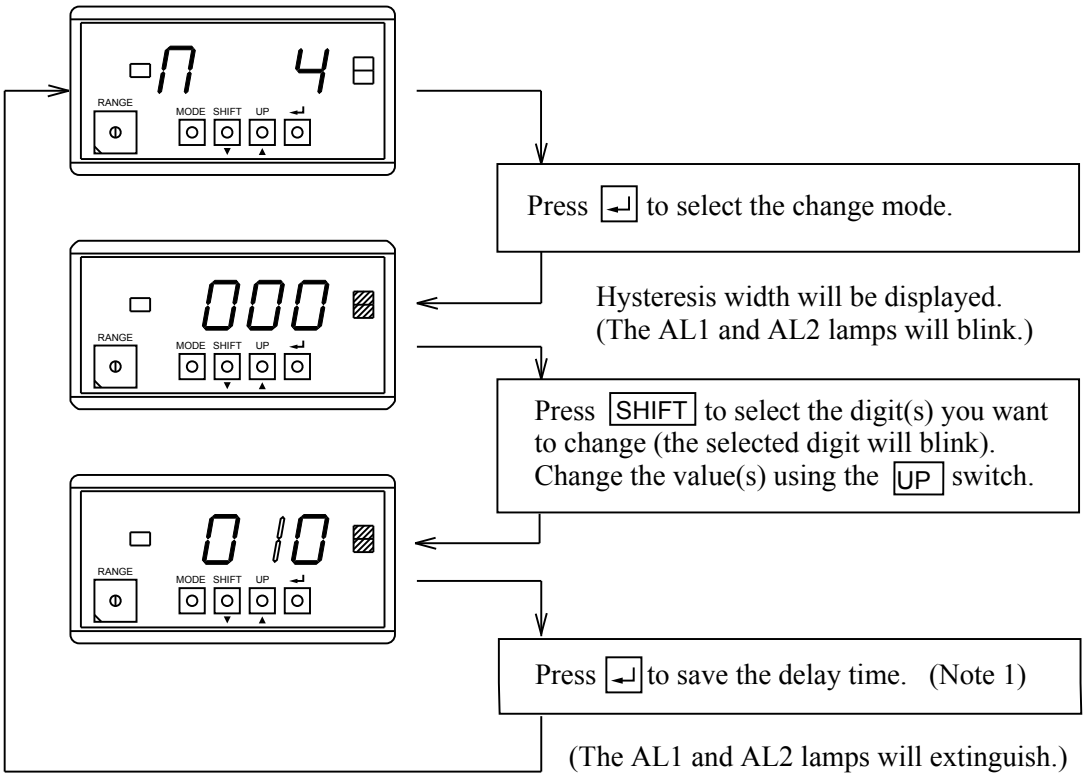
Set the hysteresis width to 10.



~Note *1) You must set "1" or a larger value. Setting "0" prevents the model PCA13 from proceeding. Correct the setting.*

Mode 4 (Output delay)

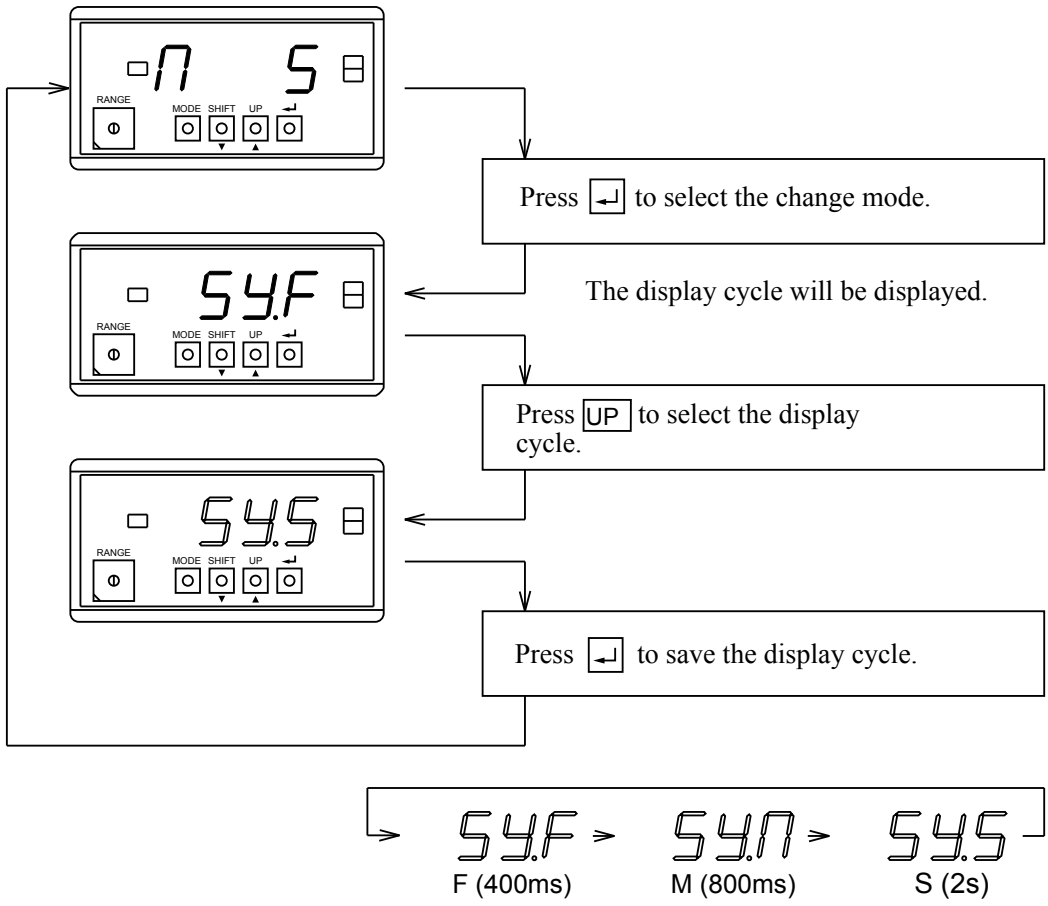
Set the output delay to 10s



~Note *1) The valid range is 0 to 100s. Values outside this range will latch to "100". Correct the setting.*

Mode 5 (Display Cycle)

Set the display cycle to 2s



Loop check function

Output setting range:0 to 100%,0.1% resolution

Display method: E00.0 ~ E99.9 E 100

0.0% to 99.9%	100%
4mA	20mA output

Setting Procedure: Set the RANGE switch to E to select the loop check function.

The display changes by 1 (0.1%) each time the ▼ or ▲ switch is pressed

The display will change rapidly if you hold the ▼ or ▲ switch down.

Press ↵ and the display will blink. The current value will be saved.

Factory setting

Table 4-4 Factory setting

No.	Range	Scaling or output setting	Comparison Setting		Hysteresis width	Output delay	Display cycle
			AL1	AL2			
0	-	-	-	-	-	-	-
1	Pt 100°C	0.0 to 500.0	OFF	OFF	1	0	400ms
2	R °C	0 to 1000					
3	K °C	0 to 1000					
4	J °C	0 to 500					
5	T °C	0 to 200					
6	B °C	0 to 1000					
7	Pt 100°F	32.0 to 932.0					
8	R °F	32 to 1832					
9	K °F	32 to 1832					
A	J °F	32 to 932					
B	T °F	32 to 392					
C	B °F	32 to 1832					
D	Receiver input	0 to 4000					
E	Loop Check Function	0%	---	---	--	--	--
F	-	-	---	---	--	--	--

Chapter 5 : Terminal Layout

Upper row

Table 5-1

Terminal name	+	-	A	B	B	Hi	Lo	A.OUT+	A.OUT -
	1	2	3	4	5	6	7	8	9
Function	T/C sensor input		RTD sensor input			Receiver input		Analog output	

Lower row

Table 5-2

Terminal name	ALI	AL2	ALCOM	HOLD	RESET	COM	GND	P2	P1
	1	2	3	4	5	6	7	8	9
Function	Alarm output			Hold	Reset	Common	Ground	Power	

Terminal Screw: M3

Tightening torque: 0.4 to 0.62 N-m
(4.7 to 6.3 kgf cm)

Grimp terminal: See the illustration on the right.

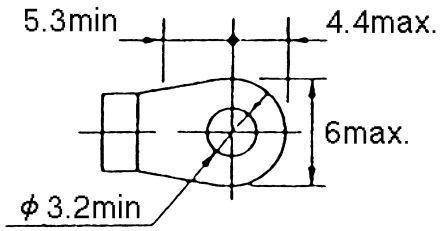


Figure 5-1 Terminal layout

⚠ WARNINGS

- Be sure to connect the cables correctly. Incorrect cabling can cause damage to hardware.
- To avoid electric shock, ensure that power is turned off before starting cabling work.
- To avoid electric shock, do not perform cabling work in a high-humidity environment while hands are wet.
- To avoid electric shock, do not touch the power terminal while it is alive.

Chapter 6 : Upper Terminals

T/C sensor input terminals (+, -)

⚠ CAUTION
Ensure correct polarities when connecting thermocouples

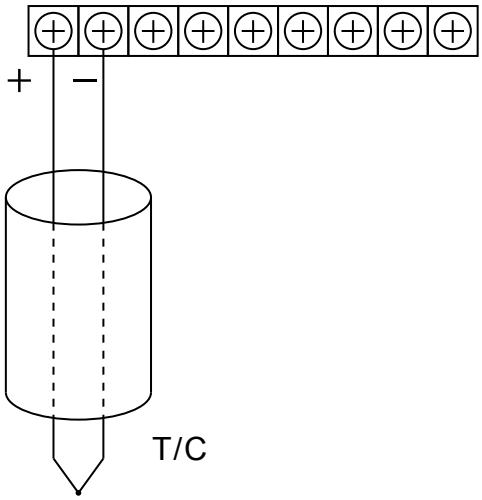


Figure 6-1 T/C sensor input terminals

RTD sensor input terminals (A, B, B)

Connect Pt.100 Ω (three wires). When two wire resistance is used, please short -circuit terminals B and B.

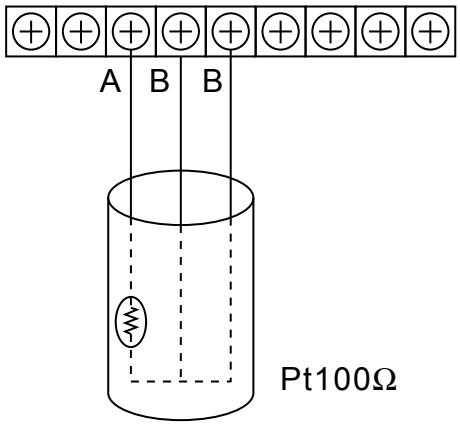


Figure 6-2 RTD sensor input terminals

Receiver input terminals (Hi, Lo)

⚠ CAUTION

- To connect the measurement input, ensure correct polarities.
- Connect the measurement input having the higher potential to the Hi terminal.
- Ensure that the input and power lines are laid independently of each other.
- Parallel cabling of the input and power lines can destabilize indication.

Analog output terminals (A.OUT+, A.Out-)

These terminals are for analog output signals that are scaled. Also, they output the set value of the loop check function as an analog signal.

⚠ CAUTION

- The analog output circuit is insulated form the input circuits. When connecting cables, ensure correct polarities.
- Do not apply a voltage to the analog output terminals from outside. Applying a voltage may cause hardware damage.

Chapter 7 : Lower Terminals

Alarm output terminals (AL1,AL2, ALCOM)

Output relay contact capacity:125V AC 0.5A (Resistance load)
250V AC 0.1A (Resistance load)
a-contact output; Common

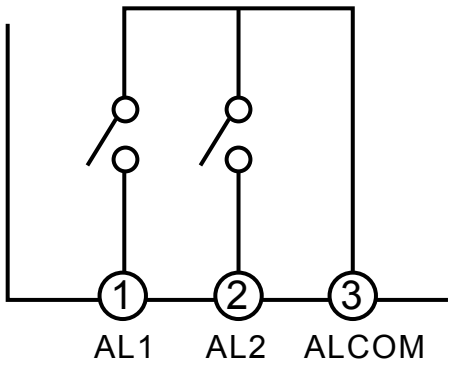


Figure 7-1 Alarm output terminals

Hold (HOLD)

When the hold terminal and the common terminal are short-circuited, measurement data and comparison output are retained. (Active “L”)

⚠ CAUTION

The input is not isolated. Isolate using a mechanism such as a photo coupler and a switch. This is essential when the input is used in the floating mode.

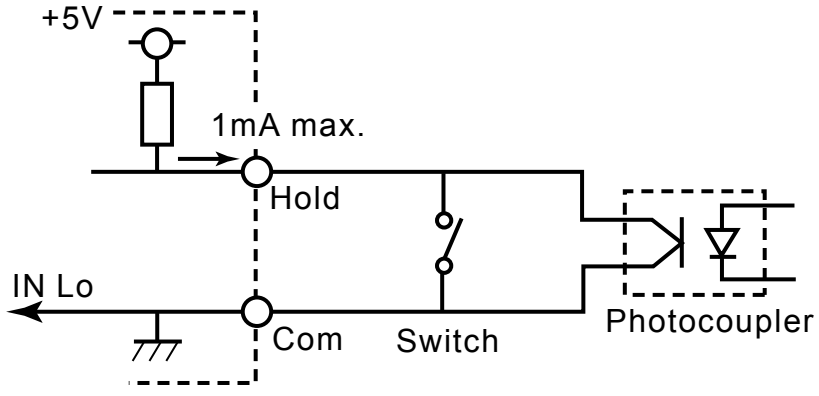


Figure 7-2 Hold terminal

Reset (RESET)

When the reset terminal and the common terminal are short-circuited, the comparison output is reset. (Active “L”)

⚠ CAUTION
The input is not isolated. Isolate using a mechanism such as a photocoupler and a switch. This is essential when the input is used in the floating mode.

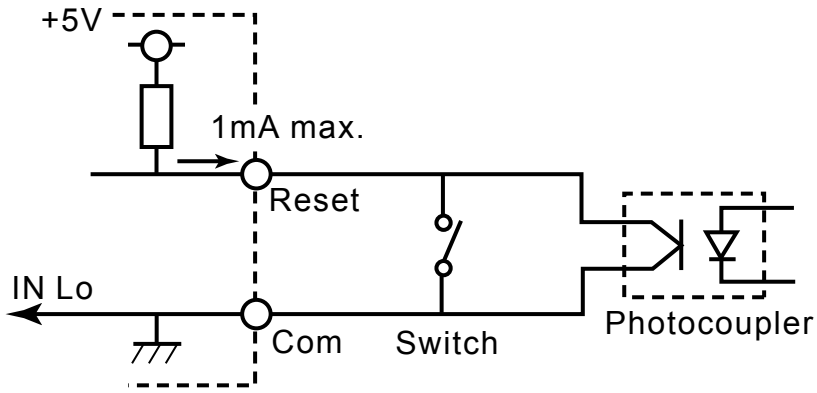


Figure 7-3 Reset terminal

Common (COM)

This common terminal is used for holding and resetting.

Ground (GND)

Connect the ground terminal directly to the ground if you anticipate frequent noise in the power line. The ground terminal need not be connected if external noise is not anticipated. However, ensure that the ground terminal does not come into contact with any other input terminal, since the neutral potential of the power supply is supplied to the ground.

Power Supply(P1,P2)

The supply voltage is specified on the terminal nameplate at shipping. Ensure that the supply voltage is within the range of 90 to 132V AC or 180 to 264V AC (50/60 Hz).

Chapter 8 : Maintenance

Maintenance

⚠ CAUTION
• Store the product within the specified temperature range (-20°C to +70°C). To clean the front panel and the case, use a soft cloth and soapy water. Please do not allow water to enter the model PCA13. Wring the cloth well, and carefully wipe the front panel and case. Do not use such organic solvents as benzene and thinners as they may deform or discolor the case.

Chapter 9 : Calibration Procedure

Introduction

Calibration of resistance thermometer bulb range, thermocouple ranges, receiver range and analog output are necessary. To calibrate the resistance thermometer bulb range or the thermocouple ranges, select either °C or °F.

No other ranges need calibration.

Calibration Procedure

Turn on the power while holding down MODE . “CAL” will be displayed after a lamp test is performed. The model PCA13 will then be in the calibration mode.

While pressing ↵, calibrate according to the following procedure:

Calibration of resistance thermometer bulb range

① Set the RANGE switch to “1” or “7”.

② Press MODE , and DP0 and DP1 will blink, indicating that the model PCA13 is ready for ZERO calibration.

Input a Value of ZERO and press ↵. The display will blink and the ZERO value will be saved.

③ Press MODE and DP2 and DP3 will blink, indicating that the model PCA13 is ready for MAX calibration.

Input the MAX value and press ↵. The display will blink and the MAX value will be saved.

④ To execute calibration again, press MODE . The model PCA13 will become ready for ZERO calibration again. Proceed to the next range for calibration, and operate the RANGE switch. To terminate calibration, turn off the power.

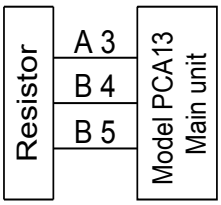


Figure 9-1 Connection diagram 1

1) Calibration of thermocouple range (2 to 6 or 8 to C)

It is necessary to calibrate the individual sensors and the reference junction compensation circuit.

1) Thermocouple range or temperature calibration.

① Calibrate the ZERO and MAX for R,K,J,T and B sensors.

Set the RANGE switch to “2” to “6” or “8” to “C”.

② Press MODE , and DP0 and DP1 will blink, indicating that the model PCA13 is ready for ZERO calibration.

Input a value of ZERO and press ↵ . The display will blink and the ZERO value will be saved.

③ Press MODE , and DP2 and DP3 will blink, indicating that the model PCA13 is ready for MAX calibration.

Input the MAX value and press ↵ . The display will blink and the MAX value will be saved.

④ To execute calibration again, press MODE . The model PCA13 will become ready for ZERO calibration again.

⑤ Repeating steps ① through ④, calibrate the thermocouple ranges that need calibration.

⑥ Proceed to the calibration of the reference junction compensation circuit in item 2).

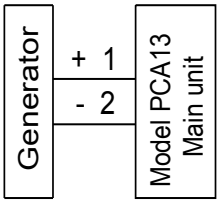


Figure 9-2 Connection diagram 2

2)Calibration of reference junction Compensation circuit.

Choose one of the sensors (R,K,J,T, and B (°C or °F)) for calibration.

① Choose one sensor by setting the RANGE switch to it.

② Press SHIFT, and DP1 and DP2 will blink, indicating that the model PCA13 is ready for calibrating the reference junction compensation circuit.

Input a Value of ZERO and press ↵. The display will blink and the ZERO value will be saved. (Holding down the SHIFT switch, select calibration of sensor or reference junction compensation circuits.)

③ Proceed to the calibration of another range, and set the RANGE switch to that range. To terminate calibration, turn off the power.

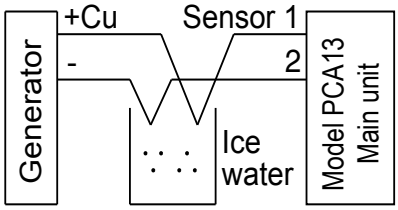


Figure 9-3 Connection diagram 3

Table 9-1

Range			ZERO value		MAX value	
1	Pt100	°C	0°C	(100.00Ω)	649.0°C	(329.64 Ω)
2	R	°C	0°C	(0.00 mV)	1749°C	(20.864 mV)
3	K	°C	0°C	(0.00 mV)	1349°C	(54.104 mV)
4	J	°C	0°C	(0.00 mV)	899°C	(51.815 mV)
5	T	°C	0°C	(0.00 mV)	399°C	(20.810 mV)
6	B	°C	0°C	(0.00 mV)	1799°C	(13.580 mV)
7	Pt100	°F	32°F	(100.00Ω)	□□□.□°F	(329.64 Ω)
8	R	°F	32°F	(0.00 mV)	3180°F	(20.864 mV)
9	K	°F	32°F	(0.00 mV)	2460°F	(54.104 mV)
A	J	°F	32°F	(0.00 mV)	1650°F	(51.815 mV)
B	T	°F	32°F	(0.00 mV)	750°F	(20.810 mV)
C	B	°F	32°F	(0.00 mV)	3270°F	(13.580 mV)

□□□.□: “000.0” flashing

Receiver Calibration

① Set the RANGE switch to “D”.

② Press MODE and DP0 and DP1 will blink, indicating that the model PCA13 is ready for ZERO calibration.

Input a value of ZERO and press ↵. The display will blink and the ZERO value will be saved.

③ Press MODE , and DP2 and DP3 will blink, indicating that the model PCA13 is ready for MAX calibration.

Input the MAX value and press ↵. The display will blink and the MAX value will be saved.

④ To execute calibration again, press MODE . The model PCA13 will become ready for ZERO calibration again. Proceed to the next range for calibration and operate the RANGE switch. To terminate calibration, turn off the power.

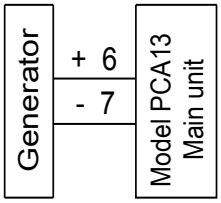


Figure 9-4 Connection diagram 4

Range		ZERO value	MAX value
1	Receiver	Offset display (1V or 4mA)	Full scale display (5V or 20 m A

~Note *The offset value of the selected mode should be input for ZERO calibration.*

The full scale value of the selected mode should be input for MAX calibration.

Analog output adjustment

① Set the RANGE switch to “E”.

② Press MODE and DP0 and DP1 will blink, indicating that the model PCA13 is ready for ZERO calibration.

Using the ▲ and ▼ switches, adjust the ammeter indication to the rated output (4.00mA±0.01 mA). Press ↵, and calibration will be executed after the display blinks.

③ Press MODE and DP2 and DP3 will blink, indicating that the model PCA13 is ready for SPAN calibration.

Using the ▲ and ▼ switches, adjust the ammeter indication to the rated output (20.00mA±0.01 mA). Press ↵, and calibration will be executed after the display blinks.

④ To execute calibration again, press MODE . The model PCA13 will become ready for ZERO calibration again. Proceed to the next range for calibration, and operate the RANGE switch. To terminate calibration, turn off the power.

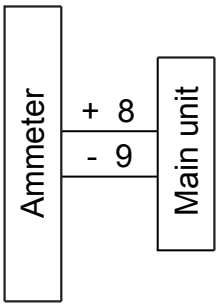


Figure 9-5 Connection diagram 5

Document Number:	CM2-PCA100-2001
Document Name:	Universal Alarm Indicator Model: PCA13 User's Manual
Date:	1st edition: Apr. 1996 4th edition: Aug. 2012
Issued/Edited by:	Azbil Corporation

Azbil Corporation