Graphical Digital Panel Meter

［Flow rate meter／ Flow totalizer］

Instruction manual

WPMZ－6－□□□－□□－□□□

Watanabe Electric Industry Co., Ltd.

INTRODUCTION

Thank you for purchasing our graphical digital panel meter the WPMZ series.
This manual describes the functions, instructions on installing and wiring, operations etc.
Before using this product, please read this manual carefully and use the product correctly.
The latest manual can be downloaded as a file from our web site（http://watanabe-electric.co..jp/en/）.
The file is in the PDF format and has the bookmark function for your convenience.

SUPPLIED ITEMS

Check that all the following items have been included in the delivered package.

item name		Quantity
Graphical panel meter WPMZ (body)		1
Case fixing attachment		2
Terminal block cover		1　（For supply power terminal）
Attached connectors	1 input / no output model	2（7P×1, 13P×1）
	1 input / with output model	3（7P×2, 13P×1） * Not BCD output 3（7P×1, 13P×1, 34P×1） *BCD output
	2 inputs / no output model	3（7P×2, 13P×1）
	2 inputs / with output model	4（7P×3, 13P×1） * Not BCD output 4（7P×2, 13P×1, 34P×1） * BCD output
Quick instruction manual		1

NOTES

・This manual covers WPMZ-6-***–**–*** of version V1.00 or later.
・This manual is subject to change without notice for improvements of the product.
・Keep this manual with close reach of persons who use this product to provide for future use.

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If you read this manual on a pc, you can jump to linked destination by clicking characters in blue.

1. PRECAUTIONS FOR USE

1－1. ENVIRONMENTS AND CONDITIONS OF USE

Please do not use the product under the following circumstances. It might cause malfunctions and shortening the life.

1) Ambient temperature of out of -5 to 50°C
2) Ambient humidity of out of 35 to 85%, or freezing condensing
3) High dust or metallic powder level
   (Storing in a dust-proof chassis and a countermeasure against heat dissipation are required.)
4) Environment of corrosive gas, salty air or oily smoke
5) Environment of much vibration or impact
6) Environment of rain or water drops (except the front panel)
7) Environment of strong electromagnetical field or much exogenous noise

RESTRICTION FOR USE

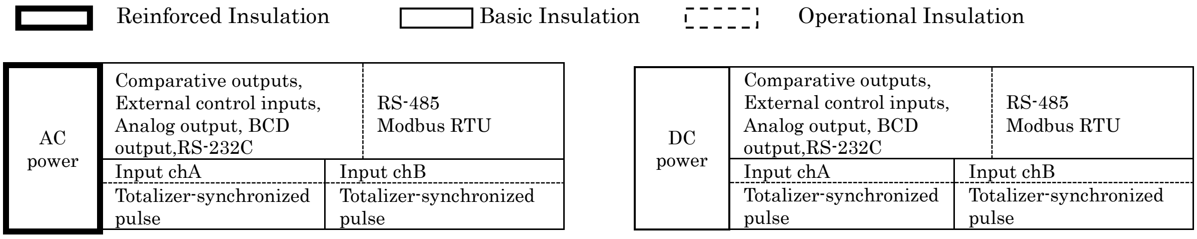
● Do not use this product as a part of equipment which aimed at life maintenance of human bodies.

● Please avoid usages of this product which bring physical accident or property damage when it breaks down.

We do not take any responsibility about the special damage, the indirect damage and the passivity damage that occurred due to this product under any circumstance.

1－2. INSTALLATION AND CONNECTION

1) Please read this manual carefully before setting and connecting, be performed by a person having a specialized technique.
2) The insulation class of this product is as shown by the figure below. Please confirm that the insulation class satisfies a use condition prior to setting.


Reinforced Insulation
Basic Insulation
Operational Insulation
AC power
Comparative outputs, External control inputs, Analog output, BCD output,RS-232C
RS-485 Modbus RTU
Input chA
Input chB
Totalizer-synchronized pulse
Totalizer-synchronized pulse
DC power
Comparative outputs, External control inputs, Analog output, BCD output,RS-232C
RS-485 Modbus RTU
Input chA
Input chB
Totalizer-synchronized pulse
Totalizer-synchronized pulse

3) Do not wire the power supply line, input signal lines and output signal lines near noise sources or relay drive lines.
4) Bundling or containing in a same duct with lines including noises might cause malfunctions.
5) This product works functionally normally right after power activation, but requires 30 minutes' warming to satisfy all performance requirements.

⚠CAUTION

1) This product is a precision measuring instrument. Please be careful not to add the strong shock to this product by falls and so on.
2) Paying attention to the circuit diagram, connect wires to this product carefully. An inappropriate connection may cause troubles of the product, a fire or an electric shock.
3) Please avoid live line works. It may cause an electric shock, troubles or a burnout of the product by the short circuit or a fire.
4) The FG terminal must be connected to ground. The grounding should be Class D grounding (previous class 3 grounding). An inappropriate grounding may cause malfunctions of the product.
5) Please use wire which has appropriate specifications. Inappropriate wire may cause a fire because of heat generation.
6) Please use crimp terminals which meet specifications of wire. Otherwise, it may cause breaking of wire, poor contact and may bring into a malfunction of the product, a breakdown, a burnout, or a fire.
7) After tightening screws, confirm that the screws do not loosen. A looseness of screws may cause a malfunction of the product, a fire or an electric shock.
8) An excessive tightening of screws may damage terminals or screws. A poor tightening of screws may cause a malfunction of the product, a fire or an electric shock.
9) Attach a terminal block cover to the product. Otherwise it may cause an electric shock.
10) Never attempt to disassemble or modify this product. It may cause a breakdown, an electric shock or a fire.

１－３. CHECKING BEFORE USE

Please install this product under the environments and conditions of use which meet requirements. If you find any damage to the product by the transportation or any problem, please contact to your dealer or our company directly.

１－４. CHECKING FOR ABNORMALITIES

If you find strange sound, smell, smoke, heat from this product, shut down the power immediately. And check followings before considering a breakdown of the product.

1) Power is supplied correctly.
2) Wires are connected correctly.
3) Wires have no breaking.
4) Settings are configured correctly.

１－５. MAINTENANCE AND INSPECTION

For the stain on the surface of the product, wipe it off using soft cloth. For heavy stein, turning off the power, wipe off it using cloth wrung out of water. Do not use organic solvents such as benzene and thinner.
For a trouble-free and long use of this product, give inspections of followings periodically.

1) Whether the product has damage.
2) Whether the display has abnormality.
3) Whether the product give out strange sound, smell, heat.
4) Mounting and connections of terminals have no looseness, check under power off condition.

１－６. DISPOSAL OF THIS PRODUCT

When you dispose this product, treat as a general industrial waste.

2. WARRANTY

２－１. TERM OF WARRANTY

The term of a warranty of this product is one year after delivery.

２－２. WARRANTY RANGE

If any failures found to be the responsibility of our company occurs within the term of warranty, the product shall be offered a replacement or repaired by retuning to us at no cost.
However, in the case that the cause of the failure corresponds to the followings, it is excluded from the warranty range.

1) Failure caused by being used under inappropriate conditions, circumstances and handlings which are written in this manual.
2) Failure caused by unapproved modifications or repair of structure, performance and specifications etc. which are performed not by our company.
3) Failure caused not by this product.
4) Failure caused by reasons unpredictable by standards of science and technology at time of the shipment from our company.
5) Failure caused by any other reasons that are found not to be the responsibility of our company including natural disasters, human disasters and accidental forces.

In addition, this warranty is limited to this product as a component; any other damages provoked by failure or defect of this product are out of this warranty range.

２－３. LIMITATION OF LIABILITY

Our company is not responsible for any consequential damage caused by this product.

3. BEFORE USING THE PRODUCT

3－1. MODEL CODES

The model code of this product is shown as below. Check the product which has been delivered has a same model code you ordered.

WPMZ－6－□□□－□□－□□□

Series name	Supply power	Input A	Input B	Output	Comparative output	Test report	Additional code	Description
WPMZ-6								Flow rate meter/Flow totalizer
	1							Supply power：AC100 to 240V
	3							Supply power：DC12V
	4							Supply power：DC24 to 48V
		P						Pulse input（Note 1）
		A						Analog input（Note 2）
			X					Nothing
			P					Pulse input（Note 3）
			A					Analog input
				X				No output (Display only)
				1				Analog output
				2				BCD output (open collector NPN)
				3				BCD output (open collector PNP)
				4				RS-232C
				5				RS-485 Modbus RTU
					E			Open collector NPN
					F			Open collector PNP
					R			Relay output (Normally open)
						X		Without test report
						T		With test report
							00	Standard (Initial language:Japanese)
							E0	Initial language setting: English

(Note 1) Pulse input

Open collector (NPN/PNP), voltage pulse, totem pole (complementary output), Zero cross (AC signal), two-wire (proximity sensor etc.)

(Note 2) Analog input

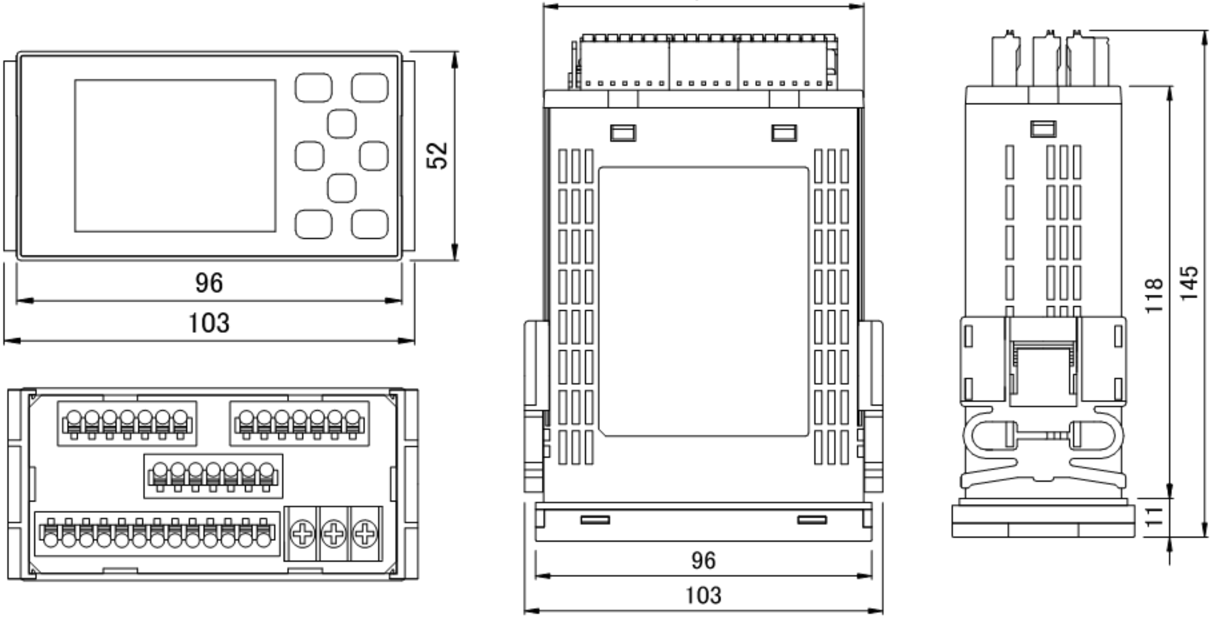
Voltage input (1-5V/0-10V), current input (4-20mA/ ±20mA)

(Note 3) Combination of 2 pulse inputs

The combination of 2 pulse inputs (the channel A single phase input and the channel B single phase input) can be used for a 2-phase (90° phase) pulse input.

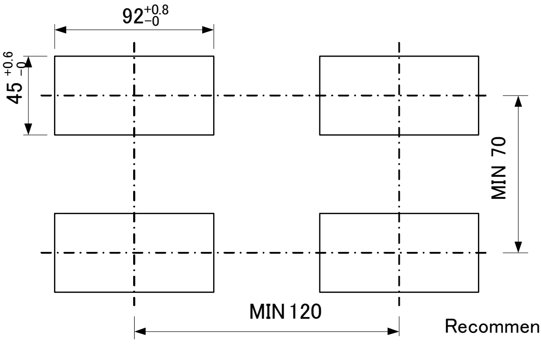
4. MOUNTING METHOD

４－１. EXTERNAL FORM DIMENSIONS



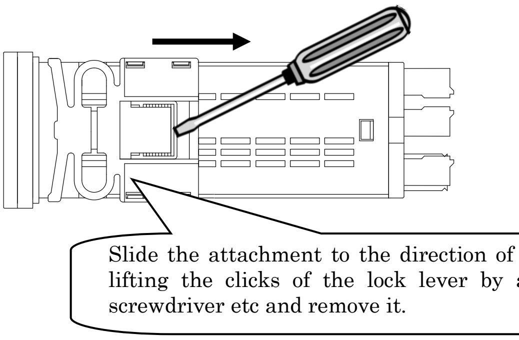
４－２. PANEL MOUNTING METHOD

Panel cut dimensions are as shown by the figure below.



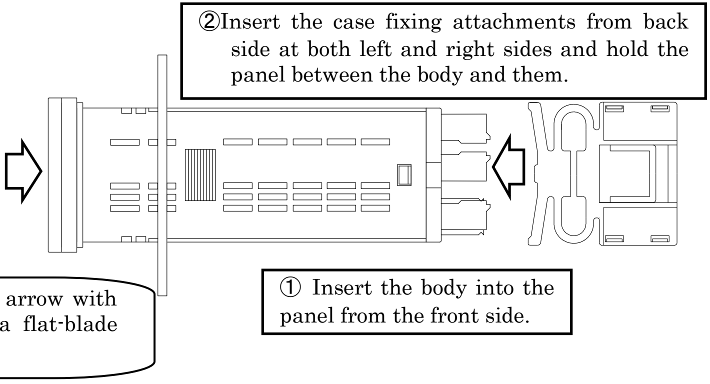
Recommended panel thickness : 0.8 to 5mm

1）Removal of case fixing attachments



Slide the attachment to the direction of arrow with lifting the clicks of the lock lever by a flat-blade screwdriver etc and remove it.

2）Installment of case fixing attachments



②Insert the case fixing attachments from back side at both left and right sides and hold the panel between the body and them.

① Insert the body into the panel from the front side.

CAUTION

○ Prior to the installation of this product please read “1-1. ENVIRONMENTS AND CONDITIONS OF USE” (page5)

○ In the case of installation or replacing of this product, please pay attention to the damage and accident by dropping.

○ In the case of some wires are connected, do not install or replacing this product. It may cause shock, damage fire etc.

5. CONNECTING TERMINALS

５－１. WIRING TO TERMINALS

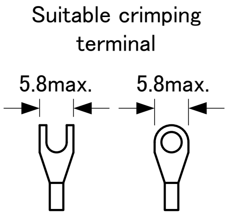
The connections to this product are done by connecting wires to the screw terminal block (power supply) and screwless terminal blocks on the back side of the body. Show below for the method and precautions.

５－１－１. CONNECTING TERMINALS

Use crimp-type terminal lugs for M3 screws to connect the terminals.

① Loosen the screws of the terminal block.
In the case of R-type terminal lugs, remove the screw terminals from the terminal block.

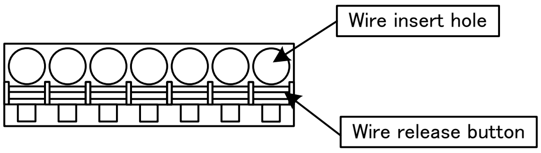
②Insert lugs under the washers of loosened screws and fasten the screws.
（Recommended torque：0.6 [N･m]）



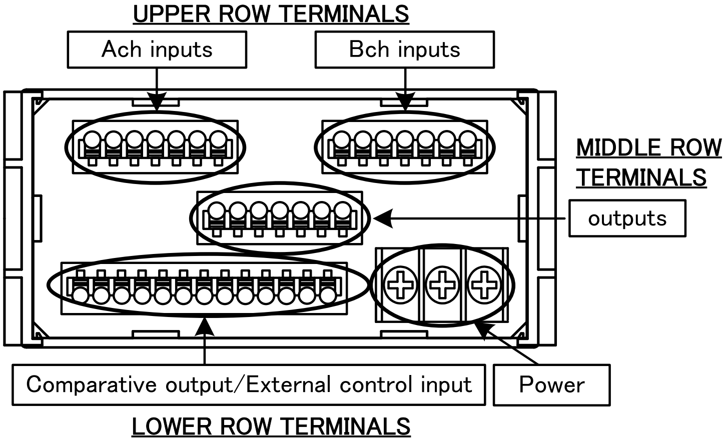
５－１－２. WIRING TO SCREWLESS TERMINALS

① Pushing the wire release button with a flat-blade screwdriver, open the wire insert hole.
(Flat-blade screwdriver : The point of a blade width 2.5mm)

② Wire is inserted in an expanded wire insertion hole and a flat-blade screwdriver is removed.
（Suitable wire:AWG24 to 16）



５－１－３. THE LOCATION OF EACH TERMINAL STAND



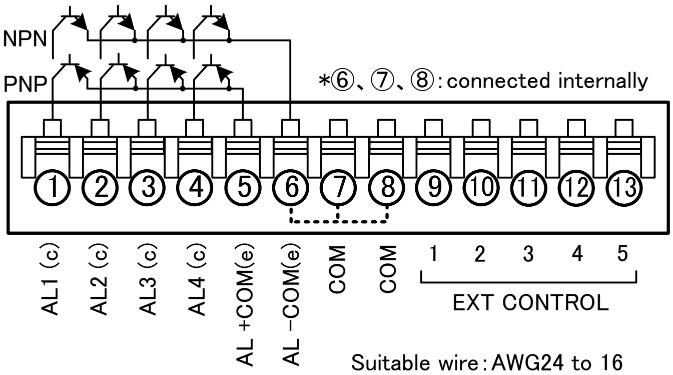
Note: In this manual, “channel A”, “channel B” may be abbreviated to “chA”,”chB” (or “Ach”,”Bch”).

５－２．CONNECTION FOR LOWER ROW TERMINALS

５－２－１．COMPARATIVE OUTPUT/EXTERNAL CONTROL INPUT

[Opencollector output product]

Screwless terminals



*⑥、⑦、⑧：connected internally

Suitable wire：AWG24 to 16

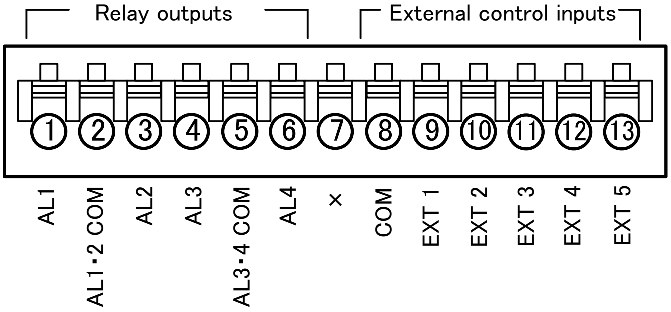
No.	Name	Description
1	AL1 c	AL1 open-collector output (collector)
2	AL2 c	AL2 open-collector output (collector)
3	AL3 c	AL3 open-collector output (collector)
4	AL4 c	AL4 open-collector output (collector)
5	AL+COM e	Common terminal for PNP output (emitter) (NPN output : no connection)
6	AL-COM e	Common terminal for NPN output (emitter) (PNP output : GND for PNP)
7,8	COM	Common terminal for external control inputs
9	1	External control input No.1
10	2	External control input No.2
11	3	External control input No.3
12	4	External control input No.4
13	5	External control input No.5

*1 “AL-COM e terminal” and “COM terminal” is connected internally and same voltage level.

5－2－2． COMPARATIVE OUTPUT(relay)/EXTERNAL CONTROL INPUT

[Relay output product]

Screwless terminals



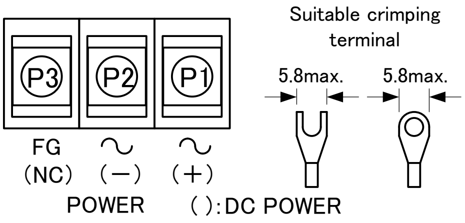
Suitable wire：AWG 24 to 16

No.	Name	Description
1	AL1	AL1 relay output
2	AL1・2 COM	Common terminal for outputs of AL1 and AL2
3	AL2	AL2 relay output
4	AL3	AL3 relay output
5	AL3・4 COM	Common terminal for outputs of AL3 and AL4
6	AL4	AL4 relay output
7	×	N.C. *1
8	COM	Common terminal for external control inputs
9	EXT CONTROL 1	External control input No.1
10	EXT CONTROL 2	External control input No.2
11	EXT CONTROL 3	External control input No.3
12	EXT CONTROL 4	External control input No.4
13	EXT CONTROL 5	External control input No.5

*1 Please do not wire to N.C. terminal.

5－2－3． SUPPLY POWER

Screw terminals



Terminal	Name	Description
P1	POWER (+)	Power source terminal (In case of DC power, +V)
P2	POWER (-)	Power source terminal (In case of DC Power, 0V)
P3	FG (NC)	FG terminal (DC power option: no connection (*Non-usable for a relay terminal))

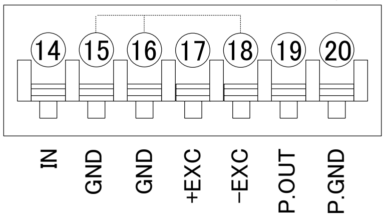
5－3. CONNECTION FOR UPPER ROW TERMINALS

5－3－1. PULSE INPUTS / OUTPUT

Screwless terminals

Ch A pulse input / output

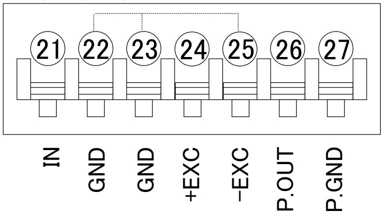
*⑮、⑯、⑱ :connected internally



Suitable wire : AWG24 to 16

Ch B pulse input / output

* ㉒、㉓、㉕ :connected internally



Suitable wire : AWG24 to 16

●Channel A pulse input

terminal	name	descriptions
14	IN	ChA pulse input terminal
15,16	GND	ChA input ground terminal
17	+EXC	ChA sensor power output terminal (+)
18	-EXC	ChA sensor power output terminal (-)
19	P.OUT	ChA totalizer-synchronous pulse output terminal (+)
20	P.GND	ChA totalizer-synchronous pulse output terminal (-)

*1 "GND terminal" and "-EXC terminal" is connected internally and same voltage level.

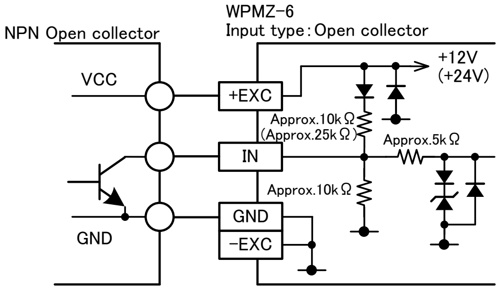
●Channel B pulse input

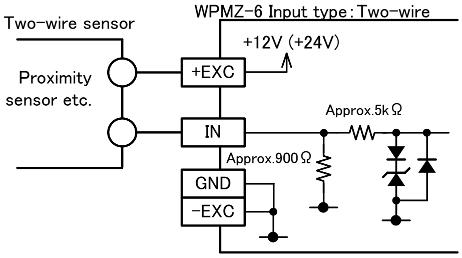
terminal	name	descriptions
21	IN	ChB pulse input terminal
22,23	GND	ChB input ground terminal
24	+EXC	ChB sensor power output terminal (+)
25	-EXC	ChB sensor power output terminal (-)
26	P.OUT	ChB totalizer-synchronous pulse output terminal (+)
27	P.GND	ChB totalizer-synchronous pulse output terminal (-)

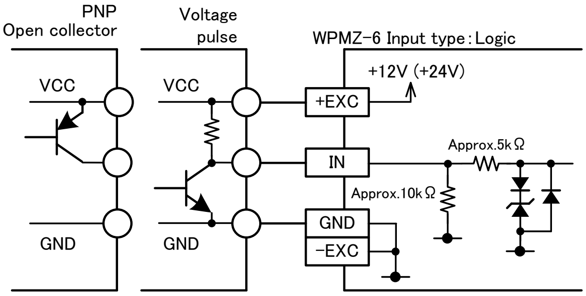
*1 "GND terminal" and "-EXC terminal" is connected internally and same voltage level.

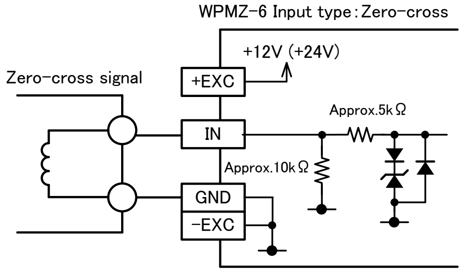
*2 The combination of 2 pulse inputs [the channel A (GND terminal (15 or 16)) single phase input and the channel B (GND terminal (22 or 23)) single phase input] can be used for a 2-phase (90°phase) pulse input.

●Examples for Input connections







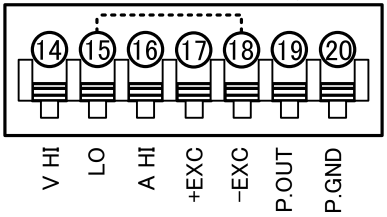


5－3－2. ANALOG INPUTS / PULSE OUTPUT

Screwless terminals

Ach Analog input / Pulse Output

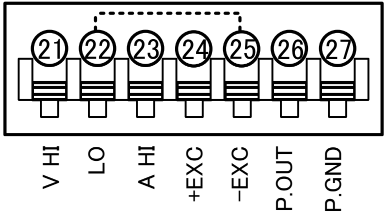
＊⑮、⑱:connected internally



Suitable wire：AWG24 to 16

Bch Analog input / Pulse Output

＊㉒,㉕ :connected internally



Suitable wire：AWG24 to 16

●Channel A analog input

terminal	name	description
14	V HI	ChA voltage range input terminal (+)
15	LO	ChA input common terminal (-)
16	A HI	ChA current range input terminal (+)
17	+EXC	ChA sensor power output terminal (+)
18	-EXC	ChA sensor power output terminal (-)
19	P.OUT	ChA totalizer-synchronous pulse output terminal (+)
20	P.GND	ChA totalizer-synchronous pulse output terminal (-)

*1 “LO terminal” and “-EXC terminal” is connected internally and same voltage level.

●Channel B analog input

terminal	name	description
21	V HI	ChB voltage range input terminal (+)
22	LO	ChB input common terminal (-)
23	A HI	ChB current range input terminal (+)
24	+EXC	ChB sensor power output terminal (+)
25	-EXC	ChB sensor power output terminal (-)
26	P.OUT	ChB totalizer-synchronous pulse output terminal (+)
27	P.GND	ChB totalizer-synchronous pulse output terminal (-)

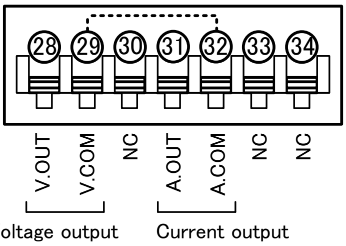
*1 “LO terminal” and “-EXC terminal” is connected internally and same voltage level.

5－4. CONNECTION FOR MIDDLE ROW TERMINALS

5－4－1. ANALOG OUTPUT

Screwless terminals

＊㉙、㉜ :connected internally



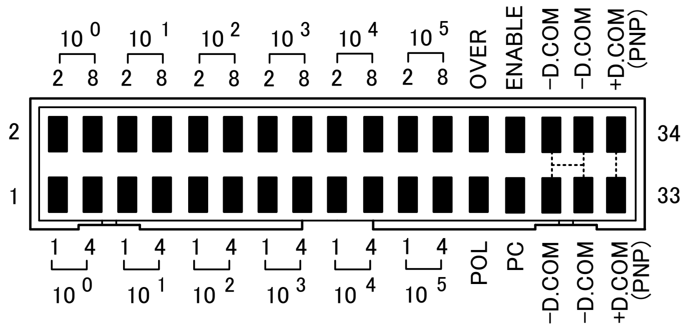
Suitable wire：AWG24 to 16

terminal	name	descriptions
28	V.OUT	Analog voltage output terminal (+)
29	V.COM	Analog voltage output terminal (-)
30	NC	No connection *Non-usable for a relay terminal
31	A.OUT	Analog current output terminal (+)
32	A.COM	Analog current output terminal (-)
33,34	NC	No connection *Non-usable for a relay terminal

*1 “V.COM terminal” and “A.COM terminal” is connected internally and same voltage level.

5－4－2. BCD OUTPUT

Crimp connector

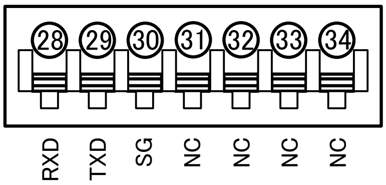


Suitable wire：AWG#28 flat cable(7/0.127mm)

terminal	name	description
1 to 4	$10^0$1-8	Bit 1-8 of BCD 10^0 digit output terminals
5 to 8	$10^1$1-8	Bit 1-8 of BCD 10^1 digit output terminals
9 to 12	$10^2$1-8	Bit 1-8 of BCD 10^2 digit output terminals
13 to 16	$10^3$1-8	Bit 1-8 of BCD 10^3 digit output terminals
17 to 20	$10^4$1-8	Bit 1-8 of BCD 10^4 digit output terminals
21 to 24	$10^5$1-8	Bit 1-8 of BCD 10^5 digit output terminals
25	POL	BCD polarity output terminal
26	OVER	BCD over output terminal
27	PC	BCD synchronous signal output terminal
28	ENABLE	BCD enable terminal By bringing to same voltage level of -D.COM or connecting to –D.COM, transistors of BCD outputs become OFF.
29 to 32	-D.COM	Common terminal for BCD open collector NPN
33,34	+D.COM	External power terminal for BCD open collector PNP

５－４－３. RS-232C

Screwless terminals



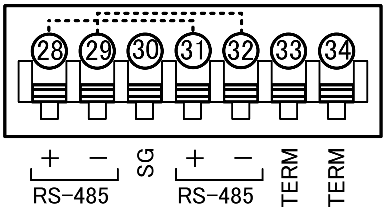
Suitable wire：AWG24 to 16

terminal	name	description
28	RXD	Receive data terminal
29	TXD	Transmit data terminal
30	SG	Common terminal for communication function
31 to 34	NC	No connection *Non-usable for a relay terminal

５－４－４. RS-485　MODBUS RTU

Screwless terminals

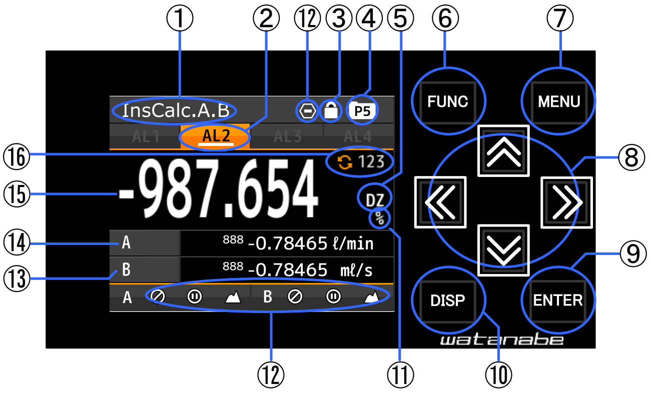
＊㉘、㉛＆㉙、㉜：connected internally

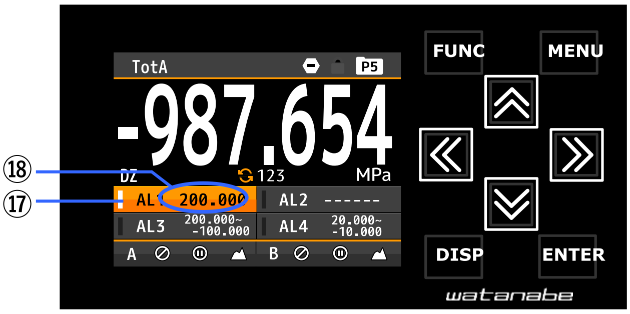


Suitable wire：AWG24 to 16

terminal	name	description
28	+	Non-inverting signal
29	-	Inverting signal
30	SG	Signal ground
31	+	Non-inverting signal
32	-	Inverting signal
33,34	TERM	Terminal resistance（120Ω）terminals * Short 33 and 34 to be enable the resistance.

6. NAMES OF EACH PART





No.	Name	Function
①	Display title	Indicates contents of display
②	Comparison result	Lights when the result of comparative output is ON.
③	Key lock	Lights when the key lock is effective.
④	Pattern	Indicates pattern No. in use.
⑤	DZ icon	DZ lights up during digital zero operation. *Analog input product only
⑥	FUNC key	Used for registering external control shortcut function.
⑦	MENU key	Used for moving to setting display and returning measurement display.
⑧	Arrow keys	Used to move the cursor while setting and move other displays. *When the shortcut function is registered, the assigned function will be valid by holding down the arrow key (over 1 second).
⑨	ENTER key	Used to validate setting value.
⑩	DISP key	Used to switch measurement displays.
⑪	Display unit	Unit for 1st item display
⑫	External control	Lights when any of external control functions are valid
⑬	3rd item display	Displays measured value of 3rd item
⑭	2nd item display	Displays measured value of 2nd item
⑮	1st item display	Displays measured value of 1st item
⑯	Over counter	In case that 1st item display is totalized value, indicate overrun count.
⑰	Comparison result	Lights when the result of comparative output is ON.
⑱	Judgement value	Shows value or area of comparison judgement

6－1. EXPLANATION OF ICONS

6－1－1. DISPLAY ICONS ON THE MEASUREMENT DISPLAY

These icons are displayed on the top or the bottom of the measurement display.

icon	meanings
P5	Indicates pattern No. in use.
🔒	Indicates key lock function is effective.
⊖	Indicates comparative output reset function（an external control function） is effective.
⊘	Indicates measurement inhibit function（an external control function） is effective.
ⓘ	Indicates display hold function（an external control function） is effective.
◮ ◭	Indicates maximum value or minimum value hold function（an external control function） is effective.

6－1－2. KEY OPERATION ICONS ON THE SETTING DISPLAY

Key operation icons which are displayed on setting displays are shown below.

icon	meanings	icon	meanings
M	MENU key	◀	ARROW key（LEFT）
F	FUNC key	▶	ARROW key（RIGHT）
E	ENTER key	⇕	ARROW key（UP&DOWN）
D	DISP key	⇔	ARROW key（LEFT&RIGHT）
▲	ARROW key（UP）	✥	ARROW key（ALL）
▼	ARROW key（DOWN）	• P1	Pattern No. under setting

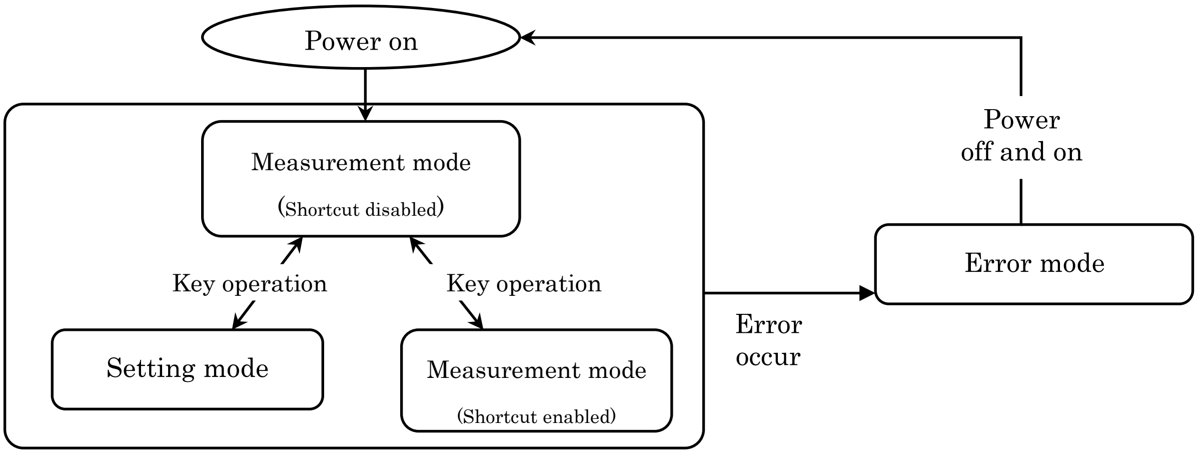
7. MODES OF OPERATION

7－1. WHAT YOU CAN DO USING THIS PRODUCT

Mode	Summary	Related Page
Measurement mode	**Measured value display** ・Can display the measured value with a numerical number, a bar graph or a trend graph.	page20
Setting mode	**1.Input Setting** PULSE INPUT A / PULSE INPUT B ANALOG INPUT A / ANALOG INPUT B ・Settings for inputs such as input type, scaling etc. for each channel. 2-INPUT CALCILATION ・Settings of calculation such as formula etc. for 2 channel inputs. EXTERNAL CONTROL ・Settings of external control functions which are assigned to external control terminals.	page24
	2.Output Setting COMPARATIVE OUTPUT AL1 to AL4 ・Settings of comparative output such as comparative judgment value, output mode etc. PULSE OUTPUT A / PULSE OUTPUT B ・Setting of totalized-synchronized pulse for each channel. ANALOG OUTPUT ・Setting of analog output such as output range, scaling. BCD OUTPUT ・Setting of BCD outputs such as output logic RS-485 MODBUS RTU ・Setting of communication such as unit ID, baudrate. RS-232C ・Setting of communication such as baudrate, delimiter.	page 25

Mode	Summary	Related Page
Setting Mode	**3.Display setting** DISPLAY SELECT ・Selection of display in measurement mode such as numerical value, trend display etc. LEVEL DISPLAY ・Setting of scale on level display TREND DISPLAY ・Setting of scale on trend display	page 25
	4.System setting GENERAL ・ Basic setting such as Brightness of display,Direction of display etc. INITIALIZE ・Setting about initialize such as initialize to user settablevalues or factory defaults etc.	page 26
	5.Input-Output Diagnosis INPUT DIAGNOSIS ・Makes a diagnosis to inputs. SIMULATED OUTPUT (OUTPUT TEST) ・Outputs simulated signals for each output.	page26
Shortcut enabled mode	Can control external control functions which are assigned to arrow keys by operations of the keys	page171
Error mode	Displays error codes when some error occurs.	page 185

7－2. STATE TRANSITION DIAGRAM



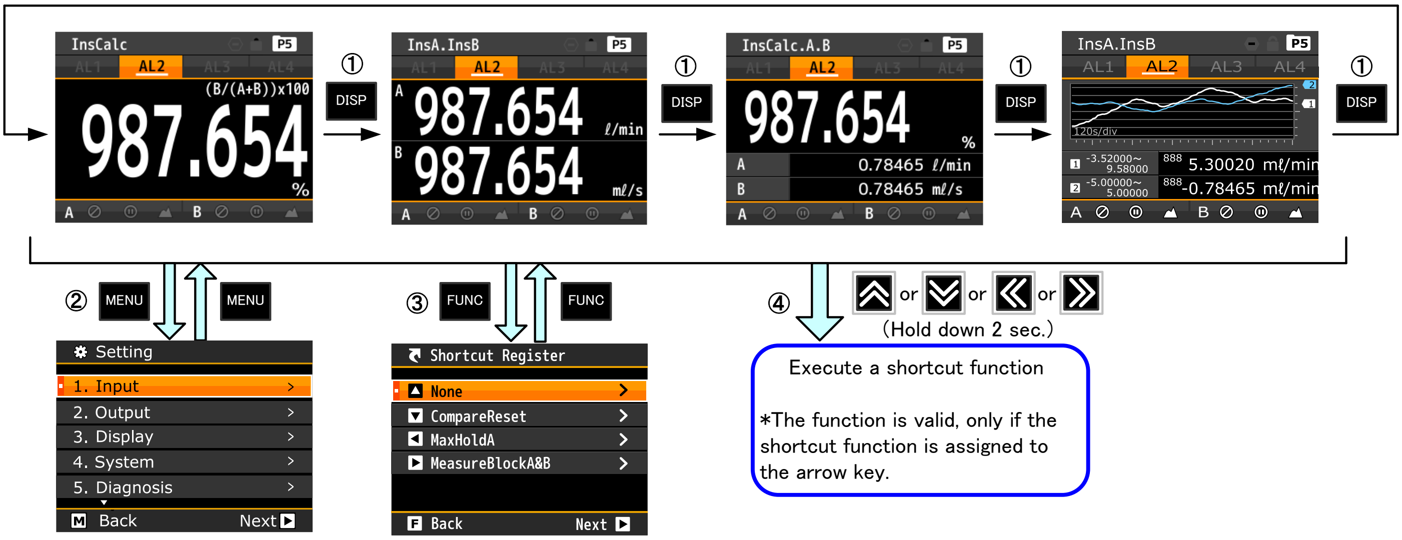
8. MEASUREMENT MODE

8－1. WHAT YOU CAN DO IN MEASUREMENT MODE

WHAT YOU CAN DO	DESCRIPTION	RELATED PAGE
Display of measured value	Displays results of measurement	page 21
Switch of measurement displays	Switches measurement displays which are entries in advance.	page20
Shortcut functions	Executes external control functions which are assigned to arrow keys.	page171

8－2. OPERATIONS IN MEASUREMENT MODE

In the measurement mode, the following key operations are available.



Execute a shortcut function

*The function is valid, only if the shortcut function is assigned to the arrow key.

No.	Key operation	Action
①	DISP	Can switch measurement displays which are set in “Display select”.
②	MENU	Moves to the setting display.
③	FUNC	Moves to the shortcut entry display.
④	⏫ ⏬ ⏪ ⏩	By holding down each key for 1 seconds (i.e. long-pressing), executes or cancels external control functions which are registered.
⑤	DISP + ENTER	Executes or cancels key lock function.

⚠CAUTION

When the key lock is enabled, key operations are not acceptable. Operate the keys after canceling key lock function.

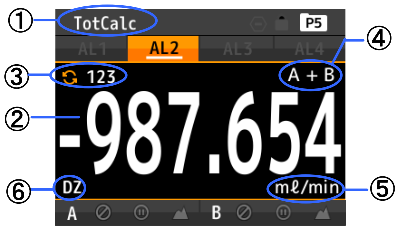
８－３. MEASUREMENT VALUE DISPLAY

Along with the numerical number format, this product can display the measured value in level format (bar graph) or trend format (polygonal line graph).

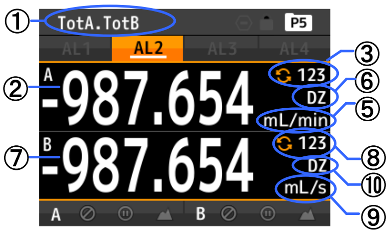
８－３－１. MEASUREMENT (NUMERICAL NUMBER) DISPLAY

The measurement (numerical number) display shows measurement result in numerical number and can display 1 item to 3 items on one display.

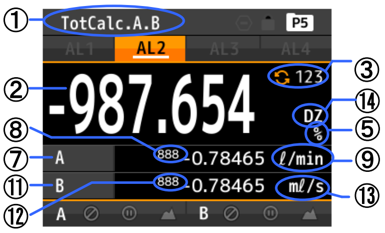
1st item display



2nd item display



3rd item display



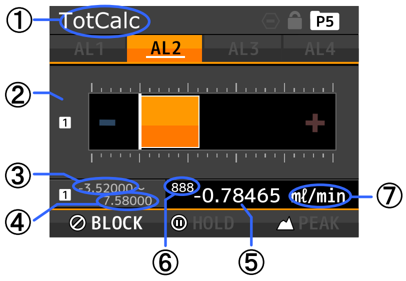
No.	Description
①	Shows the title of display which is currently displayed in measurement display. *In the case of “Total Calc, A,B”, totalized calculation value is treated as the 1st item, totalized value A is treated as the 2nd item and totalized value B is the 3rd item.
②	Shows measurement result of the 1st item.
③	In the case of totalized value display in 1st item, shows number of overflows. *In the case of “Inst Calc A, B”, overflow count is not displayed.
④	If displayed value on 1st item is calculated value, shows calculating formula. *If calculated value display is selected in 2-item display, calculating formula is not displayed.
⑤	When any units are selected in display setting, the unit is displayed. *The unit can be replaced by custom unit with up to 6 characters of the combination of alphabets and symbols.
⑥	DZ icon lights up during DZ operation. (1st item)
⑦	Shows measurement result of the 2nd item.
⑧	In the case of totalized value display in the 2nd item, shows number of overflows. *In the case of “Inst Calc A, B”, overflow count is not displayed.
⑨	When any units are selected in display setting, the unit is displayed. *The unit can be replaced by custom unit with up to 6 characters of the combination of alphabets and symbols.
⑩	DZ icon lights up during DZ operation. (2nd item)
⑪	Shows measurement result of the 3rd item.
⑫	In the case of totalized value display in 2nd item, shows number of overflows. *In the case of “Inst Calc A, B”, overflow count is not displayed.
⑬	When any units are selected in display setting, the unit is displayed. *The unit can be replaced by custom unit with up to 6 characters of the combination of alphabets and symbols.
⑭	DZ icon lights up while either the 1st or 2nd element is in DZ operation.

Note: Other than ①-⑭, refer to “**エラー! 参照元が見つかりません。エラー! 参照元が見つかりません。**”.
⑥ , ⑩ and ⑭ are only applicable analog input products.

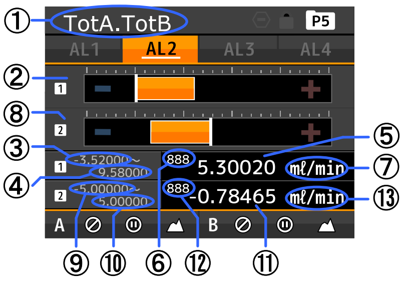
8－3－2. LEVEL DISPLAY (BAR GRAPH)

The level display (Bar graph) shows measurement result in level (bar graph) and numerical number.
Upper limit value (right edge) and lower limit value (left edge) of level display can be set arbitrary and are displayed on display.
The display can show 1 item or 2 items on one display.

1st item display



2nd item display



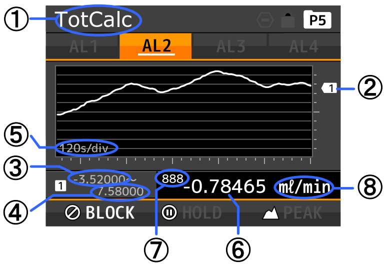
Item	Description
①	Shows the title of display which is currently displayed in measurement display. *In the case of "InstA TotalA", instantaneous value A is treated as 1st item and totalized value is treated as 2nd item.
②	Shows measurement result (1st item) by level display (bar graph). * 1 denotes 1st item.
③	Shows lower limit value (left edge) of level display (bar graph) scale for 1st item.
④	Shows upper limit value (right edge) of level display (bar graph) scale for 1st item.
⑤	Shows measurement result of 1st item by numerical number.
⑥	When displayed value of 1st item is totalized value, shows overflow count.
⑦	When any units are selected in display setting, the unit is displayed. *The unit can be replaced by custom unit with up to 6 characters of the combination of alphabets and symbols.
⑧	Shows measurement result of 2nd item by level display (bar graph). * 2 denotes 2nd item.
⑨	Shows lower limit value (left edge) of level display (bar graph) for 2nd item.
⑩	Shows upper limit value (right edge) of level display (bar graph) for 2nd item.
⑪	Shows measurement result of 1st item by numerical number.
⑫	When displayed value of 2nd item is totalized value, shows overflow count.
⑬	When any units are selected in display setting, the unit is displayed. *A custom unit, which is up to 6 characters of the combination of alphabets and symbols, can be also used as a unit.

Note: Other than ①-⑬, refer to "6-1.NAME OF EACH PART".

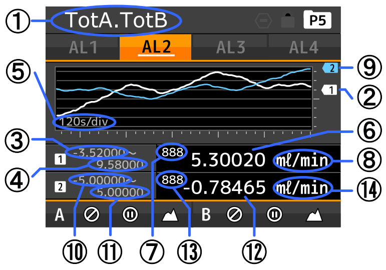
８－３－３. TREND DISPLAY (LINE GRAPH)

Trend display shows measurement result in a line graph, therefore the chronological change of the measurement value can be recognized simply and also shows current measurement value in numerical number.
Upper limit value (upper edge) and lower limit value (lower edge) of trend display can be set arbitrary and are displayed on display.
The display can show 1 item or 2 items on one display.

1st item display



2nd item display



Item	Description
①	Shows the title of display which is currently displayed in measurement display. * In the case of “InstA TotalA”, instantaneous value A is treated as 1st item and totalized value is treated as 2nd item.
②	Shows measurement result of the 1st item by trend display (line graph). * 1 denotes 1st item.
③	Shows lower limit value (lower edge) of level display (bar graph) scale for 1st item.
④	Shows upper limit value (upper edge) of level display (bar graph) scale for 1st item.
⑤	Shows unit of time axe (tame base). *The time axe (tame base) is common to the 1st item and the 2nd item.
⑥	Shows measurement result of the 1st item in numerical number.
⑦	When displayed value of the 1st item is totalized value, shows overflow count.
⑧	When any units are selected in display setting, the unit is displayed. *A custom unit, which is up to 6 characters of the combination of alphabets and symbols, can be also used as a unit.
⑨	Shows measurement result of the 2nd item by trend display (line graph). * 2 denotes 2nd item.
⑩	Shows lower limit value (lower edge) of trend display (line graph) scale for 2nd item.
⑪	Shows upper limit value (upper edge) of trend display (line graph) scale for 2nd item.
⑫	Shows measurement result of the 2nd item in numerical number.
⑬	When displayed value of the 2nd item is totalized value, shows overflow count.
⑭	When any units are selected in display setting, the unit is displayed. *A custom unit, which is up to 6 characters of the combination of alphabets and symbols, can be also used as a unit.

Note: Other than ①-⑭, refer to “6-1.NAME OF EACH PART”.

9. SETTING MODE

９－１. WHAT YOU CAN DO IN “THE SETTING MODE”

９－１－１. WHAT YOU CAN DO IN “THE INPUT SETTING GROUP”

PULSE INPUT（chA / chB）→page37

- Select a pattern number to configure settings.
- Selects the type of the input.
- Selects the analog filter of input.
- Selects voltage of supply power for sensor.
- Sets scaling for instantaneous value display.
- Selects position of decimal point for instantaneous value display.
- Selects a unit for instantaneous value display.
- Makes settings for stabilizing instantaneous value display.
- Sets scaling for totalized value display.
- Sets initial value of totalized value display.
- Selects direction of add-subtract for totalized value.
- Selects position of decimal point for totalized value display.
- Selects a unit for totalized value display.
- Selects overflow count method of totalized value.

*Available for models with pulse input.

ANALOG INPUT（chA / chB）→page56

- Select a pattern number to configure settings.
- Selects the type of the input.
- Selects voltage of supply power for sensor.
- Sets 0 correction function.
- Sets linearize function.
- Sets scaling for instantaneous value display.
- Selects position of decimal point for instantaneous value display.
- Selects a unit for instantaneous value display.
- Makes settings for stabilizing instantaneous value display.
- Sets scaling for totalized value display.
- Sets initial value of totalized value display.
- Selects direction of add-subtract for totalized value.
- Selects position of decimal point for totalized value display.
- Selects a unit for totalized value display.
- Selects method of counting overflow of totalized value.

*Available for models with analog input.

2 INPUT CALCULATION SETTING →page75

- Select a pattern number to configure settings.
- Sets calculating formula for instantaneous value display.
- Sets decimal point for instantaneous value display.
- Sets unit for instantaneous value display.
- Sets step for instantaneous value display.
- Sets calculating formula for totalized value display.
- Sets decimal point for totalized value display.
- Sets unit for totalized value display.
- Selects overflow count method of totalized value.

*Available for 2-inputs (A channel and B channel) models

EXTERNAL CONTROL →page85

- Selects a function assigned to the external control terminal 1.
- Selects a function assigned to the external control terminal 2.
- Selects a function assigned to the external control terminal 3.
- Selects a function assigned to the external control terminal 4.
- Selects a function assigned to the external control terminal 5.

9－1－2. WHAT YOU CAN DO IN “THE OUTPUT SETTING GROUP”

COMPARATIVE OUTPUTS(AL1-AL4) SETTING →page88

- Select a pattern number to configure settings.
- Select source display item for comparative output.
- Select compare mode of comparative output.
- Set ON condition of comparative output.
- Set judgement value of comparison.
- Set delay time of comparative output.
- Set output mode of comparative output.
- Set logic of comparative output.
- Select color of display background when comparative output is ON.

PULSE OUTPUT (chA. / chB.) SETTING → page100

- Select a pattern number to configure settings.
- Select display item for totalizer-synchronous pulse.
- Select digit which totalizer-synchronous pulse is synchronized to.
- Select pulse width of totalizer-synchronous pulse.
- Select output logic of totalizer-synchronous pulse.

ANALOG OUTPUT SETTING→page106

- Select a pattern number to configure settings.
- Select output range of analog output.
- Select display item to be output from analog output.
- Set scaling of analog output.

*Available for models with analog output.

BCD OUTPUT SETTING→page111

- Select a pattern number to configure settings.
- Select display item to be output from BCD output.
- Select output logic of BCD data.
- Select output logic of data synchronized signal.

*Available for models with BCD output.

RS-485 MODBUS COMMUNICATION SETTING →page122

- Set unit ID.
- Set parameters for communication.

*Available for models with RS-485 Modbus.

RS-232C COMMUNICATION SETTING →page116

- Set parameters for communication.

*Available for models with RS-232C.

9－1－3. WHAT YOU CAN DO IN “THE DISPLAY SETTING GROUP”

DISPLAY SELECT SETTING→page126

- Select display items to switch.
- Select the display item to show level display.
- Select the display item to show trend display.

LEVEL DISPLAY SETTING →page131

- Select a pattern number to configure settings.
- Set display scales of the level display.

TREND DISPLAY SETTING →page135

- Select a pattern number to configure settings.
- Set display scales of the trend display.
- Set the time axis.

９－１－４. WHAT YOU CAN DO IN “THE SYSTEM SETTING GROUP”

GENERAL SETTINGS →page140

- Change brightness of display.
- Provide wait time after power on.
- Darken the display after a specified period of time.
- Select whether the totalized value to save or not.
- Selects whether or not to retent the execution state and value of digital zero.
- Select languages of display.
- Set the direction of the display.
- Disable changing the settings.
- Copy pattern data.

INITIALIZINGS →page151

- Save current settings as user defaults.
- Initialize to saved settings.
- Initialize to factory defaults.

９－１－５. WHAT YOU CAN DO IN “THE DIAGNOSIS GROUP”

INPUT DIAGNOSIS →page153

- Check input signals are applied.
- Check status of external control terminals.

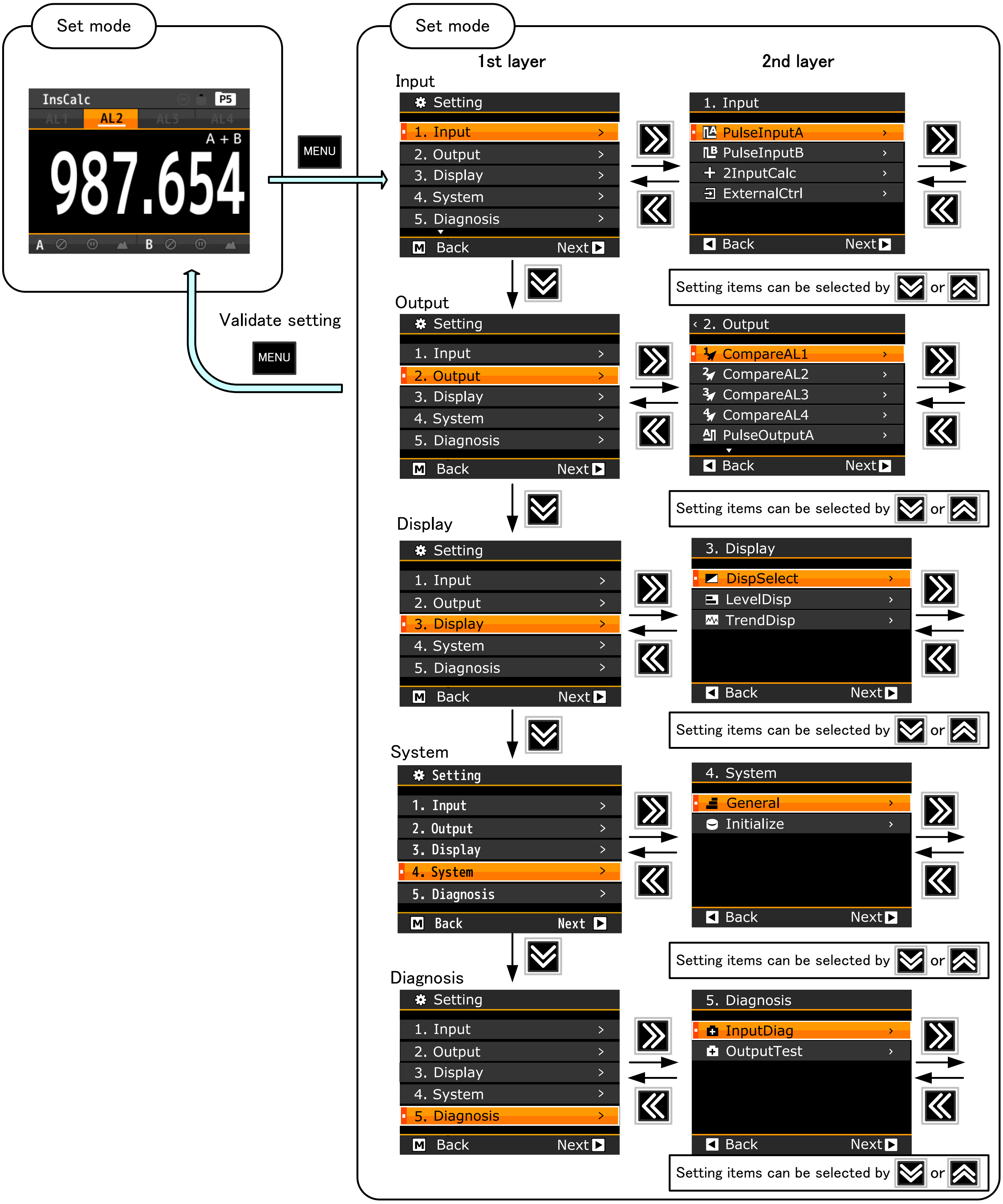
SIMULATED OUTPUT (OUTPUT TEST) →page157

- Output simulated output to comparative output.
- Output simulated output to totalizer-synchronous pulse.
- Output simulated output of specified value to analog output.
- Output simulated output to each bit of BCD output.
- Display receive data and transmit data of communication.

9－2. OPERATION IN SETTING MODE

9－2－1. TRANSFER BETWEEN SETTING GROUPS

The chart below shows basic operation procedures such as transfers between each setting groups.

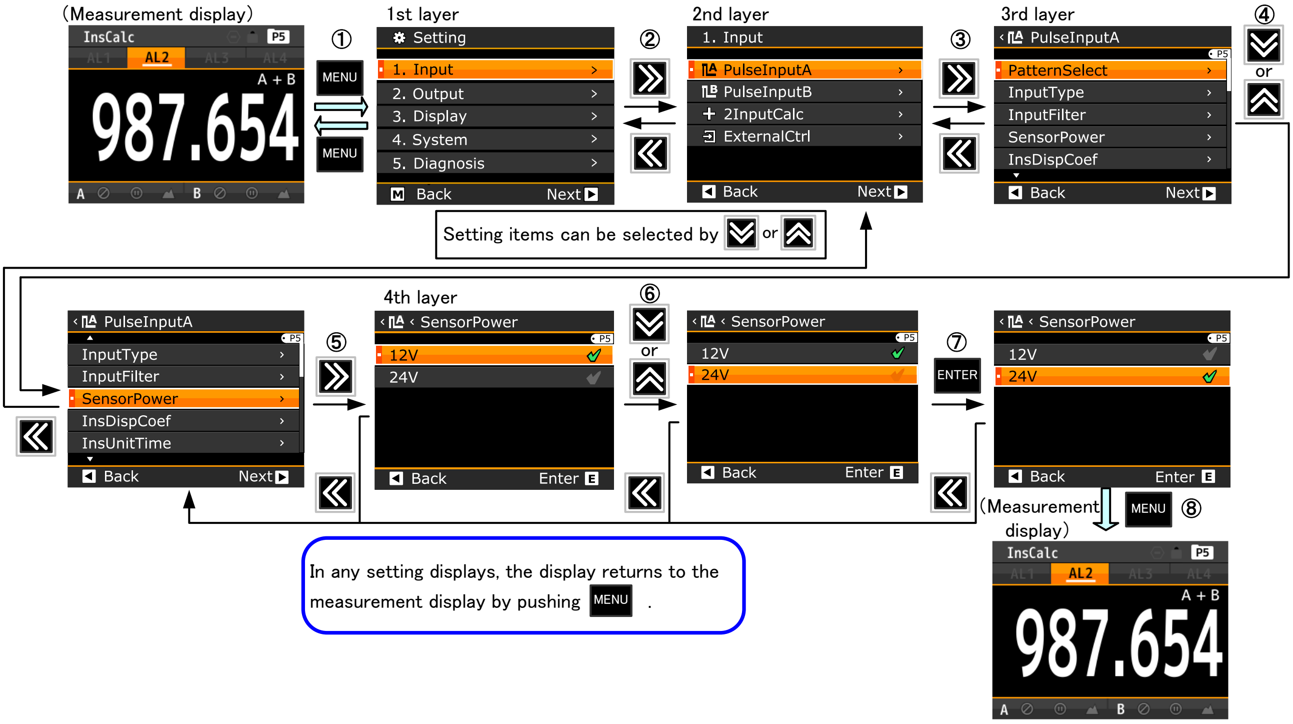


⚠CAUTION

During the setting mode, external control inputs become disabled and the analog output and comparative judgement results hold values just before the transfer to the setting mode.

9－2－2. OPRERATING PROCEDURE

An operating procedure for a concrete setting is shown below. The chart below is an explanation for changing of the sensor power voltage.



Setting items can be selected by ⩔ or ⩓

In any setting displays, the display returns to the measurement display by pushing MENU .

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the 1st layer (major categories). By moving the cursor with "**ARROW (UP/DOWN)**" key, the selection of major categories to set can be changed. * On the 1st layer, by pushing the "**MENU**" key, the display returns to the measurement display.
②	Pointing the cursor to a major category to set and pushing "**ARROW (RIGHT)**" key, the display moves to the 2nd layer (small categories). By moving the cursor with "**ARROW (UP/DOWN)**" key, the selection of small categories of the setting can be changed. If the "**ARROW (LEFT)**" key is pushed, the display returns to the 1st layer. * On the 2nd layer, by pushing the "**MENU**" key, the display returns to the measurement display.
③	Pointing the cursor to a small category to set and pushing "**ARROW (RIGHT)**" key, the display moves to the 3rd layer (setting variables). If the "**ARROW (LEFT)**" key is pushed, the display returns to the 2nd layer. * On the 3rd layer, by pushing the "**MENU**" key, the display returns to the measurement display.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, select a setting variable. If the "**ARROW (LEFT)**" key is pushed, the display returns to the 2nd layer.
⑤	At the selected setting variable, by pushing "**ARROW (RIGHT)**" key, the display moves to the 4th layer (setting contents) and a current selected content has a check mark. If the "**ARROW (LEFT)**" key is pushed, the display returns to the 3rd layer.
⑥	By moving the cursor with "**ARROW (UP/DOWN)**" key, select content. If the "**ARROW (LEFT)**" key is pushed, the display returns to the 3rd layer.
⑦	By pushing the "**ENTER**" key, the selected content is confirmed and a check mark accompanies. If the "**ARROW (LEFT)**" key is pushed, the display returns to the 3rd layer.
⑧	By pushing the "**MENU**" key, the selected contents are stored and the display returns the measurement display.

Note : If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－３．OVERVIEW OF PARAMETERS AND INITIAL VALUES

９－３－１．INPUT SETTING GROUP OVERVIEW

1st Layer (Large Categories)	2nd Layer (Small Categories)	3rd Layer (Setting variables)		4th Layer (Setting values)		Remarks
		Names of variables	Character Strings on Display (Abbreviated Form)	Initial Values	Selectable Values	
1.Input	Pulse input A Pulse input B	Pattern select	PatternSelect	Pattern1 (or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Input type	InputType	OpenCollector	OpenCollector/Logic/ ZeroCross/2Wire/ 2PhaseOpenCol/2PhaseLogic /2Phase2wire	Select input signal type
		Input filter	InputFilter	None	None/30Hz/1.5kHz/15kHz	Select analog input filters
		Sensor power	SensorPower	12V	12V/24V	Switch Sensor power voltage
		Instantaneous value display coefficient	InsDispCoef	1.00000×10^{0}	0.00000 to $9.99999\times10^{-9\sim9}$	For scaling setting of instantaneous value display, multiply frequency by instantaneous coefficient and unit time.
		Instantaneous Unit Time	InsUnitTime	Sec	Sec/Min/Hour	
		Instantaneous value decimal point position	InsDecPoint	###### (No decimal point)	###### / #####.# / ####.## / ###.### / ##.#### / #.#####	Set number of digits after decimal point
		Instantaneous value display unit	InsDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to detailed instruction manual about custom unit
		Instantaneous value auto zero	InsAutoZero	0.00	0.00 to 99.99sec	Displays 0 if no pulse input over more than setting time.
		Instantaneous value moving average	InsMoveAve	None	None/2times/3times /4times /5times /6times /7times /8times / 9times	Set number of moving average.
		Instantaneous value simple average	InsSimpleAve	None	None/2 times /4 times /8 times /16 times /32 times /64 times /128 times /256 times	Set number of simple average for internal sampling (10ms)
		Instantaneous value display step	InsDispStep	None	None/5steps/10steps	Setting of steps of display（If set to 5steps, displayed only 0 or 5 on LSB）
		Totalized value display coefficient	TotDispCoef	1.00000×10^{5}	0.00000 to $9.99999\times10^{-9\sim9}$	Scaling setting for totalized value display.
		Totalized value default value	TotDefaults	0.00000×10^{0}	$\pm9.99999\times10^{-9\sim9}$	Setting of Initial value of totalized value
		Total calculation direction	TotDirection	AddToDefault	AddToDefault/SubFromDefault	Set addition or subtraction for totalized value
		Totalized value decimal point position	TotDecPoint	###### (No decimal point)	###### / #####. # / ####. ## / ###. ### / ##. #### / #. #####	Set number of digits after decimal point

1st Layer (Large Categories)	2nd Layer (Small Categories)	3rd Layer (Setting variables)		4th Layer (Setting values)		Remarks
		Names of Variables	**Character Strings on Display (Abbreviated Form)**	**Initial Values**	**Selectable Values**	
1.Input	PulseInput A PulseInput B	Totalized value display unit	TotDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to the detailed instruction manual about the custom unit
		Totalized value overflow count	TotOverCount	None	None/999times/Endless	Setting for overflow count
	Analog Input A Analog Input B	Pattern select	PatternSelect	Pattern1 (or pattern No. in use)	Pattern1/ 2/3/4/5/6/7/8	Select pattern No. to set.
		Input Range	InputRange	4 ~ 20mA	0 ~5 V/1 ~ 5V/0 ~ 10V/ 4 ~ 20mA/0 ~ 20mA	Select input signal type
		Sensor power	SensorPower	12V	12V/24V	Switch Sensor power voltage
		Input Low Cut	InputLowCut	0.500	0.000 to 99.999%	Cutting off low level input signal
		Linearize Function	InputCorrect	Disable	Disable/Enable	Switch ON/OFF of linearize function.
		Linearize Point	Linearize Point	0.00 to 100.0 0.00 to 100.0	Input value（1st to 21st point）: 0.00 to 100.00% Output value（1st to 21st point）: 0.00 to 100.00%	On after 2nd point, if both of input value and output value are 0.00, the following points become invalid.
		Instantaneous value display coefficient	InsDispCoef	1.00000×10^{4}	0.00000 to $9.99999\times10^{-5\sim5}$	For scaling setting of instantaneous value display.
		Instantaneous value decimal point position	InsDecPoint	###### (No decimal point)	###### / #####.# / ####.## / ###.### / ##.#### / #.#####	Set number of digits after decimal point
		Instantaneous value display unit	InsDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to detailed instruction manual about custom unit
		Instantaneous value moving average	MoveAve	None	None/2times/3times /4times /5times /6times /7times /8times / 9times	Set number of moving average for analog inputs.
		Instantaneous value simple average	SimpleAve	None	None/2 times /4 times /8 times /16 times /32 times /64 times /128 times /256 times	Set number of simple average for internal sampling (10ms)
		Instantaneous value display step	InsDispStep	None	None/5steps/10steps	Setting of steps of display（If set to 5steps, displayed only 0 or 5 on LSB)
		Totalized unit time	TotUnitTime	Hour	See/Min/Hour	See unit time
		Totalized value display coefficient	TotDispCoef	1.00000×10^{5}	0.00000 to $9.99999\times10^{-9\sim9}$	Scaling setting for totalized value display.
		Totalized value default value	TotDefaults	0.00000×10^{0}	$\pm9.99999\times10^{-9\sim9}$	Setting of Initial value of totalized value
		Total calculation direction	TotDirection	AddToDefault	AddToDefault/SubFromDefault	Set addition or subtraction for totalized value

1st Layer (Large Categories)	2nd Layer (Small Categories)	3rd Layer (Setting variables)		4th Layer (Setting values)		Remarks
		Names of Variables	Character Strings on Display (Abbreviated Form)	Initial Values	Selectable Values	
1.Input	Analog Input A Analog Input B	Totalized value decimal point position	TotDecPoint	###### (No decimal point)	###### / #####. # / ####. ## / ###. ### / ##. #### / #. #####	Set number of digits after decimal point
		Totalized value display unit	TotDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to the detailed instruction manual about the custom unit
		Totalized value overflow count	TotOverCount	None	None/999times/Endless	Setting for overflow count
	2 input calculation	Pattern select	Pattern select	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Expression for instantaneous value	InsExpression	None	None/ (B/A)*100 / (B/A-1)*100 /B-A / (B/(A+B))*100 / A+B	Select expression for calculation of instantaneous value.
		Instantaneous value decimal point position	InsDecPoint	###### (No decimal point)	###### / #####.# / ####.## / ###.### / ##.#### / #.#####	Set number of digits after decimal point
		Instantaneous value display unit	InsDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to detailed instruction manual about custom unit
		Instantaneous value display step	InsDispStep	None	None/5steps/10steps	Setting of steps of display（If set to 5steps, displayed only 0 or 5 on LSB）
		Expression for totalized value	TotExpression	None	None/A+B / B-A	Select expression for calculation of totalized value.
		Totalized value decimal point position	TotDecPoint	###### (No decimal point)	###### / #####. # / ####. ## / ###. ### / ##. #### / #. #####	Set number of digits after decimal point.
		Totalized value display unit	TotDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to detailed instruction manual about custom unit
		Totalized value overrun count	TotOverCount	None	None/999times/Endless	Setting for overrun count
	External Control	Function of external control terminal 1 to 5	ExtCtrl1Func ExtCtrl2Func ExtCtrl3Func ExtCtrl4Func ExtCtrl5Func	None	None/ CompareReset/ TotalResetA/ TotalResetB/ TotalResetA&B/ MeasureBlockA/ MeasureBlockB/ MeasureBlockA&B/ DispHoldA/ DispHoldB/ DispHoldA&B/ MaxHoldA/ MaxHoldB/ MaxHoldA&B/ MinHoldA/ MinHoldB/ MinHoldA&B/ DigitalZeroA/ DigitalZeroB/ DigitalZeroA&B/ PatternChange1/ PatternChange2/ PatternChange3/ MonitorChange/ TrendHold	Select functions assigned to external control terminals. *DigitalZero can select only analog input products.

*1 According to the model code of the product you have purchased, some setting variables do not appear.

９－３－２. OUTPUT SETTING GROUP OVERVIEW

1st Layer (Large Categories)	2nd Layer (Small Categories)	3rd Layer (Setting variables)		4th Layer (Setting values)		Remarks
		Names of Variables	Character Strings on Display (Abbreviated Form)	Initial Values	Selectable Values	
2.Output	CompareList	---	---	---	Go to screen of CompareList	
	Comparative Output AL1,Comparative Output AL2 Comparative Output AL3,Comparative Output AL4	Pattern select	PatternSelect	Pattern No. in use	Pattern1 to 8	Select pattern No. to set.
		Source output display value	OutputDispValue	None	None/InsA/InsB/InsCalc/TotA/TotB/TotCalc	Select source output display value to compare.
		Compare mode	CompareMode	LevelJudge	LevelJudge/ ZoneJudge	Select compare mode
		Condition of ON	OnConditions	Excess	Excess/LessThan	In level judge mode
				InTheZone	InTheZone/OutsideTheZone	In zone judge mode
		Comparison judgement value	Threshold	10000 0	Threshold:±999999 Hysteresis:0 to 999999	In level judge mode
				0 10000 0	Zone lower limit:±999999 Zone upper limit :±999999 Hysteresis :0 to 999999	In zone judge mode
		Comparison ON delay	OnDelay	None	None/20ms/50ms/100ms/200ms/500ms 1s/5s/10s/20s	Comparative output turns ON, if ON condition continues over set delay time.
		Comparison OFF delay	OffDelay	None		Comparative output turns OFF, if OFF condition continues over set delay time.
		Output mode	OutputMode	Normal	Normal/Latch/OneShot5ms/ OneShot 10ms/ OneShot 20ms/ OneShot 50ms/ OneShot 0.1s/ OneShot 0.2s/ OneShot 0.5s/ OneShot 1s/ OneShot 2s	Select output mode of comparison
		Output logic	OutputLogic	Negative(NO)	Positive(NC)/Negative(NO)	NC/NO are for relay output product.
		Background Color at ON	OnBgColors	Black	Black/Red/Yellow/Green	Background color priority AL1>AL2>AL3>AL4
	Pulse Output A Pulse Output B	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Source output display value	OutputDispValue	None	None/TotATotA/TotB/TotCalc	Select source output display value to output as totalizer-synchronous pulse
		Output synchronous digit	OutputSyncDigit	1stDigit	1stDigit/2ndDigit/3rdDigit/4thDigit/5thDigit /6thDigit	Select display digit with which totalizer-synchronous pulse synchronized.
		Output pulse width	OutputPulseWidth	5ms	5ms/10ms/20ms/50ms/100ms/500ms/1s/2s	Select width of totalizer-synchronous pulse.
		Output logic	OutputLogic	Negative	Positive/Negative	Select logic of totalizer-synchronous pulse.
	Analog Output	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Output range	OutputRange	0-10V	0-10V/±10V/1-5V/0-20mA/ 4-20mA	Select output range (type).

1st Layer (Large Categories)	2nd Layer (Small Categories)	3rd Layer (Setting variables)		4th Layer (Setting values)		Remarks
		Names of Variables	Character Strings on Display (Abbreviated Form)	Initial Values	Selectable Values	
2.Output	Analog Output	Source output display value	OutputDispValue	None	None/InsA/InsB/InsCalc/TotA/TotB/TotCalc	Select a displayable item for analog output
		Output scale	OutputScale	0 10000	0% display value :±999999 (±99999) 100% display value : ±999999(±99999)	Set scaling for analog output. Set expected display values at 0% and 100% output.
	BCD Output	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Source output display value	OutputDispValue	None	None/InsA/InsB/InsCalc/TotA/TotB/TotCalc	Select a displayable item for BCD output
		Data signal logic	DataSignalLogic	Negative	Positive /Negative	Select logic of data signal output.
		Synchronous signal logic	SyncSignalLogic	Negative	Positive /Negative	Select logic of synchronous signal (PC) output.
	RS-485 Modbus communication	SlaveAddress	SlaveAddress	1	1/2/3/4/ ····· /30/31	Set ID number.
		Baudrate	Baudrate	19200bps	9600bps/19200bps/38400bps	Set baudrate.
		Parity	Parity	Even	None/Even/Odd	Set parity bit.
	RS-232C communication	Protocol	Protocol	Modbus-RTU	Modbus-RTU/OriginalCommand/OriginalOutput	Set protocol
		Baudrate	Baudrate	19200bps	9600bps/19200bps/38400bps	Set baudrate.
		Data length	DataLength	7bit	7bit/8bit	Set data character length
		Parity	Parity	Even	None/Even/Odd	Set parity bit.
		Stop bit	Stopbit	1bit	1bit/2bit	Set stop bit length.
		Delimiter	Delimiter	CR LF	CR/CR LF	Set delimiter type.

*1 According to the model code of the product you have purchased, some setting variables do not appear.

９－３－３. DISPLAY SETTING GROUP OVERVIW

1st Layer (Large Categories)	2nd Layer (Small Categories)	3rd Layer (Setting variables)		4th Layer (Setting values)		Remarks
		Names of Variables	Character Strings on Display (Abbreviated Form)	Initial Values	Selectable Values	
3.Display	Display Select	Measure select	MeasureSelect	1input: InsA+ TotA 2inputs: InsA+ TotA / InsB+ TotB	InsA/InsB/InsCalc/ InsA+InsB / InsCalc+A+B/ TotA/TotB/TotCalc / TotA+TotB/TotCalc+A+B/ InsA+ TotA / InsB+ TotB/ InsCalc+ TotCalc/ InsA+Comp/InsB+Comp/InsCalc+Comp/ TotA+Comp/TotB+Comp/ TotCalc+Comp	Select displayable items can be switched by DISP key or external control (multiple selects are available)
		Level select	LevelSelect		InsA/InsB/InsCalc/ InsA+InsB / TotA/TotB/TotCalc / TotA+TotB / InsB+ TotB/ InsCalc+ TotCalc	Select an item displayed on level display
		Trend select	TrendSelect			Select an item displayed on trend display.
	Level Display	Pattern select	PatternSelect InsA Scale	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Instantaneous value A scale	InsA Scale	0 10000	Lower limit:±999999 Upper limit:±999999	Set display scale of level display. Left edge of display is lower limit and right edge of display is higher limit
		Instantaneous value B scale	InsB Scale			
		Instantaneous calculation scale	InsCalcScale			
		Totalized value A Scale	TotA Scale			
		Totalized value B Scale	TotB Scale			
		Totalized calculation scale	TotCalcScale			
	Trend Display	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Instantaneous value A scale	InsA Scale	0 10000	Lower limit :±999999 (±99999) Upper limit :±999999 (±99999)	Set display scale of trend display. Bottom edge of display is lower limit and top edge of display is higher limit.
		Instantaneous value B scale	InsB Scale			
		Instantaneous calculation scale	InsCalcScale			
		Totalized value A scale	TotA Scale	0 10000	Lower limit :±999999 (±99999) Upper limit :±999999 (±99999)	Set display scale of trend display. Bottom edge of display is lower limit and top edge of display is higher limit.
		Totalized value B scale	TotB Scale			
		Totalized calculation scale	TotCalcScale			
		Time axis	TimeAxis	1s/div	1s/div,2s/div,5s/div,10s/div, 30s/div,60s/div,120s/div	Select time for 1 division of time axis.

*1 According to the model code of the product you have purchased, some setting variables do not appear.

９－３－４. SYSTEM SETTING GROUP OVERVIEW

1st Layer (Large Categories)	2nd Layer (Small Categories)	3rd Layer (Setting variables)		4th Layer (Setting values)		Remarks
		Names of Variables	Character Strings on Display (Abbreviated For)	Initial Values	Settable Variables	
4.System	General	Brightness	Brightness	5 Bright	5 Bright/4/3/2/1 Dark/0 Off	Select brightness of display *”0 Off” is set, whole display is black out
		Power on delay	PowerOnDelay	None	None/2sec/5sec/10sec/20sec /30sec/60sec	Select time from power on to starting measurement
		Power saving time	PowerSavingTime	None	None/1min/2 min/5 min/10 min/30 min/60 min	In power saving state, brightness becomes “1 Dark” level.
		Totalized value Memory	TotMemory	Enable	Enable/Disable	Select saving totalized value or not.
		Digital zero retention	D-ZeroRetention	Disable	Enable/Disable	Selects whether or not to retent the execution state and value of digital zero. *Analog input products only.
		Language	Language	日本語	日本語 / English	Select language
		Direction of display	DisplayDirection	Horizontal	Horizontal/Vertical	Select direction of display
		Setting protect	SettingProtect	Disable	Disable / Enable	If Enable, changing settings are disabled.
		Pattern Copy	PatternCopy	Pattern1 (source) Pattern2 (destination)	Pattern1/2/3/4/5/6/7/8 Pattern1/2/3/4/5/6/7/8/All Patterns	Function of copying settings for each pattern.
	Initialize	Save user defaults	UserDefaultSave	Message “Save current settings as user initial values?”		
		Initialize to user defaults	UserDefaultLoad	Message “Initialize setting values to user initial values?”		
		Initialize to factory default	FactoryDefaultLoad	Message “Initialize setting values to factory default?”		

*1 According to the model code of the product you have purchased, some setting variables do not appear.

９－３－５. DISGNOSIS OVERVIEW

1st Layer (Large Categories)	2nd Layer (Small Categories)	3rd Layer (Setting variables)		4th Layer (Setting Contents)		Remarks
		Names of variables	Character Strings on Display (Abbreviated Form)	Initial Values	Selectable Values	
5.Diagnosis	Input Diagnosis	Pulse input A Pulse input B	PulseInputA PulseInputB	–	–	Check for input signal existence. (Displays pulse counts)
		Analog input A Analog input B	AnalogInputA AnalogInputB	–	–	Check for input signal existence. (Displays level in percentage of rating.)
		External control inputs	ExternalCtrl	–	–	Check for ON/OFF state of terminals
	Output Test	Comparative output AL1 to AL4	CompareAL1 CompareAL2 CompareAL3 CompareAL4	–	–	Outputs ON level or OFF level
		Pulse output A Pulse output B	PulseOutputA PulseOutputB	–	–	Outputs ON level or OFF level
		Analog output	AnalogOutput	–	–	Outputs level of 10% steps of rating
		BCD Output(Data) BCD Output(PC)	BCD Output(Data) BCD Output(PC)	–	–	Outputs ON level or OFF level for each bit
		Modbus Communication RS-485	ModbusCom	–	–	Displays receive data and transmit data
		RS-232C	RS-232C Com	–	–	Displays receive data and transmit data

*1 According to the model code of the product you have purchased, some setting variables do not appear.

９－４. DETAILS OF INPUT SETTING GROUP

The input setting group is classified into the following 4 groups which can be configured respectively.

2nd layer/ Small categories	Descriptions	Remarks
Pulse input A	- Settings for the sensor connected with. - Settings for scaling	Displayed only in models with pulse input.
Pulse input B		
Analog input A		Displayed only in models with analog input.
Analog input B		
2 input calculation	Setting for the calculation of 2 channel inputs.	Displayed only in models with chB input.
External control inputs	Setting about assignments of external control terminals.	

９－４－１. PULSE INPUT A / PULSE INPUT B

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Select a pattern number to configure settings	Pattern select	page38
Select input signal type	Input type	page 39
Select input analog filter	Input filter	page 40
Select voltage of power for the sensor.	Sensor power	page 41
Set scaling functions for instantaneous value and totalized value	Instantaneous value display coefficient	page 42
	Instantaneous unit time	
	Instantaneous value decimal point position	
	Totalized value display coefficient	
	Totalized value decimal point position	
Set units for instantaneous value display and totalized value display	Instantaneous value display unit	page 47
	Totalized value display unit	
Set time after that passes the instantaneous value display becomes zero	Instantaneous value auto zero	page 49
Set functions which stabilize the instantaneous value display.	Instantaneous value moving average	page 50
	Instantaneous value simple average	
	Instantaneous value display step	
Set initial value of totalized value display.	Totalized value default value	page 53
Select totalizing direction (addition or subtraction) for totalized value.	Total calculation direction	page 54
Select count method of overflow of totalized value.	Totalized value overflow count	page 55

９－４－１－１. Select a Pattern Number to Configure Settings

This product can memorize 8 patterns (8 kinds) of parameters including input settings (pulse input A/B, analog input A/B, 2 input calculations), output settings and display settings.
In measurement mode, the product calculates using one of 8 patterns which are configured.
This setting selects the pattern number which a configuration is performed.

⚠CAUTION

The pattern number is common to input settings, output settings and display settings.
Please pay attention to the target pattern number which the following “Pulse Input” configuration is performed to.

3rd layer Setting variable	4th layer Setting values	Initial value	Meanings of setting values
Pattern select [PatternSelect]	Pattern1	Pattern number which is selected in measurement mode.	Performs a configuration to pattern No.1
	Pattern2		Performs a configuration to pattern No.2
	Pattern3		Performs a configuration to pattern No.3
	Pattern4		Performs a configuration to pattern No.4
	Pattern5		Performs a configuration to pattern No.5
	Pattern6		Performs a configuration to pattern No.6
	Pattern7		Performs a configuration to pattern No.7
	Pattern8		Performs a configuration to pattern No.8

●How to select “Pattern 8” is shown below.
(Same operation could be applied to the pulse input B.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the 1st layer (major categories).
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“1.INPUT”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Pulse input A”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Pattern select”** and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting values)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Patern8”** * Select pattern No. which need to be set.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note : If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－4－1－2. Selecting Type of Input

This setting variable selects a suitable input type for the sensor you use.

3rd layer Setting variable	4th layer Setting values	Initial value	Meanings of setting values
Input type [InputType]	Open collector	*	Connecting for a sensor with NPN open collector output etc.
	Logic		Connecting for a sensor with voltage pulse or PNP open collector output etc.
	Zero cross		AC voltage signal.
	2 wire		Connecting for a proximity sensor etc.
	2-phase open collector		Available for 2 phase pulse input (90°phase).
	2-phase logic		
	2-phase 2 wire		

⚠CAUTION

○The setting values of 2-phase input types are only shown in “Pulse input A” equipped with a B ch. input.

○Setting parameters for the Pulse input B are not shown when any of “2-phase open collector”, “2-phase logic”, “2-phase 2 wire” are selected.

○When the input type setting is changed, the measurement function is inhibited in 50ms after returning to the measurement mode.

●How to set the input type to “Zero cross” is shown below. (Same operation is also applied to the pulse input B.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW(UP/DOWN)**” key, point the cursor to “**Pulse input A**” and push “**ARROW (RIGHT)**” key, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Input type**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Zero cross**” *Select input type which is suitable for the sensor in use.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note : If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－4－1－3. Selecting Analog Filter for Input

The low pass filter eliminates high-frequency noise from input signal.
The filer can be set to 4 kinds of cutoff frequency so that match usage environment.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Input filter [InputFilter]	None	*	No low pass filter
	30Hz		Low pass filter of 30Hz
	1.5kHz		Low pass filter of 1.5KHz
	15kHz		Low pass filter of 15KHz

⚠CAUTION

When the input filter setting is changed, the measurement function is inhibited in 50ms after returning to the measurement mode.

●How to set the input analog filter to “1.5 kHz” is shown below. (Same operation is also applied to the pulse input B.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW(UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the 2nd layer (small categories).
③	By moving the cursor with “**ARROW (UP/DOWN)** key”, point the cursor to “**Pulse input A**” and push “**ARROW (RIGHT)** key”, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Input type**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.5kHz**”. *Select a parameter in conformity with the actual condition of use.
⑥	By pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *By pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note : If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9−4−1−4. Selecting Voltage of Supply Power for the Sensor.

This setting variable selects supply power voltage which is supplied to the sensor.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Sensor power [SensorPower]	12V	*	Supplies DC12V power to the sensor (100mA max.). * For 2 channel inputs, total current for chA and chB is up to 100mA.
	24V		Supplies DC24V power to the sensor (50mA max.) *For 2 channel inputs, total current for chA and chB is up to 50mA.

⚠CAUTION

- When the sensor power voltage setting is changed, the measurement function is inhibited in approx. 1 second after returning to the measurement mode.
- In the case of the combination of DC12V and DC24V, the total power is 1.2 W max.

●How to set the sensor power to “DC24V” is shown below. (Same operation is also applied to the pulse input B.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Sensor Power**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**24V**”. *Select suitable voltage for the sensor in use.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note: **If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.**

９－４－１－５. Setting Scaling for Instantaneous Value Display and Totalized Value Display.

Set scaling parameters of scaling settings required for flow rate measurement.

3rd layer (Setting variables)				
Names of variables	**Character Strings on Display (Abbreviated Form)**	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Instantaneous value display coefficient	InsDispCoef	0.00000 to $9.99999\times10^{-9\sim9}$	1.00000×10^{0}	Scaling setting for instantaneous value display. Multiplying frequency by instantaneous coefficient and unit time.
Instantaneous Unit Time	InsUnitTime	Sec	Sec	
		Min		
		Hour		
Instantaneous value decimal point position	InsDecPoint	######	######	Select decimal point position for instantaneous value display.
		#####. #		
		####. ##		
		###. ###		
		##. ####		
		#. #####		
Totalized value display coefficient	TotDispCoef	0.00000 to $9.99999\times10^{-9\sim9}$	1.00000×10^{0}	Scaling setting for totalized value display.
Totalized value decimal point position	TotDecPoint	######	######	Select decimal point position for totalized value display.
		#####. #		
		####. ##		
		###. ###		
		##. ####		
		#. #####		

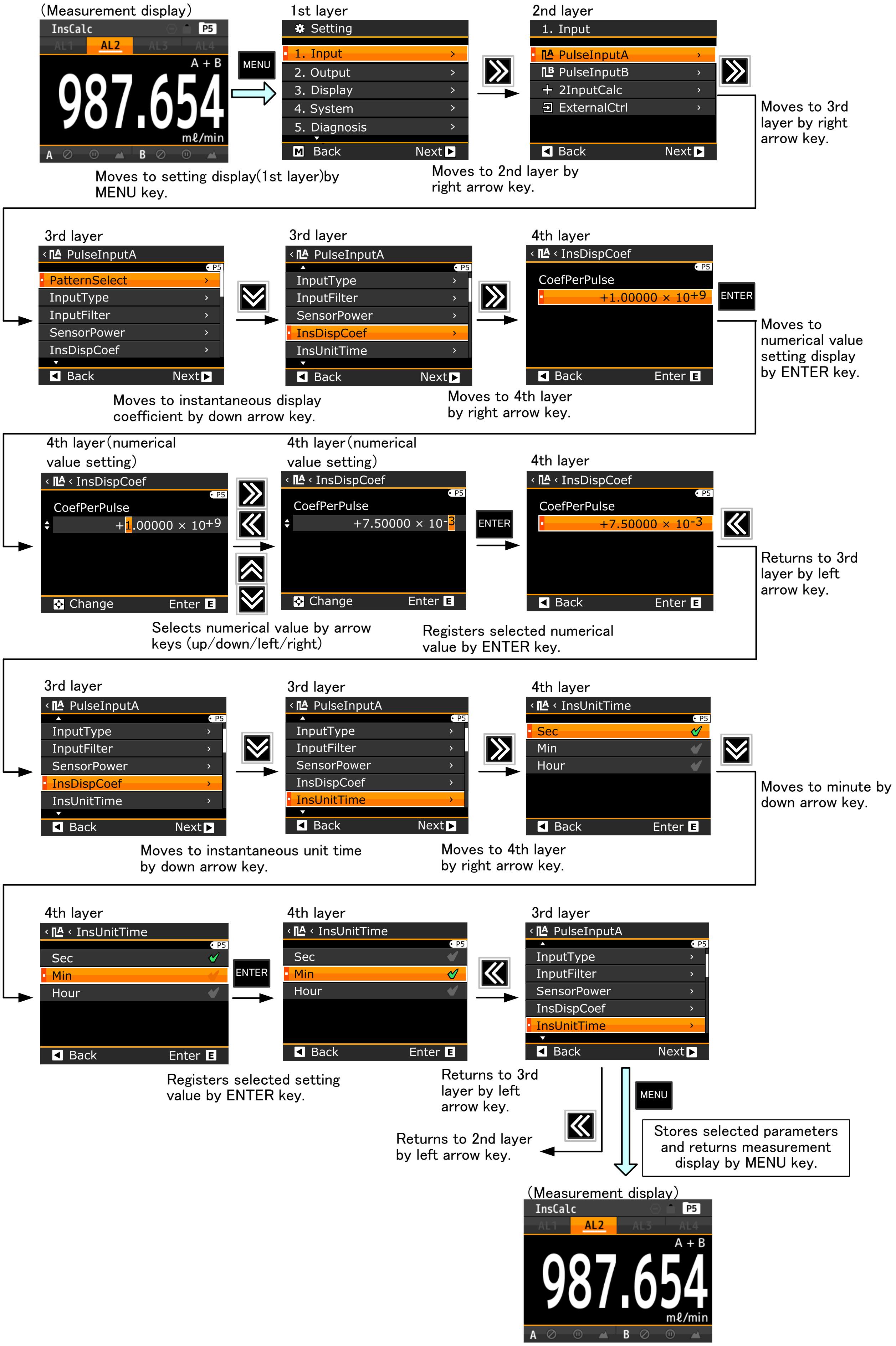
【Scaling setting examples】

1) Example 1

When maximum flow rate is approx. 40[ℓ/min], using a sensor of rating 7.5[mℓ/Pulse] (NPN open collector type), instantaneous flow rate will be displayed in [ℓ/min] with 3 decimal places and total flow volume will be displayed in [kℓ] with 2 decimal places.

3rd layer (Setting variables)	**4th layer (Setting values)**	**Descriptions for setting examples**
Input type [InputType]	Open collector	The sensor is an open collector output type, therefore select “open collector” as input type.
Instantaneous value display coefficient [InsDispCoef]	7.50000×10^{-3}	**(Setting for instantaneous flow rate display)** Set flowrate per 1 pulse as instantaneous display coefficient Although instantaneous flow rate will be displayed in [ℓ/min], the rating of the sensor is 7.5[mℓ/Pulse], it should be converted to7.5×10^{-3}[ℓ/Pulse]. ・Set the “Instantaneous display factor” as “**7.50000×10^{-3}**”
Instantaneous Unit Time [InsUnitTime]	Min	Displayed unit is [ℓ/min], therefore select “minute” as the instantaneous unit time.
instantaneous decimal point position [InsDecPoint]	###. ###	To display 3 digits after the decimal point, select “###.###” for “instantaneous decimal point position”.
Totalized value display coefficient [TotDispCoef]	7.50000×10^{-6}	**(Setting for totalize flow rate display)** Set flowrate per 1 pulse as totalize display coefficient ・Although totalize flow rate will be displayed in [kℓ], the rating of the sensor is 7.5[mL/Pulse], it should be converted to7.5×10^{-6}[kℓ/Pulse]. ・Set the “Totalize display factor” as “**7.50000×10^{-6}**”
Totalized value decimal point position [TotDecPoint]	####. ##	To display 2 digits after the decimal point, select “####. ##” for “totalized decimal point position”.

- Setting method of instantaneous display coefficient and Instantaneous Unit Time is shown below.
Setting procedures for other setting variables are same.
(Same operation is also applied to the pulse input B.)



Moves to setting display(1st layer)by MENU key.

Moves to 2nd layer by right arrow key.

Moves to 3rd layer by right arrow key.

Moves to instantaneous display coefficient by down arrow key.

Moves to 4th layer by right arrow key.

Moves to numerical value setting display by ENTER key.

Selects numerical value by arrow keys (up/down/left/right)

Registers selected numerical value by ENTER key.

Returns to 3rd layer by left arrow key.

Moves to instantaneous unit time by down arrow key.

Moves to 4th layer by right arrow key.

Moves to minute by down arrow key.

Registers selected setting value by ENTER key.

Returns to 3rd layer by left arrow key.

Returns to 2nd layer by left arrow key.

Stores selected parameters and returns measurement display by MENU key.

2) Example 2

Using a sensor (Voltage output type) which outputs 15 [Hz] for 90[ℓ/min], instantaneous flow rate will be displayed in [ℓ/sec] without a decimal point and total flow volume will be displayed in [kℓ] without a decimal point.

3rd layer (Setting variables)	4th layer (Setting values)	Descriptions for setting examples
Input type [InputType]	logic	The sensor is voltage output type, therefore select "LOGIC" for "input type".
Instantaneous value display coefficient [InsDispCoef]	1.00000×10^{-1}	(Setting for instantaneous flow rate display) Set flowrate per 1 pulse as "instantaneous display coefficient". ・Calculate number of pulses per 1 [ℓ]. The sensor outputs pulses of 15[Hz] at 90[ℓ/min], therefore, (15×60)/90＝10[Pulse/ℓ] . ・Calculate flowrate par 1 pulse. Number of pulses per 1 litter is 10[Pulse/ℓ], therefore, 1/10＝1×10^{-1}[ℓ/Pulse]. ・Set "1.00000×10^{-1}" for the "instantaneous value display coefficient". * Any of "1.00000×10^{-1}", "0.10000×10^{0}" and "0.01000×10^{1}" for the "instantaneous value display coefficient" bring same results.
Instantaneous Unit Time [InsUnitTime]	sec	Unit to display is [ℓ/sec], therefore, select "Sec" for the "instantaneous unit time".
instantaneous decimal point position [InsDecPoint]	######	Displays without decimal point, therefore select "######" for Instantaneous value decimal point position
Totalized value display coefficient [TotDispCoef]	1.00000×10^{-4}	(Setting for the totalized value display) As setting of the totalized value display coefficient, set flow volume per 1 pulse. ・The totalized value is displayed in [kℓ], therefore convert 1×10^{-1} [ℓ/Pulse] to 1×10^{-4}[kℓ/Pulse]. ・Set " 1.00000×10^{-4}" for the totalized value display coefficient
Totalized value decimal point position [TotDecPoint]	######	Displays without decimal point, therefore select "######" for Totalized value decimal point position

*Setting procedures are same as Example 1. Refer to example 1.

3) Example 3

Detecting pulses from a gear wheel which generates 5 pulses per 1 round by proximity switch (open collector output), displays the revolving speed in [rpm].

3rd layer (Setting variables)	**4th layer (Setting values)**	**Descriptions for setting examples**
Input type [InputType]	Open collector	The sensor is an NPN open collector type, therefore “open collector” should be selected as the input type.
Instantaneous value display coefficient [InsDispCoef]	2.00000×10^{-1}	(Setting for Instantaneous flow rate display) For setting of Instantaneous display coefficient, number of rotation per 1 pulse is needed. ・Calculate the number of rotation per 1 pulse. Because of 5 [Pulse] per 1 round, therefore, $1/5=2\times10^{-1}$[round] ・Set ” **2.00000×10^{-1}**” as the Instantaneous display coefficient
Instantaneous Unit Time [InsUnitTime]	MINUTE	Unit to display is [rpm], therefore, select “MINUTE” for the instantaneous unit time.
instantaneous decimal point position [InsDecPoint]	######	Displays without decimal point, therefore select “######” for Instantaneous value decimal point position
totalized value display coefficient	1.00000×10^{5}	（Setting for totalized flow rate display） The totalize function is not used, therefore, the setting in not needed.
Totalizes value decimal point position	######	The totalize function is not used, therefore, the setting in not needed.

*Setting procedures are same as Example 1. Refer to example 1.

9－4－1－6. Set Units for Instantaneous Value Display and Totalized Value Display

Units for the instantaneous value display and the totalized value display can be set separately.
The WPMZ has 62 selectable units. If you cannot find a suitable unit among them, you can compose custom unit up to 6 characters.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meanings of setting values
Instantaneous value display unit [InsDispUnit]	None, μA,mA,A,kA, μV,mV,V,kV,VA, W,kW,MW, μm,mm,cm,m, Ω,kΩ,MΩ, g,kg, N,kN,MN, Pa,kPa,MPa,hPa, J,kJ,MJ, Hz,kHz,MHz, m^3, mm/s,mm/min, cm/min, m/s,m/min,m/h,m/s^2, m^3/s,m^3/min,m^3/h, kg/h,kg/m^2,kg/m^3, N/m^2, ℓ,ℓ/s,ℓ/min,ℓ/h, %,‰,%RH,°C, pH,ppm,rpm,t,inch, custom unit	None	Set unit for instantaneous value display.
Totalized value display unit [TotDispUnit]	None, μA,mA,A,kA, μV,mV,V,kV,VA, W,kW,MW, μm,mm,cm,m, Ω,kΩ,MΩ, g,kg, N,kN,MN, Pa,kPa,MPa,hPa, J,kJ,MJ, Hz,kHz,MHz, m^3, mm/s,mm/min, cm/min, m/s,m/min,m/h,m/s^2, m^3/s,m^3/min,m^3/h, kg/h,kg/m^2,kg/m^3, N/m^2, ℓ,ℓ/s,ℓ/min,ℓ/h, %,‰,%RH,°C, pH,ppm,rpm,t,inch, custom unit	None	Set unit for totalized value display.

⚠CAUTION

If you choose the custom unit, define the unit in the 5th layer.
Characters which can be used in custom unit are alphabets “a” to “z”, “A” to “Z” and marks.
（marks：[,],(,),$_1$,$_2$,$_3$,^{1},^{2},^{3},$^-$,μ,Ω,g,･,/,ℓ,%,‰,°,’,”)

【Display unit setting example】

1) Example 1

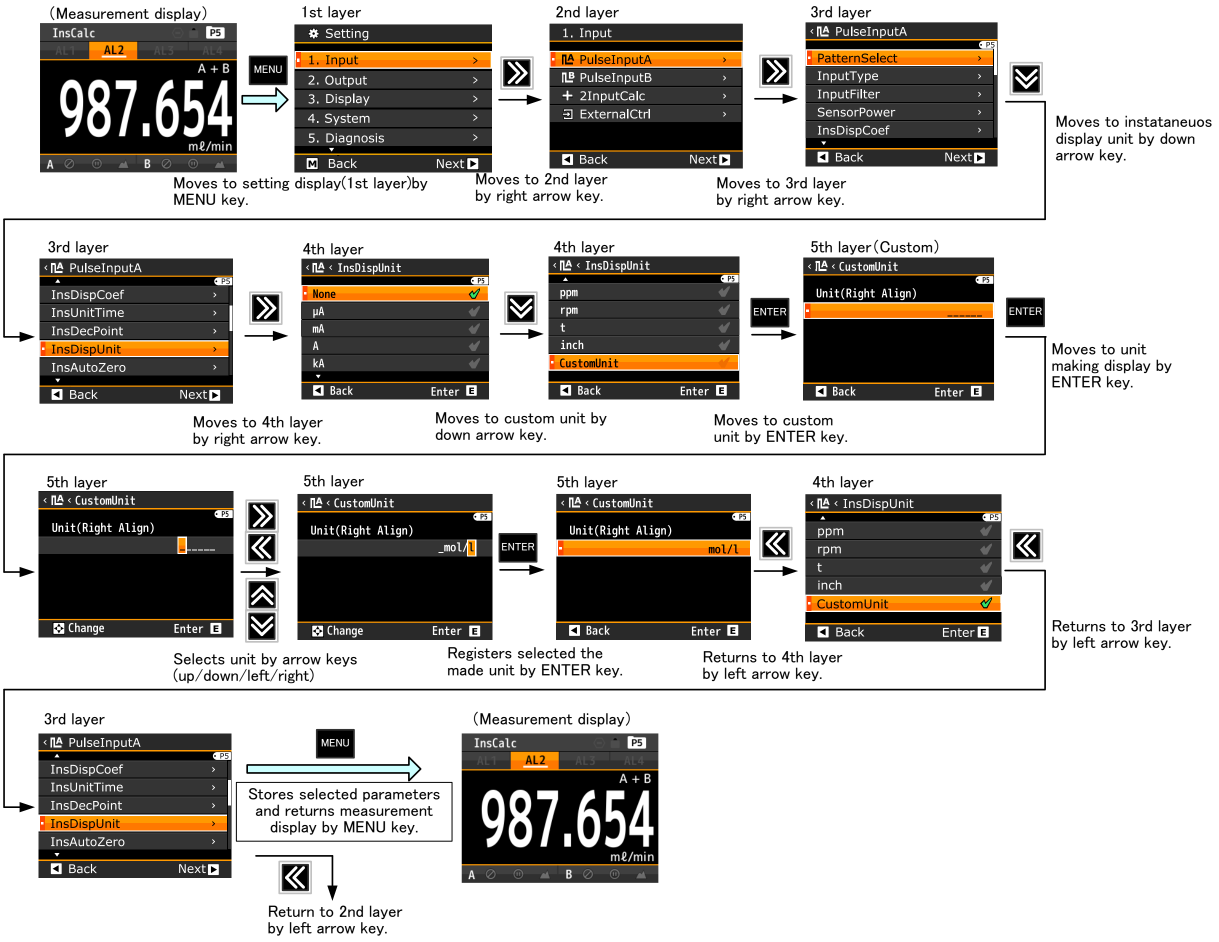
The method for setting the display unit of Instantaneous value to “ℓ/min” is shown below. (Same operation is also applied to the pulse input B.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)** key”, point the cursor to “**Pulse input A**” and push “**ARROW (RIGHT)** key”, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Instantaneous display unit**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**ℓ/min**”. *Select a proper unit for your use.
⑥	Pushing **“ENTER”** key, selected parameter becomes valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note : If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

2) Example 2

As the display unit for the totalized value, steps of making a custom unit of “mol/l” are shown below. (Same steps are also applied to the pulse input B.)

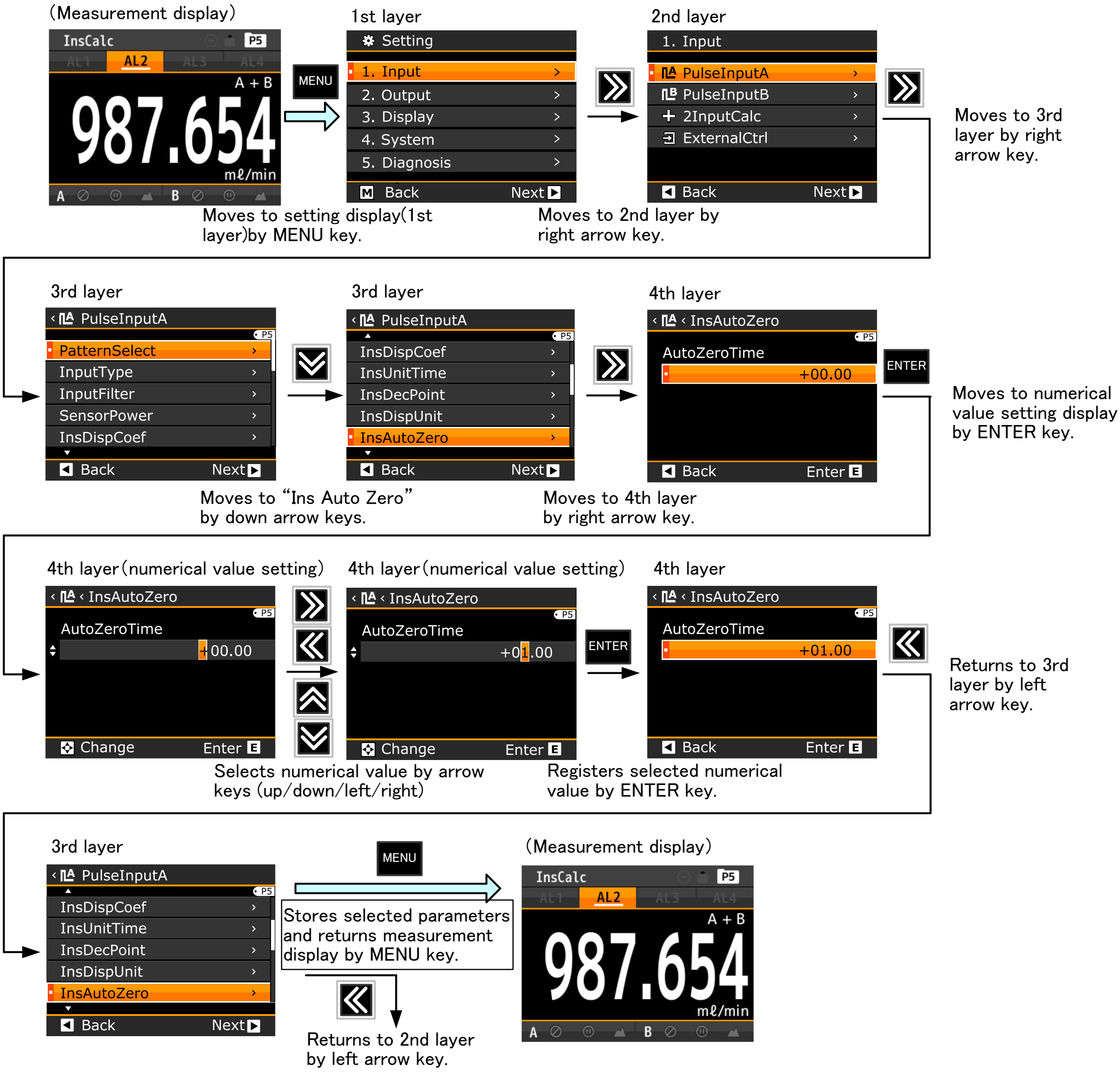


9－4－1－7. Setting Time for Instantaneous Value Set to Zero

As input gets closer to 0 Hz, the pulse period gets longer, and the displayed value is not updated waiting a pulse input.
If a pulse is not detected before setting time, judging no input, the displayed value becomes "0".

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Instantaneous value auto zero [InsAutoZero]	00.00 to 99.99s	00.00s	Set waiting time for input pulse. *The unit is “Second”. By setting to 0.00, the function is disabled.

●How to set the waiting time for input pulse (Instantaneous value auto zero) to 1 second is shown below. (Same operation is also applied to the pulse input B.)



Moves to setting display(1st layer)by MENU key.

Moves to 2nd layer by right arrow key.

Moves to 3rd layer by right arrow key.

Moves to “Ins Auto Zero” by down arrow keys.

Moves to 4th layer by right arrow key.

Moves to numerical value setting display by ENTER key.

Selects numerical value by arrow keys (up/down/left/right)

Registers selected numerical value by ENTER key.

Returns to 3rd layer by left arrow key.

Stores selected parameters and returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

9－4－1－8. Stabilizing Instantaneous Value Display (Instantaneous Value Moving Average)

This setting variable set the number of moving average for input pulse.
Instantaneous value of an impeller which has a difference to the installation angles of the blades is not stable. To reduce it, the number of moving average for the number of the blades can be set.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Instantaneous Value Moving Average [InsMoveAve]	None	*	Sets the number of moving average for input pulse.
	2times		
	3times		
	4times		
	5times		
	6times		
	7times		
	8times		
	9times		

●A method to set the moving average to “5 times” is shown below.
(Same operation is also applied to the pulse input B.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)** key”, point the cursor to “**Pulse input A**” and push “**ARROW (RIGHT)** key”, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Instantaneous value moving average**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**5 times**”. *Select a parameter in conformity with the actual condition of use.
⑥	By pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *By pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note: If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－4－1－9. Stabilizing Instantaneous Value Display (Instantaneous Value Simple Average)

The simple average is not an average of input pulses but an average in multiple internal sampling periods (calculation periods).

⚠CAUTION

Internal sampling period (calculation period) is 10 ms. Each of this period, comparative outputs, analog output and BCD outputs are outputted.
*If Instantaneous Value Simple Average are set to 2 to 256, PC signal of BCD outputs (synchronization signal of BCD data) is output in 10ms period.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Instantaneous value simple average [InsSimpleAve]	None	*	No average. Update interval of data is 10ms.
	2times		Update interval of data is 20ms.
	4 times		Update interval of data is 40ms.
	8times		Update interval of data is 80ms.
	16 times		Update interval of data is 160ms.
	32times		Update interval of data is 320ms.
	64 times		Update interval of data is 640ms.
	128 times		Update interval of data is 1.28s.
	256times		Update interval of data is 2.56s.

●A method to set the simple average to “32 times” is shown below.
(Same operation is also applied to the pulse input B.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)** key”, point the cursor to “**Pulse input A**” and push “**ARROW (RIGHT)** key”, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Instantaneous value simple average**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**32times**”. *Select a parameter in conformity with the actual condition of use.
⑥	By pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *By pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

９－４－１－１０. Stabilizing Instantaneous Value Display (Instantaneous Value Display Step)

By adjusting the LSD (least significant digit) of instantaneous display value, drift of the displayed value is suppressed.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Instantaneous value display step [InsDispStep]	None	*	LSD 0 to 9 (No adjusting)
	5steps		LSD 0 or 5 Adjusts 0-4 to "0" and 5-9 to "5".
	10steps		LSD 0 Adjusts 0-9 to "0" * LSD is fixed to "0".

●A method to set the display step to "10 steps" is shown below. (Same operation is also applied to the pulse input B.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)** key", point the cursor to "**Pulse input A**" and push "**ARROW (RIGHT)** key", then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Instantaneous display step**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**10steps**". *Select a step number in conformity with the actual condition of use.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－4－1－11. Setting Initial Value of Totalized Value Display

This setting variable sets the initial value of totalized value display.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Totalized value defaults [TotDefaults]	±9.99999×$10^{-9 \sim 9}$	0.00000×10^0	Sets Initial value for totalized value display. Setting of "0.00000×10^{+0}" makes "0" display. Setting of "1.00000×10^{+2}" makes "100" display.

●A method to set the initial value for totalized value to "10" is shown below.
(Same operation could be applied to the pulse input B.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)** key", point the cursor to "**Pulse input A**" and push "**ARROW (RIGHT)** key", then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Totalized value Default value**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	Pushing **"ENTER"** key, move to numerical value setting display.
⑥	Using the "**ARROW (UP/DOWN/LEFT/RIGHT)**" keys, set setting value to "**+1.00000×10^{+1}**". * Set desired initial value for your use in actually.
⑦	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑧	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note : If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－4－1－12. Setting Addition or Subtraction for the Totalized Value

This setting variable determines whether addition to initial value or subtraction from initial value.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Total calculation direction [TotDirection]	Add to default [AddToDefault]	*	Totalized value calculation is performed by adding to default value.
	Subtract from default [SubFromDefault]		Totalized value calculation is performed by subtracting from default value.

●A method of setting the total calculation direction to subtraction is shown below. (Same operation could be applied to the pulse input B.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)** key", point the cursor to "**Pulse input A**" and push "**ARROW (RIGHT)** key", then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Total calculation direction**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Subtract from default**". *Select a direction in conformity with the actual condition of use.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note：<u>If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.</u>

９－４－１－１３. Select Count Method of Totalized Value Overrun

This setting variable determines the method of counting to the overrun (i.e. overflow) of the totalized value.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Totalized value overrun count [TotOverCount]	None	*	When the totalized count value excesses 999999, the display indicates OVER.
	999times		When the totalized count value exceeds 999999, the number of times of overruns is increased by one by resetting the totalized count value to zero. When the totalized count value excesses 999999 999times, the display indicates OVER. The number of times of overruns is indicated at the upper left of totalized value in small size characters.
	Endless		When the totalized count value excesses 999999 999times, the number of times of overruns is cleared and the totalized count restarts from initial value.

● Setting steps to set the totalized value overrun count to “999 times” be shown below. (The same steps could be applied to the pulse input B.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)** key”, point the cursor to “**Pulse input A**” and push “**ARROW (RIGHT)** key”, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Totalized value overrun count**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**999 times**”. *Select a parameter in conformity with the actual condition of use.
⑥	By pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *By pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

９－４－２. ANALOG INPUT A / ANALOG INPUT B

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Select a pattern number to configure settings	Pattern select	page57
Select input range	Input range	page 58
Select voltage of power for the sensor.	Sensor power	page 59
Set input low cut function.	Input low cut	page 60
Set input correction function.	Input correct	page 61
	Linearize point	
Set scaling functions for instantaneous value and totalized value.	Instantaneous value display coefficient	page 65
	Instantaneous value decimal point position	
	Totalized value display coefficient	
	Totalized value decimal point position	
Set units for instantaneous value display and totalized value display.	Instantaneous value display unit	page 67
	Totalized value display unit	
Set functions which stabilize the instantaneous value display.	Instantaneous value moving average	page 69
	Instantaneous value simple average	
	Instantaneous value display step	
Set initial value of totalized value display.	Totalized value default value	page 72
Select totalizing direction (addition or subtraction) for totalized value.	Total calculation direction	page 73
Select count method of overflow of totalized value.	Totalized value overflow count	page 74

９－４－２－１. Select a Pattern Number to Configure Settings

This product can memorize 8 patterns (8 kinds) of parameters including input settings (pulse input A/B, analog input A/B, 2-input calculation), output settings and display settings.
In measurement mode, the product calculates using one of 8 patterns which are configured.
This setting selects the pattern number which a configuration is performed.

⚠ CAUTION

The pattern number is common to input settings, output settings and display settings.
Please pay attention to the target pattern number which the following "Analog Input" configuration is performed to.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Pattern select [PatternSelect]	Pattern1	Pattern number which is selected in measurement mode.	Performs a configuration to pattern No.1
	Pattern2		Performs a configuration to pattern No.2
	Pattern3		Performs a configuration to pattern No.3
	Pattern4		Performs a configuration to pattern No.4
	Pattern5		Performs a configuration to pattern No.5
	Pattern6		Performs a configuration to pattern No.6
	Pattern7		Performs a configuration to pattern No.7
	Pattern8		Performs a configuration to pattern No.8

●Setting steps to set pattern number to "Pattern8" are shown below.
(The same steps could be applied to the analog input B.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"1.INPUT"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Analog input A"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Pattern select"** and push "**ARROW (RIGHT)**" key, then the display moves to the 4th layer (setting values). *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Patern8"** * Select the pattern number which you need to be configured.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note : **If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.**

9－4－2－2. Select Input Range

This setting variable selects a suitable input type for the sensor you use.

3rd layer Setting variable	**4th layer Setting values**	**Initial value**	**Meanings of setting values**
Input type [InputType]	0 ~ 5V		Measurement range: 0 to 5V
	1 ~ 5V		Measurement range: 1 to 5V
	0 ~ 10V		Measurement range: 0 to 10V
	4 ~ 20mA	*	Measurement range: 4 to 20mA
	0 ~ 20mA		Measurement range: 0 to 20mA

● Setting steps to set the input type to "1 ~ 5V" are shown below.
(Same steps could be applied to the analog input B.)

No.	**Descriptions**
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"1.INPUT"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Analog input A"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Input type"** and push "**ARROW (RIGHT)**" key, then the display moves to the 4th layer (setting values). *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"1 ~ 5V"** *Select a suitable input type for the sensor which you connect to WPMZ actually.
⑥	By pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *By pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note: If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－4－2－3. Select Voltage of Power for the Sensor

This setting variable selects voltage of the power source which is supplied to the sensor.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Sensor power [SensorPower]	12V	*	Supplies DC12V（100mA max） to the sensor. *In the case of 2ch inputs, arrowable current for both chA and chB is 100mA max.
	24V		Supplies DC24 V（50mA max） to the sensor. *In the case of 2ch inputs, arrowable current for both chA and chB is 50mA max.

⚠CAUTION

○When the setting of the sensor power is changed, measurement function is inhibit for approx. 1 second after returning measurement mode.

○In the case of combination of DC12V and DC24V, maximum arrowable power is 1.2W

●A method to select "DC24V" as sensor power is shown below.
（Same operation could be applied to the analog input B.）

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Analog input A"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Sensor Power"** and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting values)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"24V"** *Select suitable voltage for the sensor in use.
⑥	By pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *By pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note：**If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.**

9－4－2－4. Set Input Low Cut Function

This function eliminates floating input near zero level and let display value to zero for input under setting value in %.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Input low cut [InputLowCut]	0.000 to 99.999%	0.500%	Sets input level to shut down in % value.

⚠CAUTION

○For analog input products, processing of the input low cut function is performed after the calculation process of the digital zero function (see page 169).

A method for shutdown input value to "5%"is displayed below.
(Same operation could be applied to the analog input B.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Analog input A"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"InputLowCut"** and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting values)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	Pushing **"ENTER"** key, move to numerical value setting display.
⑥	Using the "**ARROW (UP/DOWN/LEFT/RIGHT)**" keys, set setting value to "**5.00**". * Set desired value of input % in actually.
⑦	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑧	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note：**If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.**

９－４－２－５. Set Input Correction Function（Linear Correction Function）

As input correction function, this product has linearize correction and square route correction.
* Please refer to page 63 for the characteristic setting of linearize.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Input Correction Function [InputCorrect]	Non	*	No Input correction
	Linearize		Select linearize correction
	SquareRoot		Select square root correction

⚠CAUTION

Calculation processing of the input correction function is performed after calculation processing of the input low cut function.

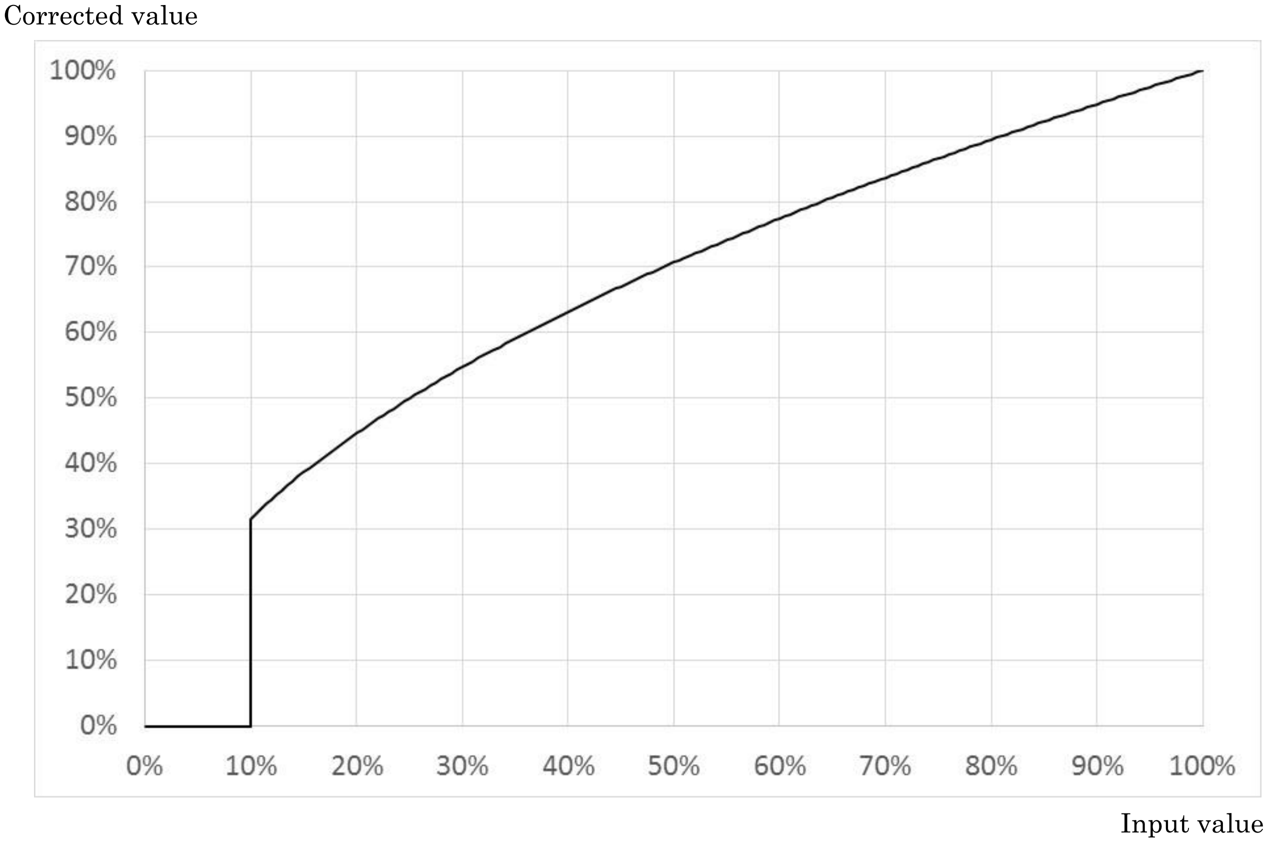
● A method to select the linearize correction is shown below.
(Same operation could be applied to the analog input B.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)** key", point the cursor to "**AnalogInputA**" and push "**ARROW (RIGHT)** key", then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**InputCorrect**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**linearize**".
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note：<u>If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.</u>

● Selecting the input correction [SquareRoot], square root calculation is performed on the input value, and the correction as shown below in performed

* The figure below shows the correction characteristics when input low cut function (see page 60) is set to 10%.



９－４－２－６. Set Linearize（Linearize Point）

21 points of linearize settings are available.
Each setting needs 2 settings of input value % (input value before correction) and output value % (input value after correction).

⚠CAUTION

After 2nd point, “0.00” is set on both of input value % and output value %, it is recognized as end, and the following points are invalid.

3rd layer (Setting variables)	4th layer (Setting values)	Initial values	Meanings of setting values
Linearize Points [LinearizePoint]	0.00 to 100.00%	0.00	1st point input value (Input value of 1st point before correction)
	0.00 to 100.00%	0.00	1st point output value (Input value of 1st point after correction)
	0.00 to 100.00%	5.00	2nd point input value (Input value of 2nd point before correction)
	0.00 to 100.00%	5.00	2nd point output value (Input value of 2nd point after correction)
	0.00 to 100.00%	10.00	3rd point input value (Input value of 3rd point before correction)
	0.00 to 100.00%	10.00	3rd point output value (Input value of 3rd point after correction)
	0.00 to 100.00%	15.00	4th point input value (Input value of 4th point before correction)
	0.00 to 100.00%	15.00	4th point output value (Input value of 4th point after correction)
	0.00 to 100.00%	20.00	5th point input value (Input value of 5th point before correction)
	0.00 to 100.00%	20.00	5th point output value (Input value of 5th point after correction)
	0.00 to 100.00%	25.00	6th point input value (Input value of 6th point before correction)
	0.00 to 100.00%	25.00	6th point output value (Input value of 6th point after correction)
	0.00 to 100.00%	30.00	7th point input value (Input value of 7th point before correction)
	0.00 to 100.00%	30.00	7th point output value (Input value of 7th point after correction)
	0.00 to 100.00%	35.00	8th point input value (Input value of 8th point before correction)
	0.00 to 100.00%	35.00	8th point output value (Input value of 8th point after correction)
	0.00 to 100.00%	40.00	9th point input value (Input value of 9th point before correction)
	0.00 to 100.00%	40.00	9th point output value (Input value of 9th point after correction)
	0.00 to 100.00%	45.00	10th point input value (Input value of 10th point before correction)
	0.00 to 100.00%	45.00	10th point output value (Input value of 10th point after correction)
	0.00 to 100.00%	50.00	11th point input value (Input value of 11th point before correction)
	0.00 to 100.00%	50.00	11th point output value (Input value of 11th point after correction)
	0.00 to 100.00%	55.00	12th point input value (Input value of 12th point before correction)
	0.00 to 100.00%	55.00	12th point output value (Input value of 12th point after correction)
	0.00 to 100.00%	60.00	13th point input value (Input value of 13th point before correction)
	0.00 to 100.00%	60.00	13th point output value (Input value of 13th point after correction)
	0.00 to 100.00%	65.00	14th point input value (Input value of 14th point before correction)
	0.00 to 100.00%	65.00	14th point output value (Input value of 14th point after correction)
	0.00 to 100.00%	70.00	15th point input value (Input value of 15th point before correction)
	0.00 to 100.00%	70.00	15th point output value (Input value of 15th point after correction)
	0.00 to 100.00%	75.00	16th point input value (Input value of 16th point before correction)
	0.00 to 100.00%	75.00	16th point output value (Input value of 16th point after correction)
	0.00 to 100.00%	80.00	17th point input value (Input value of 17th point before correction)
	0.00 to 100.00%	80.00	17th point output value (Input value of 17th point after correction)
	0.00 to 100.00%	85.00	18th point input value (Input value of 18th point before correction)
	0.00 to 100.00%	85.00	18th point output value (Input value of 18th point after correction)
	0.00 to 100.00%	90.00	19th point input value (Input value of 19th point before correction)
	0.00 to 100.00%	90.00	19th point output value (Input value of 19th point after correction)
	0.00 to 100.00%	95.00	20th point input value (Input value of 20th point before correction)
	0.00 to 100.00%	95.00	20th point output value (Input value of 20th point after correction)
	0.00 to 100.00%	100.00	21st point input value (Input value of 21st point before correction)
	0.00 to 100.00%	100.00	21st point output value (Input value of 21st point after correction)

●A method to set the 2nd point input value to "3.15%" and the 2nd point output value to "4.05%" is shown below.
(Same operation could be applied to the analog input B.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" keys, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)** keys", point the cursor to "**Analog input A**" and push "**ARROW (RIGHT)** key", then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" keys, point the cursor to "**Linearize Points**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" keys, point the cursor to setting value of "**1st point input value"** and push **"ENTER"** key to move to numerical value setting display.
⑥	Using "**ARROW (UP/DOWN/LEFT/RIGHT)**"keys, set the setting value to **"3.15".** *Set it to a desired value in input % in actually.
⑦	By pushing **"ENTER"** key, the set value is fixed. By moving the cursor with "**ARROW (UP/DOWN)**" keys, point the cursor to setting value of "**2nd point output value"** and push **"ENTER"** key to move to numerical value setting display.
⑧	Using "**ARROW (UP/DOWN/LEFT/RIGHT)**" keys, set the setting value to **"4.05".** *Set it to a desired value in output % in actually.
⑨	By pushing **"ENTER"** key, the set value is fixed. *Pushing "**ARROW (LEFT)**"key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑩	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－４－２－７. Set Scaling Functions for Instantaneous Value and Totalized Value.

These setting variables are used for the scaling setting needed in the flow measurement.

3rd layer Setting variables	4th layer Setting values	Initial value	Meanings of setting values
Instantaneous value display coefficient [InsDispCoef]	0.00000 to $9.99999\times10^{-5\sim5}$	1.00000×10^4	Scaling setting for instantaneous display. For scaling setting of instantaneous value display, multiply frequency by instantaneous coefficient and unit time.
Instantaneous value decimal point position [nsDecPoint]	#####	#####	Set number of digits after decimal point for instantaneous display.
	####. #		
	###. ##		
	##. ###		
	#. ####		
Totalized value display coefficient [TotDispCoef]	0.00000 to $9.99999\times10^{-9\sim9}$	1.00000×10^5	Scaling setting for totalized value display.
Totalized value decimal point position [TotDecPoint]	######	######	Set number of digits after decimal point for totalized values display.
	#####. #		
	####. ##		
	###. ###		
	##. ####		
	#. #####		

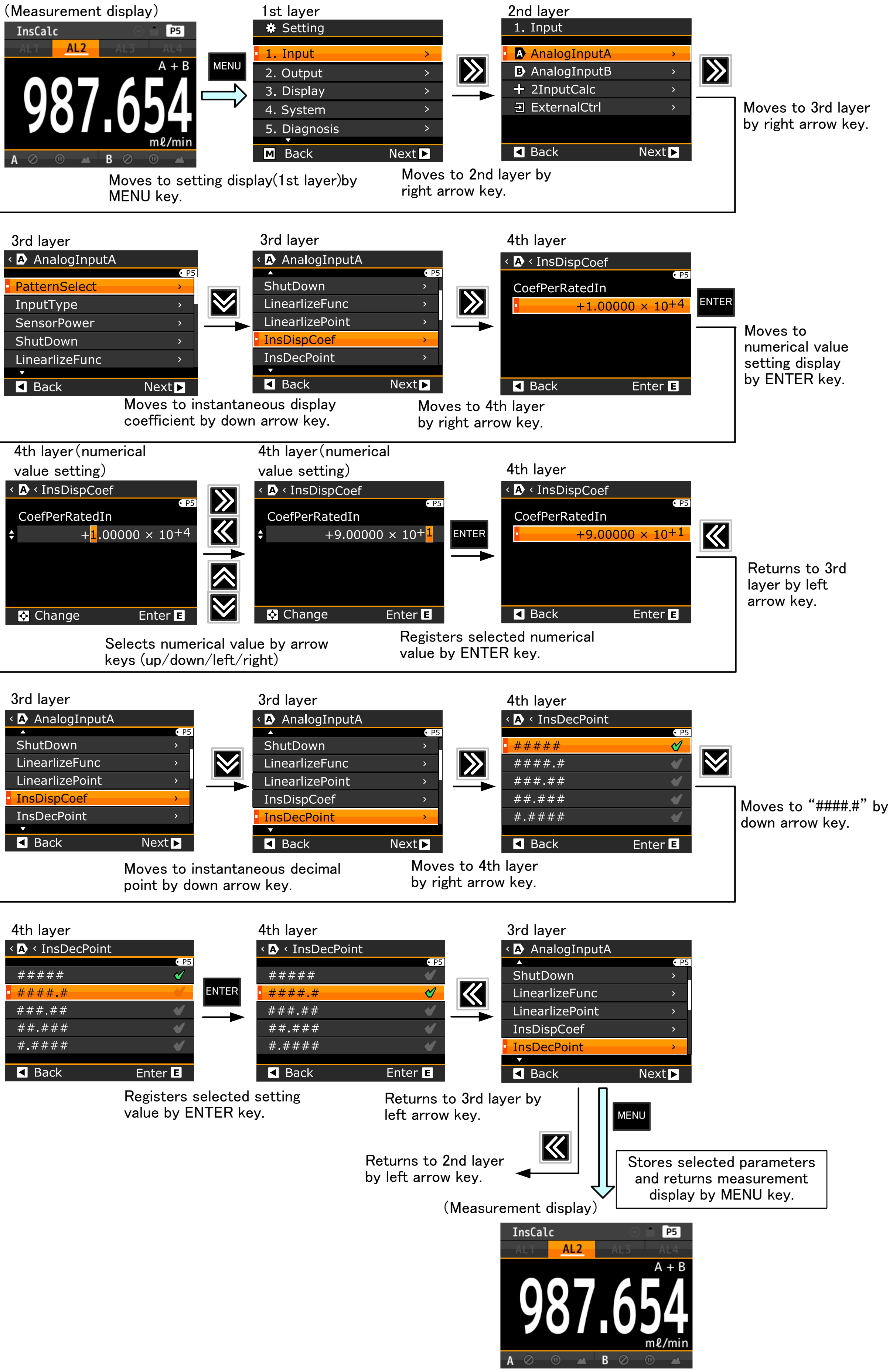
【Scaling setting example】

1） **Setting Example 1**

Using a sensor outputs 4-20 [mA] for flowrate of 0-90[ℓ/min], display instantaneous flow rate in [ℓ/min] with 1 decimal place and totalized value in [kℓ] with 3 decimal places.

3rd layer (Setting variables)	4th layer (Setting values)	Descriptions for setting examples
Input Type	4 to 20mA	The sensor outputs 4to 20[mA], therefore select “**4 to 20mA**” for input type
Instantaneous value display coefficient	9.00000×10^1	**（Setting for instantaneous flow rate display）** As setting of instantaneous display coefficient, set flow rate at 20 [mA] output. ・The sensor outputs 20 [mA] at 90 [ℓ/min], therefore set **9.00000×10^1** as instantaneous display coefficient.
Instantaneous value decimal point position	####. #	To display to one decimal place, select “####. # ” for Instantaneous value decimal point position
Totalized value display coefficient	5.40000×10^0	**（Setting for totalized value display）** As setting of totalized value display coefficient, set flow volume for 1 hour of 20 [mA] input. ・The sensor outputs 20[mA] at 90[ℓ/min], therefore the flow volume after 1 hour work is 90×60＝5400[ℓ], the unit to display is [kℓ], therefore the setting value is 5.4[kℓ] ・Set ” **5.40000×10^0**” for the totalized value display coefficient
Instantaneous value decimal point position	###. ###	To display to three decimal places, select “##. ### ” for Instantaneous value decimal point position

- The steps to set instantaneous value display coefficient and instantaneous value decimal point position are shown below.
  For other setting variables, same steps are applied.
  (Same steps could be also applied to the analog input B.)



Moves to setting display(1st layer)by MENU key.

Moves to 2nd layer by right arrow key.

Moves to 3rd layer by right arrow key.

Moves to instantaneous display coefficient by down arrow key.

Moves to 4th layer by right arrow key.

Moves to numerical value setting display by ENTER key.

Selects numerical value by arrow keys (up/down/left/right)

Registers selected numerical value by ENTER key.

Returns to 3rd layer by left arrow key.

Moves to instantaneous decimal point by down arrow key.

Moves to 4th layer by right arrow key.

Moves to "####.#" by down arrow key.

Registers selected setting value by ENTER key.

Returns to 3rd layer by left arrow key.

Returns to 2nd layer by left arrow key.

Stores selected parameters and returns measurement display by MENU key.

９－４－２－８. Set Units for Instantaneous Value Display and Totalized Value Display

Units for the instantaneous value display and the totalized value display can be set separately. This product has 62 selectable units. If you cannot find a suitable unit among them, you can compose custom unit up to 6 characters.

3rd layer (Setting variables)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Instantaneous value display unit [InsDispUnit]	None, μA,mA,A,kA, μV,mV,V,kV,VA, W,kW,MW, μm,mm,cm,m, Ω,kΩ,MΩ, g,kg, N,kN,MN, Pa,kPa,MPa,hPa, J,kJ,MJ, Hz,kHz,MHz, m^3, mm/s,mm/min, cm/min, m/s,m/min,m/h,m/s^2, m^3/s,m^3/min,m^3/h, kg/h,kg/m^2,kg/m^3, N/m^2, ℓ,ℓ/s,ℓ/min,ℓ/h, %,‰,%RH,°C, pH,ppm,rpm,t,inch, custom unit	None	Set unit for instantaneous value display.
Totalized value display unit [TotDispUnit]	None, μA,mA,A,kA, μV,mV,V,kV,VA, W,kW,MW, μm,mm,cm,m, Ω,kΩ,MΩ, g,kg, N,kN,MN, Pa,kPa,MPa,hPa, J,kJ,MJ, Hz,kHz,MHz, m^3, mm/s,mm/min, cm/min, m/s,m/min,m/h,m/s^2, m^3/s,m^3/min,m^3/h, kg/h,kg/m^2,kg/m^3, N/m^2, ℓ,ℓ/s,ℓ/min,ℓ/h, %,‰,%RH,°C, pH,ppm,rpm,t,inch, custom unit	None	Set unit for totalized value display.

⚠ CAUTION

If you choose the custom unit, define the unit in the 5th layer.
Characters which can be used in custom unit are alphabets “a” to “z”, “A” to “Z” and marks.
（marks：[,],(,),$_1$,$_2$,$_3$,^{1},^{2},^{3},$^-$,μ,Ω,g,･,/,ℓ,%,‰,°,’,”）

【Display Unit Setting Example】

1) Example 1

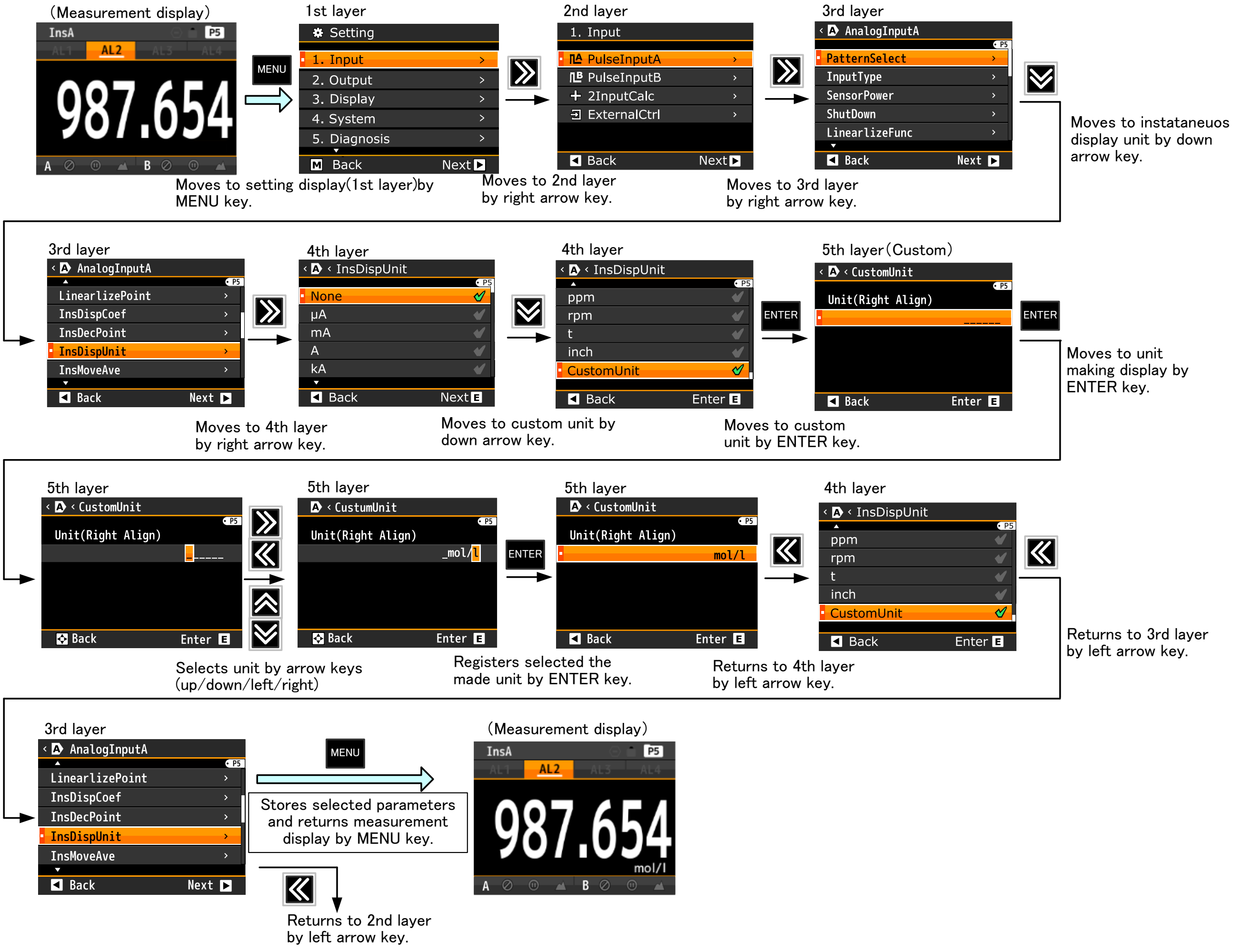
The steps to set the display unit of instantaneous calculation result to “ℓ/min” are shown below. (Same steps are also applied to the setting of the display unit of total calculation result.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN) key**”, point the cursor to **“2-Input Calculation”** and push “**ARROW (RIGHT)** key”, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Instantaneous value display unit**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**ℓ/min**”. *Select a proper unit for your usage in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note : <u>If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.</u>

2) Example 2

As the display unit for the totalized value, steps of making a custom unit of “mol/l” are shown below. (Same steps are also applied to the analog input B.)



Moves to setting display(1st layer)by MENU key.

Moves to 2nd layer by right arrow key.

Moves to 3rd layer by right arrow key.

Moves to instataneuos display unit by down arrow key.

Moves to 4th layer by right arrow key.

Moves to custom unit by down arrow key.

Moves to custom unit by ENTER key.

Moves to unit making display by ENTER key.

Selects unit by arrow keys (up/down/left/right)

Registers selected the made unit by ENTER key.

Returns to 4th layer by left arrow key.

Returns to 3rd layer by left arrow key.

Stores selected parameters and returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

9－4－2－9. Set Functions Which Stabilize the Instantaneous Value Display (Instantaneous Moving Average)

This setting variable sets a number of times of moving average which is performed to sampling values after simple average.
The moving average is a function which brings filter effect without decreasing of sampling rate.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Instantaneous Value Moving Average [InsMoveAve]	None	*	No moving average（No delay）
	2times		Moving average 2 times （With delay of 1 sampling period）
	3 times		Moving average 3 times （With delay of 2 sampling periods）
	4 times		Moving average 4 times （With delay of 3 sampling periods）
	5 times		Moving average 5 times （With delay of 4 sampling periods）
	6 times		Moving average 6 times （With delay of 5 sampling periods）
	7 times		Moving average 7 times （With delay of 6 sampling periods）
	8 times		Moving average 8 times （With delay of 7 sampling periods）
	9 times		Moving average 9 times （With delay of 8 sampling periods）

● Setting steps which set the moving average to “5 times” are shown below.
（The same steps could be also applied to the analog input B.）

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)** key”, point the cursor to “**Analog input A**” and push “**ARROW (RIGHT)** key”, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Instantaneous Moving Average**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**5 times**”. *Select a proper number of times for your use.
⑥	Pushing **“ENTER”** key, selected parameter becomes valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－4－2－10. Set Functions Which Stabilize the Instantaneous Value Display (Instantaneous Simple Average)

This setting variable sets a number of times of simple average to the input signal.
The sampling speed is controlled as simple average of inner sampling (100times/sec).

⚠CAUTION

In the cases that the measured signal varies slowly or this product is used under a circumstance which is influenced by noise strongly, small number of times of simple average (i.e. fast sampling speed) may cause fluctuations of display.

Comparative outputs, analog output and BCD output are output at this sampling speed.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Instantaneous Simple Average [IndSimpleAve]	None	*	No simple average（sampling 100 times /sec）
	2times		Simple average 2 times（sampling 50 times /sec）
	4 times		Simple average 4 times（sampling 25 times /sec）
	8 times		Simple average 8 times（sampling 12.5 times /sec）
	16 times		Simple average 16 times（sampling 6.25 times /sec）
	32 times		Simple average 32 times（sampling 3.13 times /sec）
	64 times		Simple average 64 times（sampling 1.56 times /sec）
	128 times		Simple average 128times（sampling 0.78times /sec）
	256 times		Simple average 256times（sampling 0.39times /sec）

●Setting steps which set the simple average to "32 times" are shown below.
(The same steps could be also applied to the analog input B.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)** key", point the cursor to "**Analog input A**" and push "**ARROW (RIGHT)** key", then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Instantaneous Simple Average**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. * In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**32 times**". * Select a proper number of times for your use.
⑥	Pushing **"ENTER"** key, selected parameter becomes valid and a check mark accompanies. * Pushing "**ARROW (LEFT)**"key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note: If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－４－２－１１. Set Functions Which Stabilize the Instantaneous Value Display (Instantaneous Value Display Step）

This function reduces the fluctuation of the displayed value by correcting the least significant digit (LSD) of it.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Instantaneous value display step [InsDispStep]	None	*	LSD 0 to 9 (No correction)
	5 steps		LSD 0，5 Correct 0 to 4 to "0", 5 to 9 to "5".
	10 steps		LSD 0 Correct 0 to 9 to "0"　　*LSD is fixed to "0"

- Setting steps to set display step to "10 steps" are shown below.
  (The same steps could be applied to the analog input B.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Analog input A"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Instantaneous Display Step"** and push "**ARROW (RIGHT)**" key, then the display moves to the 4th layer (setting values). *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"10 Steps"** *Select a proper steps for your use.
⑥	By pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *By pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note：**If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.**

９－４－２－１２. Set Initial Value of Totalized Value Display

This setting variable sets the initial value of totalized value display.

3rd layer (Setting variables)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Totalized value defaults [TotDefaults]	±9.99999×10$^{-9\sim 9}$	0.00000×10^{0}	Set initial value for totalized value. Setting of “0.00000×10^{0}” is equivalent to ”0” Setting of ”1.00000×10^{2}” is equivalent to “100”

●Setting steps which set initial value of totalized value to “10” are shown below.
(The same steps could be applied to the analog input B.)

No.	**Descriptions**
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)** keys”, point the cursor to “**Analog input A**” and push “**ARROW (RIGHT)** key”, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” keys, point the cursor to “**Totalized value Default”** and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	Pushing **“ENTER”** key, move to numerical value setting display.
⑥	Using the “**ARROW (UP/DOWN/LEFT/RIGHT)**” keys, set setting value to “**+1.00000×10^{+1}**”. * Set desired initial value for your use in actually.
⑦	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑧	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note:If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

９－４－２－１３. Select Totalizing Direction (Addition or Subtraction) for Totalized Value

This setting variable selects addition to initial value or subtraction from initial value for totalized value calculation.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Total Calculation Direction [TotDirection]	Addition to initial value [AddToDefault]	*	Totalized value is calculated by adding to initial value.
	Subtraction from initial value [SubFromDefault]		Totalized value is calculated by subtracting from initial value.

●Setting steps to set total calculation direction to “Subtraction” are shown below.
(The same steps could be applied to the analog input B.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Analog input A”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Total Calculation Direction”** and push “**ARROW (RIGHT)**” key, then the display moves to the 4th layer (setting values). *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Subtract from Default”.** *Select the direction in use.
⑥	By pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *By pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note:If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

９－４－２－１４. Select Count Method of Overflow of Totalized Value.

This setting variable selects the method of overflow of totalized value.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Totalized value overrun count [TotOverCount]	None	*	When the totalized value overruns 999,999, indicated value shows "OVER".
	999times		When the totalized count value exceeds 999999, the number of times of overruns is increased by one by resetting the totalized count value to zero. When the totalized value overruns 999,999, 999 times, indicated value shows "OVER". The number of times of overflow is shown on upper left of the indicated value in small characters.
	Endless		When the totalized value overruns 999,999, the calculation restarts from initial value.

●The setting steps to set this item to "999 times" are shown below.
（The same steps could be applied to the analog input B.）

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)** key", point the cursor to "**Analog input A**" and push "**ARROW (RIGHT)** key", then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Totalized value overrun count**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**999times**". *Select a proper option for your usage.
⑥	Pushing **"ENTER"** key, selected parameter becomes valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－４－３. 2-INPUT CALCULATION

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Select a pattern number to configure settings	Pattern select [PatternSelect]	page76
Select Calculation Expression for 2-Input Instantaneous values	Expression for instantaneous values [InsExpression]	page 77
Set decimal point position of calculation result for instantaneous values	Instantaneous value decimal point position [InsDecPoint]	page 78
Set variation width for instantaneous calculation result	Instantaneous value display step [InsDispStep]	page 79
Select Calculation Expression for 2-Input Totalized values	Expression for totalized values [TotExpression]	page 80
Set decimal point position of calculation result for totalized values	Instantaneous value decimal point position [InsDecPoint]	page 81
Set units for instantaneous value display and totalized value display	Instantaneous value display unit	page 82
	Instantaneous value display unit	
Select count method of totalized value overrun	Totalized value overrun count	page 84

9－4－3－1. Select a Pattern Number to Configure Settings

This product can memorize 8 patterns (8 kinds) of parameters including input settings (pulse input A/B, analog input A/B, 2-input calculation), output settings and display settings.
In measurement mode, the product calculates using one of 8 patterns which are configured.
This setting selects the pattern number which a configuration is performed.

⚠ CAUTION

The pattern number is common to input settings, output settings and display settings.
Please pay attention to the target pattern number which the following "2-input Calculation" configuration is performed to.

3rd layer (Setting variable)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Pattern select [PatternSelect]	Pattern1	Pattern number which is selected in measurement mode.	Performs a configuration to pattern No.1
	Pattern2		Performs a configuration to pattern No.2
	Pattern3		Performs a configuration to pattern No.3
	Pattern4		Performs a configuration to pattern No.4
	Pattern5		Performs a configuration to pattern No.5
	Pattern6		Performs a configuration to pattern No.6
	Pattern7		Performs a configuration to pattern No.7
	Pattern8		Performs a configuration to pattern No.8

●Setting steps to set pattern number to "Pattern8" are shown below.

No.	**Descriptions**
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"2-Input Calculation"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Pattern select"** and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting values)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Patern8"** * Select the pattern number which you need to be configured.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note : **If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.**

9－4－3－2. Select Calculation Expression for 2-Input Instantaneous Value

This setting variable selects a calculation equation for instantaneous values of the A channel input and the B channel input.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Expression for instantaneous values [InsExpression]	None	*	No calculation
	AbsRatio (B/A)×100		Expression for absolute ratio
	ErrRatio (B/A-1)×100		Expression for error ratio
	Err B-A		Expression for error
	Dens (B/(A+B))×100		Expression for density
	SUM A+B		Expression for sum

⚠CAUTION

"A" in the calculation expressions denotes "A Channel Input" and "B" in the calculation expressions denotes "B Channel Input".
Please pay attention to the relationship of A and B in the calculation expressions.
*

●Setting steps which select expression for instantaneous values to "Dens (B/(A+B))×100" are shown below.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)** key", point the cursor to "**2 Input Calculation**" and push "**ARROW (RIGHT)** key", then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**InsExpression** (Expression for Instantaneous Values)" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Dens (B/(A+B))×100**". *Select a proper expression for your usage.
⑥	Pushing **"ENTER"** key, selected parameter becomes valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－４－３－３. Set Decimal Point Position of Calculation Result for Instantaneous Values

This setting variable selects position of decimal point of calculation result for instantaneous values.

3rd layer (Setting variable)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Instantaneous value decimal point position [InsDecPoint]	(For Pulse Input)		Set decimal point position of calculation result for instantaneous values.
	######	*	
	#####. #		
	####. ##		
	###. ###		
	##. ####		
	#. #####		
	(For Analog Input)		
	#####	*	
	####. #		
	###. ##		
	##. ###		
	#. ####		

●Setting steps to display the calculation result of instantaneous values down to 2 decimal points are shown below.

No.	**Descriptions**
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"2-Input Calculation"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Instantaneous value decimal point position** [InsDecPoint]**"** and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting values)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"####.##"** * Select the pattern number which you need to be configured. *Select a proper option for your usage.
⑥	Pushing **"ENTER"** key, selected parameter becomes valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－4－3－4. Set Variation Width for Instantaneous Calculation Result

This function reduces the fluctuation of the displayed value by correcting the least significant digit (LSD) of it.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Instantaneous value display step [InsDispStep]	None	＊	LSD 0 to 9 (No correction)
	5 steps		LSD 0，5 Correct 0 to 4 to “0”, 5 to 9 to “5”.
	10 steps		LSD 0 Correct 0 to 9 to “0” ＊LSD is fixed to “0”

●Setting steps to set display step to “10 steps” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2-Input Calculation”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables**).
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Instantaneous Display Step”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 4th layer (setting values).** *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“10 Steps”** *Select a proper steps for your use.
⑥	By pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *By pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－4－3－5. Select Calculation Expression for 2-Input Totalized Value

This setting variable selects a calculation equation for totalized values of the A channel input and the B channel input.

⚠CAUTION

"A" in the calculation expressions denotes "A Channel Input" and "B" in the calculation expressions denotes "B Channel Input".
Please pay attention to the relationship of A and B in the calculation expressions.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Expression for totalized values [TotExpression]	None	*	No calculation
	Add A+B		Expression for sum
	Sub B-A		Expression for difference

●Setting steps which select expression for totalized values to "SUM A+B" are shown below.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)** key", point the cursor to "**2 Input Calculation**" and push "**ARROW (RIGHT)** key", then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**TotExpression** (Expression for Totalized Values)" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Add A+B**". *Select a proper expression for your usage.
⑥	Pushing **"ENTER"** key, selected parameter becomes valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note: If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－4－3－6. Set Decimal Point Position of Calculation Result for Totalized Values

This setting variable selects position of decimal point of calculation result for totalized values.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Totalized value decimal point position [TotDecPoint]	######	*	Set decimal point position of calculation result for totalized values.
	#####. #		
	####. ##		
	###. ###		
	##. ####		
	#. #####		

●Setting steps to display the calculation result of totalized values down to 2 decimal points are shown below.

No	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**1.INPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"2-Input Calculation"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Totalized value decimal point position** [TotDecPoint]**"** and push "**ARROW (RIGHT)**" key, then the display moves to the 4th layer (setting values). *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"####.##"** * Select the pattern number which you need to be configured. *Select a proper option for your usage.
⑥	Pushing **"ENTER"** key, selected parameter becomes valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected parameters are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－4－3－7. Set Units for Instantaneous Value Display and Totalized Value Display

Units for the instantaneous value display and the totalized value display can be set separately. This product has 62 selectable units. If you cannot find a suitable unit among them, you can compose custom unit up to 6 characters.

3rd layer (Setting variable)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Instantaneous value display unit [InsDispUnit]	None, μA,mA,A,kA, μV,mV,V,kV,VA, W,kW,MW, μm,mm,cm,m, Ω,kΩ,MΩ, g,kg, N,kN,MN, Pa,kPa,MPa,hPa, J,kJ,MJ, Hz,kHz,MHz, m^3, mm/s,mm/min, cm/min, m/s,m/min,m/h,m/s^2, m^3/s,m^3/min,m^3/h, kg/h,kg/m^2,kg/m^3, N/m^2, ℓ,ℓ/s,ℓ/min,ℓ/h, %,‰,%RH,°C, pH,ppm,rpm,t,inch, custom unit	None	Set unit for instantaneous value display.
Totalized value display unit [TotDispUnit]	None, μA,mA,A,kA, μV,mV,V,kV,VA, W,kW,MW, μm,mm,cm,m, Ω,kΩ,MΩ, g,kg, N,kN,MN, Pa,kPa,MPa,hPa, J,kJ,MJ, Hz,kHz,MHz, m^3, mm/s,mm/min, cm/min, m/s,m/min,m/h,m/s^2, m^3/s,m^3/min,m^3/h, kg/h,kg/m^2,kg/m^3, N/m^2, ℓ,ℓ/s,ℓ/min,ℓ/h, %,‰,%RH,°C, pH,ppm,rpm,t,inch, custom unit	None	Set unit for totalized value display.

⚠ CAUTION

If you choose the custom unit, define the unit in the 5th layer.
Characters which can be used in custom unit are alphabets “a” to “z”, “A” to “Z” and marks.
（marks：[,],(,),$_1$,$_2$,$_3$,^{1},^{2},^{3},$^-$,μ,Ω,g,･,/,ℓ,%,‰,°,’,”)

【Display Unit Setting Example】

1) Example 1

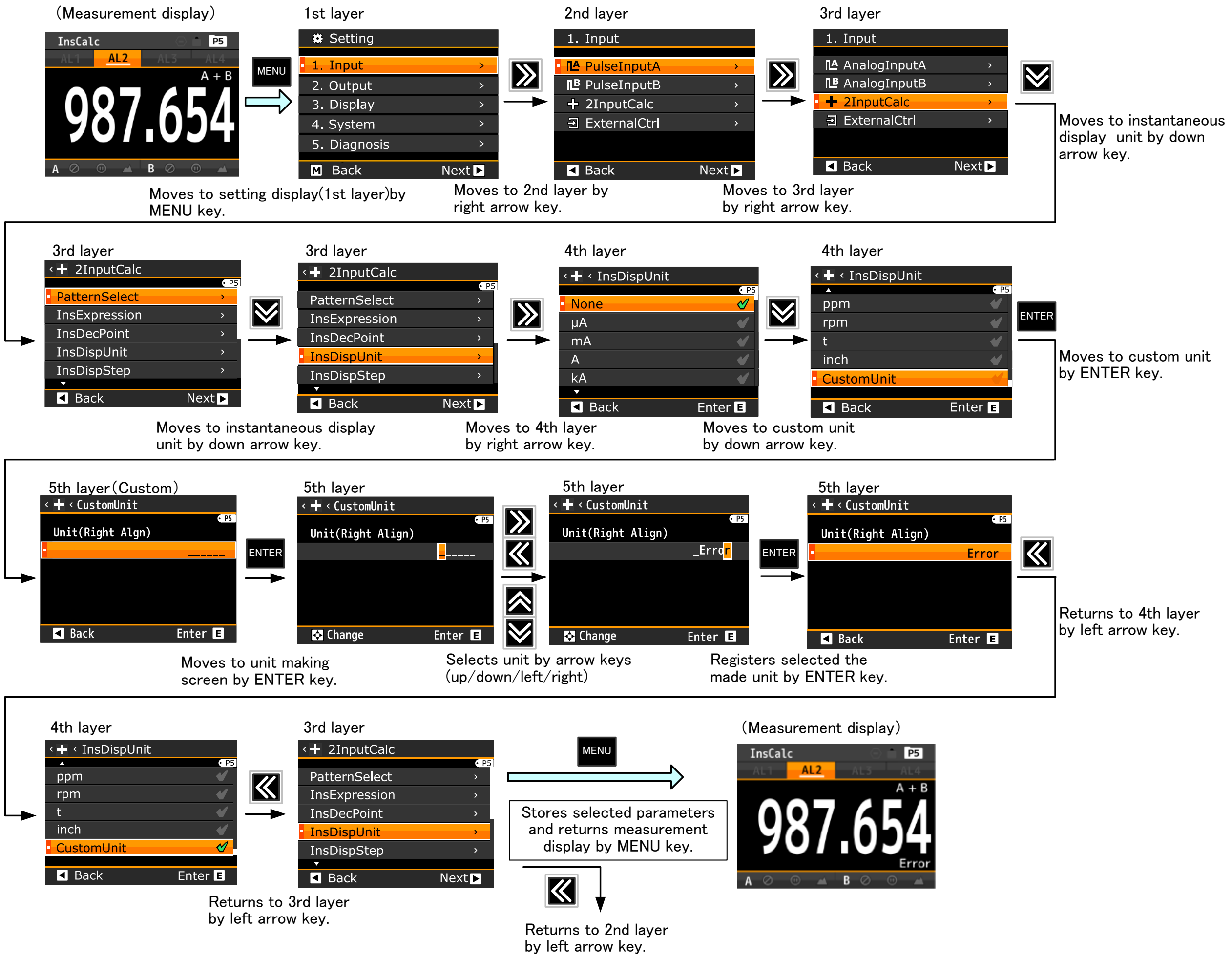
The steps to set the display unit of instantaneous value to “ℓ/min” are shown below.
(Same steps are also applied to the setting of the display unit of totalized value.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)** key”, point the cursor to **“Analog Input A”** and push “**ARROW (RIGHT)** key”, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Instantaneous value display unit**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**ℓ/min**”. *Select a proper unit for your usage in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note: If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

2) Example 2

Setting steps to make a custom unit “Error” for a totalized value display unit are shown below.
(The same steps could be applied to the analog input B.)



Moves to setting display(1st layer)by MENU key.

Moves to 2nd layer by right arrow key.

Moves to 3rd layer by right arrow key.

Moves to instantaneous display unit by down arrow key.

Moves to instantaneous display unit by down arrow key.

Moves to 4th layer by right arrow key.

Moves to custom unit by down arrow key.

Moves to custom unit by ENTER key.

Moves to unit making screen by ENTER key.

Selects unit by arrow keys (up/down/left/right)

Registers selected the made unit by ENTER key.

Returns to 4th layer by left arrow key.

Returns to 3rd layer by left arrow key.

Stores selected parameters and returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

9－4－3－8. Select Count Method of Totalized Value Overrun

This setting variable determines the method of counting to the overrun (i.e. overflow) of the totalized value.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Totalized value overrun count [TotOverCount]	None	*	When the totalized count value excesses 999999, the display indicates OVER.
	999times		When the totalized count value excesses 999999 999times, the display indicates OVER. The number of times of overruns is indicated at the upper left of totalized value in small size characters.
	Endless		When the totalized count value excesses 999999 999times, the number of times of overruns is cleared and the totalized count restarts from initial value.

● Setting steps to set the totalized value overrun count to “999 times” is shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)** key”, point the cursor to “**2 Input Calculation**” and push “**ARROW (RIGHT)** key”, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Totalized value overrun count**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**999 times**”. *Select a parameter in conformity with the actual condition of use.
⑥	By pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *By pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note: If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

９－４－４. EXTERNAL CONTROL

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Select functions assigned to each external control terminal.	Terminal 1 function	page85
	Terminal 2 function	
	Terminal 3 function	
	Terminal 4 function	
	Terminal 5 function	

９－４－４－１. Select Functions Assigned to Terminals 1 to 5

These setting variables select functions from 10 functions of external control for each terminal.
*Functions of terminals 1 to 5 are configured individually.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meanings of setting values
Function of External Control Terminal 1 [ExtCtrl1Func] Function of External Control Terminal 2 [ExtCtrl2Func] Function of External Control Terminal 3 [ExtCtrl3Func] Function of External Control Terminal 4 [ExtCtrl4Func] Function of External Control Terminal 5 [ExtCtrl5Func]	None	*	Assigns no function.
	Compare Reset		Assigns “compare reset” function.
	Total Reset A		Assigns “total value reset” function for chA.
	Total Reset B		Assigns “total value reset” function for chB. *Displayed only chB input is available.
	Total Reset A&B		Assigns “total value reset” function for chA and chB. *Displayed only chB input is available.
	Measure Block A		Assigns “measurement inhibit” function for chA.
	Measure Block B		Assigns “measurement inhibit” function for chB *Displayed only chB input is available.
	Measure Block A&B		Assigns “measurement inhibit” function of chA and chB. *Displayed only chB input is available.
	DispHold A		Assigns “current value hold” function for chA.
	DispHold B		Assigns “current value hold” function for chB. *Displayed only chB input is available.
	DispHold A&B		Assigns “current value hold” function for chA and chB. *Displayed only chB input is available.
	MaxHold A		Assigns “maximum value hold” function for chA.
	MaxHold B		Assigns “maximum value hold” function for chB. *Displayed only chB input is available.
	MaxHold A&B		Assigns “maximum value hold” function for chA and chB. *Displayed only chB input is available.
	MinHold A		Assigns “minimum value hold” function for chA.
	MinHold B		Assigns “minimum value hold” function for chB. *Displayed only chB input is available.
	MinHold A&B		Assigns “minimum value hold” function for chA and chB. *Displayed only chB input is available.
	Digital Zero A		Assigns “Digital Zero” function for chA. *Displayed only chA input is analog type.
	Digital Zero B		Assigns “Digital Zero” function for chB. *Displayed only chB input is analog type.
	Digital Zero A&B		Assigns “Digital Zero” function for chA and chB. *Displayed only both inputs are analog type.
	Pattern Change 1		Assigns “pattern select (1st bit)” function.
	Pattern Change 2		Assigns “pattern select (2nd bit)” function.
	Pattern Change 3		Assigns “pattern select (3rd bit)” function.

	Monitor Change		Assigns “monitor change” function.
	Trend Hold		Assigns “trend hold” function.

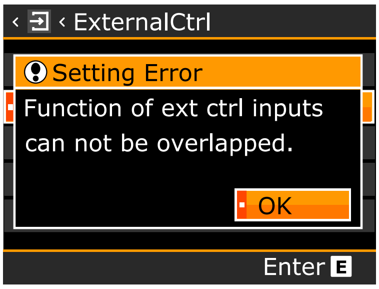
●The setting steps to assign “measurement inhibit A” to terminal 2 are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**1.INPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)** key”, point the cursor to “**External Control**” and push “**ARROW (RIGHT)** key”, then the display moves to the **3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**ExtCtrl2 Func**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “measurement inhibit A”. *Select a proper option for your usage.
⑥	Pushing **“ENTER”** key, selected parameter becomes valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display content returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected parameters are stored and display returns the measurement display.

Note:If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

⚠CAUTION

If functions which assigned to terminal 1 to 5 overlap (except “NONE”), the following message is deployed.
In this case, push “ENTER” key to return to setting display and configure again to prevent the overlap.



Function of ext ctrl inputs can not be overlapped.

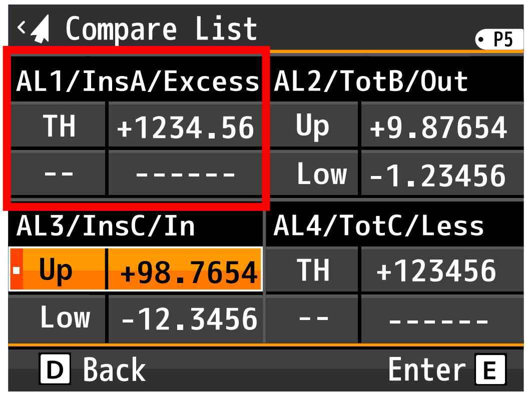
９－５. DETAIL OF OUTPUTSETTING GROUP

The output setting group is classified to the following small 6 categories and can be configured respectively.

2nd layer (Small categories)	Descriptions	Remarks
Comparative output AL1	Settings related to comparative outputs.	
Comparative output AL1		
Comparative output AL1		
Comparative output AL1		
Pulse output A	Settings related to the totalizer-synchronous pulse output	Displayed only with a chB input option.
Pulse output B		
Analog output	Settings related to the analog output.	Displayed only with an analog output option.
BCD output	Settings related to the BCD output.	Displayed only with a BCD output option.
RS-232C communication	Settings related to the RS-232C communication.	Displayed only with a RS-232C communication option.
Modbus communication	Settings related to the Modbus communication.	Displayed only with Modbus communication option.

９－５－１. COMPARE LIST

When you move on to “Compare List” screen, the comparison output setting parameters are displayed in a list.
In the example of the red frame in the upper left of the figure below (AL1 setting), [AL1 / OutputDispValue: InsA / OnConditions: Excess] and [Threshold: +1234.56].
*By registering this screen with a shortcut key, you can move on to this screen directly from measurement display.



AL1/InsA/Excess		AL2/TotB/Out	
TH	+1234.56	Up	+9.87654
--	------	Low	-1.23456
AL3/InsC/In		**AL4/TotC/Less**	
Up	+98.7654	TH	+123456
Low	-12.3456	--	------

９－５－２. COMPARATIVE OUTPUT AL1 - 4

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Select a pattern number to configure settings	Pattern select [PatternSelect]	page89
Select displayable source item for comparative output	Output Display Value [OutputDispValue]	page 90
Select compare mode of comparative output	Compare mode [CompareMode]	page 91
Set condition that comparative outputs turn on	Condition of ON [OnCondition]	page 92
Set comparison judgement value	Comparison judgement value [Threshold]	page 93
Set delay time of comparative output	Comparison ON delay [OnDelay]	page 95
	Comparison OFF delay [OffDelay]	page 96
Set output mode of comparative output	Output Mode [OutputMode]	page 97
Set output logic of comparative output	Output Logic [OutputLogic]	page 98
Set background color at comparative output ON state	Background Color at ON [OnBgColor]	page 99

９－５－２－１. Select a Pattern Number to Configure Settings

This product can memorize 8 patterns (8 kinds) of parameters including input settings (pulse input A/B, analog input A/B, 2 input calculations), output settings and display settings.
In measurement mode, the product calculates using one of 8 patterns which are configured.
This setting selects the pattern number which a configuration is performed.

⚠ CAUTION

The pattern number is common to input settings, output settings and display settings.
Please pay attention to the target pattern number which the following “comparative output” configuration is performed to.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meaning of setting value
Pattern select [PatternSelect]	Pattern1	Pattern number which is selected in measurement mode.	Performs a configuration to pattern No.1
	Pattern2		Performs a configuration to pattern No.2
	Pattern3		Performs a configuration to pattern No.3
	Pattern4		Performs a configuration to pattern No.4
	Pattern5		Performs a configuration to pattern No.5
	Pattern6		Performs a configuration to pattern No.6
	Pattern7		Performs a configuration to pattern No.7
	Pattern8		Performs a configuration to pattern No.8

●Setting steps to set the “Pattern select” to “Pattern 8” are shown below.
(Same steps could be applied to AL2-AL4.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. OUTPUT”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Comparative output AL1”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Pattern select”** and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting values)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Patern8”** * Select the pattern number which you need to be configured.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：<u>If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.</u>

9－5－2－2. Select Displayable Source Item for Comparative Output

Comparative outputs AL1-AL4 can be configured independently and are needed to be selected which displayable source items (source output display values) are applied to.
For example, the instantaneous measured value of chA is assigned to AL1, the instantaneous measured value of chB is assigned to AL2, the instantaneous calculated value is assigned to AL3 and AL4, etc. To each displayable source item, comparative outputs can be assigned arbitrarily.
Because multiple items are selectable for comparative outputs, item to use for compare should be selected by this setting variable.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Source output display value [OutputDispValue]	None	*	No comparative output
	InsA		Compare to instantaneous measured value of chA.
	InsB		Compare to instantaneous measured value of chB. *Displayed in the option with chB input only.
	InsCalc		Compare to instantaneous calculated value of chA & chB *Displayed in the option with chB input only.
	TotA		Compare to totalized value of chA.
	TotB		Compare to totalized value of chB .*Displayed in the option with chB input only.
	TotCalc		Compare to calculated totalized value of chA & chB *Displayed in the option with chB input only.

●Setting steps to set displayable source item of comparative output AL1 to "TotA" (totalized value of chA).
Same steps could be applied to comparative outputs AL2 - AL4.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**2.OUTPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Comparative output AL1"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"OutputDispValue"** and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting values)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"TotA".** *Select a desired source item in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note:<u>If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.</u>

９－５－２－３. Select Compare Mode of Comparative Output

Modes of comparison in comparative output function have 2 modes of “Level judge mode” and “Zone judge mode”.

3rd layer (Setting variable)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Compare mode [CompareMode]	Level judge [LevelJudge]	*	Compare to 1 judgement value in magnitude (high/low) relation.
	Zone judge [ZoneJudge]		Compare to 2 judgement values in inclusion (in/out) relation.

●Setting steps to compare mode of comparative output AL1 to “Zone judge” are shown below.
（Same steps could be applied to comparative out AL2 - AL4.）

No.	**Descriptions**
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**2.OUTPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Comparative output AL1”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables**).
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Compare mode”** and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting values)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Zone judge”.** *Select a compare mode for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note:**If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.**

9－5－2－4. Set Condition That Comparative Outputs Turn on

This setting variable selects the condition that makes comparative output turn ON in comparison with Comparison judgement values.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meanings of setting values
Condition of ON (OnCondition)	Compare mode in "Level judgement"		*Displayed only when compare mode is level judgement
	Excess	*	Comparative output is ON when displayed value excess judgement value.
	LessThan		Comparative output is ON when displayed value is less than judgement value.
	Compare mode in "Zone judgement"		*Displayed only when compare mode is zone judgement
	InTheZone	*	Comparative output is ON when displayed value is between 2 judgement values.
	OutsideTheZone		Comparative output is ON when displayed value is outside of 2 judgement values.

●The setting steps to set "Condition of ON" of comparative output AL1 to "Less Than" are shown below.
(The same steps could be applied to comparative output AL2-AL4.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**2.OUTPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Comparative output AL1"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables**).
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"OnCondition"** and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting values)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"LessThan".** *Select a desired condition for your use in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－5－2－5. Set Comparison Judgement Value

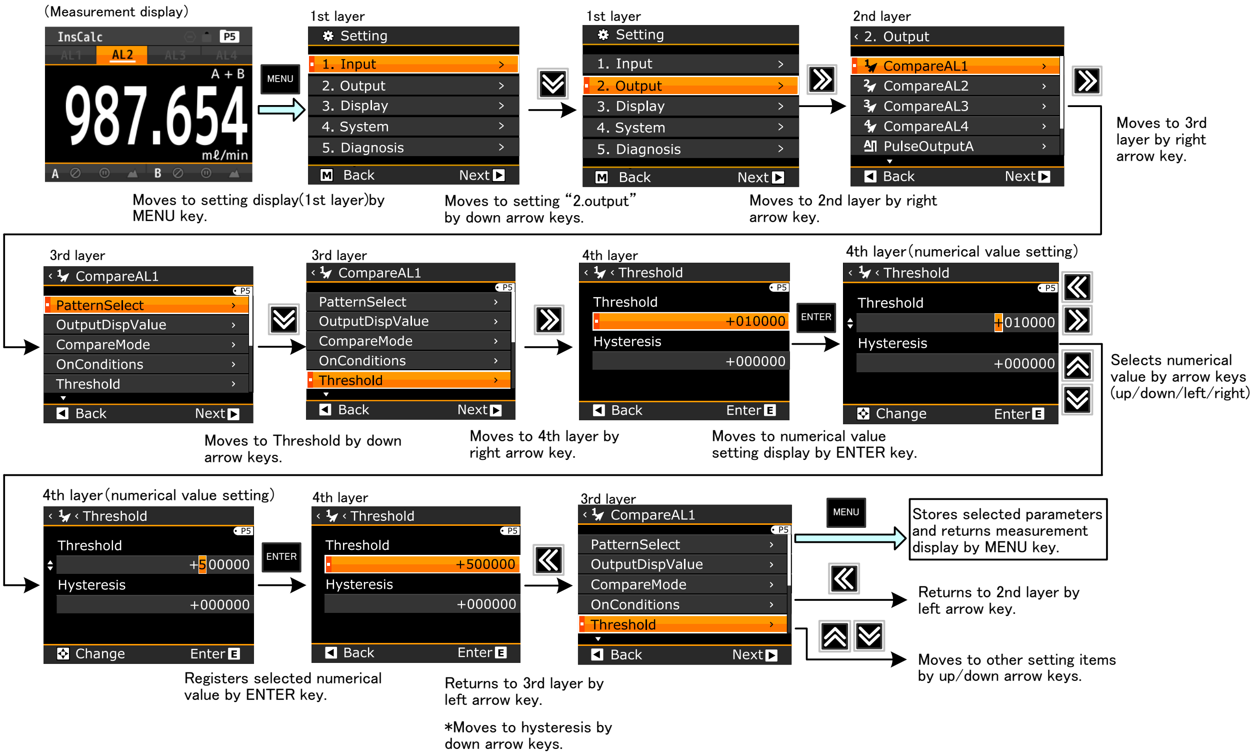
This setting variable determines comparison judgement values (thresholds) and hysteresis widths.

3rd layer (Setting variable)	4th layer (Setting values)	Initial values	Meanings of setting values
Comparison Judgement Value [Threshold]	Compare mode in “Level judgement”		*Displayed only when compare mode is level judgement
	Threshold	10000	
	hysteresis	0	
	Compare mode in “Zone judgement”		*Displayed only when compare mode is zone judgement
	Zone lower limit	0	
	Zone upper limit	10000	
	hysteresis	0	

●<u>Setting method of compare judgement value in level judgement of compare mode</u>

The setting steps to set threshold of comparative output AL1 to “50000” are shown below. For the hysteresis, the same steps could be applied.

(The same steps could be applied to comparative output AL2 –AL4.)



Moves to setting display(1st layer)by MENU key.

Moves to setting “2.output” by down arrow keys.

Moves to 2nd layer by right arrow key.

Moves to 3rd layer by right arrow key.

Moves to Threshold by down arrow keys.

Moves to 4th layer by right arrow key.

Moves to numerical value setting display by ENTER key.

Selects numerical value by arrow keys (up/down/left/right)

Registers selected numerical value by ENTER key.

Returns to 3rd layer by left arrow key.

*Moves to hysteresis by down arrow keys.

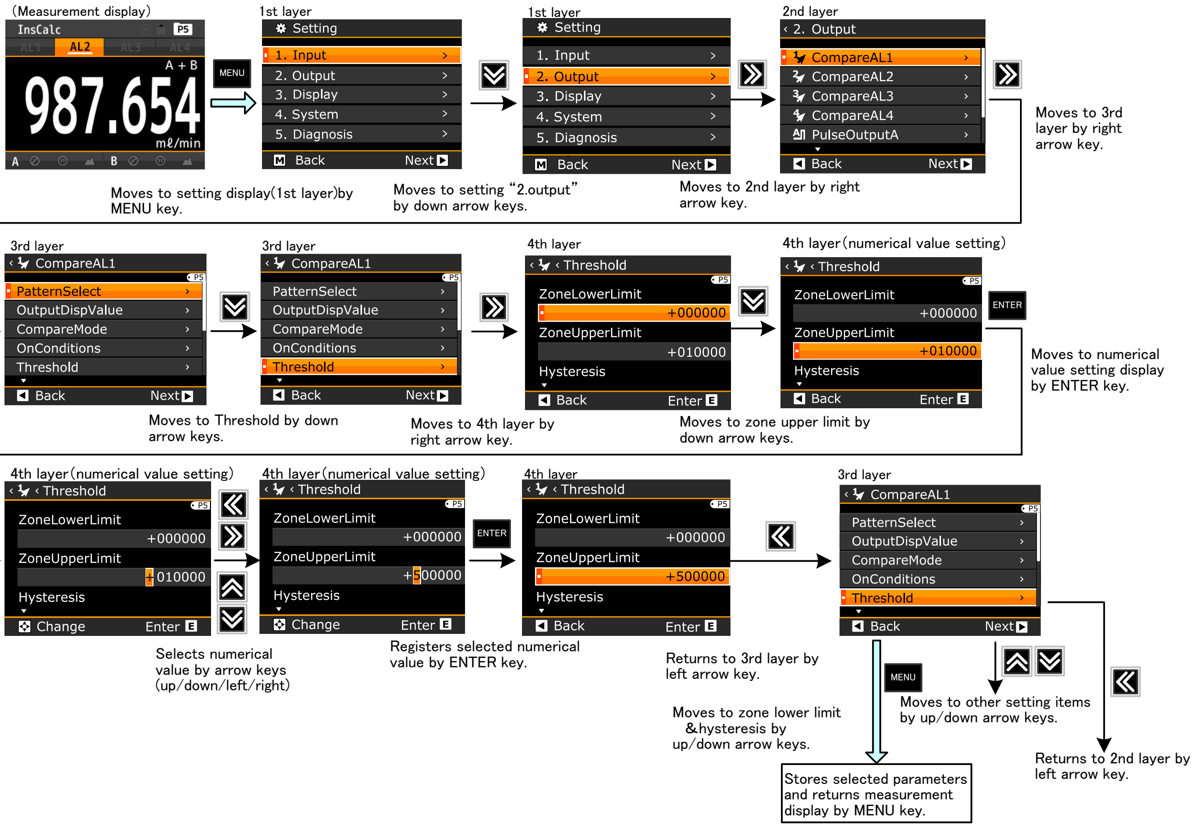
Stores selected parameters and returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

Moves to other setting items by up/down arrow keys.

- <u>Setting method of compare judgement value (zone judgement value) in zone judgement of compare mode</u>

  The setting steps to set zone upper limit to "50000" are shown below.
  The same steps could be applied to zone lower limit and hysteresis.
  (The same steps could be applied to comparative output AL2 - AL4.)



Moves to setting display(1st layer)by MENU key.

Moves to setting "2.output" by down arrow keys.

Moves to 2nd layer by right arrow key.

Moves to 3rd layer by right arrow key.

Moves to Threshold by down arrow keys.

Moves to 4th layer by right arrow key.

Moves to zone upper limit by down arrow keys.

Moves to numerical value setting display by ENTER key.

Selects numerical value by arrow keys (up/down/left/right)

Registers selected numerical value by ENTER key.

Returns to 3rd layer by left arrow key.

Moves to zone lower limit &hysteresis by up/down arrow keys.

Moves to other setting items by up/down arrow keys.

Returns to 2nd layer by left arrow key.

Stores selected parameters and returns measurement display by MENU key.

9－5－2－6. Set Delay Time of Comparative Output (Comparison ON Delay)

Comparison ON delay is the delay function which the output does NOT turn on immediately after meeting the compare ON condition, but after keeping on setting time continuously turns ON.

3rd layer (Setting variable)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Comparison ON Delay [OnDelay]	None	*	No output ON delay
	20ms		Output ON delay 20ms
	50ms		Output ON delay 50ms
	100ms		Output ON delay 100ms
	200ms		Output ON delay 200ms
	500ms		Output ON delay 500ms
	1s		Output ON delay 1s
	5s		Output ON delay 5s
	10s		Output ON delay 10s
	20s		Output ON delay 20s

●Setting steps to set output ON delay of comparative output AL1 to “200ms” are shown below.
（Same steps could be applied to Comparative output AL2-AL4.）

No.	**Descriptions**
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**2.OUTPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Comparative output AL1”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Ondelay**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“200ms”.** *Select a desired delay time for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：<u>If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.</u>

９－５－２－７. Set Delay Time of Comparative Output (Comparison OFF Delay)

Comparison OFF delay is the delay function which the output does NOT turn off immediately after meeting the compare OFF condition, but after keeping on setting time continuously turns OFF.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Comparison OFF Delay [OffDelay]	None	*	No output OFF delay
	20ms		Output OFF delay 20ms
	50ms		Output OFF delay 50ms
	100ms		Output OFF delay 100ms
	200ms		Output OFF delay 200ms
	500ms		Output OFF delay 500ms
	1s		Output OFF delay 1s
	5s		Output OFF delay 5s
	10s		Output OFF delay 10s
	20s		Output OFF delay 20s

●Setting steps to set output OFF delay of comparative output AL1 to “200ms” are shown below. (Same steps could be applied to Comparative output AL2-AL4.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**2.OUTPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Comparative output AL1”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables**).
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**OffDelay**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“200ms”.** *Select a desired delay time for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：**If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.**

９－５－２－８. Set Output Mode of Comparative Output

This setting variable selects output mode of comparative output.

3rd layer (Setting variable)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Output Mode [OutputMode]	Normal	*	While the condition is met, output turns ON.
	Latch		Once the condition is met, output keeps ON. *Turns OFF by comparative output reset.
	OneShot 5ms		When the condition is met, output turns ON for 5ms.
	OneShot 10ms		When the condition is met, output turns ON for 10ms.
	OneShot 20ms		When the condition is met, output turns ON for 20ms.
	OneShot 50ms		When the condition is met, output turns ON for 50ms.
	OneShot 0.1s		When the condition is met, output turns ON for 0.1 s.
	OneShot 0.2s		When the condition is met, output turns ON for 0.2s.
	OneShot 0.5s		When the condition is met, output turns ON for 0.5 s.
	OneShot 1s		When the condition is met, output turns ON for 1 s.
	OneShot 2s		When the condition is met, output turns ON for 2s.

●Setting steps to set the output mode of “comparative output AL1” to “OneShot 50ms” are shown below.
（Same steps could be applied to AL2-AL4.）

No.	**Descriptions**
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**2.OUTPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Comparative output AL1”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**OutputMode**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“OneShot 50ms”.** *Select a desired mode for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

９－５－２－９. Set Output Logic of Comparative Output

This setting variable selects output logic of comparative output.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Output Logic (OutputLogic)	Positive（NC)		When comparative output is ON, transistor is OFF (1 level) . Relay OFF (relay output product)
	Negative (NO)	*	When comparative output is ON, transistor is ON (0 level) . Relay ON (relay output product)

⚠CAUTION

The above explanation is described with reference to NPN Open collector output.
In the case of PNP outputs, the output turns 1 level at transistor ON and turns 0 level at transistor OFF.
In other words, the output logic is reversed on PNP output.

●Setting steps to set output logic of comparative output AL1 to “Positive” are shown below.
(Same steps could be applied to AL2-AL4.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**2.OUTPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Comparative output AL1”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables**).
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**OutputLogic**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Positive Logic”.** *Select a desired logic for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：<u>If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.</u>

９－５－２－１０. Set Background Color at Comparative Output ON State

This setting variable selects background color of display when comparative output is ON.

⚠CAUTION

This setting is for the color of background, not for color of characters.
The color of characters can be changed and its color is white in measurement display.

3rd layer (Setting variable)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Background Color at ON [OnBgColors]	Black	*	Background color is still black when comparative output is ON.
	Red		Background color turns red when comparative output is ON.
	Yellow		Background color turns yellow when comparative output is ON.
	Green		Background color turns green when comparative output is ON.

●Setting steps to set background color of comparative output AL1 to “Red” are shown below.
(Same steps could be applied to AL2-AL4.)

No.	**Descriptions**
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**2.OUTPUT**” and push “**ARROW (RIGHT)**” key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Comparative output AL1”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**OnBgColors**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Red”.** *Select a desired color for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

９－５－３. PULSE OUTPUT A/ PULSE OUTPUT B

WHAT YOU CAN DO	**3rd layer (Setting variables)**	**Reference page**
Select a pattern number to configure settings	Pattern select (PatternSelect)	page101
Select displayable source item for totalizer-synchronous pulse output	Output Display Value (OutputDispValue)	page 102
Select display digit with which totalizer-synchronous pulse synchronized.	Output Synchronous Digit (OutputSynchDigit)	page 103
Select pulse width of totalizer-synchronous pulse	Output Pulse Width (OutputPulseWidth)	page 104
select output logic of totalizer-synchronous pulse	Output Logic (OutputLogic)	page 105

９－５－３－１. Select a Pattern Number to Configure Settings

This product can memorize 8 patterns (8 kinds) of parameters including input settings, output settings and display settings.

In measurement mode, the product calculates using one of 8 patterns which are configured.

This setting selects the pattern number which a configuration is performed.

> ⚠ CAUTION
>
> The pattern number is common to input settings, output settings and display settings.
>
> Please pay attention to the target pattern number which the following "Pulse Output" configuration is performed to.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Pattern select	Pattern1	Pattern number which is selected in measurement mode.	Performs a configuration to pattern No.1
	Pattern2		Performs a configuration to pattern No.2
	Pattern3		Performs a configuration to pattern No.3
	Pattern4		Performs a configuration to pattern No.4
	Pattern5		Performs a configuration to pattern No.5
	Pattern6		Performs a configuration to pattern No.6
	Pattern7		Performs a configuration to pattern No.7
	Pattern8		Performs a configuration to pattern No.8

● Setting steps to set pattern number for pulse output A to "Pattern8" are shown below.
(Same steps could be applied for pulse output B.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**2.OUTPUT**" and push "**ARROW (RIGHT)**" key, then the display moves to the **2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Pulse Output A"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Pattern select"** and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting values)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Patern8"** * Select the pattern number which you need to be configured.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note : If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－５－３－２. Select Displayable Source Item for Totalizer-Synchronous Pulse Output

This setting variable selects a displayable source item which is output as totalizer-synchronous pulse.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Source Output Display value [OutputDispValue]	None	*	No pulse output.
	TotA (Totalized value A)		Totalizer-synchronous pulse outputs for Totalized value of chA.
	TotB (Totalized value B)		Totalizer-synchronous pulse outputs for Totalized value of chB. *Displayed in the option with chB input only.
	TotCalc (Totalized value calculation)		Totalizer-synchronous pulse outputs for calculated value of chA input and chB input. *Displayed in the option with chB input only.

●Setting steps to set "source output display value" to "TotA" are shown below.
（same steps are applied to the pulse output B.）

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"2. Output"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Pulse Output A"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**OutputDispValue**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"TotA".** *Select a desired source item in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－５－３－３. Select Display Digit with Which Totalizer-Synchronous Pulse Synchronized

This setting variable selects a digit of the selected totalized value, which is selected displayed numerical value which the totalizer-synchronous pulse is synchronized with.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Output Synchronous digit [OutoputSyncDigit]	1stDigit	*	Pulse is output in synchronization with 1st digit (LSD) of the selected totalized value.
	2ndDigit		Pulse is output in synchronization with 2nd digit of the selected totalized value.
	3rdDigit		Pulse is output in synchronization with 3rd digit of the selected totalized value.
	4thDigit		Pulse is output in synchronization with 4th digit of the selected totalized value.
	5thDigit		Pulse is output in synchronization with 5th digit of the selected totalized value.
	6thDigit		Pulse is output in synchronization with 6th digit of the selected totalized value.

Note: The used totalized value is selected by the setting variable “OutputDispValue (Output Display Value)” from source items.

●Setting steps to set “OutoputSyncDigit” of the pulse output A to “3rdDigit” are shown below.
(same steps are applied to the pulse output B.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Pulse Output A”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**OutputSyncDigit**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“3rdDigit”.** *Select a desired digit number in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

９－５－３－４. Select Pulse Width of Totalizer-Synchronous Pulse

This setting variable selects the pulse width of the totalizer-synchronous pulse.

⚠CAUTION

○Minimum pulse output period is 10ms. Therefore, the totalizer-synchronous pulse of the frequency over 100Hz is not available.

○If the set pulse width is wider than the interval of pulses, the totalizer-synchronous pulse keeps ON state.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Output Pulse Width (OutputPulseWidth)	5ms	*	ON duration of the output pulse is 5ms.
	10ms		ON duration of the output pulse is 10ms.
	20ms		ON duration of the output pulse is 20ms.
	50ms		ON duration of the output pulse is 50ms.
	100ms		ON duration of the output pulse is 100ms.
	200ms		ON duration of the output pulse is 200ms.
	500ms		ON duration of the output pulse is 500ms.
	1s		ON duration of the output pulse is 1s.
	2s		ON duration of the output pulse is 2s.

● Setting steps to set “OutputPulseWidth” of the pulse output A to “50ms” are shown below.
（Same steps are applied to the pulse output B.）

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Pulse Output A”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**OutputPulseWidth**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“50ms”.** *Select a desired pulse width in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－5－3－5. Select Output Logic of Totalizer-Synchronous Pulse

This setting variable selects the output logic of the totalizer-synchronous pulse.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Output Logic (OutputLogic)	Positive		When pulse output is ON, transistor is OFF (1 level)
	Negative	*	When pulse output is ON, transistor is ON (0 level)

●Setting steps to set output logic of pulse output A to "Negative" are shown below.
(Same steps are applied to the pulse output B.)

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"2. Output"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Pulse Output A"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**OutputLogic**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Negative".** *Select a desired logic for your use in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note: **If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.**

９－５－４. ANALOG OUTPUT

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Select a pattern number to configure settings	Pattern select (PatternSelect)	page107
Select output range of analog output	Output range (OutputRange)	page 108
Select displayable source item for analog output	Source Output display value (OutputDispValue)	page 109
Set scaling of analog output	Output scale (OutputScale)	page 110

⚠CAUTION

Setting variables about analog output appear on models with analog output (WPMZ-6-***-1*-***).

９−５−４−１. Select a Pattern Number to Configure Settings

This product can memorize 8 patterns (8 kinds) of parameters including input settings, output settings and display settings.
In measurement mode, the product calculates using one of 8 patterns which are configured.
This setting selects the pattern number which a configuration is performed.

⚠ CAUTION

The pattern number is common to input settings, output settings and display settings.
Design contents related to“Analog Output”are registered in the pattern number selected.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Pattern select [Pattern Select]	Pattern1	Pattern number which is selected in measurement mode.	Performs a configuration to pattern No.1
	Pattern2		Performs a configuration to pattern No.2
	Pattern3		Performs a configuration to pattern No.3
	Pattern4		Performs a configuration to pattern No.4
	Pattern5		Performs a configuration to pattern No.5
	Pattern6		Performs a configuration to pattern No.6
	Pattern7		Performs a configuration to pattern No.7
	Pattern8		Performs a configuration to pattern No.8

- Setting steps to set pattern number for analog output to “Pattern8” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“AnalogOutput”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**PatternSelect**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Patern8”** * Select the pattern number which you need to be configured.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

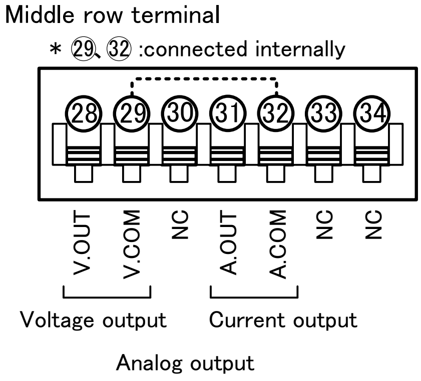
Note：<u>**If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.**</u>

9－5－4－2. Select Output Range of Analog Output

This setting variable selects the output range of the analog output.

⚠CAUTION

Depending on the selection of the analog output range, terminals for use varies



3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Output range [OutputRange]	DC0-10V	*	Analog output range: DC0 to 10V Load resistance: more than 2kΩ
	DC±10V		Analog output range: DC-10 to 10V Load resistance: more than 2kΩ
	DC1-5V		Analog output range: DC1 to 5V Load resistance: more than 2kΩ
	DC0-20mA		Analog output range: DC4 to 20mA Load resistance: less than 550Ω
	DC4-20mA		Analog output range: DC0 to 20mA Load resistance: less than 550Ω

- Setting steps to set output range of analog output to “DC1-5V” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“AnalogOutput”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**OutputRange**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“DC1-5V”** *Select a desired output range for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note:If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－5－4－3. Select Displayable Source Item for Analog Output

Because multiple items are selectable for the analog output, an item to use as the analog output should be selected by this setting variable.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Source output display value (OutputDispValue)	None	*	No analog output.
	Instantaneous value A (InsA)		Analog output outputs for instantaneous value of chA
	Instantaneous value B (InsB)		Analog output outputs for instantaneous value of chB *Displayed in the option with chB input only.
	Instantaneous calculated value (InsCalc)		Analog output outputs for instantaneous calculated value of chA and chB. *Displayed in the option with chB input only.
	Totalized value A (TotA)		Analog output outputs for totalized value of chA
	Totalized value B (TotB)		Analog output outputs for totalized value of chB *Displayed in the option with chB input only.
	Totalized calculated value (TotCalc)		Analog output outputs for totalized calculated value of chA and chB. *Displayed in the option with chB input only.

● Setting steps to set "Source output display value (OutputDispValue)" of the analog output to "Totalized value A (TotA)" are shown below.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"2. Output"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"AnalogOutput"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**OutputDispValue**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"TotA".** *Select a desired source item for analog output in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note : <u>If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.</u>

9－5－4－4. Set Scaling of Analog Output

This setting variable set scaling for analog output.

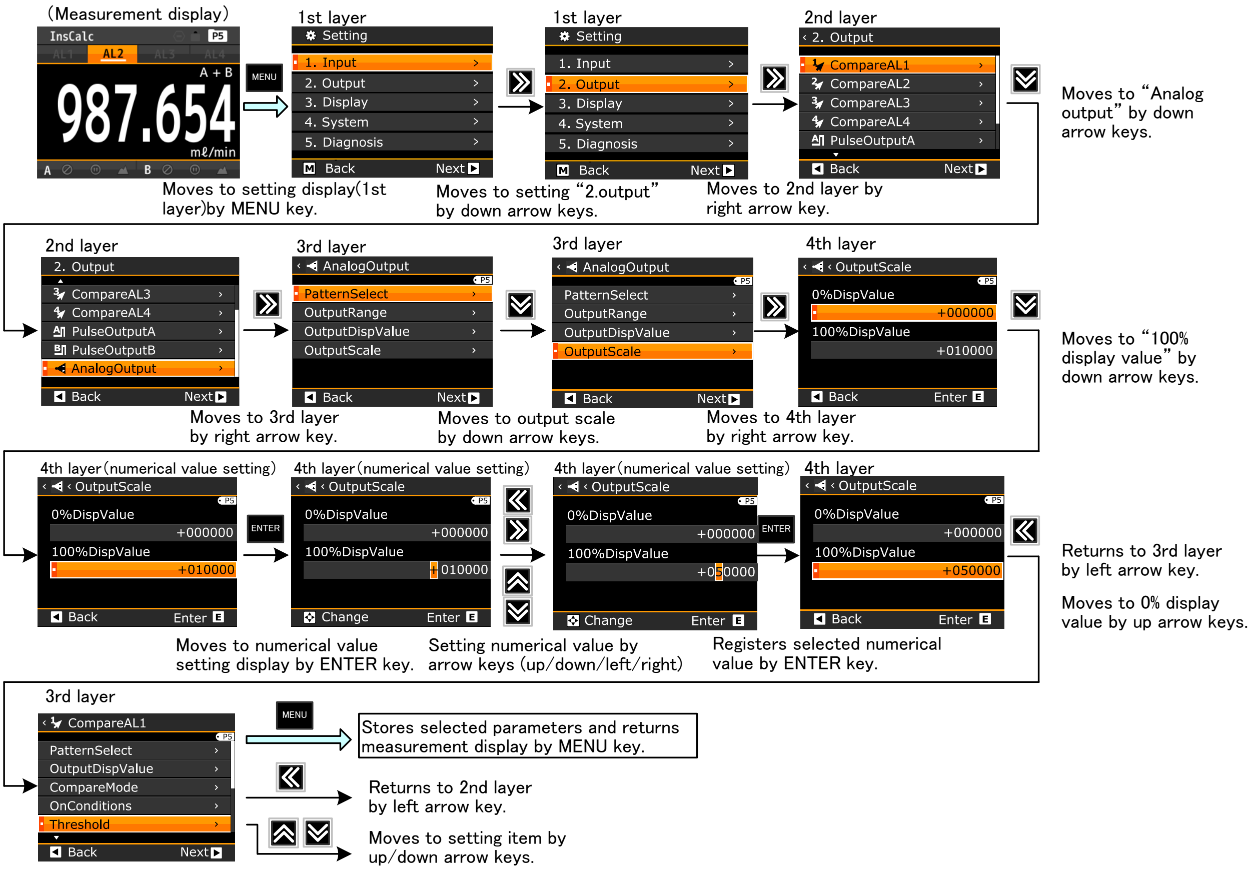
3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meanings of setting values
Output scale (OutputScale)	0% display value ±999999	+000000	Set display value when analog output outputs 0% of full scale.
	100% display value ±999999	+010000	Set display value when analog output outputs 100% of full scale.

【Setting example of scaling】

For the instantaneous value of chA input of 0 to 50000, outputs 4 to 20mA on the analog outputs.

3rd layer (Setting variables)	4th layer (Setting values)	Descriptions for the setting examples
Output range (OutputRange)	DC4-20mA	To output by “4-20mA” range, the setting variable “output range” should be selected to “DC4-20mA”.
Source output display value (OutputDispValue)	Instantaneous value A (InsA)	To output the instantaneous value of chA on the analog output, the setting variable “Source output display value” should be selected to “Instantaneous value A”.
Output scale (OutputScale)	(0% display value) +000000	When the instantaneous value is “0”, to output 4mA on the analog output, sets “0% display value” to “+000000”.
	(100% display value) +050000	When the instantaneous value is “50000”, to output 20mA on the analog output, sets “100% display value” to “+050000”.

- A setting method of the “output scale” is shown on the following chart.



Moves to setting display(1st layer)by MENU key.

Moves to setting “2.output” by down arrow keys.

Moves to 2nd layer by right arrow key.

Moves to “Analog output” by down arrow keys.

Moves to 3rd layer by right arrow key.

Moves to output scale by down arrow keys.

Moves to 4th layer by right arrow key.

Moves to “100% display value” by down arrow keys.

Moves to numerical value setting display by ENTER key.

Setting numerical value by arrow keys (up/down/left/right)

Registers selected numerical value by ENTER key.

Returns to 3rd layer by left arrow key.

Moves to 0% display value by up arrow keys.

Stores selected parameters and returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

Moves to setting item by up/down arrow keys.

９－５－５. BCD OUTPUT

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Select a pattern number to configure settings	Pattern select (PatternSelect)	page112
Select displayable source item for analog output	(OutputDispValue)	page 113
Select output logic of data signals.	Data signal logic (DataSignalLogic)	page 114
Select output logic of synchronous signal.	Synchronous signal logic (SyncSignalLogic)	page 115

⚠CAUTION

The setting variables for BCD OUTPUT are shown on the models with BCD output option (WPMZ-6-***-**2 or 3***-***) only.

９－５－５－１. Select a Pattern Number to Configure Settings

This product can memorize 8 patterns (8 kinds) of parameters including input settings (pulse input A/B, analog input A/B, 2 input calculations), output settings and display settings.
In measurement mode, the product calculates using one of 8 patterns which are configured.
This setting selects the pattern number which a configuration is performed.

⚠ CAUTION

The pattern number is common to input settings, output settings and display settings.
Design contents related to“BCD Output”are registered in the pattern number selected.

3rd layer (Setting variable)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Pattern select	Pattern1	Pattern number which is selected in measurement mode.	Performs a configuration to pattern No.1
	Pattern2		Performs a configuration to pattern No.2
	Pattern3		Performs a configuration to pattern No.3
	Pattern4		Performs a configuration to pattern No.4
	Pattern5		Performs a configuration to pattern No.5
	Pattern6		Performs a configuration to pattern No.6
	Pattern7		Performs a configuration to pattern No.7
	Pattern8		Performs a configuration to pattern No.8

● Setting steps to set pattern number for BCD Output to “Pattern8” are shown below.

No.	**Descriptions**
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“BCD Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**PatternSelect**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Pattern8”** * Select the pattern number which you need to be configured.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note: **If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.**

9－5－5－2. Select Displayable Source Item for BCD Output

Because multiple items are selectable for the BCD output, an item to use as the BCD output should be selected by this setting variable.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meanings of setting values
Source output display value (OutputDispValue)	None	*	No BCD output
	Instantaneous value A (InsA)		BCD output outputs for instantaneous value of chA
	Instantaneous value B (InsB)		BCD output outputs for instantaneous value of chB *Displayed in the option with chB input only.
	Instantaneous calculated value (InsCalc)		BCD output outputs for instantaneous calculated value of chA and chB. *Displayed in the option with chB input only.
	Totalized value A (TotA)		BCD output outputs for totalized value of chA
	Totalized value B (TotB)		BCD output outputs for totalized value of chB *Displayed in the option with chB input only.
	Totalized calculated value (TotCalc)		BCD output outputs for totalized calculated value of chA and chB. *Displayed in the option with chB input only.

● Setting steps to set “Source output display value (OutputDispValue)” of the BCD output to “Totalized value A (TotA)” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“BCD Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**OutputDispValue**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“TotA”.** *Select a desired source item for the BCD output in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

９－５－５－３. Select Output Logic of BCD Data Signals

This setting variable selects the output logic of the BCD data signals.

3rd layer (Setting variables)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Output Logic (OutputLogic)	Positive		When data output is ON, transistor is OFF （1 level）
	Negative	*	When data output is ON, transistor is ON （0 level）

⚠ CAUTION

The above explanation is described with reference to NPN Open collector output.
In the case of PNP outputs, the output turns 1 level at transistor ON and turns 0 level at transistor OFF.
In other words, the output logic is reversed on PNP output.

●Setting steps to set output logic of BCD data to “Positive” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“BCD Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**DataSignalLogic**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Positive”.** *Select a desired logic for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－5－5－4. Select Output Logic of BCD Data Synchronous Signal

This setting variable selects the output logic of the BCD data signals.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Output Logic (OutputLogic)	Positive		When synchronous output is ON, transistor is OFF （1 level）
	Negative	*	When synchronous output is ON, transistor is ON （0 level）

⚠CAUTION

To acquire BCD data, if the synchronous signal (PC) is negative, use the off-state of transistor(i.e. the leading edge or 1 level of PC).
If synchronous signal (PC) is positive, use the on-state of transistor
(i.e. the trailing edge or 0 level of PC).
*This explanation is described with reference to NPN Open collector output.
In the case of PNP outputs, the polarity of the output is opposite.

●Setting steps to set output logic of synchronized signal (PC) to “Negative” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“BCD Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**SyncSignalLogic**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Negative”.** *Select a desired logic for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：<u>If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.</u>

９－５－６. RS-232C COMMUNICATION

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Select protocol	Protocol	page 116
Select baud rate	Baudrate	page 116
Select data length	Datalength	page 118
Select parity bit	Parity	page 119
Select stop bit	Stopbit	page 120
Select delimiter	Delimiter	page 121

⚠CAUTION

The setting variables for RS-232C communication appear only on models with RS-232C option（WPMZ-6-***-4*-***）.

９－５－６－１. Select Protocol

This setting variable selects the protocol of RS-232C communication.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Protocol	Modbus-RTU	*	-
	OriginalCommand		-
	OriginalOutput		-

●Setting steps to set the protocol of RS-232C to “OriginalCommand” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“RS-232C Com”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Protocol**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“OriginalCommand”.** *Select a desired baud rate for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

９－５－６－２. Select Baud Rate

This setting variable selects the baud rate of RS-232C communication.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Baudrate	9600bps		Baud rate 9600bps
	19200bps	*	Baud rate 19200bps
	38400bps		Baud rate 38400bps

●Setting steps to set the baud rate of RS-232C to “38400bps” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“RS-232C Com”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Baudrate**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“38400 bps”.** *Select a desired baud rate for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note : If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－5－6－3. Select Data Length

This setting variable selects the data length of RS-232C communication.

3rd layer (Setting variables)	**4th layer (Setting values)**	**Initial value**	**Meaning of setting value**
Datalength	7bit	*	Data bit length 7 bit
	8bit		Data bit length 8 bit

●Setting steps to set the data length of RS-232C to “8bit” are shown below.

No.	**Descriptions**
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“RS-232C Com”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**DataLength**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“8bit”.** *Select a desired bit length for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note: **If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.**

9－5－6－4. Select Parity Bit

This setting variable selects the parity bit of RS-232C communication.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Parity	None		No parity bit
	Even	*	Even parity: count of 1's in the data is even
	Odd		Odd parity: count of 1's in the data is odd

●Setting steps to set parity of RS-232C to "Odd" are shown below.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"2. Output"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"RS-232C Com"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Parity**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Odd".** *Select a desired parity for your use in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note:If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－５－６－５. Select Stop Bit

This setting variable selects the stop bit of RS-232C communication.

3rd layer (Setting variables)	**4th layer (Setting values)**	**Initial value**	**Meaning of setting value**
Stop bit	1bit	*	Stop bit: 1bit
	2bit		Stop bit: 2bit

●Setting steps to set stop bit of RS-232C communication to “2bit” are shown below.

No.	**Descriptions**
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“RS-232C Com”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Stopbit**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2bit”.** *Select a desired stop bit for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－5－6－6. Select Delimiter

This setting variable selects the delimiter of RS-232C communication.

3rd layer (Setting variables)	**4th layer (Setting values)**	**Initial value**	**Meaning of setting value**
Delimiter	CR		Delimiter: CR
	CR LF	*	Delimiter: CR. LF

●Setting steps to set delimiter of RS-232C communication to "CR LF" are shown below.

No.	**Descriptions**
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"2. Output"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"RS-232C Com"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Delimiter**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"CR LF".** *Select a desired delimiter type for your use in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－５－７. MODBUS COMMUNICATION

WHAT YOU CAN DO	**3rd layer (Setting variables)**	**Reference page**
Select device address	SlaveAddress	page123
Select baud rate	Baudrate	page 124
Select parity bit	Parity	page 125

⚠CAUTION

The setting variables for Modbus communication appear only on models with Modbus communication option（WPMZ-6-***-5*-***）

９－５－７－１. Select Device Address

This setting variable selects a device address (slave address) of Modbus communication.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Slave Address	1	*	Device ID 1
	2		Device ID 2
	3		Device ID 3
	4		Device ID 4
	5		Device ID 5
	6		Device ID 6
	7		Device ID 7
	8		Device ID 8
	9		Device ID 9
	10		Device ID 10
	11		Device ID 11
	12		Device ID 12
	13		Device ID 13
	14		Device ID 14
	15		Device ID 15
	16		Device ID 16
	17		Device ID 17
	18		Device ID 18
	19		Device ID 19
	20		Device ID 20
	21		Device ID 21
	22		Device ID 22
	23		Device ID 23
	24		Device ID 24
	25		Device ID 25
	26		Device ID 26
	27		Device ID 27
	28		Device ID 28
	29		Device ID 29
	30		Device ID 30
	31		Device ID 31

●Setting steps to set device ID (Slave address) of Modbus communication “10” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“2. Output”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“ModbusCom”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**SlaveAddress**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“10”.** *Select a desired device Delimiter type for your use in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－5－7－2. Select Baud Rate

This setting variable selects the baud rate of Modbus communication.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Baudrate	9600bps		Baud rate 9600bps
	19200bps	*	Baud rate 19200bps
	38400bps		Baud rate 38400bps

●Setting steps to set the baud rate of Modbus to "38400bps" are shown below.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"2. Output"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"ModbusCom"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Baudrate**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"38400 bps".** *Select a desired baud rate for your use in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－5－7－3. Select Parity Bit

This setting variable selects the parity bit of Modbus communication.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Parity	None		No parity bit
	Even	*	Even parity: count of 1's in the data is even
	Odd		Odd parity: count of 1's in the data is odd

●Setting steps to set parity of Modbus to "Odd" are shown below.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"2. Output"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"ModbusCom"** and push "**ARROW (RIGHT)"** key, then the display moves to **the 3rd layer (setting variables).**
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**Parity**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Odd".** *Select a desired parity for your use in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－６. DETAIL OF DISPLAY SETTING GROUP

The display setting group is classified to the following small 3 categories and can be configured respectively.

2nd layer (Small categories)	Descriptions	Remarks
Display Select	Select the measurement screen to be displayed during measurement.	display styles : numerical value display, level display and trend display
Level Display	Sets scales of level display.	
Trend Display	Sets scales of trend display.	

９－６－１. DISPLAY SELECT

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Selects contents to display on numerical value display from displayable items.	MeasureSelect	page126
Selects contents to display on level display from displayable items.	LevelSelect	page 129
Selects contents to display on trend display from displayable items.	TrendSelect	page130

Note: In each display style, multiple selections are available. All selected display patterns are switched by DISP key or “Monitor Change” functions of the external control input.

９－６－１－１. Select Measurement Display Contents Displayed in Measurement Mode

This product can display multiple items from measured values or calculated values (i.e. displayable source items) on each measurement display style (i.e. numerical value display, level display and trend display). Therefore, by using this setting variable, contents to be shown on each display style should be selected. Each display patterns can be switched by “DISP” key or “pattern change” function of the external control input.

Note: Displayable source items are also used for each output (i.e. comparative outputs, pulse outputs, analog output).

⚠CAUTION

Initial values of display screens are different from 1 input (without chB input) and 2 inputs (with chB input).

○1- input (without chB input) models （WPMZ-6-***PX**-**-*****, WPMZ-6-***AX**-**-*****）

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Display Select (DisplaySelect)	Instantaneous value A (InsA)		Display Instantaneous value of chA input.
	Totalized value A (TotA)		Display totalized value of chA input.
	Instantaneous value A + Totalized value A (InsA+TotA)	*	Display 2 items of instantaneous value and totalized value of chA input.
	InsA + Comp		Displays instantaneous value of chA input, comparison judgement values and result.
	TotA + Comp		Displays total value of chA input, comparison judgement values and result.

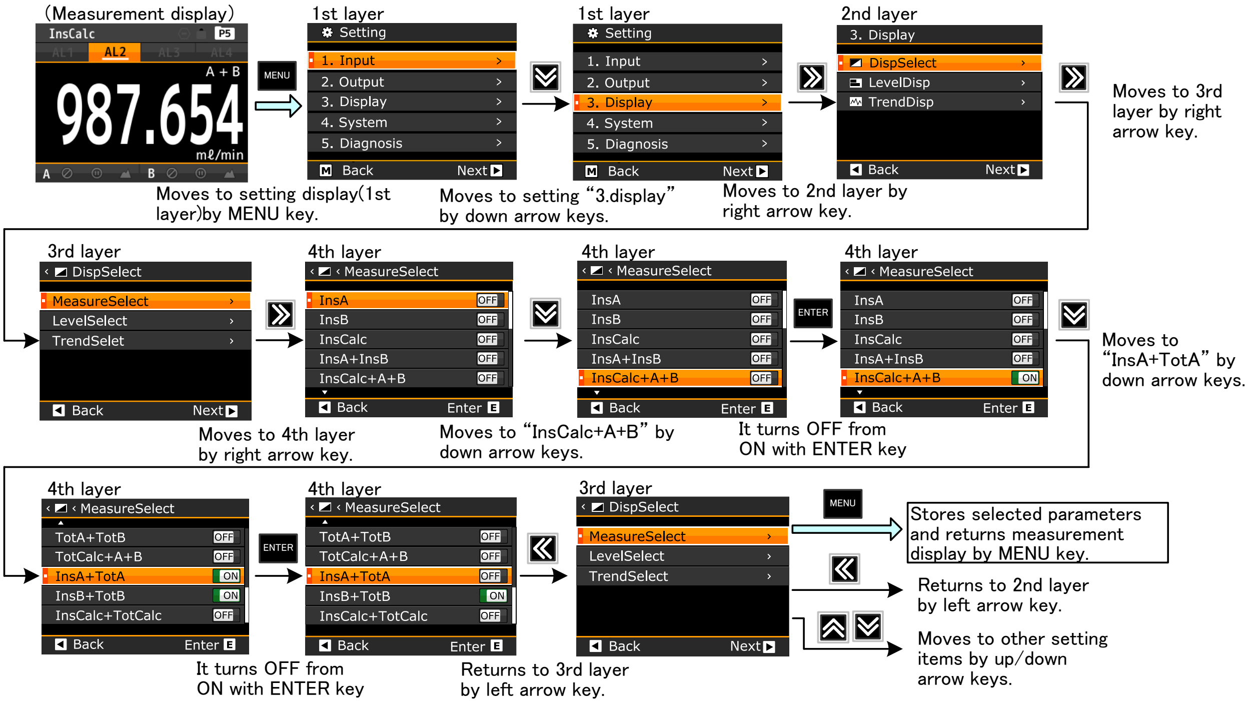
○2-input (with chB input) models （WPMZ-6-***PP**-**-***, WPMZ-6-***AA**-**-***）
（WPMZ-6-***PA**-**-***, WPMZ-6-***AP**-**-***）

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Display Select (DisplaySelect)	Instantaneous value A (InsA)		Displays Instantaneous value of chA input.
	Instantaneous value B (InsB)		Displays Instantaneous value of chB input.
	Instantaneous value calculation (InsCalc)		Displays calculation result of chA input instantaneous value and chB input instantaneous value.
	Instantaneous value A + Instantaneous value B (InsA+InsB)		Displays 2 items of chA input instantaneous value and chB input instantaneous value.
	Instantaneous value calculation+ Instantaneous value A + Instantaneous value B (InsCalc+A+B)		Displays 3 items of instantaneous value calculation result, chA input instantaneous value and chB input instantaneous value.
	Totalized value A (TotA)		Display totalized value of chA input.
	Totalized value B (TotB)		Displays totalized value of chB input.
	Totalized value calculation (TotCalc)		Displays a calculation result of chA input totalized value and chB input totalized value.
	Totalized value A＋ Totalized value B (TotA+TotB)		Displays 2 items of chA input totalized value and chB input totalized value.
	Totalized value calculation+ totalized value A + totalized value B (TotCalc+A+B)		Displays 3 items of totalized value calculation result, chA input totalized value and chB input totalized value.
	Instantaneous value A + Totalized value A (InsA+TotA)	*	Display 2 items of instantaneous value and totalized value of chA input.
	Instantaneous value B + Totalized value B (InsB+TotB)	*	Display 2 items of instantaneous value and totalized value of chB input.
	Instantaneous value calculation+ Totalized value calculation+ (InsCalc+TotCalc)		Displays 2 items of instantaneous value calculation result and totalized value calculation result of, chA input and chB input.
	InsA + Comp		Displays instantaneous value of chA input, comparison judgement values and result.
	InsB + Comp		Displays instantaneous value of chB input, comparison judgement values and result.
	InsCalc + Comp		Displays calculation result value of instantaneous values, comparison judgement values and result.
	TotA + Comp		Displays total value of chA input, comparison judgement values and result.
	TotB + Comp		Displays total value of chB input, comparison judgement values and result.
	TotCalc + Comp		Displays calculation result value of total values, comparison judgement values and result.

⚠ CAUTION

Two phase (90deg phase) pulse inputs are acceptable on pulse 2-input models (WPMZ-6-*PP-**-***). In the case that two-phase is selected as input type and chB or calculated result are selected in Display Select, measurement display shows “------”.

●In the “Display Select” configuration of a two-inputs model, setting steps that select “Instantaneous value calculation+ Instantaneous value A + Instantaneous value B(InsCulc+A+B)” and does not show default setting “Instantaneous value A + Totalized value A (InsA+TotA)” are shown below.


(Measurement display)
InsCalc
AL1 AL2 AL3 AL4
A + B
987.654
mℓ/min
MENU
Moves to setting display(1st layer)by MENU key.
1st layer
Setting
1. Input
2. Output
3. Display
4. System
5. Diagnosis
Back
Next
Moves to setting “3.display” by down arrow keys.
2nd layer
3. Display
DispSelect
LevelDisp
TrendDisp
Moves to 2nd layer by right arrow key.
Moves to 3rd layer by right arrow key.
3rd layer
DispSelect
MeasureSelect
LevelSelect
TrendSelet
Moves to 4th layer by right arrow key.
4th layer
MeasureSelect
InsA
InsB
InsCalc
InsA+InsB
InsCalc+A+B
OFF
ON
Enter
Moves to “InsCalc+A+B” by down arrow keys.
ENTER
It turns OFF from ON with ENTER key
Moves to “InsA+TotA” by down arrow keys.
TotA+TotB
TotCalc+A+B
InsA+TotA
InsB+TotB
InsCalc+TotCalc
It turns OFF from ON with ENTER key
Returns to 3rd layer by left arrow key.
3rd layer
DispSelect
MeasureSelect
LevelSelect
TrendSelect
Stores selected parameters and returns measurement display by MENU key.
Returns to 2nd layer by left arrow key.
Moves to other setting items by up/down arrow keys.

9－6－1－2. Selects Displayable Items to Display on Level Display

This setting variable selects displayed items on level display from displayable items.
Each display can be switched by “DISP” key or “pattern change” function of the external control input.

⚠CAUTION

Initial values of display screens are different in the case of 1 input (without chB input) and in the case of 2 inputs (with chB input).
In level display, 3 item display is not available even for 2 inputs.

○1- input (without chB input) models（WPMZ-6-***PX**-**-***, WPMZ-6-***AX**-**-***)

3rd layer (Setting variables)	**4th layer (Setting values)**	**Initial value**	**Meaning of setting value**
Level Select	Instantaneous value A [InsA]		Display Instantaneous value of chA input.
	Totalized value A [TotA]		Display totalized value of chA input.
	Instantaneous value A＋Totalized value A [InsA+TotA]	*	Display 2 items of instantaneous value and totalized value of chA input.

○2-input (with chB input) models（WPMZ-6-***PP**-**-***, WPMZ-6-***AA**-**-***)

3rd layer (Setting variables)	**4th layer (Setting values)**	**Initial value**	**Meaning of setting value**
Level select	Instantaneous value A [InsA]		Displays Instantaneous value of chA input.
	Instantaneous value B [InsB]		Displays Instantaneous value of chB input.
	Instantaneous value calculation [InsCalc]		Displays calculation result of chA input instantaneous value and chB input instantaneous value.
	Instantaneous value A＋Instantaneous value B [InsA+InsB]		Displays 2 items of chA input instantaneous value and chB input instantaneous value.
	Totalized value A [TotA]		Display totalized value of chA input.
	Totalized value B [TotB]		Displays totalized value of chB input.
	Totalized value calculation [TotCalc]		Displays a calculation result of chA input totalized value and chB input totalized value.
	Totalized value A＋Totalized value B [TotA+TotB]		Displays 2 items of chA input totalized value and chB input totalized value.
	Instantaneous value A＋Totalized value A [InsA+TotA]	*	Display 2 items of instantaneous value and totalized value of chA input.
	Instantaneous value B＋Totalized value B [InsB+TotB]	*	Display 2 items of instantaneous value and totalized value of chB input.
	Instantaneous value calculation+ Totalized value calculation+ [InsCalc+TotCalc]		Displays 2 items of instantaneous value calculation result and totalized value calculation result of, chA input and chB input.

⚠CAUTION

Two phase (90deg phase) pulse inputs are acceptable on pulse 2-input models (WPMZ-6-*PP-**-***). In the case that two-phase is selected as input type and chB or calculated result are selected in Display Select, measurement display shows “------”.

●The setting method is same as that of “Display Select”. Refer to “9-6-1-1. Select measurement display contents displayed in measurement mode”

9－6－1－3. Selects Displayable Items to Display on Trend Display

This setting variable selects displayed items on level display from displayable items
Each display can be switched by “DISP” key or “pattern change” function of the external control input.

> ⚠ CAUTION
>
> Initial values of display screens are different in the case of 1 input (without chB input) and in the case of 2 inputs (with chB input).
> In trend display, 3 item display is not available even for 2 inputs.

○1- input (without chB input) models（WPMZ-6-***PX**-**-***, WPMZ-6-***AX**-**-***)

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Trend select	Instantaneous value A [InsA]		Displays Instantaneous value of chA input.
	Totalized value A [TotA]		Display totalized value of chA input.
	Instantaneous value A＋Totalized value A [InsA+TotA]	*	Display 2 items of instantaneous value and totalized value of chA input.

○2-input (with chB input) models（WPMZ-6-***PP**-**-***, WPMZ-6-***AA**-**-***)

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Trend select	Instantaneous value A [InsA]		Displays Instantaneous value of chA input.
	Instantaneous value B [InsB]		Displays Instantaneous value of chB input.
	Instantaneous value calculation [InsCalc]		Displays calculation result of chA input instantaneous value and chB input instantaneous value.
	Instantaneous value A＋Instantaneous value B [InsA+InsB]		Displays 2 items of chA input instantaneous value and chB input instantaneous value.
	Totalized value A [TotA]		Display totalized value of chA input.
	Totalized value B [TotB]		Displays totalized value of chB input.
	Totalized value calculation [TotCalc]		Displays a calculation result of chA input totalized value and chB input totalized value.
	Totalized value A＋Totalized value B [TotA+TotB]		Displays 2 items of chA input totalized value and chB input totalized value.
	Instantaneous value A＋Totalized value A [InsA+TotA]	*	Display 2 items of instantaneous value and totalized value of chA input.
	Instantaneous value B＋Totalized value B [InsB+TotB]	*	Display 2 items of instantaneous value and totalized value of chB input.
	Instantaneous value calculation+ Totalized value calculation+ [InsCalc+TotCalc]		Displays 2 items of instantaneous value calculation result and totalized value calculation result of, chA input and chB input.

> ⚠CAUTION
>
> Two phase (90deg phase) pulse inputs are acceptable on pulse 2-input models（WPMZ-6-*PP-**-***). In the case that two-phase is selected as input type and chB or calculated result are selected in Display Select, measurement display shows “------”.

●The setting method is same as that of “Display Select”. Refer to “9-6-1-1. Select measurement display contents displayed in measurement mode”

９－６－２. LEVEL DISPLAY

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Select a pattern number to configure settings	Pattern select (PatternSelect)	page132
Set scales of level display for instantaneous value.	Instantaneous value A scale (InsA Scale)	page133
	Instantaneous value B scale (InsB Scale)	
	Instantaneous value calculation scale (InsCalc Scale)	
Set scales of level display for totalized value.	Totalized value A scale (TotA Scale)	page134
	Totalized value B scale (TotB Scale)	
	Totalized value calculation scale (TotCalc Scale)	

９－６－２－１. Select a Pattern Number to Configure Settings

This product can memorize 8 patterns (8 kinds) of parameters including input settings, output settings and display settings.
In measurement mode, the product calculates using one of 8 patterns which are configured.
This setting selects the pattern number which a configuration is performed.

⚠CAUTION

The pattern number is common to input settings, output settings and display settings.
Design contents related to“Level Display”are registered in the pattern number selected.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Pattern select	Pattern1	Pattern number which is selected in measurement mode.	Performs a configuration to pattern No.1
	Pattern2		Performs a configuration to pattern No.2
	Pattern3		Performs a configuration to pattern No.3
	Pattern4		Performs a configuration to pattern No.4
	Pattern5		Performs a configuration to pattern No.5
	Pattern6		Performs a configuration to pattern No.6
	Pattern7		Performs a configuration to pattern No.7
	Pattern8		Performs a configuration to pattern No.8

- Setting steps to set pattern number for Level Display to “Pattern8” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“3. Display”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“LevelDisp”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**PatternSelect**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Pattern8”** * Select the pattern number which you need to be configured in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

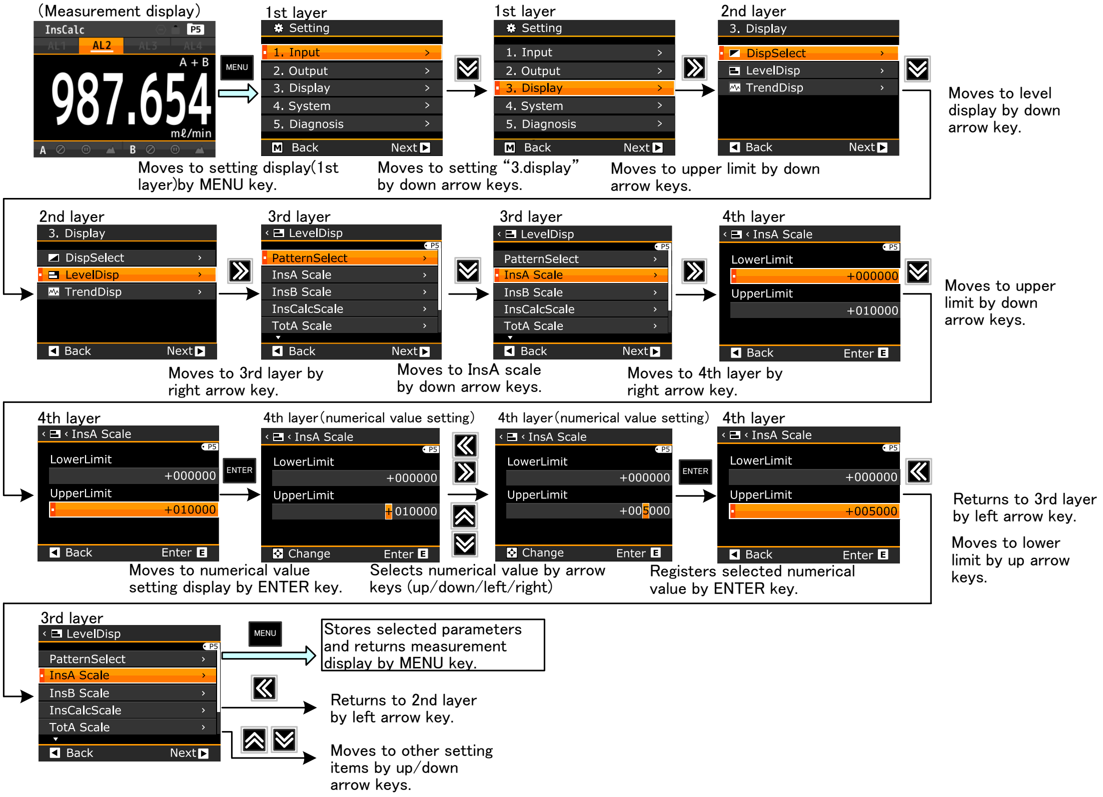
9－6－2－2. Sets Scales of Level Display for Instantaneous Value.

These setting variables set display scales (display range) of level display (bar graph display) for instantaneous value of inputs.
The range between scale lower limit and scale upper limit is displayed on level display as a bar graph.

> ⚠CAUTION
>
> These setting variables set scales (display range) of level display only. Scaling settings for instantaneous values are not performed by these setting variables.
> “Instantaneous value B scale (InsB Scale)” and “Instantaneous value calculation scale (IncCalc Scale)” appears on models with 2-inputs (with chB).

3rd layer (Setting variables)	4th layer (Setting values)	Initial values	Meanings of setting values
Instantaneous value A scale	scale lower limit ±999999	+000000	Set lower limit value of level display for chA instantaneous values. Left edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of level display for chA instantaneous values. Right edge is upper limit of scale.
Instantaneous value B scale	scale lower limit ±999999	+000000	Set lower limit value of level display for chB instantaneous values. Left edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of level display for chB instantaneous values. Right edge is upper limit of scale.
Instantaneous calculation value scale	scale lower limit ±999999	+000000	Set lower limit value of level display for instantaneous calculated values. Left edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of level display for instantaneous calculated values. Right edge is upper limit of scale.

●In the level display, setting steps to set upper limit value for chA instantaneous values to “5000” are shown below. Same steps can be applied to lower limit value, chB instantaneous value and instantaneous calculation value.



Moves to setting display(1st layer)by MENU key.

Moves to setting “3.display” by down arrow keys.

Moves to upper limit by down arrow keys.

Moves to level display by down arrow key.

Moves to 3rd layer by right arrow key.

Moves to InsA scale by down arrow keys.

Moves to 4th layer by right arrow key.

Moves to upper limit by down arrow keys.

Moves to numerical value setting display by ENTER key.

Selects numerical value by arrow keys (up/down/left/right)

Registers selected numerical value by ENTER key.

Returns to 3rd layer by left arrow key.

Moves to lower limit by up arrow keys.

Stores selected parameters and returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

Moves to other setting items by up/down arrow keys.

9－6－2－3. Sets Scales of Level Display for Totalized Value

These setting variables set scales of level display (bar graph display) for totalized value of inputs The range between scale lower limit and scale upper limit is displayed on level display as bar a graph.

⚠CAUTION

These setting variables set scales (displayed range) of level display only. Scaling settings for totalized values are not performed by these setting variables.
"Totalized value B scale (TotB Scale)" and "Totalized value calculation scale(TotCalc Scale)" appears on models with 2-inputs (with chB).

3rd layer (Setting variables)	4th layer (Setting values)	Initial values	Meanings of setting values
Totalized value A scale [TotA Scale]	scale lower limit ±999999	+000000	Set lower limit value of level display for chA totalized values. Left edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of level display for chA totalized values. Right edge is upper limit of scale.
Totalized value B scale [TotB Scale]	scale lower limit ±999999	+000000	Set lower limit value of level display for chB totalized values. Left edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of level display for chB totalized values. Right edge is upper limit of scale.
Totalized calculation value scale [TotCalcScale]	scale lower limit ±999999	+000000	Set lower limit value of level display for totalized calculated values. Left edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of level display for totalized calculated values. Right edge is upper limit of scale.

●The setting method is same as that of scale setting for instantaneous value. Refer to "9-6-2-2. Sets scales of level display for instantaneous value".

９－６－３. TRENDDISPLAY

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Select a pattern number to configure settings	Instantaneous value A scale (InsA Scale)	page136
Set scales of trend display for instantaneous value.	Instantaneous value B scale (InsB Scale)	page137
	Instantaneous value calculation scale (InsCalc Scale)	
	Totalized value A scale (TotA Scale)	
Set scales of trend display for totalized value.	Totalized value B scale (TotB Scale)	page138
	Totalized value calculation scale (TotCalc Scale)	
	Instantaneous value A scale (InsA Scale)	
Set time axis for trend display	Time axis (TimeAxis)	pgae139

9－6－3－1. Select a Pattern Number to Configure Settings

This product can memorize 8 patterns (8 kinds) of parameters including input settings, output settings and display settings.
In measurement mode, the product calculates using one of 8 patterns which are configured.
This setting selects the pattern number which a configuration is performed.

⚠CAUTION

The pattern number is common to input settings, output settings and display settings.
Design contents related to"Trend Display" are registered in the pattern number selected.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meaning of setting value
Pattern select	Pattern1	Pattern number which is selected in measurement mode.	Performs a configuration to pattern No.1
	Pattern2		Performs a configuration to pattern No.2
	Pattern3		Performs a configuration to pattern No.3
	Pattern4		Performs a configuration to pattern No.4
	Pattern5		Performs a configuration to pattern No.5
	Pattern6		Performs a configuration to pattern No.6
	Pattern7		Performs a configuration to pattern No.7
	Pattern8		Performs a configuration to pattern No.8

- Setting steps to set pattern number for trend display to "Pattern8" are shown below.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"3. Display"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"TrendDisplay"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**PatternSelect**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Pattern8"** * Select the pattern number which you need to be configured in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－6－3－2. Set Scales of Trend Display for Totalized Value

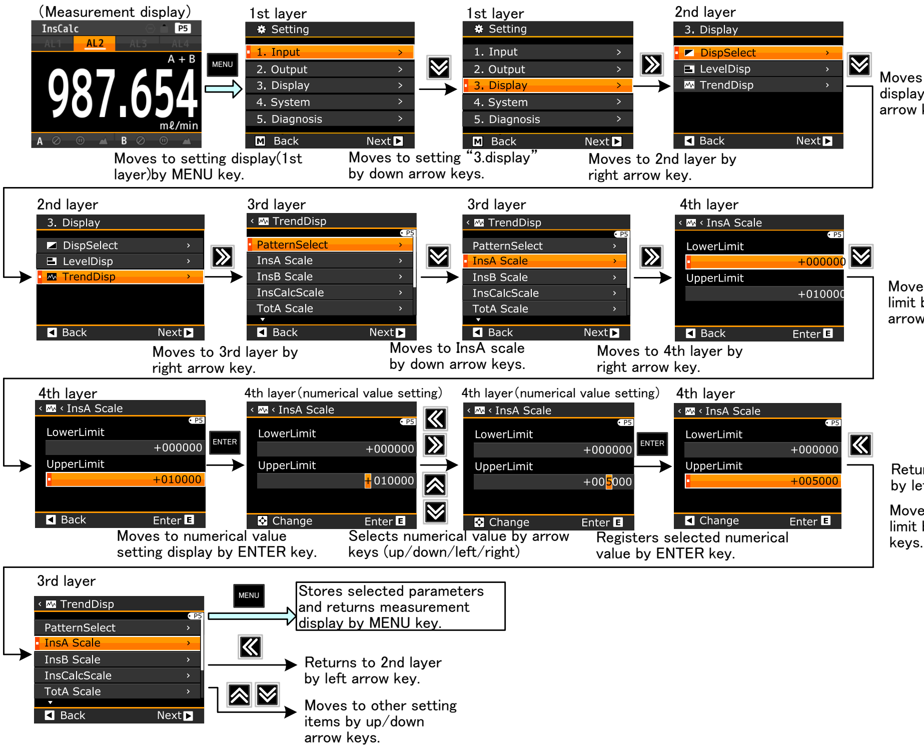
These setting variables set display scales (display range) of trend display for instantaneous value of inputs.
The range between scale lower limit and scale upper limit is displayed on trend display.

⚠CAUTION

○These setting variables set scales (display range) of trend display only. Scaling settings for instantaneous values are not performed by these setting variables.
○When the scale is modified, the trend display is redrawn using current value right after the modification and starting with the right end.
○“Instantaneous value B scale (InsB Scale)” and “Instantaneous value calculation scale (InsCalc Scale)” appear on models with 2 inputs (with chB).

3rd layer (Setting variables)	4th layer (Setting values)	Initial values	Meanings of setting values
Instantaneous value A scale	scale lower limit ±999999	+000000	Set lower limit value of trend display for chA instantaneous values. Lower edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of trend display for chA instantaneous values. Upper edge is upper limit of scale.
Instantaneous value B scale	scale lower limit ±999999	+000000	Set lower limit value of trend display for chB instantaneous values. Lower edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of trend display for chB instantaneous values. Upper edge is upper limit of scale.
Instantaneous calculation value scale	scale lower limit ±999999	+000000	Set lower limit value of trend display for instantaneous calculated values. Lower edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of trend display for instantaneous calculated values. Upper edge is upper limit of scale.

●In the trend display, setting steps to set upper limit value for chA instantaneous values to “5000” are shown below. Same steps can be applied to lower limit value, chB instantaneous value and instantaneous calculation value.



Moves to setting display(1st layer)by MENU key.

Moves to setting “3.display” by down arrow keys.

Moves to 2nd layer by right arrow key.

Moves to trend display by down arrow keys.

Moves to 3rd layer by right arrow key.

Moves to InsA scale by down arrow keys.

Moves to 4th layer by right arrow key.

Moves to upper limit by down arrow keys.

Moves to numerical value setting display by ENTER key.

Selects numerical value by arrow keys (up/down/left/right)

Registers selected numerical value by ENTER key.

Returns to 3rd layer by left arrow key.

Moves to lower limit by up arrow keys.

Stores selected parameters and returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

Moves to other setting items by up/down arrow keys.

９－６－３－３．Sets Scales of Trend Display for Totalized Value

These setting variables set display scales (display range) of trend display for totalized values. The range between scale lower limit and scale upper limit is displayed on trend display.

⚠CAUTION

○This setting variables set scales (displayed range) of trend display only. Scaling settings for totalized values are not performed by these setting variables.
○When the scale is modified, the trend display is redrawn using current value right after the modification and starting with the right end.
○"Totalized value B scale (TotB Scale)" and "Totalized value calculation scale (TotCalc Scale)" appears on models with 2-inputs (with chB).

3rd layer (Setting variables)	4th layer (Setting values)	Initial values	Meanings of setting values
Totalized value A scale	scale lower limit ±999999	+000000	Set lower limit value of trend display for chA totalized values. Lower edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of trend display for chA totalized values. Upper edge is upper limit of scale.
Totalized value B scale	scale lower limit ±999999	+000000	Set lower limit value of trend display for chB totalized values. Lower edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of trend display for chB totalized values. Upper edge is upper limit of scale.
Totalized calculation value scale	scale lower limit ±999999	+000000	Set lower limit value of trend display for totalized calculated values. Lower edge is lower limit of scale.
	scale upper limit ±999999	+010000	Set upper limit value of trend display for totalized s calculated values. Upper edge is upper limit of scale.

●The setting method is same as that of scale setting for instantaneous value. Refer to "9-6-3-2. Sets scales of level display for instantaneous value".

9−6−3−4. Set Time Axis for Trend Display

This setting variable sets the time axis of trend display.

> **⚠CAUTION**
>
> When the time axis is modified, the trend display is redrawn using current value right after the modification and starting with the right end.

3rd layer (Setting variable)	**4th layer (Setting values)**	**Initial value**	**Meanings of setting values**
Time axis (Time Axis)	1s/div	*	1 division of time axis is equivalent to 1 second. (Maximum display time) Horizontal display: 0.5min,Vertical display: 0.3min
	2s/div		1 division of time axis is equivalent to 2 seconds. (Maximum display time) Horizontal display: 0.9min,Vertical display: 0.7min
	5s/div		1 division of time axis is equivalent to 5 seconds. (Maximum display time) Horizontal display: 2.3min,Vertical display: 1.7min
	10s/div		1 division of time axis is equivalent to 10 seconds. (Maximum display time) Horizontal display: 4.7min,Vertical display: 3.3min
	30s/div		1 division of time axis is equivalent to 30 seconds. (Maximum display time) Horizontal display: 14min,Vertical display: 10min
	60s/div		1 division of time axis is equivalent to 60 seconds. (Maximum display time) Horizontal display: 28min,Vertical display: 20min
	120s/div		1 division of time axis is equivalent to 120 seconds. (Maximum display time) Horizontal display: 56min,Vertical display: 40min

●Setting steps to set the time axis of trend display to "30s/div" are shown below.

No.	**Descriptions**
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"3. Display"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"TrendDisp"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**TimeAxis**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"30s/div"** * Select the time axis which you need to be configured in actually.
⑥	By pushing "**ENTER**" key, a message "**Changing the time axis, trend data will be cleared"** appears and the cursor is placed on "**Cancel**"
⑦	By moving the cursor with "**ARROW (UP/DOWN)**" keys, point the cursor to **"OK".** Push "**ENTER**" key, then the setting becomes valid and the check mark moves to "30s/div". *If the setting is needed to cancel, move the cursor to **"CANCEL** "and push **"ENTER"** key.
⑧	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note:If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－７. DETAIL OF SYSTEM SETTING GROUP

The system setting group is classified to the following small 2 categories and can be configured respectively.

2nd layer (Small categories)	Descriptions	Remarks
General	Configure setting of supporting functions, such as brightness of display	
Initialize	Configure setting about initialization.	

９－７－１. GENERAL

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Change brightness of display	Brightness	page 141
Delay start up time	PowerOnDelay	page 142
Set power saving time	PowerSaving Time	page 143
Select whether to retent totalized value at power shutdoun	TotMemory	page 144
Select whether to maintain the digital zero execution state and offset value at the time of power shutdown at restart	D-ZeroRetention	page 145
Change displayed language	Language	page 146
Change direction of display	DisplayDirecton	page 147
Protect settings	SettingProtect	page 148
Copy data of a pattern number to other pattern number(s).	PatternCopy	page 149

9－7－1－1. Change Brightness of Display

By this setting variable, the brightness oh display can be controlled by 6 steps.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Brightness	5 Bright	*	Bright
	4		Rather dark
	3		Dark
	2		Very dark
	1 Dark		Darkest
	0 Off		Light off

⚠ CAUTION

If “0 Off (Light off)”is set, whole of display turns light off and goes black.
In this case, display lights up by pushing MENU key and FUNC key.

●Setting steps to set brightness of display to “1 Dark “are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“4. System”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“General”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Brightness**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“1 Dark”.** *Select a desired brightness in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW(LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note : If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9−7−1−2. Provide Wait Time after Power on

This setting variable provides waiting time after power on to start measurement.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
PowerOnDelay	None	*	No waiting time
	2sec		Waiting time 2sec
	5 sec		Waiting time 5sec
	10 sec		Waiting time 10sec
	20 sec		Waiting time 20sec
	30 sec		Waiting time 30sec
	60 sec		Waiting time 60sec

⚠CAUTION

○In the power on delay period, the display indicates "------".
○While "------"is displayed, all outputs keep OFF state.

●Setting steps to set "Power on delay" to "10sec"are shown below.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"4. System"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"General"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**PowerOnDelay**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"10sec".** *Select a desired time in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW(LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note: If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

９－７－１－３. Set Power Saving Time

This setting variable sets time of power saving mode.
After no key operation over the time, the display turns power saving mode automatically.
During power saving display, if any key is pushed, the power saving mode is released.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Power saving time [PowerSavingTime]	None	*	No power saving display.
	1min		After 1minute of no key operation, display turns power saving display.
	2min		After 2minutes of no key operation, display turns power saving display.
	5min		After 5minutes of no key operation, display turns power saving display.
	10min		After 10minutes of no key operation, display turns power saving display.
	30min		After 30minutes of no key operation, display turns power saving display.
	60min		After 60minutes of no key operation, display turns power saving display.

⚠CAUTION

In "Power saving display" mode, the brightness of the display is "1 dark".

●Setting steps to set "PowerSavingTime" to "5min"are shown below.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"4. System"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"General"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**PowerSavingTime**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"5min".** *Select a desired time for power saving in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note : If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－7－1－4. Memorize Totalized Value

This setting variable decides whether backup of totalized value is enabled or not.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Totalized value memory (TotMemory)	Disable		Totalized value is NOT backed up.
	Enable	*	Totalized value is backed up.

⚠CAUTION

If this item is set to “Disable”, the totalized value is cleared by power-off.

●Setting steps to set “Totalized PowerSavingTime” value memory” to “Disable” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“4. System”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“General”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**TotMemory**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Disable”.** *Caution: If this item is set to “Disable”, the totalized value is cleared
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note: **If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.**

９−７−１−１. Digital Zero Retention

This setting is whether or not to save the operating state and offset value of the digital zero function when the power is turned off
By setting "Enable", the following operation is performed.

● DZ indication from the external control terminal
When turning off the power while keeping the DZ indication and restarting with the external control terminal shorted or 0 level, keep the offset value at the last power off and start up.

● DZ instruction by shortcut key or communication (RS-232C or RS-485)
When turning the power off and restarting in the DZ indication state, restart will be done in the DZ indicated state by the offset value at the last power off.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Digital Zero Retention (D-ZeroRetention)	Disable	*	DZ state and value is NOT backed up.
	Enable		DZ state and value is backed up.

●Setting steps to set "Digital zero retention" to "Enable" are shown below.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"4. System"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"General"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**D-ZeoroRetention**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Enable".**
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note：If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－7－1－2. Select Displayed Language

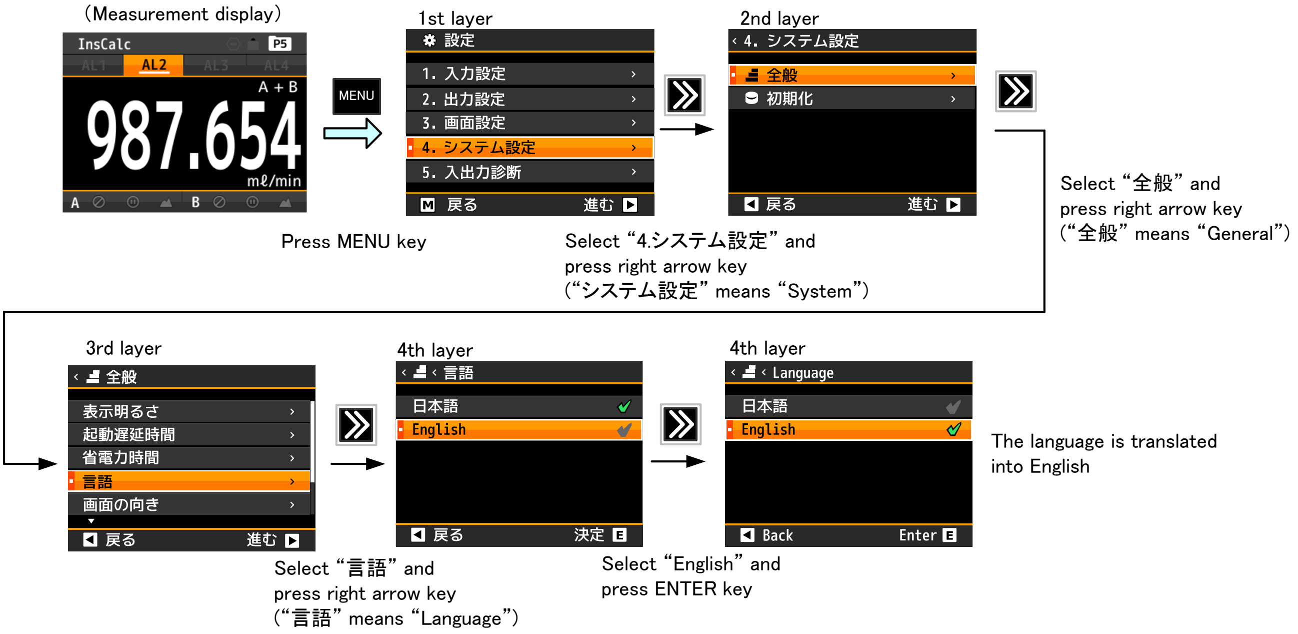
This setting variable selects language displayed in measurement mode and setting mode.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Language	日本語	*	Displayed in Japanese.
	English		Displayed in English.

●Setting steps to set language from “日本語” to “English” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“4. システム設定”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“全般”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**言語**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“English”.** *Select a desired language in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note : <u>If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.</u>



Press MENU key

Select “4.システム設定” and press right arrow key (“システム設定” means “System”)

Select “全般” and press right arrow key (“全般” means “General”)

Select “言語” and press right arrow key (“言語” means “Language”)

Select “English” and press ENTER key

The language is translated into English

9－7－1－3. Change Direction of Display

This setting variable selects direction of display in measurement mode and setting mode.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Direction of display (DisplayDirection)	Horizontal	*	Horizontal display.
	Vertical		Vertical display.

⚠CAUTION

If you change direction of display, measurement values are cleared and measurement restarts.
Functions of Arrow keys (UP/DOWN/LEFT/RIGHT) are adapted to the direction of display.

●Setting steps to set direction of display to "Vertical" are shown below.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"4. System"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"General"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables**).
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**DisplayDirection**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"Vertical".** *Select a desired direction in actually.
⑥	Pushing **"ENTER"** key, selected parameters become valid and a check mark accompanies. *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Note: If the power is shut down before being pushed the "MENU" key, the selected contents are not stored.

9－7－1－4. Protect Settings

By this setting variable, settings which have been configured can be protected to prevent further change in setting mode.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Setting protect (SettingProtect)	Disable	*	Protection of settings is disabled.
	Enable		Protection of settings is enabled.

⚠CAUTION

When setting protect is enabled, you can see setting values which are configured, but you cannot change them. If you need to change them, let setting protect to disable in advance.

●Setting steps to set “Setting protect” to “Enable” are shown below.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“4. System”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“General”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables**).
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**SettingProtect**” and push “**ARROW (RIGHT)**” key, then the display moves to the **4th layer (setting contents)**. *In the 4th layer, the currently selected parameter accompanies a check mark.
⑤	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Enable”.** *Select a desired setting in actually.
⑥	Pushing **“ENTER”** key, selected parameters become valid and a check mark accompanies. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Note : If the power is shut down before being pushed the “MENU” key, the selected contents are not stored.

9－7－1－5. Copy Configured Pattern Data to Other Patterns

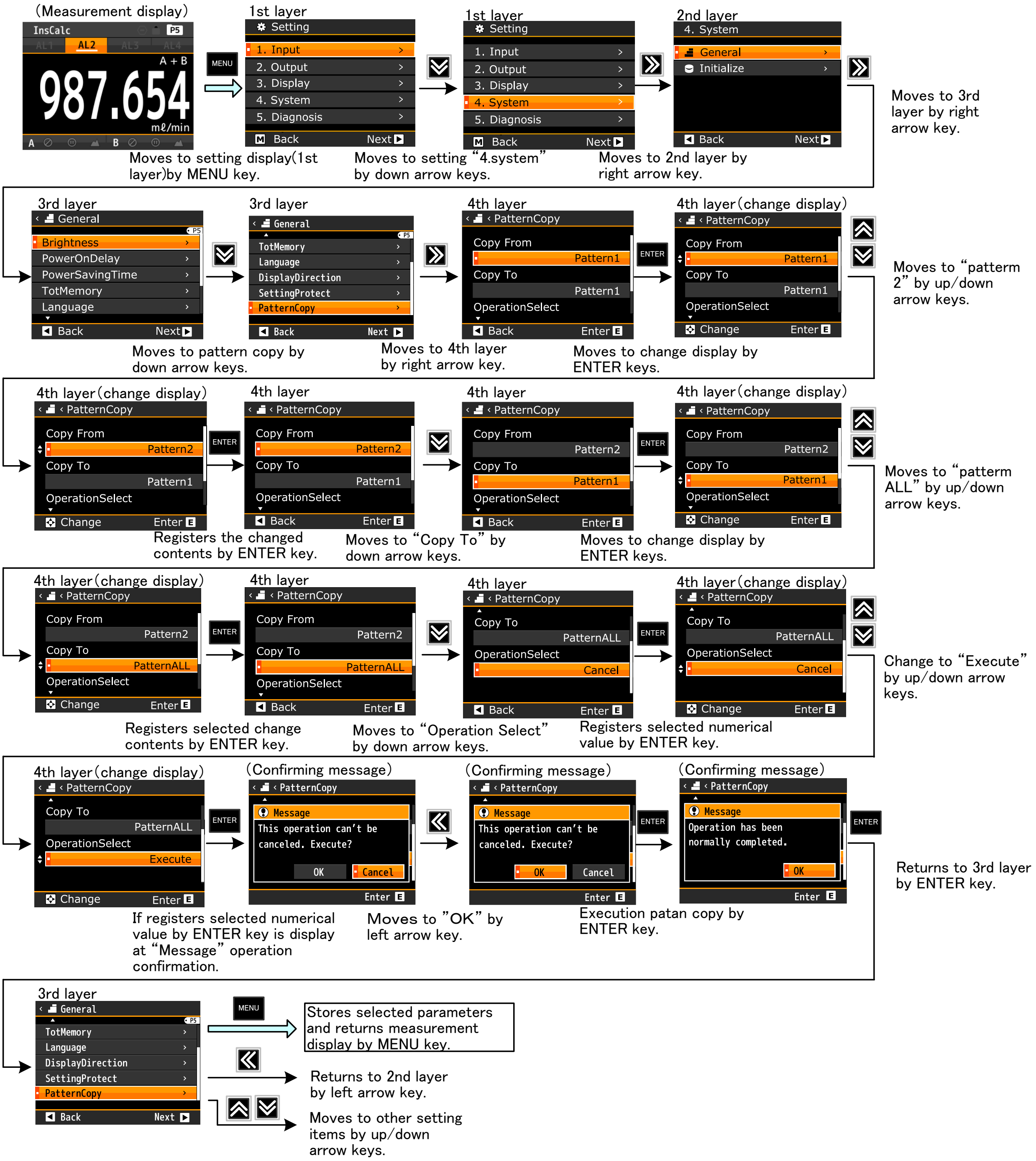
Using this setting variable, you can copy a configured pattern data on some pattern number to other pattern number(s).

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Pattern copy	（Copy from） [Source pattern number]		
	Pattern1	*	Copy data of Pattern 1 to destination pattern No.
	Pattern2		Copy data of Pattern 2 to destination pattern No.
	Pattern3		Copy data of Pattern 3 to destination pattern No.
	Pattern4		Copy data of Pattern 4 to destination pattern No.
	Pattern5		Copy data of Pattern 5 to destination pattern No.
	Pattern6		Copy data of Pattern 6 to destination pattern No.
	Pattern7		Copy data of Pattern 7 to destination pattern No.
	Pattern8		Copy data of Pattern 8 to destination pattern No.
	（Copy to）[Destination pattern number]		
	Pattern1		Copy data of source pattern No to Pattern 1.
	Pattern2		Copy data of source pattern No to Pattern 2.
	Pattern3		Copy data of source pattern No to Pattern 3.
	Pattern4		Copy data of source pattern No to Pattern 4.
	Pattern5		Copy data of source pattern No to Pattern 5.
	Pattern6		Copy data of source pattern No to Pattern 6.
	Pattern7		Copy data of source pattern No to Pattern 7.
	Pattern8		Copy data of source pattern No to Pattern 8.
	All patterns	*	Copy data of source pattern No to All pattern No.
	（Operation Selects）		
	Cancel	*	Cancel pattern copy
	Execute		Execute pattern copy

⚠CAUTION

When setting protects is enabled, you can see setting values which are configured, but you cannot change them. If you need to change them, let setting protect to disable in advance.

●Setting steps to copy configured data of pattern 2 to all pattern numbers are shown below.



Moves to setting display(1st layer)by MENU key.

Moves to setting "4.system" by down arrow keys.

Moves to 2nd layer by right arrow key.

Moves to 3rd layer by right arrow key.

Moves to pattern copy by down arrow keys.

Moves to 4th layer by right arrow key.

Moves to change display by ENTER keys.

Moves to "patterm 2" by up/down arrow keys.

Registers the changed contents by ENTER key.

Moves to "Copy To" by down arrow keys.

Moves to change display by ENTER keys.

Moves to "patterm ALL" by up/down arrow keys.

Registers selected change contents by ENTER key.

Moves to "Operation Select" by down arrow keys.

Registers selected numerical value by ENTER key.

Change to "Execute" by up/down arrow keys.

If registers selected numerical value by ENTER key is display at "Message" operation confirmation.

Moves to "OK" by left arrow key.

Execution patan copy by ENTER key.

Returns to 3rd layer by ENTER key.

Stores selected parameters and returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

Moves to other setting items by up/down arrow keys.

９－７－２. INITIALIZATION

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Restore setting values to user default value.	Save user defaults (UserDefaultSave)	page151
	Initialize to user defaults (UserDefaultLoad)	page151
Restore setting values to factory default value	Initialize to factory defaults (FactoryDefaultLoad)	page152

９－７－２－１. Restore Setting Values to User Default Vale (Save User Defaults)

Using this setting variable, you can save setting values you have configured as user default values and can initialize to these saved values. First, registering user default values are needed.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meaning of setting value
Save user defaults (UserDefaultSave)	Save current settings as user initial values?		
	Yes		Execute saving to register.
	No	*	Cancel saving to register.

⚠CAUTION

To save user default values, setting values must be configured to values which are used as initial values.

*The operation for registering user default values is same as the case of “initialize to factory defaults ”. Refer to “9-7-2-3. Restore setting values to factory default value”.

９－７－２－２. Restore Setting Values to User Default Vale (Initialize to User Defaults)

Using this setting variable, setting values can be restored to user default values.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Initialize to user defaults (UserDefaultLoad)	Initialize setting values to user initial values?		
	Yes		Execute initialization.
	No	*	Cancel initialization.

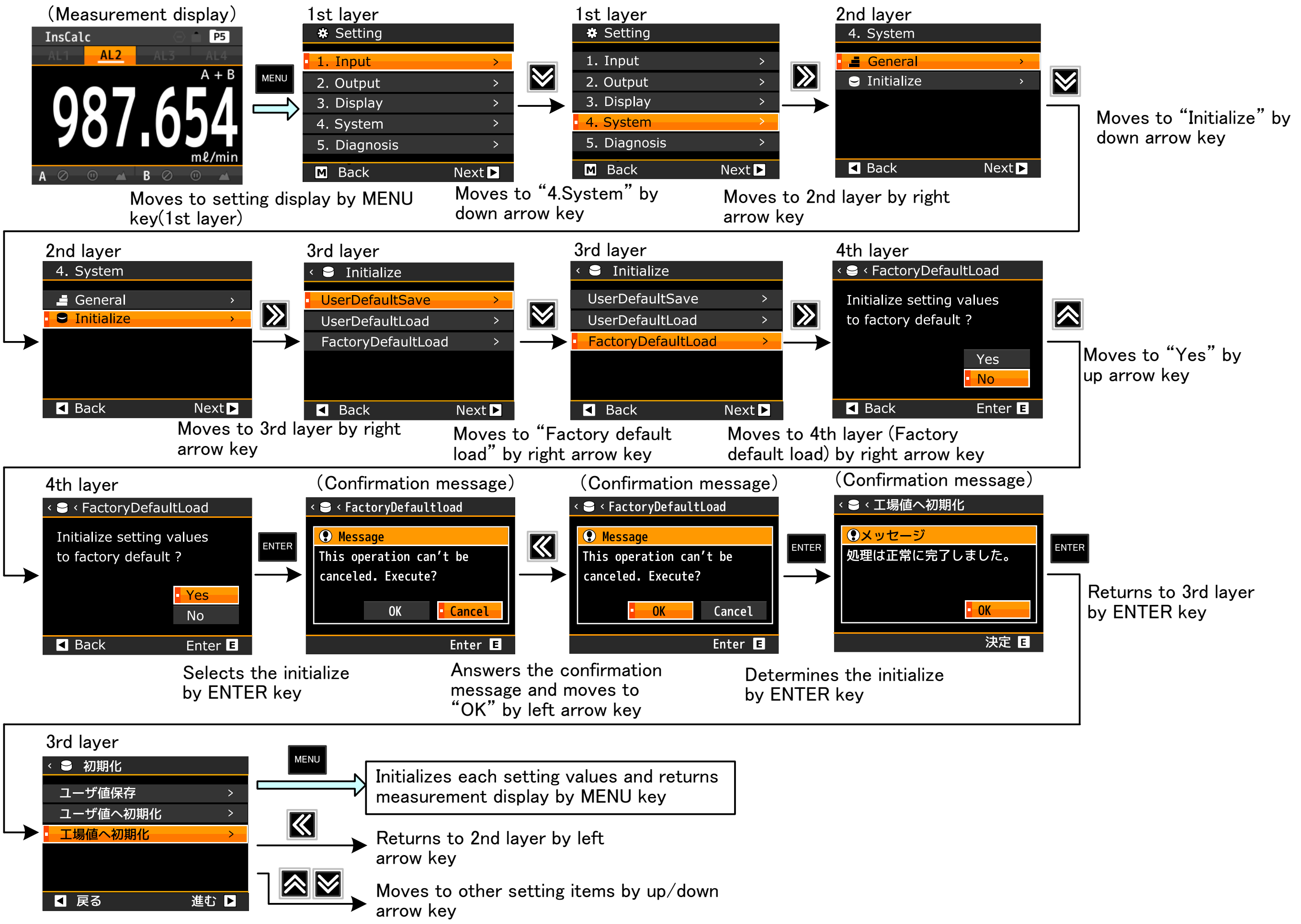
*The operation for registering user default values is same as the case of “initialize to factory defaults”. Refer to “9-7-2-3. Restore setting values to factory default value”.

９－７－２－３. Restore Setting Values to Factory Default Value

Using this setting variable, setting values can be restored to factory default values.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Initialize to factory defaults (FactoryDefaultLoad)	Initialize setting values to factory defaults?		
	Yes		Execute initialization.
	No	*	Cancel initialization.

●To initialize setting values to factory default values perform the following operation.



Moves to setting display by MENU key(1st layer)

Moves to "4.System" by down arrow key

Moves to 2nd layer by right arrow key

Moves to "Initialize" by down arrow key

Moves to 3rd layer by right arrow key

Moves to "Factory default load" by right arrow key

Moves to 4th layer (Factory default load) by right arrow key

Initialize setting values to factory default ?

Moves to "Yes" by up arrow key

Selects the initialize by ENTER key

This operation can't be canceled. Execute?

Answers the confirmation message and moves to "OK" by left arrow key

処理は正常に完了しました。

Determines the initialize by ENTER key

Returns to 3rd layer by ENTER key

Initializes each setting values and returns measurement display by MENU key

Returns to 2nd layer by left arrow key

Moves to other setting items by up/down arrow key

Note: The setting method of the language is referred to p146

９－８. DETAIL OF INPUT-OUTPUT DIAGNOSIS GROUP

The input-output diagnosis group is classified to the following small 2 categories and can be configured respectively.

2nd layer (Small categories)	Descriptions	Remarks
Input diagnosis	Performs diagnosis for inputs.	
Output test	Outputs “simulated outputs”	

９－８－１. INPUT DIAGNOSIS

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Pulse input diagnosis	PulseInputA	page154
	PulseInputB	
Analog input diagnosis	AnalogInputA	page155
	AnalogInputB	
External control input diagnosis	ExtenalCtrl	page156

9—8—1—1. Pulse Input Diagnosis

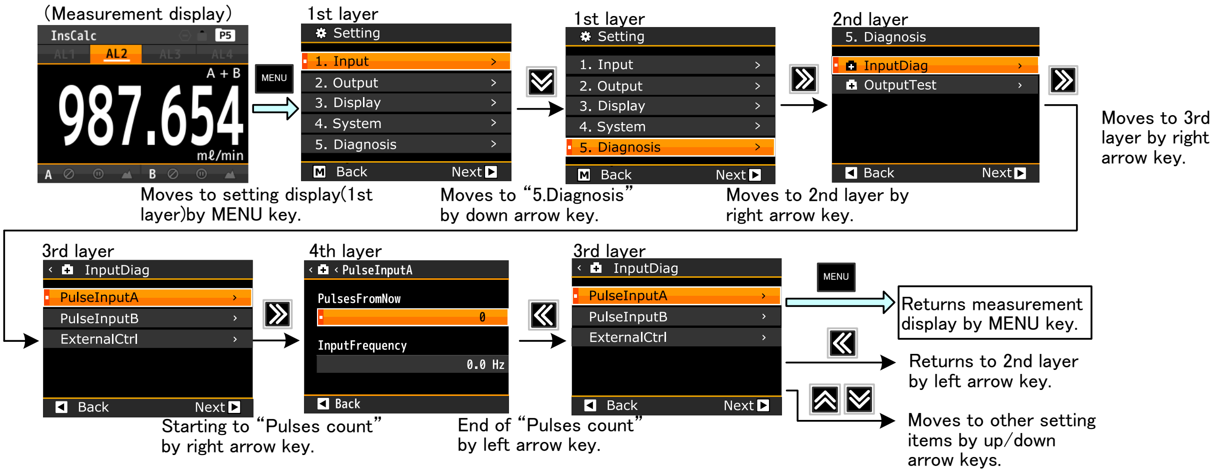
Pulse input diagnosis is useful for checking the pulse inputs when display value is not correct or when existence of sensor outputs is uncertain.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meanings of setting values
PulseInputA	—	—	No setting value, no initial value
	Number of pulses after entering 4th layer		Entering 4th layer, starts counting pulse immediately.
	InputFrequency		Display current frequency measurement value
PulseInputB	—	—	No setting value, no initial value
	Number of pulses after entering 4th layer		Entering 4th layer, starts counting pulse immediately.
	InputFrequency		Display current frequency measurement value

⚠CAUTION

Only WPMZ-6-*PP-**-***, “PulseInputB” appears. In this case, “PulseInputA” is for chA input, “PulseInputB” is for chB input.

●To perform the pulse input diagnosis, the following operation is needed.
(Same operation can be also applied to the pulse input B.)



Moves to setting display(1st layer)by MENU key.

Moves to “5.Diagnosis” by down arrow key.

Moves to 2nd layer by right arrow key.

Moves to 3rd layer by right arrow key.

Starting to “Pulses count” by right arrow key.

End of “Pulses count” by left arrow key.

Returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

Moves to other setting items by up/down arrow keys.

9－8－1－2. Analog Input Diagnosis

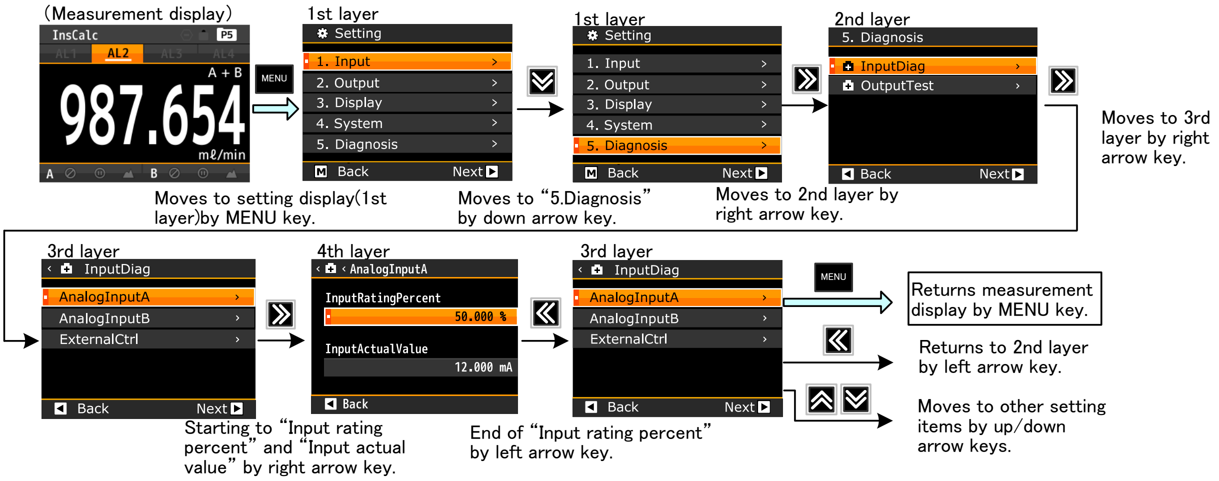
Analog input diagnosis is useful for checking whether the inputs are supplied from sensors correctly.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
AnalogInputA	—	—	No setting values, No initial value
	displays input value in % of input rating		Entering 4th layer, displays applied input in % of input rating immediately.
	InputActualValue		Display current analog signal value
AnalogInputB	—	—	No setting values, No initial value
	displays input value in % of input rating		Entering 4th layer displays applied input in % of input rating immediately.
	InputActualValue		Display current analog signal value

⚠ CAUTION

Only WPMZ-6-*AA-**-***, “AnalogInputB” appears. In this case, “AnalogInputA” is for chA input, “AnalogInputB” is for chB input.

●To perform the analog input diagnosis, the following operation is needed.
(Same operation can be also applied to the analog input B.)



InputRatingPercent 50.000 %

InputActualValue 12.000 mA

Moves to setting display(1st layer)by MENU key.

Moves to “5.Diagnosis” by down arrow key.

Moves to 2nd layer by right arrow key.

Moves to 3rd layer by right arrow key.

Starting to “Input rating percent” and “Input actual value” by right arrow key.

End of “Input rating percent” by left arrow key.

Returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

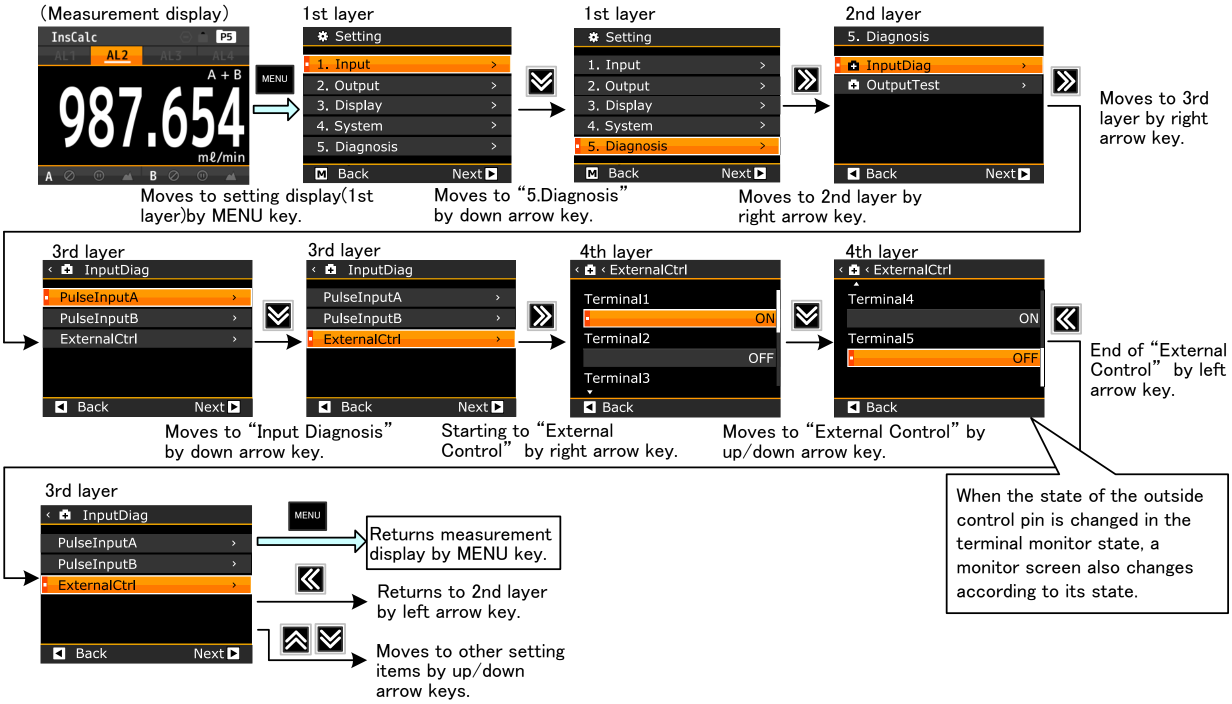
Moves to other setting items by up/down arrow keys.

9－8－1－3. External Control Input Diagnosis

By External Control Input Diagnosis, the status of external control terminal can be monitored.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
External Control Inputs (ExternalCtrl)	(terminal 1)		
	Current status	－	Displays current status in “OFF” or “ON”.
	(terminal 2)		
	Current status	－	Displays current status in “OFF” or “ON”.
	(terminal 3)		
	Current status	－	Displays current status in “OFF” or “ON”.
	(terminal 4)		
	Current status	－	Displays current status in “OFF” or “ON”.
	(terminal 5)		
	Current status	－	Displays current status in “OFF” or “ON”.

●To perform the external control input diagnosis, the following operation is needed.



Moves to setting display(1st layer)by MENU key.

Moves to “5.Diagnosis” by down arrow key.

Moves to 2nd layer by right arrow key.

Moves to 3rd layer by right arrow key.

Moves to “Input Diagnosis” by down arrow key.

Starting to “External Control” by right arrow key.

Moves to “External Control” by up/down arrow key.

End of “External Control” by left arrow key.

When the state of the outside control pin is changed in the terminal monitor state, a monitor screen also changes according to its state.

Returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

Moves to other setting items by up/down arrow keys.

９－８－２. OUTPUT TEST

WHAT YOU CAN DO	3rd layer (Setting variables)	Reference page
Simulated output on comparative output	Comparative output AL1 (Compare AL1)	page158
	Comparative output AL2 (Compare AL2)	
	Comparative output AL3 (Compare AL3)	
	Comparative output AL4 (Compare AL4)	
Simulated output on totalized synchronized pulse	PulseOutputA	page 160
	PulseOutputB	
Simulated output on analog output	AnalogOutput	page 161
Simulated output on BCD output	BCD Output（DATA）	page 163
	BCD Output（PC）	
Diagnosis of RS-232C communication	RS-232C Com	page165
Diagnosis of Modbus communication	Modbus Com	page166

９－８－２－１．Simulated Output of Comparative Output

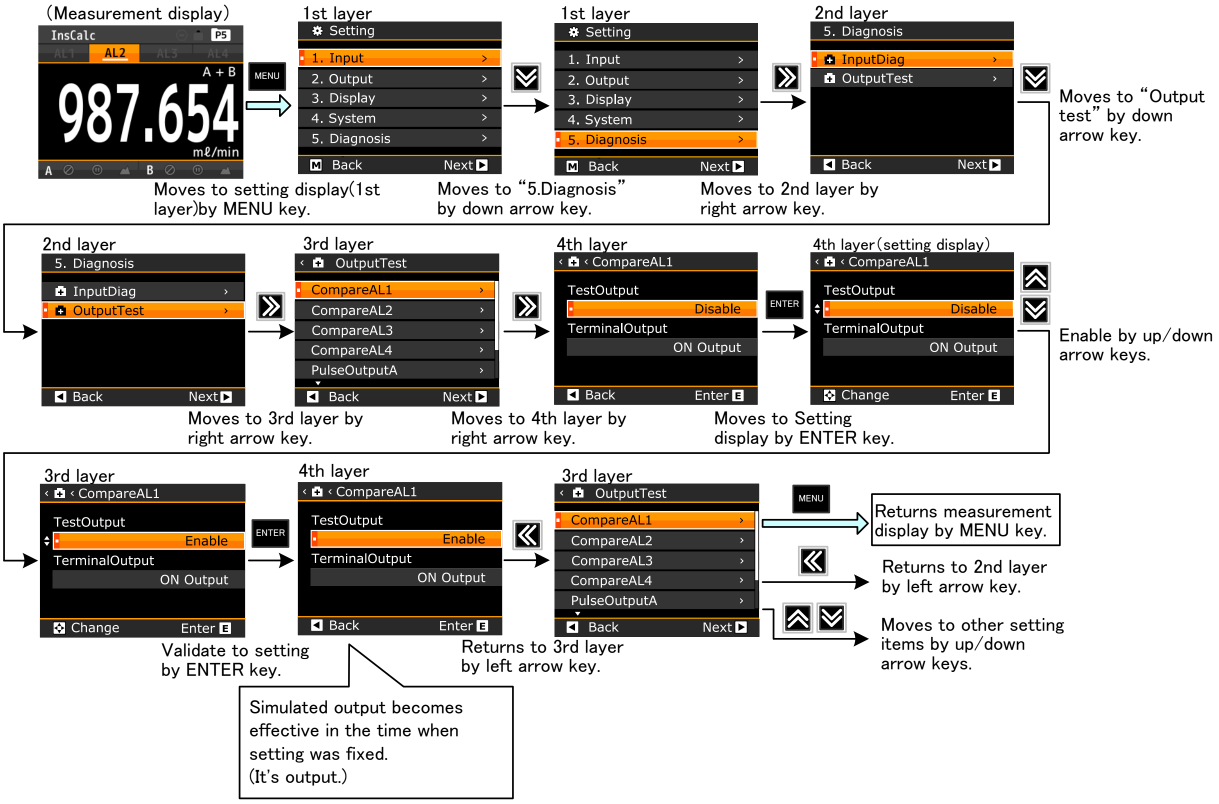
By using simulated output of comparative output, the status of comparative output can be set to “ON” or “OFF” arbitrary.　You can test devices connected to comparative outputs in advance.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meanings of setting values
Comparative output AL1 (Compare AL1)	TestOutput		
	Disable	*	Simulated output is disabled.
	Enable		Simulated output is enabled.
	TerminalOutput		
	ON output	*	Terminal state is ON when enabled.
	OFF output		Terminal state is OFF when enabled.
Comparative output AL2 (Compare AL2)	TestOutput		
	Disable	*	Simulated output is disabled.
	Enable		Simulated output is enabled.
	TerminalOutput		
	ON output	*	Terminal state is ON when enabled.
	OFF output		Terminal state is OFF when enabled.
Comparative output AL3 (Compare AL3)	TestOutput		
	Disable	*	Simulated output is disabled.
	Enable		Simulated output is enabled.
	TerminalOutput		
	ON output	*	Terminal state is ON when enabled.
	OFF output		Terminal state is OFF when enabled.
Comparative output AL4 (Compare AL4)	TestOutput		
	Disable	*	Simulated output is disabled.
	Enable		Simulated output is enabled.
	TerminalOutput		
	ON output	*	Terminal state is ON when enabled.
	OFF output		Terminal state is OFF when enabled.

⚠ CAUTION

If simulated output is enabled, output continues until the setting is set to disable or power off.

- To perform the test output of comparative output, the following operation is needed. (Same operation can be also applied to comparative outputs AL2-AL4.)



TestOutput: Disable → Enable

TerminalOutput: ON Output

Moves to setting display(1st layer)by MENU key.

Moves to "5.Diagnosis" by down arrow key.

Moves to 2nd layer by right arrow key.

Moves to "Output test" by down arrow key.

Moves to 3rd layer by right arrow key.

Moves to 4th layer by right arrow key.

Moves to Setting display by ENTER key.

Enable by up/down arrow keys.

Validate to setting by ENTER key.

Returns to 3rd layer by left arrow key.

Returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

Moves to other setting items by up/down arrow keys.

Simulated output becomes effective in the time when setting was fixed.
(It's output.)

*To stop simulated output, set "simulated output setting" to "Disable" or turn the power once.

9－8－2－2. Simulated Output of Totalizer-Synchronous Pulse Output

By Simulated Output of Totalizer-Synchronous Pulse Output, the status of Totalizer-Synchronous Pulse Output can be set to “ON” level or “OFF” level arbitrary. You can test devices connected to totalizer-synchronous pulse outputs in advance.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meanings of setting values
PulseOutputA	TestOutput		
	Disable	*	Simulated output is disabled.
	Enable		Simulated output is enabled.
	TerminalOutput		
	ON output	*	Terminal state is ON when enabled.
	OFF output		Terminal state is OFF when enabled.
PulseOutputB	TestOutput		
	Disable	*	Simulated output is disabled.
	Enable		Simulated output is enabled.
	TerminalOutput		
	ON output	*	Terminal state is ON when enabled.
	OFF output		Terminal state is OFF when enabled.

⚠CAUTION

○If simulated output is enabled, output continues until the setting is set to disable or power off.
○The simulated output is not pulse output but level output.
○“PulseOutputB” appears only on 2-input (with chB) model.

●To perform the test output of Totalizer-Synchronous Pulse Output, the following operation is needed. (Same operation can be also applied to Totalizer-Synchronous Pulse B.)

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“5. Diagnosis”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Output test”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to “**Pulse output A**” and push “**ARROW (RIGHT)**” key, then the display moves to **the 4th layer**.
⑤	By pushing “**ENTER**” key, setting is acceptable and icon of “**ARROW (UP/DOWN)** “key appears on left edge of the cursor. Using “**ARROW (UP/DOWN)**” keys, test output is set to “**Valid**”.
⑥	By pushing “**ENTER**” key, setting values are fixed and **Simulated output start to output**. *Pushing “**ARROW (LEFT)**”key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

Caution: To stop simulated output, set setting to “Disable” or turn off the power of the product.

9－8－2－3. Simulated Output of Analog Output

Simulated output of analog output can output 0 to 100% (10% step) value of selected output range. You can test devices connected to analog outputs in advance.

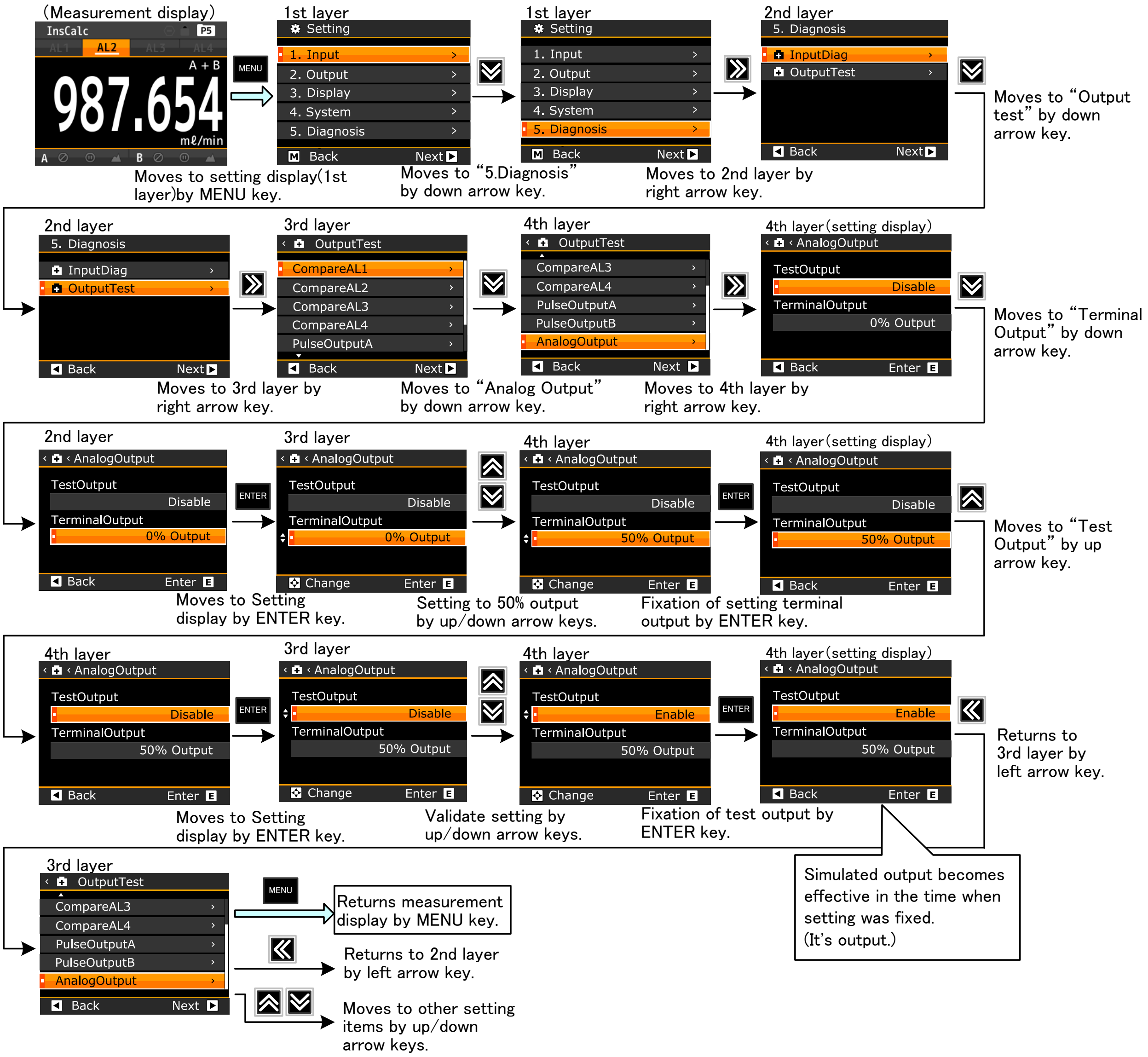
3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
Analog output (AnalogOutput)	TestOutput		
	Disable	*	Simulated output is disabled.
	Enable		Simulated output is enabled.
	TerminalOutput		
	0%	*	Outputs 0 % value of output range.
	10%		Outputs 10 % value of output range.
	20%		Outputs 20 % value of output range.
	30%		Outputs 30 % value of output range.
	40%		Outputs 40 % value of output range.
	50%		Outputs 50 % value of output range.
	60%		Outputs 60 % value of output range.
	70%		Outputs 70 % value of output range.
	80%		Outputs 80 % value of output range.
	90%		Outputs 90 % value of output range.
	100%		Outputs 100 % value of output range.

⚠CAUTION

* Once simulated output is enabled, output continues until the setting is set to disable or turning off power of the product.

* This setting variable appears only on models with analog output（WPMZ-6-***-1*-***）.

●To perform the test output of analog Output, the following operation is needed. The operation is an example to output 50% value of rating.


Moves to setting display(1st layer)by MENU key.

Moves to "5.Diagnosis" by down arrow key.

Moves to 2nd layer by right arrow key.

Moves to "Output test" by down arrow key.

Moves to 3rd layer by right arrow key.

Moves to "Analog Output" by down arrow key.

Moves to 4th layer by right arrow key.

Moves to "Terminal Output" by down arrow key.

Moves to Setting display by ENTER key.

Setting to 50% output by up/down arrow keys.

Fixation of setting terminal output by ENTER key.

Moves to "Test Output" by up arrow key.

Moves to Setting display by ENTER key.

Validate setting by up/down arrow keys.

Fixation of test output by ENTER key.

Returns to 3rd layer by left arrow key.

Simulated output becomes effective in the time when setting was fixed. (It's output.)

Returns measurement display by MENU key.

Returns to 2nd layer by left arrow key.

Moves to other setting items by up/down arrow keys.

* To stop simulated output, set setting to "Disable" or turn off the power of the product.

９－８－２－４. Simulated Output of BCD Output

Simulated output of BCD output can set each bit of BCD to “ON” level or “OFF” level arbitrarily. You can test devices connected to BCD outputs in advance.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
BCD output（DATA）	TestOutput		
	Disable	*	Simulated output is disabled.
	Enable		Simulated output is enabled.
	POL Output		Output to POL terminal
	OFF output	*	Terminal state is OFF when enabled.
	ON output		Terminal state is ON when enabled.
	OVER Output		Output to OVER terminal
	OFF output	*	Terminal state is OFF when enabled.
	ON output		Terminal state is ON when enabled.
	10^5-1/10^5-2/10^5-4/10^5-8 Output		Output to 10^5 digit 1/2/4/8bit terminal
	OFF output	*	Terminal state is OFF when enabled.
	ON output		Terminal state is ON when enabled.
	10^4-1/10^4-2/10^4-4/10^4-8 Output		Output to 10^4 digit 1/2/4/8bit terminal
	OFF output	*	Terminal state is OFF when enabled.
	ON output		Terminal state is ON when enabled.
	10^3-1/10^3-2/10^3-4/10^3-8 Output		Output to 10^3 digit 1/2/4/8bit terminal
	OFF output	*	Terminal state is OFF when enabled.
	ON output		Terminal state is ON when enabled.
	10^2-1/10^2-2/10^2-4/10^2-8 Output		Output to 10^2 digit 1/2/4/8bit terminal
	OFF output	*	Terminal state is OFF when enabled.
	ON output		Terminal state is ON when enabled.
	10^1-1/10^1-2/10^1-4/10^1-8 Output		Output to 10^1 digit 1/2/4/8bit terminal
	OFF output	*	Terminal state is OFF when enabled.
	ON output		Terminal state is ON when enabled.
	10^0-1/10^0-2/10^0-4/10^0-8 Output		Output to 10^0 digit 1/2/4/8bit terminal
	OFF output	*	Terminal state is OFF when enabled.
	ON output		Terminal state is ON when enabled.
BCD output（PC）	TestOutput		
	Disable	*	Simulated output is disabled.
	Enable		Simulated output is enabled.
	PC Output		Output to PC terminal.
	OFF output	*	Terminal state is OFF when enabled.
	ON output		Terminal state is ON when enabled.

⚠CAUTION

- Once simulated output is enabled, output continues until the setting is set to disable or turning off power of the product.
- This setting variable appears only on models with BCD output（WPMZ-6-***-2 or 3*-***）

To perform the test output of BCD Output, the following operation is needed. The operation is an example to output POL.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"5. Diagnosis"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"OutputTest"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**BCD Output (DATA)**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer**.
⑤	By moving the cursor with "**ARROW (DOWN)**" key, point the cursor to "**POL Output**" and by pushing "**ENTER**" key, setting becomes acceptable. And, icon of "**ARROW (UP/DOWN)**" key appears on left side of the cursor. Using "**ARROW (UP/DOWN)**" keys, test output is set to "**ON output**". *Set all bits for outputs desired to be tested to "ON output" or "OFF output" in actually.
⑥	By pushing "**ENTER**" key, the setting is fixed, the icon of "**ARROW (UP/DOWN)**" key on left side of the cursor disappears.
⑦	By moving the cursor with "**ARROW (UP)**" key, point the cursor to "**TestOutput"** and push "**ENTER**" key, then setting is acceptable. And, icon of "**ARROW (UP/DOWN)"** key appears on left side of the cursor. Using "**ARROW (UP/DOWN)**" keys, test output is set to "**Enable**".
⑧	By pushing "ENTER" key, setting values are fixed and **Simulated output start to output.** *Pushing "**ARROW (LEFT)**"key each time, the display returns to the 3rd layer, the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑨	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

Caution: To stop simulated output, set setting to "Disable" or turn off the power of the product.

9−8−2−5. Diagnosis of RS-232C Communication

Diagnosis of RS-232C communication provides monitoring of communication condition. Command sent from host and response to the command is displayed.

3rd layer (Setting variable)	4th layer (Setting values)	Initial value	Meanings of setting values
RS-232C Communication	ReceiveData		Displays data sent from host (command)
	–	–	No setting value (No initial value)
	TransmitData		Displays response data
	–	–	No setting value (No initial value)

⚠CAUTOION

This setting variable appears only on models with RS-232C communication (WPMZ-6-***-4*-***).

●To perform diagnosis of RS-232C communication, the following operation is needed.

No.	Descriptions
①	By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"5. Diagnosis"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to **"OutputTest"** and push "**ARROW (RIGHT)**" key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with "**ARROW (UP/DOWN)**" key, point the cursor to "**RC-232C Com**" and push "**ARROW (RIGHT)**" key, then the display moves to the **4th layer** and diagnosis (communication check) can be done.
⑤	If Data (command) is sent from host correctly, it is displayed as **Receive Data** and **Response data** is displayed as transmit data.
⑥	Pushing "**ARROW (LEFT)**"key, the display returns to the 3rd layer and diagnosis of RS-232C is terminated. Pushing "**ARROW (LEFT)**"key moreover, the display returns to the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **"MENU"** key, the selected contents are stored and display returns the measurement display.

９－８－２－６. Diagnosis of Modbus Communication

Diagnosis of RS-485 (Modbus) communication, which although belongs to “Output Test” category, allows to monitoring the condition of communication.
Both of received data which is transmitted by the host as command and transmitted data which is transmitted by this product as the response to the command can be displayed.

3rd layer (Setting variables)	4th layer (Setting values)	Initial value	Meaning of setting value
Modbus Communication [ModbusCom]	Received data		Displays data transmitted from the host as command.
	－	－	No setting value (No initial value)
	Transmitted data		Displays data transmitted from this product as response.
	－	－	No setting value (No initial value)

⚠ CAUTION

This setting variable appears only on models with Modbus communication function（WPMZ-6-***-5*-***）.

●For diagnosis of Modbus communication, perform the following operation.

No.	Descriptions
①	By pushing the “**MENU**” key in the measurement mode, the display moves to the setting display and shows the **1st layer (major categories)**.
②	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“5. Diagnosis”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 2nd layer (small categories)**.
③	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“Output test”** and push “**ARROW (RIGHT)**” key, then the display moves to **the 3rd layer (setting variables)**.
④	By moving the cursor with “**ARROW (UP/DOWN)**” key, point the cursor to **“ModbusCom”** and push “**ARROW (RIGHT)**” key, then the display moves to the 4th layer and diagnosis (communication check) can be done.
⑤	If Data (command) is sent from host correctly, it is displayed as **Receive Data** and **Response data** is displayed as transmit data.
⑥	Pushing “**ARROW (LEFT)**”key, the display returns to the 3rd layer and diagnosis of Modbus is terminated. Pushing “**ARROW (LEFT)**”key moreover, the display returns to the 2nd layer and 1st layer. If you need other settings, operate required steps continuously.
⑦	By pushing the **“MENU”** key, the selected contents are stored and display returns the measurement display.

１０． CONTROL FUNCTIONS

１０－１． EXTERNALCONTROL FUNCTIONS

As external control functions, this product have compare reset function, totalized value reset function, measurement inhibit function, display hold function, maximum value hold function, minimum value hold function, digital zero function,pattern select function etc., each function can be performed by assigning to external control terminals 1-5.

１０－１－１． EXTRLNAL CONTROL FUNCTION ICONS

When an EXTERNAL CONTROL FUNCTION is enabled, an ICON for each function lights up.

Icon	Description
P5	Indicates pattern No. in use.
🔒	Indicates the KEY LOCK function is effective.
⊖	Indicates the COMPARATIVE OUTPUT RESET function is effective.
⊘	Indicates the MEASUREMENT INHIBIT function is effective.
⏸	Indicates the DISPLAY HOLD function is effective.
△	Indicates the MAXIMUM VALUE HOLD function is effective.
▽	Indicates the MINIMUM VALUE HOLD function is effective.
DZ	Indicates the DIGITAL ZERO function is effective.

１０－１－２． TERMINAL CONTROL

The control of assigned functions is performed by shorting each terminal to the com terminal or bringing to the “0” level

“0” level: 0 to 1.5V
“1” level: 3.5 to 5V
Input current: -1.2mA
* The control terminals 1 to 5 are isolated from Power and input as DC signals.

１０－１－３． COMPARATIVE OUTPUT RESET FUNCTION

Comparative output reset function makes all of comparative judgement results and their outputs OFF.
The function becomes valid while the terminal which is assigned the function is shortened to the COM terminal or brought to 0 level.

１０－１－４． TOTAL RESET FUNCTION

The total reset function makes the totalized value clear and reset to the initial totalized value and can be selected from the following 3 kinds.
The target totalized value is reset at the timing when the terminal to which the function is assigned is shorted to the COM terminal or set to 0 level.

Total reset A: Resets totalized value of chA
Total reset B: Resets totalized value of chB
Total reset A&B: Resets totalized values of chA and chB

⚠ CAUTION

1) Total reset function by external control terminal input operates at the timing when the function-allocated terminal is shorted to with the COM terminal or "0" level.
Even if the short with the COM terminal or "0" level is maintained as it is, the totalized value is counted without stopping.
2) When turning on the power with the terminal to which the function is assigned shorted with the COM terminal or at "0" level, until the terminal is released or the "1" level is detected, the totalized value reset will not be done.
* If you want to reset the totalized value at startup, refer to "Digital zero retention" (page 144).

１０－１－５. MEASUREMENT INHIBIT FUNCTION

The measurement inhibit function inhibits the input and the display value accompanies this.
This function can be selected from the following 3 kinds.
The function becomes valid while the terminal which is assigned the function is shortened to the COM terminal or brought to 0 level.

Measurement inhibit A: Inhibits the input of chA
Measurement inhibit B: Inhibits the input of chB
Measurement inhibit A&B: Inhibits the inputs of both chA and chB

１０－１－６. DISPLAY HOLD FUNCTION

Display hold function holds current display value and can be selected from the following 3 kinds.
The function becomes valid while the terminal which is assigned the function is shortened to the COM terminal or brought to 0 level.
While this function is valid, measurement action is performed internally and the latest measurement value is displayed when the function become invalid.

Display hold A: Holds the display of chA
Display hold B: Holds the display of chB
Display hold A&B: Holds the display of chA and chB

１０－１－７. MAXIMUM VALUE HOLD FUNCTION

Maximum value hold function is the function which holds the maximum display value and can be selected from the following 3 kinds.
The function becomes valid while the terminal which is assigned the function is shortened to the COM terminal or brought to 0 level.

Maximum hold A: Holds the maximum display value of chA
Maximum hold B: Holds the maximum display value of chB
Maximum hold A&B: Holds the maximum display value of chA and chB

*If the displayed value becomes over while the maximum hold function is valid, over display never disappears until the function is canceled.

Note: This function is valid for the instantaneous value only and invalid for the totalized value.

１０－１－８. MINIMUM VALUE HOLD FUNCTION

Minimum value hold function is the function which holds the minimum display value and can be selected from the following 3 kinds.
The function becomes valid while the terminal which is assigned the function is shortened to the COM terminal or brought to 0 level.
*When both of the maximum value hold and the minimum value hold are ON simultaneously, only the maximum value hold becomes valid.

Minimum hold A: holds the minimum display value of chA
Minimum hold B: holds the minimum display value of chB
Minimum hold A&B: holds the minimum display value of chA and chB

*If the displayed value becomes -over while the minimum hold function is valid, -over display never disappears until the function is canceled.

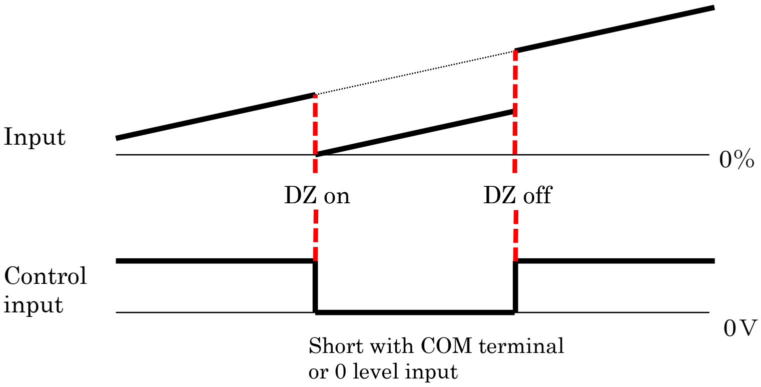
Note: This function is valid for the instantaneous value only and invalid for the totalized value.

１０－１－９. DIGITAL ZERO FUNCTION

The digital zero function (hereinafter referred to as DZ) is a function to set the input value to zero when the DZ instruction is made. During the DZ instruction, the fluctuation width from the start of instruction is treated as input value.
The function is valid while the terminal to which the function is assigned is shorted with the COM terminal or "0" level.

Digital zero A: Executes DZ for chA
Digital zero B: Executes DZ for chB
Digital zero A&B: Executes DZ for chA and chB

*DZ is a function for instantaneous values.
The totalize operation during DZ instruction is for the result of DZ function operation.



It is also possible to maintain the shift value by the DZ function at the last power OFF at restart after turning off the power.
For details, refer to the contents of "Digital Zero Retention" (page 145).

⚠ CAUTION

1) The digital zero function is installed only in analog input products.
2) "Set the input value to zero" means 0% in the set input range.
For example, setting the input range to 4 ~ 20 mA and make DZ instruction, the input at DZ instruction will be treated as 4 mA.
3) If the DZ instruction is issued during measurement inhibit function and various hold functions are executed, the digital zero function is executed at the sampling immediately after these are canceled.
4) When instantaneous display value is OVER or -OVER, when DZ indication is made, digital zero is executed at the sampling immediately after display value OVER, -OVER disappears.

１０－１－１０. PATTERN SELECT FUNCTION

This product can memorize 8 patterns (8 kinds) of parameters including input settings (pulse input A/B, analog input A/B, 2 input calculations), output settings and display settings.
By using pattern select 1-3, Up to 8 patterns can be switched.

Function Name	Selected pattern No. (pattern No. in use)							
	1	2	3	4	5	6	7	8
Pattern select1	Open	Short	Open	Short	Open	Short	Open	Short
Pattern select2	Open	Open	Short	Short	Open	Open	Short	Short
Pattern select3	Open	Open	Open	Open	Short	Short	Short	Short

Open : pattern select terminal is open or connected to “1” level.
Short: pattern select terminal is shorted to COM terminal or connected to “0” level.

⚠ CAUTION

If the used pattern is switched, measured data is cleared and the measurement restarts from the switched time point.

１０－１－１１. MONITOR CHANGE FUNCTION

The monitor change function is the function which switches display.
The display is switched by shortening the terminal, which the function is assigned to, to COM terminal or bringing it to “0” level for over 20ms.
Performs same action of DISP key at front panel.

１０－１－１２. TREND HOLD FUNCTION

The trend hold function is a function which holds the trend display.
The function becomes valid while the terminal which is assigned the function is shortened to the COM terminal or brought to 0 level.

⚠CAUTION

When the function is disabled, the WPMZ starts plotting the trend display with the current measurement value.

１０－２．SHORTCUT FUNCTION

Shortcut function is external control functions and “CompareList” function are registered to arrow keys and are performed not by the terminal control but by the operation of the keys.

*External control functions which would be performed by shortcuts to arrow keys.

１０－２－１．SHORTCUT REGISTER KEYS

Keys which can be registered shortcuts function in are shown below.

Keys can be registered shortcut Functions in		
︽	Up arrow key	Used in the shortcut function on measurement display.
︾	Down arrow key	
«	Left arrow key	
»	Right arrow key	

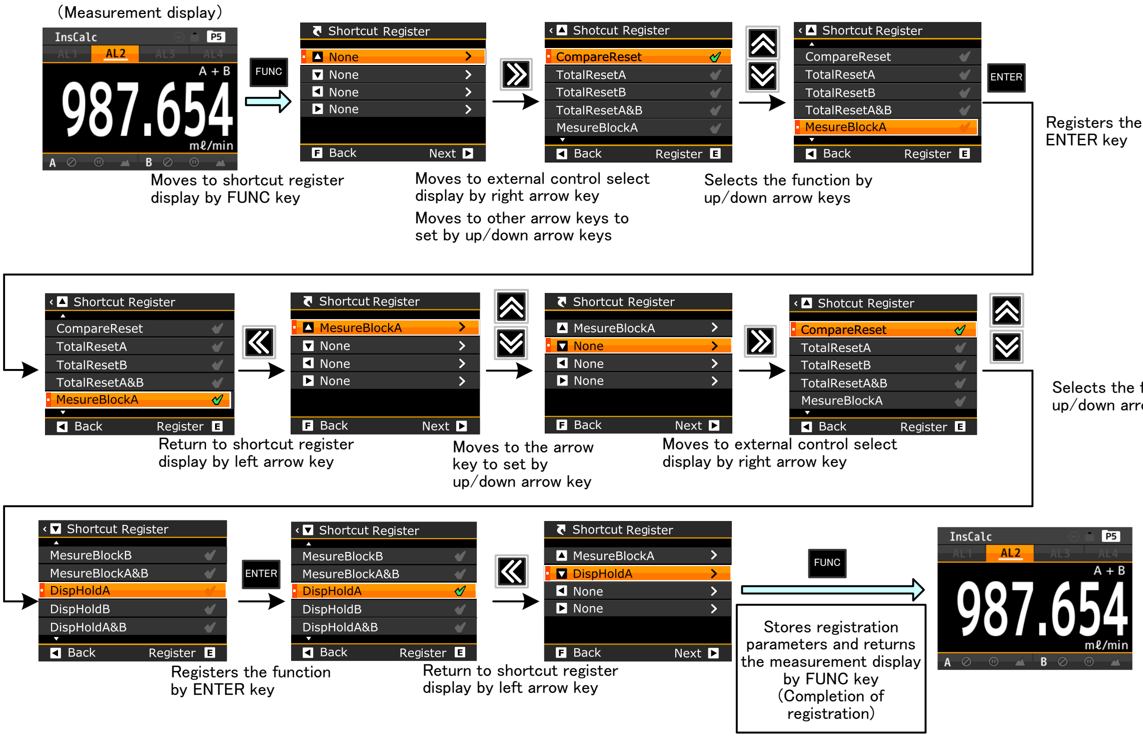
１０－２－２. FUNCTIONS CAN BE REGISTERED TO SHORTCUT

Functions which can be registered to shortcut functions are shown below

Function	Action
None	No function.
Comparative output reset	Comparative output reset function makes all of comparative judgement results and their outputs OFF.
Total reset A	The total reset chA is function makes the totalized value clear and reset to the initial totalized value.
Total reset B	The total reset chB is function makes the totalized value clear and reset to the initial totalized value.
Total reset A&B	The total reset chA and chB is function makes the totalized value clear and reset to the initial totalized value.
Measurement inhibit A	The measurement inhibit chA is function inhibits the input and the display value accompanies this.
Measurement inhibit B	The measurement inhibit chB is function inhibits the input and the display value accompanies this.
Measurement inhibit A&B	The measurement inhibit chA and chB is function inhibits the input and the display value accompanies this.
Display hold A	Display hold chA function holds display value.
Display hold B	Display hold chB function holds display value.
Display hold A&B	Display hold chA and chB function holds display value.
Maximum value hold A	Maximum value hold chA function is the function which holds the maximum display value.
Maximum value hold B	Maximum value hold chB function is the function which holds the maximum display value.
Maximum value hold A&B	Maximum value hold chA and chB function is the function which holds the maximum display value.
Minimum value hold A	Minimum value hold chA function is the function which holds the minimum display value.
Minimum value hold B	Minimum value hold chB function is the function which holds the minimum display value.
Minimum value hold A&B	Minimum value hold chA and chB function is the function which holds the minimum display value.
Digital zero A	Digital zero A is the function that handles the input value of the instructed timing as zero for chA. (Analog input products only)
Digital zero B	Digital zero B is the function that handles the input value of the instructed timing as zero for chB. (Analog input products only)
Digital zero A&B	Digital zero A and B is the function that handles the input value of the instructed timing as zero for chA and chB. (Analog 2-input products only)
Pattern select	Pattern select function assigned to 1st bit
Trend hold	The trend hold function is a function which holds the trend display.
CompareList	Function to go to the setting list of comparison judgement and change or reference the judgment value.

10－2－3. REGISTERING SHORTCUT FUNCTIONS

Registering shortcuts how to set up is shown below



Moves to shortcut register display by FUNC key

Moves to external control select display by right arrow key

Moves to other arrow keys to set by up/down arrow keys

Selects the function by up/down arrow keys

Registers the function by ENTER key

Return to shortcut register display by left arrow key

Moves to the arrow key to set by up/down arrow key

Moves to external control select display by right arrow key

Selects the function by up/down arrow keys

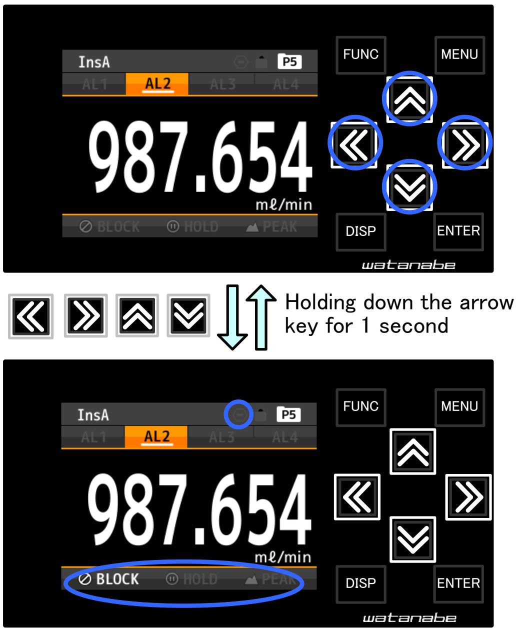
Registers the function by ENTER key

Return to shortcut register display by left arrow key

Stores registration parameters and returns the measurement display by FUNC key (Completion of registration)

10－2－4. EXECUTION AND RELEASE SHORTCUT FUNCTIONS

A shortcut function is performed by holding down the arrow key which an external control function is registered for 1 second.
An active function becomes inactive by holding down the arrow key which the function is registered for 1 second again.



Holding down the arrow key for 1 second

The icon for active external control lights up

⚠ CAUTION

If the external control assigned to the shortcut is registered in the terminal, it can not be controlled with shortcut function.
※Priority of external control is
“RS control”> “control with external control terminal”> “control with arrow keys (shortcut function)”.

11. COMPARATIVE OUTPUT FUNCTION

１１－１．COMPARATIVE OUTPUT FUNCTION

Comparative output function compares displayed value (including other displayable values) and judgement value which is configured in advance and shows the result on “comparison result” on the display and also outputs the result on comparative output terminals.

Comparative outputs are open-collector outputs which can be selected from NPN type or PNP type by model codes.

As modes of the comparison, 2 modes shown below are available.

Comparison mode	Action
Level judgement	Compares a displayable value to 1 judgement value in magnitude relation.
Zone judgement	Compares a displayable value to 2 judgement values in inclusion relation.

１１－１－１．SOURCE DISPLAYABLE VALUE FOR COMPARISON

As comparative outputs, this product has 4 outputs AL1-AL4 which can be configured independently.

To each displayable value, comparative outputs AL1-AL4 can be assigned arbitrarily.

For example, you can assign each displayable value to all of AL1-AL4, or else, you can assign the instantaneous value of chA input to AL1, the totalized value of chA input to AL2, instantaneous value of chB to AL3 and totalized value of chB to AL4

⚠ CAUTION

Comparative output can be assigned to a displayable item including items which are not displayed on the display. If the condition of comparison is met, “comparison result” is displayed and comparative output is output.

１１－１－２．LEVEL JUDGEMENT

In the case that the “level judgement” is selected in compare mode, this product judges magnitude relation to comparison judgement value.

To output comparison result, by configurations for”Condition of ON (OnConditions)”,”output mode (OutputMode)” etc. , compare action should be determined.

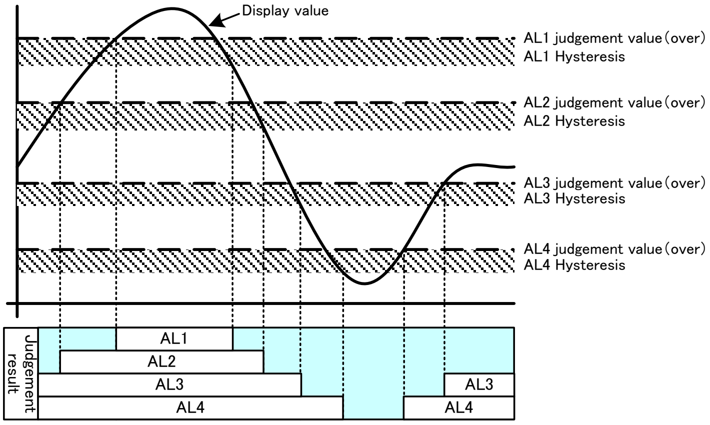
The followings show judgement actions on each output mode in the case that comparative outputs AL1-AL4 are assigned to one displayable item (i.e. source value).

1) Upper judgement of 4 steps

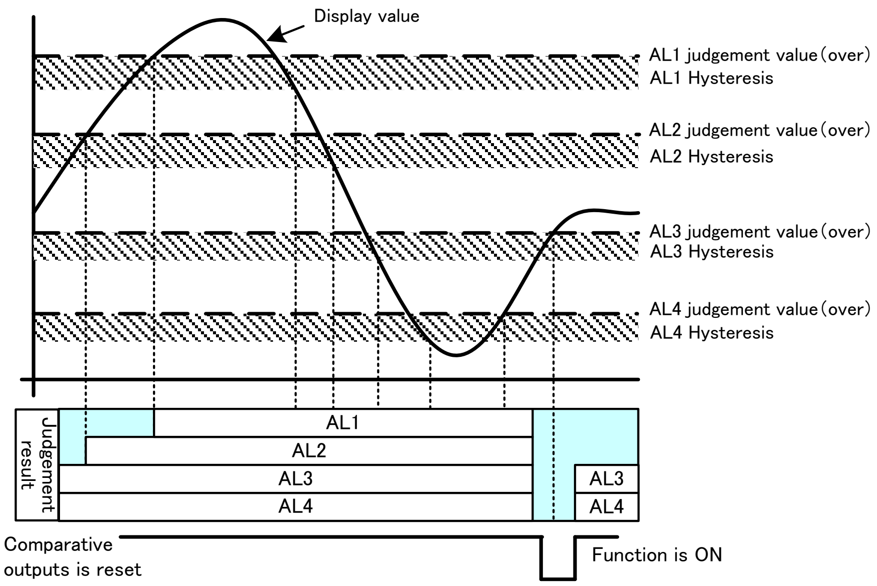
For using in the upper judgement, the setting variable“Condition of ON (OnCondition)” should be configured to “excess”.

Comparative output	Condition of ON	Condition of comparison	Judgement result
AL1	ON at “Excess”	Display value >AL1 judgement value	AL1
AL2	ON at “Excess”	Display value >AL2 judgement value	AL2
AL3	ON at “Excess”	Display value >AL3 judgement value	AL3
AL4	ON at “Excess”	Display value >AL4 judgement value	AL4

●Judgement action in the case that output mode is “Normal”.
Output mode “Normal”: comparative output is valid while judgement is ON.


Display value
AL1 judgement value (over)
AL1 Hysteresis
AL2 judgement value (over)
AL2 Hysteresis
AL3 judgement value (over)
AL3 Hysteresis
AL4 judgement value (over)
AL4 Hysteresis
Judgement result
AL1
AL2
AL3
AL3
AL4
AL4

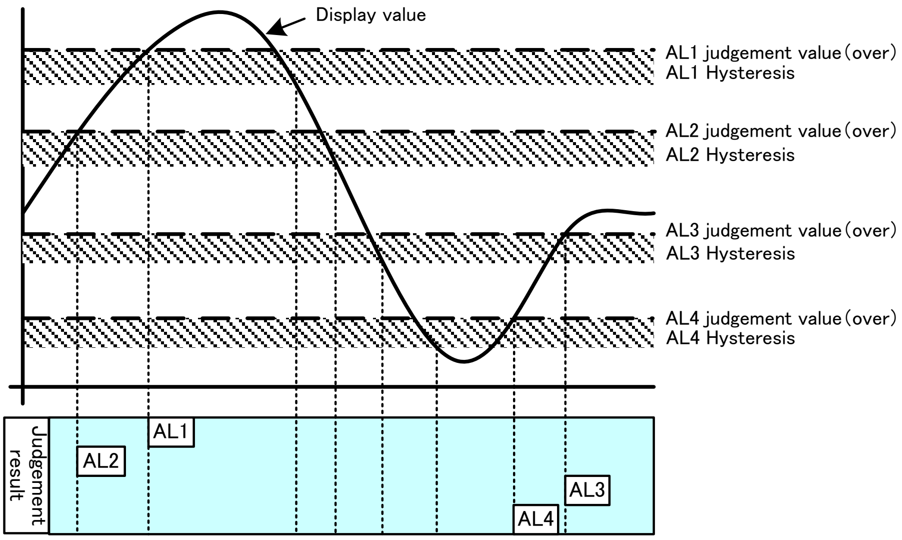
- Judgement action in the case that output mode is “Latch”.
  Output mode “Latch”: Comparative output keeps valid once judgement becomes ON.


Display value
AL1 judgement value (over)
AL1 Hysteresis
AL2 judgement value (over)
AL2 Hysteresis
AL3 judgement value (over)
AL3 Hysteresis
AL4 judgement value (over)
AL4 Hysteresis
Judgement result
AL1
AL2
AL3
AL4
AL3
AL4
Comparative outputs is reset
Function is ON

⚠CAUTION

In Latch mode, reset of comparative output is performed by comparative output reset of external control.

- Judgement action in the case that output mode is “One Shot”.
  Output mode “One Shot”: Comparative output is valid while setup time period after judgement is ON.


Display value
AL1 judgement value (over)
AL1 Hysteresis
AL2 judgement value (over)
AL2 Hysteresis
AL3 judgement value (over)
AL3 Hysteresis
AL4 judgement value (over)
AL4 Hysteresis
Judgement result
AL1
AL2
AL4
AL3

2) Upper judgement of 2 steps and lower judgement of 2 steps (HH/HI/LO/LL)

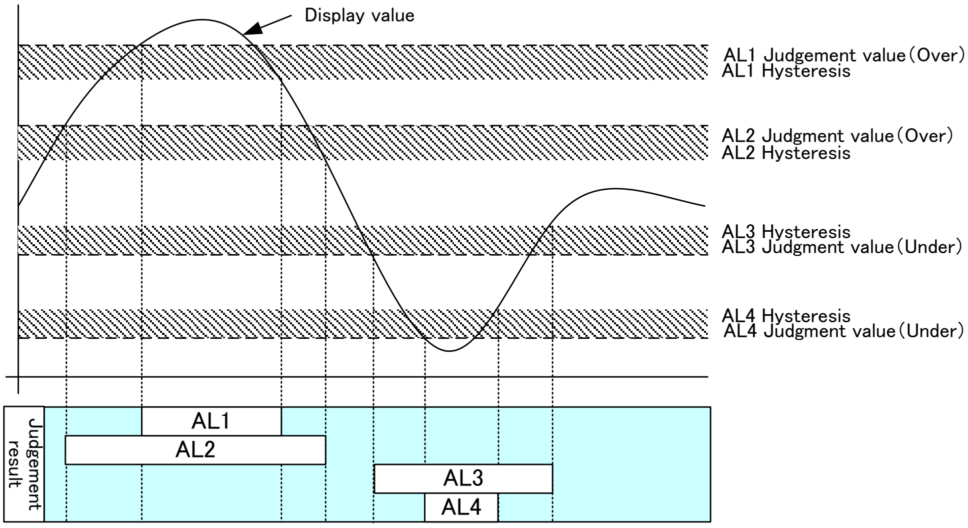
For AL1 and AL2 used in the upper judgement, the setting variable"Condition of ON (OnCondition)" should be configured to "Excess".

For AL3 and AL4 used in the lower judgement, the setting variable"Condition of ON (OnCondition)" should be configured to "Less Than".

Comparative output	**Condition of ON**	**Condition of comparison**	**Judgement result**
AL1	ON at "Excess"	Display value >AL1 judgement value	AL1
AL2	ON at "Excess"	Display value >AL2 judgement value	AL2
AL3	ON at "Less Than"	Display value <AL3 judgement value	AL3
AL4	ON at "Less Than"	Display value <AL4 judgement value	AL4

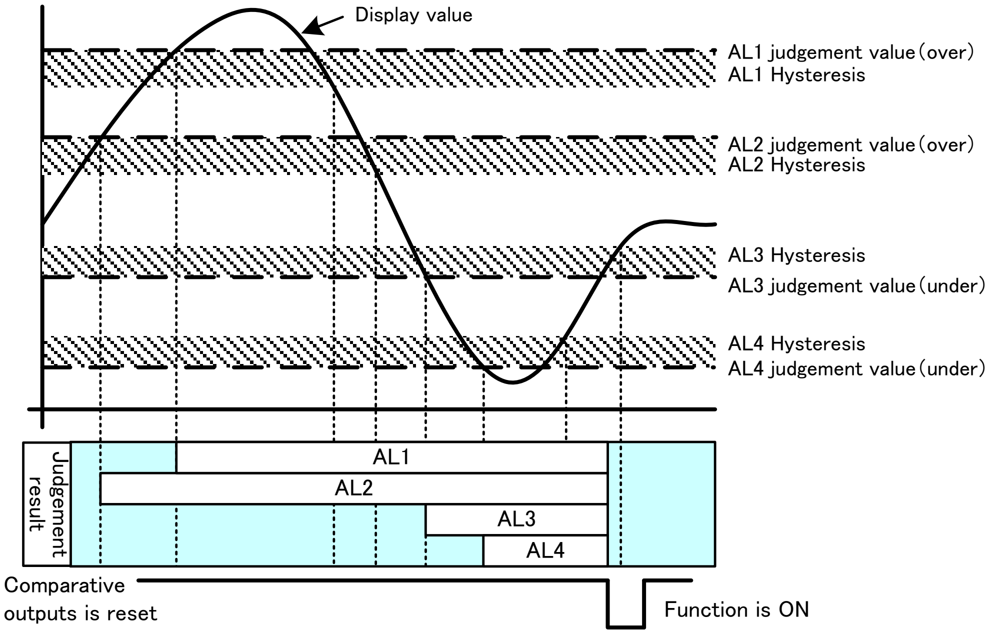
●Judgement action in the case that output mode is "Normal".

Output mode "Normal": comparative output is valid while judgement is ON.


Display value
AL1 Judgement value (Over)
AL1 Hysteresis
AL2 Judgment value (Over)
AL2 Hysteresis
AL3 Hysteresis
AL3 Judgment value (Under)
AL4 Hysteresis
AL4 Judgment value (Under)
Judgement result
AL1
AL2
AL3
AL4

●Judgement action in the case that output mode is "Latch".

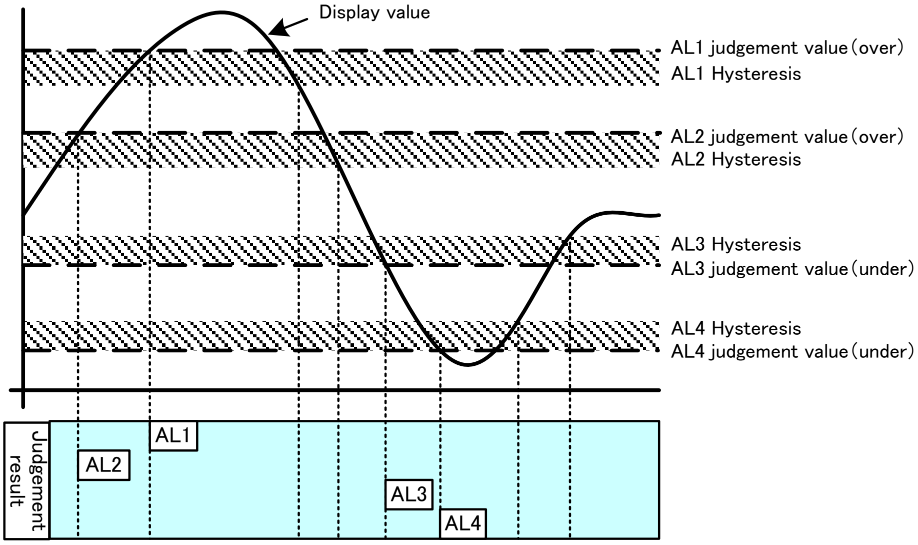
Output mode "Latch": comparative output keeps valid once judgement becomes ON.


Display value
AL1 judgement value (over)
AL1 Hysteresis
AL2 judgement value (over)
AL2 Hysteresis
AL3 Hysteresis
AL3 judgement value (under)
AL4 Hysteresis
AL4 judgement value (under)
Judgement result
AL1
AL2
AL3
AL4
Comparative outputs is reset
Function is ON

⚠CAUTION

In Latch mode, reset of comparative output is performed by comparative output reset of external control.

●Judgement action in the case that output mode is “One Shot”.
Output mode “One Shot”: comparative output is valid while setup time period after judgement is ON.

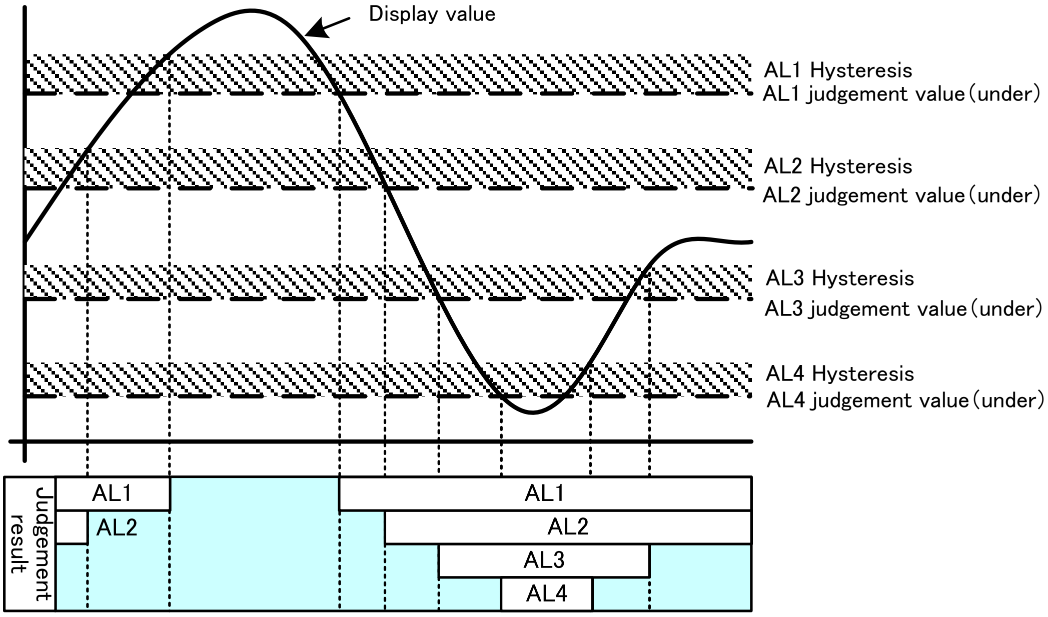

Display value
AL1 judgement value (over)
AL1 Hysteresis
AL2 judgement value (over)
AL2 Hysteresis
AL3 Hysteresis
AL3 judgement value (under)
AL4 Hysteresis
AL4 judgement value (under)
Judgement result
AL1
AL2
AL3
AL4

3) Lower judgement of 4 steps

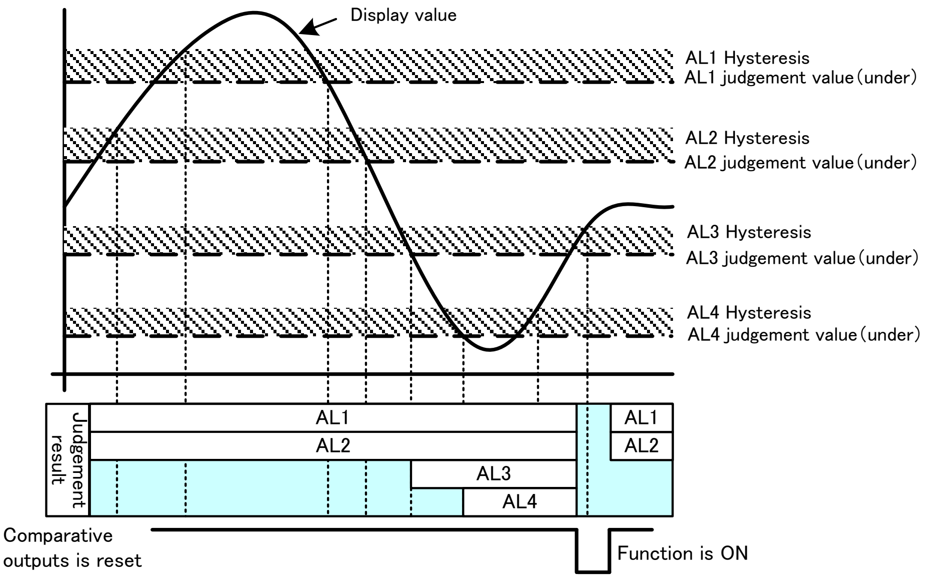
For using in the lower judgement, the setting variable“Condition of ON (OnCondition)” should be configured to “Less Than”.

Comparative output	Condition of ON	Condition of comparison	Judgement result
AL1	“Less Than”	Display value <AL1 judgement value	AL1
AL2	“Less Than”	Display value <AL2 judgement value	AL2
AL3	“Less Than”	Display value <AL3 judgement value	AL3
AL4	“Less Than”	Display value <AL4 judgement value	AL4

●Judgement action in the case that output mode is “Normal”.
Output mode “Normal”: comparative output is valid while judgement is ON.


Display value
AL1 Hysteresis
AL1 judgement value (under)
AL2 Hysteresis
AL2 judgement value (under)
AL3 Hysteresis
AL3 judgement value (under)
AL4 Hysteresis
AL4 judgement value (under)
Judgement result
AL1
AL1
AL2
AL2
AL3
AL4

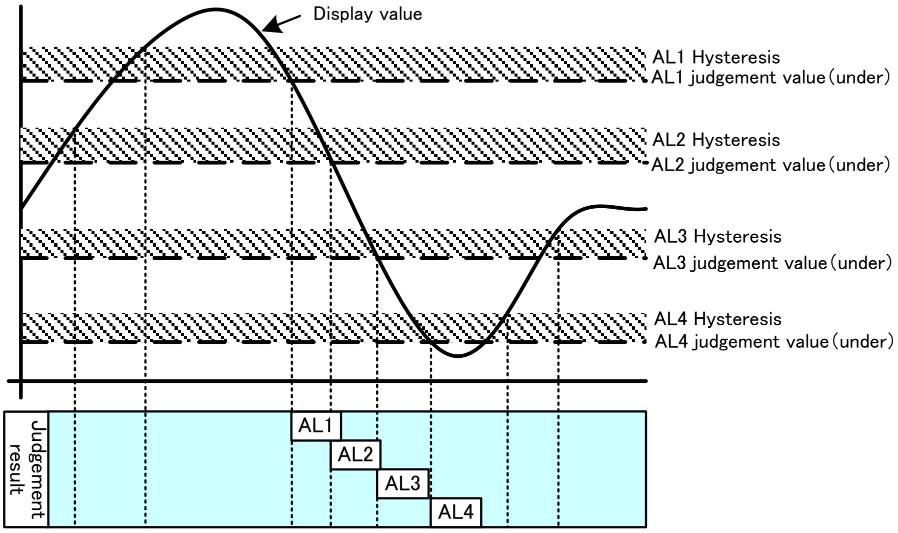
- Judgement action in the case that output mode is “Latch”.
  Output mode “Latch”: Comparative output keeps valid once judgement becomes ON.


Display value
AL1 Hysteresis
AL1 judgement value (under)
AL2 Hysteresis
AL2 judgement value (under)
AL3 Hysteresis
AL3 judgement value (under)
AL4 Hysteresis
AL4 judgement value (under)
Judgement result
AL1
AL2
AL3
AL4
AL1
AL2
Comparative outputs is reset
Function is ON

⚠CAUTION

In Latch mode, reset of comparative output is performed by comparative output reset of external control.

- Judgement action in the case that output mode is “One Shot”.
  Output mode “One Shot”: comparative output is valid while setup time period after judgement is ON.


Display value
AL1 Hysteresis
AL1 judgement value (under)
AL2 Hysteresis
AL2 judgement value (under)
AL3 Hysteresis
AL3 judgement value (under)
AL4 Hysteresis
AL4 judgement value (under)
Judgement result
AL1
AL2
AL3
AL4

11－1－3. ZONE JUDGEMENT

In the case that the “Zone judgement” is selected in compare mode, this product judges inclusion relation to 2 comparison judgement values.
To output comparison result, by configurations for”Condition of ON (OnConditions)”,”output mode (OutputMode)” etc. , compare action should be determined.
The followings show judgement actions on each output mode.

⚠CAUTION

Comparative outputs AL1-AL4 can be configured independently and can be assigned to displayable items arbitrary. Therefore, for each comparative output, 2 setting values of the upper limit and the lower limit are required to perform zone judgement.

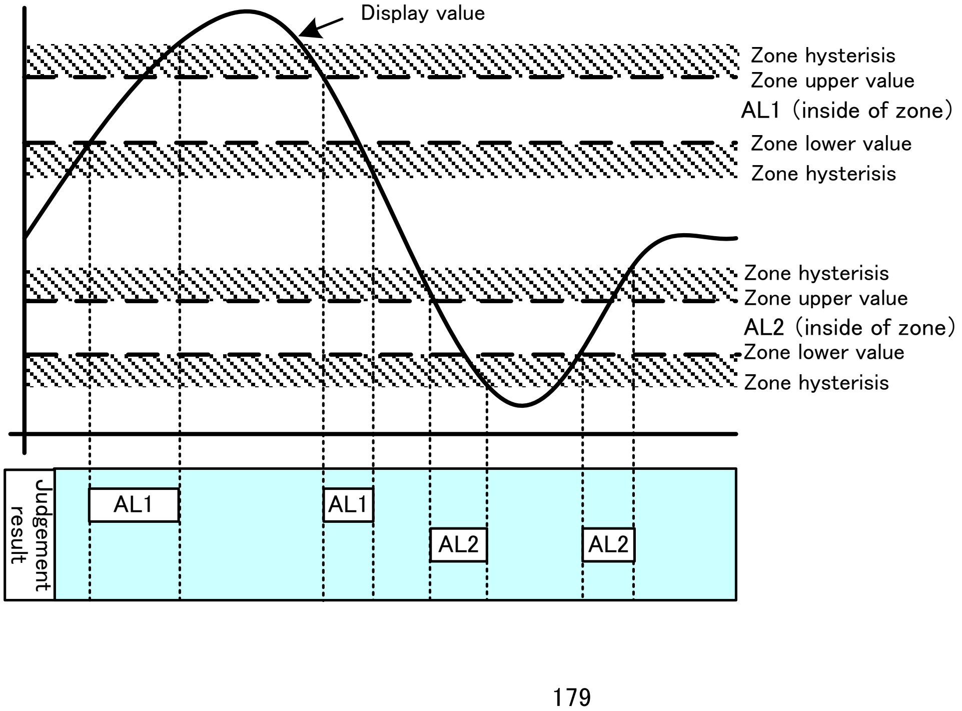
1) “Condition of ON (OnCondition)” is “In the zone”
When the value of the source item (displayable value) for comparison is between”Zone upper limit” and “Zone lower limit”, comparative output result turns ON.

Comparative output	Condition of ON	Condition of comparison	Judgement result
AL1	“In the zone”	AL1 Zone upper limit ≥ Display value ≥AL1 Zone lower limit	AL1
AL2		AL2 Zone upper limit ≥ Display value ≥AL2 Zone lower limit	AL2
AL3		AL3 Zone upper limit ≥ Display value ≥AL3 Zone lower limit	AL3
AL4		AL4 Zone upper limit ≥ Display value ≥AL4 Zone lower limit	AL4

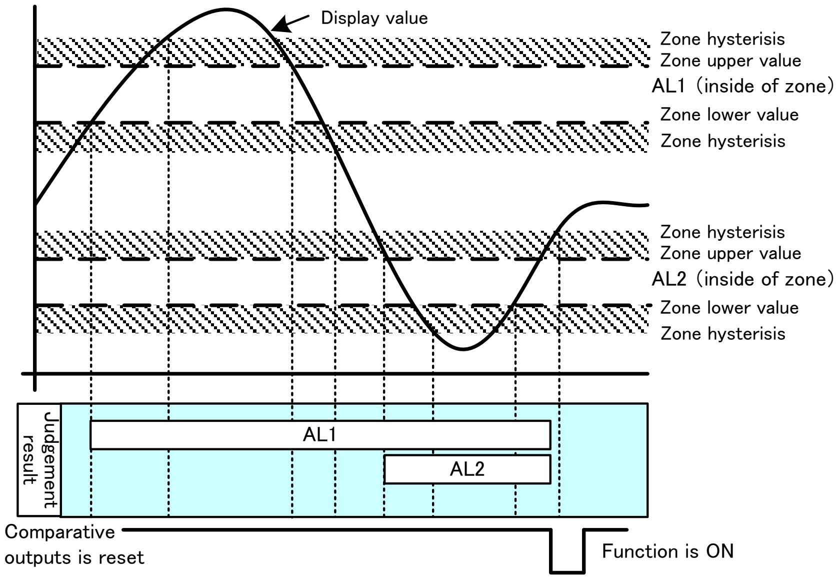
⚠CAUTION

Hysteresis lie on outside (upper side) of the zone upper limit and outside (lower side) of the zone lower limit. The widths of the hysteresis are same on both zone upper limit and zone lower limit.

- Judgement action in the case that output mode is “Normal”.
  Output mode “Normal”: comparative output is valid while judgement is ON.



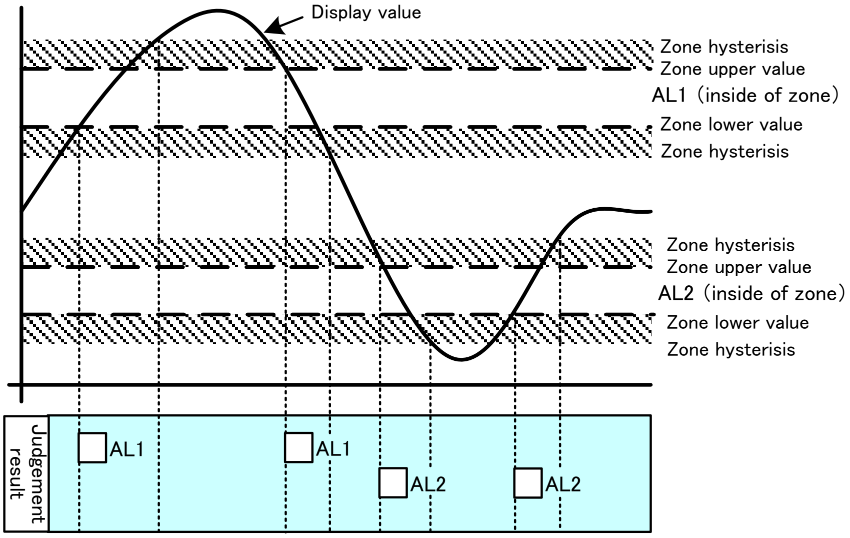
●Judgement action in the case that output mode is “Latch”.
Output mode “Latch”: Comparative output keeps valid once judgement becomes ON.



⚠CAUTION

In Latch mode, reset of comparative output is performed by comparative output reset of external control.

●Judgement action in the case that output mode is “One Shot”.
Output mode “One Shot”: Comparative output is valid while setup time period after judgement is ON.



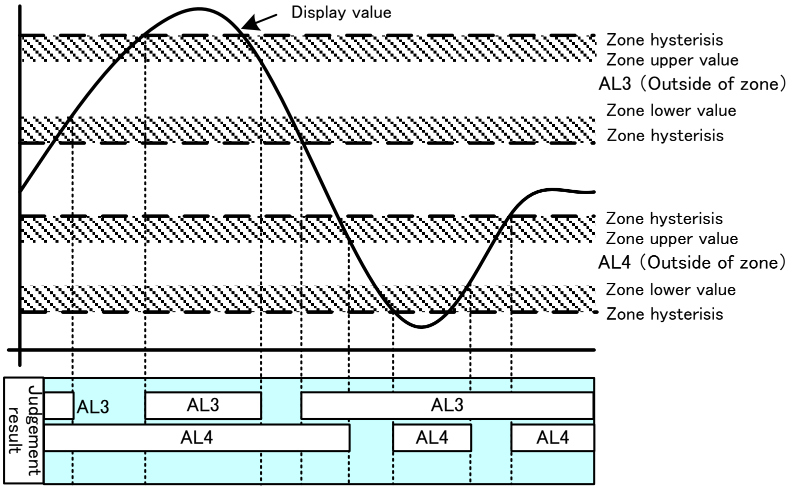
2) “Condition of ON (OnCondition)” is “Outside of the zone”
When the value of the source item (displayable value) for comparison is over”Zone upper limit” or under “Zone lower limit”, comparative output result turns ON.

Comparative output	Condition of ON	Condition of comparison	Judgement result
AL1	“Outside of the zone”	Display value > AL1 Zone upper limit or AL1 Zone lower limit > Display value	AL1
AL2		Display value > AL2 Zone upper limit or AL2 Zone lower limit > Display value	AL2
AL3		Display value > AL3 Zone upper limit or AL3 Zone lower limit > Display value	AL3
AL4		Display value > AL4 Zone upper limit or AL4 Zone lower limit > Display value	AL4

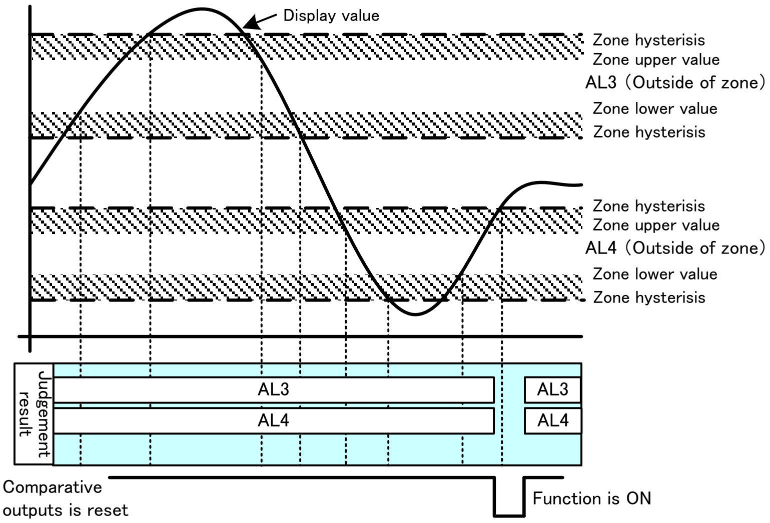
⚠ CAUTION

Hysteresis lie on outside (upper side) of the zone upper limit and outside (lower side) of the zone lower limit. The widths of the hysteresis are same on both zone upper limit and zone lower limit.

●Judgement action in the case that output mode is “Normal”.
Output mode “Normal”: comparative output is valid while judgement is ON.



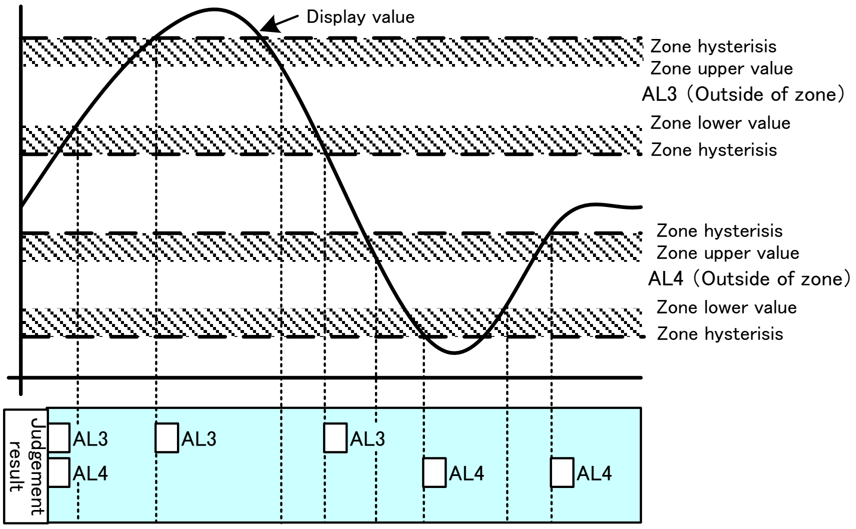
●Judgement action in the case that output mode is “Latch”.
Output mode “Latch”: Comparative output keeps valid once judgement becomes ON.



⚠ CAUTION

In Latch mode, reset of comparative output is performed by comparative output reset of external control.

- Judgement action in the case that output mode is “One Shot”.
  Output mode “One Shot”: comparative output is valid while setup time period after judgement is ON.



１２. OUTPUT FUNCTIONS

１２－１. PULSE OUTPUTFUNCTION

This product can output pulses which are synchronized with the totalized value.
The type of the output is NPN open-collector (DC30V, 20mA max).

⚠CAUTION

○ The minimum pulse output period is10ms. Therefore, totalizer-synchronous pulse of over 100Hz cannot be applicable.

○ If the pulse width is set wider than pulse output interval, totalized synchronous pulse output keeps ON state.

１２－２. ANALOG OUTPUT FUNCTION

The models with an analog output option can output an analog output for a displayable value.
As output ranges, 5 types of 0-10V, ±10 0V, 1-5V, 0-20mA, 4-20mA are equipped and they can be switched by a setting variable in “Analog Output” in “Output”.

１２－２－１. SOURCE DISPLAYABLE VALUE FOR OUTPUT

Analog output has one channel and an output source should be selected from various displayable items.
Even if the selected item is not displayed, the output is valid.

１２－２－２. ANALOG OUTPUT SCALING

Analog output can be scaled arbitrary. For the scaling, settings of display value for 0% output and display value for 100% for each output range are required.

Output range	0%output value	100%output value
DC0-10V	0V	10V
DC±10V	-10V	10V
DC1-5V	1V	5V
DC0-20mA	0mA	20mA
DC4-20mA	4mA	20mA

１２－２－３. OUTPUT RANGE OF ANALOG OUTPUT

Analog output can output in the range of ±10 % of full scale for each output range.

Output range	Output lower limit	Output upper limit
DC0-10V	-1V	11V
DC±10V	-11V	11V
DC1-5V	0.6V	5.4V
DC0-20mA	0mA	22mA
DC4-20mA	2.4mA	21.6mA

⚠CAUTION

In DC0-20mA output range, output lower limit is 0mA.

１２－３. BCD OUTPUT FUNCTION

The models with a BCD output option can output a BCD output for a displayable value.

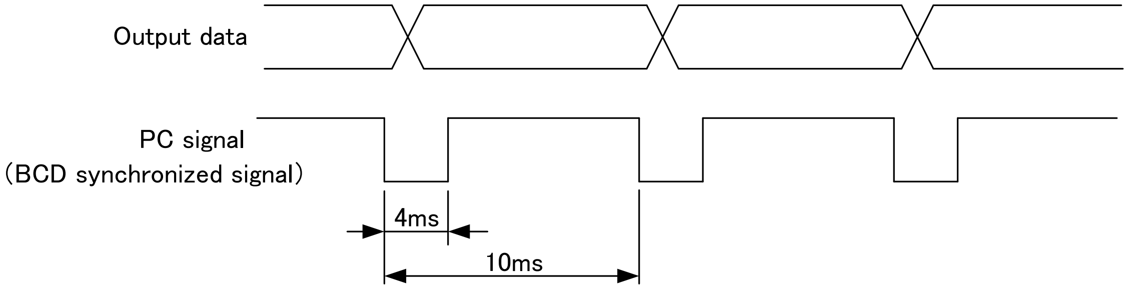
BCD outputs are open-collector outputs which can be selected from NPN type or PNP type by model codes.

１２－３－１. SOURCE DISPLAYABLE VALUE FOR OUTPUT

BCD output has one channel and an output source should be selected from various displayable items.
Even if the selected item is not displayed, the output is valid.

１２－３－２. DATA OUTPUT

Data of selected source displayable value is output at the rate of sampling rate (10ms).
The acquisition of the data should be done when the PC signal (BCD synchronized signal) is OFF.
*By configuration, the output logic of BCD data signal and PC signal can be inverted.



⚠CAUTION

In the case that Instantaneous simple average is set to other than NONE in Input setting, calculation period expands as long as the average times, but the period of PC signals is 10ms.

１２－３－３. ENABLE

By shorting the enable terminal to -D.COM or bringing to same voltage level, the BCD data and PC signal (BCD synchronous signal) output transistors become OFF.

１２－４. RS-232C COMMUNICATION FUNCTION

The models with a RS-232C communication option can be acquired display data and set various configuration.

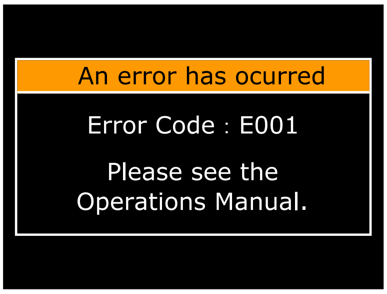
１２－５. RS-485 (MODBUS RTU) COMMUNICATION FUNCTION

The models with a RS-485 communication option can be acquired display data and set various configuration.

13. ERROR MODE

13－1. DISPLAY ON OCCURRENCE OF AN ERROR

When some malfunctions occur, error codes are displayed according to the factor of the error.



An error has ocurred

Error Code : E001

Please see the
Operations Manual.

13－2. LIST OF ERROR CODES AND RECOVERY PROCEDURES

When some malfunction occurs, an error code is displayed according to the factor of the error.

ERROR CODE	ERROR MESSAGE	RECOVERY PROCEDURE
E000	Program sum error	During the error mode, hold down the ENTER key for 1 second (long-press) to reset or power down and on. *If the WPMZ does not recover by this procedure, please contact your dealer or our company.
E006	RAM error	
E100 to 102	Errors associated with serial flash memory	
E103 to 105 E210 to 211	Errors associated with FRAM	
E202 to 203	Errors associated with calibration values	
E110 to 111	Error associated with sensor power short	
E204 to 205	Errors associated with setting values	
E206 to 209	Errors associated with initial values	
Other than above codes	Other errors	

- If start-up delay is enabled, the WPMZ displays “------” according to the delay time.
- If display value becomes out of displayable range, “OVER” is displayed in the display.

⚠CAUTION

If error display is not recovered by system reset or power re-activation, please let us know the error code and situation.
During error mode, outputs are disabled.

14. SPECIFICATIONS

14－1. BASIC SPECIFICATIONS

Number of measurement channel : 1 or 2 （ according to model codes）

Display : 2.4 inch TFT liquid crystal display
Used in 1ch input ： ChA measurement result
Used in 2ch inputs ： ChA measurement result,
Ch. B measurement result, calculation result,ChA and Ch.B measurement results,ChA or Ch.B measurement result and calculation result

Over warning : By exceeding the range of display, displays OVER or -OVER

External controls : 5 functions of the followings can be assigned to control terminals (user-configurable).
①Comparative output reset function
②Measurement inhibit function：Measurement inhibit A/B/A&B
③Current value hold function：Current value hold A/B/A&B
④Maximum value hold function：Maximum value hold A/B/A&B
⑤Minimum value hold function：Minimum value hold A/B/A&B
⑥Digital zero function：Digital zero A/B/A&B
⑦Totalized value reset function：Totalized value reset A/B/A&B
⑧Display select function
⑨Pattern select function：Pattern select 1/2/3
⑩Trend Hold function
As follows, only shortcut setting
⑪CompareList function

Ambient temperature range : -5 to 50°C 35 to 85%RH（Non condensing）

Storage temperature range : -10 to 70°C up to 60%RH

Supply power : AC power（WPMZ-6-1**-**-***）
AC100 to 240V±10% 50/60Hz
DC power（WPMZ-6-3**-**-***）
DC12V±10%
DC power（WPMZ-6-4**-**-***）
DC24 to 48V±10%

Power consumption : AC power（WPMZ-6-1**-**-***）
At AC100V：10VA max At AC240V：14VA max
DC power（WPMZ-6-3**-**-***）
At DC12V：6W max,
DC power（WPMZ-6-4**-**-***）
At DC24V：6W max, At DC48V：6.5W max

Sensor power : DC12V±10% 100mA max. DC24V±10% 50mA max.
*For 2ch inputs, arrowable current of both chA and chB is same as above.
*Combine at DC12V, 24V: 1.2W max.

External dimension's : 96mm（W）×52mm（H）×145mm（D）

Weight : Approx. 350g

Withstand voltage : AC power （WPMZ-6-1**-**-***）
Between Power terminals and inputs/external controls/comparative outputs/other outputs AC3000V for 1 minute
DC power （WPMZ-6-3or4**-**-***）
Between Power terminals and inputs/external controls/comparative outputs/other outputs AC1500V for 1 minute
AC power and DC power
Between input terminals and external controls/comparative outputs/other outputs AC1500V for 1 minute
Between enclosures and each terminals AC3000V for 1 minute

Insulation resistance : Between terminals mentioned above, at DC500V 100MΩor higher

Vibration tolerance : 10 to 55Hz half amplitude 0.15mm in X,Y,Z directions for 30 minutes

Protective structure : IP66（front）

Installation environment : indoor use

Rated altitude : up to 2000m

Transient overvoltage : Ⅱ

Pollution degree : 2

Conformed EN standard : EN61326-1（EMS：industrial electromagnetic environment／EMI：Class A）
(Applicable to line length only under 30m)
EN61010-1
EN IEC 63000

Material of enclosure : polycarbonate（PC） black UL94V-0

１４－２．INPUT SPECIFICATIONS

１４－２－１．PULSE INPUT INSTANTANEOUS AND TOTALIZED MEASUREMENT

- Input specifications（common to chA,chB）

Frequency range : 0.01Hz to 500kHz (*2ch input:250kHz)

Input signal : Single ended

Input method : Single phase pulse
*In the 2ch input option, 2 phase pulse (90°phase) can be accept.

Input level : Open collector
  Pullup to 12V or 24V
Logic
  L level: ≤1.0V
  H level：3.9 to 30V （max. allowable voltage ±50V）
Zero Cross
  AC60mV to 40V （max. allowable voltage 70V）
  *AC signal which gets across 0V.

Input resistance : Open collector
  Pulled up to 12 V through approx. 10kΩ(in the case of sensor power 12V）
  Pulled up to 24 V through approx. 25kΩ(in the case of sensor power 24V）
  Pulled down to GND through approx. 10kΩ.
Logic/Zero Cross
  Pulled down to GND through approx. 10kΩ
2 wire
  Pulled down to GND through approx. 900Ω

Input pulse width : ≥ 0.9μs（both of L level and H level）
(2 channel inputs: ≥1.8 μs)

Measurement method : Cyclic calculation method

Sampling rate : 10ms（calculation period）

Display updating period : 100ms

（Instantaneous display）

Display range : 0 to 999999

Zero display : Reading zero suppress

Decimal point : Settable freely

Display unit time : Can be selected one of second, minute, hour

Accuracy : ±（20ppm rdg +1digit） @23±5°C

（Totalized display）

Display range : -999999 to 999999
Zero display : Reading zero suppress
Decimal point : Settable freely
Totalized value reset : Totalized value can be reset to total initial value by external control.
Totalizer-synchronous pulse : NPN opencollector pulse output
DC30V 20mA max.
(Max. 100Hz)
Accuracy : ±0 （at scaling “1”）

１４－２－２. ANALOG INPUT INSTANTANEOUS AND TOTALIZED MEASUREMENT

Input specifications （Common to chA,chB）

Measurement range	Input resistance	Maximum arrowable input	Accuracy
0 to 5V	Approx. 1MΩ	±100V	±(0.05% of FS +1digit)
1 to 5V			
0 to 10V			
4 to 20mA	Approx. 10Ω	±50mA	
0 to 20mA			

*Accuracy is applicable at23±5°C 35 to 85%RH.

Conversion method : ⊿∑ conversion method
Input signal : Single ended
Sampling rate : Max. 100times/sec.
Display updating period : 100ms
Zero display : Reading zero suppress
Decimal point : Settable freely

（Instantaneous display）

Display range : 0 to 99999

（Totalized display）

Display range : -999999 to 999999
Totalized value reset : Totalized value can be reset to total initial value by external control.
Totalizer-synchronous pulse : NPN open collector pulse output
DC30V 20mA max.

１４－３．OUTPUT SPECIFICATIONS

【Comparative outputs】

Open collector output : Output rating
NPN : sink current 50mA MAX.
PNP : source current 50mA MAX.
Applied voltage 30V MAX.
Output saturation voltage ≤1.2V at 50mA
Number of outputs 4 transistor outputs

Relay output : Contact rating:AC250V 2A,DC30V 2A
Mechanical life:20 million times
Electrical life:100 thousand times or more
4 A contacts, AL1 and AL2, AL3 and AL4 share common

Control method : Microcomputer calculating method

Judgement value settable range : Pulse input : -999999 to 999999
Analog input : Instantaneous measurement -99999 to 99999
Totalized measurement -999999 to 999999

Hysteresis : Settable within the range of 1-999999 digits for each judgement value independently.

Comparison action : According to sampling rate (circulate period).

Setting condition : Condition of comparison can be set to AL1 to AL4 independently.

●Level judgement mode

The alarm is ON when display value exceeds judgement value (over alarm)

The alarm is ON when display value underruns judgement value (under alarm)

Over alarm（upper limit judgement）

Condition of comparison	Judgement result
display value>AL1 judgement value	AL1
display value>AL2 judgement value	AL2
display value>AL3 judgement value	AL3
display value>AL4 judgement value	AL4

Under alarm （under limit judgement）

Condition of comparison	Judgement result
AL1 judgement value>display value	AL1
AL2 judgement value>display value	AL2
AL3 judgement value>display value	AL3
AL4 judgement value>display value	AL4

●Zone judgement mode

The alarm is ON when display value between upper and lower judgement values （inside of zone alarm）

The alarm is ON when display value out of upper and lower judgement values（outside of zone alarm）

Inside of zone alarm

Condition of comparison	Judgement result
AL1 zone upper limit≥display value≥AL1 zone lower limit	AL1
AL2 zone upper limit≥display value≥AL2 zone lower limit	AL2
AL3 zone upper limit≥display value≥AL3 zone lower limit	AL3
AL4 zone upper limit≥display value≥AL4 zone lower limit	AL4

Outside of zone alarm

Condition of comparison	Judgement result
display value>AL1 zone upper limit or AL1 zone lower limit>display value	AL1
display value>AL2 zone upper limit or AL2 zone lower limit>display value	AL2
display value>AL3 zone upper limit or AL3 zone lower limit>display value	AL3
display value>AL4 zone upper limit or AL4 zone lower limit>display value	AL4

Comparison formula memory : 8 pattern memory

【Analog output】

Conversion method : D/A conversion method
Resolution capability : Equivalent of 13bit
Scaling : Digital scaling
Output objective : An item can be selected from source displayable values
Response speed : Up to 25ms (0→90% response)
Specifications for each output :

Output type	Load resistance	Accuracy (23±5℃ 35 to 85%RH)	Ripple
0 to 10V	≥2kΩ	±(0.1% of FS)	±50mVp-p
-10 to 10V			
1 to 5V			
0 to 20mA	≥550Ω		±25mVp-p *Ripple for 4 to 20mA is at load resistance 250Ω, 20mA output.
4 to 20mA			

【BCD output】

Output type : Open collector output NPN/PNP type
Measurement data : Negative logic transistor is ON at logical “1”
Polarity signal : Negative logic transistor is ON at minus display
Over signal : Negative logic transistor is ON at over display
Synchronized signal (PC) : Transistor is ON for a fixed period every time data becomes valid.
Transistor output capability : Voltage 30V max. Current 10mA max.
Output saturation voltage up to 1.2V at 10mA
Enable : By shorting the enable terminal to -D.COM or bringing to same voltage level, the BCD output transistors become OFF.

【RS-232C】

Communication protocol : Modbus-RTU,OriginalCommand,OriginalOutput
Communication protocol : Asynchronous
Communication method : Full duplex
Baud rate : 9600bps,19200bps,38400bps
Data length : 7bit,8bit
Start bit : 1bit
Parity bit : None, Odd, Even
Stop bit : 1bit,2bit
Delimiter : CR LF,CR
Character code : Code ASCII
Transmission control procedure : No control sequence
Used signal names : TXD,RXD,SG
Number of connectable units : 1
Cable length : Max. 15m

【RS-485 Modbus】

Communication protocol : Modbus RTU
Synchronization method : Asynchronous
Communication method : 2-wire half- duplex
Baud rate : 9600bps,19200bps,38400bps
Data length : 8bit
Start bit : 1bit
Parity bit : None, Odd, Even
Stop bit : 1bit
Used signal names : Non-inverting (+), Inverting (-)
Number of connectable units : 31
Cable length : Max.1.2km （total） *Conforming CE mark, less than 30m

15. TROUBLESHOOTING

No.	Condition	Checkpoint	Action
1	The display does not light up.	Check the power is supplied correctly.	･Check the supplied power meets requirement of supply power specifications. ･Using a circuit-tester, check voltage and wiring. Tighten up the screws of the terminals.
		Check the setting of “brightness” is set to “OFF”.	- By pushing MENU and FUNC keys, if the display lights up,”BRIGHTNESS” is set to “OFF”. Change “BRIGHTNESS” setting. *Refer to page 141.
			If the above procedure does not make an improvement, contact your dealer or our company.
2	Display keeps indicating”0” or”------”.	Check the input signal is applied adequately.	･Check the supplied input signal meets requirement of input specifications. ･Check input wiring and its continuity. ･Check with input diagnostic function of the product. ･Check status of external control function. - Measurement inhibit(see page 162) - Current value hold (see page 168) ･Check settings. - Input filter setting（see page40） - Instantaneous value auto zero setting（see page 49） - Start delay time setting（see page 142） ･Initialize the WPMZ. Caution：All settings are reset to default values by the initialization. *Initialization（see page 151）
		Check the selected display is appropriate for the input channel or displayed item in use.	･Using DISP key, try to switch display. ･Check setting of “Display Select”. * “Display Select” setting （See page126）
			If phenomenon is not improved by above methods, please contact your dealer or our company.
3	OVER alarm display Error code display	Check setting of scaling.	･Review setting values. （see page 40,65,77,80）
		Influence of noise	･Using shield cable, improving wiring. ･Input filter setting（see page40）

No.	Condition	Checkpoint	Action
4	The display disappear, display value becomes over twice times.	Influence of spark noise from nearby electromagnetic stich, solenoid, electromagnetic valve, relay etc.	・Using shield cable, improving wiring. ・Input filter setting(see page40)
5	Two wire transmitters do not operate.	Two wire input of WPMZ is not applicable to 4-10mA current pulse.	
6	Comparative output does not turn OFF.	Check setting of "comparison judgement value" and "hysteresis".	・Setting of "comparison judgement value" (see page93) ・Check whether output mode of comparative output is set to "Latch". *Output mode(see page50)
7	Spend much time for display value changing to zero after input pulse stopping.	Consideration of "Instantaneous value auto zero".	・Setting of "Instantaneous value auto zero"(see page49)
8	Fluctuations of displayed value are wide.	(Sometimes, displayed value becomes small.)	・Check the level of input signal is under nominal value. ・Input filter setting(see page40)
		(Sometimes, displayed value becomes large.)	・Input filter setting(see page40)
		(Input signal varies in actually.)	・Consideration of "Average" functions. *Instantaneous Value Moving Average(see page69) *3 Instantaneous Value Simple Average(see page51)
9	Analog output abnormal	Check by "test output"	・Check using "test output" function.
		Check connected load is suitable.	・Disconnect the load and check the output value.
		Check wiring.	・Check whether the load is connected to suitable terminal (current output or voltage output).
		Check settings.	・Check scaling setting for analog output. ・Check selected displayable value for analog output. ・Check output range of analog output.
			If phenomenon is not improved by above methods, please contact your dealer or our company.
10	BCD output abnormal	・Check connected device is suitable. (NPN/PNP,external pullup etc.) ・Check output logic setting is correct.	・Check using "test output" function.

No.	Condition	Checkpoint	Action
11	RS-232C communication abnormal	Check wiring, wire length are correct. Check setting such as baud rate is correct. Check communication command is correct.	・Check using “test output” function.
12	RS-485 communication abnormal	Check wiring, wire length, termination, number of connected devices are correct. Check setting such as baud rate is correct.	・Check using “test output” function.
13	Totalized value is fixed to”OVER”.	Check whether noise on input signal makes unexpected input.	・Input filter setting（see page40）
		Check setting of “Overrun count”	・Check “Totalized value overrun count (TotOverCount)” setting. （see page55）
14	Totalized value is larger for number of input pulse.	Chattering of relay, ringing by inductive factor of wiring.	・Input filter setting（see page40）
15	Totalized value has deceased.	Check “Overrun count”	・Check number of “Overrun count Check whether the “Total calculation direction(TotDirection)” is set to “Subtract from default (SubFromDefault)” * Total calculation direction（see page 54）
16	The number of totalizer-synchronous pulse is fewer than the totalized value.	Check the output frequency. *Totalizer-synchronous pulse output cannot adapt to the frequency of over100Hz.	
		Check the pulse width. *If pulse width is set wider than pulse output interval, output stays ON status.	・”Output pulse width” setting（see page104）
17	Totalized value is lost by power off.	Check the setting variable “Totalized value memory”	Check “Totalized value memory” is set to enable.
18	In an analog input product, instantaneous value has large offset error	Check whether the digital zero function is working	・Digital zero function (see page 169) ・Digital zero retention(see page 145)

16. APPENDIX

16－1. KEY OPERATION REFERENCE CHART

The functions of keys are shown in the chart below.

Operation in “measurement mode”

FUNC	MENU	DISP	ENTER	︽	︾	«	»	Action
○								Moves to entering short-cut function of external control.
	○							Moves to setting mode.
		○						Switches measurement display contents.
			◎					Resets the system by 1sec. long-pressing in error mode. condition
				◎				When assigned short-cut functions, makes the function ON/OFF by long-pressing.
					◎			
						◎		
							◎	
		◎	◎					Makes the key lock function ON/OFF by long-pressing simultaneously.

Operation in “setting mode”

FUNC	MENU	DISP	ENTER	︽	︾	«	»	Action
○								Moves from shortcut function entry display to measurement mode
	○							Stores settings and moves to measurement mode.
		○						No action
			○					Fixes setting parameters.
				○				Moves to other setting displays / Moves cursors in setting displays / Modifying setting values.
					○			
						○		
							○	

*Note: ○ short-pressing ◎ long–pressing (holding down more than 2sec.)

１６－２．SETTING VARIABLES

1st layer Large categories	2nd layer Small categories	3rd layer (setting variables)		4th layer （Setting values)		Remarks
		name of item	Character strings on display (abbreviated form)	Initial values	Settable variables	
1.Input	Pulse input A Pulse input B	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Input type	InputType	OpenCollector	OpenCollector/Logic/ZeroCross/2Wire/ 2PhOpenCol/2PhaseLogic/2Phase2wire	Select input signal type
		Input filter	InputFilter	None	None/30Hz/1.5kHz/15kHz	Select input analog filters
		Sensor power	SensorPower	12V	12V/24V	Switch Sensor power voltage
		Instantaneous value display coefficient	InsDispCoef	1.00000×10^0	0.00000 to $9.99999\times10^{-9\sim9}$	For scaling setting of instantaneous value display, multiply frequency by instantaneous coefficient and unit time.
		Instantaneous Unit Time	InsUnitTime	Sec	Sec/Min/Hour	
		Instantaneous valuedecimal point position	InsDecPoint	####### (No decimal point)	####### / ######.# / #####.## / ###.#### / ##.##### / #.######	Set number of digits after decimal point
		Instantaneous value display unit	InsDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to detailed instruction manual about custom unit
		Instantaneous value auto zero	InsAutoZero	0.00	0.00 to 99.99sec	Displays 0 if no pulse input over more than setting time
		Instantaneous value moving average	InsMoveAve	None	None/2times/3times /4times /5times /6times /7times /8times / 9times	Set number of moving averages.
		Instantaneous value simple average	InsSimpleAve	None	None/2 times /4 times /8 times /16 times /32 times /64 times /128 times /256 times	Set number of simple average for internal sampling (10ms)
		Instantaneous value display step	InsDispStep	None	None/5steps/10steps	Setting of steps of display（If set to 5steps, displayed only 0 or 5 on LSB）
		Totalized value display coefficient	TotDispCoef	1.00000×10^0	0.00000 to $9.99999\times10^{-9\sim9}$	Scaling setting for totalized value display.
		Totalized value default value	TotDefaults	0.00000×10^0	$\pm9.99999\times10^{-9\sim9}$	Setting of Initial value of totalized value
		Total calculation direction	TotDirection	AddToDefault	AddToDefault/SubFromDefault	Set addition or subtraction for totalized value
		Totalized value decimal point position	TotDecPoint	####### (No decimal point)	####### / ######. # / #####. ## / ###. #### / ##. ##### / #. ######	Set number of digits after decimal point
		Totalized value display unit	TotDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to detailed instruction manual about custom unit
		Totalized value overrun count	TotOverCount	None	None/999times/Endless	Setting for overrun count
	Analog Input A Analog Input B	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Input Range	InputRange	4 ~ 20mA	0 ~ 5V/1 ~ 5V/0 ~ 10V /4 ~ 20mA/0 ~ 20mA	Select input signal range
		Sensor Power	SensorPower	12V	12V/24V	Select sensor power voltage
		Input Low Cut	InputLowCut	0.500	0.000 to 99.999%	Cutting off low level input signal
		Linearize Function	LinearizeFunc	Disable	Disable/Enable	Switch ON/OFF of linearize function.
		Linearize Point	LinearizePoint	0.00 0.00	Input value（1st to 21st point）: 0.00 to 100.00% Output value（1st to 21st point）: 0.00 to 100.00%	On after 2nd point, if both of input value and output value are 0.00, the following points become invalid.
		Instantaneous value display Coefficient	InsDispCoef	1.00000×10^4	0.00000 to $9.99999\times10^{-5\sim5}$	Scaling setting of instantaneous value display.
		Instantaneous value decimal point position	InsDecPoint	##### (No decimal point)	##### / ####. # / ###. ## / ##. ### / #. ####	Setnumber of digits after decimal point
		Instantaneous value display unit	InsDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to detailed instruction manual about custom unit
		Instantaneous value moving average	InsMoveAve	None	None/2times/3times /4times /5times /6times /7times /8times / 9times	Set number of moving average for analog inputs

1st Layer (Large Categories)	2nd Layer (Small Categories)	3rd layer (setting variables)		4th layer （Setting values)		Remarks
		name of item	Character strings on display (abbreviated form)	Initial values	Settable variables	
1.Input	Analog Input A Analog Input B	Instantaneous value simple average	InsSimpleAve	None	None/2 times /4 times /8 times /16 times /32 times /64 times /128 times /256 times	Set number of simple average
		Instantaneous value display step	InsDispStep	None	None/5steps/10steps	Setting of steps of display（If set to 5steps, displayed only 0 or 5 on LSB)
		Totalized value display Coefficient	TotDispCoef	1.00000×10^5	0.00000 to $9.99999\times10^{-9\sim9}$	Scaling setting for totalized value display.
		Totalized value default value	TotDefaults	0.00000×10^0	$\pm9.99999\times10^{-9\sim9}$	Setting of Initial value of totalized value
		Total calculation direction	TotDirection	AddToDefault	AddToDefault/SubFromDefault	Set addition or subtraction for totalized value
		Totalized value decimal point position	TotDecPoint	###### (No decimal point)	###### / #####. # / ####. ## / ###. ### / ##. #### / #. #####	Set number of digits after decimal point.
		Totalized value display unit	TotDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to detailed instruction manual about custom unit
		Totalized value overrun count	TotOverCount	None	None/999times/Endless	Setting for overrun count
	2 input calculation	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Expression for instantaneous value	InsExpression	None	None/ (B/A)*100 / (B/A-1)*100 /B-A / (B/(A+B))*100 / A+B	Select expression for calculation of instantaneous value.
		Instantaneous value decimal point position	InsDecPoint	###### (No decimal point)	###### / #####.# / ####.## / ###.### / ##.#### / #.#####	Setnumber of digits after decimal point
		Instantaneous value display unit	InsDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to detailed instruction manual about custom unit
		Instantaneous value display step	InsDispStep	None	None/5steps/10steps	Setting of steps of display（If set to 5steps, displayed only 0 or 5 on LSB)
		Expression for totalized value	TotExpression	None	None/A+B / B-A	Select expression for calculation of totalized value.
		Totalized value decimal point position	TotDecPoint	###### (No decimal point)	###### / #####. # / ####. ## / ###. ### / ##. #### / #. #####	Set number of digits after decimal point.
		Totalized value display unit	TotDispUnit	None	None/select from 62 units (See 6-2)/custom unit	Refer to detailed instruction manual about custom unit
		Totalized value overrun count	TotOverCount	None	None/999times/Endless	Setting for overrun count
	External Control	Function of external control terminal 1 to 5	ExtCtrl1Func ExtCtrl2Func ExtCtrl3Func ExtCtrl4Func ExtCtrl5unc	None	None/ CompareReset/ TotalResetA/ TotalResetB/ TotalResetA&B/ MeasureBlockA/ MeasureBlockB/ MeasureBlockA&B/ DispHoldA/ DispHoldB/ DispHoldA&B/ MaxHoldA/ MaxHoldB/ MaxHoldA&B/ MinHoldA/ MinHoldB/ MinHoldA&B/ DigitalZeroA/ DigitalZeroB/ DigitalZeroA&B/ PatternChange1/ PatternChange2/ PatternChange3/ MonitorChange/ TrendHold	Select functions assigned to external control terminals. (Digital zero is installed only in analog input products)
2.Output	Compare List	---	---	---	Go to screen of CompareList	
	Comparative Output AL1 Comparative Output AL2 Comparative Output AL3 Comparative Output AL4	Pattern select	PatternSelect	Pattern No. in use	Pattern1 to 8	Select pattern No. to set.
		Source output display value	OutputDispValue	None	None/InsA/InsB/InsCalc/TotA/TotB/TotCalc	Select source output display value to compare.
		Compare mode	CompareMode	LevelJudge	LevelJudge/ ZoneJudge	Select compare mode
		Condition of ON	OnConditions	Excess	Excess/LessThan	In level judge mode
				InTheZone	InTheZone/OutsideTheZone	In Zone judge mode
		Comparison judgement value	Threshold	10000 0	Threshold :±999999 Hysteresis：0 to 999999	In level judge mode
				0 10000 0	Zone lower limit：±999999 Zone upper limit :±999999 Hysteresis：0 to 999999	In Zone judge mode
		Comparison ON delay	OnDelay	None	None/20ms/50ms/100ms/200ms/500ms/1s/5s/10s/20s	Comparative output turns ON, if ON condition continues over set delay time.
		Comparison OFF delay	OffDelay	None		Comparative output turns OFF, if OFF condition continues over set delay time.

1st Layer (Large Categories)	2nd Layer (Small Categories)	3rd layer (setting variables)		4th layer (Setting values)		Remarks
		name of item	Character strings on display (abbreviated form)	Initial values	Settable variables	
2.Output	Comparative Output AL1 Comparative Output AL2 Comparative Output AL3 Comparative Output AL4	Output mode	OutputMode	Normal	Normal/Latch/OneShot5ms/ OneShot 10ms/ OneShot 20ms/ OneShot 50ms/ OneShot 0.1s/ OneShot 0.2s/ OneShot 0.5s/ OneShot 1s/ OneShot 2s	Select output mode of comparison
		Output logic	OutputLogic	Negative (NO)	Positive(NC)/Negative(NO)	NC/NO are for relay output product.
		Background Color at ON	OnBgColors	Black	Black/Red/Yellow/Green	Background color priority AL1>AL2>AL3>AL4
	Pulse Output A Pulse Output B	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Source output display value	OutputDispValue	None	None/InsATotA/TotB/TotCalc	Select source output display value to output as totalizer-synchronous pulse
		Output synchronous digit	OutputSyncDigit	1stDigit	1stDigit/2ndDigit/3rdDigit/4thDigit/5thDigit /6thDigit	Select display digit with which totalizer-synchronous pulse synchronized.
		Output pulse width	OutputPulseWidth	5ms	5ms/10ms/20ms/50ms/100ms/500ms/1s/2s	Select width of totalizer-synchronous pulse.
		Output logic	OutputLogic	Negative	Positive/Negative	Select logic of totalizer-synchronous pulse.
	Analog Output	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Output range	OutputRange	0-10V	0-10V/±10V/1-5V/0-20mA/ 4-20mA	Select output range (type).
		Source output display value	OutputDispValue	None	None/InsA/InsB/InsCalc/TotA/TotB/TotCalc	Select a displayable item for analog output
		Output scale	OutputScale	0 10000	0% display value :±999999 (±99999) 100% display value :±999999 (±99999)	Set scaling for analog output. Set expected display values at 0% and 100% output.
	BCD Output	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Source output display value	OutputDispValue	None	None/InsA/InsB/InsCalc/TotA/TotB/TotCalc	Select a displayable item for BCD output
		Data signal logic	DataSignalLogic	Negative	Positive /Negative	Select logic of data signal output.
		Synchronous signal logic	SyncSignalLogic	Negative	Positive /Negative	Select logic of synchronous signal (PC) output.
	RS-485 Modbus communication	SlaveAddress	SlaveAddress	1	1/2/3/4/ ····· /30/31	Set ID number.
		Baudrate	Baudrate	19200bps	9600bps/19200bps/38400bps	Set baudrate.
		Parity	Parity	Even	None/Even/Odd	Set parity bit.
	RS-232C communication	Protocol	Protocol	Modbus-RTU	Modbus-RTU/OriginalCommand/ OriginalOutput	Set protocol
		Baudrate	Baudrate	19200bps	9600bps/19200bps/38400bps	Set baudrate.
		Data length	DataLength	7bit	7bit/8bit	Set data character length
		Parity	Parity	Even	None/Even/Odd	Set parity bit.
		Stop bit	Stopbit	1bit	1bit/2bit	Set stop bit length.
		Delimiter	Delimiter	CR LF	CR/CR LF	Set delimiter type.

1st Layer (Large Categories)	2nd Layer (Small Categories)	3rd layer (setting variables)		4th layer （Setting values)		Remarks
		name of item	**Character strings on display (abbreviated form)**	**Initial values**	**Settable variables**	
3.Display	Display Select	Measure select	MeasureSelect	1input: InsA+ TotA 2inputs： InsA+ TotA / InsB+ TotB	InsA/InsB/InsCalc/ InsA+InsB / InsCalc+A+B/ TotA/TotB/TotCalc / TotA+TotB/TotCalc+A+B/ InsA+ TotA / InsB+ TotB/ InsCalc+ TotCalc/ InsA+Comp/InsB+Comp/InsCalc +Comp/ TotA+Comp/TotB+Comp/ TotCalc+Comp	Select displayable items can be switched by DISP key or external control (multiple selects are available)
		Level select	LevelSelect		InsA/InsB/InsCalc/ InsA+InsB / TotA/TotB/TotCalc / TotA+TotB / InsB+ TotB/ InsCalc+ TotCalc	Select an item displayed on level display
		Trend select	TrendSelect			Select an item displayed on trend display.
	Level Display	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Instantaneous value A scale	InsA Scale	0 10000	Lower limit：±999999 Upper limit：±999999	Set display scale of level display. Left edge of display is lower limit and right edge of display is higher limit
		Instantaneous value B scale	InsB Scale			
		Instantaneous calculation scale	InsCalcScale			
		Totalized value A Scale	TotA Scale			
		Totalized value B Scale	TotB Scale			
		Totalized calculation scale	TotCalcScale			
	Trend Display	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
		Instantaneous value A scale	InsA Scale	0 10000	Lower limit ：±999999（±99999） Upper limit ：±999999（±99999）	Set display scale of trend display. Bottom edge of display is lower limit and top edge of display is higher limit.
		Instantaneous value B scale	InsB Scale			
		Instantaneous calculation scale	InsCalcScale			
		Totalized value A scale	TotA Scale			
		Totalized value B scale	TotB Scale			
		Totalized calculation scale	TotCalcScale			
		Time axis	TimeAxis	1s/div	1s/div,2s/div,5s/div,10s/div,30s/div, 60s/div,120s/div	Select time for 1 division of time axis.
4.System	General	Brightness	Brightness	5 Bright	5 Bright/4/3/2/1 Dark/0 Off	Select brightness of display *"0 Off" is set, whole display is black out
		Power on delay	PowerOnDelay	None	None/2sec/5sec/10sec/20sec /30sec/60sec	Select time from power on to starting measurement
		Power saving time	PowerSavingTime	None	None/1min/2 min/5 min/10 min/30 min/60 min	In power saving state, brightness becomes "1 Dark" level.
		Totalized value Memory	TotMemory	Enable	Enable/Disable	Select saving totalized value or not.
		Digital zero retention	D-ZeroRetention	Disable	Enable/Disable	Select the execution state and the offset value of the digital zero function whether to retent when the power is turned off
		Language	Language	Japanese	Japanese /English	Select language
		Direction of display	DisplayDirection	Horizontal	Horizontal/Vertical	Select direction of display
		Setting protect	SettingProtect	Disable	Disable/Enable	If ON, changing settings are disabled.
		Pattern Copy	PatternCopy	Pattern1 (source) Pattern2 (destination)	Pattern1/2/3/4/5/6/7/8 Pattern1/2/3/4/5/6/7/8/All Patterns	Function of copying settings for each pattern.
	Initialize	Save user defaults	UserDefaultSave	Message "Save current settings as user initial values?"		
		Initialize to user defaults	UserDefaultLoad	Message "Initialize setting values to user initial values?"		
		Initialize to factory default	FactoryDefaultLoad	Message "Initialize setting values to factory default?"		

1st Layer (Large Categories)	**2nd Layer (Small Categories)**	**3rd Layer (Setting Variables)**		**4th Layer (Setting Values)**		**Remarks**
		Name of Variables	**Character Strings on Display (Abbreviated Form)**	**Initial values**	**Settable Variables**	
5.Diagnosis	Input Diagnosis	Pulse input A Pulse input B	PulseInputA PulseInputB	—	—	Check for input signa existence. (Displays pulse counts)
		Analog input A Analog input B	AnalogInputA AnalogInputB	—	—	Check for input signal existence. (Displays level in percentage of rating.)
		External control inputs	ExternalCtrl	—	—	Check for ON/OFF state of terminals
	Output Test	Comparative output AL1 to AL4	CompareAL1 CompareAL2 CompareAL3 CompareAL4	—	—	Outputs ON level or OFF level
		Pulse output A Pulse output B	PulseOutputA PulseOutputB	—	—	Outputs ON level or OFF level
		Analog output	AnalogOutput	—	—	Outputs level of 10% steps of rating.
		BCD Output(Data) BCD Output(PC)	BCD Output(Data) BCD Output(PC)	—	—	Outputs ON level or OFF level for each bit
		Modbus Communication RS-485	ModbusCom	—	—	Displays receive data and transmit data
		RS-232C	RS-232C Com	—	—	Displays receive data and transmit data

The contents of this instruction manual are subject to change without prior notice.

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