Graphical Digital Panel Meter WPMZ-5-000-00-000 Quick instruction manual

Thank you for purchasing the WPMZ graphical digital panel meter. This manual is a quick instruction manual only for preparation, connection and basic condition settings of the WPMZ. For the all functions of WPMZ, please refer to a detailed instruction manual which can be downloaded from our homepage.

For models with RS communication functions, please refer to "Modbus communication manual" or "RS-232C communication manual" which also can be downloaded from our homepage. (http://www.watanabe-electric.co.jp/en/)

Checks before suppling power, preparations, wiring

CHECKING THE PRODUCT

-1. MODEL CODES

Please check that the product has been delivered matches the model code has been ordered in reference to "17. SPECIFICATIONS".

2. PRECAUTIONS FOR USE

2-1. ENVIRONMENTS AND CONDITIONS OF USE

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

- 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
- Environment of rain or water drops (except the frontpanel) 6) 7)Environment of strong electromagnetic field or much exogenous noises.

2-2. INSTALLATION AND CONNECTION

1) Please read this manual before the installation and the connection of wires. And they should be performed by a person having a specialized technique. In addition, the insulation class of the WPMZ is as shown by the figure below. Please confirm that the insulation class satisfies a use condition prior to the installation.

Reinforced Insulation Basic Insulation ____ Operational Insulation

AC	Comparative outp control inputs, An BCD output,RS-2	RS-485 Modbus RTU	
power	Input Ach	Input Bch	
	Comparative outp	RS-485	

DC	control inputs, Analog output,		Modbus
power	BCD output,RS-232C		RTU
	Input Ach	Input Bch	

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

Note: The inputs "A channel" and "B channel" may be abbreviated to "Ach" and "Bch" in this manual.

2-3. CHECKING BEFORE USE

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Install the WPMZ under the environments and conditions of use which meet requirements.

If you find any damage to the product or any problem, please contact to your dealer or our company directly.

3. HOW TO INSTALL (PANEL CUT DIMENTIONS)

To install the WPMZ, panel cut dimensions are as shown by the figure below. 92 1



CONNECTING TERMINALS

4-1. BACK VIEW



4-2. WIREING TO SCREWLESS TERMINALS



Pushing the wire release button with a flat-blade screwdriver, insert the wire to the wire insert hole deeply and then release the button

(Suitable tool for pushing buttons :flat-blade screwdriver blade width 2.5mm)

4-3. CONNECTON FOR LOWER ROW TERMINALS (COMPARATIVE OUTPUT/EXTERNAL CONTROL INPUT. POWER)

4-3-1. Comparative Output/External Control Input *Screwless connector

[Open-collector output products]



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 External control input No.3		
11	3			
12	4	External control input No.4		
13	5	External control input No.5		

[Relay output products]



		Suitable wire: AWG 24 to 16
No.	Name	Description
1	AL1	AL1 relay output
2	AL1. 2 COM	Common terminal for relay outputs of AL1 and AL2
3	AL2	AL2 relay output
4	AL3	AL3 relay output
5	AL3. 4 COM	Common terminal for relay outputs of AL3 and AL4
6	AL4	AL4 relay output
7	×	No connection
8	COM	Common terminal for external control inputs
9	EXT 1	External control input No.1
10	EXT 2	External control input No.2
11	EXT 3	External control input No.3
12	EXT 4	External control input No.4
13	EXT 5	External control input No.5

4-3-2. Supply Power



(Non-usable for a relay terminal)) 4-4. CONNECTION FOR UPPER ROW TERMINALS

4-4-1. Pulse Inputs (Open collector/Logic/Zero cross/2wire) *Screwless connector

Ach pulse input





Suitable wire: AWG24 to 16 A channel pulse input

terminal	name	description
14	IN	Ach pulse input terminal
15,16	GND	Ach input GND terminal
17	+EXC	Ach sensor power output terminal (+)
18	-EXC	Ach sensor power output terminal $(-)$
19,20	NC	No connection *Non-usable for a relay terminal

B channel pulse input

terminal	name	description	
21	IN Bch pulse input terminal		
22,23	GND	Bch input GND terminal	
24	+EXC	Bch sensor power output terminal (+)	
25	-EXC	Bch sensor power output terminal $(-)$	
26,27	NC	No connection *Non-usable for a relay terminal	

• Examples for Input connections

PNP





·		*Non-usable for a relay terminal		
●B c	●B channel line driver input			
terminal	name	description		
21	LINE(+)	Bch Line driver input terminal (+)		
22	LINE(-)	Bch Line driver input terminal (-)		
23	GND	GND Bch GND input terminal (+)		
24	+EXC	Bch sensor power output terminal (+)		
25	-EXC	-EXC Bch sensor power output terminal (-)		
26,27	NC	No connection *Non-usable for a relay terminal		

·Examples for Input connections



4-5. CONNECTION FOR MIDDLE ROW TERMINALS 4-5-1. Analog Output *Screwless connector





Suitable wire: AWG24 to 16

1

terminal	name	description			
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			
4-5-2. BCD Output *MIL connector					
10 ⁰ 2 8	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	10 ³ 10 ⁴ 10 ⁵ WOD Q 2 8 2 8 2 8 0 0 E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 2 8 0 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 2 8 2 8 2 8 0 C E H 2 8 2 8 2 8 2 8 2 8 2 8 2 8 2 8 2 8 2 8			
2					

33 1___4 10 ⁰ -D.COM -D.COM -D.COM (PNP) ئے 10 ⁵

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

●WPMZ-5				
terminal	name	description		
1 to 4	$10^{0}1-8$	Bit 1-8 of BCD 10 ⁰ digit output terminals		
5 to 8	1011-8	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	$10^{5}1-8$	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		
		BCD enable terminal		
28	ENADIE	By bringing to same voltage level of -D.COM		
	ENABLE	or connecting to -D.COM, transistors of BCD		
		outputs become OFF.		
27 28	PC ENABLE	BCD synchronous signal output terminal BCD enable terminal By bringing to same voltage level of -D.COM or connecting to –D.COM, transistors of BCD outputs become OFF.		

5. 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	1st item display	Displays measured value of 1st item
6	FUNC key	Used for registering external control shortcut function.
\overline{O}	MENU key	Used for moving to setting display and returning measurement display.
8	Arrow keys	Used to move the cursor and to move to other displays while setting mode. *When the shortcut function is registered, the assigned function will be valid by holding down the key over 1 second.
9	ENTER key	Used to validate setting value.
10	DISP key	Used to switch measurement display.
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	Comparison result	Lights when the result of comparative output is ON.
(16)	Judgement value	Shows value or area of comparison judgement

29 to 32	-D.COM	Common terminal for BCD open collector NPN
33,34	+D.COM	External power terminal for BCD open collector PNP

4-5-3. RS-232C *Screwless connector

2	2	3	3	3	3	3	
RXD	TXD	SG	NC	NC	NC	NC	

Suitable wire: AWG24 to 16

●WPMZ-5-□□□-**4**□-□□□

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-yeable for a relay terminal	

4-5-4. RS-485 Modbus RTU *Screwless connector



FERM LERN RS-485

Suitable wire: AWG24 to 16

	●WPMZ-5-UUU-5U-UUU				
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 (120Q)terminals * Short 33 and 34 to be enable the resistance.			



5-2. EXPLANATION OF ICONS

5-2-1. 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.					
Â	Indicates key lock function is effective.					
Θ	Indicates comparative output reset function (an external control function) is effective.					
\oslash	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.					

5-2-2. Key Operation Icons On The Setting Display

Key operation icons which are displayed on setting displays

are shown below.

Icon	Meanings	Icon	Meanings
М	MENU key	◄	ARROW key(LEFT)
F	FUNC key		ARROW key(RIGHT)
Ε	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

BASIC OPERATIONS OF MEASUREMENT DISPLAY 6.

During measurement mode, the following key operations can be done.



By pushing the "DISP key" in the measurement mode, the display can be switched to others which are selected in "display select". By pushing the "MENU key" in the measurement mode, the display moves to the setting display. Alternatively, by pushing the "MENU key" in the setting display, the display returns to the measurement display By pushing the "FUNC key" in the measurement mode, the display moves to the shortcut entry display. Alternatively, by pushing the "FUNC key" in the shortcut entry display, the display returns to the measurement display. Alternatively, by pushing the "FUNC key" in the shortcut entry display, the display returns to the measurement display. During measurement, by holding down the "arrow key" in 1 second, the shortcut function registered to the key will be executed. On this occasion, the display has no change. 12

- 3
- **(4)** On this occasion, the display has no change.

7. SETTING LAYER OVERVIEW

The setting menus of the WPMZ which are represented by key words and have layers, therefore desired setting menu can be selected accurately. The layers consist of 1st layer to 4th layer (Only custom unit setting has the 5th layer). Please refer to "8. BASIC OPERATION OF SETTING DISPLAY" about how to set up.

1 at lawar	and lower	3rd layer (se	otting items)	4th layer (setting contents)			
Large categories	Small categories	name of item	Character strings on display (abbreviated form)	Initial values	Settable variables	Remarks	
	(WPMZ-5-□P□)	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern 1/ 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	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°	0.00000 to 9.99999×10 ^{-9~9}	For scaling setting of instantaneous value display, multiply frequency by instantaneous coefficient and	
		Instantaneous unit time	InsUnitTime	Sec	Sec/Min/Hour	unit time.	
	Pulse input A	Instantaneous value decimal point position	InsDecPoint	(No decimal point)	######################################	Set number of digits after decimal point	
	Pulse input B	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)	
	(WPMZ-5-□L□)	Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern 1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern 5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.	
		Input Type	InputType	Line driver	Line driver	Only line driver	
		Input filter	InputFilter	None	None	None analog filters	
		Sensor Power	SensorPower	5V	5V	Sensor power is 5V only	
	Pulse Input A Pulse Input B	Instantaneous value display Coefficient	InsDispCoef	1.00000×10°	0.00000 to 9.99999×10 ^{-9~9}	For scaling setting of instantaneous value display, multiply frequency by instantaneous coefficient and	
		Instantaneous value unit time	InsUnitTime	Sec	Sec/Min/Hour	unit time.	
1.Input		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 99.99 sec	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 for analog inputs	
		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)	
		Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern 1/ 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.	
	2 input calculation	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)	

4/12

MODEL WPMZ-5-000-000

1st layer	2nd layer Small categories	3rd layer (setting items)		4th layer (setting contents)	
Large categories	Sillali Categories	name of item	Character strings on display	Initial values	Settable variables	Remarks
1.Input	External Control	Function of external control terminal 1 to 5	(abbreviated form) ExtCtrl1Func ExtCtrl2Func ExtCtrl3Func ExtCtrl3Func ExtCtrl5Func	None	None/ CompareReset/ MeasureBlockA/ MeasureBlockB/ MeasureBlockA&B/ DispHold&EV DispHoldA/ DispHoldB/ MaxHoldA/ MaxHold&MaxHoldA&B/ MinHoldA/ MinHoldB/ MinHoldA&B/PatternChange1/ PatternChange2/ PatternChange3/ MonitorChange/ TrendHold	Select functions assigned to external control terminals.
	CompareList			 Pattern1(or pattern No	Go to screen of CompareList. Pattern // Pattern 2/ Pattern 3/ Pattern 4/ Pattern	Select nattern No. to set
		Pattern select	PatternSelect	in use)	5/ Pattern 6/ Pattern 7/ Pattern 8	belet patern No. to set.
		Source output display value	OutputDispValue	None	None/InsA/InsB/InsCalc	Select source output display value to compare.
	Comparative	Compare mode	CompareMode	LevelJudge Excess	LevelJudge/ ZoneJudge Excess/LessThan	Select compare mode In level judge mode
	Output AL1	Condition of ON	OnConditions	InTheZone	InTheZone/OutsideTheZone	In Zone judge mode
	Comparative Output AL2	Comparison judgement value	Threshold	10000 0 10000	Threshold:±999999 Hysteresis:0 to 9999999 Zone lower limit:±999999 Zone upper limit:±999999	In level judge mode In Zone judge mode
	Comparative Output AL3	Comparison ON dolor	OnDoloy	0 None	Hysteresis:0 to 999999	Comparative output turns ON, if ON condition
	Comparative	Comparison OFF	OffDelay	New	None/20ms/50ms/100ms/200ms/500ms 1s/5s/10s/20s	continues over set delay time. Comparative output turns OFF, if OFF condition
	Output AL4	delay 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	continues over set delay time. Select output mode of comparison
		Output logic Background Color at	OutputLogic	Negative(NO)	Positive(NC)/Negative(NO)	NC/NO are for relay output product.
2 Output		ON	OnBgColors	Black	Black/Red/Yellow/Green	AL1>AL2>AL3>AL4
2.Output		Pattern select	PatternSelect	Pattern I(or pattern No. in use)	5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
	AnglenOntert	Output range	OutputRange	0-10V	0-10V/±10V/1-5V/0-20mA/4-20mA	Select output range (type).
	Analog Output	Source output display value	OutputDispValue	None	None/InsA/InsB/InsCalc	Select a displayable item for analog output
		Output scale	OutputScale	0 10000 Pattern1(or pattern No	0% display value :±999999 100% display value :±999999 Pattern 1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern	Set scaling for analog output. Set expected display values at 0% and 100% output.
		Pattern select	PatternSelect	in use)	5/ Pattern 6/ Pattern 7/ Pattern 8	Select pattern No. to set.
	BCD Output	Source output display value	OutputDispValue	None	None/InsA/InsB/InsCalc	Select a displayable item for BCD output
		Synchronous signal	SyncSignalLogic	Negative	Positive /Negative Positive /Negative	Select logic of data signal output. Select logic of synchronous signal (PC) output.
	RS-485	SlaveAddress	SlaveAddress	1	1/2/3/4/ /30/31	Set ID number.
	Modbus communication	Baudrate Parity	Baudrate Parity	19200bps Even	9600bps/19200bps/38400bps None/Even/Odd	Set baud rate. Set parity bit.
		Protocol Baud rate	Protocol Baudrate	Modbus-RTU 19200bps	Modbus-RTU/OriginalCommand/OriginalOutput 9600bps/19200bps/38400bps	Set protocol Set baudrate
	RS-232C commu	Data length	DataLength	8bit	7bit/8bit	Set data character length
	nication	Stop bit	Stopbit	None 1bit	None/Even/Odd 1bit/2bit	Set stop bit length.
		Delimiter	Delimiter	CR	CR/CR LF	Set delimiter type.
	Display Select	Measure select	MeasureSelect	linput: InsA	InsA/InsB/InsCalc/ InsA+InsB / InsCalc+A+B/ InsA+Comp/InsB+Comp/InsCalc+Comp	key or external control (multiple selects are available)
		Level select	LevelSelect	2inputs: InsA+InsB	InsA/InsB/InsCalc/ InsA+InsB	Select an item displayed on level display
		Trend select	TrendSelect			Select an item displayed on trend display.
		Pattern select	PatternSelect	Pattern1(or pattern No. in use)	Pattern 1/ 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			
3 Dienlay	Level Display	Instantaneous value B	InsB Scalse	0	Lower limit:±9999999 Unner limit:±999999	Set display scale of level display. Left edge of display is lower limit and right edge of display is higher limit
0.Display		Instantaneous	InsCalcScale	10000	opper milit. 200000	
		Pattern select	PatternSelect	Pattern1(or pattern No.	Pattern1/ Pattern 2/ Pattern 3/ Pattern 4/ Pattern	Select pattern No. to set.
		Instantaneous value A	Tate A Peolo	in use)	5/ Pattern 6/ Pattern 7/ Pattern 8	
		scale Instantaneous value B	InsA Scale	0	Lower limit :±999999	Set display scale of trend display.
	Trend Display	scale	InsB Scale	10000	Upper limit :±999999	Bottom edge of display is lower limit and top edge of display is higher limit.
		calculation scale	InsCalcScale			
		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. Select brightness of display
		D	D O D I	5 Bright		*"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 In power saving state, brightness becomes "1 Dark"
	General	Power saving time	PowerSavingTime	None 日本語	None/1min/2 min/5 min/10 min/30 min/60 min 日本語 /English	level.
		Direction of display	DisplayDirection	Horizontal	Horizontal/Vertical	Select direction of display
4.System		Pattern Copy	PatternCopy	Disable Pattern5(source) PatternAll(destination) Excuse	Disable/Enable Pattern1/2/3/4/5/6/7/8 Pattern1/2/3/4/5/6/7/8/PatternAll Onerationselect Excuse	If Enable, changing settings are disabled. Function of copying settings for each pattern.
		Save user defaults	UserDefaultSave	Message "Save current set	tings as user initial values?"	
	Initialize	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?"	
		Pulse input A Pulse	PulseInputA PulseInputB	-	-	Check for input signal existence.
	Input Diagnosis	Analog input A Analog input B	AnalogInputA AnalogInputB	-	_	(Displays level in percentage of rating)
		External control	ExternalCtrl	-	_	Check for ON/OFF state of terminals
5.Diagnosis		Comparative output AL1 to AL4	CompareAL1 CompareAL2 CompareAL3 CompareAL4	_	-	Outputs ON level or OFF level
		Analog output BCD Output(Data)	AnalogOutput BCD Output(Data)	-	-	Outputs level of 10% steps of rating.
	Output Test	BCD Output(PC) Modbus	BCD Output(PC)	-	-	Outputs ON level or OFF level for each bit
		Communication RS-485	ModbusCom	-	-	Displays receive data and transmit data
	RS-232C	RS-232C Com	-	-	Displays receive data and transmit data	

8. BASIC OPERATIONS FOR SETTING DISPLAYS

Basic operations for setting displays are shown as below.

The following is an example for changing the voltage of sensor power supply.



① By pushing the "**MENU**" key in the measurement mode, the display moves to the setting display and displays the 1st layer (major categories).

By moving the cursor with "**arrow key (UP/DOWN)**", 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 key (RIGHT)", the display moves to the 2nd layer (small categories) By moving the cursor with "arrow key (UP/DOWN)", the selection of small categories of the setting can be changed. If the "arrow key (LEFT)" 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 key (RIGHT)", the display moves to the 3rd layer (setting items). If the "arrow key (LEFT)" 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 key (UP/DOWN)", select a setting item. If the "arrow key (LEFT)" is pushed, the display returns to the 2nd layer.
- (5) At the selected setting item, by pushing "arrow key (RIGHT)", the display moves to the 4th layer (setting contents) and a current selected content has a check mark. If the "arrow key (LEFT)" is pushed, the display returns to the 3rd layer.
- (6) By moving the cursor with "arrow key (UP/DOWN)", select a content. If the "arrow key (LEFT)" 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 key (LEFT)**" is pushed, the display returns to the 3rd layer.
- By pushing the "MENU" key, the selected content is stored and returns the measurement display.
 * If the power is shut down before being pushed the "MENU" key, the selected content is not stored.

9. SETTING EXAMPLES

The instantaneous followings are some examples for some necessary setting point and operation methods to perform flow measurements

-1. SETTING EXAMPLE 1 α.

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

- Input type setting 1
- The sensor is an open collector type, therefore "open collector" should be selected as the input type. Setting for revolving speed display 2

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, $1/5=2\times10^{11}$ [round] 2.00000×10⁻¹" as the Instantaneous display Set coefficient

·Unit to display is [rpm], therefore, select "Min" for the instantaneous unit time.

·By "instantaneous decimal point position", set the number of digits after the decimal point.

3 Setup steps

Although setup steps are basically same as "8.BASIC OPERATION OF SETTING DISPLAY", setting of instantaneous display factor is needed, an example is shown below.



-2. Setting Example 2

Using a gearbox of 805[rpm] with an open collector output, displaying the circumferential speed of the roll diameter 350[mm] in [m/min] (conditions)

- (output pulse 60[P/R] built-in) •rotation speed 805[rpm] reduction ratio 1/90
- •roll diameter 350[mm] 1 Input type setting

The sensor is an open collector type, therefore "open collector" should be selected as the input type.

- 0 Setting for circumferential speed display
 - For setting of Instantaneous display coefficient, travel distance of rotation per 1 pulse is needed.
 - calculation of circumferential speed
 - 805[rpm] ×1/90× (0.35[m]×3.14)=9.82994[m/min]
 - Cumulate travel distance per 1 pulse $1/60[P/R] \times 1/90 \times (0.35[m] \times 3.14) = 2.03518 \times 10^{4}[m/Pulse]$

• Set "2.03518×10⁴" as the Instantaneous display coefficient • Display is in [min],therefore, "Min" is selected for the

instantaneous unit time. ·By "instantaneous decimal point position", set the number of digits after the decimal point.

9-3. SETTING EXAMPLE 3

When maximum flow rate is approx. $40[\ell/\min]$, using a sensor of rating 7.5[ml/Pulse] (open collector type), instantaneous flow rate will be displayed in [l/min].

- 1 Input type setting The sensor is an open collector output type, therefore select "open collector" as input type. 2 Setting for instantaneous flow rate display
 - Set flowrate per 1 pulse as instantaneous display coefficient

Although instantaneous flow rate will be displayed in $[\ell/\min]$, the rating of the sensor is 7.5[m ℓ /Pulse], it should be converted to 7.5×10^{-3} [l/Pulse].

• Set the "Instantaneous display factor" as "7.50000×10'3"

•Displayed unit is $[\ell/min],$ therefore select "Minute" as the instantaneous unit time.

By "instantaneous decimal point position", set the number of digits after the decimal point

9-4. SETTING EXAMPLE 4

Using a sensor (Voltage output type) which outputs 15 [Hz] for $90[\ell/\min]$, instantaneous flow rate will be displayed in [ℓ/sec].

- (1) Input type setting
- The sensor is Voltage output type, therefore select "LOGIC" for "input type".
- 2 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 per 1 pulse.
 - Number of pulses per 1 pulse, $10[Pulse/\ell]$, therefore, $1/10 = 1 \times 10^{-1}[\ell/Pulse]$.

• Set "1.00000×10⁻¹" for the "instantaneous value display coefficient'

* Any settings of " 1.00000×10^{-1} ", " 0.10000×10^{0} " " 0.01000×10^{1} " for the "instantaneous value di and "instantaneous value display •Unit to display is [l/sec], therefore, select "Sec" for the

instantaneous unit time"

· By "instantaneous decimal point position", set the number of digits after the decimal point.

10. SETTING OF UNITS

Units are selectable and can be displayed optionally.

If units should be used is not available, custom units up to 6 characters are can be made.

*For custom units, please refer to the detailed manual which can be downloaded from our home page.

10-1. LOCATIONS OF PARAMETERS FOR UNIT SETTING

1st layer	2nd layer	3rd layer		
1.input	pulse input A (pulse input B)	Instantaneous display unit		
setting	2 input calculation	Instantaneous display unit		

10-2. AVAILABLE UNITS

The WPMZ has selectable 62 units

Unit
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,%,%0,%RH,°C,
pH,ppm,rpm,t,inch

10-3. SETTING OPERATION

Setting procedure is same as "8. BASIC OPERATIONS FOR SETTING DISPLAY". Operate in the track of SETTING DIPLAY.

11. COMPARATIVE OUTPUT FUNCTION

Settings of comparative output functions needs 10 parameters to set for each output.

The following describe only main setting parameters and refer to detailed manual which can be downloaded from our homepage for other parameters.

11-1. LOCATIONS OF PARAMETERS FOR COMPARATIVE OUTPUT FUNCTION SETTING

1st layer	2nd layer	3rd layer						
		pattern select						
	Comparative output AL1 (Comparative output AL2) ings (Comparative output AL3) (Comparative output AL4)							output source display
		value						
		camparison mode						
		Comparative output AL1 compare ON conditi						
4. Output		compare judgement value						
settings		campare ON delay						
		campare OFF delay						
		output mode						
			output log	output logic				
		compare ON background						
		color						

*Refer to "7. SETTING LAYER OVERVIEW"

11-2. SETTING OF OUTPUT SOURCE DISPLAY VALUE

Comparative outputs AL1-AL4 are settable independently and they have no magnitude relationship.

For example, instantaneous measured value of Ach is assigned to AL1, instantaneous measured value of Bch is assigned to AL2 and instantaneous calculate value is assigned to AL3,4 and so on. Every display item can be freely assigned to comparative outputs.

Setting procedure is same as "8. BASIC OPERATIONS FOR SETTING DISPLAYS". Operate in the track of the procedure of SETTING DISPLAYS.

Caution: COM (emitter) terminal is common for AL1-AL4 in open-collector output products. Each AL1&2, AL3&4 have common terminal in relay output products.

11-3. COMPARISON JUDGEMENT VALUE

The comparison judgement value is a threshold value to judge. Although, the setting procedure is same as "8. BASIC OPERATIONS FOR SETTING DISPLAY", comparison judgement values need the settings of numerical values. Therefore, its procedure is shown below.

*The following is an explanation for the compare mode of "Level judgement".

•Level judgement action

Comparative	Comparison	Comparison	judgement
Output	type	formula	result
AL1	alarm when	display value>AL1	AL1 ON
	over	judgement value	
AL2	alarm when	display value>AL2	AL2 ON
	over	judgement value	
AL3	alarm when	display value <al3< th=""><th>AL3 ON</th></al3<>	AL3 ON
	under	judgement value	
AL4	alarm when	display value <al4< th=""><th>AL4 ON</th></al4<>	AL4 ON
	under	judgement value	

*Refer to "17. SPECIFICATIONS -output specifications [comparative output]"



12. EXTERNAL CONTROL FUNCTION

As external control functions, the WPMZ has comparative output reset function, measurement inhibit function, display hold function, maximum value hold function, minimum value hold function and pattern select function, each function can be executed by assigning to external control terminal 1 to 5.

*External control functions are also assigned (entered) to 4 arrow keys as shortcut functions.

12-1. 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.

12-2. COMPARATIVE OUTPUT RESET FUNCTION

Comparative output reset function makes all of comparative judgement results and their outputs OFF.

12-3. MEASUREMENT INHIBIT FUNCTION

The measurement inhibit function ignores the input and the display value accompanies this

Measurement inhibit A: inhibits the input of Ach Measurement inhibit B: inhibits the input of Bch Measurement inhibit A&B: inhibits the inputs of both Ach and Bch

12-4. DISPLAY HOLD FUNCTION

Display hold function holds display value. 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 Ach Display hold B: holds the display of Bch Display hold A&B: holds the display of Ach and Bch

12-5. MAXIMUM VALUE HOLD FUNCTION

Maximum value hold function is the function which holds the maximum display value.

Maximum hold A: holds the maximum display value of Ach Maximum hold B: holds the maximum display value of Bch Maximum hold A&B: holds the maximum display value of Ach and Bch

12-6. MINIMUM VALUE HOLD FUNCTION

Minimum value hold function is the function which holds the minimum display value.

*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 Ach Minimum hold B: holds the minimum display value of Bch

Minimum hold A&B: holds the minimum display value of Ach and Bch

12-7. PATTERN SELECT FUNCTION

The pattern select function is the function which switches the pattern number to use for measurement. By using pattern select <u>1-3, Up to 8 patterns can be switched.</u>

Function		Sele	cted pat	tern No.	(pattern No. in use)			
Name	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.

12-8. MONITOR CHANGE FUNCTION

The monitor change function is the function which switches display and performs same action of DISP key.

12-9. TREND HOLD FUNCTION

The trend hold function is a function which holds the trend display.

*When the function is disabled, the WPMZ starts plotting the trend display with the current measurement value.

13. SHORTCUT FUNCTION

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.

13-1. REGISTERING SHORTCUTS

External control functions which would be performed by shortcuts are assigned to arrow keys by the following steps.



13-2. PERFORMING SHORTCUTS

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.



*If an external control function assigned to a key is valid by the terminal control, the short cut function is not acceptable.

14. INITIALIZE

Setting values can be initialized to factory default settings or user saved settings.

14-1. LOCATIONS OF PARAMETERS FOR INITIALIZE

2nd layer	3rd layer	
	UserDefaultSave	
Initialize	UserDefaultLoad	
	FactoryDefaultLoad	
	2nd layer Initialize	

*Refer to "7. SETTING LAYER OVERVIEW".

14-2. INITIALIZE TO THE FACTORY DEFAULTS

By performing the following steps, setting values can be initialized to the factory defaults.



14-3. INITIALIZE TO USER DEFAULTS

Beside of initializing to factory defaults, current setting values can be saved as user default data and setting values will be initialized to the data.

14-3-1. Saving User Defaults

For initializing to user default values, entering setting values used as default values are required.

- ① Setting each values
- Set all setting values which are needed as user default values.
- 2 Saving user initial values

By executing to save user default values, current setting values are saved as user default values.

Steps for the save operation are same as "14-2. Initializing to the factory defaults". Operate the WPMZ according to the setting displays.

*Please refer to "14-1. Locations of parameters for initialize".

14-3-2. Initializing To User Defaults

By executing to initialize to user defaults, current setting values are replaced by user defaults.

Steps for the initialize operation are same as "14-2. Initializing to the factory defaults". Operate the WPMZ according to the setting displays.

*Please refer to "14-1. Locations of parameters for initialize".

15. LANGUAGE

Language can be selected from the system setting. Below is the flow when changing from Japanese to English.



16. KEY LOCK FUNCTION

To prevent unconsidered key operations, the WPMZ has the key lock function.

Indicates KEY LOCK is valid



KEY LOCK on: Enabled by pushing DISP key and ENTER key simultaneously * 1 lights up.

KEY LOCK off: Disabled by pushing DISP key and ENTER key simultaneously * Ights down.

17. ERROR CODES

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.	

ERROR CODE	ERROR MESSAGE	RECOVERY PROCEDURE
E000	Program sum error	
E006	RAM error	
E100 to 102	Errors associated with serial flash memory	
E103 to 105	Errors associated with	bald down the ENTER loss
E210 to 211	FRAM	for 1 areas de (las ranges)
E110 to 111	Error associated with sensor power short	to reset or power down and
E202 to 203	Errors associated with calibration values	*If the WPMZ does not
E204 to 205	Errors associated with setting values	please contact your dealer
E206 to 209	Errors associated with initial values	or our company.
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.



(*1) Combination of 2 inputs The combination of a pulse input and an line driver input is NOT selectable. (WPMZ-5-_PL and WPMZ-5-_LP are NOT available.)

Basic specifications

Number of	:	
measurement		1 or 2 (according to model codes)
channel		, and the second s
Display	:	2.4 inch TFT liquid crystal display
1 15		Used in 1ch input : Ach measurement result
		Used in 2ch inputs : Ach measurement result
		Bab management regult calculation regult
		Ash and Dah management wavelts
		Ach and Bch measurement results,
		Ach or Bch measurement result and calculation
D: 1		result
Display range	:	0 to 999999
Zero display	:	Reading zero suppress
Decimal point	:	Settable freely
Over warning	:	By exceeding the range of display, displays OVER or -OVER
Sampling rate	:	10ms(calculation period)
Display updating	:	100ms
period	•	1001110
External controls		5 functions of the followings can be assigned to
		control terminals (user-configurable)
		Comparative output reset function
		(2) Massurament inhibit function : Massurament
		inhibit A/B/A&B
		Current value held function: Current value held
		A/B/A&B
		AMAximum value held function Maximum value
		\oplus Maximum value notu function. Maximum value hold $\Delta/B/\Delta\&B$
		S Minimum value held function : Minimum value
		bold $\Delta/B/\Delta\&B$
		6 Pattern solvet function Pattern solvet 1/2/3
		Display soloct function
		() Display select function
		A following and a start and a start
		As follows, only short cut setting
A 11 -		(9)CompareList function
Ambient	:	-5 to 50 C 35 to 85%RH (Non condensing)
temperature range		
Storage	:	-10 to 70°C up to 60%RH
temperature range		
Supply power	:	AC power (WPMZ-5-1 \Box D- \Box D- \Box D)
		AC100 to $240V\pm10\%$ 50/60Hz
		DC power(WPMZ-5-3aa-aa-aaa)
		DC12V±10%
		DC power(WPMZ-5-4 \Box - \Box - \Box - \Box)
		DC24 to 48V±10%
Power	:	AC power(WPMZ-5-1===================================
consumption		At AC100V:10VA max At AC240V:14VA max
		DC power (WPMZ-5-3nn-nnn)
		At DC12V:6W max,
		DC power(WPMZ-5-400-000)
		At DC24V:6W max, At DC48V:6.5W max
Sensor power		Pulse input
For the second sec		$DC 12V \pm 10\% 100 mA max.$
		DC24V+10% 50mA max

*For 2ch inputs, allowable current of both Ach and

		Bch is same as above. *Combine at DC12V, 24V: 1.2W max. Line driver input DC5V±10% 200mA max. *For 2ch inputs, allowable current of both Ach and Bch is same as above.
External dimensions	:	$96 \text{mm}(W) \times 52 \text{mm}(H) \times 145 \text{mm}(D)$
Weight Withstand voltage	:	Approx. 350g AC power (WPMZ-5-1==-====) Between Power terminals and inputs/external controls/comparative outputs/other outputs AC3000V for 1 minute DC power (WPMZ-5-3or4=======) 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 enclosure and each terminals AC3000V for 1 minute
Insulation	:	Between terminals mentioned above, at DC500V 100MQ or higher
Vibration	:	10 to 55Hz half amplitude 0.15mm in X,Y,Z
tolerance		directions for 30 minutes
Protective structure	:	IP66(front)
Installation environment	:	indoor use
Rated altitude	:	up to 2000m
Transient overvoltage	:	П
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	:	polycarbonate(PC) black UL94V-0

Input Specifications

enclosure

[Pulse input instantaneous measurement]

•Input specifications (common to Ach, Bch)

Frequency	:	0.01Hz to 500kHz (*2ch input:250kHz)		
Input signal		Single ended		
I ····		Open collector(NPN/PNP type),Voltage pulse, Totem		
		pole, AC pulse, Proximity sensor		
Input level	:	Open collector		
		Pullup to 12V or 24V		
		Logic $I_{lovel} \le 1.0V$		
		H level: 3.9 to $30V$ (max. allowable voltage $\pm 50V$)		
		Zero Cross		
		AC60mV to 40V (max. allowable voltage 70V)		
. .		*AC signal which gets across 0V.		
Input	:	Open collector		
resistance		Fund up to 12 v through approx. $10k\Omega(\ln \text{ the case of sensor power } 12V)$		
		Pulled up to 24 V through approx 25kQ(in the case of		
		sensor power 24V)		
		Pulled down to GND through approx. $10k\Omega$.		
		Logic/Zero Cross		
		Pulled down to GND through approx. $10k\Omega$		
		2 wire		
Input pulse		Pulled down to GND through approx. $900\Omega \ge 0.9$ (both of L level and H level)		
width	·	(2 channel inputs: $\geq 1.8 \ \mu s$)		
Measurement	:	Cyclic calculation method		
Display unit		Can be selected one of second minute hour		
time				
Accuracy	:	\pm (20ppm rdg +1digit) @23 \pm 5°C		
[Line driver input measurement]				
 Input specifica 	tion	is (Common to Ach,Bch)		
Conversion	:	0.01Hz to 500kHz (*2ch input:250kHz)		
method				
Input signal	:	Differential input (Line driver signal)		
Input level		$\leq \pm 1V$ (Differential voltage)		
resistance		330 ¥		
Maximum		±10V (Differential voltage)		
allowable				
Input pulse	:	$\geq 0.9 \mu s$ (both of L level and H level)		
width		(2 channel inputs: $\geq 1.8 \ \mu s$)		
Measurement	:	Cyclic calculation method		
Disnlay unit		Can be selected one of second, minute, hour		
time	•			
Accuracy	:	±(20ppm rdg +1digit) @23±5°C		

OUTPUT SPECIFICATIONS

Comparative	outp	Outrut noting	
Open collector	:	NPN : sink current 50mA MAX	
output		PNP : source current 50mA MAX.	
		Applied voltage 30V MAX.	
		Output saturation voltage $\leq 1.2V$ at 50m	nA
Rolay output		Contact rating : AC250V 2A DC30V 2A	
nelay output	•	Mochanical life : 20 million times	
		Floatnical life : 100 thousand times on mos	20
		4 A contacts AI 1 and AI 2 AI 3 and AI 4 s	haro common
Control	:	Microcomputer calculating method	hare common
method		-000000 to 000000	
Judgement	:	-999999 10 999999	
value settable			
Hustorogia		Sottable within the range of 1-000000 digi	to for each
Hysteresis	•	iudgement value independently	ts for each
Comparison	:	A lie = to lie = ==to (local-toi	- J)
action		According to sampling rate (calculate peri-	od).
Setting	:	Condition of comparison can be set to AL1 independently	to AL4
condition		•Level judgement mode	
		The alarm is ON when display value excee	eds
		judgement value (over alarm)	
		iudgement value (under alarm)	rruns
		Over alarm (upper limit judgement)	
		Condition of comparison	Judgement
		display value > AL1 judgement value	result ΔL1
		display value > AL 2 judgement value	AL2
		display value > AL2 judgement value	AL 2
		display value > ALS judgement value	ALS AL4
		display value / AL4 judgement value	AL4
		Under alarm (Under limit judgement)	Judgement
		Condition of comparison	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 be	tween upper
		and lower judgement values (inside of zo	ne alarm)
		The alarm is ON when display value out	t of upper and
		Inside of zone alarm	arm)
			Judgement
		Condition of comparison	result
		AL1 zone lower limit	AL1
		AL2 zone upper limit \geq display value \geq AL2 zone lower limit	AL2
		AL3 zone upper limit≧display value≧ AL3 zone lower limit	AL3
		AL4 zone upper limit \geq display value \geq	AL4
		AL4 Zone lower limit Outside of zone alarm	
		Condition of comparison	Judgement
		display value > AL1 zone upper limit	result
		or AL1 zone lower limit>display value	AL1
		display value>AL2 zone upper limit	AL2
		or AL2 zone lower limit > display value	
		or AL3 zone lower limit>display value	AL3
		display value>AL4 zone upper limit	AL4
		or AL4 zone lower limit>display value	

[Analog output]

Conversion
method
Resolution
capability
Scaling
Output
objective
Response
speed
Specification
for each
output

An item can be selected from source displayable values

Up to 25ms $(0\rightarrow 90\%$ response)

Refer to the following chart.

D/A conversion method Equivalent of 13bit Digital scaling

Output type	Load resistance	Accuracy	Ripple
0 to 10V			
$\pm 10V$	$\geq 2k\Omega$	$\pm (0.10)$ of ES	±50mVp-p
1 to 5 V		±(0.1% 01 FS)	
0 to 20mA	< 5500		+25mVn-n
4 to 20mA	₹00022		±25mvpp

*Ripple for 4 to 20mA is at load resistance 250Ω , 20mA output.

[BCD output]

LDOD output		
Output type	:	Open collector output NPN/PNP type
Measurement	:	Negative logic transistor is ON at logical "1"
data		
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	:	Voltage 30V max. Current 10mA max.
output		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	:	$Modbus \hbox{-} RTU/Original Command/Original Output$
Synchronizatio n method	:	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	÷	ASCII
Transmission control	:	No control sequence
procedure		
Used signal	:	TXD, RXD, SG
Number of		1
connectable	•	
units		
Cable length	:	Max. 15m
[RS-485]		
Communication	:	Modbus RTU
protocol		
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		Non-inverting (+), Inverting (-)
names	•	
Number of	:	31
units		
Cable length	:	Max.1.2km (total) & Conforming CE mark, less than 30m

The contents of this instruction manual are subject to change without prior notice.

watanabe

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