New Product

Graphical Panel Meter

WPMZ Series

Evolution of Digital Panel Meter

The Highest Usability for Production Site

DC Voltage / Current Meter
WPMZ-1 New Product

Strain Gauge Meter
WPMZ-3 New Product

Rotation / Speed Meter
WPMZ-5

Flow Rate / Flow Totalizer
WPMZ-6

Graphical Panel Meter

WPMZ Series

watanabe

Evolution of Digital Panel Meter

The Highest Usability for Production Site

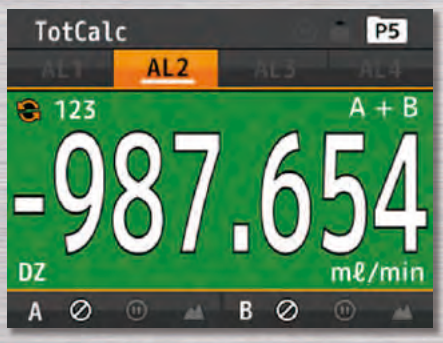
Watanabe developed WPMZ series as multi-display digital panel meter matched to the user's needs, and focused on the basic performance such as **[1. Easy to read] [2. Easy to use]**.
WPMZ has below 4 series. It is a product that can cover various requirements, such as process monitoring, quality judgement etc. at the manufacturing site for various applications and environment.

DC Voltage / Current Meter P4 — WPMZ-1
Strain Gauge Meter P8 — WPMZ-3
Rotation / Speed Meter P12 — WPMZ-5
Flow Rate / Flow Totalizer P16 — WPMZ-6

1. Easy to read

High-brightness and sharp display to read small letters

2.4 inch high brightness TFT full-color LCD.
WPMZ has 5 level brightness setting to adjust according to the indoor / outdoor lighting of site.
Also 4 high visibility background color can be set in case of alarm output is ON.



Background color changes when alarm output

5 level brightness setting

90° Display rotation is effective to use narrow places of board

There is a function to rotate display 90°.
Also able to change key assignment of cross keys.

Vertical display

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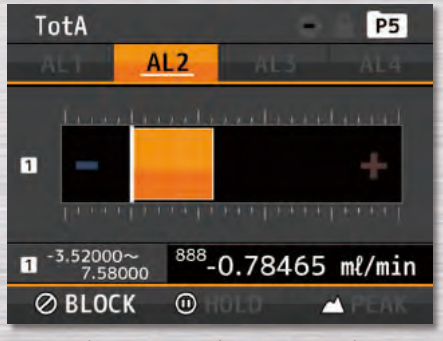
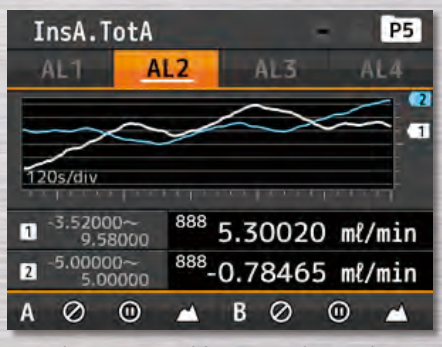
2. Easy to use

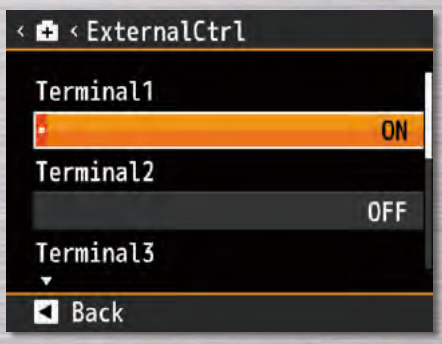
Numerical display and graph display selectable according to the measurement purpose



Shows ratio by Bar graph

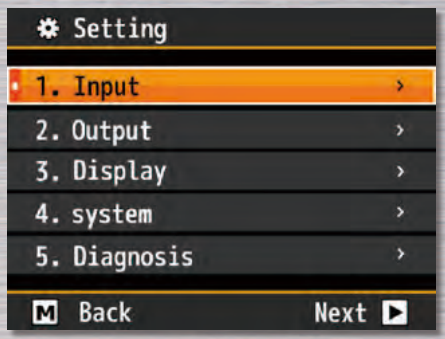


Shows trend by Trend graph



Self-diagnostics function to prevent connection trouble

Simple settings by Cross-key



English Menu

10 Arithmetic expression for 2 input calculation

Measurement value or calculation result can display 1 to 3 elements in one display. (Display below)
You can select 10 kinds of arithmetic expression for Ach & Bch calculation. (List at right)
Arithmetic expression can be easily set by cross-keys. 2ch display saves install space.

1 element display

2 element display

3 element display

Arithmetic expression for 2 input calculation

Function	Arithmetic expression
Addition	((A + B) + C) x K or (A + B) x K + C
Subtraction	((B - A) + C) x K or (B - A) x K + C
Multiplication	((A x B) + C) x K or (A x B) x K + C
Division	((B / A) + C) x K or (B / A) x K + C
Average	(((A + B) / 2) + C) x K
HighSelect	((Larger of A and B) + C) x K
LowSelect	((Smaller of A and B) + C) x K
Difference	((Abs of (B - A)) + C) x K
RelaticeError	((A / B) - 1) x K
Density	(B / (A + B)) x K

* In case WPMZ-1/3

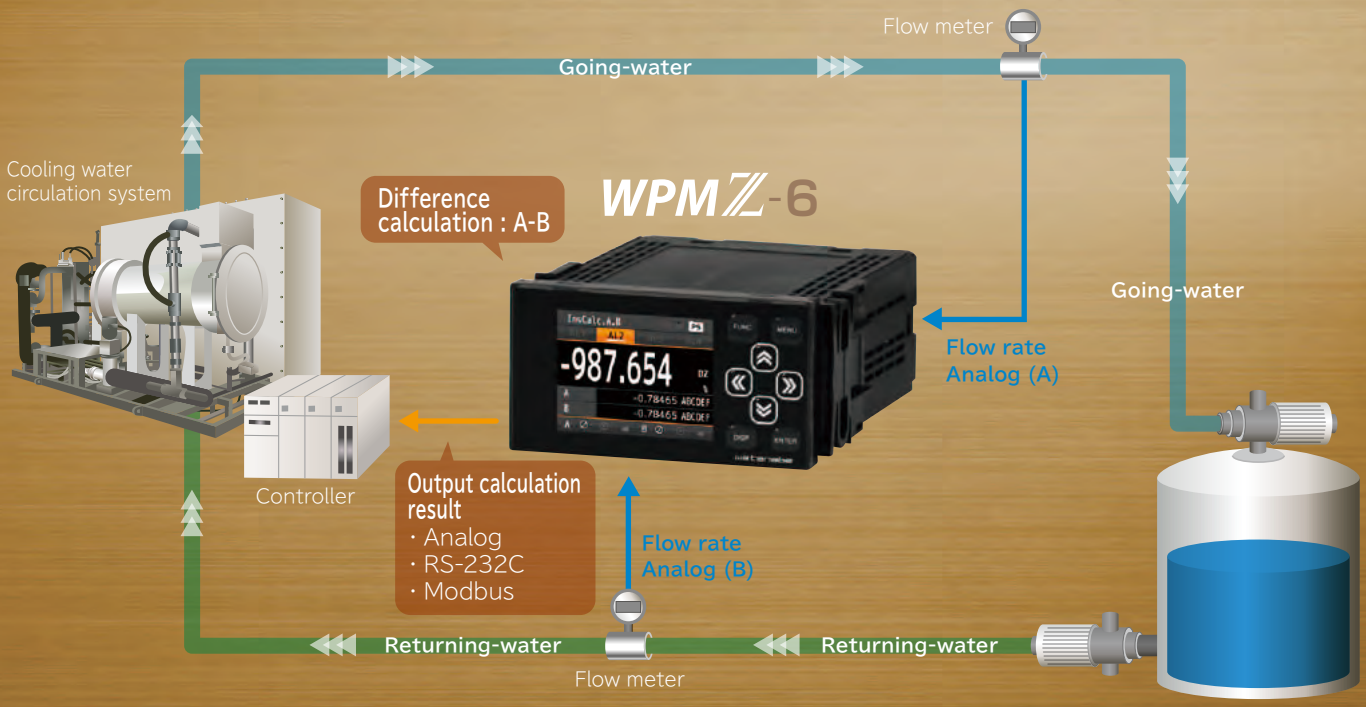
Instantaneous and integrated flow rate

WPMZ-6

- Flow rate / Flow total measurement
- Pulse input
- Analog input

[WPMZ-6] is Digital panel meter for measuring Instantaneous / Integrated Flow rate.
It is useful for flow rate / flow total measurement of tanks installed in equipment or production lines etc.
WPMZ-6 can measure two different liquids flow rates, to monitor the flow difference to stabilize the mixing process.

Application examples



Flow rate / total measurement | 3 factors display | Calculation function

Main Specifications

Power supply
- 100~240VAC ±10%
- 12VDC ±10%
- 24~48VDC ±10%

Input : Ach/Bch
- Pulse input
- Analog input input

Option output
- Analog output
- BCD output (Open collector NPN / PNP)
- RS-232C
- RS-485 (Modbus RTU)

Comparator output (AL1~AL4)
- Open collector output (NPN / PNP)

Graphical Digital Panel Meter (Flow rate / Flow total measurement) WPMZ-6

Features

- High precision measurement and various measurement menu with 32 bit microcomputer
- Easy to read by 2.4 inch TFT Full color LCD display
- [Value], [Bar graph] and [Trend graph] Display can be selected according to the measurement
- Display rotation function which can select the mounting direction
- Standard 1ch input type, and also 2ch input type which can use for special measurement

Model

WPMZ−6−①②③−④⑤−⑥⑦

Series	① Power supply	② Input Ach	③ Input Bch	④ Option output	⑤ Comparator output	⑥ Test report	⑦ Suffix code	Description
WPMZ-6								Instantaneous and integrated flow rate
	1							Power supply voltage: 100 to 240VAC
	3							Power supply voltage: 12VDC
	4							Power supply voltage: 24 to 48VDC
		P						Pulse input
		A						Analog input
			X					None
			P					Pulse input
			A					Analog input
				X				Display only (External control)
				1				Analog output
				2				BCD output (Open collector NPN)
				3				BCD output (Open collector PNP)
				4				RS-232C Output
				5				RS-485 Output (Modbus RTU)
					E			Open collector output (NPN) (AL1~AL4)
					F			Open collector output (PNP) (AL1~AL4)
					R			Relay output (Normally open)(AL1~AL4)
						X		Without test report
						T		With test report
							00	Japanese default setting
							E0	English default setting

In case of 2ch pulse input (Pulse x Pulse), 2-phase (90° phase) pulse input is available with Ach single-phase input and Bch single-phase input.

Input Specifications

Ach input (1ch) / Bch input (2ch)
Pulse input (Instantaneous / Integration)

Measurement types	Instantaneous integrated measurement
Input frequency range	10mHz to 500kHz * 250kHz for 2 channel input
Input signal	Open collector (NPN/PNP), voltage pulse, totem pole output, AC pulse, proximity sensor *In the case of two pulse input, a 2-phase (90° phase) pulse input is available
Input level	Open collector Pull up to 12V or 24V Logic L level: 1.0V or less H level: 3.9 to 30V (Max. allowable voltage ±50V) Zero-crossing 60mV to 40VAC (Max. Allowable voltage 70V)
Input pulse width	0.9μs or more (Both L level and H level) *1.8μs or more in case of 2 channel input
Measurement method (Instantaneous display)	Cyclic calculation method
Accuracy	±(20ppm reading +1digit) at 23±5°C
(Integrated display) Accuracy	±0 (When scaling is "1")
Integrated value reset	Clears integrated value by external control
Pulse output	NPN open collector pulse output 30VDC 20mA max (100Hz max)

Analog input (Instantaneous integration)

Measurement range	Inputimpedance	Maximumallowable input	Accuracy
1~5V	About 1MΩ	±100V	±(0.05% of FS + 1digit)
0~5V			
0~10V			
4~20mA	About 10MΩ	±50mA	
0~20mA			

Conversion method	⊿Σ conversion method
Input circuit	Single-ended type
Sampling rate	100 times/second max
Integrated value reset	Clears integrated value by external control
Pulse output	NPN open collector pulse output 30VDC 20mA max (100Hz max)

Common Specifications

Measurement channel	1 channel or 2 channels (Based on model selection)
Display	2.4 inch TFT LCD 1ch input: Measurement results of Ach input 2 ch input: Either measurement results of Ach input, measurement results of Bch input, or calculation results Measurement results of Ach and Bch input Measurement results and calculation results of Ach or Bch input
Display range	0 to 999999
Zero display	Leading zero suppression
Decimal point	Arbitrary setting possible
Over range warning	OVER or -Over when input range and display range are exceeded
Operating temp & humidity range	−5 to 50℃, 35 to 85% RH (No condensation)
Storage temp & humidity range	−10 to 70℃, 60% RH or less
Power supply	100 to 240VAC ±10% 50/60 Hz 12VDC ±10% 24 to 48VDC ±10%
Power consumption	10VA max. at 100VAC 14VA max. at 240VAC 6W max. at 12VDC 6W max. at 24VDC 6.5W max. at 48VDC
Sensor power supply	12VDC ±10% 100mA max; 24VDC ±10% 50mA max *When 2 channel input, allowable current of Ach and Bch together will be above current. *1.2W max. when the combination of 12VDC and 24VDC (For example: Ach is 12V and Bch is 24V) (Line driver input) 5VDC ±10% 200mA max. *When 2 channel input, allowable current of Ach and Bch together will be above current.
Dimensions	96mm(W) x 48mm(H) x 145mm(D), 1/8 DIN size
Weight	Approx. 350g

Withstand voltage	AC power supply 3000VAC for 1 minute: Between the power supply terminal - input / external control / comparator output / option output DC power supply 1500VAC for 1 minute: Between the power supply terminal - input / external control / comparator output / option output AC/DC power supply 1500VAC for 1 minute: Between the input terminal - external control / comparator output / option output
Insulation resistance	500VDC 100MΩ or more between the above terminals
Protection	IP66 (Front bezel)
Rated altitude	2000m or less
Measurement category	II
Contamination level	2
Applicable EN standard	EN61326-1 (EMS: Industrial installations; EMI: Class A) "Applies to wire length of 30m or less" EN61010-1 EN50581
Case material / color	Polycarbonate, Black UL94V-0

External control

Comparator reset	Shorted with COM terminal, turns OFF comparator output monitor and comparator output
Measurement prohibited	Shorted with COM terminal, prohibits measurement and integration Measurement prohibited A: Valid for Ach; Measurement prohibited B: Valid for Bch Measurement prohibited A & B: Valid for Ach and Bch simultaneously
Current value hold	Shorted with COM terminal, holds the display value Current value hold A: Valid for Ach; Current value hold B: Valid for Bch Current value hold A & B: Valid for Ach and Bch simultaneously
Max value hold	Shorted with COM terminal, holds the max value Max value hold A: Valid for Ach; Max value hold B: Valid for Bch Max value hold A & B: Effective for Ach and Bch simultaneously
Min value hold	Shorted with COM terminal, holds the min value Min value hold A: Valid for Ach; Min value hold B: Valid for Bch Min value hold A & B: Effective for Ach and Bch simultane-ously
Display change	Shorted with COM terminal, changes the measurement display
Pattern change 1 to 3	Shorted with COM terminal, changes the pattern used for measurement
Trend hold	Shorted with COM terminal, holds the trend display
Integrated value reset	Shorted with COM terminal, reset the integrated value

Option Specifications

Comparator Output

Output method	Open collector output or Relay output
●Open collector output	Rated output NPN : Sinc current Max. 50mA PNP : Source current Max. 50mA Applied voltage Max. 30V Output saturation voltage 1.2V or less at 50mA
●Relay output	Contact rating : 250VAC 2A,30VAC 2A Mechanical life : 20,000,000 times Electrical life : 100,000 times
Control method	Microcomputer operation method
Setting range	−99999 to 99999
Hysteresis	1 to 99999 digit for each setpoints
Comparison condition	Condition can be set to AL1 to AL4 independently

Over alarm (Upper limit judgement)

Comparison condition	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 (Lower limit judgement)

Comparison condition	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

Analog output

*Select either Ach, Bch or calculation results to be output.

Conversion method	D/A conversion method
Resolution	13bit equivalent
Scaling	Digital scaling
Response speed	25ms or less (0 → 90% response)
Specifications by types	See below

Output type	Load resistance	Accuracy (23±5℃ 35 to 85%RH)	Ripple
0～10V	2kΩ or more	±0.1%fs	±50mVp-p
±10V			
1～5V			
0～20mA	550Ω or less		±25mVp-p
4～20mA			

*Ripple for current output is at load resistance 250Ω(20mA Output)

BCD Output

*Select either Ach, Bch or calculation results to be output.

Output type	Open collector output, NPN/PNP type
Measurement data	Negative logic. Transistor ON when logic is "1"
Polarity signal	Negative logic. Transistor ON when negative display
Over signal	Negative logic. Transistor ON when over display
Print command signal	Transistor ON for fixed period when data conversion
Transistor capacity	Voltage 30V max., Current 10mA max. Output saturation voltage ≤1.2V at 10mA
Enable	Output transistor turns OFF when the enable terminal is short with D.COM

RS-232C communication

Communication protocol	Modbus RTU*, Original command, Original output
Synchronous system	Asynchronous mode
Communication method	Full duplex
Communication speed	9600bps, 19200bps, 38400bps
Data length	7bit, 8bit
Stop bit	1bit, 2bit
Parity bit	None, Odd, Even
Delimiter	CR, CR+LF
Character code	ASCII
Transmission control procedure	Non-procedure
Signal name	TXD, RXD, SGI
No. of connectable units	1 unit
Line length	15m

*No data length / stop bit / delimiter settings when Modbus RTU protocol

RS-485 communication

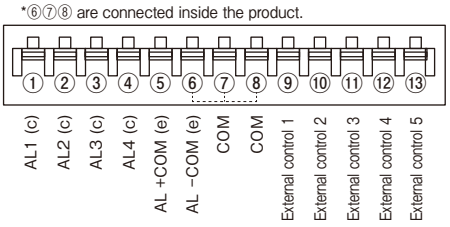
Communication protocol	Modbus RTU
Synchronous system	Asynchronous mode
Communication method	2-wire half duplex
Communication speed	9600bps, 19200bps, 38400bps
Data length	8bit
Stop bit	1bit, 2bit
Parity bit	N/A, odd number, even number
Signal name	Non-inverting (+), inverting (–)
No. of connectable units	31 units
Line length	1.2km max (Total)

Terminal Connections

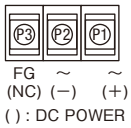
Lower terminal
(External control / comparator output / power supply)

- Comparator output / External control

Compatible wire : AWG24 to 16
*⑥⑦⑧ are connected inside the product.



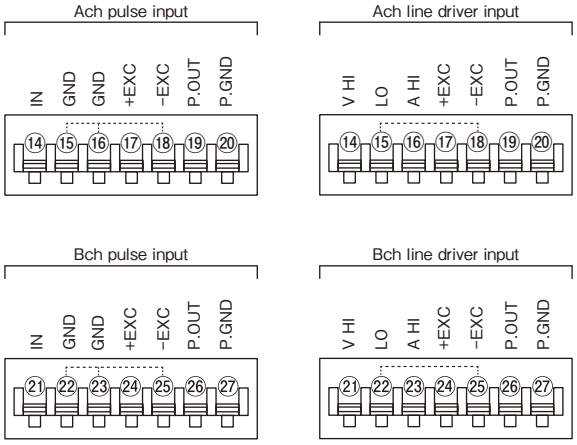
- Power supply



Upper terminal (Input)

- Input (Ach, Bch)

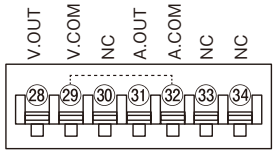
Compatible wire: AWG24 to 16



Middle terminal (Option output)

- Analog output

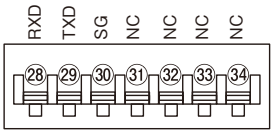
Compatible wire : AWG24 to 16



*Select either Ach, Bch or calculation results to be output.

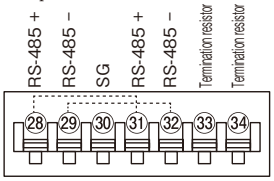
- RS-232C

Compatible wire : AWG24 to 16

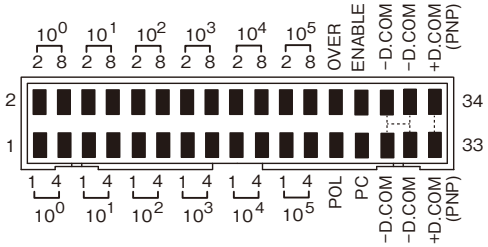


- RS-485

Compatible wire : AWG24 to 16



- BCD

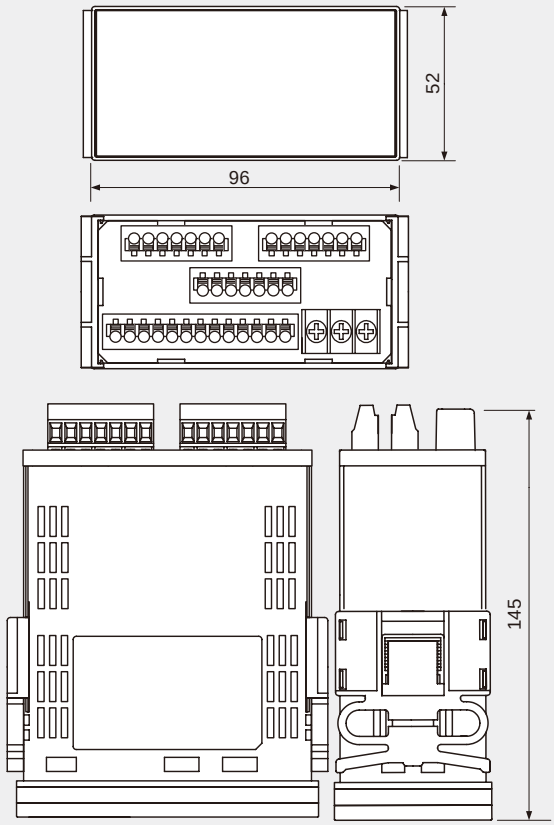


Compatible wire: AWG28 flat cable (1.27mm)

*Select either Ach, Bch or calculation results to be output.

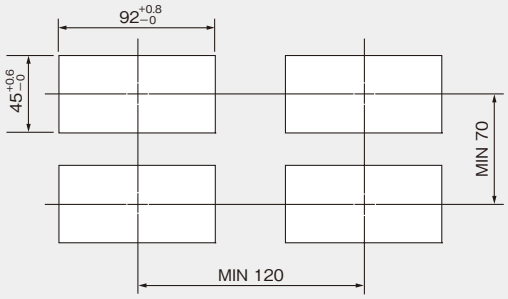
Dimensions

(1/8 DIN size)



Unit : mm

Panel cutout



* Recommended panel thickness : 0.8 to 5.0mm

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