

UNIVERSAL TYPE DIGITAL PANEL METER

A5000 SERIES



Display multiple type (A5X2X-XX)



Display single type (A5X1X-XX)

Watanabe Electric Industry Co.Ltd

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Input Specification (A5XXX-□□)



• DC voltage, current

	Range	Measurement range	Display	Maximum Resolution	Input Impedance	Input Protection	Accuracy
01	11	±99.99 mV	offset ±9999 full scale 0 to ±9999	10 µV	100 MΩ	±100 V	±(0.1% of FS)
	02	12 ±999.9 mV 13 ±9.999 V 14 ±99.99 V 15 ±600 V	offset ±9999 full scale 0 to ±9999	10 µV 1 mV 10 mV 100 mV	100 MΩ 1 MΩ 10 MΩ 10 MΩ	±100 V ±250 V ±250 V ±600 V	±(0.1% of FS) ±(0.1% of FS) ±(0.1% of FS) ±(0.15% of FS)
03	23	±9.999 mA	offset ±9999	1 µA	10 Ω	±100 mA	±(0.2% of FS)
	24	±99.99 mA	full scale 0 to ±9999	10 µA	1 Ω	±500 mA	±(0.2% of FS)
	25	±999.9 mA		100 µA	0.1 Ω	±3 A	±(0.3% of FS)

Input configuration : Single ended
 Measuring method : ΔΣ type
 Normal mode rejection : More than NMR 50dB (50/60 Hz)

• AC voltage, current (Average)

	Range	Measurement range	Input Frequency	Display	Maximum Resolution	Input Impedance	Input Protection	Accuracy
04	11	99.99 mV	40 Hz to 1 kHz	offset ±9999 full scale 0 to ±9999	10 µV	more than 1 MΩ	100 V	±(0.2% of rdg + 10 digit)
	12	999.9 mV			100 µV		100 V	±(0.2% of rdg + 10 digit)
	13	9.999 V			1 mV		250 V	±(0.2% of rdg + 10 digit)
05	14	99.99 V	40 Hz to 1 kHz	offset ±9999 full scale 0 to ±9999	10 mV	more than 1 MΩ	250 V	±(0.2% of rdg + 10 digit)
	15	600 V			100 mV		600 V	±(0.3% of rdg + 10 digit)
08	23	9.999 mA	40 Hz to 1 kHz	offset ±9999 full scale 0 to ±9999	1 µA	10 Ω	100 mA	±(0.5% of rdg + 10 digit)
	24	99.99 mA			10 µA	1 Ω	500 mA	±(0.5% of rdg + 10 digit)
	25	999.9 mA			100 µA	0.1 Ω	3 A	±(0.5% of rdg + 10 digit)
09	26	5 A	50 Hz or 60 Hz	offset ±9999 full scale 0 to ±9999	1 mA	CT	8 A	±(0.5% of rdg + 10 digit)

• AC voltage, current (TRUE-RMS)

	Range	Measurement range	Input Frequency	Display	Maximum Resolution	Input Impedance	Input Protection	Accuracy
06	11	99.99 mV	40 Hz to 1 kHz	offset ±9999 full scale 0 to ±9999	10 µV	more than 1 MΩ	100 V	±(0.2% of rdg + 20 digit)
	12	999.9 mV			100 µV		100 V	±(0.2% of rdg + 20 digit)
	13	9.999 V			1 mV		250 V	±(0.2% of rdg + 20 digit)
07	14	99.99 V	40 Hz to 1 kHz	offset ±9999 full scale 0 to ±9999	10 mV	more than 1 MΩ	250 V	±(0.2% of rdg + 20 digit)
	15	600 V			100 mV		600 V	±(0.3% of rdg + 20 digit)
10	23	9.999 mA	40 Hz to 1 kHz	offset ±9999 full scale 0 to ±9999	1 µA	10 Ω	100 mA	±(0.5% of rdg + 20 digit)
	24	99.99 mA			10 µA	1 Ω	500 mA	±(0.5% of rdg + 20 digit)
	25	999.9 mA			100 µA	0.1 Ω	3 A	±(0.5% of rdg + 20 digit)
11	26	5 A	50 Hz or 60 Hz	offset ±9999 full scale 0 to ±9999	1 mA	CT	8 A	±(0.5% of rdg + 20 digit)

Input configuration : Single ended
 Response time : Approx. 1 sec.
 Crest factor : 4:1 at fullscale (only for TRUE-RMS)
 Dead zone : 0 to 99 digit

• Resistance

	Range	Measurement range	Display	Maximum Resolution	Current	Accuracy
12	11	99.99 Ω	offset ±9999 full scale 0 to ±9999	10 mΩ	5 mA	±(0.2% of FS)
	12	999.9 Ω		100 mΩ	0.5 mA	±(0.1% of FS)
	13	9.999 kΩ		1 Ω	50 µA	±(0.1% of FS)
	14	99.99 kΩ		10 Ω	5 µA	±(0.1% of FS)

• Thermocouple

	Range	Sensor type	Measurement range	Maximum Resolution	Accuracy
13	KA	K	-50.0 to 199.9°C	0.1°C	±(0.5% of FS)
	KB	K	-50 to 1200°C	1°C	±(0.2% of FS)
	J	J	-50 to 1000°C	1°C	±(0.2% of FS)
	T	T	-50 to 400°C	1°C	±(0.6% of FS)
	S	S	0 to 1700°C	1°C	±(0.4% of FS)
	R	R	-10 to 1700°C	1°C	±(0.4% of FS)
	B	B	100 to 1800°C	1°C	±(0.4% of FS) over 500°C

available Fahrenheit display
 Cold junction compensator accuracy : ±1°C (10 to 40°C)
 Sensor lead resistance : less than 50Ω
 Linearizing method : Digital linearizing
 Burn out alarm : -----

• RTD

	Range	Sensor type	Measurement range	Maximum Resolution	Accuracy
14	PA	PT100Ω	-100.0 to 199.9°C	0.1°C	±(0.15% of FS)
	PB	PT100Ω	-100 to 600°C	1°C	±(0.3% of FS)

available Fahrenheit display

Current for resistance : Approx. 1 mA
 External lead resistance : Less than 10 Ω/lead
 Linearizing method : Digital linearizing
 Burn out alarm : ----

• Frequency

	Range	Measurement range	Display	Maximum Resolution	Display Renewal time	Accuracy
14	11	0.1 to 200 Hz	Prescale : 0.001 to 5 1 to 100	0.1 Hz	1 to 10 s	±(0.2% of FS)
	12	1 to 2000 Hz		1 Hz	1 s	±(0.2% of FS)
	13	0.01 to 20 kHz		10 Hz	100 ms	±(0.2% of FS)
	14	0.1 to 200 kHz		100 Hz	100 ms	±(0.2% of FS)

	Input type	Input voltage level	Input Protection
15	Open collector	L: less than 1 V (5 V, 2.2 kΩ) pullup	30 V
	Logic	L: less than 1 V, HI: 2.5 to 15 V	15 V
	Magnet	0.3 to 30 V P-P	15 V
16	Input type	Input voltage level	Input Protection
	Voltage	50 to 500 V rms	500 V

• Strain gauge

	Power supply for sensor	Zero adjustment range	Span adjustment range	Maximum Resolution	Accuracy
17	5 V	-0.3 to +1 mV/V	1 to 3 mV/V	0.5 μV/digit	±(0.1% of FS) +2 digit
	10 V			1 μV/digit	

Sensor : 350 Ω
 Power supply for sensor : 5 V±5% (less than 15 mA) 10 V±5% (less than 30 mA)

• Process

	Range	Measurement range	Display	Input Impedance	Input protection	Accuracy
18	1 V	1 to 5 V	offset ±9999	1 MΩ	±100 V	±(0.2% of FS)
	2 A	4 to 20 mA	full scale 0 to ±9999	10 Ω	±100 mA	±(0.2% of FS)

• Process with sensor power supply

	Range	Measurement range	Display	Input Impedance	Input protection	Accuracy
19	1 V	1 to 5 V	offset ±9999	1 MΩ	±100 V	±(0.2% of FS)
	2 A	4 to 20 mA	full scale 0 to ±9999	10 Ω	±100 mA	±(0.2% of FS)

Power supply for sensor : 12 V DC ±10% 50 mA 24 V DC ±10% 25 mA

Output Specification

• HI & LO setpoint output (A5XX1-XX)

Indication > High setpoint	HI
High setpoint ≥ Indication ≥ Lo setpoint	GO
Indication < Lo setpoint	LO

Setting range : -9999 to 9999
 Hysteresis : 1 to 999 digit for each setpoints
 Relay contact capacity : AC240V 8A resistive load DC30V 8A resistive load

• Analog output (A5XX2-XX)

Output	Resistive load	Accuracy
0 to 1 V	more than 10 kΩ	±(0.5% of FS)
0 to 10 V	more than 10 kΩ	
1 to 5 V	more than 10 kΩ	
4 to 20 mA	less than 550 Ω	

Output method : PWM method
 Scaling : Digital scaling

• RS-232C (Conforming to EIA RS-232C) (A5XX3-XX)

Communication method	: Full duplex
Transmission speed	: 2400/4800/9600/19200/38400 bps
Start bit	: 1 bit
Data length	: 7 bit/8 bit
Parity	: Even parity/odd parity
Stop bit	: 1 bit/2 bit
Character code	: ASCII code
Transmission control process	: Ignored process

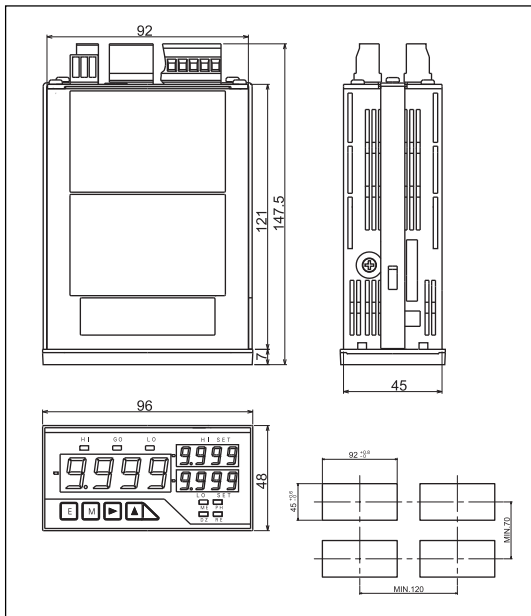
• RS-485 (Conforming to EIA RS-485) (A5XX4-XX)

Communication method	: Full duplex
Transmission speed	: 2400/4800/9600/19200/38400 bps
Start bit	: 1 bit
Data length	: 7 bit/8 bit
Parity	: Even parity/odd parity
Error detection	: BCC
Stop bit	: 1 bit/2 bit
Character code	: ASCII code
Transmission control process	: Ignored process
Signal name	: + non reversal output - reversal output
Maximum No. of meter connected	: 31
Line length	: Up to 500 m in total

Common Specification

Display	: Main display Red LED 14.2 mm height Sub display Green LED 8 mm height
Conversion rate	: 12.5 times/sec.
Maximum display	: 9999
Overrange indication	: When input exceeds the maximum display, display OL or -OL
Zero display	: Leading zero suppression
Decimal point	: Settable to any digit position
External control	: Start/Hold, Peak Hold, Digital Zero
Operating temp.	: 0 to 50°C 35 to 85% RH
Storage temp.	: -10 to 70°C less than 60% RH
Power supply	: AC 100 to 240V±10%(AC main unit) DC 9 to 60 V (DC main unit)
Power consumption	: approx 4 VA (at 100 V)
Dimensions	: 96 mm (W) X 48 mm (H) X 147.5 mm (D) DIN size
Weight	: approx. 450 g
Dielectric strength (AC)	: Power supply/input terminal/output terminal AC2000 V/1 min. Input terminal/output terminal DC500 V/1 min. Case/power supply/input terminal output terminal AC2000 V/1 min.
Dielectric strength (DC)	: Power supply/input terminal/output terminal DC500 V/1 min. Input terminal/output terminal DC500 V/1 min. Case/power supply/input terminal output terminal AC2000 V/1 min.
Insulation resistance	: DC500 V more than 100 M at the above terminals
Conformity standard	: EN61326-1, EN61010-1, EN IEC 63000

Dimensions



Ordering Code

A 5 □ □ □ - □ □

Input

01. DC voltage (± 99.99 mV)
02. DC voltage (± 999.9 mV to ± 600 V)
03. DC current (± 9.999 mA to ± 999.9 mA)
04. AC voltage AVG (99.99 mV to 9.999 V)
05. AC voltage AVG (99.99 V to 600 V)
06. AC voltage RMS (99.99 mV to 9.999 V)
07. AC voltage RMS (99.99 V to 600 V)
08. AC current AVG (9.999 mA to 999.9 mA)
09. AC current AVG (5 A)
10. AC current RMS (9.999 mA to 999.9 mA)
11. AC current RMS (5 A)
12. Resistance (99.99 to 99.99 k)
13. Temperature (Thermocouple)
14. Temperature (RTD)
15. Frequency (Open collector, Logic, Magnet)
16. Frequency (50 to 500 Vrms)
17. Strain gauge
18. 1 to 5 V, 4 to 20 mA
19. 1 to 5 V, 4 to 20 mA with sensor power supply
Impossible to use only No.19 input for DC power supply

Output

0. None
1. HI & LO setpoint
2. Analog output
3. RS-232C
4. RS-485
5. HI & LO setpoint + analog output
6. HI & LO setpoint + analog output + RS-232C
7. HI & LO setpoint + analog output + RS-485

Display board

1. Single
2. Multiple

Main board

1. AC100 - 240 V ($\pm 10\%$)
2. DC9 - 60 V

We reserve the right to change specifications without notice.

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