

Universal Type Digital Panel Meter  
**A5000 SERIES**



# Input Specifications(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)
	12	±999.9 mV	offset ±9999 full scale 0 to ±9999	10 µV	100 MΩ	±100 V	±(0.1% of FS)
02	13	±9.999 V		1 mV	1 MΩ	±250 V	±(0.1% of FS)
	14	±99.99 V		10 mV	10 MΩ	±250 V	±(0.1% of FS)
	15	±600 V	100 mV	10 MΩ	±600 V	±(0.15% of FS)	
03	23	±9.999 mA	offset ±9999 full scale 0 to ±9999	1 µA	10 Ω	±100 mA	±(0.2% of FS)
	24	±99.99 mA		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 : ΔΣtype

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	±(0.2% 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	0 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	±(0.2% 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

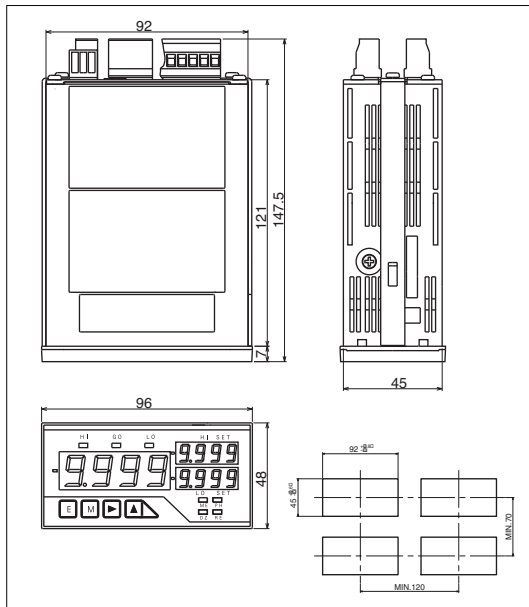
• **RS-485 (Conforming to EIA RS-485) (A5XX4-XX)**

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

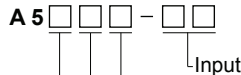
# Common Specification

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 MΩ at the above terminals

## Dimensions



## Ordering Code



- 01. DC voltage ( $\pm 99.99$  mV)
- 02. DC voltage ( $\pm 999.9$  mV to  $\pm 600$ V)
- 03. DC current ( $\pm 9.999$  mA to  $\pm 999.9$  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  $\Omega$  to 99.99 k $\Omega$ )
- 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

- 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

- 1. Single
- 2. Multiple

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

We reserve the right to change specifications without notice.

**watanabe**

**Watanabe Electric Industry Co., Ltd.**

6-16-19, Jingumae, Shibuya-ku,

Tokyo 150-0001, Japan

Phone: +81-33400-6147 FAX: +81-33409-3156

<http://www.watanabe-electric.co.jp>