Digital Scaling Panel Meter

A6000 Series

Features

- Standard 1/8 DIN size (48 x 96 mm).
- Single display and multi display types are selectable.
- Easy-to-use jog lever improves setup efficiency
- Dual-color LED (red/green) visually indicates the alarm status.
- The measurement range can be changed by switching the input range.
- Max. 1 ms high sampling rate (Approx. 1000 times/sec)

Ordering Code

A6 ① ② ③ - ④ ⑤

Series	Power supply ①	Display ②	Input ③	Comparator output ④	Output option ⑤	Description	
A6						A6000 series	
	1					100–240 V AC ±10%	
	2					12–48 V DC ±10%	
		1				Multi display	
		2				Single display	
			1			DC voltage input	±99.99 mV / ±999.9 mV / ±9.999 V / ±99.99 V / ±700 V
			2			DC current input	±99.99 µA / ±999.9 µA / ±9.999 mA / ±99.99 mA
			3			DC large current input	±999.9 mA / ±2.000 A
			4			AC voltage input (True–RMS)	0–99.99 mV / 0–999.9 mV / 0–9.999 V / 0–99.99 V / 0–700.0 V
			5			AC current input (True–RMS)	0–99.99 µA / 0–999.9 µA / 0–9.999 mA / 0–99.99 mA
			6			AC large current input (True–RMS)	0–999.9 mA / 0–5 A
			7			Resistance input	0–99.99 Ω to 0–99.99 kΩ
			8			Temperature input	Thermocouple / RTD
			9			Frequency input	Open collector / Logic / Magnetic / AC voltage
			A			Load cell input	Strain gauge 350 Ω
			B			Process signal input	1–5 V / ±5 V / 4–20 mA / ±20 mA
				0		None	
				1		Relay output	
				2		Photocoupler output	
					0	None	
					1	External control	
					2	BCD output (TTL) + External control	
					3	BCD output (Open collector) + External control	
					4	Analog output (PWM) + External control	
					5	RS-232C communication	
					6	RS-485 communication	
					7	RS-232C communication + Analog output (PWM)	
					8	RS-485 communication + Analog output (PWM)	

Input Specifications

■DC Measurement — Input code 1 2 3 B

Code	Range	Measurement range	Max. resolution	Input resistance	Max input	Accuracy
1	11	±99.99 mV	10 µV	Approx. 100 MΩ	±50 V	±(0.03% rdg + 1 digit)
	12	±999.9 mV	100 µV			
	13	±9.999 V	1 mV	Approx. 1 MΩ	±250 V	
	14	±99.99 V	10 mV	Approx. 10 MΩ		
	15	±700.0 V	100 mV		±700 V	±(0.1% rdg + 2 digit)
2	21	±99.99 µA	0.01 µA	Approx. 1 kΩ	±10 mA	
	22	±999.9 µA	0.1 µA	Approx. 100 Ω		
	23	±9.999 mA	1 µA	Approx. 10 Ω	±50 mA	
	24	±99.99 mA	10 µA	Approx. 1 Ω	±500 mA	
3	25	±999.9 mA	100 µA	Approx. 0.1 Ω	±3 A	
	26	±2.000 mA	1 mA	Approx. 0.01 Ω		
B	1V	1–5 V	1 mV	Approx. 1 MΩ	±100 V	±(0.03% rdg + 2 digit)
	2V	±5 V				
	2A	4–20 mA	10 µA	Approx. 10 Ω	±50 mA	±(0.1% rdg + 3 digit)
	3A	±20 mA				

Power supply for sensor (Input Code B only)	12 V DC ±10% 50 mA, or 24 V DC ±10% 25 mA

■AC Measurement — Input code 4 5 6

Code	Range	Measurement range	Max. resolution	Input resistance	Max. input	Accuracy
4	11	0–99.99 mV	10 µV	Approx. 100 MΩ	50 VA	±(0.2% rdg + 20 digits)
	12	0–999.9 mV	100 µV			
	13	0–9.999 V	1 mV	Approx. 1 MΩ	250 VA	
	14	0–99.99 V	10 mV	Approx. 10 MΩ		
	15	0–700.0 V	100 mV		700 V	±(0.3% rdg + 20 digits)
5	21	0–99.99 µA	0.01 µA	Approx. 1 kΩ	10 mA	±(0.5% rdg + 20 digits)
	22	0–999.9 µA	0.1 µA	Approx. 100 Ω		
	23	0–9.999 mA	1 µA	Approx. 10 Ω	50 mA	
	24	0–99.99 mA	10 µA	Approx. 1 Ω	500 mA	
6	25	0–999.9 mA	100 µA	Approx. 0.1 Ω	3 A	±(0.7% rdg + 20 digits)
	26	0–5 A	1 mA	(CT)	8 A	

Frequency range	40 Hz to 1 kHz (*50 / 60 Hz for 21, 22, 26 range)
Dead zone	0.5%fs or less (0 fixed display)
Response time	Approx. 1 s

*Accuracy applies to sine waves of 5% or more of full scale

■Resistance Measurement — Input code 7

Code	Range	Measurement range	Max. resolution	Measurement current	Accuracy
7	11	0–99.99 Ω	0.01 Ω	Approx. 9 mA	±(0.1% rdg + 4 digits)
	12	0–999.9 Ω	0.1 Ω	Approx. 900 µA	
	13	0–9.999 kΩ	1 Ω	Approx. 90 µA	
	14	0–99.99 kΩ	10 Ω	Approx. 9 µA	

Wiring system	2-wire or 4-wire

■Thermocouple Measurement — Input code 8

Code	Range	Input	Measurement range	Max. resolution	Accuracy
13	KA	K Thermocouple	-50.0 to +199.9°C	0.1°C	±0.5%fs
	KB	K Thermocouple	-50 to +1200°C	1°C	±0.2%fs
	J	J Thermocouple	-50 to +1000°C		
	T	T Thermocouple	-50 to +400°C		±0.6%fs
	S	S Thermocouple	0 to +1700°C		±0.4%fs
	R	R Thermocouple	-10 to +1700°C		
	B	B Thermocouple	+100 to +1800°C		
	PA	Pt100 Ω	-100.0 to +199.9°C	0.1°C	±0.15%fs
	JPA	JPt100 Ω			
	PB	Pt100 Ω	-100 to +600°C	1°C	±0.3%fs
	JPB	JPt100 Ω			

Cold junction compensation error (*In case Thermocouple input)	±2°C (10–40°C)
Burnout alarm	**Thermocouple :** B.OUT display **RTD :** OVER display when A or B is disconnected, B.OUT display when C is disconnected

■Frequency measurement (Open collector / Logic / Magnetic / AC Pulse)

Input code **9**

Code	Range	Measurement range	Max. resolution	Display refresh time	Accuracy
9	11	0.1–999.9 Hz	0.1Hz	1–10 s	±0.2%fs
	12	1–9999 Hz	1 Hz	1 s	
	13	0.01–99.99 kHz	10 Hz	100 ms	

Input voltage level	**Open collector** : L : 1 V or less (5 V, 5 kΩ pull-up) **Logic** : L : 1 V or less, H : 2.5–15 V **Magnetic** : 0.3–30 Vp-p **AC Voltage** : 30–500 Vrms
Prescale	0.001–10.00
Division	1–100
Sensor power supply	12 V DC ±10% 50 mA

■Load cell measurement (Strain gauge 350 Ω)

Input code **A**

Code	Sensor power	Zero adjustment range	Span adjustment range	Measurement range	Max. resolution	Accuracy
A	5V	-1.0– +1.0 mV/V	1.0–3.0 mV/V	-4.0–4.0 mV/V	0.5 μV / digit	±(0.1%fs +2 digit)
	10V				1.0 μV / digit	

Sensor power supply	5 V DC ±5% 30 mA, or 10 V DC ±5% 30 mA

Common Specifications

Display	**Main display :** Red/Green 7-segment LED (20 mm height) **Sub display :** Red 7-segment LED (6 mm height) *Multi display type only **Judgment display :** HI / GO / LO *Relay/Photocoupler output type only **Function display :** RE / PH / DZ / TZ / ME / P1 / P2 / P3
Polarity	'–' is displayed automatically at negative polarity
Display range	-9999 to 9999
Scaling	Offset : ±9999, Full scale : ±9999 (Setting range) ***Temperature input :** Fixed scaling (cannot change) ***Frequency input** : Scale by Preset & division setting ***Load cell input** : Scale adjust by calibration setting
Over range display	Displays OVER or -OVER
Decimal point	Configurable *Temperature input is fixed per range
Zero display	Leading zero suppression
Operating temperature and humidity range	0 to +50°C, 35–85% RH (Non-condensing)
Power supply	**1) AC power :** 100–240 V AC ±10% **2) DC power :** 12–48 V DC ±10%
Power consumption	**1) AC power :** 8 VA max. **2) DC power :** 7 W max.
Dimensions	48(H)×96(W)×97.5(D) mm, 1/8 DIN size (*Without option)
Weight	Approx. 450 g
Dielectric strength	**AC Power** : Power to I/O terminal : 1500 V AC / 1 min **DC Power** : Power to I/O terminal : 500 V DC / 1 min **Common** : Input to Output terminal, between output terminal : 500 V DC / 1 min Case to Terminal : 1500 V AC / 1 min
Insulation resistance	100 MΩ or more at 500 V DC between the above terminals
Sampling rate	Approx. 1 ms to 5 s (Approx. 1000–0.2 times/s) ***AC input** : Approx. 400 ms to 5 s (2.5–0.2 times/s) ***RTD input :** Approx. 100 ms to 10 s (10–0.1 times/s) ***TC input** : Approx. 200 ms to 20 s (5–0.05 times/s)
Moving average count	Select from [None / 2 / 4 / 8 / 16 / 32]
Display update cycle	Approx. 50 ms (20 times/s) ***Frequency input :** Approx. 100 ms (10 times/s) or more
Sensor power supply	**Process input :** 12 V DC ±10% 50 mA, or 24 V DC ±10% 25 mA **Frequency input :** 12 V DC ±10% 50 mA **Load cell input :** 5 V DC ±5% 30 mA, or 10 V DC ±5% 30 mA
Standard accessories	Unit sticker No.1, Terminal cover
Optional accessories	BCD output cable (A6BCDCN)

Output Specifications

◆External Control Specifications

Start / Hold	Start / Hold the display at any time
Digital zero	Set the display to zero at any time
Peak hold	Hold the [Max.] / [Min.] / [Max. - Min.] value
Pattern selection	Store and set up to 8 patterns of scaling and comparator data

◆Comparator output

Number of outputs	3 points (HI / GO / LO)
Output method	Relay contact output or Photocoupler output
•Relay contact output specifications	**Contact rating** : 250 V AC 2 A (resistance load), 30 V DC 2 A (resistance load) **Mechanical life** : 10 million times or more **Electrical life** : 50,000 make contacts, 30,000 break contacts
•Photocoupler output specifications	**Output rating** : Sink current: 20 mA **Applied voltage** : 30 V DC **Output saturation voltage** : 1.2 V or less (at 20 mA)
Judgment value setting	-9999 to 9999
Hysteresis	Adjustable 1–999 digits per judgment value
Operation speed	**Relay contact :** Max. 10 ms, **Photocoupler :** Max. 200 μs (resistance load)

Comparison conditions

Comparison conditions	Judgment result	Comparator output			Relay contact
		HI	GO	LO	
Display value > Upper limit value	HI	ON	OFF	OFF	Normally open (a contact)
Upper limit ≥ **Display value** ≥ Lower limit	GO	OFF	ON	OFF	
Lower limit value > **Display value**	LO	OFF	OFF	ON	

◆Analog Output

Output type	Load resistance	Accuracy	Ripple
0–1 V	10 kΩ or more	±0.2%fs	±50 mVp-p
0–10 V			
1–5 V			
4–20 mA	550 Ω or less		±25 mVp-p

Conversion method	PWM (Pulse Width Modulation)
Resolution	14 bit equivalent
Scaling	Digital scaling
Response time	Approx. 0.5 s (10 to 90%)

*4–20mA DC ripple with a 250 Ω load resistance (at 20 mA output)

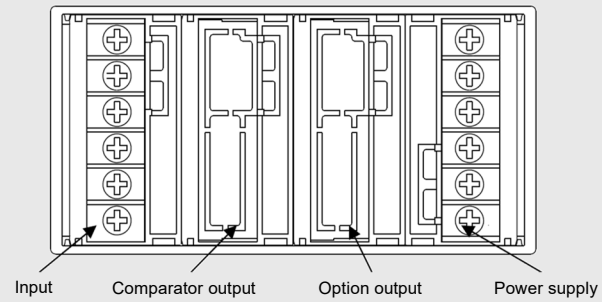
◆BCD Output

Output method	TTL or Open collector
•TTL specifications	**Polarity** : Switchable **Output signal** : TTL level fan-out = 2, CMOS compatible
•Open collector specifications	**Polarity** : Sink current: 20 mA **Transistor Output Capacity** : 30 V DC 10 mA **Output saturation voltage** : 1.2 V or less (at 10 mA)
•ENABLE Input specifications	**Function** : All BCD outputs are high impedance (TTL) or transistors are OFF with ENABLE terminal and DG terminal short-circuited **Control Signal HI Level** : 3.5–5 V relative to DG terminal **Control Signal LO Level** : 0–1.5 V relative to DG terminal **Input Current** : Input Current: -0.5 mA

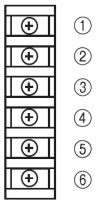
◆RS-232C, RS-485 Communication

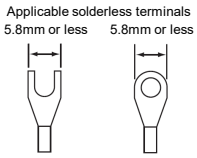
	RS-232C	RS-485
Synchronization method	Start-stop synchronization	
Communication method	Full duplex	2-wire halt duplex (Polling selection)
Communication rate	38400 / 19200 / 9600 / 4800 / 2400 bps	
Start bit	1 bit	
Data length	7 bit / 8 bit	
Parity	Even parity (default) / Odd parity / No parity	
Error detection	–	BCC check sum
Stop bit	1 bit / 2 bit	
Character code	ASCII code	
Control procedure	No procedure	
Signal name	TXD, RXD, SG	Non-inverting (+), Inverting (-)
Number of connections	1 unit	Max. 31 units
Line length	15 m	Max. 500 m (Network total)
Delimiter	CR+LF / CR	

Terminal Connections



◆Input





■DC Voltage input — Input code 1

No.	Name	Description		
1	HI (15)	Input terminal	(+)	15 range
2	HI (14)			14 range
3	HI (13)			13 range
4	HI (12)			12 range
5	HI (11)			11 range
6	LO		(-)	

■DC Current input — Input code 3

No.	Name	Description		
1	HI (24)	Input terminal	(+)	24 range
2	HI (23)			23 range
3	HI (22)			22 range
4	HI (21)			21 range
5	LO		(-)	
6				

■DC Large Current input — Input code 3

No.	Name	Description		
1	HI (25)	Input terminal	(+)	25 range
2	LO (25)		(-)	
3	NC	No connection		
4	HI (26)	Input terminal	(+)	26 range
5	LO (26)		(-)	
6	NC	No connection		

■AC Voltage input — Input code 4

No.	Name	Description		
1	HI (15)	Input terminal	(+)	15 range
2	HI (14)			14 range
3	HI (13)			13 range
4	HI (12)			12 range
5	HI (11)			11 range
6	LO		(-)	

■AC Current input — Input code 5

No.	Name	Description		
1	HI (24)	Input terminal	(+)	24 range
2	HI (23)			23 range
3	HI (22)			22 range
4	HI (21)			21 range
5	LO		(-)	
6				

■AC Large Current input — Input code 6

No.	Name	Description		
1	HI (25)	Input terminal	(+)	25 range
2	LO (25)		(-)	
3	NC	No connection		
4	HI (26)	Input terminal	(+)	26 range
5	LO (26)		(-)	
6	NC	No connection		

■Resistance input — Input code 7

No.	Name	Description	
1	HI	Input terminal	(+)
2	LO		(-)
3	+SOURCE	4-wire constant current line input terminal	(+)
4	-SOURCE		(-)
5	NC	No connection	
6			

■Temperature input — Input code 8

No.	Name	Description		
1	HI (TC)	Input terminal	(+)	Thermocouple
2	LO (TC)		(-)	
3	RTD (A)		Resistance element conductor wire (RTD)	
4	RTD (B)			
5	RTC (C)		Conductor resistance removal wire (RTD)	
6	NC	No connection		

■Frequency input — Input code 9

No.	Name	Description		
1	HI (Vrms)	Input terminal	(+)	AC Voltage
2	HI		(+)	Open Collector / Logic / Magnetic
3	LO		(-)	
4	+EXC	Sensor power supply terminal		(+)
5	-EXC			(-)
6	LO (Vrms)	Input terminal	(-)	AC Voltage

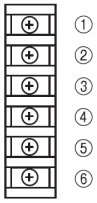
■Load cell input — Input code A

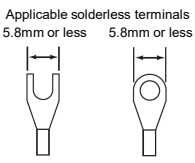
No.	Name	Description	
1	+SIG	Input terminal	(+)
2	-SIG		(-)
3	+EXC	Power supply excitation for sensor	(+)
4	-EXC		(-)
5	AG	Analog Ground (Ground for input circuit)	
6	NC	No connection	

■Process input — Input code B

No.	Name	Description		
1	HI (A)	Input terminal	(+)	Current range
2	LO (A)		(-)	
3	HI (V)		(+)	Voltage range
4	LO (V)		(-)	
5	+EXC	Power supply excitation for sensor		(+)
6	-EXC			(-)

◆Power supply





■AC Power supply

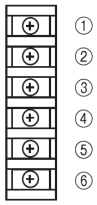
No.	Name	Description
1	NC	No connection
2		
3		
4		
5	POWER	Power supply (Non-polarity)
6		

■DC Power supply

No.	Name	Description	
1	POWER	Power supply	(+)
2			(-)
3	NC	No connection	
4			
5			
6			

◆Comparator output

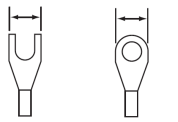
■Relay output



No.	Name	Description	
1	HI-a	HI output	Normally open, a contact
2	HI-c		Common terminal
3	GO-a	GO output	Normally open, a contact
4	GO-c		Common terminal
5	LO-a	LO output	Normally open, a contact
6	LO-c		Common terminal

■Photocoupler output

Applicable solderless terminals
5.8mm or less 5.8mm or less



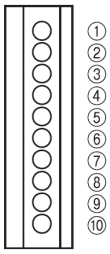
No.	Name	Description	
1	HI-c	HI output	Collector
2	HI-e		Emitter
3	GO-c	GO output	Collector
4	GO-e		Emitter
5	LO-c	LO output	Collector
6	LO-e		Emitter

◆Output option

■External control

Option code **1**

Compatible wire : 24–16 AWG



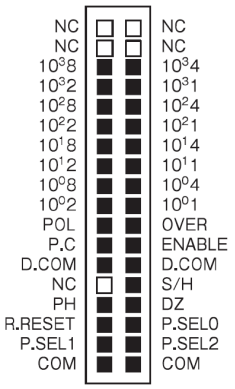
No.	Name	Description
1	S/H	Start / Hold function control
2	PH	Peak hold function control
3	DZ	Digital zero function control
4	R.RESET	Relay reset function control
5	P.SEL0	Pattern selection function control
6	P.SEL1	
7	P.SEL2	
8	COM	Common terminal for external control
9	NC	No connection
10		

■BCD output + External control

Option code **2** **3**

IDC connector : KEL 8822E-036-171-F

Compatible wire : 1.27mm pitch flat cable (28 AWG)



Name	Description
10^0 1, 2, 4, 8	Start / Hold function control
10^1 1, 2, 4, 8	Peak hold function control
10^2 1, 2, 4, 8	Digital zero function control
10^3 1, 2, 4, 8	Relay reset function control
POL	BCD polarity output
OVER	BCD overflow output
P.C	BCD print command output
ENABLE	Enable BCD control
D.COM	Digital common terminal for BCD output
S/H	Start / Hold function control
PH	Peak hold function control
DZ	Digital zero function control
R.RESET	Relay reset function control
P.SEL0	Pattern selection function control
P.SEL1	
P.SEL2	
COM	Common terminal for external control
NC	No connection

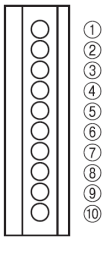
***The IDC connector for BCD output is included as standard.**

An optional 2m/5m cable with connector (A6BCDCN) is available.

■Analog output + External control

Option code **4**

Compatible wire : 24–16 AWG



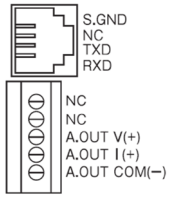
No.	Name	Description		
1	S/H	Start / Hold function control		
2	PH	Peak hold function control		
3	DZ	Digital zero function control		
4	R.RESET	Relay reset function control		
5	NC	No connection		
6				
7	COM	Common terminal for external control		
8	A.OUT V (+)	Analog output terminal	(+)	Voltage output
9	A.OUT I (+)		(+)	Current output
10	A.OUT COM		Common	

■RS-232C + Analog output

Option code **5** **7**

RS-232C Modular jack: RJ-14(6P 4C)

Analog output compatible wire : 24–16 AWG



Name	Description		
S.GND	Signal ground terminal		
NC	No connection		
TXD	Transmit data terminal		
RXD	Receive data terminal		
NC	No connection		
A.OUT V (+)	Analog output terminal	(+)	Voltage output
A.OUT I (+)		(+)	Current output
A.OUT COM		Common	

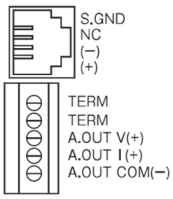
***Only modular jack in case Output code 5**

■RS-485 + Analog output

Option code **6** **8**

RS-485 Modular jack: RJ-14(6P 4C)

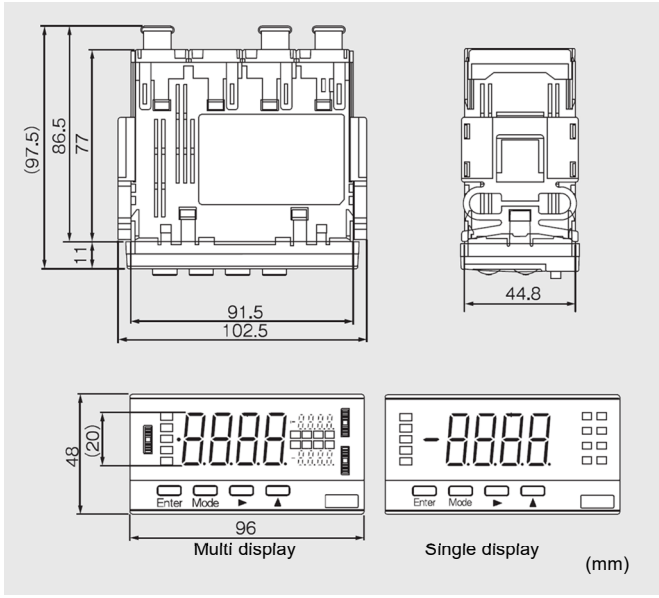
Analog output compatible wire : 24–16 AWG



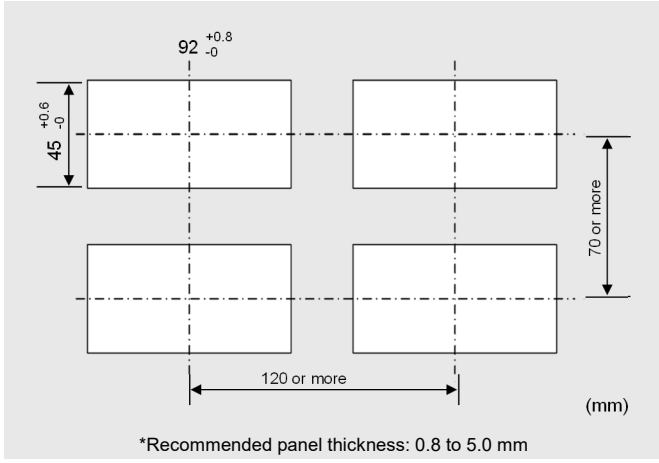
Name	Description		
S.GND	Signal ground terminal		
NC	No connection		
(-)	Inverting (Data-, B)		
(+)	Non-inverting (Data+, A)		
TERM	Termination resistor		
A.OUT V (+)	Analog output terminal	(+)	Voltage output
A.OUT I (+)		(+)	Current output
A.OUT COM		Common	

***The analog output section will become NC (No connection) in case Output code 6**

Dimensions



Panel Cutout



*Recommended panel thickness: 0.8 to 5.0 mm