

Instruction Manual for A6000 Series Universal Digital Panel Meters

Load Cell Input Unit

 Caution

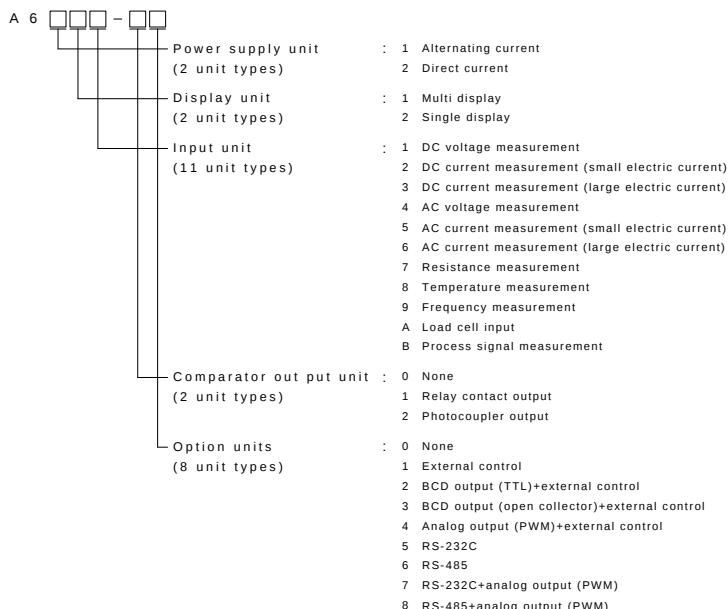
- (1) Applying a voltage or current exceeding its maximum permissible value may cause the unit to be damaged.
- (2) Always use the unit within the specified voltage range; otherwise, it may cause a fire, electric shock or personal/equipment damage.
- (3) For the purpose of functional improvement, the information written herein may be changed without prior notice.
- (4) Information contained herein is considered accurate to the best of our knowledge. If you have any question or comment on the information, please contact us or our distributor.
- (5) Read this manual carefully and thoroughly before starting to operate the unit, and keep the manual available for future reference.

1 Before Using the Unit

Thank you for purchasing our quality designed and manufactured A6000 Series. Before unpacking the unit, check for damages during transportation. If you have noticed any damage, directly contact us or our distributor.

1.1 Type Identification

Each model number of the A6000 series has its general specifications, and the following describes each note and the meaning. Before using the unit, check that the model number and specifications of the delivered unit match those of the product you ordered. For optional units, see the separate instruction Manuals.



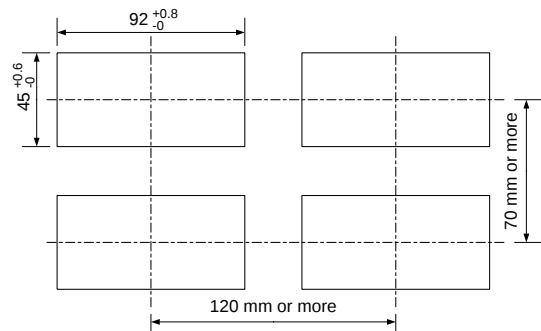
1.2 Accessories

Accessory	Quantity	Remarks
6-p terminal cover	2 or 3 each	2 without a comparator output 3 with a comparator output
Mounting band	2 pieces	
Unit indication label	1 each	

2 Mounting Method

2.1 Panel Cut Size

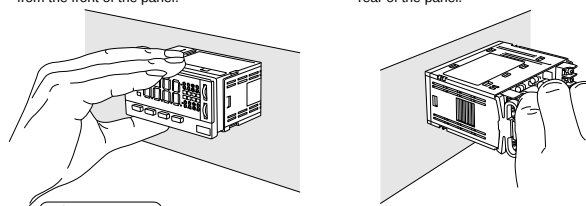
Cut the panel to mount the A6000 series in accordance with the illustration below:



2.2 How to Mount the Unit on the Panel

Mount the A6000 series to the panel in accordance with the illustration below:

- (1) Remove the mounting band and insert the case from the front of the panel.
- (2) Fix the case using the mounting band from the rear of the panel.

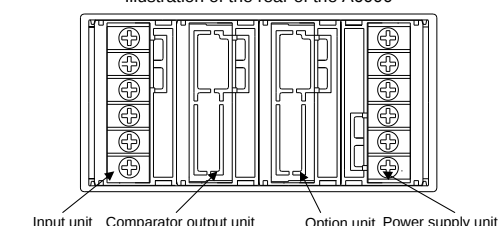


 Caution

- (1) The recommended panel thickness is 0.8 to 5mm.
- (2) Do not install the unit in locations where it is exposed to direct sunlight; where ambient temperature or humidity doesn't meet the requirements below; or where a drastic change in temperature may cause condensation.
 Ambient temperature: 0 to 50°C
 Ambient humidity: 35 to 85%
- (3) Do not install the unit where it is exposed to dust, particles, chemicals harmful to electric components, corrosive gases, etc.
- (4) When this unit is installed inside other equipment, pay attention to the heat radiation and keep the heat inside the equipment 50°C or below.
- (5) Do not install the unit where it is exposed to excessive vibration or shock.
- (6) Install the unit horizontally; otherwise, ventilation will be adversely affected and may result in deterioration.

3 Terminals and Connections

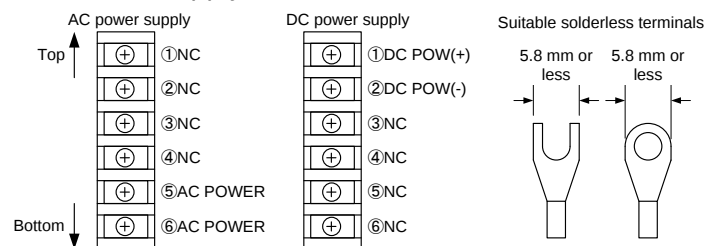
Illustration of the rear of the A6000



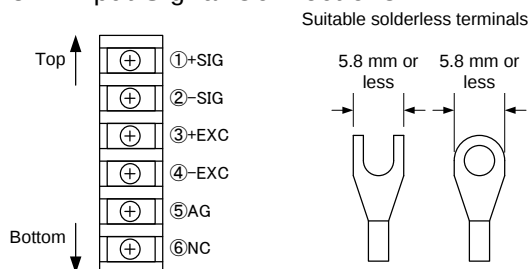
Caution

Each unit is not replaceable by the customer.

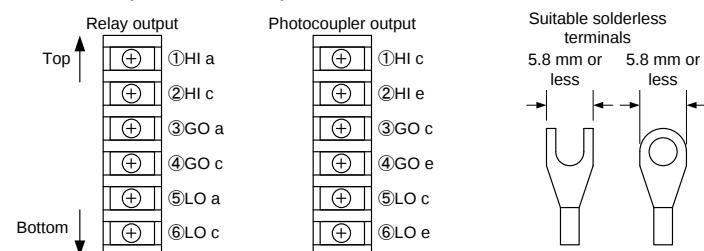
3.1 Power supply connections



3.2 Input Signal Connections



3.3 Comparator Output Connections



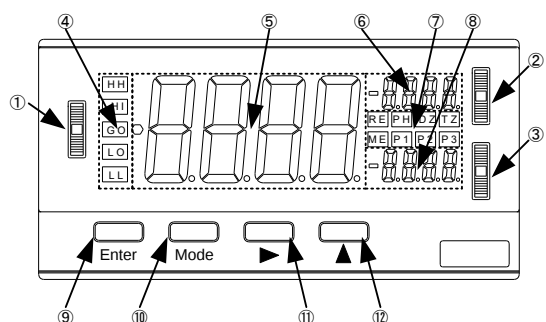
3.4 Option connections

For connections of the options, see separate optional function instruction Manuals.

4 Parameter Settings

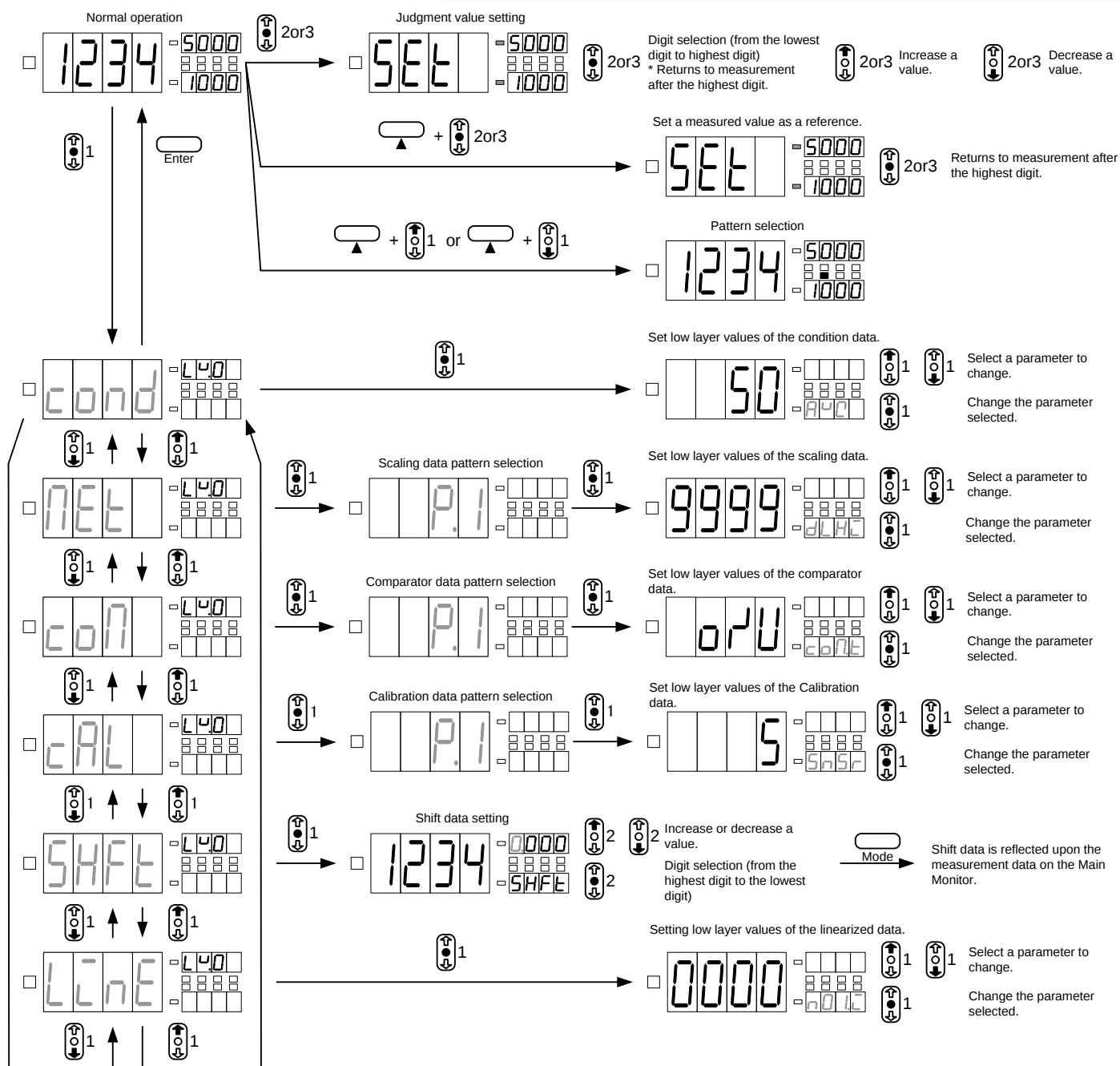
4.1 Multi Display Unit

Names and major functions

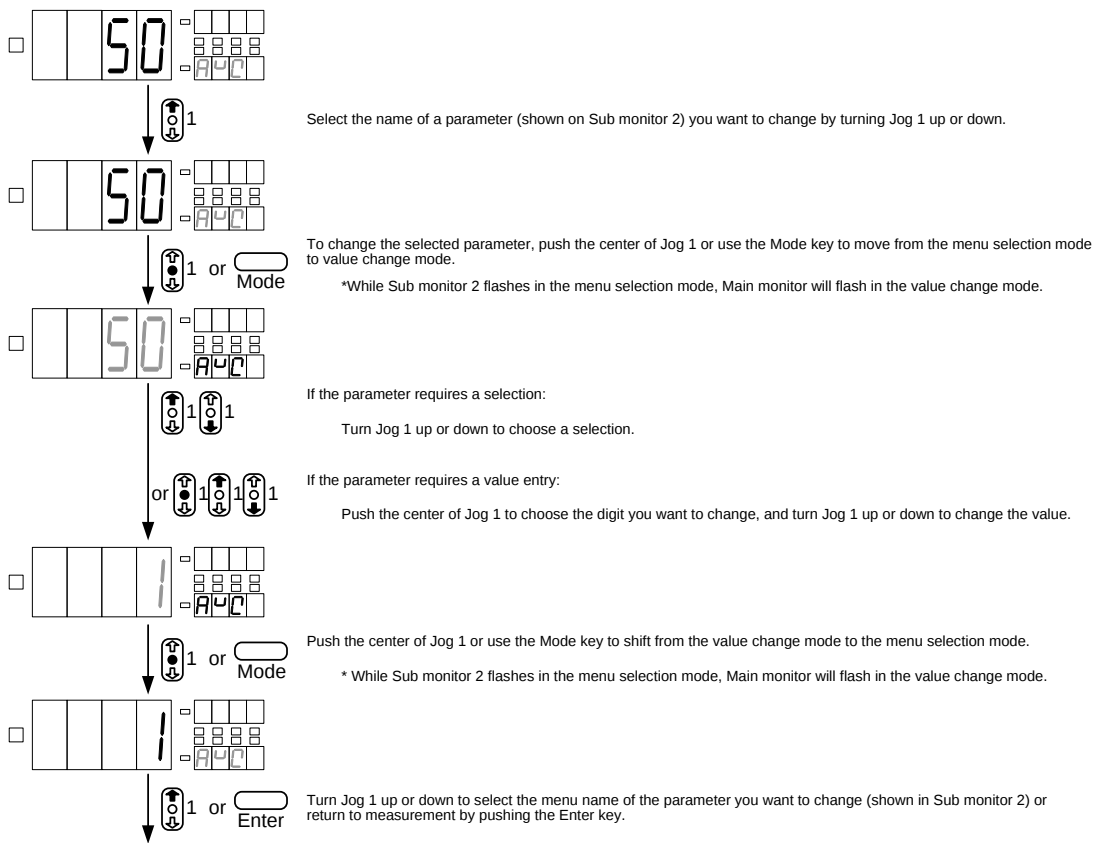


Location	Name	Major function
①	Jog 1	Menu and value selection at the time of parameter setting; pattern selection when used with Increment.
②	Jog 2	Changes judgment values when used with the meter relay; sets a current measurement value to a judgment value; switching maximum values, etc. when used without meter relay.
③	Jog 3	Changes judgment values when used with the meter relay; sets a current measurement value to a judgment value; switching maximum values, etc. when used without meter relay.
④	Judgment monitor	Displays results of judgment when used with meter relay.
⑤	Main monitor	Displays a measured value, menu name or a value at the time of parameter setting.
⑥	Sub monitor 1	Displays a judgment value when used with meter relay; displays a maximum value, etc. when used without meter relay.
⑦	Function monitor	R E Illuminates when the unit is set to the remote mode via communication function.
		P H Illuminates when peak hold, valley hold, or peak-valley hold is turned on.
		D Z Illuminates when Digital Zero is turned on.
		T Z Illuminates when Tracking Zero is turned on.
		M E Illuminates when Digital Zero Backup is turned on.
⑧	Sub monitor 2	Displays a judgment value when used with meter relay; displays a maximum value, etc. when used without meter relay.
⑨	Enter	Switches to the parameter setting mode.
⑩	Mode	Changes modes at the time of parameter setting; switches to the memory mode at the time of normal measurements (when this button is pushed and held.)
⑪	Shift	Selects digits at the time of parameter setting; DZ control at the time of normal measurements. (when this button is pushed and held.)
⑫	Increment	Changes values at the time of parameter setting; pattern selection at the time of normal measurements (when this button is pushed and held); special operations

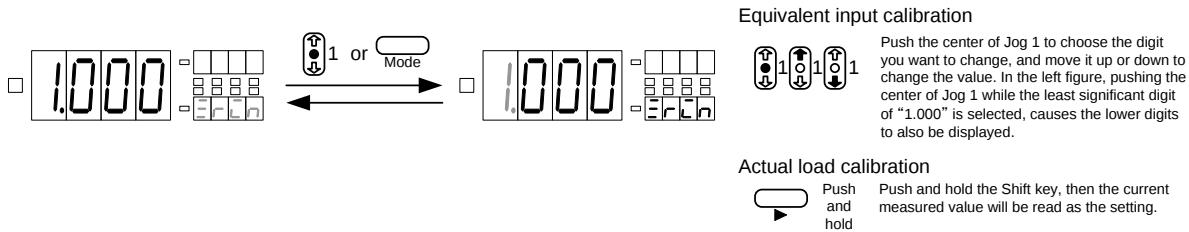
Operation procedure diagram



How to set a low layer value (Condition data/scaling data/comparator data/Calibration data)



How to calibrate the zero input (ZRIN) value and the span input (SPIN) value using an actual load or the equivalent input

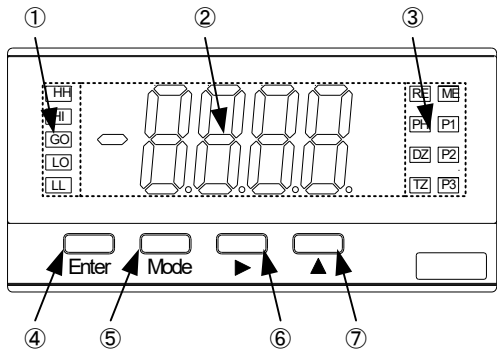


Remarks:

- ※The multi display unit can also follow the operation procedure of the single display unit operation system.
- ※Comparator judgment values can be set not only from Jog 2 and Jog 3 but also from the low layers of the comparator data.
- ※For operation procedures in the memory mode (maximum value/minimum value/(maximum value-minimum value)), see the operation procedure diagram of the single display unit.

4.2 Single Display Unit

Names and major functions



Location	Name	Major function
①	Judgment monitor	Displays judgment results when used with meter relay.
②	Main monitor	Displays a measured value as well as menu names and values at the time of parameter setting.
③	Function monitor	RE Illuminates when the unit is set to the remote mode via communication function.
		PH Illuminates when peak hold, valley hold, or peak-valley hold is turned on.
		DZ Illuminates when Digital Zero is turned on.
		TZ Illuminates when Tracking Zero is turned on.
		ME Illuminates when Digital Zero Backup is turned on.
	P1 P2 P3	Pattern 1 Pattern 2 Pattern 3 Pattern 4 Pattern 5 Pattern 6 Pattern 7 Pattern 8
		P1 ON OFF ON OFF ON OFF ON ON
		P2 OFF ON OFF OFF ON ON ON ON
		P3 OFF OFF OFF OFF ON ON ON ON
④	Enter	Switches to the parameter setting mode.
⑤	Mode	Changes modes at the time of parameter setting; switches to the memory mode at the time of normal measurements (when this button is pushed and held.)
⑥	Shift	Selects digits at the time of parameter setting; DZ control at the time of normal measurements. (when this button is pushed and held.)
⑦	Increment	Changes values at the time of parameter setting; pattern selection at the time of normal measurements (when this button is pushed and held) ; special operations

Figure 1-10: Setting the condition data.

The diagram illustrates the sequence of button presses to set various parameters on a 4-digit display. It starts with the 'cond' menu, then moves through 'net', 'con', 'shft', and 'line' menus. From each menu, pressing 'Mode' leads to a parameter selection screen (e.g., 'P.1', 'rAnD', 'con.t', '0000', 'n012'). Further presses of 'Mode' or 'Digit selection' lead to the final value setting screens (e.g., 'R40', 'rAnD', 'con.t', '0000', 'n012'). The diagram includes instructions for pushing and holding the Mode key to clear memory or select patterns, and for pushing and holding the Enter key to move between menus.

Select the name of a parameter you want to change by pushing the Increment key.

To change the selected parameter, use the Mode key to move from the menu selection mode to the value change mode.

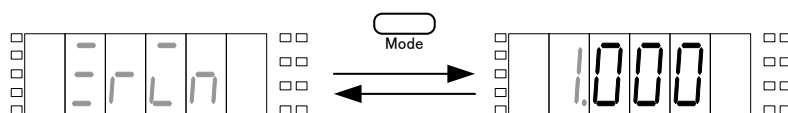
If the parameter requires a selection:
Use the Increment key to choose a selection.

If the parameter requires a value entry:
Use the Shift key to choose the digit you want to change, and push the Increment key to set the value.

Use the Mode key to shift from the value change mode to the menu selection mode.

Use the Increment key to select the menu name of the parameter you want to change or return to measurement by pushing the Enter key.

How to calibrate the zero input (ZRIN) value and the span input (SPIN) value using an actual load or the equivalent input



Equivalent input calibration

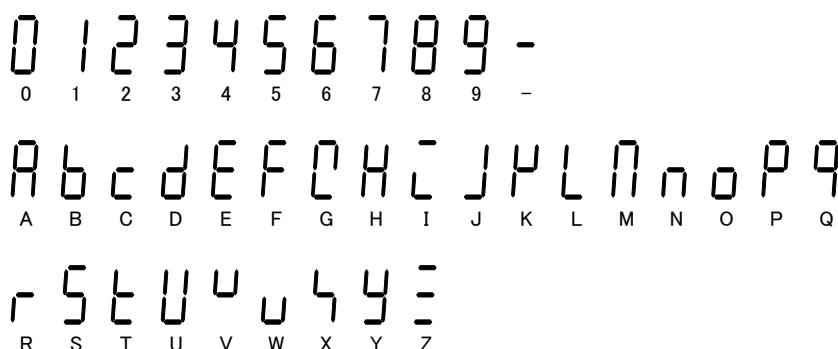
Push the center of Jog 1 to choose the digit you want to change, and move it up or down to change the value. In the left figure, pushing the shift while the least significant digit of "1.000" is selected, causes the lower digits to also be displayed.

Actual load calibration



Push and hold the Shift key, then the current measured value will be read as the setting.

4.3 Numeric and Character Indications



4.4 Protection Levels

Each parameter of the A6000 has an individual protection level, and by setting the protection level of the condition data, you can set an access level. (For the protect level of each parameter, see the P.L. column of the tables in Section 4.5.)

The higher the protection level is, the less the number of settable parameters will be. If you set the protection level to the strictest LV3, you can change the protection level only, and all the other parameters may not be changed. (No comparator judgment value can be changed using the jog switches in this case.)

*The protection level set at the time of shipment is LV1. (Settings of display colors, scaling and judgment-related values only are available.)

4.5 List of the Parameters

4.5.1 Condition Data

Menu indication	Parameter name	Initial value	P.L.	Setting range or alternatives	Major setting purpose and remarks
AVG	Average times	50	0	1/2/4/8/10/20/50/100/200/400/800/1000/2000/5000	Selects Conversion rate (average times of internal sampling; sampling time: approx. 1 millisecond)
MAV	Average times of movements	1	0	1/2/4/8/16/32	Selects the average times of movements. Filtering effects: Small<1(OFF)-2-4-8-16-32>Big
S.WD	Step wide	1	0	1/2/5/10	Selects the range of display changes to maintain image display consistency. (If this parameter is set to 5, the lowest digit will display either 0 or 5 only).
CLR	Display color	RED	1	RED/GREEN	Selects display colors.*Only when without meter relay.
CLR.T	Display color type	AUTO	1	AUTO/MANU	Selects automatic (red in the HI or LO mode or green in the GO mode) or manual setting for display color type. *Only when with meter relay.
HI.CL	HI display color	RED	1	RED/GREEN	Selects red or green as display color at the time of HI judgment.*Only when CLR.T is MANU.
GO.CL	GO display color	GREEN	1	RED/GREEN	Selects red or green as display color at the time of GO judgment.*Only when CLR.T is MANU.
LO.CL	LO display color	RED	1	RED/GREEN	Selects red or green as display color at the time of LO judgment.*Only when CLR.T is MANU.
BLNK	Display blank level	OFF	0	OFF/LV1/LV2/LV3/ON	Selects the display brightness. <bright OFF-LV1-LV2-LV3-ON>turned off
J.SW	Jog SW	ON	0	ON/OFF	Selects whether the jog SW is used or not.*With the multi display unit only.
PVH	PH Selection	PH	0	PH/VH/PVH	Selects a type that operates when the PH function is turned on (peak hold/valley hold/peak-valley hold).
DZ.BU	DZ backup	OFF	0	OFF/ON	Selects whether the digital zero value is backed up or not at the time when the unit is turned off.
P.S	P.SEL	1	0	1/2/4/8	Selects the number of patterns available for the pattern selection function.
LINE	Linearize	OFF	0	OFF/2/4/8/16	Selects whether the linearize function is enabled/disabled and sets the number of correction points.
TR.T	TZ time	000	0	000 to 999	Selects whether the tracking zero function is enabled/disabled and sets the correction time (setup value/conversion rate).
TR.W	TZ correction range	01	0	01 to 99	Sets the correction range of the tracking zero function.*Only when TR.T is set to a value other than 000.
P.ON	Power on delay time	0	0	0 to 9	Sets the time between the startup and actual start of measurements (setup value x 1 second).
PRO	Protection level	LV.1	3	Lv.0/LV.1/LV.2/LV.3	Selects the protection level to prevent operation mistakes.High< LV3-LV2-LV1-LV0 >Low
U-NO.	Unit number indication	OFF	0	OFF/ON	Selects whether the code of a unit mounted at the time of startup is displayed or not.
S/H.T	Start/hold type	A	0	A/B	Selects an operation type of start/hold (A: free run; B: one shot).*Only with the external control.
S/H.D	S/H delay time	0	0	0 to 9999	Sets the delay time at the time of startup (setup value x 1 ms).*Only with the external control.
PVH.T	PH type	A	0	A/B	Selects an operation type of peak hold (A: real-time display; B: results display).*Only with the external control.
DZ.C	DZ control	SW	0	SW/TERM	Selects a control method of Digital Zero (SW: front key; TERM: external control terminal).*Only with the external control.
P.S.C	P.SEL control	SW	0	SW/TERM	Selects a control method of Pattern Selection (SW: front key; TERM: external control terminal).*Only with the external control.
BCD.L	BCD logic	N.LOG	0	N.LOG/P.LOG	Selects the BCD output logic (N: negative logic; P: positive logic).*Only when the BCD output is available.
BAUD	Baud rate	9600	1	2400/4800/9600/19200/38400	Sets a baud rate for communication.*Only when the communication function is available.
DATA	Data length	7	1	7/8	Selects the data length for communication.*Only when the communication function is available.
P.BIT	Parity bit	E	1	E/O/N	Selects the parity bit for communication.*Only when the communication function is available.
STP.B	Stop bit	2	1	1/2	Selects the stop bit for communication.*Only when the communication function is available.
T-	Delimiter	CR.LF	1	CR.LF/CR	Selects a delimiter for communication.*Only when the communication function is available.
ADR	Equipment ID	01	1	01 to 99	Selects the equipment ID for the RS-485 function.*Only when the RS-485 function is available.

4.5.2 Scaling Data

Menu indication	Parameter name	Initial value	P.L.	Setting range or alternatives	Major setting purpose and remarks
DLHI	Digital limiter HI	9999	0	-9999 to +9999	Sets the upper limit of the displayable range. (Any value equal to or exceeding the digital limiter HI setting will not be updated and kept at the setup value.
DLLO	Digital limiter LO	-9999	0	-9999 to +9999	Sets the lower limit of the displayable range. (Any value equal to or below the digital limiter LO setting will not be updated and kept at the setup value.
A. OUT	Analog output type	0-1	1	0-1/0-10/1-5/4-20	Selects an analog output range.*Only when the analog output is available.
AOHI	Analog output HI	9999	1	-9999 to +9999	Sets the relationship between indications and analog outputs.*Only when the analog output is available.
AOLO	Analog output LO	0	1	-9999 to +9999	
DP	Decimal point	None	2	Each digit can be set independently.	Sets the position of the decimal point.

4.5.3 Comparator Data (for meter relay only)

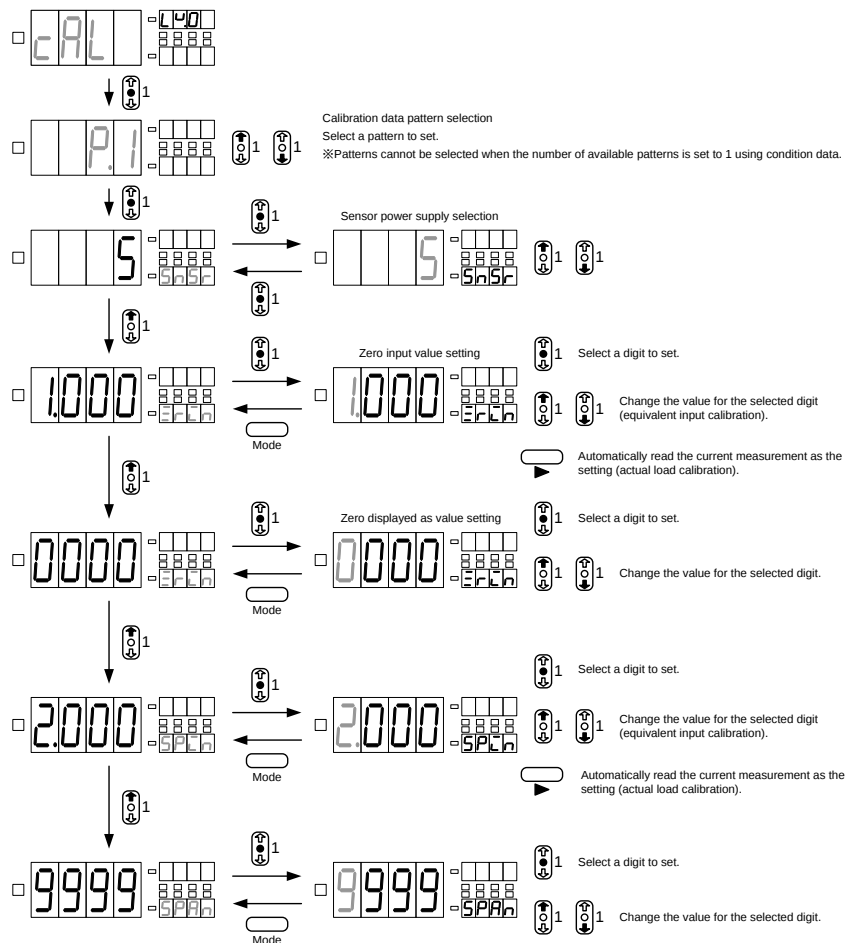
Menu indication	Parameter name	Initial value	P.L.	Setting range or alternatives	Major setting purpose and remarks
COM.T	Comparator output type	O/U	1	O/ERR	Select either [above or below] or error comparator types.
HI-S	HI judgment value	1000	2	-9999 to +9999	Sets a HI judgment value.*Only when COM.T is O/U.
LO-S	LO judgment value	500	2	-9999 to +9999	Sets a LO judgment value.*Only when COM.T is O/U.
N.VAL	Nominal value	5000	2	-9999 to +9999	Sets a nominal value.*Only when COM.T is ERR.
ERR1	Error 1	5.00	2	0.00 to 99.99	Sets an error.*Only when COM.T is ERR.
HI-H	HI hysteresis	0	1	0 to +999	Sets a HI hysteresis value *Only when COM.T is O/U.
LO-H	LO hysteresis	0	1	0 to +999	Sets a LO hysteresis value *Only when COM.T is O/U.
ER1.H	Error 1 hysteresis	1	1	0 to +999	Sets an error hysteresis *Only when COM.T is ERR.
HI-L	HI logic	N.O	0	N.O/N.C	Sets a HI output logic (N.O.=normally open or N.C.=normally closed)*Output when the power is OFF is always open (OFF).
GO-L	GO logic	N.O	0	N.O/N.C	Sets a GO output logic (N.O.=normally open or N.C.=normally closed)*Output when the power is OFF is always open (OFF).
LO-L	LO logic	N.O	0	N.O/N.C	Sets a LO output logic (N.O.=normally open or N.C.=normally closed)*Output when the power is OFF is always open (OFF).

4.5.4 Calibration Data

Menu indication	Parameter name	Initial value	P.L.	Setting range or alternatives	Major setting purpose and remarks
SNSR	Sensor power supply	5	1	-5/10	Selects a sensor power supply.
ZRIN	Zero input value	0	2	-1.2000 to +1.2000	Sets the relationship between input signals and their indications.
ZERO	Zero indication	0	2	-9999 to +9999	
SPIN	Span input value	2.000	2	-3.0000 to +3.0000	
SPAN	Span indication	9999	2	-9999 to +9999	

5 Setting Examples

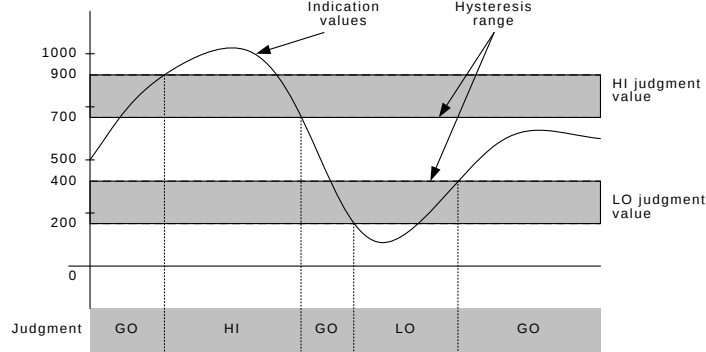
5.1 Calibration Data Setting Examples



5.2 Comparator Data Setting Examples (for meter relay only)

Example 1

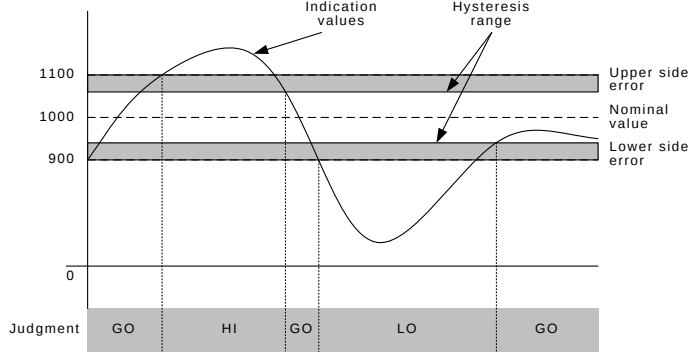
Above and below setup mode



※The hysteresis is effective either in the range lower than the HI judgment value or that higher than the LO judgment value.

Example 2

Error judgment mode



※Error is to be set as a percentage of the nominal value.
※The hysteresis is to be set as xx digits of the indication value.
※The hysteresis is effective either in the range lower than the upper side error or that higher than the lower side error.

6 Specifications and External Dimensions

6.1 Input Specifications

● Load cell input

Sensor power	Zero adjusting range	Span adjusting range	Measurement range	Error (23°C ±5°C; 35 to 85%)
5V	-1 to +1mV/V	1 to +3mV/V	-4 to +4mV/V	±(0.1% of FS +2digit)
10V				

Sampling rate : Maximum approx. 1000 times/second

Minimum input sensitivity : 0.5μV/digit (Sensor power: 5V), 1μV/digit (Sensor power: 10V)

Sensor power : 5V ±5% 30mA, 10V ±5% 30mA

Conformity sensor : 350Ω

※The error is applied when the sampling rate is 20 times/second or less.

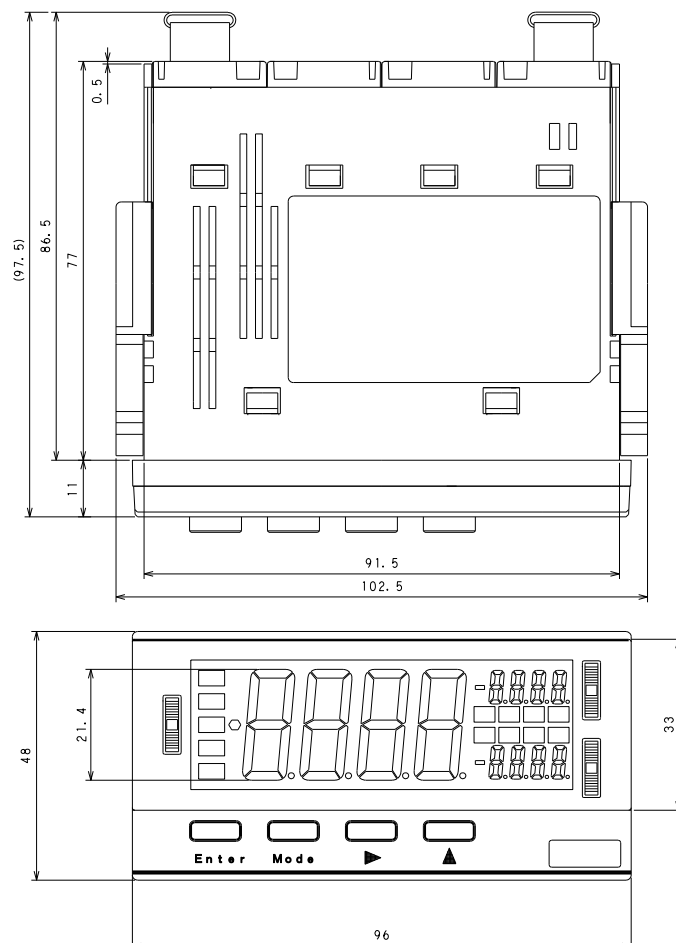
6.2 General Specifications

Display	: Multi display Main display: Red/green 7-segment display (character height: approx. 20 mm) Sub display: Red 7-segment display (character height: approx. 6 mm) Single display Red/green 7-segment display (character height: approx. 20 mm)
Display range	: -9999 to 9999
Operational temperature	: 0 to 50°C 35 to 85%RH
Storage temperature	: -10 to 70 °C: 60%RH or less
Power supply	: AC PS AC 100 to 240V±10% DC PS DC 12 to 48V±10%
Power consumption	: AC PS Maximum load: Approx. 8 VA at 100 VAC DC PS Maximum load: Approx. 7 W at 24 VDC
External dimension	: 48 mm (H) x 96 mm (W) x 97.5 mm (with no DX option unit mounted)
Weight	: Approx. 450g
Withstand voltage	: AC PS PS-input, output: 1,500 VAC, 1 minute (AC PS) Input-output: 500 VDC, 1 minute Output-output: 500 VDC, 1 minute Case-PS, input, output: 1,500 VAC, 1 minute DC PS PS-input, output: 500 VDC, 1 minute (DC PS) Input-output: 500 VDC, 1 minute Output-output: 500 VDC, 1 minute Case-PS, input, output: 1,500 VAC, 1 minute
Insulation resistance	: AC PS Among the above terminals: 500 VDC 100 MΩ or more DC PS Among the above terminals: 500 VDC 100 MΩ or more

⚠ Caution

The PS voltage must be applied or shut down at once (not gradually).
Take at least a 10-second interval between a shutdown and startup.

6.3 External Dimensions



7 Warranty and Service

7.1 Warranty

The manufacturer warrants to the original retail customer its A6000 series universal digital panel meter to be free of defects in material and workmanship for use under normal care and will repair or replace any meter at no charge to the customer during the one (1) year warranty period of the meter.

7.2 After Sales Service

Under strict quality control measures, this product was manufactured, tested, inspected and shipped. Should a defect in manufacture or workmanship be identified, please return the product to our distributor or directly to us. It would be highly appreciated if you could give a detailed account of the fault and enclose it with the product.

watanabe

WATANABE ELECTRIC INDUSTRY CO., LTD.

6-16-19, Jingumae, Shibuya-ku, Tokyo 150-0001, Japan
Phone: (81)3-3400-6141

Homepage <https://www.watanabe-electric.co.jp/en/>