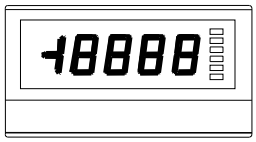
Instruction Manual for A9000 Series Digital Panelmeter

A9□16-0□ for AC large Current measurement



⚠ 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 A9000 Series Digital Panelmeter. Please make sure that the operator who uses the panelmeter keeps the manual on hand. Also, the meter should be checked upon receipt for damage that might have occurred while in transit. Should the product be damaged or any accessory be missing, notify your sales representative or our sales office directly.

1.1 Model and Suffix Code Configuration

The model and suffix code of the A9000 series are as shown below. Check that the product received matches the one you selected when ordering.

A9□1□-0□

- Power supply : 1 100-240V AC
- Power supply : 3 5-12V DC
- Power supply : 4 12-24V DC
- Display : 1 Single
- Input : 1 DC voltage
- Input : 2 DC current
- Input : 4 AC voltage (true RMS)
- Input : 5 AC current (true RMS)
- Input : 6 AC large current (true RMS)
- Input : B Precess signal
- Input : C Temparature sensor (thermocouple sensor)
- Input : D Temparature sensor (resistance tempararure detector)
- Input : E DC large voltage(15range)
- Input : F AC large voltage(15range, true RMS)
- Comparative output 0 (None)
- Output : 1 (None)+external control inputs
- Output : 2 BCD (TTL)+external control inputs
- Output : 3 BCD(Open collector)+external control inp

*Every model is provided with external control inputs.

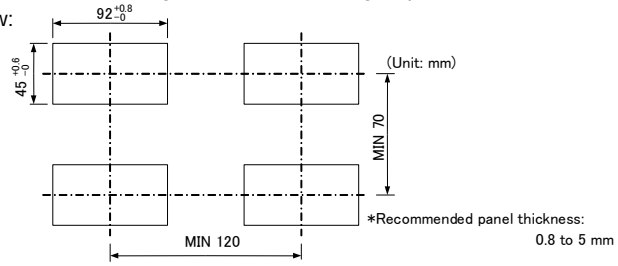
1.2 Checking the Accessories

The A9000 series accessories include one copy of this instruction manual, one unit label and a connector for BCD outputs / external control inputs.

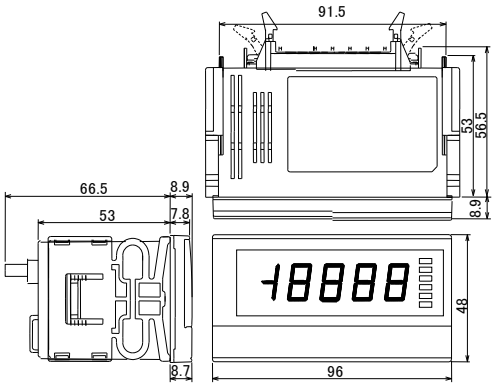
2. Mounting Method

2.1 Panel Cutout Size

Panel cutout size for mounting the A9000 series digital panelmeter is as shown below:



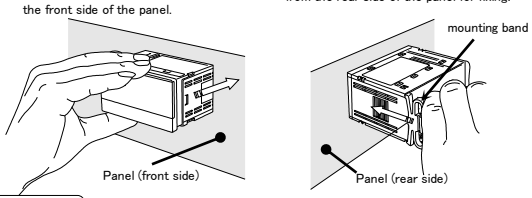
2.2 External Dimensions



2.3 How to Mount the Unit on the Panel

(1)After removing the mounting bands, insert the main unit into a opening in a panel from the front side of the panel.

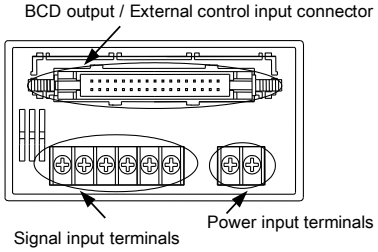
(2)Attach the mounting bands to main unit from the rear side of the panel for fixing.

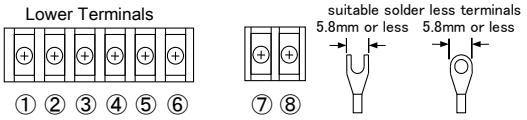


⚠ CAUTION

(1) Do not install the unit where it is exposed to dust, particles, chemicals harmful to electric components, corrosive gases, etc.
(2) 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.
(3) Exercise care so that the product is not subject to vibrations or shocks.

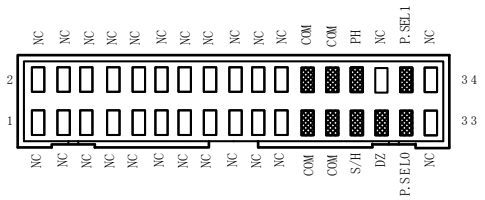
3. Terminals and Connections



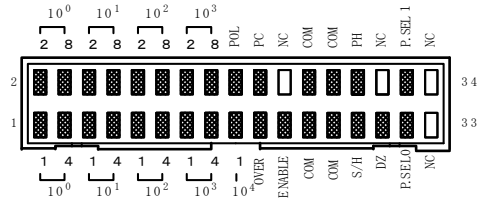


①: Input terminal HI (+ input terminal of 26-range)
③: Input terminal LO (- input terminal of 26-range)
* Make input signal wires as short as possible and keep them away from other signal wires.
* Use two-core shielded cables in locations with a lot of external noise and connect the external sheaths to the LO side of the signal source at one point.
* If harmonic noise is superimposed on an input signal, insert a low-pass filter in the input. However, care must be exercised depending on the usage conditions because a delay in response time is caused in time constant.
②④⑤⑥: NC terminals
*Do not connect anything to the NC terminals.
⑦: Power terminal (In case of DC POWER : 0 V)
⑧: Power terminal (In case of DC POWER : +V)
*This panelmeter has no power switch. Connecting it to a power source causes it to be operable immediately.

Upper terminals (without BCD outputs)



Upper terminals（with BCD outputs）



Upper Connector : HIF-3BA-34PA-2.54DS
(HIROSE)
Attachment Upper Connector : HIF-3BA-34D-2.54R
(HIROSE)

1 to 17: Outputs of bits 1,2,4 and 8 of each digit

18:BCD polarity output

19:BCD overrange output

20:BCD PC (print control) output

21:BCD enable input

・Connecting this terminal to COM terminal or bringing the potential of this terminal to “0” level causes BCD outputs to be high impedance or transistors to be turned off.

* In the case of “without BCD output” option, terminals 1 to 21 are no connection.

22,30,33,34:NC

・Do not connect anything to the NC terminals.

23-26:COM

・Common terminals for BCD outputs and control terminals.

27:Hold input

・By shorting this terminal to COM terminal or bringing its potential to the “0” level, the panelmeter maintains its indication.

28:Peak hold input

・By shorting this terminal to COM terminal or bringing its potential to the “0” level, the panelmeter displays maximum value (Peak hold), minimum value (Valley hold) or the difference value between the maximum value and the minimum value (Peak-Valley hold). These functions can be switched by using condition data.

29:Digital Zero input

・By shorting this terminal to COM terminal or bringing its potential to the “0” level, the panelmeter performs measurements with the latest displayed value as zero and displays the width of variations from that point onward.

31,32: Pattern select inputs

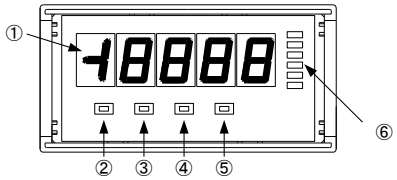
・By combining states of P.SEL0 and P.SEL1 terminals (connecting or not to the COM terminal / bringing its potential to the “0” level or the “1” level), the panelmeter uses one of the 4 patterns of scaling data set by scaling data setting.

*”0” level:0-1.5V, ”1” level:3.5-5V
（Input current:-0.5mA）

4. Parameter Settings

4.1 Components and Functions

※ Before setting parameters, remove the front panel by inserting a flat-blade screwdriver into the ditch under the front panel.



①Main display - displays a measured value during measurment operation or a menu or parameter information during parameter setting mode.

②Enter key [E] - Shifts from measurment operation to parameter setting mode. (“Enter”+“Mode”)

③Mode key [M] - In the parameter setting mode, switches items to be set.
- Shifts from measurment operation to display shift setting mode. (“Mode”+“Shift”)

④Shift key [▶] - In the parameter setting mode, switches digits to be set.
- Shifts from measurment operation to display shift setting mode. (“Mode”+“Shift”)

⑤increment key [▲] - In the parameter setting mode, selects numeric data (increment) or options for each parameter.

***“XXXX”+“YYYY” means pushing “YYYY” key with pushing “XXXX”key.**

⑥Function monitoring indicator

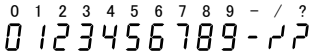
Name	functions	
	Measurement mode	Parameter setting mode
DZ	Lights while Digital Zero is ON.	Blinks while setting output value for each linearize point.
PH	Lights while Peak Hold , Valley Hold or Peak-Valley Hold is ON.	(Lights-out)
ME	Lights while Digital Zero Backup is ON.	(Lights-out)
RE	Lights under Remote Control condition by the communication function. (* This function is not available for this model.)	Blinks while setting input value for each linearize point.
P.S1	Indicates the number of a selected pattern of scaling data. P.S1 OFF,P.S0 OFF : pattern No.1 P.S1 OFF,P.S0 ON : pattern No.2 P.S1 ON, P.S0 OFF : pattern No.3 P.S1 ON, P.S0 ON : pattern No.4	(Lights-out)
P.S0		

* If Digital Zero Backup (B. UP) in the condition data is set to OFF, Digital Zero value will be cleared by power-off.

4.2 Numeric and Character Indications

Indications on the main display and characters correspond to them are as below:

0 1 2 3 4 5 6 7 8 9 - / ?



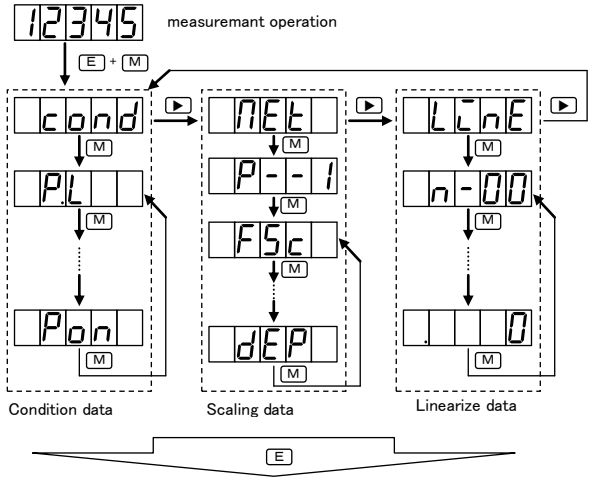
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

4.3 Parameter Types and Protect Levels

The parameters are classified into the following groups depending on the main objective. Use of the protect setting in the condition data allows a limitation to be imposed on the settable parameters.

Condition data:	A group of parameters that set up basic actions such as the sampling rate and operation type for each control.
Scaling data:	A group of parameters relating to measurements such as scaling.
Linearize data:	A group of parameters relating to the function of correcting the linearity of an input value and display value.

4.4 Shift to the Parameter Setting Mode



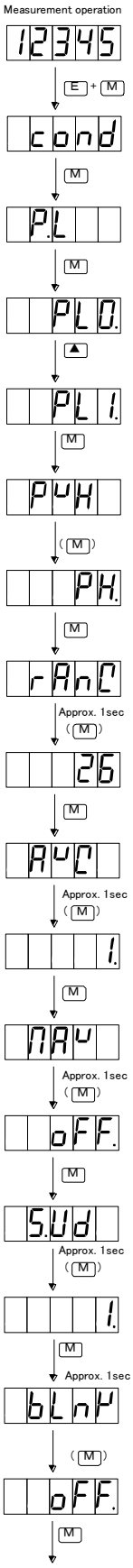
By pressing the Enter key, new parameters are stored and returns to measuremant operation.

4.5 Protect Levels

Protect level 0 (PL0):	Allows all parameters to be displayed and set.
Protect level 1 (PL1):	Allows condition data *1 and scaling data to be displayed and set. (*1) Protect level, range, averaging times (setting sampling) and BCD output type only.
Protect level 2 or 3 (PL2, 3):	Allows only protect level in condition data to be displayed and set.

4.6 Setting Condition Data

Condition data is a group of parameters for setting up basic actions such as a protect level, measurement range, and each control's operation type.



(1) Press the Enter key and the Mode key during measurement operation to enter the condition data setting mode.

(2) Press the Mode key to move to protect level setting.

(3) Press the Mode key to display the current protect level.

(4) Set up the desired protect level using the Increment key.
(This setting example sets the protect level to PL1.)
PL0: Displays all the parameters.
PL1: Displays only the condition and scaling data.
PL2/3: Displays only the protect level.
* Press the Mode key to skip the setting of this item.

(5) Press the Mode key to move to peak-hold-type setting.

(6) Set up the peak hold type using the Increment key.
(This setting example sets peak hold type to PH.)
PH: Holds the maximum display value.
PV: Holds the minimum display value.
PVH: Displays (holds) the difference between the maximum and minimum values.
* Press the Mode key to skip the setting of this item.

(7) Press the Mode key to move to range setting.

(8) This parameter can not be changed because this model has only 26-range.

26 : 0 to 5A

(9) Press the Mode key to move to averaging count setting.

(10) Set the number of averaging times using the Increment key.
1: Single (No averaging) (approx. 25 times/sec)
2: Twice averaging (approx. 12.5 times/sec)
4: Four-time averaging (approx. 6.25 times/sec)
8: Eight-time averaging (approx. 3.125 times/sec)
10: Ten-time averaging (approx. 2.5 times/sec)
20: Twenty-time averaging (approx. 1.25 times/sec)
40: Forty-time averaging (approx. 0.625 time/sec)
80: Eighty-time averaging (approx. 0.31 time/sec)
100: Hundred-time averaging (approx. 0.25 time/sec)
200: Two hundred-time averaging (approx. 0.13 time/sec)
* Press the Mode key to skip the setting of this item.

(11) Press the Mode key to move to moving averaging count setting.

(12) Set the number of moving averaging times using the Increment key.
OFF: No moving averaging 8: 8 times
2: Twice 16: 16 times
4: 4 times 32: 32 times
* Press the Mode key to skip the setting of this item.

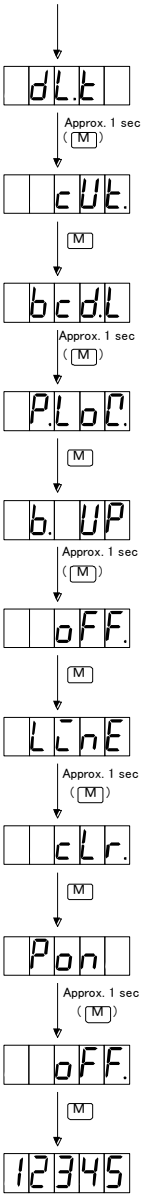
(13) Press the Mode key to move to step-wide setting.

(14) Set up step-wide using the Increment key.
1: Normal display
2: Only even numbers in the least significant digit
5: Only "0" or "5" in the least significant digit
0: Only "0" in the least significant digit
* Press the Mode key to skip the setting of this item.

(15) Press the Mode key to move to display blank setting.

(16) Set up display blank using the Increment key.
OFF: Normal brightness condition (brightest)
b-3: Bright
b-2: Slightly dim
b-1: Dim
ON: display lights off
* Press the Mode key to skip the setting of this item.

(17) Press the Mode key to move to digital limiter type setting.



(18) Set up digital limiter type using the Increment key.
CUT: Holds display indication at a digital limiter value.
OVER: Displays overrange if an input or display value exceeds the digital limiter range.
* Press the Mode key to skip the setting of this item.

(19) Press the Mode key to move to BCD output logic type setting. (*This parameter is displayed only for the units with BCD outputs.)

(20) Set up the BCD output type using the Increment key.
N.LOG: Negative logic
P.LOG: Positive logic
◎Since, as for logic, Opencollector serves as a standard, TTL becomes reverse.
* Press the Mode key to skip the setting of this item.

(21) Press the Mode key to move to digital zero value backup setting.

(22) Set up digital zero backup using the Increment key.
OFF: Discards a digital zero value when power is off.
ON: Stores a digital zero value when power is off.
* Press the Mode key to skip the setting of this item.

(23) Press the Mode key to move to linearize function setting. (This parameter is displayed only when the protect level is at PL0.)

(24) Set up the linearize function using the Increment key.
CLR: Initializes linearize data.
OFF: Disables the linearize function.
ON: Enables the linearize function.
* Press the Mode key to skip the setting of this item.

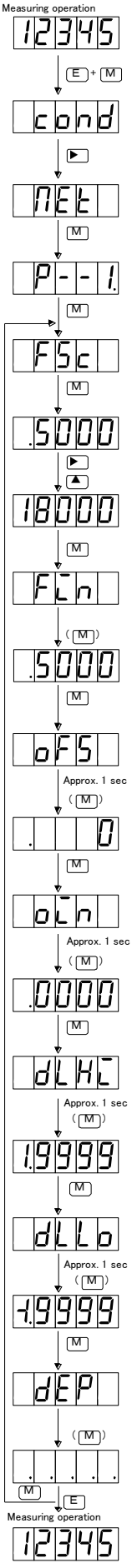
(25) Press the Mode key to move to power-on delay setting.

(26) Set up power-on delay using the Increment key.
OFF: No power-on delay
01 to 30: Set value × seconds
*Press the Mode key to skip the setting of this item.

(27) Press the Enter key to return to measurement operation (if you press the Mode key, the panelmeter returns to the setting menu).

4.7 Setting Scaling Data

Scaling data is a group of parameters relating to measurements such as scaling or decimal points.



(1) Press the Enter and Mode keys during measurement operation to enter the condition data setting mode.

(2) Press the Shift key to move to the scaling data setting mode.

(3) Press the Mode key to display the number of patterns to be set.

(4) Select the number of patterns (1-4) using the increment key.

(5) Press the Mode key to display full-scale display-value setting.

(6) Press the Mode key to enter the actual setup mode.

(7) Set up a display value provided at full-scale input, using the Shift and Increment keys.
(This setting example sets a full-scale display value to "18000.")
Shift key : Used to move to the setting digit.
Increment key : Used to set a numeric value.
* If you do not set a full-scale display value, press the Mode key to move to the next item.

(8) Press the Mode key to display full-scale input-value setting.

(9) Set up a full-scale input value using the Shift and Increment keys.
*Press the Mode key to skip the setting of this item.

(10)Press the Mode key to display offset display value setting.

(11) Set up a display value indicated at offset input using the Shift and Increment keys.
*Press the Mode key to skip the setting of this item.

(12) Press the Mode key to display offset input value setting.

(13) Set up an offset input value using the Shift and Increment keys.
*Press the Mode key to skip the setting of this item.

(14) Press the Mode key to display the digital limiter's high limit setting.

(15) Set up the digital limiter's high limit using the Shift and Increment keys.
*Press the Mode key to skip the setting of this item.

(16) Press the Mode key to display the digital limiter's low limit setting.

(17) Set up the digital limiter's low limit using the Shift and Increment keys.
*Press the Mode key to skip the setting of this item.

(18) Press the Mode key to display decimal-point setting.

(19) Using the Shift key, make the decimal point which of the digit is required to light to blink.
(If the all decimal points are not blinking, displays no decimal point in the operation mode.)
*Press the Mode key to skip the setting of this item.

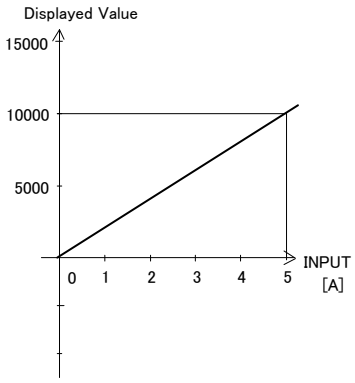
(20) Press the Enter key to return to measurement operation .
* If the Mode key is pressed, the panelmeter returns to display full-scale display-value setting.
If setting for other pattern numbers is required, press the Enter key to return to measurement operation and perform same procedures as above.

Example of setting scaling data:
Example of setting

INPUT voltage : 0 to 5A

Display : 0 to 10000

F S C :	10000
F I N :	5000
O F S :	0
O I N :	0
D L H I :	19999
D L L O :	−19999
D E P :	——

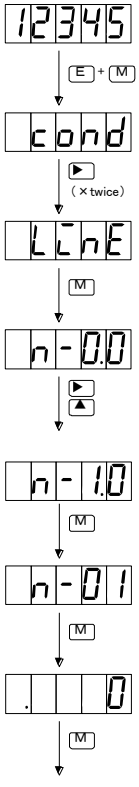


The digital limit function is a function for controlling display indication by concurrent use of digital limiter-type setting in the condition data and a digital limit set value in the scaling data.
If CUT is selected for the digital limiter type in the condition data, the display value is held at the limit value set in the scaling data as shown in example of setting 2 above. Moreover, selection of OVER for the digital limiter type causes O.L. or –O.L. to appear if an input is made that results in exceeding the limit value set in the scaling data.

4.8 Setting Linearize Data

Linearize data is a group of parameters relating to the function of correcting the linearity between input and display values. The linearize function corrects the linear relationship between input and display values at any point to change the inclination of the linearity. Linearize data is set using an input value (display value before correction) and output value (display value after correction) at any point.

To use the linearize function, carry out this linearize data setup first and then set the linearize function for activation in the condition data. The linearize function works only after that.



(1) Press the Enter and Mode keys during measurement operation to enter the condition data setting mode.

(2) Press the Shift key twice to move to the linearize data setting mode.

(3) Press the Mode key to display linearize point number setting.

(4)Set the number of linearize points using the Shift and Increment keys.

(This setting example sets the number of linearize points to "10.")

Shift key : Used to move to the setting digit.
Increment key : Used to set a numeric value.

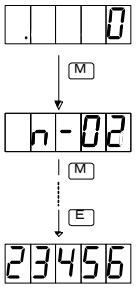
* You must set the number of linearize points; otherwise you cannot move to the next item.
To exit linearize setting, press the Mode key.

(5) Press the Mode key to display a linearize point.

(6) Press the Mode key to display input value setting with respect to the linearize point selected.
"RE" LED also blinks during setting of an input value.
* The input value is a display value for an input before executing linearization.

(7) Press the Mode key to display output value setting with respect to the linearize point.
"DZ" LED also blinks during setting of an output value.
* The output value is a display value for the input made after execution of linearization.

(8) Press the Mode key to display a next linearize point.



*The input value and output value are similarly setting.
Please set to be suitable for the following setting condition everything.

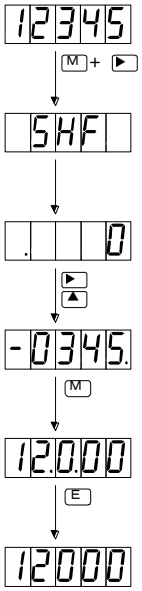
(9) Press the Enter key to return to measurement operations.
* After completion of setting, carry out linearize function setup in the condition data to activate this function for use.

* The setting conditions must be N−01 < N−02 ••• N−15 < N−16, and if these conditions are not met, ERR appears. If this happens, carry out the setting again. The number of linearize points is up to 16, but a value 17 to 19 is also displayed during setup. Note that if you set a value from 17 to 19, it is forced to set to 16.

5. Other Functions

5.1 Display Shift Function

The display shift function is a function for arbitrarily shifting only the indication without changing the inclination of an input signal.



(1) Press the Enter and Mode keys during measurement operation to enter the display shift setting mode.

(2) The panelmeter enters the shift numeric setting mode.

(3) Set the number of digits by which you wish to shift the display indication, using the Shift and Increment keys.
(This setting example sets a full−scale display value to "−345.")
Shift key: Used to move to the digit where you carry out the setting
Increment key : Used to set a numeric value
* The polarity is switched by incrementing the most significant digit.

(4) Check the computation results using the Mode key.
In this case, the decimal points of the 10^2 digit and 10^3 digit blink.

(5) Press the Enter key to return to measurement operation.
* To clear the display shift function, set "0."

5.2 Monitoring Mode

The A9000 series panelmeter can display the maximum value, minimum value, the difference between them (maximum value - minimum value), or input value in the main display. Pressing the Increment key with the Enter key held down causes the panelmeter to enter the display status in each mode. To switch to each mode, press the Shift key for approximately one second. This switches the display value in the order of the maximum value, minimum value, and the difference (maximum value -minimum value), and the input value. Moreover, pressing the Increment key for approximately one second allows you to clear the display value. Press the Enter key to return to the normal indication. (The next time you enter the monitoring mode, the mode you were in when you exited on the previous occasion is activated.)

Maximum value: The maximum value is displayed, blinking the decimal point of the 10^4 digit.

Minimum value: The minimum value is displayed, blinking the decimal point of the 10^0 digit.

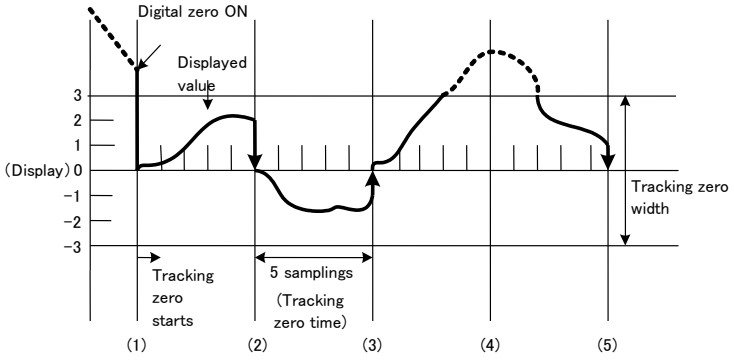
Maximum value − minimum value: The difference between the maximum and minimum values is displayed, blinking the decimal points of the 10^0 and 10^4 digits. If a display value exceeds the displayable range, the indication of the 10^3 digit becomes "?", lighting up its decimal point.

Input value: The input value is displayed, blinking the decimal points of the 10^0 and 10^1 digits. If a display value exceeds the displayable range, it displays O.L or −O.L.

5.2 Tracking Zero

The tracking zero is a function for automatically digitally correcting the movement of the zero point inside. This function starts to work at the instant the digital zero function is enabled. Correction is made according to the values set for the tracking zero time setting and tracking zero width setting in the condition data.

Example of setting: Tracking zero time setting 5 (Correction made every 5 averaging (sampling))
Tracking zero width setting 3(correction width of 3digits)



(1) Digital zero function is enabled. Displayed value becomes 0.
(2)(3) At 5th sampling time, because displayed value is under 3 digits, correction is performed and displayed value become "0".
(4) Because displayed value is over 3 digits, correction is not performed.
(5) Because displayed value is under 3 digits, correction is performed and displayed value become "0".

6. External Control Function

For those equipped with BCD outputs, there are the hold, digital zero and peak hold functions that can be external controlled.
The external control terminals are DC isolated from the power and input terminals.

6.1 Hold Function

The hold function is a function for stopping refreshing indication at an arbitrary timing. It is activated by shorting the HOLD terminal to the COM terminal or bringing its potential to the "0" level.

6.2 Digital Zero Function

The digital zero function is a function for resetting indication to zero at an arbitrary timing and then displaying a range of variations from that point onward. ON/OFF of the digital zero function can be controlled either by the terminal control or by using keys on the front panel.
For terminal control, this function is activated by shorting the DZ terminal to the COM terminal or bringing its potential to the "0" level.
For control using front-panel keys, it can be activated by pressing the Increment key with the Mode key held down. Taking the same step again causes this function to be deactivated.
* For operation using the control terminals or the front panel keys, terminal control has precedence over front-panel key operation.

6.3 Peak Hold Function

The peak hold function is a function for holding the maximum value (Peak Hold), the minimum value (Valley Hold), and the difference between them (Peak Valley Hold). Switching between these holding functions is achieved using condition data. The peak hold function is activated by shorting the P/H terminal to the COM terminal or bringing its potential to the "0" level.

6.4 Pattern Select Function

Pattern select function is a function selects one scaling data pattern from pattern 1to 4.
A pattern is selected by the conditions of P.SEL0 and P.SEL1 terminals as shown below:

Selected Pattern	P.SEL1	P.SEL0
Pattern No.1	Open / "1" level	Open / "1" level
Pattern No.2	Open / "1" level	Short with COM / "0" level
Pattern No.3	Short with COM / "0" level	Open / "1" level
Pattern No.4	Short with COM / "0" level	Short with COM / "0" level

* Only one pattern is required, leave P.SEL0 and P.SEL1 open and use pattern No.1.

6.5 Control Terminal Signal Level

Signal levels of all control terminals are as shown below :
"0" level : 0-1.5V "1" level :3.5-5V
(Input current: -0.5mA)
* Control terminals are isolated from the power input and signal inputs .

7. Specifications

■Input Specifications

●AC large Current measurements 23℃±5℃,35 to 85%

Range	Measurement range	Display	Accuracy	Input impedance	Maximum Permissible Input
26	5A	Offset ±19999 Full scale ±19999	±(0.5% of rdg + 20digit)	CT	8A

Mesurement method : True rms value calculation.
Response speed : Approx.1 second(10% to 90% Indication value)
Frequency range : 50Hz /60Hz

■Common specifications

A/D conversion : ⊿Σ conversion method
Input circuit : Single-ended
Setting sampling rate : 25times/sec (max)
Overrange warning : For an input signal exceeding the display range, displays O.L.or -O.L..
Main display : 7-segment LED (color: red, character height : 14.2mm)
Display range : -19999 ～ 19999
Zero indication : Leading zero suppression
Inner EEPROM endurance : 1,000,000 cycles *1
Operating temperature and humidity ranges : 0 to 50℃, 35 to 85 %RH (no condensation)
Storage temperature and humidity ranges : -10 to 70℃, 60%RH or less
External dimensions : 96mm(W) × 48mm(H) × 75mm(D)
Weight : 160g (TYP) (AC power) / 150g (TYP) (DC power)
Dielectric strength : AC1500V for 1minute between the power terminals and each of the input, BCD outputs and the external control (AC power).
DC500V for 1minute between the power terminals and each of the input, BCD outputs and the external control (DC power).
DC500V for 1minute between the input and each of BCD outputs and the external control.
AC1500V for 1minute between the casing and each terminal..
Insulation resistance : 100MΩ or more at 500VDC between the above-noted terminals,

(*1)A writing to the internal EEPROM is performed, when the parameter setting is done and when the DZ(digital zero)input turns from OFF to ON if the digital zero backup is enabled. Please note that the number of the writing exceeds the endurance.

■Power specifications

●AC power (A9116-0□)
Voltage range : AC100 to 240V ±10%
Power consumption : 4.5VA (MAX)
●DC power (A9316-0□)
Voltage range : DC5V -5% to 12V +10%
Power consumption : 1.5W (MAX)
●DC power (A9416-0□)
Voltage range : DC12 to 24V ±10%
Power consumption : 1.7W (MAX)

■ External control

Hold : Activated by shorting the HOLD terminal to the COM terminal or bringing the potential of the HOLD terminal to "0" level.
Digital Zero : Activated by shorting the DZ terminal to the COM terminal or bringing the potential of the DZ terminal to "0" level.
Peak hold : Activated by shorting the PH terminal to the COM terminal or bringing the potential of the PH terminal to "0" level.
Pattern select : One of scaling data patterns is selected by a combination of shorting or opening P.SEL0and P.SEL1terminals to the COM terminal
* "0" level : 0 to 1.5V with respect to COM terminal. "1" level :3.5 to 5V with respect to COM terminal.

■Option Specifications

●BCD Outputs
◎TTL output(A9□16-02)
Measured data : Tri-state parallel BCD
Polarity signal : 1 level for negative indication
Overrange signal : 1 level for overrange indication
Printout command signal : Positive pulse output after the completion of measurement
Output logic : Switchable (PC logic not switchable)
Output signal : TTL level fan-out = 2, CMOS compatible
◎Open collector output (NPN type) (A9□16-03)
Measured data : Negative logic. (Transistor ON when is logic 1)
Polarity signal : Transistor ON for negative indication
Overrange signal : Transistor ON for overrange indication
Printout command signal : Transistor ON after the completion of measurement
Output logic : Switchable (PC logic not switchable)
Transistor output capacity : Voltage 30 V DC max., Current 10 mA max. Output saturation voltage 1.2 V or less at 10 mA

●Enable function : By connecting the ENABLE terminal to COM terminal or bringing the potential of the ENABLE terminal to"0" level, BCD outputs become High impedance (TTL output) / transistors turn off (Open collector output)
* "0" level : 0 to 1.5V with respect to COM terminal, "1" level : 3.5 to 5V with respect to COM terminal

8. List of Paremeters

8.1 Condition data

Menu	Parameter	Default value	Protect level (*1)	Settable Selections / Ranges	Function / Remarks
P.L	Protect Level	PL0	———	PL0/PL1/PL2/PL3	Selects the protect level for preventing incorrect operation. The higher the protect level, the more limitations are imposed on a set parameter.
PVH	PH select	PH	PL0	PH/VH/PVH	Selects the type (peak hold, valley hold, or peak-valley hold) that is activated when the PH function is enabled.
RANG	Input Range	26	PL1	26	The input range cannot be selected.
AVG	Averaging times	1	PL1	1/2/4/8/10/20/40/80/100/200	Selects the number of averaging times (setting sampling rate). By setting as the number of averaging times of inner sampling of 25 times/sec (40 ms), the panelmeter practically uses the average as input and acts with the period of "AVG × 40ms". Display of main display and output of BCD are also synchronized with this setting sampling. *See "10. Timing chart" for relationship the averaging times and setting sampling.
MAV	Moving averaging times	OFF	PL0	OFF/2/4/8/16/32	Selects the number of moving averaging times. (Lower filtering effect OFF⇔2⇔4⇔8⇔16⇔32 Higher filtering effect)
S.WD	Step wide	1	PL0	1/2/5/0	Selects the resolution of the least significant digit. (When it is set to "5", the least significant digit indicates only "0" or "5".)
BLNK	Display blank level	OFF	PL0	OFF/B-3/B-2/B-1/ON	Selects display brightness. (Bright OFF⇔b-3⇔b-2⇔b-1⇔ON Extinguished)
DL.T	Digital limitter type	CUT	PL0	CUT/OVER	Selects display in case of overrange. When CUT is selected, the set value of DLHI/DLLO is displayed; when OVER is selected, O.L/-O.L is displayed.
BCD.L	BCD output logic	N.LOG	PL1	N.LOG/P.LOG	Selects the BCD output logic (N: negative logic, P: positive logic). * Only when BCD outputs are provided.
B. UP	DZ backup	OFF	PL0	OFF/ON	Selects whether to backup the digital zero value when power is dicconnected.
LINE	Linearize	CLR	PL0	CLR/OFF/ON	Selects the enable (ON) /disable (OFF) of the linearize function and data clear (CLR).
PON	Power on delay	OFF	PL0	OFF, 1～30	Sets the time (set point x 1 sec.) taken from when the power is turned on to the instant when measurement is actually started.

8.2 Scaling data

Menu	Parameter	Default value	Protect level	Settable Selections / Ranges	Function / Remarks
FSC	Full-scale display value	5000	PL1	-19999 ～ 19999	Sets the relationship between an input signal and display value. *See, "Example of setting scaling data" in the section"4.7 Setting Scaling Data" *In the case of AC input, please use it by "+"setting by all means. It is not displayed normally when I use it by "-" setting.
FIN	Full-scale input value	5000	PL1	-5000 ～ 5000	
OFS	Offset display value	0	PL1	-19999 ～ 19999	
OIN	Offset input value	0	PL1	-5000 ～ 5000	
DLHI	Digital limiter High	19999	PL1	-19999 ～ 19999	Sets higher limit of displayable range. For higher input over this setting, indications are not refreshed and kept the setting value.
DLLO	Digital limiter Low	-19999	PL1	-19999 ～ 19999	Sets lower limit of displayable range. For lower input below this setting, indications are not refreshed and kept the setting value.
DEP	Decimal point	. . . . .	PL1	(Arbitrarily settable at each digit)	Sets the display position of decimal-point. If ". . . . . " is set, no decimal-point is displayed.

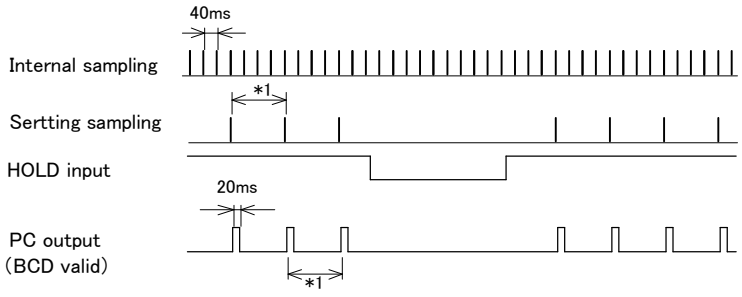
(*1) When setting value of "P.L" is "0", all parameters of PL0 to PL3 can be displayed and set.
When setting value of "P.L" is "1", parameters of PL0 can not be displayed and parameters of PL1 to PL3 can be displayed and set.
When setting value of "P.L" is "2", parameters of PL0 or PL1 can not be displayed and parameters of PL2 or PL3 can be displayed and set.
When setting value of "P.L" is "3", parameters of PL0 to PL2 can not be displayed and parameters of PL3 can be displayed and set.

(*2) Because all parameters in the scaling data is PL1, when setting value of "P.L" is 2 or 3, scaling data setting mode can not be entered.
(i.e. "NET" is never displayed when "P.L" is set to 2 or 3.)

9. Error Messages

Error Display	Description	Recovery Procedure
(O.L.) (−O.L.)	An input or displayed value is out of the measurement range	Use the panelmeter within the specified measurement and display ranges.
(WAIT)	Waiting for a displayed data's becoming valid	After power−on, this message is displayed while a displayed data is not available until first setting sampling time. Check if Averaging times (AVG) is not set too many.
(DAT)	Internal memory error	Turn the power on again. If the panelmeter doe's not recover, contact your sales representative or our sales office directly. * Display of 10^0 digit varys according to error details.
(C.O.N.D.)	Condition data error	Set condition data again. * Modify 1 or more paremeters in the data and cycle through all of other parameters.
(N.E.T. .)	Scaling data error	Set scaling data again. * Modify 1 or more paremeters in the data and cycle through all of other parameters.
(L.I.N.E.)	Linearize data error	Set linearize data again. * Modify 1 or more paremeters in the data and cycle through all of other parameters.
(S.H.F.T.)	Shift data error	Set linearize data again.
(D. .Z. .)	Digital zero back up error	Write the Digital Zero value.

10. Timing Chart



*1) Setting sampling period

AVG setting	Setting sampling rate	Setting sampling period	AVG setting	Setting sampling rate	Setting sampling period
1	25 times/sec	40ms	20	1.25 times/sec	800ms
2	12.5 times/sec	80ms	40	0.625 times/sec	1.6s
4	6.25 times/sec	160ms	80	0.3125 times/sec	3.2s
8	3.125 times/sec	320ms	100	0.25 times/sec	4s
10	2.5 times/sec	400ms	200	0.125 times/sec	8s

11. Warranty and After-Sales Service

11.1 Warranty

The warranty lasts for one year from the date of delivery. If this product fails during this period and the reason is considered to be clearly.

The manufacturer warrants to the original retail customer its A9000 series digital panelmeter 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.

11.2 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 http://www.watanabe-electric.co.jp/en/

(ED-34690L)