DIGITAL PANEL METER
MODEL AP-540 Series
INSTRUCTION MANUAL

Caution

(1) The application of voltage or current exceeding its maximum allowable value to the input terminals may result in instrument damage.

(2) The supply of power out of its allowable range may cause fire, electric shock or instrument failure.

(3) The content of this manual may subject to change without prior notice for product improvement.

(4) The manual is carefully prepared. However, if any question arises, or any mistake, omission or suggestion is found in the content of this manual, contact your nearest our sales agent.

(5) After read this manual, please keep it as anytime can see.

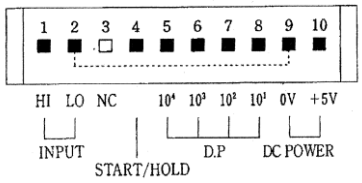
Thank you for purchasing the Model AP-540 Series digital panel meter. Prior to operation, please check that the meter has not been damaged during transportation and also there are no discrepancy between your and our specifications of this meter. Make this manual available to the operator of this meter.

1. Before Operation

■Connector connection

Connect the attached connector to the rear of this meter. As this connector fully contacts only in one direction, do not connect it in the reverse direction.

■Connector connection diagram



Note: LO(NO.2 terminal) and 0V(No.9 terminal) are internally connected.(Non-insulated type)

1,2 : Input terminals
Connect input signal (DC voltage) to these terminals.

3 : NC terminal
This is a vacant terminal. However, do not use it as a junction terminal.

4 : START/HOLD terminal
If this terminal is shorted with the 0V power terminal (NO.9 terminal), the displayed value just after these terminals are shorted is held.

5,6,7,8 : Decimal point setting terminals
If any one of these terminals is shorted with the 0V power terminal (No.9 terminal), the decimal point can be set to the relevant position.

9,10 : Power supply terminals
Connect power (5V DC ±5%) for this meter to these terminals.

■Connecting power to power supply terminals

Connect power to 0V(terminal 9) and +5V(terminal 10)of the connector.

As this meter is not provided with a power supply switch, the meter is ready to operate just when the power is connected to this meter. In addition, this meter is not internally provided with a power fuse. If it is necessary to install a power fuse for safety, externally install it with a rated current of 0.2A.

■Connecting input signal to input terminals

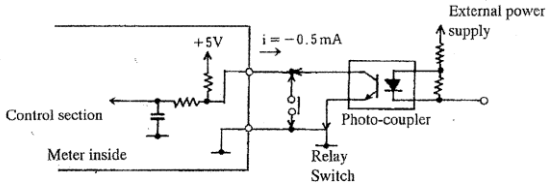
Connect input signal to terminal HI(terminal 1) and LO(terminal 2) of the meter. Shorten input signal wires as much as possible and separate them from other signal wires. If these wires pass through a location with much external noise, use a shielded 2-conductor cable for input signal and connect the shield to the LO(terminal 2) side of the signal source at one point.

2. Functions

2-1 START/HOLD

If the START/HOLD terminal (terminal 4) is shorted with the 0V power terminal (terminal 9) or is set to level "0", the measured value just after these terminals are shorted is held. In addition, measurement is started by opening these terminals (positive pulse of +5V for more than 1ms starting from 0V or contact signal) or by setting the START/HOLD terminal to level "1" at the necessary timing. The minimum time required for one measurement is approx. 400ms. As the LO input terminal (terminal 2) is internally connected with the 0V power terminal (terminal 9) and is not isolated from the 0V power terminal, perform control as much as possible by using mechanical contact signal such as relay or switch. If control is performed by using TTL or transistors, add such an external circuit as shown in Fig.1.

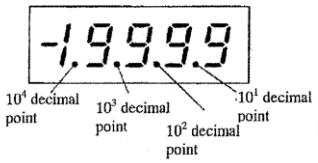
Level "0" : 0 to 1.5V
Level "1" : 3.5 to 5V
Input current : -0.5mA



[Fig. 1]

2-2 Setting position of decimal point

The decimal point can be set to any position by shorting the terminals shown in Fig.2.

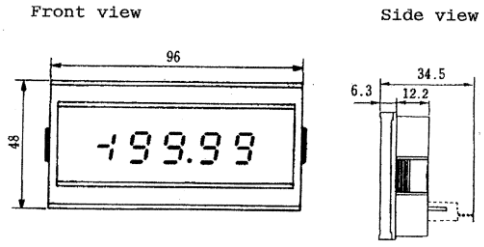


Decimal point to be lit	Connector terminal Nos. to be shorted
10^1	8 - 9
10^2	7 - 9
10^3	6 - 9
10^4	5 - 9

[Fig. 2]

3. Dimensions and mounting

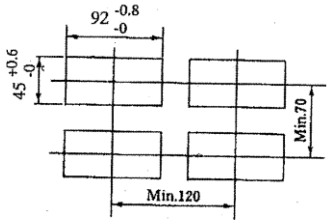
■Dimensions



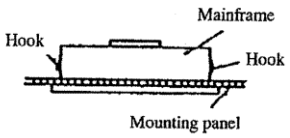
■Mounting

3-1 Mounting on panel

Make the panel cutout as shown in the following, then insert the meter in the panel cutout from the front of the panel.



[Fig. 3] Panel cutout dimensions



[Fig. 4]

・Recommended panel thickness:0.8 to 3.2mm.
・Do not mount the meter where:
  ・It is exposed to the direct sunshine.
  ・ambient temperature is not between 0 to 50℃.
  ・relative humidity is not between 35 to 85%RH.
  ・temperature changes are rapid and dew may condense.
  ・there are chemicals or corrosive gases harmful to electrical components, or dust, or
  ・it is exposed to shock or vibration.

3-2 Removing the meter from panel surface

Push the meter toward the panel surface from the back while pushing the hooks on the case in the meter. (See Fig.4.)

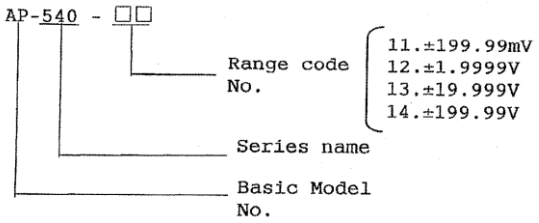
4.Specifications

■DC voltage measurement

Model & range code	Measuring range	Highest resolution	Input impedance	Max. allowable input voltage
AP-540-11	±199.99mV	10μV	100MΩ	±100V
AP-540-12	±1.9999V	100μV	100MΩ	±100V
AP-540-13	±19.999V	1mV	1MΩ	±250V
AP-540-14	±199.99V	10mV	1MΩ	±500V

Accuracy:±(0.03% of rdg +1digit)(23℃±5℃,35 to 85%RH)

■Model No. configuration



■Common specifications

Measurement function	: DC voltage measurement
Operation method	: Double integral
Input circuit	: Single ended tupe
Input bias current	: 100pA(TYP)
Sampling speed	: Approx. 2.5 time/sec
Noise rejection ratio	: NMR, More than 50dB(50/60Hz)
Maximum display	: 19999
Overrange warning	: " 0000" flashes for input signal exceeding the maximum display.
Display	: LED(Light emitting diode, numeric elements) Character height, 14.2mm (red)
Polarity display	: " −" is automatically displayed for negative input signal.
External control	: HOLD : The START/HOLD terminal shorted with the 0V power terminal, or set to level" 0". START : The START/HOLD terminal (terminal 4)opened from the 0V power terminal(terminal 9)or set to level " 1".
Decimal point	: Can be freely set to any position.
Operating temperature/humidity range	: 0 to 50℃/ 35 to 85%RH(No dew-condensing)
Power supply	: 5V DC±5% If the APS-250 or APS-300-1 special power unit is used, 100V AC or 200V AC can also used.
Consuming current	: 75mA(TYP)
Dimensions	: 96(W)×48(H)×34.5(D)mm DIN size
Weight	: Approx60g
Dielectric strength	: Between the input terminal LO(terminal 2) and case- For 1 min. at 1500V AC
Insulation resistance	: Between the above terminal and case- More than 100MΩ at 500V DC
Accessories	: Connector 1 pc. Instruction manual 1 copy

5.Cautions for maintenance

Store the meter at a storage temperature of -10 to 70℃ and a humidity or less than 60% RH. If the meter is used especially at a dusty location occasionally pull the meter out of the case by referring to item 3-2), then remove dust accumulated on the internal assembly.
(A rise in temperatures of the internal parts may shorten a meter service life.)

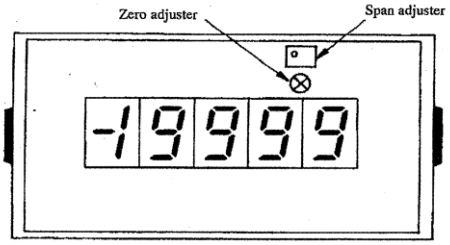
As the case and panel are molded from plastics, do not remove dust accumulated on them using a volatile liquid such as thinner.

6.Calibration

In order to assure the initial accuracy for a long period of time, it is recommended that the meter be periodically calibrated. When calibrating the meter, standard calibration equipment with an accuracy of 0.01% or more is required.

◎Calibrate the meter according to the following steps.

(1)Remove the front panel of this meter.
(2)Connect the power to warm up the meter for more than 20 minutes, then start adjusting the meter.
(3)Zero adjustment
Short the input terminals HI(terminal 1) and LO(terminal 2) then turn the zero adjuster until the display shows 0000.



7.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 indicator to be free of defects in material and workmanship for use under normal care and will repair or replace any.

8.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
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