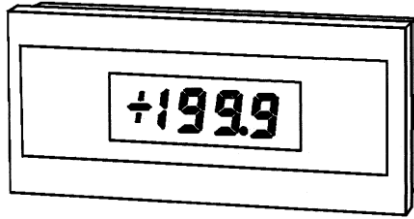


# INSTRUCTION MANUAL DIGITAL PANEL METER MODEL AL-501A Series



## 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.

## 1. Outline

The AL-501A Series digital panel meter is an extremely thin 3-1/2-digit liquid crystal display process monitoring meter with a standardized signal input of 4 to 20mA DC. No power supply is required.

A 12.7mm high LCD display with a maximum display of 1999 digits is used.

The meter is provided with offset and span adjustments which enable the input signal to be display in terms of its physical and chemical parameters. In addition, it uses screwed terminals to facilitate wiring.

## 2. Specifications

Model	Measuring range	Display	Max. allowable input current
AL-501A	4 to 20mA	Offset $\pm 200$ Fullscale 100 to 1999	$\pm 50\text{mA}$

Accuracy:  $\pm 0.1\%$  of FS +1digit (at  $23^\circ\text{C} \pm 5^\circ\text{C}$  35 to 85% RH)

Measuring function	: DC current measurement
Operation method	: Dual slope integration
Maximum number of display digits	: 1999
Temp. Coefficient	: Offset $\pm 0.3\text{digit}/^\circ\text{C}$ (Max.) Fullscale $\pm 0.3\text{digit}/^\circ\text{C}$ (Max.)
Sampling speed	: Approx. 2.5 times/sec.
Normal Mode Rejection	: NMR40dB (TYP)
OVERRANGES display	: When a signal exceeding the most significant digit is input; Displays the most significant digit +1 and numbers corresponding to lower 3 digits disappear.
Variable fullscale digits	: 100 to 1999
Variable offset digits	: $\pm 200$
Voltage drop	: 2.2V (at 20mA) Typical (110 $\Omega$ ) 1.9V (at 4mA) Typical (475 $\Omega$ ) 2.8V (at 50mA) Typical (56 $\Omega$ )
Display	: LCD (liquid crystal) display element 3-1/2-digit Character height: 12.7mm Character width: 7mm
Polarity	: Automatically displays minus when the computed result becomes negative.
External control	: A decimal point is settable to any digit position.
Operating temperature	: 0 to $50^\circ\text{C}$ , 35 to 85%RH (Non-Condensation)
Power supply	: Operated by input current
Dimensions	: 96mm (W) $\times$ 48mm (H) $\times$ 24mm (D)

Weight	: Approx 55g
Accessory	: Instruction Manual, Terminal cover
Dielectric strength	: 500V DC for 1 minute between input terminal (LO) and grounding terminal 1500V DC for 1 minute between input terminal (LO) and casing.
Conformity standard	: EN61326-1 EN IEC 63000

## 3. Handling

### 3-1 Preparation Prior to Operation and General Precautions

- 1) Use this meter only where ambient temperature is 0 to  $50^\circ\text{C}$  and humidity is less than 85%, and pay special attention to dew condensation.
- 2) Use the meter only in absence of dust, chemicals and gases harmful to electronic parts.
- 3) Do not subject the meter to shock or vibration.
- 4) Do not detach the acrylic plate from the faceplate.

### 3-2 Mounting

#### 1) Panel mounting

Make a rectangular cutout as shown in Fig.1, insert the instrument in the panel as shown in Fig.2, and then fully push the instrument into panel.

(It is recommended that panel thickness be from 1.0 to 3.2mm.)

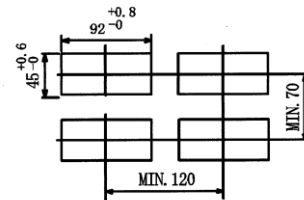


Fig. 1

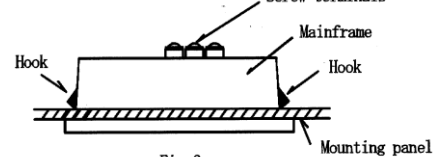


Fig. 2

#### 2) Removal of the instrument from panel

Pull out the instrument toward the panel front while pushing the hooks in the instrument case with the thumb and the middle finger.

### 3-3 Terminal connection

Connect the input signal (4 to 20mA) to the screw terminals HI and LO. When induction noise exists, ground the grounding terminal (Fig3).

### 3-4 Decimal-point setting

The position of the decimal point indication can be changed by changing the position of the socket onto difference stud pins shown in Fig. 3.

Therefore, change the position of the socket so as to meet your requirement. If the decimal point need not be lit, set the socket at the position shown in Fig.4.

Prior to factory shipment, it is set to the position of  $10^1$ -digit.

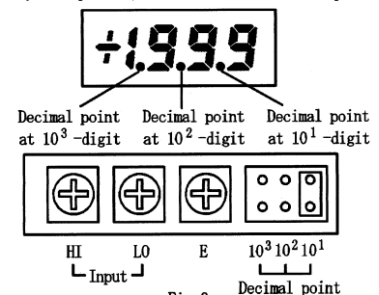


Fig. 3

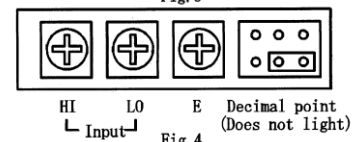


Fig. 4

### 3-5 Usage

Usually, this instrument displays 000 at the input current of 4mA and the fullscale of 1999 at 20mA.

### 3-6 Scaling function

Any display scaling becomes possible through offset and fullscale adjustment of input current.

#### 1) Offset adjustment (zero adjustment)

Offset may vary by turning the adjustment variable resistor (VR2) at the input current of 4mA.

Variable offset digits:  $\pm 200$

#### 2) Fullscale adjustment (Span)

Fullscale may vary by turning the adjustment variable resistor (VR3) at the input current of 20mA.

Variable fullscale digits: 100 to 1999

## 4. Maintenance and Inspection

### 4-1 Caution for maintenance

The storage temperature of this instrument should be within the range of  $-10^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  with relative humidity not higher than 60%. If the instrument is used at a dusty location, with-draw the meter assembly from the case at certain intervals of time and brush off dust. (The combination of dust and high temperature will shorten the life of meter parts.)

As the instrument case and bezel are molded plastic, do not use a volatile liquid such as thinner to clean them.

### 4-2 Calibration

- To maintain the initial accuracy of this instrument over an extended period, it is recommended that it be calibrated periodically by a standard reference device with an accuracy of 0.01%. None that calibration must be done in the following ambient conditions.

Temperature:  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$

Humidity: 35 to 85%RH

- Calibrate the meter by taking the following steps.

(1) Detach the front bezel.

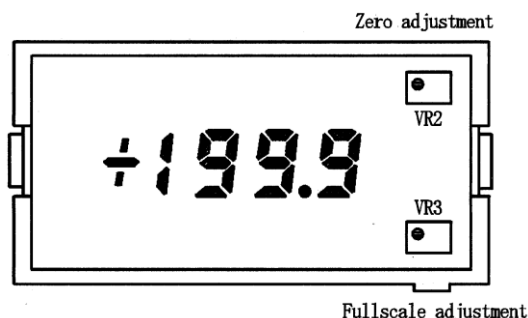
(2) Connect the power supply and after running for at least 20 minutes, start adjusting the instrument as instructed below.

(3) Zero adjustment

Apply the DC current of 4mA to input terminals HI and LO and turn the zero adjustment VR2 to display  $\pm 000$ .

(4) Span adjustment

Apply the DC current of 19.6mA to input terminals HI and LO and turn fullscale adjustment VR3 to display 1950.



## 5. Warranty

The term of warranty is 1(one) year from the date of delivery. During the warranty period, any trouble caused by our side will be repaired free of charge.

## 6. After-sale service

This instrument was carefully manufactured, inspected and tested before shipment. However, if it does not operate properly, please contact the agent from which you bought it, briefly stating the trouble you are having.

**watanabe**

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