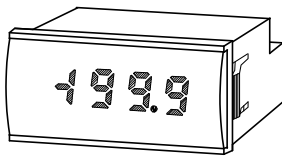


# Digital Panel Meter

## Model A2100 Series Operation Manual



### CAUTIONS

- (1) Applying a voltage or current exceeding the maximum allowable value to the input section may damage the instrument.
- (2) Please note that the information contained in this manual is subject to change without notice due to product improvements.
- (3) Every effort has been made to ensure accuracy in the presentation of this manual. Should any errors or omissions come to your attention, or should you have any questions, however, please contact your sales representative or our sales office directly.
- (4) After reading this manual, keep it nearby so that you can refer to it as needed.
- (5) In order to prevent damage by static electricity, before changing the decimal point position, touch a metal existing around you with the hand to discharge static electricity charged on your body.

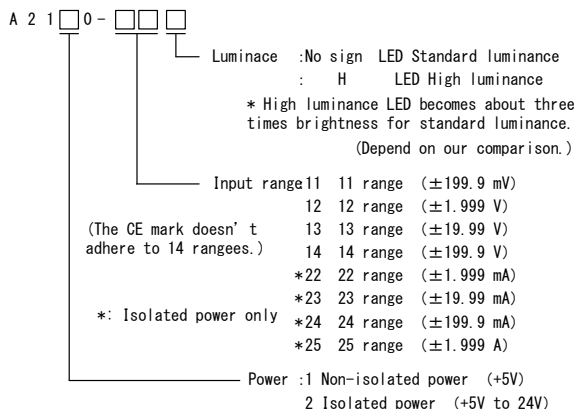
### 1 Check before Use

Thank you for purchasing our A2100 series. When you receive the product, make sure that you have all the parts and that none have been damaged during transportation. If any part is damaged or missing, contact your sales representative or our sales office directly.

### 2 Overview

The A2100 series digital power meter is a compact 3 1/2-digit indicating meter that meets DIN standards for external dimensions. Power is +5 V to 24 V DC for the isolated type, or +5 V DC for the non-isolated type. The maximum indication is  $\pm 1999$ .

#### 2.1 Type Configuration



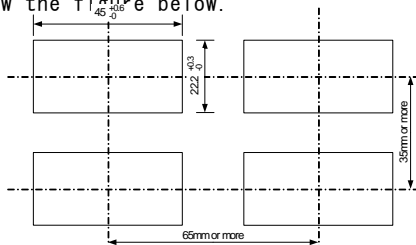
#### 2.2 Checking the Accessories

The A2100 series comes with an Operation Manual (1 copy). Should you have any questions about the manual, please contact your sales representative or our sales office directly.

#### 2.3 Mounting Method

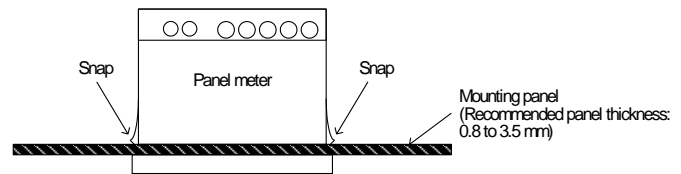
##### 2.3.1 Panel Cutout Dimensions

For the panel cutout when mounting the A2100 series panel meter, follow the figure below.



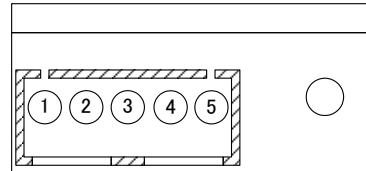
##### 2.3.2 Panel Mounting Method

To mount the A2100 series panel meter onto a panel, press the snaps on the sides of the case and fit the meter onto the panel from the front (see figure below).



#### 2.4 Description of Terminals

##### 2.4.1 Terminal Connection Diagram

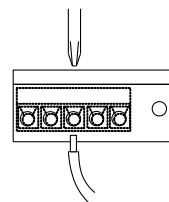


Terminal No.	Name	Description
1	HI	+ side of input signal
2	LO	- side of input signal
3	HOLD	External control terminal
4	0V	- side of power terminal
5	+V	+ side of power terminal

Isolated power type: LO and 0 V are not internally connected.  
Non-isolated power type: LO and 0 V are internally connected.

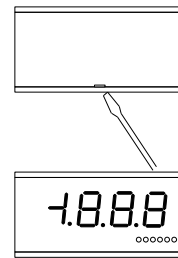
##### 2.4.2 Connection Method

### 3 Decimal-point Setting Method



The connection terminal of the A2100 series panel meter's terminals is located inside the case. When connecting a wire, insert it into the case from the rear of the meter and fasten it with a screw using a Phillips screwdriver from the top of the rear of the case.

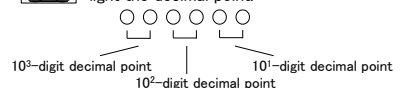
Appropriate leads: 16 to 22 AWG  
Recommended covering stripping size: 6 to 7 mm



Insert a flat-blade screwdriver or the like into the small hole in the lower part of the front panel acrylic section and pry the front panel out.

When putting the front panel back into the instrument, fit in the lugs in the upper part of the acrylic section first.

The stud pin at the lower right is a decimal-point switch. Short the short-circuit sockets concerned to light the decimal point.



### 4 Calibration Method

To calibrate this panel meter, a voltage/current generator with an accuracy of  $\pm 0.01\%$  or higher is required. Calibrate it using the following procedure under ambient conditions of  $23^\circ\text{C} \pm 5^\circ\text{C}$  and 35 to 85% R.H.

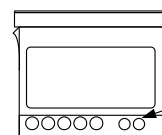
(1) Connect power to the meter and run it for more than 20 minutes.

(2) Conduct a full-scale adjustment

Apply a voltage or current equivalent to a full scale of 1990 to the input section and turn the full-scale volume knob (figure below) so that the reading shows "1990." Then apply voltage or current of the negative polarity to check that the reading shows " $-1990 \pm (0.1\% \text{ of FS})$ ."

#### CAUTION

Be sure to turn off the panelmeter before changing the decimal point position.



Full-scale volume knob

## 5 Specifications

### 5.1 Input Specifications

#### DC voltage measurement

Range	Measurement Range	Maximum Resolution	Input Impedance	Maximum Allowable Input
11	$\pm 199.9\text{mV}$	$100\text{ }\mu\text{V}$	$100\text{ M}\Omega$ or more	$\pm 50\text{V}$
12	$\pm 1.999\text{V}$	$1\text{mV}$	$100\text{ M}\Omega$ or more	$\pm 50\text{V}$
13	$\pm 19.99\text{V}$	$10\text{mV}$	Approx. $1\text{ M}\Omega$	$\pm 120\text{V}$
14	$\pm 199.9\text{V}$	$100\text{mV}$	Approx. $1\text{ M}\Omega$	$\pm 250\text{V}$

Accuracy:  $\pm (0.1\% \text{ of FS})$  (at  $23^\circ\text{C} \pm 5^\circ\text{C}$ , 35 to 85% R.H)

#### DC current measurement

Range	Measurement Range	Maximum Resolution	Input Impedance	Maximum Allowable Input
22	$\pm 1.999\text{mA}$	$1\text{ }\mu\text{A}$	Approx. $100\text{ }\Omega$	$\pm 50\text{mA}$
23	$\pm 19.99\text{mA}$	$10\text{ }\mu\text{A}$	Approx. $10\text{ }\Omega$	$\pm 150\text{mA}$
24	$\pm 199.9\text{mA}$	$100\text{ }\mu\text{A}$	Approx. $1\text{ }\Omega$	$\pm 500\text{mA}$
25	$\pm 1.999\text{A}$	$1\text{mA}$	Approx. $0.1\text{ }\Omega$	$\pm 3\text{A}$

Accuracy:  $\pm (0.2\% \text{ of FS})$  (at  $23^\circ\text{C} \pm 5^\circ\text{C}$ , 35 to 85% R.H)

### 5.2 Power Specifications

#### ●Non-isolated type

Supply voltage:  $5\text{ V DC} \pm 5\%$

Current consumption: Approx.  $60\text{ mA}$

#### ●Isolated type

Supply voltage:  $4.75\text{ to }26.4\text{ V DC}$

Current consumption:  $5\text{V}$ : Approx.  $80\text{ mA}$

$12\text{V}$ : Approx.  $50\text{ mA}$

$24\text{V}$ : Approx.  $30\text{ mA}$

### 5.3 General Specifications

Measuring function : DC voltage or DC current measurement

Operation method : Double integration method

Input circuit : Single-ended type

Sampling rate : Approx. 2.5 times/second

Maximum display : 1999

Overrange warning : Flashing of 000 or -000 if an input signal exceeding the measurement range is input

Indication : Red 7-segment LED indication  
Character height Approx.  $10\text{ mm}$

Polarity indication: If the calculation result is a negative value, the “-” symbol is automatically indicated.

Decimal point : Settable at any position using front-panel short-circuit sockets

External control : Hold (shorted with the input L0 terminal)

Operating temperature:  $0\text{ to }50^\circ\text{C}$ , 35 to 85% R.H  
(no condensation)

and humidity ranges

Storage temperature:  $-10\text{ to }+70^\circ\text{C}$ , 60% R.H or less

and humidity ranges (no condensation)

External dimensions:  $48\text{ mm (W)} \times 24\text{ mm (H)} \times 40.0\text{ mm (D)}$

Weight : Approx.  $40\text{ g}$

Withstand voltage : Power to input terminals  $500\text{VDC}$  for  $1\text{ minute}$

(Isolated type only)

Case to each terminal  $1500\text{VAC}$  for  $1\text{ minute}$

Insulation resistance: Power to input terminals  $500\text{VDC}$  at  $1\text{ M}\Omega$  or more (Isolated type only)

Compliance standard: EN61326-1

(\*14 range is outside application)

/EMI : Class A

/EMS : Controlled EM environments

EN IEC 63000

Rated altitude : Up to  $2000\text{m}$

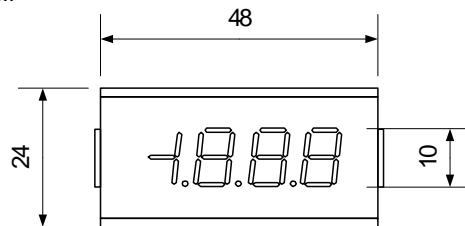
Degree of contamination: 2

Protective structure: IP40 or equivalent

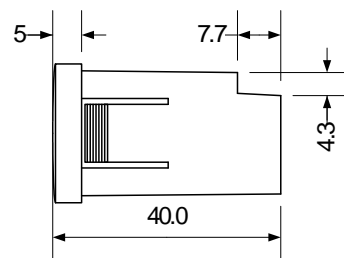
\* When using this product in combination with other products, customers themselves need to ensure compliance with applicable standards, laws, and regulation.

## 6 External Dimensions

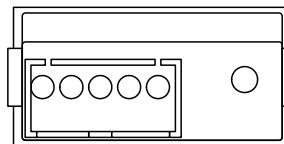
Front View



Side View



Rear View



## 7 Warranty and After-sales Service

### 7.1 Warranty

The warranty period of the product is one year from the date of delivery. If a failure occurs during this period that is clearly judged to be caused by a defect ascribable to Watanabe Electric Industry, we will repair the failure or replace any defective parts free of charge.

### 7.2 After-sales Service

The product has been manufactured, tested, and inspected with strict quality control management before shipment. Should the product break down, contact (send it to) your sales representative or our sales office directly. (In this case, write a detailed description of the problem and enclose it with the product.)

Before use, ensure the safety of equipment and devices. When using this product under conditions of in an environment not mentioned in this document, or when considering using this product for applications that may have great impact on human life properties, therefore, requiring specially safety, for example, nuclear energy control, railway, aviation, vehicles, fuel systems, medical equipment, entertainment equipment, and safety equipment, ensure that the product is used well below its rated parameters and performance limit, and give consideration to fail-safe and other safety measures.

**watanabe**

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