DIGITAL PANEL METER
MODEL AL-213
INSTRUCTION MANUAL

⚠Caution

(1) The equipment may be damaged if the input current or voltage exceeds the maximum allowed value.

(2)   Please note that the contents of this manual may be changed without notice due to product modifications.

(3) In preparing this manual, we made every effort to provide the best manual possible. Please contact your dealer or Asahi Keiki if you notice any deficiencies, errors, omissions, etc.

(4) After you finish reading the manual, keep it handy for future access.

1. General

The digital panel meter AL-213 is a compact size process monitor that equips 3 1/2 digits LED displays and does not requires power supply (works with the 4-20 mA signal).   Maximum displayed value is 1999 and the AL-213 provides the scaling function that enables the input signal to be displayed as arbitrary physical value or chemical value. Wire connections can be done easily by using screw terminals.
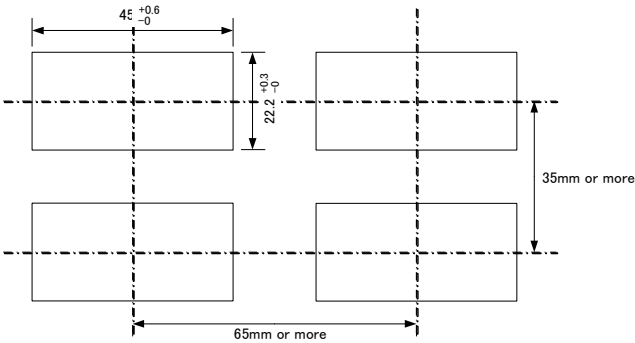
2. Before using the product

2.1 Accessory check

 The accessory for AL-213 is an instruction manual (this document).
 If you have any questions, please contact our distributors or us directly.
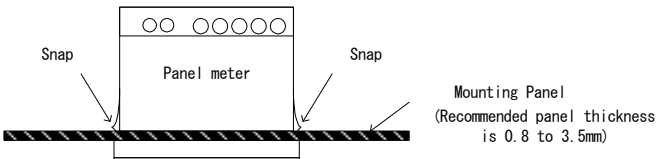
2.2 Mounting
2.2.1 Panel Cut

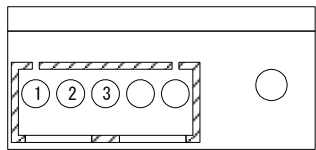Cut the panel to mount the AL-213 in accordance with the figure below.

2.2.2 Mounting to Panel

To mount the AL-213 to the panel, pushing snaps on the both side of the case, insert the body from the front side of the panel (see, the figure below)
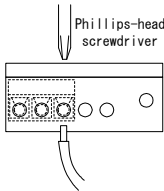

2.3 Terminals
2.3.1 Terminal connection diagram

| number	name	description
1	HI	Input signal ＋
2	LO	Input signal ―
3	E	Ground

### 2.3.2   Wire connection method

Connection terminals of AL-213 are located in the inside of the case. Insert the wires to connect from the back side and tighten the screws from the upper of back side.
Appropriate leads: 16 to 22 AWG
Recommended covering stripping size: 4 to 5mm

2.4 Connection examples

An example for connecting to a standard sensor
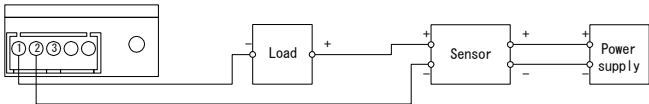
An example for connecting to a two-wire type sensor
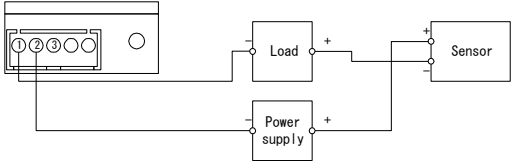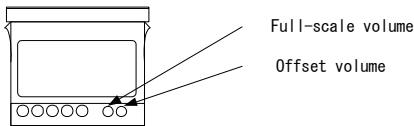

Note:

The voltage drop of the AL-213 is approx. 5.3V (@ input current 20mA).
Please pay attention to the total impedance of the whole circuit of the system.

Using the AL-213 under circumstances where inductive noise exists, connect the ground terminal (E) to ground.

3. Functions

3.1 Scaling adjustment

First, inputting 4mA signal, adapt the displayed value to an offset target value (allowable setting value :±200) by turning the offset volume. Then, inputting 20mA signal, adapt the displayed value to a full-scale target value (allowable setting value: 100 - 1999) by turning the full-scale volume.
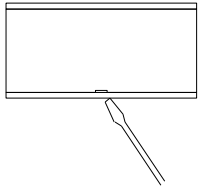

Note:
 Scaling adjustment should be done after more than 20 minute warm-up.

3.2 Decimal point setting

All decimal points on the display of the AL-213 are configured to unlit state at the factory. For turning on each decimal point, remove the front acrylic panel and slide the inner switch.

Insert a flat-blade screwdriver in a small ditch under the front acrylic panel and twist the screwdriver to remove the panel.

In addition, for fitting the panel to the body, insert the nail on the upper edge on the panel first.
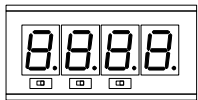
DIP switches under the each digit of the display are switches for decimal points.

Right side: light on

4. Calibration

To calibrate the AL-213, a current generator which provides within 0.01% accuracy is required.

The procedure for the calibration is same as the procedure for the scaling adjustment as described before.

5. Specifications

type	Measurement range	Display	Maximum allowable input current
AL-213	DC 4-20mA	Offset ±200 Full scale 100～1999	±50mA

Accuracy:±(0.1% of FS + 1 digit) (at 23℃±5℃, 35～85%RH)

|		
Measurement function	:	Instrumentation signal (DC 4-20mA)
Operation type	:	double integrating type A/D conversion
Maximum displayed value	:	1999
Sampling speed	:	2.5 times / second (typical)
noise rejection ratio	:	NMR 40dB（TYP）
temperature characteristics	:	Offset displayed value ±0.3 digit/℃ Full-scale displayed value ±0.3 digit/℃
Over range warning	:	most significant digit displays "1" and least significant 3 digits turn off for an input signal over 1999 equivalent
Full-scale allowable setting range	:	100～1999
Offset allowable setting range	:	±200
Voltage drop	:	4mA input 5V (TYP), 20mA input 5.3V (TYP)
Display	:	7-segment LED display (red color) character height: 10.16 mm
Polarity display	:	A minus sign is displayed if the operation result is negative.
External control inputs	:	None
Operating temperature and humidity ranges	:	0 to 50℃ ,35 to 85% RH
Power Supply	:	None（operate with input signal）
Withstand voltage	:	DC 500V, 1 minute (between Input terminal (LO) and ground terminal (E)across power terminals/ input terminals and each output terminal.
External dimensions	:	48mm(W)×24mm(H)×40mm(D)
Weight	:	Approximately 30g
Standard accessories	:	An operating manual
Compatible specification	:	EN61000-6-2:2005

6. External Dimensions

Front view
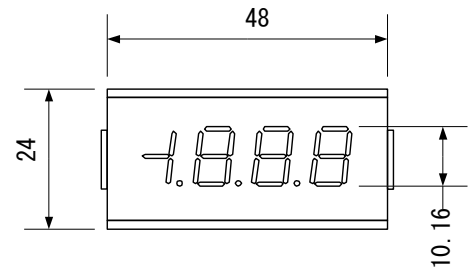
Side view
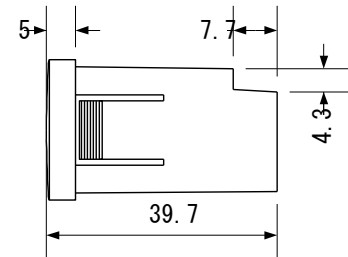
Back view
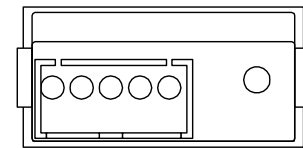
7. Warranty and after-sales service

7.1 Warranty

The warranty lasts one year from the date of delivery. If an equipment failure which is considered to be clearly at the fault of Watanabe Electric Industry occurs during this period, we will repair the equipment at no charge.

7.2 After-sales service

This product was manufactured, tested, and inspected according to rigorous quality control procedures before it was shipped from the factory. If an equipment failure should occur, please contact your dealer or Watanabe Electric Industry（send the product to us）.(Along with the failed product, please include a description with as much information as possible.)

watanabe
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