

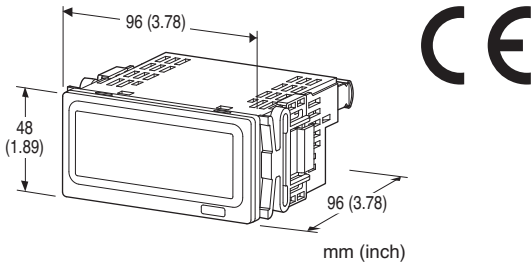
Digital Panel Meters 40 Series

DC INPUT DIGITAL PANEL METER

(4 digits, process meter)

Functions & Features

- 4 digit (± 9999) panel meter
- Scaling and HOLD functions
- High visible, 0.8" (20.3mm) high and bright LED



MODEL: 40DV-[1]-[2][3]

ORDERING INFORMATION

- Code number: 40DV-[1]-[2][3]
- Specify a code from below for each of [1] through [3].
(e.g. 40DV-V1-K3/Q)
- Specify the specification for option code /Q
(e.g. /C01/SET)

[1] INPUT

Current

- A1:** $\pm 199.9 \mu\text{A}$ DC (Conformance range)
(Input range: Approx. $-219 - +219 \mu\text{A}$, Input resistance: 1 k Ω)
- A2:** $\pm 1.999 \text{ mA}$ DC (Conformance range)
(Input range: Approx. $-2.19 - +2.19 \text{ mA}$, Input resistance: 100 Ω)
- A3:** $\pm 19.99 \text{ mA}$ DC (Conformance range)
(Input range: Approx. $-21.9 - +21.9 \text{ mA}$, Input resistance: 10 Ω)
- A4:** $\pm 199.9 \text{ mA}$ DC (Conformance range)
(Input range: Approx. $-219 - +219 \text{ mA}$, Input resistance: 1 Ω)
- A5:** $\pm 1.999 \text{ A}$ DC (Conformance range)
(Input range: Approx. $-2.19 - +2.19 \text{ A}$, Input resistance: 0.1 Ω)
- A:** 4.00 - 20.00 mA DC (Conformance range)
(Input range: Approx. 2.4 - 21.6 mA, Input resistance: 10 Ω)

Voltage

- V1:** $\pm 199.9 \text{ mV}$ DC (Conformance range)
(Input range: Approx. $-219 - +219 \text{ mV}$, Input resistance: $\geq 100 \text{ M}\Omega$)
- V2:** $\pm 1.999 \text{ V}$ DC (Conformance range)
(Input range: Approx. $-2.19 - +2.19 \text{ V}$, Input resistance: $\geq 100 \text{ M}\Omega$)
- V3:** $\pm 19.99 \text{ V}$ DC (Conformance range)
(Input range: Approx. $-21.9 - +21.9 \text{ V}$, Input resistance: 10 $\text{M}\Omega \pm 5 \%$)

- V4:** $\pm 199.9 \text{ V}$ DC (Conformance range)
(Input range: Approx. $-219 - +219 \text{ V}$, Input resistance: 10 $\text{M}\Omega \pm 5 \%$)
- V5:** $\pm 600 \text{ V}$ DC (Conformance range)
(Input range: Approx. $-659 - +659 \text{ V}$, Input resistance: 10 $\text{M}\Omega \pm 5 \%$)
(CE not available)
- 6:** 1.00 - 5.00 V DC (Conformance range)
(Input range: Approx. 0.6 - 5.4 V, Input resistance: 10 $\text{M}\Omega \pm 5 \%$)

[2] POWER INPUT

AC Power

- K3:** 100 - 120V AC
(Operational voltage range 85 - 132 V, 47 - 66 Hz)
- L3:** 200 - 240V AC
(Operational voltage range 170 - 264 V, 47 - 66 Hz)

DC Power

- R:** 24 V DC
(Operational voltage range 24 V $\pm 20 \%$, ripple 10 %p-p max.)

[3] OPTIONS

- blank:** none
- /Q:** With options (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to M-System's web site.)

Moving parts and indicators are not coated.

- /C01:** Silicone coating
- /C02:** Polyurethane coating
- /C03:** Rubber coating

EX-FACTORY SETTING

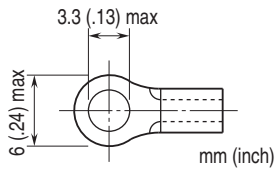
- /SET:** Preset according to the Ordering Information Sheet
(No. ESU-9532)

GENERAL SPECIFICATIONS

- Construction:** Panel flush mounting
- Connection:** M3 screw terminals (torque 0.6 N·m)
- Solderless terminal:** Refer to the drawing at the end of the section.
- Recommended manufacturer:** Japan Solderless Terminal MFG.Co.Ltd, Nichifu Co.,Ltd
- Applicable wire size:** 0.25 to 1.65 mm² (AWG 22 to 16)
- Screw terminal:** Nickel-plated steel
- Housing material:** Flame-resistant resin (gray)
- Isolation:** Input to power
- A/D conversion:** $\Sigma - \Delta$
- Sampling rate:** 10 times/sec. (100 msec.)
- Averaging:** None or moving average
- Setting:** (Front button)
 - Scaled range
 - Moving average
 - Brightness

• Others

■ **Recommended solderless terminal**



- A4: ±0.1 % rdg ±1 digit
- A5: ±0.3 % rdg ±1 digit
- A: ±0.1 % rdg ±1 digit
- V1: ±0.1 % rdg ±1 digit
- V2: ±0.1 % rdg ±1 digit
- V3: ±0.1 % rdg ±1 digit
- V4: ±0.1 % rdg ±1 digit
- V5: ±0.15 % rdg ±1 digit
- 6: ±0.1 % rdg ±1 digit

("1 digit" is multiplied by scaling-multiple. Even in case the scaling-multiple is less than 1, multiply by 1.)

Temp. coefficient: ±(0.01 % rdg +0.3 digits)/°C

("0.3 digits" is multiplied by scaling-multiple. Even in case the scaling-multiple is less than 1, multiply by 1.)

Scaling-multiple = | (Display Scaling Value B - Display Scaling Value A) ÷ (default Display Scaling Value B - default Display Scaling Value A) |

Line voltage effect: ±1 digit over voltage range

Insulation resistance: ≥ 100 MΩ with 500 V DC

Dielectric strength: 1500 V AC @1 minute (input to power to ground)

DISPLAY

Display: 4 digits of 20.3 mm (0.8 inch) height, 7-segment, red LED

Display range: -9999 to 9999

Scaling range for measurement range (conformance range): -9999 to 9999 counts

Decimal point position: 10⁻¹, 10⁻², 10⁻³ or none

Zero indication: Higher-digit zeros are suppressed.

Over-range indication: '-9999' or '9999' blinking for display values out of the display range. 'S.ERR' blinks surpassing the permissible range.

Engineering unit indication: Sticker label attached

DC, AC, mV, V, kV, μA, mA, A, kA, mW, W, kW, var, kvar, Mvar, VA, Hz, Ω, kΩ, MΩ, cm, mm, m, m/sec, mm/min, cm/min, m/min, m/h, m/s², inch, l, l/s, l/min, l/h, m³, m³/sec, m³/min, m³/h, Nm³/h, N·m, N/m², g, kg, kg/h, N, kN, Pa, kPa, MPa, t, t/h, °C, °F, %RH, J, kJ, MJ, rpm, sec, min, pH, %, ppm, etc.

INPUT SPECIFICATIONS

■ **DC Current:** Input resistor incorporated

■ **Hold Input:** Dry contact input

Detecting level: ≤ 0.8 V

Sensing: Approx. 2.1V DC, 0.03 mA

INSTALLATION

Power consumption

• **AC:**

Approx. 1.6 VA for 100 - 120 V

Approx. 1.0 VA for 200 - 240 V

• **DC:** Approx. 0.5 W

Operating temperature: -10 to +55°C (14 to 131°F)

Operating humidity: 30 to 90 %RH (non-condensing)

Mounting: Panel flush mounting

Weight: 160 g (0.35 lb)

PERFORMANCE

Accuracy (for each input code)

A1: ±0.1 % rdg ±1 digit

A2: ±0.1 % rdg ±1 digit

A3: ±0.1 % rdg ±1 digit

STANDARDS & APPROVALS

EU conformity:

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

Low Voltage Directive

EN 61010-1

Measurement Category I (input)

Installation Category II (power)

Pollution degree 2

Input to power: Reinforced insulation (300 V)

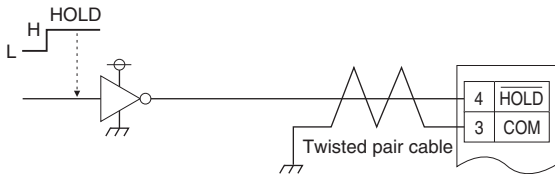
RoHS Directive

DISPLAY HOLD COMMAND

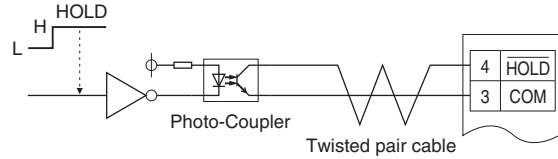
Displayed value is held with an external HOLD command input. Connect the contacts across HOLD to COM.

■ WIRING EXAMPLES

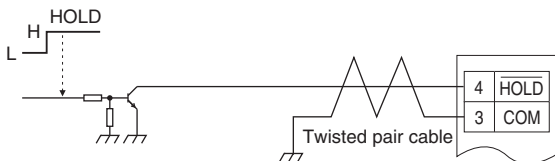
(a) 5V-CMOS, TTL



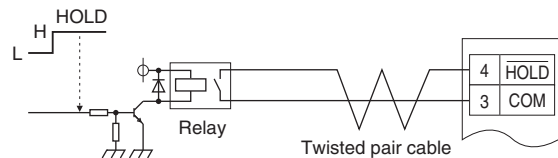
(c) Photo-Coupler



(b) Transistor

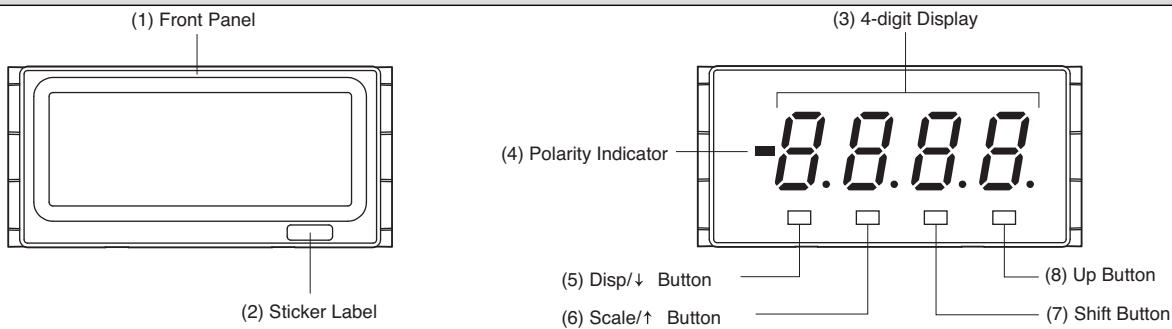


(d) Relay



Terminals 3 and 4 are NOT isolated from the internal circuit.

EXTERNAL VIEW



■ COMPONENT IDENTIFICATION

No.	COMPONENT	FUNCTIONS
(1)	Front panel	Removed at configuration.
(2)	Sticker label	Engineering unit label position
(3)	4-digit display	4-digit LED display. Range: 0 to 9999 (not including decimal point)
(4)	Polarity indicator	Turns on when negative value is displayed
(5)	Disp/↓ button	Used to move on to the display setting modes; or to shift through setting items in each setting mode.
(6)	Scale/↑ button	Used to move on to the scaling setting modes; or to shift through setting items in each setting mode.
(7)	Shift button	Used to move on to the setting standby status and shift through display digits in each setting item.
(8)	Up button	Used to select setting value.

PARAMETER LIST

■ **SCALING SETTING MODE**

PARAMETER	DISPLAY	FUNCTION	INPUT CODE	DEFAULT VALUE
Display Scaling Value A	-9999 ... 9999	Display value for measurement range 0%*1 To distinguish from B, the first decimal point is blinking.	A1	- 1999
			A2	- 1999
			A3	- 1999
			A4	- 1999
			A5	- 1999
			A	0400
			V1	- 1999
			V2	- 1999
			V3	- 1999
			V4	- 1999
			V5	-0600
			6	0 100
			Display Scaling Value B	-9999 ... 9999
A2	1999			
A3	1999			
A4	1999			
A5	1999			
A	2000			
V1	1999			
V2	1999			
V3	1999			
V4	1999			
V5	0600			
6	0500			
Decimal Point Position	10 ⁻¹ , 10 ⁻² , 10 ⁻³ or none	Decimal point position		
			A2	8888
			A3	8888
			A4	8888
			A5	8888
			A	8888
			V1	8888
			V2	8888
			V3	8888
			V4	8888
			V5	8888
			6	8888

*1. Measurement range 0 %, 100 % refers min. and max. value per each input signal code.

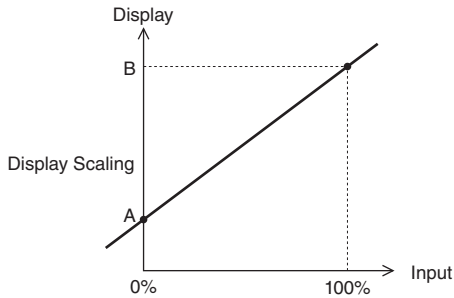
E.g. for A3: ±19.99 mA, measurement range 0 % = -19.99 mA, measurement range 100 % = 19.99 mA.

Note: When input signal (within available input range) other than measurement range is needed to display, it is required to calculate display value in the measurement range.

Refer to the instruction manual for details.

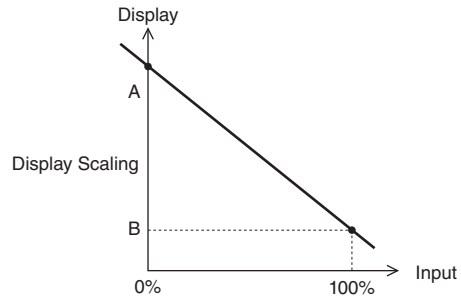
• **Normal Scaling**

The display value increases when the input signal increases.



• **Inverted Scaling**

The display value decreases when the input signal increases.



The decimal point position can be set to any digit. Set it according to the 100% value.

■ **DISPLAY SETTING MODE**

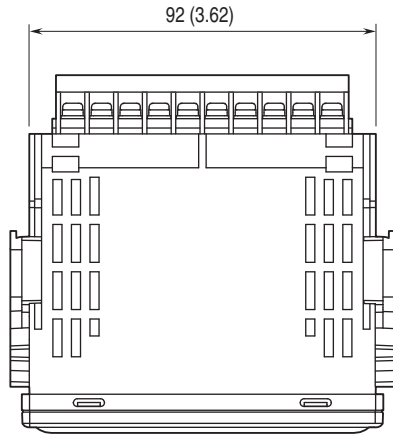
PARAMETER	DISPLAY	FUNCTION	DEFAULT VALUE
Moving Average	<i>R o F F</i>	No moving averaging	<i>R o F F</i>
	<i>R 2</i>	Moving average with 2 samples	
	<i>R 4</i>	Moving average with 4 samples	
	<i>R 8</i>	Moving average with 8 samples	
Brightness	<i>[1</i>	Brightness level 1 (dark)	<i>[5</i>
	<i>[2</i>	Brightness level 2	
	<i>[3</i>	Brightness level 3	
	<i>[4</i>	Brightness level 4	
	<i>[5</i>	Brightness level 5 (bright)	
Initialization	<i>r o F F</i>	Non-initialization	<i>r o F F</i>
	<i>r E S E</i>	Initialize settings (change to factory settings) *1	
Version Indication	-	Version number, indication only	-

*1. While "*r E S E*" is shown, pressing Disp/↓ button or Scale/↑ button initializes settings.

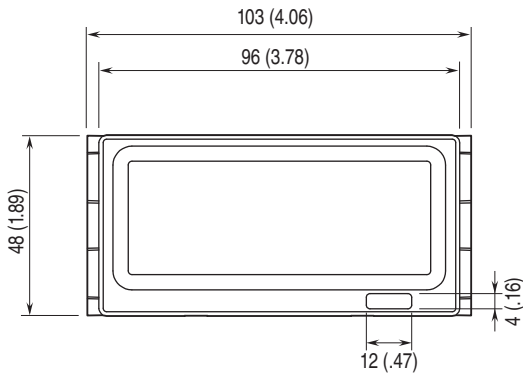
Activating "initialization", user's specified parameters will be deleted and overwritten with the factory default values. Notice that after this, Ex-factory settings will be irrecoverable.

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)

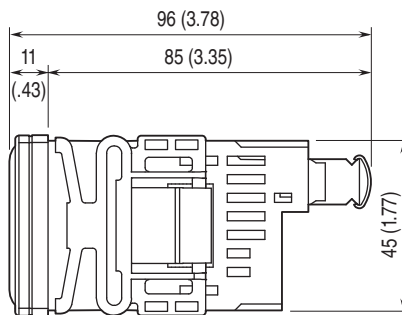
■ TOP VIEW



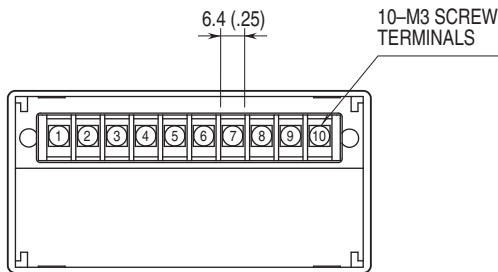
■ FRONT VIEW



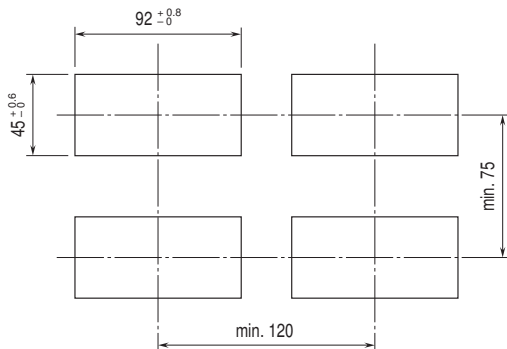
■ SIDE VIEW



■ REAR VIEW

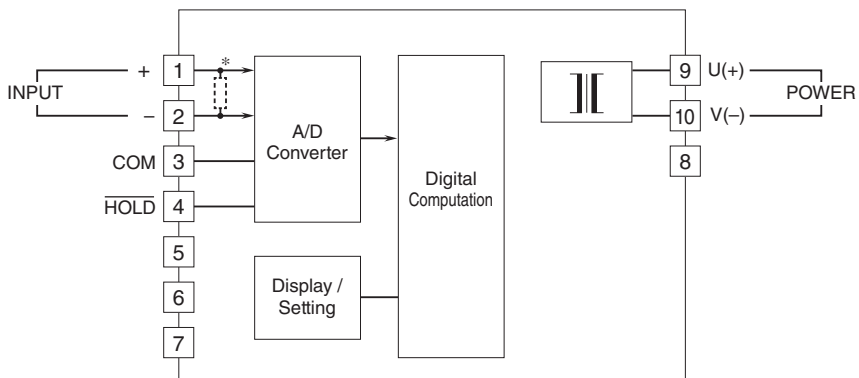


MOUNTING REQUIREMENTS unit: mm



Panel thickness: 1.6 to 8.0 mm

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



*Input shunt resistor attached for current input.



Specifications are subject to change without notice.