Digital Panel Meters *46 Series*

DC INPUT DIGITAL PANEL METER
(4-digit)

MODEL **46DL**

MODEL & SUFFIX CODE SELECTION

46DL–❑–❑

MODEL
INPUT
1 : DC voltage
2 : DC current, narrow span
3 : DC current, wide span
POWER INPUT
M2 : 100 – 240V AC
R5 : 12 – 48V DC

ORDERING INFORMATION

Specify code number and variables.
- **Code number** (e.g. 46DL-1-M2)
- **Input range** (e.g. ±99.99V)

Choose an input range from Tables 1, 2 and 3 depending on the input type specified by the model number.

Alternately, exactly scaled input and display ranges can be specified. The initial setting value will be used for the display range if not specified:
- **Input range and display scale**
  (e.g. 4 – 20mA DC, 0.0 – 150.0)

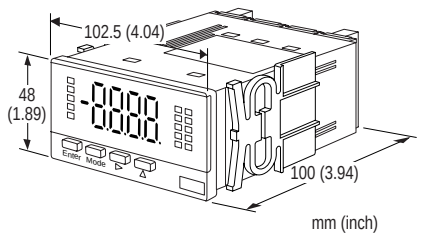
Refer to Parameter List for the initial setting values at the factory.

GENERAL SPECIFICATIONS

Construction: Panel flush mounting
Connection: M3 screw terminal
Housing material: Flame-resistant resin (black)
Input configuration: Single-ended
Scaling: Programming via the front keys
Averaging: None, average and moving average
Power ON delay: 0 – 9 seconds
Lockout protection: Prevents from unwanted key operations.

DISPLAY

LED: 20 mm (.79") 7-segment, 4 digits, bicolor (red/green) LED
Scaling range: -9999 to 9999 counts
Decimal point position: 10^{-1}, 10^{-2}, 10^{-3} or none
Read rate: 1 millisecond
Display rate: Equal to the read rate (Read rate x average sample numbers when the averaging is selecteed.)
Over-range indication: -OVER for negative; OVER for positive over-range out of the display or measured range
Zero display: Suppressing the higher digits
Engineering unit indication: Sticker label attached



Functions & Features
- 4-digit DC input digital panel meter
- 1/8 DIN size

INPUT

■DC VOLTAGE INPUT **Table 1**

CODE	RANGE	IMPEDANCE	MAX. INPUT
11	±99.99mV	≥100MΩ	±50V
12	±999.9mV	≥100MΩ	±50V
13	±9.999V	≥1MΩ	±250V
14	±99.99V	≥10MΩ	±250V
15	±700.0V	≥10MΩ	±700V

■DC CURRENT INPUT, narrow span **Table 2**

CODE	RANGE	IMPEDANCE	MAX. INPUT
21	±99.99μA	1kΩ	±10mA
22	±999.9μA	100Ω	±10mA
23	±9.999mA	10Ω	±50mA
24	±99.99mA	1Ω	±500mA

■DC CURRENT INPUT, wide span **Table 3**

CODE	RANGE	IMPEDANCE	MAX. INPUT
25	±999.9mA	0.1Ω	±3A
26	±2.000A	0.01Ω	±3A

INSTALLATION

Power input

AC: Operational voltage range 85 – 264V, 50/60 Hz, max. load approx. 8VA at 100V

DC: Operational voltage range 10.8 – 52.8V, max. load approx. 7W at 24V

Operating temperature: 0 to 50°C (32 to 122°F)

Operating humidity: 35 to 85% RH (non-condensing)

Storage temperature: -10 to +70°C (14 to 158°F)

Storage humidity: ≤60% RH

Mounting: Panel flush mounting

Dimensions: W102.5×H48×D100 mm (4.04"×1.89"×3.94")

Weight: 450 g (0.99 lbs)

PERFORMANCE

Accuracy (23°C ±5°C, read rate ≤ 20/sec)

Ammeter: ±(0.1% of |rdg| + 2 digits)

Voltmeter: ±(0.03% of |rdg| + 1 digit)
±(0.1% of |rdg| + 2 digit) for ±700.0V range

Temp. coefficient

Ammeter: ±0.015% of FS /°C (±0.008% of FS /°F)

Voltmeter: ±0.01% of FS /°C (±0.006% of FX /°F)

Analog output response time: Approx. 0.5 seconds (10 – 90%)

Insulation resistance: ≥100MΩ with 500V DC (input to power)

Dielectric strength: 1500V AC @1 minute (AC power)
500V DC @1 minute (DC powre)
(input to power)
1500V AC @1 minute
(input or power to housing)

PARAMETERS LIST

■CONDITION DATA

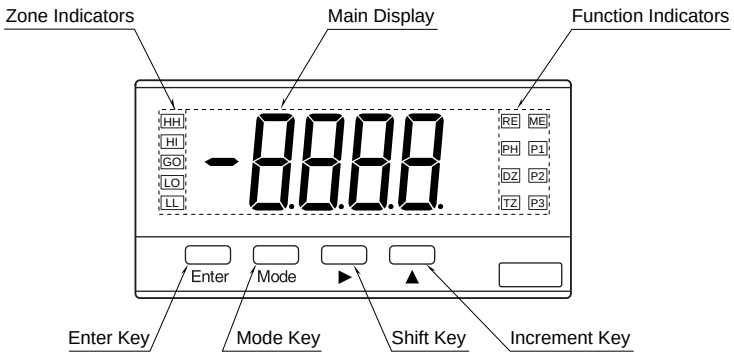
MENU	PARAMETER	INITIAL	P.L	SELECTIONS / RANGES	FUNCTIONS / REMARKS
AVG	Average rate	50	0	1 / 2 / 4 / 8 / 10 / 20 / 50 / 100 / 200 / 400 / 800 / 1000 / 2000 / 5000	Select the average sample numbers. (Read rate: approx. 1 msec.)
MAV	Moving average rate	1	0	1 / 2 / 4 / 8 / 16 / 32	Select the moving average sample numbers. 1 = OFF, Filter: [smaller] 2 < 4 < 8 < 16 < 32 [greater]
S.WD	Round off display	1	0	1 / 2 / 5 / 10 (digits)	Rounding off the display to the nearest digits to eliminate display jitter. (e.g. Displays only 0 or 5 when set to 5.)
CLR	Display color	RED	1	RED / GREN	Select the display color. (Not selectable for alarm output type)
BLNK	Display brightness cutoff	OFF	0	OFF / LV1 / LV2 / LV3 / ON	Select the display brightness cutoff level. OFF = brightest > LV1 > LV2 > LV3 > ON = completely dark
DZ/BU	Digital Zero backup	OFF	0	OFF / ON	Select whether the Digital Zero data must be backed up or not when the power is removed.
PS	Pattern selection	1	0	1 / 2 / 4 / 8	Specify the pattern selection numbers activated for use.
LINE	Linearization	OFF	0	OFF / 2 / 4 / 8 /16	Select the calibration point numbers for linearization. OFF = No linearization
TR.T	Tracking Zero time	000	0	000 to 999 (times)	Select the calibration time for the Tracking Zero function. 000 = Disable
TR.W	Tracking Zero range	01	0	01 to 99 (digits)	Select the calibrated digits for the Tracking Zero function. (Invalid with TR.T set to 000)
P.ON	Power ON delay time	0	0	0 to 9 (seconds)	Select the stand-by time (in seconds) after the power startup.
PRO	Lockout protection level	LV1	3	LV0 / LV1 / LV2 / LV3	Select the level of protection to prevent unwanted key operation. [lower] LV0 < LV1 < LV2 < LV3 [higher]
U-NO.	Hardware configuration	OFF	0	OFF / ON	Disable/enable the code display of built-in hardware unit types at the startup.

■SCALING DATA

MENU	PARAMETER	INITIAL	P.L	SELECTIONS / RANGES	FUNCTIONS / REMARKS
RANG	Input range				
	DC voltage	*1	1	11 / 12 / 13 / 14 / 15	Select the input range code. (Input terminal may vary depending on the input range.)
	DC current, narrow span	*1	1	21 / 22 / 23 / 24	
	DC current, wide span	*1	1	25 / 26	
FSC	Full-scale display reading	9999*2	2	-9999 to +9999	Select the scaled 100% display reading.
FIN	Full-scale input	9999*2	2	-9999 to +9999	Select the reading equivalent to 100% input.
OFS	Offset display	0*2	2	-9999 to +9999	Select the scaled 0% display reading.
OIN	Offset input	0*2	2	-9999 to +9999	Select the reading equivalent to 0% input.
DLHI	Digital limiter, HI	9999	0	-9999 to +9999	Select the maximum limit of display range.
DLLO	Digital limiter, LO	-9999	0	-9999 to +9999	Select the minimum limit of display range.
DP	Decimal point	None*2	2	Each digit	Select the decimal point position.

*1. Specified when ordering. *2. Specified when ordering. Initial setting if not specified.

FRONT VIEW



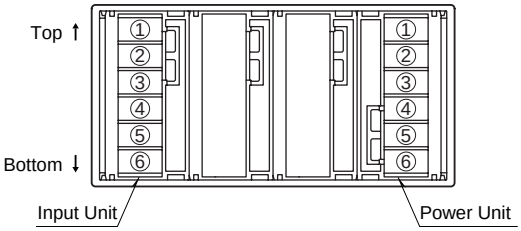
COMPONENT		FUNCTIONS
Zone Indicators		Not Used
Main Display		Shows the meter reading, menu and their selections during the parameter setting.
Function Indicators	RE	Light turns on when the remote control via serial communication is activated.
	PH	Light turns on when Peak Hold, Valley Hold or Peak/Valley Hold is activated.
	DZ	Light turns on when Digital Zero is activated.
	TZ	Light turns on when Tracking Zero is activated.
	ME	Light turns on when Digital Zero Backup is activated.

	Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5	Pattern 6	Pattern 7	Pattern 8
P1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
P2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
P3	OFF	OFF	OFF	OFF	ON	ON	ON	ON

Enter Key	Switches to the parameter setting mode.
Mode Key	Select modes during the parameter setting. Switches to the memory mode during normal measuring mode. (Press and Hold)
Shift Key	Shifts among the digits during the parameter setting. Digital Zero control during normal measuring mode.
Increment Key	Changes items and values during the parameter setting. Selects the pattern during normal measuring mode (Press and Hold) and other special functions.

TERMINAL CONNECTION

Rear View



■INPUT UNIT

•DC Voltage Input

①	15 Range HI
②	14 Range HI
③	13 Range HI
④	12 Range HI
⑤	11 Range HI
⑥	LO

•DC Current Input, Narrow Span

①	24 Range HI
②	23 Range HI
③	22 Range HI
④	21 Range HI
⑤	LO
⑥	LO

•DC Current Input, Wide Span

①	25 Range HI
②	25 Range LO
③	NC
④	26 Range HI
⑤	26 Range LO
⑥	NC

■POWER UNIT

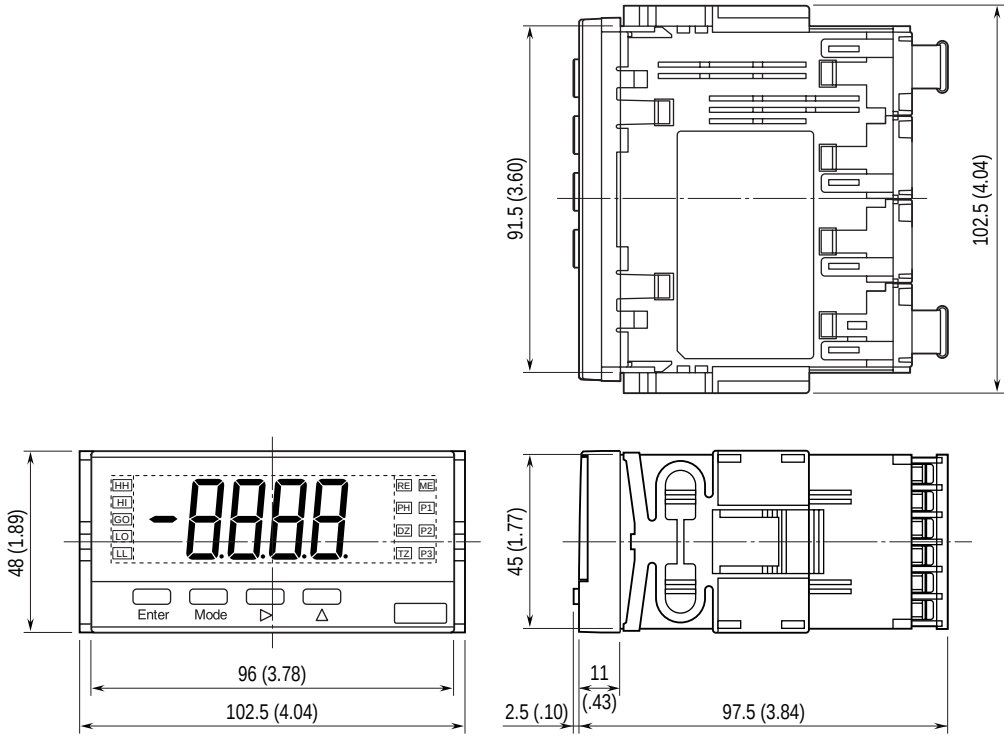
•AC Power

①	NC
②	NC
③	NC
④	NC
⑤	AC POWER
⑥	AC POWER

•DC Power

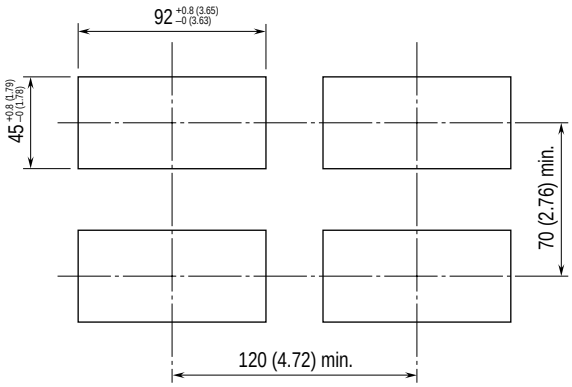
①	DC PWR (+)
②	DC PWR (–)
③	NC
④	NC
⑤	NC
⑥	NC

EXTERNAL DIMENSIONS mm (inch)



MOUNTING REQUIREMENTS mm (inch)

■PANEL CUTOUT



Panel thickness: 0.8 – 5 mm (0.03” – 0.20”)