digital panel meters | user guide

DPM8180-2 Process Meter CE

anders electronics

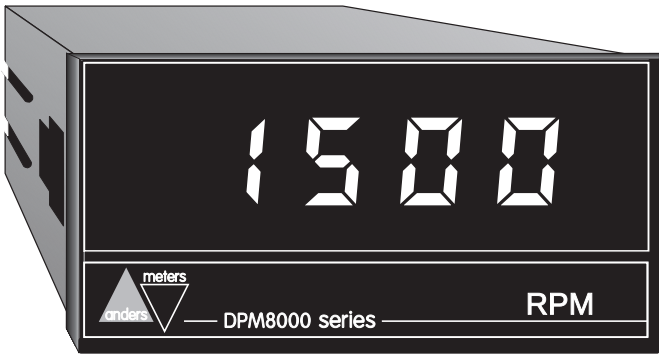
features

- CE approved and marked
- Large (14.2mm) red LED characters
- Choice of inputs (4-20mA, 10-50mA, 1-5V, 0-10V)
- Engineering read-outs e.g. pressure, flow, level
- Offset and span adjustable
- Adjustable sensor excitation output (5-24V dc)
- Display hold facility

The DPM8180 is a low cost, high performance mains powered signal process panel meter. Engineering units such as pressure, flow, temperature and level can be displayed.

It has an adjustable, 5-24V dc (50mA) excitation supply for powering transmitters and active transducers without the need for an external supply.

User calibration is performed by adjusting DIP switches and multi-turn potentiometers to choose the input format and set the corresponding display values.



ELECTRICAL SPECIFICATION				
Range	4-20mA	10-50mA	1-5V	0-10V
Input impedance	10 Ohms	10 Ohms	1 MOhm	1 MOhm
Maximum input	200mA	200mA	100V	100V

OPERATING SPECIFICATION	
Line voltage	115/230V +10%, -20%
Line frequency	50/60 Hz
Accuracy	+/- 0.1% of reading +/- 1 digit
Temperature coefficient	100 PPM/C
Operating temperature	0 to 50°C
Storage temperature	-10 to 60°C
Humidity	below 85% RH
Power consumption	6 VA
CMRR	110dB

TERMINAL DEFINITIONS		
TERMINAL	**SYMBOL**	**DESCRIPTION**
1	IN HI	Sensor input signal high
2	IN LO	Sensor input signal low
3	EX V-	Excitation voltage -ve o/p
4	HOLD	Connect to pin 2 to hold display
5	EX V+	Excitation voltage +ve o/p
6	n/c	No connection
7	230V	AC power source
8	115V	
9	0V	

FIGURE 1 FRONT VIEW (COVER REMOVED)

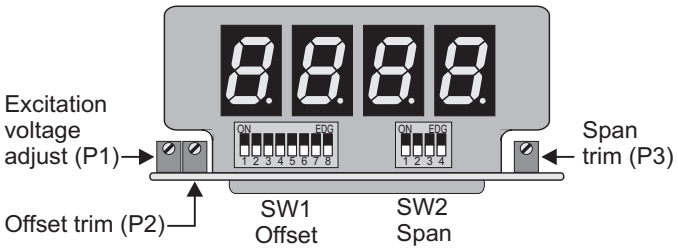


FIGURE 2 CONNECTING A 2 WIRE SENSOR

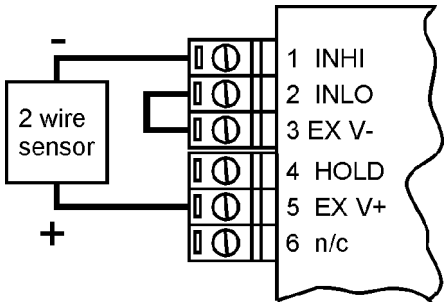


FIGURE 3 INSTALLATION DIAGRAM

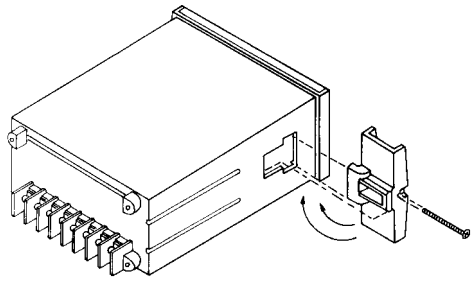
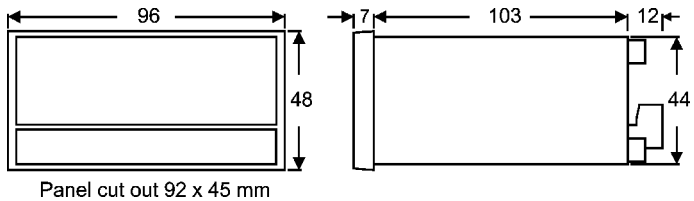


FIGURE 4 DIMENSIONS



STEP BY STEP INSTRUCTIONS

1 Remove instrument from protective plastic bag and clip off front cover. Note location of components as per fig. 1.

2 Pull off the three green safety terminals from the rear of the meter. The complete panel meter assembly can now be removed from its case by carefully levering the base of the LED display board over the plastic retaining lug while pushing gently on the terminal pins at the rear.

3 Select the required input format from **Table 1** and set the switches on SW3 accordingly (see fig.5). Return the meter assembly to the case and replace the green terminals.

4 Decide the display range required and set the decimal point using SW1(1 to 3), according to **Table 2**.
NOTE If your display is for example 0 - 35.0, then the number of counts (R2) is still 350 for the calculations in step 5 below.

5 For your chosen display range, apply the formulae from the list below, for your chosen input format. For example, for a 4-20mA input and display range of -100 to 500, the lower reading R1 = -100 (at 4mA) and the upper reading R2 = 500 (at 20mA).

Input format	Offset figure (OF)	Span figure (SF)
4-20mA	OF=(5xR1 - R2)/4	SF=(R2 - R1)/160
10-50mA	OF=(5xR1 - R2)/4	SF=(R2 - R1)/400
1-5V	OF=(5xR1 - R2)/4	SF=(R2 - R1)/160
0-10V	OF= -R1	SF=(R2 - R1)/200

Note: the offset figure (OF) can have a negative value.

6 Using your value for OF, set offset switches SW1(5 to 8) according to **Table 4**. Set the polarity switch SW_{1-4} according to the polarity of OF as indicated in **Table 3**.

7 Using your value for SF, set span switches SW2(1 to 4) according to **Table 5**.

8 Make electrical connection to the meter with reference to the Terminal Definition table on page 1.

9 Apply an accurate lower input signal, e.g. 4mA, and adjust the offset trim potentiometer (P2) until the display reads your R1 value.

10 Apply an accurate upper input signal, e.g. 20mA and adjust the span trim potentiometer (P3) until the display reads your R2 value.

11 Repeat steps 9 and 10 until consistent readings are achieved.

12 If you require the excitation output , measure the voltage with an external voltmeter across pins 5 and 3 and adjust to the required voltage using potentiometer P3.

13 When satisfied with the calibration, remove the input signal, **turn off the auxiliary a.c. power supply** and remove all the electrical connections.

14 Clip the cover back on and insert the meter into the panel cut-out. "Snap" the mounting clips into the side of the case (refer to installation diagram) and tighten the fixing screws until secure in the panel - do not over tighten!

15 With the meter installed in the panel, re-make the electrical connections to the meter with reference to the Terminal Definition Table on page 1. The meter is now ready for use.

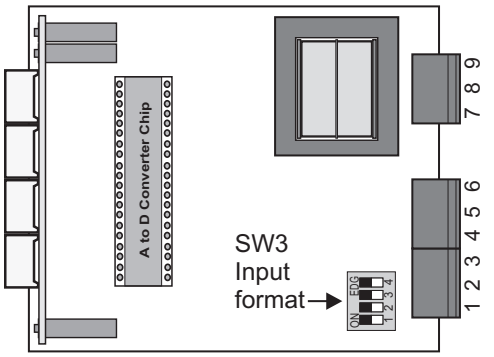
16 Worked Example Input 4-20mA Display 0-35.0 Kg

OF=(5xR1 - R2)/4 SF=(R2 - R1)/160
=(5x0 - 350)/4 =(350 - 0)/160
= - 87.5 =2.19

Following the step by step instructions the switch positions will be as follows

sw 1-1	sw 1-2	sw 1-3	sw 1-4	sw 1-5	sw 1-6	sw 1-7	sw 1-8	sw 2-1	sw 2-2	sw 2-3	sw 2-4	sw 3-1	sw 3-2	sw 3-3	sw 3-4
off	off	on	off	off	off	off	off	on	off	off	off	on	on	off	off

FIGURE 5 PLAN VIEW SHOWING SWITCH SW3



Key to tables: 0 = switch OFF position
1 = switch ON position

TABLE 1 INPUT FORMAT SETTING

	SW_{3-1}	SW_{3-2}	SW_{3-3}	SW_{3-4}
4-20mA 10-50mA	1	1	0	0
1 - 5V	0	0	1	0
0 - 10V	0	0	0	1

TABLE 2 DECIMAL POINT SELECT SETTINGS

	SW_{1-1}	SW_{2-2}	SW_{3-3}
DP1	1	0	0
DP2	0	1	0
DP3	0	0	1

TABLE 3 POLARITY SELECT

Polarity	SW_{1-4}
Negative	0
Positive	1

TABLE 4 OFFSET FIGURE (OF) SETTINGS

Offset Figure	SW_{1-5}	SW_{1-6}	SW_{1-7}	SW_{1-8}
0 - 199	0	0	0	0
200 - 399	1	0	0	0
400 - 599	0	1	0	0
600 - 799	0	0	1	0
800 - 999	0	0	0	1
1000 - 1199	1	0	0	1
1200 - 1399	0	1	0	1
1400 - 1599	0	0	1	1
1600 - 1799	1	0	1	1
1800 - 1999	0	1	1	1
2000 - 2200	1	1	1	1

TABLE 5 SPAN FIGURE (SF) SETTINGS

Span Figure	SW_{2-1}	SW_{2-2}	SW_{2-3}	SW_{2-4}
0 - 2	0	0	0	0
2 - 4	1	0	0	0
4 - 6	0	1	0	0
6 - 8	0	0	1	0
8 - 10	0	0	0	1
10 - 12	1	0	0	1
12 - 14	0	1	0	1
14 - 16	0	0	1	1
16 - 18	1	0	1	1
18 - 20	0	1	1	1
20 - 22	1	1	1	1

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