



## Digital Panel Meters and Controllers DPM

The S and MF range

- measuring and displaying
- monitoring
- recording of events
- scaling
- communication

**mettix**

# The **S-range** from Metrix

## The new class of easy-to-configure, scalable Digital Panel Meters (DPM)

A series of 2000 count DPMs which can be ranged and linearly scaled to suit virtually any DC input signal.

### ■ Simple ranging :

All models feature a choice of ten DC voltage (0.2 to 300 V) and eight DC current (1 mA to 300 mA) measuring ranges. The range required for a particular application is selected via plug-in jumpers on the back of the unit.

### ■ Easy installation :

Measuring input and power supply connections are via standard (Phoenix type) plug-in connectors, which can be pre-wired before installation. Clip-on mounting brackets simplify panel mounting and mosaic mounting is available as an option.

### ■ Choice of models :

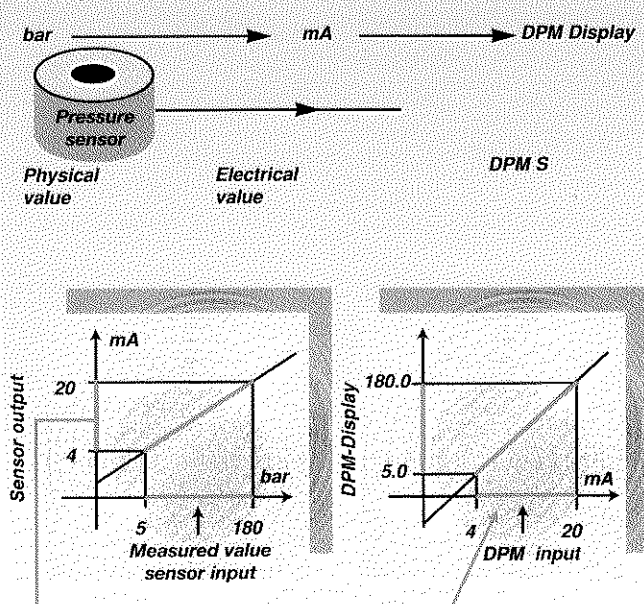
All models offer the same ranging and scaling facilities, but are offered with a choice of case size, digit height and power supply (S, SN or SNT). The "universal" world-wide power supply (SN) can operate with virtually any DC or AC voltage. Only Metrix covers such a wide range of features in just three basis types. This makes it possible to pre-stock these DPMs and configure them for individual applications, as required.

### ■ Extra features-all models :

The front facia is sealed to IP 65 standards. Display brightness is fully adjustable to suit any application, by a pre-set behind the facia window. Plug-in links, also behind the facia window, set the decimal point position independent of the display scaling.

As an option, these DPM models can be factory scaled and calibrated to your requirements.

### Scaling example :



The sensor converts a physical value into an electrical value, which is read by the DPM S and displayed as a physical value, e.g. :

- temperature
- pressure
- rotational speed
- speed
- acceleration

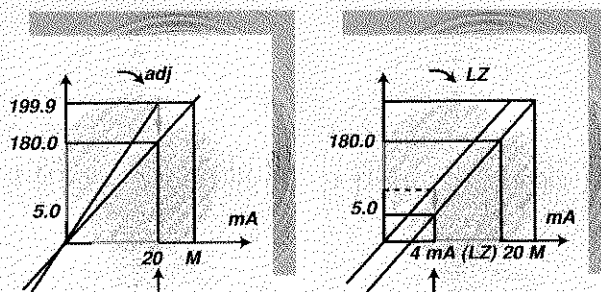
### ■ Flexible scaling :

All S-range models have the same linear scaling facilities to provide a digital display in electrical or physical values, including for "live zero" inputs e.g. 4 to 20 mA.

After setting the prime measuring range (via rear link position) the scale slope can be adjusted by the precision potentiometer (Adj) behind the facia window. E.g. 20 mA input = 180.0 display.

If required, the zero offset can be enabled and independently adjusted by a second potentiometer (LZ : Live Zero). E.g. 4 mA input = 5.0 display.

### DPM Display



The diagram shows the two scaling possibilities, which are adjustable independently of each other. Note the display range covers from -1999 to +1999. Thus a wide measuring spectrum is available.

With M set by jumper position, scale is adjusted by potentiometer

Adjust LZ potentiometer to required zero offset

# The complete **S-range** - simple, flexible, adaptable, scaling features DIN Format, IP 65 sealed facia



**DPM 24 / 2000 S**  
Low profile, compact size  
DC supply.



**DPM 24 / 2000 SN**  
Low profile  
universal supply.



**DPM 24 / 2000 S**  
Red display.



**DPM 24 / 2000 SN**  
Red display.



**DPM 48 / 2000 SN 13**  
Standard format,  
universal supply.



**DPM 48 / 2000 SNT 13**  
Standard format,  
transformer supply



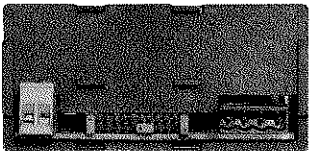
**DPM 48 / 2000 SN 20**  
Large display,  
universal supply.



**DPM 48 / 2000 SNT 20**  
Large display,  
transformer supply



**DPM 24 / 2000 S**  
Rear view.



**DPM 48 / 2000 SN**  
Rear view.

## Options :

- rubber panel sealing gasket  
(only for DPM 48/2000 SN-SNT)
- snap-on mosaic mounting
- printing of any chosen units/captions
- scaling according to pre-set values
- green display (only for 13 mm high LEDs)

## TECHNICAL DATA

### S range common specifications

Resolution/display	± 1999 digits / 7 segment red LED
Measuring rate/integration time	3 per sec/80ms
Measuring ranges	0,2 ... 300 VDC / 10 ranges 1 ... 300 mADC / 8 ranges incl. 0/4...20
Zero correction/offset	Automatic/up to + 25 % of range (for 4-20 mA, etc.)
Precision (for factory calibration)	Voltage: 0.2% +/-1 digit Current: 0.4% +/-1 digit
Storage temperature	-40 to +80 degrees C
Operating temperature	0 to +50 degrees C
Enclosure protection-facia	IP 65
Connector protection	IP 20
Connector types	Screw terminal (supply-2way, input-4 way)
Wire size	4 mm <sup>2</sup> single core, 2.5 mm <sup>2</sup> stranded wire
Panel mounting	Mounting brackets (supplied) Optional for mosaic mounting

### S range model specifications :

	DC	Mains		Universal		
Model	24 / 2000 S	48 / 2000 SNT 13	48 / 2000 SNT 20	24 / 2000 SN	48 / 2000 SN 13	48 / 2000 SN 20
Supply	5 VDC ± 5 % CM : 2 VDC	230 V, 115 V or 24 V AC ± 15 % 45-65 Hz		DC universal : 24 V ... 48 V ± 20 % AC universal : 24 V ... 230 V ± 15 % 40-70 Hz		
Power consumption	200 mA	6 VA		<4W		
Dimensions	in mm	in mm		in mm	in mm	
B x H (DIN)	96 x 24	96 x 48		96 x 24	96 x 48	
Mounting depth	80	151		151	151	
Panel Cut-out (DIN)	92 + 0.8 x 22,2 + 0,3 mm	92 + 0.8 x 45,5 + 0,6 mm		92 + 0.8 x 22,2 + 0,3 mm	92 + 0.8 x 45,5 + 0,6 mm	
Digit height	13 mm	13 mm	20 mm	13 mm	20 mm	
Safety	IEC 1010, Class 1, Overvoltage Category II 264 V, Degree of pollution 2					
EMC	IEC 801 ; VDE 871, Class B					



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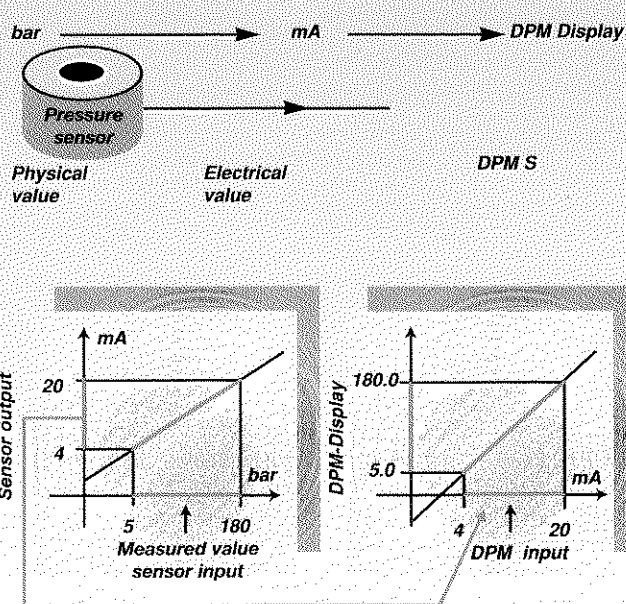
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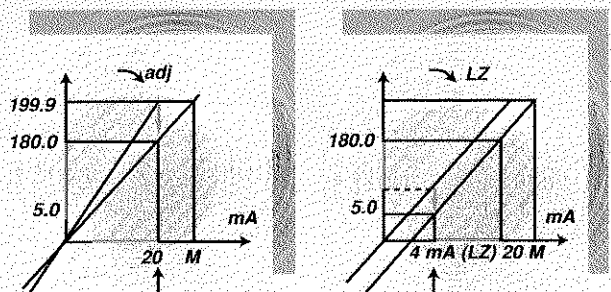
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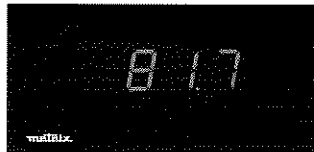
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Large display,  
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Large display,  
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**DPM 24 / 2000 S**  
Rear view.



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# MF-range from Metrix

## The new class of microprocessor based universal Digital Panel Meter/Controllers

- Multi-range input, including temperature
- Flexible scaling/linearisation
- Simple configuration via buttons, ASCII commands or PC-software
- Microprocessor computations
- Powerful communications Addressable RS 232/RS 485 (E1)/ BCD (E2)
- Four alarm channels, relay/open collector outputs
- Isolated, scalable analogue output
- Datalogging memory and reports to PC/printer
- Digital filter

In short, the DPM MF are exceptionally powerful DPM/controllers adaptable for all modern applications.

### A typical example :

The DPM is to measure 0/4...20 mA standardised signal from a pressure sensor and display the results in bar.

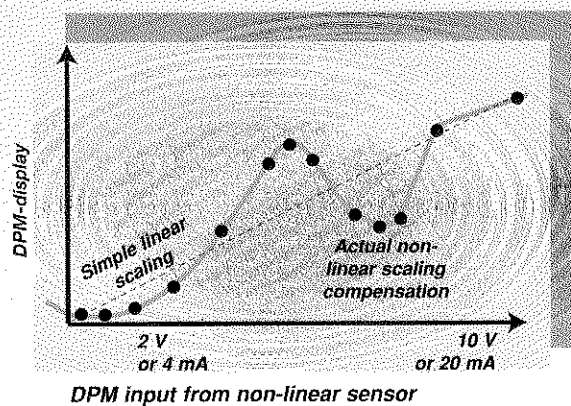
■ In order that useful information is always displayed, the display is frozen when the unit is not being used. For this, a PLC signal 24 V from the controller is required, which is transmitted to the DPM as a HOLD command.

■ An alarm is sounded via a relay if the 120 bar limit is exceeded. A 5 bar hysteresis is programmed to filter out any possible disturbances. A pressure loading of over 120 bar is permitted for 30 seconds, hence a 30 second delay is incorporated into the alarm circuit. The alarm signal is stored until it is acknowledged.

■ A very rapid increase in pressure can lead to premature wear in the transmission elements. For this reason, a pressure-variation rate has been set at 20 bar/min. If this maximum value is exceeded a second relay sounds the alarm.

### MFE Model-Non linear scaling

The 25 point look-up table is easy to programme, without the use of a calibrator, and can be used for virtually any non-linear scale compensation.



The display itself can be switched to the variation rate per minute.

■ Measuring reports should be conducted over a week during which the time and max. and min. values are recorded.

In order to immediately inform the maintenance department, the actual measured values are transmitted via the isolated analogue output to an indicator in the supervisory console.

The following are printed at regular intervals :

- Time
- Actual measured value
- Min. & max. value during the time interval
- All alarm statuses during the time interval

Up to 180 data records can be stored in the memory of the DPM which can be polled on request "en bloc" via a standard V24 interface. To print the measurement report on site in the control cabinet, we recommend the Metrix industrial panel printer IPP 144-40.

The version IPP 144-40 E supports the printing of the measured value report together with date and time on document standard thermo-paper. ISO 9000 concept. .

DPM 48/40000 MF E1

High-quality Polycarbonate and ABS housing. Facia IP 65 sealed.

4 lockable keys for configuration and important functions such as:

- Brightness adjustment
- Alarm limit entries
- Alarm acknowledgement
- Value transmission via the interface
- Display hold
- Alarm test

Universal DC and AC power supply

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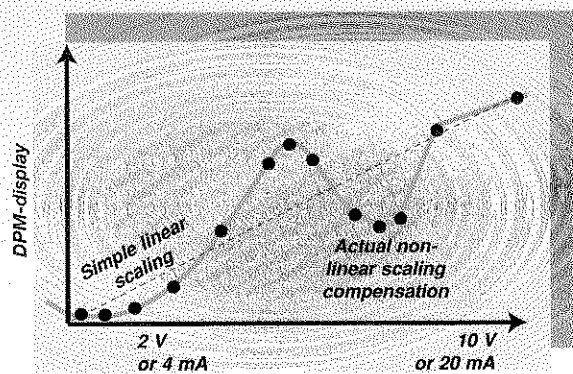
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Universal DC and AC power supply

Display status captions to indicate :

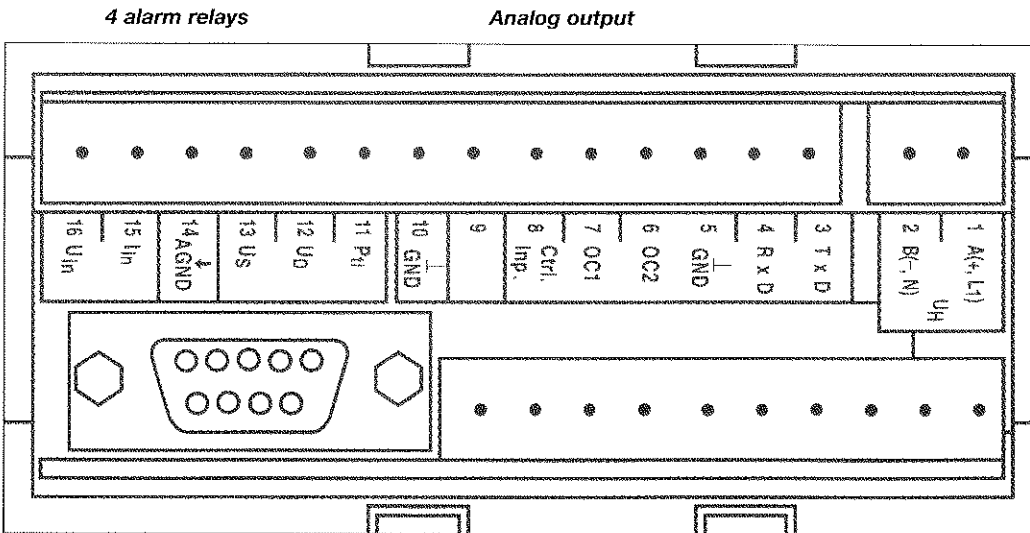
- Special display functions
- Display hold
- Measurements are being recorded
- Minimum value display
- Maximum value display

- 5-digit display
- Floating or fixed decimal point
- 3-stage brightness adjustment



Directional arrows for trend display

Alarm signals



RS-485 data system connection

Measurement inputs

RS-232 C in/output

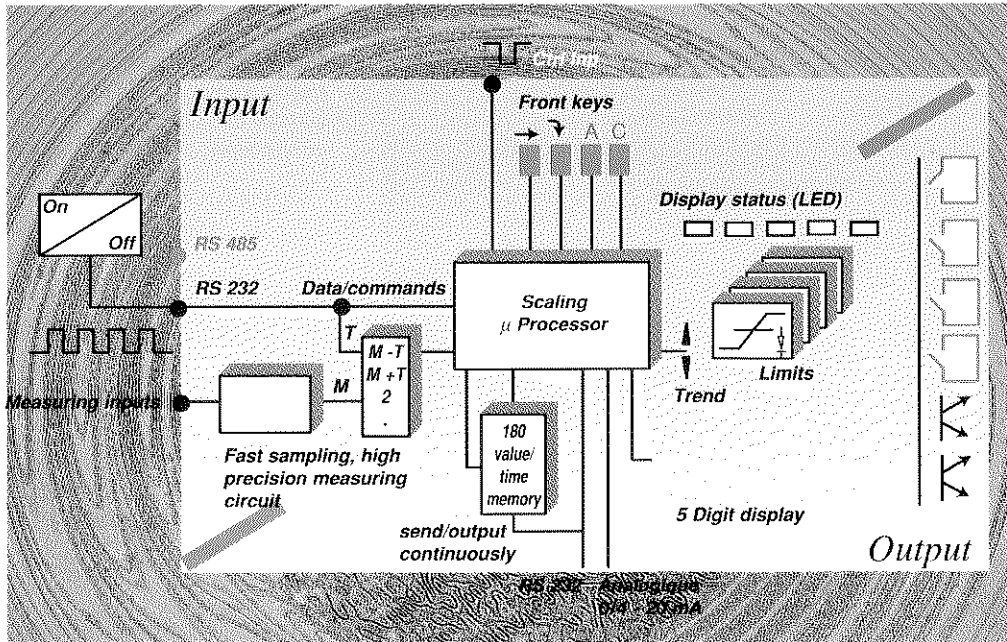
Alarm Open collectors

Multipurpose input (e.g. PLC control) or relay contact (can be assigned the same functions as the front keys).



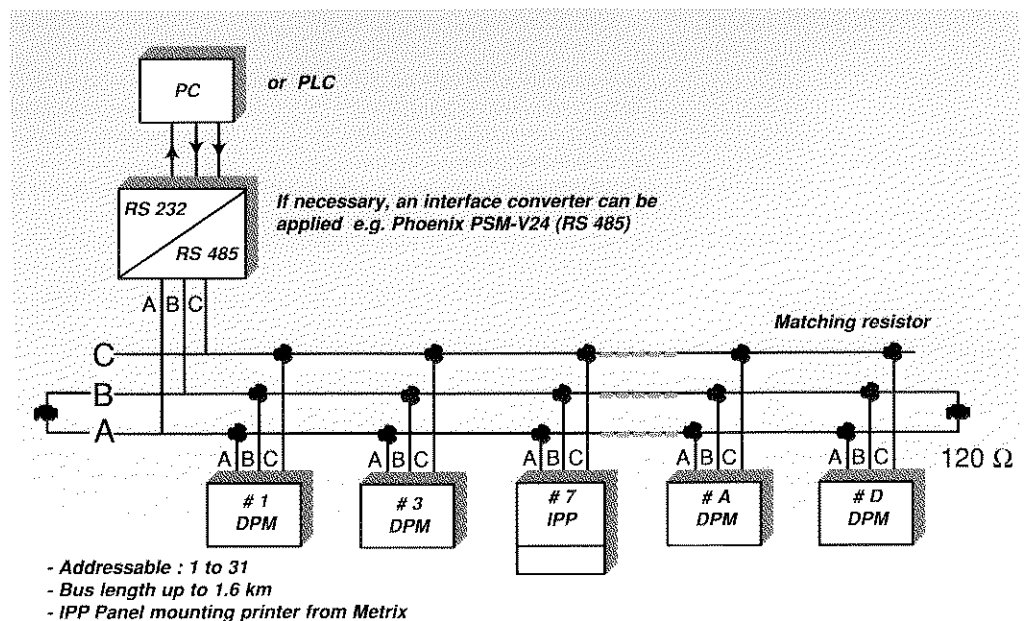
# The **MF-range** from Metrix

## The new class of universal Digital Panel Meters and controllers - DIN Format, IP 65 sealed facia



The functions which are highlighted in red are only available with the versions E1 and E2.

Communication with the units in a serial bus is possible by simply using their addresses: e.g. via the 3-letter command: 5:M (supply measurement) or 5:? (transmit measurement) permits a systematic poll.



Modern production procedures, e.g. SMD equipment, guarantee high reliability. Hence the multifunction DPM is the right measuring device for your demanding applications.

Testing methods in:

- Air and space technology
- Nuclear research
- Textile industry
- Energy supply
- Control circuit monitoring in special machinery

Flexibility in :

- Laboratories
- Special machinery manufacturing

These programmable instruments are supplied with simple default settings, e.g. 20 mA process current input.

They can be readily configured by the user for dedicated applications using the front keys (menu tree), or via the serial interface with a PC using our menu mask editor software (see PC Configuration package accessory).

In more sophisticated applications, "remote control" and dynamic reconfiguration can be achieved by sending short ASCII string commands.

Several DPMs can also be individually addressed in a loop configuration.

The front keys can be programmed to provide defined operator functions and, if required, restricted access to the menu tree, with code protection.

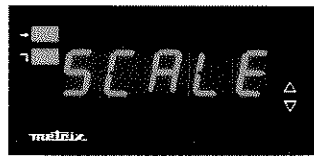


24 mm compact size  
Green display  
2 open collectors



24 mm compact size  
Red display  
2 open collectors

Incorporating sophisticated digital technology and ITT Instruments extensive experience in the field of measuring techniques, the MF range represents the most powerful, yet easy-to-use, range of DPMs available today.



48 mm housing  
2 open collectors



48 mm housing  
2 relays



True RMS, RS-485 interface  
4 relays



True RMS, BCD output  
4 relays

**Computer functions :**

- Auto zero
- Combining of two DPM measurement results :  
 $A + B, A - B, A * B, A/B,$   
 $\frac{A + B}{2}, \frac{A - B}{B} \times 100$   
 (percent deviation).  
 A : measured value (DPM 1)  
 B : received value (DPM 2)
- Digital filter
- Auto-ranging
- Linear scaling (2 points)
- Non-linear scaling (E1/E2) in terms of 25 points

- Predefined functions such as :  $x^2, \sqrt{x}, \sin x, \tan x, \cos x, \log x, \ln x$
- Temperature rate of change  $\frac{\Delta T}{\Delta t}$  in degrees C/min.
- Tare function for weighing application
- Cascading (chain switching permits the processing of multiple analog values).

**TECHNICAL DATA**

**DPM MF range common specifications :**

<b>Supply</b>	Wide range power supply : via two connectors for desired voltage sources from : DC : 19 to 60 V      Power : 2.5 W max. AC : 19 to 260 V      Power : 3 W max.
<b>Measurement types</b>	- U, I, DC or AC Basic versions : 40-400 Hz (sinewave) E1 and E2 : 30 Hz-5 KHz (TRMS) - Pt100 : 2.3 or 4 wire - Thermocouples : K, J, T, E, U, L, N, R, S, B with built-in reference junction
<b>Measurement ranges</b>	- Udc : 200 mV to 650 V (9 ranges) - Idc : 20 mA to 40 mA (2 ranges) - Uac : 500 mV to 650 V (8 ranges) - Iac : 50 mA and 100 mA (2 ranges) - Pt100 : - 200 to + 850 degrees C
<b>Resolution</b>	± 40 000 measurement points (corresponds to 4 3/4 digits) Display range : -19999 to +99999
<b>Measurement rate</b>	Min.: 10 measurements/sec. Max.: 20 measurements/sec. Display : 4 measurements/sec.
<b>Filter</b>	- Digital filter over 1...250 measured values
<b>Basic precision</b>	- DC : 0.03% of full scale ± 3d - AC : 0.2% of full scale ± 4d - Pt100 : 0.2 to 0.4 degrees C (2 or 4 wire), 0.4 to 0.8 (3 wire) - Thermocouples : 1 to 2 degrees C
<b>Temperature</b>	- reference : 23 °C ± 2 °C - operating : 0 °C to + 50 °C - storage : - 40 °C to 80 °C
<b>Humidity</b>	<80% relative humidity at + 40 °C
<b>Safety standards</b>	IEC 1010-1 class 1; Overvoltage category II 264 V degree of pollution 2
<b>EMC</b>	IEC 801; VDE 871 class B

<b>Measured value memory</b>	- Hold function (freeze display) - Min./max. display
<b>Data logging</b>	- Report storage of 180 values (ring buffer) Overwrite-protect after "trigger" event Sample rate adjustable from 1 per sec. to 1 per 18 hrs. Corresponds to a total recording time of 3 minutes to 136 days
<b>Limit values</b>	- 4 levels
<b>Non-linear scaling</b>	$x^2, \sqrt{x}, \sin x, \cos x, \tan x, \ln x, \log x, \Delta T/\Delta t$

Thermocouples	Standard	Range degrees C	Precision	Resolution
Type J Fe-CuNi	IEC 584	-210/ 1200	1.5 °C	
Type L Fe-CuNi	DIN 43710	-200/ 900	1 °C	
Type T Cu-CuNi	IEC 584	-260/ 400	1 °C	
Type U Cu-CuNi	DIN 43710	-200/ 900	1 °C	
Type K NiCr-NiAl	IEC 584	-260/ -150 -150/ 1370	2 °C 1 °C	0.2 °C
Type E NiCr-CuNi	IEC 584	-260/ 1000	1 °C	
Type N Nicrosil-Nisil	BS 4937	-260/ -50 -50/ 0 0/ 1000	2 °C 1.5 °C 1 °C	
Type R Pt13Rh-Pt	IEC 584	-50/ 1230 1230/ 1770	1.5 °C 2 °C	0.5 °C
Type S Pt10Rh-Pt	IEC 584	-50/ 1340 1340/ 1770	1.5 °C 2 °C	
Type B Pt30Rh-Pt6Rh	IEC 584	-400/ 1820	2 °C	1.0 °C

# Technical Data (Cont.)

## DPM MF range model specifications :

MODEL	DPM 24/40000 MF	DPM 48/40000 MF	DPM 48/40000 MF/R2	DPM 48/40000 MF/E1	DPM 48/40000 MF/E2
Dimensions (W x H x D) in mm	96 x 24 x 151	96 x 48 x 151		96 x 48 x 151	
Panel cut-out (DIN) in mm	92+0.8 x 22.2+0.3	92+0.8 x 45.5+0.6		92+0.8x45.5+0.6	
Mounting	Clip-on mounting brackets supplied (mosaic option)				
Display	5-digit, LED red		5-digit, LED red		
Digit height	13 mm		13 mm		
Display status captions	-		5		
Alarm status captions	-		4		
LEDs (trend/alarm)	2		2		
Front keys	2		4		
Serial interface (Tx = transmitter only)	RS-232 C		RS-232 C RS-485 RS-422 Tx		RS-232 C
BCD output 6 digits	-		-		yes I <sub>H</sub> = 1 mA
Analog output	> 2000 steps 0.5 % 0/4 ... 20 mA		> 4000 steps 0.15 % -20 ... + 20 mA		
Open Collector (max 50 V, 50 mA)	2 OC		-		2 OC
Built-in relay (max 50 Vac, 1 A, 30 Vdc, 1 A)	-		2 relays		4 relays
Voltage/current AC	average		true RMS		
Special linearisation	-		25 point table		

### Options

Green display (for DPM 48/40000 MF only)

Front window with standard captions, A, mA, µA, V, kV, mV, W, kW, kWh, g, kg, m, mm, km, °C, %, m/mm, U/min, RPM, °C/min ; others available on request

### Accessories

Panel scaling gasket for the DPM 48/40000MF, R2, E1, E2

PC configuration package with PC cable (9 or 25-pole) and mask editor software for simple and rapid configuration of your DPM.

Report printer IPP 144-40 or version 144-40 E with date and time.

DPM MF alarm outputs can trigger messages on DAA 144-120; 288-240B, C, S text displays.

Specifications are subject to change without prior notice.

Distributed by :

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