

PM85 DIFFERENTIAL MANOMETER

Instruction Manual



ALWAYS READ THESE INSTRUCTIONS BEFORE PROCEEDING

Thank you for buying one of our products. For safety and a full understanding of its benefits please read this manual before use. Technical support is available from 01923 441717 and support@martindale-electric.co.uk.

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Specifications

1 SAFETY INFORMATION

REMEMBER: SAFETY IS NO ACCIDENT

These instructions contain both information and warnings that are necessary for the safe operation and maintenance of this product. It is recommended that you read the instructions carefully and ensure that the contents are fully understood. Failure to understand and to comply with the warnings and instructions can result in serious injury, damage or even death.

Particular attention should be paid to the Warnings, Precautions and Technical Specifications.

Please keep these instructions for future reference. Updated instructions and product information are available at:
www.martindale-electric.co.uk

1.1 Meaning of Symbols and Markings



Caution - risk of danger and refer to instructions



Equipment complies with relevant EU Directives



End of life disposal of this equipment should be in accordance with relevant EU Directives.

1.2 Precautions

This product has been designed with your safety in mind, but please pay attention to the following warnings and cautions before use.

Cautions

The PM85 must only be used by a skilled and competent person who is familiar with the relevant regulations, the safety risks involved and the consequent normal safe working practices, and under the conditions and for the purposes for which it has been constructed and specified.

The maximum pressure on either port **must not** exceed 29 psi.

Before use check the unit for cracks or any other damage. Make sure the unit is free from dust, grease and moisture. **Do not** use if damaged.

Avoid severe mechanical shock or vibration and extreme temperature.

To avoid possible corrosion from leaking batteries, remove the batteries if discharged, or when the unit is not in use for an extended period.

2. INTRODUCTION

2.1 Inspection

Examine the shipping carton for any sign of damage. Inspect the unit and any accessories for damage. If there is any damage then consult your distributor immediately.

2.2 Description

The Martindale PM85 has the following functions and features:

- ◆ Differential pressure measurement to 1.45psi (100mbar)
- ◆ 8 selectable units of measurement
- ◆ Air speed measurement using a pitot tube.
- ◆ Hold, Max, Min, Max-Min and Average functions
- ◆ Auto power off
- ◆ Low battery indication
- ◆ LCD display with backlight
- ◆ Pocket-sized, compact body

2.3 Accessories

The PM85 comes with the following accessories:

- ◆ Protective cover for safe storage
- ◆ 2 x 1.5V AAA batteries
- ◆ Detachable carry strap
- ◆ Instructions

Accessories not included:
Pitot tube

2.4 Battery Installation

Refer to Section 4.1 (Battery Replacement) for the battery installation instructions for the PM85.

3. OPERATION

3.1 Low Battery Indication

If the  is displayed, the battery needs replacing as measurement accuracy can no longer be guaranteed (see section 4.1 Battery Replacement).

3.2 Description of Press Buttons

	Selects Set mode settings
	Turns on/off the PM85, turns on backlight
	Selects Set mode and Hold mode functions

3.3 Description of LCD symbols



APO	Auto power off is active
	Indicates low batteries
HOLD	Hold mode is active
MAX	Maximum recorded reading is displayed
MIN	Minimum recorded reading is displayed
MAX-MIN	The difference between maximum and minimum recorded readings is displayed
AVG	The average of recorded readings is displayed
mmH₂O mmHg psi inH₂O inHg hPa, mbar Pa	Unit of pressure measurement being displayed

fpm m/s	Unit of air speed being displayed
Density (kg/m³) (lb/ft³)	Unit of density being displayed
	Indicates press of  button required
ENTER	Indicates press of  button required

3.4 Power On/Off

To power on in Measurement mode, press  for less than 1 second.

To power on in Set mode, press  for 2 seconds.

To power off the unit, press  for 2 seconds.

3.5 Auto Power Off (APO)

If the unit is inactive for a period of 10 minutes it will automatically power off.

To disable this function refer to section 3.7.

3.6 Backlight

Press  for less than 1 second to turn on the backlight.

It will automatically turn off after 15 seconds if there is no further operation of the unit.

3.7 Set Mode

This mode sets the following in the order shown:

- ◆ Unit of measurement;
- ◆ Density of the medium (only if fpm or m/s is selected);
- ◆ Auto power off (APO).

The Set mode is selected by pressing  for 2 seconds with the unit powered off.
If the unit is switched off while in the Set mode, any changed settings will not be saved, and the unit will revert to the previous settings.

Unit of Measurement

The LCD will flash the current set unit of measurement after entering the Set mode.

Press  to select **mmH₂O, mmHg, psi, inH₂O, inHg, hPa, mbar, Pa** or if fitted with the optional pitot tube **fpm** or **m/s** may be selected.
Press  to advance to the next function.

Density (only if fpm or m/s is selected)

The LCD will display **Density** and the first numerical digit after the decimal point will flash.

Press  to increment the digit from 0 to 9 as required. After 9 the digit will step back to 0.

Press  to advance to the next digit that will now flash.

Press  to increment from 0 to 9 as required.

Press  to advance to the last digit that will now flash.

Press  to increment from 0 to 9 as required.

Press  to advance to the next function.

APO

The LCD will display **APO**.

Press  to select **ON** or **OFF** as required.

Press  to save settings and return to the Measurement mode.

3.8 Zero Function

Pressure differences up to 10hPA can be zeroed.

The zero function will not operate if the pressure difference is >10hPa. To zero the PM85, disconnect it from the pressure source, and press



3.9 Measurement Mode

It is advisable to zero the PM85 before making measurements (see section 3.8).

Taking all necessary safety precautions connect the PM85 to the pressure sources to be measured.

Read the differential pressure from the display.

While in Measurement mode, all measured values are recorded at a rate of once per second for use by the Hold mode (See section 3.10).

3.10 Hold Mode

The PM85 has the facility to display the maximum reading, the minimum reading, the difference between maximum and minimum readings and the average of the recorded readings.

To enter the Hold mode press **MODE** while in Measurement mode.

The LCD will display **HOLD** and the last measured value will be held on the display.

Successive presses of the **MODE** button will display the following in sequence:

HOLD MAX - maximum recorded reading;

HOLD MIN - minimum recorded reading;

HOLD MAX-MIN - difference between max and min recorded readings;

HOLD AVG - average of the recorded readings (Only for air speed measurement).

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The unit will return to the Measurement mode at the end of the above sequence.

To **clear the recorded readings**, press **MODE** for 2 seconds at any point in the above sequence. The unit will return to the Measurement mode.

Note: The Hold mode will not function until at least 3 measurements have been stored to memory.

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4. MAINTENANCE

4.1 Battery Replacement

The battery compartment is on the rear of the unit.

Push the battery cover up towards the inlet ports and lift away from the back of the unit.

Replace with 2 new AAA batteries (IEC LR03, NEDA 24A), observing correct polarity.

Replace the battery cover.

Note: Do not mix old and new batteries.

4.2 Calibration

To maintain the integrity of measurements made using your instrument, Martindale Electric recommends that it is returned at least once a year to an approved Calibration Laboratory for recalibration and certification.

Martindale Electric is pleased to offer you this service. Please contact our Service Department for details.

Email: service@martindale-electric.co.uk

Tel: 01923 650660

4.3 Cleaning

If contamination is found, clean with a damp soft cloth and if necessary a mild detergent. Do not use abrasives, abrasive solvents, or detergents which can cause damage to the unit. If a mild detergent is used, the unit should subsequently be thoroughly cleaned with a water dampened soft cloth. After cleaning, dry and allow to remain in a dry environment for 2 hours before use.

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4.4 Repair & Service

There are no user serviceable parts in this unit other than those that may be described in section 4. Return to Martindale Electric if faulty. Our service department will quote promptly to repair any fault that occurs outside the guarantee period.

Before the unit is returned, please ensure that you have checked the unit and batteries.

4.5 Storage Conditions

The instrument should be kept in warm dry conditions away from direct sources of heat or sunlight, and in such a manner as to preserve the working life of the unit. It is strongly advised that the unit is not kept in a tool box where other tools may damage it.

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5. WARRANTY AND LIMITATION OF LIABILITY

This Martindale product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is 2 years and begins on the date of receipt by the end user. This warranty extends only to the original buyer or end-user customer, and does not apply to fuses, disposable batteries, test leads or to any product which, in Martindale's opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation, handling or storage.

Martindale authorised resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Martindale.

Martindale's warranty obligation is limited, at Martindale's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to Martindale within the warranty period.

This warranty is the buyer's sole and exclusive remedy and is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. Martindale shall not be liable for any special, indirect, incidental or consequential damages or losses, including loss of data, arising from any cause or theory.

Since some jurisdictions do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any part of any provision of this warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision or other part of that provision.

Nothing in this statement reduces your statutory rights.

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Specification PM85 Differential manometer



All specified accuracies are at 23°C ± 5°C, <70% R.H. for 1 year.
Temperature coefficient: 0.1 x (specified accuracy) per °C, (0°C to 18°C, 28°C to 50°C).

PRESSURE

Unit of measurement	Range	Resolution
mmH ₂ O	0 to 1019.7	0.1 mmH ₂ O
mmHg	0 to 75	0.01 mmHg
psi	0 to 1.45	0.001 psi
inH ₂ O	0 to 40.14	0.01 inH ₂ O
inHg	0 to 2.953	0.001 inHg
hPa	0 to 100	0.01 hPa
mbar	0 to 100	0.01 mbar
Pa	0 to 10000	1 Pa



Specification PM85 Differential manometer

Accuracy: 0 to 0.3 hPa ± 0.03 hPa
0.3 to 1 hPa ± 0.05 hPa
1 to 100 hPa ± (0.1 hPa + 1.5% of reading)
0 to 3 mmH₂O ± 0.3 mmH₂O
3 to 10.2 mmH₂O ± 0.5 mmH₂O
10.2 to 1019.7 mmH₂O ± (1.02 mmH₂O + 1.5% of reading)

GENERAL

Display: liquid crystal display

Measurement rate: twice per second

Power: 2 x 1.5V, AAA alkaline batteries (IEC LR03, NEDA 24A)

Continuous operating time: 85 hours typical.

Low battery indication: the  is displayed when the battery voltage drops below the operating level

Auto power off: after approx. 10 minutes

Dimensions: 132.9(L) x 50.9(W) x 24.7(D) mm

Weight: 113g approx. including batteries

Includes: protective cover, 2 x 1.5V AAA batteries, detachable carry strap and instructions

ENVIRONMENTAL

Operating environment: 0°C to 50°C at <70% R.H.

Storage environment: -20°C to 60°C, <80% R.H. with batteries removed.

EMC

Conforms to BS EN61326-1

Check out what else you can get from Martindale:

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- Digital Multimeters
- Labels
- Microwave Leakage Detectors
- Motor Maintenance Equipment
- Multifunction Testers
- Non-trip Loop Testers
- Pat Testers & Accessories
- Phase Rotation Testers
- Proving Units
- Socket Testers
- Thermometers & Probes
- Test Leads
- Voltage Indicators
- Specialist Metrohm Testers (4 & 5kV)
- Specialist Drummond Testers



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