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AIRFLOW

Airflow Pocket Manometer range APM5k / APM50k

Operating Instructions.



The APM 5k unit is switchable between 2k Pa and 5k Pa
The APM 50k unit is switchable between 5k Pa and 500 mbar

Please read these instructions carefully before attempting to use the instrument.

1. Warnings.

1.1 Maximum overload pressure.

The maximum overload pressure which may be applied to either pressure port is as follows:-

APM5k: 25kPa (100in. wg) APM50k: 200kPa (830in. wg)

1.2 The instrument is designed for use with dry air or gases only and care must be taken to avoid liquid passing into the instrument through the pressure connectors. Do not apply pressure by mouth directly to the pressure connectors, and do not moisten the end of any connecting tube before pushing onto the connectors.

1.3 Use the longest reasonable lengths of pressure tubing when taking measurements in dirty or

2. Introduction.

The APM Airflow Pocket Manometer is a battery powered electronic manometer with a digital display combining portability with ease of use without the disadvantages of a liquid filled manometer.Either Metric or Imperial units may be selected.

There are two models both having dual range selection which provides excellent resolution over a wide pressure range.

The APM may be used to measure positive, negative and differential pressures for a wide range of applications and is suitable for use with pressure sensors such as the Wilson Flow Grid, telescopic and fixed length Pitot Static tubes, orifice plates and Venturi tubes.

A 0 - 1V analog output is provided for use with a compatible data-logger such as the Airflow AM1 or AM2.

The APM is housed in a strong plastic case which may be contained within the protective carry case for on - site use.

3. Battery Information.

To operate the instrument a 9v PP3 (IEC 6F22) battery must be fitted. An alkaline battery is preferred as this gives longer operating life.

The battery is not supplied.

3.1 Low battery indication.

The battery minimum operating voltage is indicated by 'BAT' appearing in the right hand side of the display. If this occurs, replace the battery immediately.

3.2 Replacing the battery.

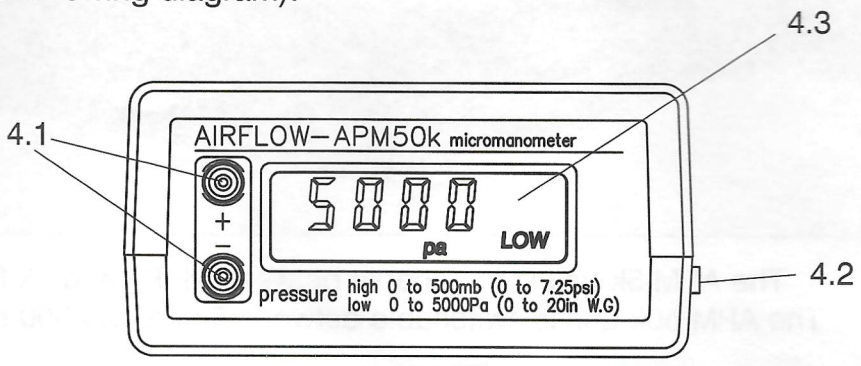
The battery is accessible through the slide and 'snap in' cover in the underside of the instrument. Remove the battery from the connector with a small screwdriver - do not disconnect it by pulling on the flying leads. Fit a replacement battery and replace the cover.

Do not leave a discharged battery in the instrument or leave a battery in place if the instrument is to be left out of use for a long time.

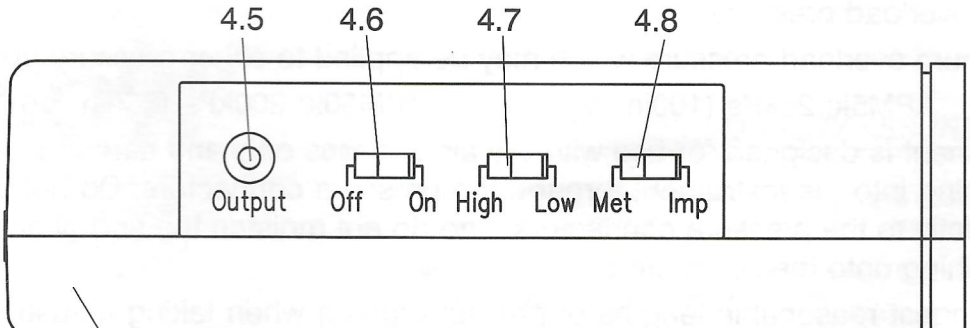
4. Description of the instrument.

Before using the instrument, users should familiarise themselves with its features.

The APM5k / APM50k unit is housed in a robust plastic case having the following external features (refer to following diagram):-



Front of Unit



4.1 Pressure connectors suitable for rubber tubing of 2.5mm internal diameter.

4.2 Zero adjustment wheel.

4.3 Custom LCD display having the following features:-

4-off 7 segment characters for displaying the pressure reading
A '-' (negative indicator) to the left hand side of the characters indicates that a negative differential pressure is being applied.
A flashing upright arrow (↑) to the left hand side of the characters indicates that the input is out of range
Either 'HIGH' or 'LOW' to the right hand side of the characters indicates range selected
'BAT' on the right hand side of the display indicates a low battery condition
One of:'Psi, mb, "wg or pa' at bottom of the display indicates the combination of the range and units selected.

4.4 Battery cover. This slides and 'snaps in' at the rear underside of the instrument.

4.5 Output socket on LHS of unit for 0 - 1volt analogue output.Suitable for 3.5mm jack plug (provided).

4.6 'On/Off' slide switch on LHS of unit. Always switch off when not in use to conserve battery power.

4.7 'High/Low' range selection slide switch on LHS of unit.

4.8 'Met/Imp' slide switch on LHS of unit to select either Metric or Imperial units of measurement.

4.9 Additional items supplied but not shown:-

2-off 2-metre lengths of 2.5mm I.D. red and blue plastic tubing
2-off 150mm lengths of 5mm I.D. red and blue plastic tubing (for connecting to differential pressure sensors, such as Pitot Static tubes.
2-off 2.5mm/5mm tube adaptors
3.5mm jack plug for the 0 - 1volt analogue output
Carrying case for holding the instrument and accessories.

Note: Airflow Developments can also supply a wide range of Pitot Static tubes of varied length and diameter all of which are compatible with the APM instrument.
Use with a Pitot Static tube is detailed in section 8.

5. Analogue output.

A 0 - 1V analogue output voltage proportional to the selected pressure range and having an output resistance of 1k ohm, is provided via the 3.5mm jack socket on the LHS of the unit (item ref 4.5).

Wiring of mating jack plug:- tip of plug: analogue output +ve
barrel of plug: analogue output -ve.

6. Using the instrument.

Before using the instrument, please make note of the warnings given in SECTION 1 on page 1.

6.1 Switch ON and check the battery state (see section 3.1). If 'BAT' does not appear in the RHS of the display then the instrument is ready for use.

6.2 Before connecting the instrument to the required pressure source, select the required range (high or low by means of range switch item 4.7) and zero the display by means of the zero thumbwheel (item 4.2).
The preferred method to achieve a steady zero is to connect the two pressure ports together with a length of tubing.
Check and adjust the zero on a regular basis; before each reading if there is a long interval between each reading and if the range is changed.

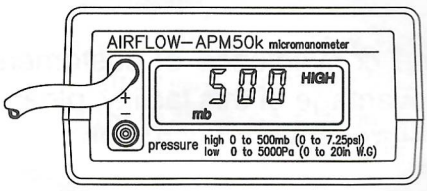
6.3 If a flashing vertical arrow (↑) appears in the extreme LHS of the display, this indicates that the input pressure is out of range and the accuracy of the reading cannot be guaranteed.

6.4 The following table details the APM ranges resulting from the combination of range and unit switch selections:-

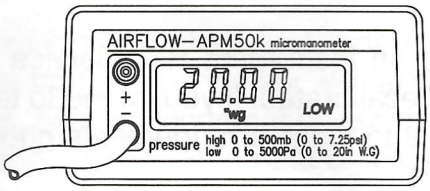
Model	Range switch setting	Units switch setting	Instrument Range	Resolution
APM5k	Low	'Met'	0 - 2000 Pa	1 Pa
		'Imp'	0 - 2 ins wg	0.001 in. wg
	High	'Met'	0 - 5000 Pa	1 Pa
		'Imp'	0 - 20 ins wg	0.01 in. wg
APM50k	Low	'Met'	0 - 5000 Pa	1 Pa
		'Imp'	0 - 20 ins wg	0.01 in. wg
	High	'Met'	0 - 500 mbar	1 mbar
		'Imp'	0 - 7.25 Psi	0.01 Psi

7. Taking pressure readings.

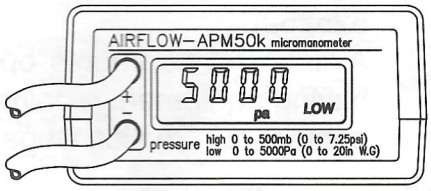
Connect the pressure source to the appropriate connector(s) depending upon the type of measurement required as follows:-



Positive pressure relative to atmosphere



Negative pressure relative to atmosphere

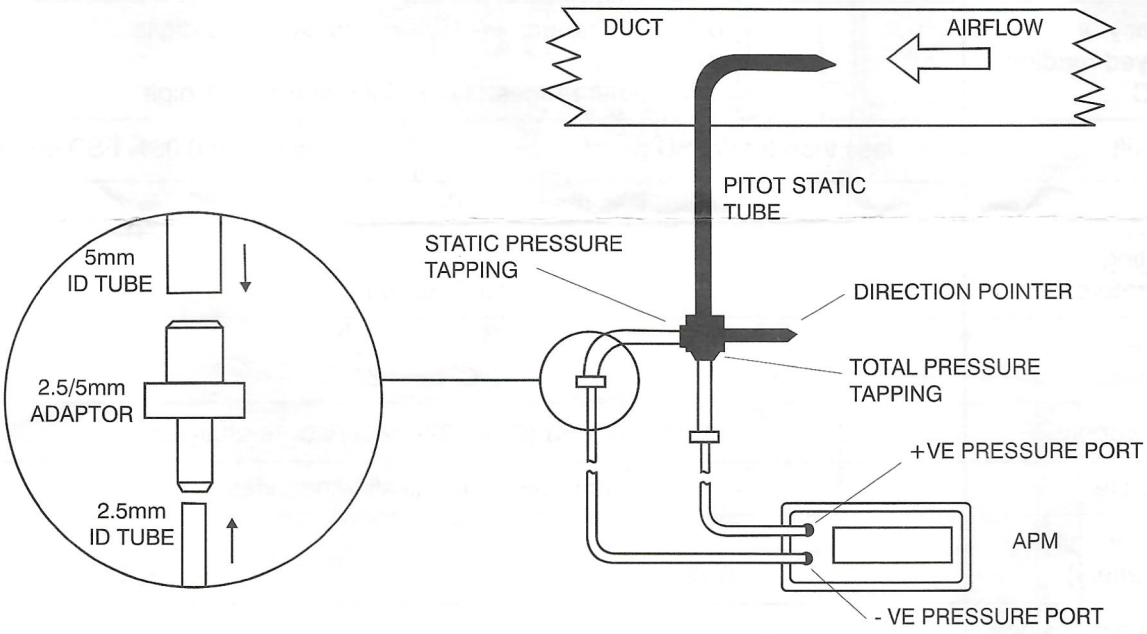


Differential pressure

If negative readings are shown on the display, this indicates incorrect connection of the pressure tubes. This will not harm the instrument but the readings may not meet the stated accuracy specification.

8. Taking velocity readings.

8.1 The APM unit is basically designed for pressure measurement but may be used for velocity measurement when used in conjunction with a Pitot Static tube connected as shown in the following diagram:-



8.2 Possible Sources of Error.

One common source of error arises from the taking of measurements in a duct too close to a source of turbulence (e.g. a bend). If possible, the Pitot Static tube should be inserted into the duct at least 6 duct diameters or widths downstream of any source of turbulence.

In the particular case of measuring the air flow from a grille, the air issuing from a grille is invariably very disturbed and results obtained by deploying the Pitot Static tube near to the grille surface are sure to be unreliable.

To prevent unreliable readings, a short length of test ducting which is just larger than the overall dimensions of the grille should be made.

This test duct can be of any convenient rigid material (e.g. stiff cardboard) and should have a length of at least twice the diagonal measurement of the grille. The test duct should be placed over the grille, and sealed to the wall with adhesive tape. The Pitot Static tube can now be deployed at the open end of the test duct.

The cross-sectional area of the test duct (not the grille) should be used in any volume flow calculations.

9. Repair and Calibration.

If a fault or the instrument's calibration is suspected (after having ensured that it is correctly zeroed), it should be returned to Airflow Developments for repair or recalibration to original standards. In any event, it is good practice to have the instrument checked at least once a year.

If an instrument is not working correctly or requires recalibration, contact your nearest Airflow Agent or U.K. Service Department on High Wycombe (01494) 525252 (International: +44 1494 525252).

Airflow Developments operate an instrument Hire Service for the convenience of customers having equipment repaired or recalibrated. If you intend to take advantage of this facility, please contact our Service Department to make arrangements prior to returning your instrument.

10. Specification.

Model	APM 5k				APM 50k			
Range	0-2000 Pa	0-5000 Pa	0-2 in. wg	0-20 in. wg	0-5000 Pa	0-500 mbar	0-20 in wg	0-7.25 Psi
Resolution	1 Pa	1 Pa	0.001 in. wg	0.01 in. wg	1 Pa	1 mbar	0.01 in. wg	0.01 Psi
Maximum overload pressure	25kPa		100 in. wg		200 kPa		830 in. wg	
Accuracy of displayed reading at 20°C	0-2 in. wg range: +/- 1½% of reading +/- 5 digits All other ranges: +/- 1% of reading +/-1 digit.							
Zero drift	less than 0.1% FSD per °C				less than 0.05% FSD per °C			
Range drift	less than +/- 0.04 % of reading per °C							
Operating temperature	10°C to 50°C							
Storage temperature	- 20°C to +60°C							
Power supply	1 only 9V PP3 (IEC6F22) Battery or re-chargeable							
Battery life	50 hours using alkaline batteries							
Weight of unit (less battery)	0.73 Kg				1.6 lbs			
Overall dimensions								

11. Material Specification.

The following materials interface with the air/gases introduced into the instrument:-
APM 5k - Silicon, polyester, epoxy adhesive, borisilicate glass and silicon to glass bond
APM 50k - Silicon, thermoplastic and silicone gel.

12. CE Marking.

The unit complies with the EEC Directive on Electromagnetic Compatibility (EMC) 89/336/EEC, Applied Harmonised Standards: EN55022 class A, Radiated Emissions EN50081-1 and EN50082 -1 Radiated and ESD immunities.

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