

ductchecker™

Duct Detector Test Tool



Instruction Manual



**Hand-Held Digital
Monometer
Model: 8252**



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Congratulations on your purchase of the **ductchecker**[™] Duct Detector Test Tool. This digital manometer is a portable, battery operated pressure measuring device.

The **ductchecker**[™] is ideal for Fire Testing Technicians measuring pressure levels in HVAC/R ducts containing smoke detectors.

INTRODUCTION

- ✓ The meter will display all LCD segments when it is first turned on for approx. 3 seconds. **Note:** Though you might see DATALOGGER, Y/M/D, REL, AVG, these are not available on this meter.
- ✓ The LCD is divided into two distinct sections: One large (**primary**) top screen and one smaller right-bottom screen (**relative Clock**). The two display areas keep you constantly updated with the pressure measurements.
- ✓ The meter measures:
 - Gauge pressure** - a measurement of pressure that is referenced to ambient pressure.
 - Differential pressure** - a measurement of difference of two pressures.

- ✓ The meter has five selectable units of measure: InH₂O, psi, mbar, bar, mmH₂O.
- ✓ Please check tubing is not leaking or damaged before using.

CONVERSION & RESOLUTION

1mbar=		Resolution
Inch of H ₂ O	0.401	0.01
psi	0.0145	0.004
mbar	1	0.1
mm of H ₂ O	10.2	1

MANOMETER QUICK START

- ✓ Unscrew the battery compartment on the rear of instrument and fit PP3 (or equivalent) battery. Replace the cover and secure with the screw.
- ✓ Press **(I)** to switch the instrument on.
- ✓ Press **(UNIT)** to select the unit of pressure measurement required. Zero by pressing **(HOLD)** and hold for 3 seconds. The instrument now reads gauge pressure.
- ✓ Press **(DIF)** for differential pressure measurement.

- ✓ Press **(HOLD)** to freeze reading. Press **(HOLD)** again to cancel feature.
- ✓ Press **(REC)** to start **clock**. Press **(REC)** again to see **time** (since start of recording). For **MAX** reading press **(REC)** again to see **time** (since start of recording). For **MIN** reading pressing **(REC)** again returns to **real time recording mode**.
- ✓ Press and hold **(REC)** for 3 seconds to turn **clock** feature off.

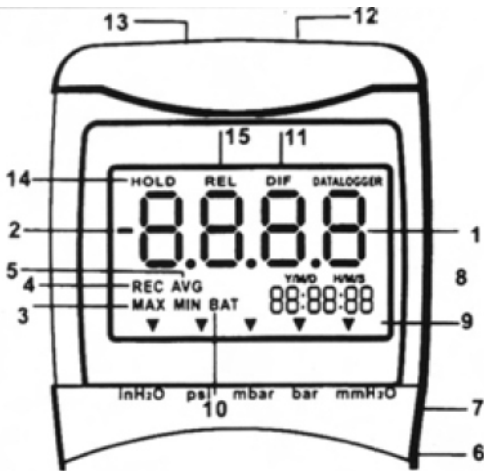
Note:

Clock feature available with gauge pressure only not differential. The instrument will automatically switch off after 20 minutes unless sleep mode is disabled, see page 5 AUTO POWER OFF.

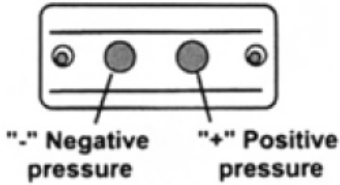
- ✓ Press **(L)** for display backlight - illuminates for approximately 30 seconds and automatically switches off.



CONTROL & INDICATORS



1. Primary Data Screen displays pressure value.
2. "-" Minus pressure display.
3. **MAX MIN** Pressure recorded.
4. **REC** Starts recording mode and displays max/min pressure recorded.
5. **AVG** Average records (N/A).
6. **DC** Power in Jack.
7. **RS232** Output port
8. **H/M/S 88:88:88** Displays time for Hour/Minute/Second.
9. ▼ Pressure unit indication
10. **BAT** Battery low indicator.
11. **DIF** Differential pressure mode
12. "+" Positive pressure connection
13. "-" Negative pressure connection
14. **HOLD** Freezes pressure reading.
15. **REL (N/A)** Establish a relative zero for the primary screen information.



AUTO POWER OFF (SLEEP FUNCTION)

This instrument will shut off automatically after approx. 20 minutes for every power on. For recording or operating over longer periods of time, you can disable the sleep mode by pressing **ⓘ** and **HOLD** simultaneously before power on.

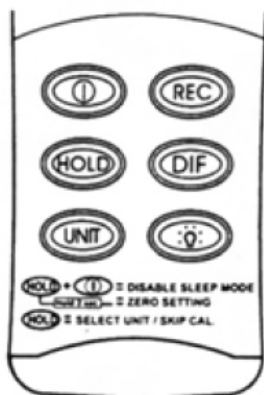
An "n" will appear in the middle of the screen at which time you can release the **HOLD** button (see Fig. A). The disable sleep mode will be invalid after power on.



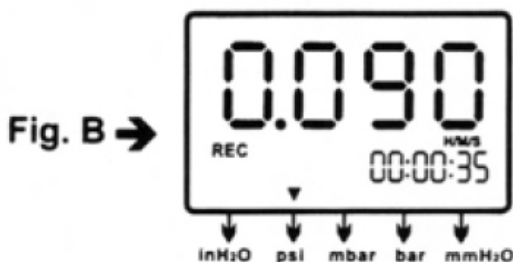
MODE OPTIONS

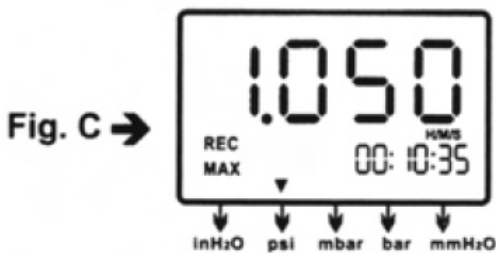
Delete and replace with programmable user selectable start-up mode. The display will default to the mode last used.

The following table lists the modes of operation that can be invoked by pressing the button indicated.

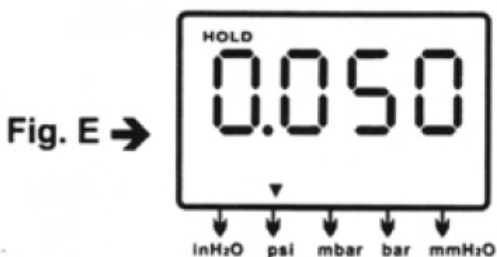


- ⓘ Turns instrument on (default setting) and off.
- REC Press momentarily and relative clock starts in the lower right screen. **REC** is displayed in the middle left of screen (Fig. B). Other button functions are locked out except **Power**, **Unit** and **Backlight**. Press momentarily again and the unit cycles through **MAX** (Fig. C) and **MIN** (Fig. D) and back to current pressure; the record mode is displayed on the LCD. Press and hold REC for 3 seconds to turn off the record function and return to normal mode.

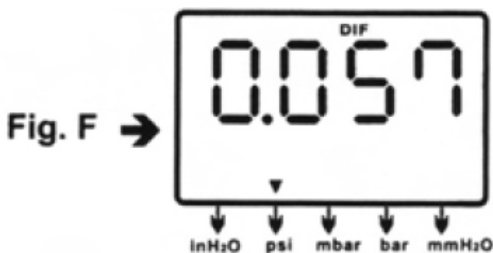




(HOLD) Press momentarily to freeze the pressure recording (Fig. E).

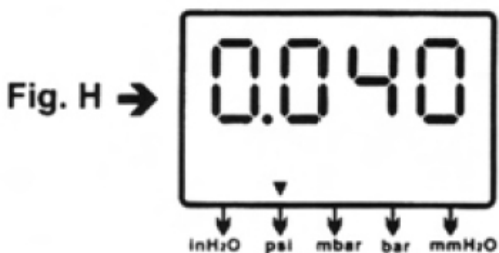
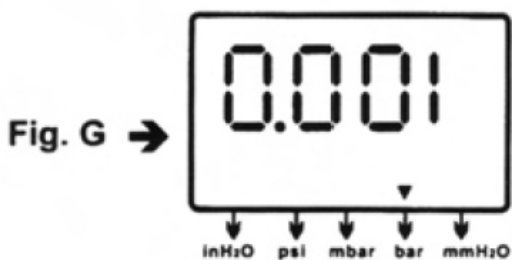


(DIF) Press momentarily, DIF appears on top of the LCD and the display indicates the relative zero (relative zero causes the value of the display to show as "0.0") - only the amount of pressure change will be indicated. Press momentarily again and the unit returns to the normal mode of pressure differential (see Fig. F).



Differential Pressure: a measurement of the difference between two pressures, i.e. use differential pressure sensor to measure gauge pressure by leaving one process connection open to the atmosphere and connecting the second sensor port to your system.

- Ⓢ Press momentarily and the unit will cycle through "**inH₂O**", "**psi**", "**mbar**", "**mmH₂O**" which are indicated on the bottom of the display (see Fig. G & H).



- 💡 Press momentarily and the backlight illuminates for approx. 30 seconds then turns off automatically. Or press momentarily to decrease the figure when calibration is being performed.

MAINTENANCE

- ✓ The meter is calibrated in-house before shipping.
- ✓ When properly maintained, the meter will maintain its accuracy to specification. To ensure your meter is performing at its peak, send it to the factory or a qualified instrument calibration facility for annual calibration.
- ✓ Recommended - always set to zero before measurement. Refer to the zero setting procedure on page 11.

Cleaning:

Use a damp cloth and mild soap to clean the case of the Monometer. Do not use harsh detergents or abrasives as these may mar the finish or damage the unit's case with an adverse chemical reaction.

CALIBRATION MODE

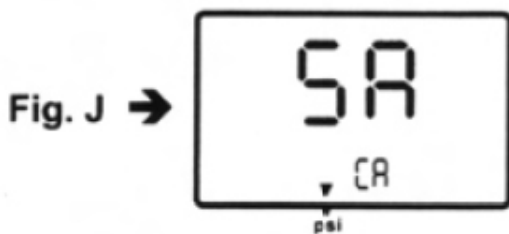
Calibration mode is only applicable for a standard manometer calibrator or any qualified calibration facility for annual calibration.

1. Manually set the display to zero (no pressure applied to the connector), refer to the manual zero procedure (see page 11).

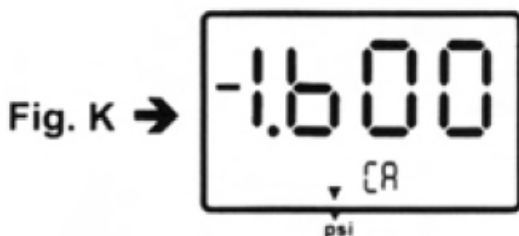
2. Turn the meter off.
3. Press **REC** & **Ⓢ** simultaneously. **"CA"** appears on the display. (see Fig.1) and the meter enters the calibration mode. Make sure the unit is set on **"PSI"** to start positive (+) pressure calibration.



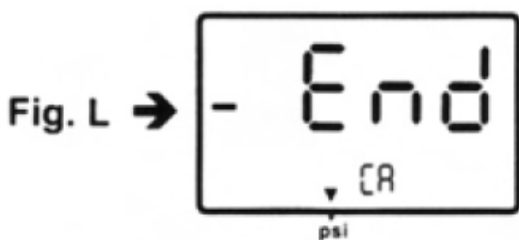
4. The meter has defaulted to 1.6 psi calibration point, the adjustable pressure range is from 1.5 to 1.7 psi. If calibration pressure source is not 1.6 psi, increase by pressing **DIF** key, or decrease by pressing **Ⓢ** key to set calibration point as required.
5. Save the calibration point by pressing **REC** key. **"SA"** and small **"CA"** appears on the display (see Fig. J). After 2 seconds, the meter auto-skips to the negative pressure (-) point for their next calibration mode.



6. Follow the same procedure as in step 4 for the negative pressure calibrator point. The LCD now displays **"- 1.600"** and a small **"CA"** (see Fig. K). Do the necessary calibration figure referring to your pressure standard if needed.



7. Again save the calibration point by pressing **REC** key, **"SA"** and **"CA"** appears in 2 seconds and then pressing **UNIT**, **"End"** and **"CA"** appears in another 2 seconds. The meter turns back to the normal mode (see Fig. L).



If you can't save by pressing the **UNIT** key, i.e. no **"SA"** appeared, please check:
(a) the calibration pressure source is between 1.5 and 1.7, or (b) if you entered the correct positive pressure (+) or negative pressure (-).

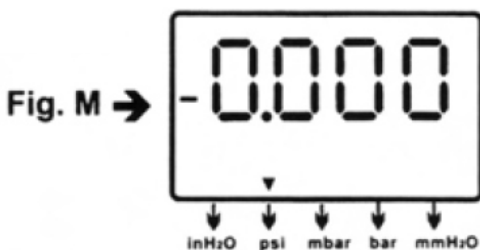
If you want to skip positive (+) calibration when in calibration mode, press **UNIT** to skip to negative (-) calibration point.

Calibration point reference

psi range	Calibration point(±)	Recommended (±)
0 ~ ±2	1.6	1.5 ~ 1.7

MANUAL ZERO SETTING

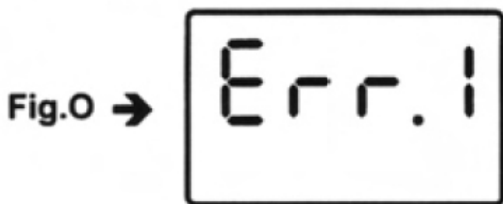
When you set the display to zero (no pressure applied to the connector), press **(HOLD)** for 2 seconds. Now the meter displays **"-0.000"** from right to left (see Fig. M), then the LCD display shows a normal mode.



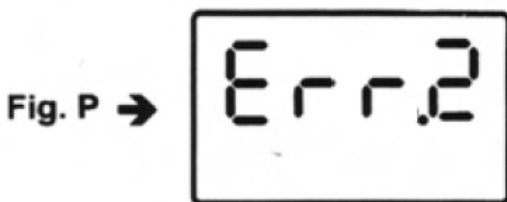
TROUBLESHOOTING

- ? **Power on but no display.** Check the battery connections. Replace with new battery or attach optional AC adaptor.
- ? **BAT indication.** Replace with a new battery when LCD displays **BAT** at the middle bottom.
- ? **No display.** Make sure battery is not empty. If the display disappears, check sleep mode is active. Refer to the disable sleep mode function for a long time on page 4. Or check the tubing is connected to the meter tightly.

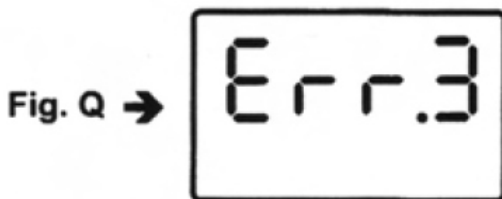
? **Err.1.** For the pressure value exceeding the maximum range, "**Err.1**" appears on the display (see Fig. O). Do not exceed above the rated pressure range of Manometer. The sensor will be damaged.



? **Err.2.** For the measurement of pressure less than minimum range, "**Err.2**" will appear (see Fig. P).

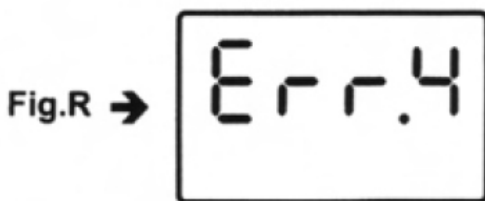


? **Err.3.** For a differential pressure value larger than maximum display, "**Err.3**" appears on the display (see Fig. Q).



? **Err.4.** When you set zero, make sure you have disconnected the tubing. If "**Err.4**" appears on the display, it means the Manometer is damaged (see Fig. R).

Note: "Err.4" will also appear if the tubing is connected during zero setting.



? **E1OL or E2OL.** When you see these errors while operating the RS232 software, it means the pressure source is less than or over the range of the instrument.

REPLACING THE BATTERY

Replace your 9-volt battery when:

- ✓ The **BAT** icon appears on the right of the screen.
- ✓ The meter will not power on.
- ✓ Use of the backlight causes the **BAT** icon to appear.

Even if the battery was recently replaced, check its voltage level if you get no response from the instrument.

To replace the battery:

1. Remove the tubing from the instrument.
2. Lay the instrument face-down on a clean, flat surface.
3. Remove the battery cover.



If you do not intend to use the instrument for a month or more remove the battery. Do not leave battery in the instrument.

OPERATING CONDITIONS

- ✓ Compensated temperature range:
0~50°C (32~122°F)
- ✓ Operating temperature range:
0~50°C (32~122°F)
- ✓ Storage temperature range:
-20~60°C (-4~140°F)
- ✓ Operating Humidity Max. 80% RH
- ✓ Power: One 9.0 volt battery
- ✓ Exceeding maximum pressure will cause permanent sensor damage.

MATERIAL SUPPLIED

This package contains:

- ✓ The Manometer
- ✓ Battery (9.0 volt)
- ✓ Operation manual
- ✓ Connection tube 6mm (ID) x 9mm (OD) x 500mm length x 2 pcs.

OPTIONAL ACCESSORIES

- ✓ RS232 software CD with D-sub connector
- ✓ Rubber boot

SPECIFICATION

	Pressure
Range	0~ ± 138 mbar = 0~ ± 55.4 inH2O = 0~ ± 1410 mm inH2O = 0~ ± 0.138 bar = 0~ ± 2 psi
Resolution	See Page 2 data sheet
Accuracy	±0.3% of full scale at ±25°C
Dimensions	72 x 182 x 30mm (meter)
Unit Weight	Approx. 220 gram (with battery)
Response time	0.5 seconds
Format	Baud Rate: 2400 bit/sec Data Bit: 8, Stp Bit: 1 P XXXXX, P - XXXXX (unit)

RS232 DATA OUTPUT

This Manometer can link with a personal computer to capture online data, display pressure records with real-time output. You can retrieve files, save the data for operating data analysis, record statistics, multi-file display on the screen etc. - versatile functions of your choice.

Connection Procedures:

1. Plug the optional accessory RS232 cable into the DC jack port (at the right side of the meter).
2. Insert the D-sub 9P type connector into the computer's Com. 1 or 2 port.
3. Start the set up of RS232 software by inserting the CD-ROM
4. When installing the RS232 software, please follow the operation manual procedure in the software package.

Hardware Master's Data Logger

Retrieve File
Save File
Conn. Port
Statistics
Print Graph
Help

Data Logger

Date: 12-19-2000 Time: 08:26:48

Logger Settings — Graph Chart

Sample Data: — — — — — — — — — — —

Sample Rate(Sec):

Recording:

Y-OFFSET (DIV)

Y GAIN (DIV)

Pressure **Alarm SW**

Alarm High High Limit: Alarm High High Limit:

Alarm Low Low Limit: Alarm Low Low Limit:

Display Range

ductchecker[™]



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