



MAN02-A
Hand Held Digital
Manometer

Users Manual

English

MAN02A_Rev001
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Limited Warranty and Limitation of Liability

Your Amprobe product will be free from defects in material and workmanship for 1 year from the date of purchase. This warranty does not cover fuses, disposable batteries or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Amprobe's behalf. To obtain service during the warranty period, return the product with proof of purchase to an authorized Amprobe Test Tools Service Center or to an Amprobe dealer or distributor. See Repair Section for details. THIS WARRANTY IS YOUR ONLY REMEDY. ALL OTHER WARRANTIES - WHETHER EXPRESS, IMPLIED OR STATUTORY - INCLUDING IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, ARE HEREBY DISCLAIMED. MANUFACTURER SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

Repair

All test tools returned for warranty or non-warranty repair or for calibration should be accompanied by the following: your name, company's name, address, telephone number, and proof of purchase. Additionally, please include a brief description of the problem or the service requested and include the test leads with the meter. Non-warranty repair or replacement charges should be remitted in the form of a check, a money order, credit card with expiration date, or a purchase order made payable to Amprobe® Test Tools.

In-Warranty Repairs and Replacement – All Countries

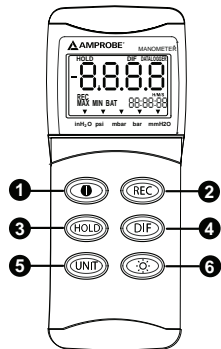
Please read the warranty statement and check your battery before requesting repair. During the warranty period any defective test tool can be returned to your Amprobe® Test Tools distributor for an exchange for the same or like product.

Additionally, in the United States and Canada In-Warranty repair and replacement units can also be sent to a Amprobe® Test Tools Service Center (see address below).

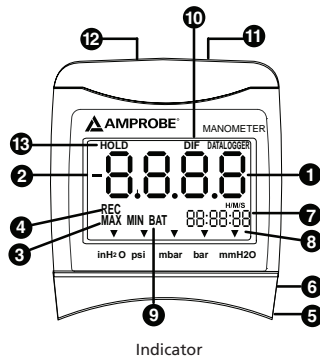
Non-Warranty Repairs and Replacement – US and Canada

Non-warranty repairs in the United States and Canada should be sent to a Amprobe® Test Tools Service Center. Call Amprobe® Test Tools or inquire at your point of purchase for current repair and replacement rates.

European non-warranty units can be replaced by your Amprobe® Test Tools distributor for a nominal charge.



- 1 ON/OFF Pushbutton
- 2 Record pushbutton
- 3 Data Hold pushbutton
- 4 Differential pushbutton
- 5 Unit Selector pushbutton
- 6 Backlight pushbutton



- 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 DC power input jack
- 6 USB output port (USB cable not included)
- 7 H/M/S 88:88:88 displays time in Hour/Minute/Second
- 8 ▼ Pressure unit indication
- 9 BAT Low battery indicator
- 10 DIF Differential pressure mode
- 11 "+" Positive pressure connection input
- 12 "-" Negative pressure connection input
- 13 Data Hold freezes pressure reading

MAN02-A
Digital Manometer

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Congratulations on your purchase of the Amprobe MAN02-A manometer. This instrument is a portable, battery operated pressure measuring device. The MAN02-A is ideal for HVAC/R technicians measuring pressure level, Medical equipment, Computer peripherals, Pneumatic controls.

INTRODUCTION

- The meter will display all LCD segments when it is first turned on for approx. 3 seconds.
- 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 will constantly update with the pressure measurements.

FEATURES

The meter measures:

- **Gauge pressure** - a measurement of pressure that is referred to ambient pressure.
- **Differential pressure** - a measurement of difference of two pressures .
- MAN02-A has 5 selectable units of measure: InH₂O, psi, mbar, bar, mmH₂O.
- Please check that the tubing is not leaking or damaged before use.

STANDARD ACCESSORIES

The package contains:

- MAN02-A
- 1 9V battery
- Users manual
- 2X connection hoses 4mm(ID) x 6mm(OD) x 500mm

OPTIONAL ACCESSORY

- TM-SWA-USB, Download Suite Software with USB cable

QUICK START


Unscrew battery compartment on the rear of the instrument and insert the battery. Replace cover and secure with screw.

1. Press **ⓘ** to switch the instrument on.
2. Press **UNIT** to select unit of pressure measurement required. For zeroing, press **HOLD** for three seconds.
3. Press **DIF** for differential pressure measurement.
4. Press **HOLD** to freeze the reading on the display. Press again to cancel feature.
5. Press **REC** to start a recording; press again to display MAX value of the recording session; press again to display MIN value of the recording session; and press again to return to real time recording mode.

The Instrument records only the Max and the Min values for each session. To record all values for a recording session, use the Download Suite Software.

Press **REC** and hold 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.

6. Press  to turn ON the back-light. It automatically switches off after 30 seconds.

AUTO POWER OFF

(Sleep mode function)

This instrument will turn off automatically in approx. 20 minutes after power-on if there are no key activations. For recording or operating over longer periods of time, you can disable the sleep mode by pressing ① and **HOLD** simultaneously before powering on.

An "n" will appear in the middle of the screen at which time you can release the button. (See Fig. 1) The disable sleep mode will be invalid after power off.

OPERATION MODE

(See Fig. 18.)

1. Turns instrument on and off.

2. Press momentarily and relative clock starts in the lower right screen.

REC is displayed in the middle left of screen (Fig.2).The other functions are locked out except **Power** and **Backlight**.

Press momentarily again and the unit cycles through **MAX** (Fig. 3) and **MIN** (Fig.4) and back to current pressure reading; the record mode is displayed on the LCD.

Press and hold for 3 seconds to turn off the record function and return to normal mode.

3. Press momentarily to freeze the pressure reading (Fig. 5).

4. 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.6).

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 atmosphere and connecting the second sensor port to your system.

5. Press momentarily and the units will cycle through "InH₂O", "psi", "mbar", "bar", "mmH₂O" which are indicated on the bottom of the display (See Fig.7 & 8).

6. Press momentarily and the backlight illuminates for approx. 30 seconds, then turns off automatically.

Press momentarily to decrease the figure when calibration is being performed.

CALIBRATION MODE

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

1. First, manually set the display to zero (no pressure applied to the connector), refer to the manual zero procedure.
 2. Turn the meter off.
 3. Press **0** & **REC** simultaneously, "CA" appears on the display, (See Fig. 9) the meter enters to the calibration mode, make sure the units setting on "PSI" to start positive (+) pressure calibration.
 4. The meter has defaulted as 1.6 psi calibration point, the adjustable pressure range is from 1.5 to 1.7.
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 in 2 seconds (See Fig. 10). The meter auto-skips to the negative pressure (-) point for next calibration mode.
 6. Follow the same procedure as step 4 for the negative pressure calibration point.
The LCD now displays " -1.600 " and small "CA" (See Fig.11). Perform the necessary calibration figure. Refer 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 press **UNIT**;"End"and "CA" appear in another 2 seconds. The meter turns back to the normal mode (See Fig. 12).
If you can't save by pressing **UNIT** key, i.e. no "SA" appeared, please check the followings:
 - the calibration pressure source is between 1.5 and 1.7. or
 - if you entered the right positive pressure (+) or negative pressure (-).
- If you want to skip positive (+) calibration when in the calibration mode, press **UNIT** key 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 the **HOLD** key for 2 seconds. The meter should display "- 0 .000" from right to left (See Fig.13). Then, the LCD display shows normal mode.

TROUBLESHOOTING

Cannot Power on.

Check the battery connections. Replace the battery or attach Optional AC adaptor.

Low BAT indication.

Replace the battery when LCD displays **BAT**.

No Display.

- Make sure the battery is functional.
- check if sleep mode is active. Refer to disable sleep mode on page.6 to turn it off.
- check if 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. 14). Do not exceed rated over pressure range of manometer. Sensor may be damaged.

Err.2.

For the measurement pressure less than minimum range, "Err. 2" will appear (See Fig. 15).

Err.3.

For a differential pressure value larger than maximum display, "Err.3" appears on the display (See Fig.16).

Err.4.

When you set zero, make sure you have disconnected the tubing. If you see an "Err.4" appear on the display, it means the manometer is damaged (See Fig.17)

Note. Err.4 Will be also appear If the tubing is connected during zero set.

E1OL or E2UL.

When you see these errors while operating USB software, it means pressure source is less or over than the range of the instrument.

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 back-light causes the BAT icon to appear.

Replacing The Battery

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

Remove battery from instruments that you do not plan to use for a month or more.

Do not leave battery in instrument.

USB PC INTERFACE CAPABILITIES

The USB cable and the Download Suite software are required to transfer data to a PC. The USB port is located on the right side of the instrument. The USB Cable is not included. It can be purchased separately as an optional accessory.

Download Suite Software installation

Insert the Download Suite CD into the CD-ROM drive.

To install the software, follow the on-screen instructions.

Operation

To open the program, double-click the Download Suite icon.

To transfer data to a PC, follow the on-screen instructions.

MAINTENANCE

The meter is calibrated in house before shipping. When properly maintained, the meter will maintain its accuracy as specified.

Cleaning

Use a damp cloth and mild soap to clean the case of the MAN02-A Manometer, do not use harsh detergents or abrasives as these may mar the finish or damage the unit's case with an adverse chemical reaction.

SPECIFICATIONS**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 Supply : 1 x 9.0 volt battery

Exceeding Maximum pressure will cause permanent sensor damage.

Range: 0 ~ ±2 psi

Conversion & Resolution

1 mbar =		Resolution
inch of H ₂ O	0.401	0.01
psi	0.0145	0.001
mbar	1	0.1
bar	0.001	0.001
mm of H ₂ O	10.2	1

Accuracy: ±0.3% of full scale at ±25°C (77°F)

Dimension: 72 x 182 x 30mm (meter)

Unit Weight: Approx. 220 gram (with battery)

Response Time: 0.5 seconds



Fig. 1



Fig. 2



Fig. 3



Fig. 4

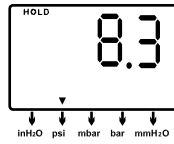


Fig. 5

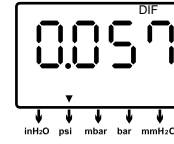


Fig. 6

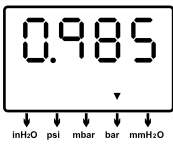


Fig. 7



Fig. 8

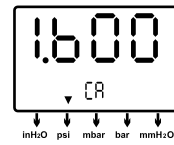


Fig. 9

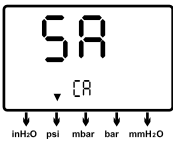


Fig. 10



Fig. 11

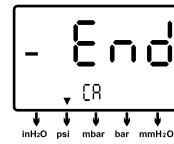


Fig. 12

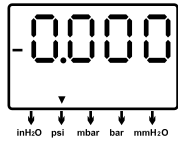


Fig. 13

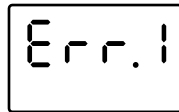


Fig. 14

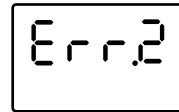


Fig. 15

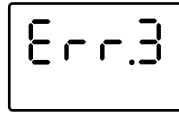


Fig. 16

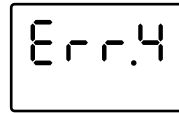


Fig. 17

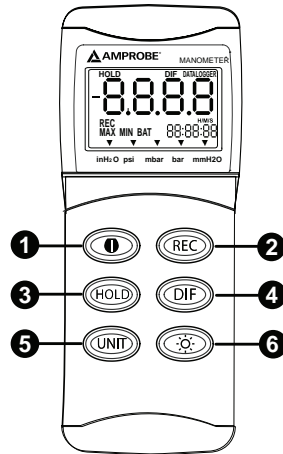


Fig. 18