

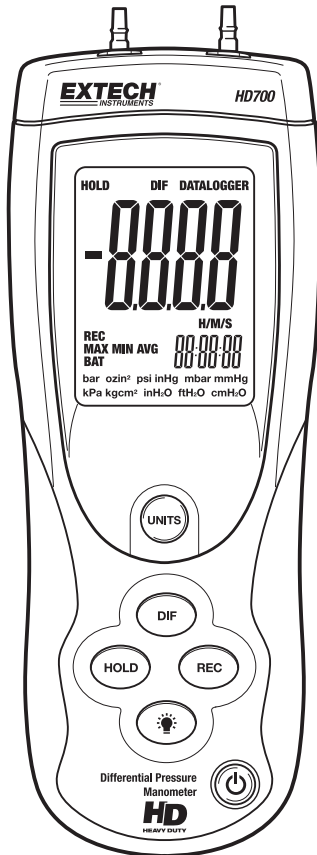
User Guide

**EXTECH**<sup>®</sup>  
**INSTRUMENTS**

A FLIR COMPANY

# Heavy Duty Differential Pressure Manometer

## Model HD700




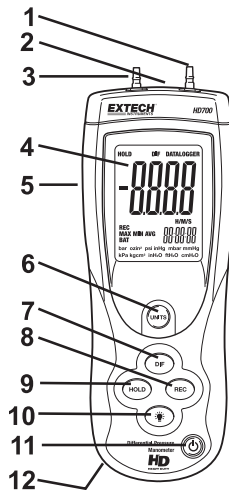
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## Introduction

Congratulations on your purchase of the Extech Manometer Model HD700. This device measures gauge and differential pressure in the range of  $\pm 2.000$  psi. The HD700 offers eleven (11) units of measure (user selectable by front panel pushbutton) and has a differential input that uses convenient quick-disconnect fittings. Advanced features include DATA HOLD, MIN-MAX-AVG RECORD mode, ZERO/OFFSET, AUTO POWER OFF, and USB PC interface. This instrument is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

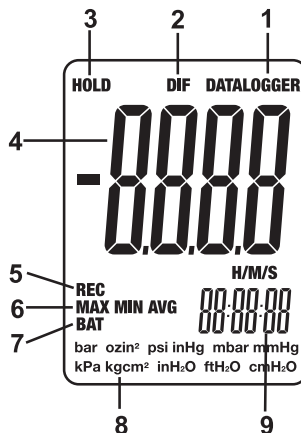
## Meter Description

1. P1 input
2. AC adaptor jack
3. P2 Input
4. LCD Display – Indicates the measurement data, unit of measure, elapsed timer, and function symbols as described in this manual
5. USB PC interface jack (3.5mm) – For use with data acquisition software
6. UNIT button – Press to select the unit of measure
7. DIF button– Press to display differential pressure. Also used to OFFSET the displayed readings.
8. RECORD button– Press to access the MIN/MAX/AVG recording mode
9. HOLD / ZERO button– Press to freeze the displayed reading. Also used to zero the display (press and hold until display shows all zeroes).
10. BACKLIGHT  button – Press to switch the display backlight ON. The backlight will automatically turn OFF after 40 seconds.
11. POWER button – Press to turn the meter ON or OFF
12. Battery compartment (on rear)



### Display

1. USB data output active
2. Differential Pressure Mode
3. Data Hold Mode
4. Primary display
5. Record Mode
6. MAX/MIN/AVG indicators
7. Low Battery Indicator
8. Pressure unit of measure
9. Elapsed Timer



# Basic Operation

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## Meter Power

The HD700 uses a 9V battery for power. If the meter does not switch on when the POWER button is pressed or if the display shows **BAT**, replace the battery.

When the POWER buttons is pressed, the meter performs a short self-test and reverts to the settings in place when the meter was last turned off.

## Automatic Power-off Feature

In order to conserve battery life, the meter has an automatic power off feature (after 20 minutes). To defeat this feature, press and hold the HOLD button while turning the meter on. Release the HOLD button when 'n' appears on the display. The meter will now remain on until the user turns it off or until the battery weakens. Note that the Auto Power OFF feature will be reactivated the next time the meter is turned off and then on.

## Unit of Measure

Press the UNIT button to select the unit of measure. This meter offers eleven (11) units of measure as listed below.

Unit of Measure	Display icon
Pounds per square inch	psi
Inches of Mercury	inHg
Milli-bar	mbar
Millimeters of Mercury	mmHg
Kilo-Pascals	kPa
Kilograms per centimeter squared	Kgcm <sup>2</sup>
Inches of water	inH <sub>2</sub> O
Feet of water	ftH <sub>2</sub> O
Centimeters of water	cmH <sub>2</sub> O
Bars	Bar
Ounces per square inch	ozin <sup>2</sup>

## Fittings Connection

Connect tubing to the P1, P2 (or both) input port(s). If both inputs are used (differential mode), the meter displays a positive pressure reading if the P1 pressure is greater than P2 and a negative reading if P2 is greater than P1.

## Zero Adjust and Offset function

To ZERO the meter: Before use and without fittings attached to the meter, press and hold the HOLD button for 3 seconds or until the display shows all zeroes.

To OFFSET meter readings: Press the DIF button while taking a measurement. Subsequent readings will represent the difference between the current measurement and the measurement that was on the display when the DIF button was pressed.

## MIN-MAX-AVG Record Mode with Elapsed Timer

The RECORD function tracks the maximum (MAX), minimum (MIN), and average (AVG) readings with a time stamp. The elapsed timer is displayed on the lower right-hand corner of the LCD and informs the user of the time a MAX or MIN reading was recorded.

1. Press the RECORD button once. The REC indicator will appear on the display and the displayed elapsed timer will start (HH:MM:SS format [hours:minutes:seconds]).
2. Press the RECORD button again to view the highest (MAX) reading recorded since the RECORD button was first pressed. The MAX indicator and maximum reading will appear on the display. The elapsed timer will show the time of the MAX event.
3. Press the RECORD button again, the MIN indicator and the minimum value will appear on the display. The elapsed timer will show the time of the MIN event.
4. Press the RECORD button again, the AVG indicator and the average value will appear on the display. The elapsed timer will continue to run.
5. To return to normal operation, press and hold the RECORD button until the display indicators REC, MAX, etc. switch off.

Note that in the RECORD mode, the backlight and the power buttons are the only available functions.

## USB PC Interface

The meter has a built-in USB port for use with the Manometer Data Acquisition software. The software allows the user to view, save, export, and print readings from the HD700. Refer to the documentation included with the software for complete details.

## Displayed Error Codes

The following codes are displayed when the meter encounters an error.

**ERR 1:** Pressure input exceeds specified limits

**ERR 2:** Pressure input is too low to read

**ERR 3:** The Differential Pressure input exceeds specified limits

**ERR 4:** The Differential Pressure input is too low to read

# Specifications

## General Specifications

<b>Display</b>	Four digit LCD with function indicators
<b>Units of Measure</b>	BAR, mBAR, psi, kg/cm <sup>2</sup> , mm Hg, inches Hg, kPa, feet H <sub>2</sub> O, inches H <sub>2</sub> O, cm H <sub>2</sub> O, and oz in <sup>2</sup>
<b>Accuracy</b>	±0.3%FS (@ 25°C)
<b>Repeatability</b>	±0.2% to 0.5% FS
<b>Linearity/Hysteresis</b>	±0.3%FS
<b>Combined Accuracy</b>	±1.1%FS
<b>Maximum Pressure</b>	10psi
<b>Response time</b>	0.5s typical
<b>Input circuit</b>	Differential inputs (P1 and P2)
<b>Input Ports</b>	Two metal 4.8mm, barbed for 1/8" (3.17mm) ID tubing
<b>Data Hold</b>	Freezes displayed reading
<b>Sensor</b>	Built-in piezoelectric sensors
<b>Zero / Offset function</b>	Pushbutton activation
<b>Sample rate</b>	0.5 sec. (approx.)
<b>Compatibility</b>	Air or non-corrosive and non-ionized gas (not intended for use with liquids)
<b>Auto Power OFF</b>	Meter turns off after approx. 20 minutes to conserve energy (can be deactivated)
<b>PC Interface</b>	Built-in USB serial interface
<b>Storage conditions</b>	0 to 60°C (14 to 140°F); < 80% RH
<b>Operating conditions</b>	0 to 50°C (32 to 122°F); < 80% RH
<b>Battery power</b>	9V alkaline battery ( <b>BAT</b> low battery indicator)
<b>Battery life</b>	125 hours typical
<b>Dimensions</b>	8.2 x 2.9 x 1.9" (210 x 75 x 50mm)
<b>Weight</b>	9.8oz (280g)

## Range Specifications

Range/Units (Max.)	Resolution
± 0.137 bar	0.001
± 137.8 mbar	0.1
± 2.000 psi	0.001
± 0.140 Kg/cm <sup>2</sup>	0.001
± 103.4 mm Hg	0.1
± 4.072 inches Hg	0.001
± 13.79 kPa	0.01
± 4.612 feet H <sub>2</sub> O	0.001
± 55.40 inches H <sub>2</sub> O	0.01
± 140.6 cm H <sub>2</sub> O	0.1
± 32.00 oz in <sup>2</sup>	0.01

**Warning:** Pressure inputs of 10 psi or higher will damage the instrument. Do not apply pressure higher than the maximum pressure listed in the specification table

## Battery Replacement

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When the low battery indicator **BAT** appears on the display or if the meter does not switch on when the POWER button is pressed, it is necessary to replace the battery.

To replace the battery:

1. Open the battery compartment by sliding the meter's rear panel in the direction of the embossed arrow.
2. Replace the 9V alkaline battery
3. Replace the battery compartment cover.



You, as the end user, are legally bound (Battery ordinance) to return all used batteries and accumulators; disposal in the household garbage is prohibited! You can hand over your used batteries / accumulators, gratuitously, at the collection points for our branches in your community or wherever batteries / accumulators are sold!

### Disposal



Follow the valid legal stipulations in respect of the disposal of the device at the end of its lifecycle

## Conversions

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Useful conversion Factors		
From	To	Multiplier
in of H <sub>2</sub> O	in of Hg	0.07355
in of H <sub>2</sub> O	cm of Hg	2.54
mm of Hg	in of H <sub>2</sub> O	0.03937

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