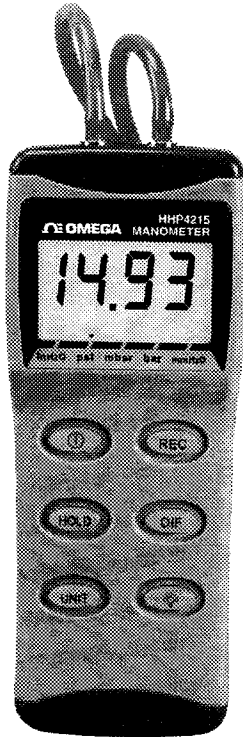


.1 YEAR
WARRANTY



User's Guide



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It is the policy of OMEGA Engineering, Inc. to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, human applications.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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Congratulations on your purchase of the Manometer ! This instrument is portable, battery operated pressure measuring device.

The Manometer 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. Though you might have seen DATALOGGER, Y/M/D, REL, AVG ..these are not available for the meter. The meter with datalogger features named 8205D/8215D/8230D/82100D. Please contact the store or the place you purchased.

✓ The LCD is divided into two distinct sections : One large (Primary) top screen and one smaller right-bottom bottom screens (Relative Clock). The 2 display areas keep you constantly updated with the pressure measurements.

✓ The Meter measures Gauge pressure-a measure of pressure in psi that is referenced to ambient pressure and Differential pressure - a measure of the difference two pressures .

✓ 11 pressure units are selectable for Imperial and Metric in the different area .: bar ,mmHg, ozin², kgcm², psi, inH₂O, kPa, ftH₂O,inHg ,cmH₂O,mbar.

4 models Manometer for your choice:
 Pressure range:0~ ± 5 psi (#8205)
 " :0~ ± 15 psi (#8215)
 " :0~ ± 30 psi (#8230)
 " :0~ ±100psi(#82100)

✓ Please check the tubing is not leakage or damaged before using.

CONVERSION & RESOLUTION

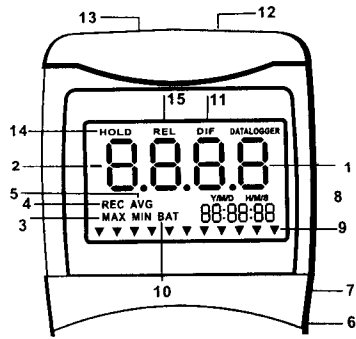
PSI	Resolution	100				30				15				5			
		Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	
psi	1.00000	0.003	0.01	0.02	0.1	0.01	0.02	0.05	0.1	0.01	0.02	0.05	0.1	0.01	0.02	0.05	0.1
inch of H ₂ O	27.686517	0.1	0.3	0.5	2	0.1	0.3	0.5	2	0.1	0.3	0.5	2	0.1	0.3	0.5	2
bar	0.068948	0.001	0.001	0.002	0.004	0.001	0.002	0.002	0.004	0.001	0.002	0.002	0.004	0.001	0.002	0.002	0.004
mbar	68.947563	0.2	1	2	4	0.2	1	2	4	0.2	1	2	4	0.2	1	2	4
mm of Hg	51.71216	0.2	0.5	1	3	0.2	0.5	1	3	0.2	0.5	1	3	0.2	0.5	1	3
oz/inch ²	16.00944	0.05	0.2	0.3	1	0.05	0.2	0.3	1	0.05	0.2	0.3	1	0.05	0.2	0.3	1
kg/cm ²	0.070309	0.001	0.001	0.002	0.004	0.001	0.002	0.002	0.004	0.001	0.002	0.002	0.004	0.001	0.002	0.002	0.004
kPa	6.894859	0.02	0.1	0.2	0.4	0.02	0.1	0.2	0.4	0.02	0.1	0.2	0.4	0.02	0.1	0.2	0.4
ft of H ₂ O	2.306719	0.01	0.02	0.04	0.2	0.01	0.02	0.04	0.2	0.01	0.02	0.04	0.2	0.01	0.02	0.04	0.2
cm of H ₂ O	70.309000	0.2	1	2	4	0.2	1	2	4	0.2	1	2	4	0.2	1	2	4

Quick Conversion Sheet ±

model	unit	Psi	inH ₂ O	mbar	kg/cm ²
8205	5	138	345	0.35	

8215	15	415	1034	1.05
8230	30	830	2068	2.10
82100	100	2768	6895	7.03

CONTROLS AND 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 data for Hour / Minute / Second.
9. ▼ . Pressure unit indication.
10. **BAT.** Battery low indicator.
11. **DIF.** Differential pressure mode.

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12. "+" Positive pressure hose plug.
13. "-" Negative pressure hose plug.
14. **HOLD.** Freezes pressure reading.
15. **REL.** Establish a relative zero for the primary screen information.(N/A)



"-" Negative pressure "+" Positive pressure

Note: There are two connecting metal lug 5mm , plastic lug 9.25mm for different application purpose . Make sure which one you want before purchasing the unit.

AUTO POWER OFF (SLEEP FUNCTION)

This instrument will shut off automatically in approx. 20 minutes for every power on.

For recording or operating over longer periods of time, you can disable the sleep mode by pressing (HOLD) and (REL) 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 off.

Fig. A →

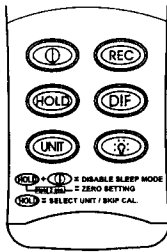


MODE OPTIONS

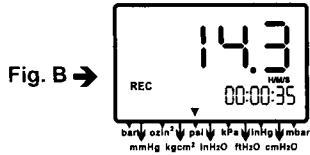
Delete and replace with program mable user selectable start-up mode. The display will default to the mode last used.

4

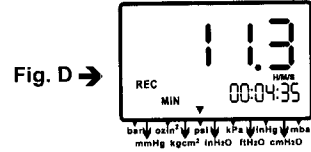
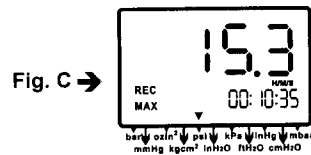
For your convenience, the meter defaults to the setting used during the last operation. The following table lists the modes of operation that can be invoked by pressing the button indicated.



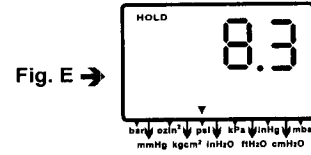
- ① Turns instrument on (Default setting) and off.
- REC Press momentarily and relative clock starts in the lower right screen. REC is displayed in the middle left of (Fig. B) other button functions are locked out except **Power**, **Unit** and **Backlight**. Press momentarily again and the unit cycles 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 to the normal mode.



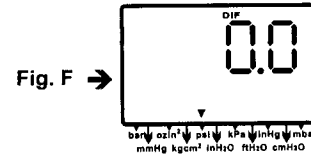
5



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



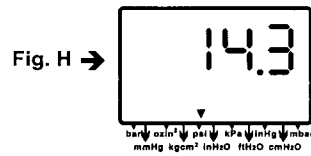
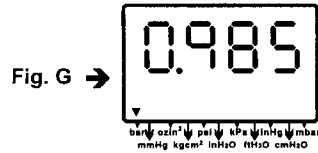
- DIF Press momentarily ,DIF appears on top of the LCD and the display indicates the relative zero (Relative zero causes the value of the display to show as "0.0")-only the amount of pressure change will be indicated. Press momentarily again and the unit returns to the normal mode of pressure differential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



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Differential Pressure : A measure 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.

UNIT Press momentarily and the unit will cycle through "bar", "mmHg", "ozin2", "kgcm2", "psi", "inH2O", "kPa", "ftH2O", "inHg", "cmH2O", "mbar", which indicated on the bottom of the display (See Fig.G &H).



UNIT Press momentarily and the back-light 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.
- ✓ To maintain the meter in the good condition for use , recommend to calibrate the meter after long time using.
- ✓ When properly maintained , the meter will maintain an accuracy specification, to ensure your meter is performing at its peak, send it to the factory or a qualified instrument calibration facility for annual calibration.
- ✓ Recommend always to set zero before measurement .Refer to the zero setting procedure in page 10.

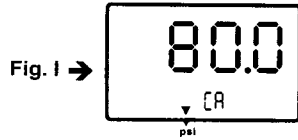
Cleaning:

Use a damp cloth and mild soap to clean the case of the 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.

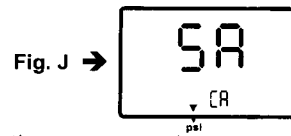
CALIBRATION MODE

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

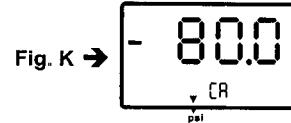
1. First , please manually set the display to zero (no pressure applied to the connector), refer to the Manual zero procedure.
2. Turn the meter off.
3. Press **REC** & **UNIT** simultaneously , "CA" appears on the display, (See Fig. I)the meter enters to the calibration mode ,make sure the pressure unit to be pointed under the arrow mark "▼" is "psi" to start positive (+) pressure calibration



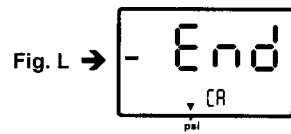
4. The meter has defaulted as 80 psi calibration point , the adjustable pressure range is from 78.0 to 82.0 . if calibration pressure source is not 80psi , to increase the figure by pressing **REL** key , or decrease the figure by pressing **UNIT** key to set calibration point as required.
5. Save the calibration point by pressing **REC** key , "SA" and small "CA" appears on the display (See Fig. J) in 2 seconds , the meter auto-skip to the negative pressure(-) point for next calibration mode.



6. Follow the same procedure as step 4 for the negative pressure calibration point by pressing **UNIT** key , the LCD now displays "-80.0" and small "CA" (See Fig.K) , do 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 "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 press **REC** key, i.e. no "SA" appeared , please check : (a) The cabliration pressure source is between 75.0 and 85.0, or check (b) if you enter the right positive pressure (+) or negative pressure (-) .

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

Above calibration is an example for model 82100, i.e. the pressure range is from 0 to +100psi (Positive pressure) or from 0 to -100 psi (Negative pressure).

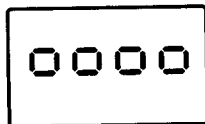
Calibration point reference

Model:	psi range	psi Calibration point(±)	Reommand (±)
3205	0~± 5	4.000	3.900~4.100
3215	0~± 15	12.00	11.70~12.30
3230	0~± 30	24.00	23.40~24.60
32100	0~±100	80.00	78.00~82.00

MANUAL ZERO SETTING

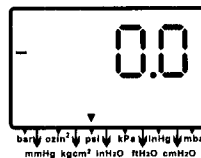
When you set the display to zero(no pressure applied to the connector), press button **HOLD** for 2 seconds, now the meter display "0.0.0.0" from right to left (See Fig.M) and then disappear each "0" from left back to right, the LCD display shows a normal mode (See Fig.N).

Fig. M →



11

Fig. N →



TROUBLESHOOTING

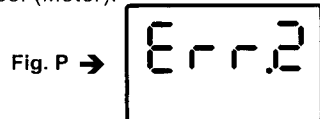
- ? **Power on but no display.** Check the battery are in place and making good contact or correct polarity, replace a new battery or attach optional AC adaptor for the weak battery caused.
- ? **BAT indication.** Replace with a new battery when LCD display **BAT** at the middle bottom.
- ? **No Display.** Make sure battery is not empty, if the display disappear, check sleep mode is active. Refer to the Disable sleep mode function for a long time using the measurement. Or check the tubing is connected to the meter tightly.
- ? **Err.1.** For the pressure value exceed the maximum range, "Err.1" appears on the display (See Fig. O), please change the sensor, otherwise, the sensor will be hurt for going on the overrange measurement.

Fig.O →

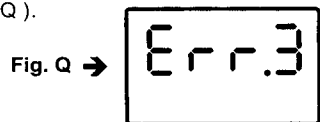


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? **Err.2.** For the measurement pressure is less than minimum range , "Err. 2" will appear (See Fig.P),recommend to change the sensor (meter).

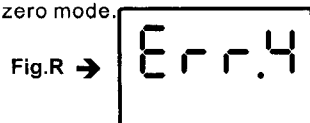


? **Err.3.** For operating the DIF function , the differential pressure value is larger than maximum display digit , Err.3 appears on the display (See Fig.Q).



? **Err.4.** When you set zero ,make sure you have disconnected the tubing ,no pressure applied to the connector. Then if you see an **Err.4** appears on the display , it means the sensor or meter damaged (See Fig.R).Return the unit to the store you purchased for repaired .

P.S. **Err.4** will be also appeared while the tube or hose is connecting during setting zero mode.



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? **E1OL or E2UL.** When you see the errors while operating Rs232 software, it means pressure source is less or over than the range of the instrument.

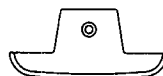
REPLACING THE BATTERY

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 back-light causes the BAT icon to appear.

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 of the instrument.
2. Lay the instrument face-down on a clean, flat surface.
3. Remove the battery by screw driver and observe indicated polarity and close the cover after replacing with a new battery.



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

Do not leave battery in instrument.

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OPERATING CONDITIONS

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

Model	Max.Pressure
8205	20 psi
8215	30 psi
8230	60 psi
82100	150 psi

SPECIFICATION

Pressure	
Range	0~±(5 or 15 or 30 or 100 psi)
Resolution	See Page 8 data sheet
Accuracy	±0.3% of full scale at±25°C
Dimension	72 x 182 x 30 mm (meter)
Unit Weight	Approx. 220 gram (with battery)
Response time	0.5 seconds
Format	Baud Rate : 2400 bit/sec Data Bit : 8 , Stop Bit : 1 P XXXXX , P - XXXXX (unit)

The meter Pressure measurement instruments are not suitable for the absolute pressure measurement.

The meter instruments are fitted with two 4.8mm lugs. Before you connect the instruments to a pressure sources , check carefully the security of all fitting.

MATERIAL SUPPLIED

This package contains:

- ✓ The meter x 1
- ✓ Battery x 1 (9.0 volt)
- ✓ Operation manual
- ✓ Hard carrying case
- ✓ Connection hose 4mm(ID)x6mm (OD) x 1000mm length x 2 pcs

OPTIONAL ACCESSORY:

- ✓ RS232 software disk or CD with D-sub connector
- ✓ DC Adaptor

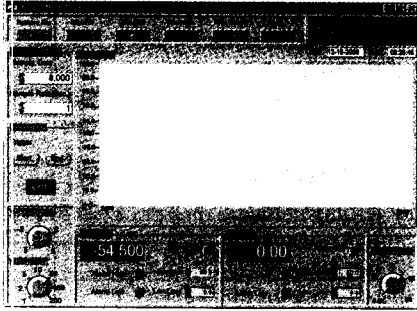
RS232 OUTPUT:

The meter can link with personal computer to capture on-line datas , display pressure records with real-time output, you can retrieve file , save the datas for operating data analysis, records statistic ,multi-files display in the screen,....versatile functions for your choice.

Connection procedures:

- 1.Plug the optional accessory RS232 cable onto the DC jack port (at the right side of the meter)

2. Insert the D-sub 9P type connector onto computer's Com.1 or 2 port or...
3. Start to set up RS232 software by inserting the CD-ROM or Floppy diskette.
4. When installing the RS232 software, please follow the operation manual procedure in the software package.



WARRANTY

The meter is warranted to be free from defects in material and workmanship for a period of one year from the date of purchase. This warranty covers normal operation and does not cover battery, misuse, abuse, alteration, tampering, neglect, improper maintenance, or damage resulting from leaking batteries. Proof of purchase is required for warranty repairs. Warranty is void if the meter has been opened.

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RETURN AUTHORIZATION

Authorization must be obtained from the supplier before returning items for any reason.

When requiring a RA (Return Authorization), please include data regarding the defective reason, the meters are to be returned along with good packing to prevent any damage in shipment and insured against possible damage or loss.

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WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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- Load Cells & Pressure Gages
- Displacement Transducers
- Instrumentation & Accessories

FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

pH/CONDUCTIVITY

- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

DATA ACQUISITION

- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

HEATERS

- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments

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