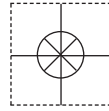


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# User's Guide



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# **EWS-BP-A** **Barometric Pressure Transmitter**



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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.

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## Section 1 - General Description

The OMEGA® Model EWS-BP-A is a low cost, wall mounted barometer/transmitter. A temperature compensated, solid state pressure sensor measures atmospheric pressure. The measurement is then converted to an industry standard, user selectable 4-20 mA or 1-5 Vdc output signal scaled across the measurement range.

## Section 2 - Unpacking

Remove the packing list and verify that you have received all your equipment. If you have any questions about the shipment, please call our Customer Service Department at

**1-800-622-2378 or 203-359-1660.** On the web you can find us at:  
**www.omega.com e-mail: cservice@omega.com**

When you receive the shipment, inspect the container and equipment for any signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

**NOTE:**

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The carrier will not honor any damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

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The following items are supplied in the box with your transmitter.

- This Manual, #M-3502 (1 ea.)
- #6 Wall Anchor (2 ea.)
- #6 Mounting Screw (2 ea.)

### Additional EWS Series Models Available

Model	Description
EWS-TC-(*)	Wall mount Thermocouple Sensor (* = insert type, J, K, T, E)
EWS-RTD	Wall mount RTD Sensor (100Ω Pt., .00385)
EWS-TX	Wall mount Solid-state Temperature Sensor/Transmitter
EWS-RH	Wall mount Relative Humidity/Temperature Transmitter

### Recommended Accessories

Power Supply, OMEGA® Part No.: **PSU-93**

Shielded 4-conductor cable, OMEGA Part No.: **TX4-100**

Conduit Box Mounting Kit, OMEGA Part No.: **EWS-MB**

## Section 3 - Theory of Operation

A 4-20 mA loop is a series loop in which a transmitter will vary the current flow depending on the input to the transmitter. In the EWS-BP-A the amount of current allowed to flow in the loop will vary depending on the atmospheric pressure being measured by the sensor. Some advantages of a current output over a voltage output is that the signal measured is less susceptible to electrical noise interference and the loop can support more than one measuring instrument as long as the maximum loop resistance is not exceeded.

A typical application utilizing a current loop will normally consist of a power supply, the transmitter and a meter, recorder or controller to measure the current flow. The loop resistance is the sum of the measuring instruments and wire used. The maximum allowable loop resistance for the EWS-BP-A to function properly is found by using the following formula:

$$R_{\max} = (\text{power supply voltage} - 8 \text{ volts}) / .02 \text{ amps}$$

For applications that require a voltage output signal the EWS-BP-A has a built-in 250 Ohm shunt resistor that will convert the transmitters output to a 1-5 Vdc signal when wired correctly. See "Transmitter Wiring Examples" in this manual.

## Section 4 - Specifications

<b>Range:</b>	20.8 to 32 in Hg (10.20 to 15.72 psi)
<b>Accuracy:</b>	±1% FSO
<b>Repeatability:</b>	±.2% FSO
<b>Pressure Hysteresis:</b>	±.15% FSO
<b>Long-Term Stability:</b>	±.1% FSO/Year
<b>Operating Temperature Range:</b>	-20 to 140°F (-29 to 60°C)
<b>Temp. Compensation Range:</b>	32 to 140°F (0 to 60°C)
<b>Output:</b>	4 – 20 mA or 1 –5 Vdc (scaled to full range)
<b>Power Requirements:</b>	
For 4-20 mA output:	8 –24 Vdc @ 20mA
For 1-5 Vdc output:	13 –24 Vdc @ 20mA
<b>Max Loop Resistance:</b>	Ohms = (V supply – 8 V) / .02 A
<b>RH Time Constant:</b>	1 ms., from 10-90% FSO
<b>Sensor Type:</b>	Solid State
<b>Media Compatibility:</b>	Clean room air with a relative humidity less than 90% (non-condensing), non-corrosive gases
<b>Enclosure Material:</b>	Acrylonitrile Butadiene
<b>Dimensions:</b>	79 x 54 x 45mm (3.12 L x 2.12 W x 1.78" H)
<b>Weight:</b>	54 g. (.12 lbs)

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**NOTE:**

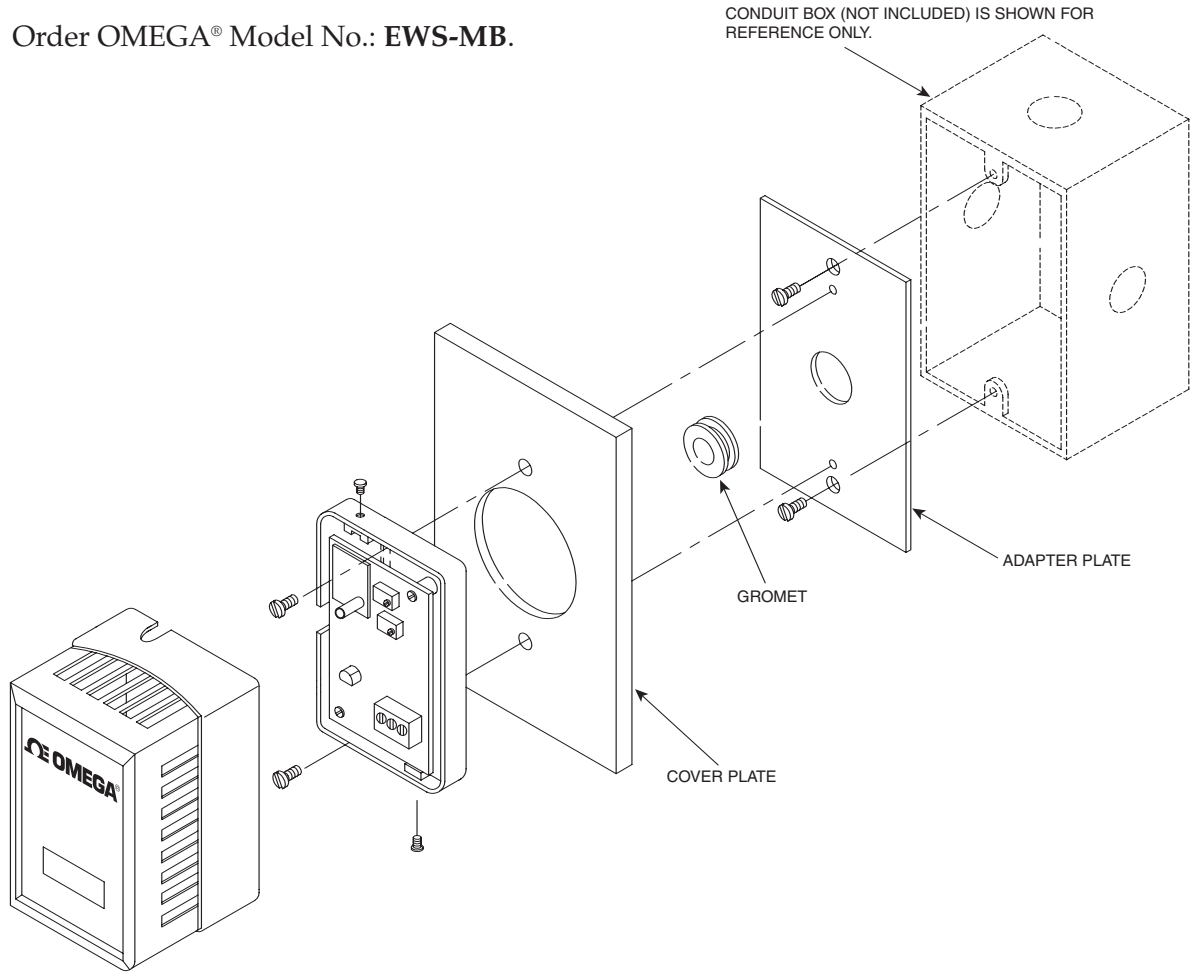
These units are not designed, nor recommended for medical use, explosive environments or outdoor applications.

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## Section 5 - Mounting

The EWS Series of sensors/transmitters are designed for wall mounting in locations that are free from dirt, grease, food particles and condensing moisture such as manufacturing clean rooms, computer rooms and laboratory type environments. Wall anchors and mounting screws are included for mounting. A conduit box mounting bracket/wall plate adapter kit is available that will allow the transmitter to be mounted to a standard electrical conduit box.

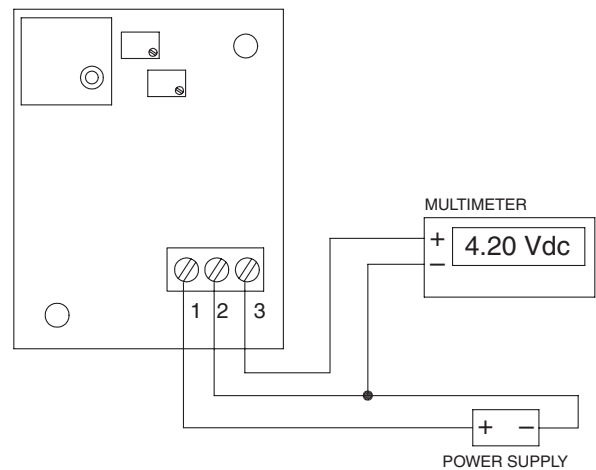
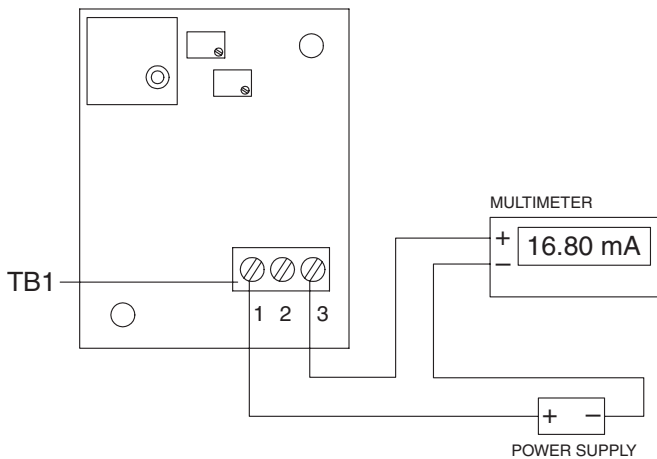
Order OMEGA® Model No.: **EWS-MB**.



## Section 6 - Transmitter Wiring Examples

For current output (4-20 mA)

For voltage output (1-5 Vdc)



## Section 7 - Barometric Pressure to Analog Output Calculations

Output Reference Table

in Hg	Psi	mm Hg	Current (mA)	Voltage (Vdc)
32	15.72	813	20	5
31	15.23	788	18.57	4.63
30	14.73	762	17.14	4.27
29	14.24	736	15.71	3.92
28	13.75	711	14.29	3.56
27	13.26	686	12.86	3.21
26	12.77	660	11.43	2.85
25	12.27	634	10	2.49
24	11.79	610	8.57	2.14
23	11.3	584	7.14	1.78
22	10.8	558	5.71	1.43
20.8	10.2	527	4	1

## Section 8 - Calibration

Your transmitter has been factory calibrated to meet or exceed the specifications outlined in this manual. To maintain original specifications it is generally recommended that your transmitter be re-calibrated on an annual basis depending on operating conditions.

### Equipment Required:

1. Regulated Power Supply, 12-24 Vdc @ 30 mA (OMEGA Model: **PSU-93**)
2. Digital DC Volt Meter (OMEGA Model: **HMM29**)
3. Handheld Differential Pressure Calibration Kit, (OMEGA Model: **PCL-200-KIT-D**)
4. Test Leads, Potentiometer adjustment tool

## Section 9 - Calibration Procedure

1. Adjust "P1" and "P2" fully counter-clockwise.
2. Connect power to the transmitter as shown in this manual for **Voltage Output** (1-5 Vdc).
3. Allow unit to warm-up for 10 minutes.
4. Connect the PCL-200-Kit D pressure calibrator the pressure port of the sensor.
5. Turn the PCL-200 on to the "PSI" setting.  
Adjust the hand pump as such to pull a vacuum down to 12.00 PSI.
6. Adjust "P1" clockwise for an output reading of 1.60 Vdc on the multimeter.
7. Adjust the hand pump as such to create a positive pressure up to 15.72 PSI.
8. Adjust "P2" clockwise for an output reading of 5.00 Vdc on the multimeter.
9. Calibration Complete.









## 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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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.

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