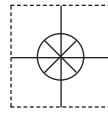


**1 YEAR**  
WARRANTY

MADE IN  
**USA**



# **Ω OMEGA®** **User's Guide**



***Shop online at  
[omega.com](http://omega.com)®***

***e-mail: [info@omega.com](mailto:info@omega.com)  
For latest product manuals:  
[omegamanual.info](http://omegamanual.info)***

**ISO 9001**  
CERTIFIED  
CORPORATE QUALITY  
STAMFORD, CT

**ISO 9001**  
CERTIFIED  
CORPORATE QUALITY  
MANCHESTER, UK

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



OMEGAnet® Online Service  
omega.com

Internet e-mail  
info@omega.com

### Servicing North America:

**U.S.A.:**  
ISO 9001 Certified  
Omega Engineering, Inc., One Omega Drive, P.O. Box 4047  
Stamford, CT 06907-0047 USA  
Toll Free: 1-800-826-6342  
FAX: (203) 359-7700  
TEL: (203) 359-1660  
e-mail: info@omega.com

**Canada:**  
976 Bergar  
Laval (Quebec), H7L 5A1, Canada  
Toll-Free: 1-800-826-6342  
FAX: (514) 856-6886  
TEL: (514) 856-6928  
e-mail: info@omega.ca

### For immediate technical or application assistance:

**U.S.A. and Canada:** Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA®  
Customer Service: 1-800-622-2378 / 1-800-622-BEST®  
Engineering Service: 1-800-872-9436 / 1-800-USA-WHEN®

**Mexico/  
Latin America:** TEL: 001 (203) 359-1660  
FAX: 001 (203) 359-7700  
e-mail: espanol@omega.com

### Servicing Asia:

**China:**  
1698 Yi Shan Road, Unit 102  
Min Hang District  
Shanghai, China 201103 P.R.C.  
Hotline: 800 819 0559 / 400 619 0559  
e-mail: info@cn.omega.com

### Servicing Europe:

**Benelux:** Toll-Free: 0800 099 3344  
FAX: +31 20 643 46 43  
TEL: +31 20 347 21 21  
e-mail: sales@omegaeng.nl

**Czech Republic:** Frystatska 184  
733 01 Karviná, Czech Republic  
TEL: +420-59-6311899  
FAX: +420-59-6311114  
e-mail: info@omegashop.cz

**France:** Toll-Free: 0805 541 038  
FAX: 01 57 32 48 18  
TEL: 01 57 32 48 17  
e-mail: esales@omega.fr

**Germany/ Austria:** Daimlerstrasse 26  
D-75392 Deckenpfronn, Germany  
Toll-Free: 0800 8266342  
FAX: +49 (0) 7056 9398-29  
TEL: +49 (0) 7056 9398-0  
e-mail: info@omega.de

**United Kingdom:**  
ISO 9001 Certified  
OMEGA Engineering Ltd.  
One Omega Drive, River Bend Technology Centre, Northbank  
Irlam, Manchester M44 5BD United Kingdom  
Toll-Free: 0800-488-488  
FAX: +44 (0) 161 777-6622  
TEL: +44 (0) 161 777-6611  
e-mail: sales@omega.co.uk

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.

# Table of Contents

<b>Section .....</b>	<b>Page</b>
Section 1 - General Description .....	1
Section 2 - Unpacking .....	1
Section 3 - Theory of Operation .....	2
Section 4 - Specifications .....	2
Section 5 - Mounting .....	3
Section 6 - Transmitter Wiring Examples .....	3
Section 7 - Barometric Pressure to Analog Output Calculations .....	4
Section 8 - Calibration .....	4
Section 9 - Calibration Procedure .....	4

# Table of Figures

<b>Figure Description .....</b>	<b>Page</b>
1. Model No. EWS-BP-A with EWS-MB .....	3
2. Transmitter Wiring Examples .....	3

## 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:**

---

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.

---

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:	12 –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)

**NOTE:**

---

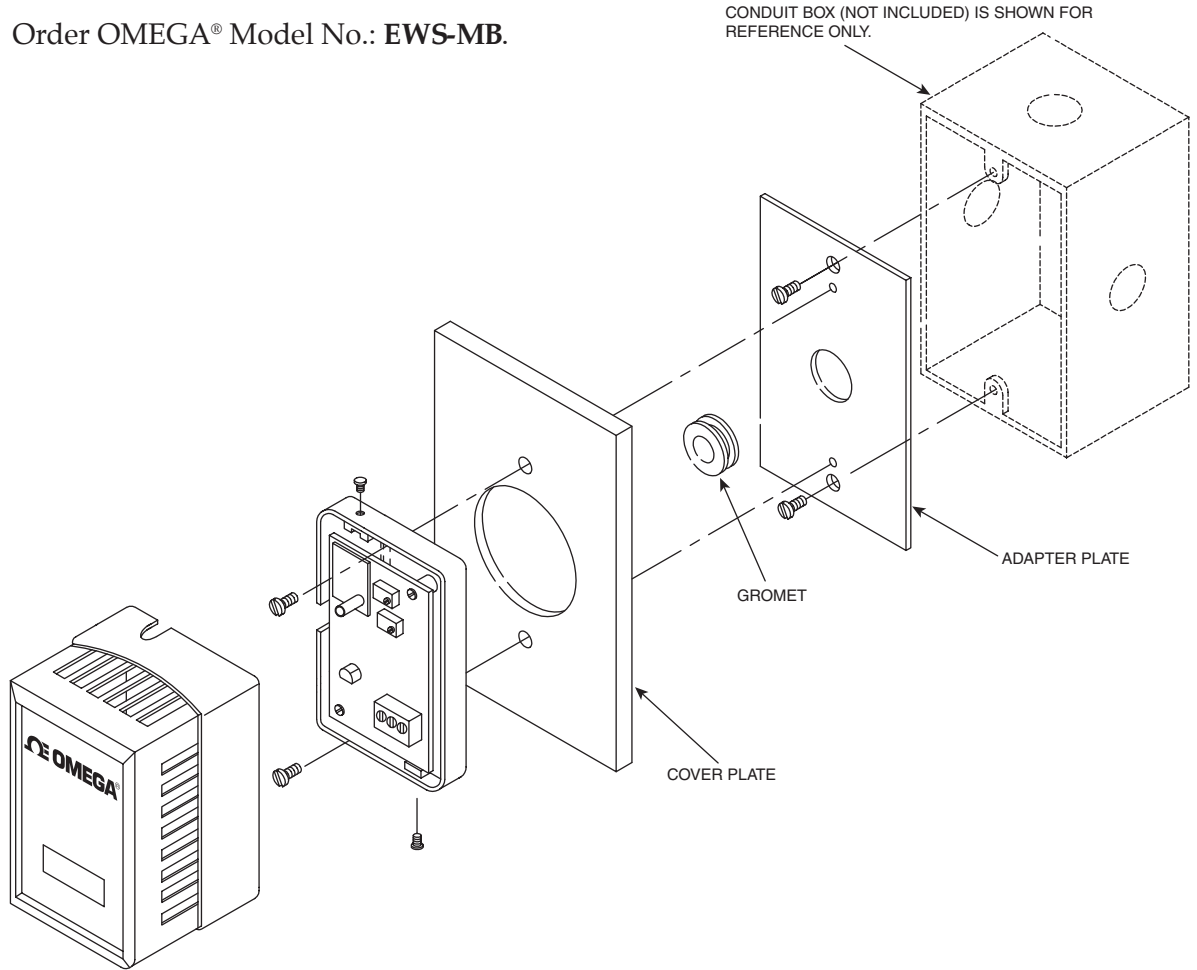
These units are not designed, nor recommended for medical use, explosive environments or outdoor applications.

---

## Section 5 - Mounting

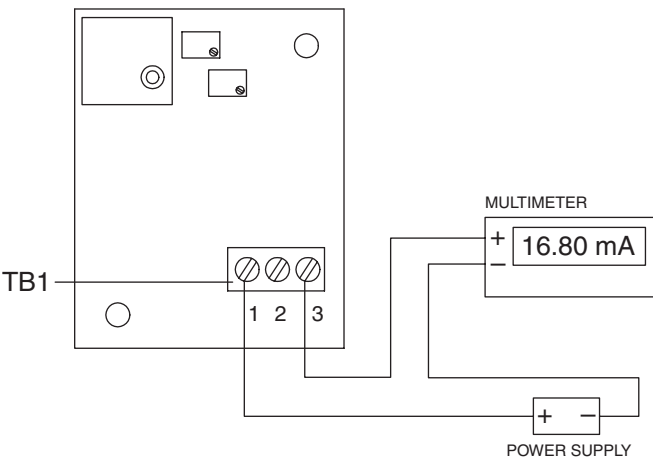
The EWS Series of sensors/transmitters are designed for wall mounting in locations that are free from dirt, grease, food particles and condensing moisture such as manufacturing clean rooms, computer rooms and laboratory type environments. Wall anchors and mounting screws are included for mounting. A 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**.

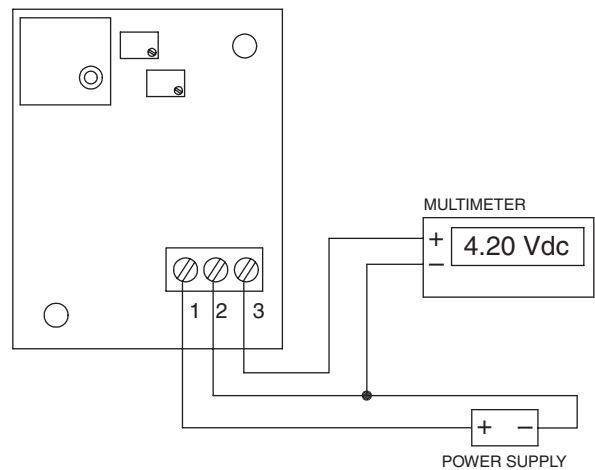


## Section 6 - Transmitter Wiring Examples

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.

**OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.**

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

## 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.

OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

© Copyright 2012 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without the prior written consent of OMEGA ENGINEERING, INC.

# Where Do I Find Everything I Need for Process Measurement and Control? **OMEGA...Of Course!** *Shop online at [omega.com](http://omega.com)<sup>SM</sup>*

## **TEMPERATURE**

- ☑ Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- ☑ Wire: Thermocouple, RTD & Thermistor
- ☑ Calibrators & Ice Point References
- ☑ Recorders, Controllers & Process Monitors
- ☑ Infrared Pyrometers

## **PRESSURE, STRAIN AND FORCE**

- ☑ Transducers & Strain Gages
- ☑ 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
- ☑ Data Logging 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