

**omega.com**<sup>®</sup>Ω OMEGA<sup>®</sup>**1 YEAR**  
WARRANTY**MADE**  
**IN**  
**USA****DPG1000B,  
DPG1001B,  
DPG1000BBL****DPG1100B,  
DPG1100BBL****DPG1000B,  
DPG1000BBL  
Ranges 2000  
and up****DPG1100B,  
DPG1100BBL  
Ranges 2000  
and up**

# Digital Pressure Gauges

**DPG1000B, DPG1001B, DPG1000BBL,  
DPG1100B, DPG1100BBL****INSTRUCTION  
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<b>DPG1000B</b>	<b>Battery Powered</b>
<b>DPG1001B</b>	<b>Battery Powered, High Accuracy</b>
<b>DPG1000BBL</b>	<b>Battery Powered w. Backlighting</b>
<b>DPG1100B</b>	<b>Battery Powered, NEMA 4X</b>
<b>DPG1100BBL</b>	<b>Battery Powered w. Backlighting, NEMA 4X</b>

## Ranges and Resolution

Resolution is fixed as indicated in table

Ranges in **Bold** are standard. Contact Omega Engineering to order other ranges listed below.

abs: Absolute reference (normally reads atmospheric pressure, reads zero at full vacuum)

vac: Vacuum gauge, minus sign not used unless specified

-30.0 inHg/15.0 psig	120.0 inHg	1600 mmHg	35.0 bar	1.000 kg/cm <sup>2</sup> abs
<b>-30.0 inHg/100.0 psig</b>	199.9 inHg abs	760 torr abs	70.0 bar	1.000 kg/cm <sup>2</sup> vac
-30.0 inHg/199.9 psig	199.9 inHg	1600 torr abs	140.0 bar	±1.000 kg/cm <sup>2</sup>
3.00 psig	50.0 oz/in <sup>2</sup>	2100 mmH <sub>2</sub> O	199.9 bar	1.000 kg/cm <sup>2</sup>
<b>5.00 psig</b>	80.0 oz/in <sup>2</sup>	3500 mmH <sub>2</sub> O	350 bar	1.999 kg/cm <sup>2</sup> abs
15.00 psi abs	240 oz/in <sup>2</sup> abs	199.9 cmH <sub>2</sub> O	19.99 kPa	1.999 kg/cm <sup>2</sup>
<b>15.00 psig vac</b>	240 oz/in <sup>2</sup> vac	350 cmH <sub>2</sub> O	35.0 kPa	4.00 kg/cm <sup>2</sup>
±15.00 psig	±240 oz/in <sup>2</sup>	1000 cmH <sub>2</sub> O	100.0 kPa abs	7.00 kg/cm <sup>2</sup> abs
<b>15.00 psig</b>	240 oz/in <sup>2</sup>	2100 cmH <sub>2</sub> O	100.0 kPa vac	7.00 kg/cm <sup>2</sup>
30.0 psi abs	85.0 inH <sub>2</sub> O	199.9 mbar	±100.0 kPa	14.00 kg/cm <sup>2</sup>
<b>30.0 psig</b>	140.0 inH <sub>2</sub> O	350 mbar	100.0 kPa	19.99 kg/cm <sup>2</sup>
60.0 psig	400 inH <sub>2</sub> O abs	1000 mbar abs	199.9 kPa abs	35.0 kg/cm <sup>2</sup>
100.0 psi abs	400 inH <sub>2</sub> O vac	1000 mbar vac	199.9 kPa	70.0 kg/cm <sup>2</sup>
<b>100.0 psig</b>	±400 inH <sub>2</sub> O	±1000 mbar	400 kPa	140.0 kg/cm <sup>2</sup>
199.9 psig	400 inH <sub>2</sub> O	1000 mbar	700 kPa abs	199.9 kg/cm <sup>2</sup>
<b>300 psig</b>	850 inH <sub>2</sub> O	2000 mbar abs	700 kPa	350 kg/cm <sup>2</sup>
<b>500 psig</b>	7.00 ftH <sub>2</sub> O	2000 mbar	1500 kPa	1.000 atm abs
<b>1000 psig</b>	12.00 ftH <sub>2</sub> O	4000 mbar	1999 kPa	±1.000 atm
<b>1999 psig</b>	35.0 ftH <sub>2</sub> O	1.000 bar abs	3500 kPa	1.000 atm
<b>3000 psig</b>	70.0 ftH <sub>2</sub> O	1.000 bar vac	5000 kPa	4.00 atm
<b>5000 psig</b>	140.0 ftH <sub>2</sub> O	±1.000 bar	3.50 MPa	7.00 atm
6.00 inHg	230 ftH <sub>2</sub> O	1.000 bar	7.00 MPa	14.00 atm
10.00 inHg	480 ftH <sub>2</sub> O	1.999 bar abs	14.00 MPa	19.99 atm
30.0 inHg abs	150.0 mmHg	1.999 bar	19.99 MPa	35.0 atm
<b>30.0 inHg vac</b>	260 mmHg	4.00 bar	35.0 MPa	70.0 atm
±30.0 inHg	760 mmHg abs	7.00 bar abs	1000 g/cm <sup>2</sup> abs	135.0 atm
30.0 inHg	760 mmHg vac	7.00 bar	1000 g/cm <sup>2</sup>	199.9 atm
60.0 inHg abs	760 mmHg	14.00 bar	2100 g/cm <sup>2</sup> abs	340 atm
60.0 inHg	1600 mmHg abs	19.99 bar	2100 g/cm <sup>2</sup>	

## Accuracy (linearity, hysteresis, repeatability)

±0.25% of full scale ±1 least significant digit

**DPG1001B:** ±0.10% of full scale ±1 least significant digit

## Display (update rate, type, size)

3 readings per second nominal display update

*Ranges up to 1999:* 3½ digit LCD, ½" digit height*Ranges 2000 and up:* 4 digit LCD, 0.4" H digits, alphanumeric display of units

BBL: Red LED display backlighting

## Controls & Functions

*Ranges up to 1999:* Front pushbutton turns gauge on/off and starts shutoff timer. Turns on backlighting for 1 minute on BBL models.*Ranges 2000 and up:* Front pushbutton turns gauge on/off, starts shutoff timer. Pressing and holding front button zeros gauge. The zero feature is not used on absolute reference gauges.

## Calibration

*Ranges up to 1999:* Front potentiometers, non-interactive zero & span, ±10% range*Ranges 2000 and up:* Internal pushbuttons, non-interactive zero, midpoint, & span, ±10% range. Calibration information stored in non-volatile memory.

## Shutoff

Last character of model number on rear label indicates shutoff time. Contact Omega for other optional shutoff times.

**-5:** 5 minute auto shutoff (standard)**-NS:** No auto shutoff, on/off via front pushbutton

## Connection Size

¼" NPT male

## Sensor Material

All wetted parts are 316 stainless steel

## Batteries

2 AA alkaline

## Battery Life

*1000B, 1001B, 1100B ranges to 1999*

Approx. 2500 hours

*1000B, 1001B, 1100B ranges 2000 and up*

Approx. 2000 hours

*1000BBL, 1100BBL ranges to 1999*

Approx. 180 hrs (backlight on when gauge is on)

*1000BBL, 1100BBL 2000 and up*

Approx. 150 to 1500 hrs depending on backlight usage

## Low Battery Indication

Low battery symbol on display when batteries must be replaced

## Dimensions (see drawing on next page)

**DPG1000**

3.5" W x 3.0" H x 2.0" D NEMA 4X housing

Add approx. 0.75" to height for pressure fitting

**DPG1100**

3.38" W x 2.88" H x 1.65" D housing

Add approx. 0.75" to height for pressure fitting

## Weight (approximate)

Gauge: 9 ounces

Shipping weight: 1 pound

## Housing Material & Color

**DPG1000**

Extruded aluminum case, light gray epoxy powder coated, black ABS/polycarbonate bezel, front and rear gaskets, polycarbonate label

**DPG1100**

Light gray ABS/polycarbonate NEMA 4X case, rear gasket, polycarbonate label

## Overpressure

2 times sensor range

3000 psig range &amp; metric equivalents: 5000 psig

5000 psig range &amp; metric equivalents: 7500 psig

Ranges 2000 and up: 112.5% out-of-range

display: |--- or |--- depending on model

## Burst Pressure

4 times sensor pressure rating, or 10,000 psi, whichever is less

## Storage Temperature

-40 to 203°F (-40 to 95°C)

## Operating Temperature

-4 to 185°F (-20 to 85°C)

## Compensated Temperature

32 to 158°F (0 to 70°C)

## Temperature Stability

±0.5% span typical, ±1% span max. 0 to 82°C

**CAUTION:****Installation and Precautions**

Install or remove gauge using wrench on hex fitting only. Do not attempt to tighten by turning housing or any other part of the gauge.

See label on back of gauge for range!

Use fittings appropriate for the pressure range of the gauge.

Do not apply vacuum to gauges not specified for vacuum operation. Permanent damage not covered by warranty will result to the sensor.

Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.

**NEVER** insert objects into the gauge port or blow out with compressed air. Permanent damage not covered by warranty will result to the sensor.

**NOTE:****Absolute Reference Gauges**

These models have engineering units shown on the rear label such as PSIA, INHGA, INH2OA, ZIN2A, BARA, MBARA, KPAA, TORR or TORRA, MMHGA, KGCMA, ATMA. The "A" indicates absolute reference. These ranges display atmospheric pressure when the gauge port is open to the atmosphere. They display zero at high vacuum.

When the gauge port is open to the atmosphere, it is normal for the reading to constantly change in response to atmospheric pressure changes. Do not adjust the calibration controls!

**Operation – Ranges up to 1999**

Press the round button on the front of the gauge to activate the display. The gauge will stay on for a period of time determined by the auto-shutoff time. The gauge can be shut off at any time by pressing the button again.

If the gauge was ordered without auto shutoff (-NS) it will stay on until the button is pressed or until the batteries are depleted. Turn gauge off when not in use to conserve battery.

Display backlighting on BBL models is on whenever the gauge is on. Backlighting may not be apparent under bright lighting conditions.

**Operation – Ranges 2000 and up including 3000 psi, 5000 psi**

These ranges have a 4-digit display with a lower alphanumeric display. Press and hold the pushbutton for approximately 1 second. The full-scale range is indicated, display segments are tested, and the reading and units are displayed.

**Power-Up With One-Touch Zero – Ranges 2000 and up including 3000 psi, 5000 psi**

1. Make absolutely certain no pressure is applied to the gauge. The gauge port should be exposed to normal atmospheric pressure. Note that the zeroing function may only be activated at power-up and the stored zero correction is erased when the gauge is shut off.
2. Press and hold the pushbutton.
3. The full-scale range is indicated and the display segments are tested.
4. Continue to press the pushbutton until **0 0 0 0** is displayed and then release the button. This indicates that the gauge has been zeroed.
5. The actual pressure is displayed.

Attempting to zero the gauge with pressure greater than approximately 3% of full-scale applied will result in an error condition, and the display will alternately indicate **E r r 0** and the actual measured pressure. The gauge must be powered down to reset the error condition.

Absolute reference gauges do not use the zero feature since they read atmospheric pressure under normal conditions.

**Normal Operation – Ranges 2000 and up including 3000 psi, 5000 psi**

Following the start-up initialization, the display indicates the pressure reading updated approximately 3 times per second and the units. The auto shutoff timer starts when the gauge is powered up or whenever the button is pushed, unless the gauge was ordered without an auto shutoff time (-NS option).

If excessive vacuum is applied to a pressure-only gauge, the display will indicate **- E r r** until the vacuum is released. Applying vacuum to a gauge designed for pressure may damage the pressure sensor. If excessive pressure is applied (112.5% over range), an out-of-range indication of **1 - - -** or **1 - . - . -** will be displayed depending on model.

**Display Backlighting (BBL models only) – Ranges 2000 and up including 3000 psi, 5000 psi**

Display backlighting can be turned on by momentarily pressing the button whenever the gauge is on. The backlighting will turn on for one minute and then automatically shut off. This also restarts the auto shutoff timer. Backlighting may not be apparent under bright lighting conditions.

**Shut-Down – Ranges 2000 and up including 3000 psi, 5000 psi**

To shut off the gauge manually at any time, press and hold the pushbutton until the display indicates **0 F F** and then release.

For gauges with auto shutoff, the display indicates **0 F F** five seconds prior to auto shutoff. The pushbutton can be pressed to keep the gauge on. The auto shutoff and backlight (if equipped) timers are reset whenever the pushbutton is pressed and released.

If the gauge was ordered without auto shutoff (-NS option) it will stay on until manually shut off or until the batteries are depleted. Turn gauge off when not in use to conserve battery life.

**Battery Replacement – All Models**

A low battery indication will be shown in the upper left-hand corner of the display when the battery voltage falls sufficiently. The battery should be replaced soon after the indicator comes on or unreliable readings may result.

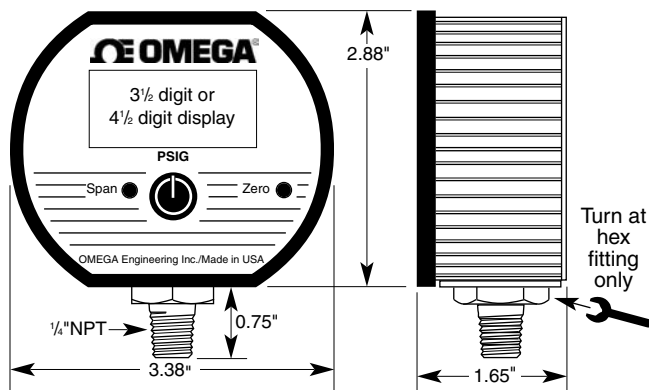
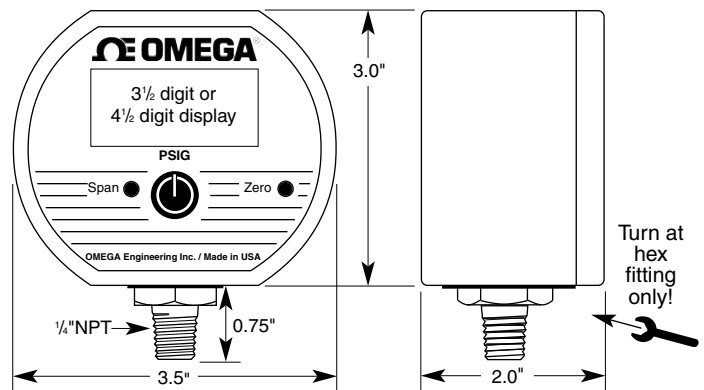
Remove the 6 Phillips head screws on the back of the unit.

Carefully remove batteries from the holders by lifting up the positive end of the battery (opposite the spring). Take care not to bend or distort the battery retention springs.

DO NOT discard the old battery into fire, any other sources of extreme heat, or in any other hazardous manner. Please consult local authorities if there is any question about proper disposal.

Always replace both batteries at the same time with high quality alkaline batteries. Observe the polarity of the batteries when replacing them. The negative (flat) end of each battery should be inserted first, and should face the spring in the battery holder.

Replace the back cover, including the rubber sealing gasket.

**1000B, 1001B, 1000BBL****1100B and 1100BBL (NEMA 4X)**

**CAUTION:**

**Calibration Precautions**

Install or remove gauge using wrench on hex fitting only. Do not attempt to tighten by turning housing or any other part of the gauge.

See label on back of gauge for range!

Use fittings appropriate for the pressure range of the gauge.

Do not apply vacuum to gauges not specified for vacuum operation. Permanent damage not covered by warranty will result to the sensor.

Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.

**NEVER** insert objects into the gauge port or blow out with compressed air. Permanent damage not covered by warranty will result to the sensor.

**NOTE:**

**Calibration Information**

All gauges are factory calibrated on NIST traceable calibration equipment. No calibration is required before placing the gauge into service.

Gauges can be returned to Omega Engineering for factory certified recalibration. NIST traceability is available. Gauges can also be recalibrated by any metrology lab with pressure calibration equipment at least four times more accurate than the gauge.

**Absolute Reference** – These models display atmospheric pressure if the gauge port is open to the ambient. It is normal for the reading to constantly change in response to atmospheric pressure changes. Vacuum generation and atmospheric pressure measurement equipment for accurate calibration and thus these are more difficult to calibrate in the field.

**Calibration Preparation – All Models**

- a. Calibration should only be performed by qualified individuals using appropriate calibration standards and procedures.
- b. The calibration equipment should be at least four times more accurate than the gauge being calibrated.
- c. Remove the screws on the back of the unit and remove cover.
- d. It is good practice to install fresh batteries before calibrating battery-powered gauges.
- e. Allow the gauge to equalize to normal room temperature before calibration.



DPG1000, DPG1001 - Pull out plastic plugs to access zero and span potentiometers



DPG1100 - Unscrew nylon screws to access zero and span potentiometers

**Calibration of Ranges up to 1999**

Remove the calibration potentiometer covers on the front of the unit to access the zero and span controls.

Gauge reference units may be re-zeroed without affecting the span calibration. The gauge port must be open to the ambient with no pressure or vacuum applied. Adjust the Zero control until the gauge reads zero with the minus (-) sign occasionally flashing.

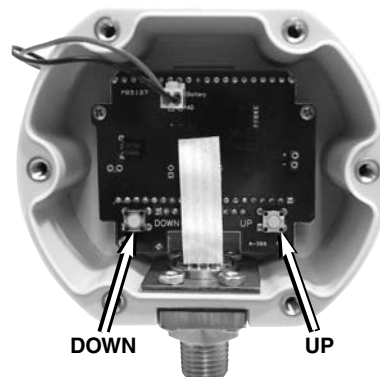
Span calibration should only be attempted if the user has access to a pressure reference of known accuracy. The quality of the calibration is only as good as the accuracy of the calibration equipment and ideally should be at least four times the gauge accuracy. Zero calibration must be done before span calibration. Record readings at three to five points over the range of gauge and adjust span control to minimize error and meet specifications.



DPG1000B, DPG1001B, DPG1000BBL  
Ranges 2000 and up



DPG1100B, DPG1100BBL  
Ranges 2000 and up



**Calibration of Ranges 2000 and up (with 4-digit 2-line display)**

**1. Entering the Calibration Mode**

- a. Remove the back cover and note the locations of the two internal calibration pushbuttons marked UP and DOWN. These buttons are disabled unless the gauge is in calibration mode.
- b. With the gauge off, press and hold the DOWN calibration button, and also press the front button to power up the gauge in calibration mode.

**2. Calibration Mode Functions**

- a. The display first indicates the gauge's full-scale pressure range, tests all display segments, and then indicates  $\epsilon RL$  to indicate that the gauge is in the calibration mode. Release all pushbuttons.
- b. The display will then indicate the current pressure reading, updating approximately 3 times per second. The gauge will remain in the calibration mode until powered down or reset manually. While in the calibration mode, the shutoff timer, One Touch Zero (gauge reference models only), Min/Max (for applicable models) are all disabled, and the calibration pushbuttons are active.
- c. Each press of the UP or DOWN button makes a small correction, which may not always be indicated on the digital display. Press and hold the pushbutton for one second or longer to make larger continuous corrections. The display of the gauge being calibrated is adjusted to match the calibrator's setting or readout.
- d. If the battery pack is unplugged or the power removed during calibration, calibration settings will not be saved.

**3. Gauge Reference Gauges (3 Points)**

- a. With the gauge port open to atmosphere, the character display will alternate between  $ZERO$  and  $\epsilon RL$ . Press the UP and DOWN buttons to obtain a display indication of zero.
- b. Apply full-scale pressure. The character display will alternate between  $+SPAN$  and  $\epsilon RL$ . Press the UP and DOWN buttons to obtain a display indication equal to full-scale pressure.
- c. Apply 50% of full-scale pressure. The character display will alternate between  $+PID$  and  $\epsilon RL$ . Press the UP and DOWN buttons to obtain a display indication equal to 50% of full-scale pressure.

**4. Exit Calibration Mode and Verify Calibration**

- a. Exit the calibration mode and save the calibration data by pressing and holding the front button until the display indicates  $OFF$ .
- b. Verify pressure indications at 0%, 25%, 50%, 75%, and 100% of full scale.
- c. Replace the rear cover and screws, taking care not to pinch the power leads between the case and the rear cover.

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OMEGAnet<sup>®</sup> Online Service  
www.omega.com

Internet e-mail  
info@omega.com

**Servicing North America:**

**USA:**  
ISO 9001 Certified

One Omega Drive, Box 4047  
Stamford CT 06907-0047  
Tel: (203) 359-1660 FAX: (203) 359-7700  
e-mail: info@omega.com

**Canada:**

976 Bergar  
Laval (Quebec) H7L 5A1, Canada  
Tel: (514) 856-6928 FAX: (514) 856-6886  
e-mail: info@omega.ca

**For immediate technical or application assistance:**

**USA and Canada:** Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA<sup>®</sup>  
Customer Service: 1-800-622-2378 / 1-800-622-BEST<sup>®</sup>  
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TELEX: 996404 EASYLINK: 62968934 CABLE: OMEGA

**Mexico:** En Español: (001) 203-359-7803 e-mail: espanol@omega.com  
FAX: (001) 203-359-7807 info@omega.com.mx

**Servicing Europe:**

**Benelux:**

Postbus 8034, 1180 LA Amstelveen, The Netherlands  
Tel: +31 (0)20 3472121 FAX: +31 (0)20 6434643  
Toll Free in Benelux: 0800 0993344  
e-mail: sales@omegaeng.nl

**Czech Republic:**

Frystatska 184, 733 01 Karviná, Czech Republic  
Tel: +420 (0)59 6311899 FAX: +420 (0)59 6311114  
Toll Free: 0800-1-66342 e-mail: info@omegashop.cz

**France:**

11, rue Jacques Cartier, 78280 Guyancourt, France  
Tel: +33 (0)1 61 37 2900 FAX: +33 (0)1 30 57 5427  
Toll Free in France: 0800 466 342  
e-mail: sales@omega.fr

**Germany/Austria:**

Daimlerstrasse 26, D-75392 Deckenpfronn, Germany  
Tel: +49 (0)7056 9398-0 FAX: +49 (0)7056 9398-29  
Toll Free in Germany: 0800 639 7678  
e-mail: info@omega.de

**United Kingdom:**

ISO 9002 Certified  
One Omega Drive, River Bend Technology Centre  
Northbank, Irlam, Manchester  
M44 5BD United Kingdom  
Tel: +44 (0)161 777 6611 FAX: +44 (0)161 777 6622  
Toll Free in United Kingdom: 0800-488-488  
e-mail: sales@omega.co.uk

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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 which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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**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.

PATENT NOTICE: U. S. Pat. No. 6,074,089; 5,465,838 / Canada 2,228,333; 2,116,055 / UK GB 2,321,712 / Holland 1008153 / Israel 123052 / France 2 762 908 / EPO 0614194. Other patents pending.

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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