

1 YEAR
WARRANTY



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**EP510, IP510, EP511, IP511 SERIES
ELECTROPNEUMATIC CONVERTERS**



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AIR CONNECTIONS

SUPPLY

Connect air supply to 1/4 NPT port marked "IN." If the above specifications are not met, possibility of internal clogging exists. Also see MAINTENANCE section.

OUTPUT

Connect output to 1/4 NPT port marked "OUT."

GAUGE

The plugged 1/8 NPT port in the base of the transducer is internally connected with the "OUT" port. A pressure gauge can be attached to this port to monitor output pressure.

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WARNING

In order to get optimal service from this transducer and ensure warranty coverage the following **MUST** be followed:

- **The supply air quality to this instrument must be instrument quality air as defined by ISA Standard 57.0.01-1996.**
 1. Dew point not higher than 35°F.
 2. No particulates larger than 3 microns in size.
 3. Maximum oil content of 1 ppm.
- No mechanical adjustments or calibrations are necessary or allowed. All calibration **MUST** be done with electrical potentiometers on the enclosed circuit board only. See "CALIBRATION" section of instructions for more information.

TABLE 1: SUPPLY PRESSURE REQUIREMENTS					
Standard Output Calibration	0-60 PSI	0-120 PSI	3-15 PSI	3-27 PSI	6-30 PSI
Transducer Supply Pressure	80-120 PSI	130-140 PSI	20-100 PSI	35-100 PSI	35-100 PSI



MOUNTING

GENERAL

NEMA 1 and NEMA 4X transducers can be mounted in any position.

DIRECT MOUNTING

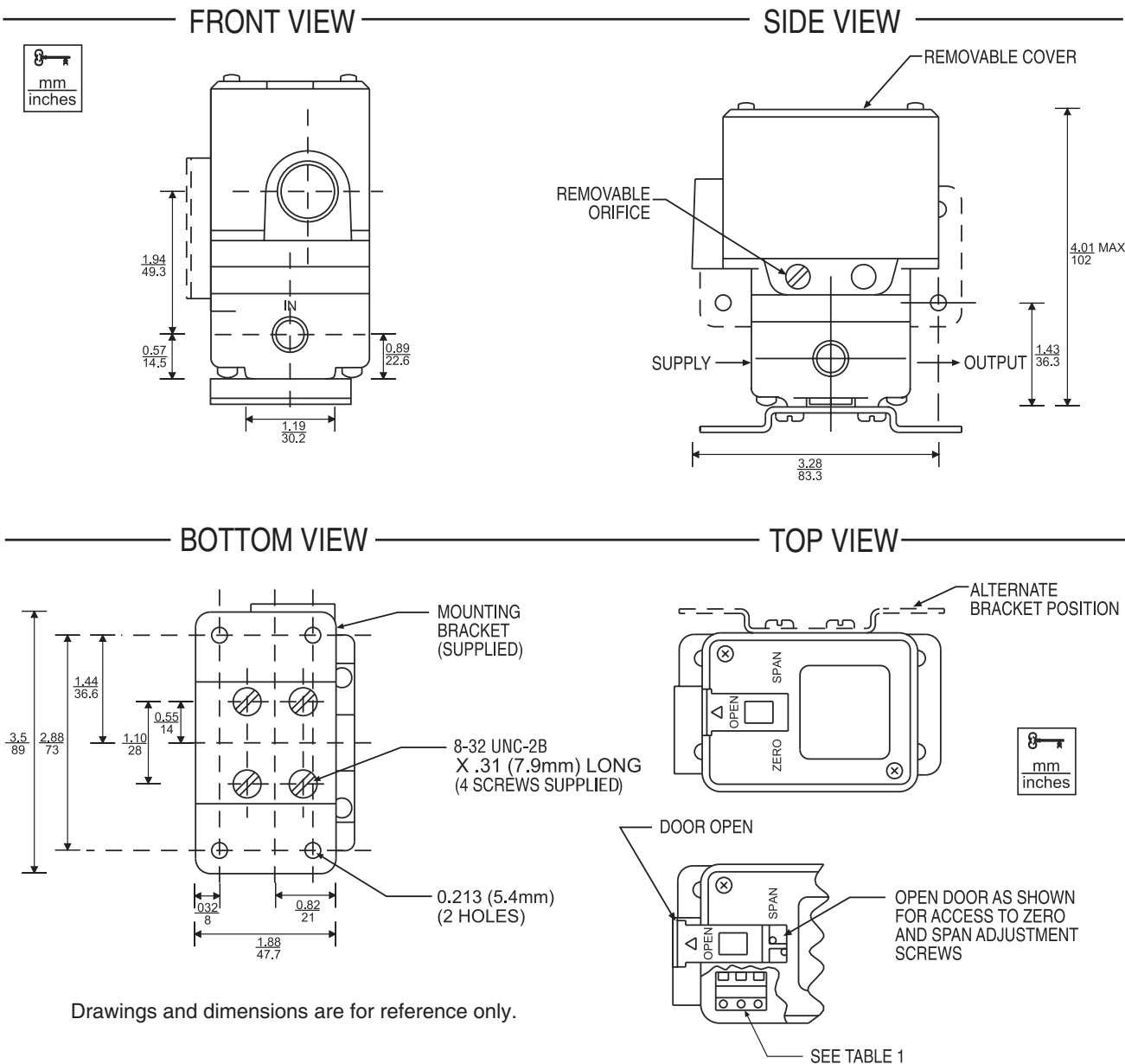
PIPE

- Any NEMA 1 transducers may be supported by its own plumbing for air supply and output. NEMA 4X transducers may also be supported using 1/2" explosion proof conduit in the electrical port.

PANEL

- NEMA 1 transducers may be mounted to a panel with two No. 10-32 screws using threaded holes in the back of a transducer or with two to four No. 8-32 screws using threaded holes in the bottom of a transducer.
- NEMA 4X transducers may be mounted to a panel with three No. 10-32 screws using threaded holes in the back of a transducer or with four No. 8-32 screws using threaded holes in the bottom of a transducer. In the case of back-mounting, if the panel extends towards the screw-on cover, a 3/16-inch-thick spacer **MUST** be used between the back of the transducer and the panel in order for the panel to clear the transducer's screw-on cover.

EP510 AND IP510



Drawings and dimensions are for reference only.

ELECTRICAL CONNECTIONS

PRECAUTIONS TO BE OBSERVED DURING INSTALLATION



The Transducers were tested at the EMC Test Centre, Dunfermline, Fife, KY11 5LB to the Electromagnetic Compatibility Directive effective January 1, 1996. The relevant EMC specifications tested were the following: EN 50081-1 (1992) and EN 50082-1 (1992). A Technical Construction File, Serial #107 was written and Certificate of Conformity issued by a Competent Body.

EN 50081-1 (1992): Test results confirmed that no precautions need to be observed during installation regarding electro-magnetic emissions from the IP510A Transducers.

EN 50082-1 (1992): The following precautions should be taken during installation to maintain the advertised accuracy specifications for the Transducers. The input wiring to the transducer should be isolated from other high voltage transient wiring. The momentary switching on and off of nearby relays, motors, or other high capacitive or inductive loads can have a minor effect on the terminal based linearity specification (1.0% of span, standard range models). Any change in output pressure is minimal and momentary, and is considered to be within its performance capabilities. Use of a ferrite bead collar on the input wires entering the transducer is recommended should installation next to high electromagnetic interference be necessary.

WARNING: In explosive atmospheres, electrical power must be removed from the transducer before attempting to remove the cover and until the cover is fully reinstalled. Failure to do so may result in electrical spark or explosion.
CAUTION: Care must be used when inserting wires into the NPT port. Wires must not enter below the circuit board due to sensitive mechanical components.

DIRECTIONS

1. Remove the cover (see WARNING above).
2. Bring wiring to the terminal block, located on the circuit board, through 1/2 NPT electrical conduit connection. 18 A.W.G. is recommended; 14 A.W.G. is the maximum wire size. Connect wires to the terminal block per TABLE 2. Care must be exercised to prevent damage to delicate internal parts when inserting wiring through the 1/2" NPT conduit opening.
3. An internal grounding screw is provided on all units to facilitate separate ground when required. An external grounding lug is also provided on NEMA 4X enclosures.
4. Reinstall the cover tightly using all o-rings and locking devices to insure compliance with Agency Approvals.

TABLE 2: ELECTRICAL CONNECTIONS

TERMINAL BLOCK	I / P TRANSDUCER MODELS	E / P TRANSDUCER MODELS
POSITION # 1	(--) NEGATIVE SIGNAL	(+) POSITIVE SIGNAL
POSITION # 2	NOT USED	COMMON GND FOR SIGNAL AND SUPPLY
POSITION # 3	(+) POSITIVE SIGNAL	(+) POSITIVE SUPPLY

CALIBRATION

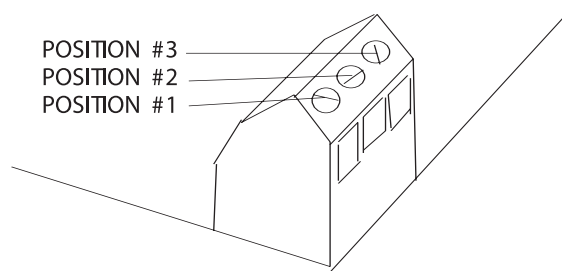


Figure 1

WARNING: In explosive atmospheres, electrical power must be removed from the transducer before attempting to remove the cover and until the cover is fully reinstalled. Failure to do so may result in electrical spark or explosion.

CAUTION: Only attempt electrical adjustments as described below. Any mechanical adjustments made will void the warranty.

WARNING

1. Remove the cover to gain access to the **“SPAN”**, (marked S), **“FINE ZERO”**, (marked Z) and the **“DAMPING”**, (3/4 turn low profile) potentiometers. The unmarked pot **“COURSE ZERO”**, is used only for major calibration range changes. This adjustment should only be attempted by factory trained personnel. For NEMA 1 enclosure, just slide open the access door on the top of the cover.
2. Set electrical input signal to 0% (e.g. 4 mA or 0 VDC).
3. **FORWARD ACTING UNITS:** Using **“FINE ZERO”** potentiometer, adjust output pressure to 0% output (e.g. 3 psi).
4. Set electrical input signal to 100% (e.g. 20 mA or 10 VDC).
5. **FORWARD ACTING UNITS:** Using **“SPAN”** potentiometer, adjust output pressure to 100% output (e.g. 15 psi).
6. Repeat steps 2 through 5 until output pressures are properly set.

NOTE: Under certain circumstances, output pressure may exhibit cycling action. To eliminate this condition, use the **“DAMPING”** potentiometer.

7. Reinstall cover using original screws and gaskets, if equipped.

MAINTENANCE

When used properly, these transducers should provide more than one million cycles without failure. If a situation should occur in which the transducer's behavior is abnormal, the cause is usually related to a pneumatic problem.

ELECTRICAL MAINTENANCE

An electrical problem must be isolated by a skilled technician. The power source and all wiring should be checked first. Circuit board failures are very rare, and can be confirmed by the following method. Loosen the screws, or posts that hold the circuit board in place. Unplug the blue connector from the circuit board, and insert two small pieces of wire into the connector.

IMPORTANT: Connect a current source with the polarity as follows. Positive to the **(RED)** coil wire and Negative to the **(BROWN)** coil wire of 10 mA to the connector, which powers the yellow coil. With supply pressure on, the unit should produce an output pressure equivalent to 80% or more of the maximum output pressure. If there is little or no output, then the unit is clogged. Should it produce an adequate output pressure, then the circuit board is the primary suspect. The unit must be returned to the factory for repair.

PNEUMATIC MAINTENANCE

All 510 and 511 Series transducers also have an internal orifice filter, but if contaminants do invade the transducer, they can clog the internal orifice and block the flow, or jam open the internal supply valve. The problem can be corrected through replacement of the orifice (see TABLE 5: KITS) or by cleaning the internal supply valve, or both.

REPLACING ORIFICE:

This can be accomplished without removing the unit from its mounting or plumbing.

1. Turn off supply pressure and unscrew the brass orifice assembly located on the side of the housing with the gauge port.

NOTE: Small sealing o-ring may remain inside of the housing. If it does, remove it with a paper clip or some other small probe. The replacement assembly will contain this o-ring.

2. Install the new orifice assembly making sure the o-ring is seated on the end of the screw.

CLEANING INTERNAL SUPPLY VALVE:

1. Turn off the supply pressure.
2. Use a 9/16" socket or wrench to unscrew the brass plug in the bottom of the transducer.

NOTE: Take care not to lose the supply valve spring which is retained by the bottom plug.

3. Clean out any dirt or debris and reassemble, making sure the stem of the supply valve is nested in the supply valve spring.

AGENCY APPROVALS, SPECIAL NOTES, AND CAUTIONS**INTRINSIC SAFETY**

All 510 and 511 Series transducers are rated intrinsically safe by both FM and CSA for:

CLASS I, DIVISION 1, GROUPS A,B,C,D HAZARDOUS LOCATIONS.

Proper FM-approved intrinsically-safe wiring requires external FACTORY MUTUAL RESEARCH CORPORATION ENTITY-APPROVED SINGLE-CHANNEL barriers to be selected, based upon MAXIMUM ENTITY PARAMETERS of 510 and 511 Series transducers:

ENTITY PARAMETERS:

$V_{max} = 28 \text{ V}$, $I_{max} = 150 \text{ mA}$, $C_i = 0.22\mu\text{F}$, $L_i = 0 \text{ mH}$.

V_{oc} and I_{sc} of a barrier shall not exceed V_{max} and I_{max} of the transducer.

$(L_i + L_{wiring})$ and $(C_i + C_{wiring})$ shall not exceed L_a and C_a of a barrier.

NOTICE: For proper FM and CSA approved intrinsically-safe wiring, request Drawing Number 990-439-000 from the Factory.

NONINCENDIVE

All 510 and 511 Series transducers are approved as NONINCENDIVE by FM and approved as suitable by CSA for:

CLASS I, DIVISION 2, GROUP A, B, C, D HAZARDOUS LOCATIONS.

A barrier is not necessary when these transducers are in these locations.

ENCLOSURES

Compliance with **NEMA 4X** and **CSA ENC4** enclosure ratings require that the screw-on cover has the O-ring installed. In case of a need for replacement parts, see TABLE 3.

EXPLOSION & DUST-IGNITION PROOF CERTIFICATIONS

FACTORY MUTUAL and CANADIAN STANDARDS ASSOCIATION

WARNING: The following ratings are valid **ONLY WHEN** the cover is installed for FM and CSA. **BOTH** the cover and the locking device, using tamper resistant screws must be installed. Screws are to be removed and installed with a special driver bit (supplied). In case of a need for replacement parts, follow TABLE 4.

EXPLOSION PROOF FOR CLASS I, DIV 1, GROUP B, C, D.

DUST-IGNITION PROOF FOR CLASS II, DIV 1, GROUP E, F, G.

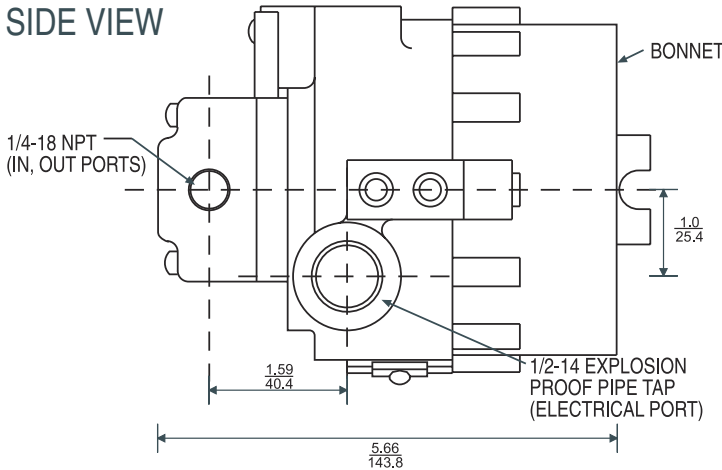
SUITABLE FOR CLASS III LOCATIONS.

TABLE 3: NEMA 4X, REPLACEMENT COVER O-RINGS	
PART NAME	PART NUMBER
O-RING SEAL, VITON	214-649-000-242
O-RING SEAL, BUNA-N	214-649-000-240
TABLE 4: NEMA 4X, REPLACEMENT PARTS FOR COVER LOCKING DEVICE	
PART NAME	PART NUMBER
LOCKING CLAMP	224-669-000-016
TAMPER-PROOF SCREW	214-648-000-401
DRIVER BIT	010132-000

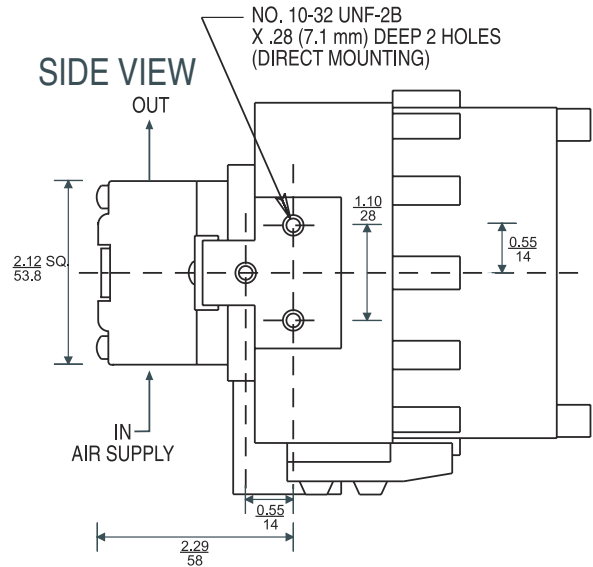
TABLE 5: KITS	
KIT NAME	PART NUMBER
1. Panel Mounting Kit	010135-000
2. Valve Mounting Kit	010134-000
3. 2" Pipe Mounting Kit (Valve Mounting Kit is required)	010143-000
4. DIN Rail Adapter	010115-000
5. Cover Locking Device Kit (for NEMA 4X enclosure only)	010136-000
6. Zero based outlet range orifice with Buna-N O-rings	010137-000
7. Zero based outlet range orifice with Viton O-rings	010137-002
8. Standard outlet range orifice with Buna-N O-rings	010137-001
9. Standard outlet range orifice with Viton O-rings	010137-003
10. Hirschmann Connector Kit (3-prong plug, O-ring sealed)	010142-000
11. Pressure Gauge Kit, 15 PSI	010138-000
12. Pressure Gauge Kit, 30 PSI	010138-001
13. Pressure Gauge Kit, 60 PSI	010138-002
14. Pressure Gauge Kit, 160 PSI	010138-003

EP511 AND IP511

SIDE VIEW



SIDE VIEW



TOPVIEW

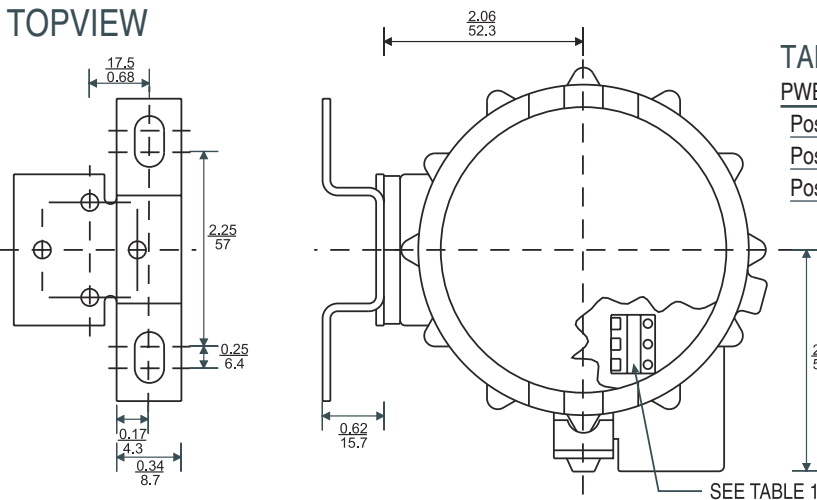


TABLE 1: WIRING TERMINATION

PWB Terminal Block	I/P Transducer	E/P Transducer
Position 3	Positive (+)	Supply (+)
Position 2	No Connection	Common
Position 1	Negative (-)	Signal (+)



Drawings and dimensions are for reference only.

510 and 511 Series I/P AND E/P TRANSDUCER SPECIFICATIONS

Accuracy:	±0.10% of output span, typical ±0.25% of output span, maximum
Hysteresis:	0.01% of output span, typical 0.10% of output span, maximum
Dead Band:	Not measurable
Repeatability:	0.01% of output span, typical 0.10% of output span, maximum
Ambient Temperature Effect Zero:	±0.004% of nominal span per °F, typical ±0.022% of nominal span per °F, maximum
Span:	±0.013% of calibrated span per °F, typical ±0.022% of calibrated span per °F, maximum
Compensated Temperature Range:	+32°F to +122°F
Operating Temperature Range Buna-N elastomers: Viton elastomers:	-20°F to 160°F 0°F to 160°F
Storage Temperature Range Buna-N elastomers: Viton elastomers:	-40°F to 200°F -15°F to 200°F
Vibration Effect:	Less than 0.5% of SPAN per 1G, 5-2000 Hz, 3G maximum, 3 axes
Mounting Position Effect:	Not measurable
Loop Load, I/P transducer:	Less than 10 VDC drop at 20 mA Less than 12 VDC drop at 50 mA
Supply Voltage, E/P Transducer Intrinsically Safe/Nonincendive: General Purpose:	9 VDC to 28 VDC, less than 20 mA 9 VDC to 40 VDC, less than 20 mA
Supply Voltage Effect:	Not measurable
Signal Impedance, E/P Transducer:	6000 Ohm minimum
RFI/EMI Effect (NEMA 4X):	Less than 0.25% of SPAN, 10V/meter, 20-1000 MHz.
Supply Pressure Requirements:	See TABLE 1
Supply Pressure Effect:	Not measurable
Air Consumption:	6.0 SCFH maximum
Forward Flow Capacity (Supply):	Standard Range 7 SCFM Extended Range (over 30 PSI) 12 SCFM
Port Sizes:	Pneumatic: 1/4" NPT Electrical: 1/2" NPT

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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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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.

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