

User's Guide

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PX921

WIRELESS

PRESSURE TRANSMITTER

INSTALLATION INSTRUCTIONS



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The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. 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.

SYSTEM DESCRIPTION

The PX921 wireless pressure transducer provides the means for remote pressure measurement without the need to lay-down cables. Utilizing an advanced microprocessor and UHF radio design, pressure measurements are digitally encoded and transmitted in a secure data frame to the PX921-R receiver over a distance of up to 500ft line-of-sight.

The PX921 uses a unique data transmission protocol, developed specifically for radio telemetry systems. Each transmitted message includes the address of its source and its destination, and has a check-sum to allow the detection of any corruption of the message.

The PX921-R receiver will decode the received message and verify that the addresses match and that the check-sum is valid. Once this is complete the receiver will convert the pressure reading to a 4-20mA output signal.

PX921 INSTALLATION

POWER SUPPLY

Powering of the PX921 is achieved by a internal 1/2AA 3.6V lithium battery, which is able to power the unit for up to 1 year without replacement. Alternatively an external 8-30Vdc supply can be used. This makes the internal battery act as a backup supply, which will take over powering the unit if the external supply is removed or fails. When supplied new the internal battery circuit is disconnected.

MEASUREMENT AND TRANSMISSION CYCLE

The time interval between each measurement and transmission cycle can be selected from one of four settings. In between each transmission, the PX921 switches to a very low power sleep mode. The majority of the power consumption occurs during the radio transmission cycle, therefore by selecting the longest time interval between each transmission, the low average power consumption is achieved. This is important when using only the internal battery supply, as this will affect the service life of the battery. Please select the most suitable setting from table 1.

| <u>SWA2</u> | | <u>TRANSMIT CYCLE</u> | <u>TYPICAL BATTERY LIFE</u> |
|-------------|---|-----------------------|-----------------------------|
| 1 | 2 | | |
| 0 | 0 | 1 in 200 mS | 1000 hours |
| 1 | 0 | 1 in 3 seconds | 5000 hours |
| 0 | 1 | 1 in 10 seconds | 8000 hours |
| 1 | 1 | 1 in 45 seconds | 9300 hours |

0=switch off

1=switch on

Table 1. Measurement and transmission cycle.

ELECTRICAL CONNECTION AND CONFIGURATION

See installation drawing figure 2.

1. Remove the screw lid to reveal the front panel.
2. Select the 8 bit identification address for the PX921 using the 8 way DIP switch array SWA1(the receiver will need to match this address).
256 address code combinations are available.
3. Select the required time intervals between each "Measurement and Transmission cycle" using the 2 way DIP switch array SWA2.
4. When using an external supply, feed the power cable through the cable gland provided and tighten sealing nut. Connect the supply leads to the specified screw terminals.
5. When using the internal battery supply as a backup or main supply, connect the jumper plug to close Link1.
6. The unit will operate correctly as soon as the supply voltage is applied. The transmission cycle will be indicated by the green LED, which will turn on during transmission period and off during the delay period.
7. A local check of the PX921 calibration can be made. To do this first connect the jumper plug to close Link2. This forces the electronics not to go into sleep mode between transmissions. The calibration signal can then be measured across the local output terminal relative to the negative supply connection. This signal is factory set: 0.2 to 1.0Vdc for Zero and Full-scale respectively, which will be reproduced as a 4-20mA output signal at the remote PX921-R receiver.
As soon as this process is over, unplug the jumper across Link2.
Failure to do this will reduce the battery service life significantly.
8. Zero and Span adjustments can be made if necessary by turning the trimming screws on the front panel, identified on the installation drawing.
9. When the electrical installation and configuration is complete, replace the screw lid and tighten down on to the seal.

PROCESS CONNECTION

See installation drawing figure 1.

1. The PX921 has a 1/2NPT connection thread, which can be directly mounted as shown.
2. Tightening of the process connection should be performed with a 27mm A/F spanner on the hexagon section as shown.

The threaded port and all wetted parts are stainless steel and provide high corrosion resistance.

PX921-R INSTALLATION

WALL MOUNTING

The PX921-R receiver is intended for wall mount installation.

To attach the unit to the intended surfaces first, unscrew the 4 retaining screws and remove the plastic enclosure lid. Locate the 4 x 4mm diameter fixing through holes situated in each corner of the enclosure, with centres at 188 x 89mm. Attach the enclosure to wall surface with 4 screws through the enclosure fixing holes. See installation drawing figure 4.

The receiver should be mounted in a position to allow a line-of-sight path for the radio transmission from the PRX921. Any obstacles or walls in the radio path will reduce the operating range. Under good conditions, 500ft. range is achievable.

As with all radio receiver equipment the enclosure should NOT be mounted with the antenna near to any large metal or electrically conductive surfaces. Positioning the antenna close to conductive surfaces may de-tune the antenna and reduce the operating range.

For mounting directly onto a metal lath and plaster or a foil backed insulation wall, use a block of wood or plastic to lift the enclosure away from the wall surface, as shown.

ELECTRICAL INSTALLATION

See installation drawing figure 5.

With the lid removed 3 x 4 way screw terminal plugs are visible with connections numbered 1 to 12. All electrical connections are made to these terminals.

Power connections

Note: 16/0.2mm wire or larger should be used for power wiring. An external 0.25 amp fast blow fuse should be fitted in the supply line.

The supply voltage can be selected to be one of the following.

| | |
|--------------------------------|--------------|
| 95 to 132 Vac (110 V nominal) | 43 to 67 Hz. |
| 190 to 264 Vac (240 V nominal) | 43 to 67 Hz. |

| <u>Supply voltage</u> | <u>Terminal Connection</u> |
|-----------------------|---|
| 110 Vac | AC Live to terminal 1 and 3 AC Neutral to terminal 2 and 4 |
| 240Vac | AC Live to terminal 1 AC Neutral to terminal 4 Link terminal 2 and 3. |

External battery/DC supply

An external battery or DC voltage supply can be used instead of mains power. A 0.5 amp fast blow fuse should be fitted in the EXT. battery line.

| <u>Supply voltage</u> | <u>Terminal Connection</u> |
|-----------------------|--|
| 10.8 to 30 Vdc | +Supply to terminal 5 - Supply to terminal 6. |

Note that the Red LED is illuminated when the power supply is connected.

Address code

An 8 way DIP switch is used to select the required transmitter and receiver address codes. The 8 Bit address code must be set the same for the PX921 and PX921-R units. 256 address code combinations are available.

OUTPUTS

Current signal

The 4-20mA output signal is provided on terminals 11 (+Iout) and 12 (-Iout). The 4-20mA output signal has a compliance voltage of 8.5Vdc, and will drive a 400 ohm load.

Communication failure alarm

The Green LED is switched on (illuminated) to indicate that a communication link is present between the transmitter and receiver units, and will switch off if the communication link is lost. This indication is also available as an open drain switch, which is connected to terminal pin8(-Alarm) and can switch a load connected to pin7. The drain connection is high impedance when the alarm is on and switched to 0V when the alarm is off.

Communications watchdog

The time period that the receiver unit waits to receive a valid data frame before activating the communication failure alarm is set to 128 seconds.

PX921 WIRELESS PRESSURE TRANSMITTER

Technical Specification

INPUT

Pressure ranges 0-10psi to 0-10,000psig
Over pressure 1.5 x rated pressure

OUTPUT

Local test voltage 0.2 to 1.0Vdc
Data transmission Serial data packet @ 2400 baud.
Sample rate Up to 1 sample per 200mS (see table 1).

RADIO

Type: UHF low power licence exempt.
Power level 250uW E.R.P.
Modulation F.M.

POWER SUPPLY

Battery:
Type: 3.6V/ 1Ahr 1/2AA lithium thionly chloride
Service Life: See table 1.
External:
Voltage range 8 to 30Vdc
Current drain 10mA peak .

ACCURACY

Resolution 0.05%FS (12 bit A.D.C.).
Linearity and hysteresis 0.3% F.S.

ENVIRONMENTAL

Housing All 316 stainless steel, rated IP65.
Pressure port All wetted part stainless steel or Titanium.

IDENTIFICATION ADDRESS: 8 Bit, 256 selectable combinations.

DIMENSIONS: Height:136mm Diameter:60 mm (see figure 3).

WEIGHT: Approximately 2.8 lbs.

PROCESS CONNECTION 1/2NPT.

OPERATING TEMPERATURE 10 to +135degF.

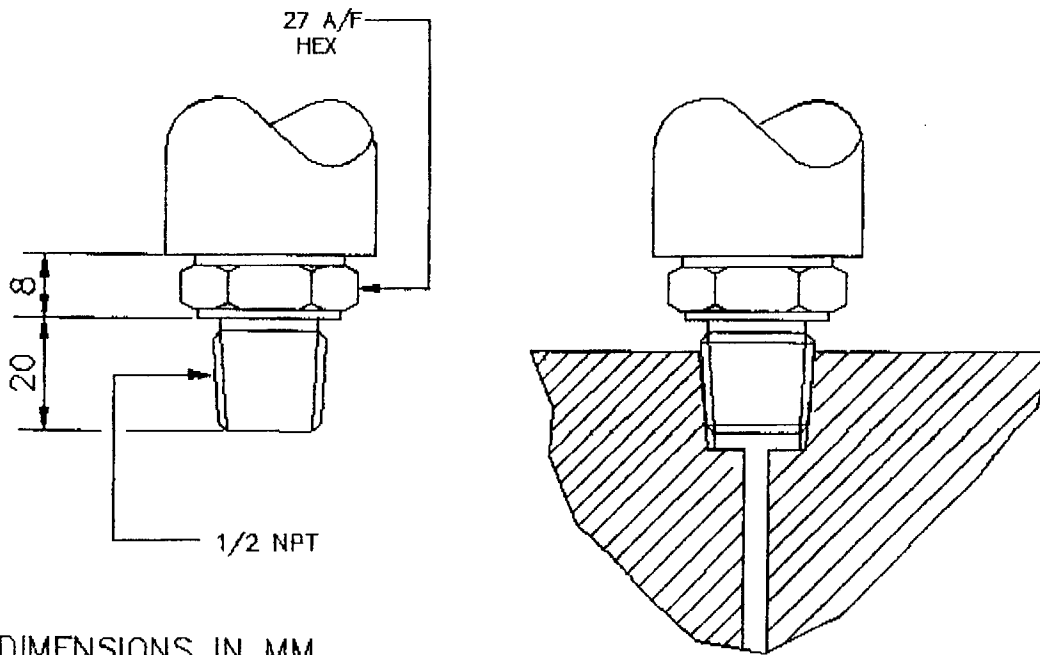
STORAGE TEMPERATURE: -20 degF to +150 degF.

PX921-R SINGLE CHANNEL RADIO RECEIVER

Technical Specification

| | |
|-----------------------------------|--|
| RADIO TYPE: | UHF/FM receiver. |
| SENSITIVITY: | -110dBm (range of 500ft light-of-sight). |
| IDENTIFICATION ADDRESS: | 8 Bit, 256 selectable combinations. |
| COMMUNICATION WATCHDOG: | 128 seconds before alarm output is activated. |
| ALARM OUTPUT: | Open drain switch, maximum current 250mA. |
| ANALOGUE OUTPUT: | 4-20mA, 0.2 - 2.0Vdc. |
| CURRENT OUTPUT COMPLIANCE: | 8.5 Vdc. |
| RESOLUTION: | Better than 0.05% (12 bit). |
| POWER REQUIREMENTS: | 110/240V 50-60Hz or 10.5-30Vdc. |
| CURRENT REQUIREMENTS: | 32mAdc. |
| HOUSING: | High impact polycarbonate, rated to IP65. |
| DIMENSIONS: | 200 x 120 x 75 mm. |
| WEIGHT: | Approximately 2 lbs. |
| OPERATING TEMPERATURE: | 10 degF to +135 degF. |
| STORAGE TEMPERATURE: | -20 degF to +150 degF. |
| ANTENNA: | 1/4 wave helical in plastic moulding. |
| RF CONNECTOR: | External BNC. |
| CABLE ENTRY: | IP65 Nylon cable gland, for cable diameter 4 to 8mm. |
| ELECTRICAL CONNECTIONS | Screw terminal plug and socket, wire size from 0.5 to 1.5mm ² . |

PX921 INSTALLATION DRAWINGS



DIMENSIONS IN MM

Figure 1. Process Connections

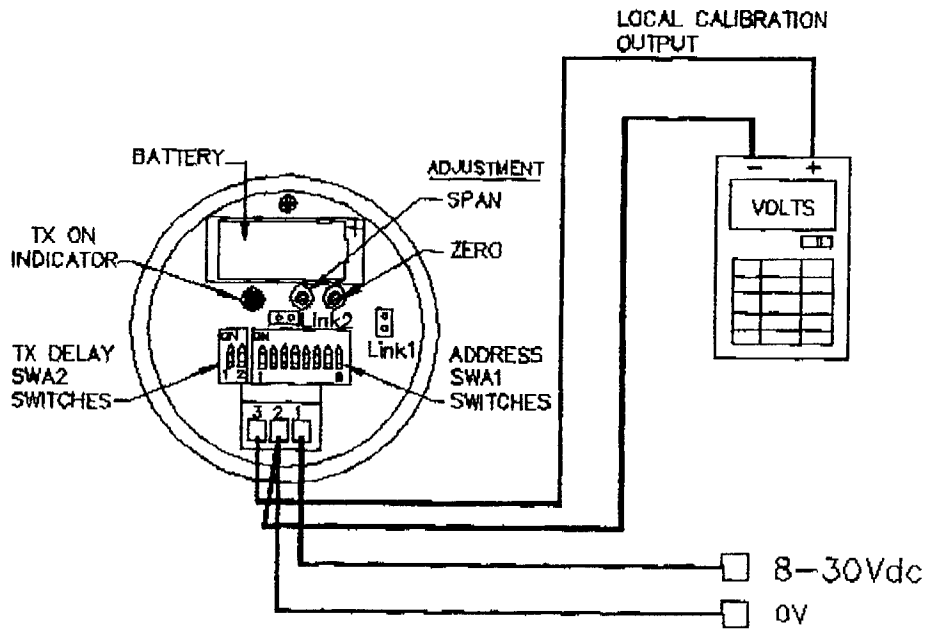
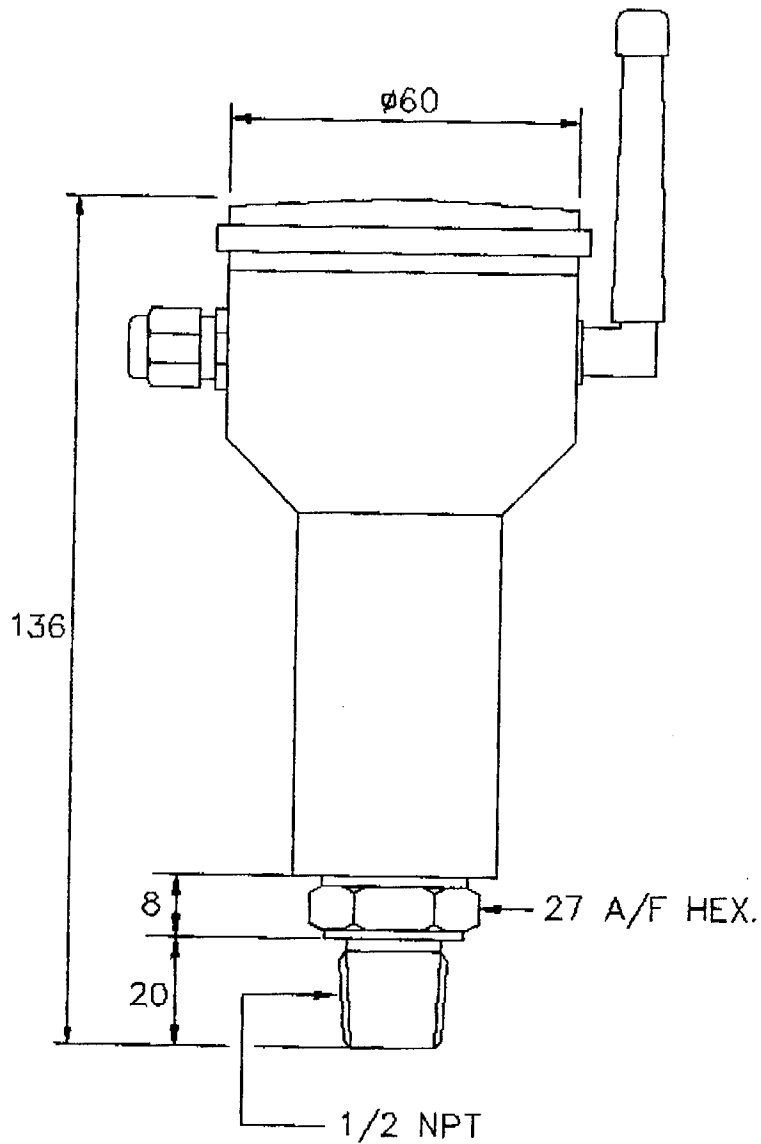


Figure 2. Electrical Connections

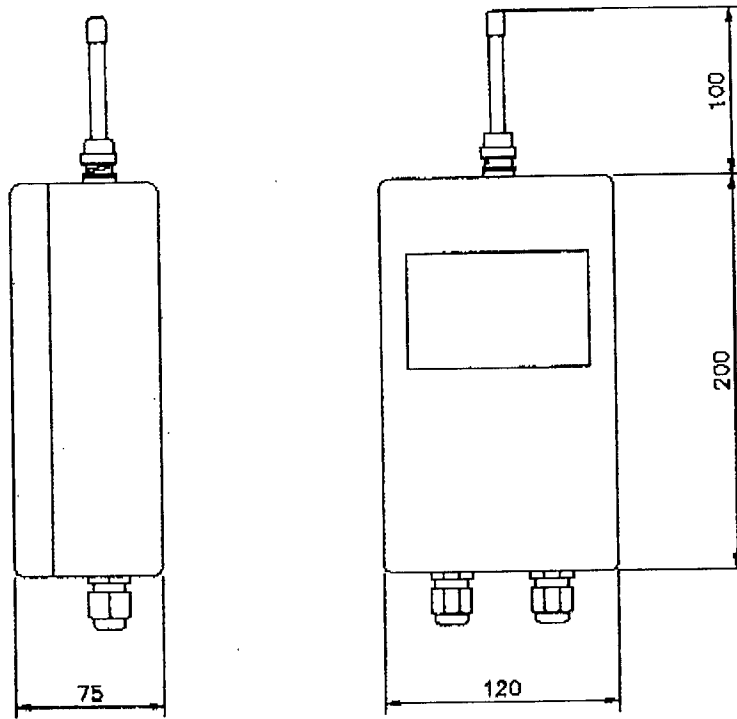
PX921 TRANSMITTER



DIMENSIONS IN MM

Figure 3. Dimensional detail

DIMENSIONS



DIMENSIONS IN M.M.

Figure 4A. PX921-R Dimensions

MOUNTING DETAIL

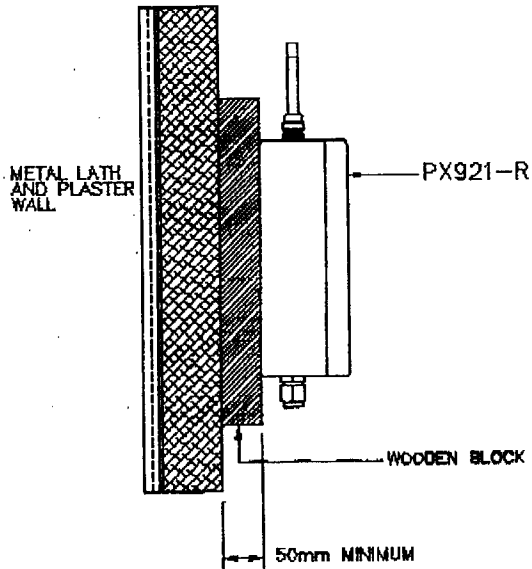


Figure 4B. PX921-R Mounting Detail

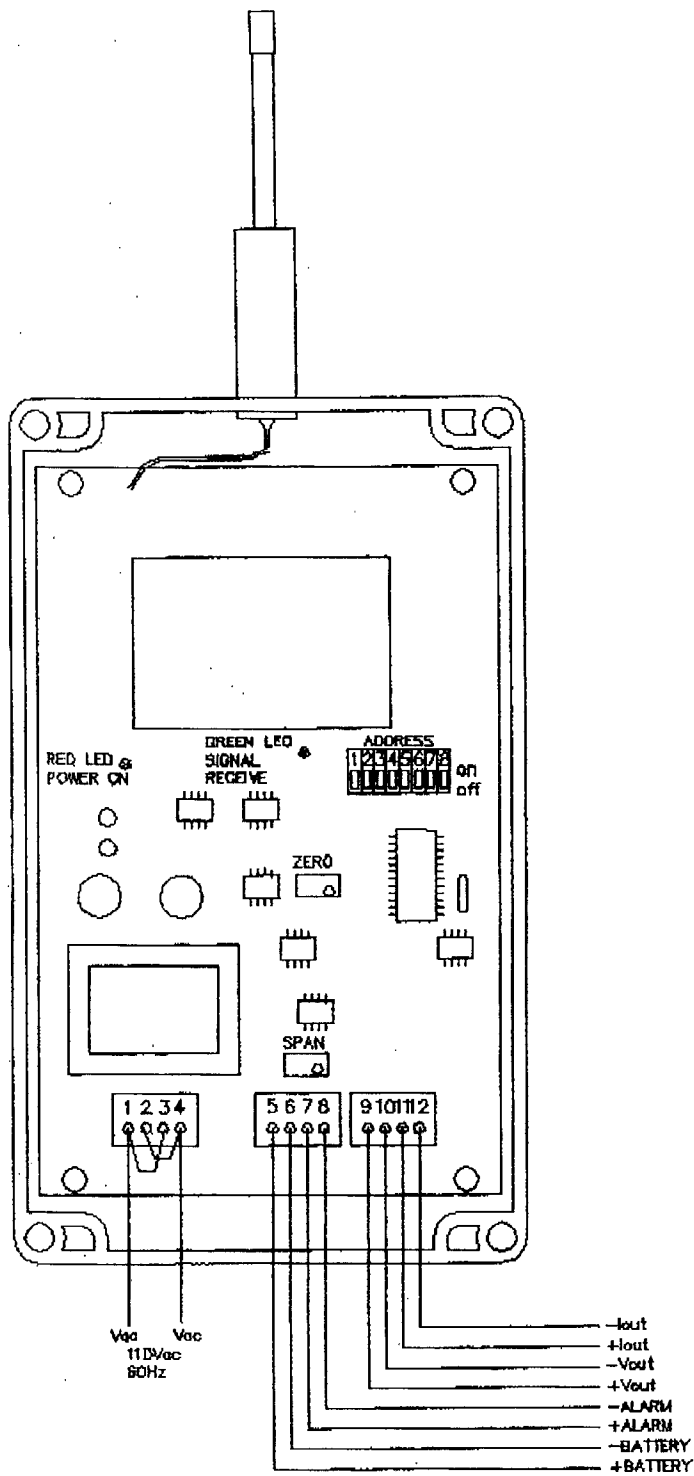


Figure 5. PX921-R Electrical Connections



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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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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