1 YEAR
WARRANTY

OMEGA™

User's Guide

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LTU2000 SERIES
Tuning Fork Point Level Switches

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Contents

LTU-2000 Series:
Point Level Switch

Omega's LTU-2000 Series use a piezo-electric crystal that enables the switch to vibrate at a fixed pre-defined resonant frequency. When the tuning fork is submerged in the medium the frequency at which the switch is vibrating, changes. This change is detected by the unit's electronics and is converted into a switch output (either relay or PNP/NPN depending on the model).

The red LED in the housing stays blinking when the LTU-2000 is in contact with the product. The same light stays on continuously when there is no contact with the product, giving a positive indication at all times that the LTU-2000 is working.

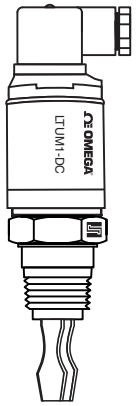
All models are made with 316 Stainless Steel and are available with ECTFE or epoxy coatings and hygienic fittings for sanitary applications. Standard versions can operate at temperatures up to 80ºC (176ºF) and higher temperature versions can operate at temperatures up to 120ºC (248ºF). All models (except the mini-versions) have adjustable time delay adjustment of 1, 5, 10 or 20 seconds and also have a Wet/Dry selection for both High and Low level application requirements.

Features

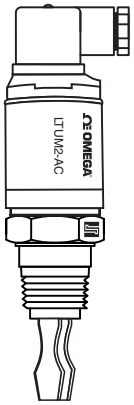
- Unaffected by variations in density, conductivity, dielectric constant or viscosity
- Unaffected by foam, tank agitation or vibration
- Available in Threaded, Sanitary and Flanged connections
- Available with customized length options to best suit your application
- All 316SS body and wetted parts, ECTFE coating when necessary
- Adjustable response time (from 1 to 20 seconds)
- Relay and Transistor outputs available

Models

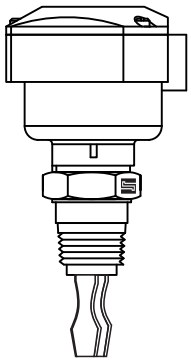
LTUM1-DC



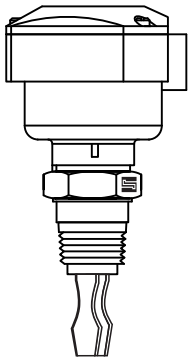
LTUM2-AC



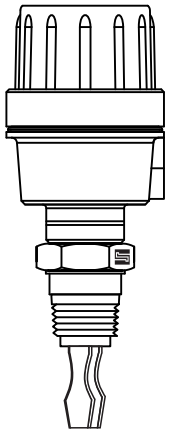
LTUP-DC
NYLON HOUSING



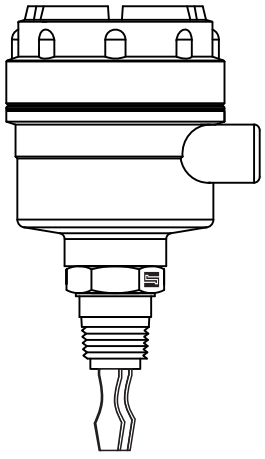
LTUR
NYLON HOUSING



LTUR
ALUMINUM HOUSING

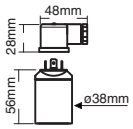


LTUR
ALUMINUM HOUSING

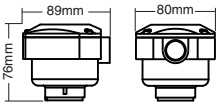


Mounting Options for LTU-2000

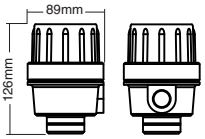
LTUM



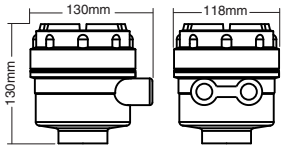
Nylon



Aluminum



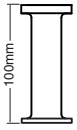
Aluminum



Extended Necks for High Temperature

MT

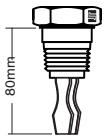
HT



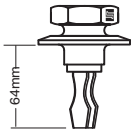
Extended necks for medium temperature (up to 100ºC) and high temperature (up to 120ºC)

Insertion Length

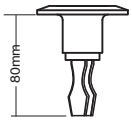
Standard



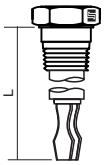
TC Standard LTU



TC Standard LTUM



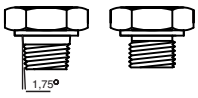
Extended Length



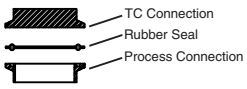
Process Connections

Threaded Connections
3/4”
1”
1 ½”
2”

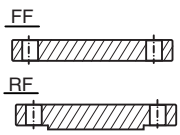
NPT BSP



Tri-Clamp Connection
1 ½”
2”
2 ½”
3”



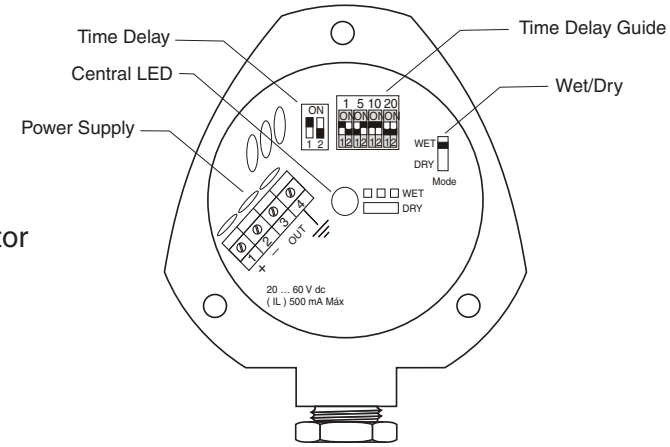
Flange Connections ANSI 150# ANSI 300#
1”
1 ½”
2”
2 ½”



Wiring Diagram

LTUP - Housing

1 - Power Supply (+)
2 - Power Supply (-)
3 - PNP/NPN Output
or +24v/0v (Max 500mA)
4 - Ground

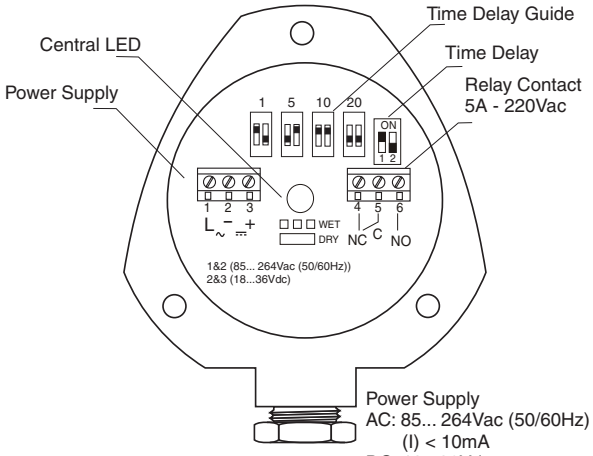


LTUP - with M12 Connector

1 - Power Supply (+)
2 - Power Supply (-)
3 - PNP/NPN Output
or +24v/0v (Max 500mA)
4 - Ground

LTUR - Universal Power Supply Nylon Housing

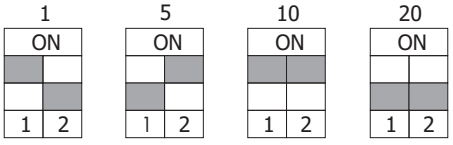
1 - Power Supply (L) } AC (~)
2 - Power Supply (-) } DC (⎓)
3 - Power Supply (+)
4 - NC Contact
5 - Common
6- NO Contact



LTUR - with M12 Connector

1 - Power Supply (L) or (+)
2 - Power Supply (-)
3 - NO Contact
4 - NC Contact
5 - Common

Time Delay Guide

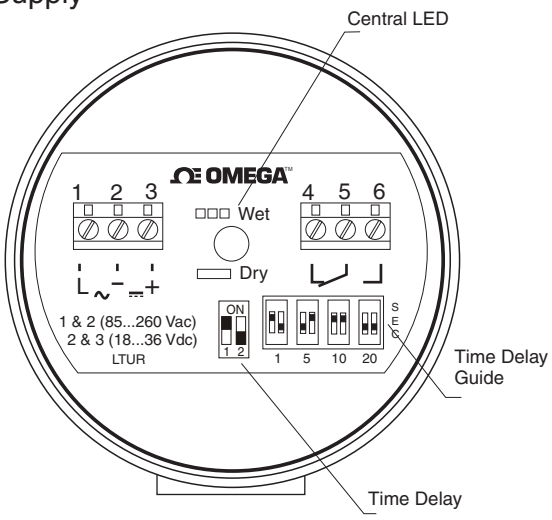


(1 ; 5 ; 10 ; 20 sec.)

The different key positions indicate the time delay in seconds.

LTUR - Universal Power Supply
Small Aluminum Housing

1 - Power Supply (L) } AC (~)
2 - Power Supply (-) } DC (⎓)
3 - Power Supply (+)
4 - NC Contact
5 - Common
6 - NO Contact

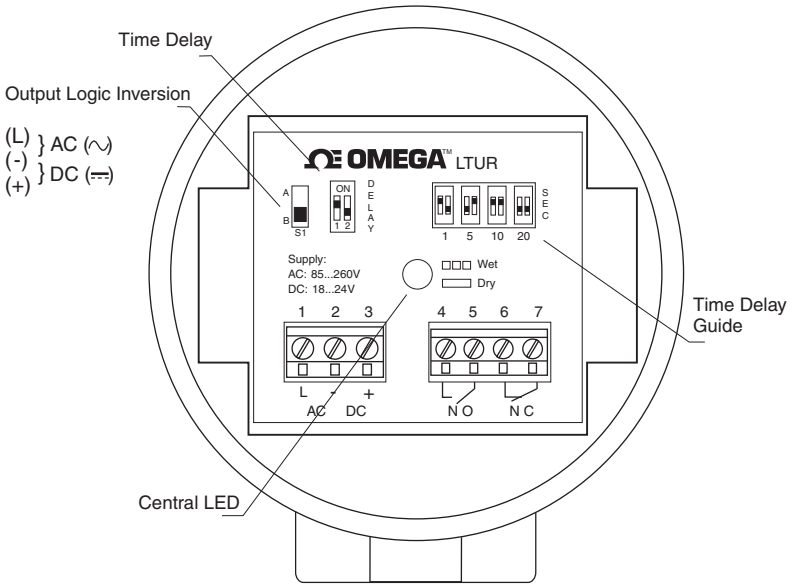


LTUR - with
M12 connector

1 - Power Supply (L) or (+)
2 - Power Supply (-)
3 - NO Contact
4 - NC Contact
5 - Common

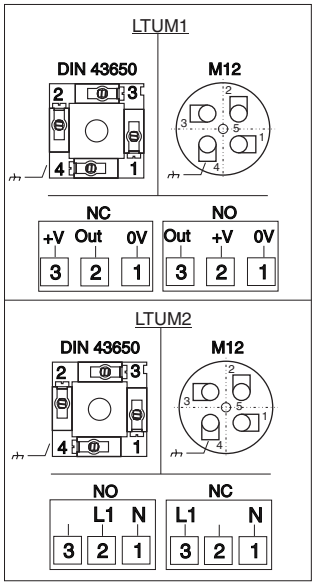
LTUR - Universal Power Supply
Large Aluminum Housing

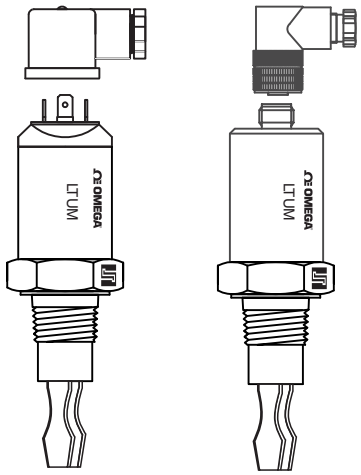
1 - Power Supply (L) } AC (~)
2 - Power Supply (-) } DC (⎓)
3 - Power Supply (+)
4 - NO Contact
5 - NO Common
6 - NC Contact
7 - NC Common



Wiring Diagram

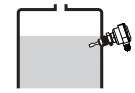
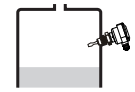
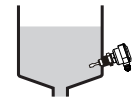
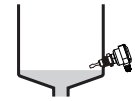
⚠ To avoid burning the unit, make sure that the load has been installed in series with the LTUM before powering it up.



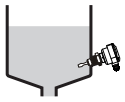
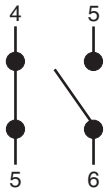
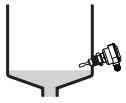
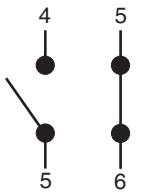


LTUP and LTUR Status Guide

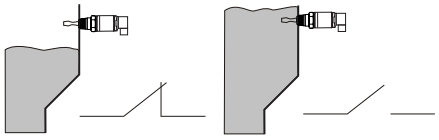
For LTUP / DC

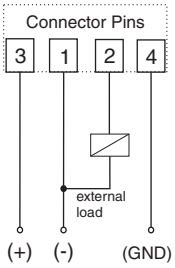
Switch Position	Level	Out	Central LED
WET Maximum fail-safe	 Probe Covered		WET (Blink)
	 Probe Uncovered		DRY (On)
DRY Minimum fail-safe	 Probe Covered		WET (Blink)
	 Probe Uncovered		DRY (On)

For LTUR (Universal Power Supply)

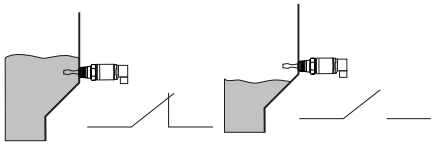
Level	NO - NC	Central LED
 Probe Covered	 4 5 5 6	WET (Blink)
 Probe Uncovered	 4 5 5 6	DRY (On)

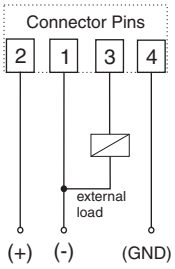
LTUM1 / DC (Operating Mode NC)



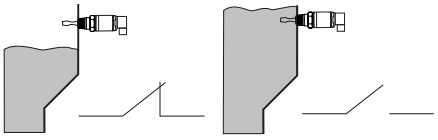


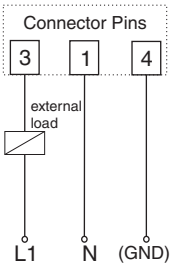
LTUM1 / DC (Operating Mode NO)



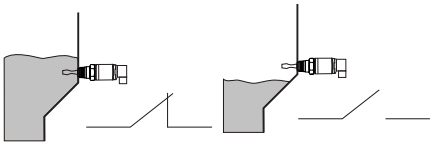


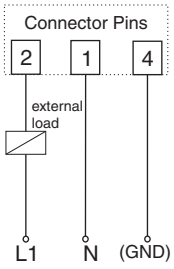
LTUM2 / AC (Operating Mode NC)





LTUM2 / AC (Operating Mode NO)





Installation

Confirm that the wire connections are correct and that the available power supply is compatible with the LTU unit.

Verify that the operating pressure and temperature of the process corresponds to the operating parameters of the LTU unit.

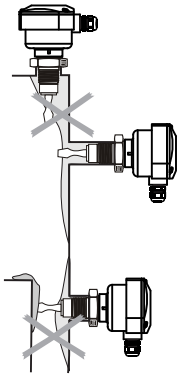
The LTU can be installed at any angle of the pipe or vessel to detect the presence of liquids.

Verify that the forks are inserted into the medium until the proper point within the vessel and that they stay clear from the inside walls (Fig. 1 and 2).

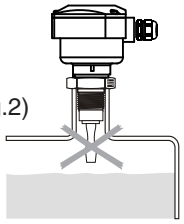
Ensure that the conduit is facing downward and makes a U-turn on the bottom of the cable to avoid moisture from entering the housing enclosure (Fig.3).

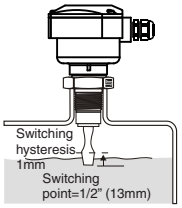
For proper installation of the LTU use the mark as a reference for correctly positioning the forks. It is recommended that the correct orientation be used to avoid build up between the forks (Fig. 4).

(Fig.1)

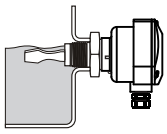


(Fig.2)



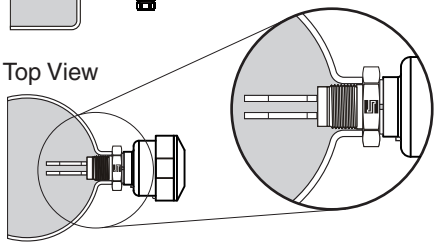


Side View

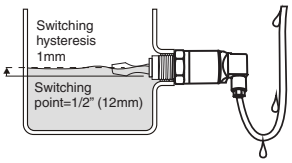


(Fig.4)

Top View

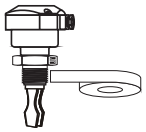


(Fig.3)



Seal the thread with Teflon tape before installation (Fig. 1).

Fig. 1

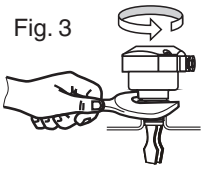


Do not thread the unit into the vessel, or turn it, by the housing (Fig. 2).

Fig. 2

Use the correct tools during the installation of the LTU (Fig. 3).

Fig. 3



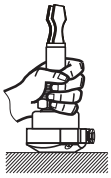
The LTU should not be dropped or suffer any impact or fall that could damage the electronics, coating or the forks of the probe (Fig. 4 and 5).

Periodic visual inspection of the LTU is required to check for corrosion or deposit build-up. If deposits are found, clean the sensor to ensure optimum performance.

Fig. 4

When cleaning the Forks use a soft brush to ensure that the coating or polishing is not damaged or scratched.

Fig. 5

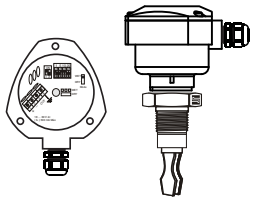


Do not alter or bend the shape of the forks (Fig. 6).

Fig. 6

Technical Specifications

LTUP

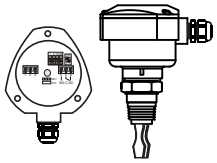


Nylon Enclosure

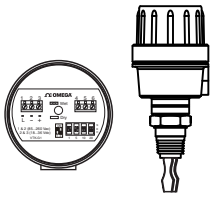
Application	Level Switch for Liquids
Operating Voltage	20...60 Vdc
Current Consumption	+/- 3mA
Output	PNP (3 wires)
Medium Viscosity	Max.: 20.000cs
Accuracy	0.1%
Repeatability	< 0.5mm
Time Delay	1 to 20 seconds (adjustable)
Switching Point	13mm from tip
Load Current	500mA
Enclosure Material	Glass Filled Nylon
Electrical Connection	½" NPT, M12 Connector or Cable Gland
Process Connection	3/4" to 1 ½" BSP, NPT or Sanitary
Wetted Material	316 Stainless Steel
Operating Temperature	-14 to 176° F (-10 to 80°C)
Max Pressure	725 PSI (50 Bar)
Class Protection	IP 65

Technical Specifications

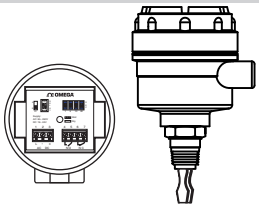
LTUR



Nylon Enclosure



Aluminum Enclosure



Aluminum Enclosure

Application	Level Switch for Liquids
Operating Voltage	18...36 Vdc 85...264 Vac (50/60Hz)
Current Consumption	DC < 6mA AC < 10mA
Output	Relay (SPDT) N1, G1 / (1NO+1NC) G2
Medium Viscosity	Max.: 20.000cs
Accuracy	0.1%
Repeatability	< 0.5mm
Time Delay	1 to 20 seconds (adjustable)
Switching Point	13mm from tip
Load Current Relay	5A (250 Vac)
Enclosure Material	Glass Filled Nylon or Aluminum
Electrical Connection	½" NPT, M12 Connector or Cable Gland
Process Connection	3/4" to 1 ½" BSP, NPT or Sanitary
Wetted Material	316 Stainless Steel
Operating Temperature	-14 to 176º F (-10 to 80ºC)
Max Pressure	725 PSI (50 Bar)
Class Protection	IP 65

Technical Specifications

LTUM1

LTUM1

Application	Level Switch forLliquids
Operating Voltage	20...60 Vdc
Current Consumption	+/- 3mA
Output	PNP (3 Wires)
Medium Viscosity	Max.: 20.000cs
Accuracy	0.1%
Repeatability	< 0.5mm
Time Delay	1 sec.
Switching Point	13mm from tip
Load Current	500mA
Enclosure Material	316 Stainless Steel
Electrical Connection	Plug DIN 43650 / M12 Connector
Process Connection	3/4" to 1 ½" BSP, NPT or Sanitary
Wetted Material	316 Stainless Steel
Operating Temperature	-14 to 248° F (-10 to 120°C)
Max Pressure	725 PSI (50 Bar)
Class Protection	IP 65 DIN 43650 connector IP 67 M12 connector

LTUM2

LTUM2

Application	Level Switch for Liquids
Operating Voltage	85...264 Vac
Current Consumption	+/- 3mA
Output	Direct Load Switching (2 Wire)
Medium Viscosity	Max.: 20.000cs
Accuracy	0.1%
Repeatability	< 0.5mm
Time Delay	1 sec.
Switching Point	13mm from tip
Load Current	100mA
Enclosure Material	316 Stainless Steel
Electrical Connection	Plug DIN 43650 / M12 Connector
Process Connection	3/4" to 1 ½" BSP, NPT or Sanitary
Wetted Material	316 Stainless Steel
Operating Temperature	-14 to 248° F (-10 to 120°C)
Max Pressure	725 PSI (50 Bar)
Class Protection	IP 65 DIN 43650 connector IP 67 M12 connector

Trouble Shooting

Fault	Case	Solution
Does not switch	The central LED is not on	Verify the Power Supply
	The LED flashes 3 times/sec.	Internal failure
	The LED flashes once every 2 seconds	Internal failure
	The LED flashes once every 4 seconds	High current load or short circuit. Check the installation.
	The Fork is encrusted with build-up	Clean the forks
Incorrect switching	Dry = on Wet = on	Properly configure the key switch
	Fast switching	Select a longer time delay

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.

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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.

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.

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- Controllers, Calibrators, Simulators & Pumps
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- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments