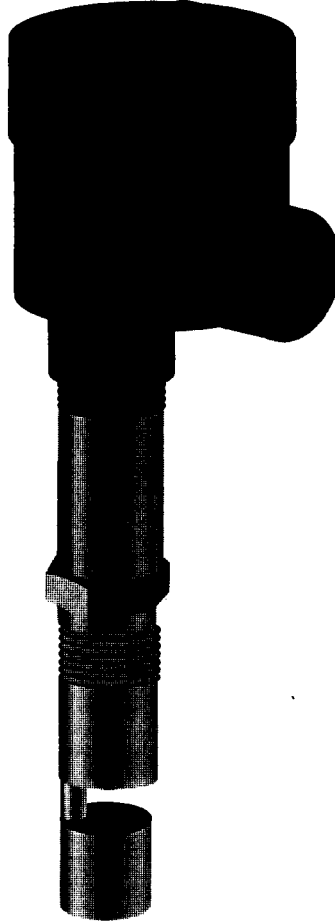


 **LVU-400**

 **High Temperature Ultrasonic
Point Level Switch**



Operator's Manual



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Unpacking Instructions

Remove the Packing List and verify that you have received all equipment, including the following (quantities in parentheses):

LVU-400 High Temperature Ultrasonic Point Level Switch (1)

Operator's Manual (1)

If you have any questions about the shipment, please call the OMEGA Customer Service Department.

When you receive the shipment, inspect the container and equipment for 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 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.



LVU-400 High Temperature Ultrasonic Point Level Switch

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General Description

The LVU-400 Series liquid level detection systems are ideal, low cost ultrasonic liquid point level systems for high temperature applications. They operate a broad spectrum of viscous to light liquids.

Point Level Model Descriptions

Model	Function	Type	Input	Output
LVU-400 series	Standard Point Level for High Temperature	Integral (450°F) Remote (550° & 750°F)	115 V ac/ 230 V ac 24 V dc/ 12 V dc	10 AMP DPDT



General Description

The LVU-400 Series operate using ultrasonic sound wave propagation. Ultrasonic sound waves are greatly attenuated when transmitted through air. Conversely, when a liquid is present, the transmission of the sound waves are greatly enhanced. The electronic control unit, either integral or remote to the sensor, generates electrical signals that are converted to bursts of ultrasonic energy at the sensor. The ultrasonic bursts are transmitted across the liquid sensing gap of the sensor. Upon receipt of a valid signal at the receiver, the solid state electronics generate a "data enable" condition indicating that a liquid is present. This signal energizes a relay and provides an output condition.



3 Installation

General

All units are easy to install. A sensor with an integral electronic control unit or a sensor with a remote control unit can be mounted in any position or orientation desired.

Make sure that all wiring, conduit and electrical fittings conform to local electrical codes for the location selected.

Visual Inspection

Unpack the control unit and sensor assemblies. Visually inspect them for any damage. Advise OMEGA immediately if either assembly is damaged.

Preliminary Operational Check

Before installing the unit, a simple operational checkout should be performed as follows:

NOTE

In a hazardous environment never open the housing cover or connect the power leads without first disconnecting the electrical power at its source.

1. Fill a container with a liquid.
2. Open the control unit housing cover and connect the power to the control unit (see the appropriate wiring diagram for your unit).
3. Apply power from the source.
4. Place the sensor in the liquid. The relay should energize.
5. Remove the sensor from the liquid. The relay will de-energize indicating that the system is functioning properly. If you do not experience the results indicated in steps 4 and 5, contact OMEGA immediately.
6. Disconnect the power to the control unit.
7. Proceed to final installation.



Invasive Contact Models

1. Drill a suitable hole in the vessel or pipe wall and tap for $\frac{3}{4}$ " NPT. In a thin walled vessel or when the material is not suitable for threading, weld or braze a bushing to accept the sensor.
2. Screw the sensor in the threaded section and make sure that there is a good seal. Use a pipe compound or sealing tape compatible with the materials and avoid excessive tightening.
3. Run the power and the control wiring cables to the electronic control unit observing all applicable electrical codes and proper wiring procedures.

Control Unit

Refer to the typical installation diagram and control unit dimensions when installing the control unit. Follow steps 1 and 2 below for remote mounted electronic units. Steps 3 through 7 are common for both the integral electronic units and remote electronic units.

1. Mount the remote control unit on any suitable wall, panel, etc. making sure there is adequate clearance for wiring.
2. Remove the PC board by removing the screws. Drill a suitable size hole in the control unit housing for a conduit fitting (if so required).
3. Remove the cover from housing. To complete wiring, either leave or remove the electronics printed circuit board in the housing on remote units and remove the encapsulate electronics in integral units.

CAUTION

Never remove unit from a vessel with power and/or output control cables connected to the electronic control unit inside the housing. Otherwise, the cable may be damaged.

4. Wire the unit as desired. Refer to the wiring diagram inside the cover.

NOTE

All wiring, conduit and fittings should conform to local electrical codes. Use a drain seal in vertical conduit run to prevent condensation from entering the control unit. OMEGA assumes no responsibility for improperly wired units.

5. Replace the printed circuit board, if removed, or the encapsulated electronics. Make certain that the wires are dressed carefully to prevent pinching between the cover and the housing.
6. Replace the housing cover.

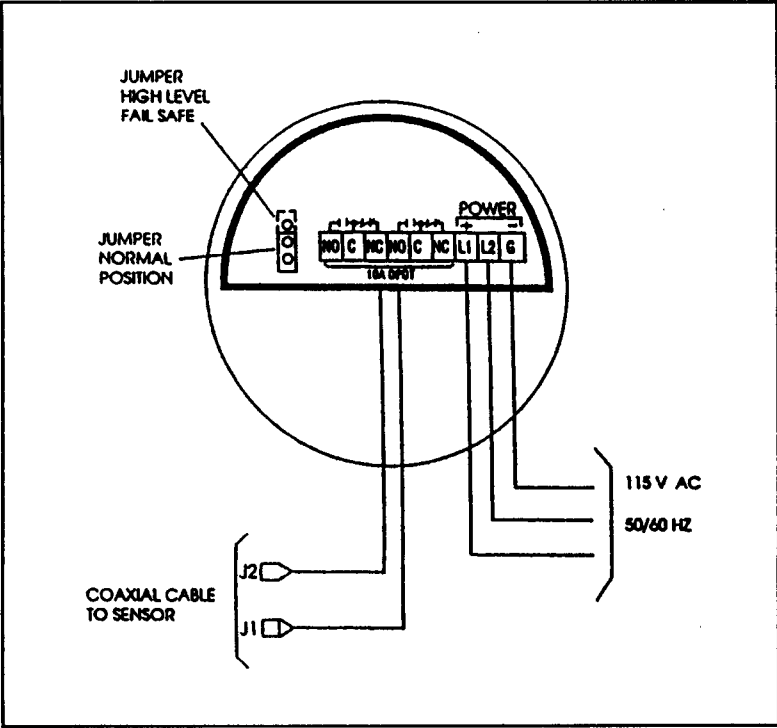


Figure 4-1. Wiring Diagram Model LVU-400 High Temperature Series



Preventive Maintenance

Electronics are constructed with solid state components and are epoxy encapsulated. Periodically check and clean the sensor when used with liquids which cause a coating build up on the sensor. No other maintenance is required.

Cleaning

If the pipe or vessel to which the unit is mounted is to be steam cleaned or cleaned with abrasive detergents, remove the entire unit before cleaning by:

1. Disconnecting the power at the source.
2. Opening the housing cover.
3. Removing the power and control wiring cables.
4. Unthreading the sensor.

To reinstall, follow the installation procedures.

System Malfunction

Should the system malfunction, notify OMEGA immediately.

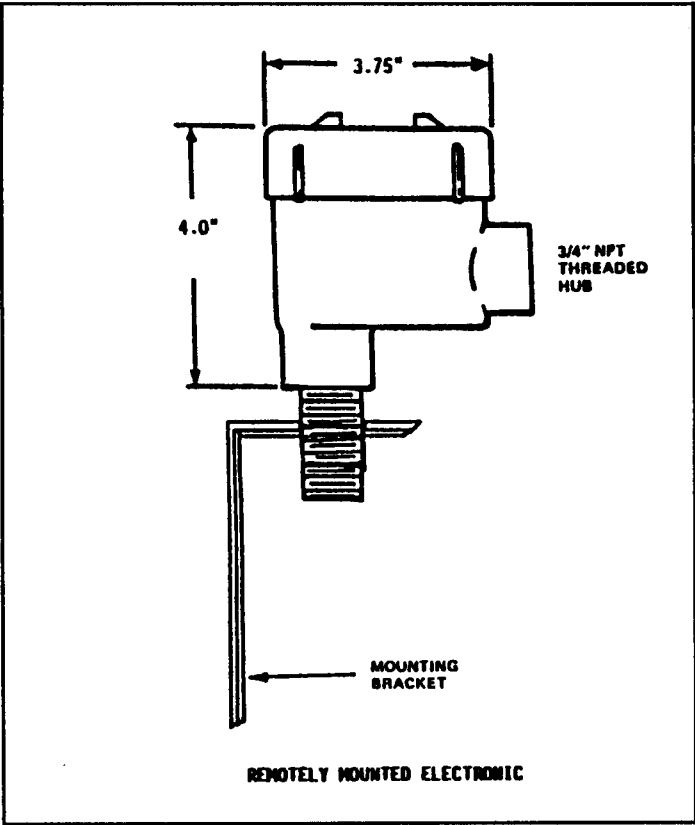


Figure 5-1. Dimensions

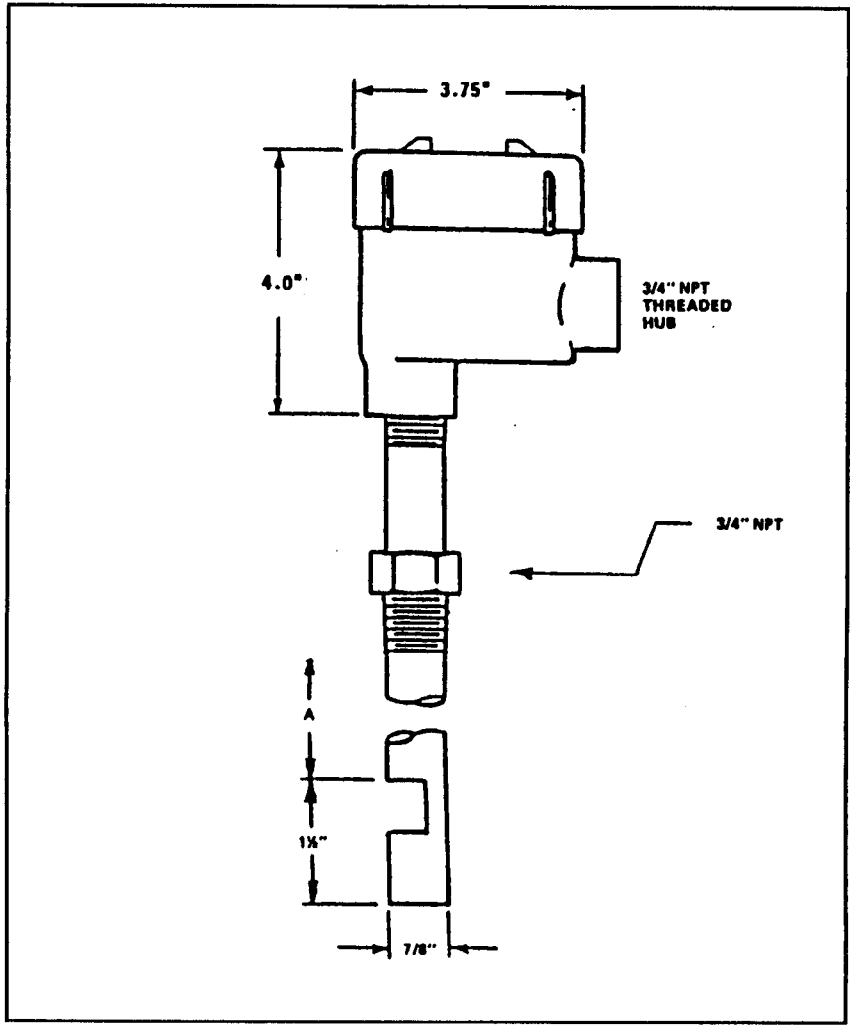


Figure 5-2. High Temperature Sensor Dimensions





WARRANTY

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of **13 months** from date of purchase. OMEGA 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 should malfunction, 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. However, this WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being 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 or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

OMEGA is glad to offer suggestions on the use of its various products. Nevertheless, OMEGA only warrants that the parts manufactured by it will be as specified and free of defects.

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Every precaution for accuracy has been taken in the preparation of this manual; however, OMEGA ENGINEERING, INC. neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages that result from the use of the products in accordance with the information contained in the manual.

SPECIAL CONDITION: Should this equipment be used in or with any nuclear installation or activity, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the equipment in such a manner.

RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING 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.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. 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 OR **CALIBRATION**, consult OMEGA for current repair/calibration charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the COST of the repair/calibration,
2. Model and serial number of 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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