

# Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!

## TEMPERATURE

- ☑ Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- ☑ Wire: Thermocouple, RTD & Thermistor
- ☑ Calibrators & Ice Point References
- ☑ Recorders, Controllers & Process Monitors
- ☑ Infrared Pyrometers

## PRESSURE, STRAIN AND FORCE

- ☑ Transducers & Strain Gauges
- ☑ Load Cells & Pressure Gauges
- ☑ Displacement Transducers
- ☑ Instrumentation & Accessories

## FLOW/LEVEL

- ☑ Rotameters, Gas Mass Flowmeters & Flow Computers
- ☑ Air Velocity Indicators
- ☑ Turbine/Paddlewheel Systems
- ☑ Totalizers & Batch Controllers

## pH/CONDUCTIVITY

- ☑ pH Electrodes, Testers & Accessories
- ☑ Benchtop/Laboratory Meters
- ☑ Controllers, Calibrators, Simulators & Pumps
- ☑ Industrial pH & Conductivity Equipment

## DATA ACQUISITION

- ☑ Data Acquisition & Engineering Software
- ☑ Communications-Based Acquisition Systems
- ☑ Plug-in Cards for Apple, IBM & Compatibles
- ☑ Datalogging Systems
- ☑ Recorders, Printers & Plotters

## HEATERS

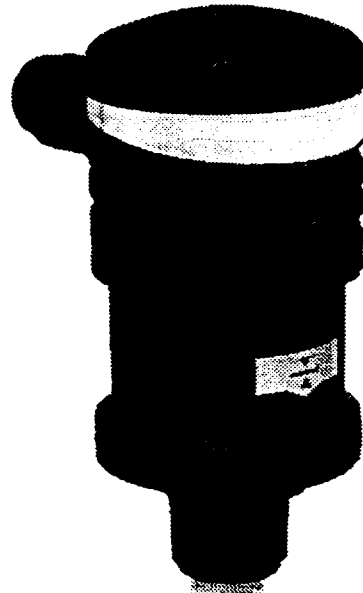
- ☑ Heating Cable
- ☑ Cartridge & Strip Heaters
- ☑ Immersion & Band Heaters
- ☑ Flexible Heaters
- ☑ Laboratory Heaters

## ENVIRONMENTAL MONITORING AND CONTROL

- ☑ Metering & Control Instrumentation
- ☑ Refractometers
- ☑ Pumps & Tubing
- ☑ Air, Soil & Water Monitors
- ☑ Industrial Water & Wastewater Treatment
- ☑ pH, Conductivity & Dissolved Oxygen Instruments

2620/0487

# User's Guide



<http://www.omega.com>  
e-mail: [info@omega.com](mailto:info@omega.com)

## LVCN-80, -81 & -82 Series Level Transmitter

It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct but OMEGA Engineering, Inc. assumes no liability for any errors or omissions. These products are not designed for use in, and should not be used for, patient connected applications.

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Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCTS TO OMEGA, PURCHASER MUST DEPARTMENT (SEE INSTRUCTIONS ON OMEGA'S CUSTOMER SERVICE CARD). THE ASSIGNED AIR NUMBER SHOULD BE PLACED ON THE RETURN PACKAGE AND ON ANY CORRESPONDENCE.

FOR NON-WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:  
1. PO number under which the product was purchased.  
2. Model and serial number of the product.  
3. Repair instructions and/or specific problems relative to the product.

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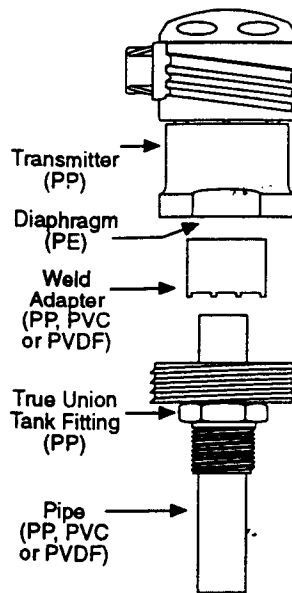
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# SPECIFICATIONS

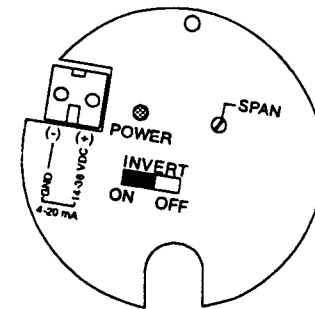
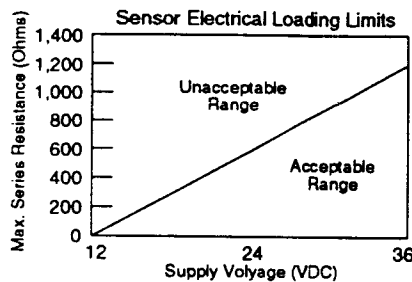
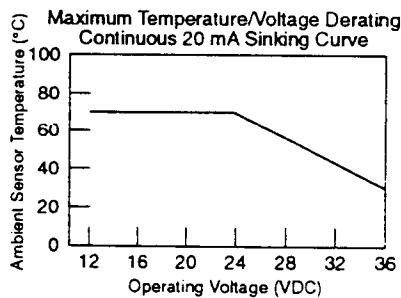
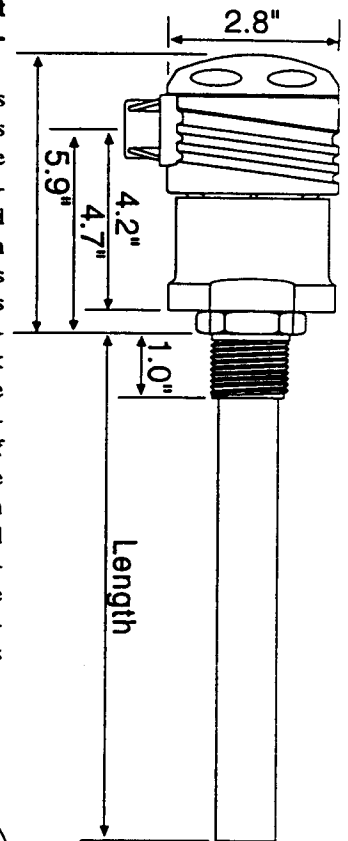
## Step One

Range:	0.3 to 10 feet
Accuracy:	± 1% of span (air)
Resolution:	0.125" (3 mm)
Frequency:	2 kHz (nominal)
Pulse rate:	5 pulses per second
Blocking distance:	2" from base of threads
Supply voltage:	12-36 VDC
Signal output:	Two-wire, 4-20 mA
Signal invert:	4-20 mA or 20-4 mA
Minimum distance:	8"
Maximum distance:	120"
Indication:	LED for power status
Temperature rating:	F: -4° to 140° C: -20° to 60°
Temp. compensation:	Automatic over range
Pressure rating:	Atmospheric
Pipe interface:	PVC: Schedule 80, 1/2" only PP / PVDF: Metric, 20 mm only
Pipe materials:	PVC, PP or PVDF
Enclosure rating:	NEMA 4X / IP65
Enclosure material:	Polypropylene
Diaphragm material:	Polyethylene
Mounting threads:	1" NPT
Conduit connection:	1/2" NPT
Thread material:	PP



## About Contact TDR Technology:

A sound wave is pulsed five times per second from the base of the transducer. The sound wave travels down the pipe and reflects against the process medium below before returning back to the receiver. The electronics measure the time of flight between the sound generation and receipt, and translates this figure into the distance between the transmitter and process medium below.



**⚠ About this Manual:** PLEASE READ THE ENTIRE MANUAL PRIOR TO INSTALLING OR USING THIS PRODUCT. This manual includes information on the LVCN-80 series contact level transmitter from OMEGA. Please refer to the part number located on the sensor label to verify the exact model which you have purchased.

**⚠ User's Responsibility for Safety:** OMEGA manufactures a wide range of liquid level sensors and technologies. While each of these sensors is designed to operate in a wide variety of applications, it is the user's responsibility to select a sensor model that is appropriate for the application, install it properly, perform tests of the installed system, and maintain all components. The failure to do so could result in property damage or serious injury.

**⚠ Proper Installation and Handling:** Because this is an electrically operated device, only properly-trained staff should install and/or repair this product. Use a proper sealant or gasket with all transmitter installations. Never overtighten the transmitter within the fitting, beyond a maximum of 80 inch-pounds torque. Always check for leaks prior to system start-up.

**⚠ Wiring and Electrical:** A supply voltage of 12-36 VDC is used to power the LVCN-80 transmitter. The sensor systems should never exceed a maximum of 36 volts DC. Electrical wiring of the sensor should be performed in accordance with all applicable national, state, and local codes.

**⚠ Material Compatibility:** The LVCN-80 enclosure is made of Polypropylene (PP) with the diaphragm made of Polyethylene (PE). The tube

and weld adapter is made of either Polypropylene (PP), Polyvinylchloride (PVC) Polyvinylidene Fluoride (PVDF). Make sure that the model which you have selected is chemically compatible with the application liquids it will contact.

**⚠ Enclosure:** While the transmitter housing is liquid-resistant when installed properly, it is not designed to be immersed. It should be mounted in such a way that the enclosure and diaphragm do not come into contact with fluid.

**⚠ Flammable, Explosive and Hazardous Applications:** The LVCN-80 transmitter systems should not be used within flammable or explosive applications.

**⚠ Make a Fail-Safe System:** Design a fail-safe system that accommodates the possibility of transmitter or power failure. In critical applications, OMEGA recommends the use of redundant backup systems and alarms in addition to the primary system.

## ⚠ WARNING ⚠

*The LVCN-80 is shipped factory calibrated with 4mA set at the end of pipe and 20mA located 2" below the top of the threads. To reverse setting with 20mA at the end, set Invert to On.*

*Avoid installing the LVCN-80 near a source of vibrations or loud repetitive noise, such as a motor.*

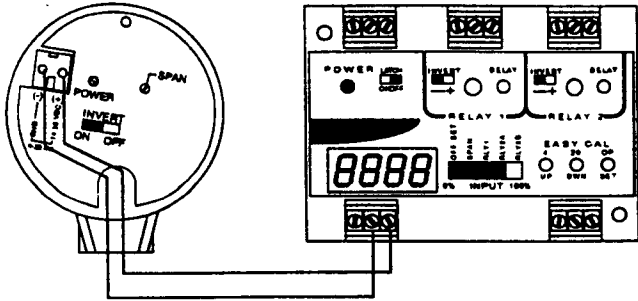
# WIRING

## Step Two

Remove the cap of the LVCN-80 transmitter enclosure. The terminals of the transmitter are visible from the top of the enclosure.

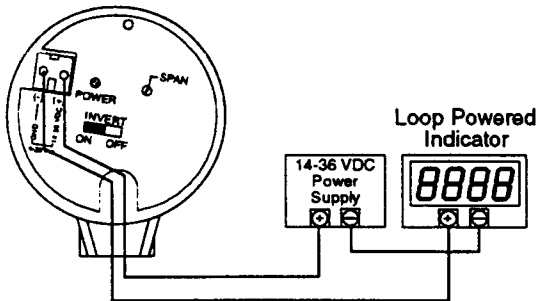
### 1. Wiring to a LVCN-51 Continuous Controller:

Connect the (+) terminal to the positive 18 VDC, 4 - 20 mA terminal on the controller. Connect the (-) terminal to the GND terminal on the continuous controller (See illustration below). Check LVCN-51 instruction manual for setting the LVCN-51 for loop powered operation.



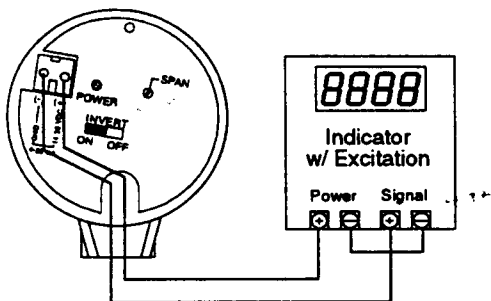
### 2. Wiring to a Two-Wire Loop Indicator:

The LVCN-80 requires a loop indicator that receives a 4-20 mA current input. A 14-36 VDC power supply is required for the system. Connect the (+) terminal of the LVCN-80 transmitter to the positive VDC terminal on the power supply. Connect the (-) terminal on the LVCN-80 to the (+) terminal on the loop indicator. Connect the (-) of the loop indicator to the (-) of the power supply (See illustration below).



### 3. Wiring to an Indicator w/ Excitation:

The LVCN-80 requires a loop indicator that provides a 14-36 VDC excitation and receives a 4-20 mA current input. Connect the (+) terminal of the LVCN-80 transmitter to the positive VDC power terminal on the indicator. Connect the (-) terminal on the LVCN-80 to the (+) signal terminal. Connect the (-) of the signal terminal to the (-) of the power terminal (See illustration below).

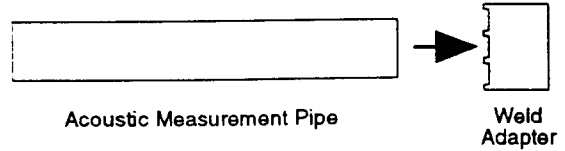


# ASSEMBLY

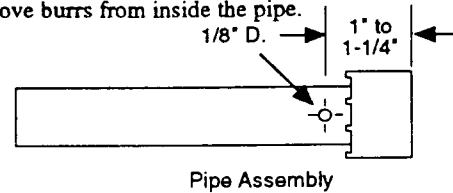
## Step Three

The LVCN-80 arrives from the factory pre-calibrated and pre-assembled. If a new acoustic measurement pipe is required, please follow the instructions below.

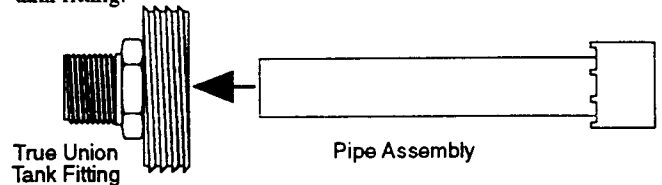
1. Attach and weld acoustic measurement pipe to weld adapter. For the LVCN-81 (PP) or LVCN-82 (PVDF), a Fusion or Thermal Weld is required. For the LVCN-80 (PVC), a solvent weld is required. Both the pipe and weld adapter must be of the same material.



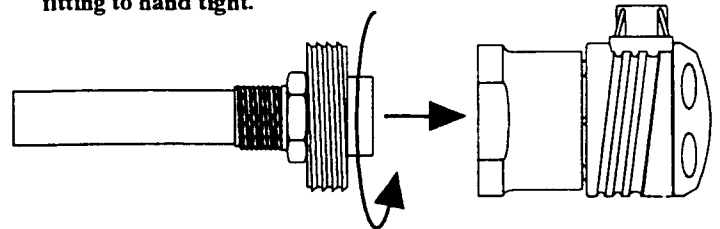
2. Use a 1/8" drill bit to create a single pressure equalization hole in the pipe assembly. The hole needs to be between 1" and 1-1/4" from the end of the pipe assembly and do not drill through the entire assembly. Remove burrs from inside the pipe.



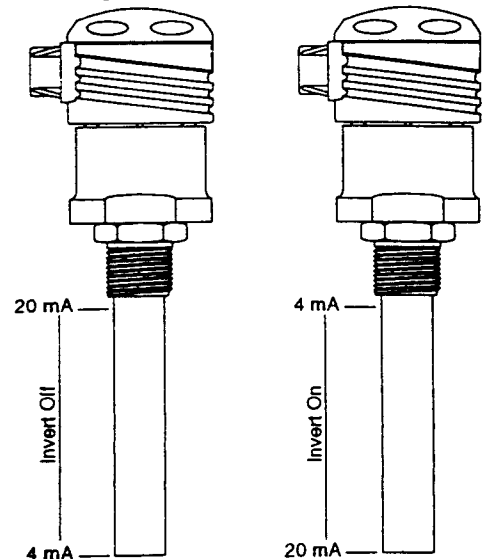
3. Next insert the pipe assembly through the true union tank fitting so that the weld adapter will rest upon the coarse threads on the true union tank fitting.



4. Finally, insert the assembled pieces into the transmitter. Tighten the fitting to hand tight.



### Invert Switch Setting:

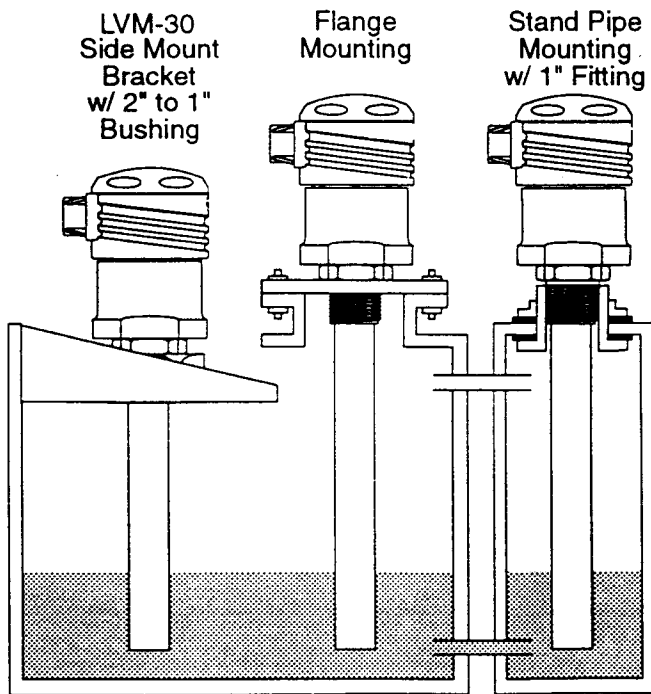


## INSTALLATION

### Step Four

The LVCN-80 transmitter may be installed through the tank top, through a stand pipe top or to the side of a tank. Tank top and stand pipe installations require a 1" NPT fitting or blind flange. Side wall installations require a side mount bracket, model LVM-30 and a 2" to 1" NPT reducer bushing or equivalent.

1. Install the appropriate 1" fitting in the top wall of the tank or stand pipe. Prior to installation, make sure that the fitting has been installed properly and checked for leaks. Use a proper sealant at the time of installation to ensure a liquid-tight seal. Secondly, make sure that the fitting's threads are not damaged or worn.
2. Unscrew the True Union Tank Fitting from the transmitter. Install True Union Tank Fitting along with the Pipe Assembly into the fitting. Apply the appropriate amount of sealant to the tapered threads which will be screwed into the fitting.
3. Insert the Transmitter on the True Union Tank Fitting and tighten to hand tight.
4. Always check for leaks prior to system start-up. To ensure proper installation, a complete leak test and simulation of actual process conditions should be performed.



### ⚠ WARNING ⚠

**Avoid installing the LVCN-80 near a source of vibrations or loud repetitive noise, such as a motor.**

**Do not insert or remove the LVCN-80 quickly from its fitting. Doing so may increase the back pressure within the pipe and cause the diaphragm to rupture.**

## CALIBRATION

### Step Five

The LVCN-80 is factory calibrated over the entire range of the pipe. If a new pipe is installed or the pipe length has been reduced, please use the following instructions.

1. Connect a multimeter in series to read current. The top of the LVCN-80 current signal is located 2" from the bottom of the threads. The calibration procedure for the transmitter requires that the bottom of the transmitter's current signal be set using the Span potentiometer.
2. Set Invert switch to OFF.
3. Set level to lowest point. A cup of liquid or a piece of tape over the end of the pipe may be used as a substitution for a low level reading.
4. Turn Span until current reads 4mA. Turning pot counterclockwise will lower the current and turning the pot clockwise will increase the current. Always increase current to above 5mA and slowly return to 4mA for best results.
5. Turn Invert to ON if 20mA signal at end of LVCN-80 is required. Adjust pot until 20mA is read. Always decrease current to below 19mA and slowly increase to 20mA for best results.
6. Remove cup of water or tape if required.

