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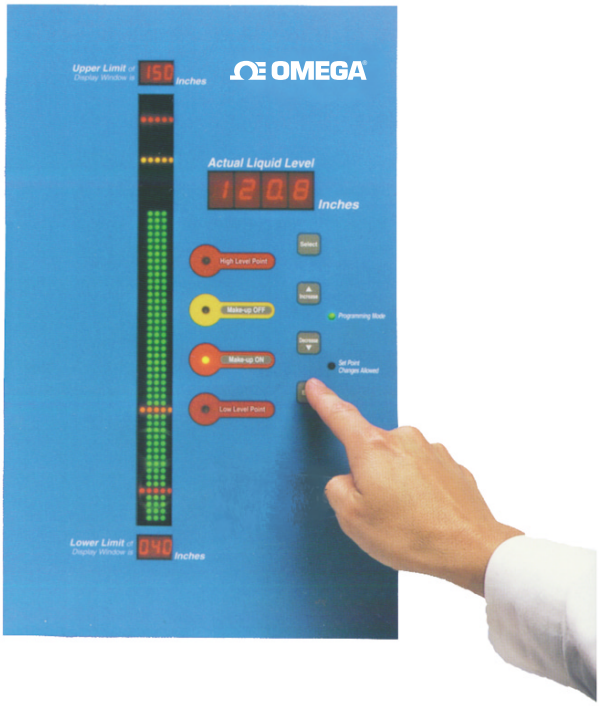
LVCN-302

Set-Up Manual for Sump Model

User's Guide

1 YEAR WARRANTY

MADE IN USA



Specifications:

Sensor Input: Isolated input accepts any type of 4-20 mA process signal. Loop power available up to 24VDC for 2 wire device

Input Power: 120VAC/900 mA; 24VDC unregulated/450 mA

Security Levels: 3 levels of access protect data changes with DIP switch on back

Control Circuits: Four Form C relays, 10.0 amp 125VAC (noninductive)

Switching Mode: Selectable, NO or NC states

Output & Input Connections: Terminal Connections are plug in Phoenix type

Programmed Memory: EEPROM - Loss of power will not affect existing programmed data

Mounting Format: Flush mounted anodized steel enclosure with eight (8) 10/32 studs and sealing gasket; NEMA 4 graphic front panel; steel back pan housing.

Overall Dimensions: Tall: 16.75" (425 mm), Wide: 10.25" (250mm), Deep 2.25" (57mm),

Weight: 4.5 kg (10 lbs.)

LVCN-302 is a solid-state controller with a variety of unique control and display features. It's designed to simply present the crucial information, at a glance. It's built to perform in all types of harsh industrial environments as well as control alarms, pumps, solenoids, etc.

Topics covered in this manual

Displaying Your Tank's Cross-Section
Security Levels / Select and Enter Data
Initial Set-Up / Eight Simple Steps
Sensor Connections / Schematics
Sending a 4-20 mA Signal to Other Devices

M3760/1201

LVCN-302 Features and Overview

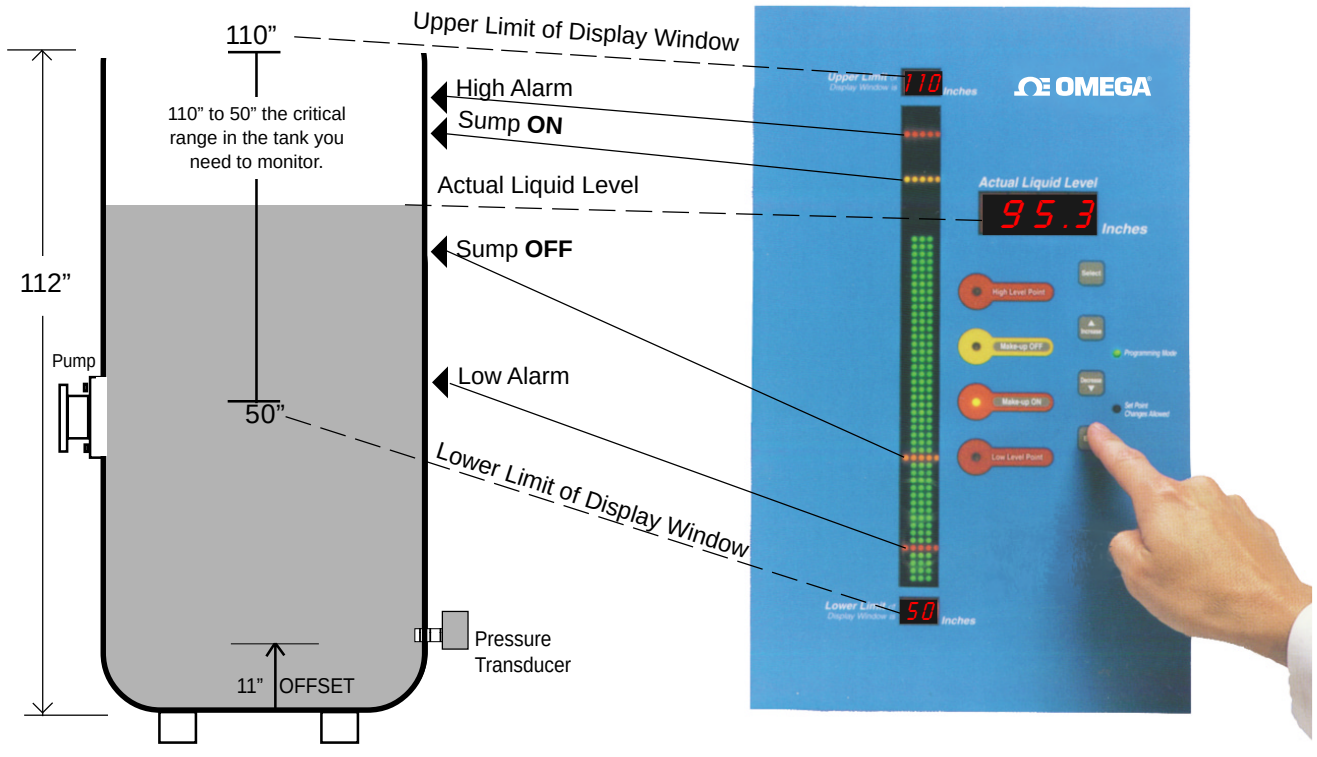
Let's say your tank is 112 inches deep, and the transducer range of the sensor you've chosen is 0-5 psi of water. 5 psi equals 138 inches H_2O The pressure transducer is located 11 inches off the bottom of the tank. With 51 inches of water in the tank you are cavitating the pump, and at 108 inches of water you are facing probable flooding.

The goal is to maintain the liquid level between 90 and 65 inches using LVCN-302. The following steps should be taken in order to display a 50 to 110 inch "window" of the tank, while maintaining a liquid level range of 90 to 65 inches. High and low alarm output circuits will be activated at 105 and 55 inches.

The ***Initial Set-up in Eight Easy Steps*** (see page 4) describes in detail how to program LVCN-302 for your specific application. To accomplish the above installation, you would enter the following:

Transducer Range	138.0 inches H_2O
Transducer Height	11.0
Upper Limit of Window	110.0
Lower Limit of Window	50.0
High Alarm/Fault Level	105.0
Sump ON Level	90.0
Sump OFF Level	65.0
Low Alarm/Fault Level	55.0

Tank Cross-Section Display with LVCN-302

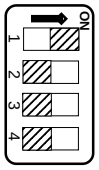


Security Levels / Selecting and Accessing Data

Operator access to data modifications has three modes of security: View Only, Set Point Changes Allowed and Programming. Each mode is selected from the back of the unit with a DIP switch setting.

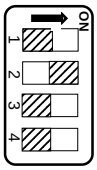
Programming Mode

This mode, #1 ON, allows you to change all eight programmable settings. It is used for initial set-up and installation.



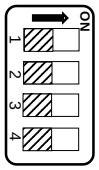
Set Point Changes Allowed

This mode, #2 ON, allows you to change all four set points: the High & Low Alarms, Make-up ON & Make-up OFF.



View Only Mode

This mode, ALL OFF, prevents any changes from being made. However, all the information, except the transducer range and transducer offset, is available by pressing SELECT.



Output & Input Terminal Connections

(All terminal connections are plug in Phoenix type)

Output Terminals

Output Terminals	
12. High Level N.C.	10.0 amp
11. High Level **Com**	
10. High Level N.O.	
9. **Sump** ON N.C.	10.0 amp
8. **Sump** ON **Com**	
7. **Sump** ON N.O.	
6. Low Level N.C.	10.0 amp
5. Low Level **Com**	
4. Low Level N.O.	
3. **Sump** ON N.C.	10.0 amp
2. **Sump** ON **Com**	
1. **Sump** ON N.O.	

#1-#3 Sump range operates at same level as #7-#9. Condiser it a spare Form C sump relay.

120 VAC Power Supply

Power Supply
3. 120 VAC - Com.
2. Ground
1. 120 VAC - Hot

24 Volt DC Power Supply (Unregulated)

Power Supply
3. 24 VDC - **Neg (-)**
2. Ground
1. 24 VDC - **Pos (+)**

Sensor Input

4. 4-20 mA (-)

3. 4-20 mA (+)

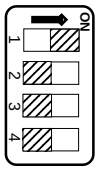
2. Ground

1. + 24 VDC Output

NOTE: Terminal #1 provides power for loop powered sensors.

Initial Set-Up in Eight Easy Steps

PROGRAMMING MODE



The initial set-up requires you to change the DIP switch to Programming Mode, #1 ON. After the initial set-up, select the DIP switch settings for View Mode or Set Point Changes Allowed. (More detail on Page 3.) Holding down the INCREASE or DECREASE arrow for 3 seconds increases the scrolling speed of the numbers on the display.

1. - Setting the Transducer Range Press the **SELECT** button on the graphic face - **RANG** will appear in the display. A few seconds later, the display will convert to R _ _ _. The **Transducer Range** of the input device needs to be entered, using the INCREASE or DECREASE arrow. The Transducer Range is determined by the manufacturer of the device. It is printed on the device, typically in either psi, inches of water or inches mercury. It is not the height of the tank you are controlling.

For example: if you want to display a 120" tank of water in inches and have a transducer that has a manufacturer's range of 0-5 psi, you would use the following formula:

$$\frac{(5.0\ \textit{psi water})\ (27.7\ \textit{inches})}{1.0\ \textit{specific gravity of water}} = 138.5 \text{ inches}$$

(Note: 1psi water = 27.7")

2. - Setting Offset / Transducer Height Press the **SELECT** button again and **OFST** will appear in the display. A few seconds later, the display will convert to L _ _ _. Enter the **Transducer Height** by pressing the INCREASE or DECREASE arrow. Transducer Height is the location of the transducer from the bottom of the tank, or if you are using a bubbler it is to the bottom of the bubbler stand pipe.

3. - Selecting the Upper Cross-Section Press the **SELECT** button again - the **Upper Limit** small numeric window display will begin to flash and the main display will convert to P _ _ _. The **Upper Limit** display level needs to be entered, using the INCREASE or DECREASE arrow. This is the "window" or cross-section of the tank you want to see displayed on the vertical bar display. It is **not** a control or alarm level.

This is one of the unique features of LVCN-302. You can select to display any portion of the height of your tank. *For example:* Suppose you have a 120" tall tank that you want to control. Filters and pumps occupy the bottom 50 inches, and you don't want the level to ever go above 105". At the same time, you want to display the crucial operating range of your tank, including make-up levels, high/low alarms and the actual level. To select the highest resolution of this crucial range on the bar display, you would enter the **Upper Limit** P _ _ _ at 110" and the **Lower Limit** P _ _ _ at 50". You can select to display any cross-section you require for the installation.

4. - Selecting the Lower Cross-Section Press the **SELECT** button again - the **Lower Limit** small numeric window display will begin to flash and the main display will convert to P _ _ _. The **Lower Limit** display level needs to be entered, using the INCREASE or DECREASE arrow. This is the window or cross-section of the tank you want to see on the bar graph display. It is **not** a control or alarm level. (See the above *For example*.)

NOTE: The previous four steps are protected from data changes when you choose either one of the other security modes. The next four steps are accessible to changes in either the Programming Mode (at the initial set-up) or with Set Point Changes Allowed mode selected.

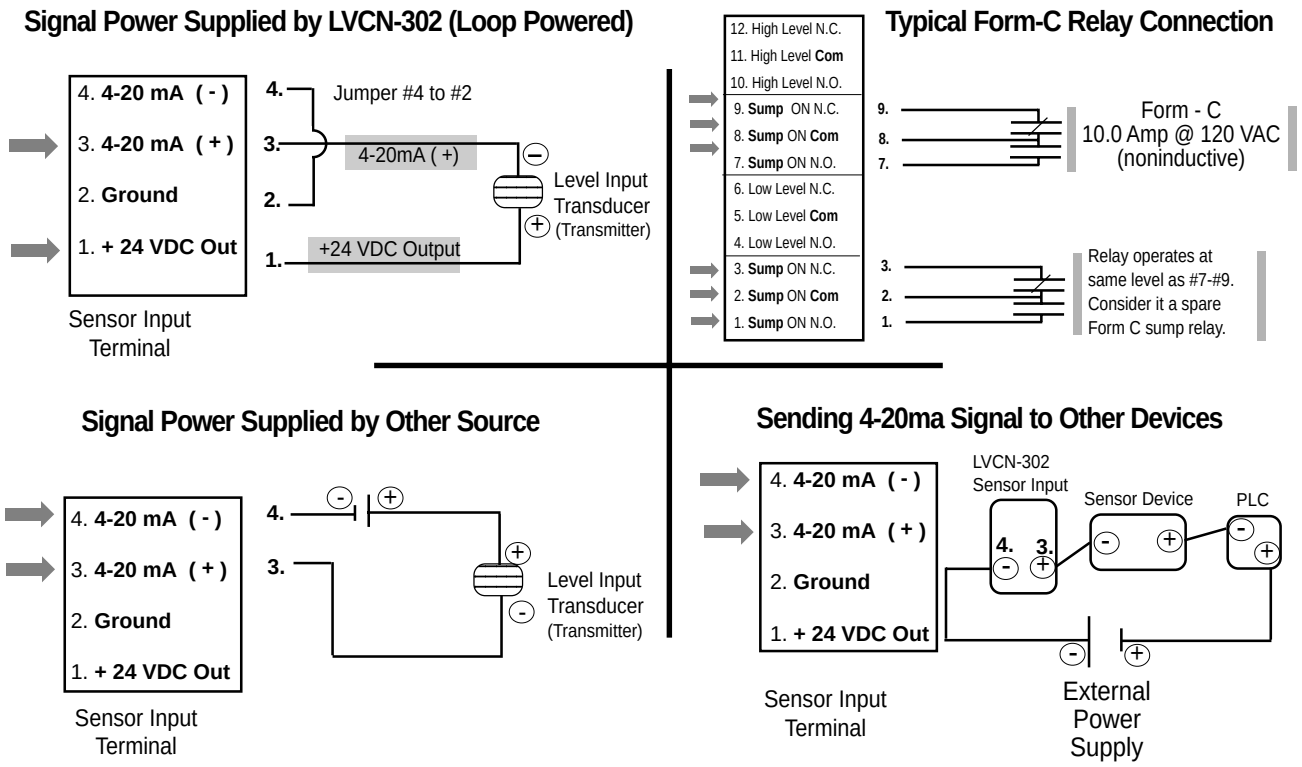
5. - Entering the High Alarm Level Press the **SELECT** button again - the **High Level Alarm Point** indicator LED on the graphic face and the top RED line in the bar graph display will flash. **P _ _ _** appears in the display. Enter the level, using the INCREASE or DECREASE arrow to set the desired level. When this point or level is reached, it will indicate a High Level Alarm has been reached and activate the control circuit/device you have designed into your system.

6. - Entering the Sump ON Level Press the **SELECT** button again - the yellow **Sump ON** indicator LED will flash along with the YELLOW line in the bar graph. **P _ _ _** appears in the display. Enter the level, using the INCREASE or DECREASE arrow to set the desired Sump ON level. When this point or level is reached, LVCN-302 will deactivate the differential output relay to the control circuit/ device you have designed into your system.

7. - Entering the Sump OFF Level Press the **SELECT** button again - the **Sump OFF** indicator LED and the ORANGE line in the bar graph will flash. **P _ _ _** appears in the display. Enter the Sump OFF level, using the INCREASE or DECREASE arrows. When this point or level is reached, LVCN-302 will activate the differential output(s) to the control circuit/device you have designed into your system.

8. - Entering the Low Alarm Level Press the **SELECT** button again - the **Low Level Alarm Point** indicator LED on the graphic face and the top RED line in the bar graph display will flash. **P _ _ _** appears in the display. Enter the Low Alarm Level, using the INCREASE or DECREASE arrow. When this point or level is reached, it will indicate a Low Level Alarm has been reached and activate the control circuit/device you have designed into your system.

Sensor Input Connections / Schematics



Other Helpful Features of LVCN-302

Interrupted 4-20 mA Signal from Sensor

Whenever the 4-20 mA signal from the sensor device is lost because of an open wire or device malfunction, an **ERR3** message is displayed in the Actual Liquid Level window. Additionally, the entire bar display will flash red and green.

Over &/or Under 4-20 mA signal received

When the input sensor is sending a 4.0 mA signal, the Actual Liquid Level display will show a V character in the first digit of the display.

Actual Liquid Level

Process Signal Input is 4.0 mA, but not an open wire.

See above for open wire

Actual Liquid Level

Process Signal Input is 20.0 mA

Software Version Numbers

The version number of your LVCN-302 unit is shown in the Actual Liquid Level display window when you power up the unit. If your unit has version 2.8, you will see in the window **LV 2.8**

Programmed data **cannot** be lost

All the data and logic are written to a permanent EEPROM, which will retain your data in the event the power supply is disconnected. There is **no battery on the board to maintain the data in the EEPROM.**

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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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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:
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