User's Guide

LVR300 Series

Continuous Level Switch System

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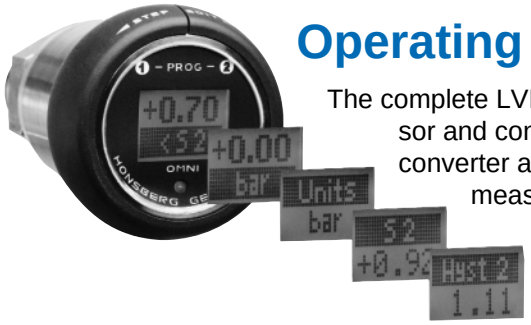
LVR300 Series Sensor Overview



Operating Principle

The complete LVR300 Series Sensor is designed to be a self-contained continuous level sensor and control, requiring only a power source. A 16-bit microcontroller with a 14-bit A/D converter and a 12-bit D/A converter provides the necessary processing speed and measurement accuracy. The signal is displayed with units using a back-lit LCD graphical display and converted to a 4-20 mA signal. Two switch points with either a positive or negative output can be programmed over the complete range.

The switching point hysteresis can be set separately in value and direction (minimum/maximum switching value). Upward and downward crossings of switching points and error messages are shown in the display with a flashing red LED that is easily visible from a distance.

Other parameters can be changed using codes, including: signal filter; selectable unit (inch, cm) includes automatic conversion of the values; selectable 0-20 mA or 4-20 mA output; value assignment of 4-20 mA (setting of zero point and span). The complete housing can be rotated around the mechanical connection so that the correct reading position can be set after mounting (installation).

This LVR300 Series is very easy to use, as dialog messages are displayed for the user. It can even be set when wearing protective gloves, if necessary.

Programming Overview

The LVR300 Series' programming ring can be rotated from the Neutral center position to Position 1 and Position 2. The following actions are possible:

A – Display of parameters with Position 1 (simultaneous display of the set parameters) – Turn the programming ring left to Position 1 to begin cycling through these programming parameters: Switching points S1 and S2, Hysteresis direction of S1 and S2, Hysteresis Hyst 1 and Hyst 2, Code (allows editing of additional parameters), Filter, Units, Output, 4 mA Value and 20 mA value. See following pages for detailed programming instructions.

B – Editing with Position 2

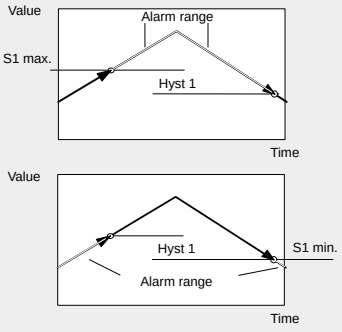
Turn the programming ring to the right to Position 2 and a flashing cursor appears showing the position to be changed. With repeated turning to Position 2, the values are increased. By turning to Position 1, you obtain the next position. Each position can be edited in this way. **If there is no action within 5 seconds, the device returns to the normal display section without the change being accepted, and you will have to cycle through the program again.**

C – Saving the change with Position 1

Turning one time toward Position 1 after quitting the last value signifies acceptance of the change.

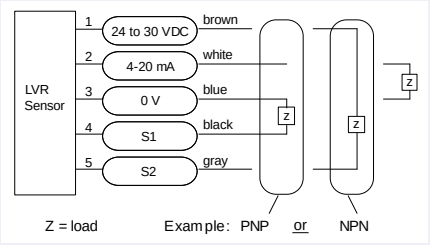
Programming Ring turns from Position 1 to Position 2

Programming protection:
The programming ring can be pulled off, inverted and replaced. This will prevent further programming resulting from turning the ring in either direction.



Example of hysteresis setting:
Examples with S1 as maximum switching point and as minimum switching point:

Terminal Assignment



The switch points are automatically changing to positive or negative, depending on your interface.

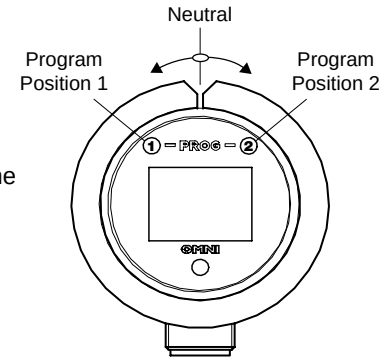
Mating Connector
M12 x 1, 5-position female, shielded, straight *or*
M12 x 1, 5-position female, shielded, right angle

Sources: Hirschmann, Binder, rde Connectors & Cables or comparable connector

LVR300 Series Programming Positions & Operation

On power-up, the company logo is displayed, followed by the preset level/unit measurement. Changing the level (by float movement) will be reflected in the display. If the level is at either of the preset switch levels S1 or S2 (the upper and lower levels), the display will also be alternating between the **S1** (or **S2**) status indication with the level reading. The **Switch Active** status is also indicated by a flashing LED.

By rotating the program ring to Position 1 (P1, toward the left) and then back to Neutral, the program steps to the S1 setting. The level for activation of the S1 switch is indicated, and may be edited by turning the program ring to the P2 position (see below). This will highlight the tenths digit. The digit value is advancing by alternating the program ring from center to the right P2 position. Turning the ring to the P1 position accepts that value and moves to the next digit. Turning the ring to Neutral and then back to P1 will cycle through all of the digits and then accept the values.



PROGRAMMING POSITIONS

The P1 to Neutral movement steps the program through positions in the following sequence:

LOGO — Logo display, only shown on initial power-up.

###.# / Inches (cm) OR **###.# / < S1** — Current float level. At right, the switch active status is indicated and alternates with the regular measurement display, and the LED is flashing.

S1 / ###.# — Switch point 1 value, sets level for activation.

S1 / Min. (Max.) — Switch point 1 is active if the level is below (or below) S1.

Hyst 1 / ##.# — Hysteresis threshold added to switch point 1 for switch = active.

S2 / ###.# — Switch point 2 value, sets level for activation.

S2 / Max. (Min.) — Switch point 2 is active if the level is above (or below) S2.

Hyst 2 / ##.# — Hysteresis threshold added to switch point 2 for switch = active.

Code / 000 — To access other program parameters, rotate ring to P2 and change 000 to 111.

###.# / Inches (cm) — Returns to regular display of current float level.

PROTECTING YOUR PROGRAMMING PARAMETERS

1. Pull off the ring. Keep it as a personal key.
2. Use ring in reverse position on the sensor (PROG.LOCK position).

MODIFYING OPERATING PARAMETERS

From any of the Programming Position steps noted at left, follow these steps to modify the operating parameter:

1 Turn the programming ring to the right to Position 2, and then back to Neutral, to bring up the editing cursor in the first decimal place.

2 Turning the ring to the right and back to Neutral increases the current decimal place to the next highest value.

3 Turning the ring to the left and back to Neutral moves the cursor on to the next decimal position. Repeat step 2 to edit the current position.

4 To confirm the new value, continue to turn the ring to the left and back to neutral until you cycle through all of the decimal places and the next parameter shows on the display.

ENTERING ADDITIONAL PROGRAM PARAMETERS

After reaching the Code step, enter 111 by turning the ring P1 to Neutral, and you can access these additional parameters:

1 **Filter / ##.#** — Time for the measurement to respond (seconds)

2 **Units / Inch (cm)** — Switch between inches and cm; Switch points are converted automatically

3 **Output / 4-20 mA** — Switchable to 0-20 mA

4 **4 mA / ###.#** — Set the 4 mA level (may be higher than the min. level)

5 **20 mA / ###.#** — Set the 20 mA level

6 **###.# / Inches (cm)** — Returns to regular display mode

Enter Code 989 to return to Factory Default Settings.

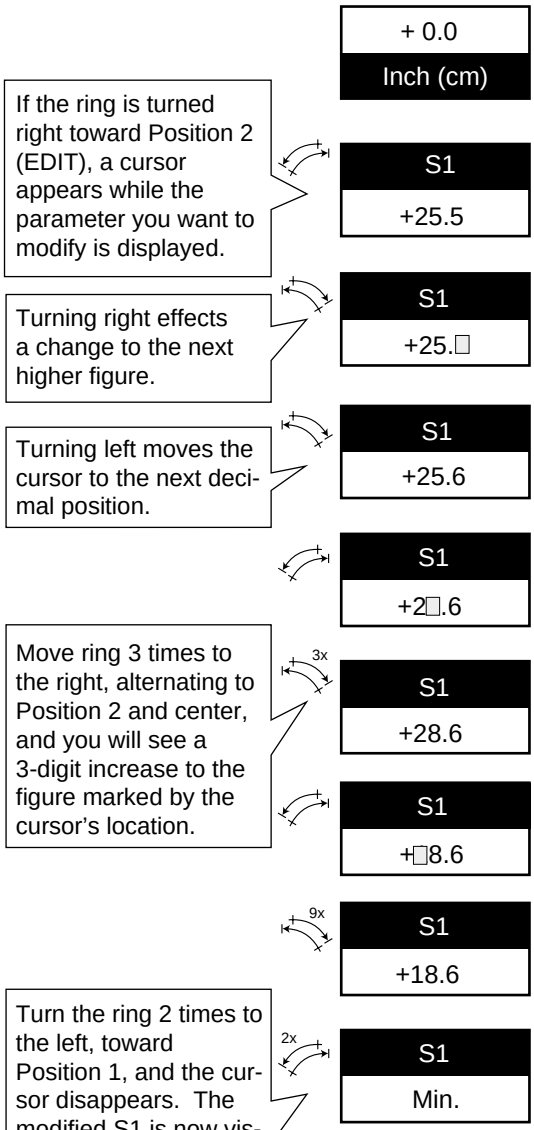
Step-by-step program examples are illustrated on the following pages.

Note: During the programming process, if there is no new action taken within 30 seconds, the sensor will return to "measurement display" without saving your changes. You will have to go through the entire program a second time to re-program the unit.

LVR300 Series Quick Reference – Programming Steps

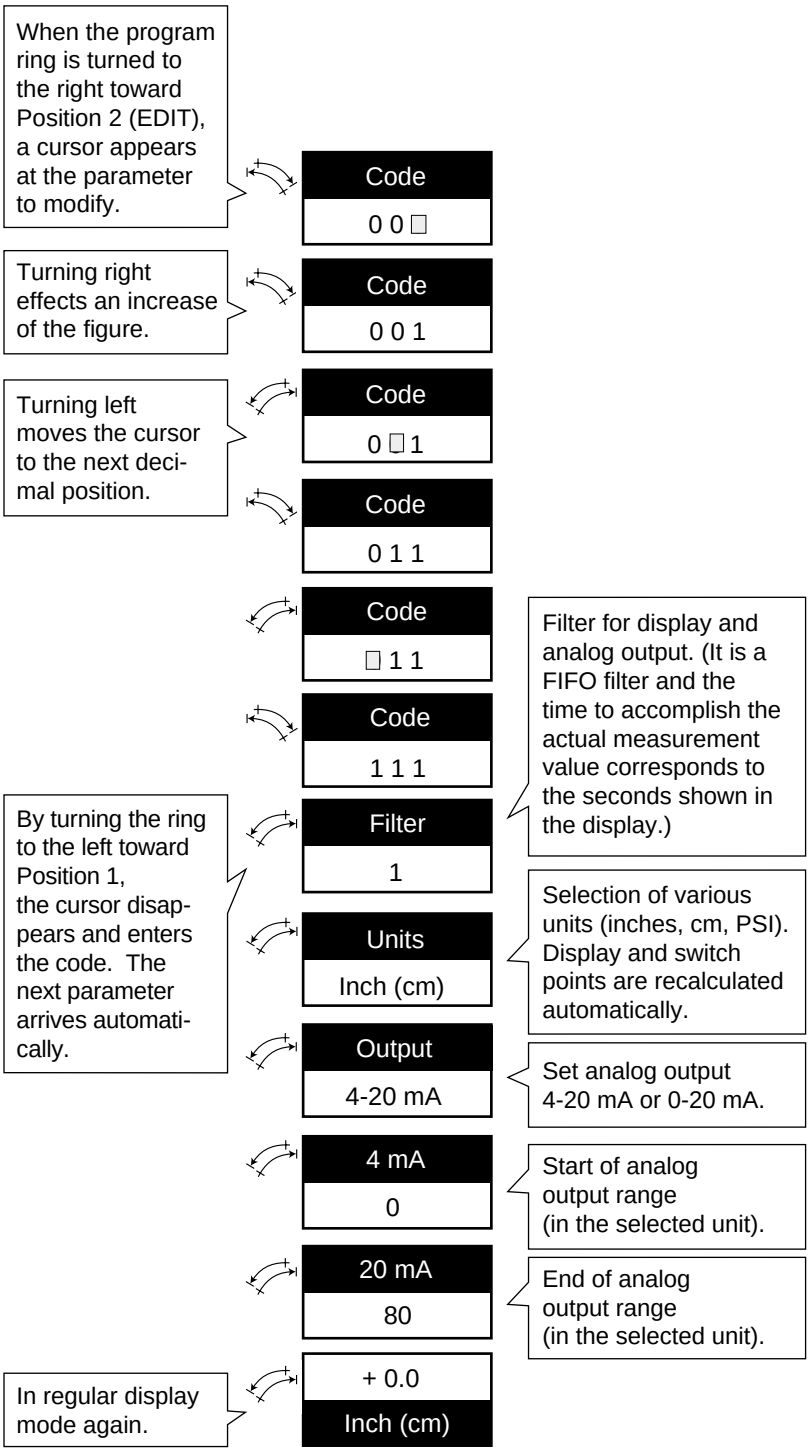
HOW TO MODIFY THE SENSOR OPERATING PARAMETERS

Example: S1 = +18.6 Inches (or cm)



NOTE: If you remain idle in the programming stage for 30 seconds, the display indication will return to "measurement display" without saving your new settings. You will have to cycle through the program again to make your changes.

HOW TO ENTER ADDITIONAL PARAMETERS & INFORMATION



TO RETURN TO THE FACTORY DEFAULT SETTING:
Set the code to 989.
All individual parameters are now overwritten.

LVR300 Continuous Level Sensor Installation Guide

General Information

1. Continuous Level Sensors should be installed rigidly so the float is free to move as the liquid level changes.
2. Continuous Level Sensors should be mounted in a tank area free of severe turbulence or protected from such turbulence by appropriate and adequate slosh shields.
3. Continuous Level Sensors stems should be vertical for best results, but satisfactory operation is possible in most liquids with the stem at up to a 30º angle from vertical.
4. Care should be taken that Continuous Level Sensors are always operated within electrical ratings.

Cautions

1. The pressure, temperature and electrical limitations shown for the specified level sensor must not be exceeded.
2. The pressures and temperatures must take into consideration possible surges in the temperature and pressure of the system.
3. The liquids used must be compatible with the materials of construction. Specifications of materials will be given upon request.
4. Life expectancy of the sensor varies with applications.
5. Ambient temperature changes can affect sensor set points, since specific gravities of liquids vary with temperature. Consult factory for assistance.
6. Level sensors have been designed to be shock and vibration resistant. For maximum life, both should be minimized. Consult factory for assistance.
7. Excessive contaminants in fluid may inhibit float operation and occasional wipe down may be necessary.
8. Physical damage to product may render product unserviceable.
9. Installation in a vessel made from magnetic materials may affect operation.

MADE IN USA

WARRANTY/DISCLAIMER

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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 in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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

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2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

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2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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