

# Fisher® L2 Liquid Level Controller

The rugged Fisher L2 liquid level controller uses a displacer type sensor to detect liquid level or the interface of two liquids of different specific gravities. This controller is ideal for controlling level on gas separators and scrubbers. The reliability of the L2 design makes it well suited for liquid level applications in natural gas production, compression, and processing. The device delivers a pneumatic output signal to a control/dump valve. The sensor uses a threaded 2 NPT or an NPS 2 CL150 through 1500 slip-on flange connection to the vessel.

## Features

- **More Reliable Control**—Two-stage proportional relay with integral action provides more dependable liquid level control.
- **Snap-Acting or Throttling Control**—One standard controller available as either throttling or snap-acting.
- **Vibration Resistant Sensor Dynamics**—O-ring friction and process pressure sensitivity are minimal. Performance stays constant with process pressure changes and controller remains vibration resistant.
- **NACE Service Ready**—Standard construction uses materials that comply with the requirements of NACE MR0175-2002.
- **Field-Configurable Vertical or Horizontal Displacer**—Displacer may be adjusted in the field for vertical or horizontal operation without additional parts.
- **Field-Reversible Output**—The controller can be adjusted in the field for direct or reverse action without additional parts. The controller also has adjustable gain sensitivity.
- **CL1500 Pressure Rating**—Sensor assembly is designed and specified for ASME B16.34 CL1500 service when using a Polyvinylchloride (PVC) displacer. For PED (97/23/EC) maximum pressure is limited to 200 bar (2900 psig).
- **Vent-Away Case**—The ability to pipe away exhaust permits using natural gas as the operating medium.
- **Easy Maintenance**—Both the controller and the sensor can be easily disassembled to inspect the process seals and for maintenance.



## Specifications

### Available Configurations

**Controllers:** Snap-acting or throttling  
**Sensor:** Displacer-type liquid level sensor for mounting to side of tank. Displacer travel is transmitted to controller by pivotal movement of displacer rod

### Input Signal

**Type:** Liquid level or liquid-to-liquid interface

Level Change Required for Full Change in Output Signal in a 1.0 Specific Gravity Liquid, with 1.4 bar (20 psig) Supply Pressure, Direct Action, and Standard 1-7/8 X 12-Inch (48 x 305 mm) Vertical Displacer with Standard Lever Arm Length:

Control Mode	Minimum Span Level Change, mm (Inches) <sup>(1)</sup>	Maximum Span Level Change, mm (Inches) <sup>(1)</sup>
Throttling	102 (4)	305 (12)
On-off	127 (5)	305 (12)
Snap-acting	13 (0.5)	20 (0.8)

### Minimum Specific Gravity<sup>(2)</sup>

**Throttling Controller:** Minimum specific gravity, or specific gravity differential for interface applications, is 0.1<sup>(3)</sup>

**Snap-Acting Controller:** Minimum specific gravity, or specific gravity differential for interface applications, is 0.1

### Output Signal

Pneumatic  on-off or  proportional pressure signal

#### Ranges:

**Throttling:**  0.2 to 1.0 bar (3 to 15 psig) or  0.4 to 2.0 bar (6 to 30 psig)

**On-Off:** 0 (off) or full supply pressure (on)

**Action:** Field-reversible between direct (increasing level increases output signal) and reverse (increasing level decreases output signal)

### Supply Pressure Requirements

**Throttling Controller:**

**Throttling:** 1.4 bar (20 psig) for 0.2 to 1.0 bar (3 to 15 psig) output signal and 2.4 bar (35 psig) for 0.4 to 2.0 bar (6 to 30 psig) output signal

**On-Off:** Any desired pressure between 1.4 and 3.4 bar (20 and 50 psig)

**Snap-Acting Controller:** Any desired pressure between 1.4 and 5.2 bar (20 and 50 psig) direct, and 1.4 and 2.4 bar (20 and 35 psig) reverse

Do not use supply pressure below 1.4 bar (20 psig)

### Supply Pressure Medium

Air or natural gas<sup>(4)</sup>

### Steady-State Air Consumption<sup>(5)</sup>

**Throttling Controller:** ≤0.03 normal m<sup>3</sup>/hr (1.0 scfh) at 1.4 bar (20 psig) supply pressure

**Snap-Acting Controller:** ≤0.03 normal m<sup>3</sup>/hr (1.0 scfh) at 1.4 bar (20 psig) supply pressure or ≤0.04 normal m<sup>3</sup>/hr (1.5 scfh) at 2.4 bar (35 psig) supply pressure in tripped condition; air consumption increases during trip

### Sensor to Vessel Connection

2 NPT threaded or  NPS 2 CL150 through 1500 slip-on flange connection<sup>(6)</sup>

### Controller Connections

**Supply:** 1/4 NPT internal located on the bottom of the case

**Output:** 1/4 NPT internal located on the top of the case

**Case Vent:** 1/4 NPT internal with vent screen assembly located on the back of the case

### Standard Displacer Size

48 x 305 mm, 541 cm<sup>3</sup> (1-7/8 x 12 inches, 33 in<sup>3</sup>)

### Maximum Displacer Insertion Length<sup>(7)</sup>

Standard lever arm length plus one 6-inch extension, horizontal or vertical

### Displacer Material and Maximum Sensor Working Pressure<sup>(8)</sup>

**PVC Displacer:** Consistent with CL1500 pressure temperature ratings per ASME B16.34 up to maximum pressure of 258.5 bar (3750 psig)  
 For PED (97/23/EC) maximum pressure limited to 200 bar (2900 psig)

**S31603 SST Displacer:** CL600 pressure temperature ratings per ASME B16.34 up to maximum pressure of 99.3 bar (1440 psig)

**Note:** For slip-on flange connection, maximum sensor working pressure must be consistent with the flange ratings

-continued-

## Specifications (continued)

### Displacer Material and Sensor Temperature Limits<sup>(8)</sup>

PVC Displacer: -29 to 79°C (-20 to 175°F)  
S31603 SST Displacer: -40 to 204°C (-40 to 400°F)

### Operative Ambient Temperature Limits<sup>(8)</sup>

Controller: -29 to 71°C (-20 to 160°F)

### Standard Supply, and Output Pressure Gauge Indications

Triple scale gauges in 0 to 60 psig/0 to 0.4 MPa/  
0 to 4.0 bar

### Construction Materials

Controller:  
*Case and Cover:* Marine grade aluminum  
*Relay Body:* Thermoplastic  
*Relay Trim:* Stainless steel, nitrile  
*Span Levers:* Stainless steel

### Sensor:

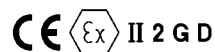
*Sensor Body:* LCC  
*O-Rings:* Fluorocarbon  
*Pivot Assembly:* Stainless steel  
*Displacer:* ■ Polyvinylchloride (PVC) or ■ S31603 SST  
*Sensor Spring:* Stainless steel

### Dimensions

Refer to figure 1

### Hazardous Area Classification

Complies with the requirements of ATEX Group II  
Category 2 Gas and Dust



### Declaration of SEP

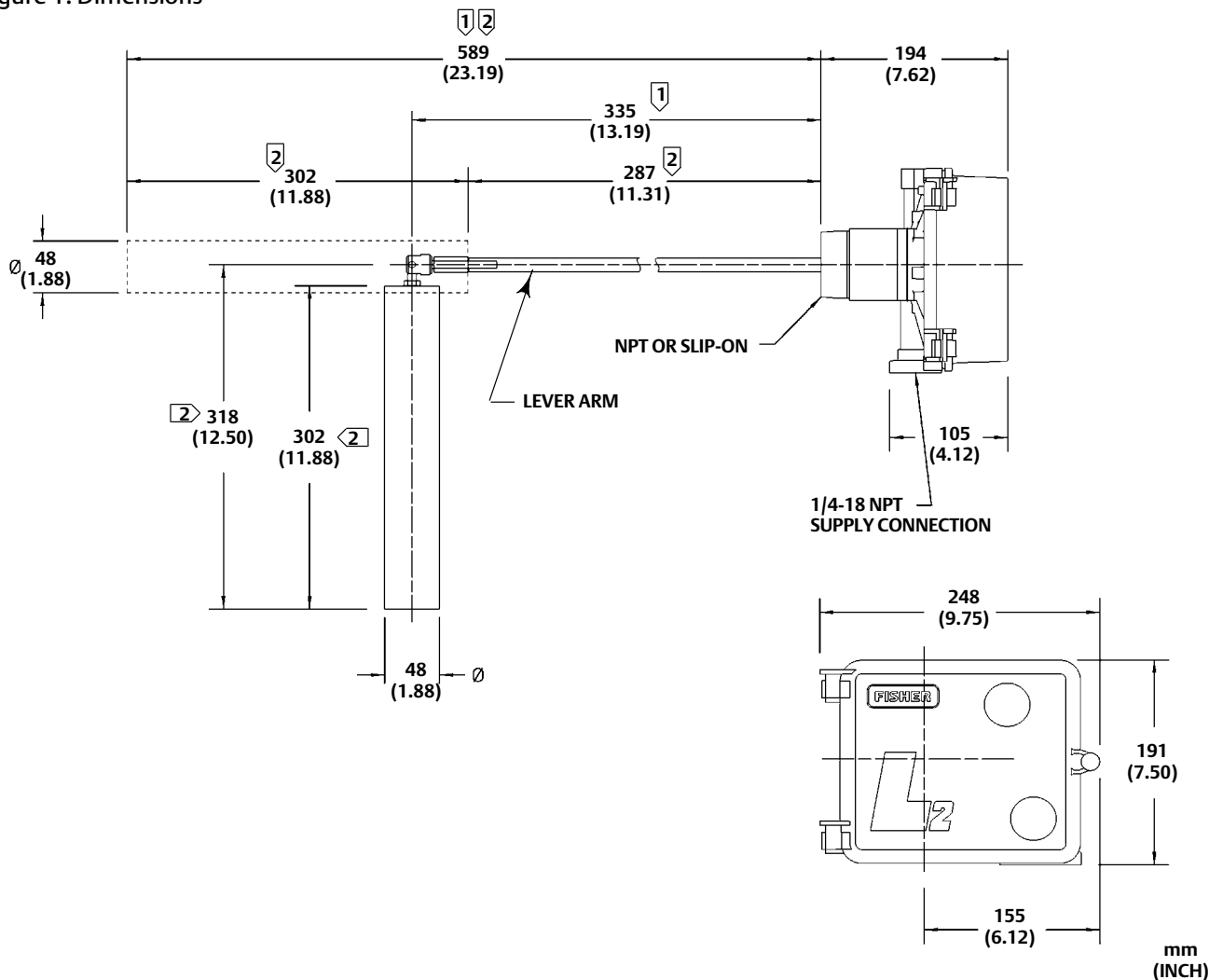
Fisher Controls International LLC declares this product to be in compliance with Article 3 paragraph 3 of the Pressure Equipment Directive (PED) 97 / 23 / EC. It was designed and manufactured in accordance with Sound Engineering Practice (SEP) and cannot bear the CE marking related to PED compliance.

However, the product *may* bear the CE marking to indicate compliance with *other* applicable European Community Directives.

NOTE: Specialized instrument terms are defined in ANSI/ISA Standard 51.1 - Process Instrument Terminology.

1. Any deviation from the standard construction described in the input signal specification above requires special displacer sizing considerations. Contact your Emerson Process Management sales office for information.
2. Minimum specific gravity values apply to both horizontal and vertical displacers with standard lever arm length (see dimension in figure 1).
3. Minimum specific gravity differential with standard displacer is 0.4. Minimum specific gravity differential of 0.1 is possible with special displacer. Consult your Emerson Process Management sales office for displacer sizing information.
4. This product can be used with natural gas as the supply medium. Natural gas should contain no more than 20 ppm of H<sub>2</sub>S.
5. Normal m<sup>3</sup>/hr-Normal cubic meters per hour (0°C and 1.01325 bar, absolute). Scfh-Standard cubic feet per hour (60°F and 14.7 psia).
6. Converting from a threaded NPT connection to a flange connection is to be done by the end-user. Refer to Converting a Threaded NPT Connection to a Flange Connection instruction Manual Supplement (D103277X012), available at [www.Fisher.com](http://www.Fisher.com) or from your Emerson Process Management sales office.
7. Standard lever arm length. See figure 1.
8. The pressure and temperature limits in this document and any applicable code limitations should not be exceeded.

Figure 1. Dimensions



Notes:

① Dimensions include one standard 152 mm (6-inch) extension. Contact your Emerson Process Management sales office for optional extension lengths.

② Dimensions valid with standard displacers only.

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