

# Fisher™ L2sj Low Emission Liquid Level Controller

The rugged Fisher L2sj low emission liquid level controller uses a displacer type sensor to detect liquid level. This controller features a rugged, low emission proportional relay with integral action. The device delivers a direct acting on/off pneumatic output signal to a control/dump valve.

## Features

- **Designed for use with Natural Gas**—The L2sj controller is intended for use with natural gas as the pneumatic supply.
- **Increased Revenue**—Reduced emissions result in an increase in natural gas available to the sales line.
- **Reduced Operating Costs**—Integral action relay with rugged metal seats requires less maintenance and provides more dependable liquid level control, which can improve uptime.
- **Reduced Carbon Footprint**—A low-bleed relay helps to conserve natural gas to reduce greenhouse gas emissions. The relay provides a steady state consumption rate that is less than the 6 scfh requirement set for the oil and gas industry by the US Environmental Protection Agency (New Source Performance Standards Subpart OOOO, EPA-HQ-QAR-2010-0505).
- **NACE Service Ready**—Sensor and vessel connection complies with the requirements of NACE MR0175-2002.
- **Ease of Field Setup**—Simplified dry and wet setup and adjustments. Setup and Adjustments illustrated inside L2sj cover as shown in figure 6.
- **Field-Configurable Vertical or Horizontal Displacer**—Displacer may be adjusted in the field for vertical or horizontal operation without additional parts.
- **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.
- **Low Supply Pressure**—Can operate down to 0.34 bar (5 psi) instrument supply pressure for coal seam applications.



**Specifications**

**Available Configuration**

Controller: On/Off / Direct Acting  
Sensor: Displacer-type liquid level sensor for mounting to side of vessel.

**Input Signal**

Liquid Level (gas over liquid)

**Liquid Level Span<sup>(1)</sup>**

See table 1

**Minimum Specific Gravity**

3 x 6 inch displacer: 0.6  
1-7/8 x 12 inch displacer: 0.75

**Output Signal**

Control: Pneumatic On/Off  
Range: 0 psi (off) or full supply pressure (on)  
Action: Direct acting (increasing level increases output signal)

**Supply Pressure Requirements**

Any desired pressure between 0.34 and 2.4 bar (5 and 35 psig).

**Supply Medium**

Air or Natural Gas

**Steady-State Air Consumption<sup>(2)</sup>**

< 0.01 normal m<sup>3</sup>/hr (< 0.3 scfh) at 1.4 bar (20 psig) supply pressure

**Sensor to Vessel Connection**

■ 2 NPT threaded or ■ NPS 2 CL150 through 1500 slip-on flange connection

**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

**Displacer Size**

■ 48 x 305 mm, 541 cm<sup>3</sup> (1-7/8 x 12 inches, 33 in<sup>3</sup>)<sup>(3)</sup> or ■ 76 x 152 mm, 688 cm<sup>3</sup> (3 x 6 inches, 42 in<sup>3</sup>)<sup>(4)</sup>

**Displacer Insertion Length**

See figure 7 and 8

**Maximum Sensor Working Pressure<sup>(5)</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

**Sensor Temperature Limits<sup>(5)</sup>**

PVC Displacer: -18 to 71°C (0 to 160°F)

S31603 SST Displacer: -40 to 204°C (-40 to 400°F)

**Operative Ambient Temperature Limits<sup>(5)</sup>**



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

-Continued-

**Specifications (continued)**

**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



**Hazardous Area Classification**  
Complies with the requirements of ATEX Group II Category 2 Gas and Dust

  **II 2 GD**    **EX h IIC Tx Gb**  
**EX h IIIC Tx Db**

Maximum surface temperature (Tx) depends on operating conditions

**Gas:** T6  
**Dust:** T71

Meets Customs Union technical regulation TP TC 012/2011 for Groups II/III Category 2 equipment

 **II Gb c T\*X**  
**III Db c T\*X**    

NOTE: Specialized instrument terms are defined in ANSI/ISA Standard 51.1 - Process Instrument Terminology.  
1. Level change required for full change in output signal.  
2. 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).  
3. Supplied with one 6 inch extension.  
4. Supplied with one 3 inch extension.  
5. The pressure and temperature limits in this document and any applicable standard or code limitation should not be exceeded.

**Table 1. Liquid Level Span**

SENSOR	SPECIFIC GRAVITY OF LIQUID		
	0.6	0.75	1
<b>Vertical Displacer</b>	<b>Span, mm (Inch)</b>		
1-7/8 x 12 inch Displacer with 6 inch extension	n/a	135 (5.3)	102 (4.0)
3 x 6 inch Displacer 3 inch extension	57 (2.25)	46 (1.8)	35 (1.35)
<b>Horizontal Displacer</b>	<b>Span, mm (Inch)</b>		
3 x 6 inch Displacer with 3 inch extension	22 (0.85)	17 (0.67)	13 (0.5)
Notes 1. Level change required for full change in output signal. 2. Span adjuster set for maximum sensitivity. 3. 1.4 bar (20 psig) supply pressure. 4. For vessels with fast dump cycles, actual liquid span will be larger			

Figure 6. Setup and Adjustments Label (Inside Fisher L2sj Cover)

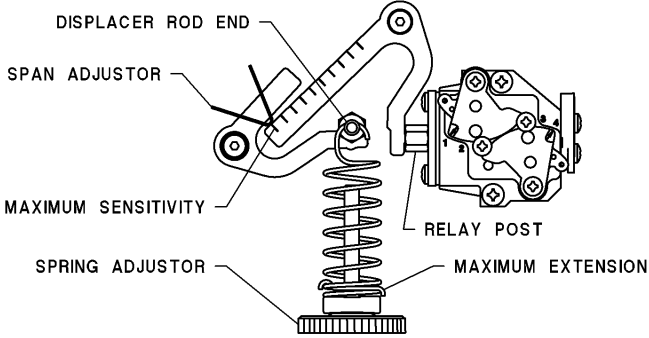
**L2sj**

LOW EMISSION  
LEVEL CONTROLLER

### SETUP AND ADJUSTMENTS

#### DRY DISPLACER SETUP

1. SET SUPPLY PRESSURE TO 25 PSIG.
2. SET SPAN ADJUSTOR TO THE MAXIMUM SENSITIVITY.
3. TURN SPRING ADJUSTOR TO TIGHTEN THE SPRING TO IT'S MAXIMUM EXTENSION.  
IF THE OUTPUT PRESSURE RISES, LOOSEN THE SPRING UNTIL THE OUTPUT PRESSURE EXHAUSTS TO 0 PSIG.
4. CHECK THE SETUP:
  - A. PRESS DOWN FIRMLY ON THE DISPLACER ROD END AND OBSERVE THE AMOUNT OF TIME IT TAKES FOR THE OUTPUT PRESSURE TO REACH SUPPLY PRESSURE.
  - B. SLOWLY RELEASE THE DISPLACER ROD AND OBSERVE THE AMOUNT OF TIME IT TAKES FOR THE OUTPUT PRESSURE TO EXHAUST TO 0 PSIG.
  - C. THE TIME OBSERVED IN STEP A SHOULD EQUAL THE TIME IN STEP B. IF NOT, LOOSEN THE SPRING FOR QUICKER EXHAUST ACTION.



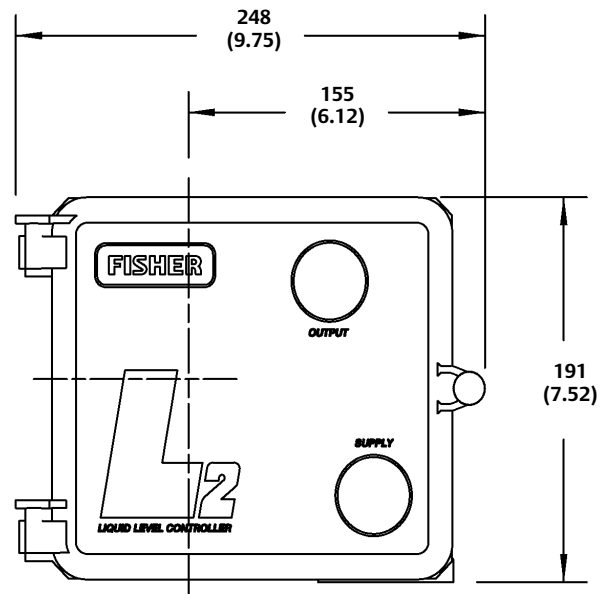
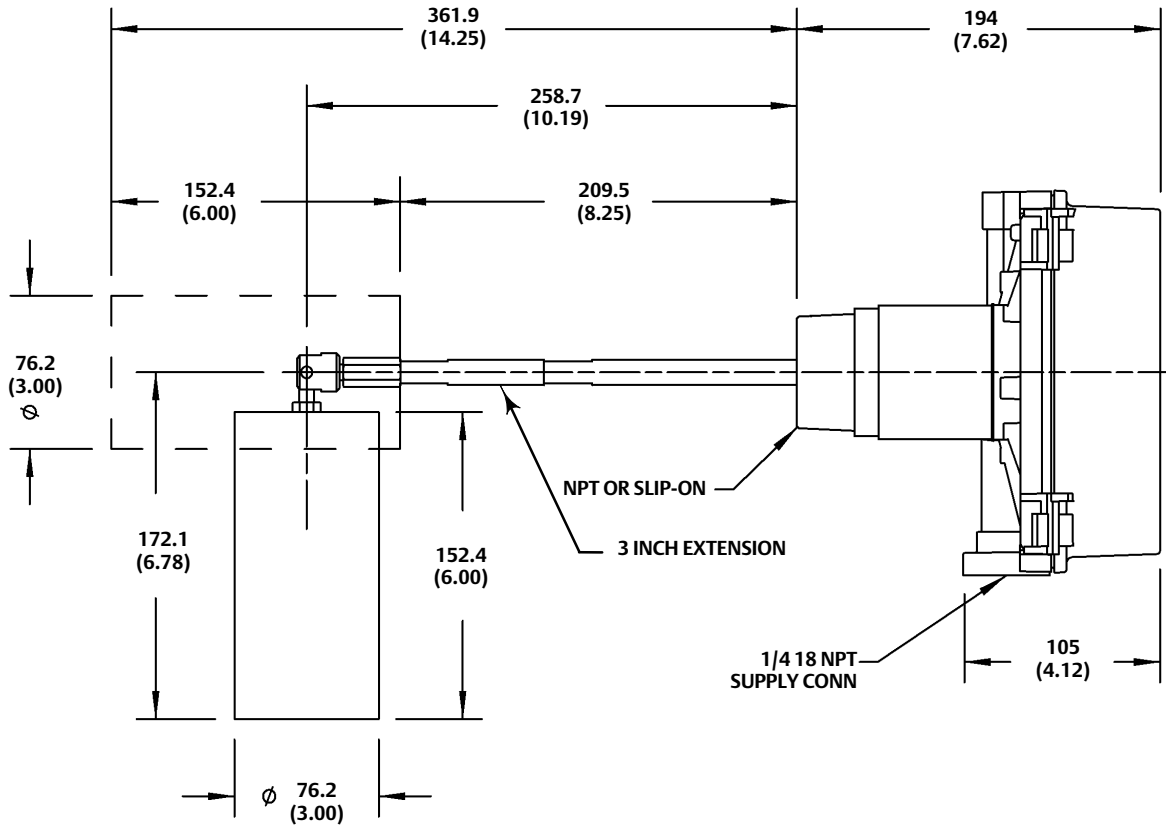
#### WET DISPLACER ADJUSTMENTS

- TO RAISE THE POSITION WHERE THE L2sj CATCHES A RISING LEVEL, LOOSEN THE SPRING.
- TO LOWER THE POSITION WHERE THE L2sj CATCHES A RISING LEVEL, TIGHTEN THE SPRING.  
IF THE SPRING IS AT IT'S MAXIMUM EXTENSION, EXTEND THE RELAY POST SLIGHTLY.
- TO INCREASE THE LEVEL SPAN, DECREASE THE SENSITIVITY BY SLIDING THE SPAN ADJUSTOR TO THE RIGHT.

**NOTE: ALWAYS OBSERVE ONE OR MORE DUMP CYCLES TO VERIFY L2sj SETTINGS AND ADJUSTMENTS.**

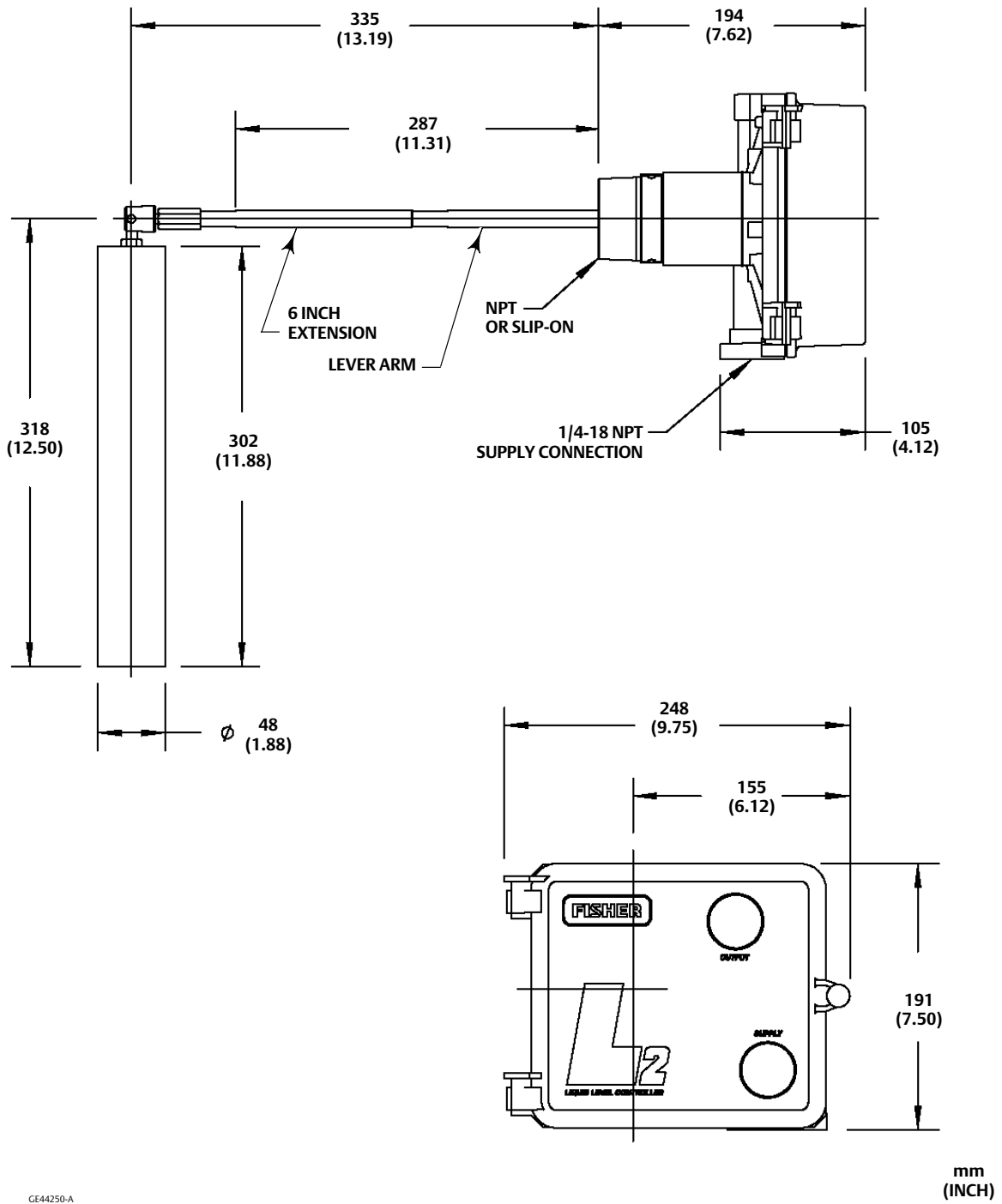
GE16844

Figure 7. Dimensions: 76 x 152 mm (3 x 6 inches) with 76 mm (3 Inch) Extension



mm  
(INCH)

Figure 8. Dimensions: 48 x 305 mm (1-7/8 x 12 inches) with 152 mm (6 Inch) Extension



GE44250-A



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**Emerson Automation Solutions**  
Marshalltown, Iowa 50158 USA  
Sorocaba, 18087 Brazil  
Cernay, 68700 France  
Dubai, United Arab Emirates  
Singapore 128461 Singapore

[www.Fisher.com](http://www.Fisher.com)

