

3.1.4. Fisher™ L2e Electric Level Controller

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Description

Optimizing existing control loops for environmental compliance using no-bleed instruments reduces operating costs and provides positive return on investment (ROI). Modeled on the successful Fisher™ L2 pneumatic controller, the Fisher™ L2e Electric level-controller uses a displacer-type sensor to detect liquid level or the interface of two liquids of different specific gravities, but provides an electric on-off level output instead of a pneumatic output.

In its normal position, the weight of the displacer is balanced against the spring force within the controller, the pneumatic supply pressure available, and the buoyant force acting on the displacer. When sufficient buoyant force is present, the imbalance in force is converted to an electric output that runs to a control/dump valve, which changes position and helps bring the forces back into equilibrium. This controller is ideal for controlling level in oil and gas separators, treaters, and scrubbers. The reliability of the L2e force-balanced sensor design makes it well-suited for applications in the oil and natural gas production, compression, and processing industries.



Technology Group

Wellsite and Upstream Facilities Instrumentation and Controls – Facilities Design and Equipment

Site Applicability

Oil and gas production, compression, and processing

Emissions Reduction and Energy Efficiency

Reductions up to 30scfh (0.8m³/hr) of fuel gas have been achieved when retrofitting Fisher™ 2900 series level controllers. Additional details are available in the field studies, manufacturer published specs¹, and Table C2 in Appendix C of the Quantification Protocol for Greenhouse Gas Emission Reductions from Pneumatic Devices².

Economic Analysis

Capital Cost: New no-bleed instruments are available for \$1,000 to \$3,000 per unit. Pricing

¹Manufacturer specs found using Emerson Process Management's Energy Responsible Tool at

<http://www3.emersonprocess.com/fisher/energyresponsibletool/index.html>

²<https://open.alberta.ca/publications/9781460131633>



is specific to model capability and materials of construction.

Installation Cost:	Typical installation costs are between \$150 and \$300 per controller. This cost variance is impacted by proximity and access to site.
Operating Cost:	Operating costs are low. The instrument doesn't consume power; it just provides the signal to the dump valve when required based on the level of fluid in the vessel. The quality design and components help eliminate current leakage.
Maintenance Cost:	Maintenance costs are minimal given the controller contains no repairable or replaceable parts, and can easily be replaced in the field.
Carbon Offset Credits:	A Fisher™ L2e controller is eligible for offsets in Brownfields in Alberta. Using no-bleed electric controllers is not considered business-as-usual and is eligible for offsets in Greenfield applications as well.
Payback, Return on Investment and Marginal Abatement Cost:	The payback is specific to the value of fuel gas and the carbon offset. However, installing this instrument in the field can pay for itself in less than a year when a carbon offset protocol is available. Note that vent rate reductions are larger when dynamic consumption is included in the pre and post retrofit vent rate measurements or emission factors. The period of payback is dependent on both the type of level controller replaced and the dump frequency. In Alberta, please refer to Quantification Protocol for Greenhouse Gas Emission Reductions from Pneumatic Devices.

Reliability

Expected Lifetime:	Field experience demonstrates that instrument longevity is impacted by how dynamic the control loop is. The Fisher™ L2e sensor is based on the Fisher™ L2 design. Insufficient field data is currently available to accurately determine an expected lifetime.
Maintenance:	Replacing a conventional pneumatic level loop with fully electric level control eliminates controller- and dump-valve venting and requires less maintenance. Please refer to the Fisher™ L2e level controller manual ³ .

Safety

The Fisher™ L2e utilizes the same displacer sensor and pressure containing components as the Fisher™ L2 pneumatic controller. The Fisher™ L2 Canadian registration number (CRN) also applies to the Fisher™ L2e. The Fisher™ L2e level controller is a pressure-containing component of the vessel when threaded into the 2" NPT process connection or bolted to the flange on the vessel. The controller case of an older Fisher™ L2 can be separated from the displacer, while the latter is left in place. This allows for field retrofit by replacing the Fisher™ L2 level controller case with a Fisher™ L2e level controller case, without needing to depressurize the process vessel. Note that it is best practice to ensure the process flow into

³http://www.documentation.emersonprocess.com/groups/public/documents/instruction_manuals/d103531x012.pdf



the vessel is isolated while performing the retrofit unless manual dump operations can be performed while doing so.

Regulatory

A Fisher™ L2e level controller is a form of no-bleed compliance.

Vendor Information

Company Name:	Spartan Controls Ltd.
Company Website:	http://www.spartancontrols.com/
Product Website:	https://www.documentation.emersonprocess.com/groups/public/documents/bulletins/d103532x012.pdf
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