



Type L100

Bubble-Tube Liquid Level System

Precision Transmission of Liquid Level in Open Tanks

The L100 Bubble-Tube Level System is a fully self-contained instrument, requiring only connections to air or gas supply, dip tube and electrical power source to provide precise level indication. Because only the stationary dip tube and the purge gas come in contact with the liquid, this system is ideal for applications involving hazardous locations or liquids which are highly corrosive, viscous, hot, (molten metal), explosive, slurry type or food stuff. In addition, the electronic output from the L100 is compatible with almost all analog instrumentation, including local and remotely-located indicators, computers, data loggers, recorders and controllers.

Features

- High accuracy and Stability
- Blow-Down Capability
- Unaffected by Foam or Vapors
- Excellent for High-Temperature, Corrosive, Remote Hazardous Area or Waste Water Level Measurement
- NEMA 4X Enclosures Available



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The L100 Bubble-Tube Level System provides a variety of features which simplify the application of dip tube techniques to liquid level measurement. Using the field-proven ControlAir P200 P/I Transducer, this system is capable of superior accuracy and longevity. Over-pressure relief and back-flow check valves are used to protect the P/I transducer and are supplied as standard in every system along with a rotameter to read purge flow rates. Provision for manual blow-down of the bubble pipe by high pressure air is included to allow the user to clear any obstruction or media build-up from the bubble pipe.

Aside from the many standard features of the ControlAir L100 Bubble-Tube Level System, there are numerous options which are listed in the specifications section. If your specific configuration is not listed, the Bubble-Tube System may be custom-configured to your requirements.



Principles of Operation

In the L100 Bubble-Tube Liquid Level System, the level in a vented tank is determined by measuring the pressure required to force gas into the liquid at a point beneath the surface. This system provides accurate level measurement without liquid entering the piping or the instrument.

A pressure regulator and constant-flow regulator combine to establish a consistent flow of clean air or gas to a bubble pipe immersed a fixed distance in the tank. The flow is regulated to a very low level, building up pressure in the bubble pipe until it just balances the fluid pressure at the end of the bubble pipe. Thereafter, pressure is kept at this value by escape of air bubbles through the liquid. Changes in the tank level cause the pressure in the bubble pipe to build or drop. The P200 pressure transducer is used to

measure this pressure and send an electrical signal proportional to the level or volume of liquid.

The presence of the high-quality, industry-leading P200 P/I transducer in the L100 Bubble-Tube Level System provides the user with an established and recognized electronic interface. Since the totally solid-state P200 transducer is typically capable of accuracies of 0.15% of span, the entire L100 System can be expected to maintain a 0.25% accuracy.

Specifications

Ranges	0-50 inches water to 0-830 inches water or equivalent, full scale
Air Input	1.0 to 7.0 SCFH, regulated on-board to a pressure of 200% of full scale liquid head. Maximum blow-down pressure is 150 psi. Maximum on-board regulated pressure is 60 psi
Electrical Input	Using P200: 10-42 VDC (units with automatic blow-down and digital readout options also require 120 VAC)
Electrical Output	P200: 2 wire, 4-20mA into 700Ω at 24 VDC or 2 wire, 10-50mA into 280Ω at 24 VDC
Accuracy	± 0.25% of span guaranteed; ±0.20% of span typical. Includes combined effects of linearity, hysteresis and repeatability errors.
Sensitivity	±0.02% of span guaranteed
Repeatability	±0.10% of span guaranteed; ±0.05% of span typical
Operating Temperature	30° F to 161° F
Thermal Sensitivity	Span: 0.007% of span per °F guaranteed Zero: 0.007% of span per °F guaranteed
RFI/EMI Effect	Meets or exceeds SAMA PMC 33.1, 1978, 2-abc: 0.1% of span at 10 volts/meter
Environmental	Basic Bubble-Tube system mounted on a panel assembly has no environmental protection. Option "E" provides the panel assembly mounted in a NEMA 4X enclosure.
Fittings	Brass All Input and Output fittings on enclosures are for 1/4 inch O.D. tubing. If not in an enclosure, all fittings will be 1/4 - 18 NPT.
Available Options	NEMA 4X enclosure with or without digital readout, remote analog readout, auto purge

Highly accurate and stable level indication—excellent for hazardous or high-temperature liquids

Applications

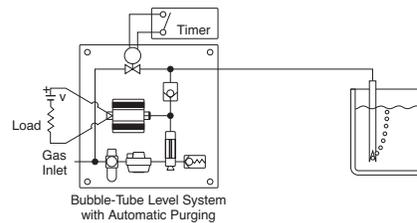
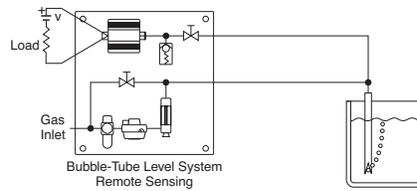
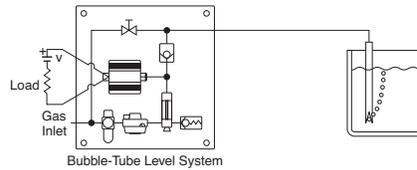
Air bubbler systems have no moving parts which make them ideal for measuring viscous fluids, liquids with suspended solids, slurries, sewage, drainage water and sludge. The L100 is also unaffected by foam on the surface of the liquid, vapors in the tank and can be used in media temperatures over 350 degrees Fahrenheit.

The L100 is ideal for remotely measuring liquid levels in tanks located in hazardous areas. The point of measurement at the dip tube in the tank is non-electrical. The bubbler control system is located outside of the tank in a separate protected enclosure with only the pneumatic tubing running to the tank. This isolates the hazardous area from the safe area.

In addition the L100 can measure the level of very corrosive or caustic liquids because the dip tube that is immersed in the tank can be fabricated from any chemically compatible material.

The L100 can measure the level of:

- Ballast Water
- Drill Mud & Drill Water
- Fuel & Lube
- Service Tanks
- Liquid Cargo
- Waste Water (Gray & Black)
- Dry Docks



L100 Basic System

Standard bubble-tube configuration provides excellent accuracy and stability. Factory pre-set ranges available from 0-50" to 0-830".

L100R Remote Sensing

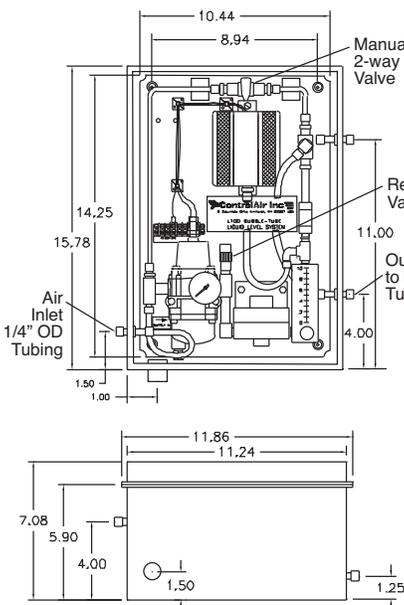
This approach eliminates the small errors which can occur when operational changes cause a small change in purge flow. In this configuration, there is no flow in the measurement line as in the L100

L100A Automatic Blow Down

This arrangement allows for periodic bubble-tube blow-down to clear the tube on an automatic basis with no operator interface. Upon request, the L100 can be configured at the factory for automatic blow-down or remote sensing.

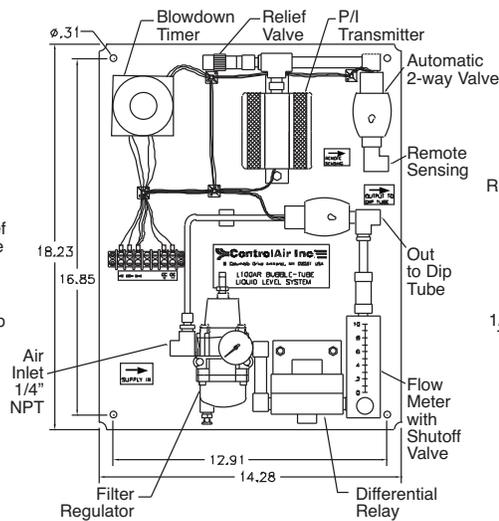
Dimensions

L100-ES
("ES" small NEMA 4X enclosure)
For L100 & L100-R



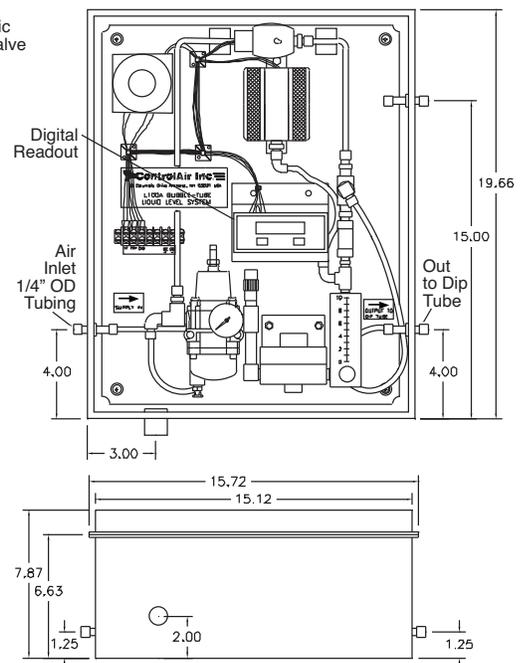
Panel Only 14.25"H x 10.44"W

Panel Only (large)
For L100-AR, L100-A, L22



Panel Only (large) 18.23"H x 14.28"W

L100-EL
("EL" large NEMA 4X enclosure)
For L100-A, L100-AR & L100-L22"K"



Panel Only 19.66"H x 15.72"W

Type L100

Ordering Use this coding system to order

Model L100

Enclosure

- ES** Small NEMA 4X Enclosure (L100, L100-R)
- EL** Large NEMA 4X Enclosure (L100-A, L100-AR, L22)
- Blank** Panel Only, No Enclosure

Ranges

	In. of Water	PSI	BAR
L11	0-50" to 0-166"	0-1.8 to 0-6.0	0-0.12 to 0-0.41
L12	0-167" to 0-498"	0-6 to 0-18	0-0.41 to 0-1.24
L13	0-499" to 0-830"	0-18 to 0-30	0-1.24 to 0-2.1

Specify exact range for calibration (inches water)

Transducer

- P200** ControlAir P/I Transducer (see P200 specifications separately)
- N** No P/I Transducer

Digital Readout

- L22W** Inches water- Digital readout, scaled for range
- L22A** 4-20mA- Digital readout, scaled for range
- L22P** 0-100 % - Digital readout, scaled for range
- Blank** No Digital readout

Assembly

- R** Remote Sensing
- A** Automatic blow down & built-in timer
- AR** Automatic blow-down & remote-sensing
- Blank** Basic bubble-tube system

Note: When ordering, please indicate the specific gravity of the liquid being measured if it is different than that of water.

Note: A large enclosure (see Dimensions) is needed when ordered with Digital Readout (L22).

Warranty ControlAir LLC products are warranted to be free from defects in materials and workmanship for a period of eighteen months from the date of sale, provided said products are used according to ControlAir LLC recommended usages. ControlAir LLC's liability is limited to the repair, purchase price refund, or replacement in kind, at ControlAir LLC's sole option, of any products proved defective. ControlAir LLC reserves the right to discontinue manufacture of any products or change products materials, designs or specifications without notice. Note: ControlAir does not assume responsibility for the selection, use, or maintenance of any product. Responsibility for the proper selection, use, and maintenance of any ControlAir product remains solely with the purchaser and end user. Drawing downloads available at www.controlair.com



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