



ControlAir 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 Hazardous, High-Temperature, Corrosive or Waste Water Level Measurement
- NEMA 4X Enclosures Available



ControlAir Inc.



L100

Highly accurate and stable level indication-

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.

S P E C I F I C A T I O N S

Ranges	0-50 inches water to 0-830 inches water or equivalent, full scale
Gas Input	1.0 to 7.0 SCFH, regulated on-board to a pressure between 120% or 3 psi, whichever is greater, and 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 110 VAC
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
RF/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
Available Options	NEMA 4X enclosure with or without digital readout, remote analog readout, auto purge

-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

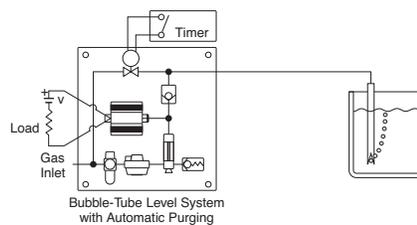
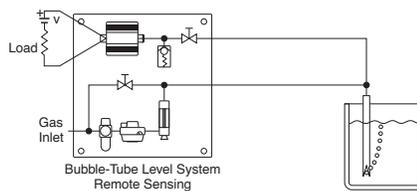
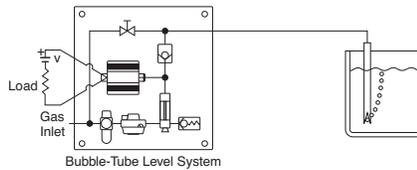
Standard bubble-tube configuration provides excellent accuracy and stability. Factory preset ranges available from 0-50" to 0-830".

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

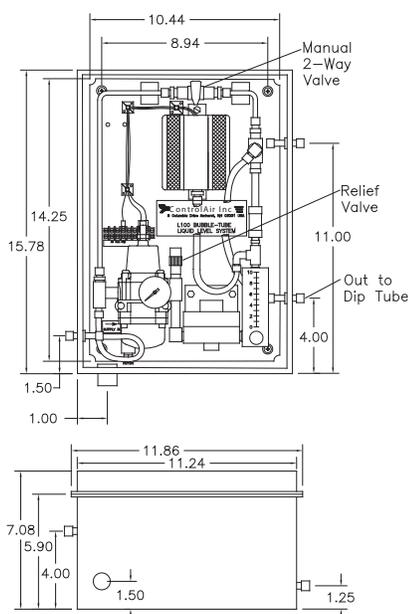
L100A AUTOMATIC BLOW DOWN

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.

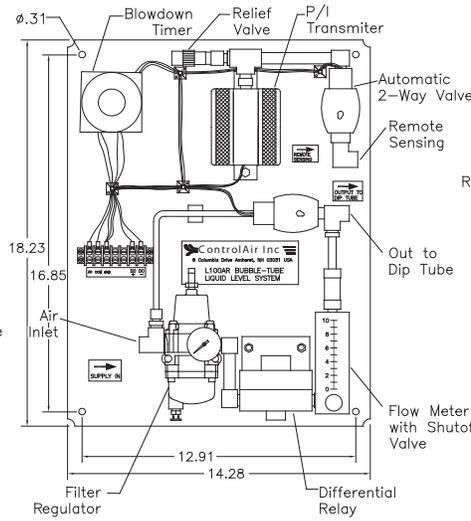


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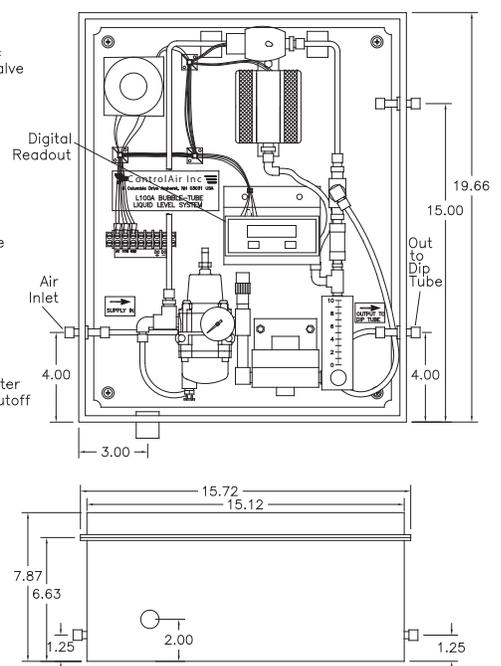
BASIC L100E



L100 AR



L100AE+L22



Ordering Information

Use this coding system to order

Model
L100 -

Enclosure
E NEMA 4X
Blank No enclosure, panel only

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

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

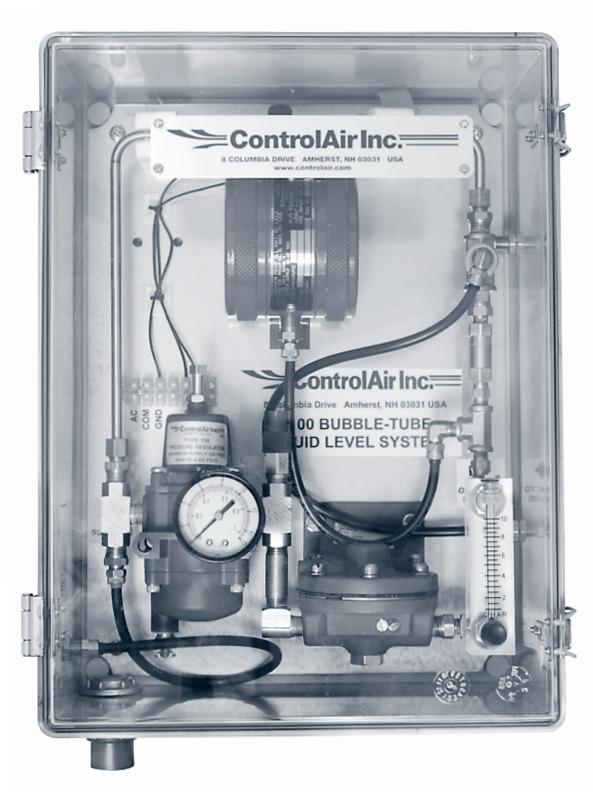
Digital Readout
L22W Inches water- Digital readout, scaled for range
L22A 4-20mA- Digital readout, scaled for range
L22P 0-100 % - Digital readout, scaled for range
Blank No Digital readout

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)

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



Warranty

ControlAir, Inc. 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, Inc. recommended usages. ControlAir, Inc.'s liability is limited to the repair, purchase price refund, or replacement in kind, at ControlAir, Inc.'s sole option, of any products proved defective. ControlAir, Inc. reserves the right to discontinue manufacture of any products or change products materials, designs or specifications without notice.