

LevelBAR™ System

Electronic Column Display for Tank Level Gauging

- Direct Replacement for Manometer Gauges
- Electronic (4-20 mA) or Pneumatic Input
- Custom Marked Scale

Tank Level Indication

KING-GAGE LevelBAR system is designed for liquid level tank gauging. This unique analog column indicator works as a stand-alone system or supplemental remote display in new or retrofit applications. The system will accept standard 4-20 mA transmitter output or can accommodate direct pneumatic pressure measurement. With its available differential pressure (D/P) transducer, it can be used as a direct replacement for mercury tank gauges or other fluid-filled manometers.

The multi-segment LED column provides graphic indication of tank levels for operations personnel. A simple adjustment allows full scale ranging of the display when maximum input is less than 20 mA, such as with fixed-range transmitters. LevelBAR includes a custom scale marked in any specified measurement unit (volume, weight, depth, % full).

Pneumatic Input (D/P Option)

A high precision piezoresistive pressure transducer provides a proportional 4-20 mA_{dc} output suitable for indication or control functions. With this D/P option, pneumatic-to-current (P/I) conversion permits bubblers and other air-driven systems to be retrofitted with an electronic LevelBAR indicator, eliminating older manometer type gauges.

Electronic Input

The LevelBAR System is designed to work as a tank level monitor. The system accepts a 4-20 mA proportional signal from typical pressure based level transmitters/sensors. It will provide full scale display even if the transmitter does not provide full scale output (such as with fixed range pressure sensors).



Pneumatic System

When used with either an air-driven diaphragm sensor or bubbler, the pressure signal is directed into the LevelBAR (with D/P option). The internal transducer generates a milliamp output in response to the applied pressure. Individual LED segments on the scale illuminate as the signal (e.g., tank depth) increases. The scale itself is custom marked for the actual tank dimensions and pressure range of the gauging application.

Bubbler (Downpipe) System - uses compressed air to purge an open ended pipe extending down into the tank. A regulator or purge control supplies the air which fills the pipe. The resulting downstream pressure (within the pipe) is directly proportional to liquid depth. As depth increases, so does pressure. Conversely, as depth decreases, downstream pressure is equally reduced as excess air flows out the immersed end of the pipe.

Diaphragm Sensor - uses compressed air directed to one side of a sensitive diaphragm to balance it against the force of liquid in the tank. An air flow and backpressure control regulates the supply and exhaust lines feeding the diaphragm sensor. The sensor acts as a force balance creating a pneumatic pressure equal to the force of liquid which is proportional to its depth. As the depth in the tank changes, the pneumatic pressure also changes accordingly.

Systems such as these can use pneumatic sensors such as the KING-GAGE AcraSensor diaphragm unit, KING-GAGE TeleSensor diaphragm unit, or air purge regulators such as the KING-GAGE LiquiSeal Control or 780 Purge Control for downpipe (bubbler) systems.

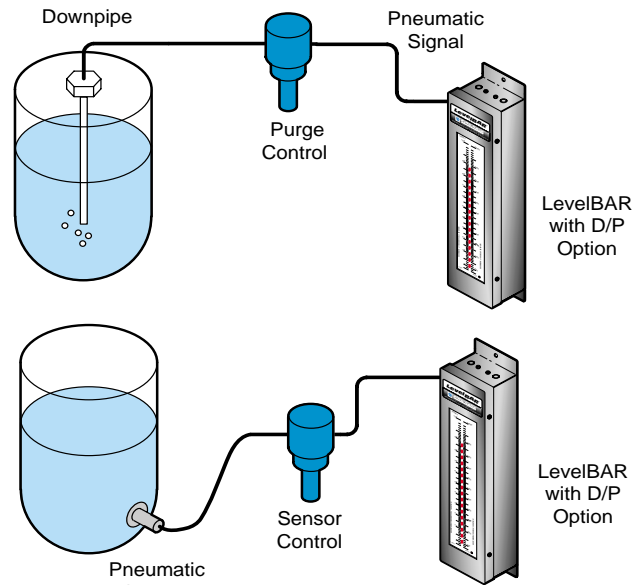
Electronic System

Local or remote indication of tank inventory is provided by the LevelBAR column display. The electronic sensor or D/P transmitter provides a standard 4-20 mA signal which is proportional to the hydrostatic pressure created by liquid depth.

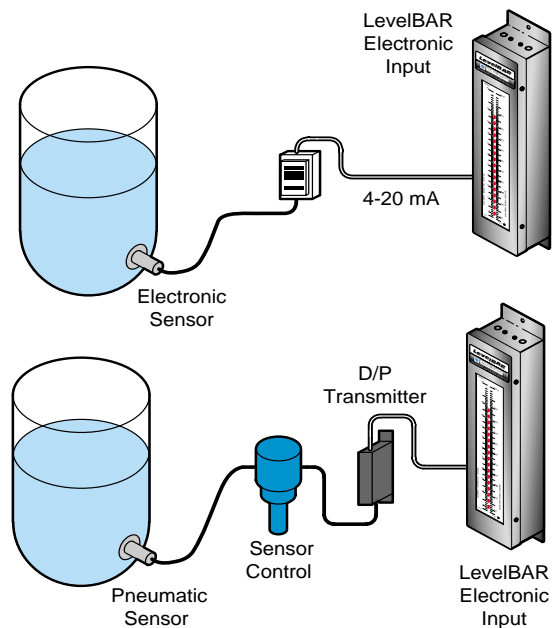
As tank depth and milliamp values increase, the LED segments are illuminated. The scale itself is custom marked for the actual tank dimensions so that capacity in volume or total weight can be read at the indicator.

Systems such as these can use the KING-GAGE Electronic Sensor or a combination of pneumatic sensor and D/P pressure transmitter.

The LevelBAR package has an available 24 Vdc supply that can be used to power most transmitters. This eliminates the need for a separate external DC power supply on the signal loop.



PNEUMATIC – Pressure signal from Bubbler or Air-Driven Diaphragm Sensor is transmitted to LevelBAR (D/P Option)



ELECTRONIC – 4-20 mA signal from Sensor or Electronic Transmitter is transmitted to LevelBAR (electronic input)

LevelBAR - Electronic Input

The electronic input version accepts a standard 4-20 mA signal from typical two wire pressure transmitters. A full scale ranging feature allows the LevelBAR to be used with fixed range pressure devices in situations where maximum signal output would be less than 20 mA.

LevelBAR indicators can be used singly or in multiples to provide additional display locations. Simply jumper out the excitation supply on each LevelBAR added to the signal loop.

MODEL NO.	
5110-10	Electronic Input (4-20 mA)

LevelBAR - Pneumatic Input

These versions incorporate the D/P option with an internal piezoresistive fixed range pressure transducer. Pneumatic-to-current (P/I) conversion generates a 4-20 mA signal proportional to the input applied. A scale ranging adjustment provides full scale display for most applications.

The D/P option also allows the LevelBAR to provide signal output to additional receivers including PLCs or other controlling devices.

MODEL NO.	
5110-20	Pneumatic Input (0-5 psid)
5110-21	Pneumatic Input (0-10 psid)
5110-22	Pneumatic Input (0-15 psid)
5110-23	Pneumatic Input (0-30 psid)
5110-24	Pneumatic Input (0-50 psid)

Simple Installation

Installation of the LevelBAR system is quick and easy. There are no extensive adjustments or calculations to perform. Simply connect power and signal input to make the system operational. It's rugged stainless enclosure suits any environment.*

For custom installations, a flush mounting version of the LevelBAR is also available.

* The use of waterproof conduit hubs or fittings may be required during installation. Not rated for continuous explosion hazard areas.

LevelBAR Custom Scale

The standard LevelBAR scale is custom marked in any specified unit of measurement (gallons, pounds, liters, barrels, etc.). An optional 2-unit scale can combine any two different measurements such as weight and volume, or volume and depth.

Scales are calculated for the individual tank geometry and product specific gravity. Due to the factory-calibrated scale, the LevelBAR system can be used for almost any kind and shape of tank, including horizontal cylindrical types. Scaling adjustments are noted for setting the full scale display (REF HIGH), although they are normally factory-preset to match the scale calibration.



LevelBAR™ System

Specifications

Display Accuracy/Resolution
1%

Display Type
100-segment LED (light emitting diode)

Display Length
10" / 254 mm

Input Power
115 Vac 50/60 Hz nominal

Output Power
24 Vdc (transmitter excitation)

Input Impedance (Resistance)
150 ohm nominal (3.0 Vdc drop @ 20 mA)

Current Limiting (Overload)
Automatic trip/reset circuit using PTC (positive temperature coefficient) resistor holds maximum current level within operating range of internal components.

Electronic Input Model Only

Input Scaling Adjustment Range
4-12 mAdc thru 4-20 mAdc

D/P Option Models Only

Pressure Ranges
0-5, -10, -15, -30, -50 psid fixed range transmitter element (accepts clean, dry air/gas pressure input). Maximum pressure rating is 300% FS.

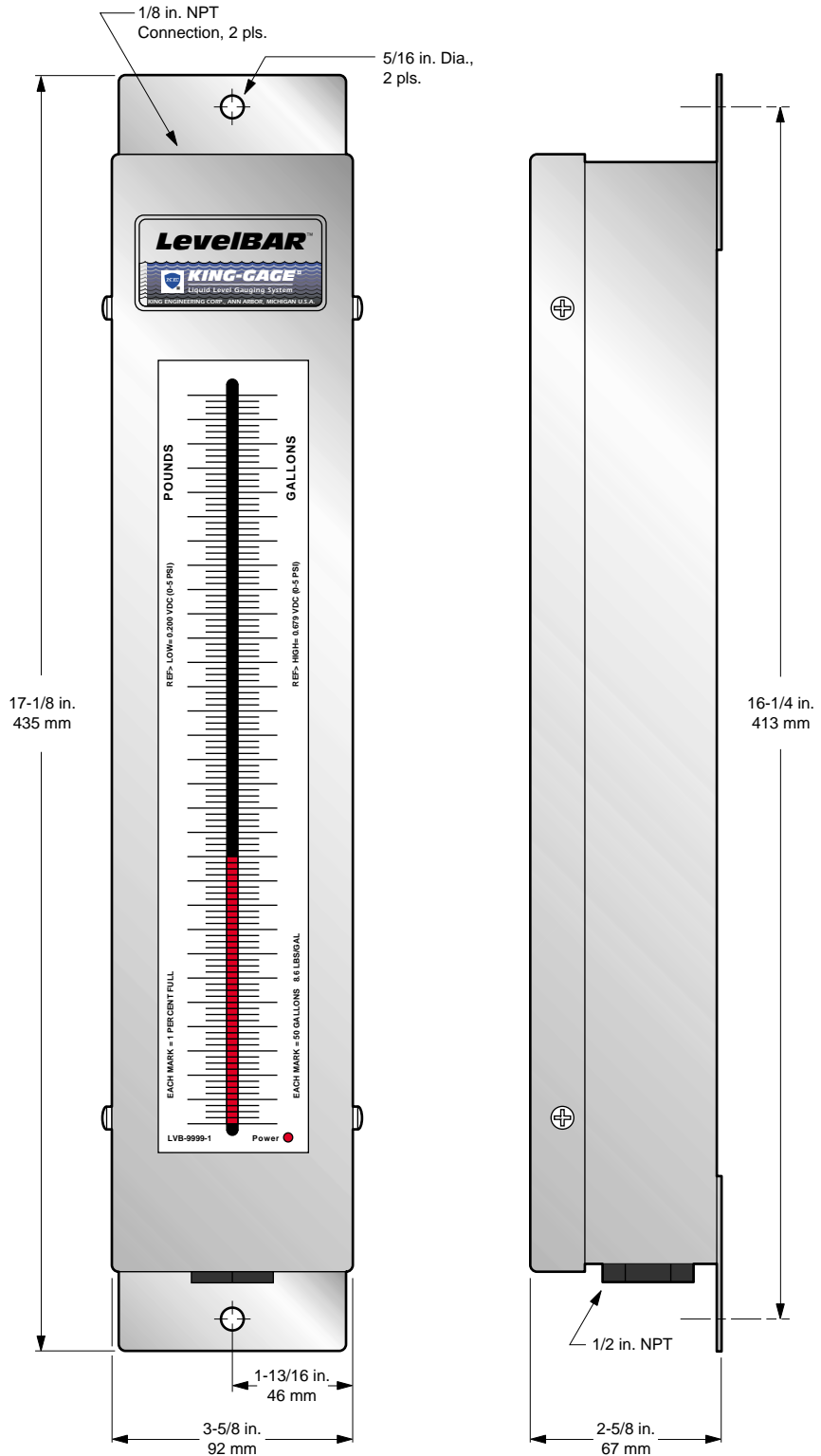
Minimum pressure range for proper operation is 50% of nominal. The lowest acceptable input pressure range is 0-2.5 psid using the 0-5 psid transducer element.

Transmitter Accuracy
0.5% FS

Output
4-20 mAdc (assumes FSO)

Power Supply Voltage (External)
10-42 Vdc (unregulated)

Maximum Load Capacity
1400 ohms @ 42 Vdc (external power)
500 ohms @ 24 Vdc (internal power)



Box 1228, Ann Arbor, Michigan 48106-1228 U.S.A.
Phone: (734) 662-5691 ■ FAX: (734) 662-6652

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