KING-GAGE® Marine Systems

Tank Level and Draft Indicating Systems for the Marine and Offshore Industries

Handpump Tank Level Gauge

Model 5992

- **Manual Intermittent Purge System**
- **Integral Hand Pump Operation**
- **Suitable for Use on Potable Water Tanks***

KING-GAGE Model 5992 Hand Pump Tank Gauge is a fully integrated tank level indicating system. It can be mounted remotely from the tank. 1/4" air line tubing connects the indicating system to a downpipe extending into the tank. Pressurized air for system operation is supplied by the integral hand pump.

This system is recommended where continuous bubbling of compressed air into the tank is prohibited. Use this manually operated gauge for periodic indication of liquid level in potable water or fuel oil storage tanks. This gauge design is used in thousands of vessels, both freshwater marine and ocean going fleets.

KING-GAGE Model 5992 Indicator has a column display read against a custom marked scale in one or two units of measurement (feet/inches, tons, barrels, etc.). It measures hydrostatic pressure as a frictionless force balance for accurate and dependable operation. The system is an extremely rugged design suited to the rigors of marine service. Case construction is carbon steel with durable black polyurethane textured finish.

Model 5992

* The KING-GAGE Intermittent Purge System has been approved by the U.S. Public Health Service for use on potable (fresh) water tanks.

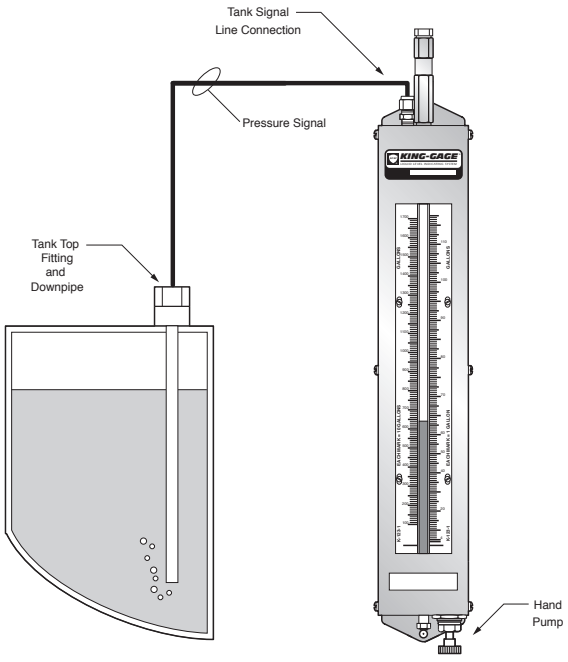
Principles of Operation

The KING-GAGE system uses hydrostatic pressure measurement to determine liquid level. This pressure is created by the actual depth of liquid above the measurement point. Individual indicator scales are calibrated to the pressure range (depth), density (specific gravity) of the liquid, and the volumetric capacity of the tank or compartment.

The KING-GAGE Model 5992 works as a frictionless hydrostatic force balance. Within the glass display tube, a liquid fill rises in direct proportion to the magnitude of pressure applied. The indicating liquid used determines the actual pressure range of this instrument (refer to Determining Scale Range).

Bubbler (Downpipe) System - uses air to purge an open ended pipe extending down into the tank. Engaging the hand pump introduces a flow of air into the downpipe. Pressure is created as liquid is purged from the downpipe, increasing until an equilibrium point is reached (air pressure = hydrostatic pressure). Equilibrium is maintained by excess air escaping through the bottom of the downpipe (and bubbling up through the tank contents).

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.



Typical Downpipe System

Integral Hand Pump

A manually operated pump introduces air flow through the system tubing to purge the downpipe. This permits on-demand measurement of liquid depth without having to continuously bleed air into the system. The hand pump eliminates the need for a compressed air supply.

Indicator Scales

Each system scale is individually calibrated and custom marked in any specified unit of measurement (depth, total weight or volume). An optional 2nd scale unit can be included to combine different measurements such as depth and volume. Scales are manufactured for the individual tank geometry and specific gravity of tank contents. Due to the factory calibrated scale, the KING-GAGE Tank Level Indicator can be used for almost any kind and shape of tank.

Determining Scale Range

Overall length of the scale can vary depending upon the range and degree of readability necessary for the application. This "readability" refers to the minimum readable change in liquid depth that can be observed at the indicator.

Three factors determine scale length:

- Maximum tank depth
- Specific gravity (density) of tank contents
- Type of indicating liquid (scale factor)

A simple calculation using these factors will yield the minimum scale length required:

D (depth) x **G** (sp.gr.) x **L** (liquid scale factor) = **Scale Length**

The resulting value represents the scale length in inches. Refer to the scale sizes available for the indicator and select one that will accommodate the calculated length.

Liquid	Color	Specific Gravity	Liquid Scale Factor
Mercury	Silver	13.546	0.074
No. 294	Red	2.940	0.337
No. 175	Purple	1.750	0.566

Tank Level and Draft Applications

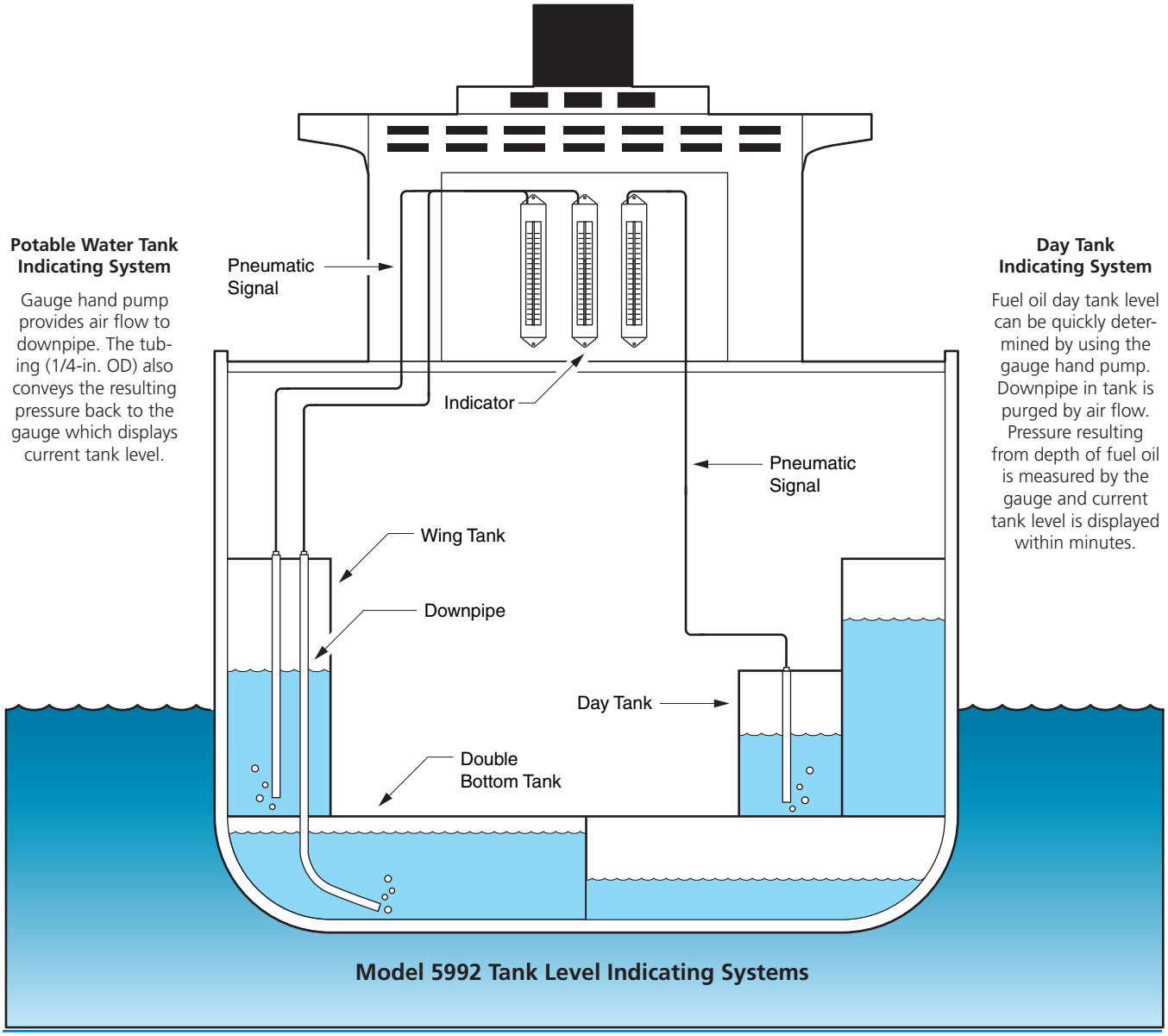
The KING-GAGE indicators can be mounted directly to a panel, bulkhead or other rigid structural member. Depending upon the application, install these indicators in the engine room, control center or ship's bridge.

Applications Include:

- Potable water tanks
- Fuel oil tanks
- Day tanks
- Bunker oil tanks

Potable Water Tank Indicating System

Gauge hand pump provides air flow to downpipe. The tubing (1/4-in. OD) also conveys the resulting pressure back to the gauge which displays current tank level.



Day Tank Indicating System

Fuel oil day tank level can be quickly determined by using the gauge hand pump. Downpipe in tank is purged by air flow. Pressure resulting from depth of fuel oil is measured by the gauge and current tank level is displayed within minutes.

Model 5992 Tank Level Indicating Systems

KING-GAGE® Marine Systems

KING-GAGE Marine Indicator

Single tank display surface mounts to bulkhead or other structural surface. Optional multiple gauge panel assembly available on special order.

The KING-GAGE Intermittent Purge System has been previously approved by the U.S. Public Health Service for use on potable (fresh) water tanks when an integral hand pump is included.

Operating Principle
Well-type manometer acts as a frictionless hydrostatic force-balance. A liquid fill is raised in direct proportion to the magnitude of pressure applied. (Varies based on type of indicating liquid employed.)

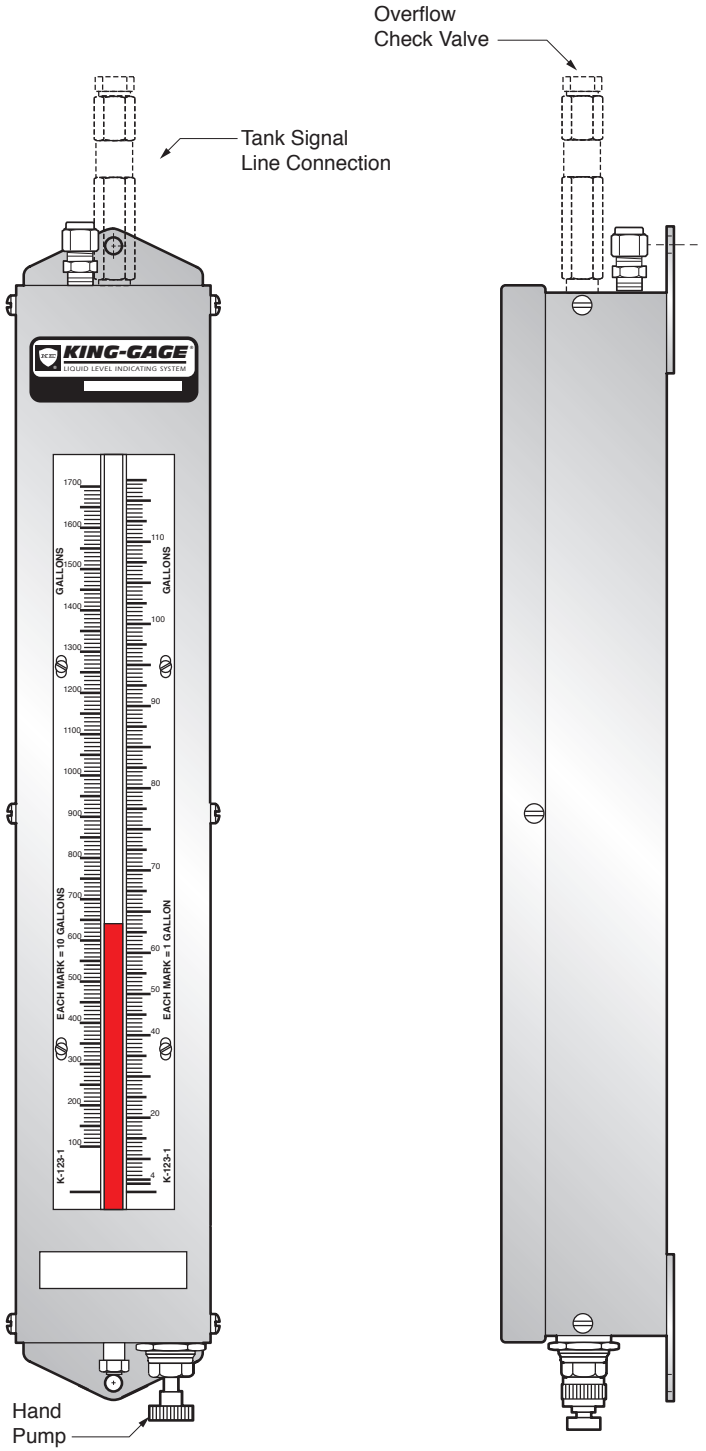
Resolution
Infinite based on type of indicating liquid employed.

Input Connection(s)
1/4" NPT tapped connection for typical tube fittings.

Materials of Construction
Formed channel indicator housing; carbon steel with durable black polyurethane textured finish. Heavy plate glass window; acrylic plastic window available as special order.

Wetted Parts
316 stainless steel liquid well and tubing.

Indicating Tube
High strength, fully annealed glass (Pyrex ®)



Range Overall Dimensions (inches)

Range	Overall Dim. (H x W x D)
20	29" x 4-3/8" x 2-7/8"
35	45" x 4-3/8" x 2-7/8"
43	53" x 4-3/8" x 2-7/8"
51	61" x 4-3/8" x 2-7/8"
66	77" x 4-3/8" x 2-7/8"

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