



ORION
INSTRUMENTS

A Magnetrol Company

Benefits of Orion Atlas™ Over Glass Liquid Level Gages

Many customers in process industries desire the ability to visually view the level of liquid in various stages of the process. Traditionally, armored glass sight gages have been used in this capacity. These same customers are moving away from using glass gages primarily from a safety standpoint. They realize the potential for leaks of hazardous materials and even breakage or bursting. The solution is simple—use Atlas.

This article is intended to highlight the functional similarities in using Atlas over glass gages and yet point out the differences in operating principles. By virtue of these differences, the safety issues are compared and discussed for the two approaches.

Operating Principles Glass Level Gages

First of all, a review is in order of the measurement operating principle of each device so that the benefits of Atlas become obvious. In general, the glass level gage provides a visual view of the liquid in the vessel and is usually mounted on a connecting bridge. Although Atlas can replace almost any type of glass level gage, the more expensive flat glass gages are the primary candidates. Atlas can be configured to handle almost any pressure that these gages handle. These flat glass gages are available in either transparent or reflective glass configurations. The transparent glass configuration utilizes two glass plates with one in front and one in back of the gage as shown in Figure 1.

This configuration is used when not only level but also color or interface of the liquid needs to be viewed.

The reflective glass configuration utilizes only one glass plate in the front of the gage as shown in Figure 2.

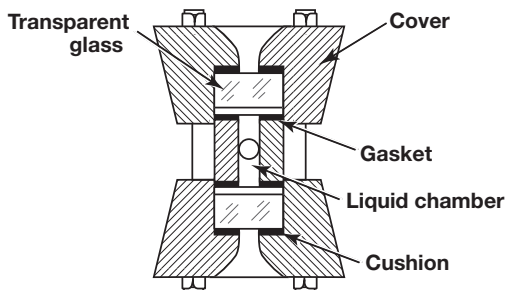


Figure 1

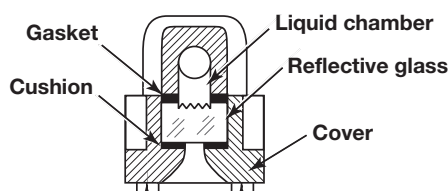


Figure 2

The process wetted side of the glass has multiple bevels to achieve a prismatic effect. This effect will cause light striking the glass in the wetted area to pass into the interior of the gage giving a dark appearance. Conversely, light striking the open or unwetted area causes a reflection or mirror-like appearance. The change in appearance from dark to light indicates the liquid level. The reflective glass units will withstand slightly higher pressures than the transparent glass units.

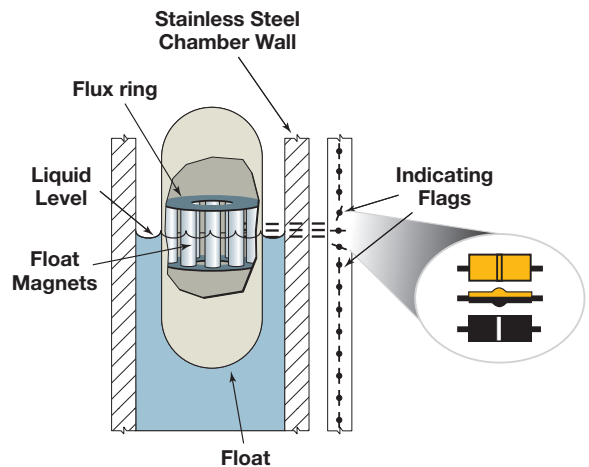


Figure 3

Atlas utilizes the magnetic coupling principle to provide level indication, switch action or continuous level output. Figure 3 shows a cross-section of the unit.

The float travels up and down following the surface of the liquid. The float's integral magnet provides a very precise magnetic field which is transmitted through the chamber wall to the indicator flags. Each flag contains a magnet of its own which reacts with the float magnet to flip the flag when the float passes—revealing a contrasting color. The magnets within the flags couple to prevent inadvertent flipping. Externally mounted switches provide alarm indication by reacting to the float magnet's field. Another measurement option is a resistive reed chain transmitter which provides continuous level monitoring by reading the float's position via the magnetic field.

Atlas' Benefits Safety

The most obvious benefit is the safety of Atlas over glass gages simply due to the use of a metallic instead of a glass pressure boundary. Essentially, the magnetic liquid level indicators are as safe as any other piping connected to the vessel. Since the indicators, switches, and transmitters are externally mounted, they are unaffected by the pressure inside the chamber.

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Atlas' Benefits Safety cont.

Another safety related item is the chemical compatibility of the liquid with the measurement devices. The glass gages need to be concerned with the compatibility of not only the metal liquid chamber but also the gage glass and the gage glass gaskets as well (refer to Figures 1 and 2). Atlas' chemical compatibility is restricted to the float and the chamber which are both metallic.

Maintenance

Outside of safety, several other advantages exist to using Atlas instead of glass gages. One of these advantages is that periodic maintenance is required with glass sight gages to check for leaks as well as cleaning. Scale and product buildup can cause these gages to become unreadable. Atlas' indicator never touches the process, therefore the unit is virtually maintenance-free once installed.

Visibility

Visibility is another major factor since long distance viewing of a glass gage provides no indication of level whatsoever. For the magnetic liquid level indicators, the bright gold flags contrast with the black backside to provide liquid level indication that is visible at up to 100 feet. The Atlas indicator can be adjusted to provide level indication in a different direction than originally installed. This adjustment is simple to perform by loosening the indicator straps, rotating the indicator to the desired position and retightening the straps.

Installation

In many cases the longest single length of a glass gage is approximately 12 inches. Therefore even a short measurement range of 30 inches requires 3 glass gages. In addition to the gages, at least 6 isolation valves are required and multiple pipe fittings and threaded joints making installation more time consuming, cumbersome and expensive. Figure 4 compares a typical glass gage installation with a typical Atlas installation.

Flexibility

The glass level gage provides one type of measurement capability—visual level indication. Atlas is superior in providing the same visual indication; also, it provides the opportunity to expand to other measurement options. The optional alarm switches and/or a continuous level transmitter can be provided. Either option can be provided during initial purchase or can be added later as needed. Since both measurement options are externally mounted, they offer an expansion of Atlas' output capabilities.

Summary

In considering the whole scope of level applications, glass gages are still an economical solution for some installations. For many level applications, Atlas is the common sense choice when keeping these key advantages in mind:

- Increased Safety
- Virtually No Maintenance
- Highest Visibility
- Low Installation Cost
- High Measurement Flexibility

Many customers in the process industries are not aware of an alternative to glass gages. Atlas is the ideal alternative providing visual indication plus much, much more!

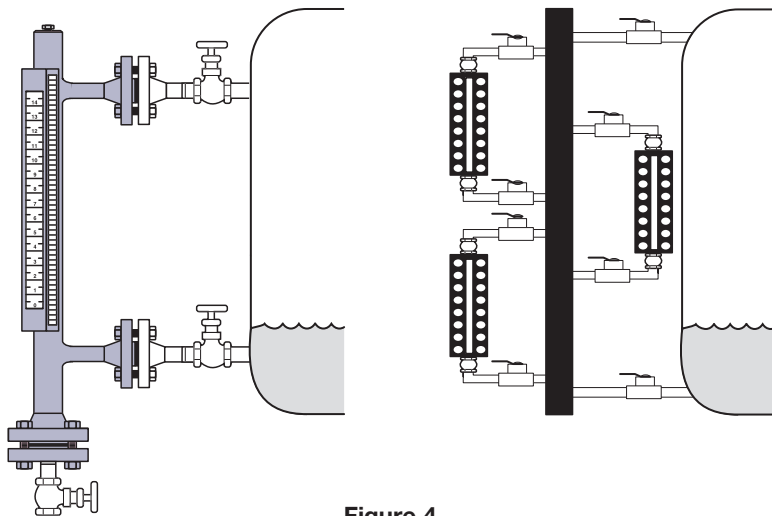


Figure 4



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