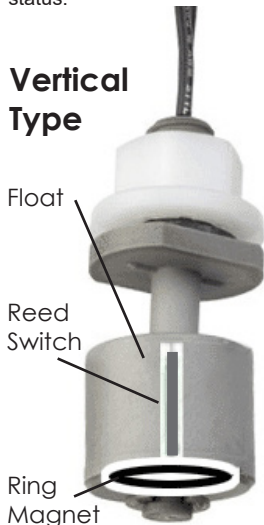


Considering a float switch for your level sensing needs?

If you are thinking about selecting a float switch for a liquid level sensing application, there are a number of factors that need to be considered - including switch and gasket materials, physical arrangement, electrical ratings and cable type - explains **Simon Dear** of Cynergy3 Components

Industrial processes often require devices that are able to sense the level of liquid stored within various types of tank or chamber. The signals from these devices may be used to control the production process or to provide indication of the status.



One of the most reliable technologies for liquid level sensing is a float switch, comprising a magnet contained within a float, as well as a magnetic reed switch within a fixed housing. The movement of the float, due to the changing liquid level, will cause the reed switch to operate (i.e. close or open) at a particular level. This tried and trusted technology is based on a relatively simple design that offers long term reliability without the need for the user to calibrate the switch.

Whilst there are different methods available for selecting the right float switch for an application, the main factors to consider include the following:

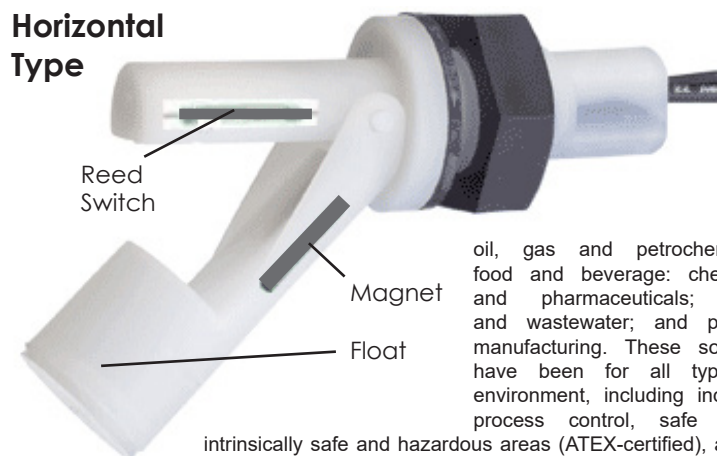
Physical arrangement and style

The choice of styles that may be suitable for an application will depend on the physical arrangement of the tank, the available mounting positions and whether access is available to the inside of the tank. The main styles are horizontal/side mounting and vertical mounting.

The horizontal/side mounting type normally has a fixed housing, which passes through the sidewall of a tank, with a hinged float attached to the fixed housing. Vertical mounting types normally have a fixed vertical stem, which is installed through the top or bottom of a tank, along which slides a cylindrical float.

Another important consideration is whether a build-up of deposits from the liquid on the float body is likely to occur. These deposits can, over a period of time, accumulate to such an extent that the float switch can fail to operate. Whilst particular types of float switch have been developed to limit the effects of this build up, the experience and knowledge of the switch manufacturer is also critical here.

Float switches are seen as one of the most reliable technologies for liquid level sensing



Material matters

A float switch needs to be constructed from the right materials, ones which are compatible with the liquids and temperatures of the particular application. Component damage as a result of incorrect materials selection can ultimately cause failure of a float switch, which may have severe consequences. Typical float switch materials include:

- Nylon: suitable for many oils, diesel, organic chemicals and MEK-based printing inks.
- Polypropylene (PP): suitable for many acids and alkali, detergents, inorganic and organic chemicals, oils and water.
- Polyphenylene sulphide (PPS): suitable for many of the more aggressive chemicals and higher process temperatures, up to 120°C.
- Buna/Nitrophenyl: suitable for many oils, diesel, petrol and water (non-potable applications).
- D300 foam (PVC): suitable for most hydraulic oils and many chemical solutions.
- Stainless steel: suitable for most medical and food applications, chemicals, hydraulic fluids, fuel oils and applications with process temperatures up to 135°C.

Selection of the most suitable materials for both float switch and gasket can be made by referring to a 'Chemical Compatibility' table. For some process liquids, it may be necessary to obtain a sample float switch to test the compatibility.

Electrical

It is important to fully understand the nature of the load that needs to be switched and to ensure that the float switch is capable of handling this load. The electrical ratings, which most manufacturers provide in their float switch specifications, are for purely resistive loads. Any loads that have either inductive or capacitive components should have the appropriate contact protection measure applied.

Cables

In applications where aggressive liquids may spill onto external wiring, it is important to specify particular materials for the cables used to connect to the float switches. There are standard, UL-approved cable types for the various float switches, as well as high temperature, low smoke zero halogen (LSZH) and other specialised materials.

Custom engineered solutions

The operating environment is critical to the choice of float switch. A water tank for an industrial process may only require a simple plastic float switch. However, if the application is in a hazardous area - a petrochemical storage tank where flammable gases, vapours or dust are present, for example - a stainless steel, explosion-proof float switch will be required.

Over the years, Cynergy3 has custom engineered many variants of its float switches to match particular customer requirements in a wide range of industry sectors, including

oil, gas and petrochemicals;
food and beverage; chemicals and pharmaceuticals; water and wastewater; and process manufacturing. These solutions have been for all types of environment, including industrial process control, safe areas, intrinsically safe and hazardous areas (ATEX-certified), as well as WRAS-approved switches for drinking water applications.