

Seven reasons to select a VS pump design in oil and gas applications

David Aldrich, Product Manager from Floway discusses seven benefits of using a VS pump design within oil and gas applications

When selecting a pump type, a user must consider various aspects such as; flow, pressure, Net Positive Suction Head (NPSH), space constraints, piping, and vertical versus horizontal pump orientation. Within the oil and gas industry, where the API 610 standard is required, pump selection is typically between a VS and BB designated pump. The VS design offers the following advantages over the BB type pump.

7 Advantages of the VS designed pump:

1. Thrust/Radial Loads

As a result of the VS design, there are minimal radial loads on the pump shaft and bearings (see Fig. 1). The majority of loads are based on thrust in the axial direction, therefore less expensive bushing type bearings can be used instead of more expensive anti-friction bearings. Also, shaft deflections are minimal which maximizes the bearing and mechanical seal life.

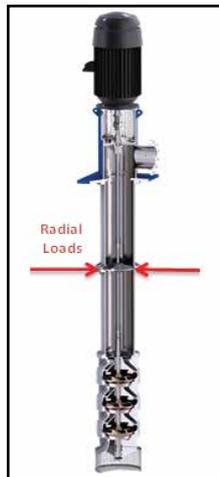


Fig. 1

2. Smaller Footprint

The VS type pump has a smaller footprint than a typical BB type pump.

3. Multi-stage Design

VS1 or VS6 pumps include a multiple stage design which allows for pressure flexibility by altering the number of stages as well as adjusting the impeller trim and varying the speed for a particular pump design. A single stage BB1 pump only allows for changes in pressure via impeller trim variations and/or speed adjustments.

4. Multi-impeller Design

VS1 or VS6 pumps allow for multiple impeller hydraulics to be combined to establish a curve shape to meet a particular customer requirement. A BB1 pump is a single-stage design and consequently does not allow for this hydraulic flexibility.

5. Limited Net Positive Suction Head Available (NPSHa)

In pump systems which include limited NPSHa, pump selection can be dictated by the NPSH Required (NPSHr) of the pump in order to assure proper margin (i.e. 3 ft.) between the two values. The VS pump design allows for the lengthening of the pump in order to increase the NPSHa. Whereas, a BB type pump has no means of increasing this NPSHa value and is solely dependent on minimizing the NPSHr of the pump.

6. Motor Protection From Flooding

Because the VS pump has an elevated motor design, there is less chance for damage in case of flooding (see Fig. 2).

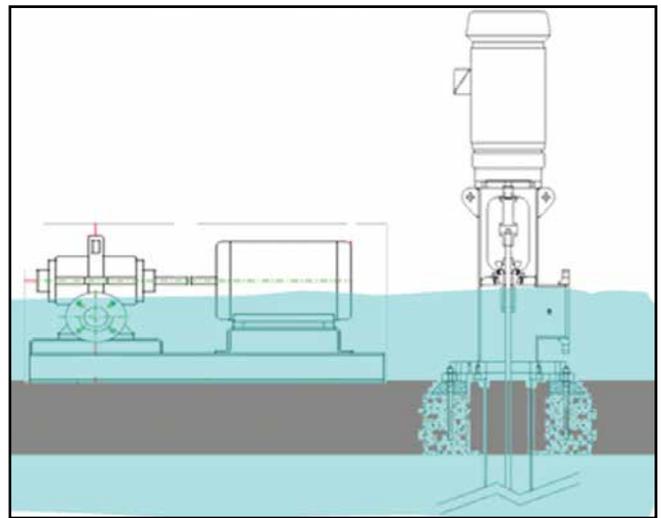


Fig. 2

7. Fluid Flow Uniformity

Since fluid pressure is developed around the full 360° of the casing, the pump operates in nearly perfect hydraulic balance resulting in reduced radial loads. (see Fig. 3).

Because of our significant experience with pump technology, the Floway model VHP VS type is a preferred pump in the oil and gas industry. Its design offers extended bearing and mechanical seal life, has significant flexibility with pressure and hydraulics, has simple means to increase NPSHa, removes the pump from potential flood damage, and operates with reduced radial loads.



Fig. 3

These pump features result in greater flexibility in where and how the pump operates, lower maintenance and repair, and increased overall pump performance and pump life—simply put, the Floway model VHP pump can save oil refineries significant time and money.

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