



### Correct Rotation for Flygt Submersible Pumps

## Check the impeller rotation



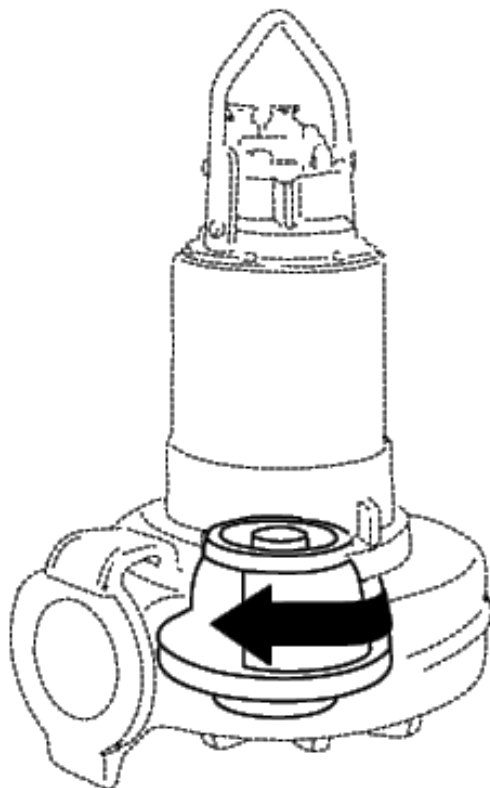

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**WARNING:**

The starting jerk can be powerful.

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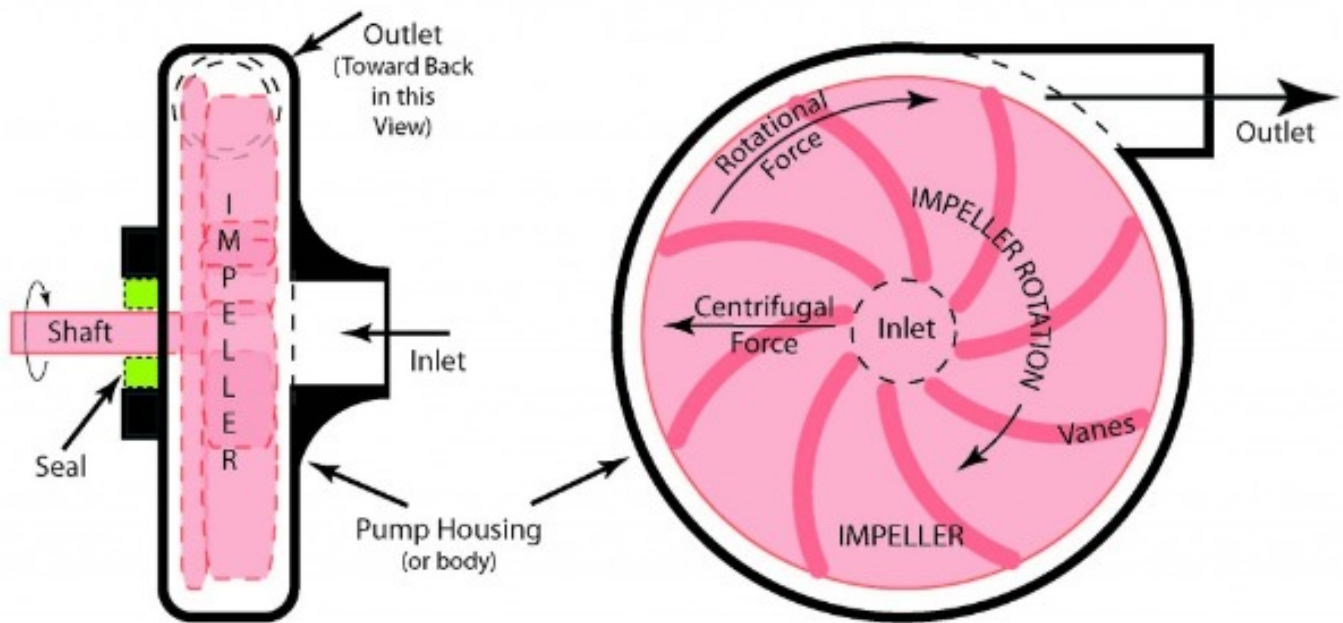
1. Start the motor.
2. Stop the motor after a few seconds.
3. Check that the impeller rotates according to this illustration.



The correct direction of impeller rotation is clockwise when you look at the pump from above.

4. If the impeller rotates in the wrong direction, do one of these steps:
  - If the motor has a 1-phase connection, contact the local ITT shop.
  - If the motor has a 3-phase connection, transpose two phase leads and do this procedure again.

[More General Information on Impellers](#) —————→



In a centrifugal pump, liquid enters the pump directed at the center of a rotating impeller. The impeller has raised vanes shaped to impart centrifugal and rotational force to the liquid. The combination of centrifugal and rotational force propel the liquid to the outlet which is positioned tangential to the impeller's direction of rotation. A liquid tight seal on the shaft driving the impeller prevents liquid from leaking from the pump body while still allowing the shaft to rotate.

\*\*\*\*\* **Also Please Note: The Direction of rotation is often marked on pump housing**\*\*\*\*\*

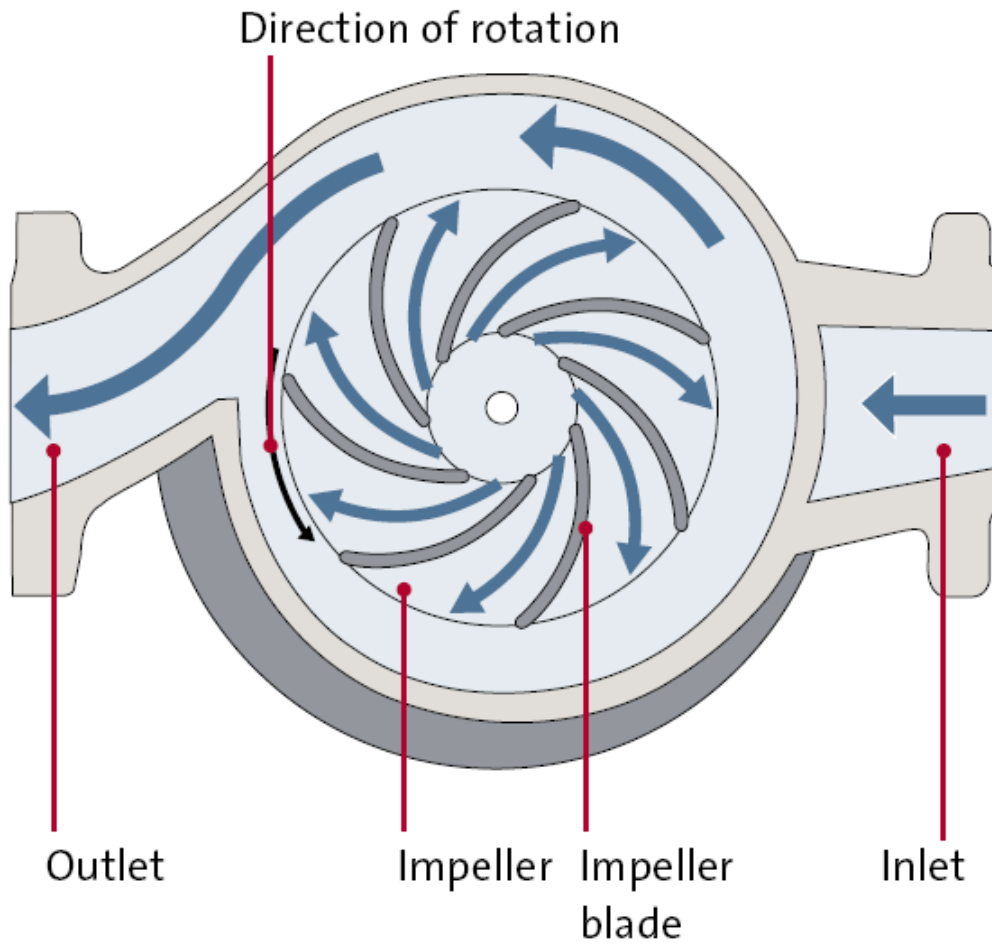


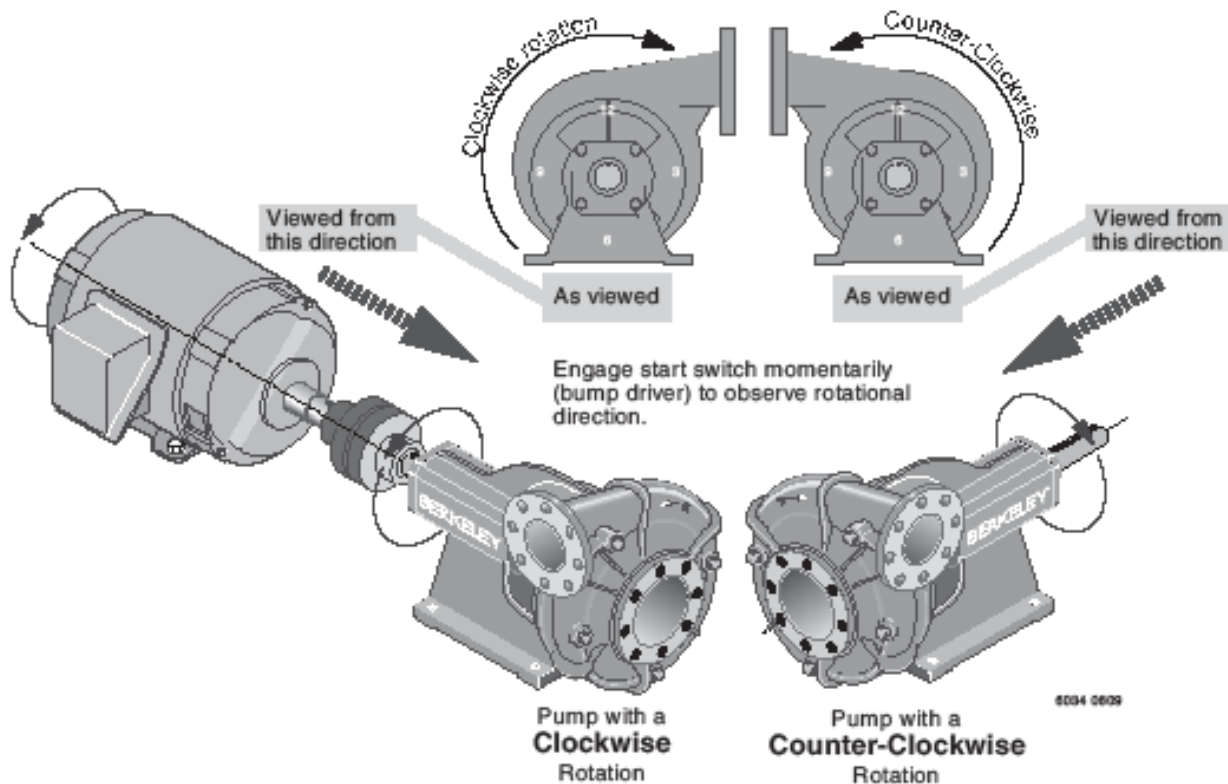
Figure 1.1: Fluid path through the centrifugal pump.



**Looking At End of Pump**

## Start-up

# Determine Pump Rotation



- **Electric Motors:**

**Single Phase:** Refer to wiring information on the motor plate to obtain proper rotation.

**Three Phase:** If pump runs backwards, reverse any two leads coming off incoming power (L1, L2, L3) until proper rotation is obtained. Reverse L1 and L2, or L2 and L3, or L1 and L3.

- Pump running backward - Centrifugal pumps will still pump liquids, however, GPM and head will be a fraction of the published performance.

- **Engine Driven:**

If engine is used for pump driver, check with engine instruction and operation manual or engine manufacturer to determine how rotation is defined, then use above illustration for proper connection.

## Impellers

The energy is transferred from the shaft to the impeller and from the impeller to the water. There are three types of impellers, based on the number of **shrouds**<sup>17</sup>:

- Closed impeller – When an impeller has a shroud in the front and in the back.
- Semi-open impeller – When there is only a shroud in the back of the impeller.
- Open impeller – When there are no shrouds.

The impeller type is selected by the pump manufacturer to meet specific conditions.



The rotation of the pumping vanes may also seem to run backwards as one may think to "draw" the liquid into the pump housing.

Since the designs of the vanes are like small crescent moons or cups, you may think that the cups would "scoop" the water to move the liquid from the low-pressure side to the high-pressure outlet.

In fact, the water vanes move in such a way as to use the curves to "pull in" or "suck" the liquid by the action of the rotating crescents or cups.

In other words, the curved portions of the vanes pull in the liquid by the crescents passing in front of the inlet port. As the liquid moves to the other side of the chamber, it becomes slightly compressed and wants to exit from the outlet port due to its higher, squeezed pressure.