

# GUNT FEMLine

## Water pump training part 1 roto dynamic pumps

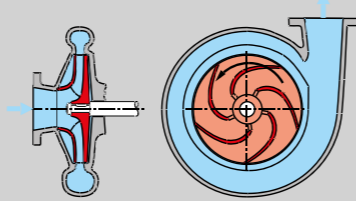
Water pumps are driven machines. They can be designed as positive displacement pumps or rotodynamic pumps. The selection of the correct pump type is crucial when designing industrial systems or installing a pump. This is why it is important

that future engineers understand the characteristics of pumps and interpret diagrams to be able to distinguish between the different types of pumps.

### 1<sup>st</sup> part

#### Rotodynamic pumps as water pumps:

The centrifugal pump is the most common water pump. It belongs to the group of rotodynamic pumps. The water pump training from GUNT offers four different types of centrifugal pumps, based on which students can learn about the mode operation and the differences of these types:



#### Standard design centrifugal pump

Standard pumps are pumps that are designed in accordance with international standards. The standard defines rating schemes and key dimensions so that standard pumps from different manufacturers can be exchanged without replacing the piping and ground plate.



HM 365.11  
Centrifugal pump, standard design

#### Centrifugal self-priming pump

Self-priming pumps are able to suck in and transport air and water. In contrast to a simple centrifugal pump, they can also be started if there is air in the intake line. This is possible because of an additional side-channel suction stage that removes the air from the intake line and creates the negative pressure that is needed to suck in the fluid.



HM 365.12  
Centrifugal pump, self-priming

#### 4-stage centrifugal pump

In centrifugal pumps with multiple stages, several impellers are arranged in series. This allows the pump to overcome large differences in head.



HM 365.13  
Centrifugal pump, multistage

#### Different circuit configurations for centrifugal pumps

In complex systems, pumps can be connected in series or in parallel. In series operation the head is the sum of the individual heads; in parallel operation the flow rates of the individual pumps are combined.



HM 365.14  
Centrifugal pumps,  
series and parallel connected

#### Side channel pump

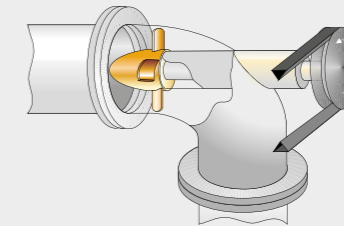
Side channel pumps form a category between positive displacement pumps and rotodynamic pumps. During the suction phase the side channel pump operates according to the positive displacement principle. As soon as the suction process is over, the side channel pump starts working like a centrifugal pump. The centrifugal force of the rotating impeller separates the fluid and gas. Side channel pumps are therefore self-priming pumps.



HM 365.15  
Side channel pump

#### Axial-flow pump

Axial-flow pumps are also known as propeller pumps. Axial-flow pumps come with fixed blades and with variable blades. The flow passes through the impeller in axial direction. In axial-flow pumps, the pressure is not built up by the effect of centrifugal force but, like the aerodynamic principle, by the propeller blade. Propeller pumps are not self-priming pumps. They are used when high flow rates and a small head are needed. The typical areas of application for propeller pumps are drainage systems, wastewater treatment plants and cooling water supply systems.

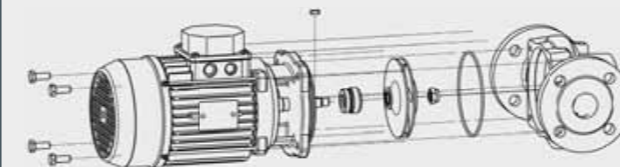


HM 365.45  
Axial-flow pump

#### Sectional models and assembly training



HM 700.17 Cutaway model: centrifugal pump



MT 185 Assembly & maintenance exercise: in-line centrifugal pump exploded drawing of an inline centrifugal pump

To complete the water pump training, GUNT offers **sectional models and assembly and maintenance training** for different pumps. Please refer to catalogue 4 for more information on these devices.

MT 181 Assembly & maintenance exercise: multistage centrifugal pump

