ENGINEERED SUBMERSIBLE SOLUTIONS

Designed to complement the **Hayward Tyler** motor range, our submersible solutions offer a comprehensive choice for the materials of construction. The pump duty is matched to customer requirements by selecting the pump size, number of stages and trimming the impellers. The applications are usually seawater lift or firewater pumps. The pumps are supplied, fitted to and powered by a submersible motor.

The advantages of Submersible Driven Sea Water Lift Pumps over Line Shaft Units

Weight
The total weight of a submersible unit is normally significantly less than an equivalent line shaft unit.

Space
The footprint and vertical space required for the submersible's spool piece is considerably smaller.

Noise
A submersible pump will only generate noise from the movement of the pumped fluid through the pipes at deck level, and as a result has minimal noise considerations.

Vibration
The submersible support structure (rising pipe) is well defined and modelled, negating structural vibration concerns.

Utilities
The submersible unit only requires electrical power for the motor and anti-fouling system.

Maintenance
The submersible's maintenance requirement is significantly simpler than a line shaft unit.

Area Classification
A fluid filled submerged motor is in an intrinsically safe environment.

Cost & Ease of Installation
A submersible unit requires a straightforward installation requiring minimal manpower allocation.

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Submersible Motors

Model	Power (50Hz)	Speed
V	75 to 150 kW 30 to 75 kW	2P 4P
P	130 to 225 kW 100 to 130 kW	2P 4P
Q	225 to 350 kW 150 to 225 kW	2P 4P
K	350 to 400 kW 250 to 350 kW	2P 4P
Engineered	400 to 5,000 kW	2P 4P 6P 8P

The squirrel cage induction motor is a 'wet' type in which a clean water and preservative blend is circulated between the rotor and stator and throughout the windings, with the return path through the stator slots. This circulation ensures efficient cooling of the conductors and enables a high power output to be obtained from a small frame size motor. The motor is wound with a thermoplastic insulated cable that is impervious to water. The standard insulation system has a temperature classification of "Y" which is suitable for use up to 90C (194F) and is available for voltage from 380 volts to 11kV.

A high duty water lubricated tilting pad type thrust bearing, with a self-aligning seat, is located within the motor enclosure. The Hayward Tyler thrust plate consists of an in-house developed engineered polymer resin impregnated material, T2, and the pads are of hardened stainless steel. The radial bearings are of the water-lubricated type lined with phenolic resin bushes.

The forged rotor shaft is carbon steel to BS970 Gr070M20 with a stub shaft material specification to suit the pump application.

The shaft is sleeved with renewable hardened stainless steel journal sleeves.

A mechanical seal prevents entry of seawater when the motor is immersed, irrespective of whether the motor is in operation or not.

The Hayward Tyler engineered submersible motors are similar to the standard design with the following observations:

- The winding cables are specifically selected for the application to maximise operating life. Hayward Tyler mould the electrical connections within the motor to ensure the complete motor insulation system is of a high uniform grade.
- The pressure volume compensating device balances the changes in internal and external pressure.
- The thrust bearing is sized to handle the thrust transmitted to the motor by the close-coupled pump, or other driven equipment. The journal bearings for the smaller motors, up to approx. 300 kW, have a tilting pad type journal bearing similar to those used for the thrust bearing.

Function

Standard submersible motors and pumps are sold as complete units for offshore platforms. The applications include 'seawater lift' and 'firewater' pumping.

The seawater lift pumps provide the cooling water on the platform topsides.

The firewater circuit is maintained at a constant pressure by the jockey pumps, with the firewater pumps auto starting during an emergency situation.

The engineered motors would usually be supplied as the drive unit for seawater lift pumps, but not exclusively.

Key Features

- Efficient cooling system; water has superior thermal conductivity over the oil fill
- Heat balanced system; a motor that runs cooler runs longer
- Higher unit efficiencies over oil filled motors
- Header tank provides visual health check
- Pressure compensator ensures low differential pressure on the motor seal
- Diaphragm accommodates dynamic volume change

HAYWARD TYLER

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pushing the boundaries of motor technology

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