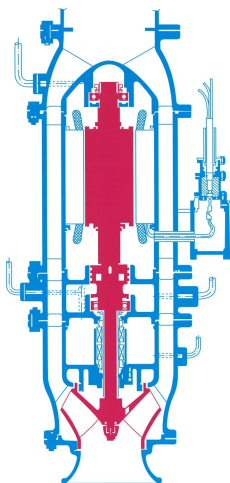


SMV, SMRV

Submersible Pumps



TORISHIMA PUMP

General

Submersible pumps are widely used for deep wells, construction projects and factory applications, because of their ability to be used under water.

The merits of submersible pumps have been recognized and they are now being used at public waterworks, sewerage and agriculture projects. Torishima manufacture its first large submersible pump and the first of its kind in Japan in 1963 after many years' research. We have supplied hundreds of submersible pumps to various users throughout the world. Submersible pumps provide as great a reliability factor as ordinary pumps installed on the surface, and they have established a solid reputation for superior service under all conditions.

Operating Range

Sizes	I.D.	150 ~ 1500 mm
Total heads	H	2 ~ 70 m
Capacities	Q	1.5 ~ 350 m ³ /min

Applications

Public waterworks, sewerage . . .	Water intake, water distribution, water supply, booster, drainage
Agriculture	Irrigation, drainage
Thermal or unclear power plants .	Water intake, water circulation, water supply for miscellaneous uses.
Construction	Water supply and drainage
Industry	Water supply, cooling water, drainage
Buildings	Drainage, waste water drainage

FEATURES:

1. Since both the pump and motor are submerged, and only delivery bend is above ground, no pump house is required. Cranes are not required for installing medium and small capacity types.
2. Compact and lightweight. Use of heavy duty bearings allows vertical, horizontal or inclined installation. Surface installation is also possible.
3. Minimum installation space required, reducing construction cost substantially.
4. Since both pump and motor are submerged, noise almost totally eliminated.
5. Simple construction and the elimination of an intermediate shaft simplifies assembly and disassembly, and allows unskilled personnel to service the unit.
6. Starting is easy since the pump is submerged. Unattended operation, e.g. automated operation and remote control operation are possible.
7. This submersible pump has high overall efficiency with a minimum number of bends and flow liquid in the axial direction.
8. Various combinations of mixed flow or axial flow pumps with perfect water sealed or oil sealed motors by mechanical seals are available to allow you to select the type most suitable for your particular requirements.
9. Due to complete sealing, there is no fear of water entry into the motor.

SMV type Submersible Pump

Construction (water-sealed)

Bearing

Mitchell type axial thrust bearings of solid lubricant and stainless steel are used to support axial thrust forces while radial thrust is supported by special bronze cylinder bearings.

Both bearings are lubricated and cooled using the water used for motor sealing.

Insulation:

Special waterproof insulated wire is used for voltages up to 3,300V.

Antirust treatment

Anticorrosion material and special waterproof paint are applied on the pump.

Shaft seal

The double shaft sealing system consists of two chambers. Motor chamber and two buffer chambers are sealed from pumping water with a sand guard, oil seal and two mechanical seals respectively. Water can be fed into the upper buffer chamber from a head tank installed on the ground.

Protection devices

For added safety under special conditions, the following protective devices can be attached to the pump. Overcurrent preventive device, insulation-resistance detector, vibration detector, thrust bearing wear detector, sealing water leakage detector, coil burn preventive device and antifreeze system for sealing water.

Respiration of sealing water

To compensate for sealing water expansion or contraction due to temperature changes in the motor, the bottom buffer chamber is connected with the outside air via a pipe, to adjust sealing water respiration.

Construction (oil-sealed type)

Bearing

No bearings come into contact with water. Strong angular contact ball bearings (thrust bearings), ball bearings or roller bearings are used. Compared to watersealed types, it has a simple construction.

Pumps of this type can endure high speed operation and high loads, and can be installed horizontally, vertically or inclined.

Insulation method

Terminal box has double casing for positive insulation, and easy disconnection of cable. Heavy-duty underwater cable is used for more positive, long time insulation.

Shaft seal

In addition to our exclusive mechanical seals, slingers, and dust seals are used to remove sand and mud from the sealing area.

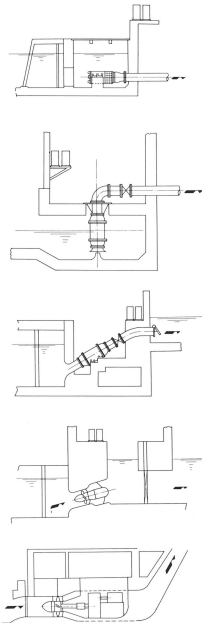
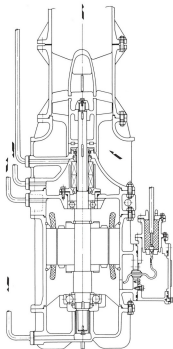
Protective device

The head tank for oil lubrication, installed on the ground is located higher than the water level, to assure that no outside water can enter into the motor.

If any mechanical seal malfunction or other failure occurs in any chamber, the nature of the failure and its location can be quickly determined by checking the oil level of the relevant head tank. If a liquid level relay is attached to the head tank, the pump can be controlled remotely.

Features

1. With its oil-sealed motor, this type is suitable for low-to-medium heads with pumps of 200-800mm or for high heads with pumps of less than 200mm.
2. Simple construction. The suction mouth is placed between motor and pump.
3. This type is designed so that the penetrating parts of the motor shaft and sealing is at the low pressure side of the pump. This provides a higher degree of safety and allows it to be used as multi-stage pump.
4. No motor outer casing is required, so gross weight is lighter and the cost is lower.
5. When a high head is required, this pump can be executed as multi-stage pump.
6. This pump is for underwater operation only.

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