Performance Range

Type of Installation

Above floor installation

Two-floor installation

Pump motor unit

Below floor installation

References

Pumps beyond the standard range are also available.

References:

- Cooling water pump for P.A.I. Shuabba, Kuwait (Size: 1,400mm, Driver: 1,500kW)
- Vaporizing pumps in LNG Plant, Korea
- Various seawater pumps in Al Taweela MSF desalination plant, Abu Dhabi, UAE
- Brine recirculation pump for Sabia MSF desalination plant, Kuwait (Size: 1,600mm, Driver: 3,550kW)
- Circulating water pump for Mesaieed A WPP project, Qatar (Size: 1,500mm, Driver: 1,500kW)
Vertical Mixed-Flow Pump

The TORISHIMA SPV is a vertical, mixed-flow pump suitable for a wide range of applications. Whatever process you operate; Power, Desalination, Petrochemical, LNG, Water Treatment or Supply, Drainage or general industries, the complete plant operation depends on the reliable performance of the main intake, cooling or seawater pumps. Torishima’s reputation for providing reliable mixed flow pumps to operate in critical processes is second to none. With several thousand pumps operating worldwide you can count on Torishima pumps to be the driving force behind your pumping requirements.

Applications

- Power
  - Cooling Tower and Cooling Water Circulation
- Desalination
  - Seawater Intake
  - Brine Recirculation / Blowdown
  - Distillate
- Petrochemical
  - Seawater Intake
  - Seawater Transfer
  - Water Transfer
- Water, Wastewater, Drainage
  - River water intake
  - Water Transfer
  - Waste or Storm Water Sump Drainage
  - Irrigation Supply and Land Drainage
  - Flood Control
- Industries
  - Cooling Water
  - Fire and Service Water

Technical Data

- Head : 3 to 100 m (10 to 330 ft)
- Capacity : 600 to 81,600m³/h (2,600 to 360,000 USgpm)
- Temperature : -10 to +80 °C (14 to 176 °F)
- Size : 300 to 2,800mm (12" to 110")

Materials

Critical applications require pumps from a reliable manufacturer who has proven experience in a wide range of applications and materials. Torishima provides a wide range of expertise in material selection and has experience in manufacturing pumps from the following materials:

- Pump Diffuser Casing and Impellers
  - Duplex and Super Duplex Stainless Steel
  - Stainless Steel
  - Cast iron, Ductile iron, Ni Resist Cast Iron
  - Bronze, Aluminium Bronze
- Shaft
  - Duplex and Super Duplex Stainless Steel
  - Stainless Steel
  - Carbon Steel,
- Discharge Bend and Rising Main
  - Duplex and Super Duplex Stainless Steel
  - Stainless Steel
  - Cast iron, Ni Resist Cast Iron
  - Carbon Steel

Specific material grades are available on request.

Product Life Cycle Support

The mixed flow pumps are always operated under the most arduous conditions particularly for seawater intake and drainage applications. Unexpected operating conditions can occur on site, so it is important that the pump supplier understands the complete plant design. As a qualified plant supplier Torishima can provide a wide range of technical design services to extend the lifecycle of your mixed flow pumps.

Torishima Design Services

- Intake sump modelling
- Finite Element analysis
- 3D Flow Modelling
- Noise and Vibration Analysis
- Model Pump Testing
- Surge Analysis

Torishima Site Support

Torishima’s site service capability backed by our design expertise ensures the best service for our customers. Our global team can provide network installation & Commissioning, Pump Performance Testing, Overhaul, Maintenance vendor management.

Torishima - Research and Development

To provide reliable and energy efficient mixed-flow pumps, our experienced engineers are dedicate to:

- Pump Hydraulic Development and Model Testing
- Bearing design and development
- Computer aided model pump design
- Mechanical Seal Development

Reliable Design

Thrust Bearings Options

Bearing are designed to provides:
- Low bearing temperature rise
- Maximum maintenance intervals
- Safe reverse running

Location
- Thrust by driver / Thrust by pump mounted thrust bearing

Designs
- Antriction (Grease and Oil) / Tilting Pad type (Oil)

Cooling
- Air cooled / Water cooled

Shaft Seal

Torishima sealing options are designed for:
- Minimum maintenance
- Reduction in external flushing
Seals Available
- Gland packing / Mechanical seal

Flushing plans
- Wide range available from self flushed (with no external piping) to recirculation via filtration, to API plans.

Guide Bearing

Torishima has significant operating experience in applications where no pre-lubrication of the bearings is required. The method provides:
- Simplified control and operation
- Low risk of pump failure
- Extended life of intermediate bearing
- Environmentally friendly

The options which are available at present are
- Ceramic / Thermo Plastics
- Cutless rubber / Carbon

Hydraulic Design

Impeller and diffuser designs are based on proven model designs and incorporate a wide range of pump specific features to provide:
- Stable performance
- Lower power consumption
- Higher operating efficiency
- Lower NPSHR characteristics

Impeller designs available are
- Open / Semi-open / Closed

Diffuser designs available
- Cast Type / Fabricated Type

Shaft Design to ensure:
- Low risk of vibration
- Maximum life
- Safe shaft critical speed throughout the operating ranges

Thrust Balance

Dependent on the duty conditions, Torishima pumps incorporate a range of axial thrust compensation designs to provide:
- Improved reliability
- Extended bearing life
- Lower thrust loads

Balance methods available are
- Back wear rings & Balance holes / Back vane
Options to meet clients’ needs

- Fabricated main stational parts
- Reduced weight
- Reduced spare parts cost
- Reduced capital cost
- High efficiency

Non-pull-out type
- Reduced maintenance cost and time
- Elimination of standby pump, spare rotor can be held as spare parts

Rotor pull-out type
- Energy cost saving
- The operating point can be adjusted to achieve the heat efficiency point for energy cost saving.

Blade pith adjustment
- Low NPSH

Canister type (SPTV)