A World-leading Pump Manufacturer since 1919

Founded in 1919 in Osaka, Japan, Torishima has been contributing to society by providing engineered pump solutions across all industries for over 90 years, and established a solid reputation for high technology in pumps. The Torishima brand is built on reliability, flexibility, and customer satisfaction.

A Pioneer in Pumps for Seawater Desalination

The usable fresh water in the world amounts to 0.01% of the world’s water. There is no doubt that water demand is increasing with the growth of population and industrialization. Consequently the necessity of seawater desalination plants is rapidly increasing. This requires innovative pumping solutions to provide clean drinking water to all.

Desalination pumps are required to operate in harsh climates 24 hours a day, 365 days a year; they must be highly durable, resistant to corrosion from seawater, and outstanding efficiency to minimize power consumption.

Torishima has met the challenge of those demands, and has supplied pumps for a wide range from low to high pressure applications for all desalination processes, MSF, MED and RO, for 40 years. There are now over 2,100 pumps operating in desalination plants in about 20 countries around the world. Our global desalination projects include some of the largest desalination plants currently in operation.
Pumps for Thermo Desalination System

Flowchart of Multi-stage Flash System

Flowchart of Multi-effect Distillation System

CDKS
Horizontal radially split double-suction pump
- Capacity: up to 1,000m³/hr
- Total head: up to 300m
- Size: 500 to 1,000mm

CDKTV
Vertical double-suction pump with canister
- Capacity: up to 10,000m³/hr
- Total head: up to 100m
- Size: 500 to 1,000mm

CDM
Horizontal axially split double-suction pump
- Capacity: up to 1,500m³/hr
- Total head: up to 300m
- Size: 500 to 1,000mm

CPC
End-suction volute pump
- Capacity: up to 1,500m³/hr
- Total head: up to 220m
- Size: 3 to 350mm

MMTV
Vertical mixed-flow multistage pump with canister
- Capacity: up to 2,000m³/hr
- Total head: up to 300m
- Discharge pressure: up to 4MPa (39.2bar)
- Size: 45 to 650mm

SPSY
Horizontal mixed-flow volute pump
- Capacity: up to 10,000m³/hr
- Total head: up to 100m
- Size: 350 to 1,500mm

SPTV
Vertical mixed-flow pump with canister
- Capacity: 800 to 8,000m³/hr
- Total head: up to 100m
- Size: 300 to 3,000mm

SPV
Vertical mixed-flow pump
- Capacity: 800 to 8,000m³/hr
- Total head: up to 100m
- Size: 300 to 3,000mm

* MSF / MED Application Chart

<table>
<thead>
<tr>
<th>Pumps for Thermo Desalination System</th>
<th>CDKS</th>
<th>CDKTV</th>
<th>CDM</th>
<th>CPC</th>
<th>MMTV</th>
<th>SPSY</th>
<th>SPTV</th>
<th>SPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seawater Intake Pumps</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brine Recirculation Pumps</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brine Blowdown &amp; Distillate Pumps</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brine Heater Condensate Pumps</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Seawater Recirculation Pumps</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Potable Water Pumps</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Pumps for Reverse Osmosis System

Flowchart of Reverse Osmosis System (With Pressure Exchanger System)

Energy Recovery System

In the reverse osmosis seawater desalination system, high pressure enriched seawater is produced simultaneously with product water.

The running cost of the plant can be reduced significantly by recovering energy of the enriched seawater utilizing an energy recovery system.

We can provide pumps for all types of energy recovery systems.

*RO Application Chart

<table>
<thead>
<tr>
<th></th>
<th>CDK8</th>
<th>CDM</th>
<th>CFHV</th>
<th>CPC</th>
<th>CBR</th>
<th>MHB</th>
<th>MML</th>
<th>MSH</th>
<th>MSH-T</th>
<th>SPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seawater Intake &amp; Filtered Water Pumps</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Pressure Pumps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERD Booster Pumps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Pass Feed &amp; Back Wash &amp; Flushing Pumps</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potable Water Pumps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CDK8
- Horizontal radially split double-suction pump
- Capacity: up to 3,000m³/hr
- Total head: up to 300m
- Size: 200 to 500mm

CDM
- Horizontal axially split double-suction pump
- Capacity: up to 3,000m³/hr
- Total head: up to 300m
- Size: 200 to 1,400mm

CFHV
- Vertical centrifugal volute pump
- Capacity: up to 1,000m³/hr
- Total head: up to 125m
- Discharge: up to 10,784m³/hr
- Size: 40 to 100mm

CPC
- End-suction volute pump
- Capacity: up to 1,000m³/hr
- Total head: up to 100m
- Size: 200 to 500mm

CBR
- End-suction volute pump
- Capacity: up to 2,000m³/hr
- Total head: up to 70m
- Size: 125 to 400mm

MHA
- Horizontal end-suction multistage ring section pump
- Capacity: up to 200m³/hr
- Total head: up to 400m
- Size: 125 to 250m

MHH
- Axially split multi-stage pump
- Capacity: up to 200 to 800m³/hr
- Total head: up to 800m
- Size: 100 to 300mm

MML
- Horizontal multi-stage ring section pump
- Capacity: up to 1,000m³/hr
- Total head: up to 500m
- Size: 40 to 300mm

MSH
- Horizontal axially split multi-stage volute pump
- Capacity: up to 1,000m³/hr
- Total head: up to 800m
- Size: 100 to 300mm

MSH-T
- Horizontal twin-suction axially split multi-stage pump
- Capacity: up to 3,000m³/hr
- Total head: up to 800m
- Size: 200 to 350mm

SPV
- Vertical mixed-flow pump
- Capacity: up to 600 to 80,000m³/hr
- Total head: up to 600m
- Size: 300 to 2,400mm
Torishima engages in our best efforts to improve pump performance through test, R&D and aftermarket service.

**Materials**
- Torishima can meet the customers' needs and suggest the most appropriate materials for each seawater desalination plant.
  - Super Duplex Stainless Steel
  - Duplex Stainless Steel
  - Austenitic Stainless Steel
  - N-Resist
  - Any others on customers’ request

**Testing**
- Torishima has the full test facilities for pumps for seawater desalination and always conducts a performance test before delivery. Our quality procedures and continual testing ensures the high quality standards.

**Research & Development**
- Torishima is fully committed not only to providing innovative designs for future applications but the continual improvement of existing designs to maximize efficiency and increase the reliability of pumps for seawater desalination.

**Service Solutions**
- Torishima continues to develop its global network of service solutions to deal with customers' needs all around the world. Our innovative solutions can enhance performance and increase the life span of pumps. This allows operators to maximize efficiency, reduce maintenance costs and conserve energy.

**Typical Applications**
- 1st Pass RO HP Pump
  - Location: Fujairah, UAE
  - Project: Fujairah Water Desalination Plant
- Main Pump
  - Location: U.A.E.
  - Project: Showashin Water Transmission Scheme
- 1st Pass RO HP Pump
  - Location: China
  - Project: Marta Desalina de Agua de Mar Val de Copaco
- 2nd Pass RO HP Pump
  - Location: China
  - Project: Jeddah Air
- 3rd Pass RO HP Pump
  - Location: Japan
  - Project: NIMCO

**High pressure pump**
- String test of high pressure pump with energy recovery turbine for RO desalination system

**CFD Computstrial Fluid Dynamics**
- Analysis of visible shapes

**FEM (Finite Element Method)**
- Analysis of structures

**Hydraulic pressure test**
- Particle Image Velocimetry (PIV) measurement

**Covering Middle East**
- India
- U.A.E.
- Saudi Arabia
- Pakistan
- Turkey

**Covering Europe**
- Russia
- Ukraine
- Germany

**Covering Southeast Asia**
- Indonesia
- Malaysia
- Singapore

**Covering China**
- Australia
- New Zealand
- India

**Covering South East Asia, Oceania**
- Japan
- U.S.A.