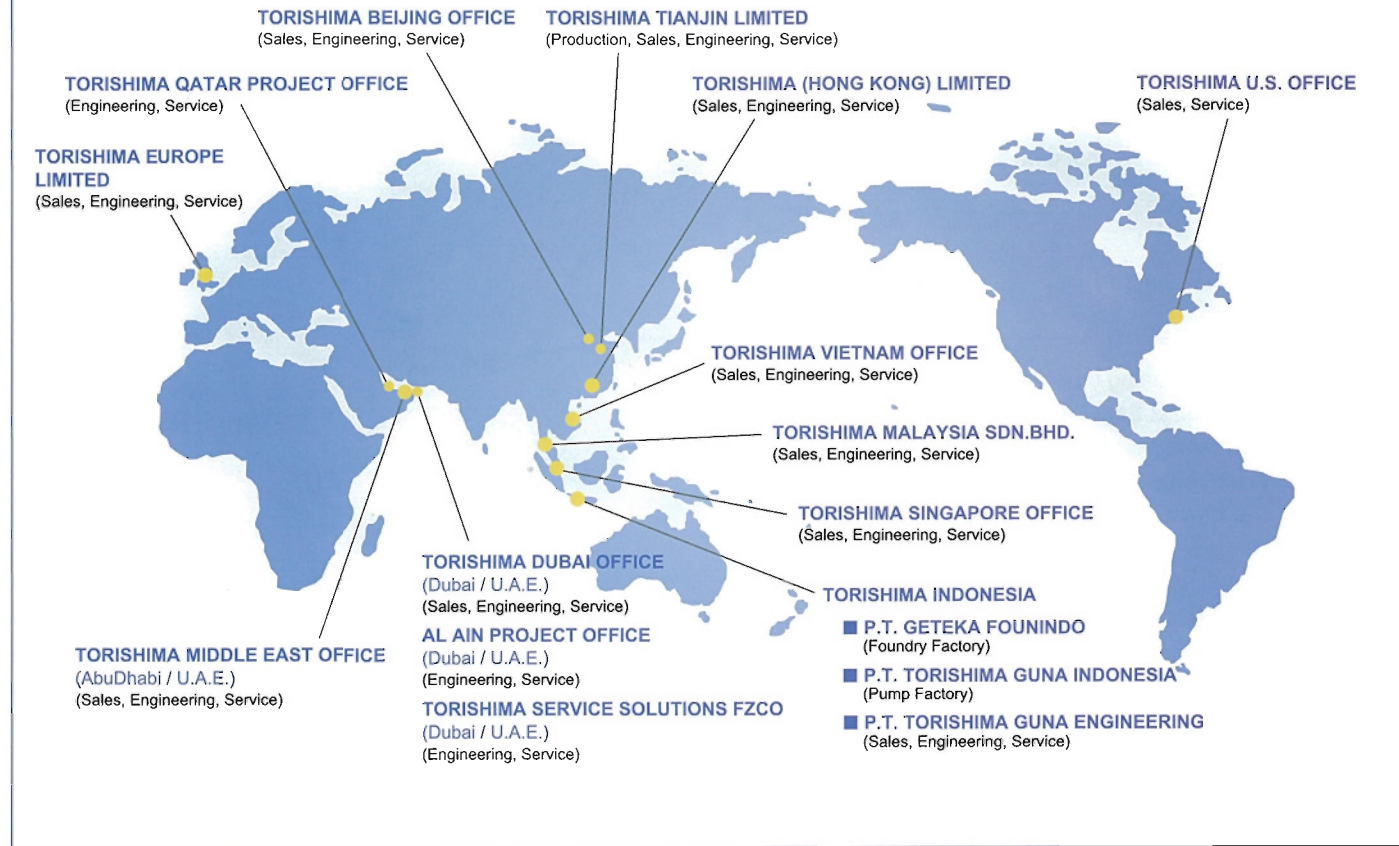


TGT
TORISHIMA GLOBAL TEAM Global Network



TORISHIMA PUMP MFG. CO., LTD.

Head Office & Works: 1-1-8, Miyata-cho, Takatsuki City, Osaka, Japan. Phone: 072-695-0551 Fax: 072-693-1288

TORISHIMA CHINA

BEIJING OFFICE
 Rm707, Building 1, KUNSHA CENTER,
 No.16 Xinyuanli, Chaoyang District, Beijing,
 P.R. China PC: 100027
 Phone: (86)10-8468-2891 Fax: (86)10-8468-2890

TORISHIMA TIANJIN

TORISHIMA TIANJIN LIMITED
 to be opened in Dec. 2010

TORISHIMA HONG KONG

TORISHIMA (HONG KONG) LIMITED
 Unit 605, 6/F., Tower II, Enterprise Square,
 9 Sheung Yuet Road, Kowloon Bay,
 Kowloon, Hong Kong
 Phone: (852)2795-1838 Fax: (852)2754-3293

TORISHIMA VIETNAM

VIETNAM OFFICE
 No.76 Bui Thi Xuan Street, Hai Ba Trung
 District, Hanoi, Socialist Republic of Vietnam
 Phone: (84)4-943-7880 Fax: (84)4-943-7876

TORISHIMA SINGAPORE

SINGAPORE OFFICE
 30 Ubi Crescent #01-02 Ubi Techpark
 Singapore 408566
 Phone: (65)6779-0123 Fax: (65)6779-6900

TORISHIMA MALAYSIA

TORISHIMA MALAYSIA SDN.BHD
 Lot 19, 1st Floor Bangunan Ipmuda
 Jalan 13/2 46200 Petaling Jaya Selangor
 Phone: (60)3-7960-5771 Fax: (60)3-7960-5772

TORISHIMA INDONESIA

PT TORISHIMA GUNA INDONESIA
 Jalan Rawa Sumur Timur No.1,
 Pulogadung Industrial Estate,
 Jakarta 13930, Indonesia
 Phone: (62)21-460-3963 Fax: (62)21-460-3937

PT TORISHIMA GUNA ENGINEERING

Jalan Rawa Sumur Timur No.1,
 Pulogadung Industrial Estate,
 Jakarta 13930, Indonesia
 Phone: (62)21-460-3963 Fax: (62)21-460-3937

PT GETEKA FOUNINDO(Foundry Factory)

JL Pulo Ayang Kav. AA2
 Pulogadung Industrial Estate,
 Jakarta 13011, Indonesia
 Phone: (62)21-460-3963 Fax: (62)21-460-3937

TORISHIMA U.A.E.

MIDDLE EAST OFFICE
 5th Floor, office No.503, Al Salmeen
 Golden Tower, P.O Box: 53567,
 Electra Street, Abu Dhabi, U.A.E.
 Phone: (971)2-674-3880 Fax: (971)2-674-3881

DUBAI OFFICE

Office No.304 Building No.1979, Ahmed S.A.Al
 Amri Baesha Area, Dubai, United Arab Emirates
 P.O Box: 283175, Dubai, U.A.E.
 Phone: (971)-4-430-9404 Fax: (971)-4-430-9403

AL AIN PROJECT OFFICE

TORISHIMA SERVICE SOLUTIONS FZCO

TORISHIMA QATAR

QATAR PROJECT OFFICE
 Office No.11, 1st Floor, West Bay Corner
 Building, Salwa Road, Doha, Qatar
 Phone: (974)450-6915 Fax: (974)450-6916

TORISHIMA EUROPE

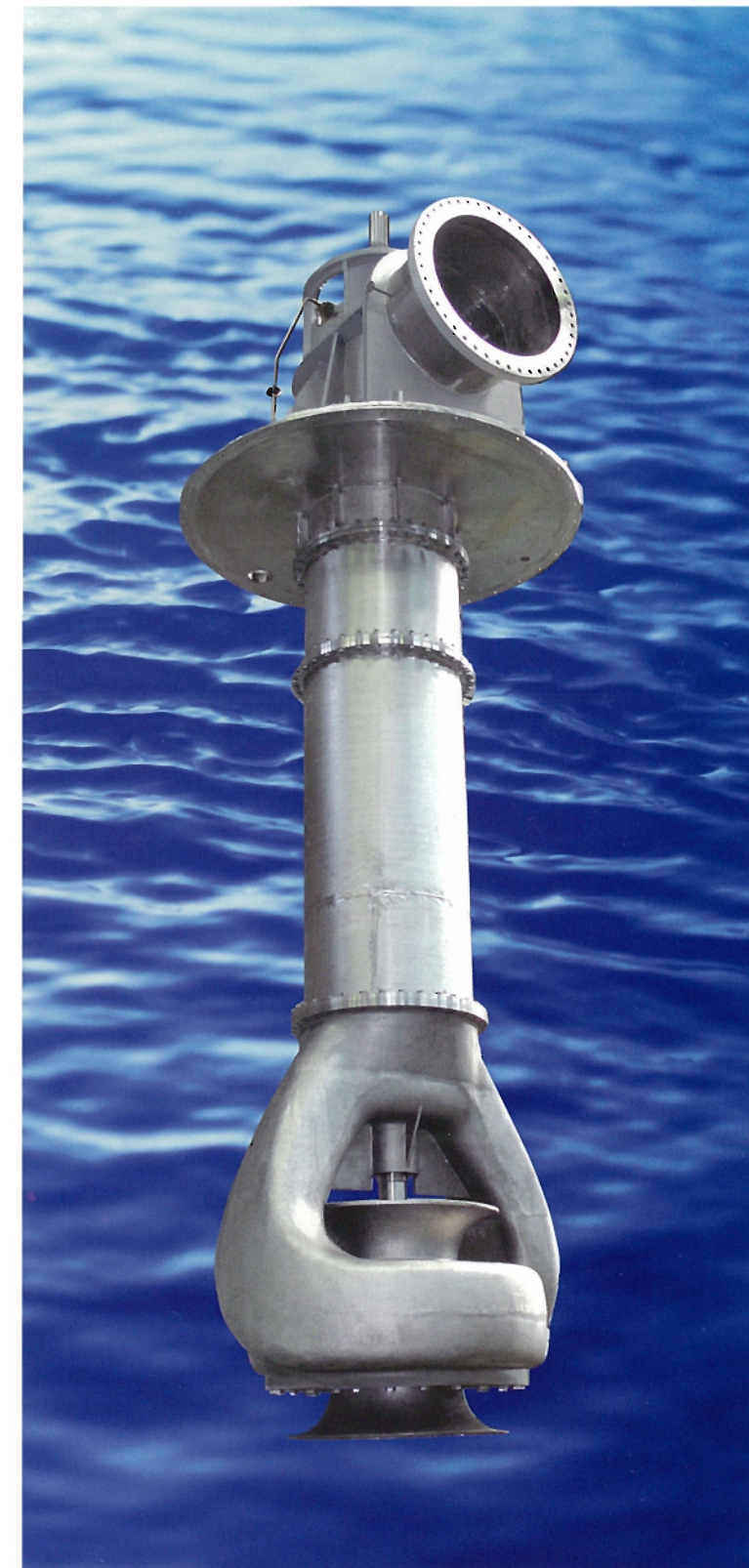
TORISHIMA EUROPE LIMITED
 Sunnyside Works, Gartsherrie Rd
 Coatbridge, Scotland ML5 2DL
 Phone: (44)1236-443951 Fax: (44)1236-702875

TORISHIMA U.S.A.

NORTH AMERICAN OFFICE
 100 Grove Street, Suite217,
 Worcester MA01605-0000 USA
 Phone: (1)508-753-6600 Fax: (1)508-753-8276

CDKTV

Vertical Barrel-type Double Suction Pump



Design Features & Benefits

Applications

CDKTV vertical barrel-type double suction impeller pumps are specially designed for installations where the products is only able to flow into the large volume and high head pump from a very low positive suction head.

Handling brine in sea water desalination plant and condensate in geothermal power and energy systems

Operating Data

Total Head * : up to 100m
 Flow rate * : up to 20,000 m³/hr
 Temperatures : max 100 deg C
 Nozzle Size : 500 to 1500 mm
 Speed : up to 1800 min⁻¹

*Higher pump heads and flow rates on request

Design

- Vertical, barrel type volute pump
- Double suction impeller and Single stage or multi-stage construction

Features

- Compact design due to high speed application, allowing the use of low cost drive motor
- A flat and low NPSHreq curve helps to minimize the barrel and pump length
- The stable characteristics of the pump ensure a reliable operation even with partial flow range

Installation

The barrel is arranged in a pit below the installation floor. The pump is connected with the structure by means of a baseplate.

Design

Volute casing and Impeller

The pump comprises of a double volute casing and double suction impeller.

Impeller is closed type with replaceable wear rings.

Shaft

The shafting is subdivided into separate lengths, depending on the installation depth of the pump. The individual shafts are connected with sleeve type coupling.

Exchangeable shaft protecting sleeves are arranged in the range of the stuffing box and the bearings.

Bearings and Lubrication

Medium-lubricated radial plain bearings are provided inside the pump

Materials are Carbon graphite or Rubber Bearings

Axial thrust are supported by driver's thrust bearing via rigid coupling between pump and driver's shaft.

Thrust bearing can be provided on the pump (option)

Shaft Seal

Packed Gland, Asbestos free or single mechanical seal. In the shaft seal area, the shaft is provided with a replaceable shaft sleeve.

Nozzle Position

Suction : Can be arranged above or below floor level as required.

Discharge : Always located at above floor level.

Flange

Connection dimensions according to JIS or Customer's specification

Drive

Direct driven by vertical shaft electric motor

The motor is arranged on a motor stool above pump

Materials

Fluid pumped	Sea water Brine	Geothermal Condensate
Bell Mouth	Ni-Resist, 316 AUS, Al-Bronze Duplex, Super Duplex	Cast iron, Carbon steel, 316 AUS, 13% Chr
Volute Casing	Ni-Resist, 316 AUS, Al-Bronze Duplex, Super Duplex	Cast iron, Carbon steel, 316 AUS, 13% Chr
Impeller	316 AUS, Duplex, Super Duplex	316 AUS, 13% Chr
Wear Rings	316 AUS, Duplex, Super Duplex	Cast iron, 316 AUS, 13% Chr
Shaft & Shaft Coupling	316 AUS, Duplex, Super Duplex	316 AUS, 13% Chr, Duplex, Super Duplex
Journal Bearing	Rubber	Carbon graphite, Rubber
Discharge Elbow	Ni-Resist, 316 AUS, Duplex, Super Duplex	Cast iron, Carbon steel, 316 AUS, 13% Chr
Barrel	FRP, GRP, 316 AUS, Duplex, Super Duplex	Carbon Steel, 316 AUS, FRP, GRP

Separate Fabricated Driver Stool

The Driver is arranged on a driver stool above pump

Shaft Sealing

- Packed stuffing box, Asbestos free
- Mechanical Seal Single Balanced
- Removal Seal box allows servicing the throttle bushing without removing the Discharge Nozzle.

Fabricated Discharge Nozzle Flange

- Connection dimensions according to JIS or Customer's specification.
- Casting version available.
- Top Casing with Suction and Discharge Nozzles available

Sleeve Intermediate Shaft Coupling

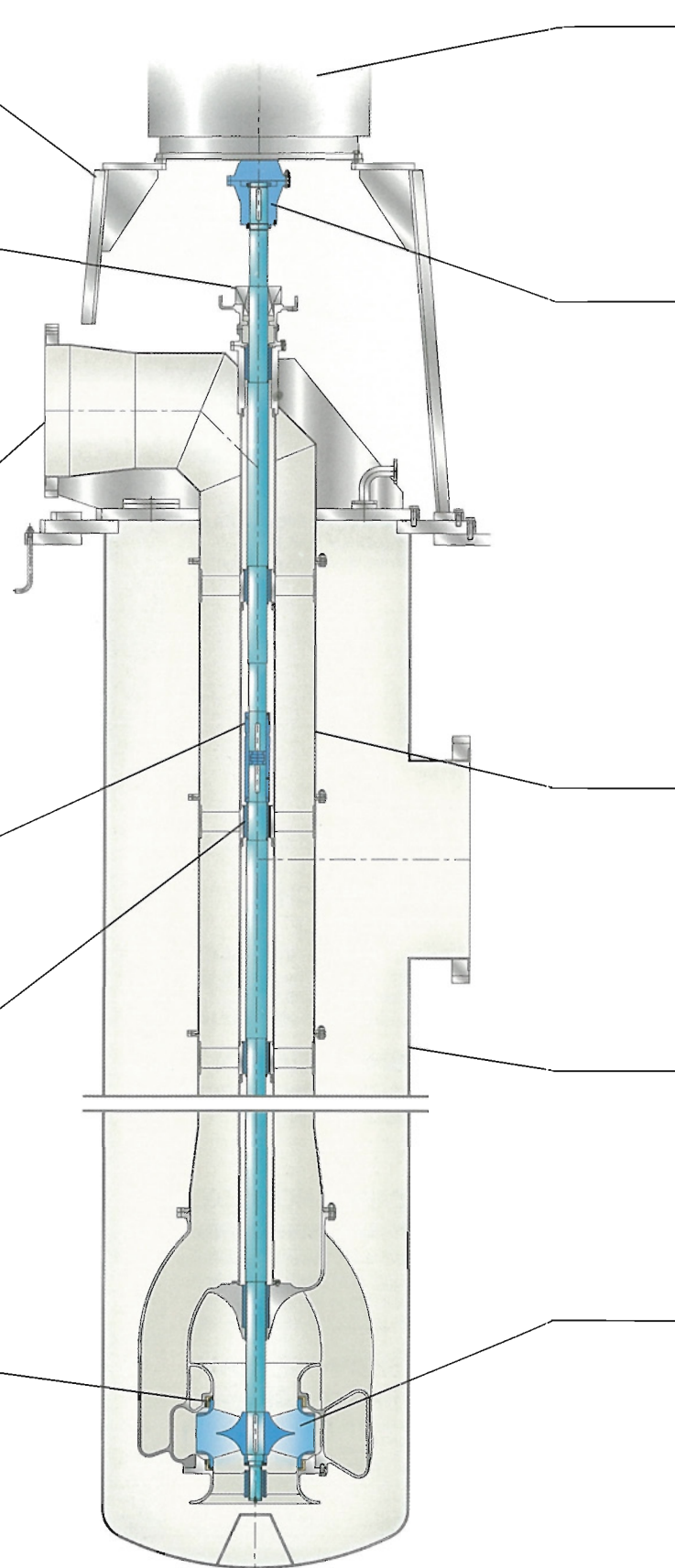
- Designed for all shaft diameter

Radial Bearings

- Product lubricated bearings are Carbon graphite or Rubber.
- Provide for long maintenance-free periods.
- Located in all Bearing Spiders and Casing

Dual Wearing Surface

- Provides replaceable wear rings for Impellers and Casings
- Prevent galling allow economical retention of operating efficiency and maintain mechanical stability



Vertical Solid Shaft Motor

- Direct driven by vertical electric motor
- Designed with thrust bearing to handle the pump axial thrust.

Rigid Coupling

- Thrust bearing can be omitted to provide in the pump.
- Flexible coupling also available. (Option)

Thrust Bearing Application(option)

- Thrust Bearing can be provided in the pump. It has enough size to support the axial thrust generated by pump at normal operation and at start-up periods

Flanged Fabricated Column Pipes

- Designed with bolted joint flange and sealed O-rings.
- Provide adequate sealing without overstressing the bolts.

Fabricated Barrel

- Has bottom rib; provide uniform and adequate velocity flow downstream along with barrel length

First Stage Double Suction Impeller

- The pumps are designed with double suction, high suction specific speed (NSS).
- A flat and low NPSHreq curve helps to minimize the barrel and pump length.
- This impeller is a between bearing design
- Multi-stage construction is also available.



Typical applications

Handling brine in Seawater desalination plant



Brine recirculation pump for Jebel Ali M (MSF) desalination plant, U.A.E.
(Size : 1,200mm, Driver : 4,900kW)



Brine recirculation pump for Shuweiht S2 IWPP (MSF) desalination plant, U.A.E.
(Size : 1,200mm, Driver : 4,100kW)

Condensate in Geothermal power and energy system



Hot well pump for Darajat III Geothermal power station, Indonesia
(Size : 1,200mm, Driver : 1,050kW)



Hot well pump for Germencik Geothermal power project, Turkey
(Size : 1000mm, Driver : 600kW)