

PUMPS & EQUIPMENT *for Power Generation*



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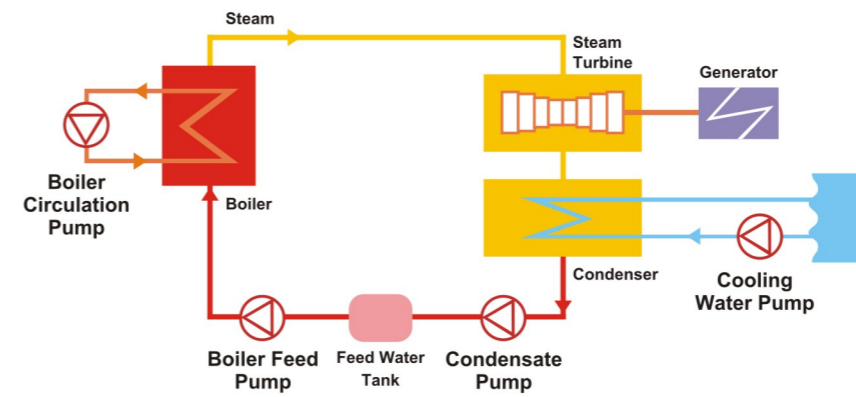
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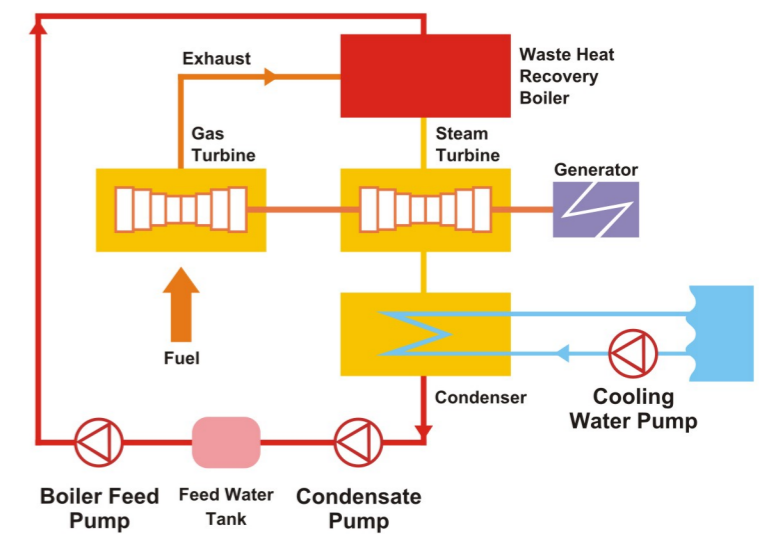
POWER GENERATION SYSTEMS & MAIN PUMPS

Steam Power Generations



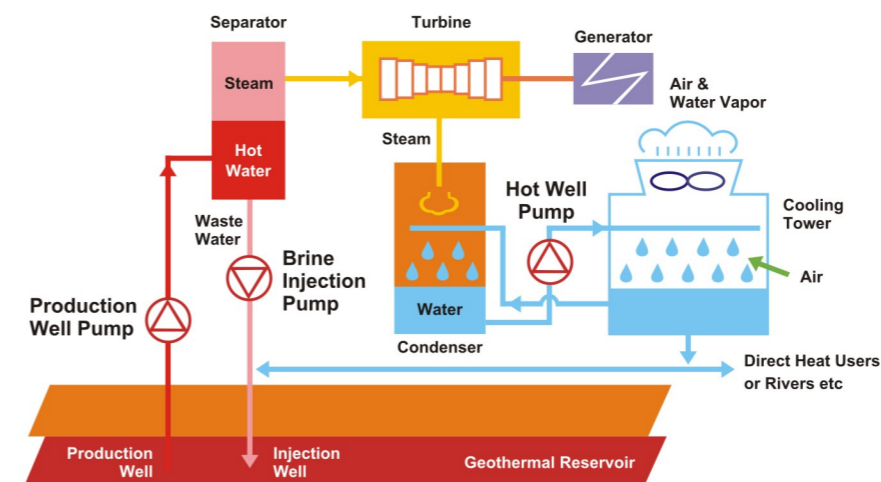
Tarahan Steam Power Generation, Indonesia

Combined Cycle Power Generations



Muara Karang Combined Cycle Power Plant, Indonesia

Geothermal Power Generations



Chevron Geothermal Salak, Indonesia

FOREWORD

TorishimaGuna and Torishima Pump Mfg.Co.,Ltd. offers a comprehensive pump program for all of applications power generation.

Security in energy supply should be the world top priority in the future as well as at present time. Especially the electrical power plays a remarkable part all the time in steady increasing of our overall energy consumption. Adequate electricity supply can only be achieved by building new power stations. Various types and designs of pumps have function of vital importance in the primary and auxiliary loops of energy conversion processes in the power plants. TorishimaGuna and Torishima Pump Mfg.Co.,Ltd. offers a comprehensive pump program for all of these applications. The advanced engineering and reliability of our full line of products are based on many years experiences plus intensive R + D as well as the most up-to-date test methods combined with extensive and strict quality assurance.



Performance Test Condensate Pump
MMTV 250 / 4 Vertical Multi Stage
with Barrel 420 kW, Muara Karang.

Warning
Deep
water

**SELECTION
BY APPLICATION**

Pump Products



Applications

| | HLV, HLAV | SPV | SPS | IS, ISV | MMTV | MMK, MML, MMO | MHD, MHG, MHB | CDM, CDMV | CDKY, CDKS, CDKTV | CA, EN, CSA, CE, CNS, CNA | CPC, CENS | SSC, SWO, SSV | SMIV, SMSV | SN2, EBRN |
|--|-----------|-----|-----|---------|------|---------------|---------------|-----------|-------------------|---------------------------|-----------|---------------|------------|-----------|
| Auxiliary Condensate | | | | | ● | | | ● | ● | | ● | | | |
| Industrial Water, Water Supply for Fire-fighting | | | ● | | | ● | | ● | | ● | ● | | ● | |
| Drainage and Sewage / Effluent | | ● | | ● | | | | | | | | ● | ● | |
| Heating Installations | | | | | | | | | | | ● | | | |
| Component Cooling and Water Plants | | | | | | | | ● | ● | | | | | |
| Water Supply | | ● | ● | ● | | ● | | ● | ● | ● | ● | | | |
| District Heating | | | | | | ● | | | | | ● | | | |
| Fuel Supply Fuel Transfer | | | | | | | | | | | | | | ● |
| Feed Water Pumping | | | | | | | ● | | | | | | | |
| Main Cooling Water Pumping | | ● | | | | | | ● | | | ● | | | |
| Main Condensate Pumping | | | | | ● | | | | ● | | | | | |
| Boiler Circulations | ● | | | | | | | | | | | | | |

● Fossil
● Geothermal

SPECIALIZED PUMP

HLV, HLA

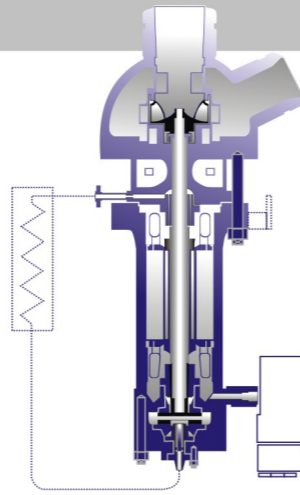
Glandless (sealless) Pump Motor Unit (Boiler Circulation Pump)

Pump and motor are integrated in a pressure-tight casing. The glandless design (*no shaft seal*) makes this best suited for pumping of high temperature and high pressure liquids without any leakage. Volute, annular or spherical casing design optionally available.

Application :

Boiler circulation in super / sub critical power plants.

| | |
|-------------|----------------------------------|
| Total Head | : Up to 180 m |
| Capacity | : Up to 6,000 m ³ / h |
| Temperature | : 40 to 420 °C |
| Size | : Up to 400 mm |
| Pressure | : Up to 32 Mpa |



ISV

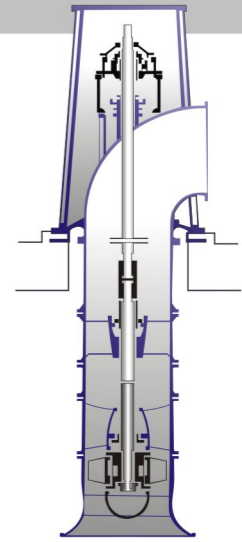
Vertical Axial-flow Propeller Pump

Diffuser type, axial flow propeller suspended within wet pit. Especially used for large capacity with low head of water. The various hydraulic models applied to the change of the capacity and head.

Application :

Water pumping / Drainage for agriculture, River water drainage, Cooling water in Power Plants.

| | |
|------------|-------------------------------------|
| Total Head | : 1.5 to 5 m |
| Capacity | : 660 to 186,000 m ³ / h |
| Size | : 400 to 4,600 mm |



MIXED FLOW PUMPS

SPV

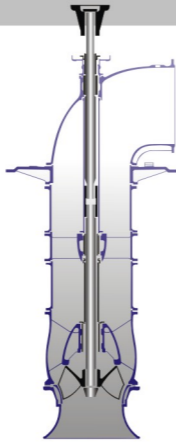
Vertical Mixed-Flow Impeller Pump

Since the impeller is submerged under the water at all times this pump resists cavitation and offers easy automatic operation. Impellers are hydraulically balanced, residual thrust absorbed by thrust bearing. Also available on multi-stage structure for high head and structure with barrel casing for low NPSH.

Application :

Rain water drainage / Water intake for water works / sewage, Circulation / Cooling Water / Condensate in Power Plants, Sea Water Intake / Brine recirculation in sea water desalination plants.

| | |
|-------------|-------------------------------|
| Total Head | : Up to 100 m |
| Capacity | : Up to 22 m ³ / s |
| Temperature | : Up to 80 °C |
| Size | : DN 300 to 3000 mm |
| Pressure | : Up to 10 bar |



MULTI STAGE PUMPS

MHD

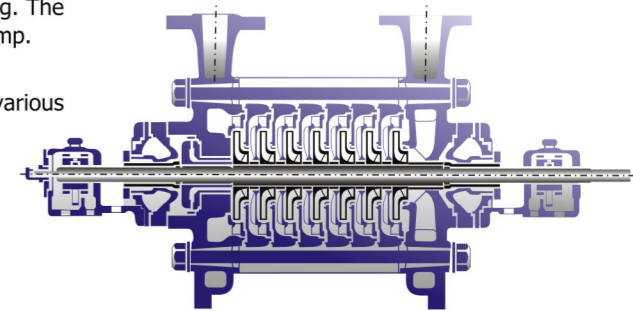
Ring Section High Pressure Pump

Radially split ring-section high-pressure multistage diffuser type pump achieving high efficiency and low NPSH. No warming through required enabling rapid start-up. Centerline mounted for compensation toward thermal expansion of suction / discharge casing. The axial thrust is compensated by the balancing disk and seat at the discharge end of pump.

Application :

Boiler feed in Power Plants, High pressure feed water in RO desalination / various industries, and others.

| | |
|-------------------------|--------------------------------|
| Total Head | : Up to 1,200 m |
| Capacity | : Up to 300 m ³ / h |
| Temperature | : -10 to 180 °C |
| Size | : DN 50 to 125 mm |
| Max. Suction Pressure | : Up to 30 bar |
| Max. Discharge Pressure | : Up to 140 bar |



SPS

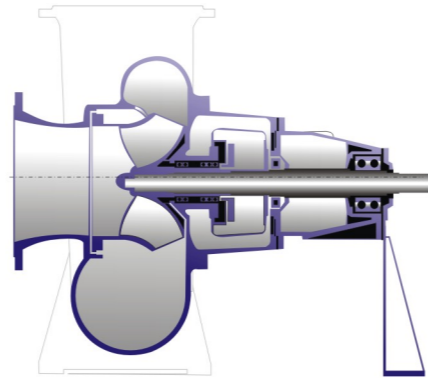
Mixed-Flow Volute Pump

Suitable for fresh water and waste water pumping. Both open and closed type impeller available.

Application :

Distribution / Drainage for water works / sewage, Water pumping for agriculture, Cooling water in Power Plants, Seawater circulations in seawater desalination plants, and others.

| | |
|------------|-----------------------------------|
| Total Head | : Up to 50 m |
| Capacity | : Up to 20,000 m ³ / h |
| Size | : 350 to 1,200 mm |



MHG

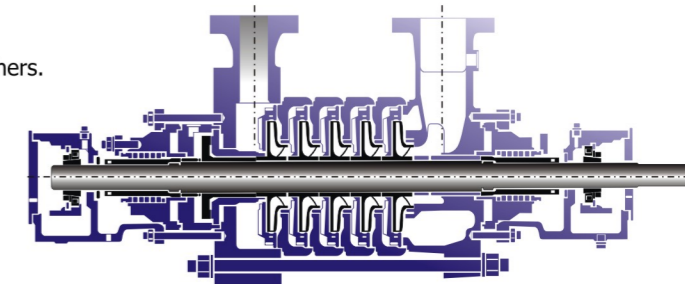
High Pressure Multistage Diffuser Pump with Ring Section Construction

Radially split ring-section high-pressure multistage diffuser type pump. No warming through required enabling rapid start-up.

Application :

Boiler feed in Power Plants, High pressure feed water in various industries, and others.

| | |
|-------------------------|----------------------------------|
| Total Head | : Up to 4,200 m |
| Capacity | : Up to 1,400 m ³ / h |
| Temperature | : Up to 200 °C |
| Size | : 40 to 250 mm |
| Max. Suction Pressure | : Up to 30 bar |
| Max. Discharge Pressure | : Up to 420 bar |



AXIAL FLOW PUMPS

IS

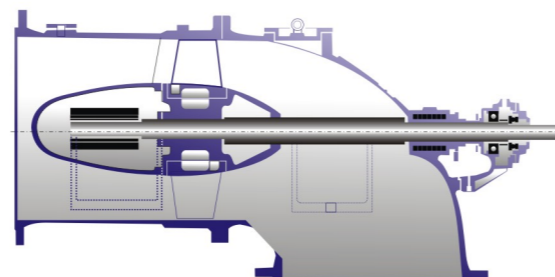
Axial-flow Propeller Pump

Diffuser type, axial flow propeller suspended within wet pit. Offering various hydraulic models suitable for large capacity with low pump head of water. Axially split design offering easy maintenance without removing the lower casing.

Application :

Water pumping / Drainage for agriculture, Sewage transfer, Rain water Drainage, Storm surge drainage, and others.

| | |
|------------|------------------------------------|
| Total Head | : 1.5 to 5 m |
| Capacity | : 660 to 36,000 m ³ / h |
| Size | : 400 to 2,000 mm |



MHB

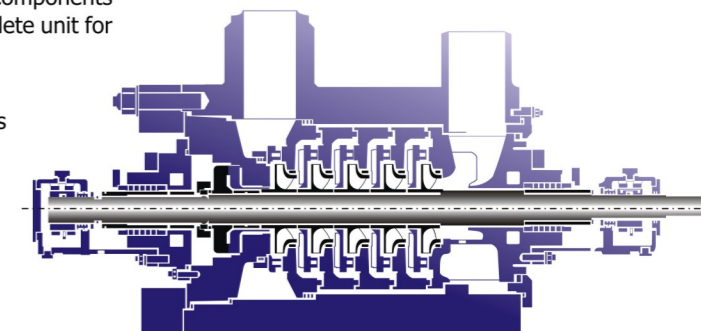
Radially Split Barrel Casing Pump

The barrel casing is fully welded to the pipe work and supported at its centerline on a fabricated steel base plate. The inner cartridge, which contains all pump components except the barrel and main stud bolts, is removable from the barrel as a complete unit for ease of maintenance.

Application :

Boiler feed in thermal Power Plants, High pressure feed water in various industries, and others.

| | |
|-------------|----------------------------------|
| Total Head | : Up to 4,200 m |
| Capacity | : Up to 2,000 m ³ / h |
| Temperature | : Up to 230 °C |
| Size | : 80 to 200 mm |



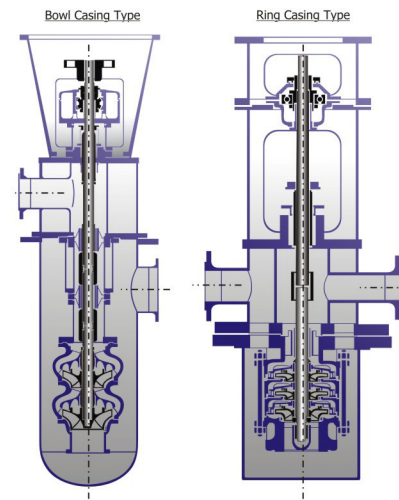
Specially designed vanes and wide suction inlets. It can be installed at low positions. Impeller are hydraulically balanced and the residual axial thrust absorbed by anti-friction bearing or thrust bearing.

The high pressure vertical canister pump offers significant advantages in those cases where limited suction head is available. Applicable especially for condensers in power plants, desalination plants and other pipeline pumping applications.

Application :

Hot water / Condensate / High and low pressure drain in thermal Power plants.

| | |
|-------------|----------------------------------|
| Total Head | : Up to 780 m |
| Capacity | : Up to 4,000 m ³ / h |
| Temperature | : Up to 200°C |
| Size | : DN 40 to 500 mm |



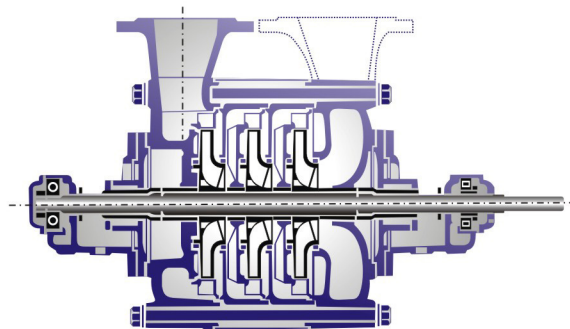
Axial thrust of MMK is balanced by the impeller balance holes.

And by way of MML the balance disc. So that MMK and MML can operate with high reliability at high speed

Application :

Boiler feed in Power Plants, High pressure feed water in various industries, Condensate in seawater desalination, Distribution / Boosting for water works, irrigation for agriculture, and others.

| | |
|-------------|----------------------------------|
| Total Head | : Up to 500 m |
| Capacity | : Up to 1,200 m ³ / h |
| Temperature | : Up to 250°C |
| Size | : DN 40 to 350 mm |

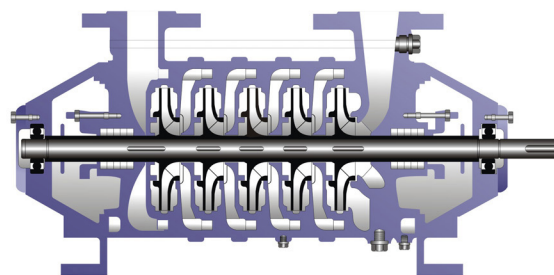


High pressure centrifugal pumps are pumps of ring section type. Suitable for clean media free from abrasive and solid particles and not liable to attack the pump mechanically (abrasion) or chemically (corrosion). Compact and light-weight. Pump feet integrally cast onto bearing housings, allowing free orientation of both suction and discharge nozzles.

Application :

Water works, Pressure boosting systems, Sprinkling system, Irrigation installation, Fire fighting systems, Boiler Feed, Cooling water / Hot and cold water circulation and others.

| | |
|-------------|--------------------------------|
| Total Head | : Up to 400 m |
| Capacity | : Up to 112 m ³ / h |
| Temperature | : Up to 100°C |
| Size | : 32 to 65 mm |



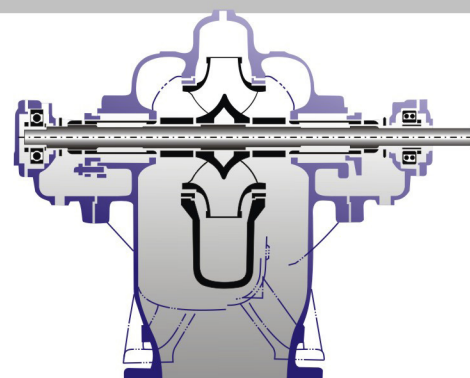
DOUBLE SUCTION PUMPS

The world's most advanced high efficiency pump achieved by design to match the double suction and three-dimensional impeller with the latest hydraulics. Simple disassembly of upper half casing without disturbing pipe work enables ease of maintenance and inspection.

Application :

Condensate, Industrial water supply, Fire fighting, Component cooling systems, Water supply and Service water, District heating.

| | |
|-------------|----------------------------------|
| Total Head | : Up to 180 m |
| Capacity | : Up to 5,700 m ³ / h |
| Temperature | : Up to 80°C |
| Size | : DN 200 to 700 mm |

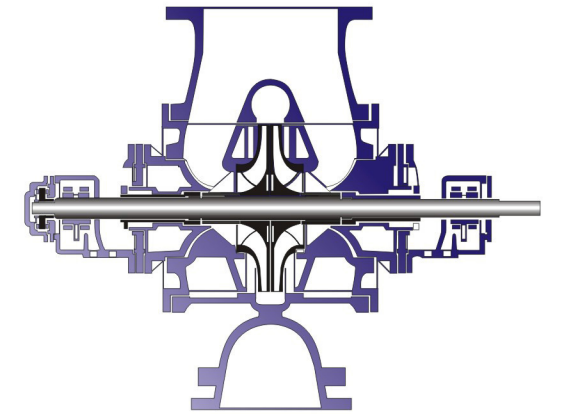


The rotating parts can be taken out by removing the side cover in axial direction. Suitable for handling high temperature and pressure liquids in chemical plants and power plants. CDKY mainly used as booster pump for boiler feed pump and hot water circulation pump.

Application :

Process in power / chemical / pulp industries, and others.

| | |
|-------------|----------------------------------|
| Total Head | : Up to 160 m |
| Capacity | : Up to 3,480 m ³ / h |
| Temperature | : Up to 210°C |
| Size | : 125 to 400 mm |

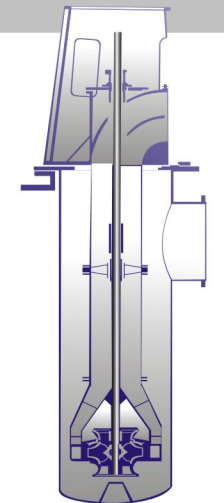


The hydraulic design of the double-suction impeller offering low-shut off head, low NPSH and high speed. Mainly applicable for brine recirculation in seawater desalination plants and condensate in geothermal power plants when severe suction condition with large capacity and high head required.

Application :

Boiler recirculation, Brine blow down in seawater desalination plants, Hot well / Large volume condensate in geothermal power plants.

| | |
|-------------|-----------------------------------|
| Total Head | : Up to 100 m |
| Capacity | : Up to 20,000 m ³ / h |
| Temperature | : Up to 100°C |
| Size | : 500 to 1,500 mm |



END SUCTION PUMPS

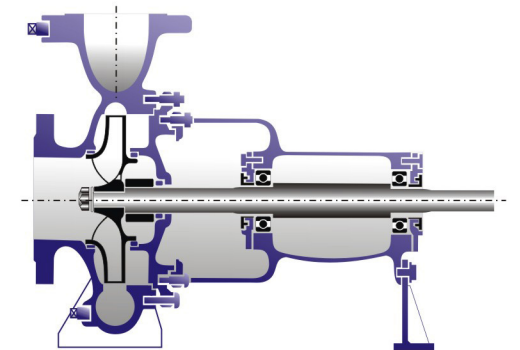
Taking advantage of our existing pump designs, CA Series are totally optimized design pumps which adopt the efficient impeller design. The components focus on interchangeability.

High quality standard pump of process type construction. Uncooled mechanical seal equipped as standard shaft seal.

Application :

Cooling water pump, Hot water(circulation) pump, Fire fighting, Transfer pump, Industrial water pump, Chilled water pump, and others.

| | |
|-------------|--------------------------------|
| Total Head | : Up to 100 m |
| Capacity | : Up to 600 m ³ / h |
| Temperature | : - 10°C to 100°C |
| Size | : 32 to 200 mm |

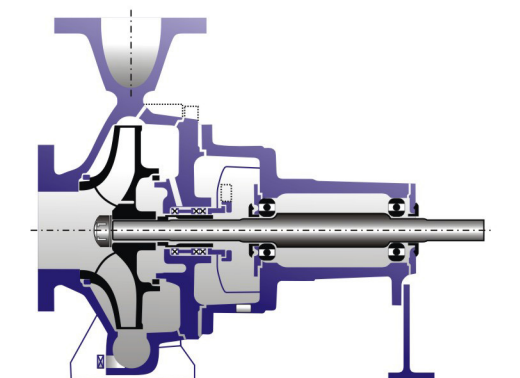


CEN are industrial pumps of back pull out design, according to JIS B 8313.

Application :

Condensate, Industrial Water Supply, Fire fighting, Heating installation, Component cooling systems water supply, Service water installation.

| | |
|--------------------|--------------------------------|
| Total Head | : Up to 100 m |
| Capacity | : Up to 670 m ³ / h |
| Temperature | : Up to 140°C |
| Size | : DN 32 to 150 mm |
| Discharge Pressure | : Up to 16 bar |



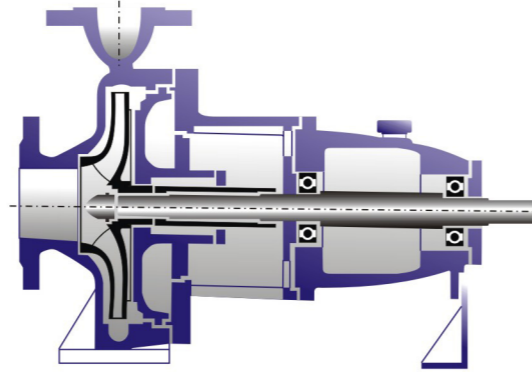
CPC**End Suction Volute Pump for Process**

Conforms to ISO 2858, a wide range of structural designs of material and seals meet various specification requirements as process pump for chemical and general industries.

Application :

Condensate, Industrial water supply, Fire fighting, Heating installation, Component cooling systems water supply, Service water installation.

| | |
|-------------|--------------------------------|
| Total Head | : Up to 150 m |
| Capacity | : Up to 300 m ³ / h |
| Temperature | : Up to 220°C |
| Size | : DN 40 to 100 mm |

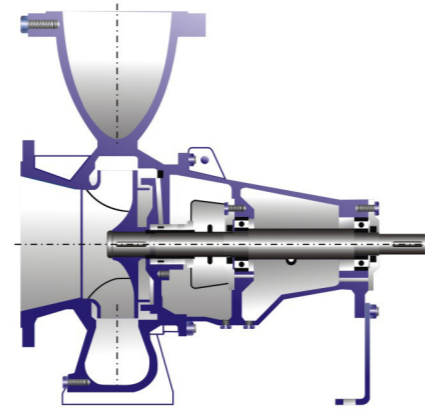
**CSA****End Suction Centrifugal Pump with High Efficiency Design**

CSA Series is a new line of centrifugal pump with high efficiency, excellent hydraulic performance and construction design enabling significant of the operating cost of the unit for various application.

Application :

Main application is for water intake, pressure boosting, circulating pumps, distribution pumps.

| | |
|-------------|----------------------------------|
| Total Head | : Up to 80 m |
| Capacity | : Up to 1,500 m ³ / h |
| Pressure | : Up to 1.6 Mpa |
| Size | : Up to 250 mm |
| Temperature | : - 10 to 80 °C |

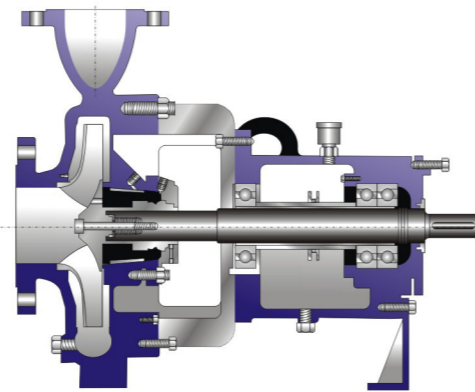
**CENS****General Process Pump**

CENS series are horizontal single stage, single suction centrifugal pumps meet the standard of ANSI / ASME B73.1.

Application :

Main application are in the field of chemical service, petrochemical plant, oil refinery, steel works, power plant and pulp paper industry.

| | |
|-------------|----------------------------------|
| Total Head | : Up to 250 m |
| Capacity | : Up to 1,800 m ³ / h |
| Temperature | : - 40 to 260 °C |
| Size | : 25 to 300 mm |

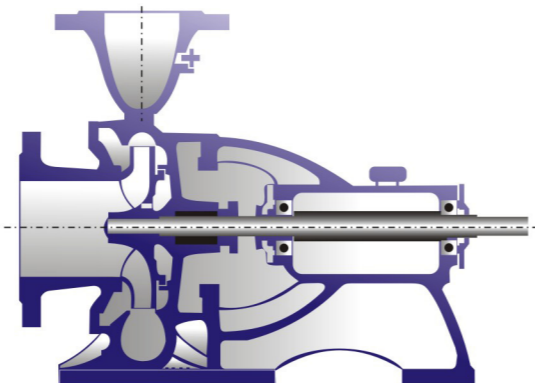
**CE****End Suction Volute Pump**

A single or two stage end suction volute pump. Various materials and structural designs employed to meet specification requirements for a variety of applications from fresh water, chemical and heat transfer.

Application :

Water intake, Distribution, Supply, Boosting, Clarification for Water Works, Various processes for chemical industries, water pumping / drainage for agriculture, Boiler feed pump, Heat medium circulation, Heater drain, and others.

| | |
|-------------|----------------------------------|
| Total Head | : Up to 90 m |
| Capacity | : Up to 2,100 m ³ / h |
| Temperature | : Up to 140°C |
| Size | : 200 to 300 mm |

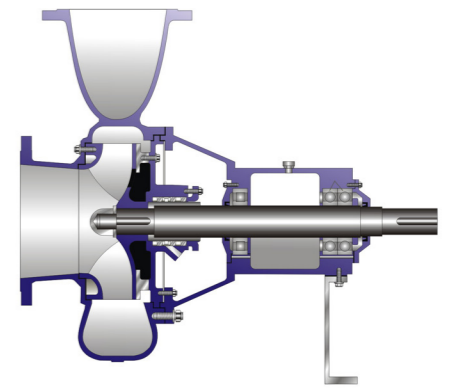
**CNO****Non Clogging Process Pump**

Combined the advantages of open impeller centrifugal pump with those of the centrifugal pump in back pull-out design. The maintenance of which is greatly simplified.

Application :

Waste water industry, Sugar industry, Palm oil mills, Civil engineering, Chemical industry, Paper industry, Mining industry.

| | |
|-------------|--------------------------------|
| Total Head | : Up to 50 m |
| Capacity | : Up to 700 m ³ / h |
| Temperature | : Up to 100°C |
| Size | : 80 to 250 mm |

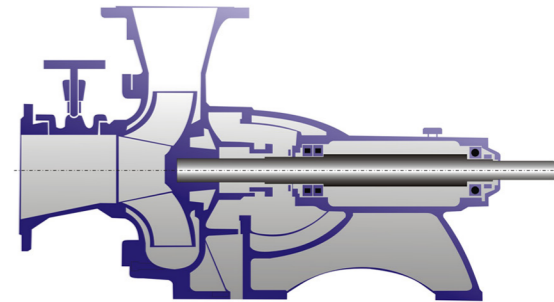
**CNA****Non Clogging End Suction Volute Pump**

The discharge opening of the non-clogging impeller is produced especially wide to permit free passing of any solids measuring 50 to 70 % of the pump nozzle size.

Application :

Sewage transfer, Drainage of liquids containing sludge for general industries, Transfer of grain and water mixtures, Transfer of cellulous pulp of less than 2.5% B.D free from air.

| | |
|-------------|------------------------------|
| Total Head | : Up to 70 m |
| Capacity | : 9 ~ 500 m ³ / h |
| Size | : 50 to 200 mm |
| Temperature | : Up to 140 °C |

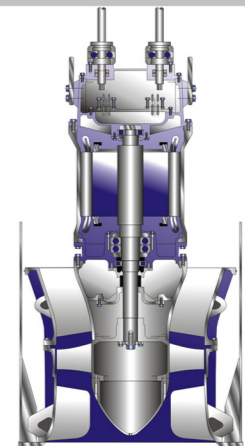
**SUBMERSIBLE PUMPS****SMIV****Column Type Submersible Pump (Axial Flow)**

SMIV model (Axial Flow) are large capacity type submersible propeller pumps with low head capabilities. These pump, which offer high efficiency and superior performance complete with compact design and easy operation, are designed to meet the requirements for efficient handling of large quantities of water.

Application :

Storm water and flood control, Agriculture water / Irrigation, Industrial water, River water intake, Dry dock drainage, Water level regulation of reservoirs, Seawater intake regulation, Fish farming, and others.

| | |
|-------------|---------------------------------|
| Total Head | : Up to 10 m |
| Capacity | : Up to 600 m ³ /min |
| Temperature | : Up to 40 °C |
| Size | : Up to 2000 mm |

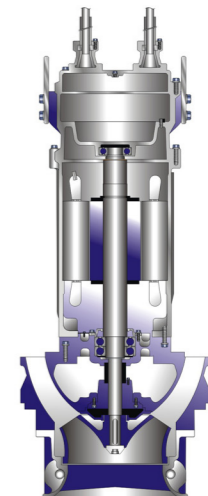
**SMSV****Column Type Submersible Pump (Mixed Flow)**

SMSV model (Mixed Flow) are large capacity type submersible propeller pumps with low head capabilities. These pump, which offer high efficiency and superior performance complete with compact design and easy operation, are designed to meet the requirements for efficient handling of large quantities of water.

Application :

Storm water and flood control, Agriculture water / Irrigation, Industrial water, River water intake, Dry dock drainage, Water level regulation of reservoirs, Seawater intake regulation, Fish farming, and others.

| | |
|-------------|----------------------------------|
| Total Head | : Up to 20 m |
| Capacity | : Up to 320 m ³ / min |
| Temperature | : Up to 40 °C |
| Size | : Up to 1500 mm |



SSC

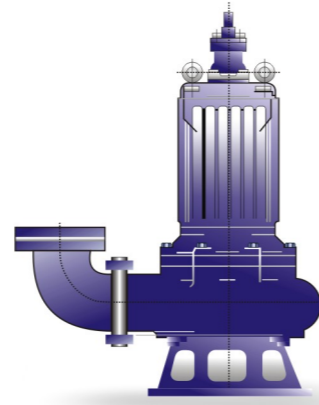
Raw Water Intake / Sewage Pump Non Clogging Impeller

Closed impeller design suitable for transfer sewage, waste water, effluent. Wet parts material available in cast iron and stainless steel / SCS13.

Application :

Raw water intake slurry and fibrous material in sewage water, Transfer solid at sewage, waste water treatment plant, Effluent transfer from waste & waster water treatment plant, Fountain / Decoration waterfall, Supply water for industry.

| | |
|------------|-------------------------------|
| Total Head | : Up to 45 m |
| Capacity | : Up to 40 m ³ / h |
| Power | : Up to 110 kW |
| Size | : DN 50 to 500 mm |

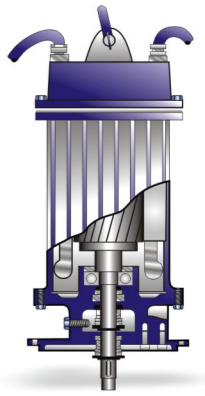
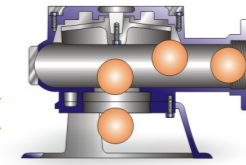


DG

Submersible Pumps - Vortex type (Non Clog)

DG of submersible pumps have a vortex type impeller to allow free passage and even entirely free passage, and are therefore ideal for treatment of heavily polluted or foamy liquids, sewage, liquids containing oily, fibrous or solid substances, including substances which cannot be broken up, active biological sludges, sewage of animal origin, rainwater and seepage.

| | |
|------------|--------------------------------|
| Total Head | : Up to 18.5 m |
| Capacity | : Up to 360 m ³ / h |
| Power | : Up to 16.4 kW |
| Size | : Up to DN 125 mm |



SWO

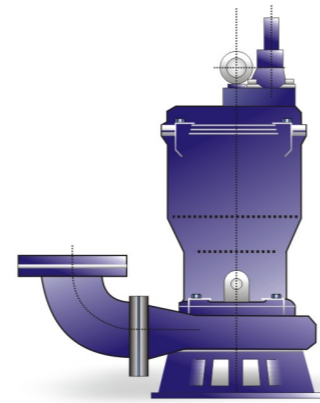
Waste Water and Effluent Pump

SWO is semi open impeller type suitable for transfer waste water, sewage, effluent. Wet parts material available in cast iron and stainless steel / SCS13.

Application :

Transport from waste & sewage water treatment plant, Subway station, Underground, Industrial site, Fountain, Decoration waterfall, and others.

| | |
|------------|--------------------------------|
| Total Head | : Up to 60 m |
| Capacity | : Up to 3 m ³ / min |
| Power | : Up to 30 kW |
| Size | : DN 50 to 150 mm |

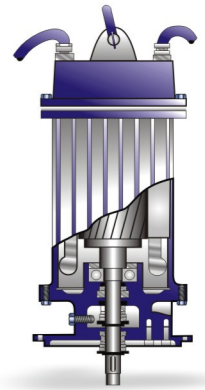
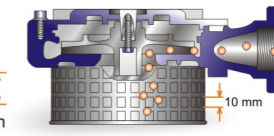


AP/GR

Submersible Pumps - Open Multi-Channel High Head Impellers

AP / GR includes submersible pumps with open multi-channel high head impellers which are used with clear waters, rainwater and seepage, sandy and muddy waters, including those containing small bodies in suspension.

| | |
|------------|---------------------------------|
| Total Head | : Up to 58 m |
| Capacity | : Up to 50 m ³ / min |
| Power | : Up to 16.4 kW |
| Size | : DN 125 mm |



SSV

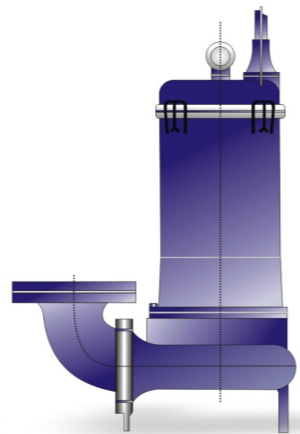
Submersible Vortex Pump

With vortex pump type impeller suitable to transfer sludge and sewage which contain solid particle.

Application :

Raw water intake slurry and fibrous material in sewage water, Transfer solid at sewage, waste water treatment plant, Effluent transfer from waste & waster water treatment plant, Fountain / Decoration waterfall, Supply water for industry.

| | |
|------------|------------------------------|
| Total Head | : Up to 20 m |
| Capacity | : Up to 3 m ³ / h |
| Power | : Up to 15 kW |
| Size | : DN 80 to 100 mm |



GEAR PUMPS

SN2

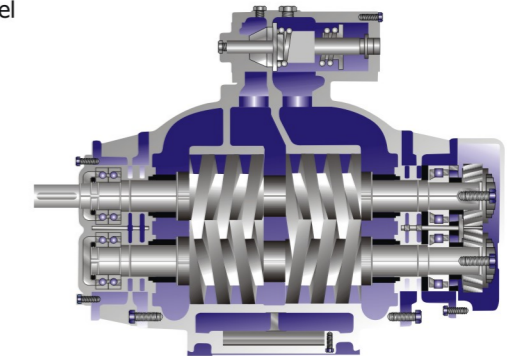
Double Absorb Twin Screw Pump

For viscous medium such as lubrication oils, crude oils, marine fuel oils, residual oils, diesel oil, gasoline, etc.

Application :

Food industry, Oil & Gas industry, Ship building, Chemical industry, Paint industry.

| | |
|-------------|------------------------------------|
| Pressure | : Up to 6.9 Mpa |
| Capacity | : Up to 2,500 m ³ / h |
| Temperature | : - 30°C to 300°C |
| Viscosity | : 0.5 to 10,000 mm ² /s |
| Size | : DN 80 to 400 mm |

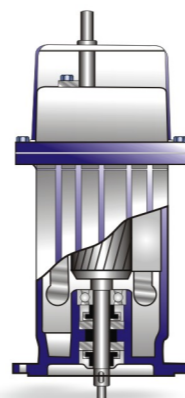
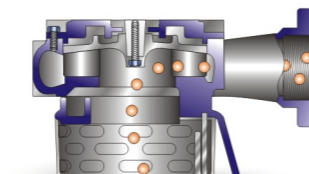


DR

Submersible Pumps - Open Multi Channel Impeller

DR includes submersible pumps with immersed open multi channel impellers, normally used with biological liquids which are not very heavily polluted, strained liquids, sewage, liquids containing colloidal or oily substances, rainwater and seepage from civil and industrial sources.

| | |
|------------|--------------------------------|
| Total Head | : Up to 50 m |
| Capacity | : Up to 550 m ³ / h |
| Power | : Up to 25.6 kW |
| Size | : Up to 150 mm |



EBRN

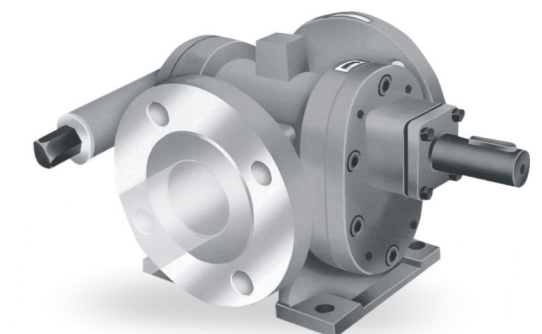
Rotary Gear Pump

For fuel oil, lube oil, veg. Oil, mineral oil, loading - unloading & transfer application.

Application :

Oil industry, Petrochemical industry, Chemical industry, Marine industry, and others.

| | |
|-------------|--------------------------------|
| Capacity | : Up to 200 m ³ / h |
| Temperature | : Up to 110°C |
| Pressure | : Up to 21 bar |
| Viscosity | : 100,000 CST |



Torishima World Wide

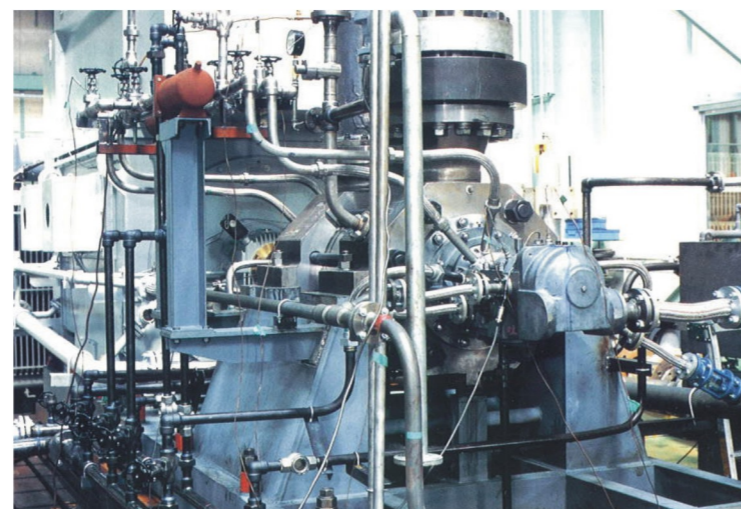
Torishima have delivered many pumping plants for power station in around the world whose power generation is increasing year by year as economy grows.



CDKTV Hot Well Pump, for 110 MW Geothermal Power Plant Chevron Texaco Energy Indonesia (Derajat II) Indonesia.



MHB Barrel type Boiler Feed Pump, Having 100 % load capacity (for Elbistan - B P/S. 360 MW) Turkey.



Segmental Ring Section Casing Boiler Feed Pump, 3,018 fr - 2.100 usgpm - 2.980 rpm - 2.500 HP Fujairah Power Plant, Abu Dhabi UAE.

TORISHIMAGUNA OTHER SERVICES



TURBOMACHINERY SERVICES

PT Torishima Guna Engineering, an integrated ISO and API Q1 Certified Company, is a private Indonesia company providing services for rotating equipments such as Gas Turbine, Steam Turbine, Centrifugal Pump, Centrifugal Compressor and other related turbomachinery equipments.

Started as pump manufacturer in 1984 in Indonesia, the company has grown into a wide scale company to fulfill and support our customer needs in include Engineering Services, foundry and now in the field of Turbomachinery Services. As an engineering company, TorishimaGuna are fully committed to excellence and our goal is to be recognized as a world-class Turbomachinery Services Company.



REDU " RE-ENGINEERING & DESIGN UP "

To improve your plants's productivity, TorishimaGuna offer more reliable and higher efficiency pumps. In addition to servicing our own units, we restore, repair, improve and upgrade even for pumps of other manufacturers. Using the most advanced technologies, we offer products that provide you with the highest efficiency and highest possible performance.

TorishimaGuna has ability to combine field service engineering and product design technology. This result our engineers being able to provide advice on improved design and the upgrade of in-site pumping equipment and other rotating equipment.



MECHANICAL SCREEN

Mechanical Screen, Electrical Driven Units.



PRIMING SYSTEM

Priming System for Centrifugal Pumps, with Vacuum Pump Assistance

