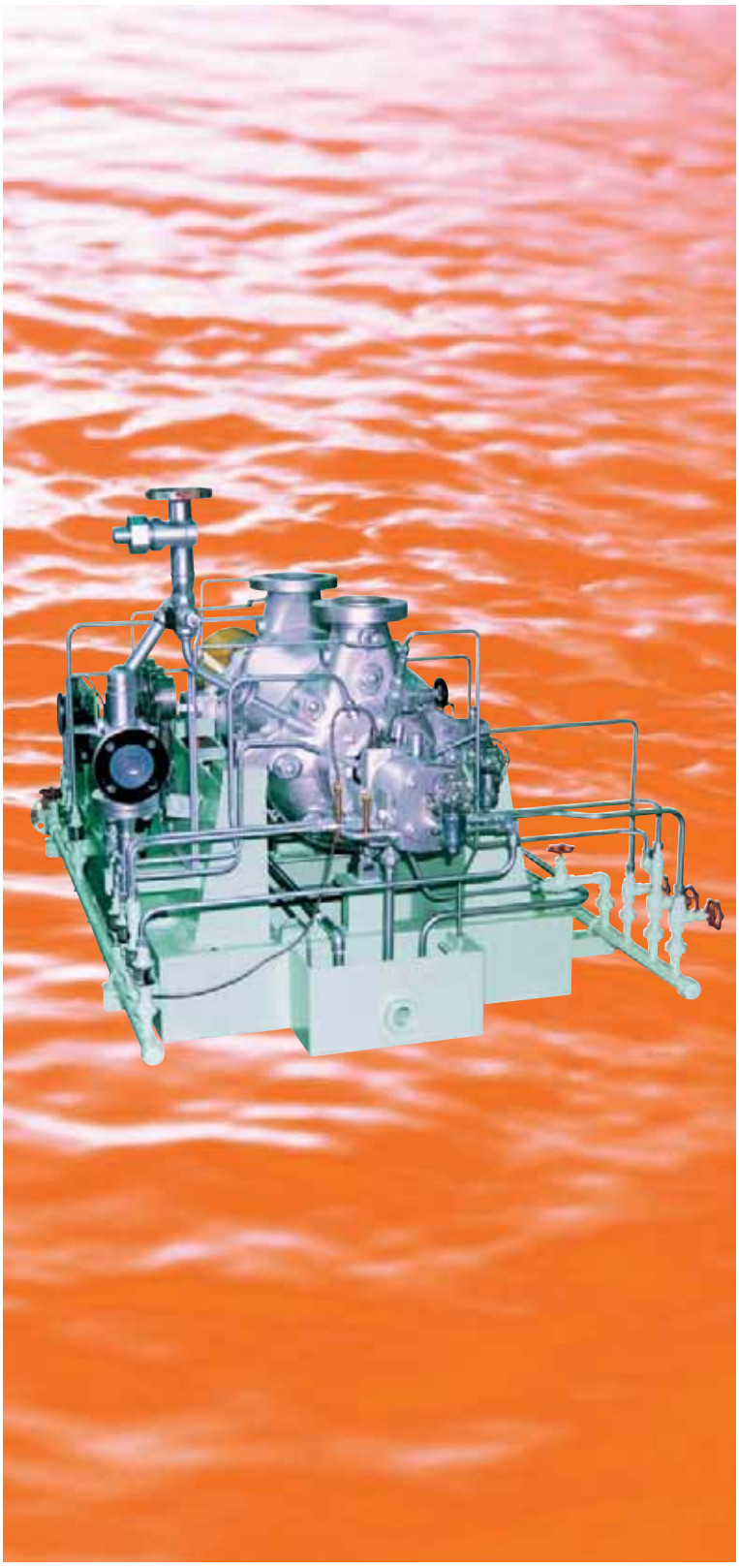
MHD

Ring Section High Pressure Pumps



TORISHIMA PUMP

MHD-E, MHD-F Multistage Ring Section High Pressure Pumps

Introduction

TORISHIMA model MHD series are ring-sectional, multi-stage type high pressure pumps which have been developed from our extensive experience in manufacturing, supplying and operation of pumps for power plants and in conjunction with our R&D.
With its superior reliability and economical operation, these high performance pumps are applied for not only boiler feed pumps but also high pressure pumps in all kind of industries.

Applications

· Boiler feed
· Reverse osmosis seawater desalination
· High pressure service for all kind of industries

Performance Range

Size	50 to 125mm (2 to 5")
Capacity	up to 300m^3/hr (1320U.S.gpm)
Max. suction pressure	up to 30bar (420psi)
Max. discharge pressure	up to 140bar (2050psi)
Operating temperature	–10 to 180°C (14 to 356°F)

Features

1. **High reliability and durability**
   High reliability and durability by superior materials and precise manufacturing know-how under strict quality control.
2. **Excellent hydraulic characteristics**
   As the impeller and diffuser are designed to be high efficiency, low NPSH and stable head/capacity curves in wide range and effective operation is ensured.
3. **Simple construction and easy maintenance**
   The construction is simplified and less components are used. Overhaul can be easily carried out, and number of spare parts reduced.
4. **Brief delivery**
   Under parts stock control system, these pumps are completely standardized for fast shipment.

Materials

■ Suction casing	Cast Iron, Ni-Cr Cast Iron, Cast Steel
■ Discharge Casing	Cast Steel
■ Stage casing	Cast Iron, Ni-Cr Cast Iron, Cast Steel
■ Diffuser	Cast Iron, Ni-Cr Cast Iron, Cast Bronze, 13% Chrome Steel
■ Shaft	Carbon Steel, Stainless Steel
■ Impeller	Cast Iron, Ni-Cr Cast Iron, Cast Bronze, 13% Chrome Steel
■ Balancing disk	Stainless Steel
■ Balancing disk seat	Stainless Steel
■ Tie bolt	Nickel Chrome Molybdenum Steel

Note · The materials of parts are changeable according to liquid and temperature. (ex. sus316, Duplex, Super Duplex)

Rational Design

- Casing support at shaft centerline prevents vibration caused from the thermal expansion of suction/discharge casings.
- According to excellent hydraulic design and standardization, programs of products are excellent for NPSH, price and operating cost.
- The interface at the respective stages are sealed perfectly by metallic sealing faces with back-up O-rings and clamped together by strong tie bolts.

Bearings

・Coupling side : Roller bearing
・Anti-coupling side : Roller bearing
※Journal bearing can be supplied on request.

Nozzle orientation

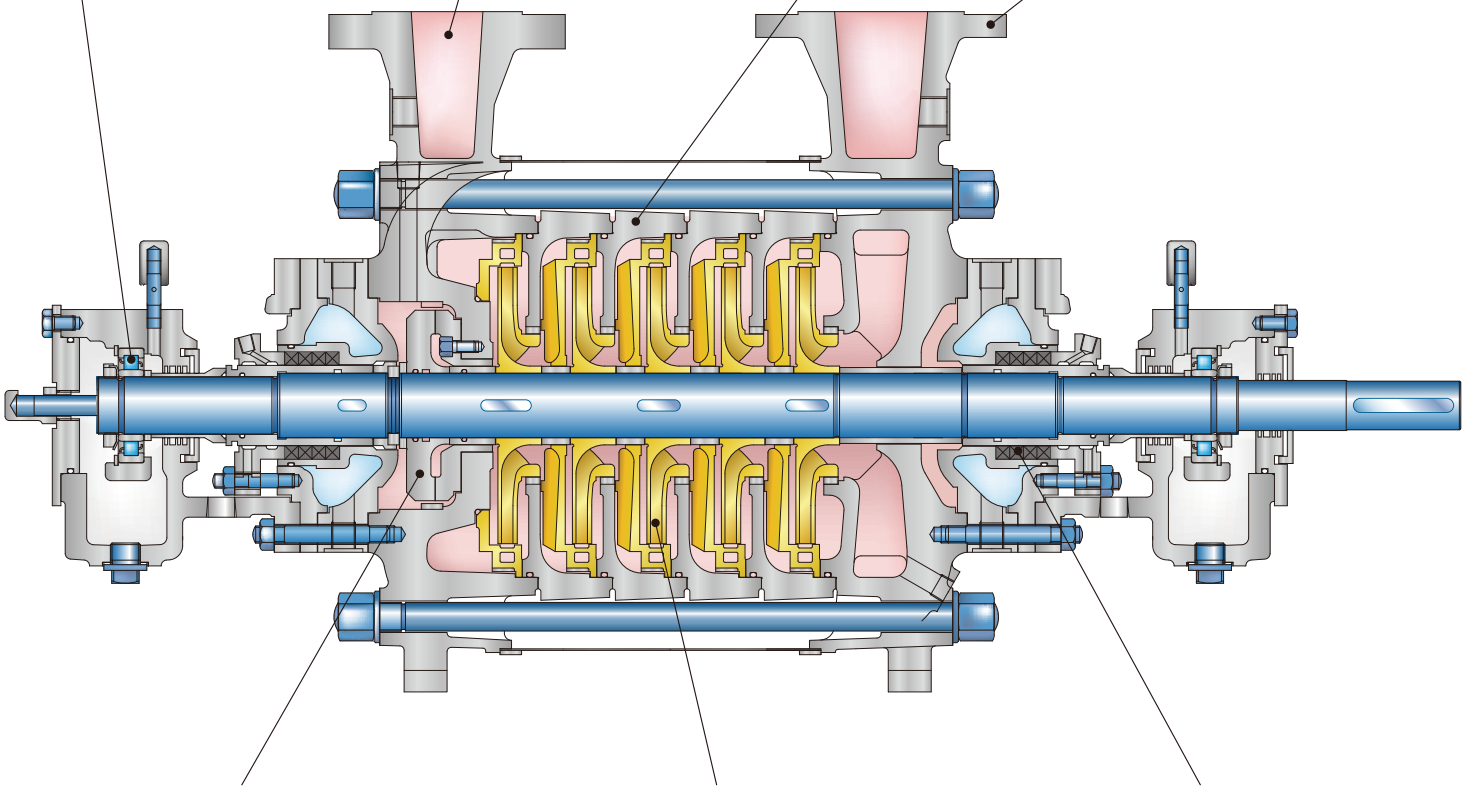
・Suction nozzle : Top
・Discharge nozzle : Top

Casing

Ring-section single casing
Feet at shaft centerline

Flange

JIS, ANSI, DIN



Balancing device

The axial thrust is compensated by the balancing disc & seat at the discharge end of the pump.

Impeller

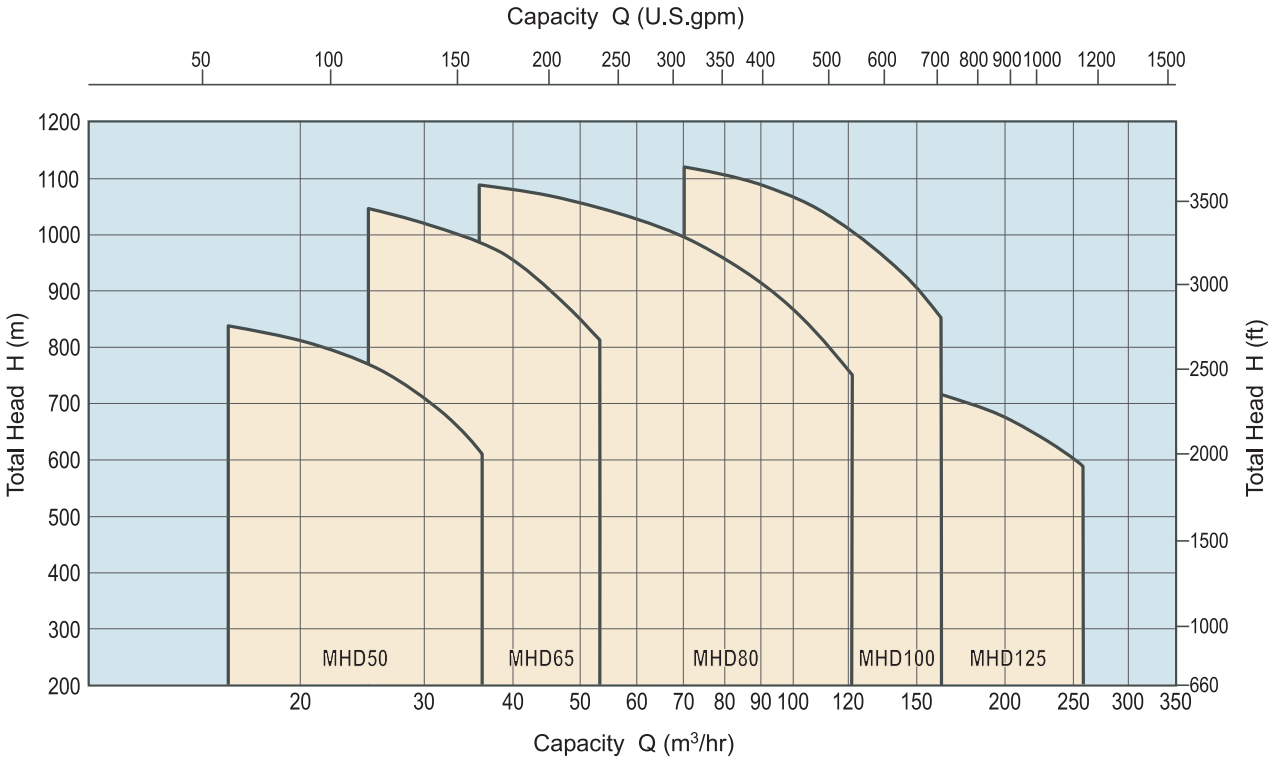
Closed impeller of three dimensions

Shaft seal

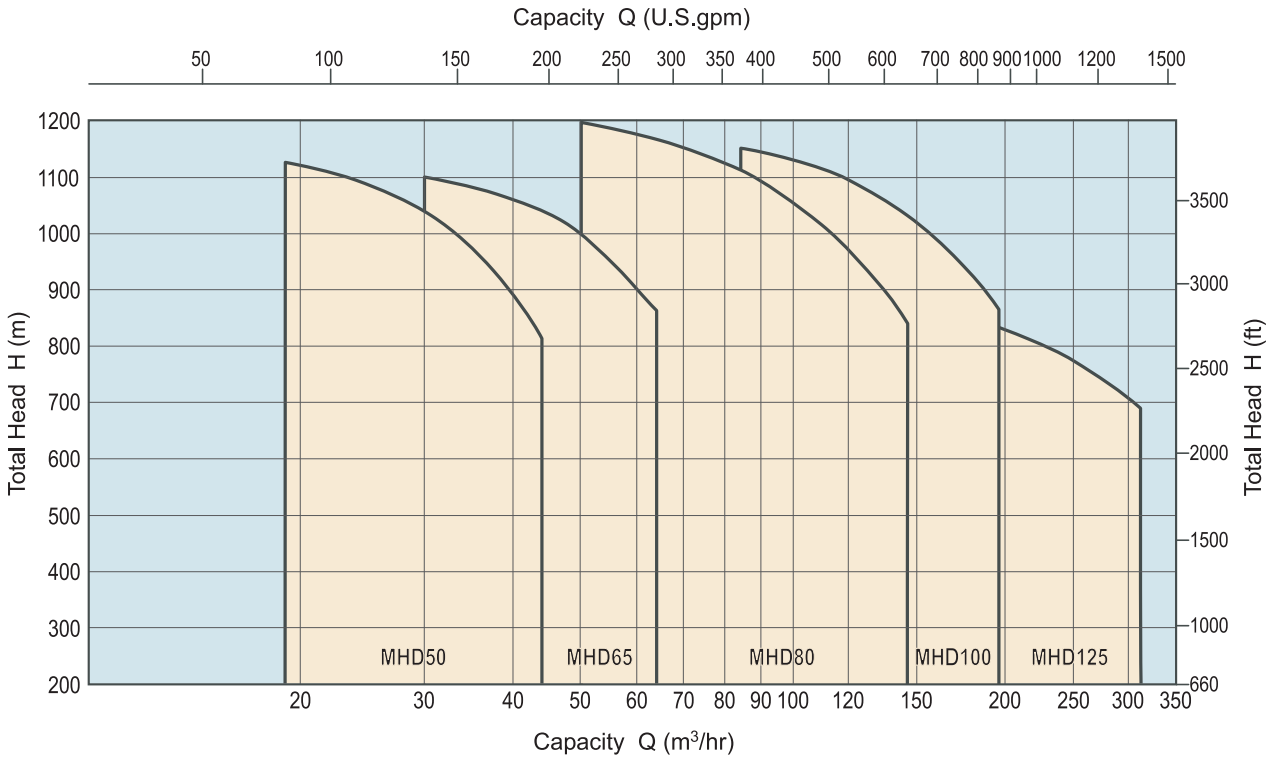
・Packed gland
・Mechanical seal

Selection Charts

50Hz-2P
(2900min^{-1})



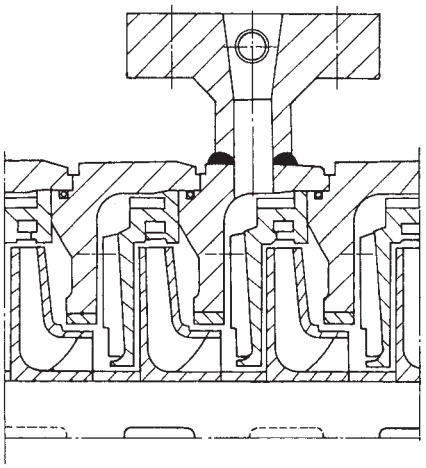
60Hz-2P
(3500min^{-1})



Additional Design Options

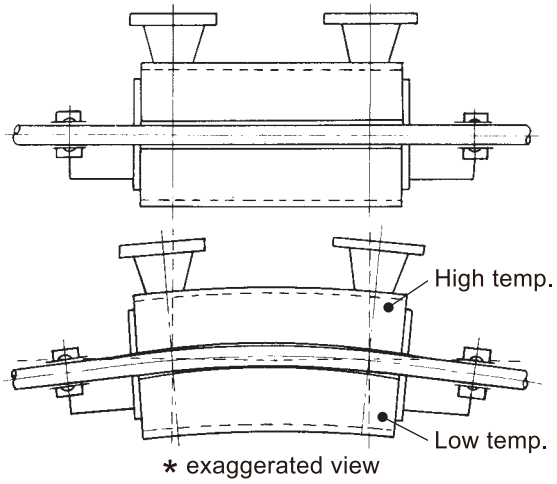
Bleeding from stage casing

If situation requires lower pressurized water than the discharge pressure of the pump, ring-sectional casing pumps can be easily extracted the pressurized water from suitable middle casing or casings by an extraction pipe in necessary.



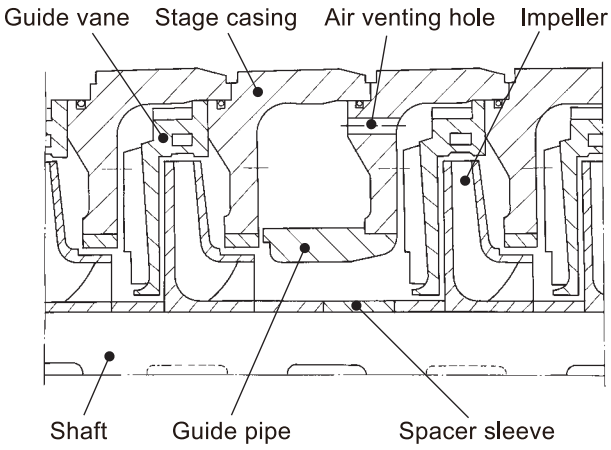
Start-up from ambient temperature condition

For a ring-sectional single casing pump it is possible to start-up quickly and it is not necessary to warm the pump from cold water or ambient condition.
The figure on the right shows distortion of a pump because of difference of temperature.
In general, the upper part of the casing expands more than the lower part because of difference of temperature inside the pump. Since the MHD type pump casings are tightened each other by strong tie-bolts outside to prevent for the above mentioned influence, even large size pump can start up from the cold water without warming.
(Warming or circulator can be supplied on request.)

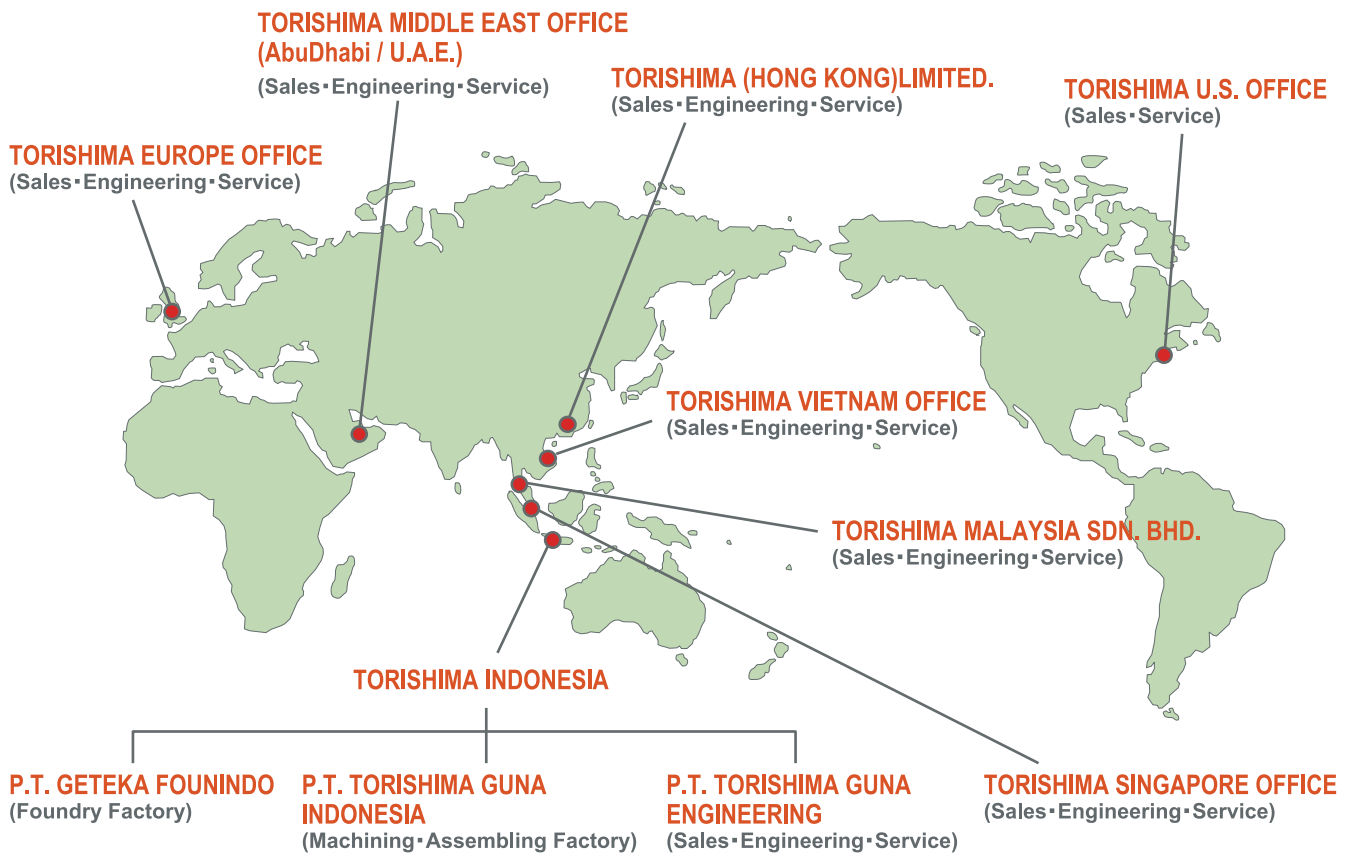


Blind stage

This method is applicable to multistage pumps that require a reduction in pump head, temporarily or parmanently, or require future uprating of the head, without changing the pump casing size.
After removing the required of impellers and guide vanes corresponding to the head to be reduced, guide pipes and spacer sleeves are inserted respectively.
This method is applied to intermediate stage impellers only. If it is necessary to remove more than one stage impeller, allow a space of one or more stages is left rather than arranging the black stages successively.



TGT TORISHIMA GLOBAL TEAM Global Network



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