

SNM

RADIALLY SPLIT MULTISTAGE DOUBLE CASING PUMPS

Model BTBF (BTBFD)

API 610 11th Edition Process Pump



MODEL BTBF (BTBFD) Radially Split Multistage Double Casing Between Bearings Pumps (API Class BB5)

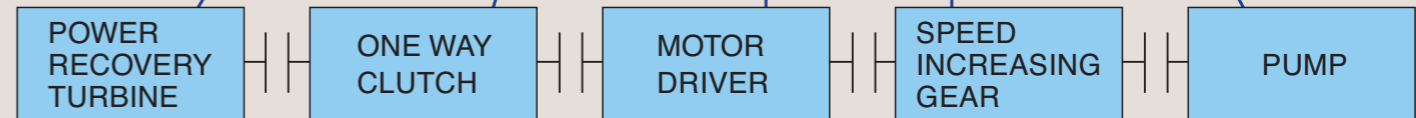
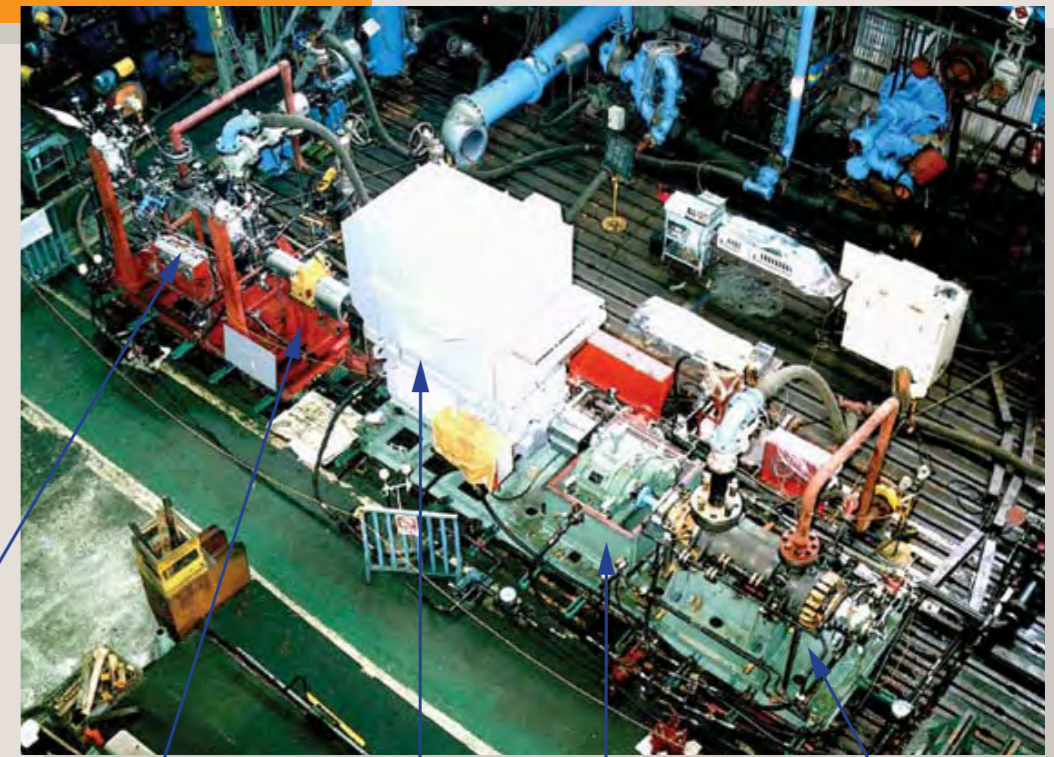
Design Feature

- The model BTBF is horizontal, radially split, multistage, single suction (BTBFD=double suction at 1st stage), double casing, diffuser guide-vane type, centerline support, between bearings barrel pump.
- BTBF(BTBFD) is suitable for high pressure, high temperature, high speed, (BTBFD=for low NPSH), other wide range of heavy duty process and industrial applications.
- Heavy duty construction is in full compliance with API 11th edition.
- Seal chamber
Seal chamber dimensions are in full compliance with API682 and API610 standards. Dual seals can be installed with our standard seal chamber dimension.
- Easy maintenance
Overhaul can be carried out without disturbing main pipings and driver. Jack bolt is furnished at rabbeted fit area in order to prevent obstruction of disassembly by sticking. Special tool can be prepared to help maintenance of inner case parts as an option.
- Long bearing life
Hydraulic axial balance device and diffuser guide-vane design produce pumps with optimum radial and axial forces balance. This ensures smooth operation and a long bearing life.
- Low vibration
Full circular construction of bearing housing, well balanced rotor assembly and optimum clearance design minimizes vibration of pump.
- Self vent
Top discharge, top suction nozzles are capable of self venting and ensure smooth start up.
- Minimal variety of spare parts
By standardizing our horizontal, between bearings pumps, replacement parts are interchangeable and can be provided with little or no lead time.

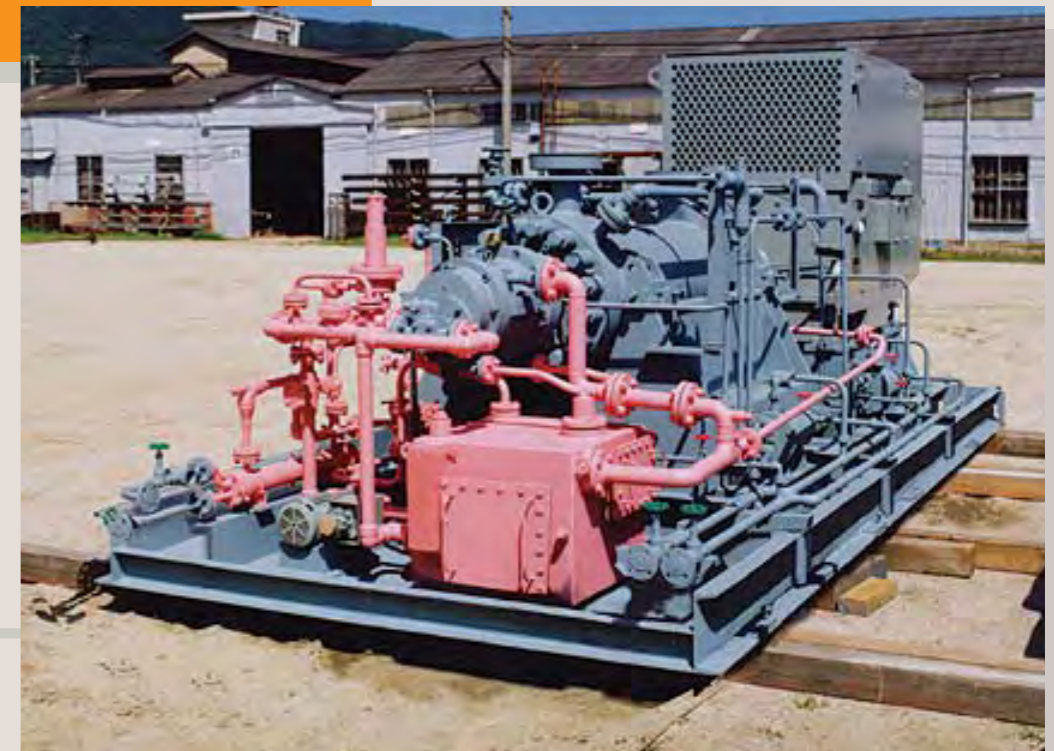
Specification

- Max. flow rate up to 2000 m³/h
- Max. discharge pressure up to 2500# Flange rating
- Max. operation temperature up to 450 °C
- Max. speed up to 7000 rpm

Shop running test



BTBF (with lube oil unit)



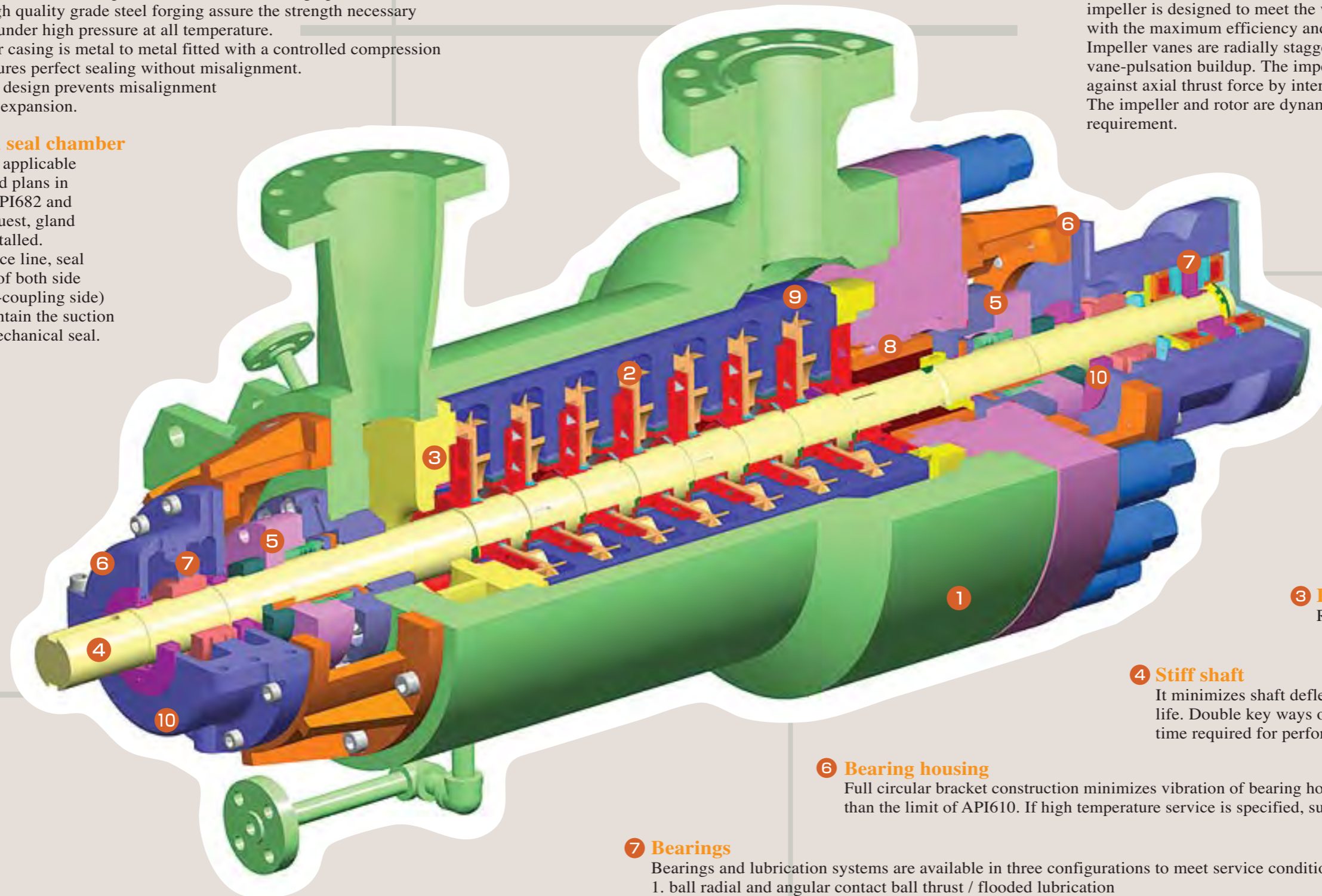
MODEL BTBF (BTBFD) Radially Split Multistage Double Casing Between Bearings Pumps

1 Outer casing

The casing is designed in full compliance with API610. (design pressure, nozzle force and moment, etc.)
The cylindrical high quality grade steel forging assure the strength necessary for safe operation under high pressure at all temperature.
Radially split outer casing is metal to metal fitted with a controlled compression Gasket, which ensures perfect sealing without misalignment.
Centerline support design prevents misalignment caused by thermal expansion.

5 Shaft seals and seal chamber

Mechanical seal is applicable to all seal types and plans in accordance with API682 and API610. Upon request, gland packing can be installed.
By using the balance line, seal chamber pressure of both side (coupling and anti-coupling side) is designed to maintain the suction pressure for the mechanical seal.



2 Impeller

Closed single suction(BTBFD : double suction at 1st stage) multistage impeller is designed to meet the wide range of specific operating condition with the maximum efficiency and low NPSH-required (NPSH3).
Impeller vanes are radially staggered against diffusers one to avoid vane-pulsation buildup. The impeller is positively secured along the shaft against axial thrust force by interference fit and sprit ring.
The impeller and rotor are dynamically balanced to meet the API610 requirement.

3 Renewable wear rings

Renewable wear rings are furnished.

4 Stiff shaft

It minimizes shaft deflection for longer bearing and seal life. Double key ways on the shaft reduces the difficulty and time required for performing fine tolerance balancing.

6 Bearing housing

Full circular bracket construction minimizes vibration of bearing housing. Pump vibration is much lower than the limit of API610. If high temperature service is specified, suitable cooling system is furnished.

7 Bearings

Bearings and lubrication systems are available in three configurations to meet service conditions and the requirements of API610.
1. ball radial and angular contact ball thrust / flooded lubrication
2. sleeve radial and angular contact ball thrust / oil ring lubrication
3. sleeve radial and tilting pad thrust / pressurized lubrication

8 Hydraulic axial balance device

One pressure reducing sleeve on the thrust end of the rotor reduces axial thrust force and prolongs bearing life.

10 Replaceable labyrinth end seals and deflectors

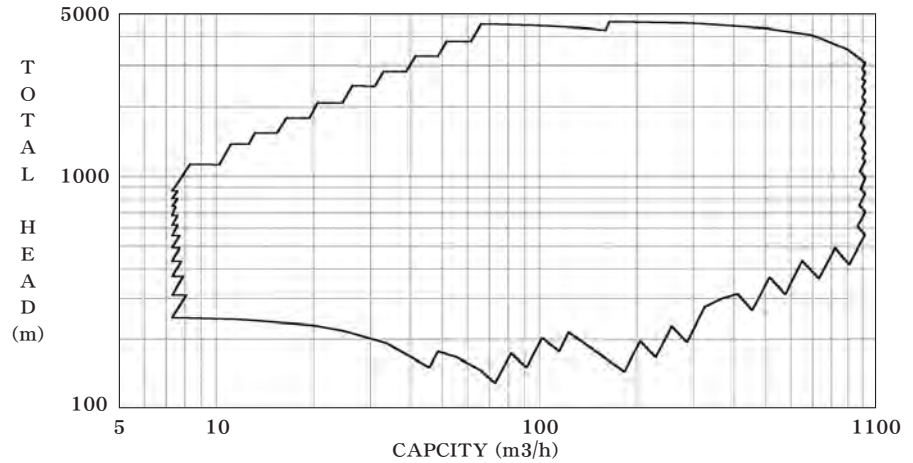
Labyrinth end seals and deflectors effectively retain oil in the housing and prevent entry of foreign material into the housing.

9 Inner casing

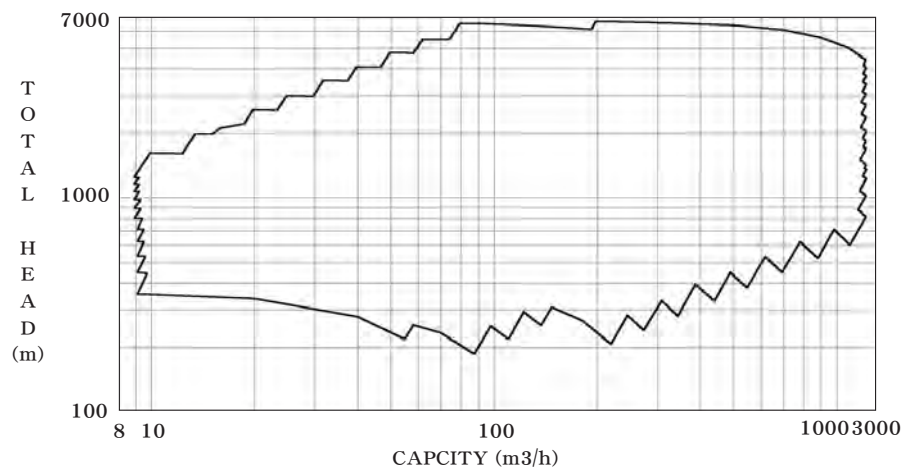
Precision machined inner casing of forged steel has improved machining accuracy, surface roughness and reliability of materials.
Intermediate covers with radial split and metal to metal fit structure minimize internal leakage and misalignment.
Diffusers with equally spaced multiple vanes equalize the head pressure at all points around the periphery of the impellers, eliminating radial forces and the resultant shaft deflection.

Model BTBF performance chart

Coverage-50Hz



Coverage-60Hz



(※) In addition to above-mentioned chart, we will provide the best design for your application.

Optional Feature

Design for optimum operating condition

3D machined impeller

3D machined impellers(※) can be designed and produced to meet specific operating condition by using advanced flow analysis method.

(※)Machining processes for fabricated impellers offer capabilities for more exact profiles and higher efficiency.

Optimized impeller



Optional lubrication

Oil mist lubrication

Oil mist lubrication can be provided.

Optional Feature

■ For higher efficiency requirement

- Non-metallic material wear rings

Use of non-metallic material wear rings ensures improvement of pump efficiency. Running clearance can be reduced with improved reliability as well as termination of seizure under specified operating conditions.

- CCD (=Continuous Crossover Diffuser)

All machined CCD allow for less flow loss.

Machined surfaces on flow passage are smoother and more precise than casting.

The continuous crossover flow passages are based on flow analysis program and improve the hydrodynamic efficiency.

Forged steel extends the diffuser's life.



CCD

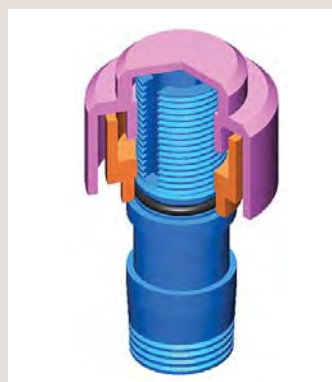
■ Special protector

- Special labyrinth seal and deflector
- Special gas breather
- Bearing protector

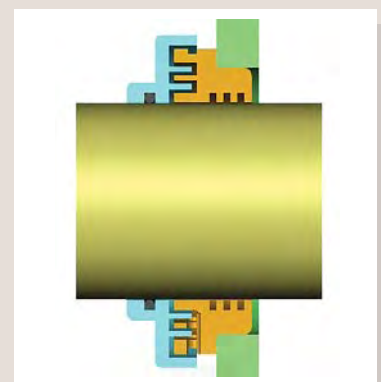
The above-mentioned parts will prevent lubricant contamination caused by cloudburst, sandstorm, entry of steam and other heavy condition.



Bearing protector



Special gas breather



Special labyrinth seal
And deflector

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