Type HH Range of Shaft Seals

The HH Range of Seals are suitable for all types of turbines, including reversible pump turbines. If there is access for adjustment after installation then face loading can be achieved by using Springs or Weights, when no access is available then Pneumatic Cylinders can be used to load the faces.

All HH Type Seals are custom designed and are fully split for ease of installation and maintenance. The main wearing face is made from a special composite material that will regenerate mutually conforming seal faces if damaged by abrasive particles.

The design can be adapted to suit either horizontal or vertical shafts (weights can only be used on vertical shafts), and are capable of operating at circumferential velocities up to 30 m/sec (100 ft/sec), and pressures up to 10 bar (150 p.s.i.). With hydrostatic feed these parameters can be increased.

fig 1

HHSS Type Seal (fig 1): (click here for pdf of fig 1)

The Cone (C) is secured to the shaft, and rotates with the shaft.
The composite fibre End Seal (A) is located in the Sleeve (D) and is secured in position by the Retaining Ring (B).
Face loading is achieved by Springs (P) and turbine water pressure.
As the End Seal (A) wears, the Sleeve (D) slides through the Main O-Ring (H) which is located in Top Plate (G).

The Wear Indicator System (J/K) can be linked mechanically to a gauge panel or electronically to a digital display unit (mechanical version shown).

All metallic components can be supplied in a choice of materials to suit individual applications.

Cooling water, which can be unfiltered penstock water, must be supplied to the seal under all working conditions (whenever the shaft is rotating) if hydrostatic feed is not utilised. If hydrostatic feed is incorporated into the seal, the water supply to this feed needs to be filtered to 25 microns (100 mils).

HHSW Type Seal (fig 2): (click here for pdf of fig 2)

The HHSW seal is only used on vertical shafts as seal loading is achieved by using weights.
Once the correct seal loading has been achieved there is no need for periodic adjustment until planned maintenance is required.
The weight rings are supplied in different weights so that the rings can be added or subtracted until the desired seal loading has been achieved.

fig 2

HHSC Type Seal (fig 3): (click here for pdf of fig 3)

The HHSC seal is used only where there is no access to the seal after installation.

Seal loading is achieved by using pneumatic cylinders which are controlled by a regulator on a simple control circuit.

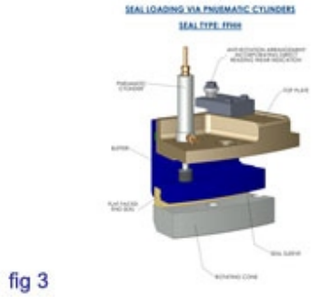
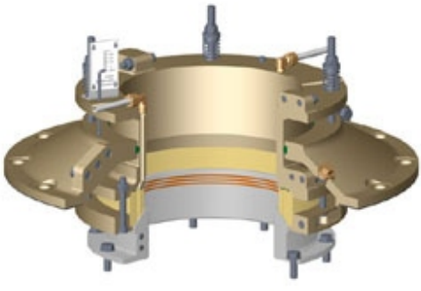


fig 3

This arrangement is the most suitable for use on reversible pump turbines.

The full HH Type Seal product range includes:

- HHSS - Straight Springs
- HHSW - Straight Weights
- HHSC - Straight Cylinders
- HHCS - Cantilevered Springs
- HHCW - Cantilevered Weights
- HHCS - Cantilevered Cylinders
- FFHH - Flat Face with Cylinders



Benefits

- Positive Sealing - Hydraulically balanced faces dimensioned to suit the application to give minimum leakage.
- Long Life - Seal life is built in and this combined with a wear indicator facilitates planned maintenance. Seal face life in excess of ten years has been achieved.
- Non-Clogging - Smooth contours and no springs in the water prevent clogging in silty conditions.
- Durable Materials - All wetted components are manufactured from corrosion resistant materials.
- Robust - The composite wearing face can be dropped without damage unlike carbon. It can also withstand vibration and abrasives without permanent damage.
- Space Saving - Custom designed seals can usually be engineered to fit into the available space allocated for the main shaft seal.
- Easy Maintenance - Simple robust components are easier to handle and fit than multi-segment carbon glands, thereby, reducing downtime and maintenance costs.
- Flexible Design - Can accommodate axial and radial shaft movements without special precautions.