

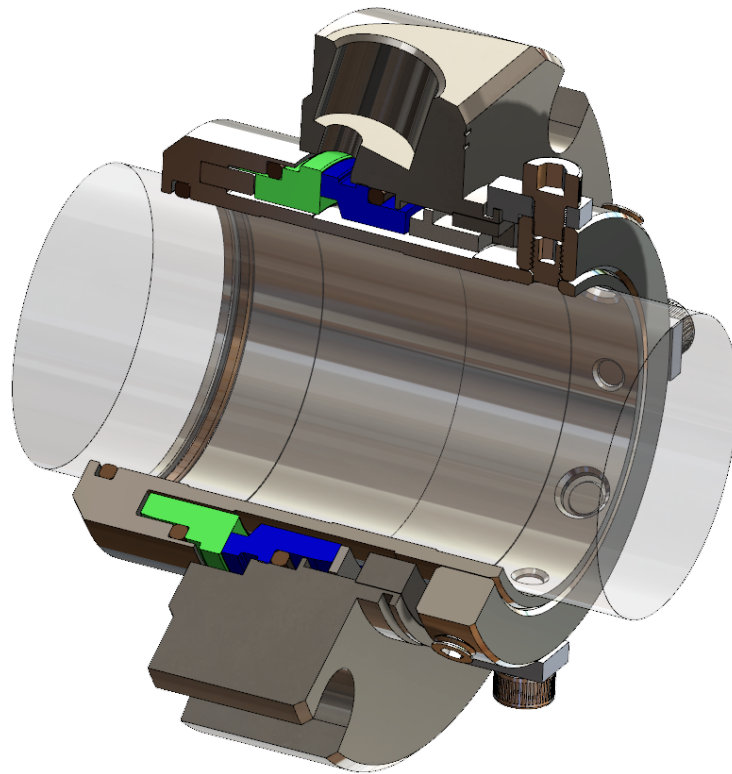


SINGLE AND DOUBLE CARTRIDGE SEALS

CARTRIDGE SEAL

GENERAL  
INSTALLATION  
INSTRUCTIONS

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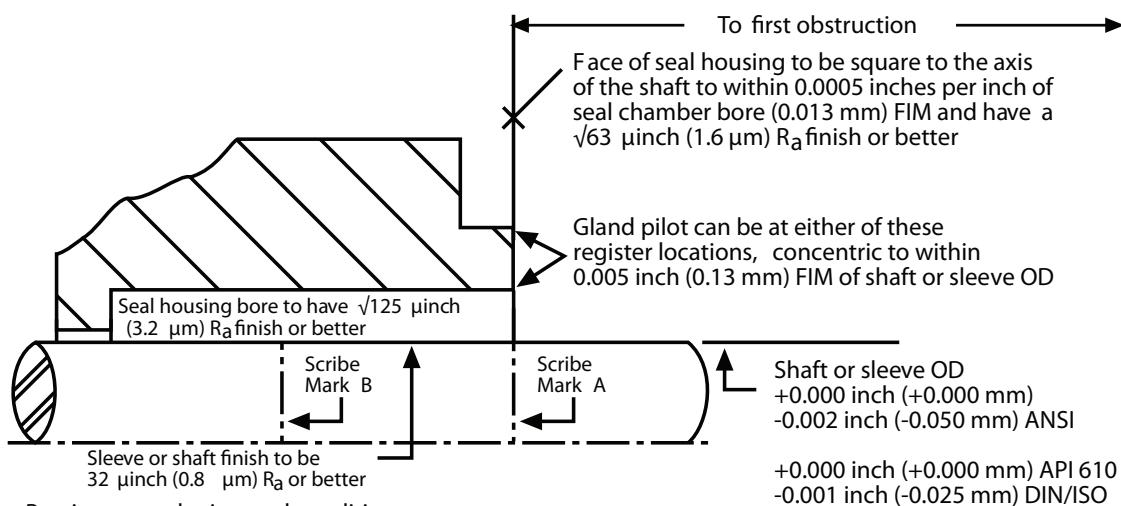


## 1 Equipment Check

- 1.1 Follow plant safety regulations prior to equipment disassembly:
  - lock out motor and valves.
  - wear designated personal safety equipment.
  - relieve any pressure in the system.
  - consult plant MSDS files for hazardous material regulations.
- 1.2 Disassemble equipment to allow access to seal installation area.
- 1.3 Remove all burrs and sharp edges from the shaft or sleeve including sharp edges of keyways and threads. Replace shaft or sleeve if it is worn in the sleeve gasket area. Make sure the seal housing bore and face are clean and free of burrs.
- 1.4 Check requirements for shaft, sleeve, and seal housing. See Figure 1.

Seal Chamber Requirements

Figure 1



- Bearings must be in good condition
- Maximum lateral or axial movement of shaft (end play) = 0.010 inch (0.25 mm) FIM
- Maximum shaft runout at face of seal housing = 0.002 inch (0.05 mm) FIM
- Maximum dynamic shaft deflection at seal housing = 0.002 inch (0.05 mm) FIM

- 1.5 Check assembly drawing included with the cartridge seal for specific seal design, materials of construction, dimensions, and piping connections.
- 1.6 Check shaft or sleeve OD, seal housing bore, and distance to the first obstruction to ensure they are dimensionally the same as shown on the seal assembly drawing.
- 1.7 Check gland pilot and bolt holes to ensure they are adaptable to the equipment and are the same as shown on the assembly drawing. Many cartridge seal designs include setting devices that center the seal around the shaft and do not require a gland pilot.
- 1.8 Handle all seal parts with care, they are manufactured to precise tolerances. The rubbing contact faces of the rotating and stationary faces are of special importance. These two sealing faces are lapped flat to within three light bands (34.8 millionths of an inch). Keep the seal faces perfectly clean at all times.

## 2 Cartridge Seal Installation

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- 2.1 Lubricate the shaft or sleeve lightly with lubricant provided with the seal.
- 2.2 Install the complete cartridge seal assembly on the shaft.
- 2.3 For overhung pumps: Position the seal close to the bearing housing with the seal oriented toward the pump. Install the pump back-plate or seal housing and assemble the pump.
- 2.4 Position the cartridge gland against the seal housing face and tighten the gland stud nuts up evenly, cross staggering the adjustment of the nuts. The gland nuts should be torqued to a maximum of 10 ft-lbs (13 N-m). Excessive gland nut pressure can result in distortion of the stationary face.
- 2.5 For between bearings pumps: Assemble the bearings, coupling, etc. and adjust the impeller so that the shaft is in its operating axial position.
- 2.6 For end suction pumps: Adjust the bearings, coupling, and impeller so that the shaft is in its operating axial position.

2.7 Tighten the set screws on the seal cartridge drive collar.

Note: Any subsequent axial adjustment of the shaft requires resetting of the seal.

2.8 Disengage or remove setting devices. Eccentric washer or slotted plate type setting devices should be repositioned clear of rotating parts and locked to the gland in a neutral position. Centering type devices cap screwed to the sleeve drive collar should be removed and stored for future seal removal and repair. All setting device types need to be reinstalled for resetting the seal when repositioning the pump impeller.

2.9 See Operational Recommendations, paragraph 3 and 4, before starting pump.

### 3 Operational Recommendations for Single Cartridge Seal

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3.1 Do not start up the equipment dry. Vent air from the casing of the pump and the seal chamber before startup. Check the seal assembly drawing for the recommended piping plan and follow any special instructions. Plan 11 is a good default flush plan if none are specified for horizontal pumps.

3.2 If the seal runs hot, check for proper seal setting, seal housing dimensions, and check the bypass or flush line for obstructions. Do not allow the equipment to run for any extended time if the seal gets hot or squeals.

## 4 Operational Recommendations for Dual Cartridge Seal

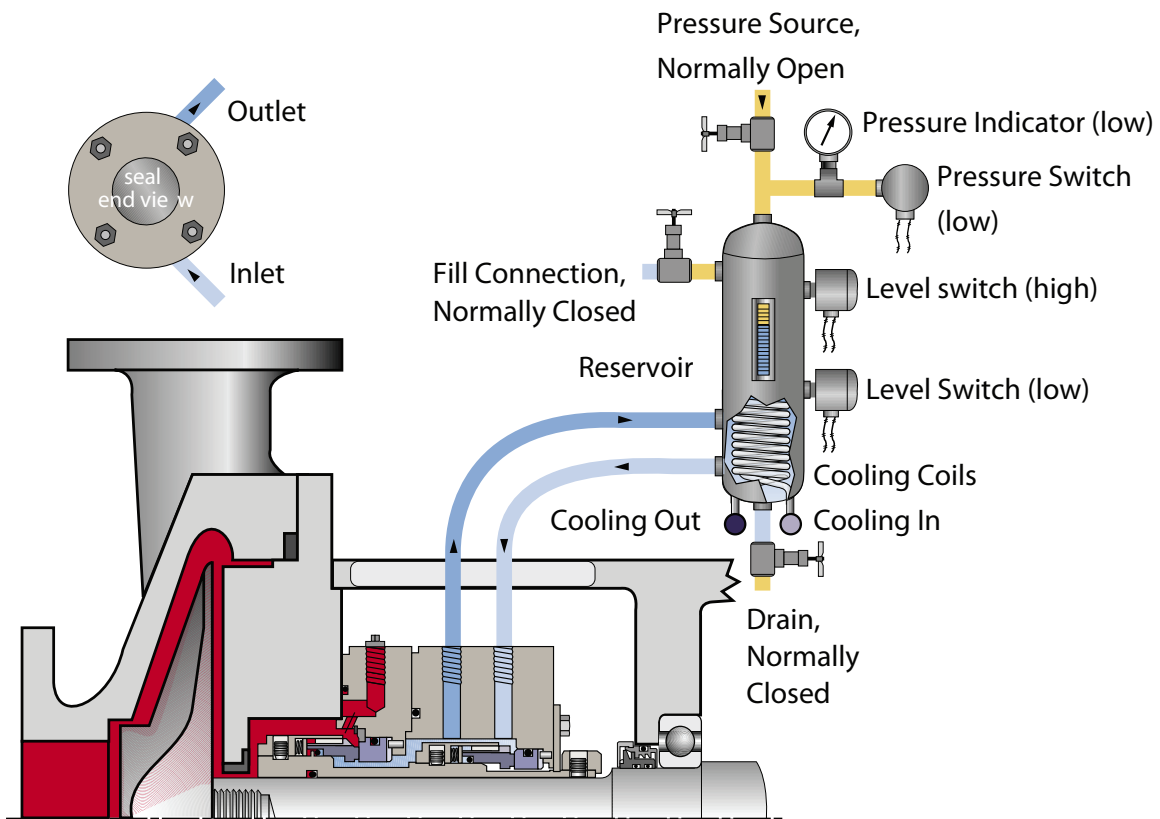
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- 4.1 A dual seal must be supplied a clean buffer/barrier fluid compatible with the product.
- 4.2 Dual pressurized seals must at all times maintain barrier fluid pressure at least 25 psig (172 kPa) above the maximum product pressure in the seal chamber.
- 4.2 The recommended piping for a dual pressurized seal with the use of a Supply Tank is shown in Figure 2, Plan 53A. Circulation from an external source is shown in Figure 3, Plan 54. Other mechanical seal support systems are also available.
- 4.3 Turn on any cooling water to the supply tank or other support system.
- 4.4 Start-up the seal barrier fluid system before starting pump.
- 4.5 Do not start up the equipment dry. Vent air from the casing of the pump before startup.
- 4.6 If the seal runs hot, check for proper seal setting, seal housing dimensions, and check the barrier fluid system. Do not allow the equipment to run for any extended time if the seal gets hot or squeals.

## Recommended Piping for Dual Liquid Lubricated Seals

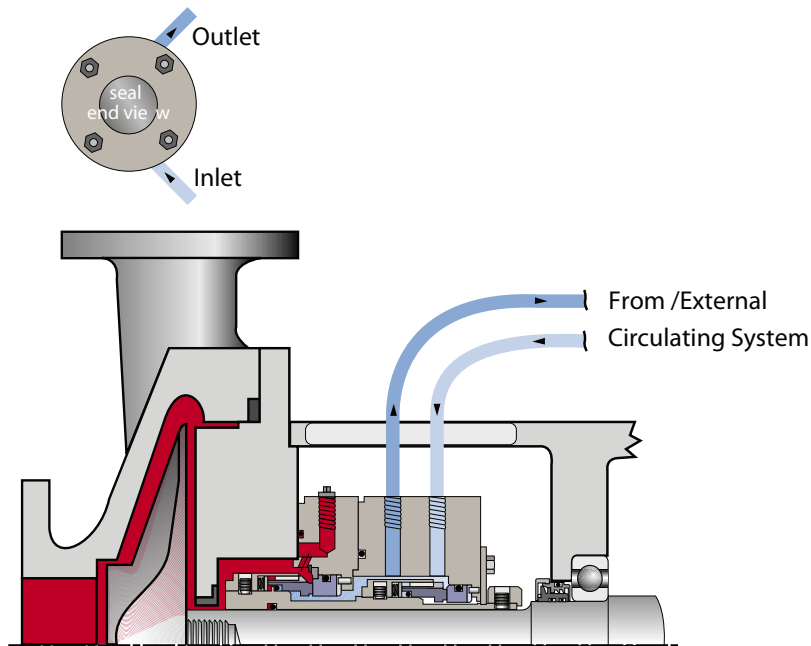
Figure 2

Plan 53A - Dual pressurized seal with circulation through a supply tank



Plan 54 - Dual seal circulation from an external source

Figure 3



## 5 Repair

This product is a precision sealing device. The design and dimension tolerances are critical to seal performance. Only parts supplied by Hydroflo should be used to repair a seal. These are available from numerous Hydroflo stocking distributors. To order replacement parts, refer to the part code number and serial number. A spare backup seal should be stocked to reduce repair time.

When repairs are not conducted at the customer's location, decontaminate the seal assembly and return it to Hydroflo, with an order marked "**Repair or Replace**". A signed certificate of decontamination must be attached. A Material Safety Data Sheet (MSDS) must be enclosed for any product that came in contact with the seal. The seal assembly will be inspected and, if repairable, it will be rebuilt, tested, and returned in its original condition.

# Hydroflo pumps



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