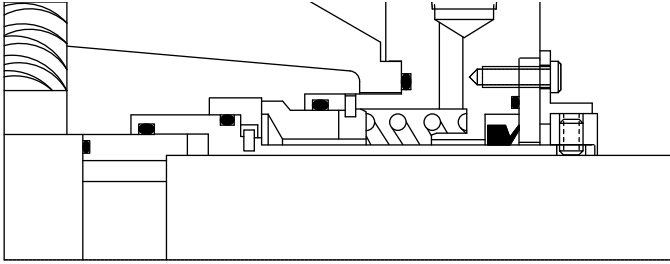


FLUSHLESS CARTRIDGE SEAL

Installation, Operation & Maintenance Instructions

Foreword

These instructions are provided to familiarize the user with the seal and its designated use. These instructions must be read and applied whenever work is done on the seal, and must be kept available for future reference.



ATTENTION These instructions are for the installation and operation of a seal as used in rotating equipment and will help to avoid danger and increase reliability. The information required may change with other types of equipment or installation arrangements. These instructions must be read in conjunction with the instruction manuals for both the pump and any ancillary equipment.

If the seal is to be used for an application other than that originally intended or outside the recommended performance limits, John Crane must be contacted before its installation and use.

Any warranty may be affected by improper handling, installation, or use of this seal. Contact John Crane for information as to exclusive product warranty and limitations of liability.

If questions or problems arise, contact your local John Crane representative or the original equipment manufacturer, as appropriate.

ATTENTION John Crane mechanical seals are precision products and must be handled appropriately. Take particular care to avoid damage to lapped sealing faces and to flexible sealing rings. Do not excessively compress the seal before or during installation.

Safety Instructions

1. The following designations are used in the installation instructions to highlight instructions of particular importance.

NOTE: Refers to special information on how to install or operate the seal most efficiently.

ATTENTION Refers to special information or instructions directed toward the prevention of damage to the seal or its surroundings.



Refers to mandatory instructions designed to prevent personal injury or extensive damage to the seal or its surroundings.

2. Installation, removal, and maintenance of the seal must be carried out only by qualified personnel who have read and understood these installation instructions.
3. The seal is designed exclusively for sealing rotating shafts. The manufacturer cannot be held liable for use of the seal for purposes other than this.
4. The seal must only be used in technically perfect condition, and must be operated within the recommended performance limits in accordance with its designated use set out in these installation instructions.

5. If the pumped fluid is hazardous or toxic, appropriate precautions must be taken to ensure that any seal leakage is adequately contained. Further information on sealing hazardous or toxic fluids should be obtained from John Crane prior to seal installation.
6. Fluorocarbon components should never be burned or incinerated as the fumes and residues are highly toxic. If fluorocarbons are accidentally heated above 750°F/400°C, they can decompose. Protective gloves should be worn as hydrofluoric acid may be present.
7. PTFE components should never be burned or incinerated as the fumes are highly toxic.

Before Starting The Equipment

1. Check the pump at the coupling for proper alignment of the driver or motor.
2. Ensure that the gland plate nuts/bolts are securely tightened according to the pump manual instructions, and that all screws are securely fastened.
3. Complete the assembly of the pump, and turn the shaft (by hand if possible) to ensure free rotation.
4. Consult all available equipment operating instructions to check for correctness of all piping and connections, particularly regarding seal recirculation/flush, heating or cooling requirements, and services external to the seal.

ATTENTION This mechanical seal is designed to operate in a liquid so the heat energy it creates is adequately removed. Therefore, the following check should be carried out not only after seal installation, but also after any period of equipment inactivity.

5. Check that the seal chamber fluid lines are open and free of any obstruction, and ensure that the seal chamber is properly vented and filled with liquid - refer to the pump instruction manual.

ATTENTION Dry-running - often indicated by a squealing noise from the seal area - will cause overheating and scoring or other damage to the sealing surfaces, resulting in excessive leakage or a much shortened seal life.



Before start-up, ensure that all personnel and assembly equipment have been moved to a safe distance, so there is no contact with rotating parts on the pump, seal, coupling, or motor.

WARNING: Seal installation should be handled only by qualified personnel. If questions arise, contact the local John Crane representative. Improper use and/or installation of this product could result in injury to the person and/or harmful emissions to the environment, and may affect any warranty on the product. Please contact John Crane for information as to exclusive product warranty and limitations of liability.

FLUSHLESS CARTRIDGE SEAL

Installation, Operation & Maintenance Instructions

Installing The Seal

These installation instructions are for TaperBore™ PLUS seal chambers having the VPE ring and other flow modifying seal chambers that have sufficient radial and axial space to fit the seal. Please note that some packing and standard seal chambers may interfere with the fit and/or function of the 5870 seal.

1. Lubricate the seal's sleeve O-ring (#9).
2. Slide the cartridge seal onto the pump shaft / sleeve and push back to the bearing frame. If the seal design includes a stub sleeve (#10), install it with its O-ring (#11) on the pump shaft now, properly aligning it with the key way slot on the shaft.
3. Bring the pump's seal chamber over the shaft and bolt to the bearing frame.

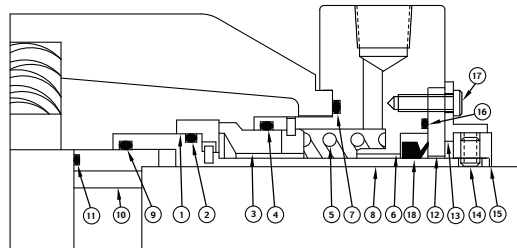
NOTE: Take care when bringing the pump's seal chamber towards the bearing frame and over the seal faces. Make sure the bore of the seal chamber does not contact the seal's faces (#1 and #3) during this step causing them to distort or break!

4. Finish assembling the rest of the pump.
5. Slide the cartridge seal towards the seal chamber and bolt to the seal chamber ensuring the position of the piping connection on the gland plate (#6), marked "Q", is at or near top dead center. If that is not possible, then

position the connections at the 3 o'clock / 9 o'clock positions.

6. Make any last pump impeller adjustments.
7. Tighten the seal's set screws (#14) to the pump shaft / sleeve.
8. Loosen the seal's spacer clip cap screws (#17) and slide the spacer clips (#13) away from the seal's collar (#15) and re-tighten the cap screws.

NOTE: If required, the 5870 seal can be used with a water or grease quench seal support method, API Plan 62. Please contact the local John Crane representative to determine if and what quench support method is needed.



9. Water Quench Piping (if required)

- 9.1 Connect a reliable source of water via a flow control device to the seal's gland plate connection marked "Q".
- 9.2 Install outlet piping/tubing with no restrictions from the gland plate connection marked "D" at the bottom to a suitable drain.
- 9.3 Set the water flow rate at about 2 to 4 gallons (7.5 to 15 liters) per hour, and pressure at 5 psig or lower.

10 Grease Quench Piping - Manual Feed (if required)

NOTE: The fittings supplied with all seals are only for grease quenched seals. Store these items if no quench or a water quench is used instead.

- 10.1 Install outlet piping/tubing with no restrictions from the gland plate connection marked "Q" to a short position away from the seal gland to expel used grease into a suitable container.
- 10.2 Install the supplied hex bushing and grease fitting into the gland plate connection marked "D" at the bottom.
- 10.3 From the bottom connection, slowly fill the seal quench cavity with any general purpose NLGI grade 1 or 2 grease using a grease gun until it expels from the outlet gland connection piping/tubing.

11. Grease Quench Piping - Automatic Feed (if required)

- 11.1 Install outlet piping / tubing with no restrictions from the gland plate connection marked "Q" to a short position away from the seal gland to expel used grease into a suitable container.
- 11.2 Install inlet piping using a 90° elbow with the supplied hex bushing and grease fitting at the end of a short extension pipe into the gland plate connection marked "D" at the bottom.

WARNING: It is recommended that Automatic Grease Feeders be installed to the seal gland connection with piping. Thin wall tubing may not adequately support the weight of a filled unit.

- 11.3 From the bottom connection, slowly fill the seal quench cavity with any general purpose NLGI grade 1 or 2 grease using a grease gun until it expels from the outlet gland connection piping / tubing. Remove the grease fitting from the hex bushing.
- 11.4 Fill the grease feeder by connecting a grease gun to the side grease fitting on the unit until grease comes out of the base coupler. Screw the grease feeder immediately into the inlet piping hex bushing—hand-tighten only.

NOTE: For more information about quench seal support, refer to TRP-QUENCH.

Quality Assurance

This seal has been assembled in accordance with John Crane quality assurance standards, and with proper maintenance and use will give safe and reliable operation to the maximum recommended performance as shown in any relevant approved John Crane publication.

Operating (non-concurrent) Limits

Temperatures:	Up to 300°F / 150°C
Pressures:	Up to 300 psig / 21 bar g
Particle Size:	Up to 5,000 micron
Speeds:	Up to 2200 fpm / 11 m/s
Axial Movement:	± 0.080" / 2mm
Services:	Up to 6% paper stock, ash slurries, corn slurries, beer wort, sugar juice, raw sewage, slurries up to 20% by weight.

Materials of Construction

Description	Standard	Option
Face/Primary Ring	Solid Tungsten Carbide	Silicon Carbide
Seat/Mating Ring	Solid Tungsten Carbide	Silicon Carbide
Gland Plate Assembly	316 Stainless Steel	—
Sleeve Assembly	"	"
Stub Sleeve	"	"
Auxiliary Gland	"	"
Collar	"	"
Capscrews	"	"
Spring	"	"
O-Rings	TFE Elastomer (Aflas®)	Ethylene Propylene Fluoroelastomer (Viton®)
V-Ring	Nitrile	—

Aflas is a registered trademark of Asahi Glass Co. Ltd.
Viton is a registered trademark of DuPont.



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