



# Type 4620P Dual O-Ring Cartridge Installation Instructions

## Foreword

These instructions are provided to familiarize the user with the seal and its designated use. The 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.

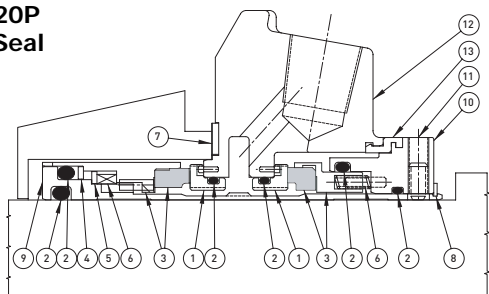
If the seal is to be used for an application other than that originally intended or outside the recommended performance limits, John Crane must be contacted before its installation and use.

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

If questions or problems arise, contact your local John Crane Sales/Service Engineer 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.

### Typical Type 4620P Dual Cartridge Seal Arrangement



Part Name		
1 Mating Ring	6 Spring	11 Set Screws
2 O-Ring	7 Gasket	12 Gland Plate Assembly
3 Primary Ring Assembly	8 Snap Ring	13 Spacer
4 Anti-X-Ring	9 Sleeve	
5 Disc	10 Collar	

## Safety Instructions

- 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 towards 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.

- Installation, removal and maintenance of the seal must be carried out only by qualified personnel who have read and understood these installation instructions.
- 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.
- 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.
- 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.
- Fluorocarbon components should never be burned or incinerated, as the fumes and residues are highly toxic. If fluorocarbons are accidentally heated above 400°C/750°F, they can decompose, therefore, protective gloves should be worn as hydrofluoric acid may be present.
- PTFE components should never be burned or incinerated, as the fumes are highly toxic.

## Materials of Construction - Standard

Primary Ring	Carbon Graphite Silicon Carbide (optional) Inboard only
Mating Ring	Silicon Carbide
Cartridge Hardware	316 S.S. or better
Secondary Seal	Fluoroelastomer*

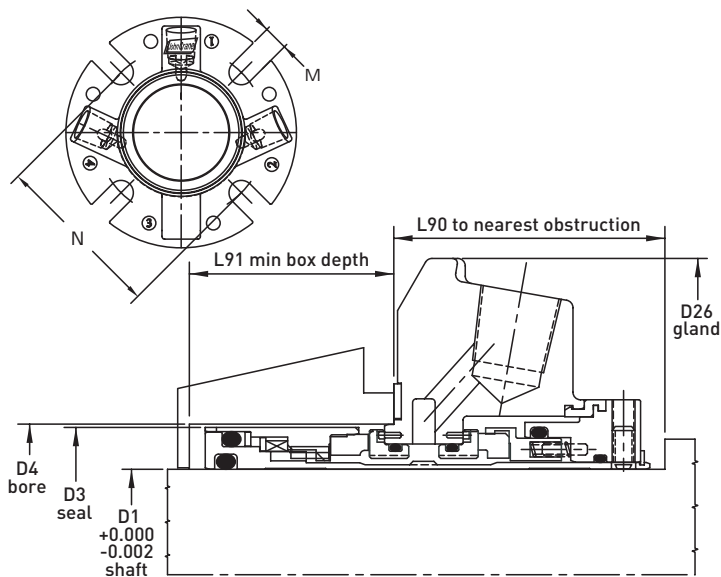
## Operating Limits

Pressure:	300 psig** maximum
Temperature:	+400°F** maximum
Speed:	5000 fpm

\* Various Options

\*\* Depending on materials and product being sealed

## Type 4620P Installation Dimensions

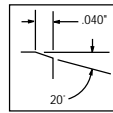
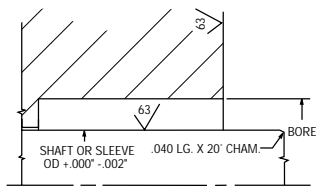


## Type 4620P Dimensional Data (inches)

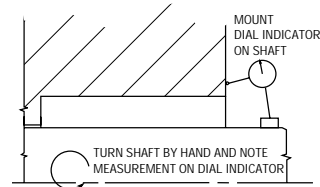
D1 Shaft Size	D4 Box Bore		D26	L90	L91 Min.	N	M
	Min.	Max.					
1.000	1.625	1.889	4.000	2.000	1.635	2.805	0.525
1.125	1.750	2.015	4.125	2.125	1.603	2.933	0.525
1.250	1.875	2.294	4.250	2.125	1.603	3.213	0.525
1.375	2.000	2.421	4.375	2.125	1.603	3.338	0.525
1.500	2.250	2.680	4.875	2.187	1.680	3.599	0.525
1.625	2.375	2.812	5.000	2.187	1.680	3.766	0.562
1.750	2.500	2.918	5.250	2.187	1.680	3.875	0.562
1.875	2.625	2.918	5.250	2.187	1.680	3.875	0.562
2.000	2.750	3.015	5.500	2.375	1.711	4.000	0.562
2.125	2.875	3.360	5.859	2.375	1.711	4.469	0.687
2.250	3.000	3.485	6.500	2.475	1.711	4.566	0.687
2.375	3.125	3.610	6.500	2.528	1.711	4.719	0.687
2.500	3.375	3.891	6.750	2.625	1.703	5.000	0.687
2.625	3.687	4.062	6.750	2.562	1.727	5.170	0.687
2.750	3.687	4.062	6.750	2.562	1.727	5.170	0.687

## Preparing the Equipment

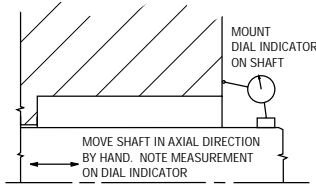
1. Check seal chamber dimensions and finishes.



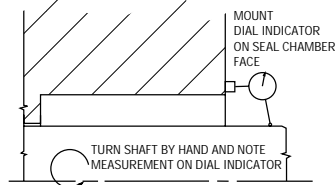
3. Determine squareness of seal chamber face to shaft (sizes to 2.750" = .002" F.I.M. max.).



2. Measure axial end play (sizes to 2.750" = .003" F.I.M. max.).



4. Measure shaft runout (sizes to 2.750" = .002" F.I.M. max.).



**NOTE:** If measured dimensions exceed those values given, correct the equipment to meet specifications prior to seal installation.

## Installing the Seal

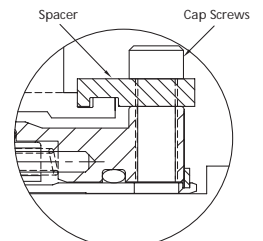
1. Before starting the installation, read the following instructions carefully.
2. Remove the seal from its packaging, inspect for any damage, and wipe clean.
3. The equipment should be clean and meet the specifications noted in the "Preparing the Equipment" section. Lubricate sleeve O-ring with lubricant recommended in chart below. Lubricate shaft sparingly. Lubricate gland plate bolts/nuts as required.

ELASTOMER	LUBRICANT
Fluoroelastomer (i.e. Viton™) Aflas®	Vegetable Oil, Animal Oil, Mineral-Hydrocarbon Oils, Soap Solution, Parker "Super-O-Lube", Silicone Grease
Ethylene Propylene	Vegetable Oil, Polywater™, Soap Solution, Glycerine, Propylene Glycol, Silicone Grease
Perfluoroelastomer	Vegetable Oil, Animal Oil, Mineral-Hydrocarbon Oils

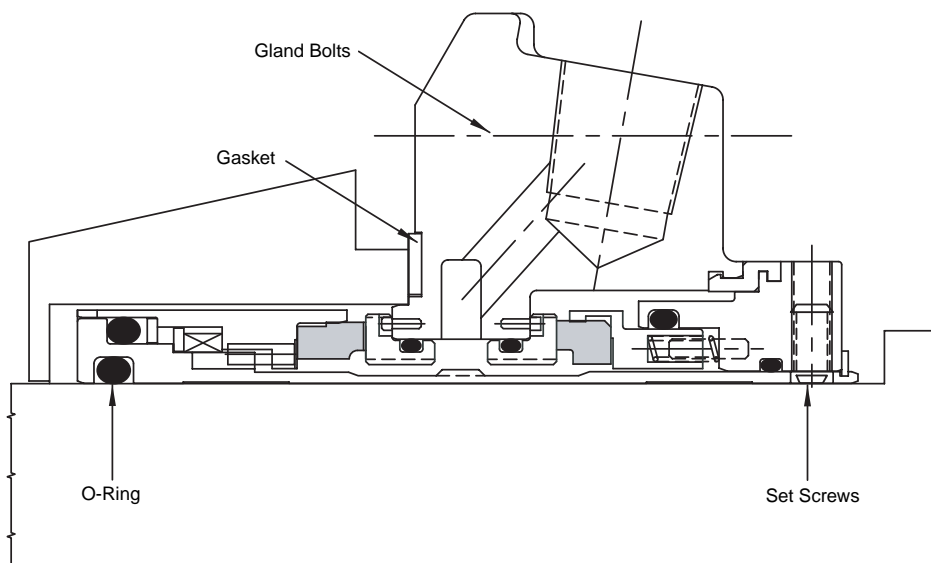
**NOTE:** Always use a lubricant that is compatible with your machinery and product. Use lubricant sparingly, only enough to install seal with ease.

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Aflas is a registered trademark of Asahi Glass Co. Ltd.  
Polywater is a registered trademark of American Polyware Co.

4. Make sure that gland plate gasket is properly positioned, and that collar set screws do not extend past sleeve ID. Slide complete cartridge seal assembly onto shaft. For ANSI pumps position gland plate so pipe connection #1 is at or near top dead center. Slide cartridge onto studs (if applicable) until gasket is flush against the face of seal chamber. Hand tighten gland plate bolts/nuts.
5. Reassemble pump and make all necessary impeller adjustments.
6. Continue tightening gland plate bolts/nuts in an alternating pattern until gland plate is secure (1/4 turns, 180° apart). Do not over-stress or distort gland plate.
7. Tighten collar set screws evenly (1/4 turns, 180° apart), securing cartridge seal to shaft.
8. On the 1.000" seal size only, the external spacer clip must be removed prior to start-up.
9. Make appropriate piping connections to seal assembly.



1.000" size seal spacer



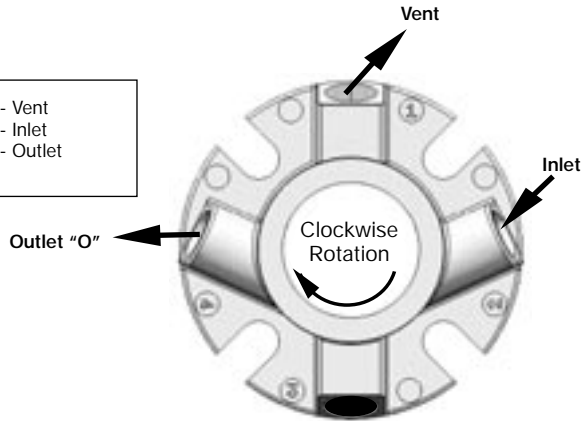
## Installing the Seal (continued)

The piping should follow the guidelines established in John Crane Manual LE-Plan 52/53-A. It is also recommended that a Plan 11 (by-pass from discharge) be used with the standard plan 52/53.

For Clockwise Shaft Rotation:

### Preferred

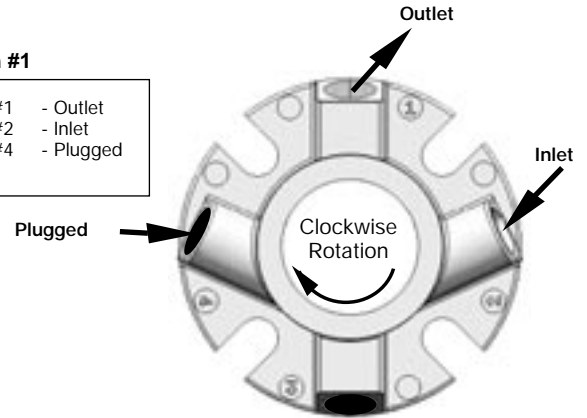
- |         |          |
|---------|----------|
| Port #1 | - Vent   |
| Port #2 | - Inlet  |
| Port #4 | - Outlet |



Direction of view is from the driver end of pump.

### Option #1

- |         |           |
|---------|-----------|
| Port #1 | - Outlet  |
| Port #2 | - Inlet   |
| Port #4 | - Plugged |

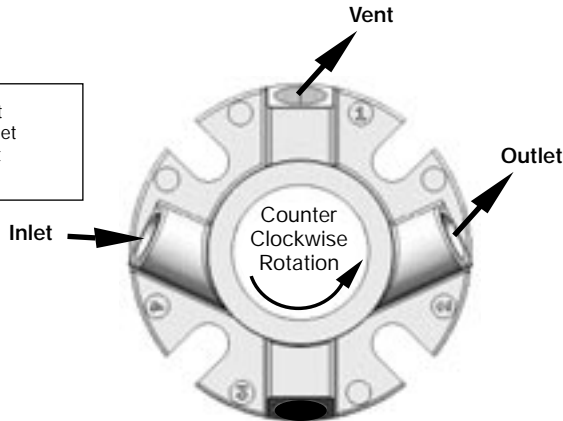


Preferred plan requires manual venting of entrapped air through Port #1. Replace plug when venting is completed prior to start-up.

For Counter Clockwise Shaft Rotation:

### Preferred

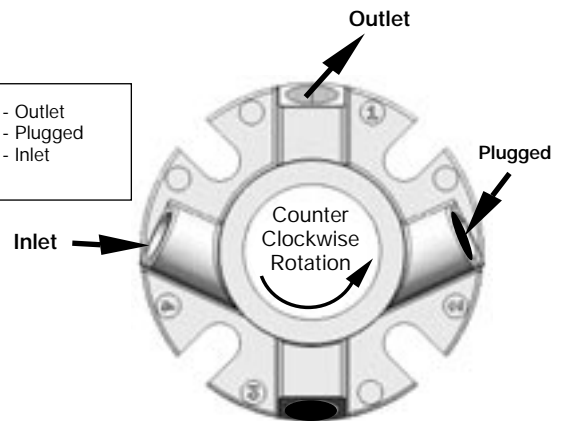
- |         |          |
|---------|----------|
| Port #1 | - Vent   |
| Port #2 | - Outlet |
| Port #4 | - Inlet  |



Direction of view is from the driver end of pump.

### Option #1

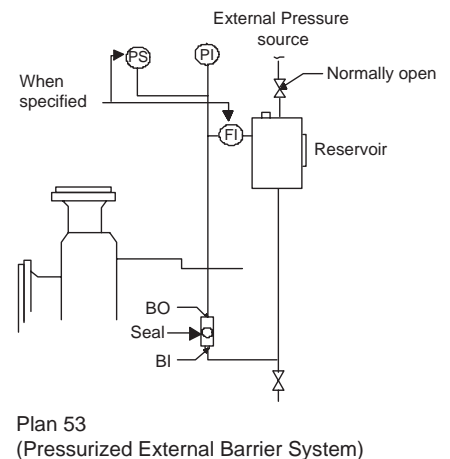
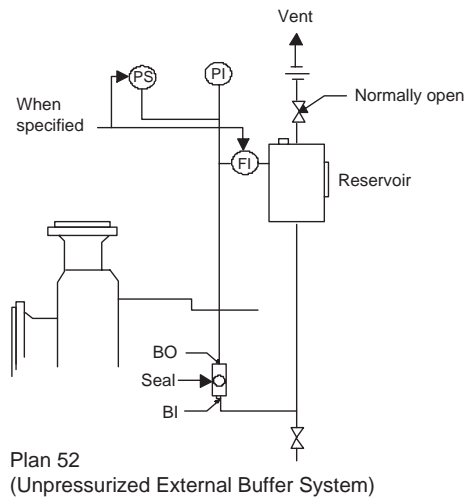
- |         |           |
|---------|-----------|
| Port #1 | - Outlet  |
| Port #2 | - Plugged |
| Port #4 | - Inlet   |



Preferred plan requires manual venting of entrapped air through Port #1. Replace plug when venting is completed prior to start-up.

## Piping Plans 52 & 53

- |    |                   |
|----|-------------------|
| BO | - Barrier Out     |
| BI | - Barrier In      |
| FI | - Flow Indicator  |
| PS | - Pressure Switch |



## 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 that 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 Sales/Service Engineer. 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 the company for information as to exclusive product warranty and limitations of liability.

## Maintenance

No maintenance of a seal is possible while installed. Therefore, it is recommended that a spare seal unit be held in stock to allow immediate replacement of a removed seal.

It is recommended that used seals are returned to a John Crane Seal facility and an exchange/rebuilt seal be purchased.



It is the responsibility of the equipment user to ensure that any parts being sent to a third party have appropriate safe handling instructions externally attached to the package.

## 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.

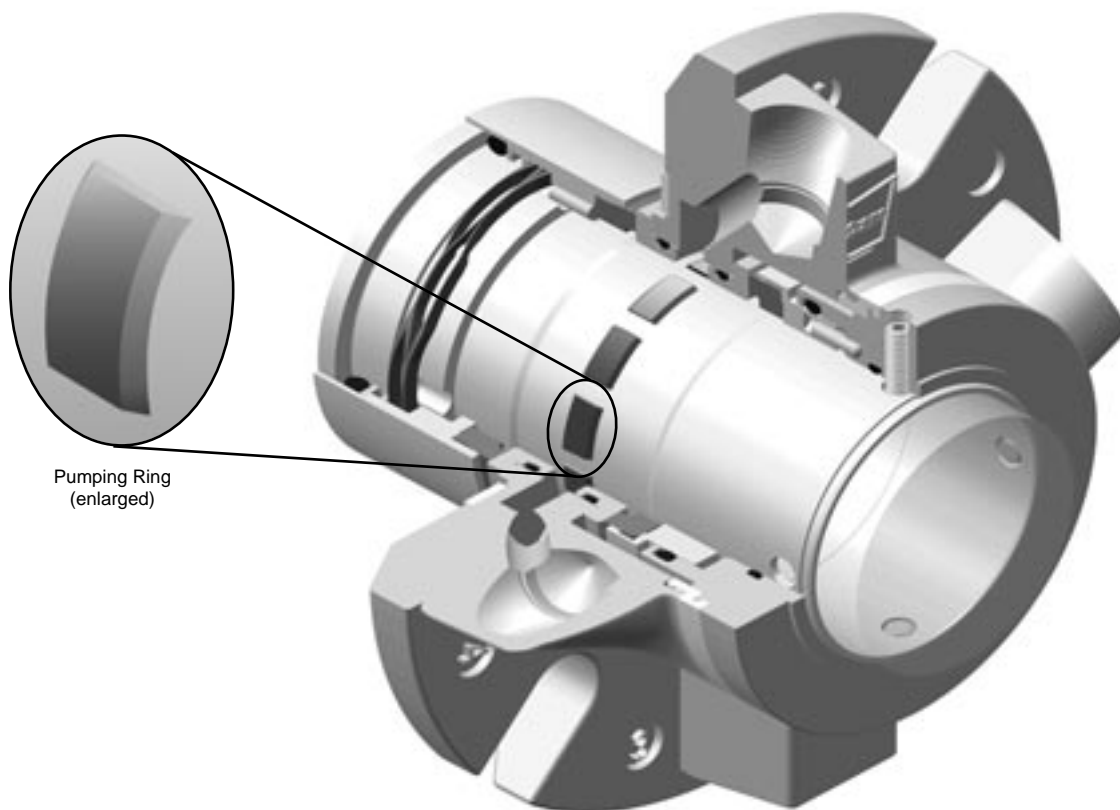
## After the Equipment has Run

1. Ensure that the pump is electrically isolated.



If the equipment has been used on toxic or hazardous fluids, ensure that the equipment is correctly decontaminated and made safe prior to commencing work. Remember, fluid is often trapped during draining and may exist outside the seal. The pump instruction manual should be consulted to check for any special precautions.

2. Ensure that the pump is isolated by the appropriate valves. Check that the fluid is drained and pressure is fully released.



Pumping Ring  
(enlarged)



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