FLOWSERVE

Installation Instructions

CBR Series

Single Inside Bellows Seal

flowserve.com

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 system.
- consult plant MSDS files for hazardous material regulations.

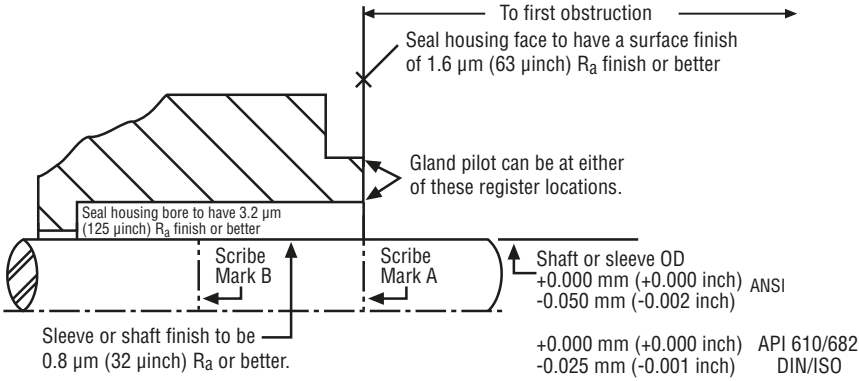
1.2 **Disassemble equipment** to allow access to seal installation area.

1.3 **Remove all burrs** and sharp edges from the shaft or sleeve including sharp edges of keyways and threads. Replace worn shaft or sleeve. 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



1.5 **Check assembly drawing** included with the seal for specific seal design, materials of construction, dimensions, and piping connections.

1.6 **Check shaft or sleeve OD, box bore, box depth, and distance to first obstruction** to ensure that 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.

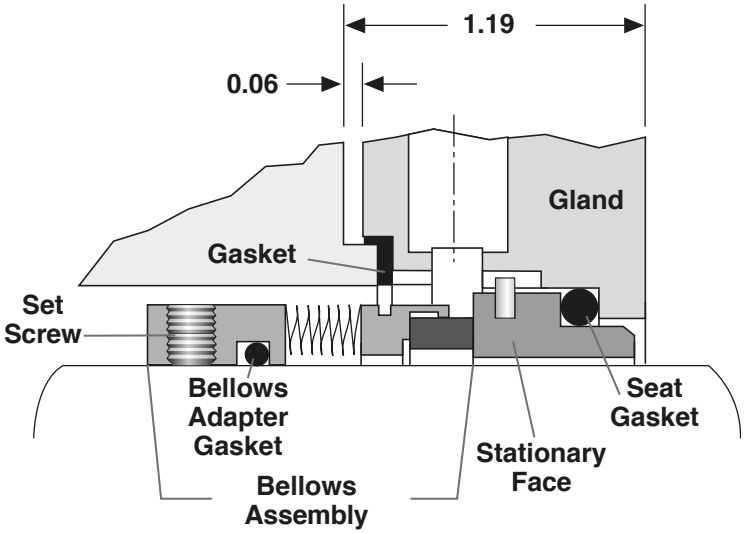
1.8 **Handle all seal parts with care**, they are manufactured to precise tolerances. The seal faces; Seal Ring and Insert, are of special importance. These two sealing faces are lapped flat to within three light bands (34.8 millionths of an inch). **Keep the seal faces perfectly clean at all times**.

2 Installation

The basic CBR design is shown in Figure 2. Variations may include rotating face gasket, seat gasket, and environmental control features. See the Flowserve assembly drawing included with each complete seal for details. Additional recommendations for vertical pumps are shown in Section 3.

2.1 Scribe mark **A**, Figure 1, on the shaft or sleeve to line up with the face of the seal housing. The shaft or sleeve must be in its final axial operating position with regard to the seal housing face before mark **A** is scribed.

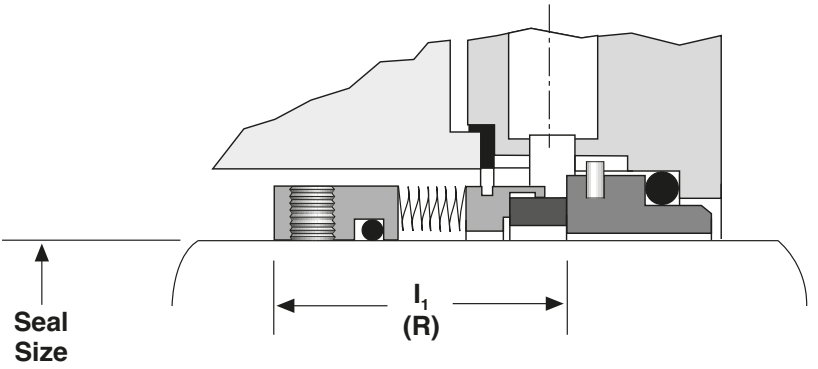
Basic CBR Figure 2



Determining the Correct Installed Operating Length Dimension

Figure 3

Metric Units
(Inch Units)



Seal Size mm			CBR Bellows Assembly Installed Length (l_1)
18	thru	22	27.5 mm
24	thru	25	30.0 mm
28	thru	35	32.5 mm
38	thru	48	34.0 mm
50	thru	55	34.5 mm
58	thru	65	39.5 mm
	68		37.2 mm
70	thru	75	44.7 mm
80	thru	85	44.3 mm
90	thru	100	49.3 mm

Seal Size inch			CBR Bellows Assembly Installed Length (R)
.750"	thru	1.250"	1.38"
1.375"	thru	2.375"	1.56"
2.500"	thru	3.375"	1.75"
3.500"	thru	4.750"	1.88"
	5.000"		2.00"
	5.500"		.25"

2.2 Scribe mark **B**, Figure 1, at the seal setting point shown on the assembly drawing included with the seal. (This is the seal setting dimension as measured from the face of the seal housing to the back of the bellows drive collar. The back of the bellows drive collar will be located at this point. See Figure 3 for the correct installed operating length dimension **l_1 (R)**. This dimension can be used to calculate the seal setting point **B** if no assembly drawing is available.

2.3 Lightly lubricate the stationary face mounting O-ring with the silicone lubricant provided with the seal and install the O-ring in the gland.

2.4 Lightly lubricate the stationary face gasket shoulder and carefully press the face into the seat gasket O-ring in the gland. Use hand pressure only. All standard CBR stationary faces are supplied with holding pins. Locate the pin to engage the pin slot in the gland to avoid over compressing the bellows assembly.

2.5 Install the gland with the stationary face over the shaft. Place the gland as close to the bearing bracket as possible. Do not bump the stationary face against the shaft as it may chip, crack, or break.

2.6 Lightly lubricate the shaft or sleeve lightly with silicone lubricant.

2.7 Lightly lubricate the Bellows adapter gasket O-ring with silicone lubricant and install the O-ring in the bellows drive collar end groove.

2.8 Install the CBR bellows assembly with the bellows rotating face gasket O-ring in place onto the shaft or sleeve. Do not compress the CBR bellows assembly more than the indicated working length **l_1 (R)** shown on the assembly drawing. Excessive compression may destroy the capability of the seal to operate properly.

2.9 Set the back of the CBR bellows assembly at reference mark **B**, Figure 1, and tighten set screws firmly and evenly. The rotating bellows assembly is now in the proper position to provide the correct setting and spring compression for final assembly.

2.10 Wipe the seal faces clean with alcohol before completing equipment assembly. Seal faces should not be lubricated, but should be left clean and dry.

2.11 Assemble the pump.

2.12 Position the gland to the face of the seal housing. Be sure the gland pilot is properly engaged. Tighten the gland stud nuts evenly, cross stagger the adjustment of the nuts. Excessive gland bolt tightening can result in distortion of the stationary face.

2.13 See section 4, Operational Recommendations, before starting pump.

3 Vertical Pumps

3.1 Follow the above installation instructions except that (a) the reference mark **A** must be established with the shaft, impeller(s), and coupling in their final running position and (b) the gland assembly, Step 2.5, is installed after the bellows assembly is installed, Step 2.10.

3.2 Any change in position of the shaft requires resetting of the seal.

3.3 Special attention must be taken to avoid trapping air in the seal chamber. When the seal chamber pressure is below pump discharge pressure, use Piping Plan 11, bypass line from pump discharge to the gland flush tap to ensure sealing liquid at the seal faces. When the seal chamber pressure is at pump discharge pressure, use Piping Plan 13, bypass line from seal chamber to pump suction.

3.4 See section 4, Operational Recommendations, before starting pump.

4 Operational Recommendations

4.1 Do not start up the equipment dry. Vent air from the casing of the pump and the seal chamber before startup. Circulate clean product or a clean fluid from an external source through the seal chamber whenever the equipment is in operation, Piping Plan 11.

4.2 If the seal runs hot, check for proper seal setting, seal housing dimensions, and check the bypass or flush line for obstructions. Shut down the equipment immediately if the seal gets hot.

For special problems encountered during installation, contact your nearest Flowserve Sales and Service Representative.

5 Repair

This product is a precision sealing device. The design and dimension tolerances are critical to seal performance. Only parts supplied by Flowserve should be used to repair a seal. To order replacement parts, refer to the part code and B/M number. A spare backup seal should be stocked to reduce repair time.

When seals are returned to Flowserve for repair, **decontaminate the seal assembly** and include 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.

FLOWSERVE®

TO REORDER REFER TO
B/M #_____
F.O. _____

FIS117eng REV 09/2018 Printed in USA

To find your local Flowserve representative
and find out more about Flowserve Corporation,
visit www.flowserve.com

USA and Canada
Kalamazoo, Michigan USA
Telephone: 1 269 381 2650
Telefax: 1 269 382 8726

Europe, Middle East, Africa
Etten-Leur, the Netherlands
Telephone: 31 765 028 200
Telefax: 31 765 028 487

Asia Pacific
Singapore
Telephone: 65 6544 6800
Telefax: 65 6214 0541

Latin America
Mexico City
Telephone: 52 55 5567 7170
Telefax: 52 55 5567 4224