

186 Single Bellows Cartridge Seal

286 Dual Tandem Bellows Cartridge Seal

SEAL INSTALLATION

Preparation

Determine if the pump is in good condition.

A. Check the shaft or sleeve.

1. Remove all burrs and sharp corners, especially in areas where the O-ring has to slide. Cover threads and keyway slots with a thin tape to prevent cutting the O-ring. The distance from the face of the stuffing box to the center of the O-ring groove is approximately 1.500"(38mm) for 186 seals and 2.000"(50mm) for 286 seals.
2. The shaft finish should be 32 microinches RA (0,8 microns) maximum. It should feel smooth if you run your fingernail along the shaft in the axial direction.
3. **Make sure the shaft or sleeve diameter is within tolerance (no more than +/- .002" (0,05 mm) from nominal).** Example: 1.750" shaft should not be larger than 1.752" or smaller than 1.748".
4. Use a dial indicator to measure the shaft runout in the area where the seal is to be installed. **Readings should not exceed .001" TIR per inch (0,001 mm TIR per millimeter) of shaft diameter.**
5. Place the dial indicator on the shaft and alternately push and pull the shaft axially to measure end play. End play should not exceed .005" (0,12 mm) TIR.
6. Protect the sleeve O-ring by lubricating the shaft with a clean silicone based lubricant as that provided with the seal.

B. Check the stuffing box.

1. The stuffing box face must be a maximum of 125 microinches RA (3,2 microns) for a gasket to seal.
2. Split case pumps will sometimes cause a step (misalignment) to occur on the stuffing box face. This step must be machined flat within 0.001 in (0,03 mm).
3. Make sure the stuffing box is clean and clear along its entire length.
4. If possible, attach the base of a dial indicator to the shaft and rotate shaft and indicator slowly while reading the runout of the stuffing box face. Misalignment of the stuffing box face relative to the shaft should not exceed .002" TIR per inch (0,002 mm TIR per millimeter) of shaft diameter.

Installation

1. Check the chemical listing to determine if the O-rings installed in this seal are compatible with the fluid being sealed.
2. The cup point set screws go through the larger holes in the sleeve. Make sure all screws are engaged in the sleeve but do not protrude into the inside diameter of the seal sleeve. Do not disengage these screws from the sleeve when positioning the seal.
3. To reposition or remove the seal, make sure that all setting clips and hex head cap screws are engaged.

4. Setting clips have been preset at the factory. If for any reason you loosen or remove the 5/16" hex head cap screw, retighten the cap screw finger tight (approximate 30 inch-pounds of torque).
5. Slide the completely assembled 186 or 286 seal onto the shaft. Make sure that all the set screws are engaged through the sleeve but do not protrude into the sleeve ID bore.
6. Reassemble the pump and make necessary shaft alignments and impeller adjustments.
7. Orient the flush connection for 186 seals and the barrier fluid ports on 286 seals, to the location required. The ports are plugged prior to shipping. **CAUTION:** Shipping plugs limit the dirt and contamination, which could enter the seal and cause seal malfunction. When plugs are removed ensure that dirt, liquid, and contamination do not enter the seal ports.
8. **Piping connections should not be made prior to tightening the gland bolts.**
9. Tighten the gland bolts evenly. **IMPORTANT: The gland bolts must be tightened before tightening the screws onto the shaft.**

SEAL INSTALLATION

10. Evenly tighten the cup point set screws on the lock ring to the shaft with the hex key provided. If rotation of the lock ring is required for tightening set screws, loosen or remove one setting clip. After all set screws have been tightened by hand, retighten the set screws with a torque wrench to 20-28 in-lbs for 286 seals sizes 1.000" to 2.500". For 186 seals sizes 1.000" to 2.500", retighten the set screws with a torque wrench to 50-60 in-lbs.
11. Remove hex head cap screws and the setting clips. Retain for later use.
12. **IMPORTANT: It is important to make sure that the gland is properly centered over the sleeve**
To do this, turn the shaft by hand to make sure the seal turns freely. If you hear metal to metal contact within the seal, it was improperly centered. Re-install the setting clips finger tight. Loosen the gland bolts. Fully tighten clips. Loosen the set screws. Re-tighten the gland bolts. Re-tighten the set screws. Remove the clips. If metal to metal contact still exists check the centering of the stuffing box.
13. For 186 seals, determine if flush / re-circulation or quench and drain piping is required. The flush connection is the 3/8" NPT port on the outer diameter of the gland marked "F". Plug the flush port if no connection is used. The quench and drain connections are the 1/4" NPT ports marked "Q/D".
14. For 286 seals, the Barrier Fluid Connections are 3/8" NPT, marked "BI" for barrier fluid in and "BO CW" and "BO CCW" for barrier fluid out. The piping connections are dependent on shaft rotation. Direction of shaft rotation is determined when looking at the lock ring end of the seal.
15. Take all necessary precautions and follow normal safety procedures before starting the equipment.

STANDARD MATERIALS***

All Metal Parts:

316SS.

Bellows:

- Hastelloy C*, AM350

Rotary Face:

- Carbon, Tungsten Carbide

Stationary Face:

- Silicon Carbide

Elastomers:

- Perfluoroelastomer, Fluorocarbon, AFLAS**
Ethylene Propylene, TJ/FKM

*Haynes International, Inc. Registered Trademark.,

**Asahi Glass Company Ltd. Registered Trademark.,

***Other materials available upon request.

OPERATING LIMITS

Speed:

- To 4000 FPM (20 mps)

Temperature:

- To 300°F (150°C) Ethylene Propylene, TJ/FKM
- To 400°F (205°C) Fluorocarbon, AFLAS

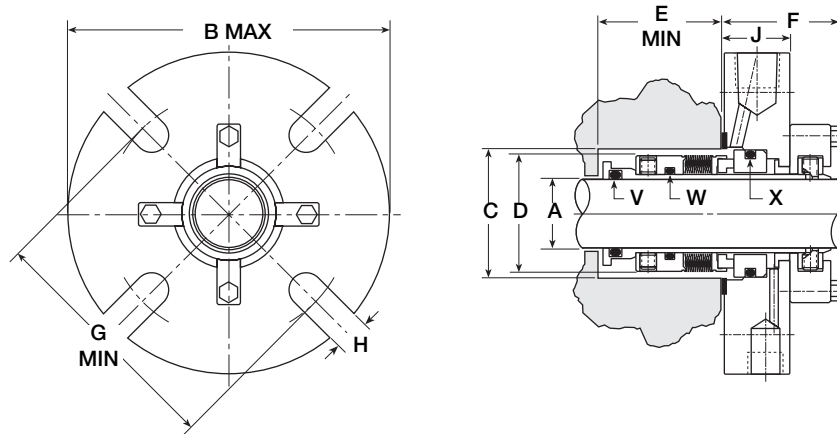
(For higher temperature applications, consult the factory)

CAUTIONS

These instructions are general in nature. It is assumed that the installer is familiar with seals and certainly with the requirements of their plant for the successful use of mechanical seals. If in doubt, get assistance from someone in the plant who is familiar with seals or delay the installation until a seal representative is available. All necessary auxiliary arrangements for successful operation (heating, cooling, flushing) as well as safety devices must be employed. These decisions are to be made by the user. The chemical listing is intended as a **general** reference for this seal **only**. The decision to use this seal or any other Chesterton seal in a particular service is the customer's responsibility.

DIMENSIONAL DATA (INCH)

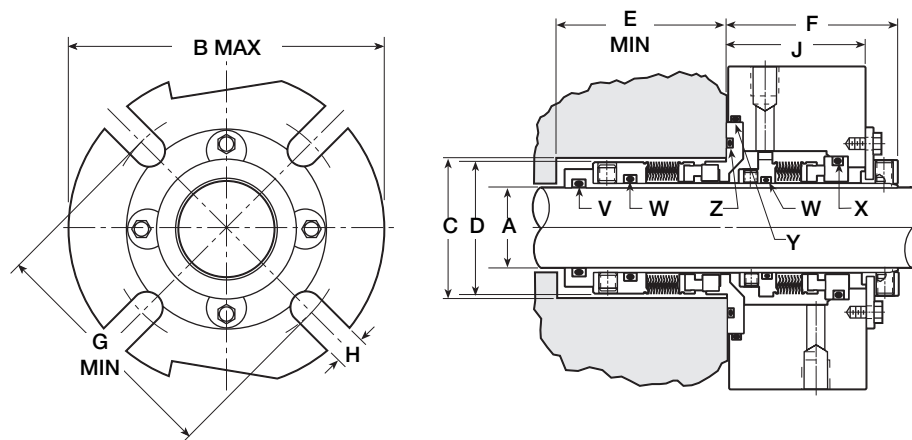
186 DIMENSIONAL DATA



PIPING CONNECTIONS;
Flush (3/8 NPT),
Quench or Drain (1/4 NPT)

SHAFT SIZE A	GLAND OD B MAX	STUFFING BOX BORE		IB SEAL DIA D MAX	SB DEPTH E MIN	OB LENGTH F MAX	G MIN BY BOLT SIZE			SLOT WIDTH H MAX	GLAND WIDTH J MAX	O-RINGS		
		C MIN	C MAX				3/8"	1/2"	5/8"			SHAFT V	ROTARY W	STATIONARY X
1.000	4.25	1.75	1.86	1.69	1.45	1.79	2.81			0.44	1.03	214	122	222
1.125	4.25	1.75	2.11	1.69	1.51	1.79	2.90			0.44	1.03	216	124	223
1.250	4.25	2.00	2.23	1.94	1.63	1.79	3.02			0.44	1.03	218	126	224
1.375	4.25	2.00	2.36	1.94	1.63	1.79	3.15			0.44	1.03	220	128	225
1.500	4.50	2.25	2.61	2.19	1.70	1.79	3.39	3.51		0.56	1.03	222	130	227
1.625	5.00	2.38	2.74	2.31	1.76	1.79	3.51	3.64		0.56	1.03	223	132	228
1.750	5.50	2.50	2.86	2.44	1.82	1.79	3.62	3.75		0.56	1.03	224	134	229
1.875	5.50	2.63	2.98	2.56	1.82	1.79	3.75	3.88		0.56	1.03	225	226	230
2.000	5.50	2.75	3.24	2.69	1.82	1.85	4.00	4.13	4.25	0.56	1.09	226	138	232
2.125	6.00	2.88	3.36	2.81	1.88	1.85	4.13	4.25	4.38	0.69	1.09	227	140	233
2.250	6.25	3.00	3.48	2.94	1.88	1.91	4.25	4.38	4.50	0.69	1.16	228	142	234
2.375	6.25	3.25	3.61	3.19	1.98	1.91	4.38	4.50	4.63	0.69	1.16	229	144	235
2.500	6.50	3.38	3.61	3.31	2.04	1.98	4.38	4.50	4.63	0.69	1.22	230	146	235

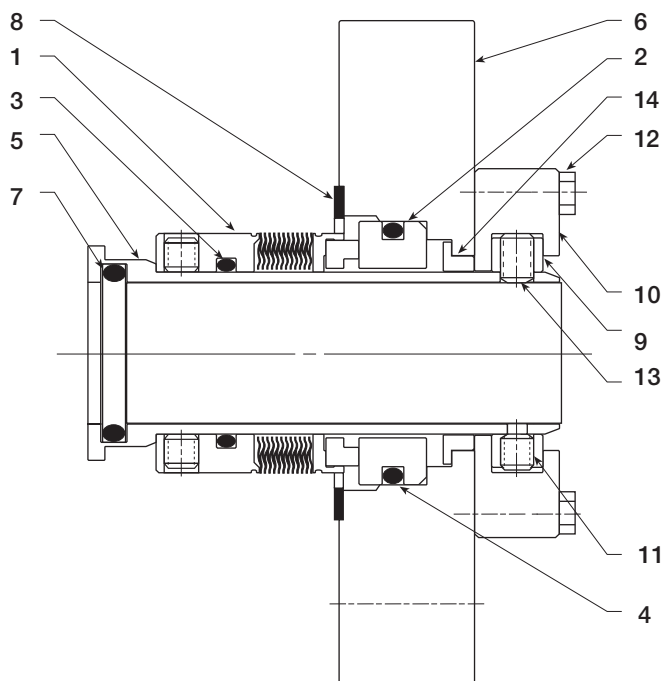
286 DIMENSIONAL DATA



PIPING CONNECTIONS;
Barrier Fluid In (.375" - 18 NPT),
Barrier Fluid Out (.375" - 18 NPT)

SHAFT SIZE A	GLAND OD B MAX	STUFFING BOX BORE		IB SEAL DIA D MAX	SB DEPTH E MIN	OB LENGTH F MAX	G MIN BY BOLT SIZE			SLOT WIDTH H MAX	GLAND WIDTH J MAX	O-RINGS				
		C MIN	C MAX				3/8"	1/2"	5/8"			SHAFT V	ROTARY W	STATIONARY X	GLAND Y	STUFFING BOX Z
1.000	4.13	1.75	1.88	1.69	2.03	2.06	2.90			0.44	1.70	214	122	222	139	135
1.125	4.25	1.75	1.88	1.69	2.03	2.06	2.90			0.44	1.70	216	124	223	139	135
1.250	4.25	2.00	2.13	1.94	2.06	2.13	3.02			0.44	1.76	218	126	224	141	139
1.375	4.25	2.00	2.19	1.94	2.06	2.03	3.25			0.44	1.67	216	128	225	144	140
1.500	4.50	2.25	2.38	2.19	2.25	2.13	3.50	3.63		0.56	1.75	222	130	227	148	143
1.625	5.00	2.38	2.50	2.31	2.21	2.13	3.56	3.69		0.56	1.76	223	132	228	149	145
1.750	5.50	2.50	2.56	2.44	2.34	2.13	3.63	3.75		0.56	1.76	224	134	229	150	146
1.875	5.50	2.63	2.69	2.56	2.34	2.13	3.75	3.88		0.56	1.76	225	136	230	151	148
2.000	5.50	2.75	2.94	2.69	2.34	2.13	4.01	4.13		0.56	1.76	226	138	232	152	151
2.125	6.00	3.00	3.19	2.81	2.40	2.13	4.25	4.38	4.50	0.69	1.76	227	140	233	153	152
2.250	6.25	3.13	3.19	2.94	2.40	2.13	4.25	4.38	4.50	0.69	1.76	228	142	234	153	152
2.375	6.25	3.25	3.44	3.19	2.31	2.25	4.38	4.50	4.63	0.69	1.88	229	144	235	153	153
2.500	6.50	3.38	3.44	3.31	2.41	2.19	4.56	4.81	4.81	0.69	1.77	230	146	235	154	153

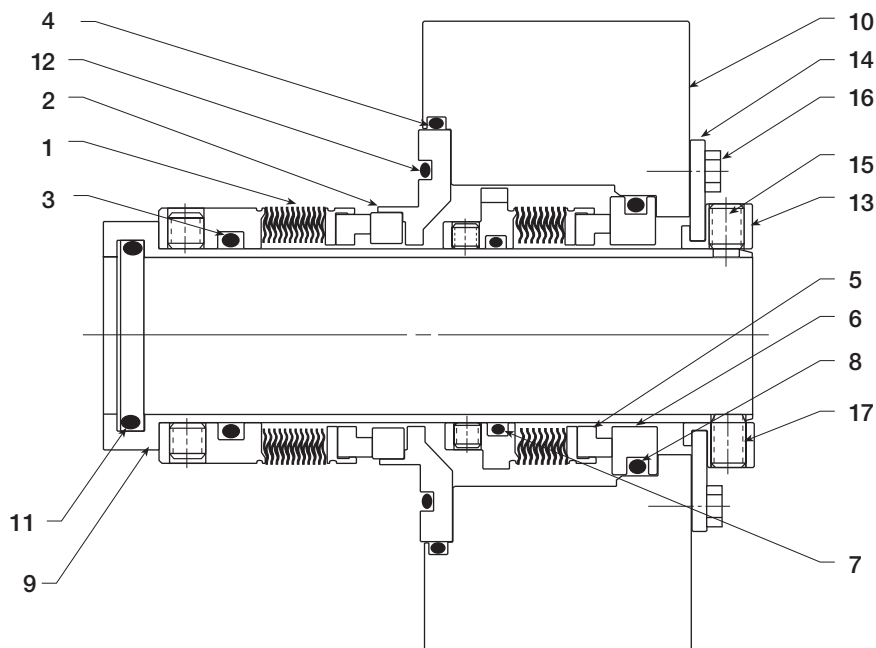
186 PARTS IDENTIFICATION



KEY (186)

- 1- Rotary Assembly
- 2- Stationary
- 3- Rotary O-Ring
- 4- Stationary O-Ring
- 5- Sleeve
- 6- Gland
- 7- Shaft O-Ring
- 8- Gland Gasket
- 9- Lock Ring
- 10- Setting Clips
- 11- Dog Point Set Screw
- 12- Hex Head Cap Screw
- 13- Cup Point Set Screw
- 14- Throttle Bushing

286 PARTS IDENTIFICATION



KEY (286)

- 1- Inboard Rotary Assembly
- 2- Inner Gland Assembly
- 3- Inboard Rotary O-Ring
- 4- Inner Gland O-Ring
- 5- Outboard Rotary Assembly
- 6- Outboard Stationary Ring
- 7- Outboard Rotary O-Ring
- 8- Outboard Stationary Ring O-Ring
- 9- Sleeve
- 10- Outer Gland
- 11- Sleeve O-Ring
- 12- Stuffing Box O-Ring
- 13- Lock Ring
- 14- Setting Clip
- 15- Dog Point Set Screw
- 16- Hex Head Cap Screw
- 17- Cup Point Set Screw

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FORM NO. 073033

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PRINTED IN USA 2/01