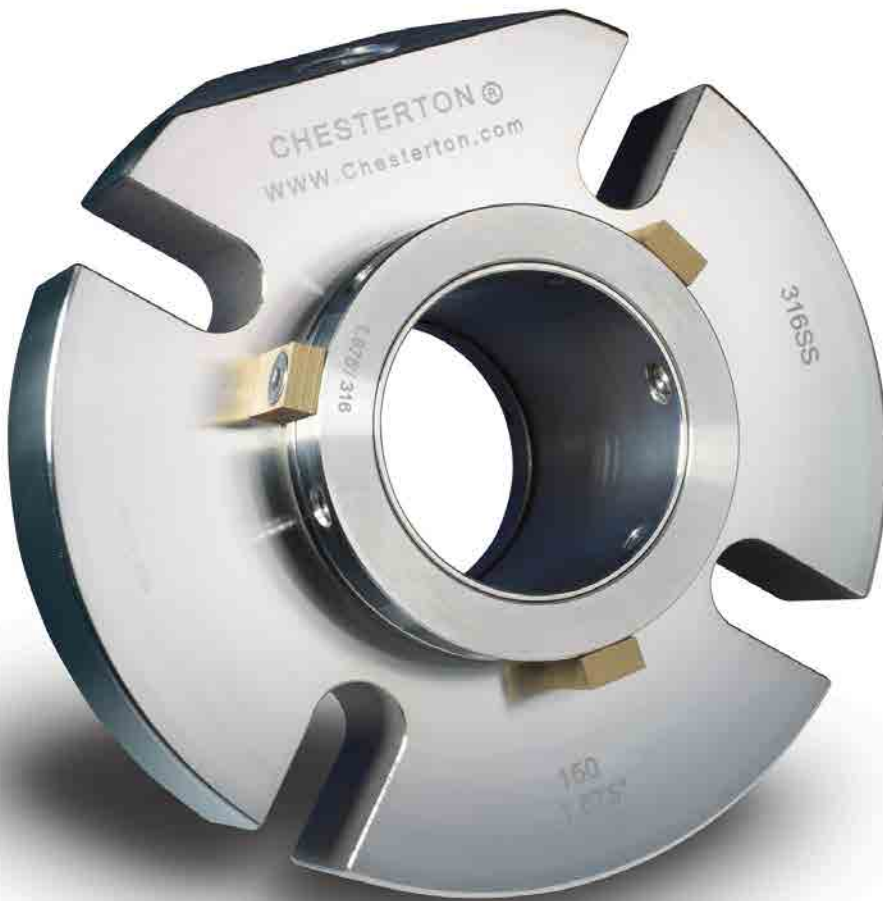


# 150™ Cartridge Single Seal

## Installation, Operation and Maintenance Instructions



### TABLE OF CONTENTS

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1.0	Cautions.....	2
2.0	Transport and Storage.....	2
3.0	Description.....	2 - 5
3.1	Parts Identification.....	2
3.2	Operating Parameters.....	3
3.3	Intended Use.....	3
3.4	Dimensional Data.....	3 - 5
4.0	Preparation for Installation.....	6 - 7
4.1	Equipment.....	6
4.2	150 Cartridge Mechanical Seal.....	7
5.0	Seal Installation.....	7
6.0	Commissioning/Equipment Start-up.....	8
7.0	Decommissioning/Equipment Shut Down.....	8
8.0	Spare Parts.....	8
9.0	Seal Maintenance and Repair.....	8
9.1	Seal Maintenance.....	8
9.2	Returning Seals for Repair.....	8

## 1.0 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 decision to use this seal or any other Chesterton seal in a particular service is the customer's responsibility.

Do not touch the mechanical seal for any reason while it is operating. Lockout or uncouple the driver prior to personal contact with the seal. Do not touch the mechanical seal while it is in contact with hot or cold fluids. Ensure that all the mechanical seal materials are compatible with the process fluid. This will prevent possible personal injury.

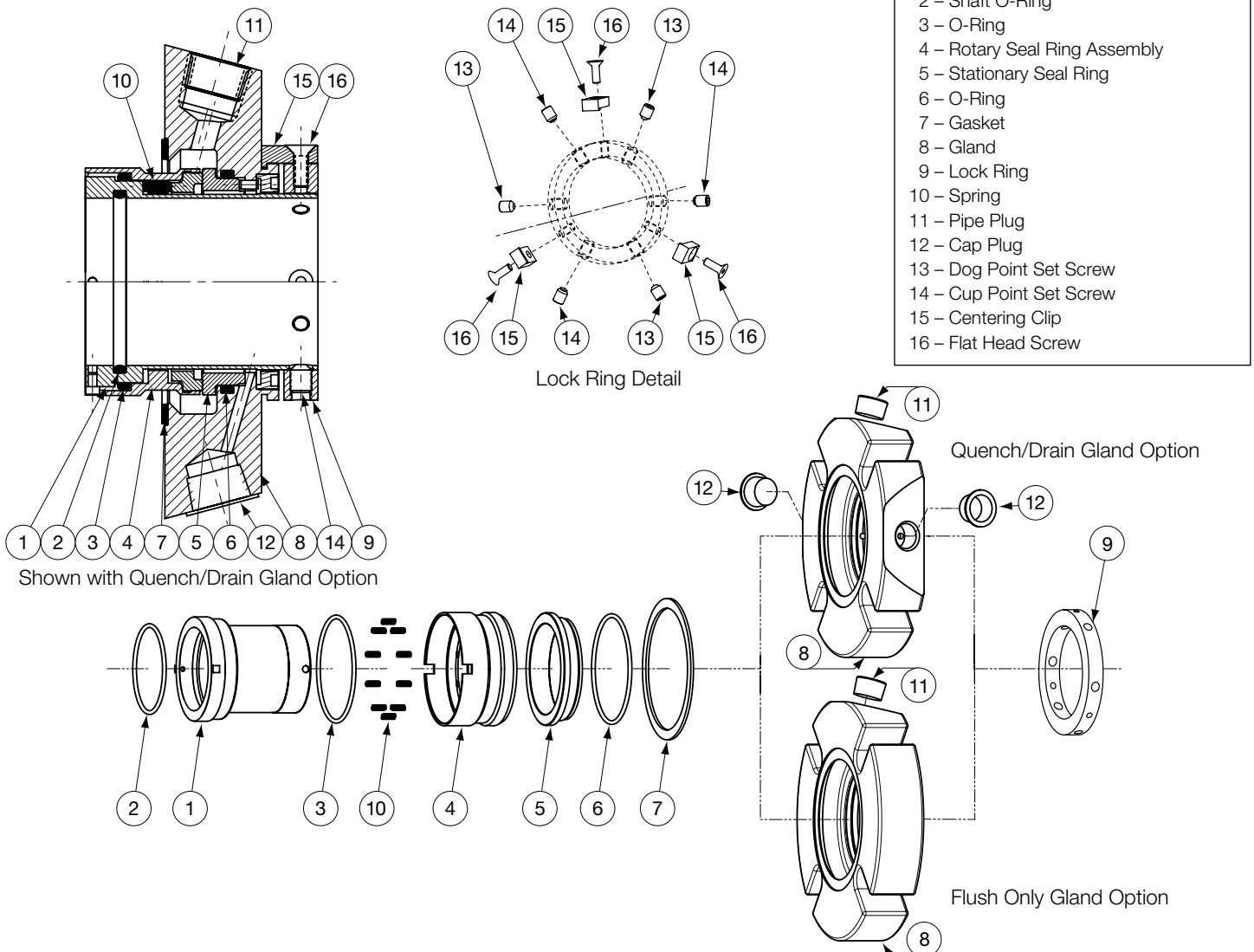
## 2.0 TRANSPORT AND STORAGE

Transport and store seals in their original packaging. Mechanical seals contain components that may be subject to alteration and ageing. It is therefore important to observe the following conditions for storage:

- Dust free environment
- Moderately ventilated at room temperature
- Avoid exposure to direct sunlight and heat
- For elastomers, storage conditions according to ISO 2230 should be observed.

## 3.0 DESCRIPTION

### 3.1 Parts Identification – Figure 1



### 3.0 DESCRIPTION cont.

#### 3.2 Operating Parameters\*

**Process Pressure Limits:**

21 bar g (28" Hg Vacuum to 300 psig)

**Speed Limits:**

Up to 3600 RPM

**Temperature Limits:**

*Elastomers*

To 150°C (300°F) EPDM

To 205°C (400°F) FEPM, FKM

*Rotary Face*

To 150°C (300°F) Silicon Carbide

To 205°C (400°F) Carbon

**Standard Materials:**

All Metal Parts: 316 SS / EN 1.4401

Springs: Alloy C276 / EN 2.4819

Rotary Face: Carbon; Silicon Carbide

Stationary Face: Silicon Carbide

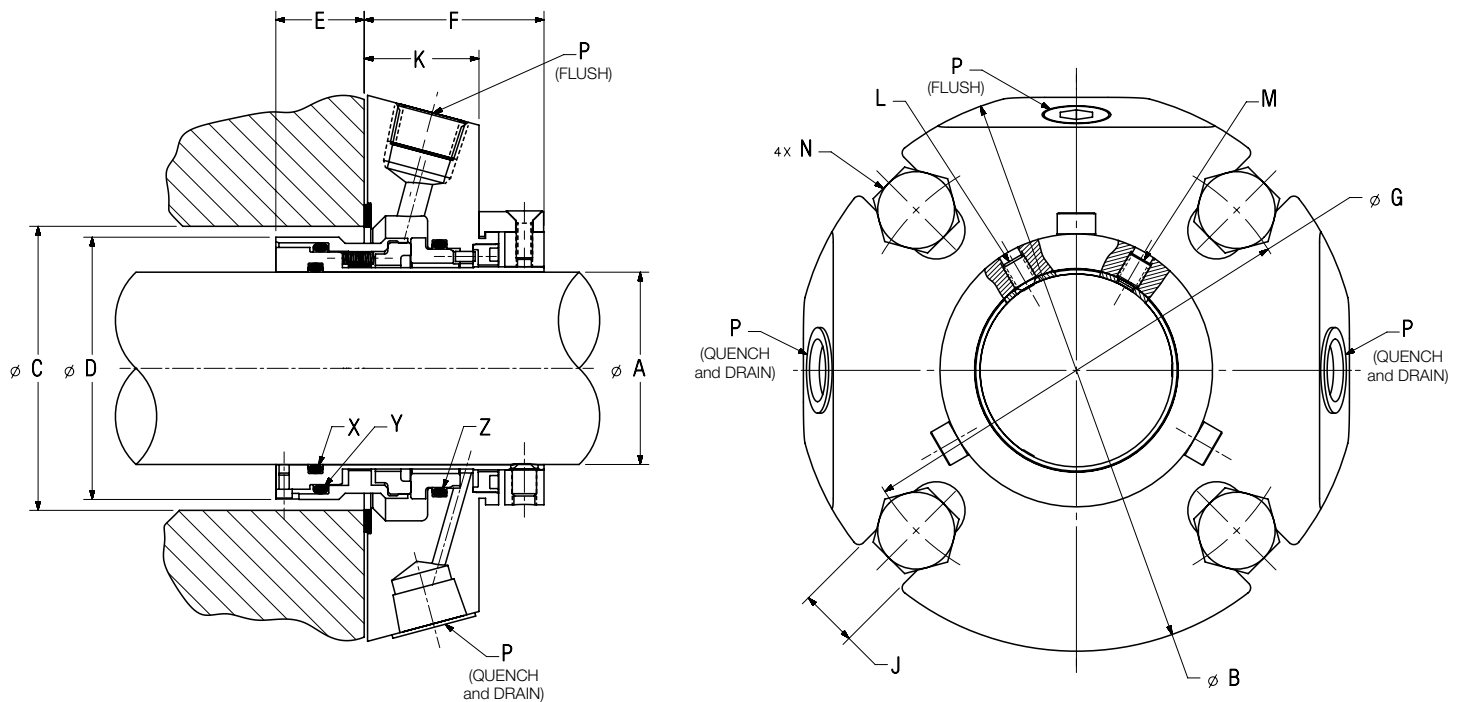
Elastomers: FKM; EPDM; FEPM; Perfluoroelastomer

\* Consult Chesterton Mechanical Seal Application Engineering for higher operating conditions..

#### 3.3 Intended Use

The mechanical seal is specifically designed for the intended application and is to be operated within the operating parameters as specified. For use beyond the intended application and/or outside the operating parameters, consult Chesterton to confirm the suitability of the mechanical seal prior to putting the mechanical seal in operation.

#### 3.4 Dimensional Data – Figure 2



A (SHAFT SIZE)	P (NPT SIZE)
25 mm – 38 mm (1" – 1.500")	1/4 – 18 NPT
40 mm – 68 mm (1.625" – 2.625")	3/8 – 18 NPT
70 mm – 120 mm (2.750" – 4.750")	1/2 - 14 NPT

### 3.0 DESCRIPTION cont.

**Dimensional Data (inch) – Table 2**

A	B	C		D MAX	E	F	G MIN			J	K	X	Y	Z
		MIN	MAX				3/8	1/2	5/8					
0.938	4.11	1.63	2.01	1.58	0.78	1.75	2.88			0.44	1.12	119	027	126
1.000	4.11	1.63	2.01	1.58	0.78	1.75	2.88			0.44	1.12	120	027	126
1.063	4.11	1.75	2.04	1.70	0.78	1.75	2.88			0.44	1.12	121	029	128
1.125	4.11	1.75	2.04	1.70	0.78	1.75	2.88			0.44	1.12	122	028	128
1.125 OS	4.49	2.50	2.75	1.70	0.78	1.75	3.71			0.44	1.12	122	028	128
1.188	4.11	1.88	2.27	1.84	0.78	1.75	3.12			0.44	1.12	123	029	130
1.250	4.11	1.88	2.27	1.84	0.78	1.75	3.12			0.44	1.12	124	029	130
1.313	4.36	2.00	2.33	1.95	0.78	1.75	3.13	3.25		0.57	1.12	125	030	132
1.375	4.36	2.00	2.33	1.95	0.78	1.75	3.13*	3.25*		0.57	1.12	126	030	132
1.375 OS	5.39	2.68	3.00	1.95	0.78	1.75	4.03			0.57	1.12	126	030	132
1.438	4.49	2.25	2.62	2.19	0.86	1.75	3.33	3.45		0.57	1.12	128	134	135
1.500	4.49	2.25	2.62	2.19	0.86	1.75	3.33	3.45		0.57	1.12	128	134	135
1.563	4.99	2.38	2.68	2.32	0.86	1.75	3.52	3.65		0.57	1.12	129	135	137
1.625	4.99	2.38	2.68	2.32	0.86	1.75	3.52	3.65		0.57	1.12	130	136	137
1.688	5.49	2.50	2.81	2.44	0.86	1.75	3.62	3.75		0.57	1.12	131	137	139
1.750	5.49	2.50	2.81	2.44	0.86	1.75	3.62	3.75		0.57	1.12	132	138	139
1.750 OS	6.64	3.37	3.75	2.44	0.86	1.75	4.63	4.75		0.57	1.12	132	138	139
1.813	5.49	2.63	2.94	2.57	0.86	1.75	3.75	3.87		0.57	1.12	134	140	141
1.875	5.49	2.63	2.94	2.57	0.86	1.75	3.75*	3.87*		0.57	1.12	134	140	141
1.875 OS	5.99	3.42	3.81	2.57	0.86	1.75		4.80		0.57	1.12	134	140	141
1.938	5.49	2.75	3.19	2.69	0.86	1.75	4.00	4.13		0.57	1.12	136	142	143
2.000	5.49	2.75	3.19	2.69	0.86	1.75	4.00	4.13		0.57	1.12	136	142	143
2.063	5.99	2.88	3.44	2.82	0.86	1.75	4.25	4.38		0.69	1.12	138	144	145
2.125	5.99	2.88	3.44	2.82	0.86	1.75	4.25	4.38	4.50	0.69	1.12	138	144	145
2.125 OS	6.99	3.75	4.25	2.82	0.86	1.75			5.37	0.69	1.12	138	144	145
2.188	5.99	3.00	3.56	2.94	0.86	1.75	4.37	4.50	4.62	0.69	1.12	140	146	147
2.250	5.99	3.00	3.56	2.94	0.86	1.75	4.37	4.50	4.62	0.69	1.12	140	146	147
2.313	5.99	3.13	3.59	3.07	0.86	1.75	4.43	4.56	4.68	0.69	1.12	142	148	149
2.375	5.99	3.13	3.59	3.07	0.86	1.75	4.43	4.56	4.68	0.69	1.12	142	148	149
2.375 OS	8.40	4.13	4.50	3.07	0.86	1.75			5.62	0.69	1.12	142	148	149
2.438	6.49	3.25	3.81	3.19	0.86	1.75	4.62	4.75	4.87	0.69	1.12	144	150	151
2.500	6.49	3.25	3.81	3.19	0.86	1.75	4.62	4.75	4.87	0.69	1.12	144	150	151
2.500 OS	7.77	4.37	4.75	3.19	0.86	1.75			6.37	0.69	1.12	144	150	151
2.563	6.45	3.38	3.94	3.32	0.86	1.75	4.90	5.02	5.15	0.69	1.12	146	151	151
2.625	6.45	3.38	3.94	3.32	0.86	1.75	4.90	5.02	5.15	0.69	1.12	146	151	151
2.625 OS	6.98	4.38	4.78	3.32	0.86	1.75			5.90	0.69	1.12	146	151	151
							1/2	5/8	3/4					
2.688	7.70	3.75	4.38	3.68	1.38	2.25	5.42	5.55		0.69	1.47	232	236	238
2.750	7.70	3.75	4.38	3.68	1.38	2.25	5.42	5.55		0.69	1.47	232	236	238
2.813	7.83	3.88	4.50	3.80	1.38	2.25	5.50	5.62		0.69	1.47	233	237	239
2.875	7.83	3.88	4.50	3.80	1.38	2.25	5.50	5.62		0.69	1.47	233	237	239
2.938	7.94	4.00	4.69	3.93	1.38	2.25	5.65	5.77		0.69	1.47	234	238	240
3.000	7.94	4.00	4.69	3.93	1.38	2.25	5.65	5.77		0.69	1.47	234	238	240
3.000 OS	8.64	4.93	5.39	3.93	1.38	2.25	7.00	7.13	7.25	0.94	1.47	234	238	240
3.063	7.99	4.13	4.81	4.05	1.38	2.25	5.80	5.92		0.69	1.47	235	239	241
3.125	7.99	4.13	4.81	4.05	1.38	2.25	5.80	5.92		0.69	1.47	235	239	241
3.188	8.19	4.25	4.94	4.18	1.38	2.25	5.93	6.05		0.69	1.47	236	240	242
3.250	8.19	4.25	4.94	4.18	1.38	2.25	5.93	6.05		0.69	1.47	236	240	242
3.313	8.30	4.38	5.06	4.30	1.38	2.25	6.02	6.14	6.27	0.81	1.47	237	241	243
3.375	8.30	4.38	5.06	4.30	1.38	2.25	6.02	6.14	6.27	0.81	1.47	237	241	243
3.438	8.44	4.50	5.19	4.43	1.38	2.25	6.18	6.31	6.43	0.81	1.47	238	242	244
3.500	8.44	4.50	5.19	4.43	1.38	2.25	6.18	6.31	6.43	0.81	1.47	238	242	244
3.563	8.49	4.63	5.31	4.55	1.38	2.25	6.31	6.44	6.56	0.81	1.47	239	243	245
3.625	8.49	4.63	5.31	4.55	1.38	2.25	6.31	6.44	6.56	0.81	1.47	239	243	245
3.688	8.71	4.75	5.39	4.68	1.38	2.25	6.38	6.51	6.63	0.81	1.47	240	244	246
3.750	8.71	4.75	5.39	4.68	1.38	2.25	6.38	6.51	6.63	0.81	1.47	240	244	246
3.750 OS	9.76	5.08	6.40	4.68	1.38	2.25	8.25			0.69	1.47	240	244	246
3.813	8.84	4.88	5.51	4.80	1.38	2.25	6.52	6.64	6.77	0.81	1.47	241	245	247
3.875	8.84	4.88	5.51	4.80	1.38	2.25	6.52	6.64	6.77	0.81	1.47	241	245	247
3.938	8.96	5.00	5.69	4.93	1.38	2.25	6.66	6.78	6.91	0.81	1.47	242	246	248
4.000	8.96	5.00	5.69	4.93	1.38	2.25	6.66	6.78	6.91	0.81	1.47	242	246	248
4.063	8.99	5.13	5.81	5.06	1.38	2.25	6.79	6.90	7.03	0.81	1.47	243	247	249
4.125	8.99	5.13	5.81	5.06	1.38	2.25	6.79	6.90	7.03	0.81	1.47	243	247	249
4.188	8.99	5.25	5.94	5.18	1.38	2.25	6.91	7.04	7.16	0.81	1.47	244	248	250
4.250	8.99	5.25	5.94	5.18	1.38	2.25	6.91	7.04	7.16	0.81	1.47	244	248	250
4.313	9.33	5.38	6.06	5.30	1.38	2.25	7.03	7.15	7.28	0.81	1.47	245	249	251
4.375	9.33	5.38	6.06	5.30	1.38	2.25	7.03	7.15	7.28	0.81	1.47	245	249	251
4.438	9.49	5.50	6.19	5.43	1.38	2.25	7.18	7.30	7.43	0.81	1.47	246	250	252
4.500	9.49	5.50	6.19	5.43	1.38	2.25	7.18	7.30	7.43	0.81	1.47	246	250	252
4.563	9.49	5.63	6.31	5.55	1.38	2.25	7.28	7.40	7.53	0.81	1.47	247	251	253
4.625	9.49	5.63	6.31	5.55	1.38	2.25	7.28	7.40	7.53	0.81	1.47	247	251	253
4.688	10.49	5.75	6.47	5.68	1.38	2.25	7.40	7.53	7.65	0.81	1.47	248	252	254
4.750	10.49	5.75	6.47	5.68	1.38	2.25	7.40	7.53	7.65	0.81	1.47	248	252	254

\*⊙ Minimum bolt circle requires the use of D-washers

OS = oversize

### 3.0 DESCRIPTION cont.

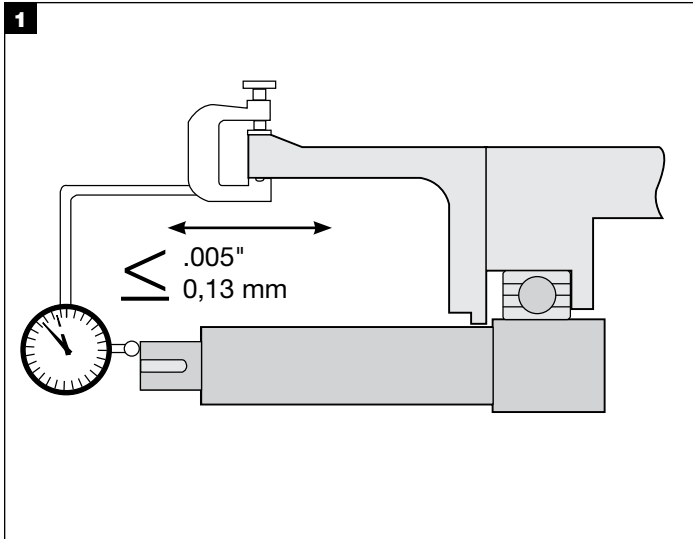
**Dimensional Data (metric) – Table 2**

A	B	C		D MAX	E	F	G MIN				J	K	X	Y	Z
		MIN	MAX				10 mm	12 mm	16 mm	20 mm					
25	104	41	51	40.0	19.8	46.0	73				11.2	28	120	027	126
28	104	44	52	42.6	19.8	46.0	73				11.2	28	122	028	128
30	104	46	57	44.6	19.8	46.0	78				11.2	28	123	029	129
32	104	48	58	46.6	19.8	46.0	80				11.2	28	124	029	130
33	113	49	59	47.6	19.8	46.0	81	83			14.5	28	125	030	131
35	111	51	59	49.6	19.8	46.0	80	82*			14.5	28	126	030	132
38	114	57	67	55.6	21.9	44.5	85	87			14.5	28	128	134	135
40	126	59	68	57.5	21.9	44.5	90	92			13.6	28	129	135	137
43	126	62	69	60.5	21.9	44.5	91	93			13.6	28	131	137	139
45	139	64	73	62.5	21.9	44.5	95	97			13.6	28	133	138	140
48	139	67	73	65.5	21.9	44.5	95	97			13.6	28	134	140	142
50	139	69	78	67.5	21.9	44.5	100	102			13.6	28	136	142	143
53	152	73	87	71.5	21.9	44.5	109	111	115		17.5	28	138	144	145
55	152	74	83	72.5	21.9	44.5	105	107	111		17.5	28	139	145	146
58	152	80	91	77.9	21.9	44.5	114	116	120		17.5	28	141	148	149
60	152	80	91	77.9	21.9	44.5	114	116	120		17.5	28	142	148	149
63	165	83	97	81.0	21.9	44.5	119	121	125		17.5	28	144	150	151
65	164	86	100	84.2	21.9	44.5	125	127	131		17.5	28	145	151	151
68	165	87	100	85.5	21.9	44.5	125	127	131		17.5	28	147	151	152
70	196	96	111	93.6	35.1	57.1		137	141		17.5	37	232	236	238
75	202	102	119	99.8	35.1	57.1		143	147		17.5	37	234	238	240
80	203	106	122	103.6	35.1	57.1		147	151		17.5	37	236	239	241
85	211	111	128	109.3	35.1	57.1		152	156	160	20.6	37	237	241	243
90	214	116	132	113.6	35.1	57.1		156	160	164	20.6	37	239	242	244
95	221	121	137	118.8	35.1	57.1		161	165	169	20.6	37	240	244	246
100	228	127	144	125.2	35.1	57.1		168	172	176	20.6	37	242	246	248
105	228	131	148	128.6	35.1	57.1		172	176	180	20.6	37	243	247	249
110	237	137	154	134.7	35.1	57.1		177	181	185	20.6	37	245	249	251
115	241	143	160	141.0	35.1	57.1		182	186	190	20.6	37	247	251	253
120	266	146	164	144.2	35.1	57.1		187	191	195	20.6	37	248	252	254

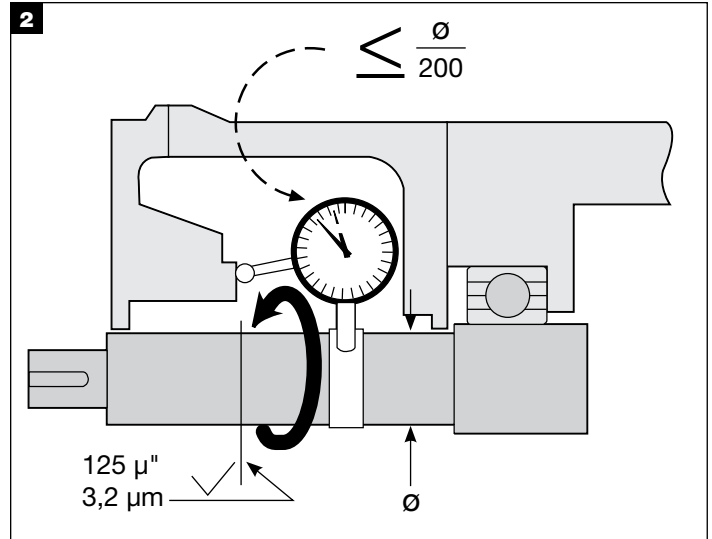
\*⊙ Minimum bolt circle requires the use of D-washers

## 4.0 PREPARATION FOR INSTALLATION

### 4.1 Equipment

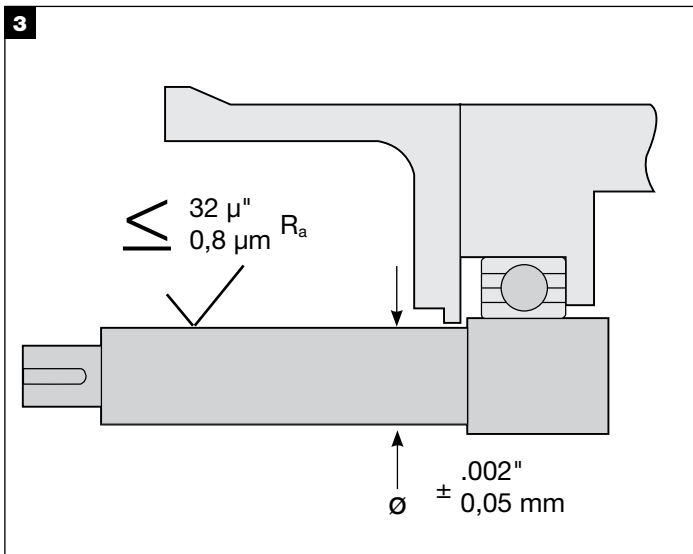


If practical, place the dial indicator tip on the end of the shaft sleeve or on a step in the shaft to measure end play. Alternately push and pull the shaft in the axial direction. If the bearings are in good condition, end play should not exceed 0,13 mm (.005").

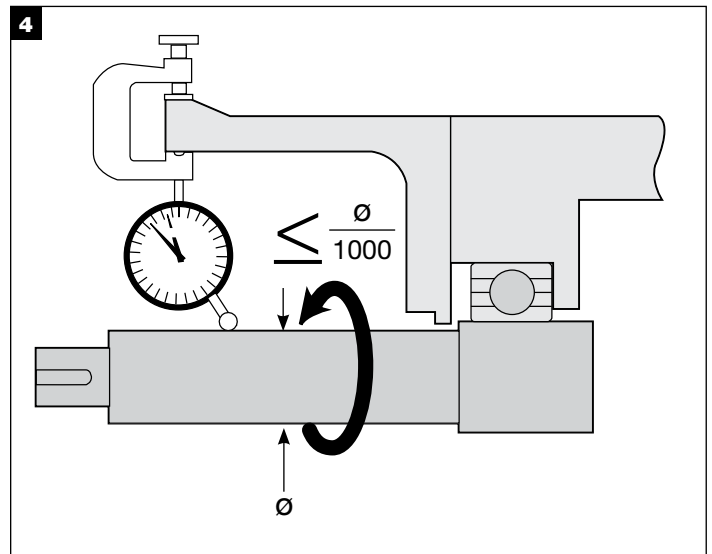


If possible, attach a base dial indicator to the shaft and rotate both the indicator and shaft slowly while reading the runout of the stuffing box face. Misalignment of the stuffing box face relative to the shaft should not exceed 0,005 mm TIR per mm (.005 in per inch) of shaft diameter.

The stuffing box face must be flat and smooth enough to seal the gland. Surface roughness should be 3,2 microns (125 microinch) Ra maximum for gaskets and 0,8 micron (32 microinch) Ra for O-Rings. Steps between halves of split case pumps should be machined flat. Make sure the stuffing box is clean and clear along its entire length.



Remove all sharp corners, burrs, and scratches on the shaft, especially in areas where the O-ring will slide, and polish if necessary to achieve a 0,8 micron (32 microinch) Ra finish. Make sure the shaft or sleeve diameter is within 0,05 mm (.002") of nominal.



Use a dial indicator to measure the shaft runout in the area where the seal will be installed. Runout should not exceed 0,001 mm TIR per mm (.001 in per inch) of shaft diameter.

## 4.0 PREPARATION FOR INSTALLATION cont.

### 4.2 150 Cartridge Mechanical Seal

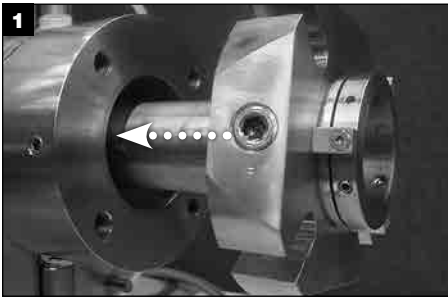


Check chemical listing to determine if the O-Rings installed in this seal are compatible with the fluid (s) being sealed.

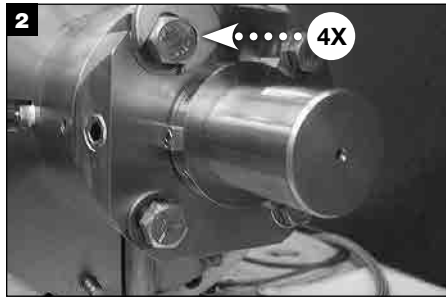


Apply a thin film of grease to shaft diameter.

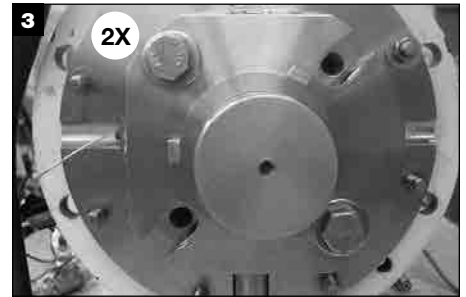
## 5.0 SEAL INSTALLATION



Slide seal onto shaft.



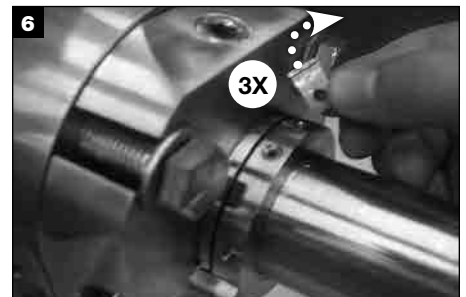
Align gland slots with bolt holes in stuffing box face and install bolts. Tighten gland bolts evenly.






Tighten the 3 dog point set screws; tighten the 3 cup point set screws.



Loosen socket head cap screws and remove 3 centering clips; retain screws and centering clips for future impellor adjustments or seal re-installation.



### Torque Values – Table 3

A (SHAFT SIZE)	25 mm – 60 mm (1" – 2.500")	65 mm – 120 mm (2.625" – 4.75")
L 	5,7 – 6,8 Nm (50 – 60 in-lbf)	7,3 – 8,3 Nm (65 – 75 in-lbf)
M 	5,7 – 6,8 Nm (50 – 60 in-lbf)	7,3 – 8,3 Nm (65 – 75 in-lbf)
N 	27 – 40 Nm (20 – 30 ft-lbf)	34 – 48 Nm (25 – 35 ft-lbf)

## 6.0 COMMISSIONING / EQUIPMENT START UP

---

1. Rotate the shaft by hand, if possible, to ensure no metal-to-metal contact within the seal.
2. Attach appropriate plumbing/environmental controls to the seal. Take all necessary precautions and follow normal safety procedures before starting the equipment.

*Please Contact Chesterton Mechanical Seal Application Engineering for assistance regarding cartridge single seals.*

## 7.0 DECOMMISSIONING / EQUIPMENT SHUT DOWN

---

Ensure that the equipment 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. Ensure that the pump is isolated and check that the stuffing box is drained from any

fluid and pressure is fully released. Disassemble the seal and remove from equipment in the reverse order from installation instructions. In case of disposal, ensure the local regulations and requirements for disposal or recycling of the different components in the seal are adhered to.

## 8.0 SPARE PARTS

---

Use only Chesterton original spare parts. Use of non-original spare parts represents risk of failure, danger to persons/equipment and voids the product warranty.

Spare Parts Kit can be purchased from Chesterton.

## 9.0 SEAL MAINTENANCE AND REPAIR

---

### 9.1 Seal Maintenance

A correctly installed and operated mechanical seal requires little maintenance. It is recommended to periodically check the seal for leakage. Wearing components of a mechanical seal such as seal faces, O-ring, etc., require replacement over time. While a seal is installed and operating, maintenance is not possible. Therefore it is recommended that a spare seal unit or a spare parts kit be held in stock to allow quick repair.

Note the condition of the parts, including elastomer surfaces and gland springs. Analyze the cause of failure and correct the problem, if possible, before reinstalling the seal.

Clean all elastomer and gasket surfaces with cleaning solvent.

### 9.2 Returning Seals For Repair And Hazard Communication Requirements

Any mechanical seal returned to Chesterton that has been in operation, must comply with our Hazard Communication requirements. Please scan the QR Code with your mobile device or go to our web page at **[www.chesterton.com/Mechanical\\_Seal>Returns](http://www.chesterton.com/Mechanical_Seal>Returns)** to obtain information required for returning seals for repair or seal analysis.



DISTRIBUTED BY:

*Chesterton ISO certificates available on [www.chesterton.com/corporate/iso](http://www.chesterton.com/corporate/iso)*

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