



Bearing Isolators

Bearing isolators are dynamic seals designed to protect bearings from outside contaminants. They are comprised of a rotor (rotating) and stator (stationary) member. Some bearing isolators are of labyrinth construction while others use O-rings or other positive seals. Bearing isolators are an improvement over the older stationary labyrinths.

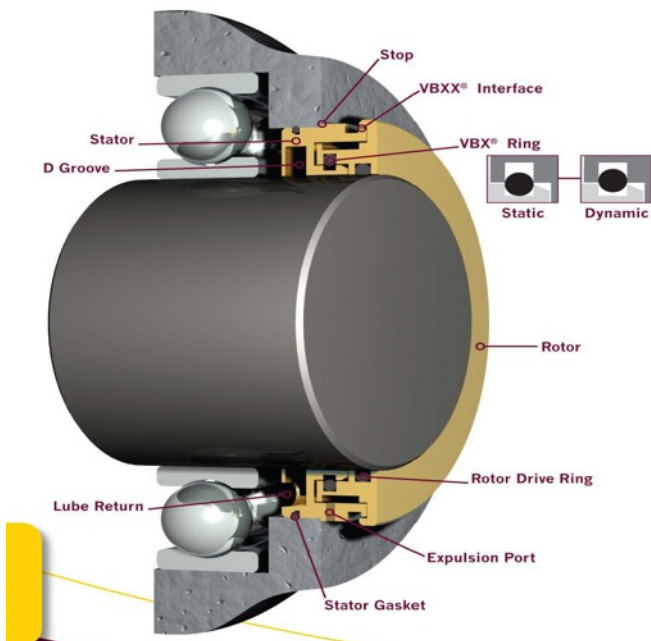
It has long been recognized that the majority of all the rolling element bearings installed in the world's machinery fall far short of reaching the manufacturer's calculated L-10 life. L-10 is defined as the number of operating hours at which 10% of an identical bearing population will either have failed, or will exhibit visible or measurable damage. Research and follow-up analysis have established lubricant contamination as the predominant cause of failure. Much airborne contamination finds its way into bearing housings through openings where shafts protrude through bearing housings, or at vents and breathers on the lubricated assembly. Bearing isolators are designed with inherent clearances, so an air gap separates the rotating and stationary elements. The following can be said:

1. Bearing isolators perform better than lip seals and labyrinth seals.
2. Bearing isolators with dynamic O-rings perform better than those without the O-ring.
3. Magnetic bearing-housing seals are a cost effective means of precluding the alternating, in and out movement of airborne contaminants, which occur due to the temperature shifts between day and night and in the operating cycles. With increasing temperatures, the vapors above the liquid oil will expand and, with decreasing temperatures, they will contract. In a closed volume, increasing temperatures cause pressures to go up, while decreasing temperatures cause pressures to decrease.

Hermetically sealing the bearing housing is really what we want and this implies that nothing enters and nothing escapes. The best results to achieve this are found using Magnetic Face Seals and they are used in aircraft task pumps and in aircraft generator seals. A manufacturer of such seals is [Isomag Corporation](#)

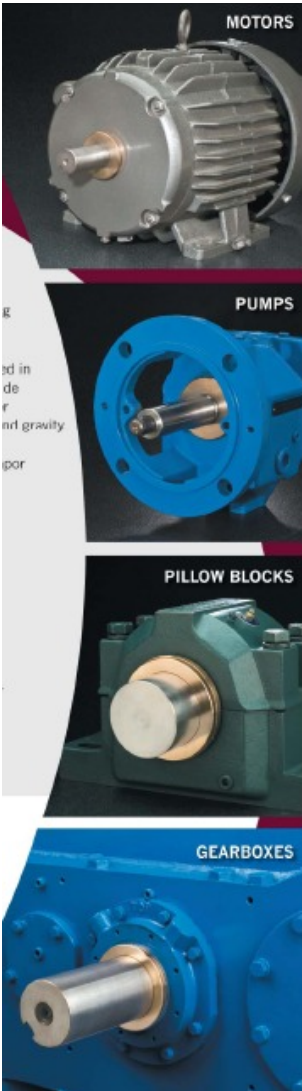
The other two popular suppliers of non-magnetic isolators are [Impro Seal](#) and [Garlock Klozure](#).

IMPRO patented VBX Vapor Blocking Ring



Two Garlock Bearing Isolators

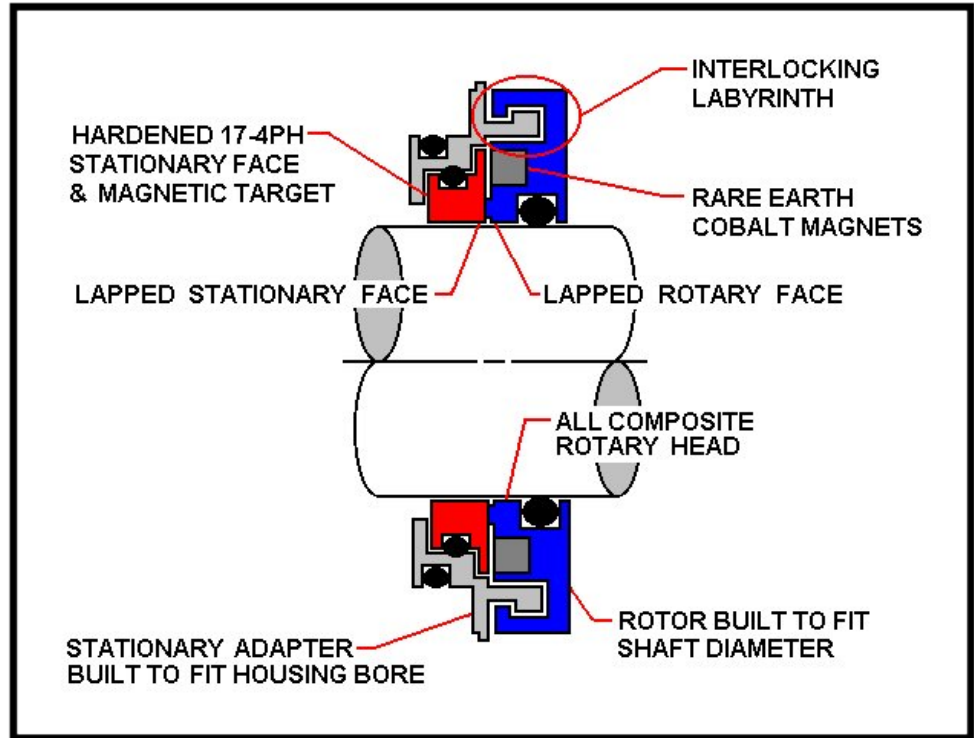




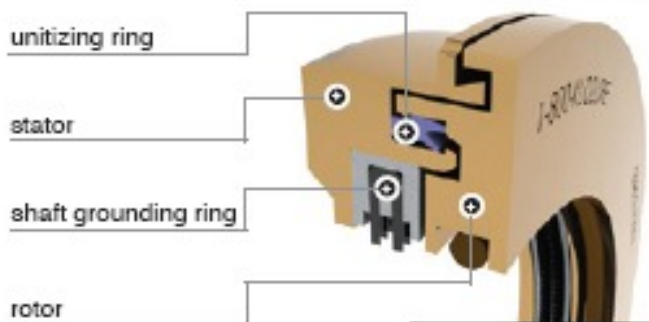
Bearing isolators can be used on many types of plant equipment



Here is a diagram illustrating the parts of a Magnetic Face Seal










*****A new interesting development is the marriage of the bearing isolator to the shaft current grounding ring. An example of this is the Garlock SGi**



Construction: Bronze with Fluoroelastomer O-rings
Size range: 0.875" to 6.000" shaft diameter
Speed: 0 to 12,000 f/m
Axial Motion: 0 to 0.010"
Shaft-to-Bore Misalignment: 0 to 0.015"
Protection: to IP56
Temperature: -22°F to 300°F
Shaft Grounding: AEGIS™ Shaft Grounding Ring

On the next 4 pages are shown the varieties of Bearing Isolators offered by Garlock Klozure

Holland Industrial, 518 West Montgomery Street, Henderson, NC., 27536
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GUARDIAN™ Model Number	Features	Materials	IP Rating	Temp*	Shaft Diameter in. (mm)**	Surface Speed	Axial Motion in. (mm)	Misalign. & Runout in. (mm)	Pressure
Flanged 29602, 29604 	<ul style="list-style-type: none"> Meets NEMA MG 1-2003 Surpasses IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Filled PTFE unitizing ring Fluoroelastomer O-rings standard 	IP 56	-22°F (-30°C) to 400°F (204°C)	0.875 to 10.500 (22.2 to 266.7)	12,000 f/m (60.9 m/s)	±0.025 (0.64)	±0.020 (0.51)	Ambient
Small Cross Section 29606, 29607, 29608 	<ul style="list-style-type: none"> Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Fits in c/s as small as 0.188" (4.76mm) 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Filled PTFE unitizing ring Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 5.500 (22.2 to 139.7)	12,000 f/m (60.9 m/s)	±0.015 (0.38)	±0.010 (0.25)	Ambient
Flangeless Narrow Width 29609, 29611 	<ul style="list-style-type: none"> Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Flangeless design fits in spaces as narrow as 0.375" (9.53mm) 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Filled PTFE unitizing ring Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 4.000 (22.2 to 139.7)	12,000 f/m (60.9 m/s)	±0.015 (0.38)	±0.010 (0.25)	Ambient
Flangeless 29612, 29619 	<ul style="list-style-type: none"> Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Does not extend past face of housing 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Filled PTFE unitizing ring Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 10.500 (22.2 to 266.7)	12,000 f/m (60.9 m/s)	±0.025 (0.64)	±0.020 (0.51)	Ambient
Split Pillow Block 29616, 29617*** 	<ul style="list-style-type: none"> Meets NEMA MG 1-2003 Surpasses IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Standard and custom design for split pillow blocks 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Filled PTFE unitizing ring Fluoroelastomer O-rings standard 	IP 56	-22°F (-30°C) to 400°F (204°C)	0.875 to 10.500 (22.2 to 266.7)	12,000 fpm (60.9 m/s)	±0.025 (0.64)	±0.020 (0.51)	Ambient
Step Shaft 29697 	<ul style="list-style-type: none"> Meets NEMA MG 1-2003 Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Custom designed for individual step shaft applications 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Filled PTFE unitizing ring Fluoroelastomer O-rings standard 	(N/A)	-22°F (-30°C) to 400°F (204°C)	0.875 to 10.500 (22.2 to 266.7)	12,000 fpm (60.9 m/s)	±0.025 (0.64)	±0.020 (0.51)	Ambient
Vertical 29620, 29621, 29622, 29623 	<ul style="list-style-type: none"> Meets NEMA MG 1-2003 Surpasses IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Fits in c/s as small as 0.188 in. (4.76mm) Vertical design for top applications only 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Filled PTFE unitizing ring Fluoroelastomer O-rings standard 	29620 IP 56 29621 IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 10.500 (22.2 to 266.7)	12,000 fpm (60.9 m/s)	Std: ±0.025 (0.64) Small C/S: ±0.015 (0.38)	Std: ±0.020 (0.51) Small C/S: ±0.010 (0.25)	Ambient

* Temperature rating based on standard fluoroelastomer o-rings

** For larger or smaller shaft diameters, please contact Klozure®.

*** Solid seal for split pillow block application




Bearing Isolators PRODUCT INFORMATION

Split GUARDIAN™ Model Number	Features	Materials	IP Rating	Temp*	Shaft Diameter in. (mm)**	Surface Speed	Axial Motion in. (mm)	Misalign. & Runout in. (mm)	Pressure
Flanged 29702 	<ul style="list-style-type: none"> Meets NEMA MG 1-2003 Surpasses IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Split design allows for installation without disassembly of equipment 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Filled PTFE unitizing ring Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 10.500 (22.2 to 266.7)	4,500 f/m (22.9 m/s)	±0.025 (0.64)	±0.020 (0.51)	Ambient
Split Pillow Block 29716*** 	<ul style="list-style-type: none"> Meets NEMA MG 1-2003 Surpasses IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Standard and custom design for split pillow blocks Split design allows for installation without disassembly of equipment 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Filled PTFE unitizing ring Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 10.500 (22.2 to 266.7)	4,500 f/m (22.9 m/s)	±0.025 (0.64)	±0.020 (0.51)	Ambient

* Temperature rating based on standard fluoroelastomer o-rings



** For larger or smaller shaft diameters, please contact Klozure®.

*** Split seal for split pillow block application.

MICRO-TEC® II Model Number	Features	Materials	IP Rating	Temp*	Shaft Diameter in. (mm)**	Surface Speed	Axial Motion in. (mm)	Misalign. & Runout in. (mm)	Pressure
Flanged 29102, 29106 	<ul style="list-style-type: none"> Unique microcellular technology Protects against severely dusty environments Meets NEMA MG 1-2003 Surpasses IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Silicone foam Filled PTFE Unitizing Ring Fluoroelastomer O-rings standard 	IP 56	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	±0.025 (0.64)	±0.020 (0.51)	Ambient
Small Cross Section 29104, 29107 	<ul style="list-style-type: none"> Unique microcellular technology Protects against severely dusty environments Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Fits in c/s as small as 0.188" (4.76mm) 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Silicone foam Filled PTFE Unitizing Ring Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	±0.015 (0.38)	±0.010 (0.25)	Ambient
Flangeless 29112, 29119 	<ul style="list-style-type: none"> Unique microcellular technology Protects against severely dusty environments Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Does not extend past face of housing 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Silicone foam Filled PTFE Unitizing Ring Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	±0.025 (0.64)	±0.020 (0.51)	Ambient

* Temperature rating based on standard fluoroelastomer o-rings






** For larger or smaller shaft diameters, please contact Klozure®.

MICRO-TEC® II Model Number	Features	Materials	IP Rating	Temp*	Shaft Diameter in. (mm)**	Surface Speed	Axial Motion in. (mm)	Misalign. & Runout in. (mm)	Pressure
Split Pillow Block 29116, 29117*** 	<ul style="list-style-type: none"> Unique microcellular technology Protects against severely dusty environments Meets NEMA MG 1-2003 Surpasses IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Standard and custom design for split pillow blocks 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Silicone foam Filled PTFE Unitizing Ring Fluoroelastomer O-rings standard 	IP 56	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	±0.025 (0.64)	±0.020 (0.51)	Ambient
Vertical 29120, 29121, 29122, 29123 	<ul style="list-style-type: none"> Unique microcellular technology Protects against severely dusty environments Meets NEMA MG 1-2003 Surpasses IEEE 841-2001 test standards Conforms to API 610 (Bronze only) No arbor press required for installation No internal metal-to-metal contact Standard and custom design for split pillow blocks 	<ul style="list-style-type: none"> Bronze or 316 stainless steel construction Silicone foam Filled PTFE Unitizing Ring Fluoroelastomer O-rings standard 	Std: IP 56 Small c/s: IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	Std: ±0.025 (0.64) Small c/s: ±0.015 (0.38)	Std: ±0.020 (0.51) Small c/s: ±0.010 (0.25)	Ambient



* Temperature rating based on standard fluoroelastomer o-rings

** For larger or smaller shaft diameters, please contact Klozure®.

*** Split seal for split pillow block application.




ISO-GARD® Model Number	Features	Materials	IP Rating	Temp*	Shaft Diameter in. (mm)**	Surface Speed	Axial Motion in. (mm)	Misalign. & Runout in. (mm)	Pressure
Flanged 29500, 29502 	<ul style="list-style-type: none"> Filled PTFE construction Excellent chemical resistance Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards No arbor press required for installation 	<ul style="list-style-type: none"> FDA compliant blue glass filled PTFE Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	±0.015 (0.38)	±0.020 (0.51)	Ambient
Small Cross Section 29507 	<ul style="list-style-type: none"> Filled PTFE construction Excellent chemical resistance Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards No arbor press required for installation Fits in c/s as small as 0.188" (4.76mm) 	<ul style="list-style-type: none"> FDA compliant blue glass filled PTFE Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	±0.015 (0.38)	±0.020 (0.51)	Ambient
Flangeless 29519 	<ul style="list-style-type: none"> Filled PTFE construction Excellent chemical resistance Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards No arbor press required for installation Does not extend past face of housing 	<ul style="list-style-type: none"> FDA compliant blue glass filled PTFE Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	±0.015 (0.38)	±0.020 (0.51)	Ambient
Grease Purgeable 29518 	<ul style="list-style-type: none"> Filled PTFE construction Excellent chemical resistance Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards No arbor press required for installation Relief in seal allows regreasing with no disassembly of equipment 	<ul style="list-style-type: none"> FDA compliant blue glass filled PTFE Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	±0.015 (0.38)	±0.020 (0.51)	5 psi
Split Pillow Block 29516 	<ul style="list-style-type: none"> Filled PTFE construction Excellent chemical resistance Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards No arbor press required for installation Standard and custom design for split pillow blocks 	<ul style="list-style-type: none"> FDA compliant blue glass filled PTFE Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	±0.015 (0.38)	±0.020 (0.51)	Ambient

Bearing Isolators PRODUCT INFORMATION

ISO-GARD® Model Number	Features	Materials	IP Rating	Temp	Shaft Diameter in. (mm)**	Surface Speed	Axial Motion in. (mm)	Misalign. & Runout in. (mm)	Pressure
Step Shaft 29597 	<ul style="list-style-type: none"> Filled PTFE construction Excellent chemical resistance Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards No arbor press required for installation Custom designed for individual stepshaft applications 	<ul style="list-style-type: none"> FDA compliant blue glass filled PTFE Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	±0.015 (0.38)	±0.020 (0.51)	Ambient
Vertical 29520, 29521 	<ul style="list-style-type: none"> Filled PTFE construction Excellent chemical resistance Meets NEMA MG 1-2003 Meets IEEE 841-2001 test standards No arbor press required for installation Style 29521 offers two O.D. O-Rings for increased retention in the bore Vertical design for top applications only 	<ul style="list-style-type: none"> FDA compliant blue glass filled PTFE Fluoroelastomer O-rings standard 	IP 55	-22°F (-30°C) to 400°F (204°C)	0.875 to 11.000 (22.2 to 279.4)	4,500 f/m (22.9 m/s)	±0.015 (0.38)	±0.020 (0.51)	Ambient

* Temperature rating based on standard fluoroelastomer o-rings

** For larger or smaller shaft diameters, please contact Klozure®.

EQUALIZER® Model Number	Features	Materials	IP Rating	Temp	Shaft Diameter in. (mm)**	Surface Speed	Axial Motion in. (mm)	Misalign. & Runout in. @ f/m (mm@m/s)	Pressure
Flanged 24802 	<ul style="list-style-type: none"> Excellent chemical resistance Multi-position capability No arbor press required for installation Unique pumping/fanning action 	<ul style="list-style-type: none"> Graphite-filled PTFE Fluoroelastomer O-rings standard 	(N/A)	-22°F (-30°C) to 400°F (204°C)	0.875 to 6.000 (22.2 to 152.4)	4,500 f/m (22.9 m/s)	±0.015 (0.38)	±0.015 (0.38)	Ambient
Small Cross Section 24807 	<ul style="list-style-type: none"> Excellent chemical resistance Multi-position capability No arbor press required for installation Unique pumping/fanning action Designed to fit small c/s with no equipment modification 	<ul style="list-style-type: none"> Graphite-filled PTFE Fluoroelastomer O-rings standard 	(N/A)	-22°F (-30°C) to 400°F (204°C)	0.875 to 10.500 (22.2 to 266.7)	4,500 f/m (22.9 m/s)	±0.015 (0.38)	±0.015 (0.38)	Ambient
Flangeless 24801 	<ul style="list-style-type: none"> Excellent chemical resistance Multi-position capability No arbor press required for installation Unique pumping/fanning action Does not extend past face of housing 	<ul style="list-style-type: none"> Graphite-filled PTFE Fluoroelastomer O-rings standard 	(N/A)	-22°F (-30°C) to 400°F (204°C)	0.875 to 6.000 (22.2 to 152.4)	4,500 f/m (22.9 m/s)	±0.015 (0.38)	±0.015 (0.38)	Ambient

* Temperature rating based on standard fluoroelastomer o-rings

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