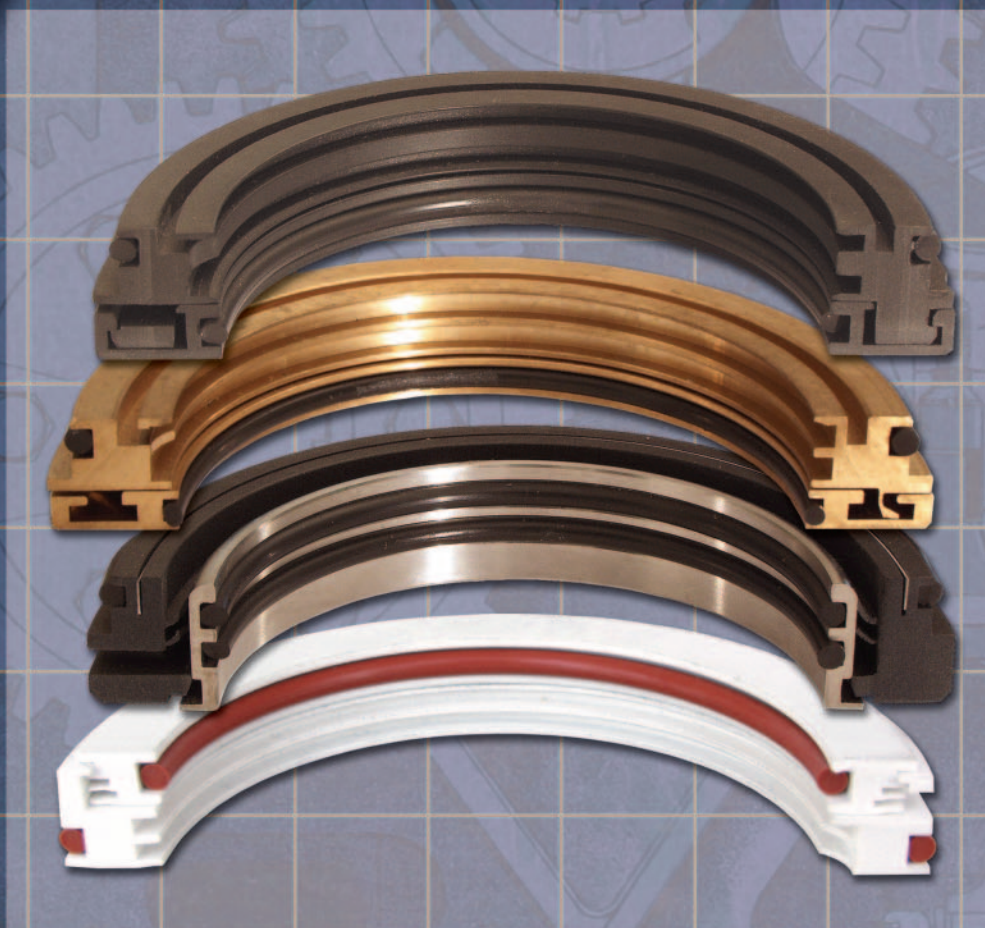


ProTech™ Bearing Isolators

Parker

Catalog EPS 5275/USA

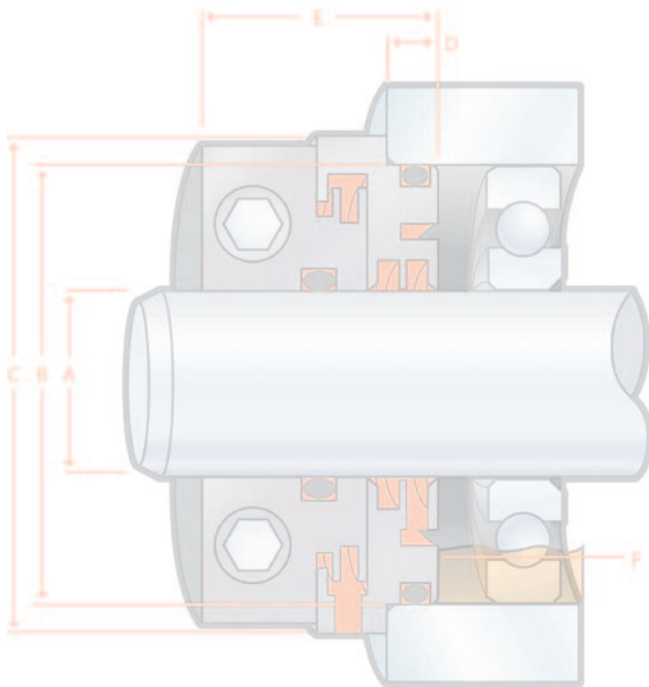


PROTECH

ProTech™ Bearing Isolators

The Ultimate in Bearing Protection

- Unitized, two-piece, non-contact design
- Zero lubricant leakage
- Total exclusion of contaminants
- Extended bearing life
- Exceeds IEEE-841 for electric motors
- Patented and additional patents pending
- 24-hour shipment available



FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other Information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise. Before you select or use any product or system, it is important that you analyze all aspects of your application and review the information concerning the product in the current product catalog. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, safety and warning requirements of the application are met.

Offer of Sale

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice. This offer and its acceptance are governed by the provisions stated in the "Offer of Sale."

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Parker Hannifin Corporation
EPS Division
Salt Lake City, Utah

ProTech Bearing Isolators

02/07/06



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Unmatched Corrosion Resistance

Advanced proprietary PTFE compounds mean ProTech is well suited for caustic environments such as citric acids found in juice processing and strong sulfides in pulp and paper processing. ProTech's superior chemical resistance allows for the standardization of a single material within a plant, eliminating the need to stock duplicate sizes in expensive stainless steel, Hastelloy® or other exotic materials. PTFE is compatible with over 160 chemicals vs. 11 for bronze and 30 for stainless steel.



Superior Bearing Protection Even In Harsh Operating Environments

Parker developed the unique ProTech design to provide unmatched **two way** sealing for zero lubricant leakage and total exclusion of contaminants. This is accomplished by using non-contact labyrinth seal technology. ProTech features the most effective labyrinth design for both dirt exclusion and oil retention and is far superior to isolators that rely on internal o-rings or other internal seals for sealability. If you want more than just an o-ring for bearing protection – step up to ProTech!

Ultimate Performance

The isolator protection you rely on for protecting bearings in pumps and motors is also available for gearbox applications. ProTech 360 is a hybrid design that incorporates an outboard labyrinth for contaminant exclusion and PTFE lip technology for positive oil retention, even in vertical down applications. ProTech 360 is used by numerous OEM's for their most demanding gearbox applications.



BEFORE



Severe and costly damage to internal gearbox components, including gear teeth, routinely occurred (approx. every 90 days) due to lip seal's failure to exclude contaminants.

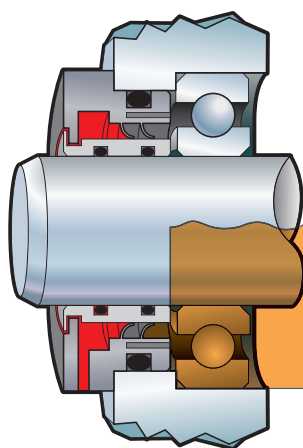
AFTER



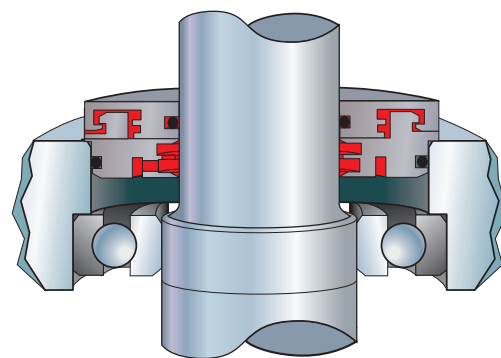
Inspection of same gearbox 13 months after installation of ProTech. Photo taken as-is after cover removed.

Cooling Tower Gearboxes Sealed From Top To Bottom

Upgrading gearboxes that drive cooling tower fans with the ProTech 360 design on the input shaft and the ProTech LW design for the vertical up location is becoming the industry standard for preventing failure due to moisture intrusion.



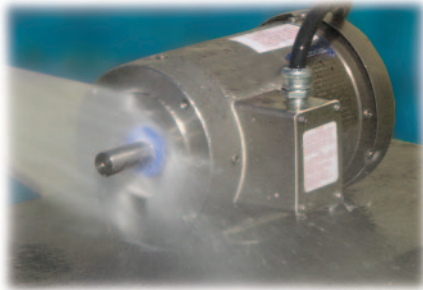
Input Shaft
ProTech 360



Output Shaft
ProTech LW

The Best Solutions For Food Processing Applications

ProTech's unique designs and superior performance are eating the competition's lunch in the food processing market. The WD is an economical profile for high volume, disposable equipment such as wash down grade motors and drives. It also greatly reduces maintenance costs and down time in food processing applications such as picker hubs in poultry processing. Anti-microbial and FDA materials are readily available.



ProTech WD meets IP69k



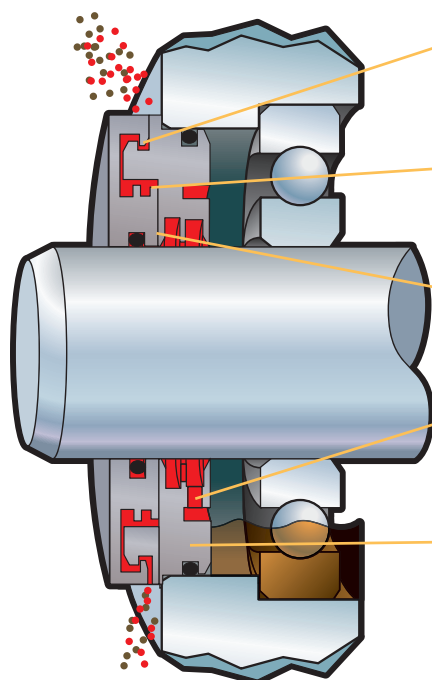
Prefer A Metallic Isolator?

Parker's Millennium™ bearing isolator is much more than just a bronze o-ring holder. Based on patented labyrinth seal technology, Millennium's robust non-contact isolator needs no internal o-ring seal to exclude heavy water spray. No internal seal means zero wear and longer life. Severe oil splash retention grooves, unitized cartridge design and tool-free installation are also standard features. If you demand metallic isolators, demand Millennium!

ProTech Seal Design

With years of experience in the design and manufacture of sealing solutions for industrial applications, Parker is an industry leader in seal design technology and is *the* innovation leader when it comes to bearing isolator design.

Parker's ProTech design innovations include the first bearing isolator with a two-piece unitized design, complete wrap around rotor, severe splash oil grooves and a hybrid isolator for flooded applications.



ProTech "LW"

- First to offer two piece unitized construction. Patented design locks seal together and won't wear like internal o-rings, PTFE elements or other locking rings.
- Contaminant exclusion relies on labyrinth technology, not an internal seal. ProTech does not rely on a simple internal o-ring to protect your bearings.
- Superior chemical resistance provided by proprietary PTFE materials.
- Setting the standard for oil retention. Inboard labyrinth is the most efficient design for retaining oil splash. Far superior to the single groove concept.
- External o-rings provide press fit at shaft and seal housing for zero wear of shaft and housing. Also allows for easy installation.

First Isolator U.L. tested to IEEE 841, meets or exceeds IP55, IP56, IP66, IP69k and API 610.

ProTech Materials

ProTech is constructed of proprietary reinforced PTFE, and is made to perform in high speed, high temperature, and extreme chemical environments. PTFE fillers extend the range of operating conditions by delivering enhanced physical properties to meet specialized environmental conditions such as those found in pulp and paper, petrochemical and food service applications.

Quality

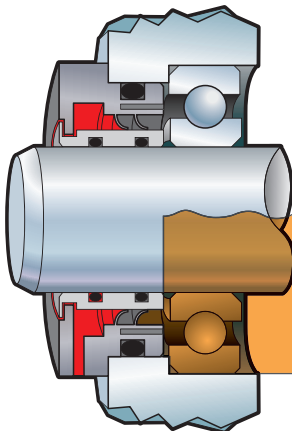
ProTech is manufactured under strict quality control processes — from raw material selection to finished product. The highest quality and absolute consistency from lot-to-lot are assured by:

- Our many years of seal manufacturing experience
- Use of only first-grade virgin PTFE resins
- Sophisticated system for controlling critical sintering process
- Specialized CNC production equipment
- QS-9000 certification

Reliable Performance

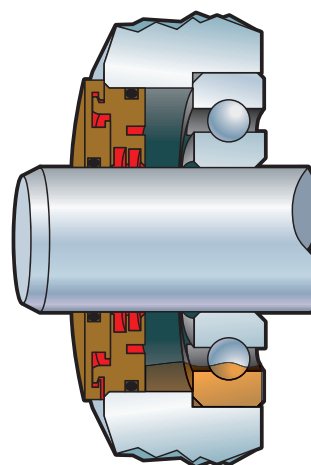
CHARACTERISTICS	FEATURES	BENEFITS
ProTech can replace radial lip oil seals when performance and reliability are critical. In addition, ProTech can be made for a wide range of industrial applications.	Non-Contact Design	■ Virtually no torque consumption ■ Will not wear or groove shafts
	Two-Piece Unitized Construction	■ Complete exclusion of dust and water ■ Zero oil leakage ■ Fewer components and ease of installation
	Accommodates Greatest Axial Movement in Industry	■ Reduces a major factor causing labyrinth seal leakage
	Fluoroelastomer O-rings	■ Static elastomer seal for the most severe services
	No Lubrication Required	■ Can run dry because of non-contact design
	High Shaft Speeds	■ Operates far beyond shaft speed limits of standard radial lip seals ■ Liberal specifications for shaft and bore finish result in low shaft cost
	Precision-Machined Seal	■ Allows retrofit of most bore and shaft combinations ■ No tooling charges

PROTECH 360



The **ProTech 360** profile is the first and only hybrid isolator designed for flooded oil and oil mist applications. Used by numerous gearbox OEMs as standard equipment, the ProTech 360 features internal dual PTFE lips on an internal SS sleeve for zero shaft wear.

MILLENNIUM



The **Millennium** profile is the first and only metallic isolator that is unitized without internal o-rings or locking rings. Millennium's patented labyrinth technology does not rely on a simple o-ring for bearing protection.

Extreme Testing

Laboratory testing has significant advantages over field testing. The lab effectively compresses time and more easily explores limits. Before ProTech saw its first field test, it was put through laboratory tests far more severe than conditions ever encountered in the field. ProTech's effectiveness is also validated by independent laboratory testing.

Both ProTech and competitive seals were subjected to three extreme in-house tests with ProTech clearly emerging as the seal of choice.

1. Oil Leakage Test

ProTech and other seals were subjected to critical oil seal testing using a machine built to SAE J110 standards. One-hundred hour tests were conducted with severe oil splash.

2. Water Exclusion Test

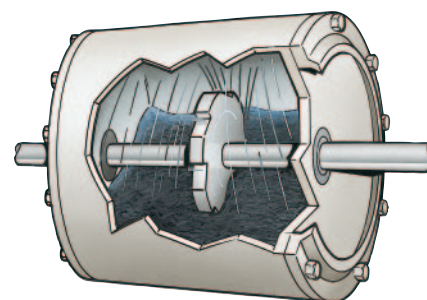
The test machine was modified by mounting five nozzles at various positions relative to the exterior of the seal to simulate severe external wash down. Using water at pressures of 30 to 62 psi, these nozzles individually sprayed each seal from a distance of 3" in both a static mode and while the shaft rotated at various speeds up to 3525 rpm. The nozzles tried to force water past the seal for nearly two hours.

3. Dust Exclusion Test

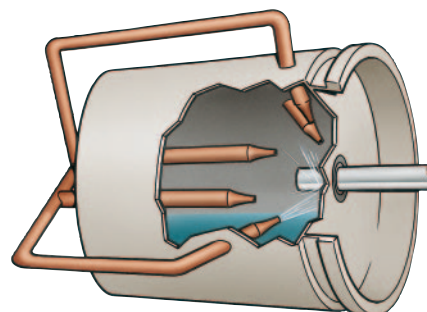
The test machine was modified with an enclosed chamber containing a large quantity of fine dust and sand which was vigorously agitated with the chamber attached to the outside of each seal area. The equipment operated at speeds up to 3525 rpm for a period of 70 hours in an environment that was literally a dense dust storm.

Conclusions

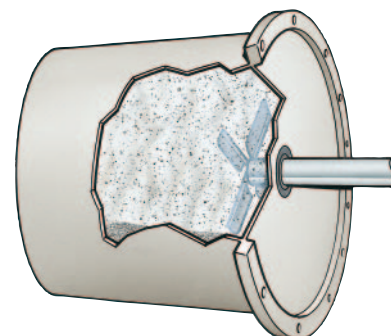
ProTech was the only seal that passed all three torture tests. In addition to lab testing, field trials confirm ProTech's performance superiority.



Oil Leakage Test



Water Exclusion Test



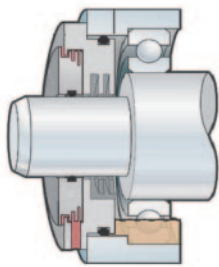
Dust Exclusion Test

EXTREME TEST RESULTS				
Material: Expulsion Method: Design Type: Brand	PTFE Single-Port 2-Pc. Unitized Parker	Bronze Single-Port 2-Pc. Non-Unitized Brand A	PTFE Multi-Port 3-Pc. Unitized Brand B	Bronze Single-Port 3-Pc. Unitized Brand C
Oil Leak Test	Pass	Fail	Pass	Fail
Water Pressure Test	Pass	Fail	Fail	Fail
Dust Test	Pass	Pass	Fail	Fail

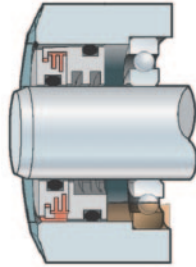
ProTech is available in multiple designs to meet specific design requirements and geometry constraints.

Available with or without flange to provide labyrinth sealing in restricted widths • **Single and multiple expulsion ports** available when directional installation is a problem • **Exceeds IEEE-841** to provide premium bearing protection on severe-duty electric motors • **New split pillow block design** meets OEM specifications.

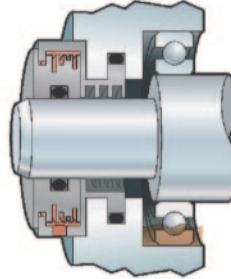
STANDARD DESIGNS



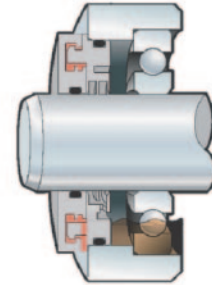
LS
Flanged



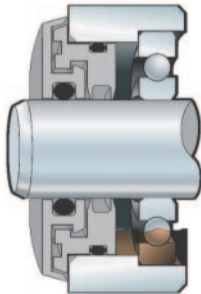
LN
Non-Flanged



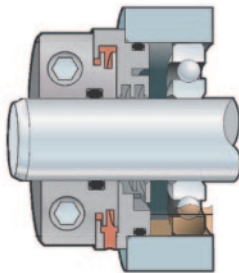
LB
Pillow Block



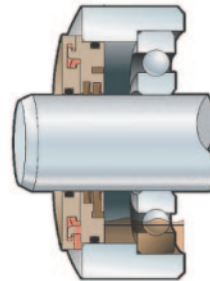
LW
Wrap Around



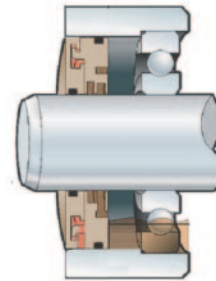
WD
Wash Down



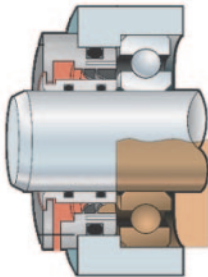
SL
Split



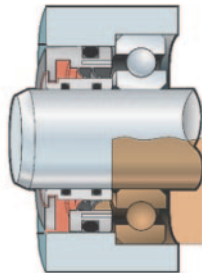
ML Flanged
Millennium



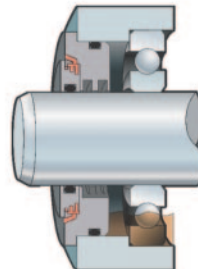
MN Non-Flanged
Millennium



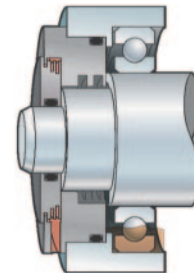
FS
Flanged 360



FN
Non-Flanged 360

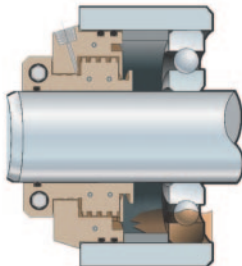


LD
Multi Port

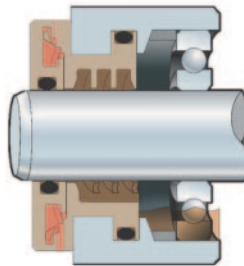


LM
Step Shaft

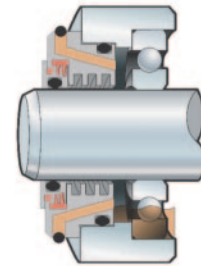
CUSTOM DESIGN EXAMPLES



Split Air
Purge



Turbine



Grease
Purge

Flanged Design – LS Standard Operating Parameters

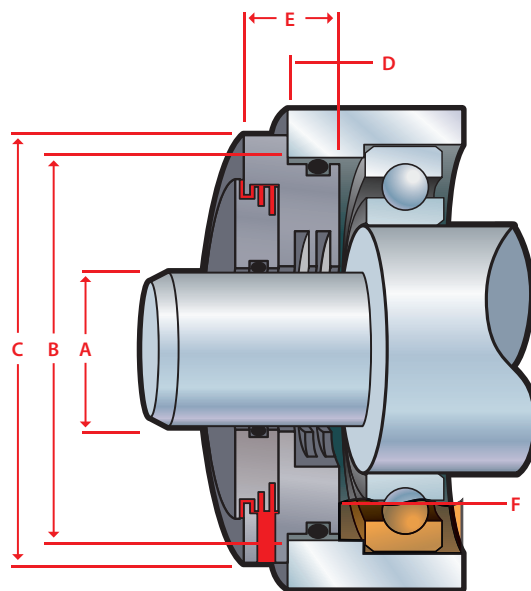
Total Eccentricity: .020" (.51 mm)
 Shaft Speed: Up to 5,000 fpm (25 m/s)
 Pressure: 0 psi / bar
 Temperature Range: -40 to 250 F (-40 to 121 C)
 Axial Movement: .020" (.51 mm) Special designs up to .070" (1.78 mm)
 Shaft / Bore Tolerances: $\pm .002"$ ($\pm .05$ mm)
 Special designs available

Seal Material:

Standard Proprietary PTFE
 Optional Food grade, Anti microbial, FDA 3A

O-Ring Material:

Standard FKM
 Optional NBR, FDA silicone, EPDM, Aflas®†



MOUNTING		LUBRICATION		
	Position	Grease	Oil	Dry
Horizontal	Y	Y	Y	Y
Vertical Up	Y*	Y	Y	Y
Vertical Down	Y	Y	N	Y

*If contaminant level is heavy see "LW" design (page 12)

Retain: Grease and oil splash (operating oil level in cavity between seal and bearing must be below inboard oil drain-back port of seal "F")

Exclude: Heavy water spray and dry contaminants from bearing cavity, best for vertical down applications

Equipment: Motors, pumps, mixers, gearboxes, blowers and custom equipment

STANDARD DIMENSIONS					
Type	"A" Shaft Diameter Range Inch	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
LSE	0.500 – 3.000	0.626 – 1.500	0.250	0.313	0.688
LSE	3.001 – 4.000	0.626 – 1.500	0.250	0.375	0.750
LSE	4.001 – 6.000	0.874 – 1.500	0.250	0.375	0.750
LSE	6.001 – 10.000 ²	0.874 – 1.500	0.250	0.438	0.815

Type	"A" Shaft Diameter Range Metric	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
LSM	12.0 – 40.0	10.0 – 40.0	6.0 ¹	7.0	16.0
LSM	40.1 – 60.0	12.0 – 40.0	6.0 ¹	8.0	17.0
LSM	60.1 – 80.0	15.0 – 40.0	6.0 ¹	9.0	18.0
LSM	80.1 – 130.0	20.0 – 40.0	6.0	9.0	18.0
LSM	130.1 – 254.0 ²	24.0 – 40.0	6.0	11.0	20.0

¹ May be larger for small cross sections. Consult factory for dimensions.

² Contact factory for requirements outside of standard dimensions listed above
 Note: Cross Section = (Bore – Shaft) / 2

† Aflas® is a registered trademark of Asahi Glass Co.

Flush Mount Design – LN Standard Operating Parameters

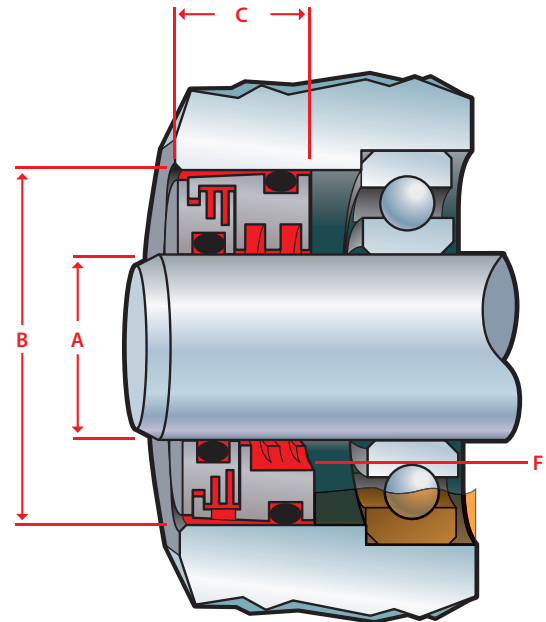
Total Eccentricity: .020" (.51 mm)
Shaft Speed: Up to 5,000 fpm (25 m/s)
Pressure: 0 psi / bar
Temperature Range: -40 to 250 F (-40 to +121 C)
Axial Movement: .020" (.51 mm) special designs up to .070" (1.78 mm)
Shaft / Bore Tolerances: $\pm .002"$ ($\pm .05$ mm)
Special designs available

Seal Material:

Standard Proprietary PTFE
Optional Food grade, Anti microbial, FDA 3A

O-Ring Material:

Standard FKM
Optional NBR, FDA silicone, EPDM, Aflas®



MOUNTING		LUBRICATION		
	Position	Grease	Oil	Dry
Horizontal	Y	Y	Y	Y
Vertical Up	NR*	Y	Y	Y
Vertical Down	Y	Y	N	Y

*Not Recommended (NR). If contaminant level is heavy see "LW" design (page 12)

Retain: Grease and oil splash (operating oil level in cavity between seal and bearing must be below inboard oil drain-back port of seal "F")

Exclude: Heavy water spray and dry contaminants from bearing cavity

Equipment: Applications requiring seal to be flush mounted to equipment housing. Motors, pumps, mixers, gearboxes, blowers and custom equipment

STANDARD DIMENSIONS			
Type	"A" Shaft Diameter Range Inch	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" In Bore Depth
LNE	0.500 – 4.000	0.750 – 1.500	0.562
LNE	4.001 – 10.000 ¹	0.874 – 1.500	0.625

Type	"A" Shaft Diameter Range Metric	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" In Bore Depth
LNM	12.0 – 80.0	14.0 – 40.0	10.0
LNM	80.1 – 130.0	16.0 – 40.0	12.0
LNM	130.1 – 250.0 ¹	18.0 – 40.0	15.0

¹ Contact factory for requirements outside of standard dimensions listed above
Note: Cross Section = (Bore – Shaft) / 2

Split Pillow Block Design – LB Standard Operating Parameters

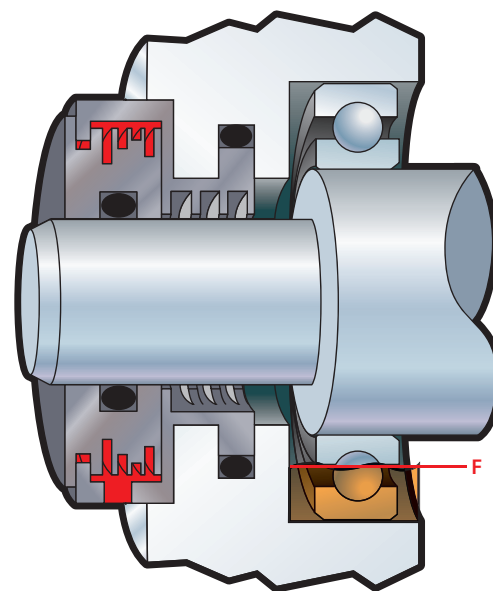
Total Eccentricity: .020" (.51 mm)
Shaft Speed: Up to 5,000 fpm (25 m/s)
Pressure: 0 psi / bar
Temperature Range: -40 to 250 F (-40 to 121 C)
Axial Movement: .020" (.51 mm) special designs up to
.070" (1.78 mm)
Shaft / Bore Tolerances: $\pm .002"$ ($\pm .05$ mm)
Special designs available

Seal Material:

Standard Proprietary PTFE
Optional Food grade, Anti microbial, FDA 3A

O-Ring Material:

Standard FKM
Optional NBR, FDA silicone, EPDM, Aflas®



Split Seal Design (SB) Also Available

MOUNTING		LUBRICATION		
	Position	Grease	Oil	Dry
Horizontal	Y	Y	Y	Y
Vertical Up	Y	Y	Y	Y
Vertical Down	Y	Y	N	Y

Retain: Grease and oil splash (operating oil level in cavity between seal and bearing must be below inboard oil drain-back port of seal "F")

Exclude: Heavy water spray and dry contaminants from bearing cavity. Excellent for taconite exclusion

Equipment: Drop-in replacement for LER seal. Available as a solid (LB) or split (SB) seal. Easily interchanged by LER No. and shaft diameter. Contact authorized distributor for complete interchange

SPLIT PILLOW BLOCK BEARING			
HOUSING	SHAFT	LER	PROTECH PART NO.
SAF 211, 209, 212, 309, 311, 513	2-1/4	30	LBE-2250-2823-J64
SAF 210, 310	2-3/8	35	LBE-2375-2948-M07
SAF 213, 313, 515, 615	2-7/16	37	LBE-2438-3188-D96
SAF 213, 313, 515, 615	2-1/2	38	LBE-2500-3188-J61
SAF 211, 311	2-9/16	40	LBE-2563-3198-K90
SAF 215, 312, 314, 516, 616	2-5/8	43	LBE-2625-3563-AI58
SAF 215, 312, 314, 516, 616	2-11/16	44	LBE-2688-3563-D97
SAF 215, 312, 314, 516, 616	2-3/4	45	LBE-2750-3563-R52
SAF 213, 216, 313, 517	2-15/16	53	LBE-2938-3813-B77
SAF 520, 620	3-7/16	102	LBE-3438-4460-C65
SAF 317, 522, 622	3-15/16	109	LBE-3938-4960-D98
SAF 220, 224, 320, 324, 526, 626	4-7/16	117	LBE-4438-5543-D36
SAF 222, 226, 322, 326, 528, 625	4-15/16	122	LBE-4938-5980-E29
SAF 224, 228, 324, 328, 530, 630	5-5/16	127	LBE-5313-6375-C97
SAF 532, 632	5-7/16	130	LBE-5438-6750-E30
SAF 232, 332, 534, 634	5-15/16	140	LBE-5938-7343-E92
SAF 234, 334, 536	6-7/16	148	LBE-6437-7780-E45
SAF 332, 336, 538, 638	6-15/16	224	LBE-6938-8282-K52
SAF 238, 338, 540, 640	7-5/16	228	LBE-7313-8570-G56
SAF 234, 240, 334, 340	7-7/16	161	LBE-7438-8945-D02

Wrap Around Design – LW Standard Operating Parameters

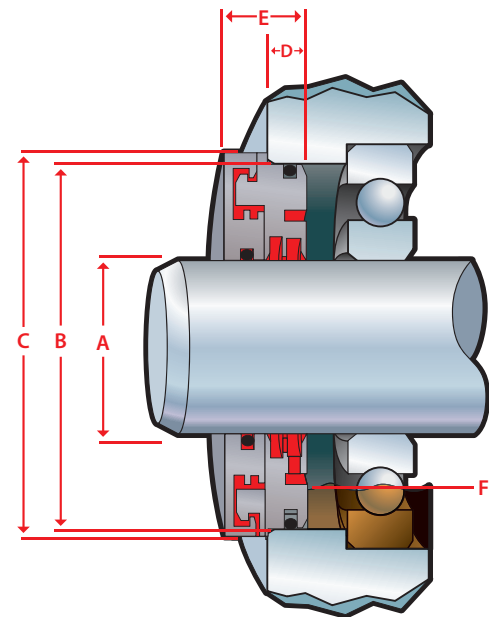
Total Eccentricity: .020" (.51 mm)
Shaft Speed: Up to 3,000 fpm⁴ (15 m/s)
Pressure: 0 psi / bar
Temperature Range: -40 to 250 F (-40 to 121 C)
Axial Movement: .020" (.51 mm) special designs up to .070" (1.78 mm)
Shaft / Bore Tolerances: ± .002" (± .05 mm)
Special designs available

Seal Material:

Standard Proprietary PTFE
Optional Food grade, Anti microbial, FDA 3A

O-Ring Material:

Standard FKM
Optional NBR, FDA silicone, EPDM, Aflas®



MOUNTING		LUBRICATION		
	Position	Grease	Oil	Dry
Horizontal	Y	Y	Y	Y
Vertical Up	Y*	Y	Y	Y
Vertical Down	Y	Y	N	Y

*Optional "LX" design (w/o drain port) recommended

Retain Grease and oil splash (operating oil level in cavity between seal and bearing must be below inboard oil drain-back port of seal "F")
Exclude Equipment Heavy water spray and dry contaminants from bearing cavity
Motors, pumps, mixers, gearboxes, blowers and custom equipment.

STANDARD DIMENSIONS					
Type	"A" Shaft Diameter Range Inch	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
LWE ³	0.492 – 1.575	0.394 – 1.575	0.236 ¹	0.276	0.630
LWE ³	1.576 – 2.362	0.472 – 1.575	0.236 ¹	0.315	0.669
LWE ³	2.363 – 3.150	0.630 – 1.575	0.236 ¹	0.354	0.709
LWE	3.151 – 5.118	0.866 – 1.575	0.236	0.354	0.709
LWE	5.119 – 10.000 ²	0.945 – 1.575	0.236	0.433	0.787

Type	"A" Shaft Diameter Range Metric	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
LWM ³	12.5 – 40.0	10.0 – 40.0	6.0 ¹	7.0	16.0
LWM ³	40.1 – 60.0	12.0 – 40.0	6.0 ¹	8.0	17.0
LWM ³	60.1 – 80.0	16.0 – 40.0	6.0 ¹	9.0	18.0
LWM	80.1 – 130.0	22.0 – 40.0	6.0	9.0	18.0
LWM	130.1 – 254.0 ²	24.0 – 40.0	6.0	11.0	20.0

¹ May be larger for small cross sections, consult factory for dimensions

² Contact factory for requirements outside of standard dimensions listed above

³ Shaft diameters under 1.575" (40 mm) & cross sections under .433" (11 mm) have standard inboard oil splash grooves

Note: Cross Section = (Bore – Shaft) / 2

⁴ Contact factory for speeds over 3,000 fpm (15 m/s)

Wash Down Motor Design – WD Standard Operating Parameters

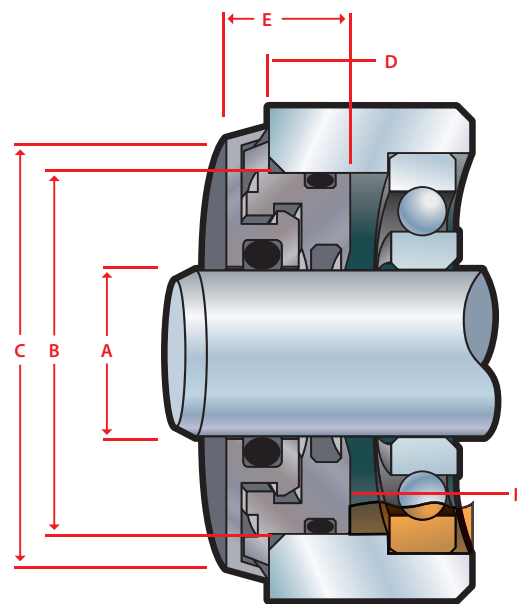
Total Eccentricity: .020" (.51 mm)
Shaft Speed: Up to 3,000 fpm³ (15 m/s)
Pressure: 0 psi / bar
Temperature Range: -40 to 250 F (-40 to 121 C)
Axial Movement: .020" (.51 mm) special designs up to .070" (1.78 mm)
Shaft / Bore Tolerances: $\pm .002$ " ($\pm .05$ mm)
Special designs available

Seal Material:

Standard Proprietary PTFE
Optional Food grade, Anti microbial, FDA 3A

O-Ring Material:

Standard FKM
Optional NBR, FDA silicone, EPDM, Aflas®



Anti Microbial Available

MOUNTING		LUBRICATION		
	Position	Grease	Oil	Dry
Horizontal	Y	Y	N	Y
Vertical Up	Y	Y	N	Y
Vertical Down	Y	Y	N	Y

Retain

Grease and oil splash (operating oil level in cavity between seal and bearing must be below inboard oil drain-back port of seal "F")

Exclude Equipment

Heavy water spray and dry contaminants from bearing cavity
Small disposable motors and equipment for food processing industry; economical seal for 140 and 180 frame motors and other high volume OEM equipment requiring wash down protection where cost to upgrade the seal has been a deterrent

STANDARD DIMENSIONS					
Type	"A" Shaft Diameter Range Inch	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
WDE	0.492 – 1.575	0.551 – 1.575	0.269 ¹	0.248	0.373
WDE	1.576 – 2.362	0.669 – 1.575	0.269 ¹	0.248	0.373
WDE	2.363 – 3.150	0.787 – 1.575	0.269 ¹	0.287	0.412
WDE	3.151 – 5.118	0.866 – 1.575	0.269	0.287	0.412
WDE	5.119 – 10.000 ²	0.945 – 1.575	0.269	0.287	0.412

Type	"A" Shaft Diameter Range Metric	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
WDM	12.5 – 40.0	14.0 – 40.0	6.8 ¹	6.3	9.5
WDM	40.1 – 60.0	17.0 – 40.0	6.8 ¹	6.3	9.5
WDM	60.1 – 80.0	20.0 – 40.0	6.8 ¹	7.3	10.5
WDM	80.1 – 130.0	22.0 – 40.0	6.8	7.3	10.5
WDM	130.1 – 254.0 ²	24.0 – 40.0	6.8	7.3	10.5

¹ May be larger for small cross sections, consult factory for dimensions

² Contact factory for requirements outside of standard dimensions listed above

³ Contact factory for speeds over 3,000 fpm (15 m/s)

Note: Cross Section = (Bore – Shaft) / 2

Split Design – SL Standard Operating Parameters

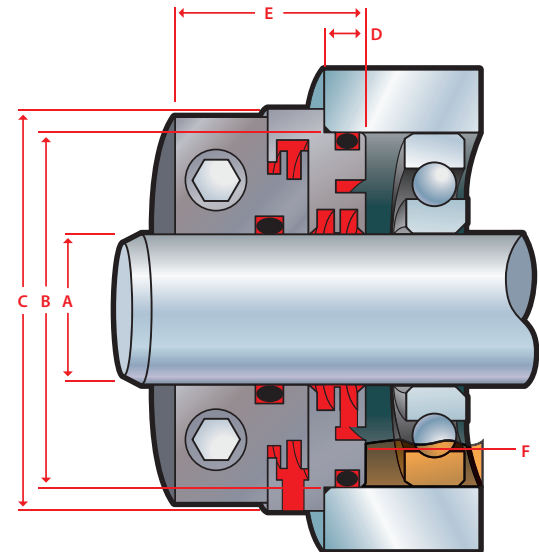
Total Eccentricity: .020" (.51 mm)
Shaft Speed: Up to 3,000 fpm⁴ (15 m/s)
Pressure: 0 psi / bar
Temperature Range: -40 to 250 F (-40 to 121 C)
Axial Movement: .020" (.51 mm) special designs up to .070" (1.78 mm)
Shaft / Bore Tolerances: ± .002" (± .05 mm)
Special designs available

Seal Material:

Standard Proprietary PTFE
Optional Food grade, Anti microbial, FDA 3A

O-Ring Material:

Standard FKM
Optional NBR, FDA silicone, EPDM, Aflas®



MOUNTING		LUBRICATION		
	Position	Grease	Oil	Dry
Horizontal	Y	Y	Y	Y
Vertical Up	Y	Y	Y	Y
Vertical Down	Y*	Y	N	Y

*Locking collar may be required

Retain Grease and oil splash (operating oil level in cavity between seal and bearing must be below inboard oil drain-back port of seal "F").

Exclude Equipment Heavy water spray and dry contaminants from bearing cavity.
For field retrofits where equipment cannot be uncoupled or disassembled. Requires no wear sleeves or shaft refurbishment. Motors, pumps, mixers, gearboxes, blowers and custom equipment

STANDARD DIMENSIONS					
Type	"A" Shaft Diameter Range Inch	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
SLE ³	0.492 – 1.575	0.394 – 1.575	0.236 ¹	0.276	1.078
SLE ³	1.576 – 2.362	0.472 – 1.575	0.236 ¹	0.315	1.117
SLE ³	2.363 – 3.150	0.551 – 1.575	0.236 ¹	0.354	1.156
SLE	3.151 – 5.118	0.787 – 1.575	0.236 ¹	0.354	1.257
SLE	5.119 – 10.000 ²	0.945 – 1.575	0.236 ¹	0.433	1.436

Type	"A" Shaft Diameter Range Metric	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
SLM ³	12.5 – 40.0	10.0 – 40.0	6.0 ¹	7.0	27.4
SLM ³	40.1 – 60.0	12.0 – 40.0	6.0 ¹	8.0	28.4
SLM ³	60.1 – 80.0	14.0 – 40.0	6.0 ¹	9.0	29.4
SLM	80.1 – 130.0	20.0 – 40.0	6.0 ¹	9.0	31.9
SLM	130.1 – 254.0 ²	24.0 – 40.0	6.0 ¹	11.0	36.5

¹ May be larger for small cross sections, consult factory for dimensions

² Contact factory for requirements outside of standard dimensions listed above

³ Shaft diameters under 1.575" (40 mm) & cross sections under .433" (11 mm) have standard inboard oil splash grooves

⁴ Contact factory for speeds over 3,000 fpm (15 m/s)

Note: Cross Section = (Bore – Shaft) / 2

Split Millennium Design – SM Standard Operating Parameters

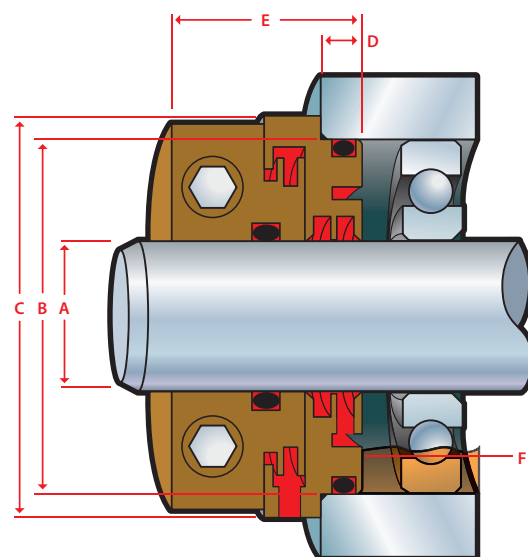
Total Eccentricity: .020" (.51 mm)
 Shaft Speed: Up to 3,000 fpm⁴ (15 m/s)
 Pressure: 0 psi / bar
 Temperature Range: -40 to 250 F (-40 to 121 C)
 Axial Movement: .020" (.51 mm) special designs up to
 .070" (1.78 mm)
 Shaft / Bore Tolerances: ± .002" (± .05 mm)
 Special designs available

Seal Material:

Standard Bronze
 Optional 302 SS, 304 SS, 316 SS, Carbon Steel

O-Ring Material:

Standard FKM
 Optional NBR, FDA silicone, EPDM, Aflas®



Up to 37" (940 mm) Shaft Diameter

MOUNTING		LUBRICATION		
	Position	Grease	Oil	Dry
Horizontal	Y	Y	Y	Y
Vertical Up	Y	Y	Y	Y
Vertical Down	Y*	Y	N	Y

*Locking collar may be required

Retain

Grease and oil splash (operating oil level in cavity between seal and bearing must remain below inboard oil drain-back port of seal "F")

Exclude Equipment

Heavy water spray and dry contaminants from bearing cavity
 For field retrofits where equipment can not be uncoupled or disassembled. Requires no wear sleeves or shaft refurbishment. Motors, pumps, mixers, gearboxes, blowers and custom equipment

STANDARD DIMENSIONS					
Type	"A" Shaft Diameter Range Inch	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
SME ³	0.610 – 1.575	0.709 – 1.575	0.236 ¹	0.276	1.078
SME	1.576 – 2.362	0.709 – 1.575	0.236 ¹	0.315	1.117
SME	2.363 – 3.150	0.709 – 1.575	0.236 ¹	0.354	1.156
SME	3.151 – 5.118	0.787 – 1.575	0.236 ¹	0.354	1.257
SME	5.119 – 10.000 ²	0.945 – 1.575	0.236 ¹	0.433	1.436

Type	"A" Shaft Diameter Range Metric	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
SMM ³	15.5 – 40.0	18.0 – 40.0	6.0 ¹	7.0	27.4
SMM	40.1 – 60.0	18.0 – 40.0	6.0 ¹	8.0	28.4
SMM	60.1 – 80.0	18.0 – 40.0	6.0 ¹	9.0	29.4
SMM	80.1 – 130.0	20.0 – 40.0	6.0 ¹	9.0	31.9
SMM	130.1 – 254.0 ²	24.0 – 40.0	6.0 ¹	11.0	36.5

¹ May be larger for small cross sections, consult factory for dimensions

² Contact factory for requirements outside of standard dimensions listed above

³ Shaft diameters under 1.575" (40 mm) & cross sections under .433" (11 mm) have standard inboard oil splash grooves

⁴ Contact factory for speeds over 3,000 fpm (15 m/s)

Note: Cross Section = (Bore – Shaft) / 2

Flanged Millennium Design – ML Standard Operating Parameters

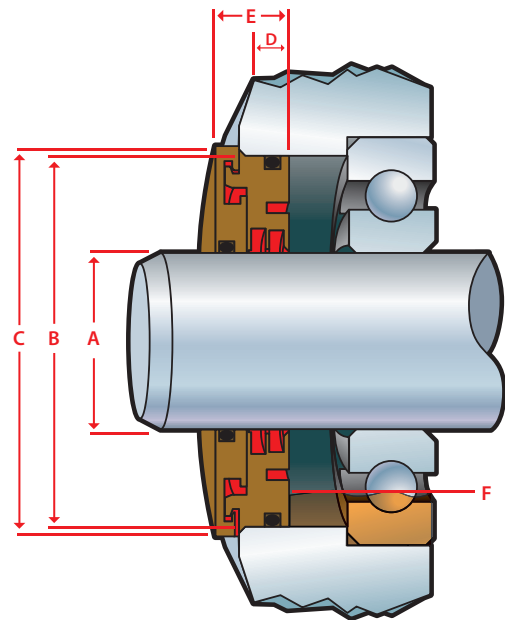
Total Eccentricity: .010" (.25 mm)
Shaft Speed: Up to 7,000 fpm (35 m/s)
Pressure: 0 psi / bar
Temperature Range: -40 to 400 F (-40 to +204 C)
Axial Movement: .010" (.25 mm) special designs up to .100" (2.55 mm)
Shaft / Bore Tolerances: $\pm .002$ " ($\pm .05$ mm)
Special designs available

Seal Material:

Standard Bronze
Optional 302 SS, 304 SS, 316 SS, Carbon steel

O-Ring Material:

Standard FKM
Optional NBR, FDA silicone, EPDM, Aflas®



MOUNTING		LUBRICATION		
	Position	Grease	Oil	Dry
Horizontal	Y	Y	Y	Y
Vertical Up	Y*	Y	Y	Y
Vertical Down	Y	Y	N	Y

*Optional "MX" design (w/o drain port) recommended

Retain Grease and oil splash (operating oil level in cavity between seal and bearing must be below inboard oil drain-back port of seal "F")
Exclude Equipment Heavy water spray and dry contaminants from bearing cavity
Gearboxes, motors, pumps, mixers, turbines, blowers and custom equipment

STANDARD DIMENSIONS					
Type	"A" Shaft Diameter Range Inch	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
MLE ³	0.610 – 1.575	0.394 – 1.575	0.236 ¹	0.276	0.551
MLE ³	1.576 – 2.362	0.472 – 1.575	0.236 ¹	0.315	0.591
MLE ³	2.363 – 3.150	0.630 – 1.575	0.236	0.354	0.630
MLE	3.151 – 5.118	0.866 – 1.575	0.236	0.354	0.630
MLE	5.119 – 6.000 ²	0.945 – 1.575	0.236	0.433	0.709

Type	"A" Shaft Diameter Range Metric	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
MLM ³	15.5 – 40.0	10.0 – 40.0	6.0 ¹	7.0	14.0
MLM ³	40.1 – 60.0	12.0 – 40.0	6.0 ¹	8.0	15.0
MLM ³	60.1 – 80.0	16.0 – 40.0	6.0	9.0	16.0
MLM	80.1 – 130.0	22.0 – 40.0	6.0	9.0	16.0
MLM	130.1 – 152.4 ²	24.0 – 40.0	6.0	11.0	18.0

¹ May be larger for small cross sections, consult factory for dimensions

² Contact factory for requirements outside of standard dimensions listed above

³ Shaft diameters under 1.575" (40 mm) & cross sections under .433" (11mm) have standard inboard oil splash grooves

Note: Cross Section = (Bore – Shaft) / 2

Non-Flanged Millennium Design – MN Standard Operating Parameters

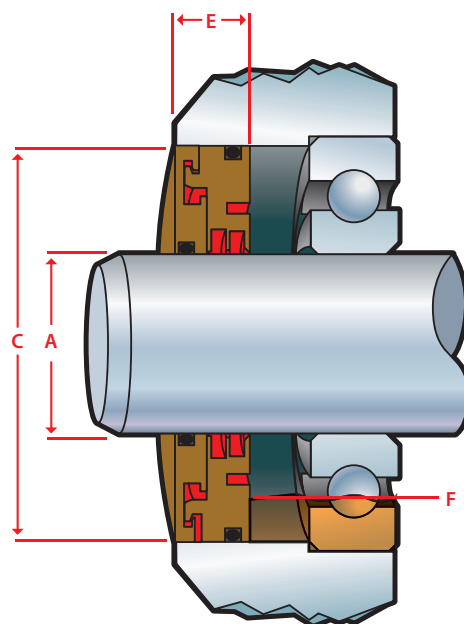
Total Eccentricity: .010" (.25 mm)
Shaft Speed: Up to 7,000 fpm (35 m/s)
Pressure: 0 psi / bar
Temperature Range: -40 to 400 F (-40 to +204 C)
Axial Movement: .010" (.25 mm) special designs up to
.100" (2.55 mm)
Shaft / Bore Tolerances: $\pm .002"$ ($\pm .05$ mm)
Special designs available

Seal Material:

Standard Bronze
Optional 302 SS, 304 SS, 316 SS, Carbon Steel

O-Ring Material:

Standard FKM
Optional NBR, FDA silicone, EPDM, Aflas®



MOUNTING		LUBRICATION		
	Position	Grease	Oil	Dry
Horizontal	Y	Y	Y	Y
Vertical Up	NR*	Y	Y	Y
Vertical Down	Y	Y	N	Y

*Not Recommended (NR) If contaminant level is heavy see "ML" design (page 16)

Retain: Grease and oil splash (operating oil level in cavity between seal and bearing must be below inboard oil drain-back port of seal "F")

Exclude: Heavy water spray and dry contaminants from bearing cavity

Equipment: Gearboxes, motors, pumps, mixers, turbines, blowers and custom equipment

STANDARD DIMENSIONS			
Type	"A" Shaft Diameter Range Inch	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"E" In Bore Depth
MNE ²	0.610 – 1.575	0.748 – 1.575	0.551
MNE ²	1.576 – 2.362	0.748 – 1.575	0.591
MNE ²	2.363 – 3.150	0.748 – 1.575	0.630
MNE	3.151 – 5.118	0.866 – 1.575	0.630
MNE	5.119 – 6.000 ¹	0.945 – 1.575	0.709

Type	"A" Shaft Diameter Range Metric	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"E" In Bore Depth
MNM ²	15.5 – 40.0	19.0 – 40.0	14.0
MNM ²	40.1 – 60.0	19.0 – 40.0	15.0
MNM ²	60.1 – 80.0	19.0 – 40.0	16.0
MNM	80.1 – 130.0	22.0 – 40.0	16.0
MNM	130.1 – 152.4 ¹	24.0 – 40.0	18.0

¹ Contact factory for requirements outside of standard dimensions listed above

² Shaft diameters under 1.575" (40 mm) & cross sections under .433" (11 mm) have standard inboard oil splash grooves

Note: Cross Section = (Bore – Shaft) / 2

Flanged Flooded Design – FS-360 Standard Operating Parameters

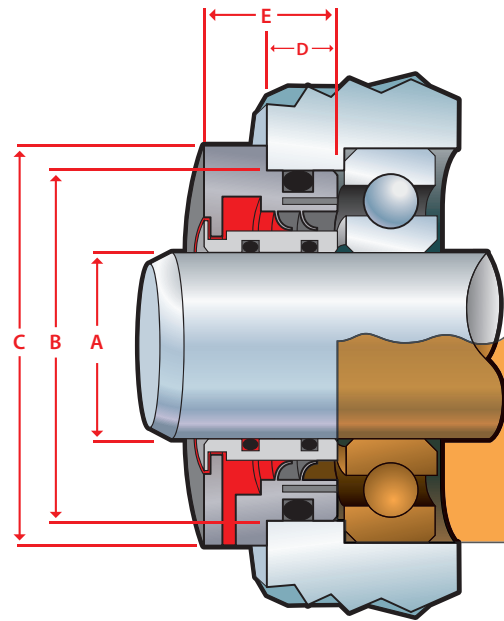
Total Eccentricity: .003" (.08 mm)
Shaft Speed: Up to 5,000 fpm¹ (25 m/s)
Pressure: 5 psi (.344 bar)
Temperature Range: -40 to 250 F (-40 to 121 C)
Axial Movement: .003" (.08 mm)
Shaft / Bore Tolerances: ± .002" (± .05 mm)
Special designs available

Seal Material:

Standard Proprietary PTFE and SS Sleeve
Optional Food grade PTFE and SS Sleeve
Anti microbial PTFE and SS Sleeve
FDA 3A PTFE and SS Sleeve

O-Ring Material:

Standard FKM
Optional NBR, FDA silicone, EPDM, Aflas®



MOUNTING		LUBRICATION		
	Position	Grease	Oil	Dry
Horizontal	Y	Y	Y	Y
Vertical Up	Y*	Y	Y	Y
Vertical Down	Y	Y	Y	Y

*For Vertical Up, contact factory if contaminant level is high

Retain Grease, oil splash, oil mist or oil flooded
Exclude Heavy water spray and dry contaminants from bearing cavity
Equipment Ideal for equipment used in food processing or subjected to frequent wash down where positive oil retention is required. Flooded oil or severe splash retention for gearboxes, motors, pumps, mixers, cooling towers, aerators and custom equipment

STANDARD DIMENSIONS					
Type	"A" Shaft Diameter Range Inch	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
FSE	0.500 – 3.000	0.750 – 1.500	0.250	0.313	0.688
FSE	3.001 – 6.000	0.750 – 1.500	0.250	0.375	0.750
FSE	6.001 – 10.000	0.874 – 1.500	0.250	0.438	0.813

Type	"A" Shaft Diameter Range Metric	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" Flange Diameter = "B" +	"D" In Bore Depth	"E" Overall Seal Width
FSM	13.0 – 76.0	19.0 – 40.0	6.0	8.0	17.0
FSM	76.1 – 152.0	19.0 – 40.0	6.0	9.0	18.0
FSM	152.1 – 250.0 ²	24.0 – 40.0	6.0	11.0	20.0

¹ Contact factory for speeds over 3,000 fpm (25 m/s)

² Contact factory for requirements outside of standard dimensions listed above

Note: Cross Section = (Bore – Shaft) / 2

Non-Flanged Flooded Design – FN-360 Standard Operating Parameters

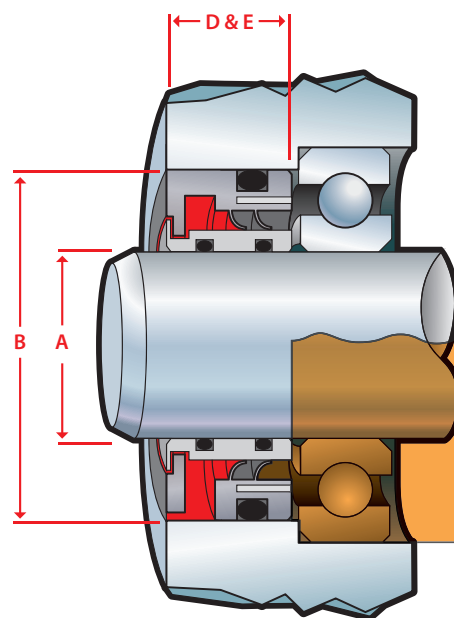
Total Eccentricity: .003" (.08 mm)
Shaft Speed: Up to 5,000 fpm¹ (25 m/s)
Pressure: 5 psi (.344)
Temperature Range: -40 to 250 F (-40 to +121 C)
Axial Movement: .003" (.08 mm)
Shaft / Bore Tolerances: ± .002" (± .05 mm)
Special designs available

Seal Material:

Standard Proprietary PTFE and SS Sleeve
Optional Food grade PTFE and SS Sleeve
Anti microbial PTFE and SS Sleeve
FDA 3A PTFE and SS Sleeve

O-Ring Material:

Standard FKM
Optional NBR, FDA silicone, EPDM, Aflas®



MOUNTING		LUBRICATION		
	Position	Grease	Oil	Dry
Horizontal	Y	Y	Y	Y
Vertical Up	Y*	Y	Y	Y
Vertical Down	Y	Y	Y	Y

*For Vertical Up, contact factory if contaminant level is high

Retain: Grease, oil splash, oil mist or oil flooded
Exclude: Heavy water spray and dry contaminants from bearing cavity
Equipment: Ideal for equipment used in food processing or subjected to frequent wash down where positive oil retention is required. Flooded oil or severe splash retention for gearboxes, motors, pumps, mixers, cooling towers, aerators and custom equipment

STANDARD DIMENSIONS			
Type	"A" Shaft Diameter Range Inch	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" In Bore Depth
FNE	0.500 – 3.000	0.750 – 1.500	0.591
FNE	3.001 – 6.000	0.750 – 1.500	0.591
FNE	6.001 – 10.000	0.874 – 1.500	0.630

Type	"A" Shaft Diameter Range Metric	"B" Bore Diameter Range Is Shaft Diameter "A" + Min-Max	"C" In Bore Depth
FNM	12.7 – 76.2	19.0 – 40.0	15.0
FNM	76.3 – 152.4	19.0 – 40.0	15.0
FNM	152.5 – 254.0 ²	22.2 – 40.0	16.0

¹ Contact factory for speeds over 3,000 fpm (25 m/s)

² Contact factory for requirements outside of standard dimensions listed above

Note: Cross Section = (Bore – Shaft) / 2

PROTECH STANDARD LISTING – INCH STANDARDS

DESIGN TYPE	SHAFT DIA. RANGE		BORE DIAMETER (add to shaft diameter)		IN BORE DEPTH	OVERALL WIDTH	CROSS SECTION		FLANGE DIA. (Bore Dia. +)
	Min.	Max.	Min.	Max.			Min.	Max.	
LSE	0.500	3.000	0.626	1.500	0.313	0.688	0.313	0.750	0.250
LSE	3.001	4.000	0.626	1.500	0.375	0.750	0.313	0.750	0.250
LSE	4.001	6.000	0.874	1.500	0.375	0.750	0.437	0.750	0.250
LSE	6.001	10.000	0.874	1.500	0.438	0.815	0.437	0.750	0.250
LWE	0.492	1.575	0.394	1.575	0.276	0.630	0.197	0.788	0.236
LWE	1.576	2.362	0.472	1.575	0.315	0.669	0.236	0.788	0.236
LWE	2.363	3.150	0.630	1.575	0.354	0.709	0.315	0.788	0.236
LWE	3.151	5.118	0.866	1.575	0.354	0.709	0.433	0.788	0.236
LWE	5.119	10.000	0.945	1.575	0.433	0.787	0.473	0.788	0.236
LNE	0.500	4.000	0.750	1.500	0.562	0.562	0.375	0.750	NA
LNE	4.001	10.000	0.874	1.500	0.625	0.625	0.437	0.750	NA
SLE	0.492	1.575	0.394	1.575	0.276	1.078	0.197	0.750	0.236
SLE	1.576	2.362	0.472	1.575	0.315	1.117	0.236	0.788	0.236
SLE	2.363	3.150	0.551	1.575	0.354	1.156	0.276	0.788	0.236
SLE	3.151	5.118	0.787	1.575	0.354	1.257	0.394	0.788	0.236
SLE	5.119	10.000	0.945	1.575	0.433	1.436	0.473	0.788	0.236
SME	0.610	1.575	0.709	1.575	0.276	1.078	0.355	0.788	0.236
SME	1.576	2.362	0.709	1.575	0.315	1.117	0.355	0.788	0.236
SME	2.363	3.150	0.709	1.575	0.354	1.156	0.355	0.788	0.236
SME	3.151	5.118	0.787	1.575	0.354	1.257	0.394	0.788	0.236
SME	5.119	10.000	0.945	1.575	0.433	1.436	0.473	0.788	0.236
MLE	0.610	1.575	0.394	1.575	0.276	0.551	0.197	0.788	0.236
MLE	1.576	2.362	0.472	1.575	0.315	0.591	0.236	0.788	0.236
MLE	2.363	3.150	0.630	1.575	0.354	0.630	0.315	0.788	0.236
MLE	3.151	5.118	0.866	1.575	0.354	0.630	0.433	0.788	0.236
MLE	5.119	6.000	0.945	1.575	0.433	0.709	0.473	0.788	0.236
MNE	0.610	1.575	0.748	1.575	0.551	0.551	0.374	0.788	NA
MNE	1.576	2.362	0.748	1.575	0.591	0.591	0.374	0.788	NA
MNE	2.363	3.150	0.748	1.575	0.630	0.630	0.374	0.788	NA
MNE	3.151	5.118	0.866	1.575	0.630	0.630	0.433	0.788	NA
MNE	5.119	6.000	0.945	1.575	0.709	0.709	0.473	0.788	NA
FSE	0.500	3.000	0.750	1.500	0.313	0.688	0.375	0.750	0.250
FSE	3.001	6.000	0.750	1.500	0.375	0.750	0.375	0.750	0.250
FSE	6.001	10.000	0.874	1.500	0.438	0.813	0.437	0.750	0.250
FNE	0.500	3.000	0.750	1.500	0.591	0.591	0.375	0.750	NA
FNE	3.001	6.000	0.750	1.500	0.591	0.591	0.375	0.750	NA
FNE	6.001	10.000	0.874	1.500	0.630	0.630	0.437	0.750	NA
WDE	0.492	1.575	0.551	1.575	0.248	0.373	0.273	0.788	0.269
WDE	1.576	2.362	0.669	1.575	0.248	0.373	0.335	0.788	0.269
WDE	2.363	3.150	0.787	1.575	0.287	0.412	0.394	0.788	0.269
WDE	3.151	5.118	0.866	1.575	0.287	0.412	0.433	0.788	0.269
WDE	5.119	10.000	0.945	1.575	0.287	0.412	0.473	0.788	0.269

Note: Cross Section = (Bore – Shaft) / 2 • CALL FOR SIZES NOT LISTED ABOVE. 1-800-233-3900



PROTECH STANDARD LISTING – METRIC STANDARDS									
DESIGN TYPE	SHAFT DIA. RANGE		BORE DIAMETER (add to shaft diameter)		IN BORE DEPTH	OVERALL WIDTH	CROSS SECTION		FLANGE DIA. (Bore Dia. +)
	Min.	Max.	Min.	Max.			Min.	Max.	
LSM	12.0	40.0	10.0	40.0	7.0	16.0	5.0	20.0	6.0
LSM	40.1	60.0	12.0	40.0	8.0	17.0	6.0	20.0	6.0
LSM	60.1	80.0	15.0	40.0	9.0	18.0	7.5	20.0	6.0
LSM	80.1	130.0	20.0	40.0	9.0	18.0	10.0	20.0	6.0
LSM	130.1	254.0	24.0	40.0	11.0	20.0	12.0	20.0	6.0
LWM	12.5	40.0	10.0	40.0	7.0	16.0	5.0	20.0	6.0
LWM	40.1	60.0	12.0	40.0	8.0	17.0	6.0	2.0	6.0
LWM	60.1	80.0	16.0	40.0	9.0	18.0	8.0	20.0	6.0
LWM	80.1	130.0	22.0	40.0	9.0	18.0	11.0	20.0	6.0
LWM	130.1	254.0	24.0	40.0	11.0	20.0	12.0	20.0	6.0
LNM	12.0	80.0	14.0	40.0	10.0	10.0	7.0	20.0	NA
LNM	80.1	130.0	16.0	40.0	12.0	12.0	8.0	20.0	NA
LNM	130.1	250.0	18.0	40.0	15.0	15.0	9.0	20.0	NA
SLM	12.5	40.0	10.0	40.0	7.0	27.4	5.0	20.0	6.0
SLM	40.1	60.0	12.0	40.0	8.0	28.4	6.0	20.0	6.0
SLM	60.1	80.0	14.0	40.0	9.0	29.4	7.0	20.0	6.0
SLM	80.1	130.0	20.0	40.0	9.0	31.9	10.0	20.0	6.0
SLM	130.1	254.0	24.0	40.0	11.0	36.5	12.0	20.0	6.0
SMM	15.5	40.0	18.0	40.0	7.0	27.4	9.0	20.0	6.0
SMM	40.1	60.0	18.0	40.0	8.0	28.4	9.0	20.0	6.0
SMM	60.1	80.0	18.0	40.0	9.0	29.4	9.0	20.0	6.0
SMM	80.1	130.0	20.0	40.0	9.0	31.9	10.0	20.0	6.0
SMM	130.1	254.0	24.0	40.0	11.0	36.5	12.0	20.0	6.0
MLM	15.5	40.0	10.0	40.0	7.0	14.0	5.0	20.0	6.0
MLM	40.1	60.0	12.0	40.0	8.0	15.0	6.0	20.0	6.0
MLM	60.1	80.0	16.0	40.0	9.0	16.0	8.0	20.0	6.0
MLM	80.1	130.0	22.0	40.0	9.0	16.0	11.0	20.0	6.0
MLM	130.1	152.4	24.0	40.0	11.0	18.0	12.0	20.0	6.0
MNM	15.5	40.0	19.0	40.0	14.0	14.0	9.5	20.0	NA
MNM	40.1	60.0	19.0	40.0	15.0	15.0	9.5	20.0	NA
MNM	60.1	80.0	19.0	40.0	16.0	16.0	9.5	20.0	NA
MNM	80.1	130.0	22.0	40.0	16.0	16.0	11.0	20.0	NA
MNM	130.1	152.4	24.0	40.0	18.0	18.0	12.0	20.0	NA
FSM	13.0	76.0	19.0	40.0	8.0	17.0	9.5	20.0	6.0
FSM	76.1	152.0	19.0	40.0	9.0	18.0	9.5	20.0	6.0
FSM	152.1	250.0	24.0	40.0	11.0	20.0	12.0	20.0	6.0
FNM	12.7	76.2	19.0	40.0	15.0	15.0	9.5	20.0	NA
FNM	76.3	152.4	19.0	40.0	15.0	15.0	9.5	20.0	NA
FNM	152.5	254.0	22.2	40.0	16.0	16.0	11.1	20.0	NA
WDM	12.5	40.0	14.0	40.0	6.3	9.5	7.0	20.0	6.8
WDM	40.1	60.0	17.0	40.0	6.3	9.5	8.5	20.0	6.8
WDM	60.1	80.0	20.0	40.0	7.3	10.5	10.0	20.0	6.8
WDM	80.1	130.0	22.0	40.0	7.3	10.5	11.0	20.0	6.8
WDM	130.1	254.0	24.0	40.0	7.3	10.5	12.0	20.0	6.8

Note: Cross Section = (Bore – Shaft) / 2 • CALL FOR SIZES NOT LISTED ABOVE. 1-800-233-3900



Quick Interchange

GOULDS PUMP	Location	ProTech Part No.
3138 S	INBOARD	LSE-2125-3000-1-1
3139 S	INBOARD	LSE-2125-3000-1-1
3145 S	OUTBOARD	LSE-2375-3250-1-1
3171 L	OUTBOARD	LPE-1875-5000-B67
3171 M	OUTBOARD	LSE-1375-3625-B66
3171 S	OUTBOARD	LPE-0875-2750-B79
3175 L	OUTBOARD	LSE-4125-5250-5-1
	INBOARD	LSE-4313-5500-5-1
3175 M	OUTBOARD	LSE-3125-4125-1-1
	INBOARD	LSE-3313-4125-1-1
3175 S	OUTBOARD	LSE-2375-3250-1-1
	INBOARD	LSE-2500-3250-1-1
3175 XL	OUTBOARD	LPE-4313-5500-C05
	INBOARD	LSE-5000-6250-5-1
3180 L	OUTBOARD/INBOARD	LSM-0700-0950-1-1
3180 M	OUTBOARD	LSM-0480-0700-1-1
3180 S	OUTBOARD	LSM-0480-0700-1-1
	INBOARD	LSM-0550-0800-1-1
3180 XL	OUTBOARD	LSM-0850-1100-1-1
3185 L	INBOARD	LSM-0700-0950-1-1
3185 M	OUTBOARD	LSM-0600-0850-1-1
3185 S	OUTBOARD	LSM-0480-0700-1-1
	INBOARD	LSM-0550-0800-1-1
3185 XL	OUTBOARD	LSM-0850-1100-1-1
3196 LT/LTC/LTX	OUTBOARD	LSE-1875-2750-1-1
	INBOARD	LSE-2125-2875-1-1
3196 MT/MTX	OUTBOARD	LSE-1125-2000-1-1
	INBOARD	LSE-1752-2875-1-1
3196 ST/STX	OUTBOARD	LPE-0875-1250-B48
	INBOARD	LPE-1375-2835-B47
3196 XLT/XTX	OUTBOARD	LSE-2375-3250-1-1
	INBOARD	LSE-2500-3250-1-1
3316 L	INBOARD	LSE-1937-3000-1-1
	OUTBOARD	LSE-2062-3000-1-1
3316 M	OUTBOARD	LSE-1375-2125-1-1
	INBOARD	LSE-1437-2250-1-1
3316 S	INBOARD	LPE-1063-1643-F08
	OUTBOARD	LSE-0937-1500-1-1
3410 L	OUTBOARD	LPE-2187-3000-1-1
	INBOARD	LPE-2125-3000-1-1
3410 M	OUTBOARD	LPE-1500-2125-Q57
	INBOARD	LPE-1375-2125-Q58
3410 S	OUTBOARD	LPE-1500-2125-Q57
	INBOARD	LPE-1375-2125-Q58
3996 M	OUTBOARD	LPE-1750-2875-B49
	INBOARD	LPE-1250-2000-B50
3996 S	OUTBOARD	LPE-0875-1250-B48
	INBOARD	LPE-1375-1875-C56
	INBOARD	LPE-1375-2125-B63

DURCO PUMP	Location	ProTech Part No.
MK II GRP I	OUTBOARD	LSE-0875-1625-1-1
	INBOARD	LPE-1125-2441-C70
MK II GRP II	OUTBOARD	LSE-1125-2000-1-1
	INBOARD	LSE-1875-2625-1-1
MK II GRP III	OUTBOARD	LSE-2625-3675-1-1
	INBOARD	LSE-2625-3625-1-1
MK III GRP I	OUTBOARD	LDE-0875-1625-1-1
	INBOARD	LDE-1375-2835-1-1
MK III GRP II	OUTBOARD	LDE-1125-2000-1-1
	INBOARD	LDE-1875-2625-1-1
MK III GRP III	OUTBOARD	LSE-1625-3675-1-1
	INBOARD	LDE-1625-3675-1-1

ITT-AC PUMP	Location	ProTech Part No.
CSO, F4A1	INBOARD	LSE-1000-1750-1-1
	OUTBOARD	LSE-1000-1750-1-1
CSO, F4B2	INBOARD	LSE-1750-2375-1-1
	OUTBOARD	LSE-1125-1750-1-1
CSO, F4B3	INBOARD	LSE-1750-2372-1-1
	OUTBOARD	LSE-1125-1750-1-1
CSO, F4D1	INBOARD	LPE-2125-2875-F73
	OUTBOARD	LSE-1250-2000-1-1
PWO, F8B1	INBOARD	LSE-3250-4000-1-1
	OUTBOARD	LSE-2750-3500-1-1
PWO, F8B2	INBOARD	LSE-3250-4000-1-1
	OUTBOARD	LSE-2750-3500-1-1
PWO, F8B4	INBOARD	LSE-3250-4000-1-1
	OUTBOARD	LSE-2750-3500-1-1
PWO, F8M1	INBOARD	LSE-3250-4000-1-1
	OUTBOARD	LSE-2750-3500-1-1
PWO, F9B1	INBOARD	LSE-3250-4000-1-1
	OUTBOARD	LSE-2750-3500-1-1
PWO, F9M1	INBOARD	LSE-3250-4000-1-1
	OUTBOARD	LSE-2750-3500-1-1
PWO, F8C1	INBOARD	LSE-4500-5500-5-1
	OUTBOARD	LSE-3750-4750-1-1

WARREN PUMP	Location	ProTech Part No.
8 MARK I	INBOARD	LSE-2875-4125-1-1
	OUTBOARD	LSE-2000-3125-1-1
11 MARK I	INBOARD	LSE-4500-5250-5-1
	OUTBOARD	LSE-3500-4375-1-1
11 MARK II	INBOARD	LSE-5000-6000-5-1
	OUTBOARD	LSE-3500-4375-1-1
125 MARK I	INBOARD	LPE-5250-6500-5-1
	OUTBOARD	LSE-4000-5375-5-1
125 MARK II	INBOARD	LSE-5875-7125-5-1
	OUTBOARD	LSE-4000-5375-5-1
138 MARK II	INBOARD	LSE-6250-7750-H19
	OUTBOARD	LSE-4500-6000-5-1

Call factory for complete pump list • Call factory for electric motor interchanges

ProTech Design Data Sheet

"A" Shaft Dia. _____ Shaft Dia. "B" _____

"C" Bore Dia, _____ Bore Depth "D" _____

"E" Distance to 1st Obstruction _____

"F" Distance from housing to step _____

SHAFT SPEED _____ RPM _____ FPM

Date: _____

Company: _____

Contact: _____

Phone: _____

FAX: _____

E-mail: _____

FDA Material Required: ☐ NO ☐ YES Lubricant: ☐ Oil ☐ Grease ☐ Dry Running

SHAFT MOVEMENT

- ☐ Rotates
☐ Oscillates
☐ Reciprocates
☐ Static

SHAFT POSITION

- ☐ Horizontal
☐ Vertical Up
☐ Vertical Down

LUBRICATION SYSTEM

- ☐ Splash, oil level at/below centerline of bearing roller
☐ Flooded, oil level above shaft
☐ Oil Mist
☐ Grease with purge system

Media Sealed Out _____

- ☐ Dry, Moderate Dust ☐ Wet, Light Spray
☐ Dry, Heavy Dust ☐ Wet, Heavy Spray

Internal Pressure:

- ☐ No ☐ Yes, _____ (psi)

Minimum Temperature _____

Average Temperature _____

Maximum Temperature _____

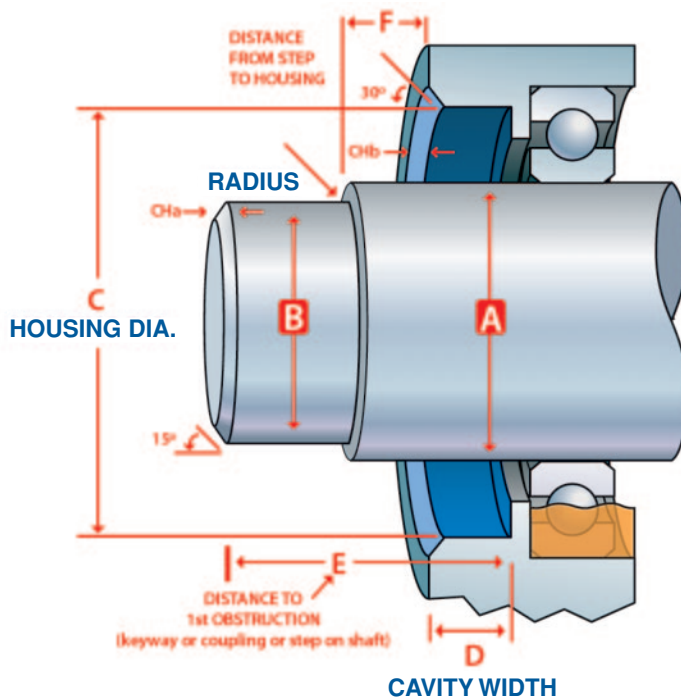
Shaft Axial Movement _____

Shaft to Bore Misalignment _____

Equipment Type _____

Manufacturer _____

Model _____



Return Completed Form to Parker

Electronic form available at www.parker.com/eps/pdds.pdf • Fax: 936-560-8998



Parker Hannifin Corporation
 EPS Division
 Salt Lake City, Utah

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To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.

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For general product information or the location of a nearby distributor, call Parker's Product Information Center at our toll-free number: 1-800-C-PARKER (1-800-272-7535). For technical service and customer service inquiries on Parker's ProTech Bearing Isolators, contact Parker EPS Division at: 1-800-233-3900. Additional information is available online at: www.parkerseals.com.

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6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an

order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereunder "Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after the Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, place or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Any special requirements for items to be provided by Seller hereunder including without limitation; compliance with military specifications, special documentation, or testing requirements, must be communicated to Seller in writing at the time the items are first requested. Any such requests that are communicated to Seller after preparation to manufacture an item has commenced may result in additional charges for rework or remanufacture of the item.

13. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either more than two (2) years after the cause of action accrues.



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