

MECHANICAL SEALS

PRODUCT CATALOG



Split
Seals



Cartridge
Seals



Gas
Seals



Slurry
Seals



Support
Systems



Equipment
Monitoring

Innovative Products and Custom Solutions

A.W. Chesterton Company® is a leading international manufacturer and distributor of mechanical seals, packing and gaskets, hydraulic and pneumatic seals, industrial lubricants and MRO products, as well as ARC industrial coatings. Each product line is positioned to provide value-driven solutions to meet industry needs.

Since 1884 we have worked closely with our customers to provide solutions that help them operate more reliably, efficiently, and economically.

A.W. Chesterton Company is ISO 9001:2008 and ISO 14001:2004 certified.

Global Solutions

Chesterton uses high performance materials, formulations, and designs to solve your toughest industrial applications. We provide value-driven solutions with documented success and recognition across the globe.

Local Service

The expertise of your local Chesterton Technical Specialist combined with the support of our engineering staff will enable you to enjoy significantly reduced operating costs, increased reliability, and years of trouble-free service.

This catalog provides you with an overview of the mechanical seals products and services that Chesterton offers. For more information about our full range of products and services, visit our web site at chesterton.com.



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CARTRIDGE SEALS

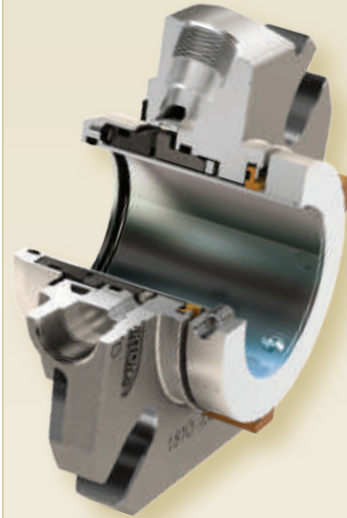
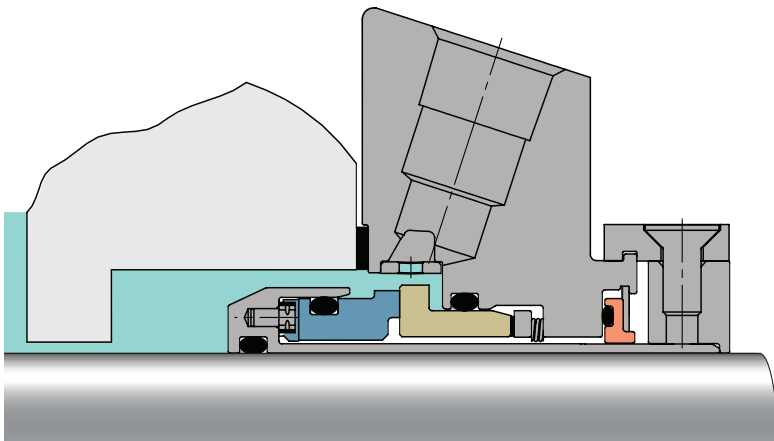
1810

Heavy-Duty Modular Single Cartridge Seal

Built on Chesterton's AXIUS™ modular platform for simple configuration and installation plant-wide

This Chesterton single cartridge seal offers you the ultimate in seal quality, flexibility, and convenience. Leveraging Chesterton's proprietary AXIUS modular platform, the 1810 can be configured with several different face profiles and auxiliary components which allow performance to be tailored to a wide range of process conditions.

A plant-wide sealing solution, the 1810 is effective for both simple and highly demanding applications. It offers selectable features around a common gland housing. This flexibility allows for the creation of the best sealing parameters for your equipment and application needs to maximize single seal reliability.



AXIUS™
Chesterton® Modular Platform

- Simplifies configuration and maximizes seal performance with the AXIUS™ modular platform
- Maintains reliability throughout temperature cycling and stop/start processes with monolithic seal faces
- Increases face life and reduces contact stress with cushioned drive pins
- Allows for easy, positive seal identification with ViewIn™ technology

Variants

- 1810 XL
for shafts from 125 mm – 200 mm (5.000" – 8.000")
- 1810H
Hydropad face technology for vaporizing fluids
- Dry Running Faces
– For applications with little/no lubrication
- Exotic Alloys
– For chemically aggressive process fluids

ViewIn™
Chesterton® Technology

Operating Conditions		Materials	
Size	25 mm – 200 mm (1.000" – 8.000")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 40 bar g (600 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS), <i>Other Metallurgies available on request</i>
Speed	25 m/s (5000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2, NSF-61

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

CARTRIDGE SEALS

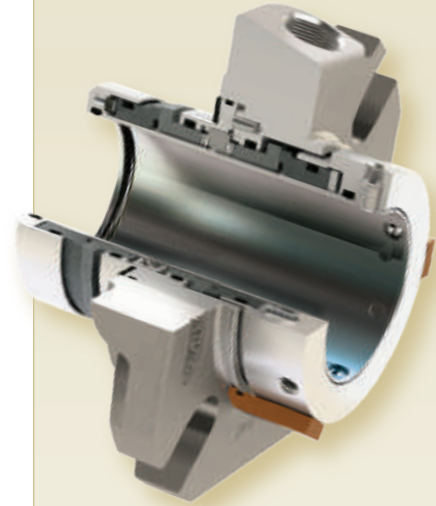
2810

Heavy-Duty Modular Double Cartridge Seal

Built on Chesterton's AXIUS™ modular platform for simple configuration and emission control plant-wide

This Chesterton double cartridge seal offers you the ultimate in seal quality, flexibility, and emissions control. Leveraging Chesterton's proprietary AXIUS modular platform, the 2810 can be configured with several different face profiles and auxiliary components within a common gland housing. This flexibility allows seal performance to be tailored to a wide range of process conditions.

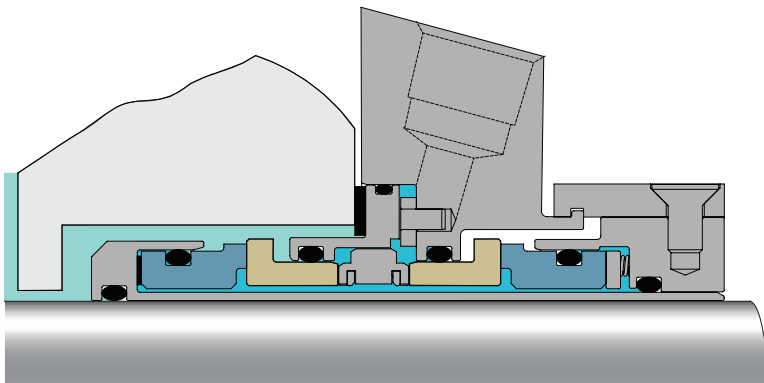
A plant-wide sealing solution, the 2810 uses a geometric double-balanced seal face design. An optimized barrier/buffer channel for enhanced fluid flow provides greater seal reliability even at elevated temperatures.



- Simplifies configuration and maximizes seal performance with the AXIUS™ modular platform
- Maintains reliability throughout temperature cycling and stop/start processes with monolithic seal faces
- Increases face life and reduces contact stress with cushioned drive pins
- Accommodates axial, radial, and angular shaft movement through unified seal face alignment
- Allows for easy, positive seal identification with ViewIn™ technology

Variants

- 2810 XL
for shafts from 125 mm – 200 mm (5.000" – 8.000")
- Exotic Alloys
– For chemically aggressive process fluids



Operating Conditions		Materials	
Size	25 mm – 200 mm (1.000" – 8.000")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 40 bar g (600 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS), <i>Other Metallurgies available on request</i>
Speed	25 m/s (5000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2, ATEX

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

CARTRIDGE SEALS

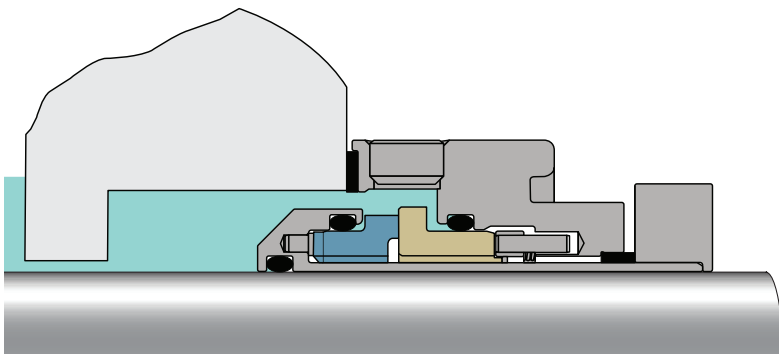
1510

General Duty Single Cartridge Seal

Simple Installation and Increased Reliability Plant-wide in General Duty Applications

Maximize maintenance efficiency and increase plant productivity with the 1510 Single Cartridge Seal. Designed to fit process equipment plant-wide by incorporating Chesterton T.A.B.S. (Tapered Adjustable Bolting System), the compact profile makes seal installation easy.

Reliability through temperature variations and intermittent operations is ensured with the use of monolithic seal faces and true non-fretting construction. Impeller adjustments after seal fitment are accommodated with the unique resettable centering strap, even when adjustment is required between routine maintenance. Incorporating Chesterton's 5 key features of good mechanical seal design, the Chesterton 1510 sets the new standard for general duty cartridge seals.



Advantages

- Reliable through temperature cycling and intermittent process with monolithic seal faces
- In service impeller adjustment is possible with the unique centering strap
- Mounts easily on various types of rotating equipment using Chesterton T.A.B.S.
- Prevents damage to your equipment and internal components via true non-fretting design

Variants

- 1510L
Single Screw Clamp Lock Ring

Five Key Seal Design Features



- ✓ *Balanced Design*
- ✓ *Non-Fretting*
- ✓ *Monolithic Seal Faces*
- ✓ *Stationary Design*
- ✓ *Protected Springs*

Operating Conditions		Materials	
Size	25 mm – 120 mm (1.000" – 4.750")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 20 bar g (300 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	55°C – 300°C (-67°F – 570°F) <i>Temperature limits depend on actual elastomers used</i>	Metals	EN 1.4401 (316SS) <i>Other Metallurgies available on request</i>
Speed	25 m/s (5000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2, NSF-61

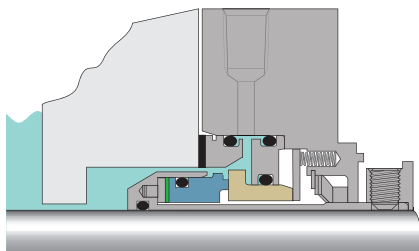
* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

CARTRIDGE SEALS

180™

Heavy-Duty Single Cartridge Seal

A heavy-duty single cartridge seal for maximum reliability in demanding applications



Operating Conditions		Materials	
Size	25 mm – 120 mm (1.000" – 4.750")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 40 bar g (600 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	25 m/s (5000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2, NSF61

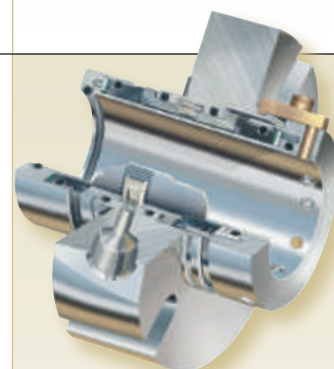
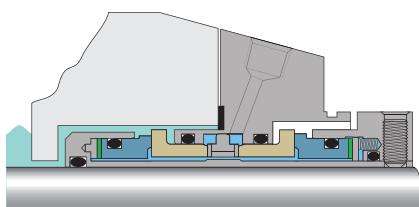
* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

- Maximum performance for demanding, high-torque applications
- Reliable sealing of slurries

280™

Heavy-Duty Double Cartridge Seal

A double seal design for severe duty and greatest reliability in difficult applications—including mixers and agitators



Operating Conditions		Materials	
Size	25 mm – 120 mm (1.000" – 4.750")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 40 bar g (600 psig)* 17 bar g (250 psig) outboard*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2, ATEX

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

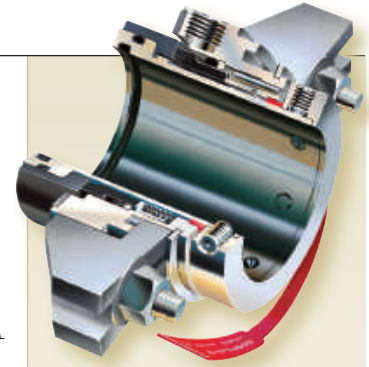
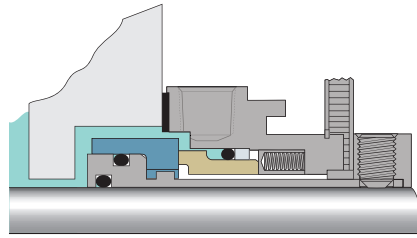
- High-reliability sealing
- Maximum solids handling capability
- Superior performance for demanding applications
- Motion tolerant for mixer applications

CARTRIDGE SEALS

155™

Standard Single Cartridge Seal

A single seal designed for plant-wide flexibility and ease of use



Operating Conditions		Materials	
Size	25 mm – 120 mm (1.000" – 4.750")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 40 bar g (600 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	25 m/s (5000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2, NSF61

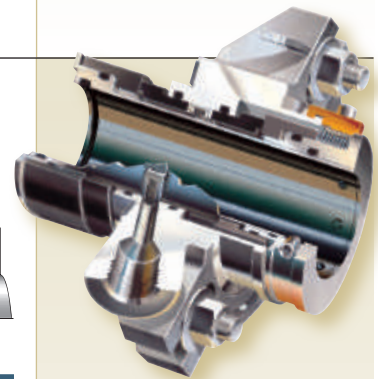
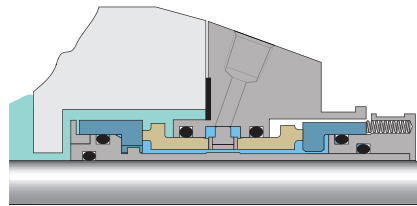
* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

- Adjustable/removable gland tabs
- 360 degree flush port rotation
- Quick release centering strap
- Available in special alloys
- Reliable sealing for a broad range of fluids
- Dynamically stress relieved narrow profile faces
- Low heat generation monolithic faces
- Self-Centering Lock Ring eliminates misalignment
- Stationary springs

255™

Standard Double Cartridge Seal

A proven design and versatile performer providing reliable double sealing capability in a wide variety of process and barrier fluids



Operating Conditions		Materials	
Size	25 mm – 120 mm (1.000" – 4.750")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 40 bar g (600 psig)* 17 bar g (250 psig) outboard*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

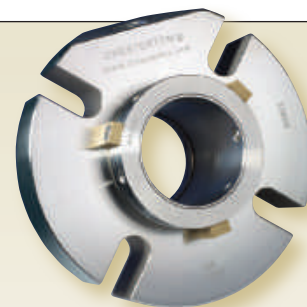
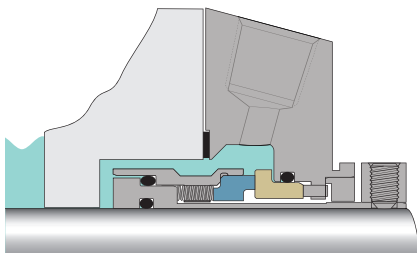
- Geometric double balance eliminates shifting O-Rings
- High flow pumping device
- Monolithic seal faces
- Self-Centering Lock Ring eliminates misalignment
- Unified Seal Face Alignment

CARTRIDGE SEALS

150

General Purpose Single Cartridge Seal

Designed for baseline applications and for upgrading packed or component-sealed equipment. This seal is a value leader in its class



Operating Conditions		Materials	
Size	25 mm – 120 mm (0.938" – 4.750")	Faces	CB, SSC
Pressure	711 mm (28") Hg Vacuum – 20 bar g (300 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Springs	EN 2.4819 (Alloy C-276)

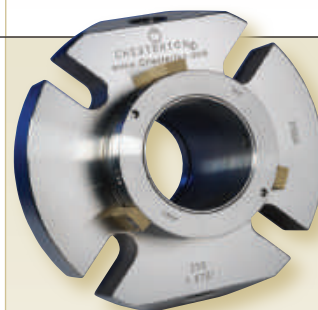
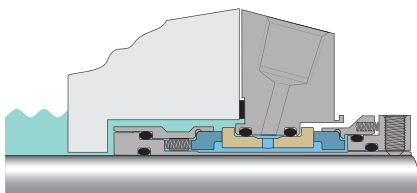
Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2, NSF61, ACS
 * Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

- Simple upgrade to reduce plant maintenance costs
- Reliable cartridge design that increases seal life

250

General Purpose Double Cartridge Seal

Designed for cost-effective upgrading from packing and underperforming single seals. This seal is a value leader in its class—further increasing plant reliability



Operating Conditions		Materials	
Size	25 mm – 120 mm (0.938" – 4.750")	Faces	CB, SSC
Pressure	711 mm (28") Hg Vacuum – 20 bar g (300 psig)* 10 bar g (150 psig) outboard*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2
 * Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

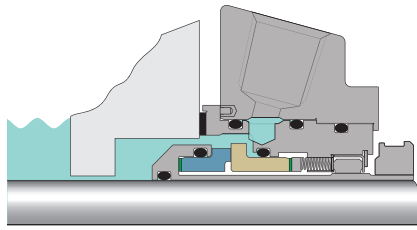
- Provides sealing security that conventional single seals cannot match
- Reliable cartridge design that increases seal life

CASSETTE SEALS

S10

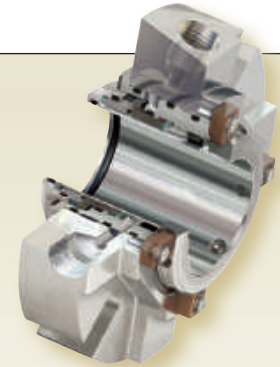
High Performance Single Cassette Seal

A unique, modular cassette that combines advanced seal technology with flexibility in maintenance and repair



Operating Conditions		Materials	
Size	25 mm – 120 mm (1.000" – 4.750")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 31 bar g (450 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	25 m/s (5000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2, NSF61
 * Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

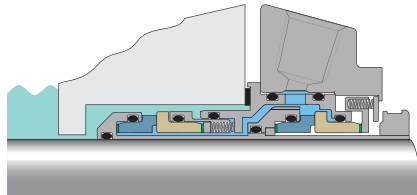


- High performance sealing
- One optimized sealing concept for plant-wide standardization
- Easy to maintain

S20

High Performance Double Cassette Seal

A unique, modular cassette that combines advanced seal technology with flexibility in maintenance and repair



Operating Conditions		Materials	
Size	25 mm – 120 mm (1.000" – 4.750")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 31 bar g (450 psig)* 17 bar g (250 psig) inboard differential*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	25 m/s (5000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2
 * Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.



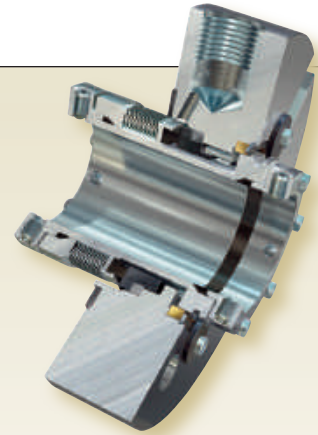
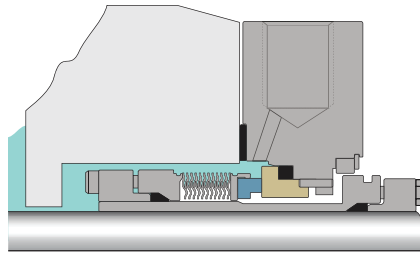
- Advanced sealing performance
- One optimized sealing concept for plant-wide standardization
- Easy to maintain

METAL BELLOWS SEALS

186HT

High-Temperature Bellows Single Cartridge Seal

Designed for high-temperature services related to petrochemical and chemical plant processes



Operating Conditions		Materials	
Size	25 mm – 65 mm (1.125" – 2.625")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 10 bar g (150 psig)*	Secondary Seal	Grafoil®
Temperature	400°C (750°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Bellows	AM 350 Heat Treated (standard) 718 Inconel® (optional)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2

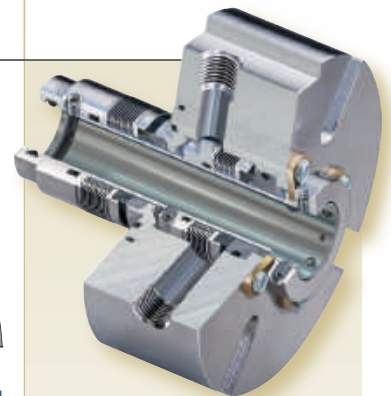
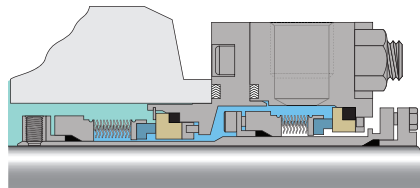
* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

- Self-cleaning, rotating bellows
- Blister-resistant carbon
- Fits majority of pumps found in high-temperature applications
- Quench and drain capability
- Fits both ISO/ANSI seal chambers

286HT

High-Temperature Bellows Double Cartridge Seal

Meets stringent high-temperature requirements for sealing emissions, toxic, and other hazardous fluids



Operating Conditions		Materials	
Size	25 mm – 65 mm (1.125" – 2.625")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 14 bar g (200 psig)* 14 bar g (150 psig) outboard*	Secondary Seal	Grafoil®
Temperature	400°C (750°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Bellows	AM 350 Heat Treated (standard) 718 Inconel® (optional)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

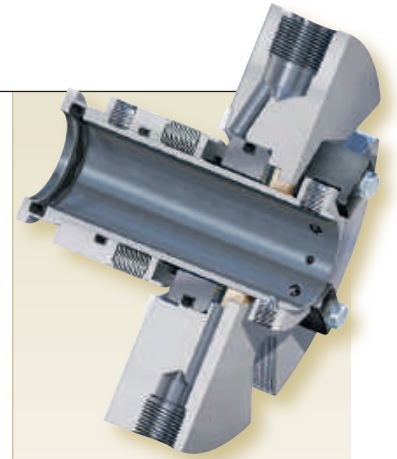
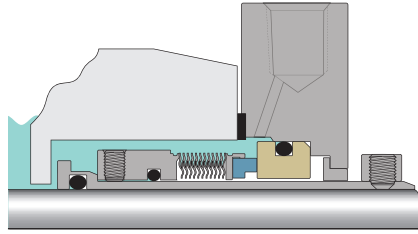
- Self-cleaning, rotating bellows
- Blister-resistant carbon
- Tandem design
- High efficiency pumping vanes
- Bidirectional barrier fluid ports

METAL BELLOWS SEALS

186

Bellows Single Cartridge Seal

Suited for harsh chemical services that can cause difficulty with other seals



Operating Conditions		Materials	
Size	1.000" – 2.500"	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 10 bar g (150 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Bellows	EN 2.4819 (Alloy C-276)

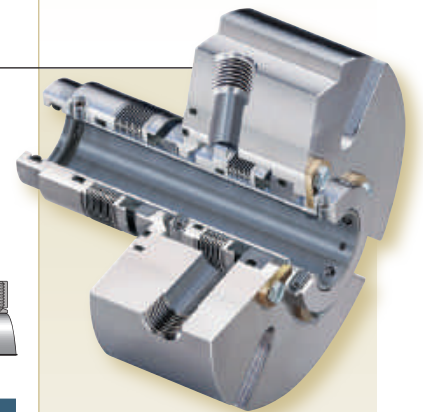
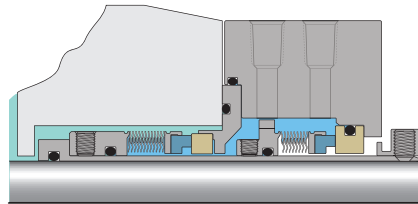
Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2
 * Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

- High-strength bellows core
- Optimized spring rate
- Corrosion-resistant bellows
- Self-cleaning, rotating bellows
- Quench and drain facility
- Slotted gland
- Face gasket design

286

Bellows Double Cartridge Seal

Meets stringent sealing requirements for sealing emissions and toxic and other hazardous fluids



Operating Conditions		Materials	
Size	1.000" – 2.500"	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 10 bar g (150 psig)* 10 bar g (150 psig) inboard differential*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Bellows	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2
 * Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

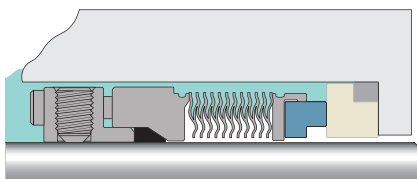
- High efficiency cooling
- Self-cleaning, rotating bellows
- Tandem design
- Helical barrier fluid flow
- Corrosion-resistant Hastelloy® C bellows

METAL BELLOWS SEALS

886HT

High-Temperature Rotary Bellows Seal

High-temperature design for the replacement of non-cartridge, low technology, direct shaft mounted seals



Operating Conditions		Materials	
Size	25 mm – 65 mm (1.000" – 2.625")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 14 bar g (200 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	400°C (750°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Bellows	AM 350 Heat Treated (standard) 718 Inconel® (optional)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

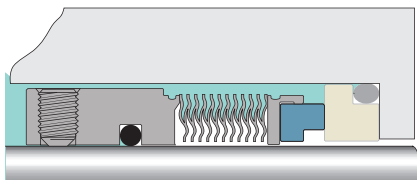


- Optimized spring rate
- Low heat generation
- Self-cleaning, rotating bellows
- Non fretting design
- Grafoil® secondary seals
- Blister-resistant carbon
- Proven heat treated AM 350 bellows construction

886

Rotary Bellows Seal

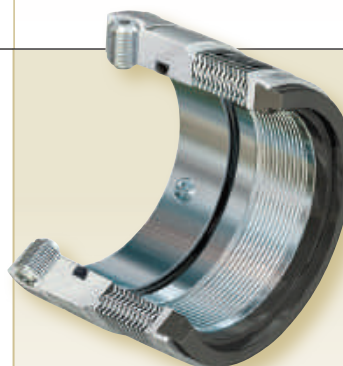
Designed for the replacement of non-cartridge, low technology direct shaft mounted seals



Operating Conditions		Materials	
Size	0.750" – 4.750"	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 10 bar g (150 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Bellows	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.



- High-strength bellows core
- Optimized spring rate
- Non-fretting design
- No dynamic O-Rings
- Corrosion-resistant Hastelloy® C bellows
- Self-cleaning, rotating bellows

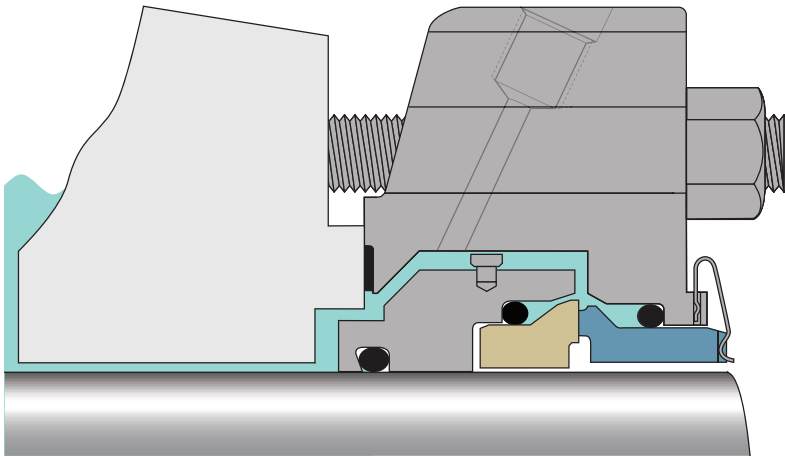
SPLIT MECHANICAL SEALS

442™**Split Mechanical Seal**

Eliminates the need for equipment disassembly during seal installation and reduces maintenance costs

The 442 split seal is ideal for equipment that is difficult and time-consuming to disassemble such as large pumps, vertical pumps, and horizontal split case pumps. This proven, compact design can be used in a wide variety of equipment and process fluids.

The high performance split technology allows the 442 to operate from vacuum to high pressures. Its compact design allows for easy installation and a fit advantage on most equipment. Split, low-cost repair kits reduce ongoing maintenance costs even further. Designed with the installer in mind, the ball-and-socket O-Rings provide a quick and easy seal without the use of adhesives. Captive screws cannot fall out, making installation straightforward and reliable.



- Easy and fast to install without equipment disassembly
- The proven design with superior performance
- Non-fretting to equipment
- Compact design

Variants

- 442PR
 - Pumping ring
- 442HP
 - High-pressure
- 442M
 - Motion (mixer)
- 442 2507
 - Super Duplex

Operating Conditions		Materials	
Size	20 mm – 990 mm (0.750" – 39.000")	Faces	CB, RSC, CR
Pressure	711 mm (28") Hg Vacuum – 30 bar g (450 psig)*	Elastomers	FKM, EPDM, FEPM
Temperature	120°C (250°F)	Metals	EN 1.4401 (316SS), <i>Other Metallurgies available on request</i>
Speed	20 m/s (4000 fpm)	Springs	Elgiloy®

Applicable Standards and Available Approvals: ISO-3069-S, ASME B73.1, ASME B73.2, NSF61, ACS, ATEX

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

SPLIT MECHANICAL SEALS

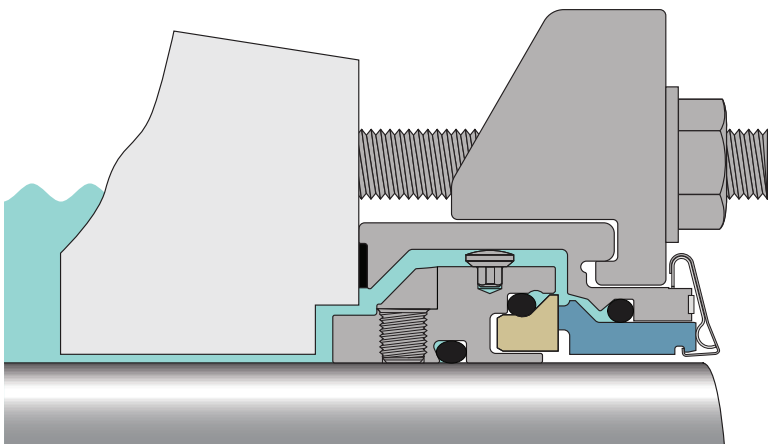
442C™

Cartridge Split Mechanical Seal

Enhanced Design for Simple Installation and Greater Sealing Reliability

The Chesterton 442C Cartridge Split Seal combines superior seal performance with the ease of installation of a cartridge seal. Our split seal technology addresses the inherent limitations found in conventional cartridge split seal designs by minimizing installation complications and excessive leakage. As with all split seals, it offers easy installation and replacement without the need for teardowns.

The 442C design also offers maximum installation flexibility with its short axial length and flexible gland positioning. It simplifies split mechanical seal repair by using a standard spare parts kit, which enables you to lower your inventory costs to maintain operations.



Mechanical Seal - Split Mechanical Seals

- Simplified split seal installation—without equipment disassembly
- Innovative design with superior performance
- Fits majority of rotating equipment
- Easy field repair

Variants

- 442C XL
 - for shafts from 125 mm – 195 mm (4.875" – 7.750")
- Exotic Alloys
 - For chemically aggressive process fluids
- 442C 2507
 - Super Duplex

Operating Conditions		Materials	
Size	25 mm – 195 mm (1.000" – 7.750")	Faces	CB, RSC, CR
Pressure	711 mm (28") Hg Vacuum – 30 bar g (450 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	120°C (250°F)	Metals	EN 1.4401 (316SS), <i>Other Metallurgies available on request</i>
Speed	20 m/s (4000 fpm)	Springs	Elgiloy®

Applicable Standards and Available Approvals: ISO-3069-S, ASME B73.1, ASME B73.2, NSF-61

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

GAS SEALS

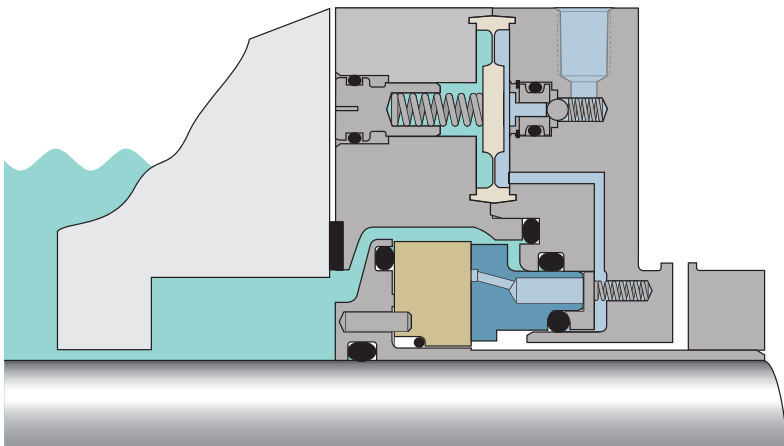
4400

Double Concentric Gas Seal

Advanced Technology Made Simple in a Gas Seal Design

The 4400 is a true double, non-contacting gas seal designed specifically for pumps, mixers, and agitators. With autonomous gas control and no wear due to face contact, the 4400 is a set-it-and-forget-it solution to “bad actor” seals in any industry/application. Its compact design allows for installation in most equipment without the need for modification, thus making it ideal for upgrading underperforming sealing solutions.

The 4400 has a unique design that enables the seal to operate as a non-contacting gas seal when barrier gas is present, operate as a contacting low-emission liquid back up seal when barrier gas is lost, and then recover and return to a non-contacting gas seal when barrier gas is restored. The ingland control system further enhances operation by automatically regulating barrier gas pressure, thus eliminating the need for—and expense of, an external gas control panel.



- Delivers low cost-of-ownership for a broad range of applications
- Advanced technology that is easy to install and operate
- Exclusive in-gland control system eliminates the need and expense of an external gas panel
- Eliminates atmospheric emissions

Variant

- Slow speed mixer design

Operating Conditions		Materials	
Size	25 mm – 90 mm (1.000" – 3.625")	Faces	CB, SSC
Pressure	711 mm (28") Hg Vacuum – 20 bar g (300 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS) <i>Other Metallurgies available on request</i>
Speed	8 m/s (1500 fpm), 25 m/s (5000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069, ASME B73.1, ASME B73.2, ACS

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

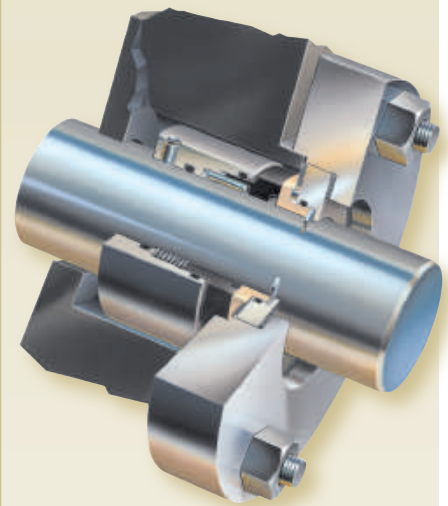
COMPONENT SEALS

891™**Rotary Pusher Single Seal**

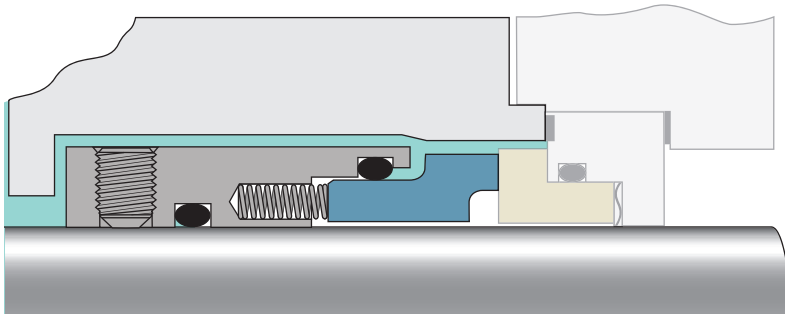
Designed for the replacement of low technology component seals, resulting in an overall reliability increase and maintenance efficiency

The 891 seal design provides an upgrade to standard original equipment component seal installations.

The 891 is designed not to damage or fret the equipment shaft/sleeve because the dynamic O-Ring is positioned on a replaceable component surface. This balanced, high-pressure monolithic seal design will provide a reliable upgrade to standard, unbalanced designs. The seal can be easily rebuilt in the field using low-cost rebuild kits.



- Monolithic seal faces
- Balanced design
- High-pressure capable
- Non-clog, isolated springs
- Designed not to fret shaft or sleeves
- Dynamic O-Ring is positioned on a replaceable component surface
- Minimized wearing components
- Easy to repair with spare part kits



Operating Conditions		Materials	
Size	16 mm – 200 mm (0.750" – 8.000")	Faces	CB, SSC, RSC, TC
Pressure	711 mm (28") Hg Vacuum – 40 bar g (600 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069S, ASME B73.1, ASME B73.2

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

COMPONENT SEALS

491

DIN Rotary Pusher Single Seal

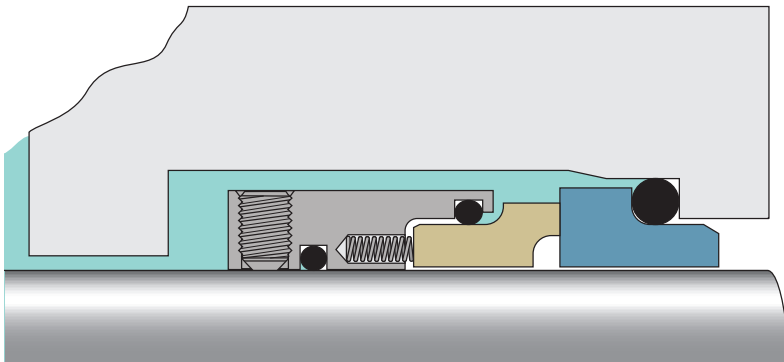
Designed for the replacement of low technology component seals, resulting in an overall reliability increase and maintenance efficiency

The 491 is designed in accordance with EN 12756 to fit the short length installation requirements.

The 491 is designed not to damage or fret the equipment shaft/sleeve because the dynamic O-Ring is positioned on a replaceable component surface. This balanced, high-pressure monolithic seal design will provide a performance upgrade to standard, original equipment component seals. The seal can be easily rebuilt in the field using low-cost rebuild kits.



- Monolithic seal faces
- Non-clog isolated springs
- Designed not to fret shaft or sleeves
- Dynamic O-Ring is positioned on a replaceable component surface
- Short axial length
- Fits EN 12756 L1K dimension



Operating Conditions		Materials	
Size	16 mm – 110 mm	Faces	CB, SSC, TC, CR
Pressure	711 mm (28") Hg Vacuum – 10 bar g (150 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069, ATEX

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

COMPONENT SEALS

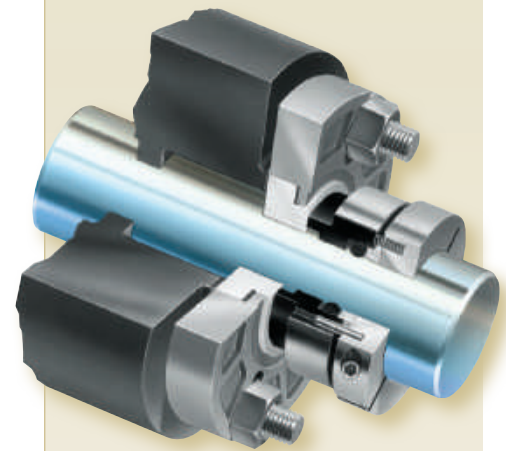
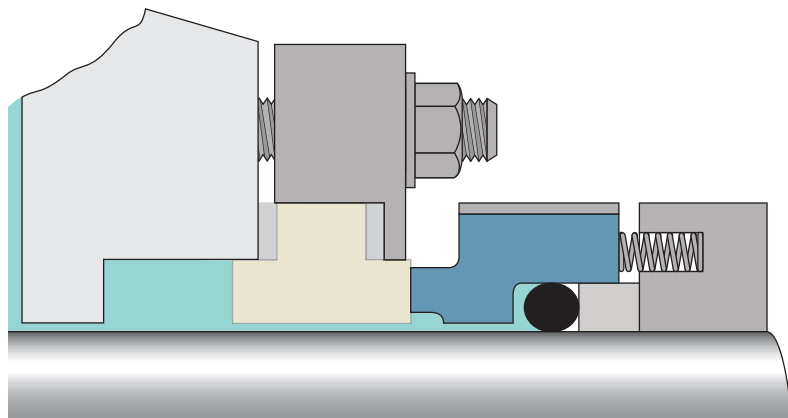
440

Non-Metallic External Single Seal

Designed for use in aggressive chemical applications

The 440 external design is used in general chemical applications where there are corrosives and other aggressive chemicals that attack standard seal materials and where special, high-cost alloys are required.

All wetted parts are sacrificial and easily replaced in a repair program. No metal parts contact the process fluid. The 440 is a low-cost replacement for seals made from expensive alloy materials.



- Nonmetallic design
- Balanced design
- Multi-coil springs
- Clamp drive, no set screws

Operating Conditions		Materials	
Size	24 mm – 110 mm (0.937" – 4.500")	Faces	CB, SSC, RSC, TC, PTFE
Pressure	711 mm (28") Hg Vacuum – 10 bar g (150 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069, ASME B73.1, ASME B73.2

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

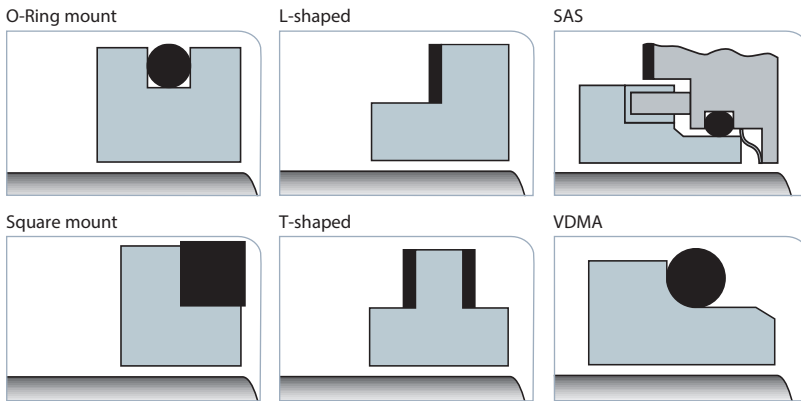
COMPONENT SEALS

Stationary Seal Rings

Versatile stationary seal rings primarily used with component seal designs

Various stationary seal ring designs can be assembled with Chesterton rotary units to make one complete, reliable replacement seal of the component design. These seal rings are designed to accommodate popular ANSI and DIN specifications.

Chesterton stationary replacement seal rings come in an array of designs and sizes. Chesterton seal rings are not plated nor are they combined with other inferior materials. They are all manufactured with high quality monolithic materials, which result in greater reliability.



Model No.	Seal Design	Material
732	O-Ring Mount	Tungsten Carbide Solid
755	O-Ring Mount, Slotted	Tungsten Carbide Solid
773	O-Ring Mount	Silicon Carbide
782	O-Ring Mount	Ceramic
414	T-shaped	Ceramic
725	Square Mount	Ceramic
714	L-shaped	Ceramic/Silicon Carbide/TC
723	L-shaped, Small OD	Ceramic
777	L-shaped, ISO	Ceramic
VDMA	DIN O-Ring Mount	Ceramic
SAS	Self-Aligning Stationary	Ceramic

MIXER SEALS

442M

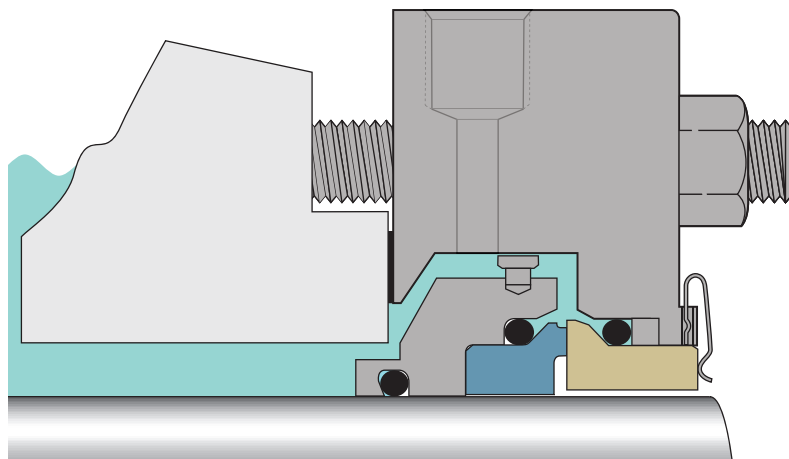
Split Mixer Seal

Eliminates the need for equipment disassembly during seal installation and reduces maintenance costs

The 442 split technology includes vacuum-to-positive pressure capability, which is especially beneficial in process vessel material mixing.

It accommodates large radial and axial shaft motion associated with mixers, agitators, reactors, and blenders. Installation is made easy with automatic centering.

The 442M uses many features, allowing for easy and cost-effective field repair. The unique ball-and-socket O-Rings are the easiest to install and perform leak-free without the use of adhesives. Captive screws cannot fall out, making installation straightforward and reliable.



- Ball and socket O-Rings
- Automatic centering
- Captive fasteners that won't fall out
- Large axial and radial motion handling capability
- Full vacuum and high-pressure sealing
- Non-clog external springs
- Non-fretting to equipment
- Dry run capable
- Compact design
- Integral dual flush port

Operating Conditions		Materials	
Size	38 mm – 305 mm (1.500" – 12.000")	Faces	CB, RSC, CR
Pressure	711 mm (28") Hg Vacuum – 15 bar g (225 psig)*	Elastomers	FKM, EPDM, FEPM
Temperature	120°C (250°F)	Metals	EN 1.4401 (316SS), <i>Other Metallurgies available on request</i>
Speed	20 m/s (4000 fpm)	Springs	Elgiloy®

Applicable Standards and Available Approvals: ISO-3069, ASME B73.1, ASME B73.2, ATEX

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

MIXER SEALS

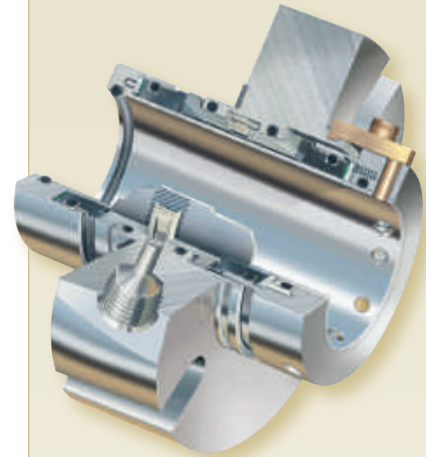
280M

Heavy-Duty Double Mixer Seal

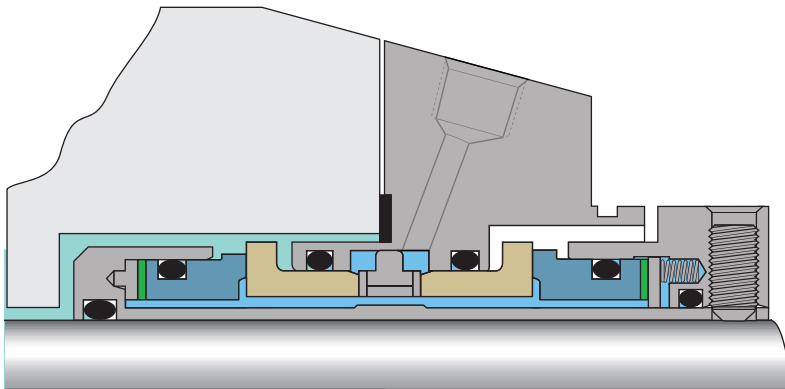
A double seal design for severe duty and greatest reliability in difficult mixer applications

The 280M is an ideal solution for the replacement of canister-type designs because its cartridge design requires no measuring or assembly of seal parts. Installation concerns on critical equipment are minimized.

The 280M has superior motion capabilities within a cartridge design. It incorporates a number of key design advancements in mechanical sealing technology. Its geometric, double-balanced design makes it the ideal choice for mixer standardization because it accepts process pressure reversals. Its non-fretting design will not damage shafts/sleeves.



- Extended motion capability
- Designed for pressure reversal
- Rugged, high-torque monolithic seal faces
- Cushioned, high-strength drives
- Direct centering
- Narrow rotating face prevents wiping of solids
- Micropolished O-Ring surfaces minimizes O-Ring hang-up



Operating Conditions		Materials	
Size	35 mm – 300 mm (1.000" – 12.000")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 40 bar g (600 psig)* 17 bar g (250 psig) outboard*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	20 m/s (4000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2, ATEX

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

SLURRY CARTRIDGE SEALS

170 / 170 ISO

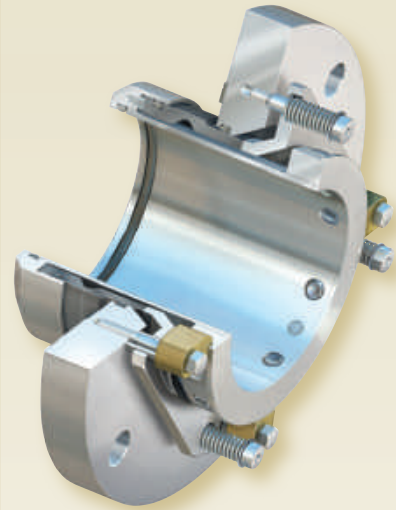
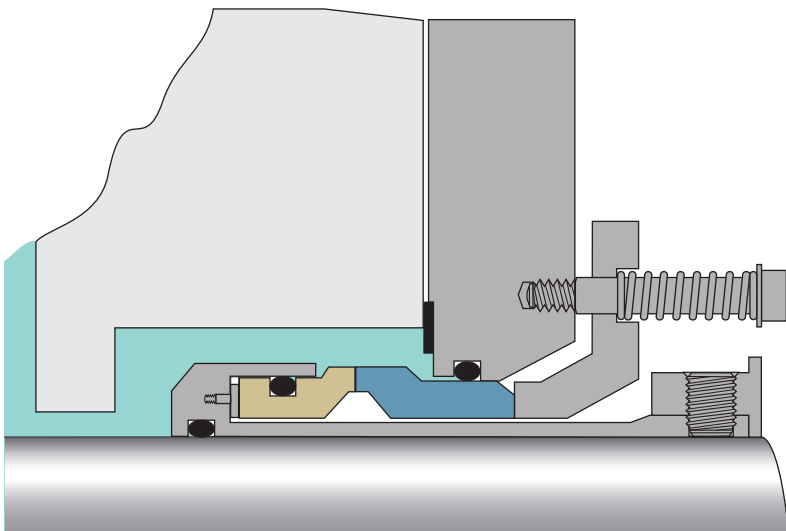
Slurry Single Cartridge Seal

Designed to extend the life of slurry pumps

Engineered to operate in harsh, heavy consistency slurry environments and eliminate costly external seal flushes in the majority of applications

The 170 is designed for sealing mineral-based process materials such as ores, limestone, coal, sugar, and phosphates. The innovative, non-clog seal utilizes a unique coil spring design in which the springs are located entirely outside the seal.

Throughout slurry processing industries, seals must accept greater movement, withstand shaft deflection, and accommodate for increased tolerances. The 170 has large clearance and rugged components designed to resist the effects of heavy slurry environments. Plant optimization can be achieved through reduced product dilution and higher production rates.



- Non-clog design
- Innovative pressure plate design
- Springs located outside the seal
- Micropolished O-Ring surfaces eliminate O-Ring hang-up
- Optimal balance for slurries
- Line-to-line slurry faces
- Stationary springs
- High-strength drives
- Integrated centering tabs
- Washable in-service
- In-field repairable
- No quench and drain needed

Variant

- 170 ISO for shafts from 40 mm – 110 mm
- Duplex and Super Duplex stainless steel available as an option

Operating Conditions		Materials	
Size	38 mm – 180 mm (1.500" – 7.000")**	Faces	SSC, TC
Pressure	711 mm (28") Hg Vacuum – 17 bar g (250 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS), EN 1.4462 (A2205)
Speed	20 m/s (4000 fpm)	Springs	EN 2.4819 (Alloy C-276)

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.
 ** Sizes up to 260 mm (12.000") available

SLURRY CARTRIDGE SEALS

170L

Slurry Single Cartridge Seal

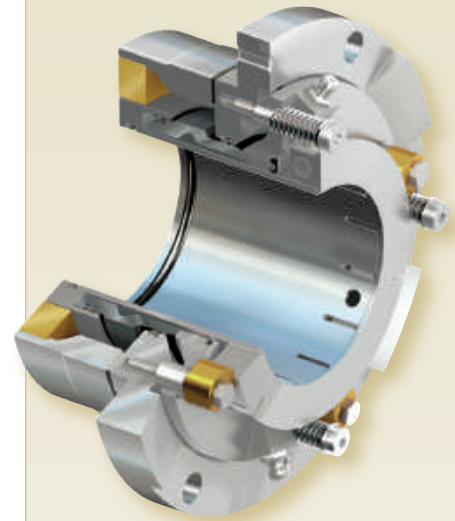
Designed to fit Warman® AH® series pump

Engineered to operate in harsh, heavy consistency slurry environments and eliminate costly external seal flushes in the majority of applications

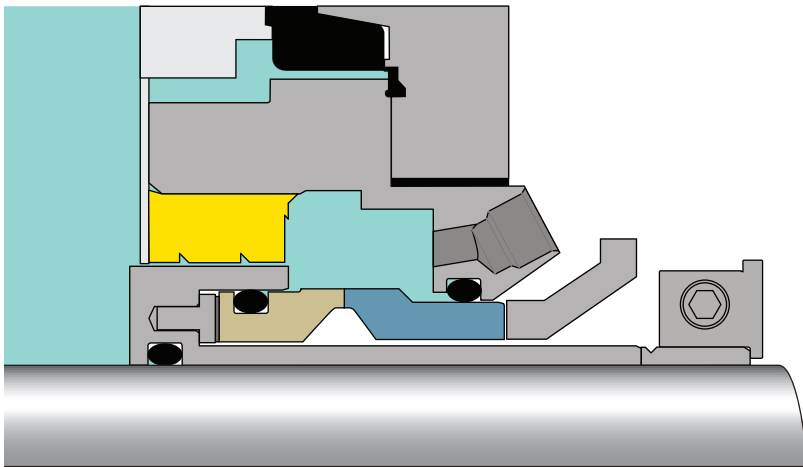
The 170L is designed for sealing mineral-based process materials such as ores, limestone, coal, sugar, and phosphates. The innovative, non-clog seal utilizes a unique coil spring design in which the springs are located entirely outside the seal.

The 170L uses a single clamping screw which simplifies seal removal in sticky or viscous fluids or where solids clog up the set screws.

The 170L has large clearance and rugged components designed to resist the effects of heavy slurry environments. Plant optimization can be achieved through reduced product dilution and higher production rates.



- Non-clog design
- Innovative pressure plate design
- Springs located outside the seal
- Micropolished O-Ring surfaces eliminate O-Ring hang-up
- Optimal balance for slurries
- Line-to-line slurry faces
- Stationary springs
- High-strength drives
- Single clamping screw simplifies seal installation and removal
- Integrated centering tabs
- Washable in-service
- In-field repairable
- variants: wet, dry quench/drain and lip seal



Operating Conditions		Materials	
Size	50 mm – 220 mm	Faces	SSC, TC
Pressure	711 mm (28") Hg Vacuum – 17 bar g (250 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS), EN 1.4462 (A2205)
Speed	20 m/s (4000 fpm)	Springs	EN 2.4819 (Alloy C-276)

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

SPECIALTY SEALS

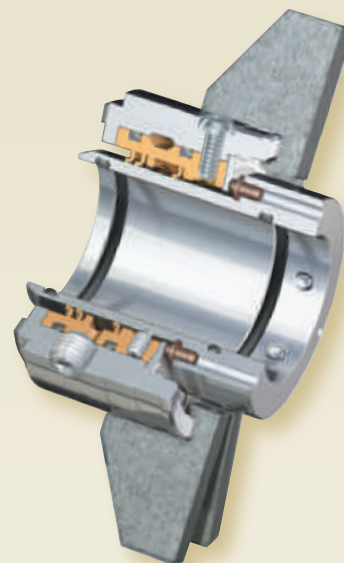
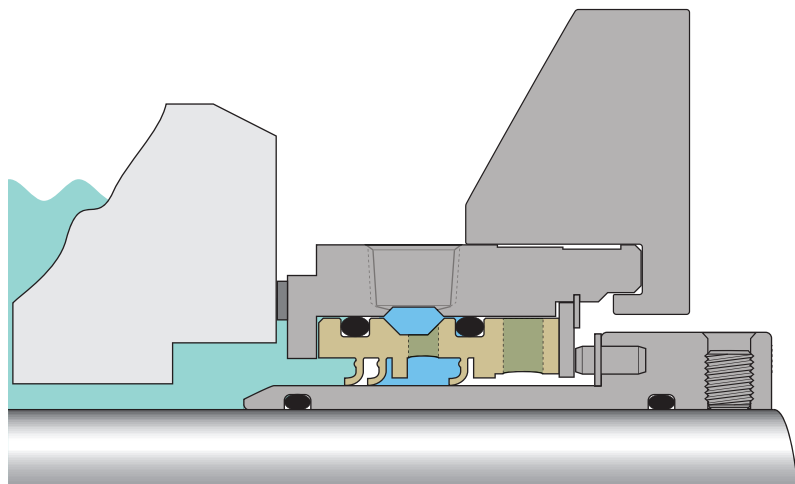
HVS

High Viscosity Seal

Designed for applications that exceed the performance limitations of conventional face seals

The HVS uses an engineered polymer sealing element that can withstand the torque, shear, and frictional heat common when pumping viscous products.

Triple contact sealing surfaces are molded into a rugged, single piece sealing element that provides reliable sealing in viscous fluids. This one-piece sealing element can be easily replaced in the field. The standard sealing materials are self-lubricating and chemically resistant.



- Triple contact advanced polymer sealing element
- High torque capable
- Shear resistant
- Capable of dry running
- One-piece polymer sealing element
- Two-step installation
- Automatic centering
- Easy field repair
- Designed to fit Viking® pumps
- Compact adjustable gland
- Removable bolt tabs
- Suited for both oil- and water-based liquids
- FDA sealing element available

Operating Conditions		Materials	
Size	25 mm – 100 mm (0.750" – 4.000")	Sealing Elements	AWC100—Oil-Based Fluids AWC400—Water-Based Fluids AWC510—FDA Fluids
Pressure	711 mm (28") Hg Vacuum – 10 bar g (150 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	120°C (250°F)	Metals	EN 1.4401 (316SS)
Speed	28 m/s (550 fpm)		

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

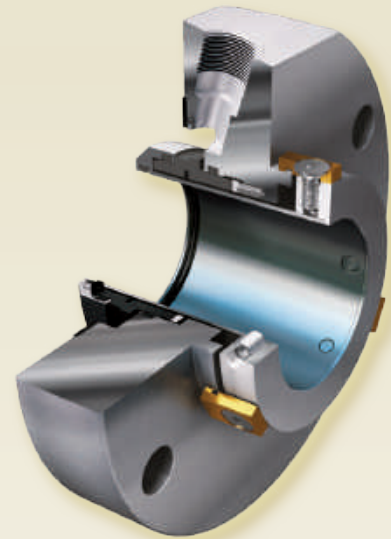
SPECIALTY SEALS

APPS

Chesterton® Single Cartridge Seal

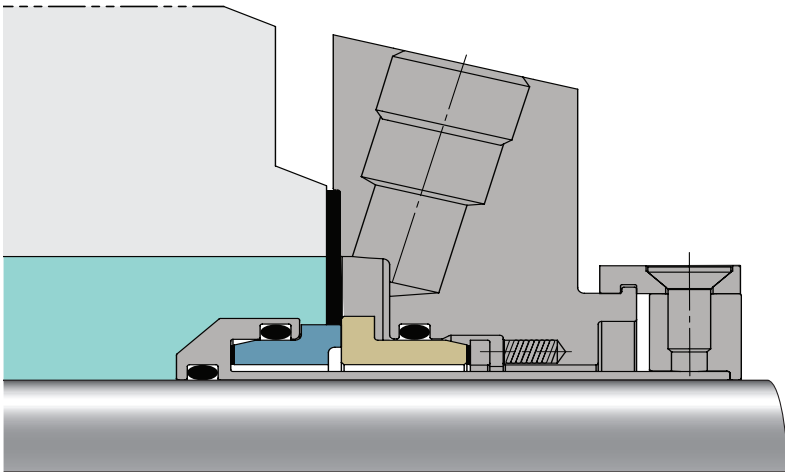
*Designed to fit Sulzer® pumps for easy upgrades**

The Chesterton APPS single cartridge mechanical seal is designed to fit Sulzer APP/NPP/WPP series process pumps to provide an easy and convenient upgrade in sealing performance without modification. Built on the AXIUS™ modular platform, the APPS seal offers both ease of use and maximum reliability through Chesterton's proven seal technology. Just like the pump that it was designed to fit, this seal is ideal for paper stock, hot condensate, liquors, solvents, and evaporation services in a variety of industries.



Advantages

- Optimized fit per Sulzer design
- Designed for simple upgrade from packing or mechanical seal
- ViewIn technology enables easy seal identification
- Flush port at 90°/270° for convenient access



Operating Conditions		Materials	
Size	30 mm, 40 mm, 50 mm, 60 mm, 80 mm, 90 mm Fits frame 1, 2, 3, 4, 5, 6 without sleeve	Faces	CB, SSC <i>Other materials available on request</i>
Pressure	711 mm (28") Hg Vacuum – 25 bar g (360 psig)*	Elastomers	FKM, EP, FEPM <i>Other materials available on request</i>
Temperature	-55°C – 300° (-67°F – 570°F) <i>Temperature limits depend on actual elastomers used</i>	Metals	EN 1.4401 (316SS) <i>Other Metallurgies available on request</i>
Speed	20 m/s (45000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069, ASME B73.1, ASME B73.2

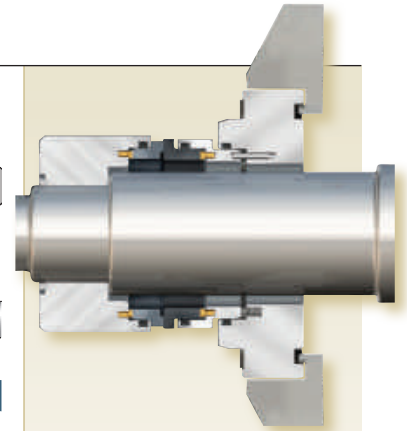
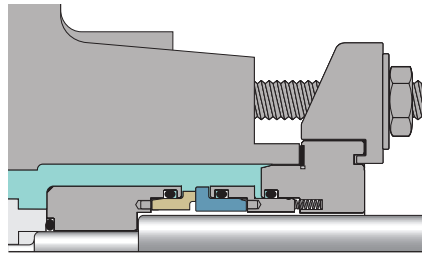
* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

SPECIALTY SEALS

DFS

DirectFit™ Single Seal

Mechanical seals designed to fit the Sulzer™ APP/APT and NPP/NPT series process pumps**



Operating Conditions		Materials	
Size	30 mm – 90 mm	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 20 bar g (300 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	25 m/s (5000 fpm)	Springs	EN 2.4819 (Alloy C-276)

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

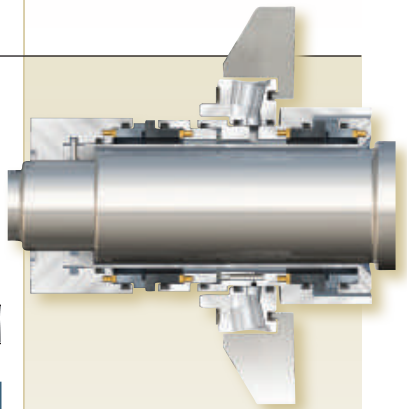
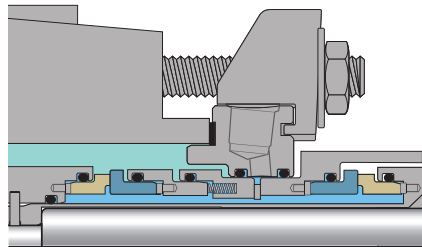
** Sulzer is in no way associated or affiliated with A.W. Chesterton Company. This reference to Sulzer pumps is intended solely to identify products of this other manufacturer for which A.W. Chesterton Company designed its DirectFit seals to be compatible.

- High-torque monolithic seal faces
- Designed to fit Sulzer APP/APT and NPP/NPT pumps
- Automatic centering
- Field repair capable
- Repair kits available

DFD

DirectFit™ Double Seal

Mechanical seals designed to fit the Sulzer™ APP/APT and NPP/NPT series process pumps**



Operating Conditions		Materials	
Size	30 mm – 90 mm	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 40 bar g (600 psig)* 14 bar g (200 psig) outboard*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	25 m/s (5000 fpm)	Springs	EN 2.4819 (Alloy C-276)

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

** Sulzer is in no way associated or affiliated with A.W. Chesterton Company. This reference to Sulzer pumps is intended solely to identify products of this other manufacturer for which A.W. Chesterton Company designed its DirectFit seals to be compatible.

- High-torque monolithic seal faces
- Double balanced double seal
- Designed to fit Sulzer APP/APT and NPP/NPT pumps
- Adjustable barrier/buffer fluid ports
- Automatic centering
- Field repair capable
- Repair kits available

SPECIALTY SEALS

442PR

Split Pumping Ring Seal

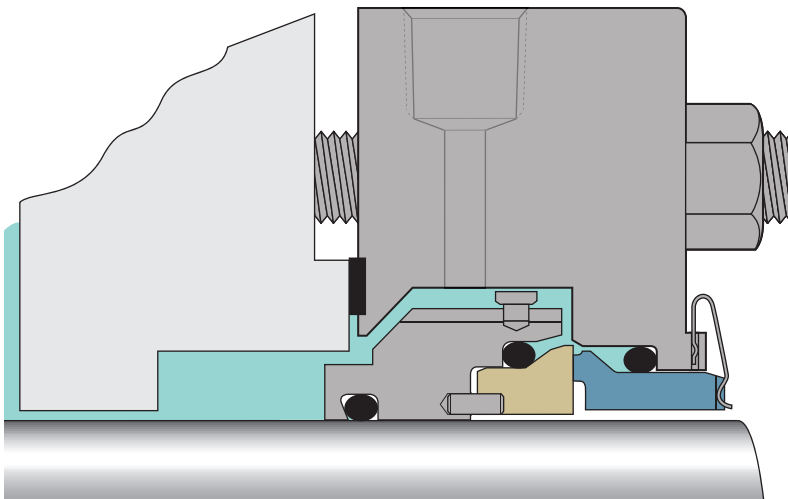
Eliminates the need for equipment disassembly during seal replacement

The 442 split design significantly reduces downtime and overall maintenance costs. This seal is ideal for hot heater drain and boiler feed equipment where cooling to a single seal must be provided.

The high capacity pumping ring provides for maximum heat removal and reliability in hot water services. Coolest running seal faces include premium high graphite seal face material combined with a silicon carbide primary face. The 442PR delivers the lowest cost of ownership with its ease of installation, low cooling cost, and reliability.



- Split performance for boiler feed and hot water circulation pumps
- High flow pumping device
- Designed for API Plan 23
- Engineered for high pressure
- High-strength external springs
- Non-fretting to equipment
- Premium high graphite carbon face
- Ball-and-socket O-Rings
- Automatic centering



Operating Conditions		Materials	
Size	20 mm – 200 mm (0.750" – 8.000")	Faces	CB, RSC, CR
Pressure	711 mm (28") Hg Vacuum – 30 bar g (450 psig)*	Elastomers	FKM, EPDM, FEPM
Temperature	120°C (250°F) w/o cooling	Metals	EN 1.4401 (316SS), EN 1.4408
Speed	20 m/s (4000 fpm)	Springs	Elgiloy®

Applicable Standards and Available Approvals: ISO-3069-S, ASME B73.1, ASME B73.2, NSF61, ATEX

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

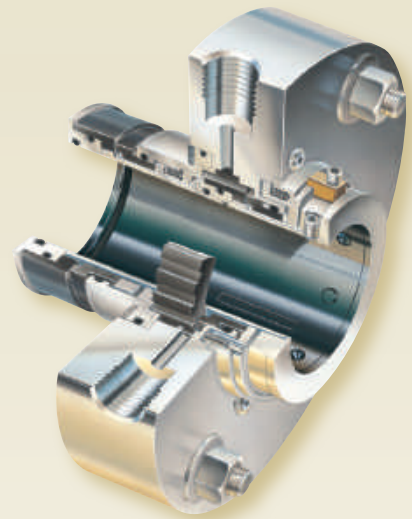
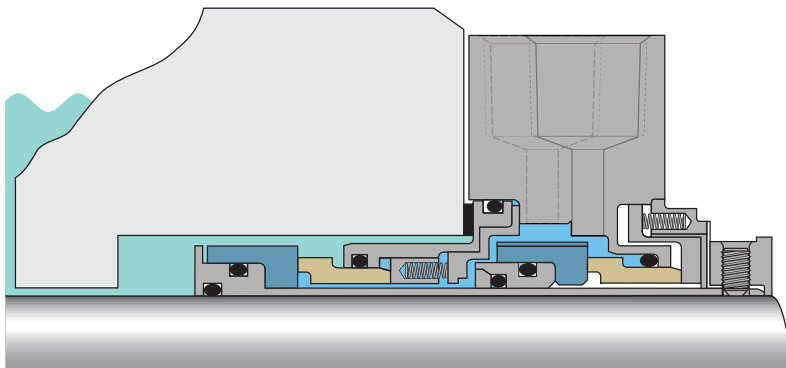
SPECIALTY SEALS

225™**Tandem Double Cartridge Seal**

A versatile, proven performer providing reliable double sealing capability in a wide variety of industrial processes

A high performance, tandem arrangement used primarily in refining and chemical applications. This seal is ideal for non-lubricating fluids—light hydrocarbon services requiring low heat generation. It is designed with simplicity in mind, so seal repair is easy and economical.

This simple tandem orientation provides higher pressure capabilities in light hydrocarbon refining applications. The outboard seal face serves as a high efficiency pumping ring and provides maximum cooling capability in the most demanding services. Seal faces are interchangeable with the 155 and 255 seals.



- Tandem configuration for highest pressures
- Narrow seal faces for lowest heat generation
- Fully vented gland
- Stationary springs
- Self-Centering Lock Ring eliminates misalignment
- High flow pumping ring
- Bidirectional barrier fluid ports to accommodate double ended pumps

Operating Conditions		Materials	
Size	25 mm – 120 mm (1.000" – 4.750")	Faces	CB, SSC, TC
Pressure	711 mm (28") Hg Vacuum – 40 bar g (600 psig)* 17 bar g (250 psig) inboard differential*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	-55°C – 300°C (-67°F – 570°F)	Metals	EN 1.4401 (316SS)
Speed	25 m/s (5000 fpm)	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

SPECIALTY SEALS

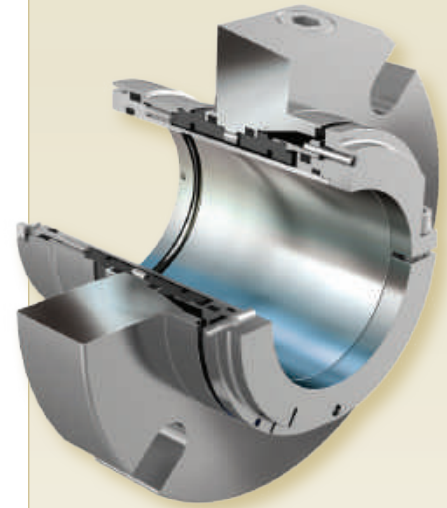
250L

Double Cartridge Seal with Clamp Lock Ring

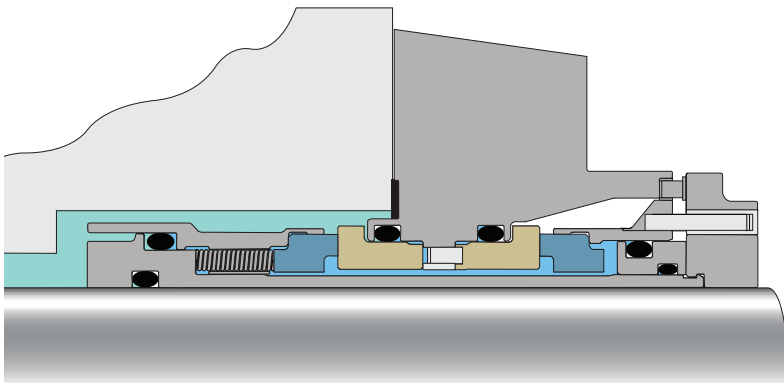
Exceptional Seal Reliability Combined with Easy Installation Features

The 250L Double Cartridge Seal is designed to fit ANSI pumps used in lower duty chemical processes such as ethanol grain processing. The 250L double seal provides sealing security that conventional single seals cannot match. A durable backup seal provides the opportunity for scheduled maintenance thereby avoiding unplanned downtime and production losses.

The 250L features a clamp-style lock ring that allows for the easiest installation and prevents sleeve damage associated with conventional lock rings.



- Simplicity and ease of installation
- Clamp lock ring with single screw tightening
- Internal centering clips with no removal necessary
- Cartridge design
- Reliable sealing with optimal performance
- Enhanced barrier and fluid flow, providing better face cooling



Operating Conditions		Materials	
Size	1.125" – 3.750"	Faces	CB, SSC
Pressure	Up to 6.9 bar g (100 psig)*	Elastomers	FKM, EPDM, FEPM, FFKM
Temperature	205°C (400°F)	Metals	EN 1.4401 (316SS)
Speed	3600 rpm	Springs	EN 2.4819 (Alloy C-276)

Applicable Standards and Available Approvals: ISO-3069C, ASME B73.1, ASME B73.2

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

SUPPORT SYSTEMS

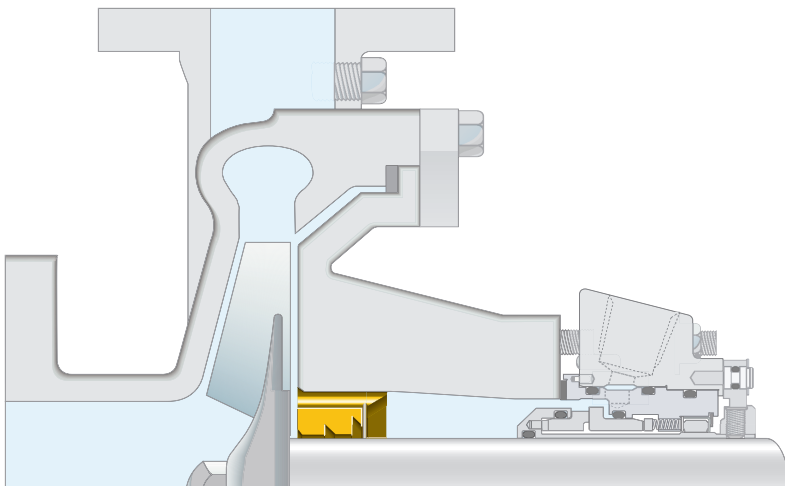
SpiralTrac®

Environmental Controllers

Environmental controllers have revolutionized the sealing environment in stuffing boxes

When used with Chesterton mechanical seals, SpiralTrac® Environmental Controllers reduce the flush fluid required and further enhance seal reliability. SpiralTrac promotes seal cavity circulation and solids removal, thus improving seal reliability and contributing to production efficiencies.

There is a SpiralTrac Environmental Controller for a wide range of applications, from split designs, made specifically for the 442 split seal, to solid stainless steel designs for conventional cartridge seal installations. SpiralTrac Environmental Controllers can be customized for specific stuffing box/back cover arrangements.



SpiralTrac is a registered trademark of Enviroseal Engineering Products Ltd.



- Removes solids from the seal chamber
- Minimizes seal clogging
- Improves cooling
- Automatic venting of the seal chamber
- Active and continuous removal of solids
- Eliminates or reduces the need for flush
- Standard designs
- Split versions available
- Customizable
- Broad range of materials

Version		Materials
F (Split)	Greatly reduced flush	EN 1.4401 (316SS) 416SS PTFE - Glass Filled PTFE - Carbon Graphite Filled Bronze EN 3.7035 (Ti) AWC800 - Red Polymer EN 2.4360 (Monel K400)
N	Reduced/ no flush in non fibrous fluids	
D	Reduced/ no flush in fibrous fluids	
P (Split)	Packing version	
C	With drain for crystallizing media	
Arrangements		
Type A	Counter bore fit	
Type B	Bore fit	
Type S	Axial split	
Type I	Impeller side installation	
Type E	Externally Keyed	

SUPPORT SYSTEMS

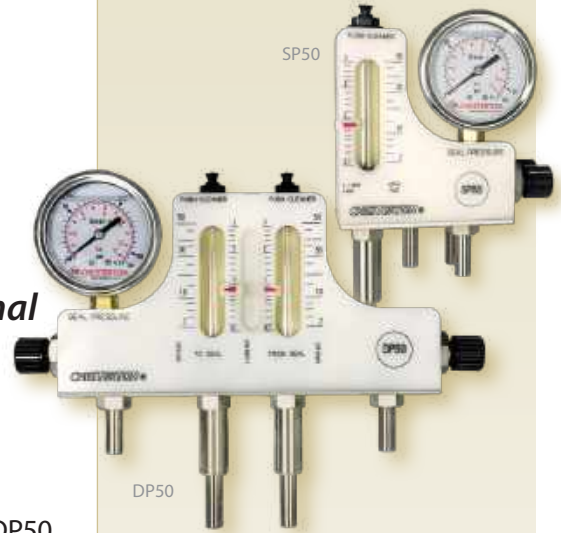
Flow Guardian™

Flow Meters

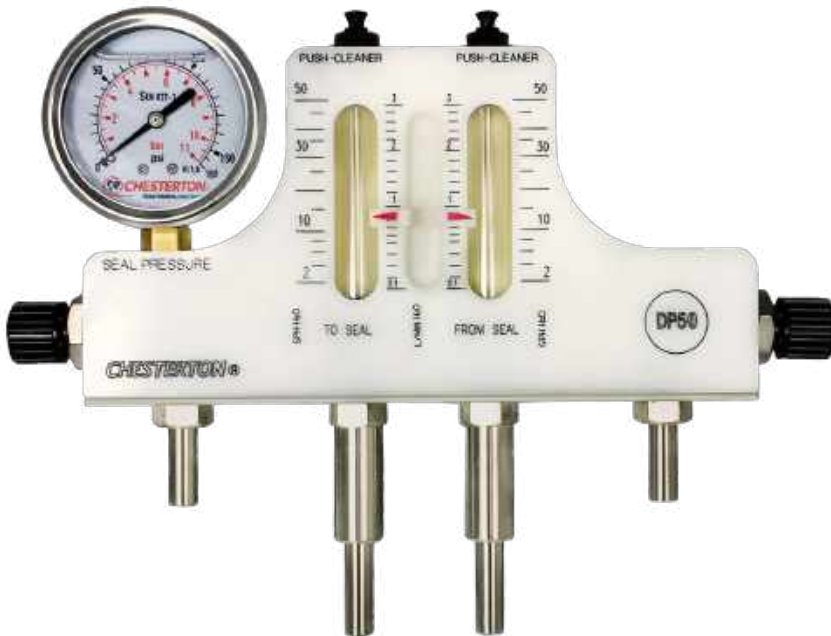
Specifically designed to supply uninterrupted, regulated seal flush water and deliver operational efficiency to the pump population

Managing flow rates while regulating important pressure differentials is possible. Costly seal failures are reduced while assisting in plant water conservation initiatives.

There is a Flow Guardian for a wide range of applications. The DP50 Dual Flow Guardian is designed to measure flow entering and exiting a double seal installation. This capability allows for early detection of leakage into the process stream as a result of inboard seal failure. The SP50 Single Flow Guardian can also regulate flow and pressure and is ideal for single seal installations or when inboard seal failure detection is of less importance.



- Built-in pressure regulator
- Innovative plunger cleaner
- Oil-filled pressure gauge
- Rugged, compact design
- Tamper proof locking system
- Alarm sensor-ready
- Excellent corrosion resistance
- Rebuild kits available
- Optional barb or compression fittings



Operating Conditions		Materials	
Flow Rate	0.1 – 3 liters/min (2 – 50 US gallons per hour)	Flow Meter Tubes	PSU (Polysulfone)
Pressure	10 bar g (145 psig)*	Body of Unit	POM (Polyoxymethylene)
Temperature	100°C (212°F)	O-Rings	FKM (Fluorocarbon)
		Pressure Gauge	Oil filled with 316SS Stainless Steel Case and Wetted Parts, 1/4" – NPT Bronze fitting
		Pressure Regulating Valve	EN 1.4401 (316SS)
		Flow Rate Regulating Valve	EN 1.4401 (316SS)
		Clean-out Plugs	320 – 3/8" Tube Fittings (for compression connections) 316 – Optional Barb Fittings
		Mounting Bracket	EN 1.4401 (316SS)

* Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

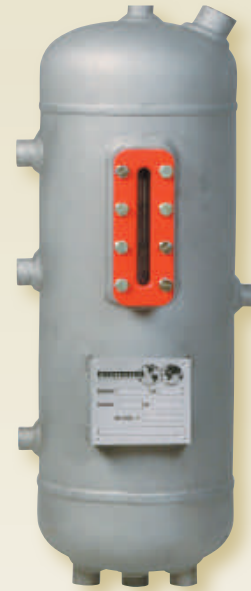
SUPPORT SYSTEMS

High Capacity Support Tanks

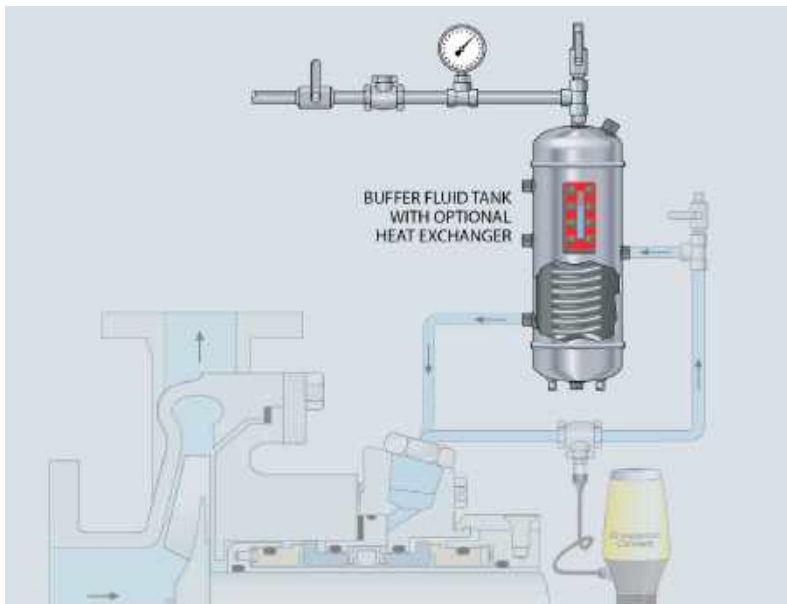
Support systems are the lifeline to double, liquid-lubricated mechanical seals

By providing a dedicated lubrication system, mechanical seal performance will be optimized; other less efficient systems will compromise seal performance and reliability goals.

Chesterton's standard support tank is built without compromise. This tank is constructed from corrosion-resistant 304 Stainless Steel and has a five-gallon capacity. The tank delivers 50% greater volume, as compared to other tanks, which delivers more fluid for cooling. This results in greater seal reliability. These tanks are manufactured to ASME Section VIII, Division I—meeting pressure vessel codes and providing safety and security to the installation—standards.



- UM stamp certified
- Cross-flow design for optimal cooling
- 19 liters (5 gallons) capacity
- High-pressure elliptical heads
- High quality armor weld pad level gauge
- High capacity cooling
- Can be configured to operator as a Buffer (Plan 52) or Barrier (Plan 53A) System
- Instrumentation to monitor Pressure, Temperature, and Fluid Level available



Operating Conditions		Materials	
Capacity	19 liters (5 gallons)	Tank Material	EN 1.430 (304SS) — bead blasted
Operating Limits	24 bar g (350 psig)* @ 177°C (350°F)	Standard Level Gauge	Carbon Steel Cover (standard) – 304SS (optional) B7 Zinc Plated Bolts (standard) – SS (optional)
Tank NPT Connections	1/2" Seal Connections 1/2" Vent and Drain 1/2" Cooling Coil Connections 3/4" High/Low Level Connections 1" Fill Connection Heavy-Duty Tank Mounting Couplings, 1/2" – 13unc	Options	Sight Pad Level Gauge Prismatic Glass EN 1.430 (304SS) Cooling Coil Mounting Stand

Applicable Standards and Available Approvals: ASME Section VIII, Division I, PED, Cat. 1

*Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and seal face combinations. For operation outside the limits and additional materials consult Chesterton Mechanical Seal Engineering.

SUPPORT SYSTEMS

Intelli-Flow™

T-30 Water Saver

Features a thermally activated valve that automatically drains hot barrier fluid only when necessary to keep double seals running cool and reliably. Valve opening temperature preset to work with 280 seals

**Operating Conditions**

Pressure	20 bar g (300 psig)
Temperature	125°C (250°F)
Temperature Set Point	80°C (176°F)
Connections	1/4 NPT
Materials	EN 1.4401 (316SS)



- Clean-in-place
- Maintenance-free
- Easy to install
- 95% water savings compared to open barrier fluid supply

Intelli-Flow™ HT

Water Saver

Features a thermally activated valve that automatically drains hot barrier fluid (only when necessary) to keep double seals running cool and reliable. Valve opening temperature preset to work with S20 seals

**Operating Conditions**

Pressure	20 bar g (300 psig)
Temperature	125°C (250°F)
Temperature Set Point	80°C (176°F)
Connections	1/4 NPT
Materials	EN 1.4401 (316SS)



- Clean-in-place
- Maintenance-free
- Easy to install
- 95% water savings compared to open barrier fluid supply

SUPPORT SYSTEMS

BSS

Buffer Support System for Double Seals

Plan 52 Non-Pressurized Tank. Easy to install, complete, non-pressurized solution for reliable operation of double seals

Technical Data	
Tank Capacity	12 l (3.2 g) Maximum 9 l (2.4 g) Operating
Tank Operating Pressure	17 bar (250 psi) Maximum
Tank Material	EN 1.4307 (304L)
Cooling Capacity	400 W Tank Only 1.5 kW with Cooling Coil 4 kW with Cooling Coil and Circulation Pump
Auxiliary Connection	1" x 2" NPT and 1" x 1/2" NPT



- Pre-configured system; simplified ordering process
- Simple maintenance of fluid level
- 1.4307 (304L) Stainless Steel construction

PSS

Pressurized Support System for Double Seals

Standard Plan 53A Tank. Easy to install, complete, pressurized solution for reliable operation of double seals

Technical Data	
Tank Capacity	12 l (3.2 g) Maximum 9 l (2.4 g) Operating
Tank Operating Pressure	17 bar (250 psi) Maximum
Tank Material	EN 1.4307 (304L)
Cooling Capacity	400 W Tank Only 1.5 kW with Cooling Coil 4 kW with Cooling Coil and Circulation Pump
Auxiliary Connection	1" x 2" NPT and 1" x 1/2" NPT



- Preconfigured system; simplified ordering process
- Simple maintenance of fluid level

WSS

Water Saving System for Double Seals

Plan 53P Automatic Water Support Tank. Easy to install, complete solution with minimal water consumption for reliable operation of double seals

Technical Data	
Tank Capacity	12 l (3.2 g) Maximum 9 l (2.4 g) Operating
Tank Operating Pressure	17 bar (250 psi) Maximum
Tank Material	EN 1.4307 (304L)
Cooling Capacity	400 W
Auxiliary Connection	1" x 1" NPT and 1" x 1/2" NPT



- Maintenance-free: automatic level and pressure management
- Minimizes seal support water usage
- Pre-configured system and options for a simplified ordering process
- EN 1.4307 (304L) Stainless Steel construction

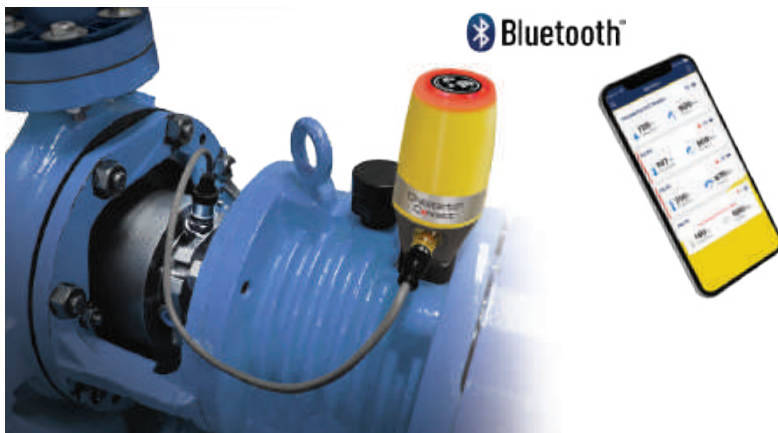
EQUIPMENT MONITORING

Chesterton Connect™

Simplified equipment and process monitoring for pumps and sealing systems

Chesterton Connect is a simple to use data acquisition tool that enables you to safely and conveniently monitor your process and equipment’s operating conditions. Utilizing Bluetooth® technology and a robust design to withstand harsh environments, Chesterton Connect makes it easy to monitor:

- Equipment vibration
- Surface temperature
- Process temperature
- Process pressure



The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc.



Chesterton Connect™

- Easy to install and configure
- Early detection of process instabilities
- Prioritize equipment maintenance
- Securely access your data
- View multiple sensors in one mobile app
- Replaceable battery



Sensor Version and Certifications

Sensor v1.0

Product ordering number: 403700
IP66, NSF61, ACS, CE, FCC, IC RoHS, VCCI, RCM



Complies with
IMDA Standards
DB106440

Sensor IS (Intrinsically Safe)

Product ordering number: 403699
IP66, NSF61, ACS, CE, FCC, IC RoHS, VCCI, RCM



Hazardous Ratings	
ATEX/IECEx	Ⓜ II 1 G Ex ia IIB T4 Ga Ⓜ II 1 D Ex ia IIIB T200 166°C Da
Zone	Class I Zone 0 AEx ia IIB T4 Ga Zone 20 AEx ia IIIB T166°C Da
Division	Class I Div 1 Groups C D T4 Class II Div 1 Groups F G T4
Rated Temp	-20°C ≤ Ta ≤ +85°C

Operating Conditions		Software Features	
Pressure Sensor Limit	-1 bar g – 68 bar g (-14.7 psig – 1000 psig)	Security	Encrypted setup and password protected operation
Temperature Limit (Body)	-20°C – 85°C (-4°F – 185°F)	Personalization	Configurable name and usage information
Temperature Limit (Sensor)	-20°C – 125°C (-4°F – 257°F)	Data Acquisition	Monitoring mode for extended battery life (5-minute intervals) and high accuracy mode for troubleshooting (1-minute intervals)
Vibration Sensor	3-axis accelerometer ±16g	Data Storage	Up to 30 days of rolling history
Battery	3.6V lithium thionyl chloride battery (replaceable)	Alerts	Configurable thresholds, alerts, and user defined maintenance events
Fitting	1/4" NPT 17–4 PH connection	Analytics	Time plotted trends and analysis
Mount	Magnetic mount base (additional mounting options sold separately)	Data Export	Email export of sensor data and alarms

EQUIPMENT MONITORING

Chesterton Connect™ Cloud

*Monitor, analyze, and compare equipment health from wherever you are**

The Chesterton Connect Cloud provides a powerful window into the health of all equipment monitored by Chesterton Connect devices.

From wherever you are on a 24/7 basis, view overall performance, explore variances and trends, add notes, and take action to increase uptime and productivity.

Chesterton Connect Cloud allows you to:









- Spot trends to address potential threats to uptime
- Pinpoint issues causing difficult-to-uncover failures
- Predict potential problems to help lower maintenance costs
- Easily modernize plant operations

Software Features	
Security	24/7 security, authentication, and backup of data
Personalization	Flexible management of user roles, permissions, and reports
Data Storage	Unlimited storage of Chesterton Connect measurements, alarms, and notes
Data Visualization	Simple to navigate graphs, alarms, and notes
Analytics	Time-plotted trends and events
Reports	Easily print asset reports
Access	Global access to unlimited sensors

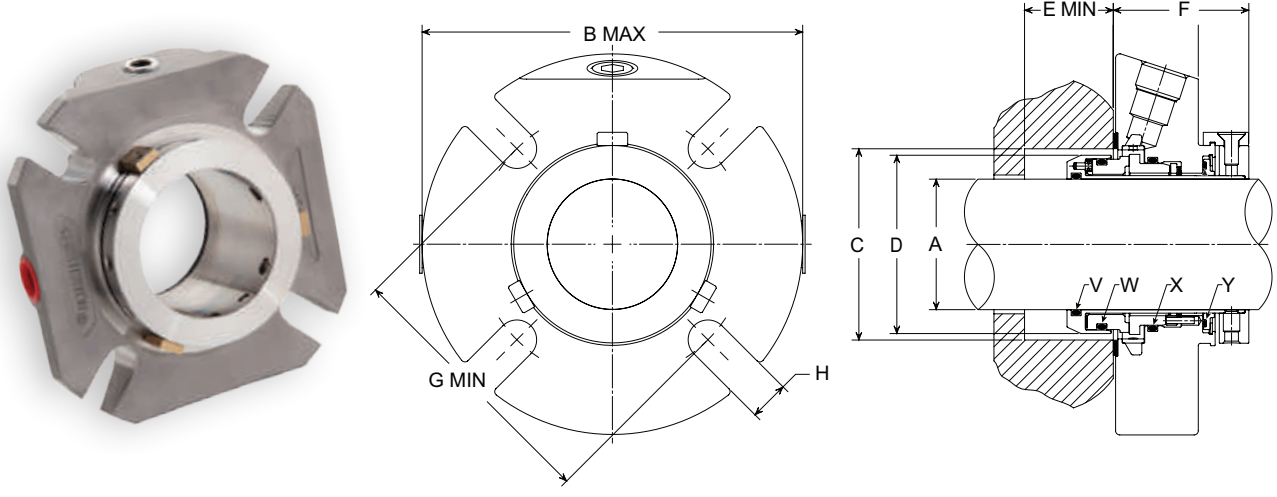


- Set alert notifications by equipment
- Correlate multiple measurements for a specific time
- Quickly overlay and compare data for multiple pieces of equipment
- Compare vibration against published standards
- Produce equipment performance reports easily

Supported on all popular browsers

	Google Chrome	
	Mozilla Firefox	
	Microsoft Edge	
	Apple Safari	

1810 Heavy-Duty Modular Single Cartridge Seal – Metric



Key			
A – Shaft Size	D – Inboard Seal Diameter	G – Minimum Bolt Circle by Bolt Size	W – Rotary Seal O-Ring
B – Gland Outside Diameter	E – Seal Chamber Depth	H – Slot Width	X – Stationary Seal O-Ring
C – Seal Chamber Bore	F – Outboard Seal Length	V – Shaft O-Ring	Y – Bushing O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	G MIN				H	V	W	X	Y
							10 mm	12 mm	16 mm	20 mm					
25	104,0	44,2	51,0	43,0	18,5	49,5	72,7	–	–	–	11,0	120	126	127	028
28	104,0	47,2	51,0	46,2	18,5	49,5	72,7	–	–	–	11,0	122	128	129	029
30	104,0	49,3	56,0	47,6	18,5	49,5	77,6	–	–	–	11,0	123	129	130	029
30 OS	126,6	59,4	68,1	47,4	18,5	49,5	90,0	–	–	–	11,2	123	129	130	029
32	110,7	51,1	57,0	50,6	18,5	49,5	79,7	–	–	–	14,0	124	103	131	030
33	110,7	52,1	58,0	50,6	18,5	49,5	79,2	81,2	–	–	14,0	125	131	132	030
35	110,7	54,1	59,0	52,5	18,5	49,5	82,9	84,9	–	–	14,0	126	132	133	031
38	113,9	57,2	66,0	55,7	18,5	49,5	86,3	88,3	–	–	14,0	128	134	135	032
40	126,6	59,2	68,0	57,6	18,5	49,5	88,1	90,1	–	–	14,0	129	135	137	033
40 OS	126,6	69,1	74,2	57,6	18,5	49,5	96,5	–	–	–	11,2	129	135	137	033
42	126,6	61,2	68,0	59,6	18,5	49,5	88,6	90,6	–	–	14,0	130	137	138	033
43	126,6	62,2	68,0	60,6	18,5	49,5	93,7	95,7	–	–	14,0	131	137	139,0	034
45	139,0	64,3	73,0	62,6	18,5	49,5	93,1	95,1	–	–	14,0	133	139	140	034
48	139,0	67,1	73,0	65,6	18,5	49,5	93,5	95,5	–	–	14,0	134	141	142	035
50	139,0	69,1	78,0	67,6	18,5	49,5	98,2	100,2	–	–	14,0	136	142	143	036
50 OS	152,0	84,9	96,3	67,6	18,5	49,5	118,6	120,6	–	–	14,5	136	142	143	036
53	152,0	72,1	87,0	71,6	18,5	49,5	108,0	110,0	114,0	–	17,0	137	144	145	037
55	152,0	74,2	83,0	72,6	18,5	49,5	104,2	106,2	110,2	–	17,0	139	145	146	038
58	152,0	77,2	91,0	77,9	18,5	49,5	112,6	114,6	118,6	–	17,0	141	148	149	039
60	152,0	79,2	91,0	77,9	18,5	49,5	112,6	114,6	118,6	–	17,0	142	148	149	039
60 OS	164,7	96,1	107,4	77,9	18,5	49,5	129,8	131,8	–	–	14,5	142	148	149	039
65	163,8	84,1	100,0	84,3	18,5	49,5	127,1	129,1	133,1	–	17,0	145	151	151	041
70	196,0	95,5	111,3	93,2	24,4	63,0	–	137,0	141,1	–	17,5	232	236	237	042
75	202,0	101,6	119,1	99,4	24,4	63,0	–	142,8	146,9	–	17,5	234	238	239	043
80	203,0	106,0	122,2	103,3	24,4	63,0	–	150,2	154,3	–	17,5	236	239	240	044
85	211,0	111,3	128,0	109,0	24,4	63,0	–	156,5	160,7	165,0	20,6	237	241	242	045
90	215,0	115,6	131,8	113,2	24,4	63,0	–	159,6	163,7	167,6	20,6	239	242	243	045
95	222,0	120,7	136,9	118,5	24,4	63,0	–	161,4	165,5	170,0	20,6	240	244	245	046
100	228,0	127,0	144,0	124,8	24,4	63,0	–	168,5	172,3	177,0	20,6	242	246	247	047
110	238,0	136,7	154,0	134,4	24,4	63,0	–	177,9	181,7	185,9	20,6	245	249	250	049
120	267,0	146,1	164,3	143,9	24,4	63,0	–	191,3	195,2	199,3	20,6	248	252	253	050
								16 mm	20 mm	24 mm					
125	285,0	171,0	190,0	162,0	39,0	95,0	218,0	222,0	226,0	–	27,0	353	359	361	256
130	291,0	178,0	196,0	168,0	39,0	95,0	224,0	228,0	232,0	–	27,0	354	361	362	258
140	298,0	184,0	202,0	174,0	39,0	95,0	231,0	235,0	239,0	–	27,0	357	362	363	259
150	311,0	197,0	215,0	187,0	39,0	95,0	243,0	247,0	251,0	–	27,0	361	364	365	261
160	323,0	210,0	228,0	200,0	39,0	95,0	256,0	260,0	264,0	–	27,0	363	366	367	263
170	330,0	216,0	234,0	206,0	39,0	95,0	262,0	266,0	270,0	–	27,0	364	367	368	264
180	342,0	229,0	247,0	219,0	39,0	95,0	275,0	279,0	283,0	–	27,0	366	369	370	266
190	349,0	235,0	253,0	225,0	39,0	95,0	281,0	285,0	289,0	–	27,0	367	370	371	267
200	361,0	248,0	266,0	238,0	39,0	95,0	294,0	298,0	302,0	–	27,0	369	372	373	269

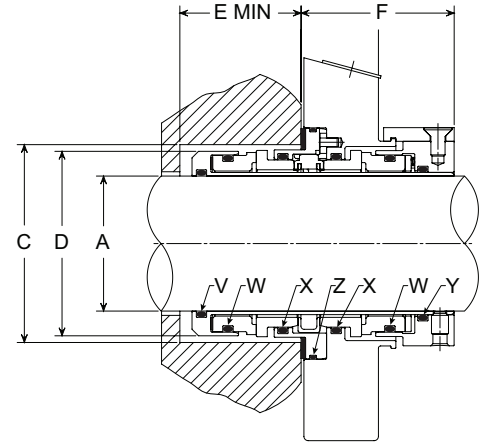
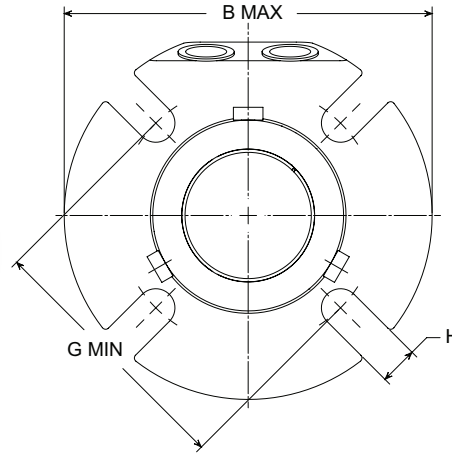
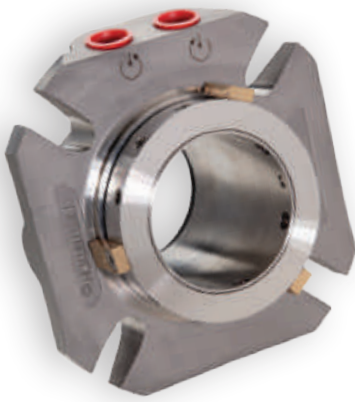
1810 Heavy-Duty Modular Single Cartridge Seal – Inch

Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – Inboard Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- V – Shaft O-Ring
- W – Rotary Seal O-Ring
- X – Stationary Seal O-Ring
- Y – Bushing O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	3/8"	1/2"	G MIN 5/8"	3/4"	7/8"	H	V	W	X	Y
1.000	4.09	1.75	2.01	1.69	0.73	1.95	2.87	–	–	–	–	0.44	120	126	127	028
1.125	4.09	1.88	2.04	1.82	0.73	1.95	2.87	–	–	–	–	0.44	122	128	129	029
1.125 OS	4.49	2.24	2.79	1.81	0.73	1.95	3.65	–	–	–	–	0.43	122	128	129	029
1.250	4.09	2.00	2.27	1.94	0.73	1.95	3.14	–	–	–	–	0.44	124	130	131	030
1.375	4.36	2.13	2.33	2.07	0.73	1.95	3.26	3.38	–	–	–	0.57	126	132	133	031
1.375 OS	5.39	2.72	2.92	2.06	0.73	1.95	3.78	–	–	–	–	0.44	126	132	133	031
1.500	4.49	2.25	2.63	2.19	0.73	1.95	3.39	3.52	–	–	–	0.57	128	134	135	032
1.625	4.99	2.38	2.69	2.32	0.73	1.95	3.50	3.63	–	–	–	0.57	130	136	137	033
1.750	5.47	2.50	2.81	2.44	0.73	1.95	3.62	3.74	–	–	–	0.57	132	138	139	034
1.750 OS	6.65	3.20	3.73	2.44	0.73	1.95	4.59	4.72	–	–	–	0.57	132	138	139	034
1.875	5.47	2.63	2.94	2.57	0.73	1.95	3.74	3.87	–	–	–	0.57	134	140	141	035
1.875 OS	5.99	3.41	3.79	2.57	0.73	1.95	4.65	4.78	–	–	–	0.57	134	140	141	035
2.000	5.47	2.75	3.19	2.69	0.73	1.95	4.13	4.25	–	–	–	0.57	136	142	143	036
2.125	5.99	2.88	3.44	2.82	0.73	1.95	4.25	4.37	4.50	–	–	0.69	138	144	145	037
2.125 OS	6.99	3.70	4.23	2.82	0.73	1.95	5.09	5.22	5.34	–	–	0.69	138	144	145	037
2.250	5.99	3.00	3.56	2.94	0.73	1.95	4.37	4.49	4.62	–	–	0.69	140	146	147	038
2.375	5.99	3.13	3.59	3.07	0.73	1.95	4.56	4.68	4.81	–	–	0.69	142	148	149	039
2.375 OS	8.39	3.93	4.48	3.07	0.73	1.95	5.34	5.47	5.59	–	–	0.69	142	148	149	039
2.500	6.45	3.25	3.81	3.19	0.73	1.95	4.62	4.74	4.87	–	–	0.69	144	150	151	040
2.500 OS	7.76	3.93	5.23	3.19	0.73	1.95	6.09	6.22	6.34	–	–	0.69	144	150	151	040
2.625	6.45	3.38	3.94	3.32	0.73	1.95	5.00	5.12	5.25	–	–	0.69	146	151	151	041
2.625 OS	6.98	4.30	4.76	3.32	0.73	1.95	5.62	5.75	5.87	–	–	0.69	146	151	151	041
2.750	7.71	3.75	4.38	3.67	0.96	2.48	–	5.42	5.55	–	–	0.69	232	236	237	042
2.750 OS	7.89	4.45	4.76	3.67	0.94	2.48	–	5.75	5.87	6.00	–	0.81	232	236	237	042
2.875	7.83	3.88	4.50	3.79	0.96	2.48	–	5.61	5.74	–	–	0.69	233	237	238	043
3.000	7.94	4.00	4.69	3.92	0.96	2.48	–	5.65	5.78	–	–	0.69	234	238	239	043
3.000 OS	8.64	4.92	5.37	3.91	0.94	2.48	–	6.36	6.48	6.61	6.73	0.93	234	238	239	043
3.125	7.99	4.13	4.81	4.04	0.96	2.48	–	5.80	5.93	–	–	0.69	235	239	240	044
3.250	8.19	4.25	4.94	4.17	0.96	2.48	–	6.07	6.20	–	–	0.69	236	240	241	044
3.375	8.31	4.38	5.06	4.29	0.96	2.48	–	6.19	6.32	6.44	–	0.81	237	241	242	045
3.375 OS	8.39	5.00	5.26	4.29	0.94	2.48	–	6.23	6.35	6.48	–	0.81	237	241	242	045
3.500	8.44	4.50	5.19	4.42	0.96	2.48	–	6.18	6.31	6.43	–	0.81	238	242	243	045
3.625	8.49	4.63	5.31	4.54	0.96	2.48	–	6.42	6.55	6.67	–	0.81	239	243	244	046
3.750	8.72	4.75	5.39	4.67	0.96	2.48	–	6.38	6.51	6.63	–	0.81	240	244	245	046
3.750 OS	9.76	5.95	6.38	4.66	0.94	2.48	–	7.37	7.49	–	–	0.68	240	244	245	046
3.875	8.84	4.88	5.51	4.79	0.96	2.48	–	6.62	6.75	6.87	–	0.81	241	245	246	047
4.000	8.96	5.00	5.69	4.92	0.96	2.48	–	6.66	6.78	6.91	–	0.81	242	246	247	047
4.125	8.99	5.13	5.81	5.04	0.96	2.48	–	6.78	6.90	7.03	–	0.81	243	247	248	048
4.125 OS	9.76	5.96	6.26	5.04	0.94	2.48	–	7.23	7.35	7.48	7.60	0.93	243	247	248	048
4.250	8.99	5.25	5.94	5.17	0.96	2.48	–	7.07	7.19	7.32	–	0.81	244	248	249	048
4.375	9.34	5.38	6.06	5.29	0.96	2.48	–	7.03	7.15	7.28	–	0.81	245	249	250	049
4.500	9.49	5.50	6.19	5.42	0.96	2.48	–	7.18	7.30	7.43	–	0.81	246	250	251	049
4.500 OS	12.49	6.74	7.49	5.41	0.94	2.48	–	8.46	8.58	8.71	–	0.88	246	250	251	049
4.625	9.49	5.63	6.31	5.54	0.96	2.48	–	7.45	7.58	7.70	–	0.81	247	251	252	050
4.750	10.49	5.75	6.47	5.67	0.96	2.48	–	7.56	7.68	7.81	–	0.81	248	252	253	050
4.750 OS	11.39	7.20	7.63	5.66	0.94	2.48	–	8.62	8.74	8.87	–	0.81	248	252	253	050
5.000	11.24	6.75	7.48	6.37	1.53	3.73	8.70	8.83	8.95	–	–	1.09	353	359	361	256
5.250	11.49	7.00	7.73	6.62	1.53	3.73	8.95	9.08	9.20	–	–	1.09	355	361	362	258
5.500	11.74	7.25	7.98	6.87	1.53	3.73	9.20	9.33	9.45	–	–	1.09	357	362	363	259
5.750	11.99	7.50	8.23	7.12	1.53	3.73	9.45	9.58	9.70	–	–	1.09	359	363	364	260
6.000	12.24	7.75	8.48	7.37	1.53	3.73	9.70	9.83	9.95	–	–	1.09	361	364	365	261
6.250	12.49	8.00	8.73	7.62	1.53	3.73	9.95	10.10	10.20	–	–	1.09	362	365	366	262
6.500	12.74	8.25	8.98	7.87	1.53	3.73	10.20	10.30	10.50	–	–	1.09	363	366	367	263
6.750	12.99	8.50	9.23	8.12	1.53	3.73	10.50	10.60	10.70	–	–	1.09	364	367	368	264
7.000	13.24	8.75	9.48	8.37	1.53	3.73	10.70	10.80	11.00	–	–	1.09	365	368	369	265
7.250	13.49	9.00	9.73	8.62	1.53	3.73	11.00	11.10	11.20	–	–	1.09	366	369	370	266
7.500	13.74	9.25	9.98	8.87	1.53	3.73	11.20	11.30	11.50	–	–	1.09	367	370	371	267
7.750	13.99	9.50	10.23	9.12	1.53	3.73	11.50	11.60	11.70	–	–	1.09	368	371	372	268
8.000	14.24	9.75	10.48	9.37	1.53	3.73	11.70	11.80	12.00	–	–	1.09	369	372	373	269

2810 Heavy-Duty Modular Double Cartridge Seal – Metric



Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – Inboard Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- V – Shaft O-Ring
- W – Rotary Seal O-Ring
- X – Stationary Seal O-Ring
- Y – Lock Ring O-Ring
- Z – Adapter O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	G MIN				H	V	W	X	Y	Z
							10 mm	12 mm	16 mm	20 mm						
25	104,0	44,2	51,3	42,7	40,1	54,1	72,7	–	–	–	11,2	120	126	127	121	035
28	104,0	47,2	52,1	45,7	40,1	54,1	72,7	–	–	–	11,2	122	128	129	123	035
30	104,0	49,3	56,9	47,8	40,1	54,1	77,6	–	–	–	11,2	123	129	130	125	036
30 OS	126,6	59,4	68,1	47,6	40,1	53,8	90,0	–	–	–	10,9	123	129	130	125	039
32	110,7	51,1	57,9	49,8	40,1	54,1	79,8	–	–	–	14,5	124	130	131	126	037
33	110,7	52,1	58,9	50,8	40,1	54,1	79,3	81,3	–	–	14,5	125	131	132	127	037
35	110,7	54,1	59,4	52,6	40,1	54,1	82,9	84,9	–	–	14,5	126	132	133	128	037
38	113,9	57,2	62,2	55,9	40,1	54,1	86,3	88,3	–	–	14,5	128	134	135	130	038
40	126,6	59,2	68,6	57,7	40,1	54,1	89,7	91,7	–	–	14,5	129	135	136	131	040
40 OS	126,6	69,3	74,3	57,6	40,1	53,8	96,5	–	–	–	10,9	129	135	136	131	041
42	126,6	61,2	68,6	59,7	40,1	54,1	89,7	91,7	–	–	14,5	131	137	138	133	040
43	126,6	62,2	69,1	60,7	40,1	54,1	93,7	95,7	–	–	14,5	131	137	138	133	040
45	139,0	64,3	73,7	62,7	40,1	54,1	94,5	96,5	–	–	14,5	133	139	140	134	041
48	139,0	67,1	74,2	65,8	40,1	54,1	95,0	97,0	–	–	14,5	134	141	142	136	041
50	139,0	69,1	78,7	67,8	40,1	54,1	99,7	101,7	–	–	14,5	136	142	143	137	042
50 OS	152,0	85,2	94,1	67,6	40,1	53,8	118,6	120,6	–	–	14,2	136	142	143	137	044
53	152,0	72,1	87,6	71,6	40,1	54,1	108,0	110,0	114,0	–	17,5	139	145	146	140	043
55	152,0	74,2	81,3	72,6	40,1	54,1	104,2	106,2	110,2	–	17,5	139	145	146	140	043
58	152,0	77,2	92,2	78,0	40,1	54,1	115,9	117,9	121,9	–	17,5	142	148	149	143	044
60	152,0	79,2	92,2	78,0	40,1	54,1	115,9	117,9	121,9	–	17,5	142	148	149	143	044
60 OS	164,7	96,2	107,5	77,9	40,1	53,8	129,8	131,8	–	–	17,3	142	148	149	144	046
65	163,8	84,1	100,3	84,3	40,1	54,1	127,1	129,1	133,1	–	17,5	145	151	152	146	045
70	195,8	95,5	113,0	93,5	52,1	63,5	–	136,9	140,9	–	17,3	232	236	237	151	157
75	201,7	100,6	119,4	99,6	52,1	63,5	–	142,7	146,7	–	17,3	234	238	239	5-557	158
80	202,9	105,4	122,4	103,4	52,1	63,5	–	149,8	153,8	–	17,3	236	239	240	153	158
85	211,1	110,5	128,8	109,0	52,1	63,5	–	152,1	156,1	160,1	20,3	237	241	242	153	159
90	214,4	115,6	132,1	113,3	52,1	63,5	–	159,6	163,6	167,6	20,3	239	242	243	154	160
95	221,5	120,4	138,4	118,6	52,1	63,5	–	161,4	165,4	169,4	20,3	240	244	245	155	161
100	227,6	125,5	144,8	125,0	52,1	63,5	–	168,3	172,3	176,3	20,3	242	246	247	5-833	162
110	237,2	135,6	154,2	134,4	52,1	63,5	–	177,7	181,7	185,7	20,3	245	249	250	157	163
120	266,4	145,5	163,8	144,0	52,1	63,5	–	187,3	191,3	195,3	20,3	248	252	253	5-403	165
								16 mm	20 mm	24 mm						
125	285,0	171,0	190,0	162,0	83,0	104,0	218,0	222,0	226,0	–	27,0	353	359	361	253	264
130	292,0	178,0	197,0	168,0	83,0	104,0	224,0	228,0	232,0	–	27,0	355	361	362	255	265
140	298,0	184,0	203,0	175,0	83,0	104,0	231,0	235,0	239,0	–	27,0	357	362	363	257	266
150	311,0	197,0	215,0	187,0	83,0	104,0	243,0	247,0	251,0	–	27,0	361	364	365	260	268
160	323,0	210,0	228,0	200,0	83,0	104,0	256,0	260,0	264,0	–	27	363	366	367	262	270
170	330,0	216,0	234,0	206,0	83,0	104,0	262,0	266,0	270,0	–	27,0	364	367	368	263	271
180	343,0	229,0	247,0	219,0	83,0	104,0	275,0	279,0	283,0	–	27,0	366	369	370	265	273
190	349,0	234,0	253,0	225,0	83,0	104,0	281,0	285,0	289,0	–	27,0	367	370	371	266	274
200	362,0	248,0	266,0	238,0	83,0	104,0	294,0	298,0	302,0	–	27,0	369	372	373	268	275

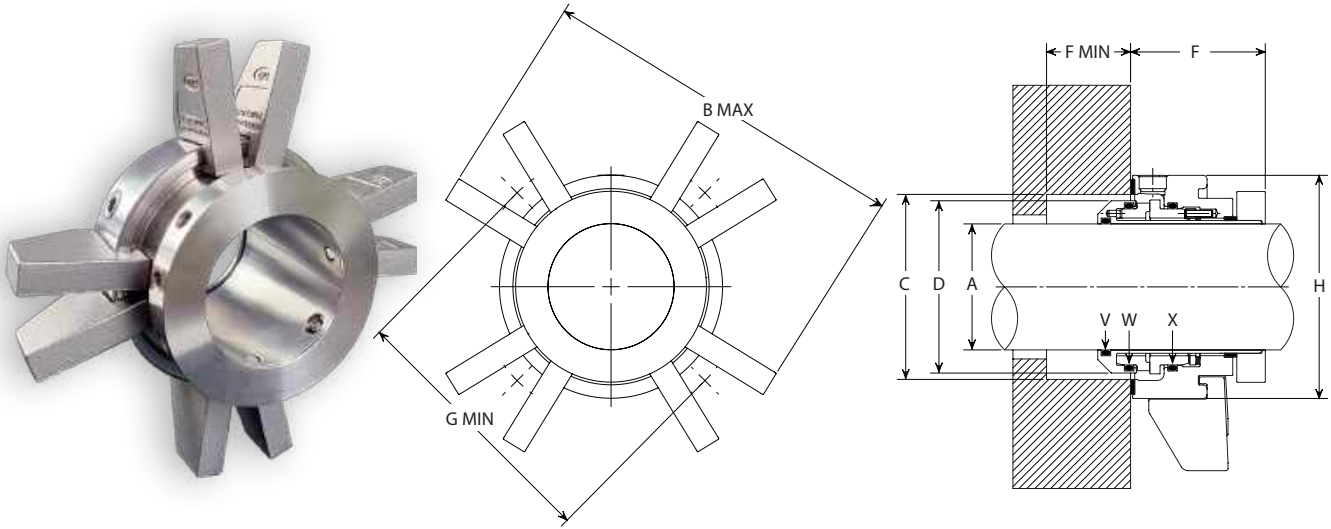
2810 Heavy-Duty Modular Double Cartridge Seal – Inch

Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – Inboard Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- V – Shaft O-Ring
- W – Rotary Seal O-Ring
- X – Stationary Seal O-Ring
- Y – Lock Ring O-Ring
- Z – Adapter O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	3/8"	1/2"	G MIN 5/8"	3/4"	7/8"	H	V	W	X	Y	Z
1.000	4.09	1.75	2.02	1.70	1.58	2.13	2.87	–	–	–	–	0.44	120	126	127	122	035
1.125	4.09	1.88	2.05	1.82	1.58	2.13	2.87	–	–	–	–	0.44	122	128	129	124	035
1.125 OS	4.49	2.61	2.92	1.82	1.58	2.12	3.77	–	–	–	–	0.43	122	128	129	124	041
1.250	4.09	2.00	2.28	1.95	1.58	2.13	3.14	–	–	–	–	0.44	124	130	131	126	037
1.375	4.36	2.13	2.34	2.07	1.58	2.13	3.26	3.38	–	–	–	0.57	126	132	133	128	037
1.375 OS	5.39	2.73	2.92	2.06	1.58	2.12	3.78	–	–	–	–	0.43	126	132	133	128	041
1.500	4.49	2.25	2.45	2.20	1.58	2.13	3.39	3.52	–	–	–	0.57	128	134	135	130	038
1.625	4.99	2.38	2.70	2.32	1.58	2.13	3.50	3.63	–	–	–	0.57	130	136	137	132	040
1.750	5.47	2.50	2.82	2.45	1.58	2.13	3.62	3.74	–	–	–	0.57	132	138	139	134	041
1.750 OS	6.65	3.48	3.73	2.44	1.58	2.12	4.59	4.72	–	–	–	0.56	132	138	139	134	044
1.875	5.47	2.63	2.95	2.57	1.58	2.13	3.74	3.87	–	–	–	0.57	134	140	141	136	041
1.875 OS	5.99	3.53	3.79	2.56	1.58	2.12	4.65	4.78	–	–	–	0.56	134	140	141	136	045
2.000	5.47	2.75	3.20	2.70	1.58	2.13	4.13	4.25	–	–	–	0.57	136	142	143	138	042
2.125	5.99	2.88	3.45	2.82	1.58	2.13	4.25	4.37	4.50	–	–	0.69	138	144	145	140	043
2.125 OS	6.99	3.86	4.23	2.81	1.58	2.12	5.09	5.22	5.34	–	–	0.68	137	144	145	140	046
2.250	5.99	3.00	3.47	2.95	1.58	2.13	4.37	4.49	4.62	–	–	0.69	140	146	147	142	044
2.375	5.99	3.13	3.63	3.07	1.58	2.13	4.56	4.68	4.81	–	–	0.69	142	148	149	144	044
2.375 OS	8.39	4.11	4.48	3.06	1.58	2.12	5.34	5.47	5.59	–	–	0.68	142	148	149	144	047
2.500	6.45	3.25	3.82	3.20	1.58	2.13	4.62	4.74	4.87	–	–	0.69	144	150	151	146	045
2.500 OS	7.76	4.48	5.23	3.19	1.58	2.12	6.09	6.22	6.34	–	–	0.68	144	150	151	146	050
2.625	6.45	3.38	3.95	3.32	1.58	2.13	5.00	5.12	5.25	–	–	0.69	146	152	153	148	045
2.625 OS	6.98	4.55	4.76	3.31	1.58	2.12	5.62	5.75	5.87	–	–	0.68	146	151	151	148	048
2.750	7.71	3.75	4.45	3.68	2.05	2.50	–	5.42	5.55	–	–	0.68	232	236	237	151	157
2.750 OS	7.89	4.45	4.76	3.67	2.05	2.50	–	5.84	5.97	6.09	–	0.81	232	236	237	151	158
2.875	7.83	3.88	4.57	3.79	2.05	2.50	–	5.50	5.63	–	–	0.68	233	237	238	151	157
3.000	7.94	4.00	4.70	3.92	2.05	2.50	–	5.65	5.78	–	–	0.68	234	238	239	152	158
3.000 OS	8.64	4.92	5.37	3.92	2.05	2.50	–	6.45	6.58	6.70	6.83	0.93	234	238	239	152	161
3.125	7.99	4.13	4.82	4.04	2.05	2.50	–	5.80	5.93	–	–	0.68	235	239	240	152	158
3.250	8.19	4.25	4.95	4.17	2.05	2.50	–	5.93	6.06	–	–	0.68	236	240	241	153	159
3.375	8.31	4.38	5.07	4.29	2.05	2.50	–	6.02	6.14	6.27	–	0.80	237	241	242	153	159
3.375 OS	8.39	4.95	5.26	4.29	2.05	2.50	–	6.33	6.45	6.58	–	0.81	237	241	242	153	160
3.500	8.44	4.50	5.20	4.42	2.05	2.50	–	6.18	6.31	6.43	–	0.80	238	242	243	154	160
3.625	8.49	4.63	5.32	4.54	2.05	2.50	–	6.31	6.44	6.56	–	0.80	239	243	244	154	160
3.750	8.72	4.75	5.45	4.67	2.05	2.50	–	6.38	6.51	6.63	–	0.80	240	244	245	155	161
3.750 OS	9.76	5.95	6.38	4.67	2.05	2.50	–	7.46	7.59	–	–	0.68	240	244	245	155	165
3.875	8.84	4.88	5.57	4.79	2.05	2.50	–	6.52	6.64	6.77	–	0.80	241	246	247	156	161
4.000	8.96	5.00	5.70	4.92	2.05	2.50	–	6.66	6.78	6.91	–	0.80	242	246	247	156	162
4.125	8.99	5.13	5.82	5.04	2.05	2.50	–	6.78	6.90	7.03	–	0.80	243	247	248	157	162
4.125 OS	9.76	5.95	6.26	5.04	2.05	2.50	–	7.33	7.45	7.58	7.70	0.93	243	247	248	157	164
4.250	8.99	5.25	5.95	5.17	2.05	2.50	–	6.91	7.04	7.16	–	0.80	244	248	249	157	163
4.375	9.34	5.38	6.07	5.29	2.05	2.50	–	7.03	7.15	7.28	–	0.80	245	249	250	157	163
4.500	9.49	5.50	6.20	5.42	2.05	2.50	–	7.18	7.30	7.43	–	0.80	246	250	251	158	164
4.500 OS	12.49	6.73	7.49	5.42	2.05	2.50	–	8.56	8.68	8.81	–	0.88	246	250	251	158	169
4.625	9.49	5.63	6.32	5.54	2.05	2.50	–	7.28	7.40	7.53	–	0.80	247	251	252	158	164
4.750	10.49	5.75	6.45	5.67	2.05	2.50	–	7.40	7.53	7.65	–	0.80	248	252	253	159	165
4.750 OS	11.39	7.20	7.63	5.67	2.05	2.50	–	8.71	8.84	8.96	–	0.81	248	252	253	159	170
5.000	11.24	6.75	7.48	6.38	3.25	4.09	8.70	8.83	8.95	–	–	1.09	353	359	361	253	264
5.250	11.49	7.00	7.73	6.63	3.25	4.09	8.95	9.08	9.20	–	–	1.09	355	361	362	255	265
5.500	11.74	7.25	7.98	6.88	3.25	4.09	9.20	9.33	9.45	–	–	1.09	357	362	363	257	266
5.750	11.99	7.50	8.23	7.13	3.25	4.09	9.45	9.58	9.70	–	–	1.09	359	363	364	259	267
6.000	12.24	7.75	8.48	7.38	3.25	4.09	9.70	9.83	9.95	–	–	1.09	361	364	365	260	268
6.250	12.49	8.00	8.73	7.63	3.25	4.09	9.95	10.08	10.20	–	–	1.09	362	365	366	261	269
6.500	12.74	8.25	8.98	7.88	3.25	4.09	10.20	10.33	10.45	–	–	1.09	363	366	367	262	270
6.750	12.99	8.50	9.23	8.13	3.25	4.09	10.45	10.58	10.70	–	–	1.09	364	367	368	263	271
7.000	13.24	8.75	9.48	8.38	3.25	4.09	10.70	10.83	10.95	–	–	1.09	365	368	369	264	272
7.250	13.49	9.00	9.73	8.63	3.25	4.09	10.95	11.08	11.20	–	–	1.09	366	369	370	265	273
7.500	13.74	9.25	9.98	8.88	3.25	4.09	11.20	11.33	11.45	–	–	1.09	367	370	371	266	274
7.750	13.99	9.50	10.23	9.13	3.25	4.09	11.45	11.58	11.70	–	–	1.09	368	371	372	267	274
8.000	14.24	9.75	10.48	9.38	3.25	4.09	11.70	11.83	11.95	–	–	1.09	369	372	373	268	275

1510 General Duty Single Cartridge Seal – Metric



Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – Seal Outside Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Hub Outer Diameter
- V – Shaft O-Ring
- W – Rotary Seal O-Ring
- X – Stationary Seal O-Ring

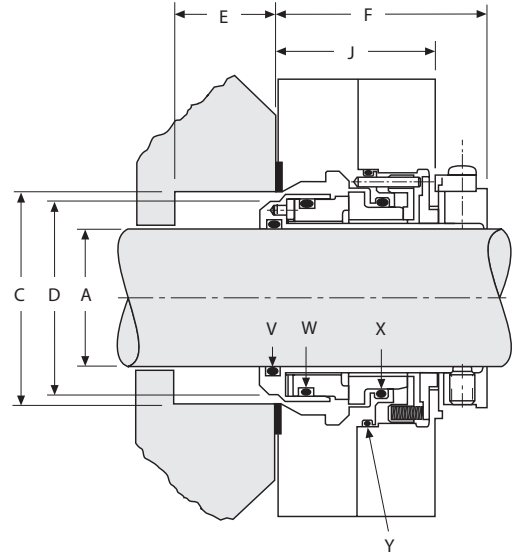
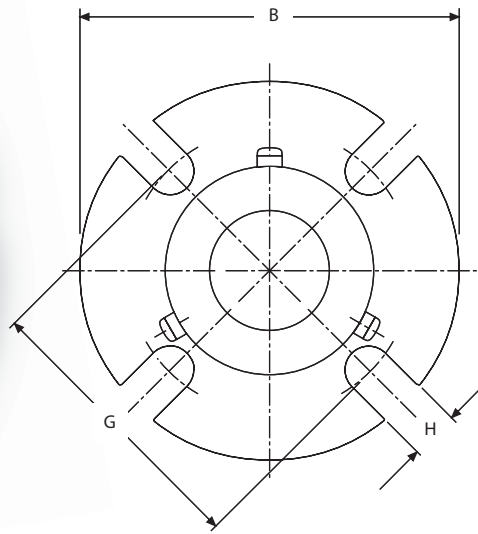
A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	8 mm	10 mm	G MIN 12 mm	16 mm	20 mm	H MAX	V	W	X
25	118,5	41,4	51,1	40,2	14,0	51,1	71,7	73,7	75,7	79,7	–	61,2	120	028	028
28	118,8	44,2	51,8	42,7	14,0	51,1	71,9	73,9	75,9	79,9	–	62,3	122	029	029
30	124,3	46,0	56,6	44,8	14,0	51,1	77,4	79,4	81,4	85,4	–	67,8	123	030	030
30 OS	135,5	59,2	68,3	44,7	14,0	51,1	88,6	90,6	92,6	96,6	–	79,0	123	030	030
32	124,9	48,0	57,7	46,8	14,0	51,1	78,1	80,1	82,1	86,1	–	68,5	124	030	030
33	124,7	49,0	58,7	47,8	14,0	51,1	77,9	79,9	81,9	85,9	–	68,3	125	031	031
35	128,4	51,1	59,2	49,6	14,0	51,1	81,6	83,6	85,6	89,6	–	72,0	126	031	031
38	133,2	57,2	66,8	55,9	14,0	51,1	86,4	88,4	90,4	94,4	–	76,8	128	135	135
40	134,7	59,2	68,3	57,7	14,0	51,1	87,9	89,9	91,9	95,9	–	78,3	129	137	137
40 OS	142,0	66,4	74,6	57,7	14,0	51,1	95,5	97,5	99,5	103,5	–	85,6	129	137	137
42	134,7	62,2	68,8	60,8	14,0	51,1	87,9	89,9	91,9	95,9	–	78,3	131	138	138
43	134,7	62,2	68,8	60,8	14,0	51,1	87,9	89,9	91,9	95,9	–	78,3	131	138	138
45	140,2	64,3	73,4	62,8	14,0	51,1	93,3	95,3	97,3	101,3	–	83,7	133	140	140
48	139,7	67,1	74,7	65,8	14,0	51,1	92,9	94,9	96,9	100,9	–	83,3	134	142	142
50	145,1	69,1	78,5	67,9	14,0	51,1	98,3	100,3	102,3	106,3	–	88,7	136	143	143
50 OS	164,1	84,8	96,7	67,8	14,0	51,1	117,6	119,6	121,6	125,6	–	107,7	136	143	143
53	153,8	73,2	87,4	71,7	14,0	51,1	107,0	109,0	111,0	115,0	–	97,4	137	145	145
55	150,2	74,2	83,6	72,7	14,0	51,1	103,3	105,3	107,3	111,3	–	93,7	139	146	146
58	160,0	79,5	91,2	78,0	14,0	51,1	113,2	115,2	117,2	121,2	–	103,6	142	149	149
60	160,0	79,5	91,2	78,0	14,0	51,1	113,2	115,2	117,2	121,2	–	103,6	142	149	149
60 OS	175,3	96,0	107,9	78,0	14,0	51,1	128,8	130,8	132,8	136,8	–	118,9	142	149	149
65	169,9	85,9	100,1	84,4	14,0	51,1	123,1	125,1	127,1	131,1	–	113,5	145	5-557	5-557
70	197,2	95,3	111,3	93,5	17,4	62,2	–	136,4	138,4	142,4	146,4	124,8	232	237	237
75	203,5	101,3	119,1	99,6	17,4	62,2	–	142,7	144,7	148,7	152,7	131,1	234	239	239
80	206,7	105,2	121,9	103,4	17,4	62,2	–	145,9	147,9	151,9	155,9	134,3	236	240	240
85	213,1	111,0	128,3	109,0	17,4	62,2	–	152,3	154,3	158,3	162,3	140,7	237	242	242
90	216,2	115,3	131,8	113,3	17,4	62,2	–	155,4	157,4	161,4	165,4	143,8	239	244	244
95	222,6	120,4	136,9	118,7	17,4	62,2	–	161,8	163,8	167,8	171,8	150,2	240	245	245
100	228,9	126,7	144,5	125,0	17,4	62,2	–	168,1	170,1	174,1	178,1	156,5	242	247	247
105	223,1	133,1	150,6	131,4	17,4	62,2	–	172,3	174,3	178,3	182,3	160,7	243	249	249
110	236,3	136,4	153,9	134,4	17,4	62,2	–	175,5	177,5	181,5	185,5	163,9	245	250	250
115	242,6	142,7	160,3	140,8	17,4	62,2	–	181,9	183,9	187,9	191,9	170,3	247	252	252
120	247,8	145,8	164,3	144,1	17,4	62,2	–	187,0	189,0	193,0	197,0	175,4	248	253	253

1510 General Duty Single Cartridge Seal – Inch

Key															
A – Shaft Size	B – Gland Outside Diameter	C – Seal Chamber Bore	D – Seal Outside Diameter	E – Seal Chamber Depth	F – Outboard Seal Length	G – Minimum Bolt Circle by Bolt Size	H – Hub Outer Diameter	V – Shaft O-Ring	W – Rotary Seal O-Ring	X – Stationary Seal O-Ring					

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	3/8"	1/2"	G MIN 5/8"	3/4"	H MAX	V	W	X
1.000	4.66	1.63	2.01	1.58	0.55	2.01	2.88	3.01	3.13	–	2.45	120	028	028
1.125	4.70	1.76	2.04	1.70	0.55	2.01	2.92	3.04	3.17	–	2.48	122	029	029
1.125 OS	5.37	2.39	2.75	1.70	0.55	2.01	3.59	3.71	3.84	–	3.15	122	029	029
1.250	4.92	1.89	2.27	1.84	0.55	2.01	3.13	3.26	3.38	–	2.70	124	030	030
1.375	5.05	2.01	2.33	1.95	0.55	2.01	3.27	3.40	3.52	–	2.84	126	031	031
1.375 OS	5.64	2.67	3.00	1.95	0.55	2.01	3.86	3.99	4.11	–	3.43	126	031	031
1.500	5.24	2.25	2.63	2.20	0.55	2.01	3.46	3.59	3.71	–	3.03	128	135	135
1.625	5.30	2.38	2.69	2.32	0.55	2.01	3.52	3.64	3.77	–	3.08	130	137	137
1.750	5.42	2.50	2.81	2.45	0.55	2.01	3.64	3.77	3.89	–	3.20	132	139	139
1.750 OS	6.71	3.47	3.75	2.45	0.55	2.01	4.93	5.05	5.18	–	4.49	132	139	139
1.875	5.54	2.63	2.94	2.57	0.55	2.01	3.76	3.89	4.01	–	3.32	134	141	141
1.875 OS	6.66	3.52	3.81	2.57	0.55	2.01	4.88	5.00	5.13	–	4.44	134	141	141
2.000	5.75	2.75	3.19	2.70	0.55	2.01	3.97	4.10	4.22	–	3.53	136	143	143
2.125	6.05	2.88	3.44	2.82	0.55	2.01	4.27	4.40	4.52	–	3.84	138	145	145
2.125 OS	7.38	3.85	4.25	2.82	0.55	2.01	5.60	5.73	5.85	–	5.17	138	145	145
2.250	6.16	3.00	3.56	2.95	0.55	2.01	4.38	4.50	4.63	–	3.94	140	147	147
2.375	6.30	3.13	3.59	3.07	0.55	2.01	4.52	4.64	4.77	–	4.08	142	149	149
2.375 OS	7.15	4.10	4.50	3.07	0.55	2.01	5.37	5.49	5.62	–	4.93	142	149	149
2.500	6.42	3.25	3.81	3.20	0.55	2.01	4.64	4.77	4.89	–	4.21	144	151	151
2.500 OS	8.21	4.47	5.25	3.20	0.55	2.01	6.43	6.56	6.68	–	6.00	144	151	151
2.625	6.69	3.38	3.94	3.32	0.55	2.01	4.91	5.03	5.16	–	4.47	146	5-557	5-557
2.625 OS	7.48	4.54	4.78	3.32	0.55	2.01	5.70	5.83	5.95	–	5.27	146	5-557	5-557
2.750	7.76	3.75	4.38	3.68	0.69	2.45	–	5.48	5.60	5.73	4.92	232	237	237
2.750 OS	8.14	4.34	4.78	3.68	0.69	2.45	–	5.83	5.95	6.08	5.27	232	237	237
2.875	7.89	3.87	4.49	3.79	0.69	2.45	–	5.60	5.73	5.85	5.04	233	238	238
3.000	8.01	3.99	4.69	3.92	0.69	2.45	–	5.73	5.85	5.98	5.17	234	239	239
3.000 OS	8.76	4.94	5.39	3.92	0.69	2.45	–	6.44	6.57	6.69	5.88	234	239	239
3.125	8.14	4.12	4.80	4.04	0.69	2.45	–	5.85	5.98	6.10	5.29	235	240	240
3.250	8.26	4.24	4.94	4.17	0.69	2.45	–	5.98	6.10	6.23	5.42	236	241	241
3.375	8.39	4.37	5.05	4.29	0.69	2.45	–	6.10	6.23	6.35	5.54	237	242	242
3.375 OS	8.64	4.88	5.27	4.29	0.69	2.45	–	6.33	6.45	6.58	5.76	237	242	242
3.500	8.51	4.49	5.19	4.42	0.69	2.45	–	6.23	6.35	6.48	5.67	238	243	243
3.625	8.64	4.62	5.30	4.54	0.69	2.45	–	6.35	6.48	6.60	5.79	239	244	244
3.750	8.76	4.74	5.39	4.67	0.69	2.45	–	6.48	6.60	6.73	5.92	241	245	245
3.750 OS	9.73	5.97	6.40	4.67	0.69	2.45	–	7.41	7.54	7.66	6.85	241	245	245
3.875	8.89	4.87	5.50	4.79	0.69	2.45	–	6.60	6.73	6.85	6.04	241	246	246
4.000	9.01	4.99	5.69	4.92	0.69	2.45	–	6.73	6.85	6.98	6.17	242	247	247
4.125	9.14	5.12	5.80	5.04	0.69	2.45	–	6.85	6.98	7.10	6.29	243	248	248
4.125 OS	9.64	5.84	6.27	5.04	0.69	2.45	–	7.33	7.45	7.58	6.76	243	248	248
4.250	9.18	5.24	5.93	5.17	0.69	2.45	–	6.89	7.02	7.14	6.33	244	249	249
4.375	9.30	5.37	6.06	5.29	0.69	2.45	–	7.02	7.14	7.27	6.46	245	250	250
4.500	9.43	5.49	6.18	5.42	0.69	2.45	–	7.14	7.27	7.39	6.58	246	251	251
4.500 OS	10.75	6.75	7.50	5.42	0.69	2.45	–	8.44	8.56	8.69	7.87	246	251	251
4.625	9.55	5.62	6.31	5.54	0.69	2.45	–	7.27	7.39	7.52	6.71	247	252	252
4.750	9.76	5.74	6.47	5.67	0.69	2.45	–	7.47	7.60	7.72	6.91	248	253	253
4.750 OS	11.36	7.22	7.65	5.67	0.69	2.45	–	9.04	9.16	9.29	8.48	248	253	253

180™ Heavy-Duty Single Cartridge Seal – Metric



Key

- A – Shaft Size
- B – Maximum Gland Diameter
- C – Seal Chamber Bore
- D – Inboard Seal Diameter
- E – Required Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Gland Width
- V – Shaft O-Ring
- W – Rotary Seal O-Ring
- X – Stationary Seal O-Ring
- Y – Gland O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	10 mm	G MIN 12 mm	16 mm	H	J MAX	V	W	X	Y
25	104	41	51	39	6	54	73	–	–	11	41	120	126	127	033
28	104	44	52	42	6	54	73	–	–	11	41	122	128	129	034
30	104	46	57	44	6	54	78	–	–	11	41	123	129	130	035
32	104	48	58	46	6	54	80	–	–	11	41	124	130	131	035
33	113	49	59	47	6	54	81	83	–	14	41	125	131	132	036
35	111	51	59	49	6	54	80	82*	–	14	41	126	132	133	036
38	114	54	61	52	6	54	85	87	–	14	41	128	134	135	037
40	127	56	68	54	6	54	90	92	–	13	41	129	135	136	038
42	127	58	66	56	6	54	88	90	–	13	41	130	136	137	039
43	127	59	69	57	6	54	91	93	–	13	41	131	137	138	039
45	139	64	73	63	18	49	95	97	–	13	43	133	139	140	150
48	139	67	73	66	18	49	95*	97*	–	13	43	134	141	142	151
50	139	69	78	68	18	49	100	102	–	13	43	136	142	143	151
53	152	73	87	72	18	49	109	111	115	17	43	137	144	145	153
55	152	74	83	73	18	49	105	107	111	17	43	139	145	146	152
58	152	80	91	78	18	49	114	116	120	17	43	140	148	149	153
60	152	80	91	78	18	49	114	116	120	17	43	142	148	149	153
							12 mm	16 mm	20 mm						
65	164	92	103	90	22	64	127	131	–	17	45	231	235	236	242
70	196	96	111	93	22	64	137	141	–	17	45	232	236	237	245
75	202	102	119	100	22	64	143	147	–	17	45	234	238	239	247
80	203	106	122	103	22	64	150	154	–	17	45	236	239	240	248
85	211	111	128	109	22	64	152	156	161	20	45	237	241	242	250
90	214	116	132	113	22	64	160	164	168	20	45	239	242	243	251
95	221	121	137	119	22	64	161	165	170	20	45	240	244	245	253
100	228	127	144	125	22	64	168	172	177	20	45	242	246	247	255
110	237	137	154	134	22	64	178	182	186	20	45	245	249	250	258
120	266	146	164	144	22	64	187	191	195	20	45	248	252	253	259

*Requires socket head cap screws or D shaped washers.

180™ Heavy-Duty Single Cartridge Seal – Inch

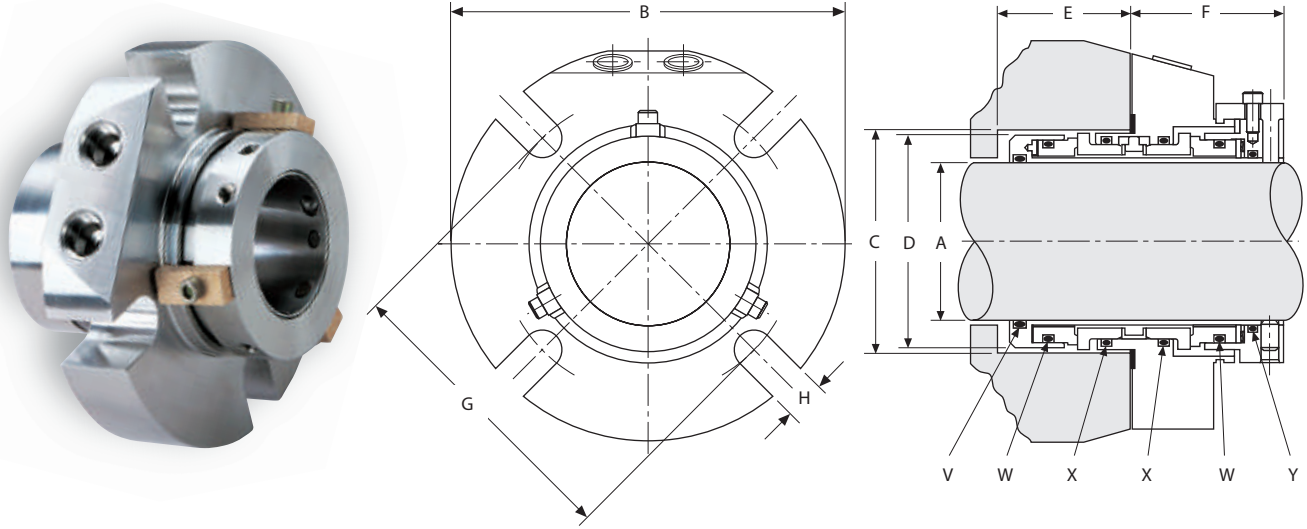
Key			
A – Shaft Size	E – Required Seal Chamber Depth	J – Gland Width	Y – Gland O-Ring
B – Maximum Gland Diameter	F – Outboard Seal Length	V – Shaft O-Ring	
C – Seal Chamber Bore	G – Minimum Bolt Circle by Bolt Size	W – Rotary Seal O-Ring	
D – Inboard Seal Diameter	H – Slot Width	X – Stationary Seal O-Ring	

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	3/8"	G MIN 1/2"	5/8"	H	J MAX	V	W	X	Y
1.000	4.11	1.63	2.01	1.55	0.22	2.11	2.88	–	–	0.44	1.62	120	126	127	0.33
1.125	4.11	1.75	2.04	1.67	0.22	2.11	2.88	–	–	0.44	1.62	122	128	129	0.34
1.125 OS	4.48	2.50	2.75	1.82	0.40	1.93	3.71	–	–	0.44	1.44	122	128	129	150
1.250	4.11	1.88	2.27	1.80	0.22	2.11	3.14	–	–	0.44	1.62	124	130	131	0.35
1.375	4.36	2.00	2.33	1.92	0.22	2.11	3.13	3.25*	–	0.57	1.62	126	132	133	0.36
1.375 OS	5.40	2.68	3.00	2.07	0.40	1.93	4.03	–	–	0.44	1.44	126	132	133	151
1.500	4.49	2.13	2.44	2.05	0.22	2.11	3.33	3.45	–	0.57	1.62	128	134	135	0.37
1.625	4.99	2.25	2.69	2.17	0.22	2.11	3.52	3.65	–	0.57	1.62	130	136	137	0.38
1.750	5.49	2.50	2.81	2.44	0.69	1.91	3.62	3.75*	–	0.57	1.27	132	138	139	150
1.750 OS	6.64	3.50	3.75	2.44	0.69	1.91	5.21	5.33	5.46	0.57	1.44	132	138	139	151
1.875	5.49	2.63	2.94	2.57	0.69	1.91	3.75	3.87*	–	0.57	1.27	134	140	141	151
1.875 OS	5.99	3.56	3.81	2.57	0.69	1.91	–	5.00	–	0.57	1.44	134	140	141	152
2.000	5.49	2.75	3.19	2.69	0.69	1.91	4.00	4.13	–	0.57	1.27	136	142	143	152
2.125	5.99	2.88	3.44	2.82	0.69	1.91	4.25	4.38	4.50	0.69	1.27	138	144	145	153
2.125 OS	6.99	3.88	4.25	2.82	0.69	1.91	–	–	5.95	0.69	1.44	138	144	145	153
2.250	5.99	3.00	3.56	2.94	0.69	1.91	4.37	4.50	4.62	0.69	1.27	140	146	147	153
2.375	5.99	3.13	3.59	3.07	0.69	1.91	4.43	4.56	4.68	0.69	1.27	142	148	149	153
2.375 OS	8.40	4.13	4.50	3.07	0.69	1.91	–	–	7.00	0.69	1.44	142	148	149	154
2.500	6.49	3.25	3.81	3.19	0.69	1.91	4.62	4.75	4.87	0.69	1.27	144	150	151	154
2.500 OS	7.77	4.50	4.75	3.19	0.69	1.91	–	–	6.75	0.69	1.44	144	150	151	154
							1/2"	5/8"	3/4"						
2.625	6.45	3.63	4.04	3.54	0.88	2.50	5.02	5.15	–	0.69	1.77	231	236	237	242
2.625 OS	6.98	4.55	4.78	3.54	0.88	2.50	6.00	–	–	0.69	1.77	231	235	236	242
2.750	7.70	3.75	4.38	3.67	0.88	2.50	5.42	5.55	–	0.69	1.77	232	236	237	245
2.750 OS	7.89	4.45	4.78	3.67	0.88	2.50	–	6.38	–	0.81	1.77	232	236	237	243
2.875	7.83	3.88	4.50	3.79	0.88	2.50	5.50	5.62	–	0.69	1.77	233	237	238	246
3.000	7.94	4.00	4.69	3.92	0.88	2.50	5.65	5.77	–	0.69	1.77	234	238	239	247
3.000 OS	8.64	4.93	5.39	3.92	0.88	2.50	7.00	7.13	7.25	0.94	1.77	234	238	239	246
3.125	7.99	4.13	4.81	4.04	0.88	2.50	5.80	5.92	–	0.69	1.77	235	239	240	248
3.250	8.19	4.25	4.94	4.17	0.88	2.50	5.93	6.05	–	0.69	1.77	236	240	241	249
3.375	8.30	4.38	5.06	4.29	0.88	2.50	6.02	6.14	6.27	0.81	1.77	237	241	242	250
3.375 OS	8.39	4.95	5.27	4.29	0.88	2.50	–	6.88	–	0.82	1.77	237	241	242	248
3.500	8.44	4.50	5.19	4.42	0.88	2.50	6.18	6.31	6.43	0.81	1.77	238	242	243	251
3.625	8.49	4.63	5.31	4.54	0.88	2.50	6.31	6.44	6.56	0.81	1.77	239	243	244	252
3.750	8.71	4.75	5.39	4.67	0.88	2.50	6.38	6.51	6.63	0.81	1.77	240	244	245	253
3.750 OS	9.76	5.08	6.40	4.67	0.88	2.50	8.25	–	–	0.82	1.77	240	244	245	252
3.875	8.84	4.88	5.51	4.79	0.88	2.50	6.52	6.64	6.77	0.81	1.77	241	245	246	254
4.000	8.96	5.00	5.69	4.92	0.88	2.50	6.66	6.78	6.91	0.81	1.77	242	246	247	255
4.125	8.99	5.13	5.81	5.04	0.88	2.50	6.79	6.90	7.03	0.81	1.77	243	247	248	256
4.125 OS	9.76	5.95	6.27	5.04	0.88	2.50	–	–	8.00	0.82	1.77	243	247	248	255
4.250	8.99	5.25	5.94	5.17	0.88	2.50	6.91	7.04	7.16	0.81	1.77	244	248	249	257
4.375	9.33	5.38	6.06	5.29	0.88	2.50	7.03	7.15	7.28	0.81	1.77	245	249	250	258
4.500	9.49	5.50	6.19	5.42	0.88	2.50	7.18	7.30	7.43	0.81	1.77	246	250	251	258
4.500 OS	12.49	6.75	7.49	5.42	0.88	2.50	–	10.76	–	0.88	1.77	246	250	251	258
4.625	9.49	5.63	6.31	5.54	0.88	2.50	7.28	7.40	7.53	0.81	1.77	247	251	252	259
4.750	10.49	5.75	6.47	5.67	0.88	2.50	7.40	7.53	7.65	0.81	1.77	248	252	253	259
4.750 OS	11.39	7.20	7.65	5.67	0.88	2.50	9.88	10.00	–	0.82	1.77	248	252	253	259

*Requires socket head cap screws or D shaped washers.

280™ Heavy-Duty Double Cartridge Seal – Metric

Mechanical Seal Dimensional Data



Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- V – Shaft O-Ring
- W – Rotary O-Ring
- X – Stationary O-Ring
- Y – Lock Ring O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	10 mm	G MIN 12 mm	16 mm	20 mm	H	V	W	X	Y
25	104	45	51	44	40	54	74	–	–	–	11	120	126	127	121
28	104	48	52	47	40	54	74	–	–	–	11	122	128	129	123
30	104	50	56	49	40	54	78	–	–	–	11	123	129	130	125
32	104	52	57	51	40	54	80	–	–	–	11	124	130	131	126
33	113	53	58	52	40	54	81	83	–	–	14	125	131	132	127
35	111	54	59	53	40	54	80	82	–	–	14	126	132	133	128
38	114	58	61	57	40	54	85	87	–	–	14	128	134	135	130
40	127	60	68	59	40	54	90	92	–	–	14	129	135	136	131
43	127	61	68	62	40	54	91	93	–	–	14	131	137	138	133
45	139	65	73	64	40	54	95	97	–	–	14	133	139	140	134
48	139	68	73	67	40	54	96	98	–	–	14	134	141	142	136
50	139	70	78	69	40	54	100	102	–	–	14	136	142	143	137
55	152	75	83	74	40	54	105	107	111	–	18	139	145	146	140
60	152	80	91	79	40	54	114	116	120	–	18	142	148	149	143
65	164	92	100	91	52	64	–	127	131	–	18	231	235	236	148
70	196	96	113	95	52	64	–	137	141	–	18	232	236	237	151
75	202	102	119	101	52	64	–	143	147	–	18	234	238	239	5-557
80	203	106	122	105	52	64	–	147	151	–	18	236	239	240	153
85	211	111	129	110	52	64	–	152	156	160	21	237	241	242	153
90	214	116	132	115	52	64	–	160	164	168	21	239	242	243	154
95	221	121	138	120	52	64	–	161	165	169	21	240	244	245	155
100	228	127	144	126	52	64	–	168	172	176	21	242	246	247	5-883
110	237	137	154	136	52	64	–	178	182	186	21	245	249	250	157
120	266	146	163	145	52	64	–	187	191	195	21	248	252	253	5-403

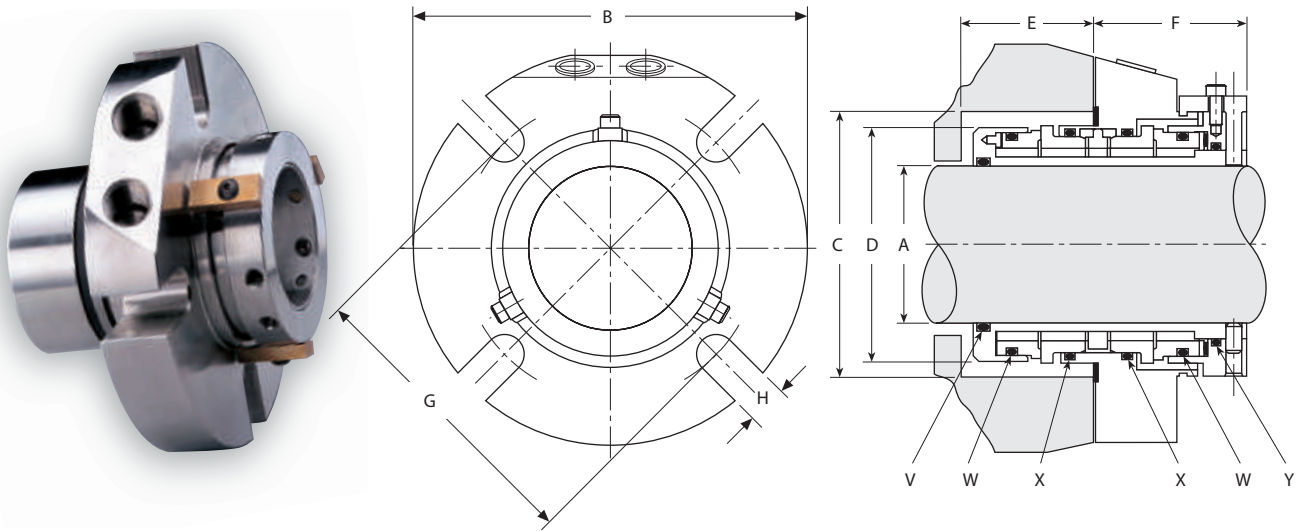
280™ Heavy-Duty Double Cartridge Seal – Inch

Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- V – Shaft O-Ring
- W – Rotary O-Ring
- X – Stationary O-Ring
- Y – Lock Ring O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	3/8"	1/2"	G MIN 5/8"	3/4"	7/8"	H	V	W	X	Y
1.000	4.11	1.75	2.01	1.73	1.58	2.13	2.88	–	–	–	–	0.44	120	126	127	122
1.125	4.11	1.88	2.04	1.86	1.58	2.13	2.88	–	–	–	–	0.44	122	128	129	124
1.250	4.11	2.00	2.27	1.98	1.58	2.13	3.14	–	–	–	–	0.44	124	130	131	126
1.375	4.36	2.13	2.33	2.11	1.58	2.13	3.13	3.25	–	–	–	0.57	126	132	133	128
1.375 05	5.40	2.81	3.00	2.80	1.58	2.13	4.03	–	–	–	–	0.44	126	132	133	128
1.500	4.49	2.25	2.44	2.23	1.58	2.13	3.33	3.45	–	–	–	0.57	128	134	135	130
1.625	4.99	2.38	2.69	2.36	1.58	2.13	3.52	3.65	–	–	–	0.57	130	136	137	132
1.750	5.49	2.50	2.81	2.48	1.58	2.13	3.65	3.77	–	–	–	0.57	132	138	139	134
1.750 05	6.64	3.50	3.75	3.48	1.58	2.13	5.37	5.49	5.62	–	–	0.57	132	138	139	134
1.875	5.49	2.63	2.94	2.61	1.58	2.13	3.78	3.90	–	–	–	0.57	134	140	141	136
1.875 05	5.99	3.56	3.81	3.54	1.58	2.13	–	5.00	–	–	–	0.57	134	140	141	136
2.000	5.49	2.75	3.19	2.73	1.58	2.13	4.03	4.15	–	–	–	0.57	136	142	143	138
2.125	5.99	2.88	3.44	2.85	1.58	2.13	4.28	4.41	4.53	–	–	0.69	138	144	145	140
2.125 05	6.99	3.88	4.25	3.86	1.58	2.13	–	–	6.00	–	–	0.69	138	144	145	140
2.250	5.99	3.00	3.56	2.98	1.58	2.13	4.40	4.53	4.65	–	–	0.69	140	146	147	142
2.375	5.99	3.13	3.59	3.11	1.58	2.13	4.46	4.59	4.71	–	–	0.69	142	148	149	144
2.500	6.49	3.25	3.81	3.23	1.58	2.13	4.65	4.78	4.90	–	–	0.69	144	150	151	146
2.500 05	7.77	4.50	4.75	4.48	1.58	2.13	–	–	6.75	–	–	0.69	144	150	151	146
2.625	6.45	3.63	3.93	3.60	2.05	2.50	–	5.02	5.15	–	–	0.69	231	235	236	149
2.625 05	6.98	4.55	4.88	4.54	2.05	2.50	–	–	6.00	–	–	0.69	231	235	236	149
2.750	7.71	3.75	4.44	3.73	2.05	2.50	–	5.42	5.55	–	–	0.69	232	236	237	151
2.750 05	7.89	4.45	4.56	4.44	2.05	2.50	–	–	–	6.38	–	0.82	232	236	237	151
2.875	7.83	3.88	4.56	3.85	2.05	2.50	–	5.50	5.62	–	–	0.69	233	237	238	151
3.000	7.94	4.00	4.69	3.97	2.05	2.50	–	5.65	5.77	–	–	0.69	234	238	239	152
3.000 05	8.64	4.93	5.17	4.92	2.05	2.50	–	–	7.00	7.13	7.25	0.94	234	238	239	152
3.125	7.99	4.13	4.81	4.10	2.05	2.50	–	5.80	5.92	–	–	0.69	235	239	240	152
3.250	8.19	4.25	4.94	4.22	2.05	2.50	–	5.93	6.05	–	–	0.69	236	240	241	153
3.375	8.31	4.38	5.06	4.35	2.05	2.50	–	6.02	6.14	6.27	–	0.81	237	241	242	153
3.375 05	8.39	4.95	5.06	4.94	2.05	2.50	–	–	–	6.88	–	0.82	237	241	242	153
3.500	8.44	4.50	5.19	4.47	2.05	2.50	–	6.18	6.31	6.43	–	0.81	238	242	243	154
3.625	8.49	4.63	5.31	4.60	2.05	2.50	–	6.31	6.44	6.56	–	0.81	239	243	244	154
3.750	8.72	4.75	5.44	4.72	2.05	2.50	–	6.38	6.51	6.63	–	0.81	240	244	245	155
3.750 05	9.76	5.97	6.18	5.94	2.05	2.50	–	–	8.25	–	–	0.69	240	244	245	155
3.875	8.84	4.88	5.56	4.85	2.05	2.50	–	6.52	6.64	6.77	–	0.81	241	246	247	156
4.000	8.96	5.00	5.69	4.97	2.05	2.50	–	6.66	6.78	6.91	–	0.81	242	246	247	156
4.125	8.99	5.13	5.81	5.10	2.05	2.50	–	6.79	6.90	7.03	–	0.81	243	247	248	157
4.125 05	9.76	5.97	6.06	5.94	2.05	2.50	–	–	–	–	8.00	0.94	243	247	248	157
4.250	8.99	5.25	5.94	5.22	2.05	2.50	–	6.91	7.04	7.16	–	0.81	244	248	249	157
4.375	9.34	5.38	6.06	5.35	2.05	2.50	–	7.03	7.15	7.28	–	0.81	245	249	250	157
4.500	9.49	5.50	6.19	5.47	2.05	2.50	–	7.18	7.30	7.43	–	0.81	246	250	251	158
4.500 05	12.49	6.78	7.25	6.75	2.05	2.50	–	–	–	10.73	–	0.89	246	250	251	158
4.625	9.49	5.63	6.31	5.60	2.05	2.50	–	7.28	7.40	7.53	–	0.81	247	251	252	158
4.750	10.49	5.75	6.44	5.72	2.05	2.50	–	7.40	7.53	7.65	–	0.81	248	252	253	159
4.750 05	11.39	7.22	7.42	7.19	2.05	2.50	–	–	9.88	10.00	–	0.82	248	252	253	159

280M Heavy-Duty Double Mixer Seal – Metric



Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- V – Shaft O-Ring
- W – Rotary O-Ring
- X – Stationary O-Ring
- Y – Lock Ring O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	10 mm	G MIN 12 mm	16 mm	H	V	W	X	Y
35	114	60	62	56	40	54	91	92	–	14	126	134	135	130
38	127	63	68	59	40	54	94	95	–	14	128	136	137	132
60	165	86	97	82	40	54	122	124	128	18	142	150	151	146
							12 mm	16 mm	20 mm					
65	199	102	116	98	52	64	139	143	–	18	231	237	238	151
70	202	108	119	101	52	64	143	147	–	18	232	238	239	152
75	208	114	125	107	52	64	150	154	–	18	234	240	241	153
80	211	117	129	110	52	64	152	156	160	21	235	241	242	153
85	216	124	135	117	52	64	160	164	168	21	237	243	244	154
90	225	130	141	123	52	64	165	169	173	21	239	245	246	155
95	228	133	144	126	52	64	168	172	176	21	240	246	247	156
100	228	140	151	132	52	64	175	179	183	21	242	248	249	156
110	241	149	160	142	52	64	184	188	191	21	245	251	252	158
							20 mm	24 mm	30 mm					
120	279	171	–	162	83	104	227	230	236	–	351	359	361	253
130	292	184	–	175	83	104	239	242	248	–	355	362	363	257
140	298	191	–	181	83	104	246	249	255	–	357	363	364	259
150	311	203	–	194	83	104	258	261	267	–	361	365	366	260
160	323	216	–	207	83	104	271	274	280	–	363	367	368	262
170	330	222	–	213	83	104	277	280	286	–	364	368	369	263
180	343	235	–	226	83	104	290	293	299	–	366	370	371	265
190	349	241	–	232	83	104	296	299	305	–	367	371	372	266
200	362	254	–	245	83	104	309	312	318	–	369	373	374	268

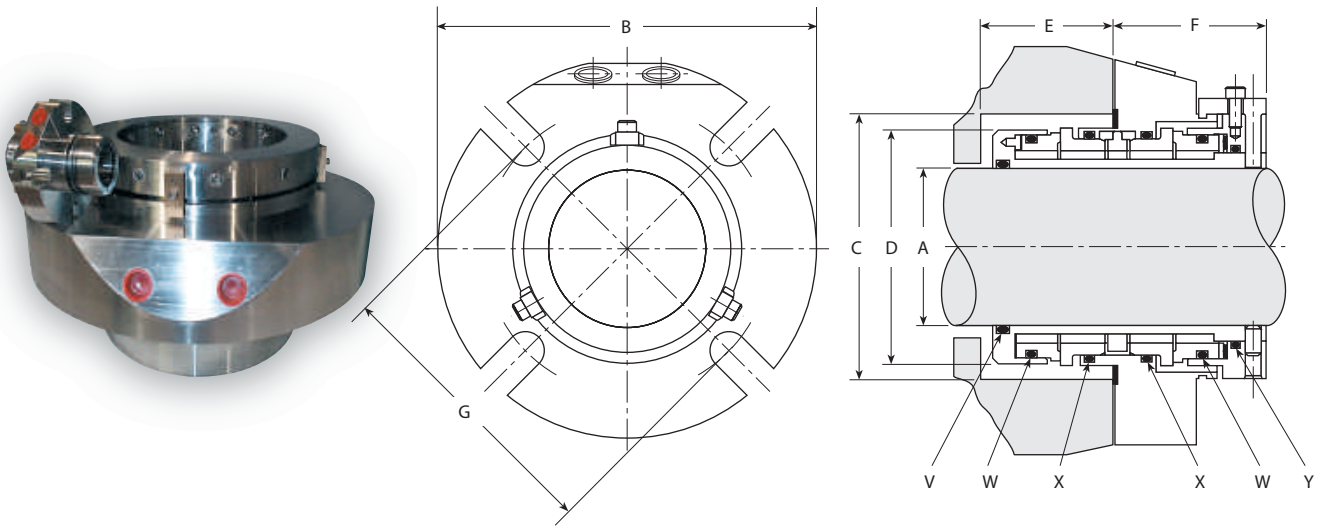
280M Heavy-Duty Double Mixer Seal – Inch

Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- V – Shaft O-Ring
- W – Rotary O-Ring
- X – Stationary O-Ring
- Y – Lock Ring O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	3/8"	G MIN 1/2"	5/8"	H	V	W	X	Y
1.000	4.11	2.00	2.15	1.85	1.58	2.13	3.14	–	–	0.44	120	128	129	124
1.125	4.11	2.12	2.21	1.98	1.58	2.13	3.14	3.26	–	0.57	122	130	131	126
1.250	4.36	2.25	2.33	2.10	1.58	2.13	3.33	3.46	–	0.57	124	132	133	128
1.375	4.49	2.37	2.57	2.23	1.58	2.13	3.53	3.66	–	0.57	126	134	135	130
1.500	4.99	2.50	2.69	2.35	1.58	2.13	3.65	3.78	–	0.57	128	136	137	132
1.625	5.49	2.62	2.81	2.48	1.58	2.13	3.78	3.91	–	0.57	130	138	139	134
1.750	5.49	2.75	3.07	2.60	1.58	2.13	4.03	4.16	–	0.57	132	140	141	136
1.875	5.49	2.87	3.32	2.73	1.58	2.13	4.28	4.41	4.53	0.69	134	142	143	138
2.000	5.99	3.00	3.44	2.85	1.58	2.13	4.40	4.53	4.65	0.69	136	144	145	140
2.125	5.99	3.12	3.50	2.98	1.58	2.13	4.46	4.59	4.71	0.69	138	146	147	142
2.250	5.99	3.25	3.69	3.10	1.58	2.13	4.65	4.78	4.90	0.69	140	148	149	144
2.375	6.49	3.37	3.81	3.23	1.58	2.13	4.77	4.90	5.02	0.69	142	150	151	146
							1/2"	5/8"	3/4"					
2.500	7.71	4.00	4.44	3.73	2.05	2.50	5.42	5.55	–	0.69	230	236	237	151
2.625	7.83	4.12	4.56	3.86	2.05	2.50	5.50	5.62	–	0.69	231	237	238	151
2.750	7.94	4.25	4.69	3.97	2.05	2.50	5.65	5.77	–	0.69	232	238	239	152
2.875	7.99	4.37	4.81	4.10	2.05	2.50	5.80	5.92	–	0.69	233	239	240	152
3.000	8.19	4.50	4.94	4.22	2.05	2.50	5.93	6.05	–	0.69	234	240	241	153
3.125	8.31	4.62	5.06	4.35	2.05	2.50	6.02	6.14	6.27	0.81	235	241	242	153
3.250	8.44	4.75	5.19	4.47	2.05	2.50	6.18	6.31	6.43	0.81	236	242	243	154
3.375	8.49	4.87	5.31	4.60	2.05	2.50	6.31	6.44	6.56	0.81	237	243	244	154
3.500	8.72	5.00	5.44	4.72	2.05	2.50	6.38	6.51	6.63	0.81	238	244	245	155
3.625	8.84	5.12	5.56	4.85	2.05	2.50	6.52	6.64	6.77	0.81	239	245	246	155
3.750	8.96	5.25	5.69	4.97	2.05	2.50	6.66	6.78	6.91	0.81	240	246	247	156
3.875	8.99	5.37	5.81	5.10	2.05	2.50	6.76	6.90	7.03	0.81	241	247	248	156
4.000	8.99	5.50	5.94	5.22	2.05	2.50	6.91	7.05	7.16	0.81	242	248	249	157
4.125	9.34	5.62	6.06	5.35	2.05	2.50	7.03	7.15	7.28	0.81	243	249	250	157
4.250	9.49	5.75	6.19	5.47	2.05	2.50	7.18	7.30	7.43	0.81	244	250	251	158
4.375	9.49	5.87	6.31	5.60	2.05	2.50	7.28	7.40	7.53	0.81	245	251	252	158
4.500	10.49	6.00	6.44	5.72	2.05	2.50	7.40	7.53	7.65	0.81	246	252	253	159
							7/8"	1"	1 1/8"					
4.75	10.99	6.75	–	6.38	3.25	4.09	8.92	9.04	9.17	–	351	359	361	253
5.00	11.24	7.00	–	6.63	3.25	4.09	9.17	9.29	9.42	–	353	361	362	255
5.25	11.49	7.25	–	6.88	3.25	4.09	9.42	9.54	9.67	–	355	362	363	257
5.50	11.74	7.50	–	7.13	3.25	4.09	9.67	9.79	9.92	–	357	363	364	259
5.75	11.99	7.75	–	7.38	3.25	4.09	9.92	10.04	10.17	–	359	364	365	260
6.00	12.24	8.00	–	7.63	3.25	4.09	10.17	10.29	10.42	–	361	365	366	261
6.25	12.49	8.25	–	7.88	3.25	4.09	10.42	10.54	10.67	–	362	366	367	262
6.50	12.74	8.50	–	8.13	3.25	4.09	10.67	10.79	10.92	–	363	367	368	263
6.75	12.99	8.75	–	8.38	3.25	4.09	10.92	11.04	11.17	–	364	368	369	264
7.00	13.24	9.00	–	8.63	3.25	4.09	11.17	11.29	11.42	–	365	369	370	265
7.25	13.49	9.25	–	8.88	3.25	4.09	11.42	11.54	11.67	–	366	370	371	266
7.50	13.74	9.50	–	9.13	3.25	4.09	11.67	11.79	11.92	–	367	371	372	267
7.75	13.99	9.75	–	9.38	3.25	4.09	11.92	12.04	12.17	–	368	372	373	268
8.00	14.24	10.00	–	9.63	3.25	4.09	12.17	12.29	12.42	–	369	373	374	269

280M Heavy-Duty Jumbo Double Mixer Seal



Key			
A - Shaft Size	D - IB Seal Diameter	G - Minimum Bolt Circle by Bolt Size	X - Stationary O-Ring
B - Gland Outside Diameter	E - Seal Chamber Depth	V - Shaft O-Ring	Y - Lock Ring O-Ring
C - Seal Chamber Bore	F - Outboard Seal Length	W - Rotary O-Ring	

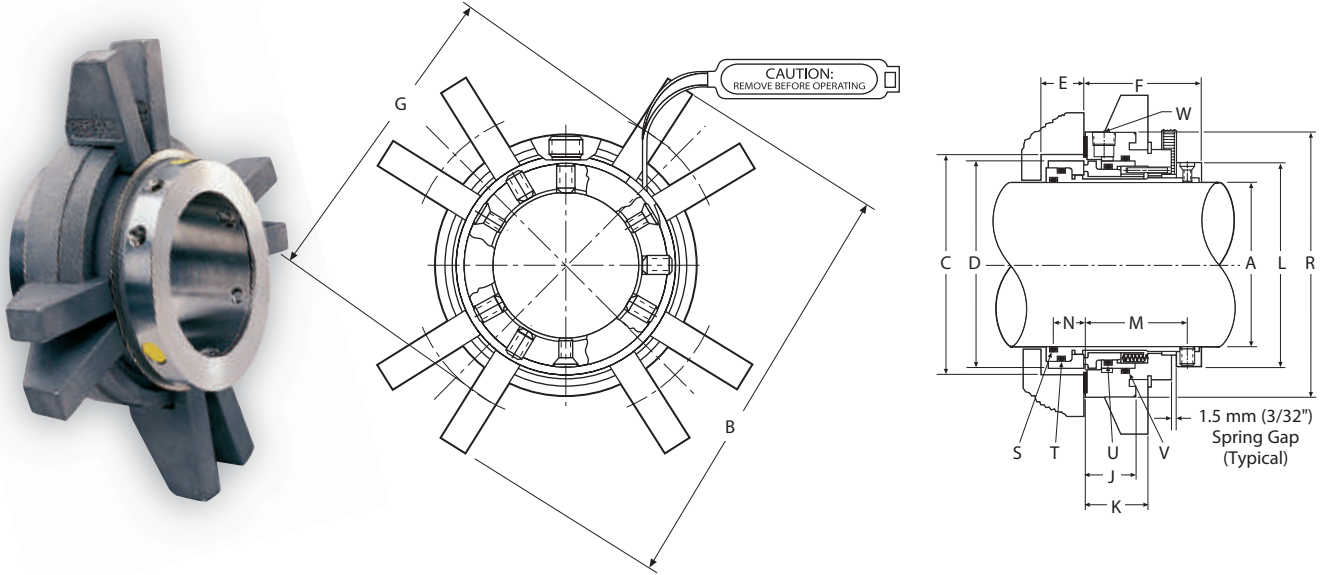
Metric

A	B MAX	C MIN	D MAX	E MIN	F MAX	20 mm	G MIN 24 mm	30 mm	V	W	X	Y
210	458	299	286	109	146	368	372	378	446	449	450	374
220	464	305	293	109	146	374	378	384	447	450	451	376
230	477	318	305	109	146	387	391	397	448	451	452	378
240	483	324	312	109	146	393	397	403	448	451	452	378
250	496	337	324	109	146	406	410	416	449	452	453	379
260	502	343	331	109	146	412	416	422	450	453	454	380
270	515	356	343	109	146	425	429	435	451	454	455	381
280	528	369	356	109	146	438	442	448	452	455	456	5-902
290	534	375	362	109	146	444	448	454	452	455	456	5-902
300	547	388	375	109	146	457	461	467	453	456	457	382

Inch

A	B MAX	C MIN	D MAX	E MIN	F MAX	7/8"	G MIN 1"	1 1/8"	V	W	X	Y
8.25	17.76	11.50	11.01	4.29	5.72	14.25	14.38	14.50	446	449	450	374
8.50	18.01	11.75	11.26	4.29	5.72	14.50	14.63	14.75	446	449	450	374
8.75	18.26	12.00	11.51	4.29	5.72	14.75	14.88	15.00	447	450	451	376
9.00	18.51	12.25	11.76	4.29	5.72	15.00	15.13	15.25	447	450	451	376
9.25	18.76	12.50	12.01	4.29	5.72	15.25	15.38	15.50	448	451	452	378
9.50	19.01	12.75	12.26	4.29	5.72	15.50	15.63	15.75	448	451	452	378
9.75	19.26	13.00	12.51	4.29	5.72	15.75	15.88	16.00	449	452	453	379
10.00	19.51	13.25	12.76	4.29	5.72	16.00	16.13	16.25	449	452	453	379
10.25	19.76	13.50	13.01	4.29	5.72	16.25	16.38	16.50	450	453	454	380
10.50	20.01	13.75	13.26	4.29	5.72	16.50	16.63	16.75	450	453	454	380
10.75	20.26	14.00	13.51	4.29	5.72	16.75	16.88	17.00	451	454	455	381
11.00	20.51	14.25	13.76	4.29	5.72	17.00	17.13	17.25	451	454	455	381
11.25	20.76	14.50	14.01	4.29	5.72	17.25	17.38	17.50	452	455	456	5-902
11.50	21.01	14.75	14.26	4.29	5.72	17.50	17.63	17.75	452	455	456	5-902
11.75	21.26	15.00	14.51	4.29	5.72	17.75	17.88	18.00	453	456	457	382
12.00	21.51	15.25	14.76	4.29	5.72	18.00	18.13	18.25	453	456	457	382

155™ Standard Single Cartridge Seal – Metric



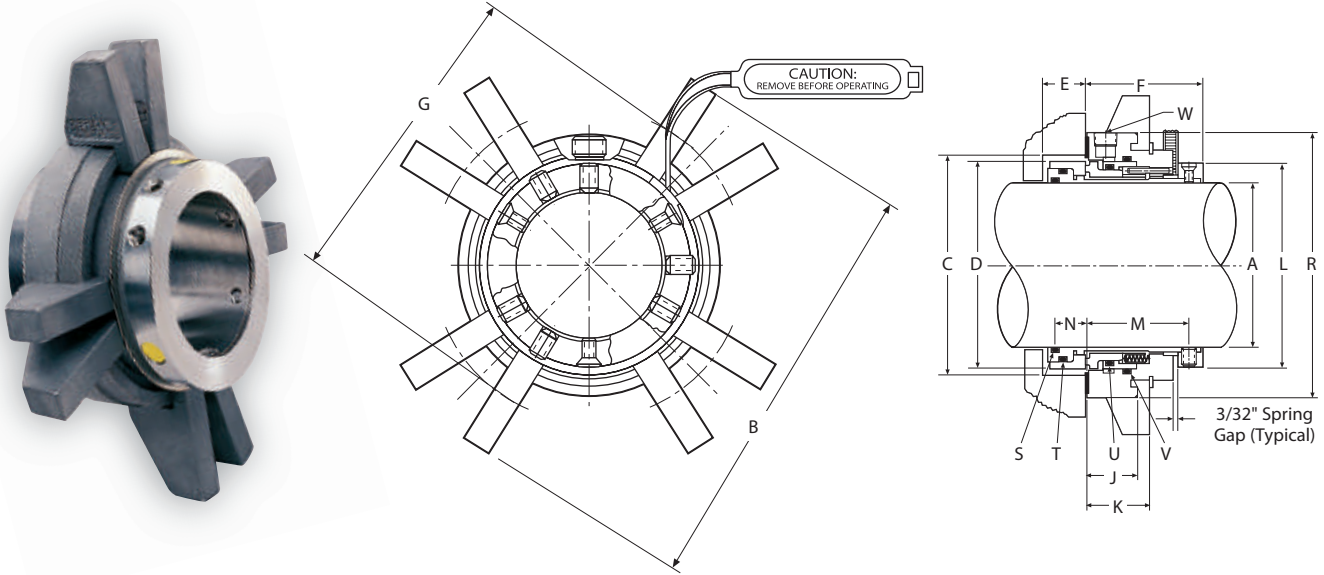
Key

A – Shaft Size	F – Outboard Seal Length	L – Lock Ring Diameter	S – Shaft O-Ring
B – Gland Outside Diameter	G – Minimum Bolt Circle by Bolt Size	M – Distance from Seal Chamber Face to Set Screws	T – Rotary O-Ring
C – Seal Chamber Bore	H – Slot Width	N – Distance from Seal Chamber Face to Shaft O-Ring	U – Stationary O-Ring
D – IB Seal Diameter	J – Gland Width	P – Hub Gland Slot Diameter	V – Gland O-Ring (applies only to large sizes)
E – Seal Chamber Depth	K – Hub Gland Slot Width	R – Hub Gland Diameter	W – NTP Size

A	B MAX TABS	C MIN	C MAX	D	E MIN	F	G MIN TABS			G MIN 478			H	J	K	L	M	N	P	R	S	T	U	W
							8 mm	10 mm	12 mm	8 mm	10 mm	12 mm												
25	118	44	51	43	16	48	70	72	74	71	73	–	11	24	9	44	40	12	57	62	120	124	126	1/8"
28	118	47	52	46	16	48	70	72	74	71	73	–	11	24	9	47	40	12	57	62	121	126	128	1/8"
30	124	49	57	48	16	48	76	78	80	77	79	–	11	24	9	49	40	12	60	68	123	127	129	1/8"
32	124	51	58	50	16	48	77	79	81	78	80	–	11	24	9	51	40	12	62	69	124	128	130	1/8"
33	124	52	59	51	16	48	76	78	80	78	80	–	11	24	9	52	40	12	62	69	125	129	131	1/8"
35	128	54	62	52	16	48	80	82	84	86	88	–	11	24	9	54	40	12	70	72	126	130	132	1/8"
38	133	57	67	56	16	48	85	87	89	86	88	–	11	24	9	57	40	12	70	77	128	132	134	1/8"
40	134	59	68	58	16	48	86	88	90	86	88	90	15	24	9	59	40	12	73	78	129	134	135	1/8"
43	134	62	69	61	16	48	86	88	90	86	88	90	15	24	9	62	40	12	73	78	131	135	137	1/8"
45	140	64	73	63	16	48	92	94	96	92	94	96	15	24	9	64	40	12	79	84	132	136	138	1/8"
48	139	67	74	66	16	48	91	93	95	92	94	96	15	24	9	67	40	12	79	84	134	139	140	1/8"
50	145	69	78	68	16	48	97	99	101	96	98	100	15	24	9	69	40	12	82	89	136	140	142	1/8"
55	150	74	83	73	16	48	102	104	106	112	114	116	17	24	9	74	40	12	94	94	139	143	145	1/8"
60	160	79	91	78	16	48	112	114	116	113	115	117	17	24	9	80	40	12	99	104	142	146	148	1/8"

A	B MAX	C MIN	C MAX	D	E MIN	F	10 mm	G MIN 12 mm	16 mm	J	K	L	M	N	R	S	T	U	V	W
65	194	92	102	90	22	64	132	134	138	27	34	89	56	17	122	231	234	236	239	1/4"
70	197	95	105	93	22	64	135	137	141	27	34	92	56	17	125	232	235	237	240	1/4"
75	203	100	113	99	22	64	141	143	147	27	34	98	56	17	131	234	237	239	242	1/4"
80	207	105	116	103	22	64	144	146	150	27	34	102	56	17	134	236	238	240	243	1/4"
85	213	110	122	109	22	64	151	153	157	27	34	108	56	17	141	237	240	242	245	1/4"
90	216	115	125	113	22	64	154	156	160	27	34	112	56	17	144	239	241	243	246	1/4"
95	222	120	131	118	22	64	160	162	166	27	34	117	56	17	150	240	243	245	248	1/4"
100	229	127	138	125	22	64	167	169	173	27	34	123	56	17	157	242	245	247	250	1/4"
110	236	136	148	134	22	64	174	176	180	27	34	133	56	17	164	245	248	250	253	1/4"
120	248	145	158	144	22	64	186	188	192	27	34	142	56	17	176	248	251	253	256	1/4"

155™ Standard Single Cartridge Seal – Inch

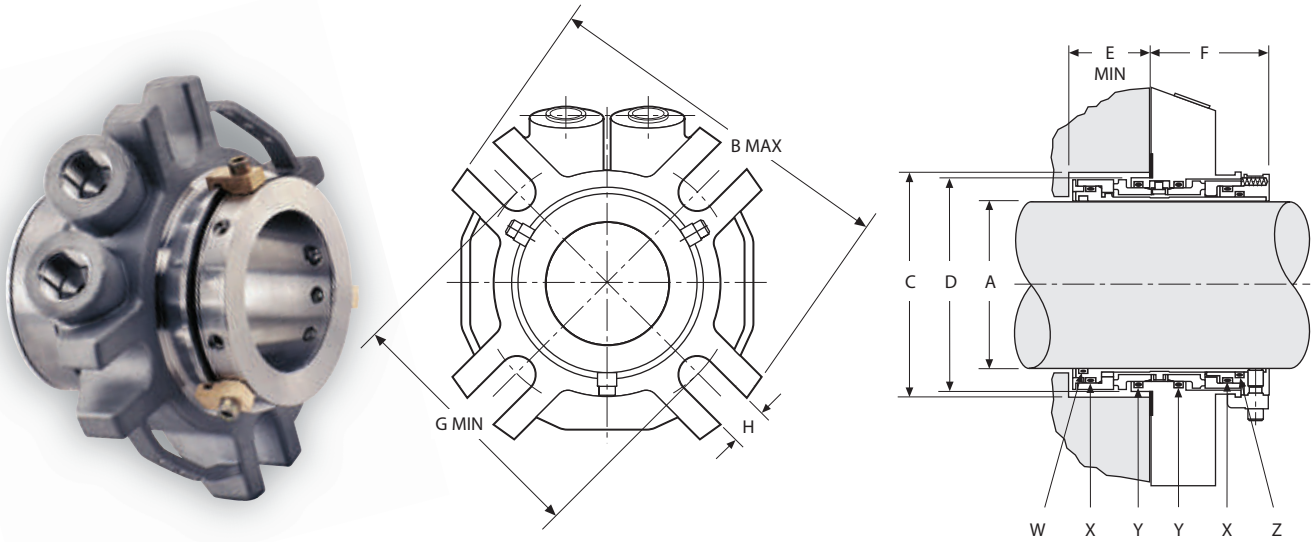


Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Gland Width
- K – Hub Gland Slot Width
- L – Lock Ring Diameter
- M – Distance from Seal Chamber Face to Set Screws
- N – Distance from Seal Chamber Face to Shaft O-Ring
- P – Hub Gland Slot Diameter
- R – Hub Gland Diameter
- S – Shaft O-Ring
- T – Rotary O-Ring
- U – Stationary O-Ring
- V – Gland O-Ring (applies only to large sizes)
- W – NTP Size

A	B MAX	C MIN	C MAX	D	E MIN	F	G MIN			G MIN 478			H	J	K	L	M	N	P	R	S	T	U	W
							3/8"	1/2"	5/8"	3/8"	1/2"	5/8"												
1.000	4.65	1.75	2.00	1.69	0.63	1.89	2.88	3.01	3.13	2.90	–	–	0.44	0.93	0.37	1.76	1.58	0.47	2.25	2.45	120	124	126	1/8"
1.125	4.69	1.88	2.03	1.82	0.63	1.89	2.92	3.05	3.17	2.90	–	–	0.44	0.93	0.37	1.89	1.58	0.47	2.25	2.48	122	126	128	1/8"
1.250	4.90	2.00	2.26	1.94	0.63	1.89	3.13	3.26	3.38	3.21	–	–	0.44	0.93	0.37	2.01	1.58	0.47	2.43	2.70	124	128	130	1/8"
1.375	5.04	2.13	2.42	2.07	0.63	1.89	3.27	3.40	3.52	3.52	–	–	0.44	0.93	0.37	2.14	1.58	0.47	2.75	2.84	126	130	132	1/8"
1.500	5.23	2.25	2.62	2.19	0.63	1.89	3.46	3.59	3.71	3.52	–	–	0.44	0.93	0.37	2.26	1.58	0.47	2.75	3.03	128	132	134	1/8"
1.625	5.29	2.38	2.68	2.32	0.63	1.89	3.52	3.65	3.77	3.51	3.63	–	0.58	0.93	0.37	2.39	1.58	0.47	2.87	3.08	130	134	136	1/8"
1.750	5.41	2.50	2.80	2.44	0.63	1.89	3.64	3.77	3.89	3.74	3.86	–	0.58	0.93	0.37	2.51	1.58	0.47	3.12	3.21	132	136	138	1/8"
1.875	5.53	2.63	2.93	2.57	0.63	1.89	3.76	3.89	4.01	3.90	4.02	–	0.58	0.93	0.37	2.64	1.58	0.47	3.25	3.33	134	138	140	1/8"
2.000	5.74	2.75	3.18	2.69	0.63	1.89	3.97	4.10	4.22	4.15	4.27	–	0.58	0.93	0.37	2.76	1.58	0.47	3.50	3.54	136	140	142	1/8"
2.125	6.04	2.88	3.43	2.82	0.63	1.89	4.27	4.40	4.52	4.53	4.66	4.78	0.69	0.93	0.37	2.89	1.58	0.47	3.75	3.84	138	142	144	1/8"
2.250	6.14	3.00	3.55	2.94	0.63	1.89	4.38	4.51	4.63	4.56	4.69	4.81	0.69	0.93	0.37	3.01	1.58	0.47	3.87	3.94	140	144	146	1/8"
2.375	6.29	3.13	3.59	3.07	0.63	1.89	4.52	4.65	4.77	4.56	4.69	4.81	0.69	0.93	0.37	3.14	1.58	0.47	3.90	4.08	142	146	148	1/8"
2.500	6.41	3.25	3.80	3.19	0.63	1.89	4.65	4.78	4.90	4.79	4.92	5.04	0.69	0.93	0.37	3.26	1.58	0.47	4.12	4.21	144	148	150	1/8"
A	B MAX	C MIN	C MAX	D	E MIN	F	1/2"	G MIN 5/8"	3/4"	J	K	L	M	N	R	S	T	U	V	W				
2.625	7.63	3.63	4.00	3.54	0.88	2.50	5.35	5.48	5.60	1.08	1.33	3.49	2.22	0.68	4.79	231	234	236	239	1/4"				
2.750	7.76	3.75	4.13	3.67	0.88	2.50	5.48	5.60	5.73	1.08	1.33	3.61	2.22	0.68	4.92	232	235	237	240	1/4"				
2.875	7.88	3.88	4.25	3.79	0.88	2.50	5.60	5.73	5.85	1.08	1.33	3.74	2.22	0.68	5.04	233	236	238	241	1/4"				
3.000	8.01	4.00	4.44	3.92	0.88	2.50	5.73	5.85	5.98	1.08	1.33	3.86	2.22	0.68	5.17	234	237	239	242	1/4"				
3.125	8.13	4.13	4.55	4.04	0.88	2.50	5.85	5.98	6.10	1.08	1.33	3.99	2.22	0.68	5.29	235	238	240	243	1/4"				
3.250	8.26	4.25	4.69	4.17	0.88	2.50	5.98	6.10	6.23	1.08	1.33	4.11	2.22	0.68	5.42	236	239	241	244	1/4"				
3.375	8.38	4.38	4.80	4.29	0.88	2.50	6.10	6.23	6.35	1.08	1.33	4.24	2.22	0.68	5.54	237	240	242	245	1/4"				
3.500	8.51	4.50	4.94	4.42	0.88	2.50	6.23	6.35	6.48	1.08	1.33	4.36	2.22	0.68	5.67	238	241	243	246	1/4"				
3.625	8.63	4.63	5.05	4.54	0.88	2.50	6.35	6.48	6.60	1.08	1.33	4.49	2.22	0.68	5.79	239	242	244	247	1/4"				
3.750	8.76	4.75	5.14	4.67	0.88	2.50	6.48	6.60	6.73	1.08	1.33	4.61	2.22	0.68	5.92	240	243	245	248	1/4"				
3.875	8.88	4.88	5.26	4.79	0.88	2.50	6.60	6.73	6.85	1.08	1.33	4.74	2.22	0.68	6.04	241	244	246	249	1/4"				
4.000	9.01	5.00	5.44	4.92	0.88	2.50	6.73	6.85	6.98	1.08	1.33	4.86	2.22	0.68	6.17	242	245	247	250	1/4"				
4.125	9.13	5.13	5.55	5.04	0.88	2.50	6.85	6.98	7.10	1.08	1.33	4.99	2.22	0.68	6.29	243	246	248	251	1/4"				
4.250	9.18	5.25	5.69	5.17	0.88	2.50	6.89	7.02	7.14	1.08	1.33	5.11	2.22	0.68	6.33	244	247	249	252	1/4"				
4.375	9.30	5.38	5.81	5.29	0.88	2.50	7.02	7.14	7.27	1.08	1.33	5.24	2.22	0.68	6.46	245	248	250	253	1/4"				
4.500	9.43	5.50	5.94	5.42	0.88	2.50	7.14	7.27	7.39	1.08	1.33	5.36	2.22	0.68	6.58	246	249	251	254	1/4"				
4.625	9.56	5.63	6.06	5.54	0.88	2.50	7.27	7.39	7.52	1.08	1.33	5.49	2.22	0.68	6.71	247	250	252	255	1/4"				
4.750	9.76	5.75	6.22	5.67	0.88	2.50	7.47	7.60	7.72	1.08	1.33	5.61	2.22	0.68	6.91	248	251	253	256	1/4"				

255™ Standard Double Cartridge Seal – Metric



Key

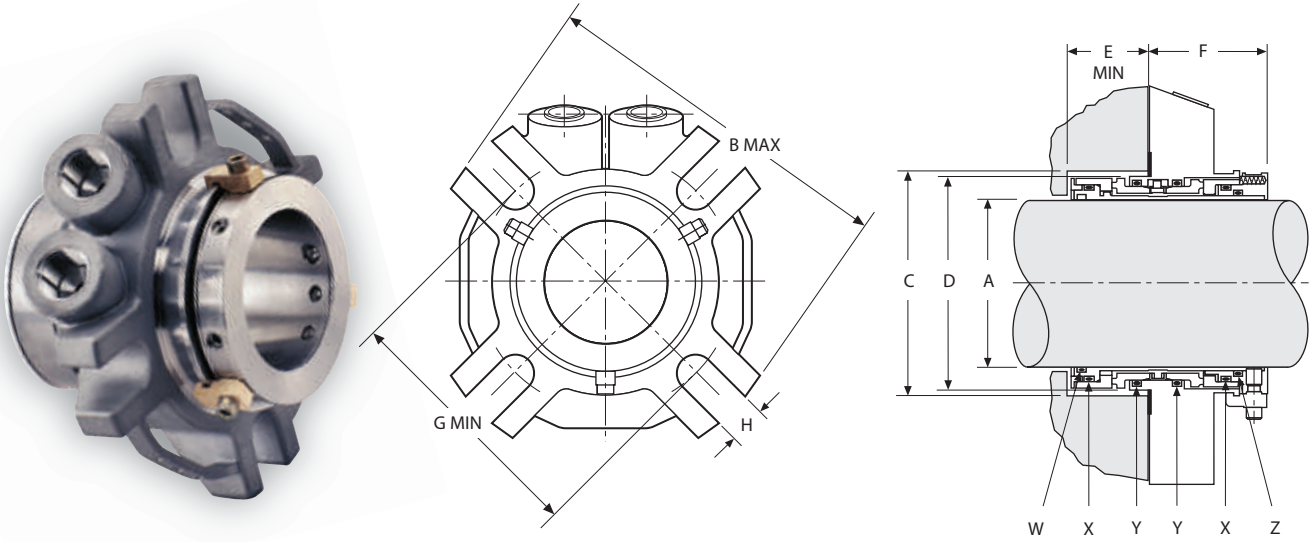
- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- W – Shaft O-Ring
- X – Rotary O-Ring (2)
- Y – Stationary Seal O-Ring (2)
- Z – Sleeve O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	8 mm	G MIN 10 mm	12 mm	H	W	X	Y	Z
25	105	44	46	43	35	55	70*	72*	74*	14	120	124	126	121
28	105	47	49	46	35	55	73*	75*	77*	14	121	126	128	123
30	105	49	51	48	35	55	76*	78*	80*	14	123	127	129	125
32	105	51	52	50	35	55	77*	79*	81*	14	124	128	131	126
33	114	54	58	53	35	55	78*	80*	82*	14	125	129	131	127
35	111	54	59	53	35	55	80*	82*	84*	14	126	130	132	128
38	114	57	62	57	35	55	83*	85*	87*	14	128	132	134	130
40	127	59	61	58	35	55	86	88*	90*	14	129	134	136	131
43	127	64	69	63	35	55	89	91*	93*	14	131	135	137	133
45	140	64	66	63	35	55	93	95*	97*	14	132	137	139	134
48	140	69	74	68	35	55	94	96*	98*	14	134	139	141	136
50	140	69	71	68	35	55	98	100	102*	14	136	140	142	137
55	153	74	76	73	35	55	–	103	105	17	139	143	145	140
60	153	79	85	79	35	55	–	113	115	17	142	146	148	144
							12 mm	16 mm	20 mm					
65	164	92	93	91	42	64	127*	131*	–	17	231	234	236	232
70	196	95	105	95	42	64	137	141	–	17	232	235	237	234
75	202	102	112	101	42	64	143	147	–	17	234	237	239	235
80	203	105	115	104	42	64	147	151	–	17	235	238	240	237
85	211	111	121	110	42	64	152	156	160*	21	237	240	242	238
90	214	114	124	114	42	64	156	160	164	21	238	241	243	240
95	221	121	131	120	42	64	161	165	169	21	240	243	245	241
100	228	127	137	126	42	64	168	172	176	21	242	245	247	243
110	237	137	147	136	42	64	177	181	185	21	245	248	250	246
120	266	146	156	145	42	64	187	191	195	21	248	251	253	249

*Two bolts only

255™ Standard Double Cartridge Seal – Inch

Mechanical Seal Dimensional Data



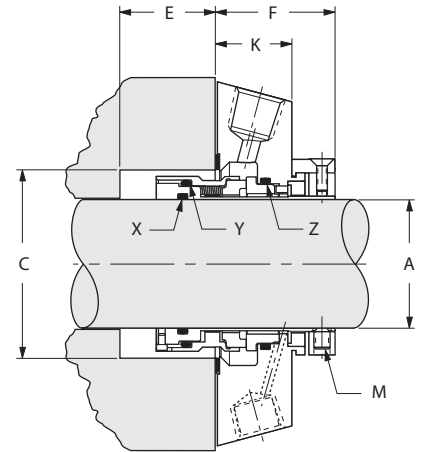
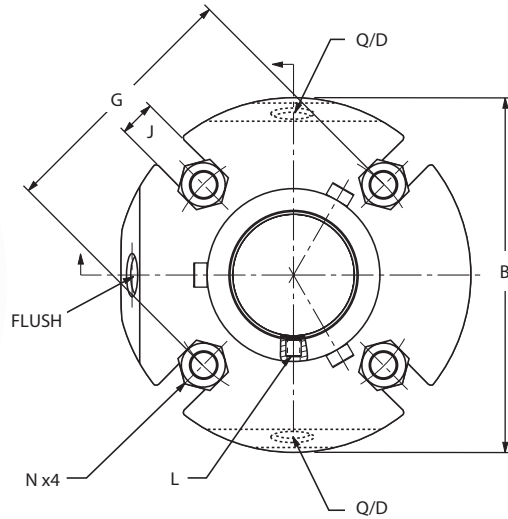
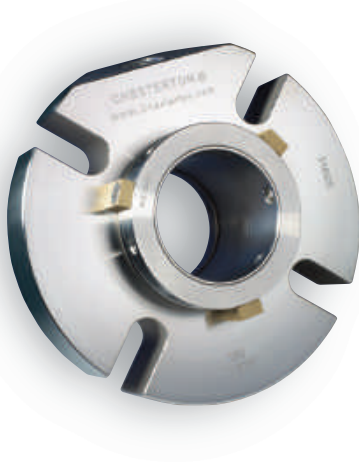
Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- W – Shaft O-Ring
- X – Rotary O-Ring (2)
- Y – Stationary Seal O-Ring (2)
- Z – Sleeve O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	3/8"	1/2"	5/8"	H	W	X	Y	Z
1.000	4.12	1.75	1.81	1.73	1.36	2.16	2.81*	2.94*	–	0.57	120	124	126	121
1.125	4.12	1.88	1.94	1.85	1.36	2.16	2.95*	3.08*	–	0.57	122	126	128	124
1.250	4.12	2.00	2.06	1.98	1.36	2.16	3.08*	3.21*	–	0.57	124	128	130	126
1.375	4.37	2.13	2.31	2.10	1.36	2.16	3.21*	3.34*	–	0.57	126	130	132	128
1.500	4.50	2.25	2.44	2.23	1.36	2.16	3.33*	3.46*	–	0.57	128	132	134	130
1.625	5.00	2.38	2.56	2.35	1.36	2.16	3.45*	3.58*	–	0.56	130	134	136	132
1.750	5.50	2.50	2.81	2.48	1.36	2.16	3.66	3.79*	–	0.56	132	136	138	134
1.875	5.50	2.63	2.94	2.60	1.36	2.16	3.78	3.91*	–	0.56	134	138	140	136
2.000	5.50	2.75	3.19	2.73	1.36	2.16	4.03	4.16	–	0.56	136	140	142	138
2.125	6.01	2.88	3.44	2.85	1.36	2.16	4.29	4.42	4.54	0.68	138	142	144	140
2.250	6.01	3.00	3.56	2.98	1.36	2.16	4.41	4.54	4.66	0.68	140	144	146	142
2.375	6.01	3.13	3.59	3.10	1.36	2.16	4.44	4.57	4.69*	0.68	142	146	148	144
2.500	6.51	3.25	3.81	3.23	1.36	2.16	4.66	4.79	4.91	0.68	144	148	150	146
							1/2"	5/8"	3/4"					
2.625	6.45	3.63	3.69	3.60	1.64	2.52	5.02*	5.15*	–	0.68	231	234	236	233
2.750	7.71	3.75	4.19	3.72	1.64	2.52	5.42	5.55	–	0.68	232	235	237	234
2.875	7.83	3.88	4.32	3.85	1.64	2.52	5.50	5.63	–	0.68	233	236	238	235
3.000	7.94	4.00	4.44	3.97	1.64	2.52	5.65	5.78	–	0.68	234	237	239	236
3.125	7.99	4.13	4.57	4.10	1.64	2.52	5.80	5.93	–	0.68	235	238	240	237
3.250	8.19	4.25	4.69	4.22	1.64	2.52	5.93	6.06	–	0.68	236	239	241	238
3.375	8.31	4.38	4.82	4.35	1.64	2.52	6.00	6.13	6.26	0.81	237	240	242	239
3.500	8.44	4.50	4.94	4.47	1.64	2.52	6.16	6.29	6.42	0.81	238	241	243	240
3.625	8.49	4.63	5.07	4.60	1.64	2.52	6.29	6.42	6.55	0.81	239	242	244	241
3.750	8.72	4.75	5.19	4.72	1.64	2.52	6.36	6.49	6.62	0.81	240	243	245	242
3.875	8.84	4.88	5.32	4.85	1.64	2.52	6.50	6.63	6.76	0.81	241	244	246	243
4.000	8.96	5.00	5.44	4.97	1.64	2.52	6.64	6.77	6.90	0.81	242	245	247	244
4.125	8.99	5.13	5.57	5.10	1.64	2.52	6.76	6.89	7.02	0.81	243	246	248	245
4.250	8.99	5.25	5.69	5.22	1.64	2.52	6.89	7.02	7.15	0.81	244	247	249	246
4.375	9.34	5.38	5.82	5.35	1.64	2.52	7.01	7.14	7.27	0.81	245	248	250	247
4.500	9.49	5.50	5.94	5.47	1.64	2.52	7.16	7.29	7.42	0.81	246	249	251	248
4.625	9.49	5.63	6.07	5.60	1.64	2.52	7.26	7.39	7.52	0.81	247	250	252	249
4.750	10.49	5.75	6.19	5.72	1.64	2.52	7.38	7.51	7.64	0.81	248	251	253	250

*Two bolts only

150 General Purpose Single Cartridge Seal – Metric



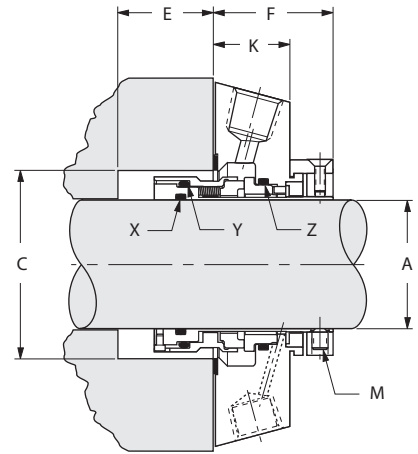
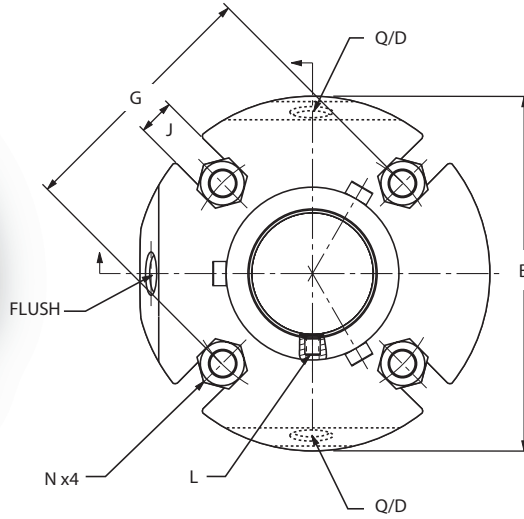
Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- J – Slot Width
- K – Gland Width
- X – Shaft O-Ring
- Y – Rotary Seal O-Ring
- Z – Stationary Seal O-Ring

A	B	C MIN	C MAX	E MIN	F	G MIN				J	K	X	Y	Z
						10 mm	12 mm	16 mm	20 mm					
25	104	41	51	19,8	46,0	73	–	–	–	11,2	28	120	027	126
28	104	44	52	19,8	46,0	73	–	–	–	11,2	28	122	028	128
30	104	46	57	19,8	46,0	78	–	–	–	11,2	28	123	029	129
32	104	48	58	19,8	46,0	80	–	–	–	11,2	28	124	029	130
33	113	49	59	19,8	46,0	81	83	–	–	14,5	28	125	030	131
35	111	51	59	19,8	46,0	80	82*	–	–	14,5	28	126	030	132
38	114	57	67	23,4	44,5	85	87	–	–	14,5	28	128	134	135
40	126	59	68	23,4	44,5	90	92	–	–	13,6	28	129	135	137
43	126	62	69	23,4	44,5	91	93	–	–	13,6	28	131	137	139
45	139	64	73	23,4	44,5	95	97	–	–	13,6	28	133	138	140
48	139	67	73	23,4	44,5	95	97	–	–	13,6	28	134	140	142
50	139	69	78	23,4	44,5	100	102	–	–	13,6	28	136	142	143
53	152	73	87	23,4	44,5	109	111	115	–	17,5	28	138	144	145
55	152	74	83	23,4	44,5	105	107	111	–	17,5	28	139	145	146
58	152	80	91	23,4	44,5	114	116	120	–	17,5	28	141	148	149
60	152	80	91	23,4	44,5	114	116	120	–	17,5	28	142	148	149
63	165	83	97	23,4	44,5	119	121	125	–	17,5	28	144	150	151
65	164	86	100	23,4	44,5	125	127	131	–	17,5	28	145	151	151
68	165	86	100	23,4	44,5	125	127	131	–	17,5	28	147	151	152
70	196	96	111	35,1	57,1	–	137	141	–	17,5	37	232	236	238
75	202	102	119	35,1	57,1	–	143	147	–	17,5	37	234	238	240
80	203	106	122	35,1	57,1	–	147	151	–	17,5	37	236	239	241
85	211	111	128	35,1	57,1	–	152	156	160	20,6	37	237	241	243
90	214	116	132	35,1	57,1	–	156	160	164	20,6	37	239	242	244
95	221	121	137	35,1	57,1	–	161	165	169	20,6	37	240	244	246
100	228	127	144	35,1	57,1	–	168	172	176	20,6	37	242	246	248
105	228	131	148	35,1	57,1	–	172	176	180	20,6	37	243	247	249
110	237	137	154	35,1	57,1	–	177	181	185	20,6	37	245	249	251
115	241	143	160	35,1	57,1	–	182	186	190	20,6	37	247	251	253
120	266	146	164	35,1	57,1	–	187	191	195	20,6	37	248	252	254

*Minimum Bolt Circle requires D Washers.

150 General Purpose Single Cartridge Seal – Inch



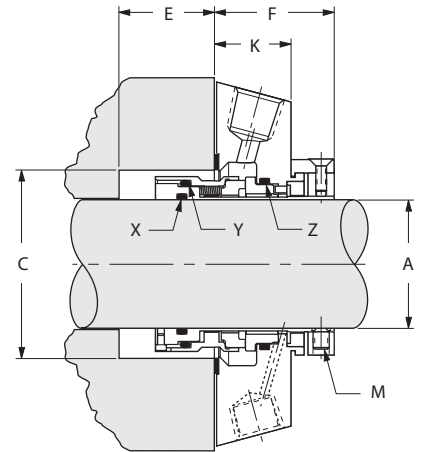
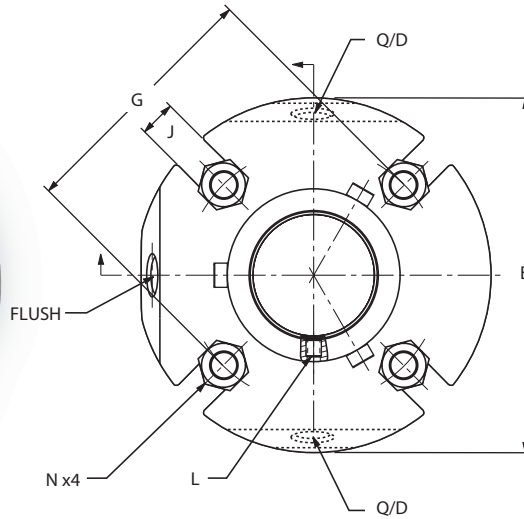
Key

- A – Shaft Size
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- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- J – Slot Width
- K – Gland Width
- X – Shaft O-Ring
- Y – Rotary Seal O-Ring
- Z – Stationary Seal O-Ring

A	B	C MIN	C MAX	D MAX	E	F	3/8"	G MIN	1/2"	5/8"	J	K	X	Y	Z
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

*Minimum Bolt Circle requires D Washers.

150 General Purpose Single Cartridge Seal – Inch



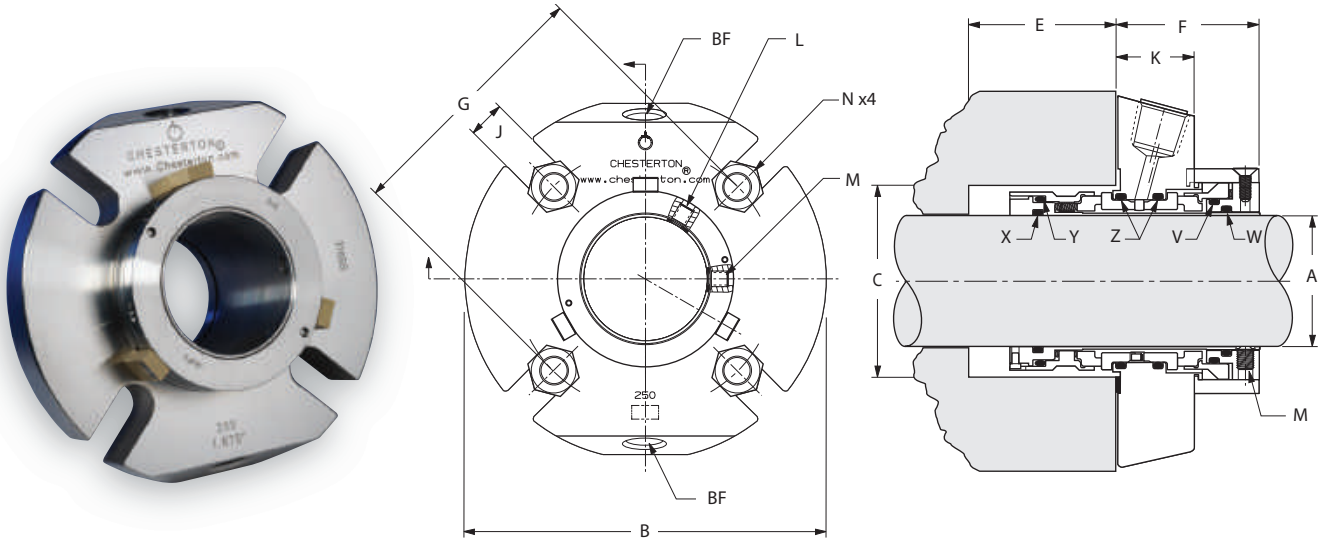
Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- J – Slot Width
- K – Gland Width
- X – Shaft O-Ring
- Y – Rotary Seal O-Ring
- Z – Stationary Seal O-Ring

A	B	C MIN	C MAX	D MAX	E	F	1/2"	G MIN 5/8"	3/4"	J	K	X	Y	Z
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 D Washers.

250 General Purpose Double Cartridge Seal – Metric

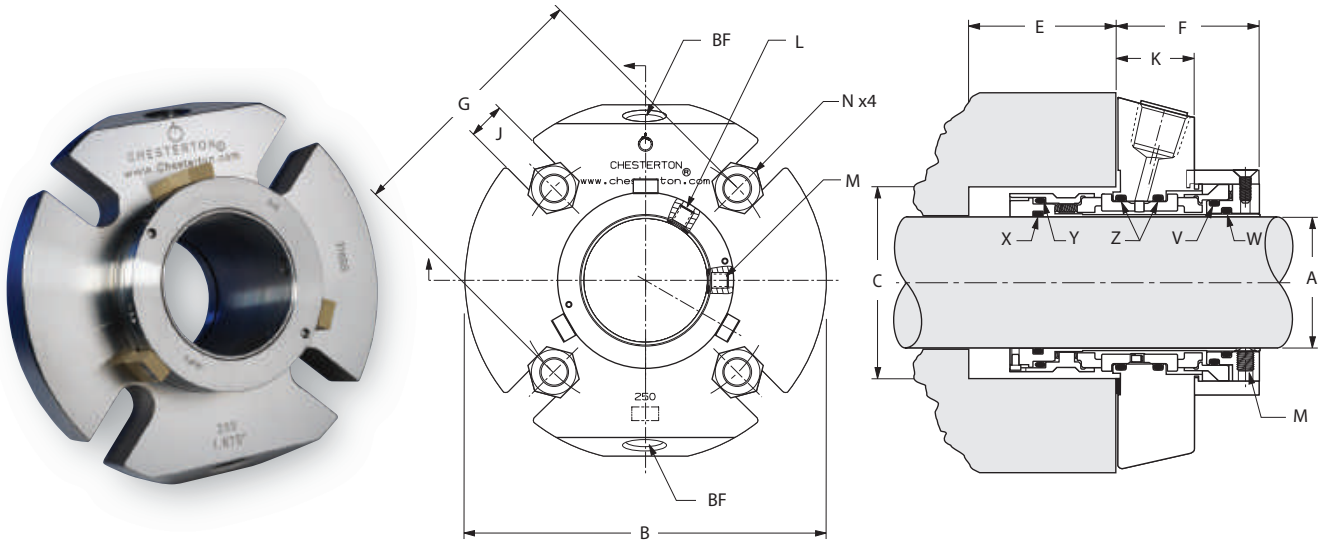


Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- J – Slot Width
- K – Gland Width
- V – Spacer O-Ring
- W – Sleeve O-Ring
- X – Shaft O-Ring
- Y – Rotary Seal O-Ring (2)
- Z – Stationary Seal O-Ring (2)

A	B	C		E MAX	F	G MIN			J	K	V	W	X	Y	Z
		MIN	MAX			10 mm	12 mm	16 mm							
25	104	41	51	36.6	52.3	73	–	–	11.2	28	123	122	120	027	126
28	104	44	52	36.6	52.3	73	–	–	11.2	28	125	123	122	028	128
30	104	46	57	36.6	52.3	78	–	–	11.2	28	126	125	123	029	129
32	104	48	58	36.6	52.3	80	–	–	11.2	28	127	126	124	029	130
33	113	49	59	36.6	52.3	81	83	–	14.5	28	128	127	125	030	131
35	111	51	59	36.6	52.3	80	82	–	14.5	28	129	128	126	030	132
38	114	57	67	38.8	52.3	85	87	–	14.5	29	133	130	128	134	135
40	126	59	68	38.8	52.3	90	92	–	13.6	29	134	131	129	135	137
43	126	62	69	38.8	52.3	91	93	–	13.6	29	136	133	131	137	139
45	139	64	73	38.8	52.3	95	97	–	13.6	29	137	134	133	138	140
48	139	67	73	38.8	52.3	95	97	–	13.6	29	139	136	134	140	142
50	139	69	78	38.8	52.3	100	102	–	13.6	29	140	137	136	142	143
53	152	73	87	38.8	52.3	109	111	115	17.5	29	143	140	138	144	145
55	152	74	83	38.8	52.3	105	107	111	17.5	29	143	141	139	145	146
58	152	80	91	38.8	52.3	114	116	120	17.5	29	147	144	141	148	149
60	152	80	91	38.8	52.3	114	116	120	17.5	29	147	144	142	148	149
63	165	83	97	38.8	52.3	119	121	125	17.5	29	149	146	144	150	151
65	164	86	100	38.8	52.3	125	127	131	17.5	29	150	148	145	151	151
68	165	86	100	38.8	52.3	125	127	131	17.5	29	151	149	147	151	152
						12 mm	16 mm	20 mm							
70	196	96	111	58.2	63.5	137	141	–	17.5	35.8	235	234	232	236	238
75	202	102	119	58.2	63.5	143	147	–	17.5	35.8	237	236	234	238	240
80	203	106	122	58.2	63.5	147	151	–	17.5	35.8	238	237	236	239	241
85	211	111	128	58.2	63.5	152	156	160	20.6	35.8	240	239	237	241	243
90	214	116	132	58.2	63.5	156	160	164	20.6	35.8	241	240	239	242	244
95	221	121	137	58.2	63.5	161	165	169	20.6	35.8	243	242	240	244	246
100	228	127	145	58.2	63.5	168	172	176	20.6	35.8	245	244	242	246	248
105	228	131	148	58.2	63.5	172	176	180	20.6	35.8	246	245	243	247	249
110	237	137	154	58.2	63.5	177	181	185	20.6	35.8	248	247	245	249	251
115	241	143	160	58.2	63.5	182	186	190	20.6	35.8	250	249	247	251	253
120	266	146	164	58.2	63.5	187	191	195	20.6	35.8	251	250	248	252	254

250 General Purpose Double Cartridge Seal – Inch



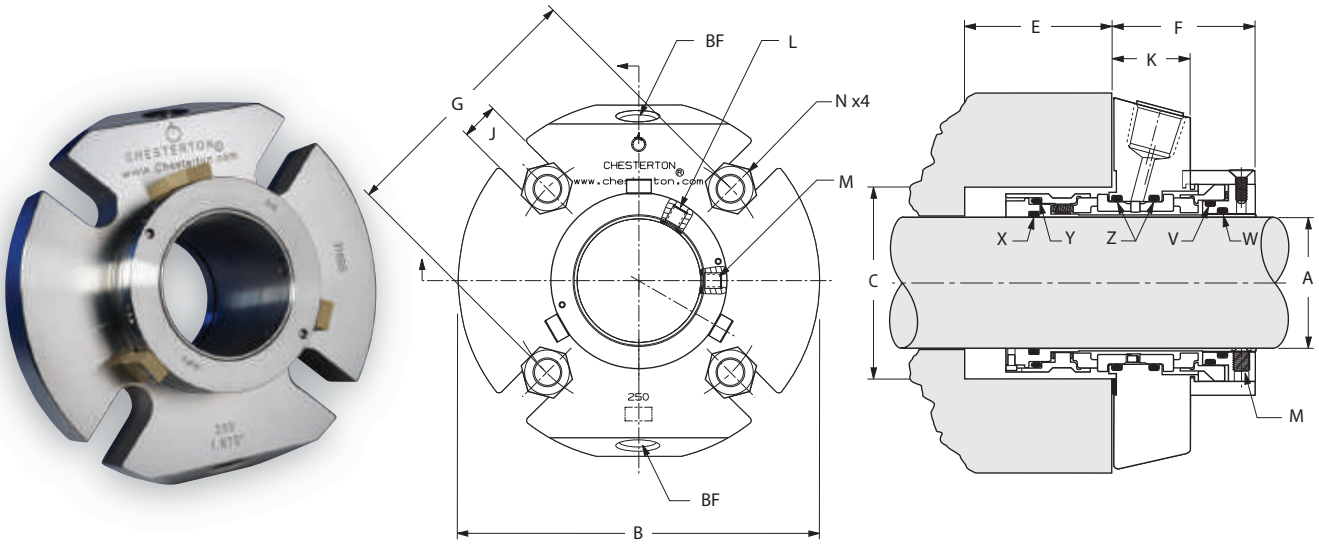
Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- J – Slot Width
- K – Gland Width
- V – Spacer O-Ring
- W – Sleeve O-Ring
- X – Shaft O-Ring
- Y – Rotary Seal O-Ring (2)
- Z – Stationary Seal O-Ring (2)

A	B	C MIN	C MAX	E MAX	F	3/8"	G MIN 1/2"	5/8"	J	K	V	W	X	Y	Z
0.938	4.11	1.63	2.01	1.44	2.06	2.88	–	–	0.44	1.12	123	122	119	027	126
1.000	4.11	1.63	2.01	1.44	2.06	2.88	–	–	0.44	1.12	123	122	120	027	126
1.063	4.11	1.75	2.04	1.44	2.06	2.88	–	–	0.44	1.12	125	123	121	028	128
1.125	4.11	1.75	2.04	1.44	2.06	2.88	–	–	0.44	1.12	125	124	122	028	128
1.125 OS	4.49	2.50	2.75	1.44	2.06	3.71	–	–	0.44	1.12	125	124	122	028	128
1.188	4.11	1.88	2.27	1.44	2.06	3.12	–	–	0.44	1.12	127	126	123	029	130
1.250	4.11	1.88	2.27	1.44	2.06	3.12	–	–	0.44	1.12	127	126	124	029	130
1.313	4.36	2.00	2.33	1.44	2.06	3.13	3.25	–	0.57	1.12	129	128	125	030	132
1.375	4.36	2.00	2.33	1.44	2.06	3.13	3.25	–	0.57	1.12	129	128	126	030	132
1.375 OS	5.39	2.68	3.00	1.44	2.06	4.03	–	–	0.44	1.12	129	128	126	030	132
1.438	4.49	2.25	2.62	1.53	2.06	3.33	3.45	–	0.57	1.12	133	130	128	134	135
1.500	4.49	2.25	2.62	1.53	2.06	3.33	3.45	–	0.57	1.12	133	130	128	134	135
1.563	4.99	2.38	2.68	1.53	2.06	3.52	3.65	–	0.57	1.12	134	131	129	135	137
1.625	4.99	2.38	2.68	1.53	2.06	3.52	3.65	–	0.57	1.12	135	132	130	136	137
1.688	5.49	2.50	2.81	1.53	2.06	3.62	3.75	–	0.57	1.12	136	133	131	137	139
1.750	5.49	2.50	2.81	1.53	2.06	3.62	3.75	–	0.57	1.12	137	134	132	138	139
1.750 OS	6.64	3.37	3.75	1.53	2.06	4.63	4.75	–	0.57	1.12	137	134	132	138	139
1.813	5.49	2.63	2.94	1.53	2.06	3.75	3.87	–	0.57	1.12	138	136	134	140	141
1.875	5.49	2.63	2.94	1.53	2.06	3.75	3.87	–	0.57	1.12	138	136	134	140	141
1.875 OS	5.99	3.42	3.81	1.53	2.06	–	4.80	–	0.57	1.12	138	136	134	140	141
1.938	5.49	2.75	3.19	1.53	2.06	4.00	4.13	–	0.57	1.12	140	137	136	141	143
2.000	5.49	2.75	3.19	1.53	2.06	4.00	4.13	–	0.57	1.12	141	138	136	142	143
2.063	5.99	2.88	3.44	1.53	2.06	4.25	4.38	4.50	0.69	1.12	143	140	138	144	145
2.125	5.99	2.88	3.44	1.53	2.06	4.25	4.38	4.50	0.69	1.12	143	140	138	144	145
2.125 OS	6.99	3.75	4.25	1.53	2.06	–	–	5.37	0.69	1.12	143	140	138	144	145
2.188	5.99	3.00	3.56	1.53	2.06	4.37	4.50	4.62	0.69	1.12	145	142	140	146	147
2.250	5.99	3.00	3.56	1.53	2.06	4.37	4.50	4.62	0.69	1.12	145	142	140	146	147
2.313	5.99	3.13	3.59	1.53	2.06	4.43	4.56	4.68	0.69	1.12	147	144	142	148	149
2.375	5.99	3.13	3.59	1.53	2.06	4.43	4.56	4.68	0.69	1.12	147	144	142	148	149
2.375 OS	8.40	4.13	4.50	1.53	2.06	–	–	5.62	0.69	1.12	147	144	142	148	149
2.438	6.49	3.25	3.81	1.53	2.06	4.62	4.75	4.87	0.69	1.12	149	146	144	150	151
2.500	6.49	3.25	3.81	1.53	2.06	4.62	4.75	4.87	0.69	1.12	149	146	144	150	151
2.500 OS	7.77	4.37	4.75	1.53	2.06	–	–	6.37	0.69	1.12	149	146	144	150	151
2.563	6.45	3.38	3.94	1.53	2.06	4.90	5.02	5.15	0.69	1.12	150	148	146	151	152
2.625	6.45	3.38	3.94	1.53	2.06	4.90	5.02	5.15	0.69	1.12	150	148	146	151	152
2.625 OS	6.98	4.38	4.78	1.53	2.06	–	–	5.90	0.69	1.12	150	148	146	151	152

250 General Purpose Double Cartridge Seal – Inch

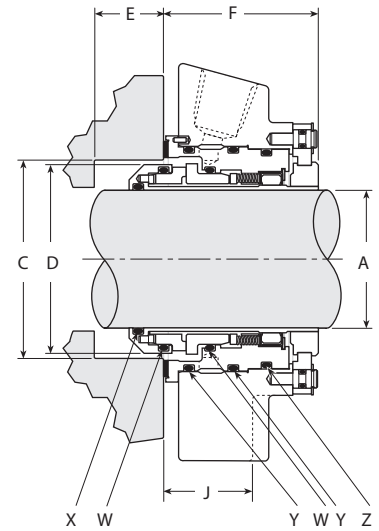
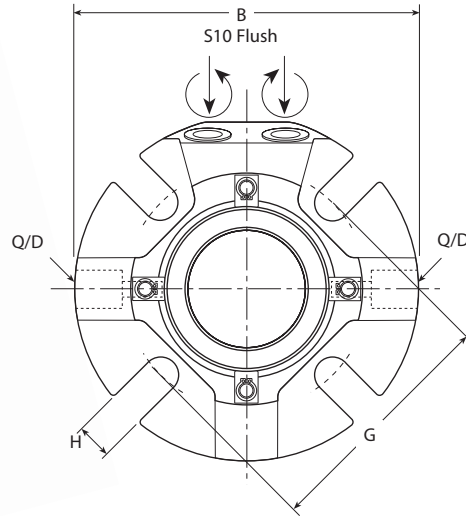
Mechanical Seal Dimensional Data



Key																
A – Shaft Size	F – Outboard Seal Length	V – Spacer O-Ring	Z – Stationary Seal O-Ring (2)													
B – Gland Outside Diameter	G – Minimum Bolt Circle by Bolt Size	W – Sleeve O-Ring														
C – Seal Chamber Bore	J – Slot Width	X – Shaft O-Ring														
E – Seal Chamber Depth	K – Gland Width	Y – Rotary Seal O-Ring (2)														

A	B	C MIN	C MAX	E MAX	F	3/8"	G MIN 1/2"	5/8"	J	K	V	W	X	Y	Z
2.688	7.70	3.75	4.38	2.29	2.50	5.42	5.55	–	0.69	1.41	235	234	232	236	238
2.750	7.70	3.75	4.38	2.29	2.50	5.42	5.55	–	0.69	1.41	235	234	232	236	238
2.813	7.83	3.88	4.50	2.29	2.50	5.50	5.62	–	0.69	1.41	236	235	233	237	239
2.875	7.83	3.88	4.50	2.29	2.50	5.50	5.62	–	0.69	1.41	236	235	233	237	239
2.938	7.94	4.00	4.69	2.29	2.50	5.65	5.77	–	0.69	1.41	237	236	234	238	240
3.000	7.94	4.00	4.69	2.29	2.50	5.65	5.77	–	0.69	1.41	237	236	234	238	240
3.000 OS	8.64	4.93	5.39	2.29	2.50	6.88	7.00	7.13	0.94	1.41	237	236	234	238	240
3.063	7.99	4.13	4.81	2.29	2.50	5.80	5.92	–	0.69	1.41	238	237	235	239	241
3.125	7.99	4.13	4.81	2.29	2.50	5.80	5.92	–	0.69	1.41	238	237	235	239	241
3.188	8.19	4.25	4.94	2.29	2.50	5.93	6.05	–	0.69	1.41	239	238	236	240	242
3.250	8.19	4.25	4.94	2.29	2.50	5.93	6.05	–	0.69	1.41	239	238	236	240	242
3.313	8.30	4.38	5.06	2.29	2.50	6.02	6.14	6.27	0.81	1.41	240	239	237	241	243
3.375	8.30	4.38	5.06	2.29	2.50	6.02	6.14	6.27	0.81	1.41	240	239	237	241	243
3.438	8.44	4.50	5.19	2.29	2.50	6.18	6.31	6.43	0.81	1.41	241	240	238	242	244
3.500	8.44	4.50	5.19	2.29	2.50	6.18	6.31	6.43	0.81	1.41	241	240	238	242	244
3.563	8.49	4.63	5.31	2.29	2.50	6.31	6.44	6.56	0.81	1.41	242	241	239	243	245
3.625	8.49	4.63	5.31	2.29	2.50	6.31	6.44	6.56	0.81	1.41	242	241	239	243	245
3.688	8.71	4.75	5.39	2.29	2.50	6.38	6.51	6.63	0.81	1.41	243	242	240	244	246
3.750	8.71	4.75	5.39	2.29	2.50	6.38	6.51	6.63	0.81	1.41	243	242	240	244	246
3.750 OS	9.76	5.08	6.40	2.29	2.50	8.13	8.25	–	0.69	1.41	243	242	240	244	246
3.813	8.84	4.88	5.51	2.29	2.50	6.52	6.64	6.77	0.81	1.41	244	243	241	245	247
3.875	8.84	4.88	5.51	2.29	2.50	6.52	6.64	6.77	0.81	1.41	244	243	241	245	247
3.938	8.96	5.00	5.69	2.29	2.50	6.66	6.78	6.91	0.81	1.41	245	244	242	246	248
4.000	8.96	5.00	5.69	2.29	2.50	6.66	6.78	6.91	0.81	1.41	245	244	242	246	248
4.063	8.99	5.13	5.81	2.29	2.50	6.78	6.91	7.03	0.81	1.41	246	245	243	247	249
4.125	8.99	5.13	5.81	2.29	2.50	6.78	6.91	7.03	0.81	1.41	246	245	243	247	249
4.188	8.99	5.25	5.94	2.29	2.50	6.91	7.04	7.16	0.81	1.41	247	246	244	248	250
4.250	8.99	5.25	5.94	2.29	2.50	6.91	7.04	7.16	0.81	1.41	247	246	244	248	250
4.313	9.33	5.38	6.06	2.29	2.50	7.03	7.15	7.28	0.81	1.41	248	247	245	249	251
4.375	9.33	5.38	6.06	2.29	2.50	7.03	7.15	7.28	0.81	1.41	248	247	245	249	251
4.438	9.49	5.50	6.19	2.29	2.50	7.18	7.30	7.43	0.81	1.41	249	248	246	250	252
4.500	9.49	5.50	6.19	2.29	2.50	7.18	7.30	7.43	0.81	1.41	249	248	246	250	252
4.563	9.49	5.63	6.31	2.29	2.50	7.28	7.40	7.53	0.81	1.41	250	249	247	251	253
4.625	9.49	5.63	6.31	2.29	2.50	7.28	7.40	7.53	0.81	1.41	250	249	247	251	253
4.688	10.49	5.75	6.47	2.29	2.50	7.40	7.53	7.65	0.81	1.41	251	250	248	252	254
4.750	10.49	5.75	6.47	2.29	2.50	7.40	7.53	7.65	0.81	1.41	251	250	248	252	254

S10 High Performance Single Cassette Seal – Metric



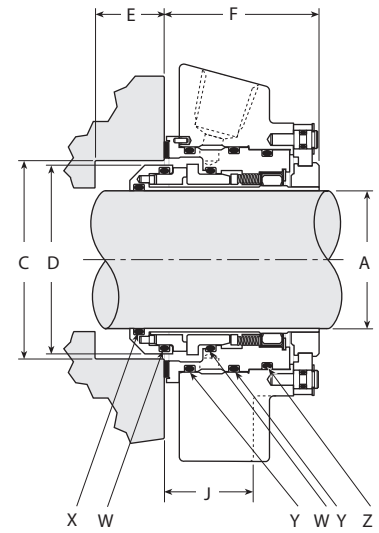
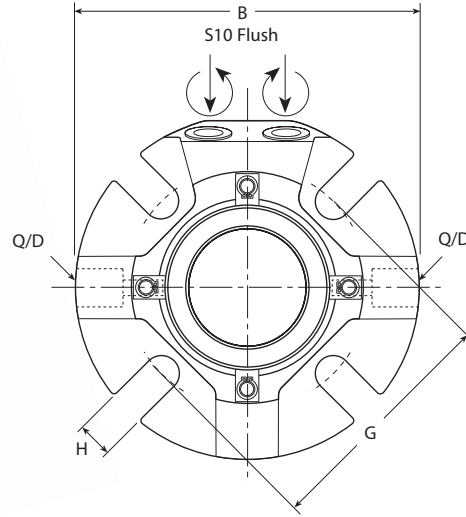
Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – Seal Outside Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Seal Chamber to Bolt Surface
- W – Rotary and Stationary O-Rings
- X – Shaft O-Ring
- Y – IB & OB Cassette O-Rings
- Z – Quench O-Ring

A	B MAX	C MIN	C MAX	D	E MIN	F	G MIN			H	J	X	W †	Y	Z
							10 mm	12 mm	16 mm						
25	104	41,0	51,1	39,9	13,0	52	73,0**	–	–	11,5	30,4	120	028	133	133
28	104	44,0	51,8	42,4	13,0	52	73,0	–	–	13,5	30,4	122	029	135	135
30	104	46,0	56,6	44,5	13,0	52	78,0	–	–	13,5	30,4	123	030	136	136
32	104	48,0	57,7	46,5	13,0	52	80,0	–	–	13,5	30,4	124	030	138	137
33	113	49,0	58,8	47,4	13,0	52	80,0	83,0**	–	15,0	30,4	125	031	138	138
35	111	51,0	59,2	49,4	13,0	52	82,0	83,7**	–	15,0	30,4	126	031	139	139
38	114	57,2	62,0	55,6	13,5	54	84,0	89,9**	–	13,5	30,4	128	135	143*	142*
40	127	60,0	68,3	57,5	13,5	54	89,2	91,7**	–	13,5	30,4	129	136	144*	143*
43	127	63,0	68,8	60,5	13,5	54	91,9	94,7**	–	13,5	30,4	131	138	146*	145*
45	140	65,0	73,4	62,5	13,5	54	94,2	96,8**	–	13,5	30,4	133	140	147*	146*
48	140	68,0	73,8	65,5	13,5	54	97,0	99,8**	–	13,5	30,4	134	142	149*	148*
50	140	70,0	78,5	67,5	13,5	54	99,3	101,9**	–	17,5	30,4	136	143	150*	149*
53	153	75,0	83,6	72,5	13,5	54	104,4	106,4**	112,0**	17,5	30,4	137	146	152	151
55	153	75,0	83,6	72,5	13,5	54	104,4	106,4**	112,0**	17,5	30,4	139	146	152	151
60	153	80,0	92,2	77,8	13,5	54	112,8	114,8	118,9**	17,5	30,4	142	149	153	152
65	164	88,9	100,1	84,2	13,5	54	124,0	126,0	129,8	17,5	30,4	145	5-557	154	153
							12 mm	16 mm	20 mm						
70	196	95,0	110,0	93,0	21	63	137,0	141**	–	17,0	41,0	232	237	242	241
75	202	104,0	119,0	99,0	21	63	143,0	147**	–	17,0	41,0	234	239	244	243
80	203	109,0	122,0	103,0	21	63	150,0	154**	–	17,0	41,0	236	240	245	244
85	211	114,0	128,0	109,0	21	63	152,0	156**	161,0	20,0	41,0	237	242	247	246
90	214	119,0	132,0	113,0	21	63	160,0	164	168,0	20,0	41,0	239	244	248	247
95	221	124,0	137,0	118,0	21	63	161,0	165**	170,0	20,0	41,0	240	245	250	249
100	228	129,0	144,0	125,0	21	63	168,0	172**	177,0	20,0	41,0	242	247	252	251
110	237	137,0	154,0	134,0	21	63	178,0	182**	186,0	20,0	41,0	245	250	255	254
120	266	146,0	164,0	144,0	21	63	187,0	191**	196,0	20,0	41,0	248	253	257	256

* Use next size larger for Style 76 O-Rings
 ** Minimum Bolt Circle requires D Washers.
 † The S10 uses a quantity of 2 O-Rings and the S20 uses a quantity of 4 O-Rings.

S10 High Performance Single Cassette Seal – Inch



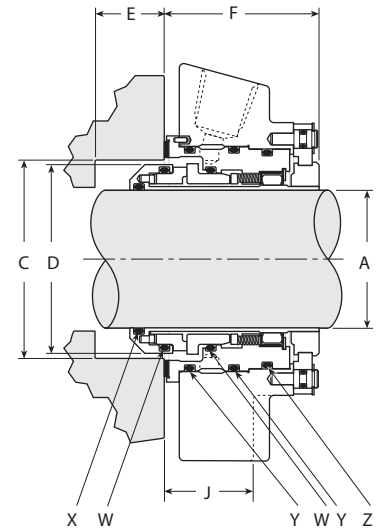
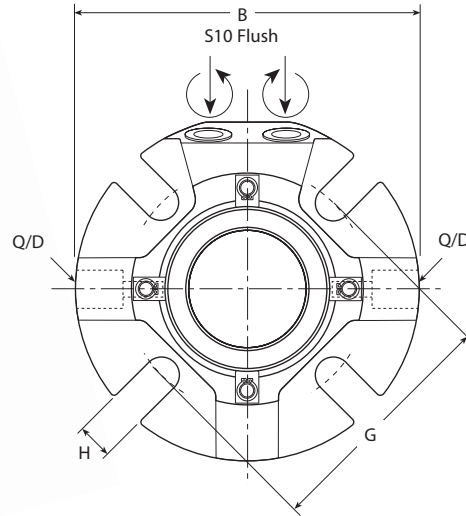
Key

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- D – Seal Outside Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Seal Chamber to Bolt Surface
- W – Rotary and Stationary O-Rings
- X – Shaft O-Ring
- Y – IB & OB Cassette O-Rings
- Z – Quench O-Ring

A	B MAX	C MIN	C MAX	D	E MIN	F	3/8"	G MIN 1/2"	5/8"	H	J	X	W †	Y	Z
1.000	4.10	1.63	2.01	1.57	0.51	2.05	2.88	–	–	0.44	1.20	120	028	133	133
1.125	4.10	1.75	2.04	1.69	0.51	2.05	2.88**	–	–	0.44	1.20	122	029	135	135
1.125 05	4.50	2.63	2.94	1.69	0.51	2.05	3.71	–	–	0.44	1.20	122	029	135	135
1.250	4.10	1.88	2.27	1.83	0.51	2.05	3.13	–	–	0.44	1.20	124	030	138	137
1.375	4.40	2.00	2.33	1.94	0.51	2.05	3.14**	3.33**	–	0.57	1.20	126	031	139	139
1.375 05	5.40	2.81	3.00	1.94	0.51	2.05	4.03	–	–	0.44	1.21	126	031	139	139
1.500	4.50	2.25	2.44	2.19	0.53	2.11	3.31**	3.55**	–	0.57	1.20	128	135	143*	142*
1.625	5.00	2.38	2.70	2.31	0.53	2.11	3.49**	3.68**	–	0.57	1.20	130	137	145*	144*
1.750	5.50	2.50	2.81	2.44	0.53	2.11	3.61**	3.80**	–	0.57	1.20	132	139	147*	146*
1.750 05	6.64	3.50	3.75	2.44	0.53	2.11	5.38	5.50	–	0.57	1.20	132	139	147*	146*
1.875	5.50	2.63	2.94	2.56	0.53	2.11	3.74**	3.93**	–	0.57	1.20	134	141	149*	148*
1.875 05	5.99	3.56	3.81	2.56	0.53	2.11	–	5.00	–	0.57	1.20	134	141	149*	148*
2.000	5.50	2.75	3.19	2.69	0.53	2.11	3.99	4.12**	–	0.57	1.20	136	143	150*	149*
2.125	6.00	2.88	3.44	2.81	0.53	2.11	4.24	4.37	4.49**	0.69	1.20	138	145	152	151
2.125 05	6.99	3.88	4.25	2.81	0.22	2.42	–	4.49	5.25	0.69	1.51	138	145	152	151
2.250	6.00	3.00	3.56	2.94	0.53	2.11	4.36	4.49	4.61**	0.69	1.20	140	147	152	151
2.375	6.00	3.13	3.62	3.06	0.53	2.11	4.42	4.55	4.68**	0.69	1.20	142	149	153	152
2.500	6.50	3.25	3.81	3.19	0.53	2.11	4.61	4.74	4.86**	0.69	1.20	144	151	153	152
2.500 05	7.77	4.50	4.75	3.19	0.53	2.11	–	6.63	6.75**	0.69	1.20	144	151	153	152
2.625	6.50	3.38	3.94	3.31	0.53	2.11	4.86	4.99	5.11	0.69	1.20	146	5-557	154	153
2.625 05	6.99	4.55	4.88	3.31	0.53	2.11	–	5.88	6.00	0.69	1.20	146	5-557	154	153

* Use next size larger for Style 76 O-Rings
 ** Minimum Bolt Circle requires D Washers.
 † The S10 uses a quantity of 2 O-Rings and the S20 uses a quantity of 4 O-Rings.

S10 High Performance Single Cassette Seal – Inch



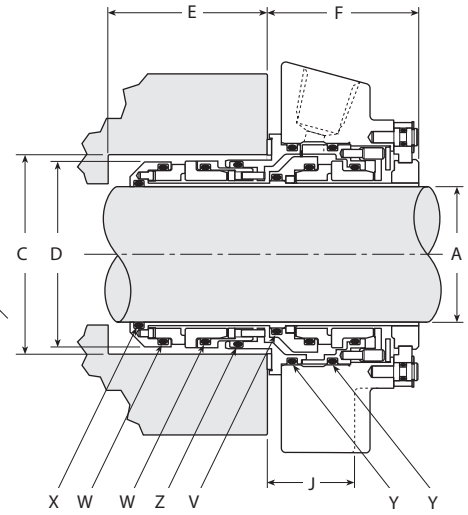
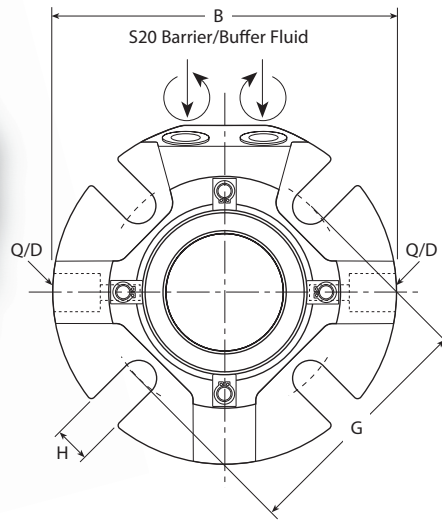
Key

- A – Shaft Size
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- D – Seal Outside Diameter
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- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Seal Chamber to Bolt Surface
- W – Rotary and Stationary O-Rings
- X – Shaft O-Ring
- Y – IB & OB Cassette O-Rings
- Z – Quench O-Ring

A	B	C MIN	C MAX	D	S20 E MIN	S10 E MIN	F	G MIN			H	J	X	Y	W †	S20		S10 Z
								1/2"	5/8"	3/4"						IB HOUSING	ROTARY HOLDER	
2.750	7.70	3.75	4.36	3.67	2.50	0.83	2.50	5.40	5.53	—	0.69	1.60	232	242	237	238	234	241
2.875	7.83	3.88	4.50	3.79	2.50	0.83	2.50	5.48	5.61	—	0.69	1.60	233	243	238	239	235	242
3.000	7.94	4.00	4.69	3.91	2.50	0.83	2.50	5.63	5.76	—	0.69	1.60	234	244	239	240	236	243
3.125	7.99	4.13	4.80	4.04	2.50	0.83	2.50	5.78	5.91	—	0.69	1.60	235	245	240	240	237	244
3.250	8.19	4.25	4.94	4.16	2.50	0.83	2.50	5.91	6.04	—	0.69	1.60	236	246	241	242	238	245
3.375	8.30	4.38	5.05	4.29	2.50	0.83	2.50	5.98	6.11	6.23	0.69	1.60	237	247	242	243	239	246
3.500	8.44	4.50	5.19	4.41	2.50	0.83	2.50	6.15	6.27	6.40	0.81	1.60	238	248	243	244	240	247
3.625	8.49	4.63	5.30	4.54	2.50	0.83	2.50	6.28	6.40	6.53	0.81	1.60	239	249	244	245	241	248
3.750	8.71	4.75	5.39	4.66	2.50	0.83	2.50	6.35	6.47	6.60	0.81	1.60	241	250	245	246	242	249
3.875	8.84	4.88	5.51	4.79	2.50	0.83	2.50	6.48	6.61	6.73	0.81	1.60	241	251	246	247	243	250
4.000	8.96	5.00	5.69	4.91	2.50	0.83	2.50	6.62	6.75	6.87	0.81	1.60	242	252	247	248	244	251
4.125	8.99	5.13	5.80	5.04	2.50	0.83	2.50	6.74	6.87	6.99	0.81	1.60	243	253	248	249	245	252
4.250	8.99	5.25	5.94	5.16	2.50	0.83	2.50	6.88	7.00	7.13	0.81	1.60	244	254	249	250	246	253
4.375	9.33	5.38	6.06	5.29	2.50	0.83	2.50	6.99	7.12	7.24	0.81	1.60	245	255	250	251	247	254
4.500	9.49	5.50	6.19	5.41	2.50	0.83	2.50	7.14	7.27	7.39	0.81	1.60	246	256	251	252	248	255
4.625	9.49	5.63	6.31	5.40	2.50	0.83	2.50	7.24	7.37	7.49	0.81	1.60	247	257	252	253	249	256
4.750	10.49	5.75	6.47	5.66	2.50	0.83	2.50	7.37	7.49	7.62	0.81	1.60	248	257	253	254	250	256

† The S10 uses a quantity of 2 O-Rings and the S20 uses a quantity of 4 O-Rings.

S20 High Performance Double Cassette Seal – Metric



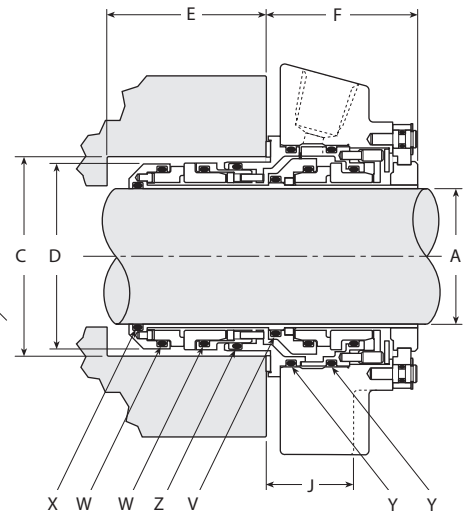
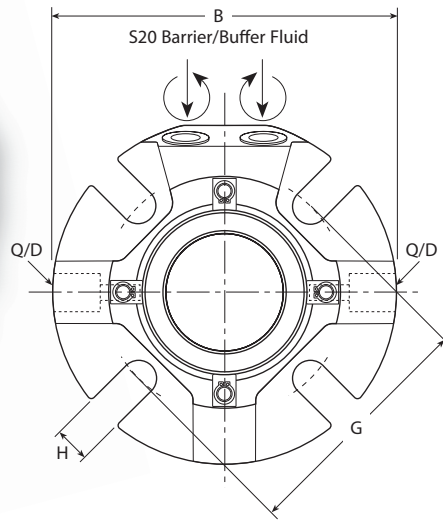
Key

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- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Seal Chamber to Bolt Surface
- V – Rotary Holder
- W – Rotary and Stationary O-Rings
- X – Shaft O-Ring
- Y – IB & OB Cassette O-Rings
- Z – Inboard Housing

A	B MAX	C MIN	C MAX	D	E MIN	F	10 mm	G MIN 12 mm	16 mm	H	J	V	W †	X	Y	Z
25	104	41.0	51.1	39.9	48	52	73.0**	–	–	11.5	30.4	025	028	120	133	029
28	104	44.0	51.8	42.4	48	52	73.0	–	–	13.5	30.4	027	029	122	135	030
30	104	46.0	56.6	44.5	48	52	78.0	–	–	13.5	30.4	028	030	123	136	030
32	104	48.0	57.7	46.5	48	52	80.0	–	–	13.5	30.4	029	030	124	138	031
33	113	49.0	58.8	47.4	48	52	80.0	83.0**	–	15.0	30.4	029	031	125	138	031
35	111	51.0	59.2	49.4	48	52	82.0	83.7**	–	15.0	30.4	030	031	126	139	032
38	114	57.2	62.0	55.6	50	54	84.0	89.9**	–	13.5	30.4	130	135	128	143*	136
40	127	60.0	68.3	57.5	50	54	89.2	91.7**	–	13.5	30.4	131	136	129	144*	137
43	127	63.0	68.8	60.5	50	54	91.9	94.7**	–	13.5	30.4	133	138	131	146*	139
45	140	65.0	73.4	62.5	50	54	94.2	96.8**	–	13.5	30.4	135	140	133	147*	141
48	140	68.0	73.8	65.5	50	54	97.0	99.8**	–	13.5	30.4	136	142	134	149*	143
50	140	70.0	78.5	67.5	50	54	99.3	101.9**	–	17.5	30.4	138	143	136	150*	144
53	153	75.0	83.6	72.5	50	54	104.4	106.4**	112.0**	17.5	30.4	141	146	137	152	147
55	153	75.0	83.6	72.5	50	54	104.4	106.4**	112.0**	17.5	30.4	141	146	139	152	147
60	153	80.0	92.2	77.8	50	54	112.8	114.8	118.9**	17.5	30.4	144	149	142	153	150
65	164	88.9	100.1	84.2	50	54	124.0	126.0	129.8	17.5	30.4	148	5-557	145	154	5-557
70	196	95.0	110	93	63	63	137	141**	–	17	41	234	237	232	242	238
75	202	104	119	99	63	63	143	147**	–	17	41	236	239	234	244	239
80	203	109	122	103	63	63	150	154**	–	17	41	238	240	236	245	241
85	211	114	128	109	63	63	152	156**	161	20	41	239	242	237	247	243
90	214	119	132	113	63	63	160	164	168	20	41	240	244	239	248	244
95	221	124	137	118	63	63	161	165**	170	20	41	242	245	240	250	246
100	228	129	144	125	63	63	168	172**	177	20	41	244	247	242	252	248
110	237	137	154	134	63	63	178	182**	186	20	41	247	250	245	255	251
120	266	146	164	144	63	63	187	191**	196	20	41	250	253	248	257	254

* Use next size larger for Style 76 O-Rings
 ** Minimum Bolt Circle requires D Washers
 † The S10 uses a quantity of 2 O-Rings and the S20 uses a quantity of 4 O-Rings

S20 High Performance Double Cassette Seal – Inch



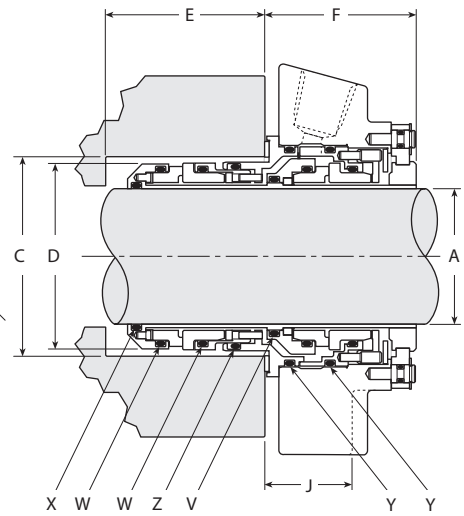
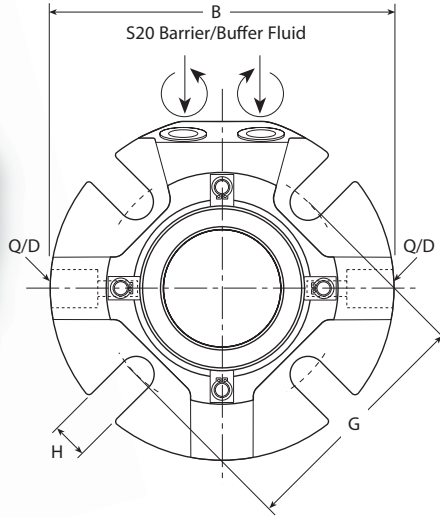
Key

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- J – Seal Chamber to Bolt Surface
- V – Rotary Holder
- W – Rotary and Stationary O-Rings
- X – Shaft O-Ring
- Y – IB & OB Cassette O-Rings
- Z – Inboard Housing

A	B MAX	C MIN	C MAX	D	E MIN	F	3/8"	G MIN 1/2"	5/8"	H	J	V	W †	X	Y	Z
1.000	4.10	1.63	2.01	1.57	1.88	2.05	2.88	–	–	0.44	1.20	025	028	120	133	029
1.125	4.10	1.75	2.04	1.69	1.88	2.05	2.88**	–	–	0.44	1.20	027	029	122	135	030
1.125 OS	4.50	2.63	2.94	1.69	1.82	2.05	3.71	–	–	0.44	1.20	027	029	122	135	030
1.250	4.10	1.88	2.27	1.83	1.88	2.05	3.13	–	–	0.44	1.20	029	030	124	138	031
1.375	4.40	2.00	2.33	1.94	1.88	2.05	3.14**	3.33**	–	0.57	1.20	030	031	126	139	032
1.375 OS	5.40	2.81	3.00	1.94	1.82	2.05	4.03	–	–	0.44	1.21	030	031	126	139	032
1.500	4.50	2.25	2.44	2.19	1.97	2.11	3.31**	3.55**	–	0.57	1.20	130	135	128	143*	136
1.625	5.00	2.38	2.70	2.31	1.97	2.11	3.49**	3.68**	–	0.57	1.20	132	137	130	145*	138
1.750	5.50	2.50	2.81	2.44	1.97	2.11	3.61**	3.80**	–	0.57	1.20	134	139	132	147*	140
1.750 OS	6.64	3.50	3.75	2.44	1.97	2.11	5.38	5.50	–	0.57	1.20	134	139	132	147*	140
1.875	5.50	2.63	2.94	2.56	1.97	2.11	3.74**	3.93**	–	0.57	1.20	136	141	134	149*	142
1.875 OS	5.99	3.56	3.81	2.56	1.97	2.11	–	5.00	–	0.57	1.20	136	141	134	149*	142
2.000	5.50	2.75	3.19	2.69	1.97	2.11	3.99	4.12**	–	0.57	1.20	138	143	136	150*	144
2.125	6.00	2.88	3.44	2.81	1.97	2.11	4.24	4.37	4.49**	0.69	1.20	140	145	138	152	146
2.125 OS	6.99	3.88	4.25	2.81	1.66	2.42	–	4.49	5.25	0.69	1.51	140	145	138	152	146
2.250	6.00	3.00	3.56	2.94	1.97	2.11	4.36	4.49	4.61**	0.69	1.20	142	147	140	152	148
2.375	6.00	3.13	3.62	3.06	1.97	2.11	4.42	4.55	4.68**	0.69	1.20	144	149	142	153	150
2.500	6.50	3.25	3.81	3.19	1.97	2.11	4.61	4.74	4.86**	0.69	1.20	146	151	144	153	151
2.500 OS	7.77	4.50	4.75	3.19	1.97	2.11	–	6.63	6.75**	0.69	1.20	146	151	144	153	151
2.625	6.50	3.38	3.94	3.31	1.97	2.11	4.86	4.99	5.11	0.69	1.20	148	5-557	146	154	5-557
2.625 OS	6.99	4.55	4.88	3.31	1.97	2.11	–	5.88	6.00	0.69	1.20	148	5-557	146	154	5-557

* Use next size larger for Style 76 O-Rings
 ** Minimum Bolt Circle requires D Washers
 † The S10 uses a quantity of 2 O-Rings and the S20 uses a quantity of 4 O-Rings

S20 High Performance Double Cassette Seal – Inch



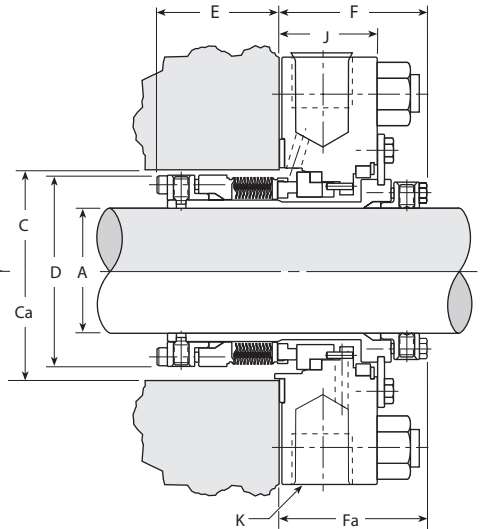
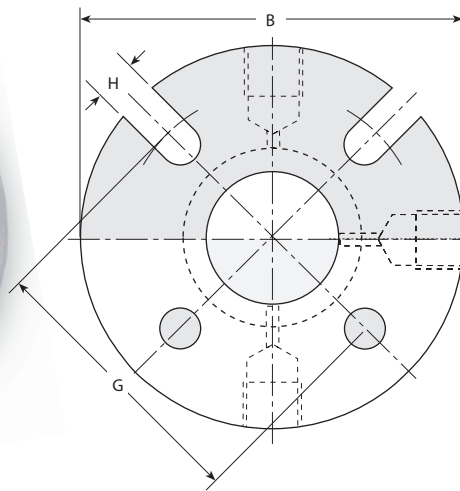
Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – Seal Outside Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Seal Chamber to Bolt Surface
- V – Rotary Holder
- W – Rotary and Stationary O-Rings
- X – Shaft O-Ring
- Y – IB & OB Cassette O-Rings
- Z – Inboard Housing

A	B	C MIN	C MAX	D	S20 E MIN	S10 E MIN	F	G MIN			H	J	X	Y	W †	S20		S10 Z
								1/2"	5/8"	3/4"						IB HOUSING	ROTARY HOLDER	
2.750	7.70	3.75	4.36	3.67	2.50	0.83	2.50	5.40	5.53	—	0.69	1.60	232	242	237	238	234	241
2.875	7.83	3.88	4.50	3.79	2.50	0.83	2.50	5.48	5.61	—	0.69	1.60	233	243	238	239	235	242
3.000	7.94	4.00	4.69	3.91	2.50	0.83	2.50	5.63	5.76	—	0.69	1.60	234	244	239	240	236	243
3.125	7.99	4.13	4.80	4.04	2.50	0.83	2.50	5.78	5.91	—	0.69	1.60	235	245	240	240	237	244
3.250	8.19	4.25	4.94	4.16	2.50	0.83	2.50	5.91	6.04	—	0.69	1.60	236	246	241	242	238	245
3.375	8.30	4.38	5.05	4.29	2.50	0.83	2.50	5.98	6.11	6.23	0.69	1.60	237	247	242	243	239	246
3.500	8.44	4.50	5.19	4.41	2.50	0.83	2.50	6.15	6.27	6.40	0.81	1.60	238	248	243	244	240	247
3.625	8.49	4.63	5.30	4.54	2.50	0.83	2.50	6.28	6.40	6.53	0.81	1.60	239	249	244	245	241	248
3.750	8.71	4.75	5.39	4.66	2.50	0.83	2.50	6.35	6.47	6.60	0.81	1.60	241	250	245	246	242	249
3.875	8.84	4.88	5.51	4.79	2.50	0.83	2.50	6.48	6.61	6.73	0.81	1.60	241	251	246	247	243	250
4.000	8.96	5.00	5.69	4.91	2.50	0.83	2.50	6.62	6.75	6.87	0.81	1.60	242	252	247	248	244	251
4.125	8.99	5.13	5.80	5.04	2.50	0.83	2.50	6.74	6.87	6.99	0.81	1.60	243	253	248	249	245	252
4.250	8.99	5.25	5.94	5.16	2.50	0.83	2.50	6.88	7.00	7.13	0.81	1.60	244	254	249	250	246	253
4.375	9.33	5.38	6.06	5.29	2.50	0.83	2.50	6.99	7.12	7.24	0.81	1.60	245	255	250	251	247	254
4.500	9.49	5.50	6.19	5.41	2.50	0.83	2.50	7.14	7.27	7.39	0.81	1.60	246	256	251	252	248	255
4.625	9.49	5.63	6.31	5.40	2.50	0.83	2.50	7.24	7.37	7.49	0.81	1.60	247	257	252	253	249	256
4.750	10.49	5.75	6.47	5.66	2.50	0.83	2.50	7.37	7.49	7.62	0.81	1.60	248	257	253	254	250	256

† The S10 uses a quantity of 2 O-Rings and the S20 uses a quantity of 4 O-Rings

186HT High-Temperature Bellows Single Cartridge Seal – Metric



Key

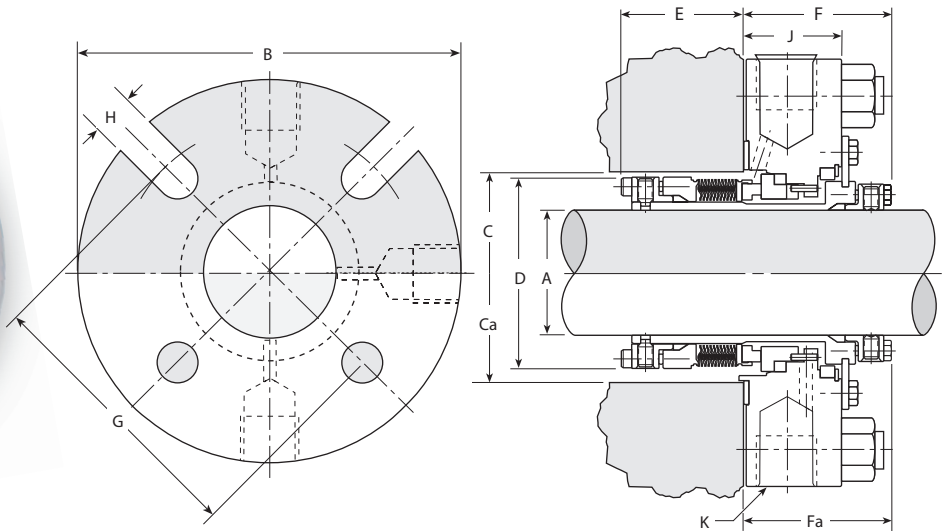
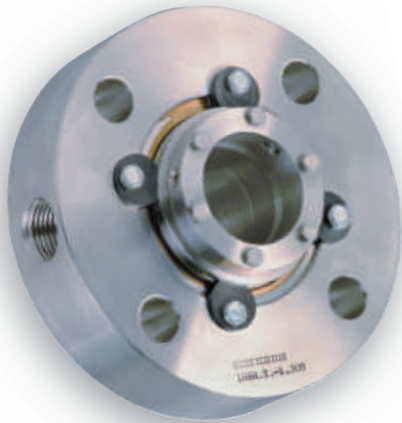
- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Gland Width
- K – NPT Size

A	B MAX	C MIN	Ca* MIN	D MAX	E MIN	F MAX	Fa** MAX	10 mm	G MIN 12 mm	16 mm	H MAX	J MAX	K
25	1,08	48	54	46	42	49	52	76	78	–	13	32	3/8"
30	1,08	51	57	49	42	49	52	79	82	–	13	32	3/8"
32	1,14	57	60	55	43	49	52	81	99	–	13	32	3/8"
35	1,21	60	67	58	43	50	54	89	92	–	14	34	3/8"
38	1,33	64	70	61	43	50	54	92	95	–	14	34	1/2"
40	1,40	67	73	65	43	50	54	95	98	–	14	34	1/2"
42	1,40	67	73	65	43	50	54	95	98	–	14	34	1/2"
45	1,46	70	76	68	43	50	54	98	101	–	14	34	1/2"
50	1,59	76	80	74	46	52	55	108	111	114	18	35	1/2"
55	1,59	79	89	77	46	52	55	111	114	117	18	35	1/2"
60	1,65	86	92	84	46	54	57	114	117	120	18	37	1/2"
65	1,65	89	95	87	46	54	57	117	120	123	18	37	1/2"

* Minimum bore diameter Ca for ID Pilot

** API OB Length Fa with Pilot design and metallic face gasket

186HT High-Temperature Bellows Single Cartridge Seal – Inch



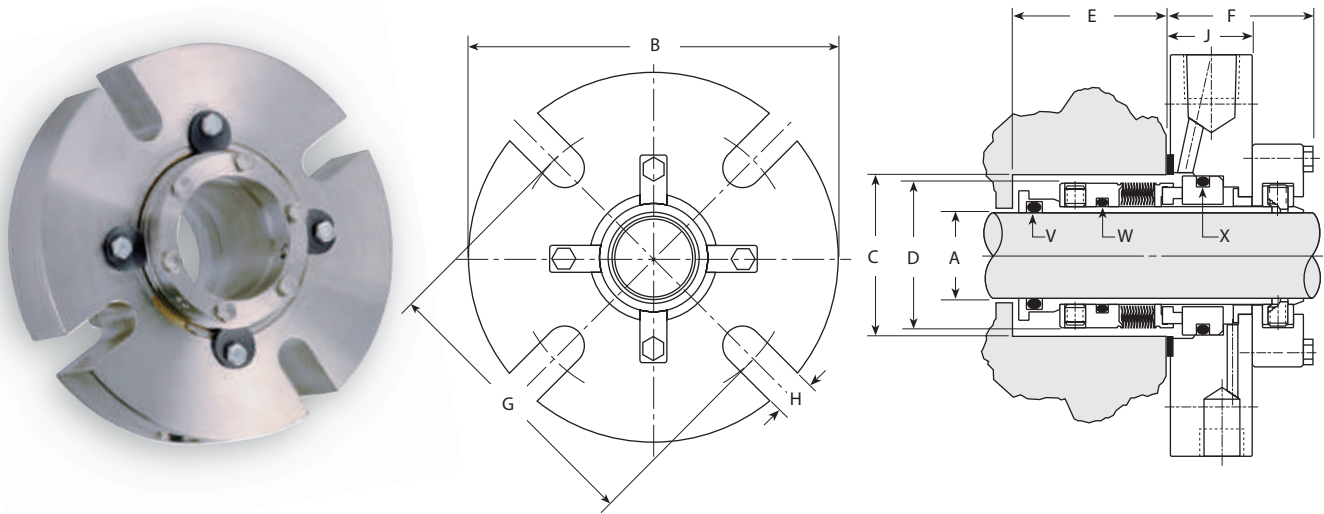
Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Gland Width
- K – NPT Size

A	B MAX	C MIN	Ca* MIN	D MAX	E MIN	F MAX	Fa** MAX	3/8"	G MIN 1/2"	5/8"	H MAX	J MAX	K
1.125	4.25	2.00	2.25	1.94	1.64	1.92	2.05	3.12	3.24	–	0.50	1.26	3/8"
1.125-X	4.25	1.88†	2.13	0.81	1.58	1.92	2.05	2.87	–	–	0.44	1.26	3/8"
1.250	4.50	2.25	2.38	2.17	1.68	1.92	2.05	3.19	3.31	–	0.50	1.26	3/8"
1.375	4.75	2.38	2.63	2.30	1.68	1.99	2.11	3.49	3.62	–	0.56	1.32	3/8"
1.375 OS	5.25	2.88	3.00	2.30	1.68	1.99	2.11	3.92	–	–	0.44	1.32	1/2"
1.375-X	4.25	2.13††	2.38	2.06	1.64	1.92	2.05	3.24	–	–	0.44	1.26	3/8"
1.500	5.25	2.50	2.75	2.42	1.68	1.99	2.11	3.62	3.74	–	0.56	1.32	1/2"
1.625	5.50	2.63	2.88	2.55	1.68	1.99	2.11	3.74	3.87	–	0.56	1.32	1/2"
1.750	5.75	2.75	3.00	2.67	1.68	1.99	2.11	3.87	3.99	–	0.56	1.32	1/2"
1.750 OS	6.50	3.50	3.63	2.67	1.68	1.99	2.11	4.92	5.04	5.17	0.69	1.32	1/2"
1.875	6.00	2.88	3.25	2.80	1.80	2.05	2.17	4.12	4.24	–	0.56	1.38	1/2"
1.875 OS	6.00	3.63	3.75	2.80	1.38	2.47	2.60	4.79	4.92	–	0.56	1.81	1/2"
2.000	6.25	3.00	3.38	2.92	1.80	2.05	2.17	4.24	4.37	4.49	0.69	1.38	1/2"
2.125	6.25	3.13	3.50	3.05	1.80	2.05	2.17	4.37	4.49	4.62	0.69	1.38	1/2"
2.125 OS	7.25	3.88	4.00	3.05	1.80	2.05	2.17	4.92	5.04	5.17	0.69	1.38	1/2"
2.250	6.50	3.25	3.63	3.19	1.80	2.05	2.17	4.49	4.62	4.74	0.69	1.38	1/2"
2.375	6.50	3.38	3.63	3.31	1.80	2.11	2.24	4.49	4.62	4.74	0.69	1.45	1/2"
2.500	6.50	3.50	3.75	3.44	1.80	2.11	2.24	4.62	4.74	4.87	0.69	1.45	1/2"
2.500 OS	8.00	4.75	4.88	3.44	1.80	2.11	2.24	6.42	6.54	6.67	0.69	1.45	1/2"
2.625	6.75	3.75	4.00	3.63	1.83	2.11	2.24	4.87	4.99	5.12	0.69	1.45	1/2"
2.625 OS	7.00	4.63	4.75	3.63	1.83	2.11	2.24	5.79	5.92	–	0.56	1.45	1/2"

* Minimum bore diameter Ca for ID Pilot
 ** API OB Length Fa with Pilot design and metallic face gasket

186 Bellows Single Cartridge Seal – Inch

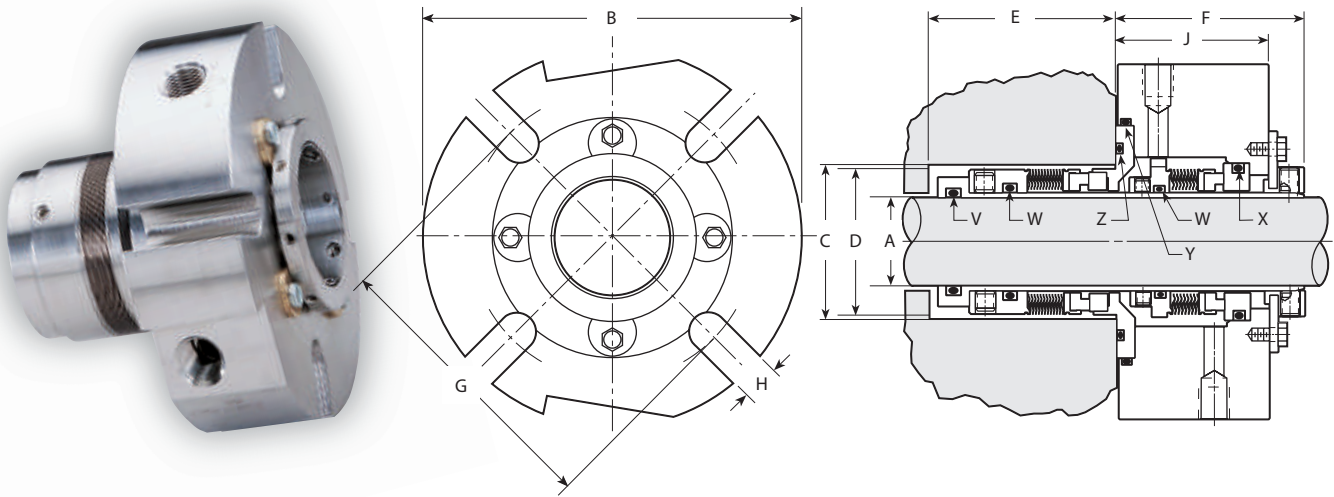


Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Gland Width
- V – Shaft O-Ring
- W – Rotary O-Ring
- X – Stationary O-Ring

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

286 Bellows Double Cartridge Seal – Inch

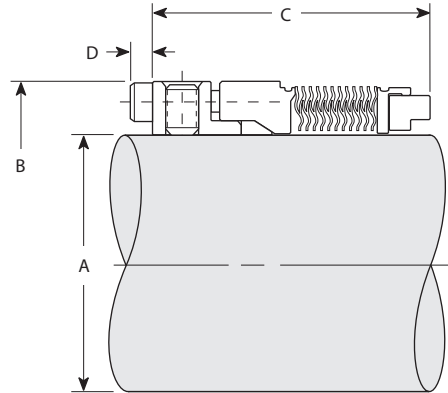


Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Gland Width
- V – Shaft O-Ring
- W – Rotary O-Ring
- X – Stationary O-Ring
- Y – Gland O-Ring
- Z – Seal Chamber O-Ring

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

886HT High-Temperature Rotary Bellows Seal



Key			
A – Shaft Size	B – Seal Diameter	C – Operating Length	D – Screw Head Protrusion

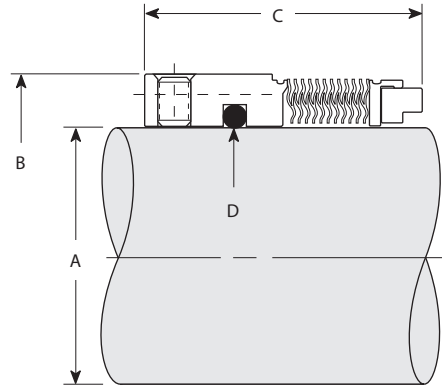
Metric

A	B	C	D
25	39,7	42,8	3,2
28	42,8	39,7	3,2
30	46,0	42,8	3,2
32	46,0	42,8	3,2
33	49,2	44,5	3,2
35	49,2	44,5	3,2
38	55,1	44,5	4,2
40	58,3	44,5	4,2
43	61,5	44,5	4,2
45	62,3	44,5	4,2
48	64,6	44,5	4,2
50	67,8	44,5	4,2
53	71,1	44,5	4,2
55	74,2	47,6	4,2
60	77,3	47,6	4,2
63	80,9	47,6	4,2
65	84,1	47,6	4,2

Inch

A	B	C	D
1.000	1.562	1.687	0.125
1.125	1.687	1.562	0.125
1.250	1.812	1.562	0.125
1.375	1.937	1.750	0.125
1.500	2.170	1.750	0.164
1.625	2.295	1.750	0.164
1.750	2.420	1.750	0.164
1.875	2.545	1.750	0.164
2.000	2.670	1.750	0.164
2.250	2.920	1.875	0.164
2.375	3.045	1.875	0.164
2.500	3.187	1.875	0.164
2.625	3.312	1.875	0.164

886 Rotary Bellows Seal – Inch



Key

A – Shaft Size

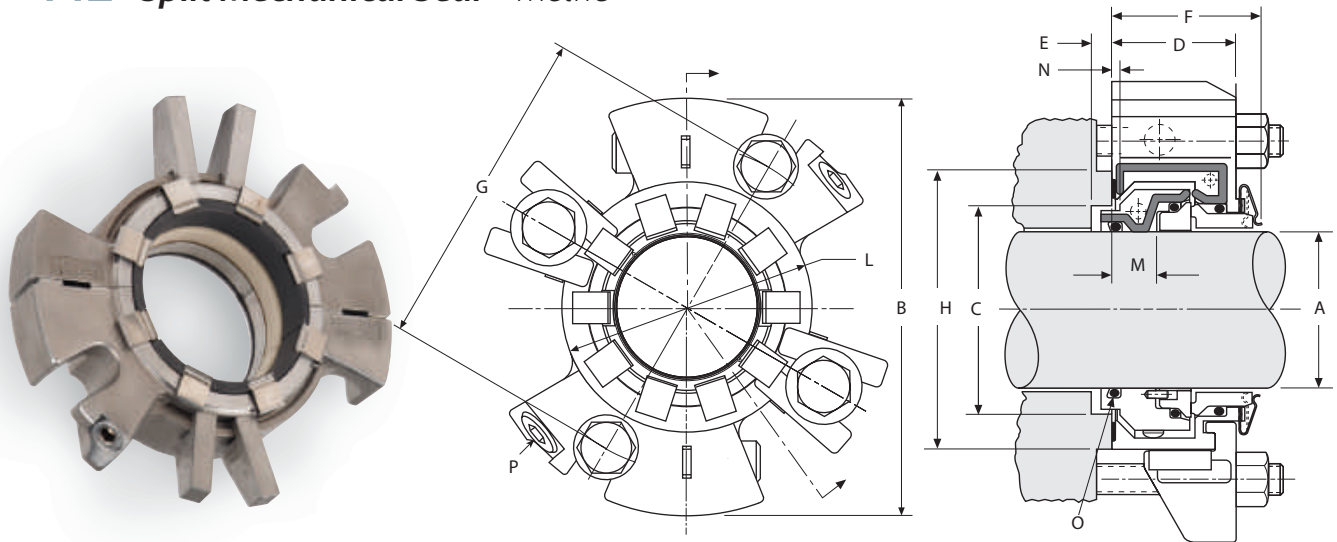
B – Seal Diameter

C – Operating Length

D – O-Ring

A	B	C	D
0.750	1.457	1.250	116
0.875	1.457	1.250	118
1.000	1.457	1.250	120
1.125	1.687	1.250	123
1.250	1.812	1.312	124
1.250 OS	1.694	1.312	124
1.375	1.937	1.437	126
1.500	2.062	1.437	128
1.500 OS	1.944	1.437	128
1.625	2.187	1.437	130
1.750	2.312	1.437	132
1.875	2.497	1.500	134
2.000	2.562	1.500	226
2.125	2.687	1.500	138
2.250	2.812	1.562	140
2.375	2.937	1.562	142
2.500	3.187	1.562	144
2.625	3.312	1.625	146
2.750	3.437	1.625	148
2.875	3.625	1.687	150
3.000	3.750	1.687	151
3.125	3.875	1.750	235
3.250	4.000	1.750	236
3.375	4.125	1.750	237
3.500	4.250	1.875	238
3.625	4.375	1.875	239
3.750	4.500	1.875	240
3.875	4.625	1.875	244
4.000	4.750	1.875	242
4.125	5.125	1.875	243
4.250	5.125	1.875	244
4.375	5.375	1.875	245
4.500	5.375	1.875	246
4.625	5.625	1.875	247
4.750	5.625	1.875	248

442™ Split Mechanical Seal – Metric



Mechanical Seal Dimensional Data

Key				
A – Shaft Size	D – Gland Length	G – Minimum Bolt Circle by Bolt Size	L – Hub Gland	O – Shaft O-Ring
B – Gland Outside Diameter	E – Seal Chamber Depth	H – Minimum Seal Chamber Face Outside Diameter	M – Holder Bore from Box (Pg 71)	P – NPT Size (Pg 71)
C – Seal Chamber Bore	F – Outboard Seal Length		N – Installation Dimension (Pg 71)	

A	B MAX	C MIN	C MAX	D	E MIN	F	G MIN										H MIN	L MAX	O
							8 mm	10 mm	12 mm	14 mm	16 mm	18 mm	20 mm	22 mm					
32	125,5	47,2	53,3	37,6	4,3	45,2	79,8	81,8	83,8	85,8	87,8	-	-	-	59,9	70,9	-219		
33	125,5	47,2	53,3	37,6	4,3	45,2	79,8	81,8	83,8	85,8	87,8	-	-	-	59,9	70,9	-220		
35	127,4	49,3	60,5	37,6	4,3	45,2	81,8	83,8	85,8	87,8	89,8	-	-	-	66,8	72,8	-221		
38	130,5	52,3	63,5	37,6	4,3	45,2	85,0	87,0	89,0	91,0	93,0	-	-	-	69,9	76,0	-223		
40	133,6	55,6	66,8	37,6	4,3	45,2	87,4	89,4	91,4	93,4	95,4	-	-	-	73,2	79,0	-223		
43	136,8	58,7	70,0	37,6	4,3	45,2	90,5	92,5	94,5	96,5	98,5	-	-	-	76,2	82,0	-224		
45	136,8	58,7	70,0	37,6	4,3	45,2	90,5	92,5	94,5	96,5	98,5	-	-	-	76,2	82,0	-225		
48	140,0	62,0	73,2	37,6	4,3	45,2	97,7	95,7	97,7	99,7	101,7	-	-	-	79,5	85,2	-226		
50	143,2	65,0	76,2	37,6	4,3	45,2	98,4	100,4	102,4	104,4	106,4	-	-	-	82,6	88,4	-226		
55	146,3	68,3	79,2	37,6	4,3	45,2	101,6	103,6	105,6	107,6	109,6	-	-	-	85,9	91,5	-228		
60	152,6	74,7	85,6	37,6	4,3	45,2	107,8	109,8	111,8	113,8	115,8	-	-	-	92,2	97,9	-230		
65	197,5	85,1	108,0	46,7	6,6	56,9	-	-	140,6	142,6	144,6	-	-	-	120,7	126,9	-231		
70	197,5	85,1	108,0	46,7	6,6	56,9	-	-	140,6	142,6	144,6	-	-	-	120,7	126,9	-233		
75	203,8	91,4	114,3	46,7	6,6	56,9	-	-	146,2	148,2	150,2	-	-	-	127,0	133,2	-234		
80	210,2	97,8	120,7	46,7	6,6	56,9	-	-	154,8	156,8	158,8	160,8	-	-	133,4	139,5	-236		
85	216,5	104,1	127,0	46,7	6,6	56,9	-	-	158,9	160,9	162,9	164,9	166,9	-	139,7	145,9	-237		
90	216,5	104,1	127,0	46,7	6,6	56,9	-	-	158,9	160,9	162,9	164,9	166,9	-	139,7	145,9	-239		
95	222,9	110,5	133,4	46,7	6,6	56,9	-	-	165,3	167,3	169,3	171,3	173,3	-	146,1	152,3	-241		
100	229,2	116,8	139,7	46,7	6,6	56,9	-	-	171,6	173,6	175,6	177,6	179,6	-	152,4	158,6	-242		
110	241,9	129,5	152,4	46,7	6,6	56,9	-	-	184,3	186,3	188,3	190,3	192,3	-	165,1	171,3	-245		
115	241,9	129,5	152,4	46,7	6,6	56,9	-	-	184,3	186,3	188,3	190,3	192,3	-	165,1	171,3	-247		
120	248,3	135,9	158,8	46,7	6,6	56,9	-	-	190,6	192,6	194,6	196,6	198,6	-	171,5	177,7	-248		
125	286,5	149,1	177,8	73,9	7,4	87,6	-	-	-	213,6	215,6	217,6	219,6	219,6	191,6	196,5	-354		
130	292,9	155,4	184,2	73,9	7,4	87,6	-	-	-	220,0	222,0	224,0	226,0	226,0	197,9	202,9	-355		
135	299,2	161,8	190,5	73,9	7,4	87,6	-	-	-	226,4	228,4	230,4	232,4	232,4	204,3	209,3	-356		
140	299,2	168,1	190,5	73,9	7,4	87,6	-	-	-	226,4	228,4	230,4	232,4	232,4	204,3	209,3	-358		
145	305,6	171,2	196,9	73,9	7,4	87,6	-	-	-	232,8	234,8	236,8	238,8	238,8	210,6	215,7	-360		
150	311,9	177,5	203,2	73,9	7,4	87,6	-	-	-	239,2	241,2	243,2	245,2	245,2	217,0	222,1	-361		
155	318,3	180,8	209,6	73,9	7,4	87,6	-	-	-	245,5	247,5	249,5	251,5	251,5	223,3	228,4	-362		
160	318,3	187,2	209,6	73,9	7,4	87,6	-	-	-	245,5	247,5	249,5	251,5	251,5	223,3	228,4	-363		
165	324,6	190,2	215,9	73,9	7,4	87,6	-	-	-	251,9	253,9	255,9	257,9	257,9	229,7	234,8	-364		
170	331,0	196,6	222,3	73,9	7,4	87,6	-	-	-	258,3	260,3	262,3	264,3	264,3	236,0	241,2	-364		
175	337,3	202,9	228,6	73,9	7,4	87,6	-	-	-	264,7	266,7	268,7	270,7	270,7	242,4	247,6	-365		
180	343,7	206,2	235,0	73,9	7,4	87,6	-	-	-	271,1	273,1	275,1	277,1	277,1	248,7	254,0	-366		
185	343,7	212,6	235,0	73,9	7,4	87,6	-	-	-	271,1	273,1	275,1	277,1	277,1	248,7	254,0	-367		
190	350,0	215,6	241,3	73,9	7,4	87,6	-	-	-	277,5	279,5	281,5	283,5	283,5	255,1	260,4	-368		
195	356,4	222,0	247,7	73,9	7,4	87,6	-	-	-	283,8	285,8	287,8	289,8	289,8	261,4	266,8	-368		

442™ Split Mechanical Seal – Inch

Mechanical Seal Dimensional Data

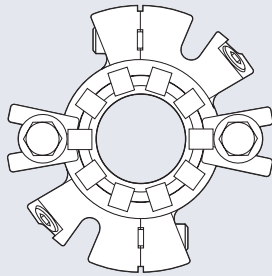
Key															
A – Shaft Size	B – Gland Outside Diameter	C – Seal Chamber Bore	D – Gland Length	E – Seal Chamber Depth	F – Outboard Seal Length	G – Minimum Bolt Circle by Bolt Size	H – Minimum Seal Chamber Face Outside Diameter	L – Hub Gland	M – Holder Bore from Box (Pg 71)	N – Installation Dimension (Pg 71)	O – Shaft O-Ring	P – NPT Size (Pg 71)			

A	B MAX	C MIN	C MAX	D	E MIN	F	3/8"	1/2"	G MIN 5/8"	3/4"	7/8"	H MIN	L MAX	O
1.250	4.94	1.86	2.10	1.48	0.17	1.78	3.20	3.33	3.45	–	–	2.35	2.79	-219
1.375	5.02	1.94	2.38	1.48	0.17	1.78	3.28	3.40	3.53	–	–	2.63	2.87	-221
1.500	5.14	2.06	2.50	1.48	0.17	1.78	3.40	3.53	3.65	–	–	2.75	2.99	-223
1.625	5.26	2.19	2.63	1.48	0.17	1.78	3.50	3.63	–	–	–	2.87	3.11	-224
1.750	5.39	2.31	2.75	1.48	0.17	1.78	3.63	3.75	–	–	–	3.00	3.23	-225
1.875	5.51	2.44	2.88	1.48	0.17	1.78	3.75	3.88	–	–	–	3.12	3.35	-226
2.000	5.64	2.56	3.00	1.48	0.17	1.78	3.94	4.06	–	–	–	3.25	3.48	-227
2.125	5.76	2.69	3.12	1.48	0.17	1.78	4.06	4.19	4.31	–	–	3.37	3.60	-228
2.250	5.88	2.81	3.25	1.48	0.17	1.78	4.19	4.31	4.44	–	–	3.50	3.73	-229
2.375	6.01	2.94	3.37	1.48	0.17	1.78	4.31	4.43	4.56	–	–	3.62	3.85	-230
2.500	6.13	3.06	3.75	1.48	0.17	1.78	4.57	4.70	4.82	–	–	4.00	4.23	-231
2.625	7.77	3.35	4.25	1.84	0.26	2.24	5.44	5.56	5.69	–	–	4.75	5.00	-232
2.750	7.77	3.35	4.25	1.84	0.26	2.24	5.44	5.56	5.69	–	–	4.75	5.00	-233
2.875	8.02	3.60	4.50	1.84	0.26	2.24	5.66	5.78	5.91	–	–	5.00	5.25	-234
3.000	8.02	3.60	4.50	1.84	0.26	2.24	5.66	5.78	5.91	–	–	5.00	5.25	-235
3.125	8.27	3.85	4.75	1.84	0.26	2.24	6.00	6.12	6.25	–	–	5.25	5.49	-236
3.250	8.27	3.85	4.75	1.84	0.26	2.24	6.00	6.12	6.25	–	–	5.25	5.49	-237
3.375	8.51	4.10	5.00	1.84	0.26	2.24	6.16	6.28	6.41	6.53	6.66	5.50	5.75	-238
3.500	8.51	4.10	5.00	1.84	0.26	2.24	6.16	6.28	6.41	6.53	6.66	5.50	5.75	-239
3.625	8.77	4.35	5.25	1.84	0.26	2.24	6.41	6.53	6.66	6.78	6.91	5.75	6.00	-240
3.750	8.77	4.35	5.25	1.84	0.26	2.24	6.41	6.53	6.66	6.78	6.91	5.75	6.00	-241
3.875	9.02	4.60	5.50	1.84	0.26	2.24	6.66	6.78	6.91	7.03	7.16	6.00	6.25	-242
4.000	9.02	4.60	5.50	1.84	0.26	2.24	6.66	6.78	6.91	7.03	7.16	6.00	6.25	-243
4.125	9.27	4.85	5.75	1.84	0.26	2.24	6.91	7.03	7.16	7.28	7.41	6.25	6.50	-244
4.250	9.27	4.85	5.75	1.84	0.26	2.24	6.91	7.03	7.16	7.28	7.41	6.25	6.50	-245
4.375	9.52	5.10	6.00	1.84	0.26	2.24	7.16	7.28	7.41	7.53	7.66	6.50	6.75	-246
4.500	9.52	5.10	6.00	1.84	0.26	2.24	7.16	7.28	7.41	7.53	7.66	6.50	6.75	-247
4.625	9.77	5.35	6.25	1.84	0.26	2.24	7.41	7.53	7.66	7.78	7.91	6.75	7.00	-248
4.750	9.77	5.35	6.25	1.84	0.26	2.24	7.41	7.53	7.66	7.78	7.91	6.75	7.00	-249
4.875	11.28	5.87	7.00	2.91	0.29	3.45	–	–	8.41	8.53	8.66	7.54	7.74	-353
5.000	11.28	5.99	7.00	2.91	0.29	3.45	–	–	8.41	8.53	8.66	7.54	7.74	-354
5.125	11.53	6.12	7.25	2.91	0.29	3.45	–	–	8.66	8.78	8.91	7.79	7.99	-355
5.250	11.53	6.24	7.25	2.91	0.29	3.45	–	–	8.66	8.78	8.91	7.79	7.99	-356
5.375	11.78	6.37	7.50	2.91	0.29	3.45	–	–	8.91	9.03	9.16	8.04	8.24	-357
5.500	11.78	6.49	7.50	2.91	0.29	3.45	–	–	8.91	9.03	9.16	8.04	8.24	-358
5.625	12.03	6.62	7.75	2.91	0.29	3.45	–	–	9.16	9.28	9.41	8.29	8.49	-359
5.750	12.03	6.74	7.75	2.91	0.29	3.45	–	–	9.16	9.28	9.41	8.29	8.49	-360
5.875	12.28	6.87	8.00	2.91	0.29	3.45	–	–	9.41	9.54	9.66	8.54	8.74	-361
6.000	12.28	6.99	8.00	2.91	0.29	3.45	–	–	9.41	9.54	9.66	8.54	8.74	-362
6.125	12.53	7.12	8.25	2.91	0.29	3.45	–	–	9.66	9.79	9.91	8.79	8.99	-362
6.250	12.53	7.24	8.25	2.91	0.29	3.45	–	–	9.66	9.79	9.91	8.79	8.99	-363
6.375	12.78	7.37	8.50	2.91	0.29	3.45	–	–	9.91	10.04	10.16	9.04	9.25	-363
6.500	12.78	7.49	8.50	2.91	0.29	3.45	–	–	9.91	10.04	10.16	9.04	9.25	-364
6.625	13.03	7.62	8.75	2.91	0.29	3.45	–	–	10.17	10.29	10.42	9.29	9.50	-364
6.750	13.03	7.74	8.75	2.91	0.29	3.45	–	–	10.17	10.29	10.42	9.29	9.50	-365
6.875	13.28	7.87	9.00	2.91	0.29	3.45	–	–	10.42	10.54	10.67	9.54	9.75	-365
7.000	13.28	7.99	9.00	2.91	0.29	3.45	–	–	10.42	10.54	10.67	9.54	9.75	-366
7.125	13.53	8.12	9.25	2.91	0.29	3.45	–	–	10.67	10.79	10.92	9.79	10.00	-366
7.250	13.53	8.24	9.25	2.91	0.29	3.45	–	–	10.67	10.79	10.92	9.79	10.00	-367
7.375	13.78	8.37	9.50	2.91	0.29	3.45	–	–	10.92	11.04	11.17	10.04	10.25	-367
7.500	13.78	8.49	9.50	2.91	0.29	3.45	–	–	10.92	11.04	11.17	10.04	10.25	-368
7.625	14.03	8.62	9.75	2.91	0.29	3.45	–	–	11.17	11.29	11.42	10.29	10.50	-368
7.750	14.03	8.74	9.75	2.91	0.29	3.45	–	–	11.17	11.29	11.42	10.29	10.50	-369

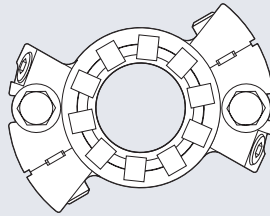
442™ Split Mechanical Seal – Metric and Inches – 32 mm – 195 mm (1.250" – 7.750")

EQUIPMENT BOLT PATTERNS

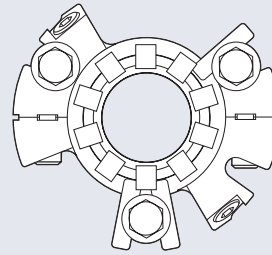
Shaft Sizes: 40 mm – 120 mm (1.625" – 4.750")



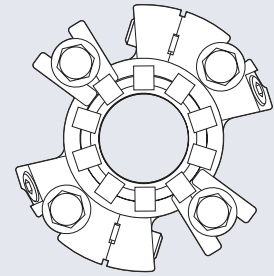
2 BOLTS



2 BOLTS

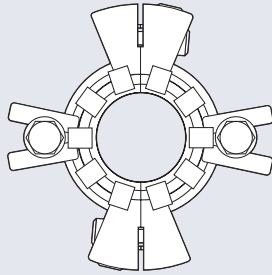


3 BOLTS

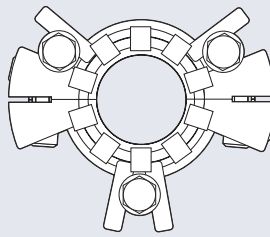


4 BOLTS

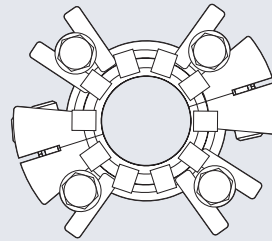
All Other Shaft Sizes



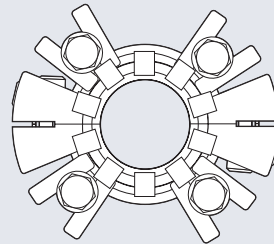
2 BOLTS



3 BOLTS



4 BOLTS

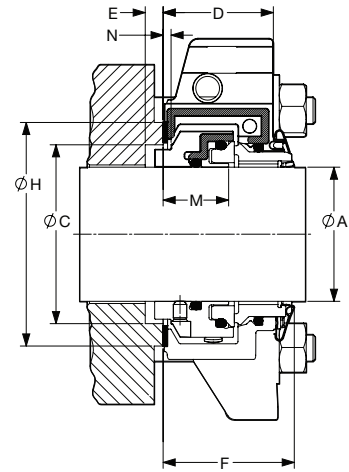
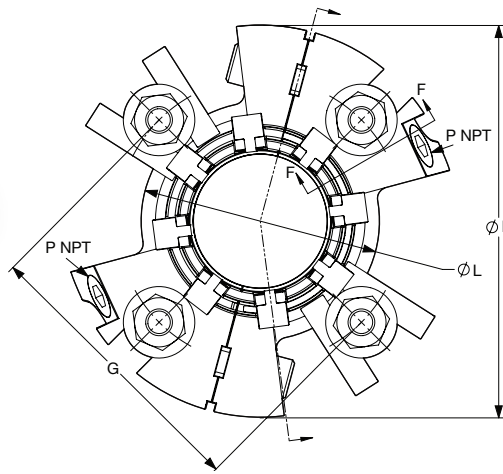
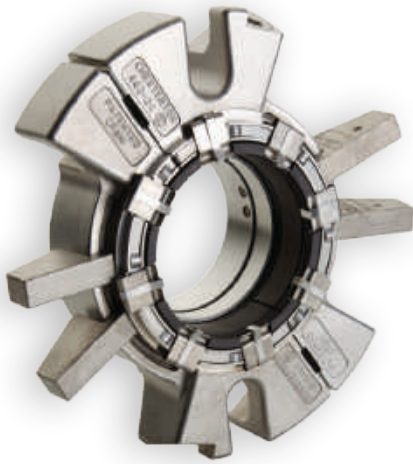


4 BOLTS

Key	SIZE	M	N	P (NPT)	SIZE	M	N	P (NPT)
	A – Shaft Size	32 mm – 38 mm	13,5	2,4	1/4"	1.250" – 1.500"	0.53	0.094
M – Holder ID from Box	40 mm – 120 mm	13,5	2,4	3/8"	1.625" – 4.750"	0.53	0.094	3/8"
N – Installation Diameter	125 mm – 195 mm	26,0	4,8	1/2"	4.875" – 7.750"	1.03	0.188	1/2"
P – NPYT Size								

442C™ Cartridge Split Mechanical Seal – Metric

Mechanical Seal Dimensional Data



Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – Gland Length
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Minimum Seal Chamber Face Outside Diameter
- L – Hub Gland
- M – Holder Bore from Box (Pg 71)
- N – Installation Dimension (Pg 71)
- O – Shaft O-Ring
- P – NPT Size (Pg 71)

A	B MAX	C MIN	C MAX	D	E MIN	F	G MIN				H MIN	L MAX			
							8 mm	10 mm	12 mm	14 mm			16 mm	18 mm	20 mm
25	125,5	47,2	53,3	40,1	4,3	47,8	79,8	81,8	83,8	85,8	87,8	–	–	59,9	70,9
30	125,5	47,2	53,3	40,1	4,3	47,8	79,8	81,8	83,8	85,8	87,8	–	–	59,9	70,9
32	125,5	47,2	53,3	40,1	4,3	47,8	79,8	81,8	83,8	85,8	87,8	–	–	59,9	70,9
33	125,5	47,2	53,3	40,1	4,3	47,8	79,8	81,8	83,8	85,8	87,8	–	–	59,9	70,9
35	127,4	49,3	60,5	40,1	4,3	47,8	81,8	83,8	85,8	87,8	89,8	–	–	66,8	72,8
38	130,5	52,3	63,5	40,1	4,3	47,8	85,0	87,0	89,0	91,0	93,0	–	–	69,9	76,0
40	133,6	55,6	66,8	40,1	4,3	47,8	87,4	89,4	91,4	93,4	95,4*	–	–	73,2	79,0
43	136,8	58,7	70,0	40,1	4,3	47,8	90,5	92,5	94,5	96,5	98,5*	–	–	76,2	82,0
45	136,8	58,7	70,0	40,1	4,3	47,8	90,5	92,5	94,5	96,5	98,5*	–	–	76,2	82,0
48	140,0	62,0	73,2	40,1	4,3	47,8	97,7	95,7	97,7	99,7	101,7*	–	–	79,5	85,2
50	143,2	65,0	76,2	40,1	4,3	47,8	98,4	100,4	102,4	104,4	106,4*	–	–	82,6	88,4
55	146,3	68,3	79,2	40,1	4,3	47,8	101,6	103,6	105,6	107,6	109,6	–	–	85,9	91,5
60	152,6	74,7	85,6	40,1	4,3	47,8	107,8	109,8	111,8	113,8	115,8	–	–	92,2	97,9
65	196,1	85,1	108,0	48,0	8,1	57,7	–	–	140,6	142,6	144,6	146,6*	148,6*	120,7	126,6
70	196,1	85,1	108,0	48,0	8,1	57,7	–	–	140,6	142,6	144,6	146,6*	148,6*	120,7	126,6
75	202,5	91,4	114,3	48,0	8,1	57,7	–	–	146,2	148,2	150,2	152,2	154,2*	127,0	133,0
80	208,8	97,8	120,7	48,0	8,1	57,7	–	–	154,8	156,8	158,8	160,8	162,8	133,4	139,3
85	215,2	104,1	127,0	48,0	8,1	57,7	–	–	158,9	160,9	162,9	164,9	166,9	139,7	145,7
90	215,2	104,1	127,0	48,0	8,1	57,7	–	–	158,9	160,9	162,9	164,9	166,9	139,7	145,7
95	221,5	110,5	133,4	48,0	8,1	57,7	–	–	165,2	167,2	169,2	171,2	173,2	146,1	152,0
100	227,9	116,8	139,7	48,0	8,1	57,7	–	–	171,6	173,6	175,6	177,6	179,6	152,4	158,4
105	234,2	123,2	146,1	48,0	8,1	57,7	–	–	177,7	179,7	181,7	183,7	185,7	160,3	166,7
110	240,6	129,5	152,4	48,0	8,1	57,7	–	–	184,3	186,3	188,3	190,3	192,3	165,1	171,1
115	240,6	129,5	152,4	48,0	8,1	57,7	–	–	184,3	186,3	188,3	190,3	192,3	165,1	171,1
120	246,9	135,9	158,8	48,0	8,1	57,7	–	–	190,6	192,6	194,6	196,6	198,6	171,5	177,4
									16 mm	18 mm	20 mm	22 mm			
125	286,5	149,1	177,8	73,9	7,4	87,6	213,6	215,6	217,6	219,6	221,6	223,6	225,6	191,6	196,5
130	292,9	155,4	184,2	73,9	7,4	87,6	220,0	222,0	224,0	226,0	228,0	230,0	232,0	197,9	202,9
135	299,2	161,8	190,5	73,9	7,4	87,6	226,4	228,4	230,4	232,4	234,4	236,4	238,4	204,3	209,3
140	299,2	168,1	190,5	73,9	7,4	87,6	226,4	228,4	230,4	232,4	234,4	236,4	238,4	204,3	209,3
145	305,6	171,2	196,9	73,9	7,4	87,6	232,8	234,8	236,8	238,8	240,8	242,8	244,8	210,6	215,7
150	311,9	177,5	203,2	73,9	7,4	87,6	239,2	241,2	243,2	245,2	247,2	249,2	251,2	217,0	222,1
155	318,3	180,8	209,6	73,9	7,4	87,6	245,5	247,5	249,5	251,5	253,5	255,5	257,5	223,3	228,4
160	318,3	187,2	209,6	73,9	7,4	87,6	245,5	247,5	249,5	251,5	253,5	255,5	257,5	223,3	228,4
165	324,6	190,2	215,9	73,9	7,4	87,6	251,9	253,9	255,9	257,9	259,9	261,9	263,9	229,7	234,8
170	331,0	196,6	222,3	73,9	7,4	87,6	258,3	260,3	262,3	264,3	266,3	268,3	270,3	236,0	241,2
175	337,3	202,9	228,6	73,9	7,4	87,6	264,7	266,7	268,7	270,7	272,7	274,7	276,7	242,4	247,6
180	343,7	206,2	235,0	73,9	7,4	87,6	271,1	273,1	275,1	277,1	279,1	281,1	283,1	248,7	254,0
185	343,7	212,6	235,0	73,9	7,4	87,6	271,1	273,1	275,1	277,1	279,1	281,1	283,1	248,7	254,0
190	350,0	215,6	241,3	73,9	7,4	87,6	277,5	279,5	281,5	283,5	285,5	287,5	289,5	255,1	260,4
195	356,4	222,0	247,7	73,9	7,4	87,6	283,8	285,8	287,8	289,8	291,8	293,8	295,8	261,4	266,8

* Two bolts only using bolt tabs

** Add 10,2 mm for minimum first obstruction length.

442C™ Cartridge Split Mechanical Seal – Inch

Key

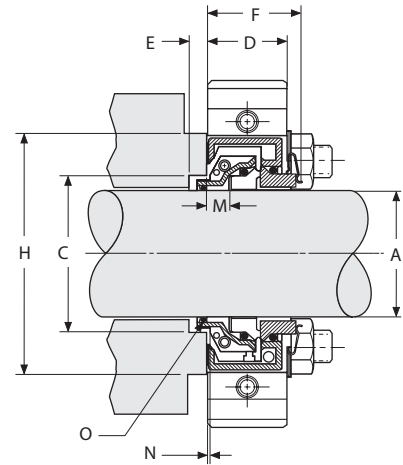
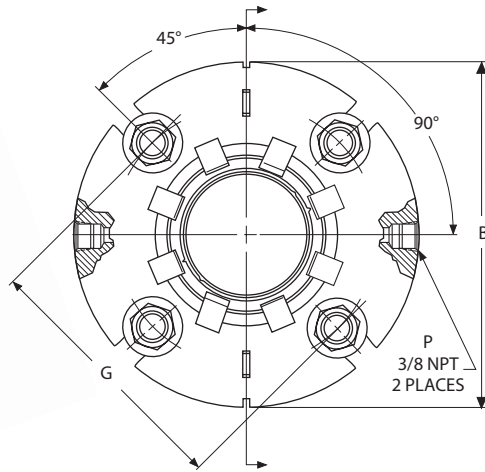
- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – Gland Length
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Minimum Seal Chamber Face Outside Diameter
- L – Hub Gland
- M – Holder Bore from Box (Pg 71)
- N – Installation Dimension (Pg 71)
- O – Shaft O-Ring
- P – NPT Size (Pg 71)

A	B MAX	C MIN	C MAX	D	E MIN	F**	3/8"	1/2"	G MIN 5/8"	3/4"	7/8"	H MIN	L MAX
1.000	4.94	1.86	2.10	1.58	0.17	1.88	3.20	3.33	3.45	3.58*	–	2.35	2.79
1.125	4.94	1.86	2.10	1.58	0.17	1.88	3.20	3.33	3.45	3.58*	–	2.35	2.79
1.250	4.94	1.86	2.10	1.58	0.17	1.88	3.20	3.33	3.45	3.58*	–	2.35	2.79
1.375	5.02	1.94	2.38	1.58	0.17	1.88	3.28	3.40	3.53	3.66*	–	2.63	2.87
1.500	5.14	2.06	2.50	1.58	0.17	1.88	3.40	3.53	3.65	3.78*	–	2.75	2.99
1.625	5.26	2.19	2.63	1.58	0.17	1.88	3.50	3.63	3.81*	3.94*	–	2.87	3.11
1.750	5.39	2.31	2.75	1.58	0.17	1.88	3.63	3.75	3.94*	4.06*	–	3.00	3.23
1.875	5.51	2.44	2.88	1.58	0.17	1.88	3.75	3.88	4.06*	4.19*	–	3.12	3.35
2.000	5.64	2.56	3.00	1.58	0.17	1.88	3.94	4.06	4.19*	4.31*	–	3.25	3.48
2.125	5.76	2.69	3.12	1.58	0.17	1.88	4.06	4.19	4.31	4.44*	–	3.37	3.60
2.250	5.88	2.81	3.25	1.58	0.17	1.88	4.19	4.31	4.44	4.56*	–	3.50	3.73
2.375	6.01	2.94	3.37	1.58	0.17	1.88	4.31	4.43	4.56	4.69*	–	3.62	3.85
2.500	6.13	3.06	3.75	1.58	0.17	1.88	4.57	4.70	4.82	4.95*	–	4.00	4.23
2.625	7.72	3.35	4.25	1.89	0.32	2.27	5.44	5.56	5.69	5.81*	5.94*	4.75	4.99
2.750	7.72	3.35	4.25	1.89	0.32	2.27	5.44	5.56	5.69	5.81*	5.94*	4.75	4.99
2.875	7.97	3.60	4.50	1.89	0.32	2.27	5.66	5.78	5.91	6.03*	6.16*	5.00	5.24
3.000	7.97	3.60	4.50	1.89	0.32	2.27	5.66	5.78	5.91	6.03*	6.16*	5.00	5.24
3.125	8.22	3.85	4.75	1.89	0.32	2.27	6.00	6.12	6.25	6.37*	6.50*	5.25	5.48
3.250	8.22	3.85	4.75	1.89	0.32	2.27	6.00	6.12	6.25	6.37*	6.50*	5.25	5.48
3.375	8.47	4.10	5.00	1.89	0.32	2.27	6.16	6.28	6.41	6.53	6.66*	5.50	5.74
3.500	8.47	4.10	5.00	1.89	0.32	2.27	6.16	6.28	6.41	6.53	6.66*	5.50	5.74
3.625	8.72	4.35	5.25	1.89	0.32	2.27	6.41	6.53	6.66	6.78	6.91*	5.75	5.99
3.750	8.72	4.35	5.25	1.89	0.32	2.27	6.41	6.53	6.66	6.78	6.91*	5.75	5.99
3.875	8.97	4.60	5.50	1.89	0.32	2.27	6.66	6.78	6.91	7.03	7.16*	6.00	6.24
4.000	8.97	4.60	5.50	1.89	0.32	2.27	6.66	6.78	6.91	7.03	7.16*	6.00	6.24
4.125	9.22	4.85	5.75	1.89	0.32	2.27	6.90	7.02	7.15	7.27	7.40*	6.25	6.49
4.250	9.22	4.85	5.75	1.89	0.32	2.27	6.90	7.02	7.15	7.27	7.40*	6.25	6.49
4.375	9.47	5.10	6.00	1.89	0.32	2.27	7.16	7.28	7.41	7.53	7.66*	6.50	6.74
4.500	9.47	5.10	6.00	1.89	0.32	2.27	7.16	7.28	7.41	7.53	7.66*	6.50	6.74
4.625	9.72	5.35	6.25	1.89	0.32	2.27	7.41	7.53	7.66	7.78	7.91*	6.75	6.99
4.750	9.72	5.35	6.25	1.89	0.32	2.27	7.41	7.53	7.66	7.78	7.91*	6.75	6.99
4.875	11.28	5.87	7.00	2.91	0.0	3.45	–	–	8.41	8.54	8.66	7.54	7.74
5.000	11.28	5.99	7.00	2.91	0.0	3.45	–	–	8.41	8.54	8.66	7.54	7.74
5.125	11.53	6.12	7.25	2.91	0.0	3.45	–	–	8.66	8.79	8.91	7.79	7.99
5.250	11.53	6.24	7.25	2.91	0.0	3.45	–	–	8.66	8.79	8.91	7.79	7.99
5.375	11.78	6.37	7.50	2.91	0.0	3.45	–	–	8.91	9.04	9.16	8.04	8.24
5.500	11.78	6.49	7.50	2.91	0.0	3.45	–	–	8.91	9.04	9.16	8.04	8.24
5.625	12.03	6.62	7.75	2.91	0.0	3.45	–	–	9.16	9.29	9.41	8.29	8.49
5.750	12.03	6.74	7.75	2.91	0.0	3.45	–	–	9.16	9.29	9.41	8.29	8.49
5.875	12.28	6.87	8.00	2.91	0.0	3.45	–	–	9.41	9.54	9.66	8.54	8.74
6.000	12.28	6.99	8.00	2.91	0.0	3.45	–	–	9.41	9.54	9.66	8.54	8.74
6.125	12.53	7.12	8.25	2.91	0.0	3.45	–	–	9.66	9.79	9.91	8.79	8.99
6.250	12.53	7.24	8.25	2.91	0.0	3.45	–	–	9.66	9.79	9.91	8.79	8.99
6.375	12.78	7.37	8.50	2.91	0.0	3.45	–	–	9.91	10.04	10.16	9.04	9.25
6.500	12.78	7.49	8.50	2.91	0.0	3.45	–	–	9.91	10.04	10.16	9.04	9.25
6.625	13.03	7.62	8.75	2.91	0.0	3.45	–	–	10.17	10.30	10.42	9.29	9.50
6.750	13.03	7.74	8.75	2.91	0.0	3.45	–	–	10.17	10.30	10.42	9.29	9.50
6.875	13.28	7.87	9.00	2.91	0.0	3.45	–	–	10.42	10.55	10.67	9.54	9.75
7.000	13.28	7.99	9.00	2.91	0.0	3.45	–	–	10.42	10.55	10.67	9.54	9.75
7.125	13.53	8.12	9.25	2.91	0.0	3.45	–	–	10.67	10.80	10.92	9.79	10.00
7.250	13.53	8.24	9.25	2.91	0.0	3.45	–	–	10.67	10.80	10.92	9.79	10.00
7.375	13.78	8.37	9.50	2.91	0.0	3.45	–	–	10.92	11.05	11.17	10.04	10.25
7.500	13.78	8.49	9.50	2.91	0.0	3.45	–	–	10.92	11.05	11.17	10.04	10.25
7.625	14.03	8.62	9.75	2.91	0.0	3.45	–	–	11.17	11.30	11.42	10.29	10.50
7.750	14.03	8.74	9.75	2.91	0.0	3.45	–	–	11.17	11.30	11.42	10.29	10.50

* Two bolts only using bolt tabs

** Add 10,2 mm for minimum first obstruction length.

442M Split Mixer Seal – Metric

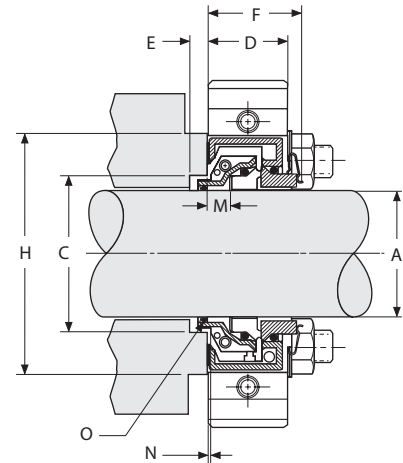
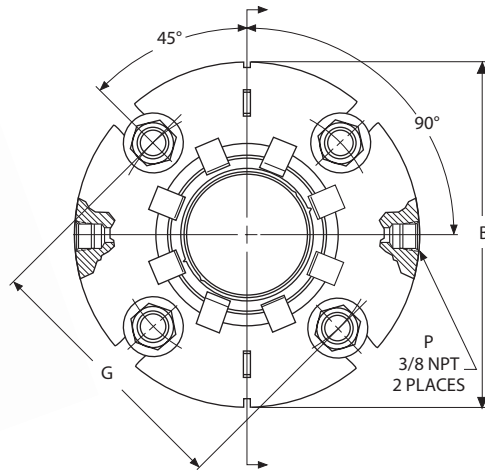


Key		SIZE	M	N	P (NPT)
A – Shaft Size	E – Minimum Seal Chamber Depth	up to 38 mm	13.5	2.4	1/4"
B – Gland Outside Diameter	F – Outboard Space Required	up to 120 mm	13.5	2.4	3/8"
C – Seal Chamber Bore	G – Minimum Bolt Circle by Bolt Size	up to 195 mm	26.0	4.8	1/2"
D – Gland Length	H – Minimum Seal Chamber Face Outside Diameter				
	M – Holder Inside Diameter from Box				
	N – Installation Dimension				
	O – Shaft O-Ring Number				

A	B MAX	C MIN	C MAX	D	E MIN	F	G MIN						H	O
							8 mm	10 mm	12 mm	14 mm	16 mm	18 mm		
38	134,1	53,6	67,4	37,6	4,3	45,2	90,6	92,6	94,6	–	–	–	73,8	223
40	137,3	56,8	70,2	37,6	4,3	45,2	93,0	95,0	97,0	–	–	–	76,2	223
43	140,5	60,0	73,4	37,6	4,3	45,2	96,1	98,1	100,1	–	–	–	79,2	224
45	140,5	60,0	73,4	37,6	4,3	45,2	96,1	98,1	100,1	–	–	–	79,2	25
48	143,6	63,1	76,6	37,6	4,3	45,2	99,4	101,4	103,4	–	–	–	82,6	226
50	146,8	66,3	80,3	37,6	4,3	45,2	104,5	106,5	108,5	110,5	–	–	86,4	226
55	150,0	69,5	83,3	37,6	4,3	45,2	107,8	109,8	111,8	113,8	–	–	89,7	228
60	156,3	75,8	94,1	37,6	4,3	45,2	119,7	121,7	123,7	125,7	–	–	101,6	230
65	204,1	87,9	115,1	46,7	6,6	56,9	145,9	147,9	149,9	151,9	–	–	127,8	231
70	204,1	87,9	115,1	46,7	6,6	56,9	145,9	147,9	149,9	151,9	–	–	127,8	233
75	210,4	94,2	121,4	46,7	6,6	56,9	152,2	154,2	156,2	158,2	–	–	134,1	234
80	216,8	100,6	127,8	46,7	6,6	56,9	157,6	159,6	161,6	163,6	165,6	167,6	140,5	236
85	223,1	106,9	134,1	46,7	6,6	56,9	164,0	166,0	168,0	170,0	172,0	174,0	146,8	237
90	223,1	106,9	134,1	46,7	6,6	56,9	164,0	166,0	168,0	170,0	172,0	174,0	146,8	239
95	229,5	113,3	140,5	46,7	6,6	56,9	170,3	172,3	174,3	176,3	178,3	180,3	153,2	241
100	235,8	119,6	146,8	46,7	6,6	56,9	176,7	178,7	180,7	182,7	184,7	186,7	159,5	242
110	248,5	132,3	159,5	46,7	6,6	56,9	189,4	191,4	193,4	195,4	197,4	199,4	172,2	245
115	248,5	132,3	159,5	46,7	6,6	56,9	189,4	191,4	193,4	195,4	197,4	199,4	172,2	247
120	254,9	138,7	159,5	46,7	6,6	56,9	189,4	191,4	193,4	195,4	197,4	199,4	172,2	248

A	B MAX	C MIN	C MAX	D	E MIN	F	18 mm	G MIN 2.0 mm	22 mm	H	L MAX	O
125	292,8	153,7	181,6	73,9	7,4	87,6	221,4	223,4	225,4	196,9	202,9	354
130	299,2	156,8	188,0	73,9	7,4	87,6	227,8	229,8	231,8	203,2	209,3	355
135	305,6	163,2	194,3	73,9	7,4	87,6	234,1	236,1	238,1	209,6	215,7	356
140	305,6	166,4	194,3	73,9	7,4	87,6	234,1	236,1	238,1	209,6	215,7	358
145	312,0	172,7	200,7	73,9	7,4	87,6	240,5	242,5	244,5	215,9	222,1	359
150	318,3	179,1	207,0	73,9	7,4	87,6	246,8	248,8	250,8	222,3	228,4	361
155	324,7	182,2	213,4	73,9	7,4	87,6	253,2	255,2	257,2	228,6	234,8	362
160	331,1	188,6	219,7	73,9	7,4	87,6	259,5	261,5	263,5	235,0	241,2	363
165	331,1	191,8	219,7	73,9	7,4	87,6	259,5	261,5	263,5	235,0	241,2	364
170	337,5	198,1	226,1	73,9	7,4	87,6	265,9	267,9	269,9	241,3	247,6	364
175	343,9	201,3	232,4	73,9	7,4	87,6	272,2	274,2	276,2	247,7	254,0	365
180	350,2	207,6	238,8	73,9	7,4	87,6	278,6	280,6	282,6	254,0	260,4	366
185	350,2	210,8	238,8	73,9	7,4	87,6	278,6	280,6	282,6	254,0	260,4	367
190	356,6	217,2	245,1	73,9	7,4	87,6	284,9	286,9	288,9	260,4	266,8	368

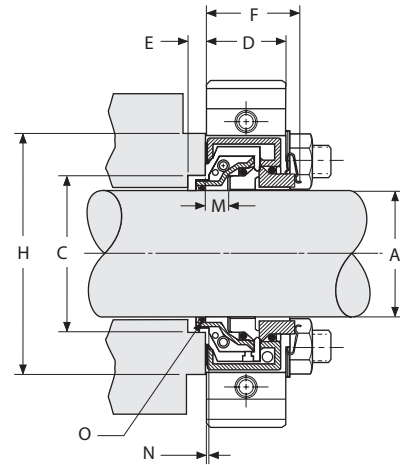
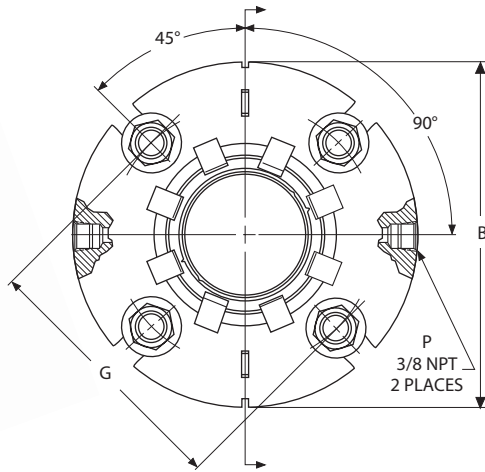
442M Split Mixer Seal – Inch – Size 1.500" – 4.750"



Key		SIZE	M	N	P (NPT)
A – Shaft Size	E – Minimum Seal Chamber Depth	up to 38 mm	13.5	2.4	1/4"
B – Gland Outside Diameter	F – Outboard Space Required	up to 120 mm	13.5	2.4	3/8"
C – Seal Chamber Bore	G – Minimum Bolt Circle by Bolt Size	up to 195 mm	26.0	4.8	1/2"
D – Gland Length	H – Minimum Seal Chamber Face Outside Diameter				
	M – Holder Inside Diameter from Box				
	N – Installation Dimension				
	O – Shaft O-Ring Number				

A	B MAX	C MIN	C MAX	D	E MIN	F	G MIN				H	O
							3/8"	1/2"	5/8"	3/4"		
1.500	5.28	2.11	2.66	1.48	0.17	1.78	3.60	3.73	–	–	2.91	223
1.625	5.41	2.24	2.77	1.48	0.17	1.78	3.70	3.82	–	–	3.00	224
1.750	5.53	2.36	2.89	1.48	0.17	1.78	3.82	3.94	–	–	3.12	225
1.875	5.66	2.49	3.02	1.48	0.17	1.78	3.95	4.07	–	–	3.25	226
2.000	5.78	2.61	3.16	1.48	0.17	1.78	4.10	4.23	4.35	–	3.40	227
2.125	5.91	2.74	3.28	1.48	0.17	1.78	4.23	4.36	4.48	–	3.53	228
2.250	6.03	2.86	3.42	1.48	0.17	1.78	4.35	4.48	4.60	–	3.65	229
2.375	6.16	2.99	3.71	1.48	0.17	1.78	4.70	4.83	4.95	–	4.00	230
2.500	6.28	3.11	3.71	1.48	0.17	1.78	4.70	4.83	4.95	–	4.00	231
2.625	8.03	3.46	4.53	1.84	0.26	2.24	5.73	5.86	5.98	–	5.03	232
2.750	8.03	3.46	4.53	1.84	0.26	2.24	5.73	5.86	5.98	–	5.03	233
2.875	8.28	3.71	4.78	1.84	0.26	2.24	5.98	6.11	6.23	–	5.28	234
3.000	8.28	3.71	4.78	1.84	0.26	2.24	5.98	6.11	6.23	–	5.28	235
3.125	8.53	3.96	5.03	1.84	0.26	2.24	6.23	6.35	6.48	6.60	5.53	236
3.250	8.53	3.96	5.03	1.84	0.26	2.24	6.23	6.35	6.48	6.60	5.53	237
3.375	8.78	4.21	5.28	1.84	0.26	2.24	6.48	6.60	6.73	6.85	5.78	238
3.500	8.78	4.21	5.28	1.84	0.26	2.24	6.48	6.60	6.73	6.85	5.78	239
3.625	9.03	4.46	5.53	1.84	0.26	2.24	6.73	6.85	6.98	7.10	6.03	240
3.750	9.03	4.46	5.53	1.84	0.26	2.24	6.73	6.85	6.98	7.10	6.03	241
3.875	9.28	4.71	5.78	1.84	0.26	2.24	6.98	7.10	7.23	7.35	6.28	242
4.000	9.28	4.71	5.78	1.84	0.26	2.24	6.98	7.10	7.23	7.35	6.28	243
4.125	9.53	4.96	6.03	1.84	0.26	2.24	7.23	7.35	7.48	7.60	6.53	244
4.250	9.53	4.96	6.03	1.84	0.26	2.24	7.23	7.35	7.48	7.60	6.53	245
4.375	9.78	5.21	6.28	1.84	0.26	2.24	7.48	7.60	7.73	7.85	6.78	246
4.500	9.78	5.21	6.28	1.84	0.26	2.24	7.48	7.60	7.73	7.85	6.78	247
4.625	10.03	5.46	6.28	1.84	0.26	2.24	7.48	7.60	7.73	7.85	6.78	248
4.750	10.03	5.46	6.28	1.84	0.26	2.24	7.48	7.60	7.73	7.85	6.78	249

442M Split Mixer Seal – Inch – Size 4.875" – 7.500"



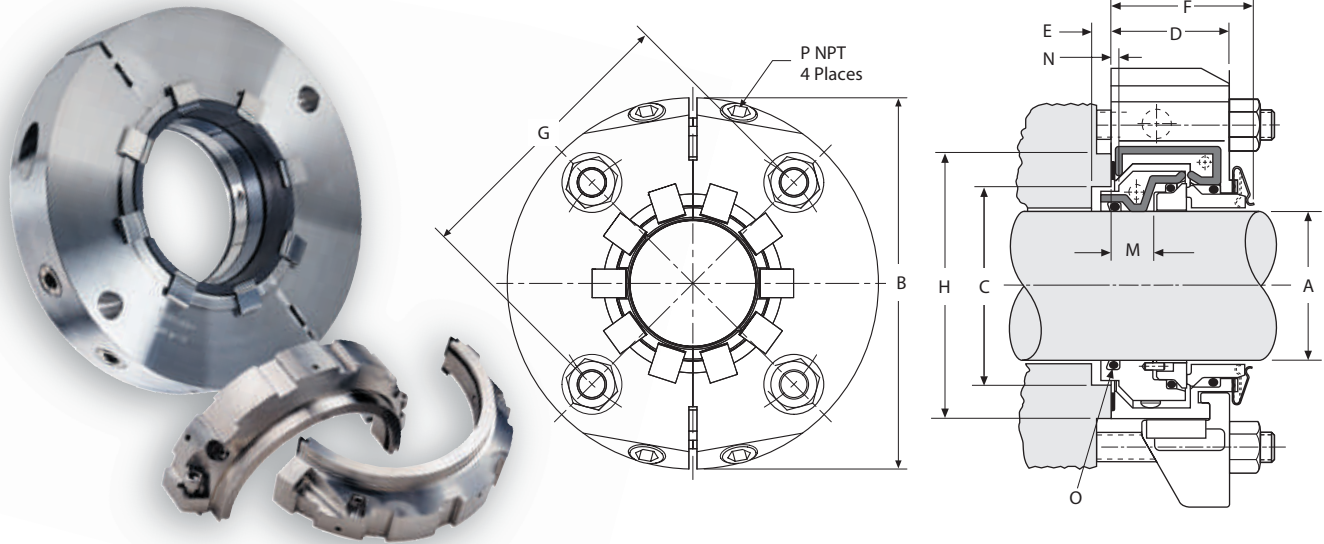
Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – Gland Length
- E – Minimum Seal Chamber Depth
- F – Outboard Space Required
- G – Minimum Bolt Circle by Bolt Size
- H – Minimum Seal Chamber Face Outside Diameter
- M – Holder Inside Diameter from Box
- N – Installation Dimension
- O – Shaft O-Ring Number

SIZE	M	N	P (NPT)
up to 38 mm	13.5	2.4	1/4"
up to 120 mm	13.5	2.4	3/8"
up to 195 mm	26.0	4.8	1/2"

A	B MAX	C MIN	C MAX	D	E MIN	F	5/8"	G MIN 3/4"	7/8"	H	L MAX	O
4.875	11.53	5.93	7.15	2.91	0.29	3.45	8.63	8.75	8.88	7.75	7.99	353
5.000	11.53	6.05	7.15	2.91	0.29	3.45	8.63	8.75	8.88	7.75	7.99	354
5.125	11.78	6.18	7.40	2.91	0.29	3.45	8.88	9.00	9.13	8.00	8.24	355
5.250	11.78	6.30	7.40	2.91	0.29	3.45	8.88	9.00	9.13	8.00	8.24	356
5.375	12.03	6.43	7.65	2.91	0.29	3.45	9.13	9.25	9.38	8.25	8.49	357
5.500	12.03	6.55	7.65	2.91	0.29	3.45	9.13	9.25	9.38	8.25	8.49	358
5.625	12.28	6.68	7.90	2.91	0.29	3.45	9.38	9.50	9.63	8.50	8.74	359
5.750	12.28	6.80	7.90	2.91	0.29	3.45	9.38	9.50	9.63	8.50	8.74	360
5.875	12.53	6.93	8.15	2.91	0.29	3.45	9.63	9.75	9.88	8.75	8.99	361
6.000	12.53	7.05	8.15	2.91	0.29	3.45	9.63	9.75	9.88	8.75	8.99	362
6.125	12.78	7.18	8.40	2.91	0.29	3.45	9.88	10.00	10.13	9.00	9.25	362
6.250	12.78	7.30	8.40	2.91	0.29	3.45	9.88	10.00	10.13	9.00	9.25	363
6.375	13.03	7.43	8.65	2.91	0.29	3.45	10.13	10.25	10.38	9.25	9.50	363
6.500	13.03	7.55	8.65	2.91	0.29	3.45	10.13	10.25	10.38	9.25	9.50	364
6.625	13.29	7.68	8.90	2.91	0.29	3.45	10.38	10.50	10.63	9.50	9.75	364
6.750	13.29	7.80	8.90	2.91	0.29	3.45	10.38	10.50	10.63	9.50	9.75	365
6.875	13.54	7.93	9.15	2.91	0.29	3.45	10.63	10.75	10.88	9.75	10.00	365
7.000	13.54	8.05	9.15	2.91	0.29	3.45	10.63	10.75	10.88	9.75	10.00	366
7.125	13.79	8.18	9.40	2.91	0.29	3.45	10.88	11.00	11.13	10.00	10.25	366
7.250	13.79	8.30	9.40	2.91	0.29	3.45	10.88	11.00	11.13	10.00	10.25	367
7.375	14.04	8.43	9.65	2.91	0.29	3.45	11.13	11.25	11.38	10.25	10.50	367
7.500	14.04	8.55	9.65	2.91	0.29	3.45	11.13	11.25	11.38	10.25	10.50	368

442PR Split Pumping Ring Seal – Inch – Size 1.250" – 4.750"

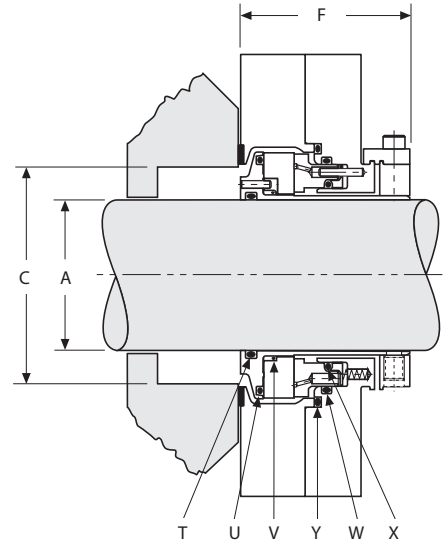
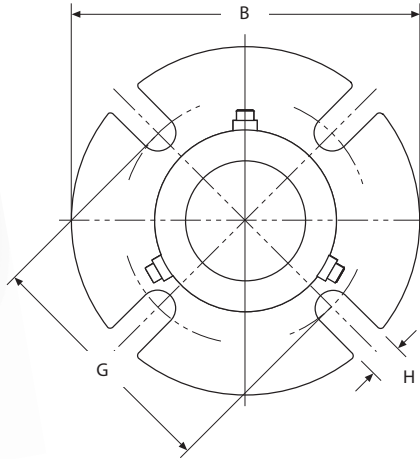


Key			SIZE	M	N	P (NPT)
A – Shaft Size	E – Minimum Seal Chamber Depth	M – Holder Inside Diameter from Box	up to -12	0.53	0.094	1/4"
B – Gland Outside Diameter	F – Outboard Space Required	N – Installation Dimension	up to -38	0.53	0.094	3/8"
C – Seal Chamber Bore	G – Minimum Bolt Circle by Bolt Size	O – Shaft O-Ring Number				
D – Gland Length	H – Minimum Seal Chamber Face Outside Diameter	P – NPT Size				

A	B MAX	C MIN	C MAX	D MAX	E	F	3/8"	1/2"	G MIN 5/8"	3/4"	7/8"	H MIN	O
1.250	4.91	1.86	2.10	1.48	0.17	1.78	3.17	3.29	3.42	3.54	3.67	2.35	219
1.375	5.01	1.94	2.38	1.48	0.17	1.78	3.25	3.38	3.50	3.63	3.75	2.63	221
1.500	5.13	2.06	2.50	1.48	0.17	1.78	3.38	3.50	3.62	3.75	3.87	2.75	223
1.625	5.26	2.19	2.63	1.48	0.17	1.78	3.50	3.62	3.75	3.87	4.00	2.87	224
1.750	5.38	2.31	2.75	1.48	0.17	1.48	3.63	3.75	3.87	4.00	4.12	3.00	225
1.875	5.50	2.44	2.88	1.48	0.17	1.78	3.75	3.87	4.00	4.12	4.25	3.12	226
2.000	5.63	2.56	3.00	1.48	0.17	1.78	3.88	4.00	4.12	4.25	4.37	3.25	227
2.125	5.76	2.69	3.12	1.48	0.17	1.78	4.00	4.12	4.25	4.37	4.50	3.37	228
2.250	5.88	2.81	3.25	1.48	0.17	1.78	4.13	4.25	4.37	4.50	4.62	3.50	229
2.375	6.01	2.94	3.37	1.48	0.17	1.78	4.25	4.37	4.50	4.62	4.75	3.62	230
2.500	6.13	3.06	3.75	1.48	0.17	1.78	4.63	4.75	4.87	5.00	5.12	4.00	231
2.625	7.76	3.35	4.25	1.84	0.26	2.24	5.38	5.50	5.63	5.75	5.88	4.75	232
2.750	7.76	3.35	4.25	1.84	0.26	2.24	5.38	5.50	5.63	5.75	5.88	4.75	233
2.875	8.01	3.60	4.50	1.84	0.26	2.24	5.63	5.75	5.88	6.00	6.13	5.00	234
3.000	8.01	3.60	4.50	1.84	0.26	2.24	5.63	5.75	5.88	6.00	6.13	5.00	235
3.125	8.26	3.85	4.75	1.84	0.26	2.24	5.88	6.00	6.13	6.25	6.38	5.25	236
3.250	8.26	3.85	4.75	1.84	0.26	2.24	5.88	6.00	6.13	6.25	6.38	5.25	237
3.375	8.51	4.10	5.00	1.84	0.26	2.24	6.13	6.25	6.38	6.50	6.63	5.50	238
3.500	8.51	4.10	5.00	1.84	0.26	2.24	6.13	6.25	6.38	6.50	6.63	5.50	239
3.625	8.77	4.35	5.25	1.84	0.26	2.24	6.38	6.50	6.63	6.75	6.88	5.75	240
3.750	8.77	4.35	5.25	1.84	0.26	2.24	6.38	6.50	6.63	6.75	6.88	5.75	241
3.875	9.02	4.60	5.50	1.84	0.26	2.24	6.63	6.75	6.88	7.00	7.13	6.00	242
4.000	9.02	4.60	5.50	1.84	0.26	2.24	6.63	6.75	6.88	7.00	7.13	6.00	243
4.125	9.27	4.85	5.75	1.84	0.26	2.24	6.88	7.00	7.13	7.25	7.38	6.25	244
4.250	9.27	4.85	5.75	1.84	0.26	2.24	6.88	7.00	7.13	7.25	7.38	6.25	245
4.375	9.52	5.10	6.00	1.84	0.26	2.24	7.13	7.25	7.38	7.50	7.63	6.50	246
4.500	9.52	5.10	6.00	1.84	0.26	2.24	7.13	7.25	7.38	7.50	7.63	6.50	247
4.625	9.77	5.35	6.25	1.84	0.26	2.24	7.38	7.50	7.63	7.75	7.88	6.75	248
4.750	9.77	5.35	6.25	1.84	0.26	2.24	7.38	7.50	7.63	7.75	7.88	6.75	249

Mechanical Seal Dimensional Data

4400 Dual Concentric Gas Seal – Metric

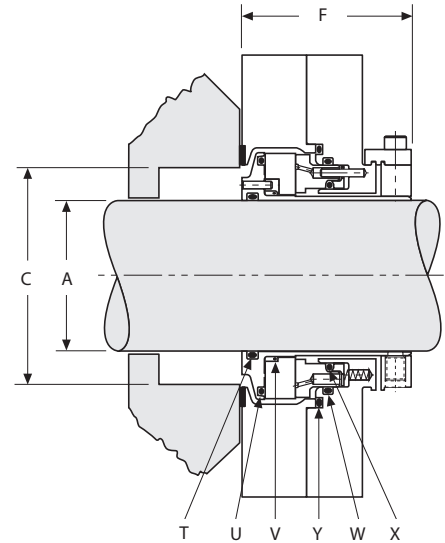
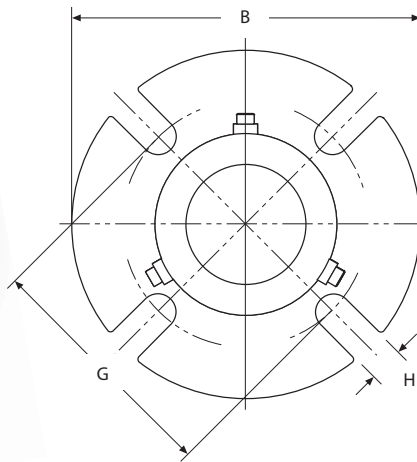


Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- T – Shaft O-Ring
- U – Rotary Seal O-Ring
- V – Rotary Cushion O-Ring
- W – Stationary Seal O-Ring Outside Diameter
- X – Stationary Seal O-Ring Inside Diameter
- Y – Gland Adapter O-Ring

A	B MAX	C MAX	F MAX	G MIN				H	T	U	V	W	X	Y
				10 mm	12 mm	16 mm	20 mm							
25	102	52	54	73	–	–	–	11	120	134	024	134	124	139
28	102	52	54	76	–	–	–	11	122	136	026	136	126	141
30	102	58	54	80	–	–	–	11	123	138	028	138	128	143
32	111	62	54	83	85	–	–	14	124	140	029	140	130	145
35	111	62	54	83	85	–	–	14	126	140	029	140	130	145
38	114	67	54	86	88	–	–	14	128	142	030	142	132	147
40	127	69	54	89	91	–	–	14	129	144	031	144	134	149
43	139	72	54	92	94	–	–	14	131	146	032	146	136	150
45	139	75	54	95	97	–	–	14	133	148	033	148	138	151
48	139	82	54	101	103	–	–	14	134	150	034	150	140	152
50	139	82	54	101	103	–	–	14	136	150	034	150	140	152
55	152	91	54	111	113	117	–	18	139	151	036	152	144	153
60	152	92	54	112	114	118	–	18	142	152	037	152	146	153
65	164	103	57	123	125	129	–	18	145	153	040	154	151	155
70	196	113	64	–	135	139	–	18	232	242	151	242	235	246
75	202	119	64	–	141	145	–	18	234	244	152	244	237	248
80	208	125	64	–	149	152	–	18	236	246	153	246	239	250
85	211	129	64	–	151	155	159	21	237	247	153	247	240	251
90	216	135	64	–	158	162	166	21	239	249	154	249	242	253

4400 Dual Concentric Gas Seal – Inch

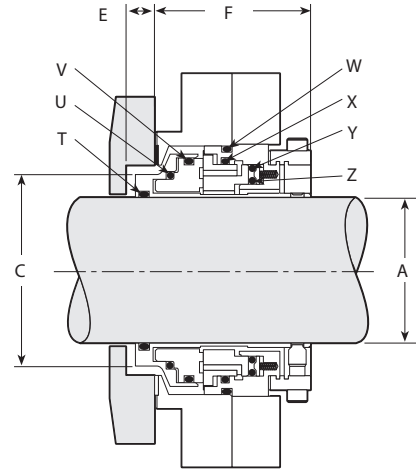
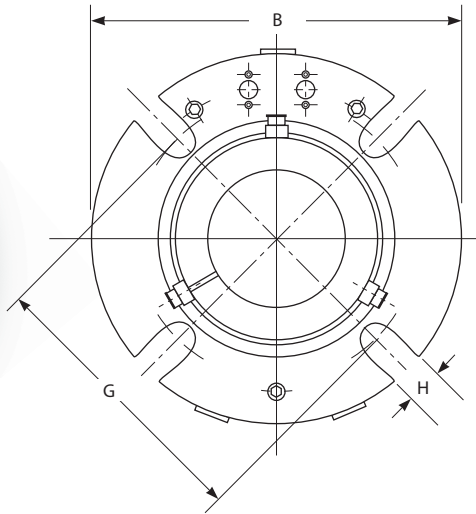
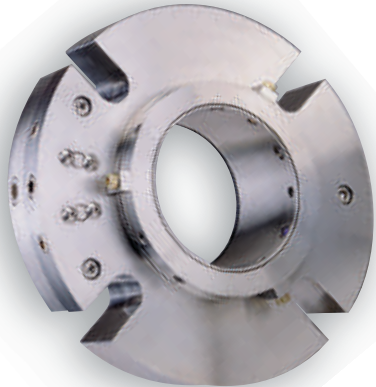


Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- T – Shaft O-Ring
- U – Rotary Seal O-Ring
- V – Rotary Cushion O-Ring
- W – Stationary Seal O-Ring Outside Diameter
- X – Stationary Seal O-Ring Inside Diameter
- Y – Gland Adapter O-Ring

A MAX	B MAX	C MAX	F	G MIN				H	T	U	V	W	X	Y
				3/8"	1/2"	5/8"	3/4"							
1.000	4.000	2.03	2.125	2.86	–	–	–	0.44	120	134	024	134	124	139
1.125	4.000	2.06	2.125	2.99	–	–	–	0.44	122	136	026	136	126	141
1.250	4.000	2.29	2.125	3.11	–	–	–	0.44	124	138	028	138	128	143
1.375	4.360	2.45	2.125	3.24	3.36	–	–	0.57	126	140	029	140	130	145
1.375 OS	5.385	3.27	2.125	3.98	4.11	–	–	0.44	126	140	029	140	130	150
1.500	4.485	2.65	2.125	3.36	3.49	–	–	0.57	128	142	030	142	132	147
1.625	4.985	2.71	2.125	3.49	3.61	–	–	0.57	130	144	031	144	134	149
1.750	5.485	2.83	2.125	3.61	3.74	–	–	0.57	132	146	032	146	136	150
1.750 OS	6.635	3.90	2.125	5.36	5.48	5.61	–	0.57	132	146	032	146	136	153
1.875	5.485	2.96	2.125	3.74	3.86	–	–	0.57	134	148	033	148	138	151
1.875 OS	5.985	3.96	2.125	4.86	4.98	5.11	–	0.57	134	148	033	148	138	153
2.000	5.485	3.21	2.125	3.97	4.10	–	–	0.57	136	150	034	150	140	152
2.125	5.985	3.46	2.125	4.22	4.34	4.47	–	0.69	138	151	035	151	142	152
2.125 OS	6.985	4.40	2.125	5.74	5.86	5.99	–	0.69	138	151	035	151	142	154
2.250	5.985	3.58	2.125	4.35	4.48	4.60	–	0.69	140	151	036	152	144	153
2.375	5.985	3.61	2.125	4.41	4.53	4.66	–	0.69	142	152	037	152	146	153
2.500	6.485	3.83	2.125	4.59	4.72	4.84	–	0.69	144	152	038	153	148	154
2.500 OS	7.760	5.40	2.125	6.49	6.61	6.74	–	0.69	144	152	038	153	148	157
2.625	6.445	4.06	2.227	4.85	4.98	5.10	–	0.69	146	153	039	154	151	155
2.625 OS	6.980	4.92	2.227	5.73	5.86	5.98	–	0.69	146	153	039	154	151	157
2.750	7.710	4.46	2.500	–	5.37	5.50	–	0.69	232	242	151	242	235	246
2.875	7.830	4.59	2.500	–	5.47	5.60	–	0.69	233	243	151	243	236	247
3.000	7.940	4.71	2.500	–	5.60	5.73	–	0.69	234	244	152	244	237	248
3.125	7.990	4.84	2.500	–	5.75	5.87	–	0.69	235	245	152	245	238	249
3.250	8.190	4.96	2.500	–	5.87	6.01	–	0.69	236	246	153	246	239	250
3.375	8.310	5.09	2.500	–	5.97	6.10	6.22	0.81	237	247	153	247	240	251
3.500	8.440	5.21	2.500	–	6.14	6.25	6.38	0.81	238	248	154	248	241	252
3.625	8.490	5.34	2.500	–	6.27	6.38	6.52	0.81	239	249	154	249	242	253

4410 Slow Speed Gas Seal – Metric



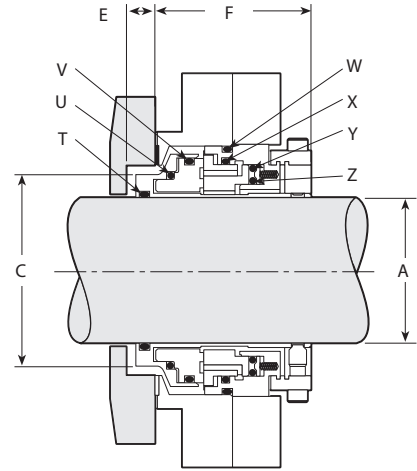
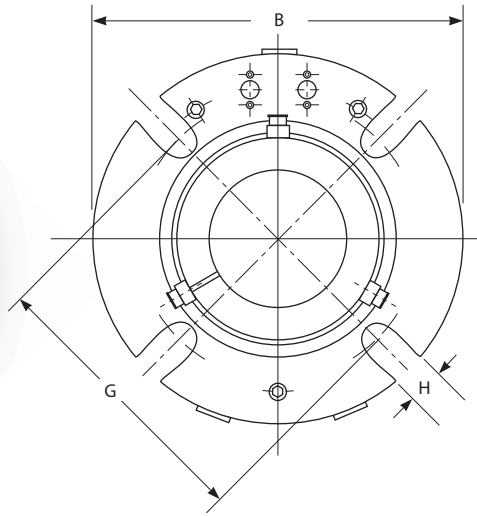
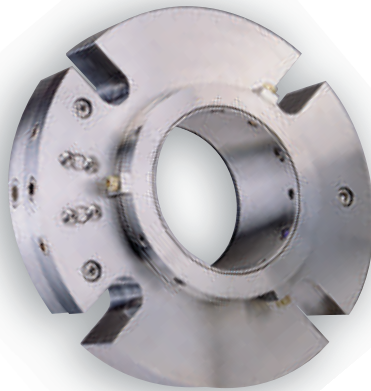
Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- E – Required Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- T – Shaft O-Ring
- U – Rotary Support O-Ring
- V – Rotary Outside Diameter O-Ring
- W – Gland Adapter O-Ring
- X – Stationary O-Ring
- Y – Gland Adapter O-Ring
- Z – Pusher Outside Diameter O-Ring

A	B MAX	C MIN	C MAX	E MIN	F MAX	G			H	T	U	V	R	X	Y	W
						12 mm	16 mm	20 mm								
65	180	91	106	10	71	133	136	–	18	230	236	240	244	241	238	235
70	183	95	109	10	71	137	140	–	18	232	237	241	245	242	239	236
75	190	101	116	10	71	144	148	–	18	234	239	243	247	244	241	238
80	196	107	122	10	71	151	154	–	18	236	241	245	249	246	243	240
85	199	111	125	10	71	153	157	160	21	237	242	246	250	247	244	241
90	206	117	132	10	71	160	163	166	21	239	244	248	252	249	246	243
95	209	120	135	10	71	162	165	168	21	240	245	249	253	250	247	244
100	215	126	141	10	71	170	173	176	21	242	247	251	255	252	249	246
110	225	136	151	10	71	179	182	186	21	245	250	254	258	255	252	249
120	234	145	161	10	71	189	193	196	21	248	253	257	260	258	255	252
						22 mm	24 mm	28 mm								
125	283	160	192	15	102	233	236	239	†	353	361	363	263	364	362	360
130	289	167	198	15	102	239	242	246	†	354	362	364	264	365	363	361
135	296	173	204	15	102	246	249	252	†	356	363	365	265	366	364	362
140	296	173	204	15	102	246	249	252	†	358	363	365	265	366	364	362
145	302	179	211	15	102	252	255	258	†	359	364	366	266	367	365	363
150	309	186	217	15	102	258	261	265	†	361	365	367	267	368	366	364
155	315	192	224	15	102	265	268	271	†	362	366	368	268	369	367	365
160	321	199	230	15	102	271	274	277	†	362	367	369	269	370	368	366
165	321	199	230	15	102	271	274	277	†	363	367	369	269	370	368	366
170	328	205	236	15	102	277	281	284	†	364	368	370	270	371	369	367
175	334	211	243	15	102	284	287	290	†	365	369	371	271	372	370	368
180	340	218	249	15	102	290	293	296	†	366	370	372	272	373	371	369
185	347	224	255	15	102	296	300	303	†	366	371	373	273	374	372	370
190	347	224	255	15	102	296	300	303	†	367	371	373	273	374	372	370
195	353	230	262	15	102	303	306	309	†	368	372	374	274	375	373	371
200	359	237	268	15	102	309	312	315	†	369	373	375	274	376	374	372

† Bolt circle manufactured to customer specifications

4410 Slow Speed Gas Seal – Inch



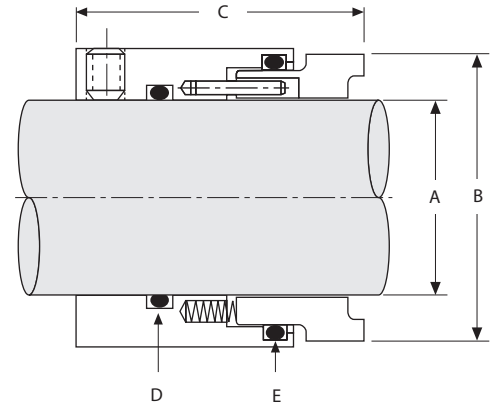
Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- E – Required Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- T – Shaft O-Ring
- U – Rotary Support O-Ring
- V – Rotary Outside Diameter O-Ring
- W – Gland Adapter O-Ring
- X – Stationary O-Ring
- Y – Gland Adapter O-Ring
- Z – Pusher Outside Diameter O-Ring

A	B MAX	C MIN	C MAX	E MIN	F MAX	1/2"	G MIN 5/8"	3/4"	H	T	U	V	R	X	Y	W
2.625	7.10	3.60	4.16	0.40	2.80	5.25	5.37	–	0.69	231	236	240	244	241	238	235
2.750	7.22	3.73	4.29	0.40	2.80	5.38	5.50	–	0.69	232	237	241	245	242	239	236
2.875	7.35	3.85	4.41	0.40	2.80	5.49	5.62	–	0.69	233	238	242	246	243	240	237
3.000	7.47	3.98	4.57	0.40	2.80	5.69	5.81	–	0.69	234	239	243	247	244	241	238
3.125	7.60	4.10	4.68	0.40	2.80	5.80	5.92	–	0.69	235	240	244	248	245	242	239
3.250	7.72	4.23	4.82	0.40	2.80	5.94	6.06	–	0.69	236	241	245	249	246	243	240
3.375	7.85	4.35	4.93	0.40	2.80	6.04	6.17	6.29	0.81	237	242	246	250	247	244	241
3.500	7.97	4.48	5.07	0.40	2.80	6.18	6.31	6.43	0.81	238	243	247	251	248	245	242
3.625	8.10	4.60	5.19	0.40	2.80	6.29	6.42	6.54	0.81	239	244	248	252	249	246	243
3.750	8.22	4.73	5.30	0.40	2.80	6.38	6.51	6.63	0.81	240	245	249	253	250	247	244
3.875	8.35	4.85	5.41	0.40	2.80	6.50	6.62	6.75	0.81	241	246	250	254	251	248	245
4.000	8.47	4.98	5.57	0.40	2.80	6.68	6.81	6.93	0.81	242	247	251	255	252	249	246
4.125	8.60	5.10	5.69	0.40	2.80	6.79	6.92	7.04	0.81	243	248	252	256	253	250	247
4.250	8.72	5.23	5.82	0.40	2.80	6.93	7.05	7.18	0.81	244	249	253	257	254	251	248
4.375	8.85	5.35	5.94	0.40	2.80	7.05	7.18	7.30	0.81	245	250	254	258	255	252	249
4.500	8.97	5.48	6.07	0.40	2.80	7.18	7.30	7.43	0.81	246	251	255	259	256	253	250
4.625	9.10	5.60	6.19	0.40	2.80	7.30	7.43	7.55	0.81	247	252	256	259	257	254	251
4.750	9.22	5.73	6.33	0.40	2.80	7.46	7.59	7.71	0.81	248	253	257	260	258	255	252
						7/8"	1"	1 1/8"								
5.000	11.15	6.32	7.55	0.60	4.00	9.17	9.30	9.42	†	353	361	363	263	364	362	360
5.250	11.40	6.57	7.80	0.60	4.00	9.42	9.55	9.67	†	355	362	364	264	365	363	361
5.500	11.65	6.82	8.05	0.60	4.00	9.67	9.80	9.92	†	357	363	365	265	366	364	362
5.750	11.90	7.07	8.30	0.60	4.00	9.92	10.05	10.17	†	359	364	366	266	367	365	363
6.000	12.15	7.32	8.55	0.60	4.00	10.17	10.30	10.42	†	361	365	367	267	368	366	364
6.250	12.40	7.57	8.80	0.60	4.00	10.42	10.55	10.67	†	362	366	368	268	369	367	365
6.500	12.65	7.82	9.05	0.60	4.00	10.67	10.80	10.92	†	363	367	369	269	370	368	366
6.750	12.90	8.07	9.30	0.60	4.00	10.92	11.05	11.17	†	364	368	370	270	371	369	367
7.000	13.15	8.32	9.55	0.60	4.00	11.17	11.30	11.42	†	365	369	371	271	372	370	368
7.250	13.40	8.57	9.80	0.60	4.00	11.42	11.55	11.67	†	366	370	372	272	373	371	369
7.500	13.65	8.82	10.05	0.60	4.00	11.67	11.80	11.92	†	367	371	373	273	374	372	370
7.750	13.90	9.07	10.30	0.60	4.00	11.92	12.05	12.17	†	368	372	374	274	375	373	371
8.000	14.15	9.32	10.55	0.60	4.00	12.17	12.30	12.42	†	369	373	375	274	376	374	372

† Bolt circle manufactured to customer specifications

891™ Rotary Pusher Single Seal – Metric

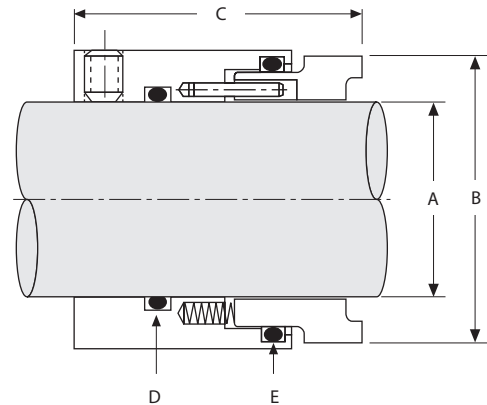
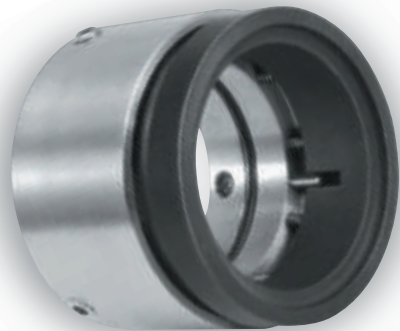


Key

A – Shaft Size B – Seal Diameter C – Operating Length D – Static O-Ring E – Dynamic O-Ring

SHAFT SIZE	A	B	C	D	E	SHAFT SIZE	A	B	C	D	E
16	16,10	30,45	35,00	115	120	85	85,11	107,95	50,80	237	241
18	18,11	32,28	35,00	116	121	90	90,11	114,30	50,80	239	243
20	20,11	34,29	35,00	117	122	95	95,11	117,48	50,80	240	244
22	22,11	36,30	35,00	118	123	100	100,11	123,83	50,80	242	246
24	24,11	38,30	35,00	119	125	110	110,11	133,35	50,80	246	249
25	25,11	39,29	35,00	120	125	120	120,19	152,40	92,07	351	356
28	28,11	42,29	35,00	122	127	125	125,19	158,75	92,07	353	358
30	30,11	44,30	35,00	123	128	130	130,19	165,10	92,07	354	360
32	32,11	46,30	44,45	124	130	135	135,19	171,45	92,07	356	362
33	33,11	47,90	44,45	125	131	140	140,19	171,45	92,07	357	362
35	35,11	49,48	44,45	126	132	145	145,19	177,80	92,07	359	363
38	38,11	54,28	44,45	128	134	150	150,19	184,15	92,07	361	364
40	40,11	56,08	44,45	129	135	155	155,19	190,50	92,07	361	365
43	43,11	59,08	44,45	131	137	160	160,19	196,85	92,07	363	366
45	45,11	61,09	44,45	133	139	165	165,19	196,85	92,07	363	366
48	48,11	64,11	44,45	134	141	170	170,19	203,20	92,07	364	367
50	50,11	66,09	44,45	136	142	175	175,19	209,55	92,07	365	368
55	55,11	71,07	44,45	139	145	180	180,19	215,90	92,07	366	369
60	60,11	77,14	44,45	142	148	185	185,19	215,90	92,07	366	369
65	65,11	83,01	44,45	145	151	190	190,19	222,25	92,07	367	370
70	70,11	86,08	44,45	148	152	195	195,19	228,60	92,07	368	371
75	75,11	98,43	50,80	234	238	200	200,19	234,95	92,07	369	372
80	80,11	104,78	50,80	236	240						

891™ Rotary Pusher Single Seal – Inch

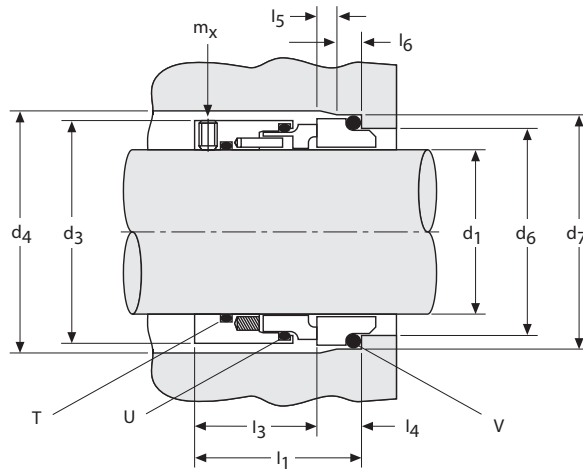


Key

A – Shaft Size B – Seal Diameter C – Operating Length D – Static O-Ring E – Dynamic O-Ring

SHAFT SIZE	A	B	C	D	E	SHAFT SIZE	A	B	C	D	E
0.750	0.754	1.323	1.375	116	122	3.625	3.629	4.500	2.000	239	243
0.875	0.879	1.448	1.375	118	124	3.750	3.754	4.625	2.000	240	244
1.000	1.004	1.573	1.375	120	126	3.875	3.879	4.750	2.000	241	245
1.125	1.129	1.698	1.375	122	128	4.000	4.004	4.875	2.000	242	246
1.250	1.254	1.823	1.750	124	130	4.125	4.129	5.000	2.000	243	247
1.375	1.379	1.948	1.750	126	132	4.250	4.254	5.125	2.000	244	248
1.500	1.504	2.143	1.750	128	134	4.375	4.379	5.250	2.000	245	249
1.625	1.629	2.268	1.750	130	136	4.500	4.504	5.375	2.000	246	250
1.750	1.754	2.393	1.750	132	138	4.750	4.758	6.000	3.625	351	356
1.875	1.879	2.518	1.750	134	140	5.000	5.008	6.250	3.625	353	358
2.000	2.004	2.643	1.750	136	142	5.250	5.258	6.500	3.625	355	360
2.125	2.129	2.768	1.750	138	144	5.500	5.508	6.750	3.625	357	362
2.250	2.254	2.893	1.750	140	146	5.750	5.758	7.000	3.625	359	363
2.375	2.379	3.018	1.750	142	148	6.000	6.008	7.250	3.625	361	364
2.500	2.504	3.143	1.750	144	150	6.250	6.258	7.500	3.625	362	365
2.625	2.629	3.268	1.750	146	151	6.500	6.508	7.750	3.625	363	366
2.750	2.754	3.625	2.000	232	236	6.750	6.758	8.000	3.625	364	367
2.875	2.879	3.750	2.000	233	237	7.000	7.008	8.250	3.625	365	368
3.000	3.004	3.875	2.000	234	238	7.250	7.258	8.500	3.625	366	369
3.125	3.129	4.000	2.000	235	239	7.500	7.508	8.750	3.625	367	370
3.250	3.254	4.125	2.000	236	240	7.750	7.758	9.000	3.625	368	371
3.375	3.379	4.250	2.000	237	241	8.000	8.008	9.250	3.625	369	372
3.500	3.504	4.375	2.000	238	242						

491 DIN Rotary Pusher Single Seal – Metric

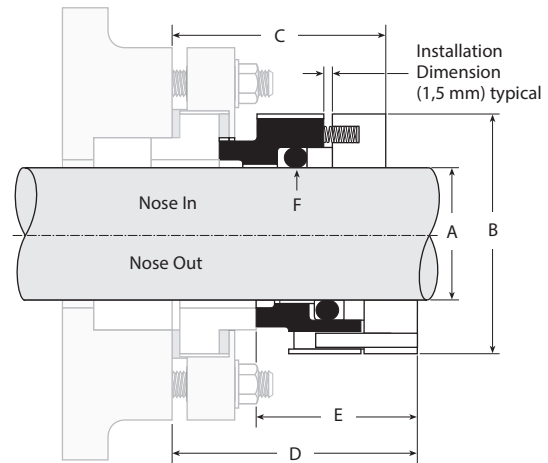


Key

- d₁** – Shaft Diameter
- d₃** – Seal Diameter
- d₄** – Seal Chamber Bore Diameter
- d₆** – Bore Diameter
- d₇** – Static Sealing Diameter
- l₁** – Axial Static O-Ring Location (1)
- l₃** – Rotary Operating Length
- l₄** – Axial Static O-Ring Location (2)
- l₅** – Chamfer Length
- l₆** – Static Sealing Surface Length
- m_x** – Set Screw Size
- T** – Static Shaft O-Ring
- U** – Dynamic O-Ring
- V** – Static Stationary O-Ring

d ₁	d ₃	d ₄	d ₆	d ₇	l ₁	l ₃	l ₄	l ₅	l ₆	m _x	T	U	V
16	28,9	31	23	27	35,0	30,0	5,0	1,5	4	M4	016	022	21,89 x 2,62 (-188)
18	32,3	34	27	33	37,5	30,0	7,5	2,0	5	M4	017	023	26,58 x 3,53 (-215)
20	34,3	36	29	35	37,5	30,0	7,5	2,0	5	M4	018	024	28,17 x 3,53 (-216)
22	36,3	38	31	37	37,5	30,0	7,5	2,0	5	M4	020	025	29,74 x 3,53 (-217)
24	38,4	40	33	39	37,5	30,0	7,5	2,0	5	M4	021	027	31,34 x 3,53 (-218)
25	39,3	41	34	40	37,5	30,0	7,5	2,0	5	M4	022	027	32,92 x 3,53 (-219)
28	42,3	44	37	43	42,5	35,0	7,5	2,0	5	M5	122	127	36,09 x 3,53 (-221)
30	44,3	46	39	45	42,5	35,0	7,5	2,0	5	M5	123	128	37,69 x 3,53 (-222)
32	46,4	48	42	48	42,5	35,0	7,5	2,0	5	M5	124	130	40,87 x 3,53 (-223)
33	48,0	49	42	48	42,5	35,0	7,5	2,0	5	M5	125	131	40,87 x 3,53 (-223)
35	49,5	51	44	50	42,5	35,0	7,5	2,0	5	M5	126	132	44,04 x 3,53 (-224)
38	54,3	58	49	56	44,0	35,0	9,0	2,0	6	M5	128	134	48,00 x 4,00
40	56,1	60	51	58	44,0	35,0	9,0	2,0	6	M5	129	135	50,00 x 4,00
43	59,1	63	54	61	44,0	35,0	9,0	2,0	6	M5	131	137	53,00 x 4,00
45	61,1	65	56	63	44,0	35,0	9,0	2,0	6	M5	133	139	55,00 x 4,00
48	64,2	68	59	66	44,0	35,0	9,0	2,0	6	M5	134	141	58,00 x 4,00
50	66,1	70	62	70	44,5	35,0	9,5	2,5	6	M5	136	142	61,00 x 4,50
53	69,1	73	65	73	46,0	35,0	11,0	2,5	6	M5	137	144	65,00 x 4,50
55	71,1	75	67	75	46,0	35,0	11,0	2,5	6	M5	139	145	65,00 x 4,50
60	76,1	85	72	80	46,0	35,0	11,0	2,5	6	M5	142	148	71,00 x 4,50
65	81,1	90	77	85	46,0	35,0	11,0	2,5	6	M5	145	151	76,00 x 4,50
68	86,1	93	81	90	46,3	35,0	11,3	2,5	7	M5	147	152	80,00 x 5,00
70	86,1	95	83	92	46,3	35,0	11,3	2,5	7	M5	148	152	82,00 x 5,00
75	98,6	104	88	97	59,3	48,0	11,3	2,5	7	M6	234	238	87,00 x 5,00
80	104,2	109	95	105	60,0	48,0	12,0	3,0	7	M6	236	240	95,00 x 5,00
85	108,1	114	100	110	60,0	48,0	12,0	3,0	7	M6	237	241	100,00 x 5,50
90	114,0	119	105	115	62,0	48,0	14,0	3,0	7	M6	239	243	105,00 x 5,50
100	117,6	129	115	125	62,0	48,0	14,0	3,0	7	M6	242	246	115,00 x 5,50
110	133,5	139	125	135	62,0	48,0	14,0	3,0	7	M6	246	249	125,00 x 5,50

440 Non-Metallic External Single Seal – Metric

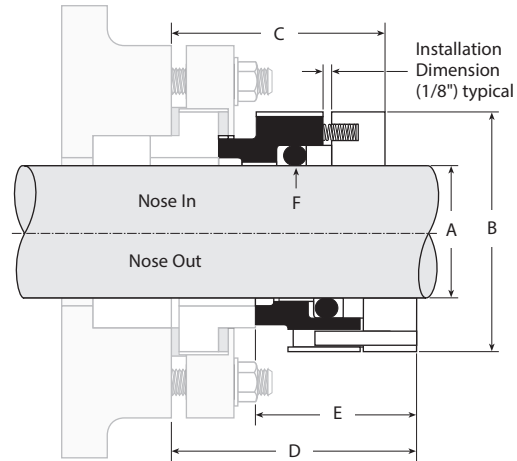


Key

- A – Shaft Size
- B – Seal Diameter
- C – Distance to First Obstruction L-shape Nose In
- D – Distance to First Obstruction L-shape Nose Out
- E – Installed Length of Rotary Seal
- F – O-Ring

A	B	C	D	E	F
24	49,2	49	55,5	38,0	317
25	50,0	49	55,5	38,0	318
28	54,0	49	55,5	38,0	320
30	57,2	49	55,5	38,0	321
32	57,2	49	55,5	38,0	322
35	60,3	49	55,5	38,0	324
38	63,5	49	55,5	38,0	325
40	66,7	49	55,5	38,0	326
42	69,9	49	55,5	38,0	326
45	69,9	49	55,5	38,0	327
48	73,0	49	55,5	38,0	328
50	76,2	49	55,5	38,0	329
55	79,4	49	55,5	38,0	331
60	85,7	49	55,5	38,0	332
65	92,1	49	55,5	38,0	334
70	98,0	62	68,5	41,5	335
75	104,4	62	68,5	41,5	337
80	108,2	62	68,5	41,5	338
85	113,8	62	68,5	41,5	340
90	118,1	62	68,5	41,5	342
95	123,4	62	68,5	41,5	343
100	128,3	62	68,5	41,5	345
110	139,2	62	68,5	41,5	348

440 Non-Metallic External Single Seal – Inch

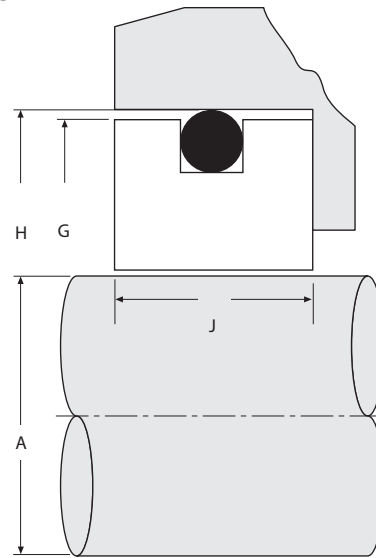


Key

- A – Shaft Size
- B – Seal Diameter
- C – Distance to First Obstruction L-shape Nose In
- D – Distance to First Obstruction L-shape Nose Out
- E – Installed Length of Rotary Seal
- F – O-Ring

A	B	C	D	E	F
0.937	1.937	1.937	2.187	1.500	317
1.000	2.000	1.937	2.187	1.500	318
1.125	2.125	1.937	2.187	1.500	320
1.250	2.250	1.937	2.187	1.500	322
1.375	2.375	1.937	2.187	1.500	324
1.437	2.500	1.937	2.187	1.500	325
1.500	2.500	1.937	2.187	1.500	325
1.625	2.625	1.937	2.187	1.500	326
1.750	2.750	1.937	2.187	1.500	327
1.875	2.875	1.937	2.187	1.500	328
2.000	3.000	1.937	2.187	1.500	329
2.125	3.125	1.937	2.187	1.500	330
2.250	3.250	1.937	2.187	1.500	331
2.375	3.375	1.937	2.187	1.500	332
2.500	3.500	1.937	2.187	1.500	333
2.625	3.625	1.937	2.187	1.500	334
2.750	3.850	2.437	2.687	1.625	335
2.875	3.980	2.437	2.687	1.625	336
3.000	4.110	2.437	2.687	1.625	337
3.125	4.230	2.437	2.687	1.625	338
3.250	4.360	2.437	2.687	1.625	339
3.375	4.480	2.437	2.687	1.625	340
3.500	4.610	2.437	2.687	1.625	341
3.625	4.730	2.437	2.687	1.625	342
3.750	4.860	2.437	2.687	1.625	343
3.875	4.980	2.437	2.687	1.625	344
4.000	5.110	2.437	2.687	1.625	345
4.125	5.230	2.437	2.687	1.625	346
4.250	5.360	2.437	2.687	1.625	347
4.375	5.480	2.437	2.687	1.625	348
4.500	5.610	2.437	2.687	1.625	349

O-Ring MOUNT *Stationary Seal Ring – Inch*

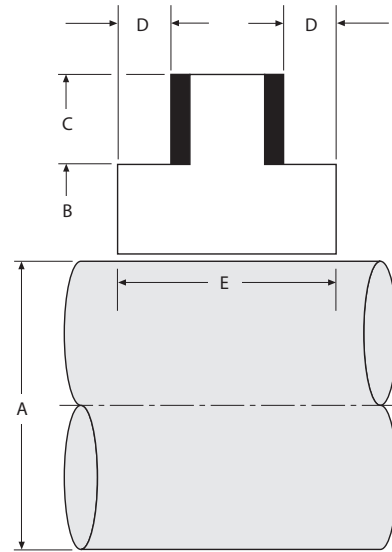
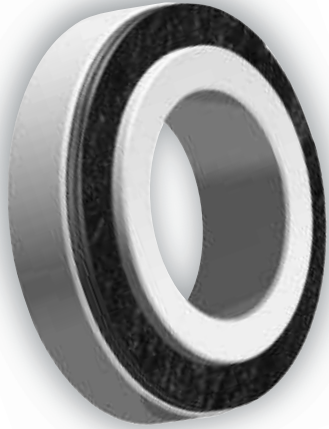


Key			
A – Shaft Size	G – Seal Diameter	H – Bore Diameter	J – Seal Face Length

A	G	H	J
0.625*	1.235	1.250	0.416
0.750*	1.360	1.375	0.416
0.875*	1.485	1.500	0.416
1.000	1.610	1.625	0.439
1.125	1.735	1.750	0.439
1.250	1.860	1.875	0.439
1.375	1.985	2.000	0.439
1.500	2.110	2.125	0.439
1.625	2.360	2.375	0.502
1.750	2.485	2.500	0.502
1.875	2.610	2.625	0.502
2.000	2.735	2.750	0.502
2.125	2.985	3.000	0.564
2.250	3.110	3.125	0.564
2.375	3.235	3.250	0.564
2.500	3.360	3.375	0.564
2.625	3.360	3.375	0.627
2.750	3.485	3.500	0.627
2.875	3.735	3.750	0.627
3.000	3.860	3.875	0.627
3.125	3.985	4.000	0.783
3.250	4.110	4.125	0.783
3.375	4.235	4.250	0.783
3.500	4.360	4.375	0.783
3.625	4.485	4.500	0.783
3.750	4.610	4.625	0.783
3.875	4.735	4.750	0.783
4.000	4.860	4.875	0.783
4.250	5.235	5.250	0.783
4.500	5.485	5.500	0.783
4.750	5.735	5.750	0.783
5.000	5.985	6.000	0.783
5.250	6.235	6.250	0.783
5.500	6.485	6.500	0.783
5.750	6.735	6.750	0.783
6.000	6.985	7.000	0.783

* These sizes available only in ceramic

T-SHAPE Stationary Seal Ring – Inch

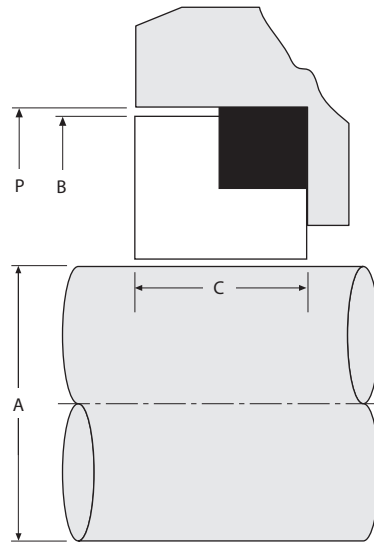


Key

A – Shaft Size B – Bore Diameter C – Seal Face Diameter D – Bore Depth E – Seal Face Length

A	B	C	D	E
0.625	–	1.63	–	–
0.750	–	1.75	–	–
0.875	–	1.88	–	–
0.938	1.557	1.94	0.19	0.75
1.000	1.620	2.09	0.25	0.88
1.125	1.745	2.22	0.25	0.88
1.188	–	2.44	0.25	0.88
1.250	1.870	2.34	0.25	0.88
1.375	1.995	2.41	0.25	0.88
1.438	2.166	2.56	–	–
1.500	2.245	2.72	0.25	0.88
1.625	2.370	2.84	0.25	0.88
1.750	2.495	3.09	0.25	0.88
1.875	2.620	3.22	0.25	0.88
2.000	2.745	3.47	0.25	0.88
2.125	2.870	3.72	0.25	0.88
2.250	2.995	3.84	0.25	0.88
2.375	3.057	3.88	0.25	0.88
2.500	3.245	4.09	0.25	0.88
2.625	3.370	4.22	0.25	0.88

SQUARE MOUNT *Stationary Seal Ring – Inch*



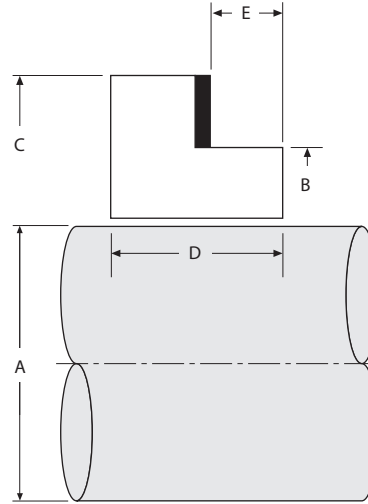
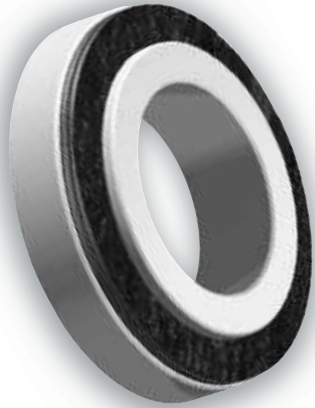
Key

A – Shaft Size B – Seal Face Diameter C – Seal Face Length P – Seal Chamber Bore

A	B	BORE DIAMETER *								C
		P DIA	P DIA	P DIA	P DIA	P DIA	P DIA	P DIA	P DIA	
1.000	1.613	1.625	1.688	1.750	1.812	1.875	2.000	2.062	–	0.437
1.125	1.738	1.750	1.791	1.796	1.812	1.875	1.937	2.062	–	0.437
1.250	1.863	1.875	1.937	2.000	2.032	2.062	2.250	–	–	0.437
1.375	1.988	2.000	2.031	2.062	2.125	2.110	2.143	2.375	2.406	0.437
1.500	2.113	2.125	2.156	2.188	2.250	2.312	2.625	–	–	0.437
1.625	2.363	2.375	2.437	2.468	2.500	2.625	2.750	–	–	0.485
1.750	2.488	2.500	2.578	2.625	3.312	–	–	–	–	0.485
1.875	2.613	2.625	2.660	2.750	2.875	3.000	–	–	–	0.485
2.000	2.738	2.750	2.875	2.937	3.000	3.060	–	–	–	0.485
2.125	2.800	2.812	2.844	2.875	3.000	3.143	3.250	–	–	0.485
2.250	3.113	3.125	3.375	–	–	–	–	–	–	0.485
2.375	3.238	3.250	3.375	–	–	–	–	–	–	0.485
2.500	3.363	3.375	3.406	3.500	3.625	3.750	–	–	–	0.485
2.625	3.363	3.375	3.500	3.625	3.750	–	–	–	–	0.485

* P – Is the bore diameter required for various stationary boots

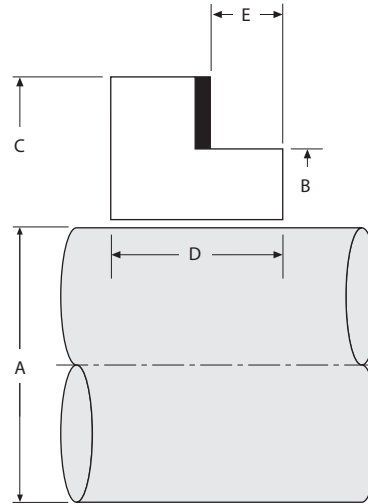
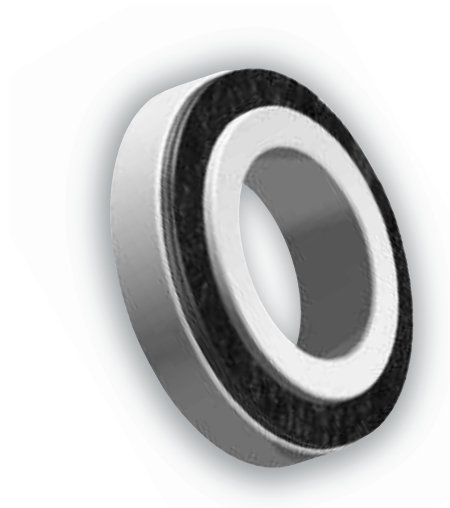
L-SHAPE Stationary Seal Ring – Metric



Key				
A – Shaft Size	B – Seal Face Minor Diameter	C – Seal Face Diameter	D – Seal Face Length	E – Nose Length

A	B	C	D	E
18	33,9	46,0	17	6,6
20	35,9	48,0	17	6,6
22	37,9	50,0	17	6,6
24	39,9	53,2	17	6,6
25	40,9	53,2	17	6,6
28	43,9	56,4	17	6,6
30	45,9	59,5	17	6,6
32	47,9	59,5	17	6,6
33	48,9	59,5	17	6,6
35	50,9	61,1	17	6,6
38	57,9	68,9	17	6,6
40	59,9	72,1	17	6,6
42	61,9	72,1	17	6,6
43	62,9	78,5	17	6,6
45	64,9	78,5	17	6,6
48	67,9	81,6	17	6,6
50	69,9	81,6	17	6,6
53	72,9	88,0	17	6,6
55	74,9	94,3	17	6,6
60	84,9	98,2	20	6,6
65	89,9	106,9	20	6,6
70	94,9	110,7	25	6,6
75	103,9	115,5	25	6,6
80	108,9	123,4	25	6,6
85	113,9	126,6	25	6,6
90	118,9	133,0	25	6,6
95	123,9	136,1	25	6,6
100	128,9	142,5	25	6,6
110	138,9	155,2	25	6,6

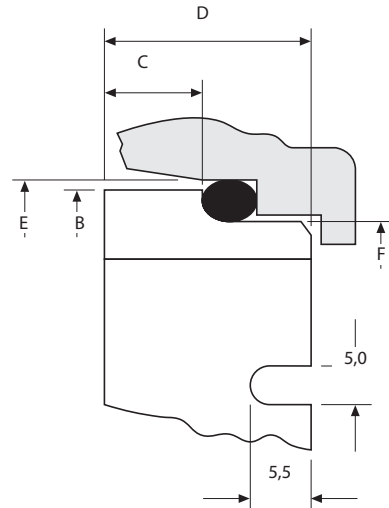
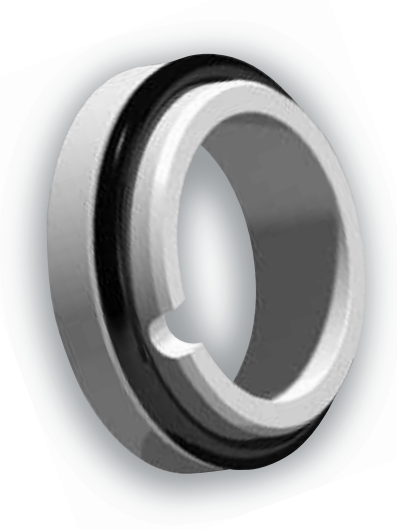
L-SHAPE Stationary Seal Ring – Inch



Key				
A – Shaft Size	B – Seal Face Minor Diameter	C – Seal Face Diameter	D – Seal Face Length	E – Nose Length

A	B	C	D	E
0.625	—	1.63	0.500	0.25
0.750	—	1.75	0.500	0.25
0.875	—	1.88	0.500	0.25
0.938	1.557	1.94	0.625	0.25
1.000	1.620	2.09	0.625	0.25
1.125	1.745	2.22	0.625	0.25
1.188	1.870	2.44	0.625	0.25
1.250	1.870	2.34	0.625	0.25
1.375	1.995	2.41	0.625	0.25
1.438	2.166	2.56	0.625	0.25
1.500	2.245	2.72	0.625	0.25
1.625	2.370	2.84	0.625	0.25
1.750	2.495	3.09	0.625	0.25
1.875	2.620	3.22	0.625	0.25
2.000	2.745	3.47	0.625	0.25
2.125	2.870	3.72	0.62	0.25
2.250	2.995	3.84	0.625	0.25
2.375	3.057	3.88	0.625	0.25
2.500	3.245	4.09	0.625	0.25
2.625	3.370	4.22	0.625	0.25
2.750	3.615	4.38	1.000	0.25
2.875	3.740	4.50	1.000	0.25
3.000	3.865	4.56	1.000	0.25
3.125	3.990	4.69	1.000	0.25
3.250	4.115	4.88	1.000	0.25
3.375	4.240	5.00	1.000	0.25
3.500	4.365	5.13	1.000	0.25
3.625	4.490	5.25	1.000	0.25
3.750	4.615	5.38	1.000	0.25
3.875	4.750	5.50	1.000	0.25
4.000	4.865	5.63	1.000	0.25
4.125	4.990	5.75	1.000	0.25
4.250	5.115	5.88	1.000	0.25
4.375	5.240	6.00	1.000	0.25
4.500	5.365	6.13	1.000	0.25

VDMA Stationary Seal Ring – Metric

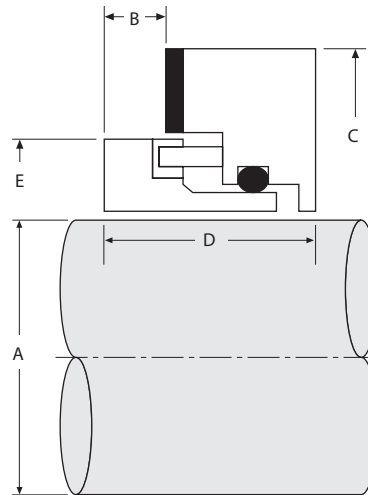


Key

- A – Shaft Size
- B – Seal Face Diameter
- C – Seal Face Nose Length
- D – Seal Face Length
- E – Static Sealing Diameter
- F – Seal Face Minor Diameter

A	B	C	D	O-Ring	E	F
18	32,6	6,5	17,0	26,58 x 3,53	33	26,5
20	34,6	6,5	17,0	28,17 x 3,53	35	28,5
22	36,6	6,5	17,0	29,74 x 3,53	37	30,5
24	38,6	6,5	17,0	31,94 x 3,53	39	32,5
25	39,6	6,5	17,0	32,92 x 3,53	40	33,5
28	42,6	6,5	17,0	36,09 x 3,53	43	36,5
30	44,6	6,5	17,0	37,69 x 3,53	45	38,5
32	47,6	6,5	17,0	40,87 x 3,53	48	41,5
33	47,6	6,5	17,0	40,87 x 3,53	48	41,5
35	49,6	6,5	17,0	44,04 x 3,53	50	43,5
38	55,6	7,0	18,0	48,00 x 4,00	56	48,5
40	57,6	7,0	18,0	50,00 x 4,00	58	50,5
43	60,6	7,0	18,0	52,00 x 4,00	61	53,5
45	62,6	7,0	18,0	55,00 x 4,00	63	55,5
48	65,6	7,0	18,0	58,00 x 4,00	66	58,5
50	69,6	8,5	20,0	60,00 x 4,50	70	61,5
55	74,6	8,5	20,0	65,00 x 4,50	75	66,5
60	79,5	8,5	20,0	70,00 x 4,50	80	71,5
65	85,4	8,5	20,0	75,00 x 4,50	85	76,5
70	91,4	10,0	22,0	82,00 x 5,00	92	82,5
75	96,4	10,0	22,0	87,00 x 5,00	97	87,5
80	104,3	10,0	22,5	95,00 x 5,50	105	94,5
85	109,3	10,0	22,5	100,00 x 5,50	110	99,5
90	114,3	10,0	22,5	105,00 x 5,50	115	104,5
95	119,3	10,0	22,5	110,00 x 5,50	120	109,5
100	124,3	10,0	22,5	115,00 x 5,50	125	114,5
110	134,3	10,0	22,5	120,00 x 5,50	135	124,5

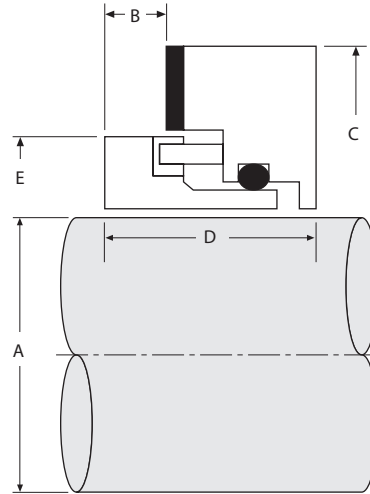
SAS Stationary Seal Ring – Metric



Key				
A – Shaft Size	B – Nose Length	C – Holder Diameter	D – Seal Face Length	E – Seal Face Diameter

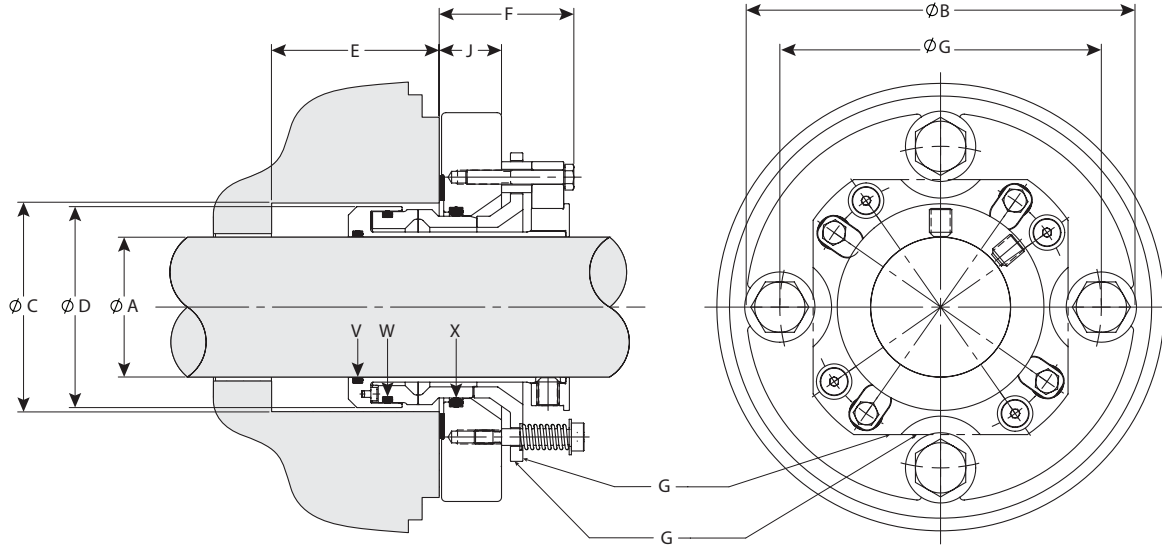
A	B	C	D	E
25	6,4	53,2	16,0	40,0
28	6,4	56,4	16,0	43,0
30	6,4	59,5	16,0	45,0
32	6,4	59,4	16,0	47,2
33	6,4	59,5	16,0	48,0
35	6,4	61,2	16,0	50,4
38	6,4	69,1	16,0	56,8
40	6,4	72,2	16,0	59,0
42	6,4	72,2	16,0	61,0
43	6,4	78,6	16,0	62,0
45	6,4	78,6	16,0	64,0
48	6,4	81,8	16,0	67,0
50	6,4	81,8	16,0	69,0
53	6,4	88,1	16,0	72,0
55	6,4	94,5	16,0	74,0
60	6,4	98,4	16,0	77,4
65	6,4	107,2	16,0	85,3
70	6,4	111,1	25,4	87,3
75	6,4	115,8	25,4	93,6
80	6,4	123,8	25,4	100,0
85	6,4	127,0	25,4	103,2
90	6,4	138,1	25,4	109,5
95	6,4	136,5	25,4	112,7
100	6,4	142,9	25,4	119,0
110	6,4	155,6	25,4	131,7

SAS Stationary Seal Ring – Inch



Key				
A – Shaft Size	B – Nose Length	C – Holder Diameter	D – Seal Face Length	E – Seal Face Diameter
0.625	0.25	1.63	0.500	–
0.750	0.25	1.75	0.500	–
0.875	0.25	1.88	0.500	–
0.938	0.25	1.94	0.625	–
1.000	0.25	2.09	0.625	1.610
1.125	0.25	2.22	0.625	1.735
1.188	0.25	2.44	0.625	–
1.250	0.25	2.34	0.625	1.860
1.375	0.25	2.41	0.625	1.985
1.438	0.25	2.56	0.625	–
1.500	0.25	2.72	0.625	2.235
1.625	0.25	2.84	0.625	2.360
1.750	0.25	3.09	0.625	2.485
1.875	0.25	3.22	0.625	2.610
2.000	0.25	3.47	0.625	2.735
2.125	0.25	3.72	0.625	2.800
2.250	0.25	3.84	0.625	2.985
2.375	0.25	3.88	0.625	3.047
2.500	0.25	4.09	0.625	3.325
2.625	0.25	4.22	0.625	3.360
2.750	0.25	4.38	1.000	3.437
2.875	0.25	4.50	1.000	3.562
3.000	0.25	4.56	1.000	3.687
3.125	0.25	4.69	1.000	3.812
3.250	0.25	4.88	1.000	3.937
3.375	0.25	5.00	1.000	4.062
3.500	0.25	5.13	1.000	4.187
3.625	0.25	5.25	1.000	4.312
3.750	0.25	5.38	1.000	4.437
3.875	0.25	5.50	1.000	4.562
4.000	0.25	5.63	1.000	4.687
4.125	0.25	5.75	1.000	4.937
4.250	0.25	5.88	1.000	4.937
4.375	0.25	6.00	1.000	5.062
4.500	0.25	6.13	1.000	5.187

170 ISO Slurry Single Cartridge Seal – Metric



Key

- A – Shaft Size
- B – Maximum Gland Diameter
- C – Minimum Stuffing Box Diameter
- D – Maximum Inboard Seal Diameter
- E – Minimum Stuffing Box Depth
- F – Outboard Length Required
- G – Minimum Bolt Circle by Bolt Size
- J – Gland Width (Including Gasket)

*For seals to fit ISO-3069-C Seal Chambers**

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	J MAX	SQUARE PUSHER BC	SQUARE PUSHER BC	SQUARE PUSHER BC	O-RINGS		
								10 mm	G MIN 12 mm	16 mm	SHAFT V	ROTARY W	STATIONARY X
40	139	65	72	62	35	47	22	–	110	–	129	138	228
45	139	70	77	67	35	47	22	–	115	–	133	141	229
50**	139	75	82	72	35	47	22	–	115	–	136	144	231
53	152	80	100	77	35	47	22	–	125	–	137	147	232
55	152	85	100	77	35	47	22	–	125	–	139	147	232
60	177	90	100	82	35	47	22	–	–	145	142	150	234
65**	177	95	113	94	45	61	29	–	–	145	231	236	237
75**	190	109	129	104	45	61	29	–	–	155	234	239	240
85**	203	119	135	113	45	61	29	–	–	165	237	242	243

* Seals only available for shaft sizes listed

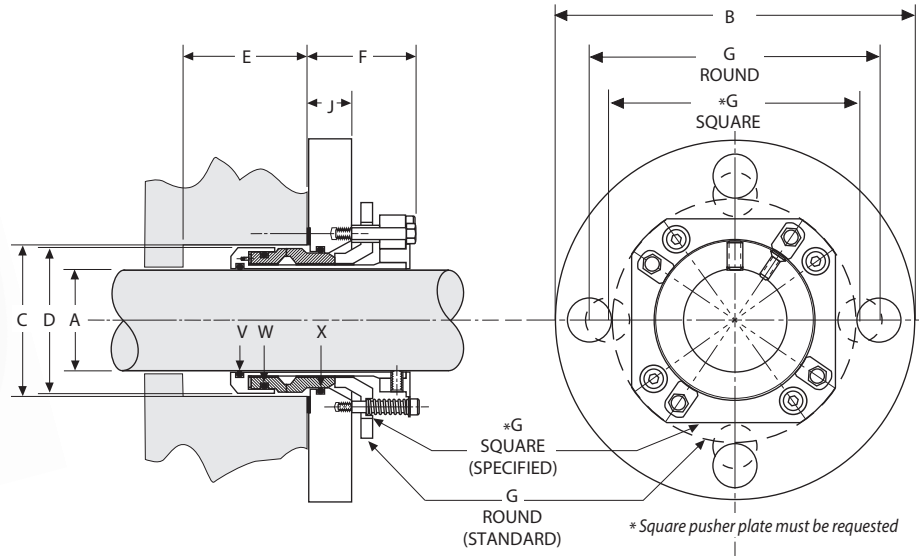
** Uses scallop pusher plate

*For seals to fit ISO-3069-H Seal Chambers**

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	J MAX	SQUARE PUSHER BC	SQUARE PUSHER BC	SQUARE PUSHER BC	O-RINGS		
								12 mm	G MIN 16 mm	20 mm	SHAFT V	ROTARY W	STATIONARY X
40	152	90	100	62	35	47	22	125	–	–	129	138	228
50	177	100	114	72	35	47	22	–	140	–	136	144	231
60	190	120	133	83	35	47	22	–	160	–	142	150	234
70	203	130	142	97	45	61	29	–	170	–	232	237	238
80	215	140	152	107	45	61	29	–	180	–	235	240	241
90	241	160	176	117	45	61	29	–	–	205	239	243	245
100	253	170	186	142	61	76	36	–	–	215	345	351	353
110	266	180	194	152	61	76	36	–	–	225	348	354	356

* Seals only available for shaft sizes listed

170 Slurry Single Cartridge Seal – Metric



Key

- A – Shaft Size
- B – Maximum Gland Diameter
- C – Minimum Seal Chamber Bore
- D – Maximum Inboard Seal Diameter
- E – Minimum Seal Chamber Depth
- F – Outboard Length Required
- G – Minimum Bolt Circle by Bolt Size
- J – Gland Width (Including Gasket)
- V – Rotary Seal O-Ring
- W – Rotary Seal O-Ring
- X – Stationary Seal O-Ring

A	B MAX	C MIN	D MAX	E MIN	F MAX	J MAX	SQUARE		ROUND		SQUARE		ROUND		SQUARE		ROUND		V	W	X
							G		G MIN		G		G MIN		SEE BELOW						
							10 mm	10 mm	12 mm	12 mm	16 mm	16 mm	20 mm	20 mm	24 mm	24 mm	30 mm	30 mm			
38	139,2	62,8	60,1	34,1	49,5	22,4	99,4	118,5	102,8	122,0	–	–	–	–	–	–	–	–	128	137	227
40	151,9	64,7	62,0	34,1	49,5	22,4	101,3	120,4	104,7	123,9	–	–	–	–	–	–	–	–	129	138	228
43	151,9	67,7	65,0	34,1	49,5	22,4	104,3	123,4	107,7	126,9	–	–	–	–	–	–	–	–	131	140	229
45	164,6	69,7	67,0	34,1	49,5	22,4	106,3	125,4	109,7	128,9	–	–	–	–	–	–	–	–	133	141	229
48	164,6	72,7	70,0	34,1	49,5	22,4	109,3	128,4	112,7	131,9	–	–	–	–	–	–	–	–	134	143	230
50	164,6	74,8	72,0	34,1	49,5	22,4	111,3	130,5	114,7	133,9	–	–	–	–	–	–	–	–	136	144	231
55	177,3	79,7	77,0	34,1	49,5	22,4	116,3	135,4	119,7	138,9	126,6	145,8	–	–	–	–	–	–	139	147	232
60	177,3	85,1	82,3	34,1	49,5	22,4	121,6	140,8	125,0	144,2	132,0	151,2	–	–	–	–	–	–	142	150	234
							12 mm	12 mm	16 mm	16 mm	20 mm	20 mm	24 mm	24 mm	30 mm	30 mm					
65	206,0	97,8	93,8	43,7	64,0	29,7	141,0	170,3	148,0	177,2	–	–	–	–	–	–	–	–	231	236	237
70	209,3	101,2	97,1	43,7	64,0	29,7	144,4	173,6	151,3	180,5	–	–	–	–	–	–	–	–	232	237	238
75	215,5	107,4	103,3	43,7	64,0	29,7	150,6	179,8	157,5	186,7	–	–	–	–	–	–	–	–	234	239	240
80	219,3	111,2	107,1	43,7	64,0	29,7	154,4	183,6	161,3	190,5	–	–	–	–	–	–	–	–	236	240	241
85	225,0	116,9	112,8	43,7	64,0	29,7	160,1	189,3	167,0	196,2	174,0	203,2	–	–	–	–	–	–	237	242	243
90	229,3	121,2	117,1	43,7	64,0	29,7	164,4	193,6	171,3	200,5	178,3	207,5	–	–	–	–	–	–	239	243	245
95	234,6	126,4	122,4	43,7	64,0	29,7	169,6	198,8	176,6	205,8	183,5	212,7	–	–	–	–	–	–	240	245	246
100	234,3	147,3	141,8	43,7	76,8	36,6	176,0	212,3	182,9	219,2	189,9	226,2	–	–	–	–	–	–	345	351	353
110	243,8	156,8	151,3	43,7	76,8	36,6	185,5	221,8	192,4	228,8	199,4	235,7	–	–	–	–	–	–	348	354	356
120	253,4	166,3	160,8	61,7	76,8	36,6	195,0	231,3	202,0	238,3	208,9	245,2	215,8	252,1	227,4	263,7	–	–	351	357	359
130	266,1	179,0	173,5	61,7	76,8	36,6	–	–	214,7	251,0	221,6	257,9	228,5	264,8	240,1	276,4	–	–	354	361	362
140	272,7	185,7	180,2	61,7	76,8	36,6	–	–	221,3	257,6	228,3	264,6	235,2	271,5	246,7	283,0	–	–	357	362	363
145	278,8	191,7	186,2	61,7	76,8	36,6	–	–	227,4	263,7	234,3	270,6	241,2	277,5	252,8	289,1	–	–	359	363	364
150	285,1	198,1	192,6	61,7	76,8	36,6	–	–	233,7	270,0	240,7	277,0	247,6	283,9	259,1	295,4	–	–	361	364	365
160	292,7	205,7	200,2	61,7	76,8	36,6	–	–	241,3	277,6	248,3	284,6	237,6	255,2	303,0	266,7	–	–	363	365	367
170	304,2	217,1	211,6	61,7	76,8	36,6	–	–	252,8	289,1	259,7	296,0	249,0	266,6	314,5	278,2	–	–	364	367	368
180	312,7	225,7	220,2	61,7	76,8	36,6	–	–	261,3	297,6	268,3	304,6	257,6	275,2	323,0	286,7	–	–	366	368	370

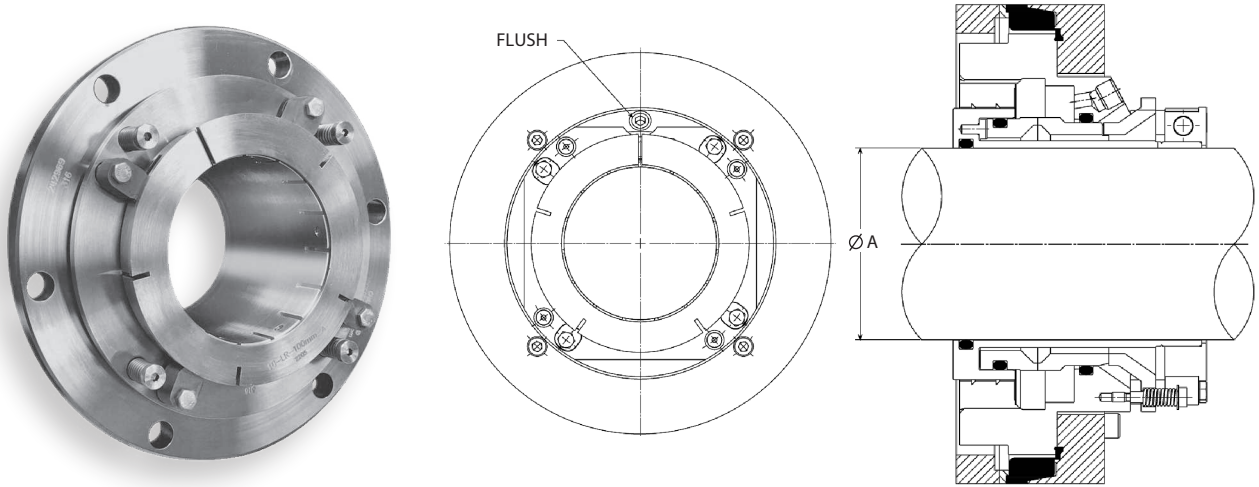
170 Slurry Single Cartridge Seal – Inch

Key

- A – Shaft Size
- B – Maximum Gland Diameter
- C – Minimum Seal Chamber Bore
- D – Maximum Inboard Seal Diameter
- E – Minimum Seal Chamber Depth
- F – Outboard Length Required
- G – Minimum Bolt Circle by Bolt Size
- J – Gland Width (Including Gasket)
- V – Shaft O-Ring
- W – Rotary Seal O-Ring
- X – Stationary Seal O-Ring

A	B MAX	C MIN	D MAX	E MIN	F MAX	J MAX	SQUARE		ROUND		SQUARE		ROUND		V	W	X
							3/8"	3/8"	1/2"	1/2"	5/8"	5/8"	7/8"	7/8"			
1.500	5.48	2.47	2.37	1.34	1.95	0.88	3.88	4.64	4.10	4.85	–	–	–	–	128	137	227
1.625	5.98	2.60	2.49	1.34	1.95	0.88	3.96	4.71	4.17	4.93	–	–	–	–	130	139	228
1.750	6.48	2.72	2.62	1.34	1.95	0.88	4.01	4.76	4.22	4.98	–	–	–	–	132	141	229
1.875	6.48	2.85	2.74	1.34	1.95	0.88	4.07	4.83	4.29	5.04	–	–	–	–	134	143	230
2.000	6.48	2.97	2.87	1.34	1.95	0.88	4.13	4.89	4.35	5.10	–	–	–	–	137	145	231
2.125	6.98	3.10	2.99	1.34	1.95	0.88	4.15	4.91	4.37	5.12	4.94	5.69	–	–	138	147	232
2.250	6.98	3.22	3.12	1.34	1.95	0.88	4.26	5.01	4.47	5.23	4.98	5.73	–	–	140	149	233
2.375	6.98	3.35	3.24	1.34	1.95	0.88	4.27	5.03	4.49	5.24	5.06	5.82	–	–	142	150	234
2.500	7.48	3.47	3.37	1.34	1.95	0.88	4.35	5.10	4.57	5.32	5.19	5.94	–	–	144	151	235
							1/2"	1/2"	5/8"	5/8"	3/4"	3/4"	7/8"	7/8"			
2.625	8.11	3.85	3.69	1.72	2.52	1.17	5.60	6.75	5.82	6.97	–	–	–	–	231	236	237
2.750	8.24	3.98	3.82	1.72	2.52	1.17	5.73	6.88	5.95	7.10	–	–	–	–	232	237	238
2.875	8.36	4.10	3.94	1.72	2.52	1.17	5.85	7.00	6.07	7.22	–	–	–	–	233	238	239
3.000	8.49	4.23	4.07	1.72	2.52	1.17	5.98	7.13	6.19	7.34	–	–	–	–	234	239	240
3.125	8.61	4.35	4.19	1.72	2.52	1.17	6.10	7.25	6.32	7.47	5.99	7.14	6.11	7.26	235	240	241
3.250	8.74	4.48	4.32	1.72	2.52	1.17	6.23	7.38	6.44	7.59	6.11	7.26	6.24	7.39	236	241	242
3.375	8.86	4.60	4.44	1.72	2.52	1.17	6.35	7.50	6.57	7.72	6.24	7.39	6.36	7.51	237	242	243
3.500	8.99	4.73	4.57	1.72	2.52	1.17	6.48	7.63	6.69	7.84	6.36	7.51	6.49	7.64	238	243	244
3.625	9.11	4.85	4.69	1.72	2.52	1.17	6.60	7.75	6.82	7.97	6.49	7.64	6.61	7.76	239	244	245
3.750	9.24	4.98	4.82	1.72	2.52	1.17	6.73	7.88	6.94	8.09	6.61	7.76	6.74	7.89	240	245	246
3.875	9.36	5.10	4.94	1.72	2.52	1.17	6.85	8.00	7.07	8.22	6.74	7.89	6.86	8.01	241	246	247
4.000	9.23	5.80	5.58	2.43	3.05	1.44	6.98	8.41	7.19	8.62	7.41	8.84	7.63	9.06	345	351	353
4.125	9.35	5.92	5.71	2.43	3.05	1.44	7.10	8.53	7.32	8.75	7.53	8.96	7.75	9.18	346	352	354
4.250	9.48	6.05	5.83	2.43	3.05	1.44	7.23	8.66	7.44	8.87	7.66	9.09	7.88	9.31	347	353	355
4.375	9.60	6.17	5.96	2.43	3.05	1.44	7.35	8.78	7.57	9.00	7.78	9.21	8.00	9.43	348	354	356
4.500	9.73	6.30	6.08	2.43	3.05	1.44	7.48	8.91	7.69	9.12	7.91	9.34	8.13	9.56	349	355	357
							3/4"	3/4"	7/8"	7/8"	1"	1"	1 1/8"	1 1/8"			
4.625	9.85	6.42	6.21	2.43	3.05	1.44	8.03	9.46	8.25	9.68	–	–	–	–	350	356	358
4.750	9.98	6.55	6.33	2.43	3.05	1.44	7.61	9.04	7.74	9.17	8.59	10.02	8.72	10.15	351	357	359
5.000	10.23	6.80	6.58	2.43	3.05	1.44	8.41	9.84	8.63	10.06	8.84	10.27	8.97	10.40	353	359	361
5.250	10.48	7.05	6.83	2.43	3.05	1.44	8.66	10.09	8.88	10.31	9.09	10.52	9.22	10.65	355	361	362
5.500	10.74	7.31	7.09	2.43	3.05	1.44	8.92	10.35	9.14	10.57	9.35	10.78	9.48	10.91	357	362	363
5.750	10.98	7.55	7.33	2.43	3.05	1.44	–	–	8.74	10.17	9.59	11.02	9.72	11.15	359	363	364
6.000	11.23	7.80	7.58	2.43	3.05	1.44	–	–	8.99	10.42	9.84	11.27	9.97	11.40	361	364	365
6.250	11.52	8.10	7.88	2.43	3.05	1.44	–	–	9.93	11.36	10.14	11.57	10.27	11.70	362	365	367
6.500	11.73	8.30	8.08	2.43	3.05	1.44	–	–	10.13	11.56	10.34	11.77	10.47	11.90	363	366	367
6.750	11.98	8.55	8.33	2.43	3.05	1.44	–	–	10.38	11.81	10.59	12.02	10.72	12.15	364	367	368
7.000	12.31	8.89	8.67	2.43	3.05	1.44	–	–	10.07	11.50	10.93	12.36	11.06	12.49	365	368	370

170L Slurry Single Cartridge Seal for Warman AH Series Pumps – Metric



Above: 170L Slurry Single Cartridge Seal—Wet Version

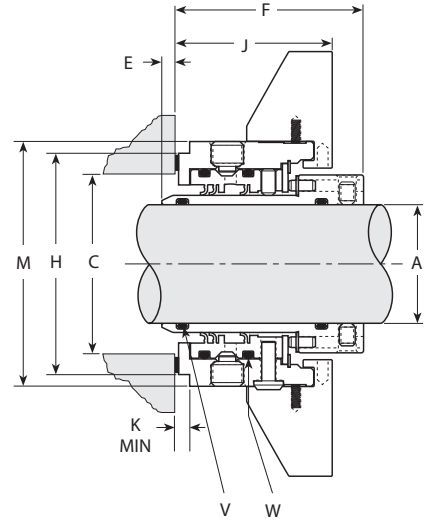
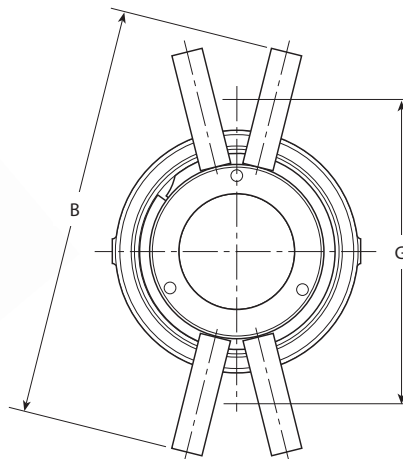
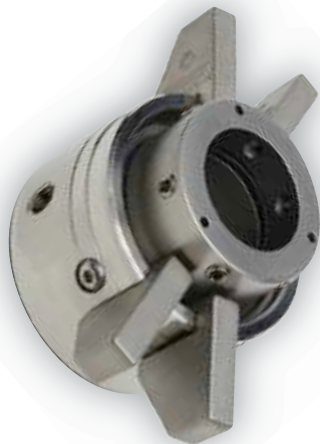
Key

A – Shaft Size

WARMAN® AH® PUMP FRAME SIZES – 170L SLURRY SEAL AVAILABILITY DRY END VERSION			
AH® PUMP MODEL/FRAME	SHAFT SIZE (mm)	STANDARD	QUENCH/DRAIN AND LIP SEAL
3/2 C&P-AH	60	✓	✓
4/3 C&P-AH			
4/3 D&Q-AH			
6/4 D&Q-AH	85	✓	✓
6/4 E-AH	100		
8/6 E&R-AH		✓	✓
10/8 E&R-M			
12/10 E&R-M			
8/6 F-AH	130		
10/8 F-M		✓	✓
12/10 F-M			
10/8 F-AH	145		
12/10 F-AH		✓	✓
14/12 F-AH			
10/8 G&T-AH	180		
10/8 ST-AH			
12/10 G&T-AH		✓	✓
12/10 ST-AH			
14/12 G&T-AH			
16/14 TU-AH	220	✓	✓
20/18 TU-AH			

WARMAN® AH® PUMP FRAME SIZES – 170L SLURRY SEAL AVAILABILITY WET END VERSION		
AH® PUMP MODEL/FRAME	SHAFT SIZE (mm)	STANDARD
1.5/1 B-AH	50	
2/1.5 B-AH		✓
3/2 C-AH	60	✓
4/3 C-AH	85	
4/3 D-AH		✓
6/4 D-AH		
6/4 E-AH	100	✓
8/6 E-AH	130	
8/6 F-AH		✓
10/8 ST-AH		✓

HVS High Viscosity Seal

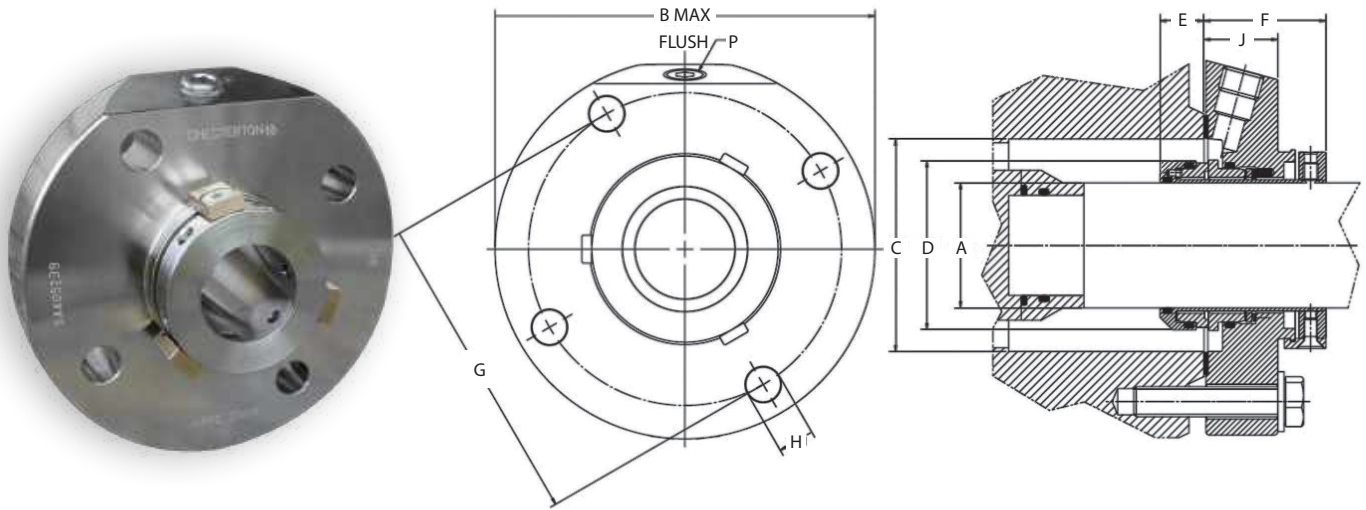


Key																
A – Shaft Size	B – Maximum Gland Diameter	C – Minimum Seal Chamber Bore	E – Minimum Seal Chamber Depth	F – Outboard Seal Length	G – Minimum Bolt Circle by Bolt Size	H – Gland Thickness	J – Distance from Seal Chamber Face to Tab Face	K – Gland Step	M – Gland OD	V – Shaft O-Ring	W – Sealing Element O-Ring					

Piping connections: 1/8" NPT

A	B MAX	C MIN	C MAX	E MIN	F	8 mm	10 mm	G MIN 12 mm	16 mm	20 mm	H	J	K	M	V	W
25	120,8	37,7	40,6	3,6	58,0	72,8	74,8	76,8	–	–	59,9	52,2	0,18	64,2	119	130
28	124,7	40,8	49,8	3,6	58,0	76,4	78,4	80,4	–	–	63,7	52,2	0,18	67,8	122	133
30	124,7	40,8	49,8	3,6	58,0	76,4	78,4	80,4	–	–	63,7	52,2	0,18	67,8	025	133
32	128,1	44,2	54,4	4,9	63,0	79,8	81,8	83,8	87,8	–	67,1	52,2	0,18	71,1	124	135
35	131,0	40,8	56,4	4,9	63,0	82,7	84,7	86,7	90,7	–	70,0	52,2	0,18	74,1	127	137
40	125,5	52,2	57,9	4,9	63,0	87,8	89,8	91,8	95,8	99,8	71,8	52,2	0,18	79,1	129	140
45	130,5	57,2	62,9	4,9	63,0	92,8	94,8	96,8	100,8	104,8	76,8	52,2	0,18	84,1	132	143
50	147,2	63,1	66,8	4,9	63,0	98,6	100,6	102,6	106,6	110,6	82,6	52,2	0,18	89,9	136	147
53	150,1	66,2	84,1	4,9	63,0	101,8	103,8	105,8	109,8	113,8	85,8	52,2	0,18	93,2	137	149
55	156,9	69,4	75,4	4,9	63,0	104,9	106,9	135,1	137,1	141,1	89,0	52,2	0,18	96,5	140	150
60	172,6	74,1	93,9	4,9	63,0	124,4	126,4	128,4	132,4	136,4	110,4	54,1	0,18	115,8	142	151
65	176,4	77,2	91,9	4,9	63,0	127,5	129,5	131,5	135,5	139,5	105,6	53,5	0,18	118,8	145	152
70	181,2	81,9	96,8	4,9	63,0	–	–	136,4	140,4	144,4	110,4	53,5	0,18	123,6	148	152
75	188,4	89,2	115,7	4,9	63,0	–	–	143,5	147,5	151,5	131,0	52,4	0,00	131,0	234	239
80	193,4	94,2	120,9	4,9	63,0	–	–	148,5	152,5	156,5	136,0	52,4	0,00	135,8	235	241
85	215,0	100,8	113,8	4,9	63,0	–	–	156,8	160,8	164,8	143,3	52,4	0,00	143,0	238	243
100	214,9	115,8	141,1	4,9	63,0	–	–	170,1	174,1	178,1	157,6	52,4	0,00	157,5	242	247
						5/16"	7/16"	1/2"	5/8"	3/4"						
0.750	4.54	1.21	1.48	.30	2.186	2.641	2.766	–	–	–	2.133	2.06	0.15	2.30	116	127
1.125	4.92	1.58	1.82	.30	2.186	3.016	3.141	–	–	–	2.510	2.06	0.15	2.67	122	133
1.375	5.17	1.83	2.06	.30	2.405	3.266	3.391	–	–	–	2.758	2.06	0.15	2.92	126	137
1.437	5.23	1.89	2.10	.30	2.405	3.328	3.453	–	–	–	2.690	2.06	0.15	2.99	127	138
1.500	5.29	1.96	2.11	.30	2.405	3.391	3.516	–	–	–	2.753	2.06	0.15	3.05	128	139
1.625	5.42	2.08	2.23	.30	2.405	3.516	3.641	3.703	–	–	2.878	2.06	0.15	3.17	130	141
1.750	5.54	2.21	2.36	.30	2.405	3.641	3.766	3.828	–	–	3.003	2.06	0.15	3.30	132	143
1.812	5.60	2.27	2.29	.30	2.405	3.703	3.828	3.890	–	–	3.065	2.06	0.15	3.36	133	144
1.875	5.67	2.33	2.45	.30	2.405	3.766	3.891	3.953	–	–	3.128	2.06	0.15	3.128	134	145
2.125	5.92	2.58	2.80	.30	2.405	–	–	4.203	4.328	4.453	3.378	2.06	0.15	3.67	138	149
2.250	6.04	2.71	2.81	.30	2.405	–	–	4.328	4.453	4.578	3.503	2.06	0.15	3.80	140	150
2.437	6.81	2.89	3.23	.30	2.465	–	–	5.095	5.220	5.345	4.034	2.06	0.15	4.57	143	151
2.500	6.87	2.96	3.41	.30	2.465	–	–	5.158	5.283	5.408	4.097	2.06	0.15	4.63	144	151
2.750	7.12	3.21	3.65	.30	2.406	–	–	5.408	5.533	5.658	4.347	2.06	0.15	4.88	148	152
2.875	7.93	3.41	3.98	.30	2.406	–	–	5.611	5.736	5.861	5.080	2.06	0.00	5.08	233	238
2.953	8.01	3.49	3.98	.30	2.406	–	–	5.689	5.814	5.939	5.160	2.06	0.00	5.16	234	239
3.437	8.50	3.97	4.48	.30	2.406	–	–	6.173	6.298	6.423	5.640	2.06	0.00	5.64	238	243
3.500	8.56	4.03	4.48	.30	2.406	–	–	6.236	6.361	6.486	5.710	2.06	0.00	5.71	238	243
4.000	9.06	4.53	4.98	.30	2.406	–	–	6.736	6.861	6.986	6.210	2.06	0.00	6.21	242	247

APPS SINGLE CARTRIDGE SEAL – Metric



Key

- A – Shaft Size
- B – Gland Outside Diameter
- C – Seal Chamber Bore
- D – IB Seal Diameter
- E – Seal Chamber Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- J – Gland Width

A	B MAX	C	D	E MIN	F	G MIN	H	P
30	127	60	44,5	13	53	95	12	1/4"
40	127	70	57,5	18	49	105	12	3/8"
50	152	85	67,5	18	49	125	14	3/8"
60	165	95	77,8	18	49	135	14	3/8"
80	203	122	103	18	66	170	18	1/2"
90	215	132	113	18	66	180	18	1/2"

APPS SINGLE CARTRIDGE SEAL – Metric

Step 1: Find Your Sulzer APP/NPP/WPP Pump Frame to Determine the Seal Diameter

Pump Frame Size	Seal Diameter
1	30 mm
2	40 mm
3	50 mm
4	60 mm
5	80 mm
6	90 mm

Example: APP32-125

3 = Bearing frame size No. 3

2 = Adapter No. 2

125 = Discharge flange in mm

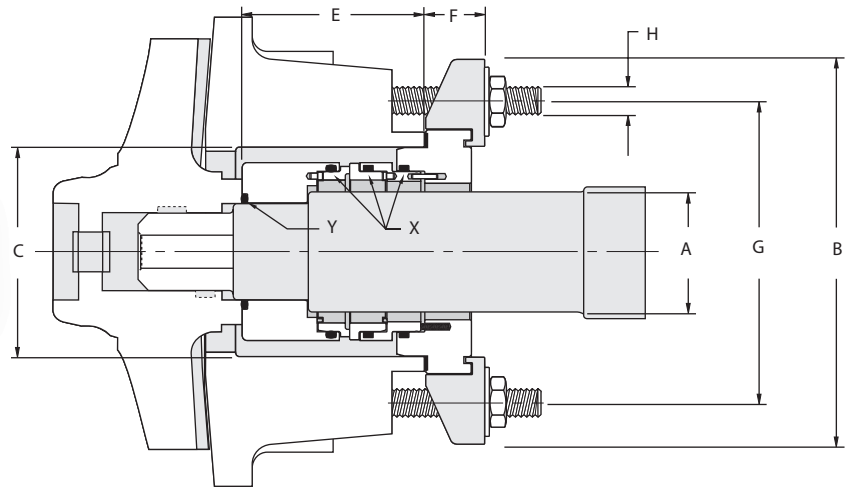
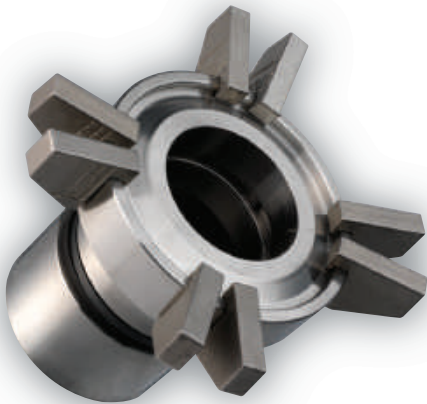


Step 2: Choose Your APPS Single Cartridge Seal

Seal Diameter	Description and Materials	Item Number	Description and Materials	Item Number
30 mm	APPS 30 mm SA CB/SSC S EP	405238	APPS 30 mm SA SSC/SSC S EP	405240
	APPS 30 mm SA CB/SSC S FKM	405239	APPS 30 mm SA SSC/SSC S FKM	405241
	APPS 30 mm SA CB/SSC S FEPM	415544	APPS 30 mm SA SSC/SSC S FEPM	415545
	APPS 30 mm SLEEVE KIT*	418314		
40 mm	APPS 40 mm SA CB/SSC S EP	405246	APPS 40 mm SA SSC/SSC S EP	405248
	APPS 40 mm SA CB/SSC S FKM	405247	APPS 40 mm SA SSC/SSC S FKM	405249
	APPS 40 mm SA CB/SSC S FEPM	415546	APPS 40 mm SA SSC/SSC S FEPM	415547
	APPS 40 mm SLEEVE KIT*	418315		
50 mm	APPS 50 mm SA CB/SSC S EP	405254	APPS 50 mm SA SSC/SSC S EP	405256
	APPS 50 mm SA CB/SSC S FKM	405255	APPS 50 mm SA SSC/SSC S FKM	405257
	APPS 50 mm SA CB/SSC S FEPM	415548	APPS 50 mm SA SSC/SSC S FEPM	415549
	APPS 50 mm SLEEVE KIT*	418316		
60 mm	APPS 60 mm SA CB/SSC S EP	405262	APPS 60 mm SA SSC/SSC S EP	405264
	APPS 60 mm SA CB/SSC S FKM	405263	APPS 60 mm SA SSC/SSC S FKM	405265
	APPS 60 mm SA CB/SSC S FEPM	415550	APPS 60 mm SA SSC/SSC S FEPM	415551
	APPS 60 mm SLEEVE KIT*	418317		
80 mm	APPS 80 mm SA CB/SSC S EP	405270	APPS 80 mm SA SSC/SSC S EP	405272
	APPS 80 mm SA CB/SSC S FKM	405271	APPS 80 mm SA SSC/SSC S FKM	405273
	APPS 80 mm SA CB/SSC S FEPM	415552	APPS 80 mm SA SSC/SSC S FEPM	415553
	APPS 80 mm SLEEVE KIT*	418318		
90 mm	APPS 90 mm SA CB/SSC S EP	405278	APPS 90 mm SA SSC/SSC S EP	405280
	APPS 90 mm SA CB/SSC S FKM	405279	APPS 90 mm SA SSC/SSC S FKM	405281
	APPS 90 mm SA CB/SSC S FEPM	415554	APPS 90 mm SA SSC/SSC S FEPM	415555
	APPS 90 mm SLEEVE KIT*	418319		

*When installing the Chesterton APPS mechanical seal for the first time, the sleeve kit is required. If the Sulzer pump is already equipped with an APPS seal, then the sleeve kit is already installed. The seal will install directly to the pump shaft.

DirectFit™ Single Seal



Key

A – Shaft Size
 B – Tab Diameter
 C – Seal Chamber Bore Diameter

E – Inboard Seal Length
 F – Outboard Seal Length
 G – Bolt Circle

H – Stud Diameter
 X – Wetted O-Rings
 Y – Impeller Hub O-Ring

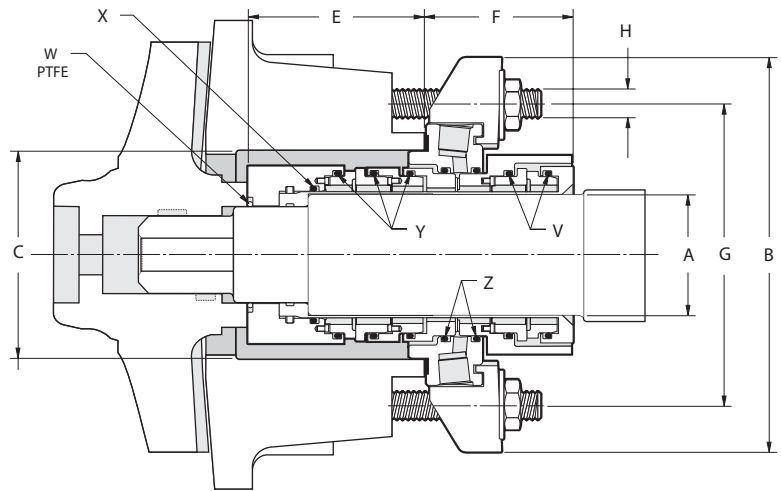
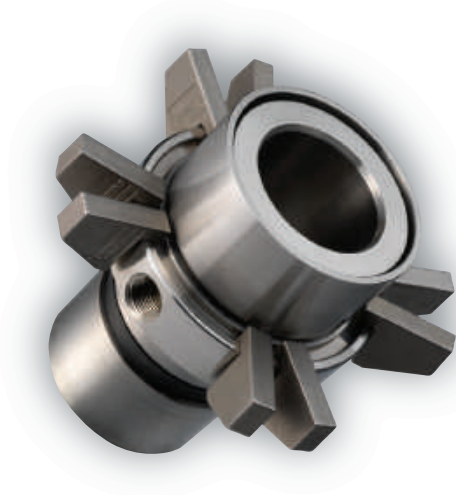
DFS APP – Metric

FRAME	A	B	C MIN	C MAX	E	F	G	H APP	X	Y
1	30	135,6	60	60,05	60,0	31,1	95,0	M10	031	119
2	40	143,8	70	70,05	60,0	31,1	105,0	M10	138	123
3	50	161,3	85	85,05	73,1	31,1	125,0	M12	145	129
4	60	170,1	95	95,05	73,1	31,1	135,0	M12	152	132
5	80	212,1	122	122,06	92,0	31,5	170,0	M16	241	231
6	90	224,3	132	132,06	92,0	31,5	180,0	M16	244	234

DFS APT – Inch

FRAME	A	B	C MIN	C MAX	E	F	G	H APP	X	Y
1	1.181	5.34	2.375	2.377	2.36	1.22	3.74	3/8-16	031	119
2	1.575	5.66	2.750	2.752	2.36	1.22	4.13	3/8-16	138	123
3	1.969	6.35	3.375	3.377	2.88	1.22	4.92	1/2-13	145	129
4	2.362	6.70	3.750	3.752	2.88	1.22	5.32	1/2-13	152	132
5	3.150	8.35	4.750	4.753	3.62	1.24	6.69	5/8-11	241	231
6	3.543	8.83	5.197	5.200	3.62	1.24	7.09	5/8-11	244	234

DirectFit™ Double Seal



Key

A – Shaft Size	E – Inboard Seal Length	H – Stud Diameter	X – Shaft O-Ring
B – Tab Diameter	F – Outboard Seal Length	V – Outboard Seal Face O-Rings	Y – Wetted O-Rings
C – Seal Chamber Bore Diameter	G – Bolt Circle	W – Impeller Hub O-Ring	Z – Gland O-Rings

DFD APT – Metric

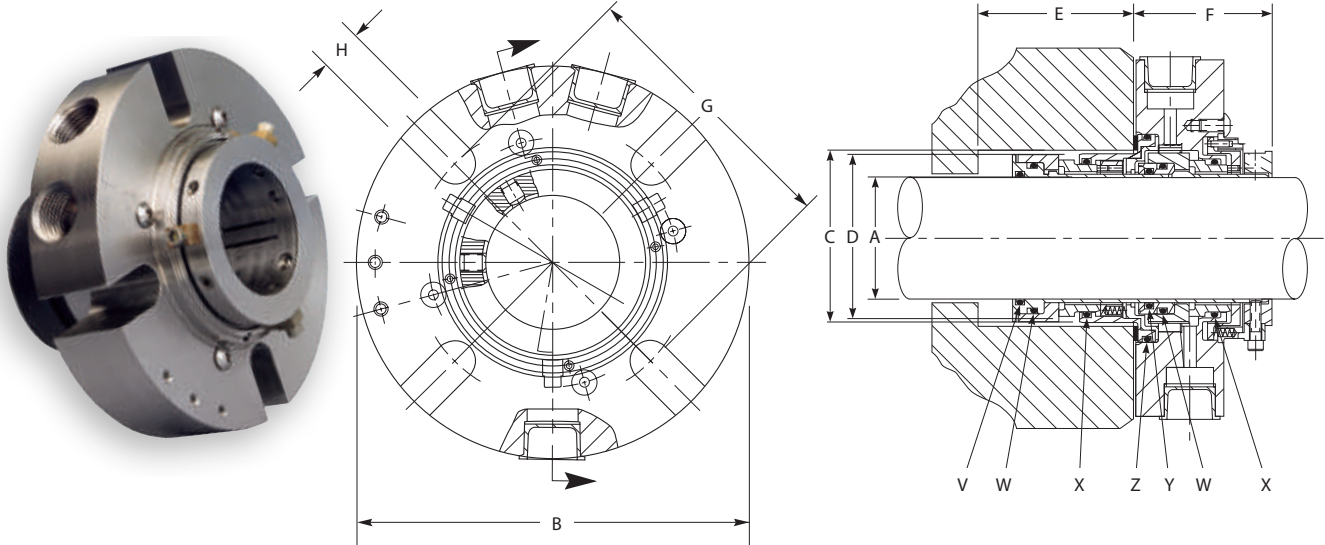
FRAME	A	B	C MIN	C MAX	E	F	G	H APP	W PTFE	X	Y/V	Z
1	30	136,6	60	60,05	60,0	60,7	95,0	M10	119	027	031	133
2	40	148,3	70	70,05	60,0	61,4	105,0	M10	123	131	138	140
3	50	164,2	85	85,05	73,0	61,5	125,0	M12	129	137	145	147
4	60	170,1	95	95,05	73,0	61,5	135,0	M12	132	144	152	152
5	80	212,1	122	122,06	92,0	69,8	170,0	M16	231	236	241	243
6	90	224,8	132	132,06	92,0	69,8	180,0	M16	234	239	244	246

DFD APT – Inch

FRAME	A	B	C MIN	C MAX	E	F	G	H APP	W PTFE	X	Y/V	Z
1	1.181	5.38	2.375	2.377	2.36	2.39	3.74	3/8-16	119	027	031	133
2	1.575	5.84	2.750	2.752	2.36	2.42	4.13	3/8-16	123	131	138	140
3	1.969	6.47	3.375	3.377	2.87	2.42	4.92	1/2-13	129	137	145	147
4	2.362	6.70	3.750	3.752	2.87	2.42	5.32	1/2-13	132	144	152	152
5	3.150	8.35	4.750	4.753	3.62	2.75	6.69	5/8-11	231	236	241	243
6	3.543	8.85	5.197	5.200	3.62	2.75	7.09	5/8-11	234	239	244	246

225™ Tandem Double Cartridge Seal – Metric

Mechanical Seal Dimensional Data

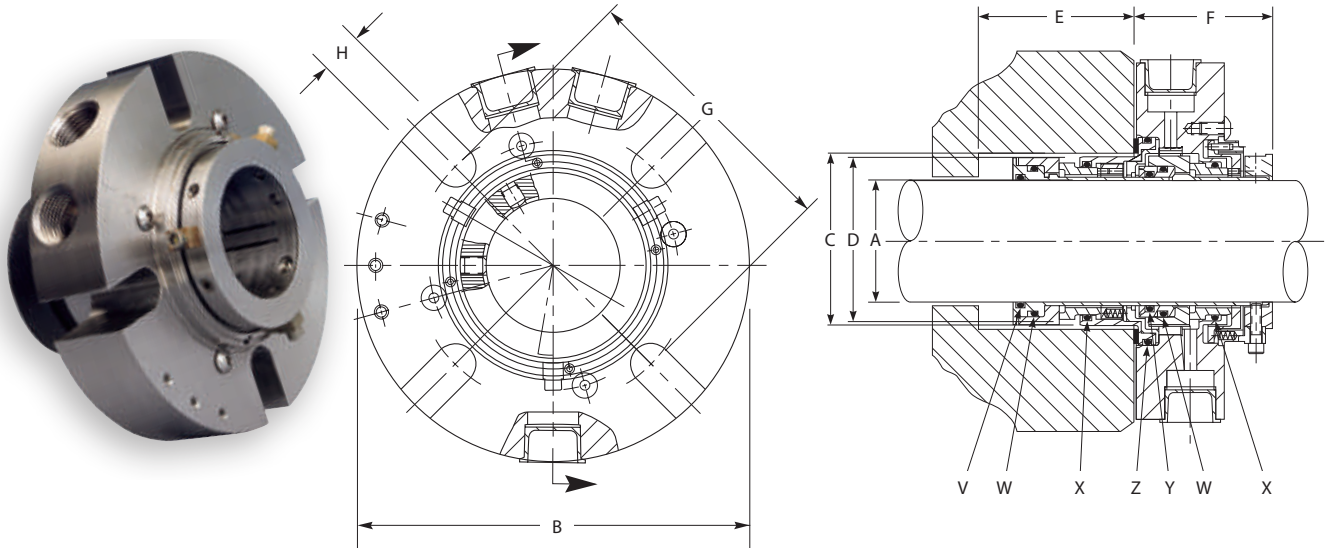


Key

- A – Shaft Size
- B – Maximum Gland Diameter
- C – Stuffing Box Inside Diameter
- D – Seal Diameter in Stuffing Box
- E – Minimum Stuffing Box Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- V – Shaft O-Ring
- W – Rotary O-Ring (2)
- X – Stationary O-Ring (2)
- Y – Sleeve O-Ring
- Z – Gland O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	G MIN				V	W	X	Y	Z	H
							10 mm	12 mm	16 mm	20 mm						
25	104	44	50	43	49	54	73	75	–	–	120	124	126	121	136	14
28	104	47	53	46	49	54	76	78	–	–	122	126	128	123	137	14
30	104	49	55	48	49	54	77	79	–	–	123	127	129	125	140	14
32	104	51	57	50	49	54	79	81	–	–	124	128	131	126	141	14
33	113	52	58	51	49	54	80	82	–	–	125	129	131	127	142	14
35	111	54	60	53	49	54	82	84	–	–	126	130	132	128	143	14
38	114	57	63	56	49	54	85	87	–	–	128	132	134	130	145	14
40	127	59	62	58	49	54	87	89	–	–	129	134	136	131	146	14
43	127	62	65	61	49	54	90	92	–	–	131	136	138	133	148	14
45	139	64	67	63	49	54	92	94	–	–	133	137	139	134	149	14
48	139	67	70	66	49	54	95	97	–	–	134	139	141	136	150	14
50	139	69	72	68	49	54	97	99	–	–	136	140	142	137	151	14
55	152	74	77	73	49	54	102	104	108	–	139	143	145	140	151	17
60	152	79	82	78	49	54	112	114	118	–	142	146	148	144	153	17
65	164	92	99	91	63	70	–	135	139	–	231	234	236	232	243	17
70	196	95	106	95	63	70	–	139	143	–	232	235	237	233	245	17
75	202	102	113	101	63	70	–	145	149	–	234	237	239	235	247	17
80	203	105	116	105	63	70	–	149	153	–	235	239	240	237	248	17
85	211	111	122	110	63	70	–	155	159	162	237	240	242	238	250	21
90	214	115	125	115	63	70	–	159	163	167	238	242	243	240	251	21
95	221	121	132	120	63	70	–	164	168	172	240	243	245	241	253	21
100	228	127	138	126	63	70	–	171	175	179	242	245	247	243	255	21
110	237	137	148	136	63	70	–	180	184	188	245	248	250	246	258	21
120	266	146	157	145	63	70	–	190	194	198	248	251	253	249	259	21

225™ Tandem Double Cartridge Seal – Inch



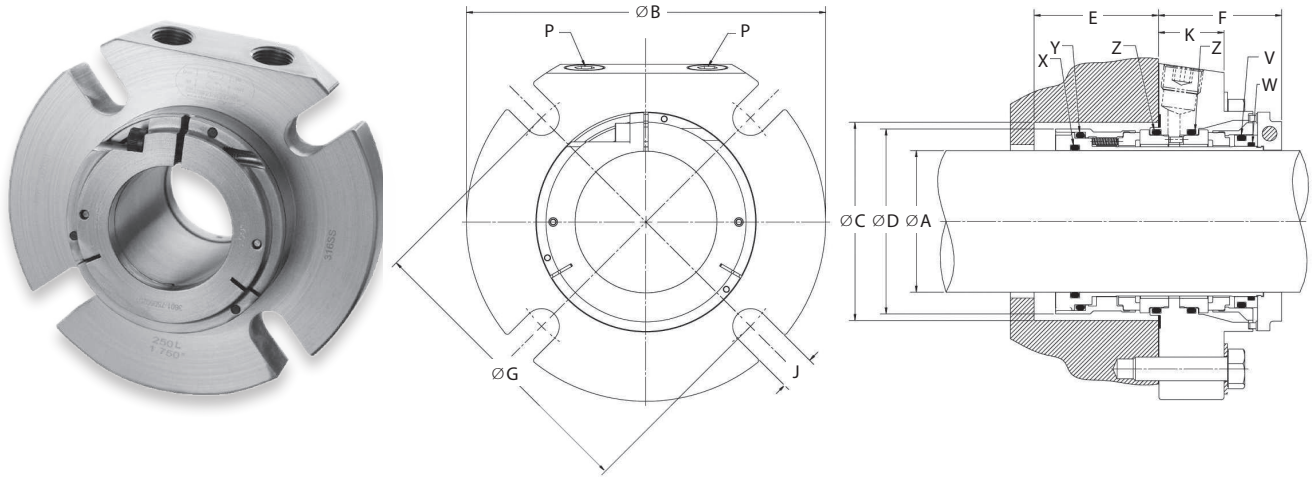
Key

- A – Shaft Size
- B – Maximum Gland Diameter
- C – Stuffing Box Inside Diameter
- D – Seal Diameter in Stuffing Box
- E – Minimum Stuffing Box Depth
- F – Outboard Seal Length
- G – Minimum Bolt Circle by Bolt Size
- H – Slot Width
- V – Shaft O-Ring
- W – Rotary O-Ring (2)
- X – Stationary O-Ring (2)
- Y – Sleeve O-Ring
- Z – Gland O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	G MIN				V	W	X	Y	Z	H
							3/8"	1/2"	5/8"	3/4"						
1.000	4.11	1.75	2.00	1.73	1.92	2.13	2.86	2.98	–	–	120	124	126	121	136	.57
1.125	4.11	1.88	2.13	1.85	1.92	2.13	2.98	3.11	–	–	122	126	128	124	137	.57
1.250	4.11	2.00	2.25	1.98	1.92	2.13	3.11	3.23	–	–	124	128	130	126	141	.57
1.375	4.36	2.13	2.38	2.10	1.92	2.13	3.23	3.36	–	–	126	130	132	128	143	.57
1.500	4.49	2.25	2.50	2.23	1.92	2.13	3.36	3.48	–	–	128	132	134	130	145	.57
1.625	4.99	2.38	2.50	2.35	1.92	2.13	3.48	3.61	–	–	130	134	136	132	147	.57
1.750	5.49	2.50	2.63	2.48	1.92	2.13	3.62	3.75	–	–	132	136	138	134	149	.57
1.875	5.49	2.63	2.75	2.60	1.92	2.13	3.75	3.87	–	–	134	138	140	136	150	.57
2.000	5.49	2.75	2.88	2.73	1.92	2.13	4.00	4.12	–	–	136	140	142	138	152	.57
2.125	5.99	2.88	3.00	2.85	1.92	2.13	4.25	4.37	4.50	–	138	142	144	140	153	.69
2.250	5.99	3.00	3.13	2.98	1.92	2.13	4.37	4.50	4.62	–	140	144	146	142	153	.69
2.375	5.99	3.13	3.25	3.10	1.92	2.13	4.41	4.55	4.67	–	142	146	148	144	153	.69
2.500	6.49	3.25	3.38	3.23	1.92	2.13	4.63	4.75	4.87	–	144	148	150	146	154	.69
2.625	6.45	3.63	3.89	3.60	2.48	2.75	–	5.37	5.50	–	231	234	236	232	243	.68
2.750	7.71	3.75	4.19	3.73	2.48	2.75	–	5.50	5.62	–	232	235	237	233	245	.68
2.875	7.83	3.88	4.32	3.85	2.48	2.75	–	5.62	5.75	–	233	236	238	234	246	.68
3.000	7.94	4.00	4.44	3.98	2.48	2.75	–	5.75	5.87	–	234	237	239	235	247	.68
3.125	7.99	4.13	4.57	4.10	2.48	2.75	–	5.87	6.00	–	235	238	240	236	248	.68
3.250	8.19	4.25	4.69	4.23	2.48	2.75	–	6.00	6.12	–	236	239	241	237	249	.68
3.375	8.31	4.38	4.82	4.35	2.48	2.75	–	6.12	6.25	6.37	237	240	242	238	250	.82
3.500	8.44	4.50	4.94	4.48	2.48	2.75	–	6.25	6.37	6.50	238	241	243	239	251	.82
3.625	8.50	4.63	5.07	4.60	2.48	2.75	–	6.37	6.50	6.62	239	242	244	240	252	.82
3.750	8.72	4.75	5.19	4.73	2.48	2.75	–	6.50	6.62	6.75	240	243	245	241	253	.82
3.875	8.40	4.88	5.32	4.85	2.48	2.75	–	6.62	6.75	6.87	241	244	246	242	254	.82
4.000	8.96	5.00	5.44	4.98	2.48	2.75	–	6.75	6.87	7.00	242	245	247	243	255	.82
4.125	8.99	5.13	5.57	5.10	2.48	2.75	–	6.87	7.00	7.12	243	246	248	244	256	.82
4.250	8.99	5.25	5.69	5.23	2.48	2.75	–	7.00	7.12	7.25	244	247	249	245	257	.82
4.375	9.34	5.38	5.82	5.35	2.48	2.75	–	7.12	7.25	7.37	245	248	250	246	258	.82
4.500	9.49	5.50	5.94	5.48	2.48	2.75	–	7.25	7.37	7.50	246	249	251	247	258	.82
4.625	9.49	5.63	6.07	5.60	2.48	2.75	–	7.37	7.50	7.62	247	250	252	248	259	.82
4.750	10.49	5.75	6.19	5.73	2.48	2.75	–	7.50	7.62	7.75	248	251	253	249	259	.82

250L Double Cartridge Seal with Clamp Lock Ring – Inch

Mechanical Seal Dimensional Data



Key

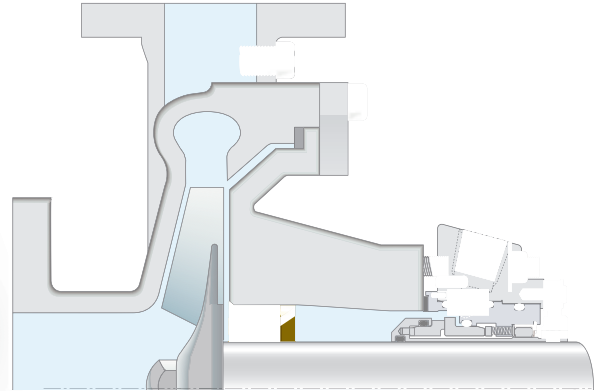
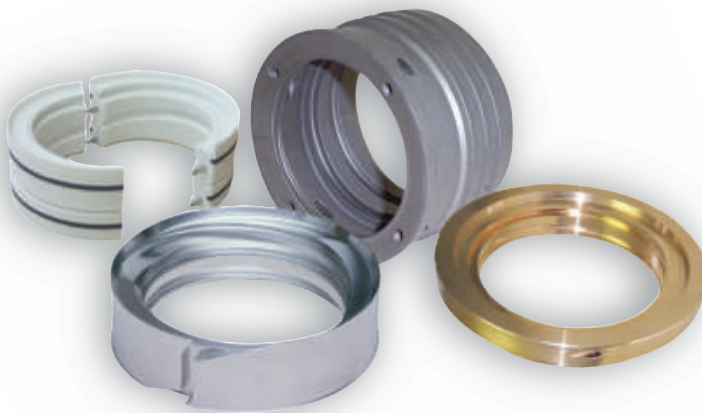
- A – Shaft Size
- B – Maximum Gland Diameter
- C – Minimum Seal Chamber Bore
- D – Maximum Inboard Seal Diameter
- E – Minimum Seal Chamber Depth
- F – Outboard Length Required
- G – Minimum Bolt Circle by Bolt Size
- J – Gland Width (Including Gasket)
- K – Standard Bore to Bolt Surface
- P – Port Size
- V – Spacer O-Ring
- W – Sleeve O-Ring
- X – Shaft O-Ring
- Y – Rotary Seal O-Ring
- Z – Stationary Seal O-Ring

A	B MAX	C MIN	C MAX	D MAX	E MIN	F MAX	3/8"	G MIN 1/2"	5/8"	J	K MAX	P	V	W	X	Y	Z
1.125	4.11	1.75	2.04	1.73	1.63	1.95	3.29	–	–	0.43	1.10	1/4-18 NPT	125	124	122	028	129
1.125 OS	4.48	2.50	2.75	1.73	1.56	2.02	4.17	–	–	0.43	1.17	1/4-18 NPT	125	124	122	028	129
1.375	4.48	2.00	2.33	1.98	1.63	1.95	3.96	–	–	0.43	1.12	1/4-18 NPT	129	128	126	030	132
1.375 OS	5.23	2.68	3.00	1.98	1.63	1.95	4.54	–	–	0.43	1.12	1/4-18 NPT	129	128	126	030	132
1.750	5.48	2.50	2.81	2.48	1.58	2.07	4.54	4.67	–	0.56	1.00	3/8-18 NPT	137	134	132	138	139
1.750 OS	6.63	3.37	3.75	3.33	1.58	2.07	5.92	6.04	–	0.56	1.00	3/8-18 NPT	137	134	132	138	139
1.875	5.48	2.63	2.94	2.60	1.58	2.07	4.17	–	–	0.43	1.00	3/8-18 NPT	138	136	134	140	141
1.875 OS	6.75	3.42	3.81	2.60	1.58	2.07	6.42	6.54	–	0.56	1.00	3/8-18 NPT	138	136	134	140	141
2.000	5.48	2.75	3.19	2.73	1.58	2.07	4.67	4.79	–	0.56	1.00	3/8-18 NPT	141	138	136	142	143
2.125	5.48	2.88	3.44	2.85	1.58	2.07	4.92	5.04	–	0.56	1.00	3/8-18 NPT	143	140	138	144	145
2.125 OS	6.98	3.75	4.25	3.71	1.58	2.07	5.67	5.79	5.92	0.71	1.00	3/8-18 NPT	143	140	138	144	145
2.250	5.98	3.00	3.56	2.98	1.58	2.07	5.34	5.46	–	0.56	1.00	3/8-18 NPT	145	142	140	146	147
2.500	6.73	3.25	3.81	3.23	1.61	2.04	5.17	5.29	5.42	0.71	1.00	3/8-18 NPT	149	146	145	150	151
2.500 OS	7.98	4.37	4.75	4.33	1.64	2.01	6.42	6.54	6.67	0.71	1.00	3/8-18 NPT	149	146	145	150	151
2.625	6.44	3.38	3.94	3.35	1.58	2.07	5.73	5.86	–	0.65	1.00	3/8-18 NPT	150	148	146	151	151
2.625 OS	7.73	4.38	4.78	3.35	1.64	2.01	6.42	6.54	6.67	0.71	1.00	3/8-18 NPT	150	148	146	151	151
3.000	7.61	4.00	4.69	3.98	2.22	2.63	6.67	6.79	6.92	0.74	1.41	1/2-14 NPT	237	152	234	238	240
3.000 OS	9.45	4.93	5.39	3.98	2.18	2.67	7.67	7.79	7.92	0.74	1.41	1/2-14 NPT	237	152	234	238	240
3.375	7.98	4.38	5.06	4.36	2.10	2.75	7.11	7.24	7.36	0.80	1.41	1/2-14 NPT	240	153	237	241	243
3.750	8.71	4.75	5.39	4.73	2.22	2.63	7.42	7.54	7.67	0.74	1.41	1/2-14 NPT	243	155	240	244	245

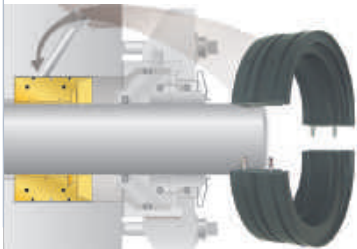
**1.125" and 1.875" Standard Bore bolts should be socket head cap screws to avoid interference with lock ring OD (hex bolts should not be used for these two sizes)

SEAL SIZE	Min. BC w/ SHCS	Min. BC w/ Hex
**1.125	2.875	2.896
**1.875	3.750	3.772

SpiralTrac® Standard

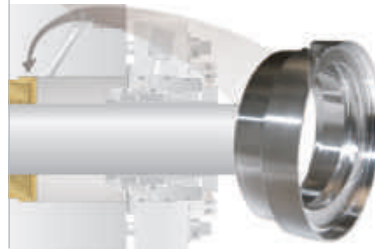


Version F Type S



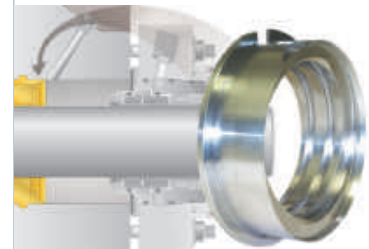
- Requires minimal flush
- Split for easy installation
- Ideal for use with split mechanical seals
- No modifications required to pump or seal cavity

Version N / D Type A



- Requires minimal or no flush
- Replaces removable throat bushings
- Some machining modifications may be required to pump or seal cavity depending on application

Version N Type E



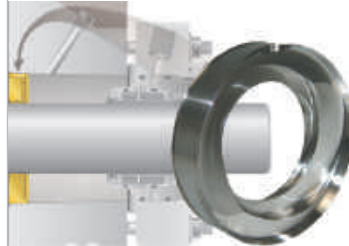
- Requires minimal or no flush
- Enables venting of air from the seal cavity
- Designed to replace keyed throat bushings in split case pumps
- No modifications required to pump or seal cavity

Version N Type B



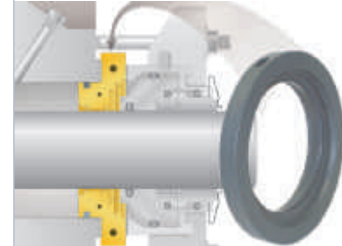
- Requires minimal flush
- Enables venting of air from the seal cavity
- Installs from the seal side of the seal cavity
- Greatly reduced flush in non-fibrous applications

Version N / D / C Type I



- Requires minimal or no flush
- Installs from the impeller side of the seal cavity
- Enables venting of air from the seal cavity
- Some machining modifications required to pump or seal cavity

Adapter

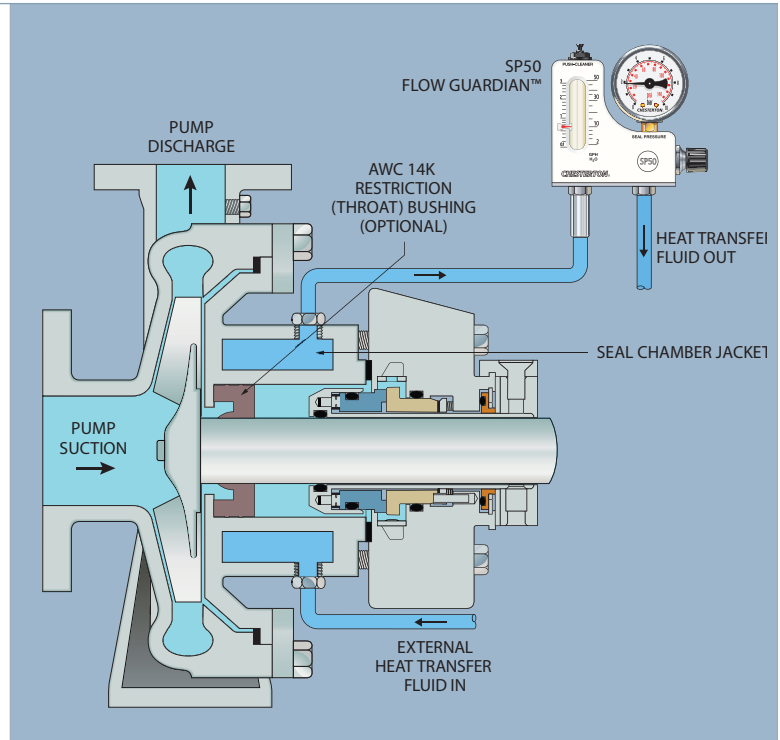


- Requires minimal flush
- Split for easy installation
- Ideal for use with split mechanical seals
- No modifications required to pump or seal cavity
- Installs between the seal cavity and the mechanical seal

PLAN 2

Cooling Jacket

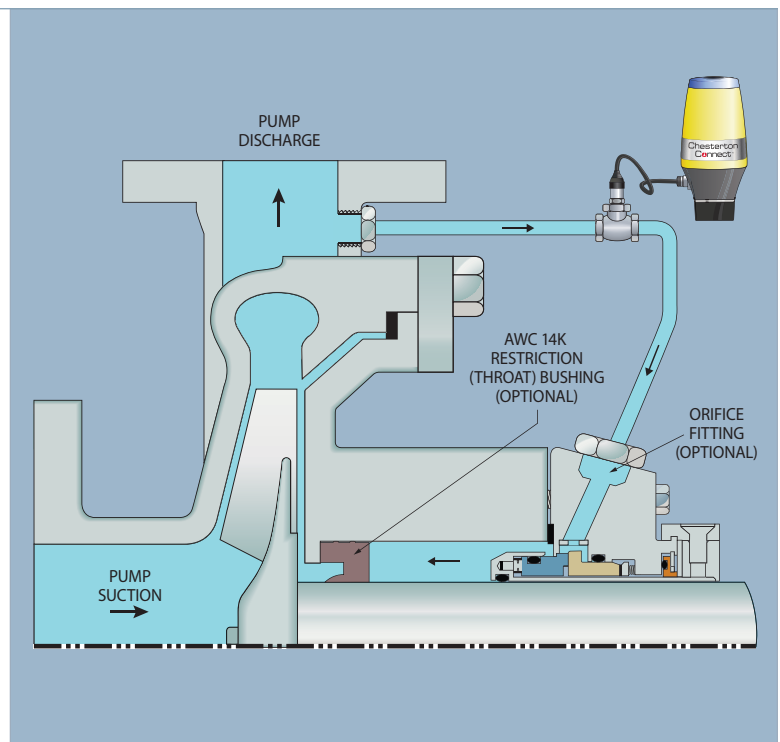
- Use with single seal or double seal to control seal chamber temperature
- Maintains or elevates box temperature to prevent/reduce product solidification with polymers, resins, tars
- Lowers seal chamber temperature in hot environments
- Common heat transfer fluids:
 - Water
 - Thermal oils
 - Steam
- Close tolerance throat bushing is required for optimum efficiency



PLAN 11

Discharge Recirculation

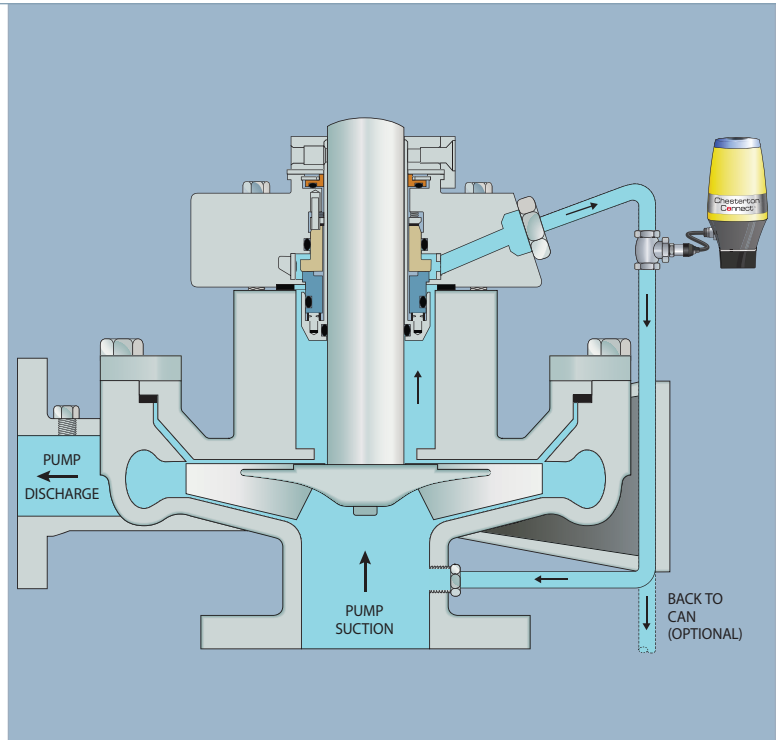
- Use with single seal or double seal
- Increases circulation
- Increases pressure in seal chamber
- Clean fluids only
 - Solids can erode seal
- An orifice can be used to reduce flow and pressure
- Close tolerance throat bushing is required for optimum efficiency



PLAN 13

Suction Recirculation

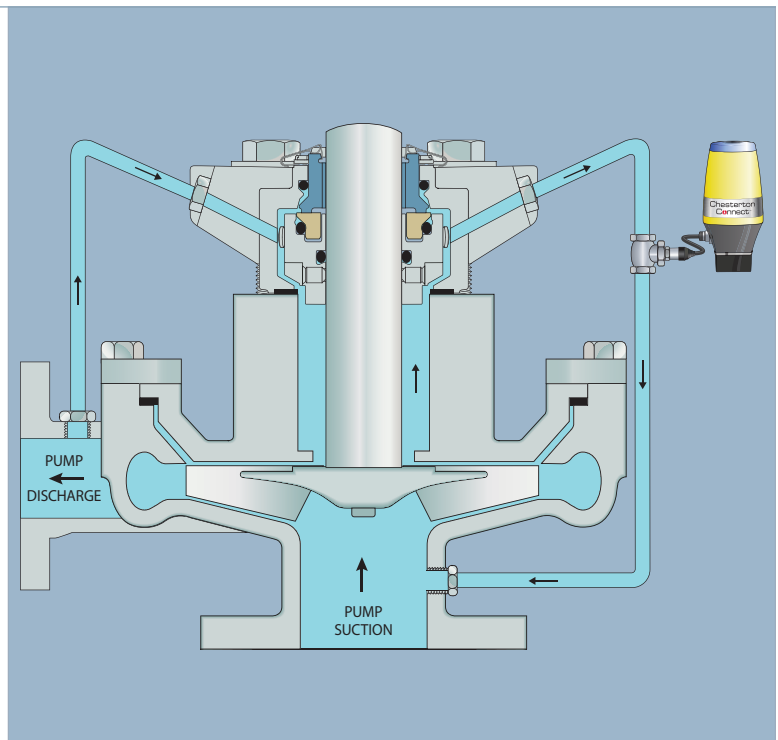
- Vents air and prevents/reduces dry run
- Prevents/reduces clogging
- Lowers pressure in seal chamber
- Cools seal
- Reduces seal-generated heat
- Use caution with low vapor pressure liquids



PLAN 14

Suction and Discharge Recirculation (Vertical)

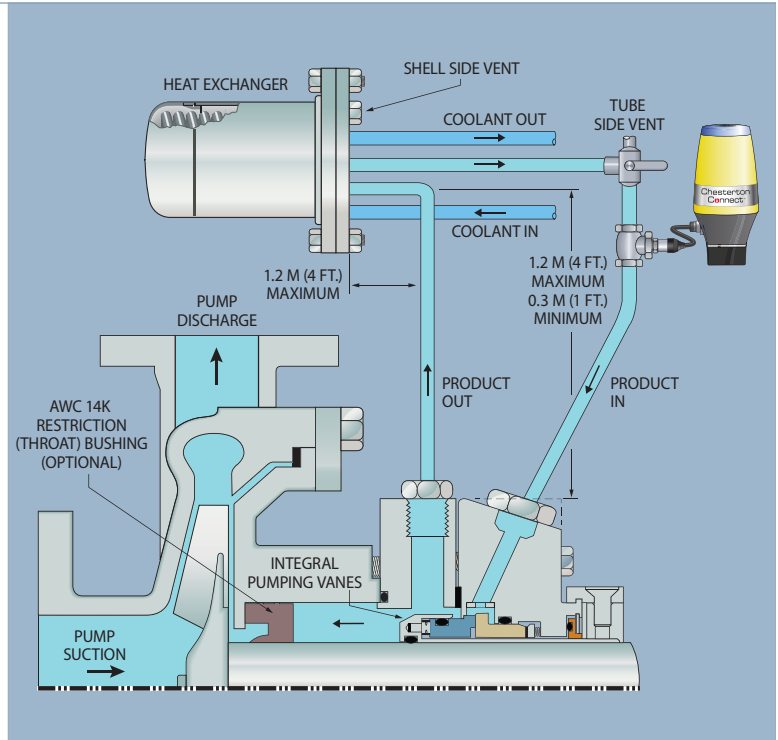
- Vents air and prevents/reduces dry run
- Use with single seal or double seal
- Prevents/reduces clogging
- Cools seal
- Promotes flow
- Reduces seal-generated heat
- Use caution with low vapor pressure liquids



PLAN 23

Cooled Seal Recirculation

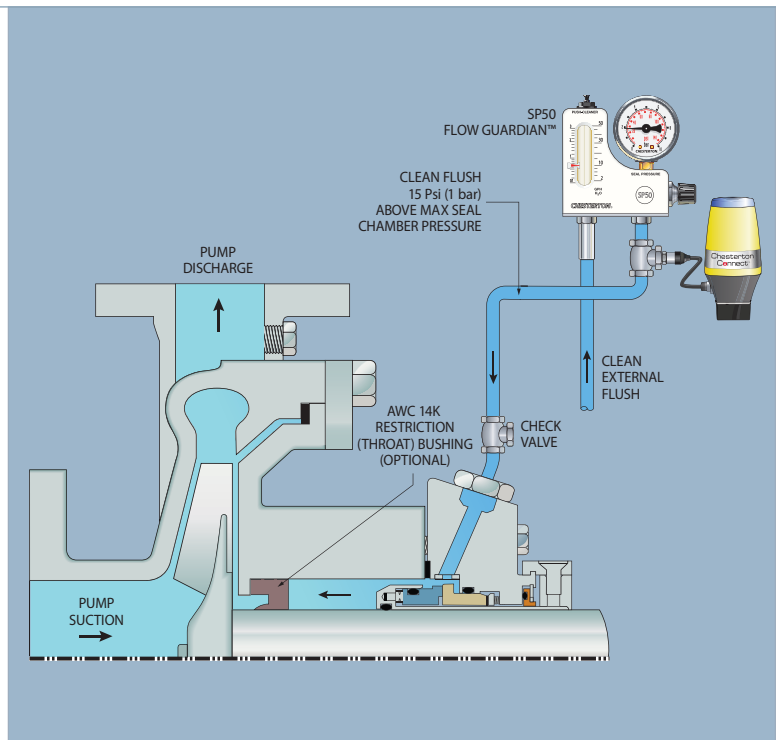
- Use with a single seal and pump mechanism
- Minimizes heat exchanger size and coolant water usage
- Cools seal while pumping hot and/or volatile fluids
- Use with close tolerance throat/restriction bushing
- Venting is important



PLAN 32

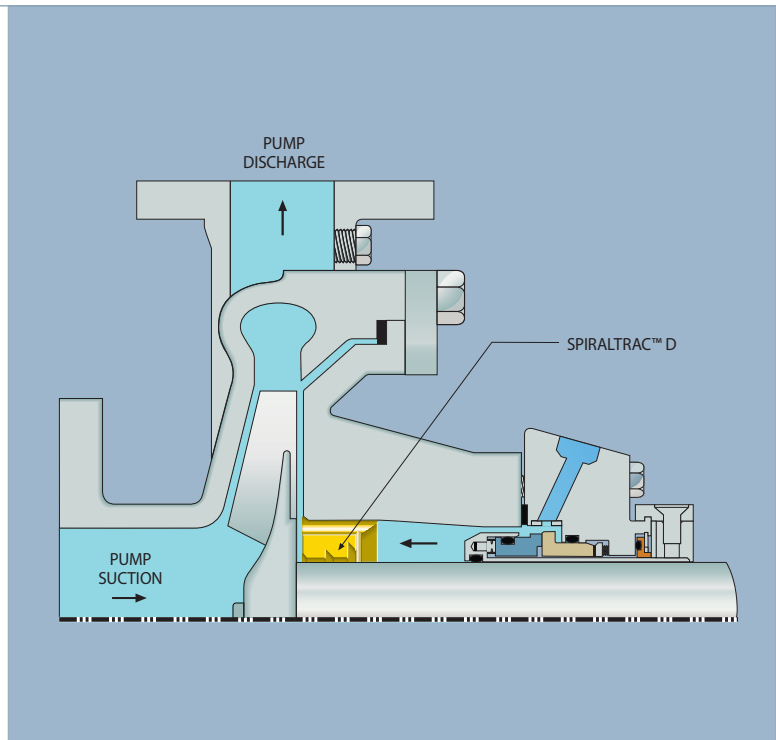
Clean Flush

- Use with a single seal
- Provides clean fluid to seal
- Prevents/reduces clogging
- Acceptable flush fluids
 - Clean, compatible fluid
 - Water, if compatible
 - Clean product
 - Downstream additive
 - Carrier solvent

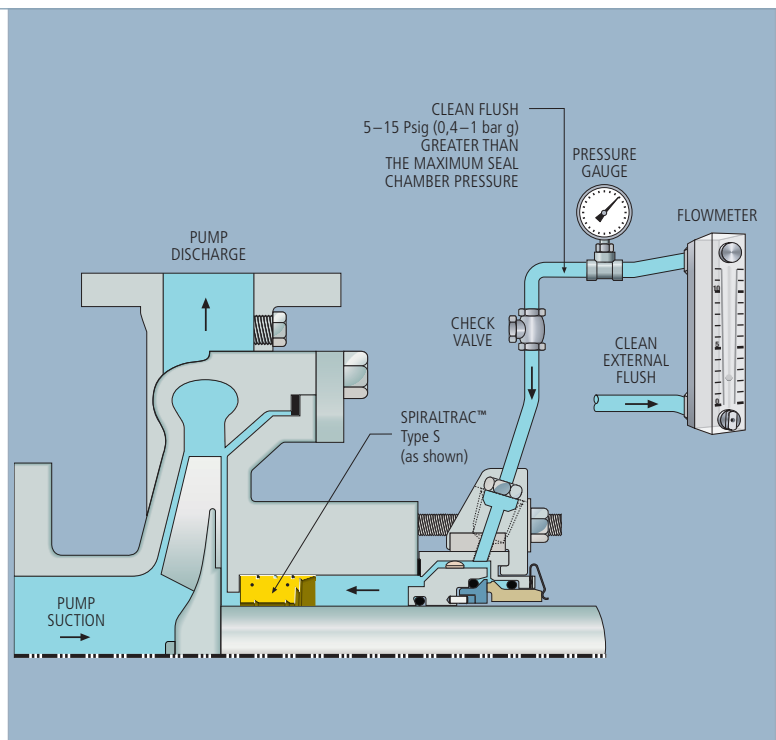


PLAN 33H**Cooling Jacket
SpiralTrac® Version D Type I**

- Use with a single seal
- Removes solids
- Seal runs in clean fluid
- Prevents/reduces clogging
- Removes vapor from seal chamber
- Prevents/reduces dry running
- No flush required

**PLAN 33S****SpiralTrac® Version F Type S**

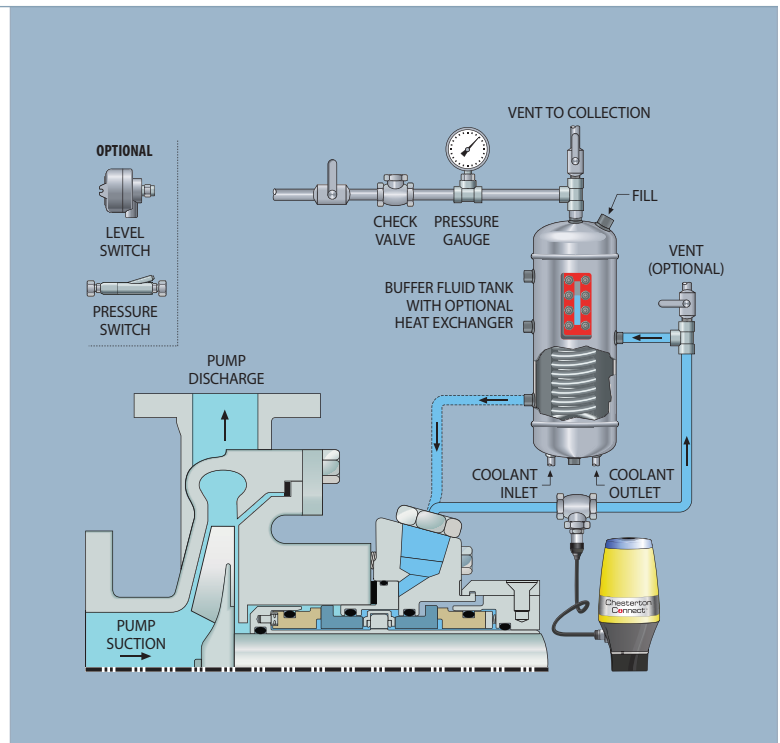
- Use with a single seal
- Removes solids
- Seal runs in clean fluid
- Prevents/reduces clogging
- Prevents/reduces dry running



PLAN 52

Circulation with External Buffer Fluid Tank

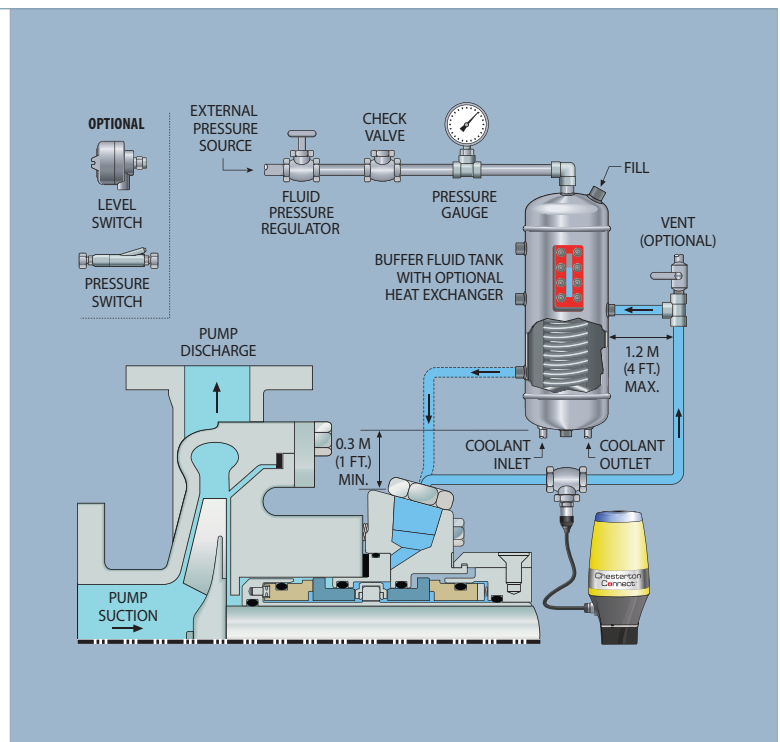
- Use with a double seal
- Low-pressure buffer fluid, 0.7 bar g (10 psig) minimum
- Buffer fluid should be clean, compatible and lubricating
- Buffer fluid pressure lower than seal chamber pressure
- Seal venting is important
- Use long sweeps in tubing bends



PLAN 53A

Circulation with Pressurized External Barrier Fluid Tank

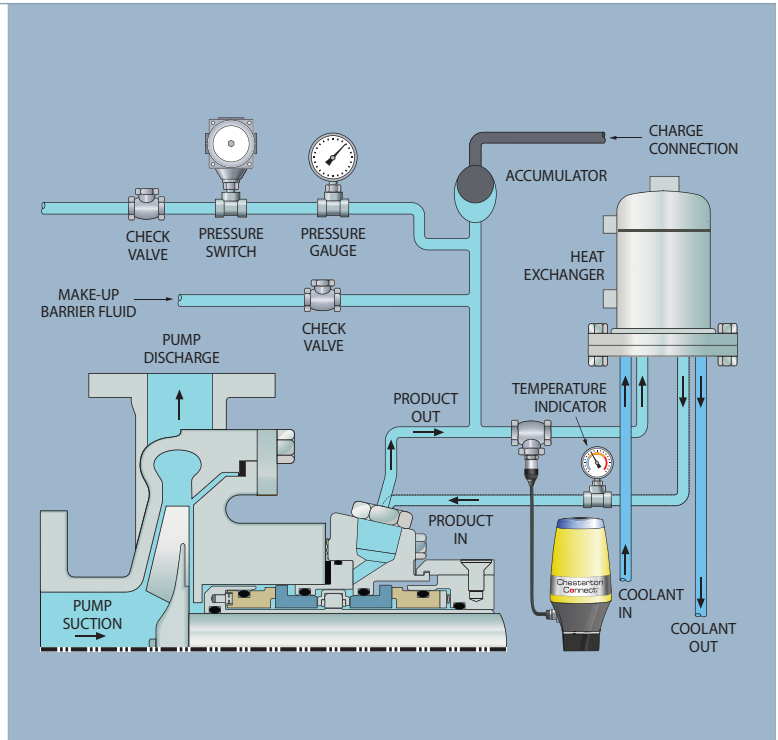
- Use with a double seal
- Pressurize barrier fluid 1 – 2 bar g (15 – 30 psig) over maximum seal chamber pressure
- Barrier fluid should be clean, compatible and lubricating
- Provides clean fluid to the inboard seal faces
- Use long sweeps in tubing bends



PLAN 53B

Closed Loop with Heat Exchanger and Accumulator

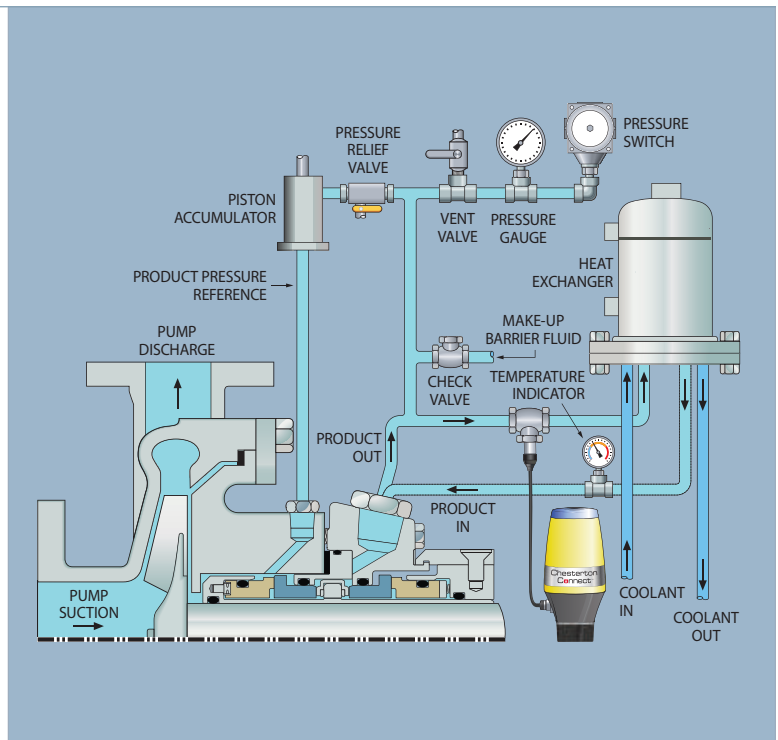
- Use with double seals
- Optional thermocouple
- No foaming
- Heat is removed by an air-cooled or water-cooled heat exchanger
- Accumulator sizing crucial
- Maintains constant pressure on the circulation system



PLAN 53C

Heat Exchanger and Piston Accumulator

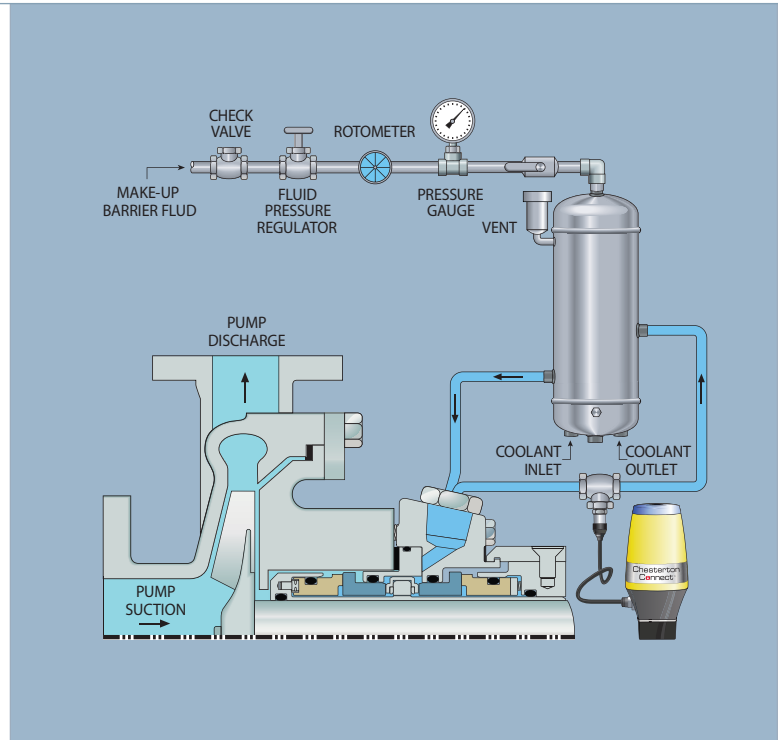
- Optional thermocouple
- No foaming
- Heat is removed by an air-cooled or water-cooled heat exchanger
- Tracks product pressure in seal chamber
- Maintains constant pressure on the circulation system



PLAN 53P

Circulation with Pressurized External Barrier Fluid Tank

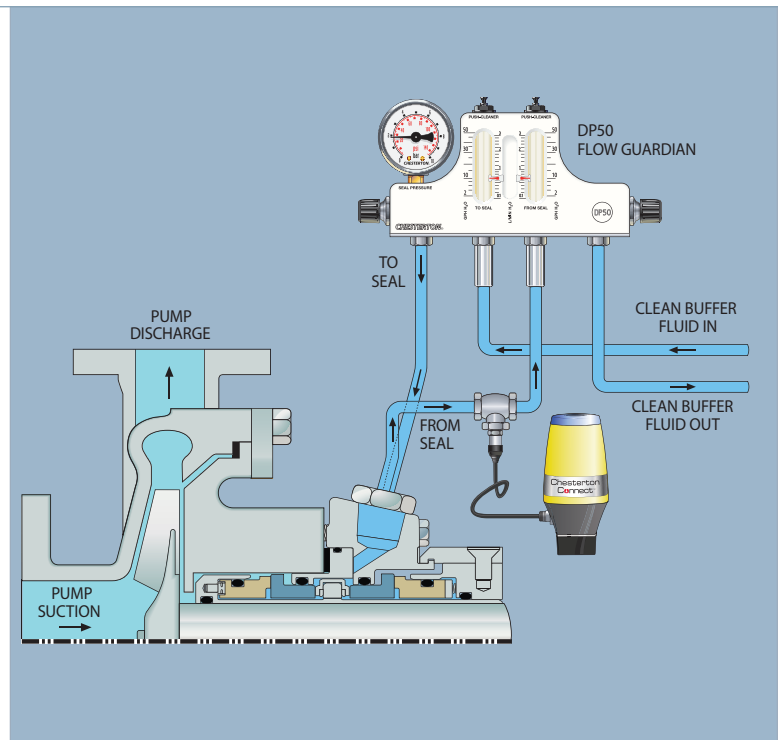
- Maintains constant pressure and liquid supply to the double seal
- External water pressure is set at 2 bar g (30 psig) over maximum seal chamber pressure
- Initial tank level is set through the external water pressure line
- System operates with a constant external water pressure



PLAN 54/55

Circulation with Pressurized External Barrier Fluid Source and Flow Guardian™ DP50

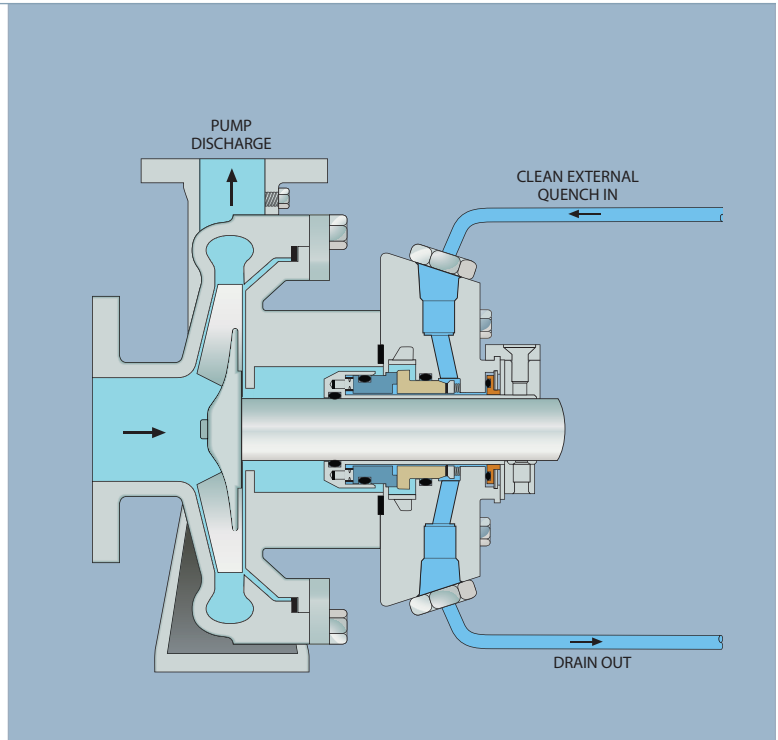
- Use with a double seal
- **Plan 54** pressurize barrier fluid 15 – 30 psig (1 – 2 bar g) over maximum seal chamber pressure
- **Plan 55** operates as a buffer with pressure below the minimum seal chamber pressure
- DP50 provides inboard seal leak detection, pressure regulation and flow control
- Barrier fluid should be clean, compatible, and lubricating
- Provides clean fluid to inboard seal faces



PLAN 62

Quench

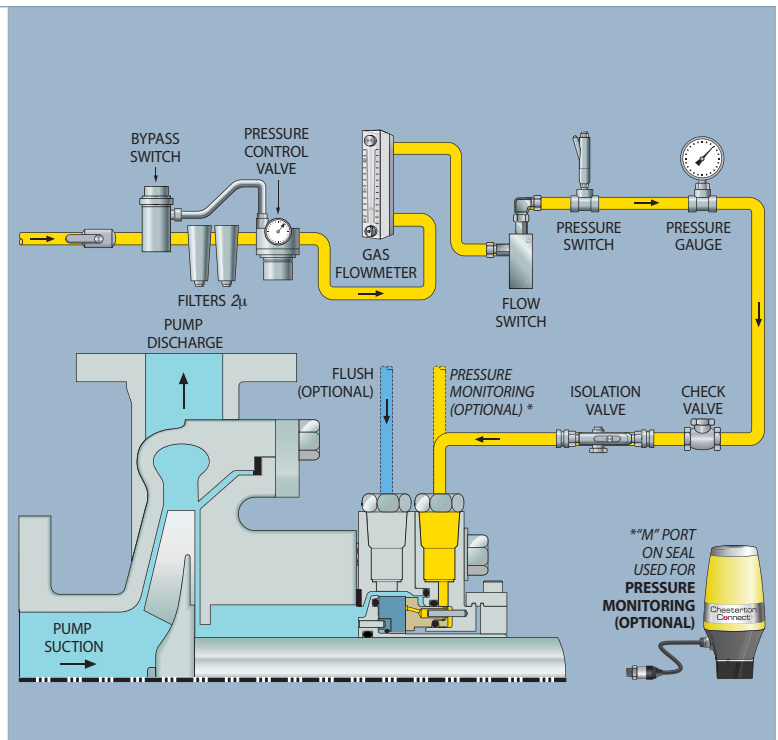
- Use with a single seal
- Prevents/reduces coking, crystallization
- Use low pressure only
- Cleans atmospheric side of seal faces
- Common quench fluids:
 - steam
 - water
 - nitrogen



PLAN 74

Externally Supplied Barrier Gas

- Use with a non-volatile gas
- Provide gas at 1.7 bar g (25 psig) above seal chamber pressure
- Venting of the seal chamber may be required prior to start-up
- Use nitrogen, carbon dioxide, or compressed air
- Zero emissions and leakage to atmosphere



CONCENTRATION AND TEMPERATURE RANGES

Concentration: Listed as a percentage of the pure component. The diluent for all non 100% entries is water unless otherwise noted.

<SP indicates the seal recommendation is valid for any concentration less than the solubility point of the substance in water.

Temperature: Temperature or range listed in degrees Celsius (°C) and Fahrenheit (°F) for which the seal recommendation is applicable at the specified concentration.

CAS

CAS numbers are internationally recognized and are a resource for scientists, industry, and regulatory bodies. The numbers are unique identifiers for chemical substances. A CAS Registry Number has no inherent chemical significance but provides an unambiguous way to identify a chemical substance or molecular structure when there are many possible generic, trade, or trivial names.

NOTES ON FLUIDS LISTED

Typically, the common name of each substance is listed in alphabetical order. If the entry is followed by parenthetical text, the added text gives additional description to the substance. For example, an entry followed by (TM) indicates the name is a trademark. In some cases, where the substance's acronym may be as common as the actual name, we have listed the acronym in parenthesis. An example would be Polyvinyl Alcohol (PVA). Other primary statements include:

Aerated - Indicates the recommendation is for the fluid stream containing entrained air. The entrained air changes the seal material selection for the fluid in its uncontaminated state.

Wet - Indicates the recommendation is for the fluid stream containing a small percentage of water. The water contamination changes the seal material selection for the fluid in its uncontaminated state.

Gas - Indicates the stated recommendation is for the material in the gaseous phase. Recommendations without this designation are for the liquid phase.

Phase - Used as a general indicator of what phase the substance, undiluted or neat, is at ambient temperature and atmospheric pressure.

C - Solid or crystalline state: material must be dissolved or suspended in solution or heated to a liquid to be sealed.

G - Gas: seal recommendations for gases assume the gas is liquefied or in the liquid state unless specified. Carbon Dioxide (gas) would indicate this seal recommendation is for Carbon Dioxide in its gaseous state, not liquefied.

L - Liquid

V - Viscous liquid

PIPING PLANS

The recommended piping plan or choice of plans to be utilized to enhance seal life and performance based on the API Auxiliary Piping Systems for mechanical seals. There is no piping plan designated for applications which typically do not require one. Where more than one plan is listed:

Plan 1, Plan 2 (separated by a comma) Use the most appropriate plan for your application.

Plan 1/Plan 2 (separated by a slash) Use both plans in conjunction for the application.

HAZARD INFORMATION

With the exception of carcinogenicity, hazard classifications listed are determined according to the internationally recognized European Council Directive 96/54/EC, dealing with the classification, packaging, and labeling of dangerous substances.

Carcinogenicity classifications listed are reported using the evaluations of the International Agency for Research on Cancer (IARC), Groups 1, 2A, or 2B.

The definitions listed below illustrate the relative hazard of each group but is not the full definition as stated in each of the compilations. If the full definition is required please review the aforementioned documents.

Code - C: Corrosive - Substance causes burns to skin tissue when in contact with either the vapor, fluid, or solid phase of the substance.

Code - Ca: Carcinogen - Substance is a suspect human carcinogen.

Code - E: Explosive - There is a risk of an explosion when substance is subjected to shock, friction, fire, or other sources of ignition.

Code - F+: Extremely Flammable - Liquid substance having a flash point lower than 0°C and a boiling point lower than or equal to 35°C or gaseous substances which are flammable in contact with air at ambient temperature and pressure.

Code - F: Highly Flammable - Liquid substance typically having a flash point lower than 21°C.

Code - R10: Flammable - Liquid substance typically having a flash point equal to or greater than 21°C, and less than or equal to 55°C.

Code - O: Oxidizing - Substances which may, themselves, cause fire or enhance the risk of fire when in contact with combustibles.

Code - N: Environment - Substance which is hazardous to ecosystems.

Code - T+: Very Toxic - Substance which is very toxic by ingestion (LD50 oral, rat 25 mg/kg), skin contact, or by inhalation.

Code - T: Toxic - Substance which is toxic by ingestion (LD50 oral, rat 200 mg/kg), skin contact, or by inhalation.

Code - Xi: Irritant - Substance causes significant inflammation of the skin or eyes and persists for at least 24 hours.

Code - Xn: Harmful - Substance which is harmful by ingestion (LD50 oral, rat 2000 mg/kg), skin contact, or by inhalation.

Code - *: Substance currently does not have a CAS Number listed; therefore, substance has not been classified accordingly.

No Code: Substance is not classified under the parameters specified in the regulations. It does not necessarily mean that there are no hazards associated with the substance.

MATERIALS OF CONSTRUCTION - PERFORMANCE CAPABILITIES

Materials of construction are grouped by metallurgy, faces, and secondary seals. Performance capabilities of the seal materials are rated A = Acceptable and B = Alternate Choice. These ratings are based on existing published data (references), laboratory tests, and informed decisions on the part of Chesterton Engineering.

Typically, an A rating in the same group of materials will have similar performance characteristics. Materials rated B may experience changes in properties which may reduce seal life and should be considered as an alternate choice. A more definitive explanation is as follows:

Metals:

A - Preferred material of construction, .002 inches per year corrosion (0.05 mm/yr.). On some rare occasions an (A) rating may exceed .002 inches per year. This material is a preferred material due to its ability to retain mechanical properties over other materials, cost constraints, material availability, and machinability.

B - Alternate material of construction, .020 inches per year corrosion (0.50 mm/yr.). The effect to mechanical properties may be significant enough for failure.

Elastomers:

A - Volumetric swell is negligible after exposure. Under process pressure and elevated temperatures some loss of physical properties may occur.

B - Volumetric swell is in excess 10% after exposure. Physical property loss and material degradation may be significant enough for failure.

Face Materials:

A - Material is not affected, chemically, by the pumped fluid.

B - The effect to physical properties may be significant enough for failure due to chemical attack of fillers, binders, and additive materials used in the manufacturing processes.

Materials Key

SS — 316 Stainless Steel

A20 — Alloy-20

HB — Hastelloy® B

HC — Hastelloy® C

MONEL — Monel®

Ti — Titanium

CB — Carbon

CR — Ceramic

TC — Tungsten Carbide

SSC — Sintered Silicon Carbide

RSC — Reaction Bonded Silicon Carbide

DC — Duplex Carbide

FKM — Fluorocarbon

EP — Ethylene Propylene

BUNA-N — BUNA-N

LD-FKM — Acid Resistant Fluorocarbon

NEOPRENE — Neoprene

TJ/FKM — PTFE Jacketed/Fluorocarbon

FF250 — ChemLast™ (Perfluorocarbon)

FF550 — ChemLast™ (Perfluorocarbon)

Table with columns: Fluid Information (Fluid, Percent Concentration, Temperature), Recommended Mechanical Seal (CAS, Seal, Material, Piping Plans), Materials of Construction Performance Capabilities (Metal, Faces, Elastomers), Fluid Properties (Phase, Specific Gravity, Vapor, Boiling Point, Melting Point, Viscosity, Hazard Information, Notes).

KEY - Page 146 NOTES - 1-CRYSTALLIZING FLUID 2-SLURRY OR ABRASIVE FLUID 3-FLUID MAY SET UP OR HARDEN 4-FLUID MAY FLASH 5-NONLUBRICATING FLUID 6-VHAP

Mechanical Seal Recommendations by Fluid																											
Fluid Information				Recommended Mechanical Seal		Materials of Construction Performance Capabilities										Fluid Properties											
FLUID	PERCENT CONCENTRATION	TEMPERATURE		CAS	SEAL	MATERIAL	PIPING PLANS	Metal					Faces			Elastomers		PHASE	SPECIFIC GRAVITY (25°C)	VAPOR (ATMOSPHERE (25°C))	BOILING POINT (°C)	MELTING POINT (°C)	VISCOSITY (CP) (25°C) (1ATM)	HAZARD INFORMATION	NOTES		
		°C	°F					SS	AZ0	HB	HC	MOHIEL	Ti	Z205	Z907	CB	CR									TC	SSC
Vinyl Chloride	100	<20	<68	75-01-4	Double	CB/SSC-SSC/CB-S-FFKM	53,54	B	A	B	A	B	A	B	A	B	A	B	A	G	0.90	3.93	-13.90	-153.79	0.17	Ca, F+, T	4, 6
Vinyl Chloride (gas)	100	<20	<68	75-01-4	Double	CB/SSC-SSC/CB-S-FFKM	53,54	B	A	B	A	B	A	B	A	B	A	B	A	G						Ca, F+, T	4, 5, 6
Vinylpyridine	100	<100	<212	1337-81-1	Double	TC/SSC-SSC/CB-S-FFKM	53,54	A	A	A	A	A	A	A	A	A	A	A	L								
Vinyltoluene	100	<20	<68	25013-15-4	Double	CB/SSC-CB/SSC-S-FKM	53,54	A	A	A	A	A	A	A	A	A	A	A	L								
Wagner (TM 21b Brake Fluid)	100	<100	<212		Single	CB/TC-S-EPDM	11,13	A	A										L						*		
Water Glass; See Sodium Silicate																											
Water, Ash	100	<100	<212		Single	TC/SSC-S-EPDM	32	A											L						*	2	
Water, Boiler Feed	100	>120	>248	7732-18-5	Single	CB/SSC-S-EPDM	21	A	A	B	A								L							2, 4, 5	
Water, Borated	100	>20	>68		Double	SSC/SSC-CB/SSC-S-EPDM	53,54	A	A	B	A								L						*	1, 2	
Water, Brackish	100	>20	>68		Single	CB/SSC-S-EPDM	11,13	A	A	B	A								L						*	2	
Water, Cooling Tower	100	>20	>68	7732-18-5	Single	TC/SSC-S-EPDM	11,13	A	A	B	A								L							2	
Water, Deionized	100	>80	>176	7732-18-5	Single	CB/SSC-S-EPDM	21	A											L							4, 5	
Water, Deionized	100	<80	<176	7732-18-5	Single	CB/SSC-S-EPDM	11,13	A	A	B	A								L								
Water, Deionized	100	>50	>122	7732-18-5	Single	CB/SSC-S-EPDM	11,13	A	A	B	A								L								
Water, Demineralized	100	<80	<176	7732-18-5	Single	CB/SSC-S-EPDM	11,13	A	A	A	A								L								
Water, Fresh	100	<100	<212	7732-18-5	Single	CB/SSC-S-EPDM	11,13	A	A	A	A								L	0.99	0.03	100.00		0.91			
Water, Heavy	100	>20	>68	7789-92-0	Single	TC/SSC-S-EPDM	13	A	A	B	A								L	1.11	0.03	101.40	3.81	1.12			
Water, Hot	100	<100	<212	7732-18-5	Single	DC/TC-S-EPDM	11	A	A										L							4, 5	
Water, Hot Condensate	100	>120	>248	7732-18-5	SinglePR	CB/SSC-S-EPDM	23	A	A	B	A								L							b	
Water, Sea	100	<20	<68		Single	TC/SSC-S-EPDM	11,13	A	A	B	A								L						*	1	
Whiskey & Wines	100	<100	<212		Single	CB/SSC-S-FKM	11,13	A	A	A	A								L						*		
White Liquor	100	<100	<212		Double	TC/TC-CB/TC-S-EPDM	53,54	A	A	A	A								L						*	1, 2	
White Oil; See Mineral Oil																											
White Pine Tar		<50	<122		Double	TC/SSC-SSC/CB-S-FKM	53,54	A	A										C						*		
White Vitriol; See Zinc Sulfate																					0.00	0.00	0.00				
White Water; See Paper Stock 1																											
Wood Alcohol; See Methyl Alcohol																											
Xenon	100	<37	<98	7440-63-3	Double	SSC/CB-SSC/CB-S-FKM	53,54	A	A										G				-111.79				
Xylenes	100	<60	<140	1330-20-7	Single	CB/SSC-S-FFKM	11,13	A	A	A	A								L						Xn	5, 6	
Xylenol	100	>100	>212	1300-71-6	Single	SSC/SSC-S-FKM	32	A											L	1.03	0.00	225.00	76.00	0.00	T, N		
Xylo; See Xylenes																											
Zeolites	<50	<20	<68	1318-02-1	Double	TC/SSC-SSC/CB-S-FKM	53,54	A	A	A	A								C								
Zinc Acetate	<5P	<60	<140	557-34-6	Double	SSC/SSC-CB/SSC-S-EPDM	53,54	A	A										C								
Zinc Chloride	<70	<100	<212	7646-85-7	Double	SSC/SSC-CB/SSC-S-FKM	53,54	B	B	B	A	B							C						C, N	1, 2, 5	
Zinc Nitrate	<5P	<65	<149	7779-88-6	Double	SSC/SSC-CB/SSC-S-FKM	53,54	A	A	A	A								C							1	
Zinc Oxide	<50	<100	<212	1314-13-2	Double	SSC/SSC-SSC/CB-S-FFKM	53,54	A											C				1975.00			5	
Zinc Phenolsulfonate, 1, 4-	<5P	<20	<68	127-82-2	Double	SSC/SSC-CB/SSC-S-FFKM	53,54	A	A										C								
Zinc Phosphate	<20	<20	<68	7779-90-0	Double	SSC/SSC-CB/SSC-HB-FFKM	53,54	A		A									C							5	
Zinc Sulfate	<40	<100	<212	7733-02-0	Single	SSC/SSC-S-FKM	62	A	A	B	B	B							C							Xi, N	1

KEY - Page 146 NOTES - 1 - CRYSTALLIZING FLUID 2 - SLURRY OR ABRASIVE FLUID 3 - FLUID MAY SET UP OR HARDEN 4 - FLUID MAY FLASH 5 - NONLUBRICATING FLUID 6 - VHAP

TECHNICAL REFERENCE

SEAL CHAMBER PRESSURE ESTIMATION

Seal chamber pressure must be known before the proper seal and flush plan can be selected. Seal chamber pressure can vary from pump design, flow rate, and fluid being pumped. Suction and discharge pressures are required to perform these calculations. Often, pump specification sheets can be old and outdated, i.e., design, operating points may have changed due to a change in process demands. It is, for this reason, that suction and discharge pressures should be physically measured with pressure gages.

Single Stage, Single Suction, Overhung Process Pumps

Overhung centrifugal pumps are the most common process pumps in the industry. The seal chamber is located behind the pump impeller. Seal chamber pressure can vary based on pump design. The following equations are based on closed throat design seal chambers. Pump designs include wear rings and balance holes in the impeller to reduce thrust load on the bearings. The seal chamber pressure is a function of wear ring clearance as well as size and location of the balance holes. Quick estimate

Enclosed or semi-enclosed impellers with wear ring design and balance holes $P_{sb} = P_s + .25(P_d - P_s)$

Open impeller design with centrifugal pump-out vanes or repeller (no balance holes) $P_{sb} = P_s + .05(P_d - P_s)$

$P_{sb} = P_s + *D(P_d - P_s)$

*D = .3 if the impeller is at minimum diameter and .1 if the impeller is at maximum diameter.

Single Stage, Double Suction Pumps

The single stage, double suction impeller is placed between bearings while the seal chambers are located adjacent to the suction eyes of the impeller. The stuffing box pressure is equal to the suction pressure.

$P_{sb} = P_s$

Multi-Stage Pumps

Multi-stage pumps inherently have higher discharge pressures, but low-to-medium stuffing box pressures due to impeller arrangement, casing design, balance drums and the use of balance lines. These multi-stage pumps can be mounted horizontally or vertically.

Two Stage Horizontal Pumps

Impeller arrangement can have two configurations:

1.) Back to Back

In this arrangement, the seal chambers are located adjacent to the suction eye of the impeller. One chamber will see suction pressure and the other will see first stage discharge pressure.

$P_{sb1} = P_s$
 $P_{sb2} = P_s + .5(P_d - P_s)$

2.) Eye to Eye

In this arrangement the seal chambers are located adjacent to the backside of the impeller. One chamber will see the discharge of the first stage and the other will see pump discharge pressure (second stage discharge).

$P_{sb1} = P_s + .5(P_d - P_s)$
 $P_{sb2} = P_d$

Multi-Stage Horizontal Pumps

Multi-stage boiler feed pumps are used to develop high pressures, but the seal chamber is not necessarily at a high pressure. These pumps have a low-pressure chamber (suction pressure) and a higher-pressure chamber (pressure between suction and discharge).

$P_{sb1} = P_s$

Typically, a balance line is used to reduce pressure in the higher pressure seal chamber. Provided pump tolerances are in check, the higher-pressure seal chamber is as follows:

$P_{sb2} = P_s + 5 \text{ bar (75 psig)}$

Note: If pump tolerances are not in check and, in the absence of a balance line, the higher-pressure chamber will be a pressure between suction and discharge pressure.

$P_{sb2} = P_s + .5(P_d - P_s)$

Multi-Stage Vertical Pumps (Can or Turbine)

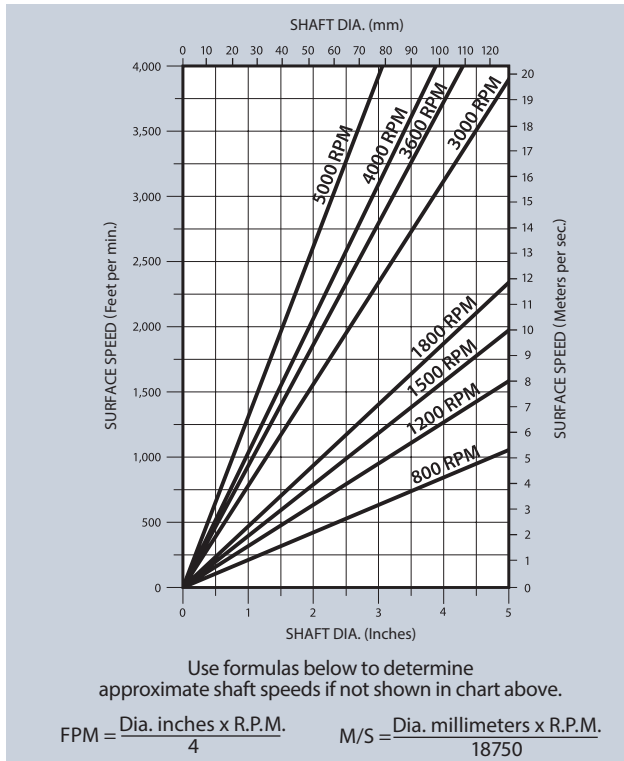
In these pumps the seal chamber is located at the discharge elbow. Therefore the seal chamber pressure would see discharge pressure.

$P_{sb} = P_d$

$P_{sb2} = P_s + 5 \text{ bar (75 psig)}$

Note: The installation of a bleed-off line can reduce seal chamber pressure, provided pump tolerances are in check.

SHAFT SPEED CONVERSION CHART



METRIC FORMULAS:

Head (m) = $\frac{\text{Pressure (bar)} \times 9.8}{SG} = \frac{\text{mm Hg.} \times 0.0014}{SG}$

Pressure (bar) = $\frac{\text{Head (m)} \times SG}{9.8}$

Mm of Mercury = $\frac{\text{Head (m)} \times SG}{0.0014}$

Power (kW) = $\frac{Q \text{ (l/min)} \times \text{Head (m)} \times SG}{\text{efficiency} \times 6128}$

IMPERIAL FORMULAS:

Head (ft.) = $\frac{\text{psi} \times 2.31}{\text{sp. gr.}} = \frac{\text{In. Hg.}}{\text{sp. gr.} \times .88}$

BHP (centrifugal) = $\frac{\text{GPM} \times \text{head (ft.)} \times \text{sp. gr.}}{3960 \times \text{pump eff.}}$

PSI = $\frac{\text{head (ft.)} \times \text{sp. gr.}}{2.31} = .49 \times \text{In. Hg.}$

BHP (Positive Disp.) = $\frac{\text{GPM} \times \text{psi}}{1715 \times \text{pump eff.}}$

TECHNICAL REFERENCE

UNITS OF MEASURE

Mariner's Measure

6 Feet = 1 Fathom
 120 Fathoms = 1 Cable Length (U.S.N.)
 8,439 Cable Lengths = 1 Nautical Mile
 6076.12 Ft. = 1 Nautical Mile
 1 Nautical Mile = 1.15 Statute Mile (International)

Inch System Conversion

Inches	x	0.0254	=	Meters
Feet	x	0.305	=	Meters
Yards	x	0.914	=	Meters
Miles	x	1609.	=	Meters
Miles	x	1.609	=	Kilometers
Millimeters	x	0.03937	=	Inches
Centimeters	x	0.3937	=	Inches
Meters	x	39.37	=	Inches
Meters	x	3.281	=	Feet
Meters	x	1.094	=	Yards
Kilometers	x	0.621	=	Miles
Sq. Centimeters	x	0.155	=	Square Inches
Sq. Meters	x	10.764	=	Square Feet
Sq. Meters	x	1.186	=	Square Yards
Cubic Centimeters	x	0.061	=	Cubic Inches
Cubic Inches	x	16.2	=	Cubic Centimeters
Liters	x	0.2642	=	Gallons
Gallons	x	3.78	=	Liters
Cubic Meters	x	1.308	=	Cubic Yards
Cubic Yards	x	0.765	=	Cubic Meters

Metric System Prefixes

Mega = 1,000,000	Deci = 0.1	Tera (T) = 10 ¹²
Kilo = 1,000	Centi = 0.01	Giga (G) = 10 ⁹
Hecto = 100	Milli = 0.001	Nano (N) = 10 ⁻⁹
Deka = 10	Micro = 0.000001	Pico (P) = 10 ⁻¹²

Length

1 centimeter	=	0.3937 inch	=	0.0328 foot
1 meter	=	39.37 inches	=	1.0936 yards
1 kilometer	=	0.62137 mile	=	3280 feet
1 inch	=	2.54 centimeters		
1 foot	=	0.3048 meter		
1 mil	=	0.001 inch		

Square Measure

1 sq. cm.	=	0.1550 sq. in.		
1 sq. meter	=	1.196 sq. yd.	=	10.764 sq. ft.
1 sq. kilometer	=	0.386 sq. mile		
1 sq. inch	=	6.452 sq. cm.		
1 sq. foot	=	929.03 sq. cm.	=	0.092903 sq. meter
1 sq. yard	=	0.8361 sq. meter		
1 sq. mile	=	2.59 sq. kilometers		
1 circular mil	=	0.7854 sq. mil		
1 sq. inch	=	1,000,000 sq. mils		

Cubic Measure

1 cu. centimeter = 0.061 cu. inch 1 cu. in. = 16.39 cu. cm.
 1 cu. meter = 1.308 cu. yards = 35.316 cu. feet
 1 gallon (U.S.) = 231 cubic inches
 1 cu. ft. = 7.48 gallons 1 liter = 1,000 cu. centimeters

Time

1 day = 86,400 seconds 1 year = 8,760 hours (approx.)

Velocity

1 ft./sec. = 0.3048 meter/sec.	1 meter/sec. = 3.281 ft./sec.
1 ft./min. = 0.00508 meter/sec.	1 meter/sec. = 196.9 ft./min.

1 mile/hr. = 0.4470 meter/sec.	1 meter/sec. = 2.237 mi./hr.
1 kilometer/hr. = 0.2778 meter/sec.	1 meter/sec. = 3.60 km/hr.

Acceleration

1 ft./sec./sec.	=	0.3048 meter/sec./sec.
1 mile/hr./sec.	=	0.4470 meter/sec./sec.
1 kilometer/hr./sec.	=	0.2778 meter/sec./sec.
Standard gravitation	=	9.806 meters/sec./sec.
Standard gravitation	=	980.6 cm./sec./sec.
Standard gravitation	=	32.2 ft./sec./sec.

Mass

1 slug = 32.2 pounds mass = 14.606 kilograms
 1 pound mass = 453.6 grams

Force

1 pound force	=	1 slug	x	1 foot sec./sec.
1 dyne	=	1 gram	x	1 centimeter/sec./sec.
1 newton	=	1 kilogram	x	meter/sec./sec.
1 pound force	=	4.452 newtons		
1 newton	=	100,000 dynes	=	0.224 pound force
1 gram force	=	980.6 dynes		

Pressure

1 atmosphere = 14.69 pounds/sq. inch = 29.92 in. of Hg.
 = 76 cm of Hg. = 33.9 ft. of water
 1 in Hg. = 0.491 pounds/sq. inch
 Water pressure pounds/sq. inch = head in ft. x 0.434

Torque

Torque is the product of force and perpendicular distance.
 1 lb.-ft. = 1.356 newton-meter = 1.356 joule/radian
 1 lb.-ft. = 1.356 x 10⁷ dynes-centimeter
 1 lb.-ft. = 1.383 x 10⁴ grams-centimeter
 1 lb.-ft. = 192 ounce-inches

Work and Energy - Mechanical

1 erg = 1 dyne x 1 centimeter
 1 joule = 1 newton x 1 meter = 10⁵ dynes x 10² cm = 10⁷ ergs
 1 ft.-lb. = 1 pound force x 1 foot = 1.356 joules

Work and Energy - Heat Equivalent

1 Btu raises 1 pound of water 1°F
 1 gram calorie raises 1 gram of water 1°C
 1 Btu = 252 gram calories = 778.3 ft.-lb. = 1054.8 joules
 1 gram calorie = 0.003964 Btu = 4.184 joules
 1 horsepower hour = 2545 Btu

Work and Energy - Electrical Equivalent

1 joule = 1 watt x 1 second = 1 amp (dc) x 1 volt (dc) x 1 sec.
 W (joules) = 1/2 L (henries) x I (amperes)²
 W (joules) = 1/2 C (farads) x E (volts)²
 1 kilowatt hour = 3,600,000 joules

Power

1 watt = 1 joule/sec.
 1 horsepower = 550 ft. lb./sec. = 746 watts
 1 watt = 3.413 Btu/hr = 0.239 gram calorie/sec.
 P watts = R (ohms) x I (amperes)²
 P watts = $\frac{E \text{ (volts)}^2}{R \text{ (ohms)}}$

Angles

1 circle = 2π radians = 360 degrees 1 radian = 57.3 degrees
 1 degree = 0.01745 radians

Geometric Figures

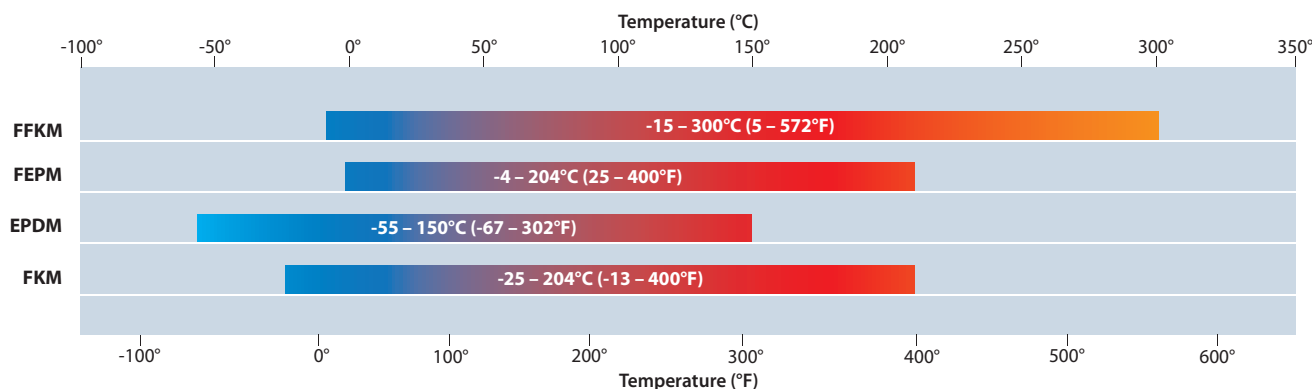
Circle, area of = D² x 0.7854 = πr² r = radius
 Circle, circumference of = πD or 2πr
 Sphere, area of = πD² = 4πr² D = diameter
 Sphere, volume of = D³ x 0.5236 = 4/3 πr³
 Triangle, area of = 1/2 altitude x base
 Cone, volume of = area of base x 1/3 altitude
 Trapezoid, area of = 1/2 (sum of parallel sides) x altitude
 Pyramid, volume of = area of base x 1/3 altitude

Miscellaneous Constants

π = 3.14159 e = 2.71828
 Log_e X = 2.30259 log₁₀ X
 Electronic charge = 4.5 x 10⁻¹⁰ e.s.u. = 1.60 x 10⁻²⁰ e.m.u.
 Mass units = 1.07 x 10⁻³ x Mev = 6.71 x 10² ergs
 Speed of light = 3 x 10⁸ meters/second
 Speed of sound = (in air at sea level) = 1100 ft/second

MATERIAL REFERENCE

Operating Limits of Elastomers



Key to Seal Materials

Component	Chesterton	EN12756	Description
Faces	CB	B	Carbon Graphite, Resin Impregnated
	SSC	Q ₁	Silicon Carbide, Sintered Pressureless
	RSC	Q ₂	Silicon Carbide, Reaction Bonded
	TC	U ₂	Tungsten Carbide, Ni-Binder
	CR	V	Aluminum Oxide, 99.5%
Metals	316	G	CrNiMo steel (EN 1.4401)
	Alloy-20	M ₃	20 Cb3 (EN 2.4660)
	Ti	T ₂	Titanium (EN 3.7035)
	HC	M ₅	Hastelloy® C-276 (EN 2.4819)
	HB	M ₁	Hastelloy® B2 (EN 2.4617)
	Monel®	M ₄	Monel® Alloy K500 (EN 2.4375)
Elastomers	FKM	V	Fluorocarbon
	EPDM	E	Ethylene Propylene
	FEPM	X	Tetrafluoroethylene-Propylene
	FFKM	K	Perfluoroelastomer

* Consult Chesterton Engineering on lower temperature limits

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