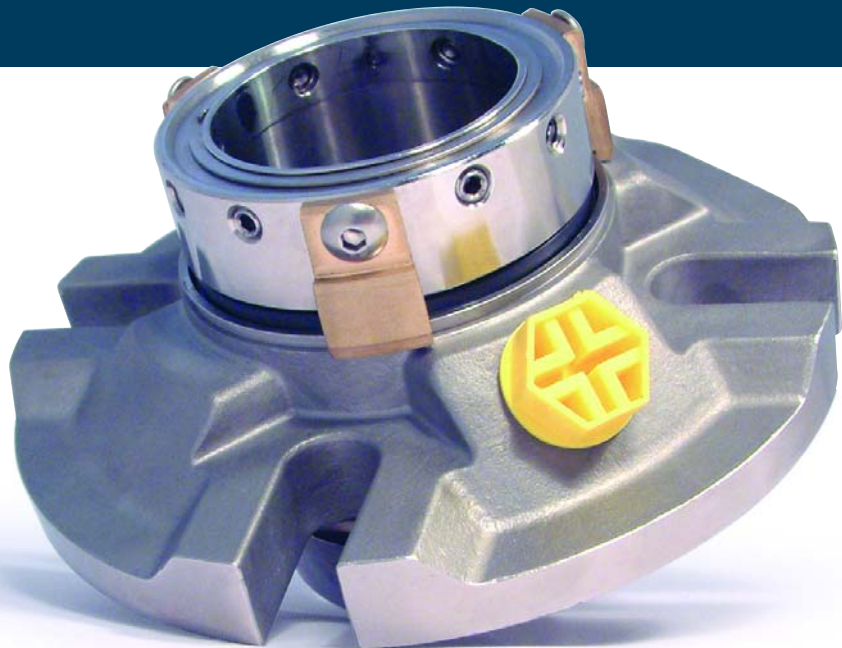




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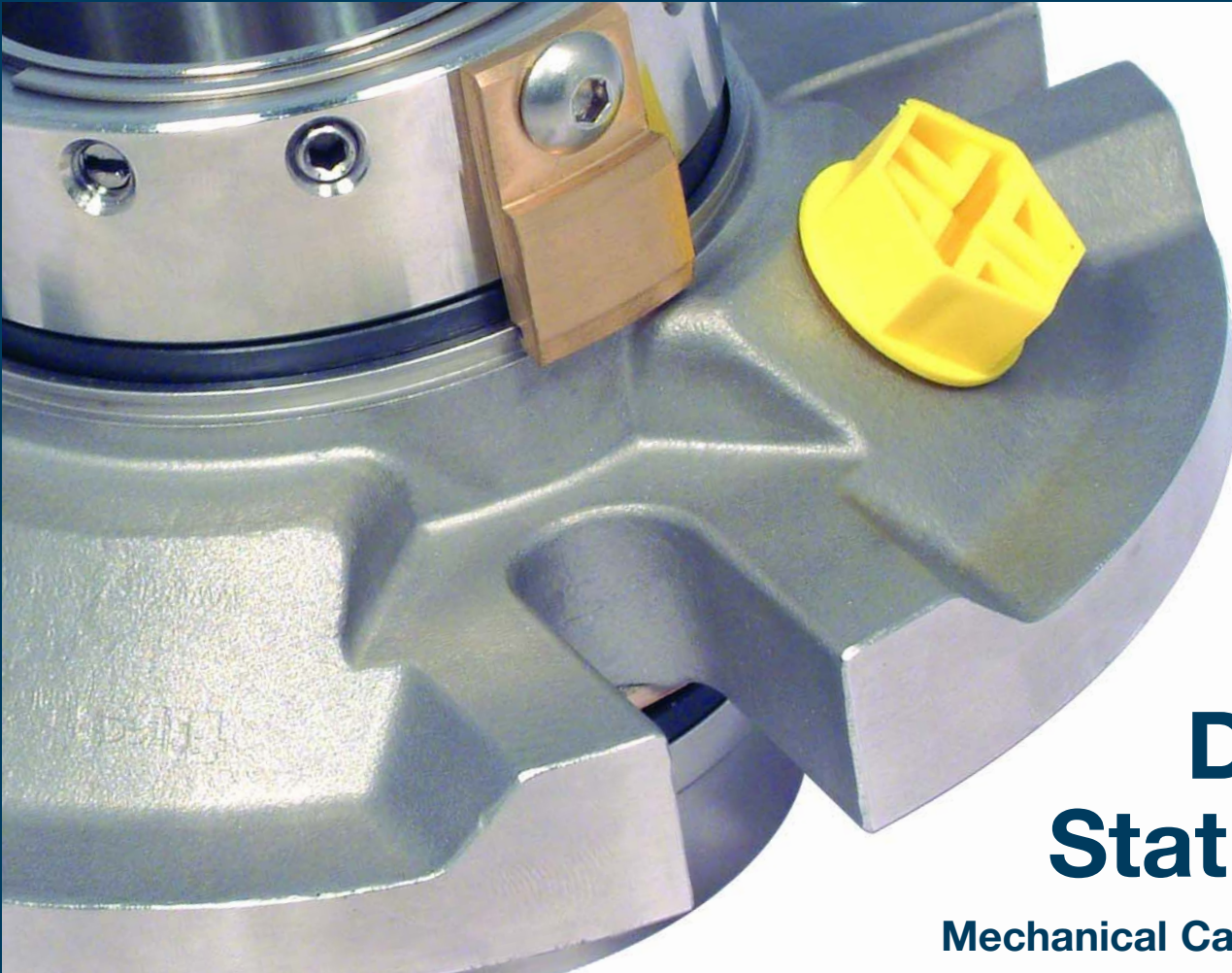
Double Stationary

**Environmental
Cartridge Mechanical Seals
f4s200™ & ANSI+ f4s200™ Series**

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Double Stationary

Mechanical Cartridge Seals



To conform to current environmental legislation, double cartridge seals are specified to provide maximum emission control in critical and noxious applications.

Double balanced cartridge seal designs use 50% of the power required by standard unbalanced seals, and only 20% of the power of pump packing.

All packing must leak to survive, whereas seals should be leak free. This reduces environmental contaminants and disposal costs.

f4s200™

double stationary mechanical cartridge seals



the green issue

f4s200™ cartridge seals can be fully refurbished with most parts being re-used.

As leakage is eliminated corrosion problems to pump, bearing and pump room are all greatly reduced.



f4s200™ series - technical specification

metal parts	316 Stainless Steel as standard, other materials also available.	stationary	Carbon or Silicon Carbide as standard. Tungsten Carbide available to order.
springs	Alloy 276	temperature limits	-30°C to 260°C (-22°F to 500°F) dependent upon specified elastomer and system configuration.
o-rings	Viton® (Fluorocarbon) or Ethylene Propylene (EPR) as standard. Aflas®, Kalrez® and other elastomers available to order.	pressure limits - media and barrier	711mm HG Vacuum to 30 Bar (-28" HG - 440 PSI). It is recommended that the barrier pressure is 1 Bar (15 psi) greater than the media.
rotary face	Silicon Carbide available as standard. Tungsten Carbide available to order.		

As the conditions of use are outside the control of first4seals, the information contained within this brochure is given in good faith but without warranty. The above temperature and pressure limits are individual maximum values for SOFT/HARD seal face combinations only. The values are provided for guidance only and are intended for use by suitably qualified application engineers. It is recommended that all users contact the first4seals Technical Department for advice on any new application.

f4s200™ series - design features

Uptime & Ease of Installation:
Self aligning design
Seal face closing is created by springs located behind the stationary face of the seal. This stationary design allows for some misalignment of the shaft and housing hence preventing spring fatigue/failure due to misalignment.

Low Maintenance:
No fretting of the pump shaft
The secondary (sleeve) seal o-ring is static on the shaft and is guaranteed never to fret the pump shaft or sleeve.

Uptime:
Autobalancing seal faces
Seal faces will remain closed in pressure failure modes in either the product or barrier fluid.

Uptime & Low maintenance:
Isolated springs
The Alloy 276 springs are not in the process fluid where they could corrode and clog, so they remain effective for the whole of the seal life.

Uptime: Full independent double seal
Design utilises two independent sets of springs to energise the seal faces. This creates an inherently safe system whereby single face failure cannot compromise the second seal.

Uptime: Pressure balanced seal faces
The seal is balanced to achieve optimum face loading for high pressure capability and provide cooler running for longer seal life.

Monolithic rotary face
Monolithic face construction reduces face rotation in high or low temperature applications.

Barrier ports
Barrier fluid is directed to the rotary surfaces. The unique pumping action also achieves cooler running.

Uptime: Balanced shrink fit stationary
Shrink fitted faces for optimum metal to metal drive and balanced loading design for stability at high temperatures.

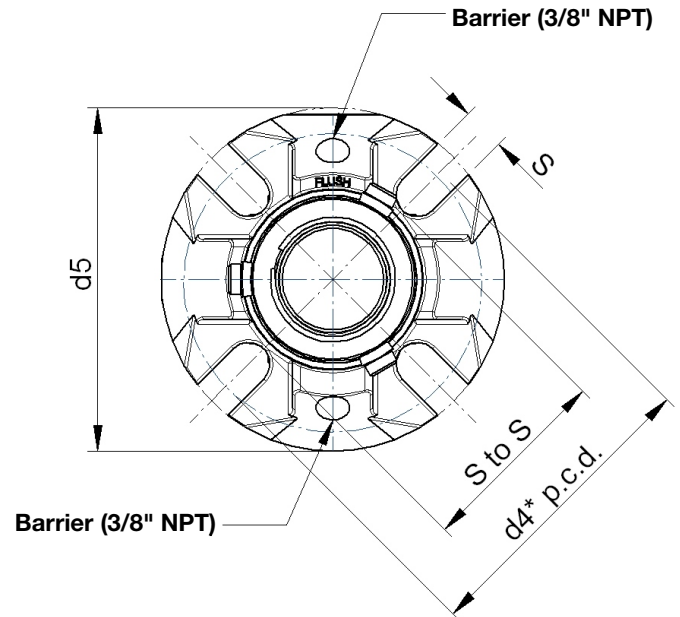
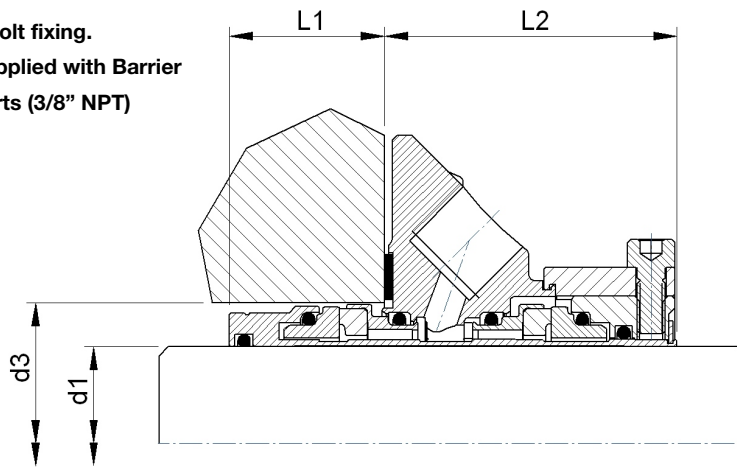
Uptime: Efficient bi-directional eccentric pumping
Novel design features in the product create a significant flow of barrier fluid within the seal face cavity. This feature reduces the heat retention within the seal, hence extending the seal life.

Easy Maintenance:
External clamping
Pump efficiency adjustments can be made without dismantling the pump.

f4s200™

f4s200™ dimensional information

4 bolt fixing.
Supplied with Barrier
ports (3/8" NPT)



f4s200™ series - size chart

d1	d3		d4*p.c.d.		d5	L1	L2	S to S	S
Metric	S/B I.D. Min	S/B I.D. Max	Min	Max	Gland O.D.	Inboard length	Outboard length	Slot to Slot	Slot Width
24	41.0	48.0	68.5	90.5	102.5	28.2	52.6	54.5	14.0
25	41.0	48.0	68.5	90.5	102.5	28.2	52.6	54.5	14.0
28	44.0	52.0	71.5	93.5	104.5	28.2	52.6	57.5	14.0
30	46.0	55.0	75.0	97.0	110.5	28.2	52.6	61.0	14.0
32	48.0	55.0	75.0	97.0	110.5	28.2	52.6	61.0	14.0
33	49.0	55.0	75.0	97.0	110.5	28.2	52.6	61.0	14.0
33K	49.0	55.0	75.0	90.0	101.6	28.2	52.6	61.0	14.0
35	51.0	57.0	77.5	97.0	111.5	28.2	52.6	63.5	14.0
38	57.0	60.0	86.0	114.5	127.0	28.0	53.3	72.0	14.0
40	60.0	63.5	86.0	114.5	127.0	28.0	53.3	72.0	14.0
43	63.0	70.0	95.0	127.0	139.7	28.0	53.3	81.0	14.0
43K	63.0	70.0	95.0	105.0	119.6	28.0	53.3	81.0	14.0
45	64.0	70.0	95.0	127.0	139.7	28.0	53.3	81.0	14.0
48	67.0	73.0	95.0	127.0	139.7	28.0	53.3	81.0	14.0
50	70.0	76.0	104.5	139.5	152.4	28.0	53.3	90.5	14.0
53	73.0	79.5	104.5	139.5	152.4	28.0	53.3	90.5	14.0
53K	73.0	79.5	104.5	117.5	130.4	28.0	53.3	90.5	14.0
55	74.0	82.5	114.4	149.0	165.1	28.0	53.3	96.9	17.5
58	77.0	82.5	114.4	149.0	165.1	28.0	53.3	96.9	17.5
60	79.0	85.5	114.4	149.0	165.1	28.0	53.3	96.9	17.5
63	83.0	92.0	127.0	160.5	177.8	23.5	58.0	109.5	17.5
65	85.0	95.0	127.0	160.5	177.8	23.5	58.0	109.5	17.5
70	90.0	98.0	127.0	160.5	177.8	23.5	58.0	109.5	17.5
75	99.0	108.0	143.0	173.0	190.5	33.8	59.5	125.5	17.5
80	102.0	111.0	143.0	173.0	190.5	33.8	59.5	125.5	17.5
85	108.0	117.0	156.5	182.5	203.2	33.8	59.5	135.5	21.0

Note: The 33K and 43K glands are specifically designed to suit the KSB CPK pump range.

d1	d3		d4*p.c.d.		d5	L1	L2	S to S	S
Imperial	S/B I.D. Min	S/B I.D. Max	Min	Max	Gland O.D.	Inboard length	Outboard length	Slot to Slot	Slot Width
1.000	1.625	1.875	2.750	3.562	4.034	1.110	2.070	2.146	0.551
1.125	1.750	2.062	2.875	3.687	4.113	1.110	2.070	2.264	0.551
1.250	1.875	2.187	3.000	3.812	4.349	1.110	2.070	2.402	0.551
1.375	2.000	2.250	3.125	3.812	4.389	1.110	2.070	2.500	0.551
1.500	2.250	2.375	3.437	4.437	5.000	1.100	2.100	2.835	0.551
1.625	2.375	2.500	3.437	4.437	5.000	1.100	2.100	2.835	0.551
1.750	2.500	2.750	3.750	4.937	5.500	1.100	2.100	3.189	0.551
1.875	2.625	2.875	3.750	4.937	5.500	1.100	2.100	3.189	0.551
2.000	2.750	3.000	4.125	5.437	6.000	1.100	2.100	3.563	0.551
2.125	2.875	3.125	4.125	5.437	6.000	1.100	2.100	3.563	0.551
2.250	3.000	3.250	4.500	5.812	6.500	1.100	2.100	3.813	0.551
2.375	3.125	3.375	4.500	5.812	6.500	1.100	2.100	3.813	0.551
2.500	3.250	3.625	5.000	6.312	7.000	0.930	2.280	4.311	0.689
2.625	3.375	3.750	5.000	6.312	7.000	0.930	2.280	4.311	0.689
2.750	3.500	3.875	5.000	6.312	7.000	0.930	2.280	4.311	0.689
2.875	3.750	4.125	5.625	6.812	7.500	1.330	2.340	4.941	0.689
3.000	3.875	4.250	5.625	6.812	7.500	1.330	2.340	4.941	0.689
3.125	4.000	4.375	5.625	6.812	7.500	1.330	2.340	4.941	0.689
3.250	4.125	4.500	6.187	7.187	8.000	1.330	2.340	5.335	0.827
3.375	4.250	4.625	6.187	7.187	8.000	1.330	2.340	5.335	0.827

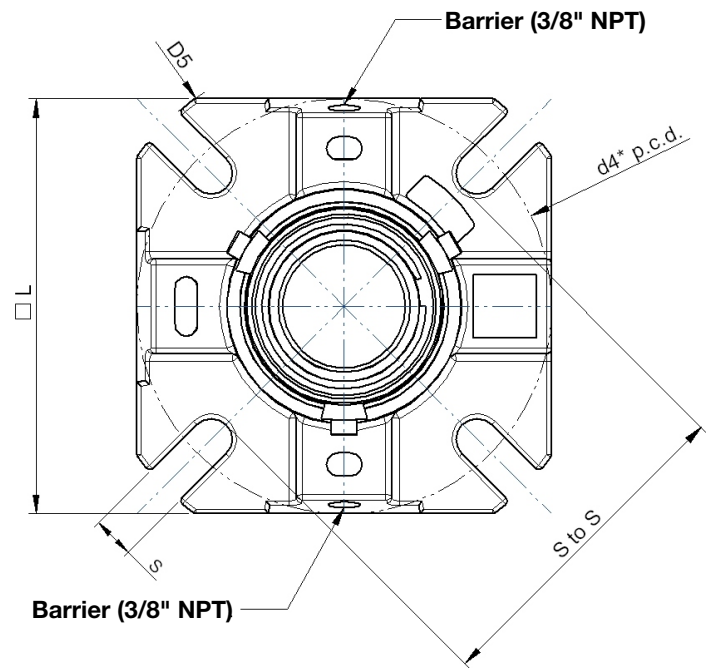
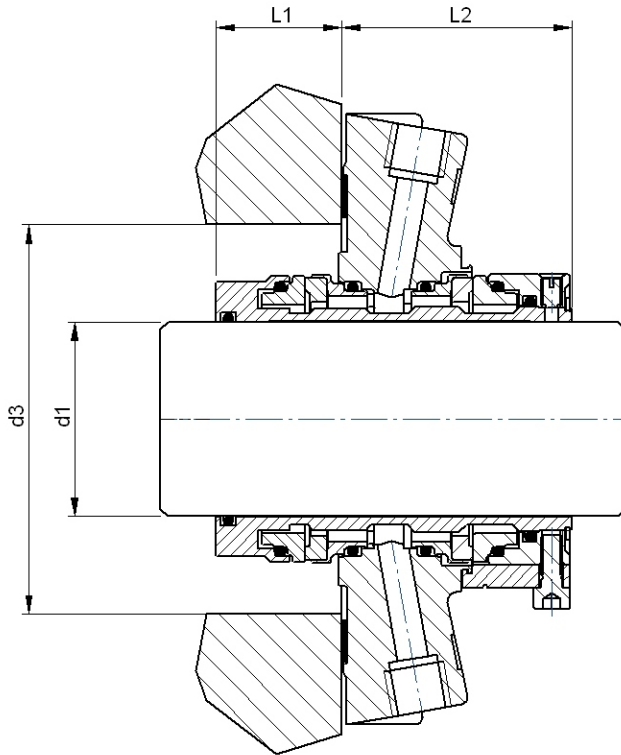
*Based on the largest bolt diameter (specials can be produced)

ANSI+ f4s200™ dimensional information

4 bolt fixing
Supplied with Barrier ports (3/8" NPT)

Hydraulically balanced double stationary cartridge seal, with environmental Barrier Fluid control and setting clips to specifically suit ANSI+ large bore seal chamber designs. Available in shaft sizes 1.125" – 2.750".

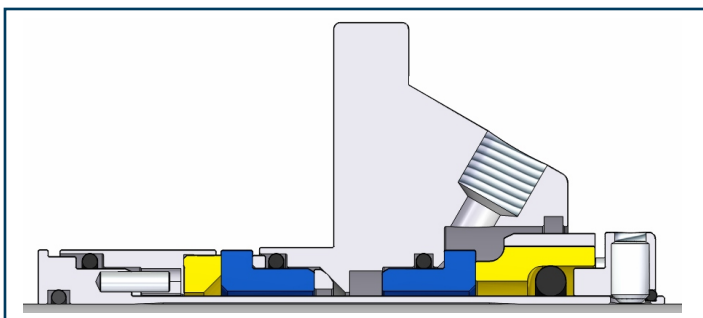
first4seals can also offer special ANSI+ designs based on our 302™ double rotary cartridge seals. Please contact our technical team for more information technical@first4seals.com



ANSI+ f4s200™ series - size chart

d1		d3		d4*pcd		d5	L1	L2	S to S	S	□ L
Imperial	S/B I.D. Min	S/B I.D. Max	Min	Max	Gland O.D.	Inboard length	Outboard length	Slot to Slot	Slot Width	Flat to Flat	
1.125	2.625	2.850	3.750	4.450	4.985	1.182	2.000	3.209	0.551	3.965	
1.375	2.875	3.100	4.000	4.812	5.457	1.182	2.000	3.425	0.551	4.301	
1.750	3.500	4.100	5.000	6.250	6.772	1.126	2.076	4.425	0.551	5.492	
1.875	3.625	4.100	5.000	6.250	6.772	1.126	2.076	4.425	0.551	5.492	
2.125	3.875	4.225	5.375	6.937	7.638	1.183	2.019	4.656	0.689	6.420	
2.500	4.500	5.100	6.125	7.312	8.268	1.067	2.136	5.413	0.689	6.703	
2.625	4.625	5.100	6.125	7.312	8.268	1.064	2.138	5.413	0.689	6.703	
2.750	4.625	5.100	6.125	7.312	8.268	1.064	2.138	5.413	0.689	6.703	

*Based on the largest bolt diameter (specials can be produced)



302™ double rotary cartridge seal

Double rotary seals available to suit a hazardous and aggressive applications. See 302™ series literature for further details.

f4s25™ & f4s25CC™ systems:

A range of seal support systems including a 25 litre (6.6 US Gallons) vessel with or without cooling coil to cover demanding applications, offering fast and problem free installation on site. These are supplied with all the necessary components and fittings. Various hose kits are available including polyamide and flexible braided stainless steel. Available to US markets only.

f4s10™ & f4s10CC™ systems:

As per f4s25 but includes a 10 litre (2.6 US Gallons) vessel with or without cooling coil to cover most standard or lower temperature applications.

Standard Buffer system:

May be used unpressurised to provide cooling on medium temperature applications, to prevent crystallisation of aqueous solutions, or to provide protection from dry-running damage.

This includes:

- 1 off vessel
- 1 off ball/drain valve
- 1 off level gauge/sight glass
- 1 off ball/fill valve
- 1 off polyamide pipe kit with fittings

Standard Water retention systems:

Water retention systems are connected directly to a suitable clean water supply (subject to local regulations) to form a low maintenance, high reliability barrier fluid system. In normal operation the supply pressurises the vessel, but negligible water is drawn. The 'Thermosyphon' effect (natural convection) ensures the seal is kept cool.

When the flow indicator eventually shows water is being drawn from the supply, this indicates the need to consider seal replacement. In the meantime the integrity of the barrier is maintained to extend seal life and prevent any loss of product.

This includes:

- 1 off vessel
- 1 off ball/drain valve
- 1 off level gauge/sight glass
- 1 off pressure gauge
- 1 off water regulator
- 1 off water supply connection
- 1 off non return valve
- 1 off flow indicator
- 1 off polyamide pipe kit with fittings
- 1 off 3 way valve

Standard Gas/air pressurised systems:

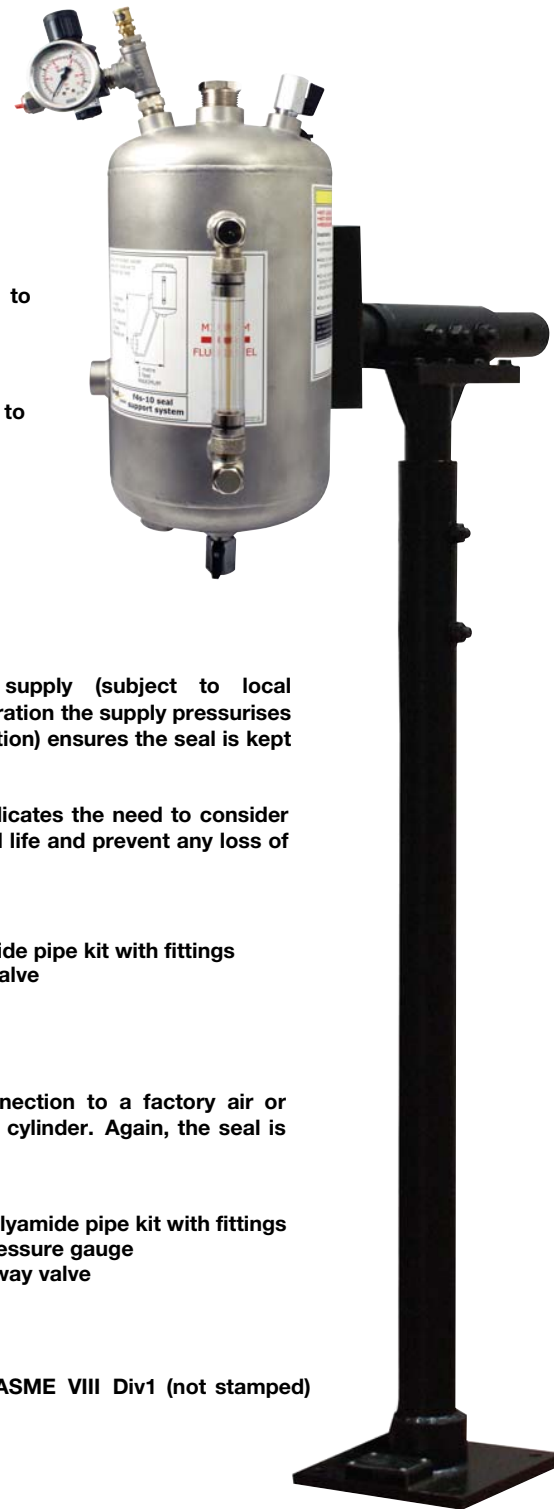
Pressure systems are partially filled with a suitable fluid then pressurised via a connection to a factory air or nitrogen supply. Alternatively, the system can be pressurised from a mobile nitrogen cylinder. Again, the seal is cooled by the 'Thermosyphon' effect.

This includes:

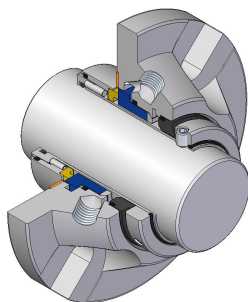
- 1 off vessel
- 1 off ball/drain valve
- 1 off level gauge/sight glass
- 1 off ball/fill valve
- 1 off air/nitrogen regulator
- 1 off relief valve
- 1 off polyamide pipe kit with fittings
- 1 off pressure gauge
- 1 off 3 way valve

Vessel code:

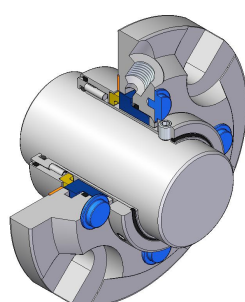
The f4s10™ & f4s25™ vessels are designed and manufactured in accordance with ASME VIII Div1 (not stamped) and comply with PED97/23/EC.



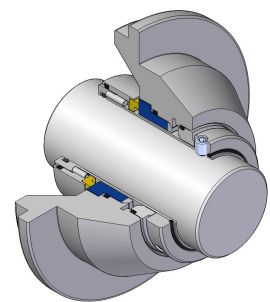
Other single cartridge seals in the F4S range:



301™ range



303A™ range



PCP range

A range of single cartridge seals are available to suit all application needs. Seals to suit progressive cavity pumps (PCP) are also available in single and double formats. See our single seal literature for further details.

Seal assessment

Each seal is cleaned to remove any chemicals or hazardous materials upon arrival and then individually inspected and assessed. The assessment process determines which components require replacement or refurbishment in order to generate an accurate and cost effective repair quotation. Materials specifications are identified through understanding of seal construction, operation and application.

Quotation

All repair quotations are based on specific parts that require refurbishment or replacement. This method is used to reduce repair costs and provide the most economic method of restoring a mechanical seal back to a usable condition.

Seal refurbishment

The refurbishment process restores seals to their original functionality at a fraction of the cost of replacement hardware. Our refurbishment service is available for all standard first4seals products and those of many leading manufacturers, to help prolong a mechanical seal's life span. We are able to repair competitor brands such as: Eagle Burgmann®, Chesterton®, Flowserve®, John Crane® and many more.

We are able to design and reverse engineer competitor components which may have failed in service. Components are modelled using state-of-the-art Computer Aided Design software to produce an accurate model. Components are manufactured using multi-axis CNC machines from a range of materials including standard 316L Stainless Steel, exotic alloys, PTFE and Carbon.

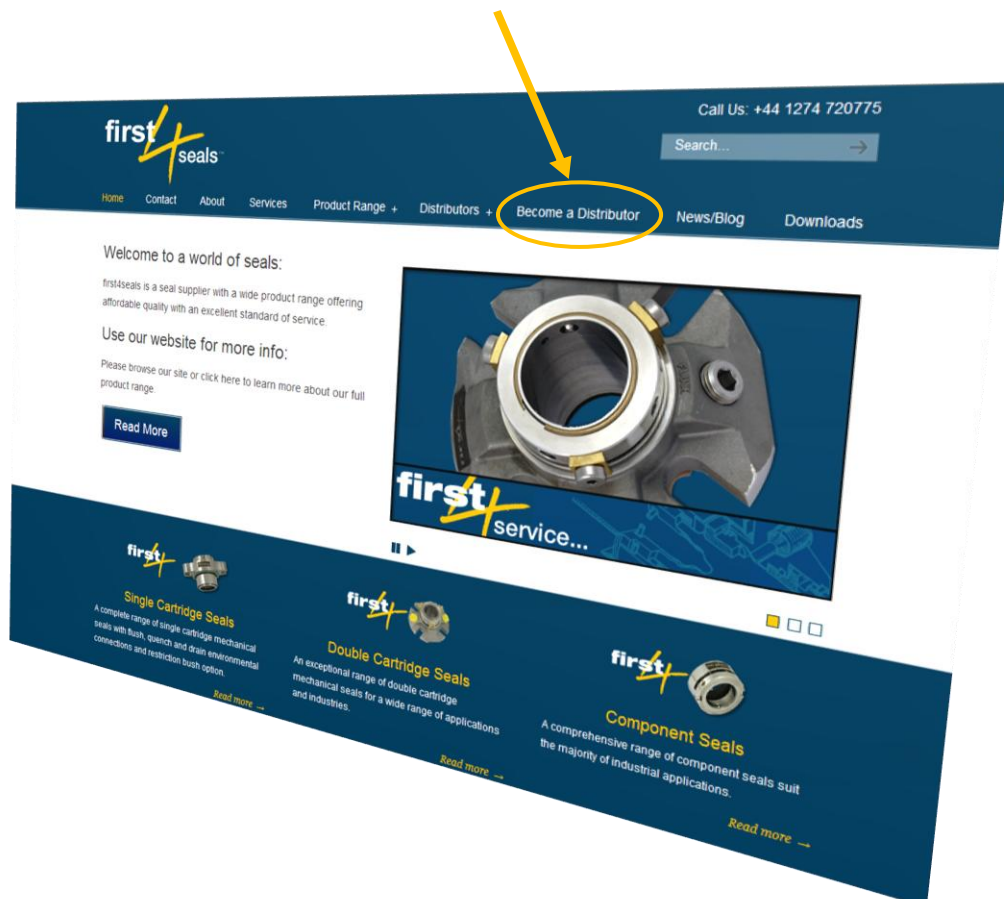
Quality

Quality and customer service are the highest priority and our business is certified to ISO 9001:2008 . All repairs are carried out by experienced workshop technicians and monitored by our Technical Team to provide a service which offers a cost-effective and environmentally sound alternative to purchasing new seals. Each seal is pressure tested before it is sent back to the customer. Testing ensures that the seal is in full working order and will perform correctly when installed back into service.

Interested in becoming a distributor?

first4seals is currently looking to recruit new distributors to help enhance its global coverage. Please contact us if you are interested in becoming a first4seals distributor:

Visit our brand new website www.first4seals.com and follow the "Become a Distributor" tab.



single spring seals



component seals



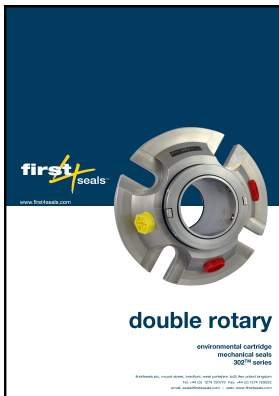
MV™ single rotary cartridge seals



301™/303A™ single rotary cartridge seals



302™ double rotary cartridge seals



f4s100™ single stationary cartridge seals



f4s200™ double stationary cartridge seals



seal support systems



THIS DOCUMENT IS DESIGNED TO PROVIDE DIMENSIONAL DATA AND IS NOT AN INDICATION OF AVAILABILITY FROM STOCK. SOME DESIGNS MAY BE SUBJECT TO MINIMUM ORDER QUANTITIES AND MANUFACTURING LEAD TIMES.



FM61505

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