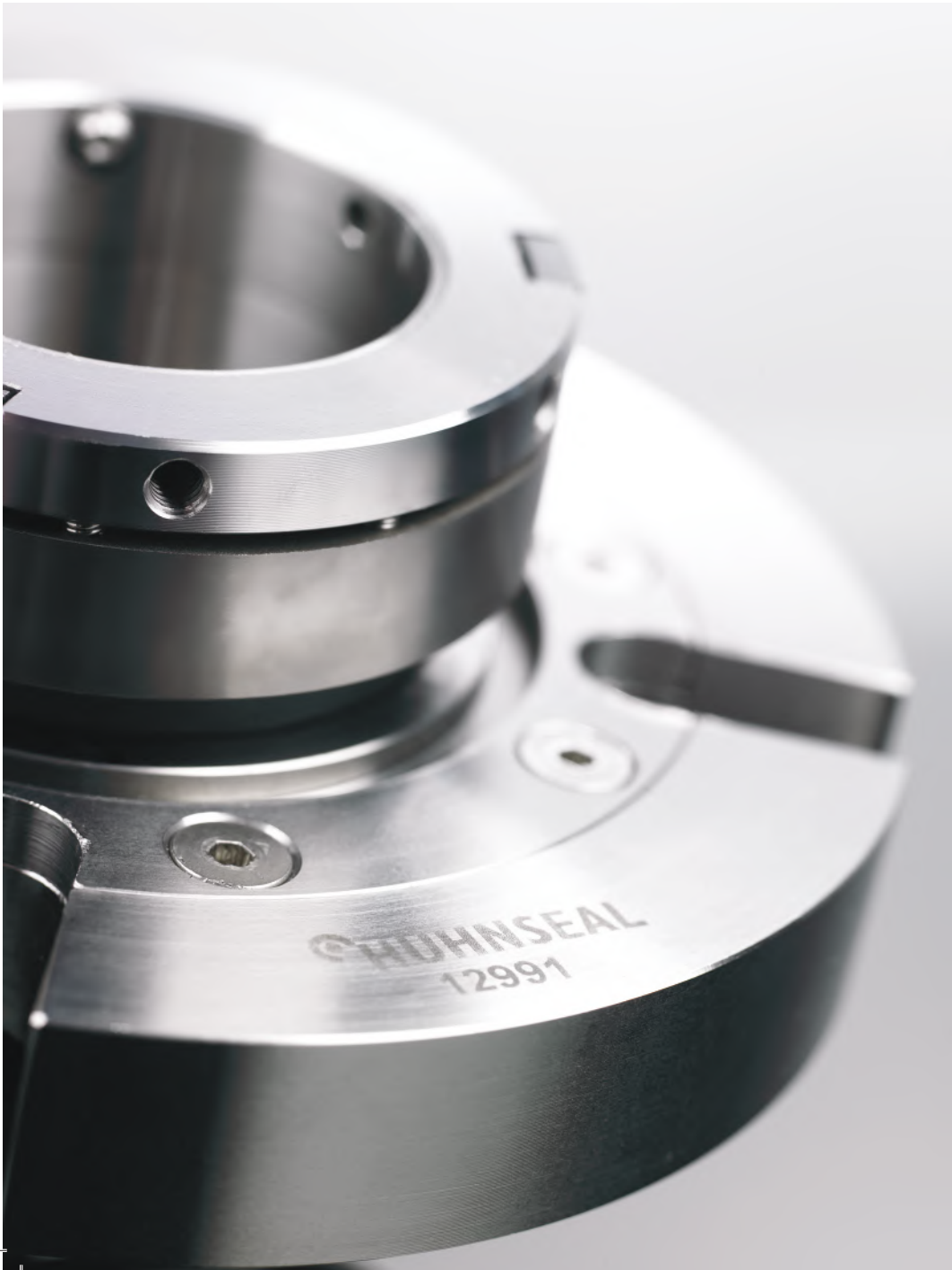


E-series

Mechanical seals designed
for the process industry



CHUNSEAL

E-series

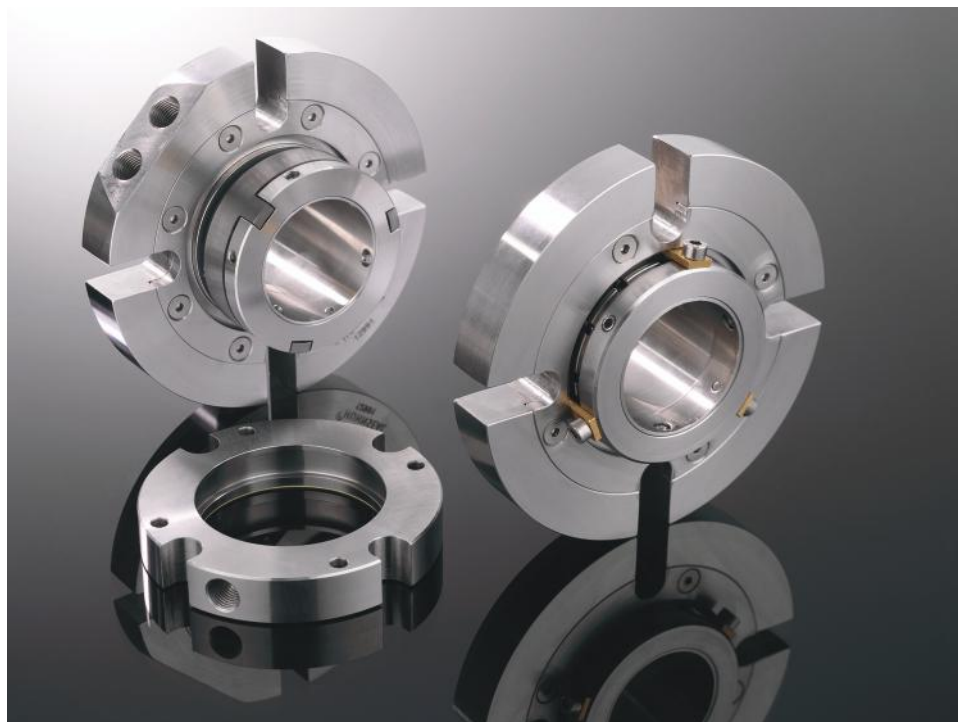
Minimized built-in dimensions

Suitable for standardizing

Spring packages isolated from product and buffer fluid

Excellent axial and radial flexibility

Easy to install



The Huhnseal E-series is a new system of sealing solutions designed for centrifugal pumps and other types of pumps or rotating equipment demanding mechanical seals. The system provides reliable and cost efficient seals with advantageous built-in dimensions, which makes them suitable for standardizing in larger process industries but also for customers with a more limited amount of positions.

During the development of the E-series, main focus has been to minimize the built-in dimensions, optimize performance and reliability, only to use first class materials and to ensure easy handling.

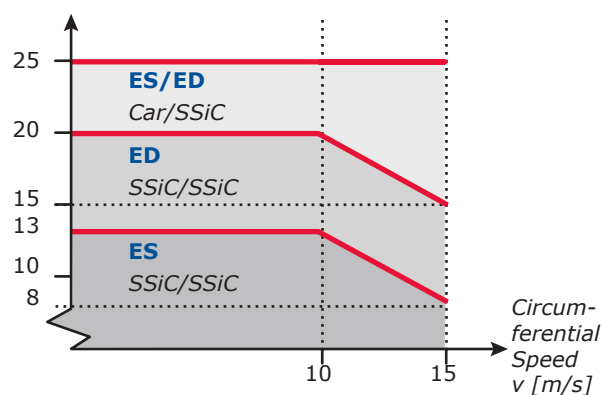
Both Huhnseal ES and ED are effectively balanced seals, to minimize heat generation. The ED-seal is also double-balanced in order to handle pressure drops in either product or barrier without opening.

Features

- Cartridge seals for easy assembly
- Minimized built-in dimensions, fits in most standard stuffing box spaces
- Balanced (ES) and double balanced (ED) design for minimum heat generation
- Both ES and ED have excellent axial and radial moving capabilities
- Suitable for standardizing
- First-class materials
- Easy and time efficient to recondition on site when required
- Protected spring package to minimize risk for clogging
- Sintered Silicon Carbide (resistant to pH-1-14) is standard
- The seals may be equipped with a separate flange for flushing

Operation limits

Product Pressure P [bar]



For the measurements of which the above values are based upon, pure room-tempered water was used.

For installations with extreme pressure, temperature and high speed, please contact Huhnseal AB or your local dealer.

Applications

	ED	EDF	ES	ESF
Clean fluids			•	
Fluids with poor lubrication capabilities	•			•
Crystallizing fluids	•			•
Fluids reacting with air	•			
Sedimentary fluids	•	•		•
High temperature fluids (>100°)	•	•		•
Fluids hazardous to health and environment	•			
Extra need of cooling/pressure balancing		•		•

Materials

	Standard	On request
Rotating face product side:	SSiC ¹	TC ²
Stationary face product side:	SSiC ¹ Carbon ⁴	TC ²
Rotating face atmospheric side:	TC ²	
Stationary face atmospheric side:	Carbon ⁴	SSiC ¹
Elastomer:	EPDM/FPM	FFPM ³
Springs:	HASTELLOY C™, EN 1.4401	
Remaining parts:	Stainless steel EN 1.4436/1.4460	Titanium/EN 1.4462

1) SSiC = Sintered Silicon Carbide

4) Resin Impregnated

2) TC = Tungsten Carbide

3) FFPM = Perfluor Elastomere

ES

Balanced cartridge seal

Huhnseal ES is a balanced single mechanical seal with a unique and modern design. The springs are not placed directly behind the stationary face, this being the most common competitor solution, but have been located on a larger diameter further away from the critical O-ring and seal face gap in order to reduce risk for clogging. Due to the relocation of the springs, more robust springs may be used enabling to change from compression to tension springs.

The robust tension spring design gives the seal better performance since it is more difficult for particles and fibers from the product to reach and clog up the springs. Additionally the relatively long springs with larger wire diameter increase the axial and radial moving capabilities of the seal. First-class materials from carefully selected suppliers ensure optimized performance at minimized built-in dimensions.

1 Hygienic solutions

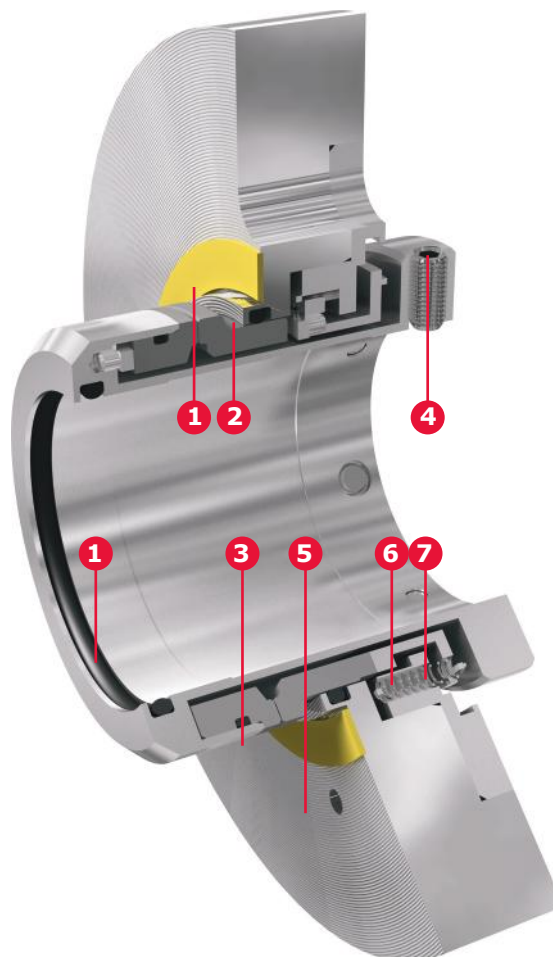
Smooth surfaces without cavities or closed spaces make the seal suitable for food and drug application. If required the gasket may be replaced with O-rings in execution according to EHEDG to achieve a hygienic designed seal suitable for CIP (Cleaning in Place).

2 Excellent angular moving capabilities

Advantage when operating against closed valves, causing shaft bending.

3 H4 design

The rotating sealing face on the product side has the new "H4-design". This means that the seal is O-ring mounted and the outer diameter of the seal face is the same as of the holder. This prevents the forming of turbulent flows, which cause heavy wear in abrasive liquids.



4 Advantageous built-in dimensions

Fits in most standard pump stuffing boxes.

5 Optional additional flange for flushing

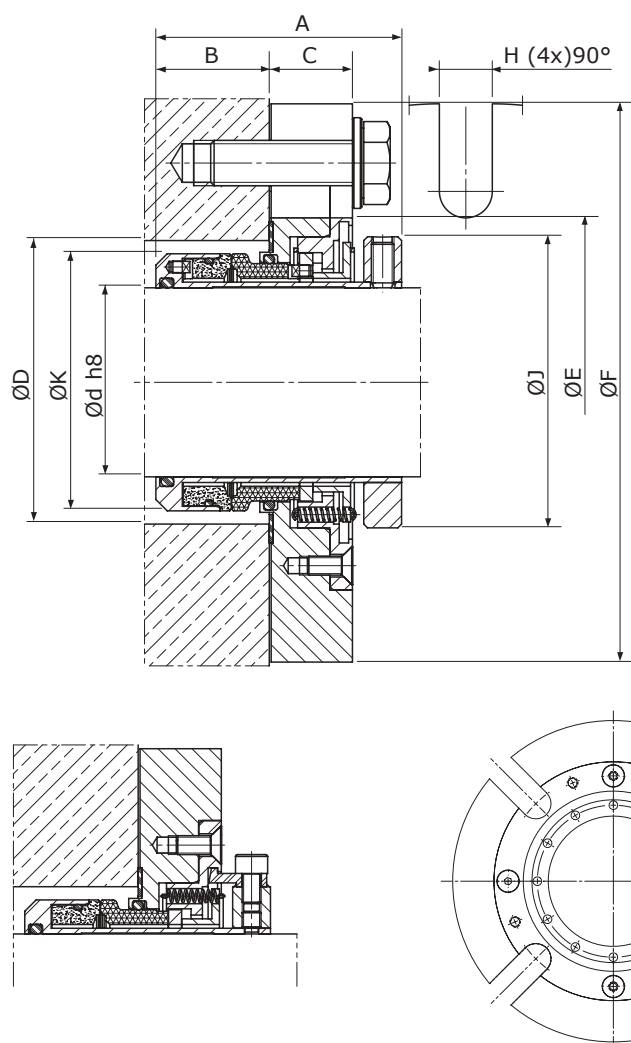
The seal may be equipped with an extra flange when flushing into the media is needed. The standard design is without flange since the chamber with a small gap given by the flushing flange may encourage material build-up if flush is not connected.

6 Spring package located on the outside of the flange

This design is better protected against fiber and particle build-up, which eventually causes clogged-up springs.

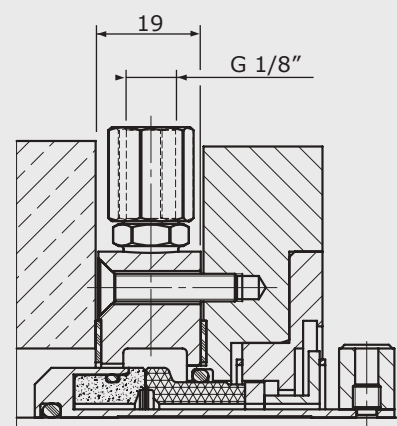
7 Patented tension springs

Allow for an excellent axial movement of $\pm 2,0$ mm.
Patent No: 9803436-6



ESF - Single Seal with optional Flushing Flange

Depending on the application, the seals may be equipped with an additional flange in order to achieve balanced pressure, flushing and/or additional cooling. This will increase the lifetime of the seal.



The axial built-in measurement increases with 19 mm irrespective of the shaft dimension.

$P_{max} = 25 \text{ barg}$
 $T_{max} = 200^\circ\text{C}$
 $V_{max} = 18 \text{ m/s (3600 rpm)}$
 Axial movement: $\pm 2,0 \text{ mm}$

d	A	B	C	Dmin	Dmax	E	F	H	J	K
25	66	30	22	44	54	62	105	14	52	43
28	66	30	22	47	57	65	105	14	55	46
30	66	30	22	49	59	67	105	14	57	48
32	66	30	22	51	61	70	110	14	59	50
33	66	30	22	52	62	70	110	14	60	51
35	66	30	22	54	64	72	112	14	62	53
38	66	30	22	57	67	75	122	14	65	56
40	66	30	22	59	69	77	122	14	67	58
43	66	30	22	62	72	80	132	14	70	61
45	66	30	22	64	74	82	138	14	72	63
48	66	30	22	67	77	85	138	14	75	66
50	66	30	22	69	79	87	148	14	77	68
55	66	30	22	74	84	93	148	18	82	73
60	66	30	22	79	92	102	157	18	87	78
65	66	30	22	84	99	109	163	18	92	83
70	66	30	22	89	108	118	178	18	97	88
75	75	35,5	25	101	118	129	190	18	108	100
80	75	35,5	25	106	124	135	194	18	113	105
85	75	35,5	25	111	128	139	198	22	118	110
90	75	35,5	25	116	135	145	204	22	123	115
95	75	35,5	25	121	138	148	208	22	128	120
100	75	35,5	25	126	144	154	218	22	133	125

ED

Double balanced cartridge seal

Huhnseal ED is a double balanced cartridge seal maintaining sealing performance even during sudden pressure drops on the product side and/or the secondary side.

The design of the seal is robust and rigid but at the same time flexible, with excellent radial and axial moving capabilities.

The springs are located outside both the product and the flush minimizing risk for clogging.

First-class materials from carefully selected suppliers ensure optimized performance at minimized built-in dimensions.

1 Excellent axial movement

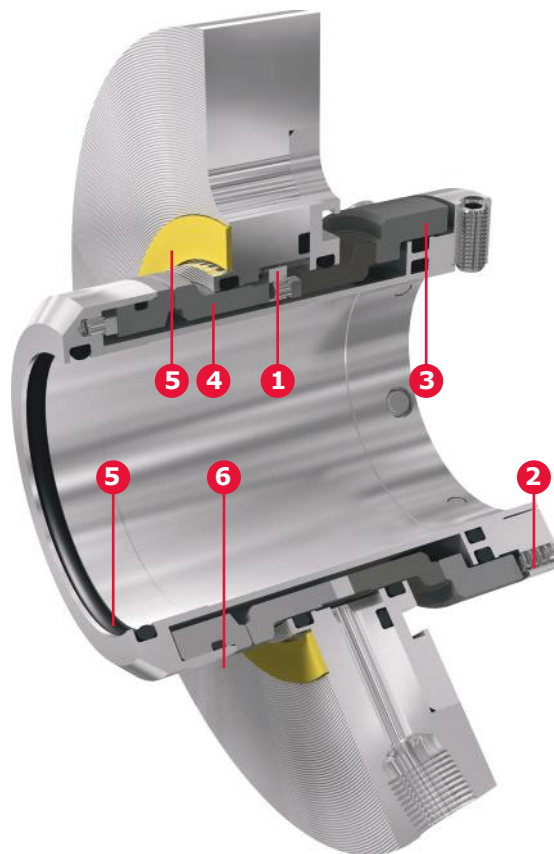
The seal can move $\pm 2,0$ mm independent of the compression of the springs. The seal follows the movement of the shaft without influencing the compression of the springs. This feature is essential when sealing equipment with flexible bearing units.

2 Patented protected spring package

The springs are located outside both the product and the flush. This eliminates the risk for clogged-up springs, which is one of the most common causes for seal failure. Patent No: 900912-2

3 Safe drive of rotating surface at the atmospheric side

The rotating face on the atmospheric side is driven by three big drive pins machined into the sealing face. The pins are not in contact with the quench liquid, eliminating the risk of them being blocked axially by residues from the quench.



4 Excellent radial moving capabilities

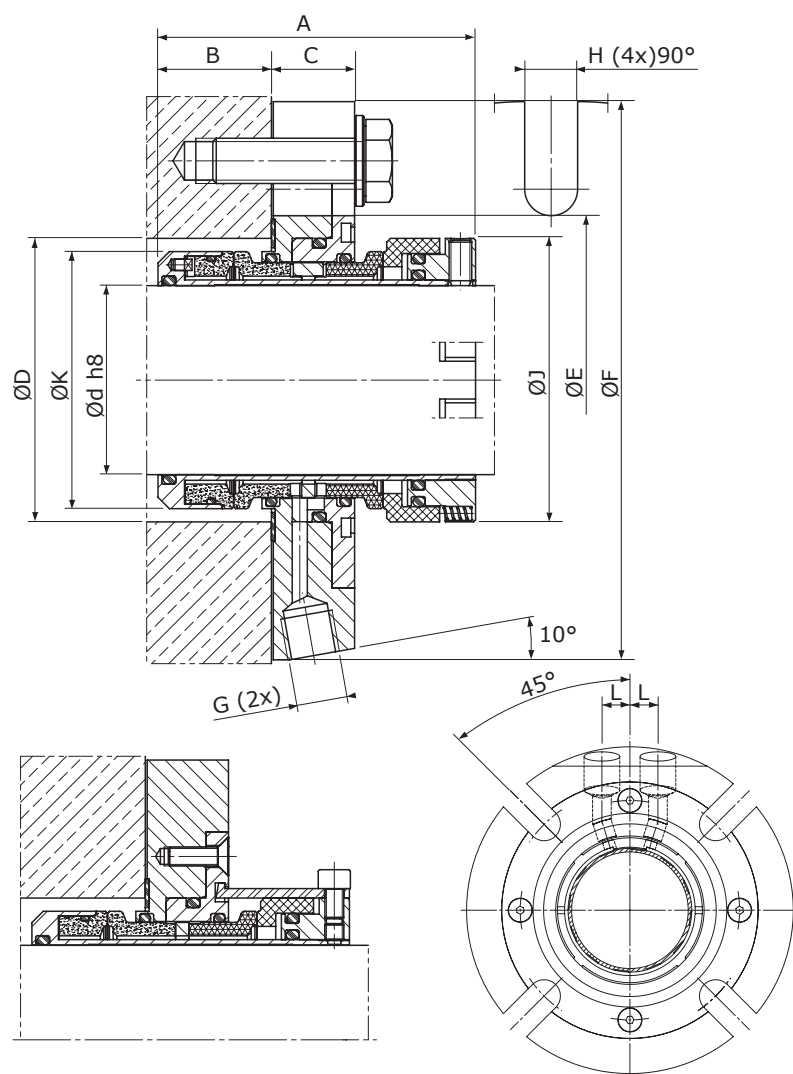
Through a new design the seal is able to compensate for angular deviation without generating stresses over the seal faces, which may influence sealing performance. This feature minimizes the effects of excessive shaft bending during operation against closed valves.

5 Hygienic applications

Smooth surfaces without cavities or closed spaces make the seal suitable for food and drug applications. If required, the gasket may be replaced with O-rings according to EHEDG in order to achieve a hygienic designed seal suitable for CIP (Cleaning in Place).

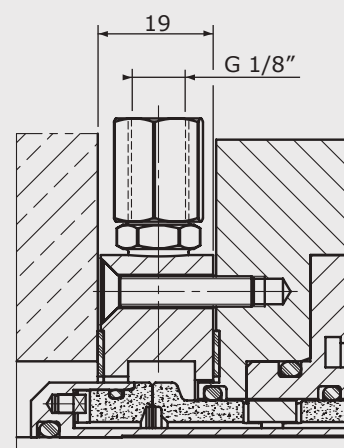
6 H4 design

The rotating sealing face on the product side has the new "H4-design". This means that the seal is O-ring mounted and the outer diameter of the seal face is the same as of the holder. This prevents the forming of turbulent flows, which cause heavy wear in abrasive liquids.



EDF - Double Balanced Seal with optional Flushing Flange

Depending on the application, the seals may be equipped with an additional flange in order to achieve balanced pressure, additional flushing and/or additional cooling. This will increase the lifetime of the seal.



The axial built-in measurement increases with 19 mm irrespective of the shaft dimension.

Max inside flush pressure = 12 barg
 $P_{max} = 25 \text{ barg}$
 $T_{max} = 200^{\circ}\text{C}$
 $V_{max} = 18 \text{ m/s (3600 rpm)}$
 Axial movement: $\pm 2,0 \text{ mm}$

d	A	B	C	Dmin	Dmax	E	F	G	H	J	K	L
25	84	30,0	22	44	54	62	105	G1/8"	14	51	43	8,0
28	84	30,0	22	47	57	65	105	G1/8"	14	54	46	9,0
30	84	30,0	22	49	59	67	105	G1/8"	14	56	48	9,5
32	84	30,0	22	51	61	70	110	G1/8"	14	58	50	9,5
33	84	30,0	22	52	62	70	110	G1/8"	14	59	51	9,5
35	84	30,0	22	54	64	72	112	G1/8"	14	61	53	9,5
38	84	30,0	22	57	67	75	122	G1/8"	14	64	56	10,0
40	84	30,0	22	59	69	77	122	G1/8"	14	66	58	10,5
43	84	30,0	22	62	72	80	132	G1/8"	14	69	61	11,0
45	84	30,0	22	64	74	82	138	G1/8"	14	71	63	12,0
48	84	30,0	22	67	77	85	138	G1/8"	14	74	66	12,0
50	84	30,0	22	69	79	87	148	G1/4"	14	76	68	12,0
55	84	30,0	22	74	84	93	148	G1/4"	18	81	73	13,0
60	84	30,0	22	79	92	102	157	G1/4"	18	86	78	14,0
65	84	30,0	22	84	99	109	163	G1/4"	18	91	83	15,0
70	84	30,0	22	89	108	118	178	G1/4"	18	96	88	16,0
75	100	35,5	25	101	118	129	190	G1/4"	18	110	100	17,5
80	100	35,5	25	106	124	135	194	G1/4"	18	115	105	18,5
85	100	35,5	25	111	128	139	198	G1/4"	22	120	110	19,5
90	100	35,5	25	116	135	145	204	G1/4"	22	125	115	20,5
95	100	35,5	25	121	138	148	208	G1/4"	22	130	120	21,5
100	100	35,5	25	126	144	154	218	G1/4"	22	135	125	22,5



Huhnseal AB is a Swedish company which develops and manufactures mechanical seals for the modern process industry. At the site in Landskrona, sealing solutions are designed, tested and manufactured for the global market. Our customers are found in a wide range of businesses, such as: pulp and paper, food and beverage, pharmaceutical, mining, general process and in the offshore industry. Huhnseal AB has a long tradition and experience of the manufacture of customer specific solutions for both OEM and End User markets. Our main philosophy is to offer our customers tailor-made seals for specific applications, that

can handle the tough demands of each industry. With the new E-series, the mechanical seal program is complemented with a single and double standard cartridge seal with advantageous built-in dimensions. The design of the E-series type seal is based on well proven features already known to be reliable in other seal designs for OEM and special applications. With the ability to work with both standardized and tailor-made sealing solutions, Huhnseal AB with the local dealers offers the market a very wide range of mechanical seal services.

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