

PS seal - flush diaphragm threaded type

Design description

The PS construction is designed for those applications where the process is very viscous and/or containing parts that might obstruct the process connection of the instrument. Typical applications can be found in pulp & paper industries and waste water treatment. The PS is a single part construction. PS is typically used in combination with pressure transmitters and gauges for pressure measurement.



Housing / diaphragm combinations

Body Material	Diaphragm material		
	General name	UNS	Wst.
AISI 316(L)	AISI 316L	S31603	1.4404
AISI 304L	AISI 304L	S30400	1.4306
AISI 310 MoLn	25-22-2 LMN	S31050	1.4466
AISI 321	AISI 321	S32100	1.4541
AISI 904(L)	AISI 904L	N08904	1.4539
Alloy 20	Alloy 20	N08020	2.4660
Alloy 400	Alloy 400	N04400	2.4360
Alloy 600	Alloy 600	N06600	2.4816
Alloy 625	Alloy 625	N06625	2.4856
Alloy 825	Alloy 825	N08825	2.4858
Alloy B2	Alloy B2	N10665	2.4617
Alloy C-22	Alloy C-22	N06022	2.4602
Alloy C-276	Alloy C-276	N10276	2.4810
Duplex F44	254 SMO (6Mo)	S31254	1.4547
Duplex F51/F60	Duplex 2205	S32205	1.4462
Duplex F53	Super Duplex 2507	S32750	1.4410
Duplex F55	Super Duplex 2507	S32750	1.4410
Nickel 201	Nickel 201	N02201	2.4068
Titanium Gr. 2	Titanium Gr. 1	R50250	2.7025
Zirconium 702	Zirconium 702	R60702	-

Process connection

Standard	Male thread
ISO 228-1 (BSP)	G ½ A – G 2 A
ISO 7-1 (BSPT)	R ½ – R 2
ANSI B 1.20.1 (NPT)	½" NPT – 2" NPT

Capillary tube and armor (protection)

The standard capillary mounting position is top side (axial) of the seal. Alternatively, the capillary can be placed at the side of the seal (radial). The standard tube material is TP316 (316SS), optionally available in Monel 400. There are three options in ID of the capillary; 2mm, 1mm, and 0.7mm. Badotherm capillaries are always protected against mechanical forces by armor. This doubled shielded armor consist is standard AISI 304, and optionally AISI 316. Additionally, the armor could be protected with a PVC sleeve in white, black, optionally with ATEX114 approval to protect against dust and water ingress and possibly corrosive ambient atmosphere.

-> See datasheet "Capillary lines"

Cooling options

There are several ways to protect the instrument from elevated temperatures, such as the extended direct mount (EDM), a temperature reducer (TR) or by means of capillary.

-> See datasheet "cooling devices"

Testing

All dry seals are helium tested according the EN 13185 test procedure A.3 up to 10^{-9} mbar l/s before used on a diaphragm seal application. More information on diaphragm seal testing can be found in "testing" datasheet.

Instrument connections

The PS seals are designed to be direct mounted to a pressure gauges or a pressure transmitter. The leading instrument connection for the PS seals is G ½. However for vibrating application that are remoted mounted with a mounting bracket, a capillary a top mounted execution is available.

Material Certification

Material traceability and related certification are applicable for all process wetted parts. Material certification possibilities depend on the type of seal, the assembly construction and the materials used. Material certification is in accordance with EN10204 3.1.

Additional material certification and testing can be provided on request, such as Positive Material Identification (PMI), Intergranular corrosion (IGC) testing, material certification in accordance with EN10204 3.2, NACE conformity for ISO-15156 (MR-0175) and/or ISO-17945 (MR-0103), NORSOK M-630 and many more.

-> Please note that the responsibility for material selection always rests with the user.

Marking & Traceability

All seals are marked with heat number, material designation, size, and a reference number for traceability purposes.

Material and origin

The seal parts are made from traceable materials according to the applicable standards. The standard sourcing of flanges is of international origin. Optionally regional preference can be requested, for example materials from EU origin.

Testing

All seals are helium tested according the EN 13185 test procedure A.3 up to 10^{-9} mbar l/s before used on a diaphragm seal application.

-> See datasheet "Diaphragm Seal testing"

Cleanliness of the wetted parts

All parts are standard cleaned from excessive oil and grease. When additional requirements are needed, the parts can be cleaned according customer requirements and cleaning specifications.

Maximum working pressure

The PS type seal has a maximum working pressure. Below the MAOP values of the PS in AISI316(L) material. The ISO 228-1 size are set by the ISO 1179-4. Using other gasket standards could have different values.

Type	MAOP @20°C
G ½ A	400 bar
G ¾ A	
G 1 A	250 bar
G 1 ½ A	160 bar
G 2 A	100 bar

Type	MAOP @20°C
½" NPT ... 2" NPT	600 bar

Example performance calculation

Whether a diaphragm seal can be used for a specific measurement, depends on the size of the diaphragm. That size is restricted by the size of the diaphragm seal.

For pressure transmitters, Badotherm offers an online performance calculation tool to calculate its performance and to ensure that the diaphragm size is suitable for your measurement.

The table below presents the minimum span of the respective diaphragm sizes with standard process conditions. As rule of thumb, a TPE of max 5% is often considered acceptable, but it depends per situation.

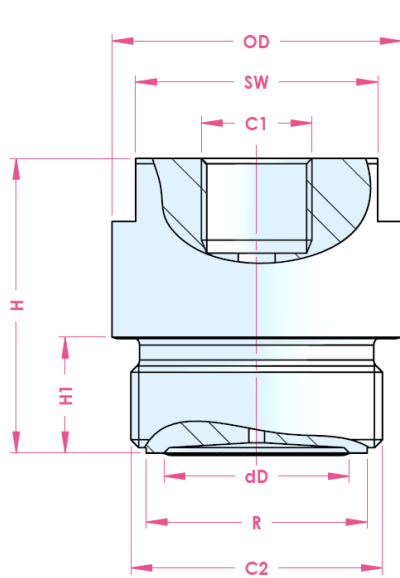
Minimum span table

dD	AP/GP
13mm	27 bar
20mm	21 bar
23.5mm	17.5 bar
35mm	7.5 bar
44mm	1575 mbar

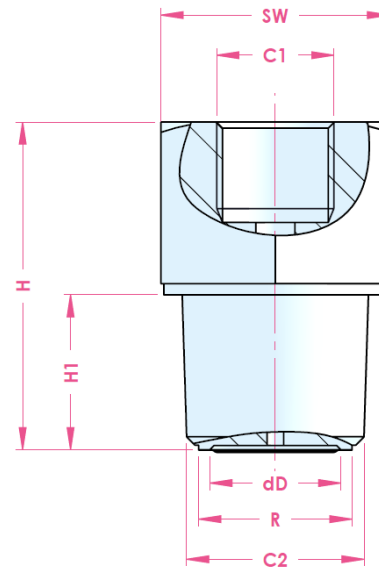
Pressure transmitter; ambient temperature -10...+30°C; process temperature 100°C with BSO 22 fill fluid; direct mounted to the pressure instrument.

See the general overview of all diaphragm sizes with several standard situations and in combination with Badotherm pressure gauges.

Dimensions table: PS



Bar round version



Hexagon version

C2	C1	dD	R	SW	OD	H1	H
1/2" Male	G 1/2	13.0	17.0	SW 27	30	27	47
3/4" Male		20.0	23.0	SW 32	32	28	52
1" Male		23.5	28.0	SW 41	45	28	58
1.5" Male		35.0	42.0	SW 46	55	34	64
2" Male		44.0	47.0	SW 54	62	37	65

Stainless steel versions 1/2", 3/4" and 1" are made from hexagon. All others are made from bar round.

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Page 5 of 5