

In-line diaphragm seal with sterile connection With union nut (milk thread fitting) Models 981.18, 981.19, 981.20 and 981.21

WIKA data sheet DS 98.40



for further approvals
see page 4

Applications

- Gases, compressed air, vapour; liquid, pasty, crystallising and flowing media
- Food and beverage production
- Dairies and dairy products
- Breweries, filling systems
- Filtration, separation, pasteurisation

Special features

- For direct, quickly removable installation in pipelines
- Self-draining in all mounting positions
- Quick cleaning, without residue
- Suitable for COP, SIP and CIP
- Dead-space free installation in pipes



In-line diaphragm seal, model 981.18

Description

Diaphragm seals are used for the protection of pressure measuring instruments in applications with difficult media. In diaphragm seal systems, the diaphragm of the diaphragm seal effects the separation of the instrument and the medium. The pressure is transmitted to the measuring instrument via the system fill fluid which is inside the diaphragm seal system.

For the implementation of demanding customer applications, there is a wide variety of designs, materials and system fill fluids available.

For further technical information on diaphragm seals and diaphragm seal systems see IN 00.06 "Application, operating principle, designs".

Due to their hygienic process connection, the model 981.18, 981.19, 981.20 and 981.21 diaphragm seals are particularly well suited for food production. The diaphragm seals can withstand the cleaning vapour temperatures occurring in the SIP processes and thus ensure a sterile connection between the medium to be measured and the diaphragm seal.

Mounting of the diaphragm seal to the measuring instrument may be made via a direct connection, for high temperatures via a cooling element or via a flexible capillary.

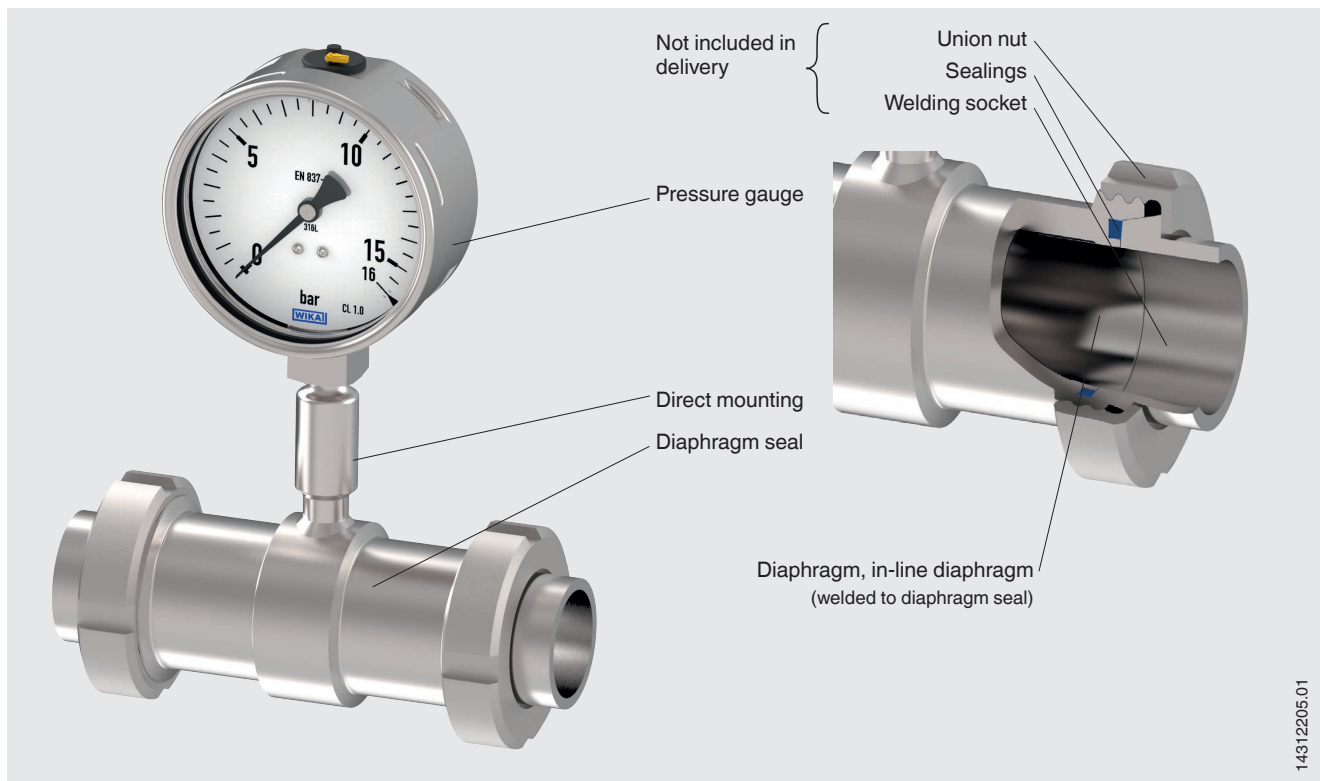
The availability of the diaphragm seals for common pipe standards and nominal widths simplifies integration into already existing pipe cross-sections.

Specifications

| Models 981.18, 981.19, 981.20 and 981.21 | Standard | Option |
|--|---|--|
| Pressure range ¹⁾ | 0 ... 0.6 bar to 0 ... 40 bar [0 ... 8.7 psi to 0 ... 580 psi] or all other equivalent vacuum or combined pressure and vacuum ranges | |
| Level of cleanliness of wetted parts | Oil and grease free per ASTM G93-03 level F WIKA standard (< 1,000 mg/m ²) | <ul style="list-style-type: none"> ■ Oil and grease free per ASTM G93-03 level D and ISO 15001 (< 220 mg/m²) ■ Oil and grease free per ASTM G93-03 level C and ISO 15001 (< 66 mg/m²) |
| Origin of wetted parts | International | EU, CH, USA |
| Surface roughness of wetted parts | Ra ≤ 0.76 µm [30 µin] per ASME BPE SF3 (except for weld seam) | Ra ≤ 0.38 µm [15 µin] per ASME BPE SF4, only with electropolished surface (except for weld seam) |
| Connection to the measuring instrument | Axial gauge adapter | Axial gauge adapter with G ½, G ¼, ½ NPT or ¼ NPT (female) |
| Type of mounting | Direct mounting | <ul style="list-style-type: none"> ■ Capillary ■ Cooling element |
| Vacuum service (see IN 00.25) | Basic service | <ul style="list-style-type: none"> ■ Premium service ■ Advanced service |
| Process connection | With union nut on both sides | <ul style="list-style-type: none"> ■ With threaded coupling on both sides ■ One side with union nut and one side with threaded coupling |
| Marking of the diaphragm seal | - | Per valid 3-A standard |
| Instrument mounting bracket (only for capillary option) | - | <ul style="list-style-type: none"> ■ Form H per DIN 16281, 100 mm, aluminium, black ■ Form H per DIN 16281, 100 mm, stainless steel ■ Bracket for pipe mounting, for pipe Ø 20 ... 80 mm, steel (see data sheet AC 09.07) |

1) The maximum pressure range depends on the selection of the process connection. See PN nominal pressure in the tables from page 5.

Installation example, model 981.18 directly mounted to Bourdon tube pressure gauge

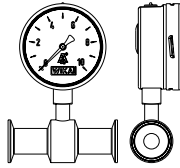


Mounting variants for pressure gauges

For horizontal pipelines

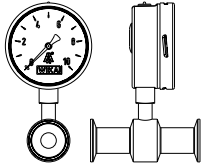
Variant 1

- Connection: Lower mount
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, horizontal pipeline



Variant 2

- Connection: Lower mount
- Pointer shaft: Parallel to flow direction
- Mounting: Direct mounting, horizontal pipeline



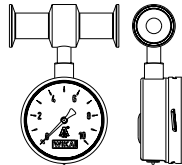
Variant 3

- Connection: Lower back mount
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, horizontal pipeline



Variant 4

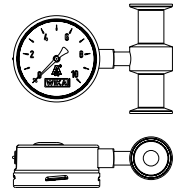
- Connection: "At 12 o'clock"
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, horizontal pipeline



For vertical pipelines

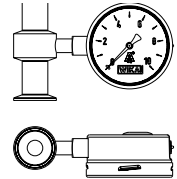
Variant 1

- Connection: "At 3 o'clock"
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, vertical pipeline



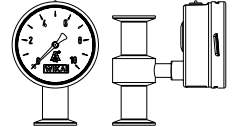
Variant 2

- Connection: "At 9 o'clock"
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, vertical pipeline



Variant 3

- Connection: Lower back mount
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, vertical pipeline



Material combinations




| Upper body of diaphragm seal | Wetted parts (diaphragm) ¹⁾ |
|--|--|
| Stainless steel 1.4435 (316L) | Stainless steel 1.4435 (316L) |
| Stainless steel 1.4435 (316L), electropolished ²⁾ | Stainless steel 1.4435 (316L), electropolished ²⁾ |

1) Marking of the parts with the material code guarantees 100 % material traceability

2) Only in connection with a surface roughness of $R_a \leq 0.38 \mu\text{m}$ for the wetted parts

Further material combinations for special process temperatures on request.

Approvals

| Logo | Description | Country |
|---|---|----------------|
|  | EU declaration of conformity Pressure equipment directive | European Union |
|  | 3-A Sanitary Standard | USA |
|  | EHEDG ¹⁾ Hygienic Equipment Design | European Union |
| - | CRN Safety (e.g. electr. safety, overpressure, ...) | Canada |
| - | MTSCHS (option) Permission for commissioning | Kazakhstan |

1) EHEDG conformity only in combination with ASEPTO-STAR k-flex upgrade, sealing from Kieselmann GmbH.

Certificates (option)

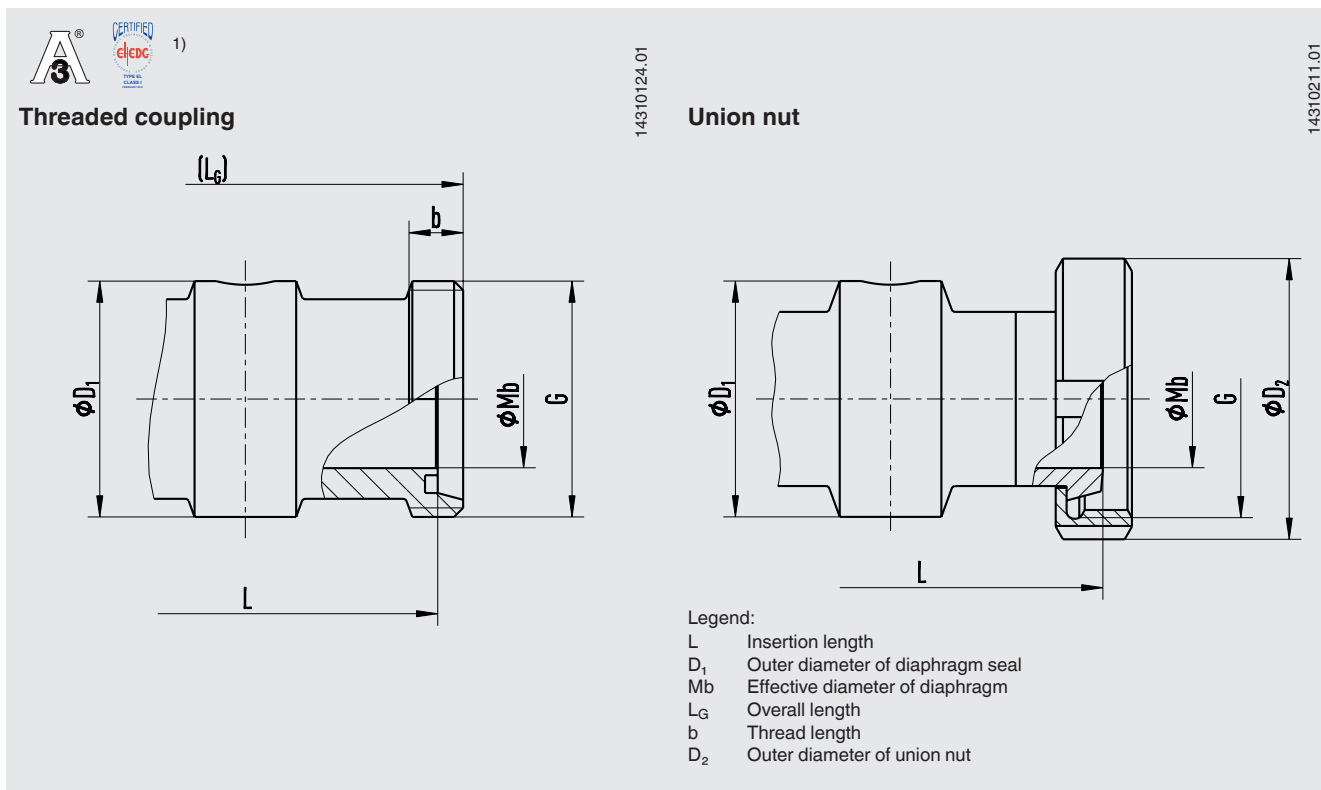
- 2.2 test report per EN 10204
 - State-of-the-art manufacturing, material proof, indication accuracy for diaphragm seal systems
 - FDA conformity of the system fill fluid
 - 3-A conformity of the diaphragm seal, based on a third party verification
- 3.1 inspection certificate per EN 10204
 - Material proof, wetted metal parts
 - Indication accuracy for diaphragm seal systems
- Manufacturer's declaration for food contact materials per regulation (EC) no. 1935/2004
- Others on request

Approvals and certificates, see website

Dimensions in mm [in]

Model 981.18, threaded connection per DIN 11851

Pipe standard: Pipes per DIN 11850 row 2

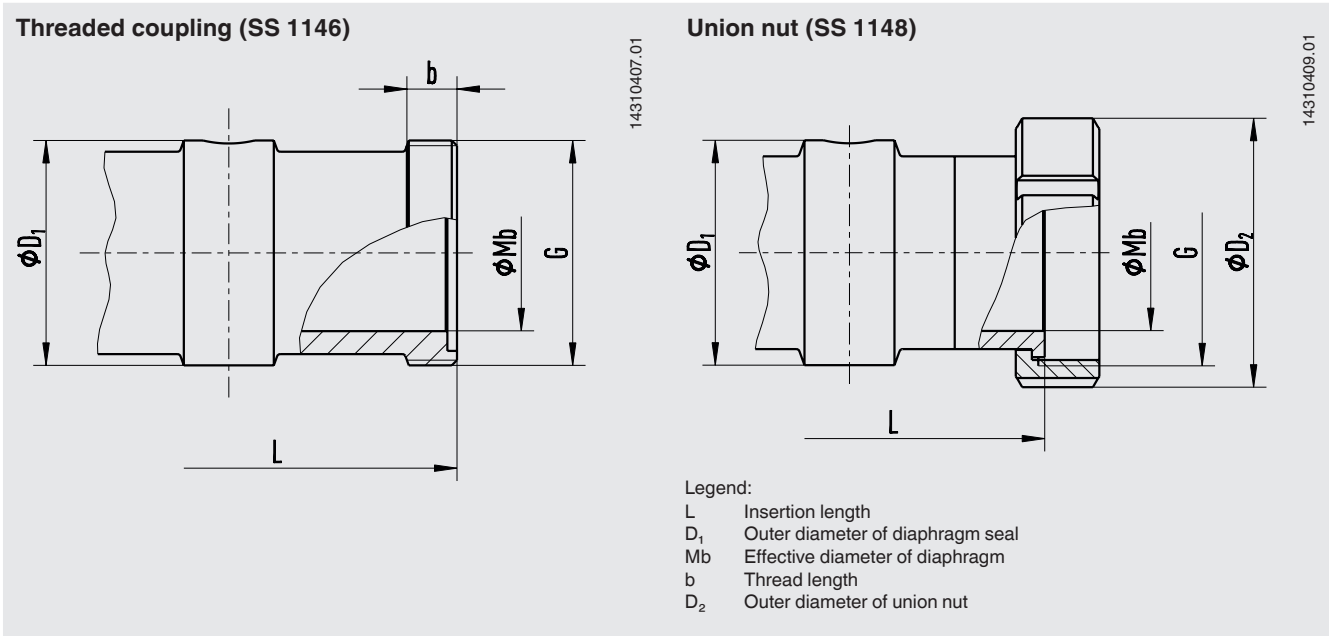


| DN | PN | G | Dimensions in mm [in] | | | | | | |
|-----|----|--------------|-------------------------------|-------------|----------------|-------------|----------------|------------|----------------|
| | | | Pipe outer Ø x wall thickness | L | D ₁ | Mb | L _G | b | D ₂ |
| 15 | 40 | RD 34 x 1/8 | 19 x 1.5 [0.748 x 0.059] | 96 [3.78] | 34 [1.339] | 16 [0.63] | 104 [4.094] | 12 [0.472] | 44 [1.732] |
| 20 | 40 | RD 44 x 1/6 | 23 x 1.5 [0.906 x 0.059] | 106 [4.173] | 44 [1.732] | 20 [0.787] | 118 [4.646] | 14 [0.551] | 54 [2.126] |
| 25 | 40 | RD 52 x 1/6 | 29 x 1.5 [1.142 x 0.059] | 114 [4.488] | 52 [2.047] | 26 [1.024] | 128 [5.039] | 14 [0.551] | 63 [2.48] |
| 32 | 40 | RD 58 x 1/6 | 35 x 1.5 [1.378 x 0.059] | 126 [4.961] | 58 [2.283] | 32 [1.26] | 140 [5.512] | 14 [0.551] | 70 [2.756] |
| 40 | 40 | RD 65 x 1/6 | 41 x 1.5 [1.614 x 0.059] | 146 [5.748] | 65 [2.559] | 38 [1.496] | 160 [6.299] | 14 [0.551] | 78 [3.071] |
| 50 | 25 | RD 78 x 1/6 | 53 x 1.5 [2.087 x 0.059] | 156 [6.142] | 78 [3.071] | 50 [1.969] | 170 [6.693] | 14 [0.551] | 92 [3.622] |
| 65 | 25 | RD 96 x 1/6 | 70 x 1.5 [2.756 x 0.059] | 166 [6.535] | 95 [3.74] | 66 [2.362] | 182 [7.165] | 16 [0.63] | 112 [4.409] |
| 80 | 25 | RD 110 x 1/4 | 85 x 2 [3.346 x 0.079] | 166 [6.535] | 110 [4.331] | 81 [3.189] | 182 [7.165] | 20 [0.787] | 127 [5] |
| 100 | 25 | RD 130 x 1/4 | 104 x 2 [4.094 x 0.079] | 162 [6.378] | 130 [5.118] | 100 [3.937] | 182 [7.165] | 20 [0.787] | 148 [5.827] |

1) EHDG conformity only in combination with ASEPTO-STAR k-flex upgrade, sealing from Kieselmann GmbH, Germany.

Model 981.19, threaded connection following Svensk Standard

Pipe standard: Pipes per ISO 1127 row 2 or ISO 2037/1992



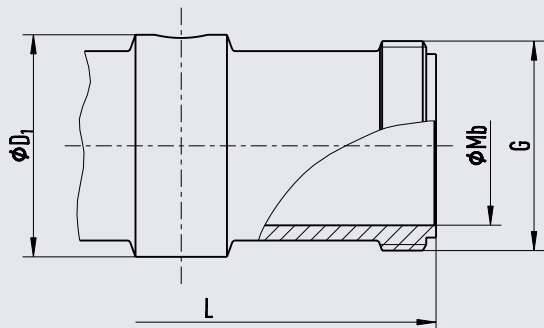
| DN | PN | G | Dimensions in mm [in] | | | | | |
|------|----|-------------|-------------------------------|-------------|----------------|--------------|------------|----------------|
| | | | Pipe outer Ø x wall thickness | L | D ₁ | Mb | b | D ₂ |
| 25 | 40 | RD 40 x 1/6 | 25 x 1.2 [0.984 x 0.047] | 120 [4.724] | 40 [1.575] | 22.6 [0.89] | 11 [0.433] | 51 [2.008] |
| 38 | 40 | RD 60 x 1/6 | 38 x 1.2 [1.496 x 0.047] | 152 [5.984] | 60 [2.362] | 35.6 [1.402] | 15 [0.591] | 74 [2.913] |
| 51 | 40 | RD 70 x 1/6 | 51 x 1.2 [2.008 x 0.047] | 162 [6.378] | 70 [2.756] | 48.6 [1.913] | 15 [0.591] | 84 [3.307] |
| 63,5 | 25 | RD 85 x 1/6 | 63.5 x 1.2 [2.5 x 0.047] | 162 [6.378] | 85 [3.346] | 60.3 [2.374] | 19 [0.748] | 100 [3.937] |
| 76 | 25 | RD 98 x 1/6 | 76.1 x 1.6 [2.996 x 0.063] | 162 [6.378] | 98 [3.858] | 73 [2.874] | 19 [0.748] | 114 [4.488] |

Model 981.20, threaded connection following IDF standard (ISO 2853 and BS 4825 part 4)

Pipe standard: Pipes per ISO 1127 row 2 or ISO 2037/1992

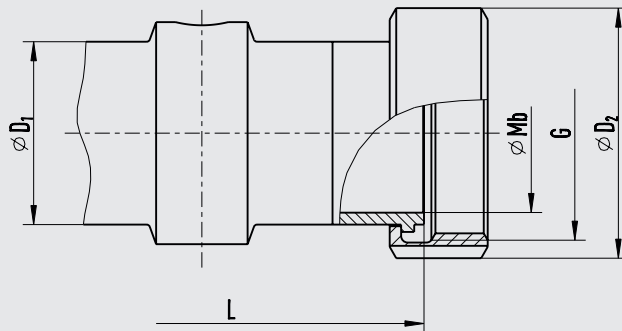


Threaded coupling



14310966.01

Union nut



14310972.01

Legend:

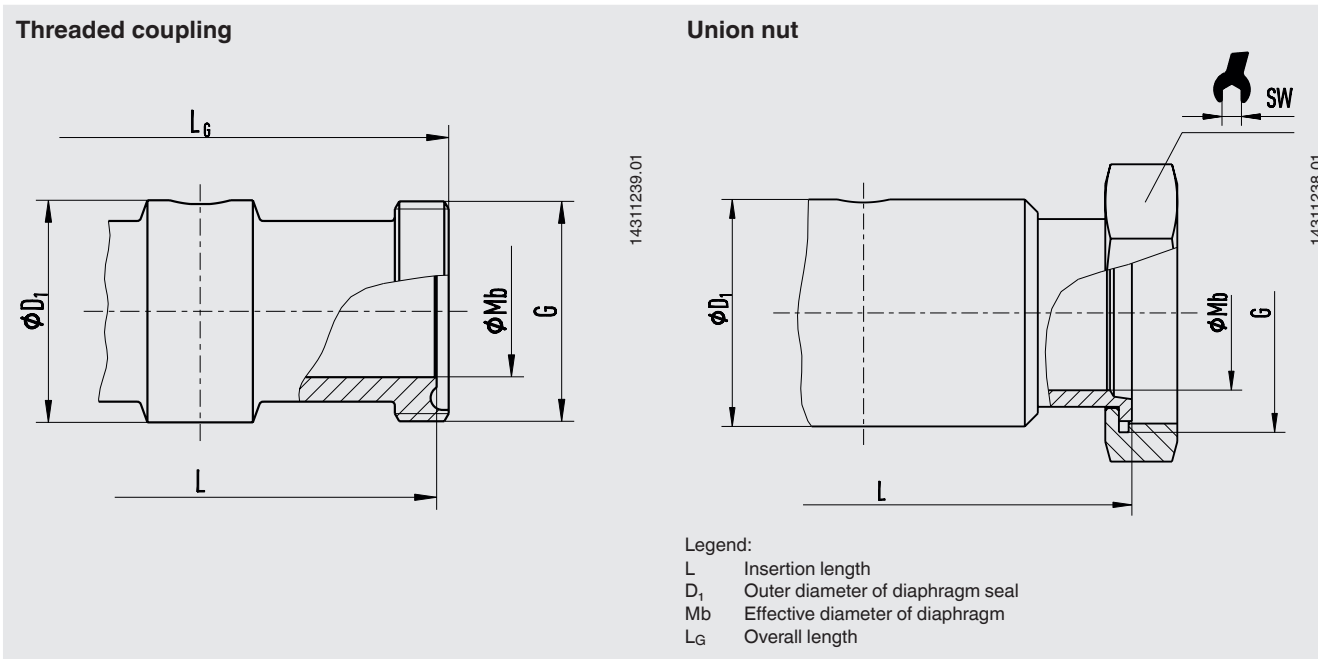
- L Insertion length
- D_1 Outer diameter of diaphragm seal
- Mb Effective diameter of diaphragm
- D_2 Outer diameter of union nut

| DN | PN | G | Dimensions in mm [in] | | | | |
|--------|----|------------|------------------------------------|-------------|------------|--------------|-------------|
| | | | Pipe outer ϕ x wall thickness | L | D_1 | Mb | D_2 |
| 1" | 40 | 1" IDF | 25 x 1.2 [0.984 x 0.047] | 114 [4.488] | 40 [1.575] | 22.6 [0.89] | 48 [1.89] |
| 1 1/2" | 40 | 1 1/2" IDF | 38 x 1.2 [1.496 x 0.047] | 146 [5.748] | 55 [2.165] | 35.6 [1.402] | 64 [2.52] |
| 2" | 40 | 2" IDF | 51 x 1.2 [2.008 x 0.047] | 156 [6.142] | 68 [2.677] | 48.6 [1.913] | 77 [3.032] |
| 2 1/2" | 25 | 2 1/2" IDF | 63.5 x 1.2 [2.5 x 0.047] | 156 [6.142] | 80 [3.15] | 60.3 [2.374] | 91 [3.583] |
| 3" | 25 | 3" IDF | 76.1 x 1.6 [2.996 x 0.063] | 156 [6.142] | 95 [3.74] | 72.9 [2.87] | 106 [4.173] |

1) 3-A compliant (only in combination with a sealing with support ring per ISO 2853)

Model 981.21, threaded connection following APV-RJT standard (BS 4825 part 5)

Pipe standard: Pipes per BS 4825 part 1 or O.D. tube



| DN | PN | G | Dimensions in mm [in] | | | | | |
|--------|----|--------------|-------------------------------|---------------|----------------|--------------|----------------|-------------|
| | | | Pipe outer Ø x wall thickness | L | D ₁ | Mb | L _G | SW |
| 1" | 40 | 1 13/16 x 8" | 25.4 x 1.6 [1 x 0.063] | 123.4 [4.858] | 47 [1.85] | 22.2 [0.874] | - | 50 [1.969] |
| 1 1/2" | 40 | 2 5/16 x 8" | 38.1 x 1.6 [1.5 x 0.063] | 155.4 [6.118] | 59 [2.323] | 34.9 [1.374] | 152 [5.984] | 65 [2.559] |
| 2" | 40 | 2 7/8 x 6" | 50.8 x 1.6 [2 x 0.063] | 167 [6.575] | 74 [2.913] | 47.6 [1.874] | 165.4 [6.512] | 80 [3.15] |
| 2 1/2" | 25 | 3 3/8 x 6" | 63.5 x 1.6 [2.5 x 0.063] | 165.4 [6.512] | 86 [3.386] | 60.3 [2.374] | - | 92 [3.622] |
| 3" | 25 | 3 7/8 x 6" | 76.2 x 1.6 [3 x 0.063] | 165.4 [6.512] | 99 [3.898] | 73 [2.874] | - | 105 [4.134] |

Ordering information

Diaphragm seal:

Diaphragm seal model / Process connection (type of process connection, pipe standard, pipe dimension) / Material (base body, diaphragm) / Surface roughness of wetted parts / Sealing / Zero point stabilisation (ZPS) / Connection to the measuring instrument / Level of cleanliness of wetted parts / Origin of wetted parts / Certificates

Diaphragm seal system:

Diaphragm seal model / Process connection (type of process connection, pipe standard, pipe dimension) / Material (base body, diaphragm) / Surface roughness of wetted parts / Sealing / Zero point stabilisation (ZPS) / Pressure measuring instrument model (per data sheet) / Mounting (direct mounting horizontal/vertical, cooling element horizontal/vertical, capillary) / min. and max. process temperature / min. and max. ambient temperature / Vacuum service / System fill fluid / Certificates / Height difference / Level of cleanliness of wetted parts / Origin of wetted parts / Instrument mounting bracket

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