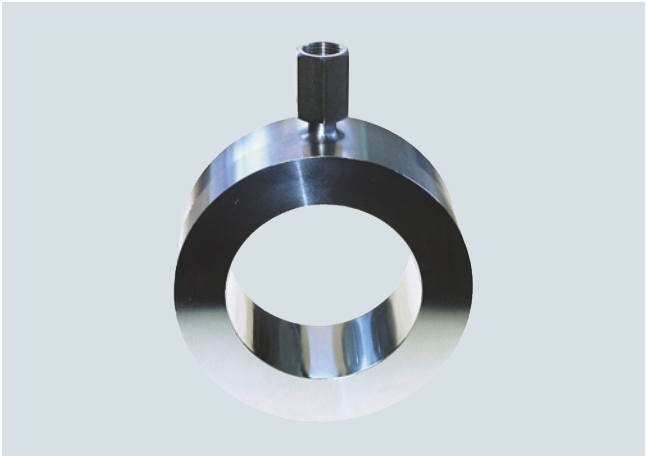
## Inline seals in sandwich design

### Overview



Inline seals for flange-mounting

The inline seal is completely integrated in the process line. It is particularly suitable for flowing and highly viscous media.

The inline remote seal consists of a cylindrical jacket into which a thin-walled pipe is welded. It is clamped directly between two flanges in the pipeline.

### Design

- Inline seals for flange-mounting (flange design) to EN/ASME for SITRANS P pressure transmitters
  - For pressure: P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
  - For differential pressure and flow: DS III with HART, DS III with PROFIBUS PA, DS III with FOUNDATION Fieldbus and P500
- Sealing surface to EN 1092-1 or ASME B16.5
- Connection to the transmitter directly or by means of a flexible capillary (max. 10 m long)
- See Technical data for details of materials used for the wetted parts
- Material used for the capillary, the guard sleeve, the seal's main body and the measuring cell: Stainless steel, mat.-No. 1.4571
- Filling liquid: Silicone oil, high-temperature oil, halocarbon oil, food oil (FDA listed) or glycerin/water (not suitable for uses in low-pressure range)

### Function

The measured pressure is transferred from the diaphragm to the filling liquid and passes either directly or through the capillary to the measuring chamber of the pressure transmitter. The interior of the diaphragm seal and of the capillary, as well as the measuring chamber of the pressure transmitter, are filled gas-free by the filling liquid.

**Note**:

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof remote seal (see Selection and Ordering data).

### Technical specifications

| **Inline seals for flange-mounting** | |
|---|---|
| Nominal diameter | Nominal pressure |
| Connecting standard EN 1092-1 | |
| • DN 25/40/50/65/80/100/125 | PN 6 ... PN 100 |
| Connecting standard ASME B16.5 | |
| • 1, 1½, 2, 2½, 3, 4, 5 inch | Class 150 ... class 2500 |
| Process connection | Flange to EN 1092-1 or ASME B 16.5 |
| Sealing surface | • for stainless steel mat. no. 1.4404/316L according to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA |
| | • for all other materials according to EN 1092-1, form B2 or ASME B16.5 RFSF |
| Materials | |
| • Main body | Stainless steel 1.4404/316L |
| • Diaphragm | Stainless steel 1.4404/316L |
| • Wetted parts | Stainless steel 1.4404/316L |
| | • Without coating |
| | • ECTFE coating (for vacuum on request) |
| | • PFA coating |
| | Monel 400, mat. No. 2.4360 |
| | Hastelloy C276, mat. No. 2.4819 |
| | Hastelloy C4, mat. No. 2.4602 |
| | Tantalum |
| • Capillary | Stainless steel, mat. No. 1.4404/316L |
| • Sheath | Spiral protective tube made of stainless steel, mat. No. 1.4301/316 |
| Capillary | |
| • Length | Max. 10 m (32.8 ft) |
| • Internal diameter | 2 mm (0.079 inch) |
| • Minimum bending radius | 150 mm (5.9 inch) |
| Filling liquid | Silicone oil M5 |
| | Silicone oil M50 |
| | High-temperature oil |
| | Halocarbon oil |
| | Food oil (FDA listed) |
| Permissible ambient temperature | See pressure transmitters, see filling liquid |
| Weight | Approx. 4 kg (8.82 lb) |
| **Certificates and approvals** | |
| Classification according to pressure equipment directive (DGRL 2014/68/EU) | For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord |

| Selection and Ordering data | Article No. | Order code |
|---|---|---|
| **Inline-diaphragm seal** | | |
| Sandwich type design, directly connected or connected with flexible capillary tube to a | | |
| • SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off ↗ | **7MF0900-** | |
| • SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off ↗ | **7MF0902-** | |
| | **-0 0** | |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | |
| **Nominal diameter** **Nominal pressure** | | |
| Connecting standard EN 1092-1 | | |
| DN 25 PN 6 ... 100 | **0BP** | |
| DN 40 PN 6 ... 100 | **0DP** | |
| DN 50 PN 6 ... 100 | **0EP** | |
| DN 65 PN 6 ... 100 | **0FP** | |
| DN 80 PN 6 ... 100 | **0GP** | |
| DN 100 PN 6 ... 100 | **0HP** | |
| DN 125 PN 6 ... 100 | **0JP** | |
| Connecting standard ASME B16.5 | | |
| 1 inch class 150 ... 2500 | **1KX** | |
| 1½ inch class 150 ... 2500 | **1LX** | |
| 2 inch class 150 ... 2500 | **1MX** | |
| 2½ inch class 150 ... 2500 | **1NX** | |
| 3 inch class 150 ... 2500 | **1PX** | |
| 4 inch class 150 ... 2500 | **1QX** | |
| 5 inch class 150 ... 2500 | **1RX** | |
| Other version Add Order code and plain text | **9AA** | **H1Y** |
| **Transmitter connection** | | |
| Without capillary tube, direct mount straight connection (for gauge pressure) | **00** | |
| Without capillary tube, direct mount connection via 90°-bow (for gauge pressure) | **01** | |
| Connection via capillary tube Length of capillary | | |
| 1 m | **10** | |
| 1,6 m | **11** | |
| 2 m | **12** | |
| 2,5 m | **13** | |
| 3 m | **14** | |
| 4 m | **15** | |
| 5 m | **16** | |
| 6 m | **17** | |
| 7 m | **18** | |
| 8 m | **20** | |
| 9 m | **21** | |
| 10 m | **22** | |
| 11 m (only for 7MF0900) | **23** | |
| 12 m (only for 7MF0900) | **24** | |
| 13 m (only for 7MF0900) | **25** | |
| 14 m (only for 7MF0900) | **26** | |
| 15 m (only for 7MF0900) | **27** | |
| Other version Add Order code and plain text | **98** | **L1Y** |

| Selection and Ordering data | Article No. | Order code |
|---|---|---|
| **Inline-diaphragm seal** | | |
| Sandwich type design, directly connected or connected with flexible capillary tube to a | | |
| • SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off | **7MF0900-** | |
| • SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off | **7MF0902-** | |
| | **-0 0** | |
| **Filling liquid** | | |
| Silicone oil M5 | **A** | |
| Silicone oil M50 | **B** | |
| High-temperature oil | **C** | |
| Halocarbon oil | **D** | |
| Food-grade oil (FDA listed) | **E** | |
| Other version Add Order code and plain text | **Z** | **P1Y** |
| **Wetted parts materials** | | |
| Stainless steel 316L | | |
| • Without coating | **A** | |
| • With PFA coating | **D** | |
| • With ECTFFE coating | **F** | |
| Monel 400, 2.4360 | **G** | |
| Hastelloy C276, 2.4819 | **J** | |
| Tantalum | **K** | |
| Hastelloy C4, 2.4610 | **U** | |
| Other version Add Order code and plain text | **Z** | **Q1Y** |

## Inline seals in sandwich design

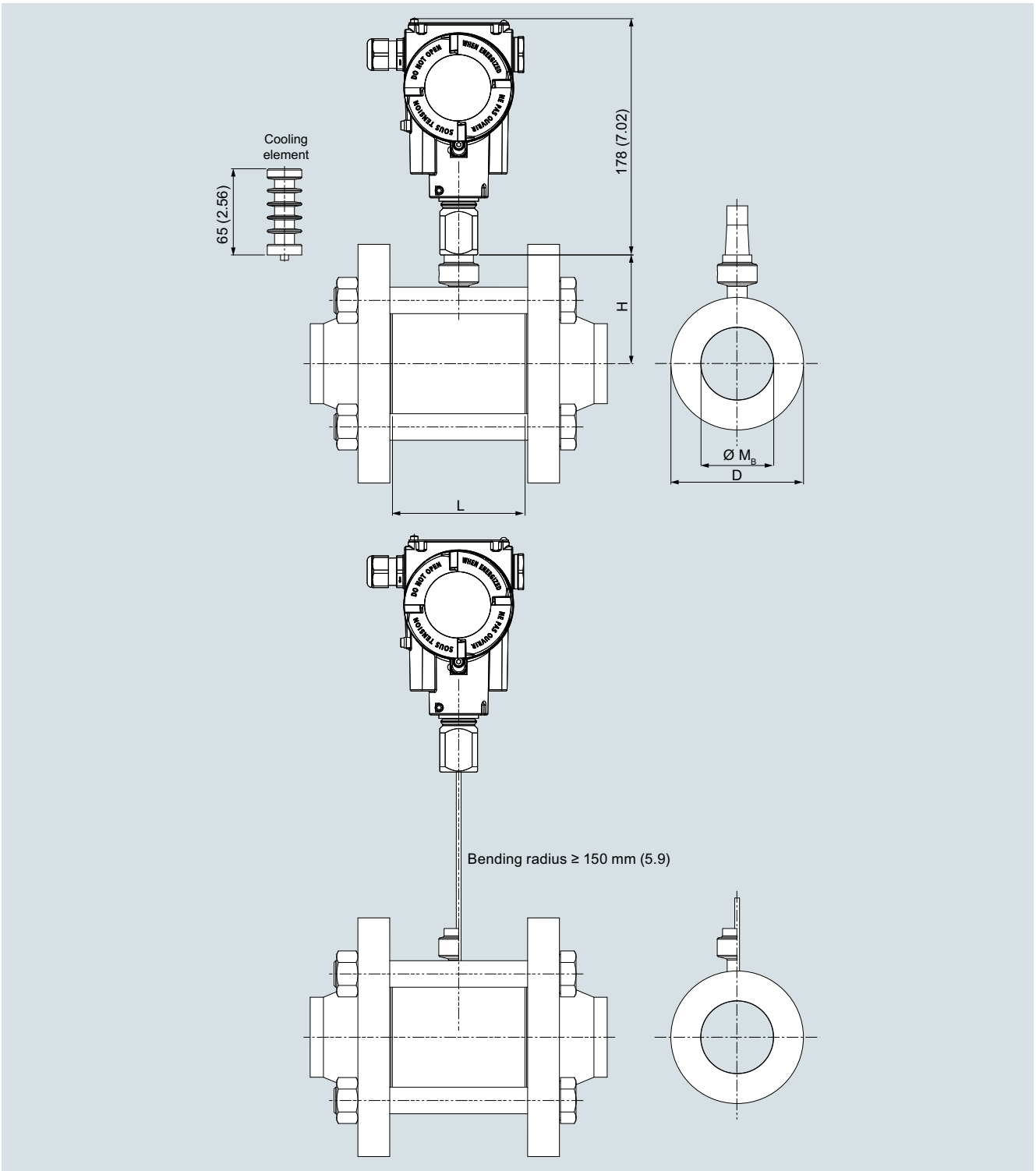
| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Add "**-Z**" to Article No. and specify Order code. | |
| **Factory certificates** | |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2 | **C11** |
| Inspection certificate to EN 10204-3.1 - material of body and wetted parts | **C12** |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel) | **C13** |
| Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts | **C15** |
| Certificate of FDA-approved fill oil (to EN10204-2.2) | **C17** |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration) | **C20** |
| **Accessories** | |
| Spark arrestor (for gauge and absolute pressure transmitters) | **D61** |
| Spark arrestor (for differential pressure and level transmitters) | **D62** |
| Low-temperature version (for Silicon Oil M50 only) | **D67** |
| **Negative pressure services** | |
| Negative pressure service (for gauge and absolute pressure transmitters) | **D81** |
| Negative pressure service (for differential pressure transmitters) | **D83** |
| Extended negative pressure service (for gauge and absolute pressure transmitters) | **D85** |
| Extended negative pressure service (for differential pressure transmitters) | **D88** |
| **General product approvals without explosion proof approvals** | |
| Oil-and grease-free cleaned version (for $O_2$-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar) | **E80** |
| Oil-and grease-free cleaned version (not for $O_2$-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil) | **E87** |
| **Sealing surface** | |
| Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only) | **M50** |
| Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only) | **M54** |
| Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only) | **M64** |
| Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only) | |
| • DN 25 | **M70** |
| • DN 40 | **M71** |
| • DN 50 | **M72** |
| • DN 80 | **M73** |
| • DN 100 | **M74** |
| • DN 125 | **M75** |
| Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only) | |
| • DN 25 | **M76** |
| • DN 40 | **M77** |
| • DN 50 | **M78** |
| • DN 80 | **M79** |
| • DN 100 | **M80** |
| • DN 125 | **M81** |

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Add "**-Z**" to Article No. and specify Order code. | |
| Sealing surface with recess to EN1092-1, form F (wetted parts 316L only) | |
| • DN 25 | **M82** |
| • DN 40 | **M83** |
| • DN 50 | **M84** |
| • DN 80 | **M85** |
| • DN 100 | **M86** |
| • DN 125 | **M87** |
| **Capillary connection** | |
| For 7MF0900 | |
| Single-side mounted at differential pressure transmitters at high-side | **S03** |
| Single-side mounted at differential pressure transmitters at low-side | **S04** |
| cooling element | **S08** |
| **Capillary coating** | |
| PE protective tube | |
| 1 m | **S10** |
| 1,6 m | **S11** |
| 2 m | **S12** |
| 2,5 m | **S13** |
| 3 m | **S14** |
| 4 m | **S15** |
| 5 m | **S16** |
| 6 m | **S17** |
| 7 m | **S18** |
| 8 m | **S19** |
| 9 m | **S20** |
| 10 m | **S21** |
| 11 m (only for 7MF0902) | **S22** |
| 12 m (only for 7MF0902) | **S23** |
| 13 m (only for 7MF0902) | **S24** |
| 14 m (only for 7MF0902) | **S25** |
| 15 m (only for 7MF0902) | **S26** |
| PTFE protective tube | |
| 1 m | **S40** |
| 1,6 m | **S41** |
| 2 m | **S42** |
| 2,5 m | **S43** |
| 3 m | **S44** |
| 4 m | **S45** |
| 5 m | **S46** |
| 6 m | **S47** |
| 7 m | **S48** |
| 8 m | **S49** |
| 9 m | **S50** |
| 10 m | **S51** |
| 11 m (only for 7MF0902) | **S52** |
| 12 m (only for 7MF0902) | **S53** |
| 13 m (only for 7MF0902) | **S54** |
| 14 m (only for 7MF0902) | **S55** |
| 15 m (only for 7MF0902) | **S56** |

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Add "**-Z**" to Article No. and specify Order code. | |
| PVC protective tube | |
| 1 m | **S70** |
| 1,6 m | **S71** |
| 2 m | **S72** |
| 2,5 m | **S73** |
| 3 m | **S74** |
| 4 m | **S75** |
| 5 m | **S76** |
| 6 m | **S77** |
| 7 m | **S78** |
| 8 m | **S79** |
| 9 m | **S80** |
| 10 m | **S81** |
| 11 m (only for 7MF0902) | **S82** |
| 12 m (only for 7MF0902) | **S83** |
| 13 m (only for 7MF0902) | **S84** |
| 14 m (only for 7MF0902) | **S85** |
| 15 m (only for 7MF0902) | **S86** |
| **Customer-specific tube length** | |
| Customer-specific tube length (specify in plain text) | **Y44** |
| **Specification of process conditions**[1)] | |
| Ambient temperature range | |
| • -10 ... +50 °C (14 ... +122 °F) preset | **D66** |
| • -40 ... +50 °C (-40 ... +122 °F) | **D67** |
| • -10 ... +85 °C (14 ... +185 °F) | **D68** |
| Process temperature min. ... °C/(°F)/max. ... °C/(°F) | **Y50** |

1) See also "Specification of process conditions for selection and ordering data", page 1/338.

## Dimensional drawings




Inline seal for flange-mounting, connected to SITRANS P pressure transmitter, dimensions in mm (inch)

***Connection to EN 1092-1***

| DN | PN | D | Mb | L | H |
|---|---|---|---|---|---|
| mm | bar | mm | mm | mm | mm |
| 25 | 6 ... 100 | 68 | 28.5 | 60 | 81 |
| 40 | | 88 | 43.1 | 60 | 91 |
| 50 | | 100 | 54.5 | 60 | 93 |
| 65 | | 120 | 70.3 | 60 | 107 |
| 80 | | 138 | 82.5 | 60 | 116 |
| 100 | | 160 | 107.1 | 60 | 127 |
| 125 | | 188 | 127 | 60 | 141 |

***Connection to ASME B16.5***

| DN | Class | D | Mb | L | H |
|---|---|---|---|---|---|
| (inch) | | mm (inch) | mm (inch) | mm (inch) | mm (inch) |
| 1 | 150 ... 2500 | 50 (1.97) | 28.5 (1.12) | 60 (2.36) | 72 (2.83) |
| 1½ | 150 ... 2500 | 73.5 (2.89) | 43.1 (1.70) | 60 (2.36) | 84 (3.31) |
| 2 | 150 ... 2500 | 91.9 (3.62) | 54.5 (2.15) | 60 (2.36) | 93 (3.66) |
| 2½ | 150 ... 2500 | 104.6 (4.12) | 70.3 (2.77) | 60 (2.36) | 99 (3.9) |
| 3 | 150 ... 2500 | 127 (5) | 82.5 (3.25) | 60 (2.36) | 110 (4.33) |
| 4 | 150 ... 2500 | 157.2 (6.19) | 107.1 (4.22) | 60 (2.36) | 125 (4.92) |
| 5 | 150 ... 2500 | 188 (7.4) | 127 (5) | 60 (2.36) | 141 (5.55) |