## Technical description

### Overview

In many cases the pressure transmitter and the measured medium have to be physically separated. It is then necessary to use a remote seal.

The remote seals can be used with the following SITRANS P pressure transmitter series:

- Pressure (P300, DS III with HART, DS III with PROFIBUS PA, DS III with FOUNDATION Fieldbus)
- Absolute pressure (P300, DS III with HART, DS III with PROFIBUS PA, DS III with FOUNDATION Fieldbus)
- Differential pressure and flow (P500, DS III with HART, DS III with PROFIBUS PA, DS III with FOUNDATION Fieldbus)

***Note***

When configuring your remote seal, be sure to read the information about transmission response, temperature error and response time to be found in the sections "Function" and "Technical data". Only then will the remote seal work to optimum effect.

### Benefits

- No direct contact between the pressure transmitter and the medium
- Individual configuration of the pressure transmitter for perfect adaptation to the operating conditions
- Available in many versions
- Specially designed for difficult operating conditions
- Quick-release versions available for the food industry

### Application

Remote seal systems should be used if a separation between the measured medium and the measuring instrument is essential or appropriate.

Examples of such cases:

- The temperature of the medium is outside the limits specified for the pressure transmitter.
- The medium is corrosive and requires diaphragm materials which are not available for the pressure transmitter.
- The medium is highly viscous or contains solids which would block the measuring chambers of the pressure transmitter.
- The medium may freeze in the measuring chambers or pulse line.
- The medium is heterogeneous or fibrous.
- The medium tends towards polymerization or crystallization.
- The process requires quick-release remote seals, as necessary e.g. in the food industry for fast cleaning.
- The process requires cleaning of the measuring point, e.g. in a batch process.

### Design

A remote seal system consists of the following components.

- Pressure transmitter
- One or two remote seals
- Filling liquid
- Connection between pressure transmitter and remote seal (direct mounting or by means of capillary)

The volume in contact with the measured medium is terminated by a flat elastic diaphragm lying in a bed. Between the diaphragm and the pressure transmitter is the filling liquid.

In many cases, a capillary has to be connected between the remote seal and the pressure transmitter in order e.g. to minimize temperature effects on the latter when hot media are involved.

However, the capillary influences the response time and the temperature response of the complete remote seal system. Two capillaries of equal length must always be used to connect a remote seal to a pressure transmitter for differential pressure.

The remote seal can be optionally equipped with a projecting diaphragm (tube).

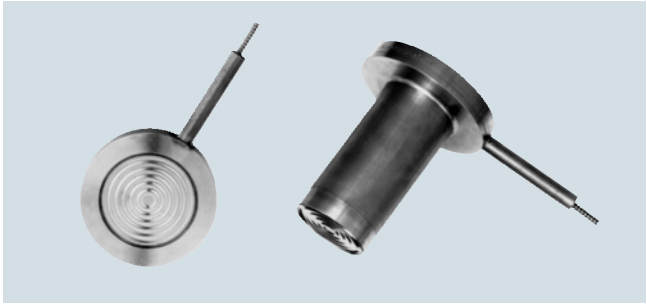
Remote seals of sandwich design are fitted with a dummy flange.

***Designs***

Diaphragm seal

With diaphragm seals, the pressure is measured by means of a flat diaphragm which rests in a bed.

The following types of diaphragm seals exist:

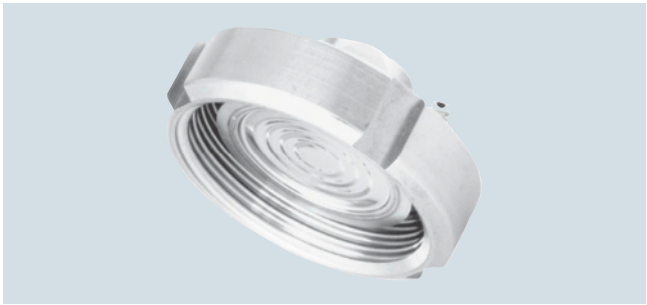


Diaphragm seal of sandwich design without (left) and with a projecting diaphragm (tube)

- Sandwich design
- Sandwich design with projecting diaphragm (tube) to DIN or ASME which are secured using a dummy flange.

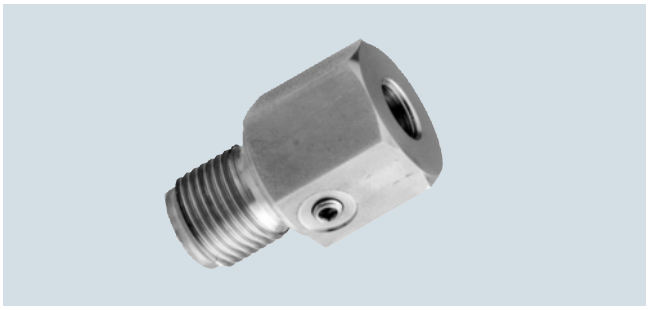
Diaphragm seal of flange design without (left) and with a projecting diaphragm (tube)

- Flange design
- Flange design with projecting diaphragm (tube) to DIN or ASME, secured using holes in the flange.



Quick-release diaphragm seal

- Quick-release remote seals, e.g. to DIN 11851, SMS standard, IDF standard, APV RJF standard, clamp connection, etc.
- Miniature diaphragm seal with male thread for screwing into tapped holes
- Remote seals with customer-specific process connections

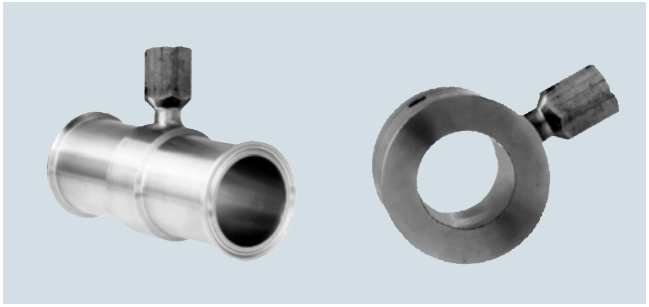


Miniature diaphragm seal with diaphragm flush with front

- Miniature diaphragm seals

The quick-release remote seals are used above all in the food industry. Their design means that the measured medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismounting is possible for cleaning.

Clamp-on seal



Clamp-on seal with quick-release design (left) and for flange mounting

With clamp-on seals, the pressure is first measured using a cylindrical diaphragm positioned in a pipe, and then transmitted to the pressure transmitter by means of the filling liquid.

The clamp-on seal is a special design for flowing media. It consists of a cylindrical pipe in which a cylindrical diaphragm is embedded. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur. Furthermore, the clamp-on seal can be cleaned by a pig.

The following types of clamp-on seals exist:

- Quick-release clamp-on seals, e.g. to DIN 11851, SMS standard, IDF standard, APV/RJF standard, clamp connection etc. The quick-release facility attached to the remote seal enables the seal to be removed quickly for cleaning purposes.
- Clamp-on seals for flanging to EN or ASME.
- Clamp-on seals with customer-specific process connections.

**Note**:

The pressure data on the transmitter and the remote seal must be observed with regard to pressure/temperature behavior.

## Function

The measured pressure is transferred from the diaphragm to the filling liquid and passes 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 transmitter, are filled gas-free by the filling liquid.

***Transmission response***

The transmission response of a remote seal is characterized by the following variables:

- Temperature error
- Adjustment time

Temperature error

Temperature errors are caused by the change of volume of the filling liquid due to temperature variations. To select the right remote seal you must calculate the temperature error.

Below you will find an overview of the factors which influence the size of the temperature error, as well as information on how to calculate the temperature error.

The temperature error is dependent on the following variables:

- Rigidity of the diaphragm used
- Filling liquid used
- Influence of the filling liquid underneath the process flanges or in the connection shank of the pressure transmitter
- Internal diameter of the capillary: The bigger the internal diameter, the bigger the temperature error
- Length of the capillary: The longer the capillary, the bigger the temperature error

Diaphragm rigidity

The rigidity of the diaphragm is of decisive importance. The bigger the diameter of the diaphragm, the softer the diaphragm and the more sensitively it reacts to temperature-induced changes in volume of the filling liquid.

The result is that small measuring ranges are only possible with large diaphragm diameters.

Other factors apart from diaphragm rigidity which also play a role:

- Diaphragm thickness
- Diaphragm material
- Coatings if present

Filling liquid

Every filling liquid reacts to temperature variations with a change of volume. Temperature errors can be minimized by selecting a suitable filling liquid, but the filling liquid must also be appropriate for the temperature limits and operating pressure. Furthermore, the filling liquid must also be physiologically harmless.

Since the filling liquid is present under the diaphragm, in the capillary and under the process flange of the pressure transmitter (or in the connection shank), the temperature error must be calculated separately for each combination.

**Note**:

A vacuum-resistant remote seal is recommended for continuous low-pressure operation at 500 mbar a or below, including during commissioning (see ordering data).

An example of a temperature error calculation can be found in the section "Technical Specifications".

## Technical description

Response time

The response time is dependent on the following factors:

- Internal diameter of the capillary: The bigger the internal diameter, the shorter the response time
- Viscosity of the filling liquid The greater the viscosity, the longer the response time
- Length of the capillary: The longer the capillary, the longer the response time
- Pressure in the pressure measuring system: The higher the pressure, the shorter the response time

Recommendations

The following should be observed to obtain an optimum combination of transmitter and remote seal:

- Choose the biggest possible diameter for the remote seal. The effective diameter of the seal diaphragm is then bigger and the temperature error smaller.
- Choose the shortest possible capillary. The response time is then shorter and the temperature error smaller
- Choose the filling liquid with the least viscosity and the smallest coefficient of expansion. Make sure, however, that the filling liquid meets the process requirements with regard to pressure, vacuum and temperature. And ensure that the filling liquid and the medium are compatible with one another.
- Note the following points for use in the vacuum range:
  - The pressure transmitter must always be positioned below the lowest spigot.
  - The operating range of some filling liquids is very limited with regard to the permissible temperature of the medium.
  - A vacuum-proof seal is necessary for continuous operation in the low-pressure range.
- Recommendations for the minimum span can be found in the section "Technical data".

***Note***

The remote seals listed here are a selection of the most common designs. On account of the large variety of process connections, certain remote seals which are not listed here may be available nevertheless.

Other versions can be:

- Other process connections, standards
- Aseptic or sterile connections
- Other dimensions
- Other nominal pressures
- Special diaphragm materials, including coatings
- Other sealing faces
- Other filling liquids
- Other capillary lengths
- Sheathing of capillaries with protective hose
- Calibration at higher/lower temperatures etc.

***Please contact your local Siemens office for further information.***

## Technical specifications

### *Temperature error Diaphragm seals*

Temperature errors of diaphragm seals when connected to pressure transmitters for pressure, absolute pressure, differential pressure (single-sided) and level

| | Nominal diameter/ design | Diaphragm diameter | | Temperature error of remote seal $f_{RS}$ | | Temperature error of capillary $f_{Cap}$ | | Temperature error of process flange/connection spigot $f_{PF}$ | | Recommended min. spans (guidance values, observe temp. error) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mm | (inch) | mbar/ 10 K | (psi/ 10 K) | mbar/ (10 K · $m_{Cap}$) | (psi/ (10 K · $m_{Cap}$)) | mbar/ 10 K | (psi/ 10 K) | mbar | (psi) |
| Sandwich design or with flange to EN 1092-1 | DN 50 without tube | 59 | (2.32) | 1.5 | (0.022) | 2 | (0.029) | 2 | (0.029) | 200 | (2.90) |
| | DN 50 with tube | 45 | (1.89) | 5 | (0.073) | 10 | (0.145) | 10 | (0.145) | 500 | (7.25) |
| | DN 80 without tube | 89 | (3.50) | 0.2 | (0.003) | 0.2 | (0.003) | 0.2 | (0.003) | 100 | (1.45) |
| | DN 80 with tube | 72 | (2.83) | 1 | (0.015) | 1 | (1.015) | 1 | (1.015) | 250 | (3.63) |
| | DN 100 without tube | 89 | (3.50) | 0.2 | (0.003) | 0.4 | (0.006) | 0.4 | (0.006) | 100 | (1.45) |
| | DN 100 with tube | 89 | (3.50) | 0.4 | (0.006) | 0.4 | (0.006) | 0.4 | (0.006) | 100 | (1.45) |
| | DN 125 without tube | 124 | (4.88) | 0.2 | (0.003) | 0.1 | (0.002) | 0.1 | (0.002) | 20 | (0.29) |
| | DN 125 with tube | 124 | (4.88) | 0.2 | (0.003) | 0.1 | (0.002) | 0.1 | (0.002) | 20 | (0.29) |
| Sandwich design or with flange to ASME B16.5 | 2 inch without tube | 59 | (2.32) | 1.5 | (0.022) | 2 | (0.029) | 2 | (0.029) | 200 | (2.90) |
| | 2 inch with tube | 45 | (1.89) | 5 | (0.073) | 10 | (0.145) | 10 | (0.145) | 500 | (7.25) |
| | 3 inch without tube | 89 | (3.50) | 0.2 | (0.003) | 0.2 | (0.003) | 0.2 | (0.003) | 100 | (1.45) |
| | 3 inch with tube | 72 | (2.83) | 1 | (0.015) | 1 | (1.015) | 1 | (1.015) | 250 | (3.63) |
| | 4 inch without tube | 89 | (3.50) | 0.2 | (0.003) | 0.4 | (0.006) | 0.4 | (0.006) | 100 | (1.45) |
| | 4 inch with tube | 89 | (3.50) | 0.4 | (0.006) | 0.4 | (0.006) | 0.4 | (0.006) | 100 | (1.45) |
| | 5 inch without tube | 124 | (4.88) | 0.2 | (0.003) | 0.1 | (0.002) | 0.1 | (0.002) | 20 | (0.29) |
| | 5 inch with tube | 124 | (4.88) | 0.2 | (0.003) | 0.1 | (0.002) | 0.1 | (0.002) | 20 | (0.29) |
| Remote seal with union nut to DIN 11851 | DN 25 | 25 | (0.98) | 20 | (0.290) | 60 | (0.870) | 60 | (0.870) | 6000 | (87) |
| | DN 32 | 32 | (1.26) | 8 | (0.116) | 25 | (0.363) | 25 | (0.363) | 4000 | (58) |
| | DN 40 | 40 | (1.57) | 4 | (0.058) | 10 | (0.145) | 10 | (0.145) | 2000 | (29) |
| | DN 50 | 52 | (2.05) | 4 | (0.058) | 5 | (0.073) | 5 | (0.073) | 500 | (7.25) |
| | DN 65 | 59 | (2.32) | 3 | (0.044) | 4 | (0.058) | 4 | (0.058) | 500 | (7.25) |
| | DN 80 | 72 | (2.83) | 1 | (0.015) | 1 | (0.015) | 1 | (0.015) | 250 | (3.63) |
| Remote seal, screwed gland design | DN 50 | 52 | (2.05) | 4 | (0.058) | 5 | (0.073) | 5 | (0.073) | 500 | (7.25) |
| Remote seal with threaded socket to DIN 11851 | DN 25 | 25 | (0.98) | 20 | (0.290) | 60 | (0.870) | 60 | (0.870) | 6000 | (87) |
| | DN 32 | 32 | (1.26) | 8 | (0.116) | 25 | (0.363) | 25 | (0.363) | 4000 | (58) |
| | DN 40 | 40 | (1.57) | 4 | (0.058) | 10 | (0.145) | 10 | (0.145) | 2000 | (29) |
| | DN 50 | 52 | (2.05) | 4 | (0.058) | 5 | (0.073) | 5 | (0.073) | 500 | (7.25) |
| | DN 65 | 59 | (2.32) | 3 | (0.044) | 4 | (0.058) | 4 | (0.058) | 500 | (7.25) |
| | DN 80 | 72 | (2.83) | 1 | (0.015) | 1 | (0.015) | 1 | (0.015) | 250 | (3.63) |
| Clamp connection | 1½ inch | 32 | (1.26) | 8 | (0.116) | 25 | (0.363) | 25 | (0.363) | 4000 | (58) |
| | 2 inch | 40 | (1.57) | 4 | (0.058) | 10 | (0.145) | 10 | (0.145) | 2000 | (29) |
| | 2½ inch | 59 | (2.32) | 3 | (0.044) | 5 | (0.073) | 5 | (0.073) | 500 | (7.25) |
| | 3 inch | 72 | (2.83) | 1 | (0.015) | 1 | (0.015) | 1 | (0.015) | 250 | (3.63) |
| Miniature diaphragm seal | G1B | 25 | (0.98) | 20 | (0.290) | 60 | (0.870) | 60 | (0.870) | 6000 | (87) |
| | G1½B | 40 | (1.57) | 4 | (0.058) | 10 | (0.145) | 10 | (0.145) | 2000 | (29) |
| | G2B | 52 | (2.05) | 4 | (0.058) | 5 | (0.073) | 5 | (0.073) | 500 | (7.25) |

Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Values apply to stainless steel as the diaphragm material.

## Technical description

Temperature errors of diaphragm seals with connection to differential pressure transmitters (double-sided)

| | Nominal diameter/ design | Diaphragm diameter | | Temperature error of remote seal $f_{RS}$ | | Temperature error of capillary $f_{Cap}$ | | Temperature error of process flange/connection spigot $f_{PF}$ | | Recommended min. spans (guidance values, observe temperature error) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mm | (inch) | mbar/ 10 K | (psi/ 10 K) | mbar/ (10 K · $m_{Cap}$) | (psi/ (10 K · $m_{Cap}$)) | mbar/ 10 K | (psi/ 10 K) | mbar | (psi) |
| Sandwich design or with flange to EN 1092-1 | DN 50 without tube | 59 | (2.32) | 0.3 | (0.0043) | 0.3 | (0.0045) | 0.3 | (0.0045) | 250 | (3.626) |
| | DN 50 with tube | 45 | (1.89) | 1.26 | (0.018) | 1.7 | (0.025) | 1.7 | (0.025) | 250 | (3.626) |
| | DN 80 without tube | 89 | (3.50) | 0.05 | (0.001) | 0.05 | (0.001) | 0.05 | (0.0007) | 50 | (0.725) |
| | DN 80 with tube | 72 | (2.83) | 0.24 | (0.004) | 0.17 | (0.003) | 0.17 | (0.003) | 100 | (1.45) |
| | DN 100 without tube | 89 | (3.50) | 0.05 | (0.001) | 0.07 | (0.001) | 0.07 | (0.001) | 50 | (0.725) |
| | DN 100 with tube | 89 | (3.50) | 0.1 | (0.002) | 0.07 | (0.001) | 0.07 | (0.001) | 50 | (0.725) |
| | DN 125 without tube | 124 | (4.88) | 0.05 | (0.001) | 0.03 | (0.0004) | 0.03 | (0.0004) | 20 | (0.29) |
| | DN 125 with tube | 124 | (4.88) | 0.05 | (0.001) | 0.03 | (0.0004) | 0.03 | (0.0004) | 20 | (0.29) |
| Sandwich design with flange to ASME B16.5 | 2 inch without tube | 59 | (2.32) | 0.3 | (0.0043) | 0.3 | (0.0043) | 0.3 | (0.0045) | 250 | (3.626) |
| | 2 inch with tube | 45 | (1.89) | 1.26 | (0.018) | 1.7 | (0.025) | 1.7 | (0.025) | 250 | (3.626) |
| | 3 inch without tube | 89 | (3.50) | 0.05 | (0.001) | 0.05 | (0.0007) | 0.05 | (0.0007) | 50 | (0.725) |
| | 3 inch with tube | 72 | (2.83) | 0.24 | (0.004) | 0.17 | (0.003) | 0.17 | (0.003) | 100 | (1.45) |
| | 4 inch without tube | 89 | (3.50) | 0.05 | (0.001) | 0.07 | (0.001) | 0.07 | (0.001) | 50 | (0.725) |
| | 4 inch with tube | 89 | (3.50) | 0.1 | (0.002) | 0.07 | (0.001) | 0.07 | (0.001) | 50 | (0.725) |
| | 5 inch without tube | 124 | (4.88) | 0.05 | (0.001) | 0.03 | (0.0004) | 0.03 | (0.0004) | 20 | (0.29) |
| | 5 inch with tube | 124 | (4.88) | 0.05 | (0.001) | 0.03 | (0.0004) | 0.03 | (0.0004) | 20 | (0.29) |
| Remote seal, screwed gland design | DN 50 | 52 | (2.05) | 1 | (0.015) | 0.83 | (0.012) | 0.83 | (0.012) | 250 | (3.626) |
| Remote seal with union nut to DIN 11851 | DN 50 | 52 | (2.05) | 1 | (0.015) | 0.83 | (0.012) | 0.83 | (0.012) | 250 | (3.626) |
| | DN 65 | 59 | (2.32) | 0.7 | (0.010) | 0.67 | (0.010) | 0.67 | (0.010) | 250 | (3.626) |
| | DN 80 | 72 | (2.83) | 0.24 | (0.004) | 0.17 | (0.003) | 0.17 | (0.003) | 100 | (1.450) |
| Remote seal with threaded socket to DIN 11851 | DN 50 | 52 | (2.05) | 1 | (0.015) | 0.83 | (0.012) | 0.83 | (0.012) | 250 | (3.626) |
| | DN 65 | 59 | (2.32) | 0.7 | (0.010) | 0.67 | (0.010) | 0.67 | (0.010) | 250 | (3.626) |
| | DN 80 | 72 | (2.83) | 0.24 | (0.004) | 0.17 | (0.003) | 0.17 | (0.003) | 100 | (1.450) |
| Clamp connection | 2 inch | 40 | (1.57) | 1 | (0.015) | 2.5 | (0.036) | 2.5 | (0.036) | 2000 | (29.01) |
| | 2½ inch | 59 | (2.32) | 0.7 | (0.010) | 0.67 | (0.010) | 0.67 | (0.010) | 250 | (3.626) |
| | 3 inch | 72 | (2.83) | 0.24 | (0.004) | 0.17 | (0.003) | 0.17 | (0.003) | 100 | (1.450) |

Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Values apply to stainless steel as the diaphragm material.

***Temperature error Clamp-on seals***

Temperature errors of clamp-on seals when connected to pressure transmitters for gauge pressure and absolute pressure, and with single-sided connection to pressure transmitters for differential pressure

| Nominal diameter/ design | Temperature error of remote seal $f_{RS}$ | | Temperature error of capillary $f_{Cap}$ | | Temperature error of process flange/connection spigot $f_{PF}$ | | Recommended min. spans (guidance values, observe temperature error) | |
|---|---|---|---|---|---|---|---|---|
| | mbar/10 K | (psi/10 K) | mbar/10 K | (psi/10 K) | mbar/10 K | (psi/10 K) | mbar | (psi) |
| DN 25 (1 inch) | 6.0 | (0.0870) | 8.5 | (0.123) | 8.5 | (0.123) | 1000 | (14.5) |
| DN 40 (1½ inch) | 4.5 | (0.065) | 4.5 | (0.065) | 4.5 | (0.065) | 250 | (3.63) |
| DN 50 (2 inch) | 4.0 | (0.058) | 3.0 | (0.044) | 3.0 | (0.044) | 100 | (1.45) |
| DN 80 (3 inch) | 9.5 | (0.138) | 5.0 | (0.073) | 5.0 | (0.073) | 100 | (1.45) |
| DN 100 (4 inch) | 8.0 | (0.012) | 3.0 | (0.044) | 3.0 | (0.044) | 100 | (1.45) |

Temperature errors of clamp-on seals with double-sided connection to pressure transmitters for differential pressure

| Nominal diameter/ design | Temperature error of remote seal $f_{RS}$ | | Temperature error of capillary $f_{Cap}$ | | Temperature error of process flange/connection spigot $f_{PF}$ | | Recommended min. spans (guidance values, observe temperature error) | |
|---|---|---|---|---|---|---|---|---|
| | mbar/10 K | (psi/10 K) | mbar/10 K | (psi/10 K) | mbar/10 K | (psi/10 K) | mbar | (psi) |
| DN 25 (1 inch) | 2.3 | (0.033) | 1.8 | (0.026) | 1.8 | (0.026) | 1000 | (14.5) |
| DN 40 (1½ inch) | 0.8 | (0.012) | 0.3 | (0.004) | 0.3 | (0.004) | 250 | (3.63) |
| DN 50 (2 inch) | 0.3 | (0.004) | 0.1 | (0.002) | 0.1 | (0.002) | 100 | (1.45) |
| DN 80 (3 inch) | 3.0 | (0.044) | 0.5 | (0.007) | 0.5 | (0.007) | 100 | (1.45) |
| DN 100 (4 inch) | 1.0 | (0.015) | 0.1 | (0.002) | 0.1 | (0.002) | 100 | (1.45) |

Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Half the values apply to glycerin/water mixture as the filling liquid.
- Values apply to stainless steel as the diaphragm material.
- Diaphragm thickness 0.05 mm (0.002 inch) for DN 25/DN 40/DN 50 and 0.1 mm (0.004 inch) for DN 80/DN 100

## Technical description

### *Calculation of the temperature error*

The following equation is used to calculate the temperature error:

$$dp = (\vartheta_{RS} - \vartheta_{Cal}) \cdot f_{RS} + (\vartheta_{Cap} - \vartheta_{Cal}) \cdot l_{Cap} \cdot f_{Cap} + (\vartheta_{TR} - \vartheta_{Cal}) \cdot f_{PF}$$

| | |
|---|---|
| dp | Additional temperature error (mbar) |
| $\vartheta_{RS}$ | Temperature on remote seal diaphragm (generally corresponds to temperature of medium) |
| $\vartheta_{Cal}$ | Calibration (reference) temperature (20 °C (68 °F)) |
| $f_{RS}$ | Temperature error of remote seal |
| $\vartheta_{Cap}$ | Ambient temperature on the capillaries |
| $l_{Cap}$ | Capillary length |
| $f_{Cap}$ | Temperature error of capillaries |
| $\vartheta_{TR}$ | Ambient temperature on pressure transmitter |
| $f_{PF}$ | Temperature error of the oil filling in the process flanges of the pressure transmitter |

### Example of temperature error calculation

**Existing conditions:**

| | |
|---|---|
| SITRANS P pressure transmitter for differential pressure, 250 mbar, set to 0 ... 100 mbar, with DN 100 remote seal diaphragms without tube, diaphragm made of stainless steel, mat. No. 1.4404/316L | $f_{RS}$ = 0.05 mbar/10 K (0.039 in$H_2O$/10 K) |
| Capillary length | $l_{Cap}$ = 6 m (19.7 ft) |
| Capillaries fitted on both sides | $f_{Cap}$ = 0.07 mbar/(10 K · $m_{Cap}$) (0.028 in$H_2O$/(10 K · $m_{Cap}$)) |
| Filling liquid silicone oil M5 | $f_{PF}$ = 0.07 mbar/10 K (0.028 in$H_2O$/10 K) |
| Process temperature | $\vartheta_{RS}$ = 100 °C (212 °F) |
| Temperature on the capillaries | $\vartheta_{Cap}$ = 50 °C (122 °F) |
| Temperature on pressure transmitter | $\vartheta_{TR}$ = 50 °C (122 °F) |
| Calibration temperature | $\vartheta_{Cal}$ = 20 °C (68 °F) |

**Required:**

Additional temperature error of remote seals: dp

**Calculation:**

**in mbar**

dp = (100 °C – 20 °C) · 0.05 mbar/10 K + (50 °C – 20 °C) · 6 m · 0.07 mbar/(10 K · m) + (50 °C – 20 °C) · 0.07 mbar/10 K

dp = 0.4 mbar + 1.26 mbar + 0.21 mbar

**in in$H_2O$**

dp = (212 °F - 68 °F) · 0.039 in$H_2O$/10 K + (112 °F - 68 °F) · 19.7 ft · 0.028 in$H_2O$/(10 K · 3.28 ft) + (112 °F - 68 °F) · (0.028 in$H_2O$/10 K)

dp = 0.16 in$H_2O$ + 0.51 in$H_2O$ + 0.08 in$H_2O$

**Result:**

**dp = 1.87 mbar (0.75 in$H_2O$)**
(corresponds to 2.27% of set span)

**Note**

The determined temperature error only applies to the error resulting from connection of the remote seal.

The transmission response of the respective transmitter is not included in this consideration.
It must be calculated separately, and the resulting error added to the error determined above from connection of the remote seal.

### *Dependence of temperature error on diaphragm material*

The temperature errors listed in the previous table are based on the use of stainless steel as the diaphragm material. If other diaphragm materials are used, the temperature errors change as follows:

| Diaphragm material | Change in temperature error of remote seal |
|---|---|
| | Increase in values by |
| Stainless steel, Duplex, ... | See previous tables |
| Hastelloy C4, mat. No. 2.4610 | 50 % |
| Hastelloy C276, mat. No. 2.4819 | 50 % |
| Monel 400, mat. No. 2.4360 | 60 % |
| Tantalum | 50 % |
| Titanium | 50 % |
| PTFE coating on stainless steel diaphragm | 80 % |
| ECTFE coating or PFA coating on stainless steel diaphragm | 100 % |
| Gold coating on stainless steel diaphragm | 40 % |
| Inconel | 50 % |
| Incoloy | 50 % |

### *Maximum temperature of medium*

The following maximum temperatures of the medium apply depending on the material of the wetted parts:

| Material | $p_{abs}$ < 1 bar (402 in$H_2O$) | | $p_{abs}$ > 1 bar (402 in$H_2O$) | |
|---|---|---|---|---|
| | °C | (°F) | °C | (°F) |
| Stainless steel, 316L | 200 | (392) | 400 | (662) |
| PTFE coating | 200 | (392) | 260 | (500) |
| ECTFE coating | 100 | (212) | 150 | (302) |
| PFA coating | 200 | (392) | 260 | (500) |
| Hastelloy C4, mat. No. 2.4610 | 200 | (392) | 260 | (500) |
| Hastelloy C276, mat. No. 2.4819 | 200 | (392) | 400 | (662) |
| Monel 400, mat. No. 2.4360 | 200 | (392) | 400 | (662) |
| Tantalum | 200 | (392) | 300 | (572) |
| Duplex, mat. No. 1.4462 | 200 | (392) | 300 | (572) |
| Titanium | 100 | (212) | 150 | (302) |
| Inconel | 200 | (392) | 400 | (752) |
| Incoloy | 200 | (392) | 400 | (752) |
| Gold coating | 200 | (392) | 400 | (752) |

### *Maximum capillary length for diaphragm seals (guidance values)*

| Nom. diam. | | Max. length of capillary | | | |
|---|---|---|---|---|---|
| | | Diaphragm seal | | Clamp-on seal | |
| | | m | (ft) | m | (ft) |
| DN 25 | (1 inch) | 2.5 | (8.2) | 2.5 | (8.2) |
| DN 32 | (1¼ inch) | 2.5 | (8.2) | 2.5 | (8.2) |
| DN 40 | (1½ inch) | 4 | (13.1) | 6 | (19.7) |
| DN 50 | (2 inch) | 6 | (19.7) | 10 | (32.8) |
| DN 65 | (2½ inch) | 8 | (26.2) | 10 | (32.8) |
| DN 80 | (3 inch) | 15 | (49.1) | 10 | (32.8) |
| DN 100 | (4 inch) | 15 | (49.1) | 10 | (32.8) |
| DN 125 | (5 inch) | 15 | (49.1) | - | - |

### *Response times*

The values listed in the following table are the response times (in seconds per meter of capillary) for a change in pressure which corresponds to the set span.

The listed values must be multiplied by the respective length of the capillary, or with transmitters for differential pressure and flow by the total length of both capillaries.

The response times are independent of the set span within the range of the respective transmitter. The response times are of insignificant importance for spans above 10 bar (145 psi). The response times of the pressure transmitters are not considered in the table.

| Filling liquid | Density | | Temperature on capillary | | Response time in s/m (s/ft) with max. span of pressure transmitter | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | kg/dm³ | (lb/in³) | °C | (°F) | 250 mbar | (101 in$H_2O$) | 600 mbar | (241 in$H_2O$) | 1600 mbar | (643 in$H_2O$) |
| Silicone oil M5 | 0.914 | (0.033) | +60 | (140) | 0.06 | (0.018) | 0.02 | (0.006) | 0.01 | (0.003) |
| | | | +20 | (68) | 0.11 | (0.034) | 0.02 | (0.006) | 0.02 | (0.006) |
| | | | - 20 | (-4) | 0.3 | (0.091) | 0.12 | (0.037) | 0.05 | (0.015) |
| Silicone oil M50 | 0.966 | (0.035) | +60 | (140) | 0.6 | (0.183) | 0.25 | (0.076) | 0.09 | (0.027) |
| | | | +20 | (68) | 0.61 | (0.186) | 0.26 | (0.079) | 0.1 | (0.030) |
| | | | - 20 | (-4) | 1.69 | (0.515) | 0.71 | (0.216) | 0.27 | (0.082) |
| High-temperature oil | 1.070 | (0.039) | +60 | (140) | 0.14 | (0.043) | 0.06 | (0.018) | 0.02 | (0.006) |
| | | | +20 | (68) | 0.65 | (0.198) | 0.27 | (0.082) | 0.1 | (0.030) |
| | | | -10 | (14) | 3.96 | (1.207) | 1.65 | (0.503) | 0.62 | (0.189) |
| Halocarbon oil | 1.968 | (0.071) | +60 | (140) | 0.07 | (0.021) | 0.03 | (0.009) | 0.01 | (0.003) |
| | | | +20 | (68) | 0.29 | (0.088) | 0.12 | (0.037) | 0.05 | (0.015) |
| | | | - 20 | (-4) | 2.88 | (0.878) | 1.2 | (0.366) | 0.45 | (0.137) |
| Food oil (FDA listed) | 0.920 | (0.033) | +60 | (140) | 0.75 | (0.229) | 0.33 | (0.101) | 0.17 | (0.052) |
| | | | +20 | (68) | 4 | (1.220) | 1.75 | (0.534) | 0.67 | (0.204) |
| | | | - 20 | (-4) | 20 | (6.100) | 8.5 | (2.593) | 3.25 | (0.991) |

### *Technical data of filling liquids*

When selecting the filling liquid, check that it is suitable with respect to the permissible temperature of the medium and the process pressure.

Also check the compatibility of the filling liquid with the measured medium. For example, only physiologically harmless filling liquids may be used in the food industry.

Oxygen and chlorine are special cases of measured medium. The liquid must not react with either of these two media or a leaking remote seal may lead to an explosion or fire.

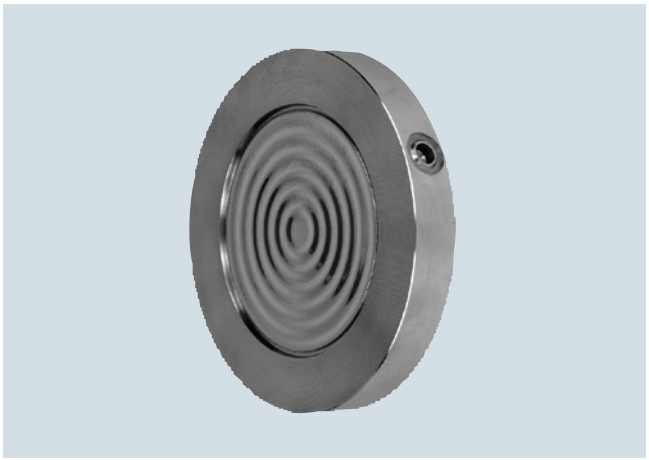
Halocarbon oil must be used as the fill fluid with the media oxygen and chlorine.

| Filling liquid | Digit in Article No. | Permissible temperature of medium | | | | Density at 20 °C (68 °F) | | Viscosity at 20 °C (68 °F) | | Coefficient of expansion | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $p_{abs}$ < 1 bar | ($p_{abs}$ < 402 in$H_2O$) | $p_{abs}$ > 1 bar | ($p_{abs}$ > 402 in$H_2O$) | | | | | | |
| | | °C | (°F) | °C | (°F) | kg/dm³ | (lb/in³) | m²/s·10⁶ | (ft²/s·10⁶) | 1/°C | (1/°F) |
| Silicone oil M5 | 1 | -60 ... +80 | (-76 ... +176) | -90 ... +180 | (-130 ... +356) | 0.914 | (0.03) | 4 | (43) | 0.00108 | (0.00060) |
| Silicone oil M50 | 2 | -40 ... +150 | (-40 ... +302) | -40 ... +250 | (-40 ... +482) | 0.96 | (0.03) | 50 | (538) | 0.00104 | (0.00058) |
| High-temperature oil | 3 | -10 ... +200 | (+14 ... +392) | -20 ... +400 | (-4 ... +752) | 1.07 | (0.04) | 57 | (613) | 0.00080 | (0.00044) |
| Halocarbon oil | 4[1)] | -40 ... +80 | (-40 ... +176) | -40 ... +175 | (-40 ... +347) | 1.968 | (0.07) | 14 | (151) | 0.00086 | (0.00048) |
| Food oil (FDA listed) | 7 | -20 ... +160 | (-4 ... +320) | -20 ... +200 | (-4 ... +392) | 0.92 | (0.03) | 10 | (107) | 0.00080 | (0.00044) |

1) Max. pressure and temperature for oxygen measurements: 50 bar (725 psi) and 60° (140 °F).

## Diaphragm seals of sandwich design with flexible capillary

### Overview



Diaphragm seals of sandwich design

### Technical specifications

| Diaphragm seals of sandwich design | |
|---|---|
| Nominal diameter | Nominal pressure |
| • DN 50 | PN 16 ... PN 400 |
| • DN 80 | PN 16 ... PN 400 |
| • DN 100 | PN 16 ... PN 400 |
| • DN 125 | PN 16 ... PN 400 |
| • 2 inch | Class 150 ... class 2500 |
| • 3 inch | Class 150 ... class 2500 |
| • 4 inch | Class 150 ... class 2500 |
| • 5 inch | Class 150 ... class 2500 |
| Sealing face | |
| • For stainless steel, mat. No. 1.4404/316L | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA |
| • For the other materials | To EN 1092-1, form B2 or ASME B16.5 RFSF |
| Materials | |
| • Main body | Stainless steel mat. no. 1.4404/316L |
| • Wetted parts | Stainless steel mat. no. 1.4404/316L |
| | • Without coating |
| | • PTFE coating (for vacuum on request) |
| | • ECTFE coating (for vacuum on request) |
| | • PFA coating (for vacuum on request) |
| | Monel 400, mat. No. 2.4360 |
| | Hastelloy C276, mat. No. 2.4819 |
| | Hastelloy C4, mat. No. 2.4610 |
| | Tantalum |
| | Duplex 2205, mat. no. 1.4462 |
| | Stainless steel 316L, gold plated, thickness approx. 25 µm |
| • Capillary | Stainless steel, mat. No. 1.4571/316Ti |
| • Sheath | Spiral hose made of stainless steel, mat. No. 1.4301/316 |
| Sealing material in the process flanges | |
| • For pressure transmitters, absolute pressure transmitters and low-pressure applications | Copper |
| • For other applications | Viton |
| Maximum pressure | See above and the technical data of the pressure transmitters |
| Tube length | Without tube as standard (tube available on request) |
| Capillary | |
| • Length | Max. 10 m (32.8 ft), longer lengths on request |
| • Internal diameter | max. 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 (for measuring $O_2$) |
| | Food oil (FDA listed) |
| Permissible ambient temperature | Dependent on the pressure transmitter and the filling liquid of the remote seal |
| | More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals |
| Weight | Approx. 4 kg (8.82 lb) |
| **Certificate and approvals** | |
| Classification according to pressure equipment directive (DRGL 97/23/EC) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) |

| Selection and Ordering data | | Article No. Ord.code |
|---|---|---|
| **Diaphragm seal** | | |
| Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately): | | |
| **for pressure** 7MF403.-... and 7MF423.-... together with Order code "V01" (vacuum-proof design) and 7MF802.-...[1]; Scope of delivery (1 off) | ↗ | **7MF4900-** |
| **for absolute pressure** 7MF433.-...; Scope of delivery (1 off) | ↗ | **7MF4901-** |
| **for differential pressure and flow** 7MF443.-... and 7MF54..-...; scope of delivery 2 off | ↗ | **7MF4903-** |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | **1 - B** |
| **Nominal diameter and nominal pressure** | | |
| • DN 50 | PN 16 ... 400 | **A** |
| (recommended only for pressure transmitters for pressure) | | |
| • DN 80 | PN 16 ... 400 | **B** |
| • DN 100 | PN 16 ... 400 | **C** |
| • DN 125 | PN 16 ... 400 | **D** |
| • 2 inch | Class 150 ... 2500 | **E** |
| (recommended only for pressure transmitters for pressure) | | |
| • 3 inch | Class 150 ... 2500 | **H** |
| • 4 inch | Class 150 ... 2500 | **L** |
| • 5 inch | Class 150 ... 2500 | **N** |
| Smooth sealing face to EN 1092-1, form B1 or to ASME B16.5 RF 125 ... 250 AA | | |
| Other version<br>Add Order code and plain text:<br>Nominal diameter: ...; Nominal pressure: ...<br>Sealing face: see "Technical data" | | **Z** **J 1 Y** |
| **Wetted parts materials** | | |
| • Stainless steel 316L | | |
| - without coating | | **A** |
| - with PTFE coating[2] | | **E 0** |
| - with ECTFE coating [2) 3)] | | **F** |
| - with PFA coating [2)] | | **D** |
| • Monel 400, mat. No. 2.4360 | | **G** |
| • Hastelloy C276, mat. No. 2.4819 | | **J** |
| • Hastelloy C4, mat. No. 2.4610 | | **U** |
| • Tantalum | | **K** |
| • Duplex 2205, mat. no. 1.4462 | | **Q** |
| • Duplex 2205, mat. no. 1.4462, incl. main body | | **R** |
| • Stainless steel 316L, gold plated, thickness approx. 25 µm | | **S 0** |
| Other version<br>Add Order code and plain text:<br>Wetted parts materials: ... | | **Z** **K 1 Y** |
| **Tube length** | | |
| • without tube | | **0** |
| Other version:<br>Add Order code and plain text:<br>Tube length: ... | | **9** **L 1 Y** |
| **Filling liquid** | | |
| • Silicone oil M5 | | **1** |
| • Silicone oil M50 | | **2** |
| • High-temperature oil | | **3** |
| • Halocarbon oil (for measuring $O_2$)[4] | | **4** |
| • Food oil (FDA listed)l | | **7** |
| Other version<br>Add Order code and plain text:<br>Filling liquid: ... | | **9** **M 1 Y** |
| | | **1 - B** |

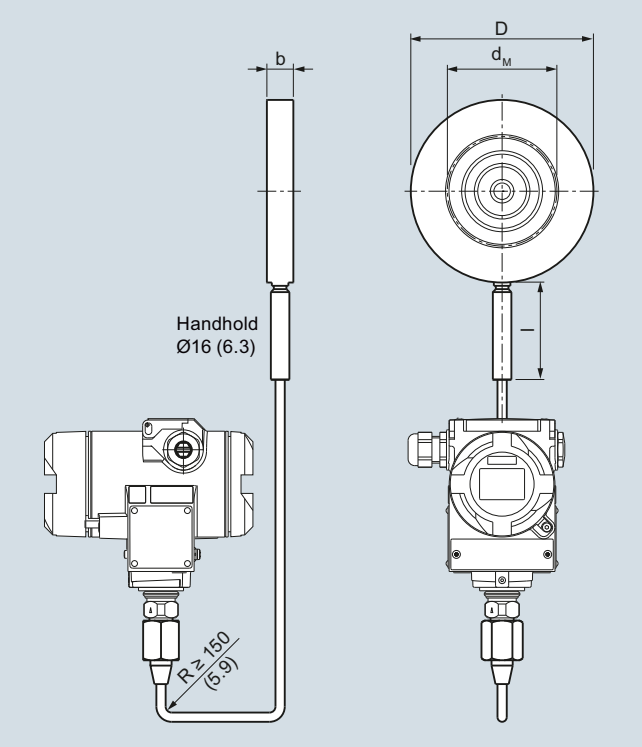
| Selection and Ordering data | | Article No. Ord.code |
|---|---|---|
| **Diaphragm seal** | | |
| Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately): | | |
| **for pressure** 7MF403.-... and 7MF423.-... together with Order code "V01" (vacuum-proof design) and 7MF802.-...[1]; Scope of delivery (1 off) | | **7MF4900-** |
| **for absolute pressure** 7MF433.-...; Scope of delivery (1 off) | | **7MF4901-** |
| **for differential pressure and flow** 7MF443.-... and 7MF54..-...; scope of delivery 2 off | | **7MF4903-** |
| **Length of capillary[5]** | | |
| • 1.0 m | (3.28 ft) | **2** |
| • 1.6 m | (5.25 ft) | **3** |
| • 2.5 m | (8.20 ft) | **4** |
| • 4.0 m | (13.1 ft) | **5** |
| • 6.0 m | (19.7 ft) | **6** |
| • 8.0 m | (26.25 ft) | **7** |
| • 10.0 m | (32.8 ft) | **8** |
| **Special lengths for capillaries** | | |
| • 2.0 m | | **9** **N 1 C** |
| • 3.0 m | | **9** **N 1 E** |
| • 5.0 m | | **9** **N 1 G** |
| • 7.0 m | | **9** **N 1 J** |
| • 9.0 m | | **9** **N 1 L** |
| only for 7MF4903-... | | |
| • 11.0 m | | **9** **N 1 N** |
| • 12.0 m | | **9** **N 1 P** |
| • 13.0 m | | **9** **N 1 Q** |
| • 14.0 m | | **9** **N 1 R** |
| • 15.0 m | | **9** **N 1 S** |

1) With 7MF802.-... and the measuring cells Q, S, T and U also order the vacuum-tight version.
2) Only possible up to max. PN 100.
3) For vacuum on request
4) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery.
5) Max. capillary length, see section "Technical description".

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code. | |
| **Spark arrestor** | |
| With spark arrestor for mounting on zone 0 (including documentation) | |
| • Pressure and absolute pressure | **A01** |
| • for differential pressure transmitters | **A02** |
| **Remote seal nameplate** | **B20** |
| Attached out of stainless steel, contains Article No. and order number of the remote seal supplier | |
| **Oil- and grease-free cleaned version** | **C10** |
| Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2 | |
| **Quality inspection certificate (Five-step factory calibration) to IEC 60770-2** | **C11** |
| **Inspection certificate** | **C12** |
| to EN 10204, section 3.1 | |
| **2.2 Certificate of FDA approval of fill oil** | **C17** |
| Only in conjunction with "Food-grade oil" fill liquid (FDA listed)" | |
| **Functional safety certificate ("SIL 2") to IEC 61508** | **C20** |
| (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter) | |
| **Functional safety certificate ("SIL 2/3") to IEC 61508** | **C23** |
| (Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter) | |
| **Certification acc. to NACE MR-0175** | **D07** |
| Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | |
| **Certification acc. to NACE MR-0103** | **D08** |
| Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | |
| **Oil- and grease-free cleaned version** | **E10** |
| Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2 | |
| **Epoxy painting** | **E15** |
| (not possible with vacuum-proof design and not for 7MF4901-...) | |
| Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42.., only possible with process connection G½B according to EN837-1 | |

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code. | |
| **Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA** | **J12** |
| instead of sealing surface B2 or RFSF (only for wetted parts made of Hastelloy C276 (2.4819), tantalum and Duplex 2205 (1.4462) and for nominal sizes 2", 3", DN 50 and DN 80) | |
| **Sealing surface groove, EN 1092-1, form D** | **J14** |
| instead of sealing surface B1 (only for wetted parts made of stainless steel 316L) | |
| **Sealing surface RJF (groove) ASME B16.5** | **J24** |
| instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L) | |
| **PE protective tube** | |
| over the spiral protective tube (color: white) of the capillaries | |
| 1.0 m | **N20** |
| 1.6 m | **N21** |
| 2.0 m | **N22** |
| 2.5 m | **N23** |
| 3.0 m | **N24** |
| 4.0 m | **N25** |
| 5.0 m | **N26** |
| 6.0 m | **N27** |
| 7.0 m | **N28** |
| 8.0 m | **N29** |
| 9.0 m | **N30** |
| 10.0 m | **N31** |
| only for 7MF4903-... | |
| 11.0 m | **N32** |
| 12.0 m | **N33** |
| 13.0 m | **N34** |
| 14.0 m | **N35** |
| 15.0 m | **N36** |
| **Vacuum-proof design** | |
| for use in low-pressure range for transmitters for | |
| • Gauge and absolute pressure from the pressure series | **V01** |
| • Differential pressure transmitters | **V03** |

## Dimensional drawings




Diaphragm seals of sandwich design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)

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

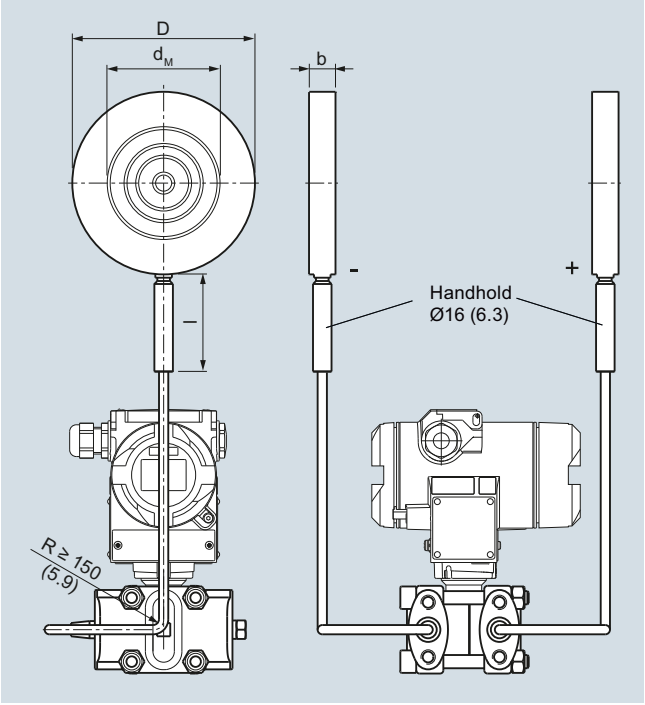
| Nom. diam. | Nom. press. | b | D | $d_M$ | l |
|---|---|---|---|---|---|
| | | mm | mm | mm | mm |
| DN 50 | PN 16 ... PN 400 | 20 | 102 | 59 | 100 |
| DN 80 | | 20 | 138 | 89 | 100 |
| DN 100 | | 20 | 158 | 89 | 100 |
| DN 125 | | 22 | 188 | 124 | 100 |

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

| Nom. diam. | Nom. press. | b | D | $d_M$ | l |
|---|---|---|---|---|---|
| | lb/sq.in. | mm (inch) | mm (inch) | mm (inch) | mm (inch) |
| 2 inch | 150 .... 2500 | 20 | 100 | 59 | 100 |
| | | (0.79) | (3.94) | (2.32) | (3.94) |
| 3 inch | | 20 | 134 | 89 | 100 |
| | | (0.79) | (5.28) | (2.32) | (3.94) |
| 4 inch | | 20 | 158 | 89 | 100 |
| | | (0.79) | (6.22) | (2.32) | (3.94) |
| 5 inch | | 22 | 186 | 124 | 100 |
| | | (0.87) | (7.32) | (4.88) | (3.94) |

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

$d_M$: Effective diaphragm diameter




Diaphragm seals of sandwich design (without flange) with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or differential pressure and flow, dimensions in mm (inch)

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

| Nom. diam. | Nom. press. | b | D | $d_M$ | l |
|---|---|---|---|---|---|
| | | mm | mm | mm | mm |
| DN 50 | PN 16 ... PN 400 | 20 | 102 | 59 | 100 |
| DN 80 | | 20 | 138 | 89 | 100 |
| DN 100 | | 20 | 158 | 89 | 100 |
| DN 125 | | 22 | 188 | 124 | 100 |

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

| Nom. diam. | Nom. press. | b | D | $d_M$ | l |
|---|---|---|---|---|---|
| | lb/sq.in. | mm (inch) | mm (inch) | mm (inch) | mm (inch) |
| 2 inch | 150 ... 2500 | 20 | 100 | 59 | 100 |
| | | (0.79) | (3.94) | (2.32) | (3.94) |
| 3 inch | | 20 | 134 | 89 | 100 |
| | | (0.79) | (5.28) | (2.32) | (3.94) |
| 4 inch | | 20 | 158 | 89 | 100 |
| | | (0.79) | (6.22) | (2.32) | (3.94) |
| 5 inch | | 22 | 186 | 124 | 100 |
| | | (0.87) | (7.32) | (4.88) | (3.94) |

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

$d_M$: Effective diaphragm diameter

## Overview

Diaphragm seals of flange design

## Technical specifications

| Diaphragm seals of flange design with flexible capillary | |
|---|---|
| Nominal diameter | Nominal pressure |
| • DN 50 (recommendable only for pressure transmitters for pressure) | PN 10/16/25/40, PN 100 |
| • DN 80 | PN 10/16/25/40, PN 100 |
| • DN 100 | PN 10/16, PN 25/40 |
| • DN 125 | PN 16, PN 40 |
| • 2 inch (recommendable only for pressure transmitters for pressure) | class 150, class 300, class 400/600, class 900/1500 |
| • 3 inch | Class 150, class 300, class 600 |
| • 4 inch | Class 150, class 300, class 400 |
| • 5 inch | Class 150, class 300, class 400 |
| Sealing face | |
| • For stainless steel, mat. No. 1.4404/316L | To EN 1092-1, form B1 or ASMR B16.5 RF 125 ... 250 AA |
| • For the other materials | To EN 1092-1, form B2 or ASME B16.5 RFSF |
| Materials | |
| • Main body | Stainless steel mat. no. 1.4404/316L |
| • Wetted parts | Stainless steel mat. no. 1.4404/316L |
| | • Without coating |
| | • PTFE coating (for vacuum on request) |
| | • ECTFE coating (for vacuum on request) |
| | • PFA coating (for vacuum on request) |
| | Monel 400, mat. No. 2.4360 |
| | Hastelloy C276, mat. No. 2.4819 |
| | Hastelloy C4, mat. No. 2.4610 |
| | Tantalum |
| | Duplex 2205, mat. no. 1.4462 |
| | Stainless steel 316L, gold plated, thickness approx. 25 µm |
| • Capillary | Stainless steel, mat. No. 1.4571/316Ti |
| • Sheath | Spiral hose made of stainless steel, mat. No. 1.4404/316L |

| | |
|---|---|
| Sealing material in the process flanges | |
| • For pressure transmitters, absolute pressure transmitters and low-pressure applications | Copper |
| • For other applications | Viton |
| Maximum pressure | See above and the technical data of the pressure transmitter |
| Tube length | Without tube as standard (tube available on request) |
| Capillary | |
| • Length | Max. 10 m (32.8 ft), longer lengths on request |
| • Internal diameter | 2 mm (0.079 inch) |
| • Minimum bending radius | 150 mm (5.9 inch) |
| Filling liquid | |
| (for remote seals of sandwich and flange design) | Silicone oil M5 |
| | Silicone oil M50 |
| | High-temperature oil |
| | Halocarbon oil (for measuring $O_2$) |
| | Food oil (FDA listed) |
| Permissible ambient temperature | Dependent on the pressure transmitter and the filling liquid of the remote seal |
| | More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals |
| Weight | Approx. 4 kg (8.82 lb) |
| **Certificate and approvals** | |
| Classification according to pressure equipment directive (DRGL 97/23/EC) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) |

| Selection and Ordering data | | Article No. Ord. code |
|---|---|---|
| **Diaphragm seal** | | |
| Flange design, with flexible capillary, connected to a pressure transmitter SITRANS P (order separately): | | |
| **for pressure** 7MF403.-... and 7MF423.-... together with Order code "V01" (vacuum-proof design) and 7MF802.-...[1]; scope of delivery: 1 off | ↗ | **7MF4920-** |
| **for absolute pressure** 7MF433.-...; scope of delivery: 1 off | ↗ | **7MF4921-** |
| **for differential pressure and flow** 7MF443.-... and 7MF54..-...; scope of delivery: 2 off | ↗ | **7MF4923-** |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | **1 ■■■■-■B ■■■** |
| **Nominal diameter and nominal pressure** | | |
| • DN 50 | PN 10/16/25/40 | **A** |
| | PN 100 | **B** |
| (DN 50 recommended only for pressure transmitters for pressure) | | |
| • DN 80 | PN 10/16/25/40 | **D** |
| | PN 100 | **E** |
| • DN 100 | PN 10/16 | **G** |
| | PN 25/40 | **H** |
| • DN 125 | PN 16 | **J** |
| | PN 40 | **K** |
| • 2 inch | Class 150 | **L** |
| | Class 300 | **M** |
| | class 400/600 | **N** |
| | class 900/1500 | **P** |
| (2 inch recommended only for pressure transmitters for pressure) | | |
| • 3 inch | Class 150 | **Q** |
| | Class 300 | **R** |
| | Class 600 | **S** |
| • 4 inch | Class 150 | **T** |
| | Class 300 | **U** |
| | Class 400 | **V** |
| • 5 inch | Class 150 | **W** |
| | Class 300 | **X** |
| | Class 400 | **Y** |
| Smooth sealing face to EN 1092-1, form B1 or to ASME B16.5 RF 125 ... 250 AA | | |
| Other version<br>Add Order code and plain text:<br>Nominal diameter: ...; Nominal pressure: ...<br>Sealing face: See "Technical data" | | **Z** **J 1 Y** |
| **Wetted parts materials** | | |
| • Stainless steel 316L | | |
| - without coating | | **A** |
| - with PTFE coating | | **E 0** |
| - with ECTFE coating[2] | | **F** |
| - with PFA coating | | **D** |
| • Monel 400, mat. No. 2.4360 | | **G** |
| • Hastelloy C276, mat. No. 2.4819 | | **J** |
| • Hastelloy C4, mat. No. 2.4610 | | **U** |
| • Tantalum | | **K** |
| • Duplex 2205, mat. no. 1.4462 | | **Q** |
| • Duplex 2205, mat. no. 1.4462, incl. main body | | **R** |
| • Stainless steel 316L, gold plated, thickness approx. 25 µm | | **S 0** |
| Other version<br>Add Order code and plain text:<br>Wetted parts materials: ... | | **Z** **K 1 Y** |
| **Tube length** | | |
| • without tube | | **0** |
| Other version:<br>Add Order code and plain text:<br>Tube length: ... | | **9** **L 1 Y** |

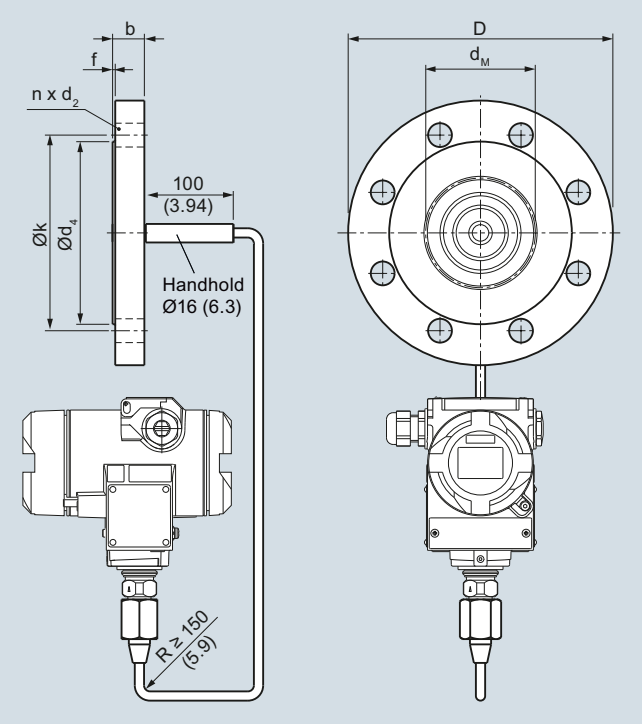
| Selection and Ordering data | | Article No. Ord. code |
|---|---|---|
| **Diaphragm seal** | | |
| Flange design, with flexible capillary, connected to a pressure transmitter SITRANS P (order separately): | | |
| **for pressure** 7MF403.-... and 7MF423.-... together with Order code "V01" (vacuum-proof design) and 7MF802.-...[1]; scope of delivery: 1 off | | **7MF4920-** |
| **for absolute pressure** 7MF433.-...; scope of delivery: 1 off | | **7MF4921-** |
| **for differential pressure and flow** 7MF443.-... and 7MF54..-...; scope of delivery: 2 off | | **7MF4923-** |
| | | **1 ■■■■-■B ■■■** |
| **Filling liquid** | | |
| • Silicone oil M5 | | **1** |
| • Silicone oil M50 | | **2** |
| • High-temperature oil | | **3** |
| • Halocarbon oil (for measuring $O_2$)[3] | | **4** |
| • Food oil (FDA listed) | | **7** |
| Other version<br>Add Order code and plain text:<br>Filling liquid: ... | | **9** **M 1 Y** |
| **Length of capillary**[4] | | |
| • 1.0 m | (3.28 ft) | **2** |
| • 1.6 m | (5.25 ft) | **3** |
| • 2.5 m | (8.20 ft) | **4** |
| • 4.0 m | (13.1 ft) | **5** |
| • 6.0 m | (19.7 ft) | **6** |
| • 8.0 m | (26.25 ft) | **7** |
| • 10.0 m | (32.8 ft) | **8** |
| **Special lengths for capillaries** | | |
| • 2.0 m | | **9** **N 1 C** |
| • 3.0 m | | **9** **N 1 E** |
| • 5.0 m | | **9** **N 1 G** |
| • 7.0 m | | **9** **N 1 J** |
| • 9.0 m | | **9** **N 1 L** |
| only for 7MF4923-... | | |
| • 11.0 m | | **9** **N 1 N** |
| • 12.0 m | | **9** **N 1 P** |
| • 13.0 m | | **9** **N 1 Q** |
| • 14.0 m | | **9** **N 1 R** |
| • 15.0 m | | **9** **N 1 S** |

1) With 7MF802.-... and the measuring cells Q, S, T and U also order the vacuum-tight version.
2) For vacuum on request.
3) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery.
4) Max. capillary length, see section "Technical description".

| Selection and Ordering data | Order code |
|---|---|
| *Further designs*<br>Please add "**-Z**" to Article No. and specify Order code. | |
| **Spark arrestor**<br>With spark arrestor for mounting on zone 0 (including documentation) for transmitters for | |
| • pressure and absolute pressure | **A01** |
| • differential pressure | **A02** |
| **Remote seal nameplate**<br>Attached out of stainless steel, contains MLFB and order number of the remote seal | **B20** |
| **Oil- and grease-free cleaned version**<br>Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2 | **C10** |
| **Quality inspection certificate (Five-step factory calibration) to IEC 60770-2** | **C11** |
| **Inspection certificate**<br>to EN 10204, section 3.1 | **C12** |
| **2.2 Certificate of FDA approval of fill oil**<br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)" | **C17** |
| **Functional safety certificate ("SIL 2") to IEC 61508**<br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter) | **C20** |
| **Functional safety certificate ("SIL 2/3") to IEC 61508**<br>(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter) | **C23** |
| **Certification acc. to NACE MR-0175**<br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | **D07** |
| **Certification acc. to NACE MR-0103**<br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | **D08** |
| **Oil- and grease-free cleaned version**<br>Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2 | **E10** |
| **Epoxy painting**<br>(not possible with vacuum-proof design and not for 7MF4921-...)<br>Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42.., only possible with process connection G½B according to EN837-1. | **E15** |

| Selection and Ordering data | Order code |
|---|---|
| *Further designs*<br>Please add "**-Z**" to Article No. and specify Order code. | |
| **Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA**<br>instead of sealing surface B2 or RFSF (only for wetted parts made of Hastelloy C276 (2.4819), tantalum and Duplex 2205 (1.4462) and for nominal sizes 2", 3", DN 50 and DN 80) | **J12** |
| **Sealing surface groove, EN 1092-1, form D**<br>instead of sealing surface B1 (only for wetted parts made of stainless steel 316L) | **J14** |
| **Sealing surface RJF (groove) ASME B16.5**<br>instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L) | **J24** |
| **PE protective tube**<br>over the spiral protective tube (color: white) of the capillaries | |
| 1.0 m | **N20** |
| 1.6 m | **N21** |
| 2.0 m | **N22** |
| 2.5 m | **N23** |
| 3.0 m | **N24** |
| 4.0 m | **N25** |
| 5.0 m | **N26** |
| 6.0 m | **N27** |
| 7.0 m | **N28** |
| 8.0 m | **N29** |
| 9.0 m | **N30** |
| 10.0 m | **N31** |
| only for 7MF4923-... | |
| 11.0 m | **N32** |
| 12.0 m | **N33** |
| 13.0 m | **N34** |
| 14.0 m | **N35** |
| 15.0 m | **N36** |
| **Vacuum-proof design**<br>for use in low-pressure range for transmitters for | |
| • Gauge and absolute pressure from the pressure series | **V01** |
| • Differential pressure | **V03** |

## Dimensional drawings




Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)

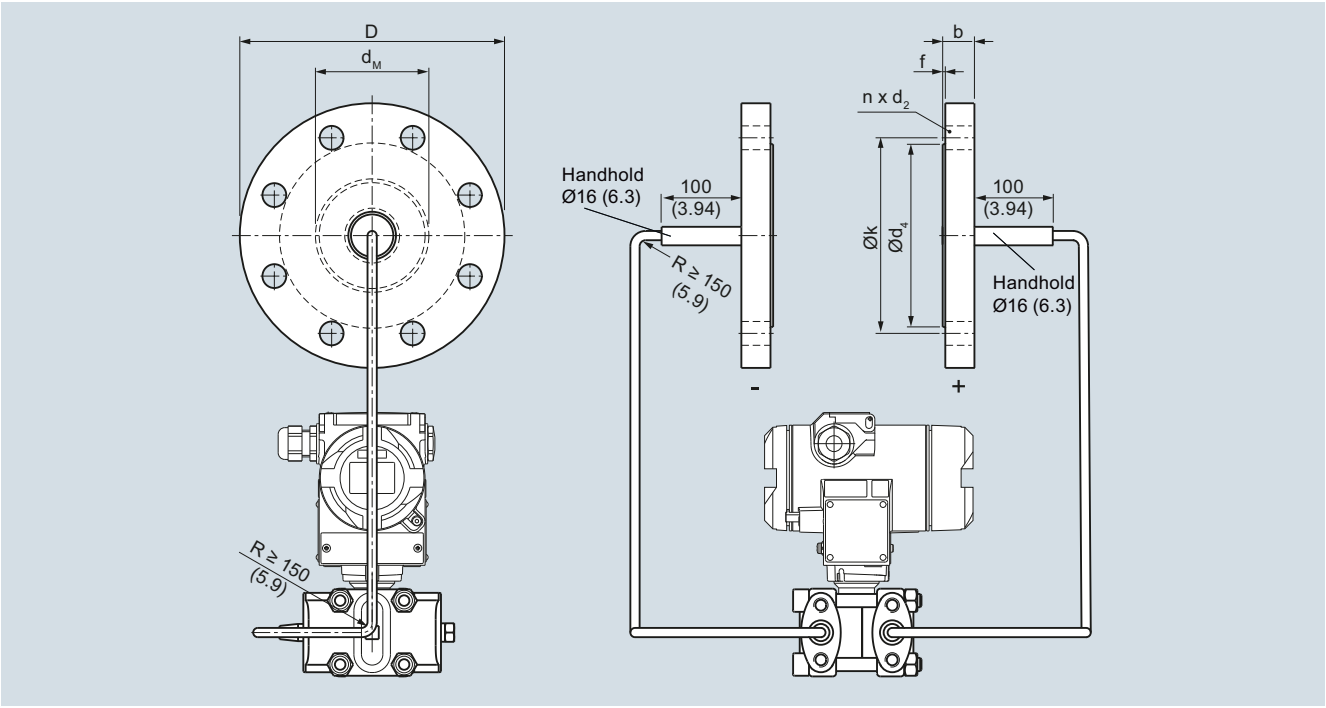
### *Connection to EN 1092-1*

| Nom. diam. | Nom. press. | b mm | D mm | $d_2$ mm | $d_4$ mm | $d_M$ mm | f mm | k mm | n |
|---|---|---|---|---|---|---|---|---|---|
| DN 50 | PN 10/16/ 25/40 | 20 | 165 | 18 | 102 | 59 | 2 | 125 | 4 |
| | PN 100 | 28 | 195 | 26 | 102 | 59 | 2 | 145 | 4 |
| DN 80 | PN 10/16/ | 24 | 200 | 18 | 138 | 89 | 2 | 160 | 8 |
| | PN 100 | 32 | 230 | 26 | 138 | 89 | 2 | 180 | 8 |
| DN 100 | PN 10/16 | 20 | 220 | 18 | 158 | 89 | 2 | 180 | 8 |
| | PN 25/40 | 24 | 235 | 22 | 162 | 89 | 2 | 190 | 8 |
| DN 125 | PN 16 | 22 | 250 | 18 | 188 | 124 | 2 | 210 | 8 |
| | PN 40 | 26 | 270 | 26 | 188 | 124 | 2 | 220 | 8 |

### *Connection to ASME B16.5*

| Nom. diam. | Nom. press. lb/sq.in. | b mm (inch) | D mm (inch) | $d_2$ mm (inch) | $d_4$ mm (inch) | $d_M$ mm (inch) | f mm (inch) | k mm (inch) | n |
|---|---|---|---|---|---|---|---|---|---|
| 2 inch | 150 | 19.5 (0.77) | 150 (5.80) | 20 (0.79) | 92 (3.62) | 59 (2.32) | 2 (0.08) | 120.5 (4.74) | 4 |
| | 300 | 22.7 (0.89) | 165 (6.50) | 20 (0.79) | 92 (3.62) | 59 (2.32) | 2 (0.08) | 127 (5) | 8 |
| | 400/600 | 32.4 (1.28) | 165 (6.50) | 20 (0.79) | 92 (3.62) | 59 (2.32) | 2 (0.08) | 127 (5) | 8 |
| | 900/1500 | 45.1 (1.78) | 215 (8.46) | 26 (1.02) | 92 (3.62) | 59 (2.32) | 7 (0.28) | 165 (6.5) | 8 |
| 3 inch | 150 | 24.3 (0.96) | 190 (7.48) | 20 (0.79) | 127 (5) | 89 (3.50) | 2 (0.08) | 152.5 (6) | 4 |
| | 300 | 29 (1.14) | 210 (8.27) | 22 (0.87) | 127 (5) | 89 (3.50) | 2 (0.08) | 168.5 (6.63) | 8 |
| | 600 | 38.8 (1.53) | 210 (8.27) | 22 (0.87) | 127 (5) | 89 (3.50) | 7 (0.28) | 168.5 (6.63) | 8 |
| 4 inch | 150 | 24.3 (0.96) | 230 (9.06) | 20 (0.79) | 158 (6.22) | 89 (3.50) | 2 (0.08) | 190.5 (7.5) | 4 |
| | 300 | 32.2 (1.27) | 255 (10.04) | 22 (0.87) | 158 (6.22) | 89 (3.50) | 2 (0.08) | 200 (7.87) | 8 |
| | 400 | 42 (1.65) | 255 (10.04) | 26 (1.02) | 158 (6.22) | 89 (3.50) | 7 (0.28) | 200 (7.87) | 8 |
| 5 inch | 150 | 24.3 (0.96) | 255 (10.04) | 22 (0.87) | 186 (7.32) | 124 (4.88) | 2 (0.08) | 216 (8.50) | 4 |
| | 300 | 35.8 (1.41) | 280 (11.02) | 22 (0.87) | 186 (7.32) | 124 (4.88) | 2 (0.08) | 235 (9.25) | 8 |
| | 400 | 45.1 (1.79) | 280 (11.02) | 26 (1.02) | 186 (7.32) | 124 (4.88) | 7 (0.28) | 235 (9.25) | 8 |

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5
$d_M$: Effective diaphragm diameter




Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or for differential pressure and flow, dimensions in mm (inch)

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

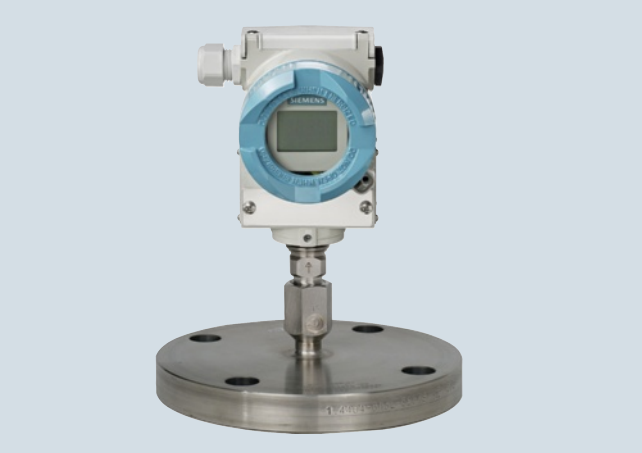
| Nom. diam. | Nom. press. | b mm | D mm | $d_2$ mm | $d_4$ mm | $d_M$ mm | f mm | k mm | n |
|---|---|---|---|---|---|---|---|---|---|
| DN 80 | PN 10/16 | 24 | 200 | 18 | 138 | 89 | 2 | 160 | 8 |
| | PN 100 | 32 | 230 | 26 | 138 | 89 | 2 | 180 | 8 |
| DN 100 | PN 10/16 | 20 | 220 | 18 | 158 | 89 | 2 | 180 | 8 |
| | PN 25/40 | 24 | 235 | 22 | 162 | 89 | 2 | 190 | 8 |
| DN 125 | PN 16 | 22 | 250 | 18 | 188 | 124 | 2 | 210 | 8 |
| | PN 40 | 26 | 270 | 26 | 188 | 124 | 2 | 220 | 8 |

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

| Nom. diam. | Nom. press. lb/sq.in. | b mm (inch) | D mm (inch) | $d_2$ mm (inch) | $d_4$ mm (inch) | $d_M$ mm (inch) | f mm (inch) | k mm (inch) | n |
|---|---|---|---|---|---|---|---|---|---|
| 3 inch | 150 | 24.3 (0.96) | 190 (7.48) | 20 (0.79) | 127 (5) | 89 (3.50) | 2 (0.08) | 152.5 (6) | 4 |
| | 300 | 29 (1.14) | 210 (8.27) | 22 (0.87) | 127 (5) | 89 (3.50) | 2 (0.08) | 168.5 (6.63) | 8 |
| | 600 | 38.8 (1.52) | 210 (8.27) | 22 (0.87) | 127 (5) | 89 (3.50) | 7 (0.28) | 168.5 (6.63) | 8 |
| 4 inch | 150 | 24.3 (0.96) | 230 (9.06) | 20 (0.79) | 158 (6.22) | 89 (3.50) | 2 (0.08) | 190.5 (7.5) | 4 |
| | 300 | 32.2 (1.27) | 255 (10.04) | 22 (0.87) | 158 (6.22) | 89 (3.50) | 2 (0.08) | 200 (7.87) | 8 |
| | 400 | 42 (1.65) | 255 (10.04) | 26 (1.02) | 158 (6.22) | 89 (3.50) | 7 (0.28) | 200 (7.87) | 8 |
| 5 inch | 150 | 24.3 (0.96) | 255 (10.04) | 22 (0.87) | 186 (7.32) | 124 (4.88) | 2 (0.08) | 216 (8.50) | 4 |
| | 300 | 35.8 (1.41) | 280 (11.02) | 22 (0.87) | 186 (7.32) | 124 (4.88) | 2 (0.08) | 235 (9.25) | 8 |
| | 400 | 45.1 (1.79) | 280 (11.02) | 26 (1.02) | 186 (7.32) | 124 (4.88) | 7 (0.28) | 235 (9.25) | 8 |

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5
$d_M$: Effective diaphragm diameter

## Overview



Diaphragm seals of flange design, directly fitted on a pressure transmitter for pressure

## Technical specifications

| **Diaphragm seals (flange design) for pressure and absolute pressure, directly fitted on a transmitter** | |
|---|---|
| Nominal diameter | Nominal pressure |
| • DN 50 | PN 10/16/25/40, PN 100 |
| • DN 80 | PN 10/16/25/40, PN 100 |
| • DN 100 | PN 10/16, PN 25/40 |
| • 2 inch | class 150, class 300, class 400/600, class 900/1500 |
| • 3 inch | Class 150, class 300, class 600 |
| • 4 inch | Class 150, class 300, class 400 |
| Sealing face | |
| • For stainless steel, mat. No. 1.4404/316L | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA |
| • For the other materials | Smooth to EN 1092-1, form B2 or ASME B16.5 RFSF |
| Materials | |
| • Main body | Stainless steel mat. no. 1.4404/316L |
| • Wetted parts | Stainless steel mat. no. 1.4404/316L |
| | • Without coating |
| | • PTFE coating (for vacuum on request) |
| | • ECTFE coating (for vacuum on request) |
| | • PFA coating (for vacuum on request) |
| | Monel 400, mat. No. 2.4360 |
| | Hastelloy C276, mat. No. 2.4819 |
| | Hastelloy C4, mat. No. 2.4610 |
| | Tantalum |
| | Duplex 2205, mat. no. 1.4462 |
| | Stainless steel 316L, gold plated, thickness approx. 25 µm |
| • Capillary | Stainless steel, 1.4571/316Ti |
| • Sealing material at the transmitter connection | Copper |
| Maximum pressure | See above and the technical data of the transmitter |
| Tube length | • Without tube |
| | • 50 mm (1.97 inch) |
| | • 100 mm (3.94 inch) |
| | • 150 mm (5.91 inch) |
| | • 200 mm (7.87 inch) |
| Capillary | |
| • Length | Max. 10 m (32.8 ft), longer lengths on request |
| • 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 (for measuring $O_2$) |
| | • Food oil (FDA listed) |
| Max. recommended process temperature | 170 °C (338 °F) |
| Permissible ambient temperature | Dependent on the pressure transmitter and the filling liquid of the remote seal. More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals. |
| Weight | Approx. 4 kg (8.82 lb) |
| **Certificate and approvals** | |
| Classification according to pressure equipment directive (DRGL 97/23/EC) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) |

1

## Diaphragm seals of flange design directly fitted on transmitter

| Selection and Ordering data | Article No. Ord.code |
|---|---|
| **Diaphragm seal** ↗ | **7MF4910-** |
| Directly fitted to a pressure transmitter SITRANS P for pressure 7MF403.-... and 7MF423.-... together with Order code "V01" (vacuum-proof design) and 7MF802.-...[1]; must be ordered separately | |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | |
| **Process connection** | |
| • Vertical (pressure transmitter upright) | 0 |
| • Horizontal | 2 |
| **Nominal diameter and nominal pressure** | |
| • DN 50 PN 10/16/25/40 | A |
| PN 100 | B |
| • DN 80 PN 10/16/25/40 | D |
| PN 100 | E |
| • DN 100 PN 10/16 | G |
| PN 25/40 | H |
| • 2 inch Class 150 | L |
| Class 300 | M |
| class 400/600 | N |
| class 900/1500 | P |
| • 3 inch Class 150 | Q |
| Class 300 | R |
| Class 600 | S |
| • 4 inch Class 150 | T |
| Class 300 | U |
| Class 400 | V |
| Smooth sealing face to DIN 1092-01, form B1 or B2, or to ASME B16.5 125 ... 250 AA or RFSF | |
| Other version<br>Add Order code and plain text:<br>Nominal diameter: ...; Nominal pressure: ... | Z J 1 Y |
| **Wetted parts materials** | |
| • Stainless steel 316L | |
| - without coating | A |
| - with PTFE coating | E 0 |
| - with ECTFE coating[2] | F |
| - with PFA coating | D |
| • Monel 400, mat. No. 2.4360 | G |
| • Hastelloy C276, mat. No. 2.4819 | J |
| • Hastelloy C4, mat. No. 2.4610 | U |
| • Tantalum | K |
| • Duplex 2205, W.-Nr. 1.4462 | Q |
| • Stainless steel 316L, gold plated, thickness approx. 25 µm | S 0 |
| **Tube length** | |
| • Without tube | 0 |
| • 50 mm • (1.97 inch) | 1 |
| • 100 mm • (3.94 inch) | 2 |
| • 150 mm • (5.90 inch) | 3 |
| • 200 mm • (7.87 inch) | 4 |
| Other version:<br>Add Order code and plain text:<br>Wetted parts materials: ...,<br>Tube length: ... | Z 8 K 1 Y |

| Selection and Ordering data | Article No. Ord.code |
|---|---|
| **Diaphragm seal** | **7MF4910-** |
| Directly fitted to a pressure transmitter SITRANS P for pressure 7MF403.-... and 7MF423.-... together with Order code "V01" (vacuum-proof design) and 7MF802.-...[1]; must be ordered separately | |
| **Filling liquid** | |
| • Silicone oil M5 | 1 |
| • Silicone oil M50 | 2 |
| • High-temperature oil | 3 |
| • Halocarbon oil (for measuring $O_2$)[3] | 4 |
| • Food oil (FDA listed) | 7 |
| Other version<br>Add Order code and plain text:<br>Filling liquid: ... | 9 M 1 Y |

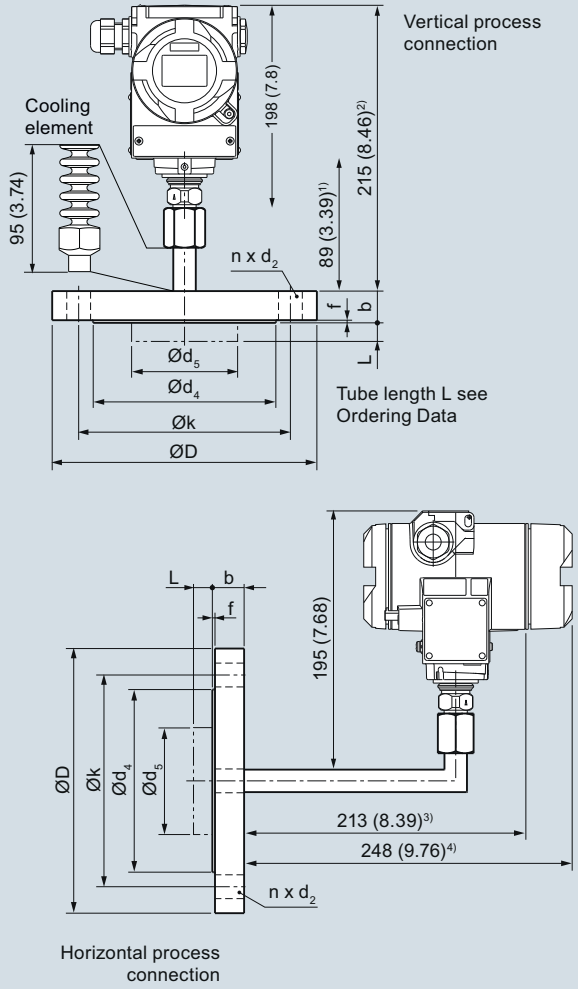
1) With 7MF802.-... and the measuring cells Q, S, T and U also order the vacuum-tight version.
2) For vacuum on request.
3) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery.

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code. | |
| **Spark arrestor** | **A01** |
| With spark arrestor for mounting on zone 0 (including documentation) for transmitters for gauge pressure and absolute pressure | |
| **Remote seal nameplate** | **B20** |
| Attached out of stainless steel, contains MLFB and order number of the remote seal | |
| **Oil- and grease-free cleaned version** | **C10** |
| Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2 | |
| **Quality inspection certificate (Five-step factory calibration) to IEC 60770-2** | **C11** |
| **Inspection certificate** | **C12** |
| to EN 10204, section 3.1 | |
| **2.2 Certificate of FDA approval of fill oil** | **C17** |
| Only in conjunction with "Food-grade oil" fill liquid (FDA listed)" | |
| **Functional safety certificate ("SIL 2") to IEC 61508** | **C20** |
| (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter) | |
| **Functional safety certificate ("SIL 2/3") to IEC 61508** | **C23** |
| (Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter) | |
| **Certification acc. to NACE MR-0175** | **D07** |
| Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | |
| **Certification acc. to NACE MR-0103** | **D08** |
| Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | |
| **Oil- and grease-free cleaned version** | **E10** |
| Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2 | |
| **Epoxy painting** | **E15** |
| Not possible with vacuum-proof design | |
| Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42.., only possible with process connection G½B according to EN837-1. | |

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code. | |
| **Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA** | **J12** |
| Instead of sealing surface B2 and RFSF (Only for wetted parts in Hastelloy C276 (2.4819), Tantal and Duplex 2205 (1.4462) and for sizes 2", 3", DN 50 and DN 80) | |
| **Sealing surface groove, EN 1092-1, form D** | **J14** |
| instead of sealing surface B1 (only for wetted parts made of stainless steel 316L) | |
| **Sealing surface RJF (groove) ASME B16.5** | **J24** |
| instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L) | |
| **Elongated pipe** | **R20** |
| 200 mm instead of 89 mm, max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid. | |
| **Elongated pipe elbow** | **R21** |
| 200 mm instead of 130 mm, max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid. | |
| **Cooling element** | **R22** |
| max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid. | |
| **Vacuum-proof design** | **V01** |
| for use in low-pressure range for transmitters for gauge and absolute pressure from the pressure series | |

## Diaphragm seals of flange design directly fitted on transmitter

### Dimensional drawings




1) 200 (7.9) with option R20, 278 (11.0) with cooling element opt. R22)
2) 324 (12.8) mit option R20, 326 (12.9) with cooling element opt. R22)
3) 283 (11.14) mit option R21
4) 318 (12.52) mit option R21

Diaphragm seals of flange design, direct connection to a SITRANS P pressure transmitter (process connection vertical (top) and horizontal (bottom)), dimensions in mm (inch)

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

| Nom. diam. | Nom. press. | b | D | $d_2$ | $d_4$ | $d_5$ | $d_M$ | f | k | n |
|---|---|---|---|---|---|---|---|---|---|---|
| | | mm | mm | mm | mm | mm | mm | mm | mm | |
| DN 50 | PN 10/16/ 25/40 | 20 | 165 | 18 | 102 | 48.3 | 45[1)] | 2 | 125 | 4 |
| | PN 100 | 28 | 195 | 26 | 102 | 48.3 | 45[1)] | 2 | 145 | 4 |
| DN 80 | PN 10/16/ 25/40 | 24 | 200 | 18 | 138 | 76 | 72[1)] | 2 | 160 | 8 |
| | PN 100 | 32 | 230 | 26 | 138 | 76 | 72[1)] | 2 | 180 | 8 |
| DN 100 | PN 10/16 | 20 | 220 | 18 | 158 | 94 | 89-2 | 2 | 180 | 8 |
| | PN 25/40 | 24 | 235 | 22 | 162 | 94 | 89 | 2 | 190 | 8 |

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

| Nom. diam. | Nom. press. | b | D | $d_2$ | $d_4$ | $d_5$ | $d_M$ | f | k | n |
|---|---|---|---|---|---|---|---|---|---|---|
| | lb/ sq.in. | mm (inch) | mm (inch) | mm (inch) | mm (inch) | mm (inch) | mm (inch) | mm (inch) | mm (inch) | |
| 2 inch | 150 | 19.5 | 150 | 20 | 92 | 48.3 | 45[1)] | 2 | 120.5 | 4 |
| | | (0.77) | (5.91) | (0.79) | (3.62) | (1.9) | (1.77)[1)] | (0.08) | (4.74) | |
| | 300 | 22.7 | 165 | 20 | 92 | 48.3 | 45[1)] | 2 | 127 | 8 |
| | | (0.89) | (6.5) | (0.79) | (3.62) | (1.9) | (1.77)[1)] | (0.08) | (5) | |
| | 400/ 600 | 32.4 | 165 | 20 | 92 | 48.3 | 45[1)] | 7 | 127 | 8 |
| | | (1.28) | (6.5) | (0.79) | (3.62) | (1.9) | (1.77)[1)] | (0.28) | (5) | |
| | 900/ 1500 | 45.1 | 215 | 26 | 92 | 48.3 | 45[1)] | 7 | 165 | 8 |
| | | (1.78) | (8.46) | (1.02) | (3.62) | (1.9) | (1.77)[1)] | (0.28) | (6.5) | |
| 3 inch | 150 | 24.3 | 190 | 20 | 127 | 76 | 72[2)] | 2 | 152.5 | 4 |
| | | (0.96) | (7.48) | (0.79) | (5) | (3) | (2.83)[2)] | (0.08) | (6) | |
| | 300 | 29 | 210 | 22 | 127 | 76 | 72[2)] | 2 | 168.5 | 8 |
| | | (1.14) | (8.27) | (0.87) | (5) | (3) | (2.83)[2)] | (0.08) | (6.63) | |
| | 600 | 38.8 | 210 | 22 | 127 | 76 | 72[2)] | 7 | 168.5 | 8 |
| | | (1.53) | (8.27) | (0.87) | (5) | (3) | (2.83)[2)] | (0.28) | (6.63) | |
| 4 inch | 150 | 24.3 | 230 | 20 | 158 | 94 | 89 | 2 | 190.5 | 8 |
| | | (0.96) | (9.06) | (0.79) | (6.22) | (3.69) | (3.50) | (0.08) | (7.5) | |
| | 300 | 32.2 | 255 | 22 | 158 | 94 | 89 | 2 | 200 | 8 |
| | | (1.27) | (10.04) | (0.79) | (6.22) | (3.69) | (3.50) | (0.08) | (7.87) | |
| | 400 | 42 | 255 | 26 | 158 | 94 | 89 | 7 | 200 | 8 |
| | | (1.65) | (10.04) | (1.02) | (6.22) | (3.69) | (3.50) | (0.28) | (7.87) | |

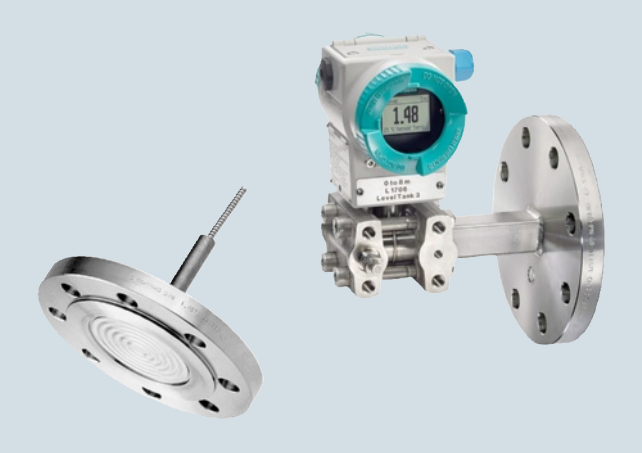
d: Inside diameter of gasket according to EN 1092-1/ ASME B16.5

$d_M$: Effective diaphragm diameter

1) 59 mm = 2.32 inch with tube length L = 0

2) 89 mm = 3½ inch with tube length L = 0

## Overview



Diaphragm seals of screwed design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

## Technical specifications

| **Diaphragm seals of screwed design for pressure transmitters for differential pressure, fixed connection and with flexible capillary** | |
|---|---|
| Nominal diameter | Nominal pressure |
| • DN 50 | PN 10/16/25/40, PN 100 |
| • DN 80 | PN 10/16/25/40 |
| • DN 100 | PN 10/16, PN 25/40 |
| • 2 inch | class 150, class 300, class 400/600, class 900/1500 |
| • 3 inch | Class 150, class 300 |
| • 4 inch | Class 150, class 300 |
| Sealing face | |
| • For stainless steel, mat. No. 1.4404/316L | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA |
| • For the other materials | To EN 1092-1, form B2 or ASME B16.5 RFSF |
| Materials | |
| • Main body | Stainless steel mat. no. 1.4404/316L |
| • Wetted parts | Stainless steel mat. no. 1.4404/316L |
| | • Without coating |
| | • PTFE coating (for vacuum on request) |
| | • ECTFE coating (for vacuum on request) |
| | • PFA coating (for vacuum on request) |
| | Monel 400, mat. No. 2.4360 |
| | Hastelloy C276, mat. No. 2.4819 |
| | Hastelloy C4, mat. No. 2.4610 |
| | Tantalum |
| | Duplex 2205, mat. no. 1.4462 |
| | Stainless steel 316L, gold plated, thickness approx. 25 µm |
| • Capillary | Stainless steel, mat. No. 1.4571/316Ti |
| • Sheath | Spiral hose made of stainless steel, mat. No. 1.4301/316 |

| | |
|---|---|
| Sealing material in the process flanges | |
| • For pressure transmitters, absolute pressure transmitters and low-pressure applications | Copper |
| • For other applications | Viton |
| Maximum pressure | See above and the technical data of the pressure transmitter |
| Tube length | Without tube |
| | 50 mm (1.97 inch) |
| | 100 mm (3.94 inch) |
| | 150 mm (5.91 inch) |
| | 200 mm (7.87 inch) |
| Capillary | |
| • Length | Max. 10 m (32.8 ft), longer lengths on request |
| • 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 (for measuring $O_2$) |
| | Food oil (FDA listed) |
| Max. recommended process temperature | 170 °C (338 °F) |
| Permissible ambient temperature | Dependent on the pressure transmitter and the filling liquid of the remote seal |
| | More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals |
| Weight | Approx. 4 kg (8.82 lb) |
| **Certificate and approvals** | |
| Classification according to pressure equipment directive (DRGL 97/23/EC) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) |

| Selection and Ordering data | | Article No. Ord. code |
|---|---|---|
| **Diaphragm seal** | | 7MF4913- |
| **Mounting flange (with tube as option)** for direct mounting to high-pressure side **and flanged remote seal without tube**, fitted by means of capillary to low-pressure side of SITRANS P for differential pressure, DS III series (7MF443.-...) and SITRANS P500 (7MF54..-...) | | 1 ■■■■-■B ■■■ |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | |
| **Flange, connection to EN 1092-1** | | |
| **Nom. diam.** | **Nom. press.** | |
| • DN 50 | PN 10/16/25/40 | A |
| | PN 100 | B |
| • DN 80 | PN 10/16/25/40 | D |
| • DN 100 | PN 10/16 | G |
| | PN 25/40 | H |
| **Flange, connection to ASME B16.5** | | |
| **Nom. diam.** | **Nom. press.** | |
| • 2 inch | class 150 | L |
| | class 300 | M |
| | class 400/600 | N |
| | class 900/1500 | P |
| • 3 inch | Class 150 | Q |
| | Class 300 | R |
| • 4 inch | Class 150 | T |
| | Class 300 | U |
| Other version<br>Add Order code and plain text:<br>Flange: ..., Nominal diameter: ...; Nominal pressure: ... | | Z J1Y |
| **Wetted parts materials** | | |
| Smooth sealing face to EN 1092-1, form B1 or B2, or to ASME B16.5 RF 125 ... 250 AA or RFSF | | |
| • Stainless steel 316L | | |
| - without coating | | A |
| - with PTFE coating | | E0 |
| - with ECTFE coating[1] | | F |
| - with PFA coating | | D |
| • Monel 400, mat. No. 2.4360 | | G |
| • Hastelloy C276, mat. No. 2.4819 | | J |
| • Hastelloy C4, mat. No. 2.4610 | | U |
| • Tantalum | | K |
| • Duplex, mat. no. 1.4462 | | Q |
| • Duplex, mat. no. 1.4462, incl. main body | | R |
| • Stainless steel 316L, gold plated, thickness approx. 25 µm | | S0 |
| **Tube length** | | |
| (for mounting flange on high-pressure side) | | |
| • Without tube | | 0 |
| • 50 mm (1.97 inch) | | 1 |
| • 100 mm (3.94 inch) | | 2 |
| • 150 mm (5.90 inch) | | 3 |
| • 200 mm (7.87 inch) | | 4 |
| Other version:<br>Add Order code and plain text:<br>Wetted parts materials: .....,<br>Tube length: ... | | Z8 K1Y |
| **Filling liquid** | | |
| • Silicone oil M5 | | 1 |
| • Silicone oil M50 | | 2 |
| • High-temperature oil | | 3 |
| • Halocarbon oil (for measuring $O_2$)[2] | | 4 |
| • Food oil (FDA listed) | | 7 |
| Other version<br>Add Order code and plain text:<br>Filling liquid: ... | | 9 M1Y |

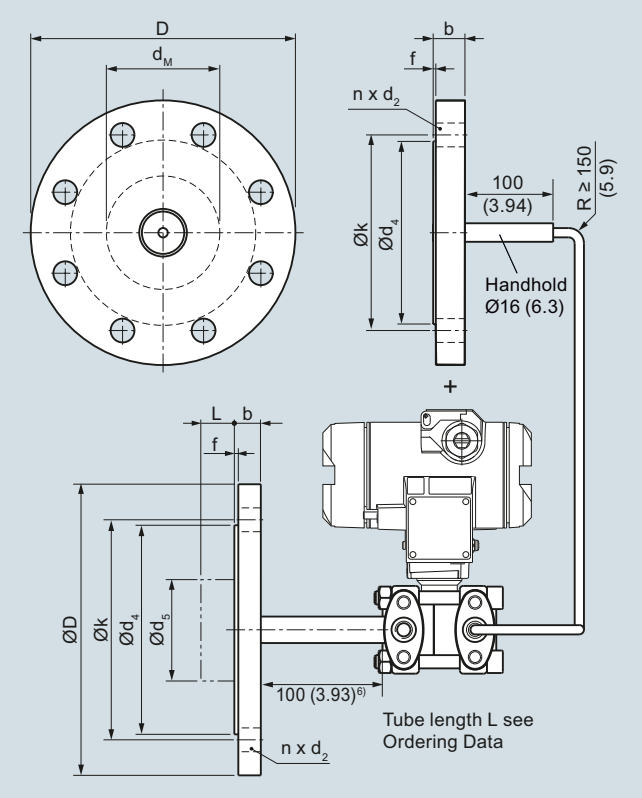
| Selection and Ordering data | | Article No. Ord. code |
|---|---|---|
| **Diaphragm seal** | | 7MF4913- |
| **Mounting flange (with tube as option)** for direct mounting to high-pressure side **and flanged remote seal without tube**, fitted by means of capillary to low-pressure side of SITRANS P for differential pressure, DS III series (7MF443.-...) and SITRANS P500 (7MF54..-...) | | 1 ■■■■-■B ■■■ |
| **Length of capillary[3]** | | |
| • 1.0 m | (3.28 ft) | 2 |
| • 1.6 m | (5.25 ft) | 3 |
| • 2.5 m | (8.20 ft) | 4 |
| • 4.0 m | (13.1 ft) | 5 |
| • 6.0 m | (19.7 ft) | 6 |
| • 8.0 m | (26.25 ft) | 7 |
| • 10.0 m | (32.8 ft) | 8 |
| **Special lengths for capillaries** | | |
| • 2.0 m | | 9 N1C |
| • 3.0 m | | 9 N1E |
| • 5.0 m | | 9 N1G |
| • 7.0 m | | 9 N1J |
| • 9.0 m | | 9 N1L |

1) For vacuum on request.
2) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery.
3) Max. capillary length, see section "Technical description".

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code. | |
| **Spark arrestor**<br>With spark arrestor for mounting on zone 0 (including documentation) | **A02** |
| **Remote seal nameplate**<br>Attached out of stainless steel, contains MLFB and order number of the remote seal | **B20** |
| **Oil- and grease-free cleaned version**<br>Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2 | **C10** |
| **Quality inspection certificate (Five-step factory calibration) to IEC 60770-2** | **C11** |
| **Inspection certificate**<br>to EN 10204, section 3.1 | **C12** |
| **2.2 Certificate of FDA approval of fill oil**<br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)" | **C17** |
| **Functional safety certificate ("SIL 2") to IEC 61508**<br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter) | **C20** |
| **Functional safety certificate ("SIL 2/3") to IEC 61508**<br>(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter) | **C23** |
| **Certification acc. to NACE MR-0175**<br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | **D07** |
| **Certification acc. to NACE MR-0103**<br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | **D08** |
| **Oil- and grease-free cleaned version**<br>Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2 | **E10** |
| **Epoxy painting**<br>Not possible with vacuum-proof design.<br>Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42.., only possible with process connection G½B according to EN837-1. | **E15** |
| **Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA**<br>Instead of sealing surface B2 and RFSF (Only for wetted parts in Hastelloy C276 (2.4819), Tantal and Duplex 2205 (1.4462) and for sizes 2“, 3“, DN 50 and DN 80) | **J12** |
| **Sealing surface groove, EN 1092-1, form D**<br>instead of sealing surface B1 (only for wetted parts made of stainless steel 316L) | **J14** |
| **Sealing surface RJF (groove) ASME B16.5**<br>instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L) | **J24** |

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code. | |
| **PE protective tube**<br>over the spiral protective tube (color: white) of the capillaries | |
| 1.0 m | **N20** |
| 1.6 m | **N21** |
| 2.0 m | **N22** |
| 2.5 m | **N23** |
| 3.0 m | **N24** |
| 4.0 m | **N25** |
| 5.0 m | **N26** |
| 6.0 m | **N27** |
| 7.0 m | **N28** |
| 8.0 m | **N29** |
| 9.0 m | **N30** |
| 10.0 m | **N31** |
| **Elongated pipe, distance from transmitter process flange to flange is 150 mm instead of 100 mm,**<br>max. medium temperature 250 °C, observe the maximum permissible media temperature of the filling liquid. | **R15** |
| **Elongated pipe, distance from transmitter process flange to flange is 100 mm instead of 100 mm,**<br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid. | **R20** |
| **Vacuum-proof design**<br>for use in low-pressure range | **V03** |

## Dimensional drawings




Diaphragm seals of screwed design with flexible capillary, fixed connection, for connection to a SITRANS P pressure transmitter for differential pressure, dimensions in mm (inch)

### *Connection to EN 1092-1*

| Nom. diam. | Nom. press. | b | D | $d_2$ | $d_4$ | $d_5$ | $d_M$ | f | k | n |
|---|---|---|---|---|---|---|---|---|---|---|
| | | mm | mm | mm | mm | mm | mm | mm | mm | |
| DN 50 | PN 10/16/ 25/40 | 20 | 165 | 18 | 102 | 48.3 | 45[1)] | 2 | 125 | 4 |
| | PN 100 | 28 | 195 | 26 | 102 | 48.3 | 45[1)] | 2 | 145 | 4 |
| DN 80 | PN 10/16/ 25/40 | 24 | 200 | 18 | 138 | 76 | 72[2)] | 2 | 160 | 8 |
| | PN 100 | 32 | 230 | 26 | 138 | 76 | 72[2)] | 2 | 180 | 8 |
| DN 100 | PN 10/16 | 20 | 220 | 18 | 158 | 94 | 89 | 2 | 180 | 8 |
| | PN 25/40 | 24 | 235 | 22 | 162 | 94 | 89 | 2 | 190 | 8 |

### *Connection to ASME B16.5*

| Nom. diam. | Nom. press. | b | D | $d_2$ | $d_4$ | $d_5$ | $d_M$ | f | k | n |
|---|---|---|---|---|---|---|---|---|---|---|
| | lb/ sq.in. | mm (inch) | mm (inch) | mm (inch) | mm (inch) | mm (inch) | mm (inch) | mm (inch) | mm (inch) | |
| 2 inch | 150 | 19.5 | 150 | 20 | 92 | 48.3 | 45[1)] | 2 | 120.5 | 4 |
| | | (0.77) | (5.91) | (0.79) | (3.62) | (1.9) | (1.77)[1)] | (0.08) | (4.74) | |
| | 300 | 22.7 | 165 | 20 | 92 | 48.3 | 45[1)] | 2 | 127 | 8 |
| | | (0.89) | (6.5) | (0.79) | (3.62) | (1.9) | (1.77)[1)] | (0.08) | (5) | |
| | 400/ 600 | 32.4 | 165 | 20 | 92 | 48.3 | 45[1)] | 7 | 127 | 8 |
| | | (1.28) | (6.5) | (0.79) | (3.62) | (1.9) | (1.77)[1)] | (0.28) | (5) | |
| | 900/ 1500 | 45.1 | 215 | 26 | 92 | 48.3 | 45[1)] | 7 | 165 | 8 |
| | | (1.78) | (8.46) | (1.02) | (3.62) | (1.9) | (1.77)[1)] | (0.28) | (6.5) | |
| 3 inch | 150 | 24.3 | 190 | 20 | 127 | 76 | 72[2)] | 2 | 152.5 | 4 |
| | | (0.96) | (7.48) | (0.79) | (5) | (3) | (2.83)[2)] | (0.08) | (6) | |
| | 300 | 29 | 210 | 22 | 127 | 76 | 72[2)] | 2 | 168.5 | 8 |
| | | (1.14) | (8.27) | (0.87) | (5) | (3) | (2.83)[2)] | (0.08) | (6.63) | |
| 4 inch | 150 | 24.3 | 230 | 20 | 158 | 94 | 89 | 2 | 190.5 | 8 |
| | | (0.96) | (9.06) | (0.79) | (6.22) | (3.69) | (3.50) | (0.08) | (7.5) | |
| | 300 | 32.2 | 255 | 22 | 158 | 94 | 89 | 2 | 200 | 8 |
| | | (1.27) | (10.04) | (0.79) | (6.22) | (3.69) | (3.50) | (0.08) | (7.87) | |

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

$d_M$: Effective diaphragm diameter

1) 59 mm = 2.32 inch with tube length L = 0

2) 89 mm = 3½ inch with tube length L = 0

## Overview

Diaphragm seal, screwed gland design with inside diaphragm for gauge, absolute and differential pressure for direct mounting

## Technical specifications

| **Diaphragm seal, screwed gland with inside diaphragm** | |
|---|---|
| Process connection | Nominal pressure |
| • Male thread G½B to EN 837-1 | PN 100, PN 250 |
| • External thread ½-14“ NPT-M | PN 100, PN 250 |
| • open measurement flange | |
| - DN 25 | PN 10 ... PN 40 |
| - 1 inch | class 150, class 300 |
| Sealing face for open measurement flange | |
| • For stainless steel, mat. no. 1.4404/316L | To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA |
| Materials | |
| • Lower section (in the case of process connection thread) | Stainless steel, Mat. no. 1.4404/316L |
| • Diaphragm | Stainless steel, Mat. no. 1.4404/316L |
| | • No coating |
| | • With PTFE coating |
| | Monel 400, mat. no. 2.4360 |
| | Hastelloy C276, mat. no. 2.4819 |
| | Hastelloy C4, mat. no. 2.4610 |
| | Tantal |
| | Stainless steel 316L, gold plated, thickness approx. 25 µm |
| • Top section (process connection in the case of an open measurement flange) | Stainless steel, mat. no. 1.4404/316L |
| • Capillary | Stainless steel 1.4571/316Ti |
| • Sealing material on the process connection | Viton or copper (in the case of vacuum-free version) |
| • Sealing material between top and bottom section | Viton (FKM) (standard)<br>Teflon (PTFE)<br>metal spring ring (silver-coated) |
| 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 (for measuring $O_2$) |
| | • Food oil (FDA listed) |
| Max. recommended process temperature | 170 °C (338 °F) |
| Permissible ambient temperature | Dependent on the pressure transmitter and the filling liquid of the remote seal |
| | More information can be found in the technical specifications of the pressure transmitters and in the section "Technical data of filling liquid" in the introduction to the remote seals |
| Weight | Approx. 1.5 kg (3.3 lb) |
| **Certificates and approvals** | |
| Classification according to pressure equipment directive (PED 97/23/EC) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) |

1

## Diaphragm seal, screwed design directly mounted or/and with capillary

| Selection and Ordering data | Article No. Ord. Code |
|---|---|
| **Remote seal, screwed gland with inside diaphragm** | |
| **Mounted on SITRANS P pressure transmitter for** ↗ | **7MF4930-** |
| • **gauge pressure** 7MF403.-... and SITRANS P300, 7MF802.-... | |
| • **absolute pressure** 7MF423.-... and SITRANS P300, 7MF802.-... | |
| In conjunction with Order code "V01" (vacuum-proof design) | |
| **Mounted on either side of SITRANS P pressure transmitter for** ↗ | **7MF4933-** |
| • **differential pressure** 7MF443.-... and 7MF54..-... | |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | ■■■■■-■B ■■■ |
| **Type** | |
| • no flushing hole | 1 |
| • with flushing hole 1x 1/8 NPT unsealed (only with process connection 316L) | 2 |
| Other version, add Order code and plain text: Version: ... | 9 H1Y |
| **Process connection version** | |
| **Lower flange material** / **Process connection** / **Nominal diameter and pressure level** | |
| 316L/1.4404 / Thread / G½B/PN100 | B |
| 316L/1.4404 / Thread / G½B/PN250 | C |
| 316L/1.4404 / Thread / ½NPT-M/PN100 | E |
| 316L/1.4404 / Thread / ½NPT-M/PN250 | F |
| 316L/1.4404 / Thread / ½NPT-F/PN100 | H |
| 316L/1.4404 / Thread / ½NPT-F/PN250 | J |
| 316L/1.4404 / open measurement flange / DN 25/PN 10 ... 40 | N |
| 316L/1.4404 / open measurement flange / 1"/Class 150 | P |
| 316L/1.4404 / open measurement flange / 1"/Class 300 | Q |
| PTFE / Thread / G½B/PN100 | T |
| PTFE / open measurement flange / DN 25/PN 10 ... 40 | U |
| PTFE / open measurement flange / 1"/Class 150 | V |
| PTFE / open measurement flange / 1"/Class 300 | W |
| Other version, add Order code and plain text: Lower flange material: ...; Process connection: ...; Nominal diameter/pressure level: ... | Z J1Y |
| **Diaphragm material** | |
| Stainless steel 316L | A |
| 316L stainless steel with PTFE film | E |
| Hastelloy C276 | J |
| Hastelloy C4 | U |
| Tantalum | K |
| Stainless steel 316L, gold plated, thickness approx. 25 µm | S |
| Other version, add Order code and plain text: Diaphragm material: ... | Z K1Y |

| Selection and Ordering data | Article No. Ord. Code |
|---|---|
| **Remote seal, screwed gland with inside diaphragm** | |
| **Mounted on SITRANS P pressure transmitter for** | **7MF4930-** |
| • **gauge pressure** 7MF403.-... and SITRANS P300, 7MF802.-... | |
| • **absolute pressure** 7MF423.-... and SITRANS P300, 7MF802.-... | |
| In conjunction with Order code "V01" (vacuum-proof design) | |
| **Mounted on either side of SITRANS P pressure transmitter for** | **7MF4933-** |
| • **differential pressure** 7MF443.-... and 7MF54..-... | |
| | ■■■■■-■B ■■■ |
| **Sealing material between top and bottom section** | |
| FKM (standard with diaphragm and 316L process connection) | 1 |
| PTFE (standard with custom material with max. 260 °C) | 2 |
| Metal C- circlip, silver coated for >260 °C) incl. high temperature-resistant screwed gland | 3 |
| **Filling liquid** | |
| • Silicone oil M5 | 1 |
| • Silicone oil M50 | 2 |
| • High-temperature oil | 3 |
| • Halocarbon oil (for measuring $O_2$)[1] | 4 |
| • Food oil (FDA-listed) | 7 |
| Other version, add Order code and plain text: filling liquid: ... | 9 M1Y |
| **Capillary length**[2] | |
| • none, direct mounting | 0 |
| • none, direct mounting with cooling element (not in conjunction with transmitter for differential pressure) | 1 |
| • 1 m | 2 |
| • 1.6 m | 3 |
| • 2.5 m | 4 |
| • 4 m | 5 |
| • 6 m | 6 |
| • 8 m | 7 |
| • 10 m | 8 |
| **Special lengths for capillaries** | |
| • 2.0 m | 9 N1C |
| • 3.0 m | 9 N1E |
| • 5.0 m | 9 N1G |
| • 7.0 m | 9 N1J |
| • 9.0 m | 9 N1L |

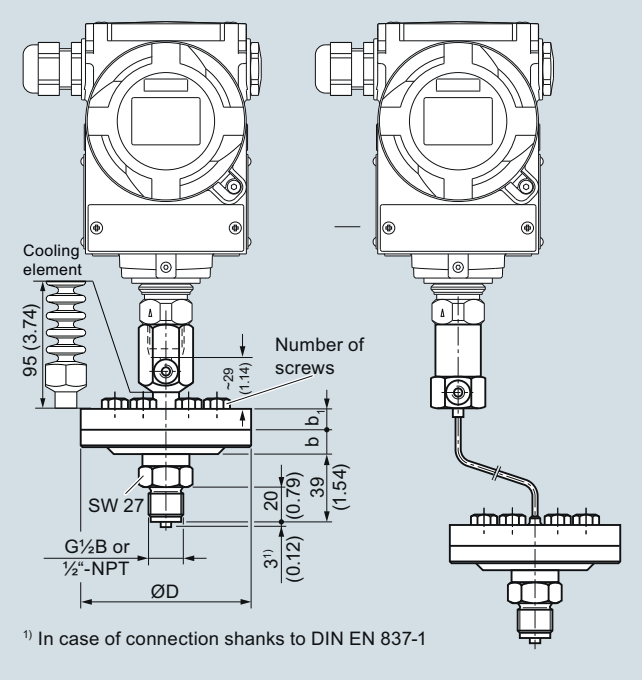
[1] Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery.

[2] Max. capillary length, see section "Technical description".

| Selection and Ordering data | Order code |
|---|---|
| *Further designs* | |
| Add "**-Z**" to Article No. and specify Order code. | |
| **Remote seal nameplate**<br>Attached out of stainless steel, contains MLFB and order number of the remote seal | **B20** |
| **Oil- and grease-free cleaned version**<br>Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2 | **C10** |
| **Quality inspection certificate (Five-step factory calibration) to IEC 60770-2** | **C11** |
| **Inspection certificate**<br>to EN 10204, section 3.1 | **C12** |
| **2.2 Certificate of FDA approval of fill oil**<br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)" | **C17** |
| **Functional safety certificate ("SIL 2") to IEC 61508**<br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter) | **C20** |
| **Functional safety certificate ("SIL 2/3") to IEC 61508**<br>(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter) | **C23** |
| **Certification acc. to NACE MR-0175**<br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | **D07** |
| **Certification acc. to NACE MR-0103**<br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | **D08** |
| **Oil- and grease-free cleaned version**<br>Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2 | **E10** |
| **Epoxy painting**<br>Not possible with vacuum-proof design.<br>Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42.., only possible with process connection G½B according to EN837-1. | **E15** |
| **Sealing surface groove, EN 1092-1, form D**<br>instead of sealing surface B1 (only for wetted parts made of stainless steel 316L) | **J14** |
| **Sealing surface RJF (groove) ASME B16.5**<br>instead of sealing surface<br>ASME B16.5 RF 125 ... 250 AA<br>(only for wetted parts made of stainless steel 316L) | **J24** |

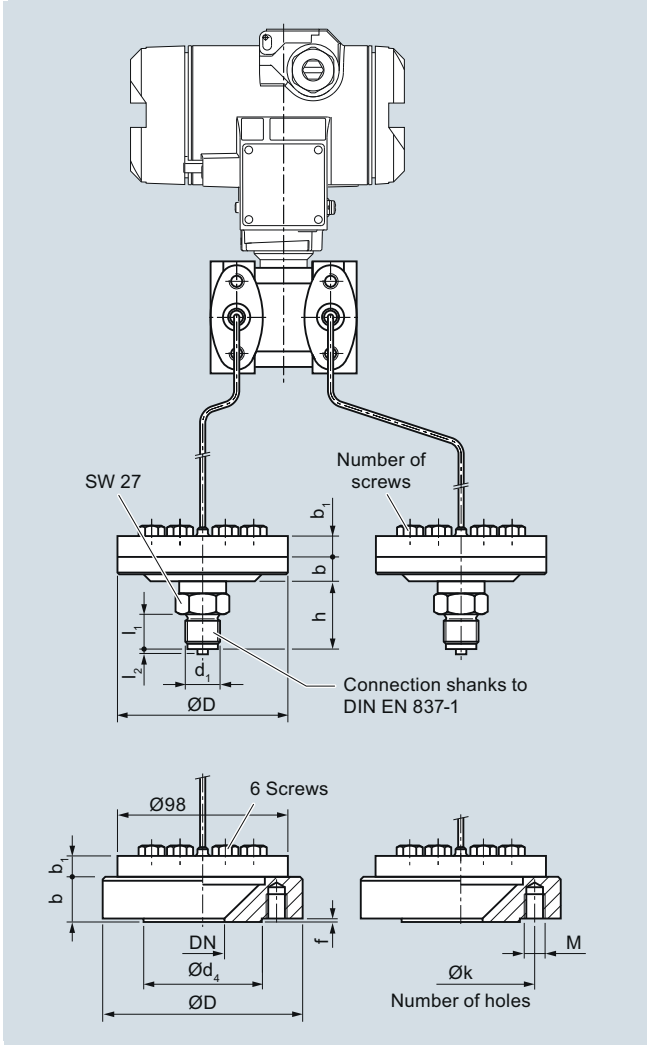
| Selection and Ordering data | Order code |
|---|---|
| *Further designs* | |
| Add "**-Z**" to Article No. and specify Order code. | |
| **PE protective tube**<br>over the spiral protective tube (color: white) of the capillaries | |
| 1.0 m | **N20** |
| 1.6 m | **N21** |
| 2.0 m | **N22** |
| 2.5 m | **N23** |
| 3.0 m | **N24** |
| 4.0 m | **N25** |
| 5.0 m | **N26** |
| 6.0 m | **N27** |
| 7.0 m | **N28** |
| 8.0 m | **N29** |
| 9.0 m | **N30** |
| 10.0 m | **N31** |
| **Vacuum-proof design**<br>for use in low-pressure range for tranmitters for | |
| • Gauge and absolute pressure from the pressure series | **V01** |
| • Differential pressure | **V03** |

## Dimensional drawings




Diaphragm seal, screwed gland with inside diaphragm, for gauge and absolute pressure, direct and attached directly to the transmitter with with capillaries, dimensions in mm (inch)

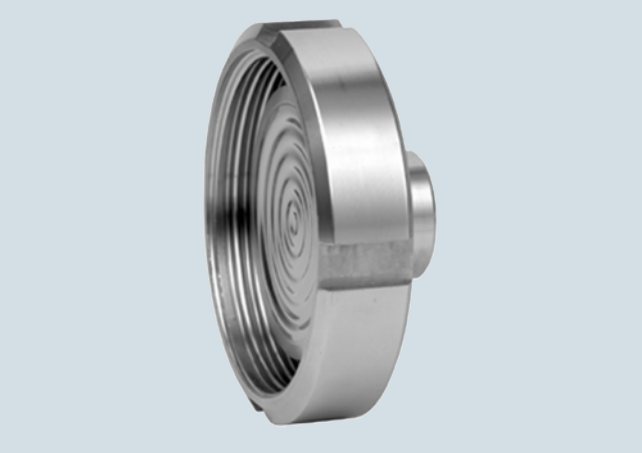
| Range | D mm | b mm | $b_1$ mm | Number of screws |
|---|---|---|---|---|
| bis 100 bar | 98 | 14 | 16 | 6 |
| bis 250 bar | 98 | 14 | 20 | 12 |




Diaphragm seal, screwed gland with inside diaphragm, for differential pressure, direct and attached directly to the transmitter with with capillaries, dimensions in mm (inch)

| Nominal diameter | Nominal pressure | D mm | $d_4$ mm | k mm | M | Number of holes | b mm | $b_1$ mm | f mm |
|---|---|---|---|---|---|---|---|---|---|
| DN 25 | PN 10/16/25/40 | 115 | 68 | 85 | M12 | 4 | 26 | 12 | 2 |
| 1 inch | 150 lb/sq.in | 108 | 50.8 | 79.2 | M12 | 4 | 22 | 12 | 1.6 |
| 1 inch | 300 lb/sq.in | 124 | 50.8 | 88.9 | M16 | 4 | 22 | 12 | 1.6 |

## Overview



Quick-release diaphragm seals, to DIN 11851 with slotted union nut

Quick-release diaphragm seals, with clamp connection

Quick-release diaphragm seals are available for the following SITRANS P pressure transmitter series:

- For pressure: P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
- For differential pressure and flow: P500, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
- The quick-release remote seals are common designs in the food industry. Their design means that the measured medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismounting is possible for cleaning.

## Technical specifications

| **Quick-release diaphragm seal** | |
|---|---|
| Connection, nominal diameter | Nominal pressure |
| For pressure | |
| • To DIN 11851 with slotted union nut | |
| - DN 25 | PN 40 |
| - DN 32 | PN 40 |
| - DN 40 | PN 40 |
| - DN 50 | PN 25 |
| - DN 65 | PN 25 |
| - DN 80 | PN 25 |
| • To DIN 11851 with threaded socket | |
| - DN 25 | PN 40 |
| - DN 32 | PN 40 |
| - DN 40 | PN 40 |
| - DN 50 | PN 25 |
| - DN 65 | PN 25 |
| - DN 80 | PN 25 |
| • Clamp connection | |
| - 1½ inch | PN 16 |
| - 2 inch | PN 16 |
| - 2½ inch | PN 16 |
| - 3 inch | PN 10 |
| For differential pressure and flow | |
| • To DIN 11851 with slotted union nut | |
| - DN 50 | PN 25 |
| - DN 65 | PN 25 |
| - DN 80 | PN 25 |
| • To DIN 11851 with threaded socket | |
| - DN 50 | PN 25 |
| - DN 65 | PN 25 |
| - DN 80 | PN 25 |
| • Clamp connection | |
| - 2 inch | PN 16 |
| - 2½ inch | PN 16 |
| - 3 inch | PN 10 |
| Sealing face | |
| • For stainless steel, mat. No. 1.4404/316L | To EN 1092-1, form B1 or ASME B 16.5RF 125 ... 250 AA |
| • For the other materials | To EN 1092-1, form B2 or ASME B16.5 RFSF |
| Materials | |
| • Main body | Stainless steel 316L |
| • Wetted parts | Stainless steel 316L |
| • Capillary | Stainless steel, mat. No. 1.4571/316Ti |
| • Sheath | Spiral hose made of stainless steel, mat. No. 1.4301/316 |
| Maximum pressure | See above and the technical data of the pressure transmitter |
| Tube length | Without tube |
| Capillary | |
| • Length | Max. 10 m (32.8 ft), longer lengths on request |
| • Internal diameter | 2 mm (0.079 inch) |
| • Minimum bending radius | 150 mm (5.9 inch) |
| Filling liquid | Food oil (FDA listed) |
| Permissible ambient temperature | Dependent on the pressure transmitter and the filling liquid of the remote seal<br>More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals |
| Weight | Approx. 4 kg (8.82 lb) |
| **Certificates and approvals** | |
| Classification according to pressure equipment directive (DRGL 97/23/EC) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) |
| EHEDG | Complies with EHEDG recommendations |

## Quick-release diaphragm seals

| Selection and Ordering data | | Article No. Ord. code |
|---|---|---|
| **Quick-release diaphragm seal** ↗ | | 7MF4940- |
| for SITRANS P pressure transmitters for pressure 7MF403.-... and 7MF423.-... together with Order code "V01" (vacuum-proof design) and 7MF802.-...[1]; must be ordered separately<br>Filling liquid: Food oil (FDA listed)<br>Material: Stainless steel, mat. No. 1.4435 | | A0 - B |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | |
| **Nom. diam.** | **Nom. press.** | |
| • Connection to DIN 11851 with slotted union nut | | |
| - DN 25 | PN 40 | 1B |
| - DN 32 | PN 40 | 1C |
| - DN 40 | PN 40 | 1D |
| - DN 50 | PN 25 | 1E |
| - DN 65 | PN 25 | 1F |
| - DN 80 | PN 25 | 1G |
| • Connection to DIN 11851 with screw necks | | |
| - DN 25 | PN 40 | 2B |
| - DN 32 | PN 40 | 2C |
| - DN 40 | PN 40 | 2D |
| - DN 50 | PN 25 | 2E |
| - DN 65 | PN 25 | 2F |
| - DN 80 | PN 25 | 2G |
| • Tri-Clamp connection to DIN 32676/ISO 2852 | | |
| - DN 40/1½ inch | PN 16 | 4L |
| - DN 50/2 inch | PN 16 | 4M |
| - DN 65/2½ inch | PN 16 | 4N |
| - DN 80/3 inch | PN 10 | 4P |
| Other version<br>Add Order codes and plain text:<br>Process connection: ..., Nominal diameter: ...; Nominal pressure: ... | | 9A ... HIY |
| **Filling liquid** | | |
| • Food oil (FDA listed) | | 7 |
| Other version<br>Add Order code and plain text:<br>Filling liquid: ... | | 9 ... M1Y |
| **Connection to pressure transmitter** | | |
| • direct | | 0 |
| through capillary, length:[2] | | |
| • 1.0 m | (3.28 ft) | 2 |
| • 1.6 m | (5.25 ft) | 3 |
| • 2.5 m | (8.20 ft) | 4 |
| • 4.0 m | (13.1 ft) | 5 |
| • 6.0 m | (19.7 ft) | 6 |
| • 8.0 m | (26.25 ft) | 7 |
| • 10.0 m | (32.8 ft) | 8 |
| **Special lengths for capillaries** | | |
| • 2.0 m | | 9 ... N1C |
| • 3.0 m | | 9 ... N1E |
| • 5.0 m | | 9 ... N1G |
| • 7.0 m | | 9 ... N1J |
| • 9.0 m | | 9 ... N1L |

[1] With 7MF802.-... and the measuring cells Q, S, T and U also order the vacuum-tight version.
[2] Max. capillary length, see section "Technical description"

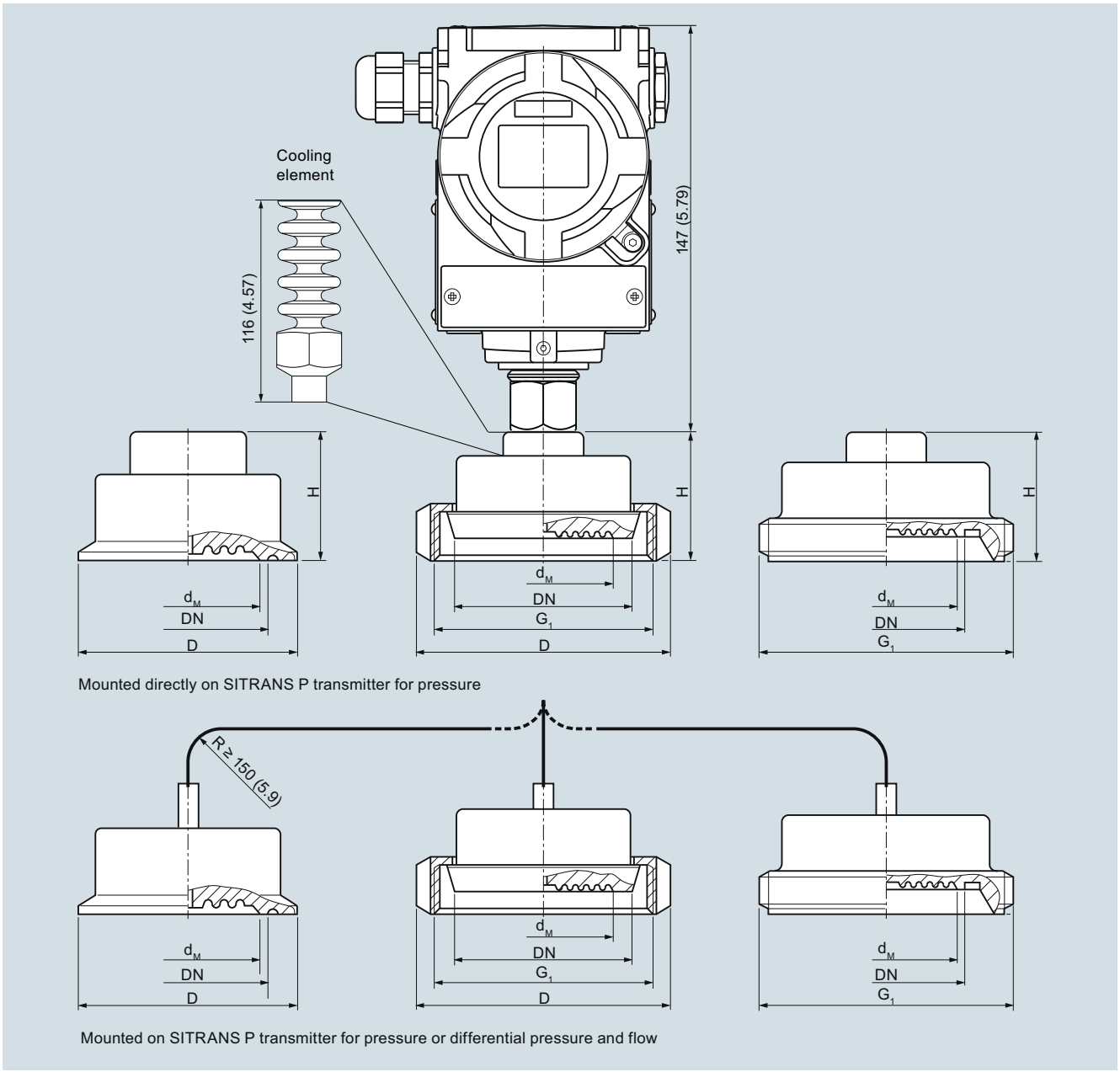
| Selection and Ordering data | Ord. code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code. | |
| **Remote seal nameplate**<br>Attached out of stainless steel, contains MLFB and order number of the remote seal | **B20** |
| **Quality inspection certificate (Five-step factory calibration) to IEC 60770-2** | **C11** |
| **Inspection certificate**<br>to EN 10204, section 3.1 | **C12** |
| **2.2 Certificate of FDA approval of fill oil**<br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)" | **C17** |
| **Functional safety certificate ("SIL 2") to IEC 61508**<br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter) | **C20** |
| **Functional safety certificate ("SIL 2/3") to IEC 61508**<br>(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter) | **C23** |
| **PE protective tube**<br>over the spiral protective tube (color: white) of the capillaries | |
| 1.0 m | **N20** |
| 1.6 m | **N21** |
| 2.0 m | **N22** |
| 2.5 m | **N23** |
| 3.0 m | **N24** |
| 4.0 m | **N25** |
| 5.0 m | **N26** |
| 6.0 m | **N27** |
| 7.0 m | **N28** |
| 8.0 m | **N29** |
| 9.0 m | **N30** |
| 10.0 m | **N31** |
| **Cooling element**<br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid. | **R22** |
| **Vacuum-proof design**<br>for use in low-pressure range for gauge and absolute pressure from the pressure series | **V01** |

| Selection and Ordering data | | Article No. Ord. code |
|---|---|---|
| **Quick-release diaphragm seal** | ↗ | **7 M F 4 9 4 3 -** |
| for SITRANS P pressure transmitters for pressure for differential pressure and flow, type 7MF443.-... and 7MF54..-...; order separately<br>Filling liquid: Food oil (FDA listed)<br>Material: Stainless steel, mat. No. 1.4435<br>Delivery unit: 2 off | | ■■ **A 0** ■ **-** ■ **B** ■■■ |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | |
| **Nom. diam.** | **Nom. press.** | |
| • Connection to DIN 11851 with slotted union nut | | |
| - DN 50 | PN 25 | **1 E** |
| - DN 65 | PN 25 | **1 F** |
| - DN 80 | PN 25 | **1 G** |
| • Connection to DIN 11851 with threaded socket | | |
| - DN 50 | PN 25 | **2 E** |
| - DN 65 | PN 25 | **2 F** |
| - DN 80 | PN 25 | **2 G** |
| • Tri-Clamp connection to DIN 32676/ ISO 2852 | | |
| - DN 50/2 inch | PN 16 | **4 M** |
| - DN 65/2½ inch | PN 16 | **4 N** |
| - DN 80/3 inch | PN 10 | **4 P** |
| Other version<br>Add Order codes and plain text:<br>Process connection: ..., Nominal diameter: ...;<br>Nominal pressure: ... | | **9 A** ■■■ **H 1 Y** |
| **Filling liquid** | | |
| • Food oil (FDA listed) | | **7** |
| Other version<br>Add Order code and plain text:<br>Filling liquid: ... | | **9** ■■■ **M 1 Y** |
| **Connection to transmitter** | | |
| through capillary, Length:[1] | | |
| • 1.0 m | (3.28 ft) | **2** |
| • 1.6 m | (5.25 ft) | **3** |
| • 2.5 m | (8.20 ft) | **4** |
| • 4.0 m | (13.1 ft) | **5** |
| • 6.0 m | (19.7 ft) | **6** |
| • 8.0 m | (26.25 ft) | **7** |
| • 10.0 m | (32.8 ft) | **8** |
| **Special lengths for capillaries** | | |
| • 2.0 m | | **9** **N 1 C** |
| • 3.0 m | | **9** **N 1 E** |
| • 5.0 m | | **9** **N 1 G** |
| • 7.0 m | | **9** **N 1 J** |
| • 9.0 m | | **9** **N 1 L** |

[1] Max. capillary length, see section "Technical description"

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code. | |
| **Remote seal nameplate**<br>Attached out of stainless steel, contains MLFB and order number of the remote seal | **B20** |
| **Quality inspection certificate (Five-step factory calibration) to IEC 60770-2** | **C11** |
| **Inspection certificate**<br>to EN 10204, section 3.1 | **C12** |
| **2.2 Certificate of FDA approval of fill oil**<br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)" | **C17** |
| **Functional safety certificate ("SIL 2") to IEC 61508**<br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter) | **C20** |
| **Functional safety certificate ("SIL 2/3") to IEC 61508**<br>(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter) | **C23** |
| **PE protective tube**<br>over the spiral protective tube (color: white) of the capillaries | |
| 1.0 m | **N20** |
| 1.6 m | **N21** |
| 2.0 m | **N22** |
| 2.5 m | **N23** |
| 3.0 m | **N24** |
| 4.0 m | **N25** |
| 5.0 m | **N26** |
| 6.0 m | **N27** |
| 7.0 m | **N28** |
| 8.0 m | **N29** |
| 9.0 m | **N30** |
| 10.0 m | **N31** |
| **Vacuum-proof design**<br>for use in low-pressure range | **V03** |

## Dimensional drawings




Quick-release diaphragm seal, dimensions in mm (inch)

**Clamp connection (left)**

| DN | Ø $d_M$ | | Ø D | | H | |
|---|---|---|---|---|---|---|
| 40 (1½ inch) | 32 | (1.26) | 50.5 | (2) | 35 | (1.38) |
| 50 (2 inch) | 40 | (1.57) | 64 | (2.52) | 35 | (1.38) |
| 65 (2½ inch) | 52 | (2.05) | 77.5 | (3.05) | 35 | (1.38) |
| 80 (3 inch) | 72 | (2.83) | 91 | (3.58) | 35 | (1.38) |

**Connection to DIN 11851 with slotted union nut (center)**

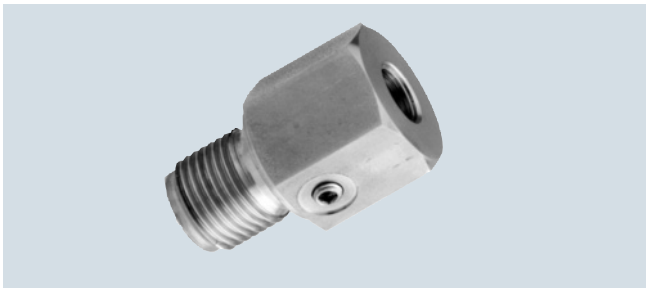
| DN | Ø $d_M$ | Ø D | H | $G_1$ |
|---|---|---|---|---|
| 25 | 25 | 63 | 36 | Rd 52x1/6 |
| 32 | 32 | 70 | 36 | Rd 52x1/6 |
| 40 | 40 | 78 | 36 | Rd 65x1/6 |
| 50 | 52 | 112 | 36 | Rd 78x1/6 |
| 65 | 65 | 112 | 36 | Rd 95x1/6 |
| 80 | 72 | 127 | 36 | Rd 110x1/6 |
| 25 | 25 | 63 | 36 | Rd 52x1/6 |

**Connection to DIN 11851 with threaded socket (right)**

| DN | Ø $d_M$ | H | $G_1$ |
|---|---|---|---|
| 25 | 25 | 36 | Rd 52x1/6 |
| 32 | 32 | 36 | Rd 52x1/6 |
| 40 | 40 | 36 | Rd 65x1/6 |
| 50 | 52 | 36 | Rd 78x1/6 |
| 65 | 65 | 36 | Rd 95x1/6 |
| 80 | 72 | 36 | Rd 110x1/6 |

$d_M$ Effective diaphragm diameter

## Overview



Miniature diaphragm seals

The miniature diaphragm seals are available for the following SITRANS P pressure transmitter series for pressure:

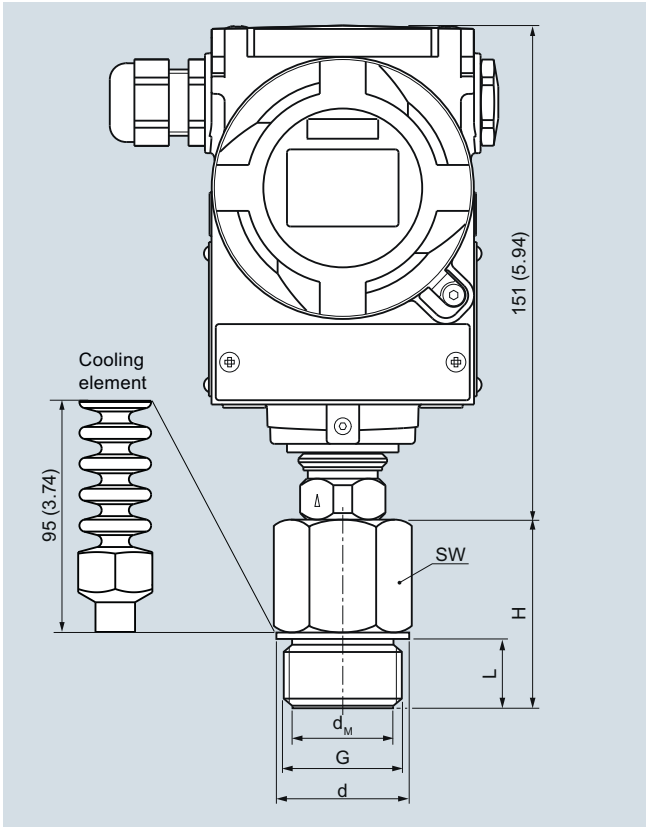
- P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus

Suitable for high pressures, contaminated, fibrous and viscous media in the chemical, paper, food and drink industries.

## Design

- Flush-mounted diaphragm
- No dead spaces
- Fixed threaded stems

## Dimensional drawings




Miniature diaphragm seal, dimensions in mm (inch)

| G | Ø $d_M$ | | SW | | Ø d | | L | | H | |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm | (inch) | mm | (inch) | mm | (inch) | mm | (inch) | mm | (inch) |
| G1B | 25 | (0.98) | 41 | (1.61) | 39 | (1.53) | 28 | (1.1) | 56 | (2.21) |
| G1½B | 40 | (1.57) | 55 | (2.17) | 60 | (2.36) | 30 | (1.18) | 50 | (1.97) |
| G2B | 50 | (1.97) | 60 | (2.36) | 70 | (2.76) | 30 | (1.18) | 63 | (2.48) |

| G | Ø $d_M$ | | SW | | L | | H | |
|---|---|---|---|---|---|---|---|---|
| | mm | (inch) | mm | (inch) | mm | (inch) | mm | (inch) |
| 1“-NPT | 27 | (1.06) | 41 | (1.61) | 25 | (0.98) | 40 | (1.57) |
| 1½“-NPT | 34 | (1.34) | 55 | (2.17) | 26 | (1.02) | 45 | (1.77) |
| 2“-NPT | 46 | (1.81) | 65 | (2.56) | 26 | (1.02) | 45 | (1.77) |

$d_M$: Effective diaphragm diameter

## Technical specifications

| **Miniature diaphragm seals** | |
|---|---|
| Span with | |
| • G1B and 1“-NPT | > 6 bar (> 87 psi) |
| • G1½B and 1½“-NPT | > 2 bar (> 29 psi) |
| • G2B and 2“-NPT | > 600 mbar (> 8.7 psi) |
| Filling liquid | Silicone oil M5 or food oil (FDA listed) |
| Material | |
| • Main body | Stainl. steel mat No. 1.4404/ 316L |
| • Diaphragm | Stainl. steel mat No. 1.4404 / 316L |
| Maximum pressure | 100% of nominal pressure of pressure transmitter, up to maximum of PN 400 (5802 psi) (depending on the seal used) |
| Temperature of use | Same as pressure transmitter |
| Temperature range of medium | Same as pressure transmitter |
| Max. recommended process temperature | 150 °C (302 °F) |
| Weight | |
| • G1B and 1“-NPT | Approx. 0.3 kg (approx. 0.66 lb) |
| • G1½B and 1½“-NPT | Approx. 0.5 kg (approx. 1.10 lb) |
| • G2B and 2“-NPT | Approx. 0.8 kg (approx. 1.76 lb) |
| **Certificate and approvals** | |
| Classification according to pressure equipment directive (DRGL 97/23/EC) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) |

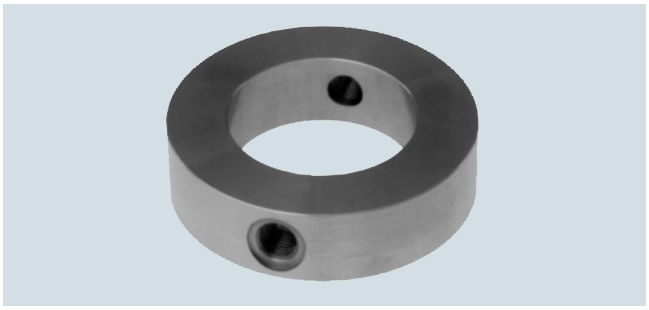
## Miniature diaphragm seals

| Selection and Ordering data | Article No. Ord. code |
|---|---|
| **Miniature diaphragm seals** ↗ | **7 M F 4 9 6 0 -** |
| directly fitted to SITRANS P pressure transmitters for pressure; type, 7MF403.-... and 7MF423.-... together with Order code "V01" (vacuum-proof design) and 7MF802.-...[1]; must be ordered separately<br>Material: Stainless steel, mat. No. 1.4404/316L<br>Nominal pressure, see "Pressure transmitters" | **1** ■ ■ **0** ■ ■ ■ ■ |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | |
| **Process connection** | |
| • G1B | **C** |
| • G1½B | **D** |
| • G2B | **E** |
| • 1" - NPT | **K** |
| • 1½" - NPT | **L** |
| • 2" - NPT | **M** |
| Other version, add Order code and plain text:<br>Process connection: ... | **Z** **J 1 Y** |
| **Wetted parts materials** | |
| • Stainless steel 316L | **A** |
| Other version, add Order code and plain text:<br>Wetted parts materials: ... | **Z** **K 1 Y** |
| **Filling liquid** | |
| • Silicone oil M5 | **1** |
| • Food oil (FDA listed) | **7** |
| Other version, add Order code and plain text:<br>Filling liquid: ... | **9** **M 1 Y** |

[1] With 7MF802.-... and the measuring cells Q, S, T and U also order the vacuum-tight version.

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs***<br>Please add "**-Z**" to Article No. and specify Order code. | |
| **Remote seal nameplate**<br>Attached out of stainless steel, contains MLFB and order number of the remote seal | **B20** |
| **Quality inspection certificate (Five-step factory calibration) to IEC 60770-2** | **C11** |
| **Inspection certificate**<br>to EN 10204, section 3.1 | **C12** |
| **2.2 Certificate of FDA approval of fill oil**<br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)" | **C17** |
| **Functional safety certificate ("SIL 2") to IEC 61508**<br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter) | **C20** |
| **Functional safety certificate ("SIL 2/3") to IEC 61508**<br>(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter) | **C23** |
| **Certification acc. to NACE MR-0175**<br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | **D07** |
| **Certification acc. to NACE MR-0103**<br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | **D08** |
| **Cooling element**<br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid. | **R22** |
| **Vacuum-proof design**<br>for use in low-pressure range for gauge and absolute pressure from the pressure series | **V01** |

## Overview



Flushing ring

Flushing rings are required for flange-mounted and sandwich-type remote seals (Article No. 7MF4900 ... 7MF4923) if the danger exists that the process conditions and the geometry of the connection could cause the medium to form deposits or blockages.

The flushing ring is clamped between the process flange and the remote seal.

Deposits can be flushed away from the diaphragm through the holes in the side, or the pressure volume can be vented. Different nominal diameters and forms permit adaptation to the respective process flange.

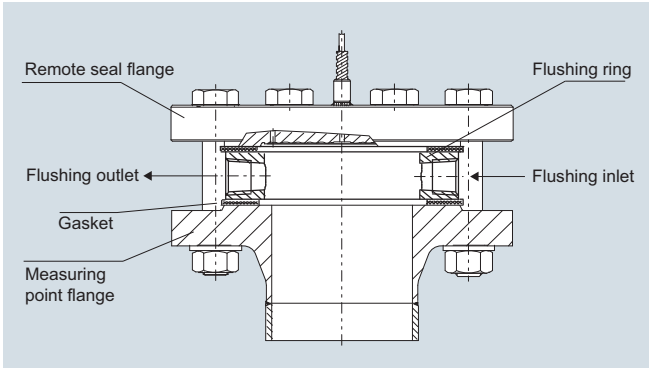
***Process connection***

For flanges to EN and ASME:
DN 50, 80, 100, 125; PN 16 ... 100 or
DN 2 inch, 3 inch, 4 inch, 5 inch; Class 150 ... 600

***Standard design***

Material: CrNi-Stahl, mat. No. 1.4404/316L
Sealing faces and flushing holes: See Selection and Ordering data

## Design




Installation example

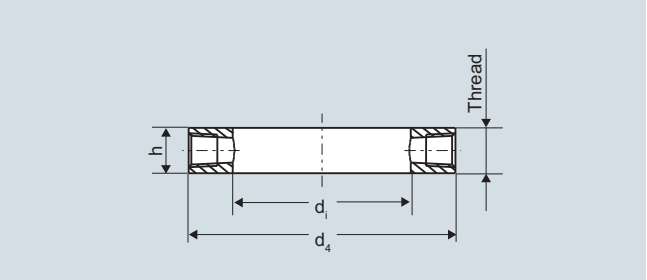
## Technical specifications

| Flushing ring for remote seals of sandwich and flange design | |
|---|---|
| Nominal diameter | Nominal pressure |
| • DN 50 | PN 16 ... PN 100 |
| • DN 80 | PN 16 ... PN 100 |
| • DN 100 | PN 16 ... PN 100 |
| • DN 125 | PN 16 ... PN 100 |
| • 2 inch | Class 150 ... class 600 |
| • 3 inch | Class 150 ... class 600 |
| • 4 inch | Class 150 ... class 600 |
| • 5 inch | Class 150 ... class 600 |
| Sealing face | |
| • To EN 1092-1 | Form B1 |
| | Form B2 |
| | Form D/Form D |
| | Form C/Form C |
| | Form C/Form C |
| | Form E |
| | Form F |
| • To ASME B16.5 | RF 125 ... 250 AA |
| | RFSF |
| | RJF ring groove |
| Flushing holes (2 off), female thread | • G¼ |
| | • G½ |
| | • ¼-18 NPT |
| | • ½-14 NPT |
| Material | Stainless steel 1.4404/316L |

## Flushing rings for diaphragm seals

| Selection and Ordering data | | Article No.Ord. code |
|---|---|---|
| **Flushing ring** | | 7MF4925- |
| for remote seals 7MF4900 to 7MF4923 | | 1 |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | |
| **Nom. diam.** | **Nom. press.** | |
| • DN 50 | PN 16 ... PN 100 | A |
| • DN 80 | PN 16 ... PN 100 | B |
| • DN 100 | PN 16 ... PN 100 | C |
| • DN 125 | PN 16 ... PN 100 | D |
| • 2 inch | Class 150 ... 600 | G |
| • 3 inch | Class 150 ... 600 | H |
| • 4 inch | Class 150 ... 600 | J |
| • 5 inch | Class 150 ... 600 | K |
| Other version<br>Add Order code and plain text:<br>Nominal diameter: ...; Nominal pressure: ... | | Z J1Y |
| **Sealing face** | | |
| • EN 1092-1 | | |
| - Form B1 | | A |
| - Form B2 | | C |
| - Form C/Form C | | D |
| - Form D/Form C | | E |
| - Form D/Form D | | F |
| - Form E | | G |
| - Form F | | H |
| • ASME B16.5 | | |
| - RF 125 ... 250 AA | | M |
| - RFSF | | Q |
| - RJF ring groove | | R |
| Other version<br>Add Order code and plain text:<br>Sealing face: ... | | Z K1Y |
| **Flushing holes (2 off)** | | |
| • Female thread G¼ | | 1 |
| • Female thread G½ | | 2 |
| • Female thread ¼-18 NPT | | 3 |
| • Female thread ½-14 NPT | | 4 |
| **Material** | | |
| • Stainless steel 316L | | 0 |
| Other version<br>Add Order code and plain text:<br>Material: ... | | 9 M1Y |
| ***Further designs***<br>Please add "**-Z**" to Article No. and specify Order code. | | Order code |
| **Inspection certificate**<br>to EN 10204, section 3.1 | | C12 |

## Dimensional drawings




Flushing ring, dimension drawing

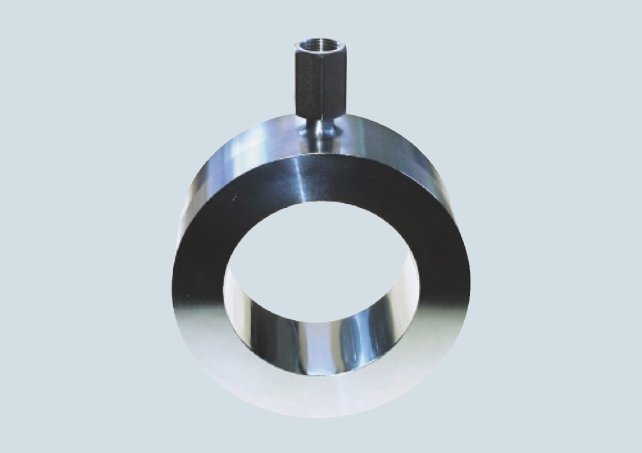
### *Connection to EN 1092-1*

| DN (mm) | PN (bar) | $d_4$ (mm) | $d_i$ (mm) | h (mm) | Weight (kg) |
|---|---|---|---|---|---|
| 50 | 16 ... 100 | 102 | 62 | 30 | 1.10 |
| 80 | 16 ... 100 | 138 | 92 | 30 | 1.90 |
| 100 | 16 ... 100 | 162 | 92 | 30 | 3.15 |
| 125 | 16 ... 100 | 188 | 126 | 30 | 3.50 |

### *Connection to ASME B 16.5*

| DN | Class | $d_4$ | | $d_i$ | | h | | Weight | |
|---|---|---|---|---|---|---|---|---|---|
| inch | | mm | (in.) | mm | (in.) | mm | (in.) | kg | (lb) |
| 2 | 150 ... 600 | 92 | (3.62) | 62 | (2.44) | 30 | (1.18) | 0.60 | (1.32) |
| 3 | 150 ... 600 | 127 | (5) | 92 | (3.62) | 30 | (1.18) | 1.05 | (2.31) |
| 4 | 150 ... 600 | 157 | (6.18) | 92 | (3.62) | 30 | (1.18) | 2.85 | (6.28) |
| 5 | 150 ... 600 | 185.5 | (7.3) | 126 | (4.96) | 30 | (1.18) | 3.30 | (7.28) |

## 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 face 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 |
| • DN 25 | PN 6 ... PN 100 |
| • DN 40 | PN 6 ... PN 100 |
| • DN 50 | PN 6 ... PN 100 |
| • DN 80 | PN 6 ... PN 100 |
| • DN 100 | PN 6 ... PN 100 |
| • 1 inch | Class 150 ... class 2500 |
| • 1½ inch | Class 150 ... class 2500 |
| • 2 inch | Class 150 ... class 2500 |
| • 3 inch | Class 150 ... class 2500 |
| • 4 inch | Class 150 ... class 2500 |
| Process connection | Flange to EN 1092-1 or ASME B 16.5 |
| Sealing face | To EN 1092-1, form B1 or to ASME B16.5 RF 125 ... 250 A or 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 |
| | • PFA coating (for vacuum on request) |
| | Monel 400, mat. No. 2.4360 |
| | Hastelloy C276, mat. No. 2.4819 |
| | Hastelloy C4, mat. No. 2.4610 |
| | Tantalum |
| • Capillary | Stainless steel, mat. No. 1.4571/316Ti |
| • Sheath | Spiral hose 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 (DRGL 97/23/EC) | For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 3, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord |

## Inline seals for flange-mounting

| Selection and Ordering data | Article No.Ord. code |
|---|---|
| **Inline seal for flange-mounting for SITRANS P pressure transmitters** | |
| **for gauge pressure** ↗ 7MF4980-<br>7MF403.-... and 7MF423.-... together with Order code "V01" (vacuum-proof design) and 7MF802.-...[1]; must be ordered separately, scope of delivery: 1 off | 7MF4980- |
| **for differential pressure and flow** ↗ 7MF4983-<br>7MF4433 or 7MF54..-...; order separately, scope of delivery: 1 pair (set); Material: Completely of stainless steel, mat. No. 1.4404/316L; Process connection to EN 1092-1 or ASME B16.5; sealing face to EN 1092-1, form B1, or to ASME B16.5 RF 125 ... 250 AA | 7MF4983- |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | 1 ■■ 0 ■ - ■ B ■■■ |
| **Nominal diameter and nominal pressure** | |
| • DN 25 PN 6 ... 100 | B |
| • DN 40 PN 6 ... 100 | D |
| • DN 50 PN 6 ... 100 | E |
| • DN 80 PN 6 ... 100 | G |
| • DN 100 PN 6 ... 100 | H |
| • 1 inch Class 150 ... 2500 | L |
| • 1½ inch Class 150 ... 2500 | M |
| • 2 inch Class 150 ... 2500 | N |
| • 3 inch Class 150 ... 2500 | P |
| • 4 inch Class 150 ... 2500 | Q |
| Other version<br>Add Order code and plain text:<br>Nominal diameter: ...; Nominal pressure: ... | Z J 1 Y |
| **Wetted parts materials** | |
| • Stainless steel 316L | |
| - Without coating | A |
| - With PFA coating | D |
| - With ECTFE coating[2] | F |
| • Monel 400, mat. No. 2.4360 | G |
| • Hastelloy C276, mat. No. 2.4819 | J |
| • Hastelloy C4, mat. No. 2.4610 | U |
| • Tantalum | K |
| Other version<br>Add Order code and plain text:<br>Wetted parts materials: ... | Z K 1 Y |
| **Filling liquid** | |
| • Silicone oil M5 | 1 |
| • Silicone oil M50 | 2 |
| • High-temperature oil | 3 |
| • Halocarbon oil (for measuring $O_2$)[3] | 4 |
| • Food oil (FDA listed) | 7 |
| Other version<br>Add Order code and plain text:<br>Filling liquid: ... | 9 M 1 Y |

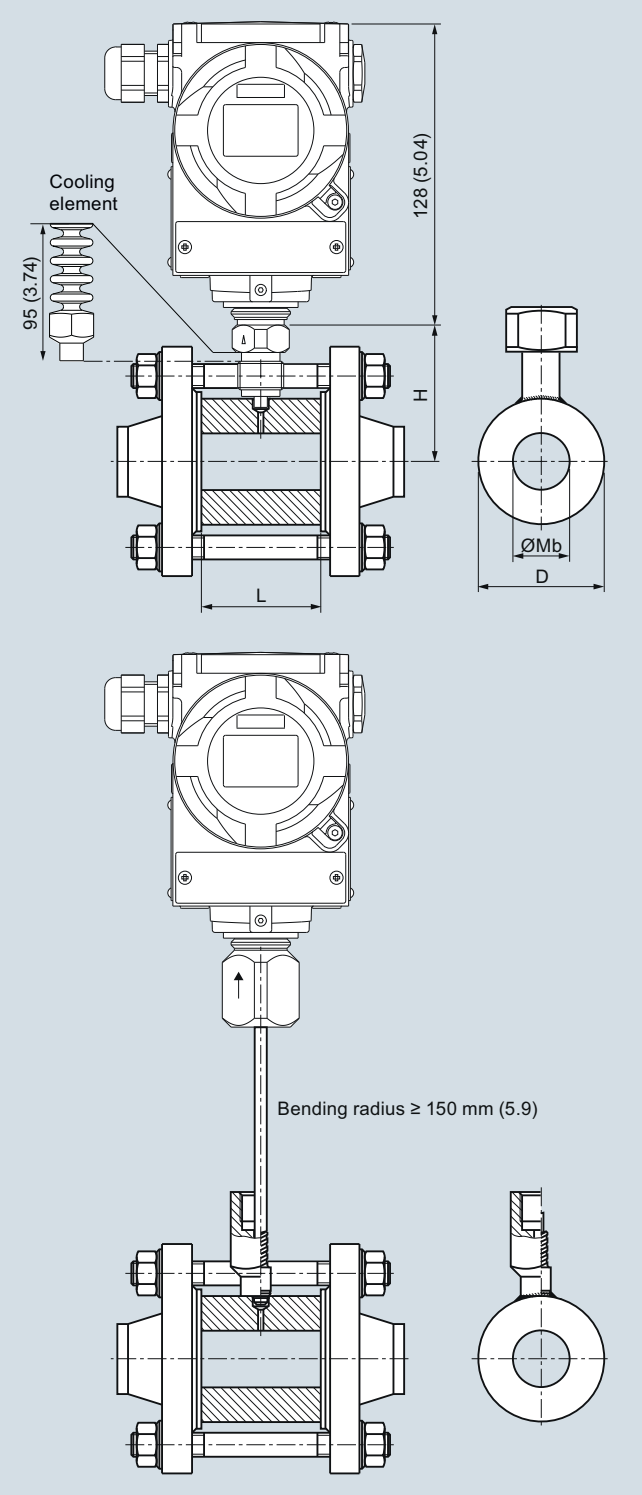
| Selection and Ordering data | Article No.Ord. code |
|---|---|
| **Inline seal for flange-mounting for SITRANS P pressure transmitters** | |
| **for gauge pressure**<br>7MF403.-... and 7MF423.-... together with Order code "V01" (vacuum-proof design) and 7MF802.-...[1]; must be ordered separately, scope of delivery: 1 off | 7MF4980- |
| **for differential pressure and flow**<br>7MF4433 or 7MF54..-...; order separately, scope of delivery: 1 pair (set); Material: Completely of stainless steel, mat. No. 1.4404/316L; Process connection to EN 1092-1 or ASME B16.5; sealing face to EN 1092-1, form B1, or to ASME B16.5 RF 125 ... 250 AA | 7MF4983- |
| | 1 ■■ 0 ■ - ■ B ■■■ |
| **Connection to transmitter** | |
| • direct (only for 7MF4980) | 0 |
| through capillary, length:[4] | |
| • 1.0 m (3.28 ft) | 2 |
| • 1.6 m (5.25 ft) | 3 |
| • 2.5 m (8.20 ft) | 4 |
| • 4.0 m (13.1 ft) | 5 |
| • 6.0 m (19.7 ft) | 6 |
| • 8.0 m (26.25 ft) | 7 |
| • 10.0 m (32.8 ft) | 8 |
| **Special lengths for capillaries** | |
| • 2.0 m | 9 N 1 C |
| • 3.0 m | 9 N 1 E |
| • 5.0 m | 9 N 1 G |
| • 7.0 m | 9 N 1 J |
| • 9.0 m | 9 N 1 L |
| only for 7MF4983-... | |
| • 11.0 m | 9 N 1 N |
| • 12.0 m | 9 N 1 P |
| • 13.0 m | 9 N 1 Q |
| • 14.0 m | 9 N 1 R |
| • 15.0 m | 9 N 1 S |

1) With 7MF802.-... and the measuring cells Q, S, T and U also order the vacuum-tight version.
2) For vacuum on request.
3) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery.
4) Max. capillary length, see section "Technical description"

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code. | |
| **Spark arrestor**<br>With spark arrestor for mounting on zone 0 (including documentation) | |
| • Pressure and absolute pressure | **A01** |
| • for differential pressure transmitters | **A02** |
| **Remote seal nameplate**<br>Attached out of stainless steel, contains MLFB and order number of the remote seal | **B20** |
| **Oil- and grease-free cleaned version**<br>Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2 | **C10** |
| **Quality inspection certificate (Five-step factory calibration) to IEC 60770-2** | **C11** |
| **Inspection certificate**<br>to EN 10204, section 3.1 | **C12** |
| **2.2 Certificate of FDA approval of fill oil**<br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)" | **C17** |
| **Functional safety certificate ("SIL 2") to IEC 61508**<br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter) | **C20** |
| **Functional safety certificate ("SIL 2/3") to IEC 61508** | **C23** |
| **Certification acc. to NACE MR-0175**<br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | **D07** |
| **Certification acc. to NACE MR-0103**<br>Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | **D08** |
| **Oil- and grease-free cleaned version**<br>Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2 | **E10** |
| **PE protective tube**<br>over the spiral protective tube (color: white) of the capillaries | |
| 1.0 m | **N20** |
| 1.6 m | **N21** |
| 2.0 m | **N22** |
| 2.5 m | **N23** |
| 3.0 m | **N24** |
| 4.0 m | **N25** |
| 5.0 m | **N26** |
| 6.0 m | **N27** |
| 7.0 m | **N28** |
| 8.0 m | **N29** |
| 9.0 m | **N30** |
| 10.0 m | **N31** |
| only for 7MF4983-... | |
| 11.0 m | **N32** |
| 12.0 m | **N33** |
| 13.0 m | **N34** |
| 14.0 m | **N35** |
| 15.0 m | **N36** |

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code. | |
| **Cooling element**<br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid. | **R22** |
| **Vacuum-proof design**<br>for use in low-pressure range | |
| • for gauge and absolute pressure from the pressure series | **V01** |
| • for transmitters for differential pressure | **V03** |
| Note:<br>Suffix "Y01" required with pressure transmitter | |

## 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 | 63 | 28.5 | 60 | 78.5 |
| 40 | 6 ... 100 | 85 | 43 | 60 | 89.5 |
| 50 | 6 ... 100 | 95 | 54.5 | 60 | 92.5 |
| 80 | 6 ... 100 | 130 | 82.5 | 60 | 112 |
| 100 | 6 ... 100 | 150 | 107 | 60 | 122 |

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

| DN | Class | D | Mb | L | H |
|---|---|---|---|---|---|
| (inch) | | mm (inch) | mm (inch) | mm (inch) | mm (inch) |
| 1 | 150 ... 2500 | 63 (2.48) | 28.5 (1.12) | 60 (2.36) | 78.5 (3.1) |
| 1½ | 150 ... 2500 | 85 (3.35) | 43 (1.69) | 60 (2.36) | 86 (3.4) |
| 2 | 150 ... 2500 | 95 (3.74) | 54.5 (2.15) | 60 (2.36) | 94.5 (3.72) |
| 3 | 150 ... 2500 | 130 (5.12) | 82.5 (3.25) | 60 (2.36) | 112 (4.4) |
| 4 | 150 ... 2500 | 150 (5.9) | 107 (4.21) | 60 (2.36) | 122 (4.8) |

## Overview

Quick-release inline seals, to DIN 11851 with threaded socket

Quick-release inline seals, with clamp connection

Quick-release inline seals for pressure are available for the following SITRANS P pressure transmitter series:

- P300
- DS III with HART
- DS III with PROFIBUS PA
- DS III with FOUNDATION Fieldbus

## Application

The quick-release inline seal is a special design for flowing media and high-viscosity media. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur. The measured medium flows unhindered through the inline seal and results in self-cleaning of the measuring chamber. Furthermore, the inline seal can be cleaned by a pig.

## Design

The quick-release clamp is available in two versions:

- DIN 11851 with threaded socket
- Clamp connection

The inline seal is connected to the pressure transmitter either directly or by way of a capillary.

## Function

The measured pressure is transferred from the diaphragm, mounted on the inner circumference of the inline seal, to the filling liquid and then passes through the capillary to the measuring chamber of the pressure transmitter. The interior of the inline 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 pressure transmitter (see Selection and Ordering data).

## Technical specifications

| **Inline seals of quick-release design for pressure** | | |
|---|---|---|
| Connection | Nominal diameter | Nominal pressure |
| • To DIN 11851 with threaded socket | DN 25 | PN 40 |
| | DN 40 | PN 40 |
| | DN 50 | PN 25 |
| | DN 65 | PN 25 |
| | DN 80 | PN 25 |
| | DN 100 | PN 25 |
| • Clamp connection | 1½ inch | PN 40 |
| | 2 inch | PN 40 |
| | 2½ inch | PN 40 |
| | 3 inch | PN 40 |
| Material | | |
| • Main body | Stainless steel 1.4404/316L | |
| • Diaphragm | Stainless steel 1.4404/316L | |
| 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 | • Food oil (FDA listed) | |
| Permissible ambient temperature | Dependent on the pressure transmitter and the filling liquid of the remote seal<br>More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals | |
| Weight | Approx. 4 kg (approx. 8.82 lb) | |
| **Certificate and approvals** | | |
| Classification according to pressure equipment directive (DRGL 97/23/EC) | For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 3, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord | |
| EHEDG | Complies with EHEDG recommendations | |

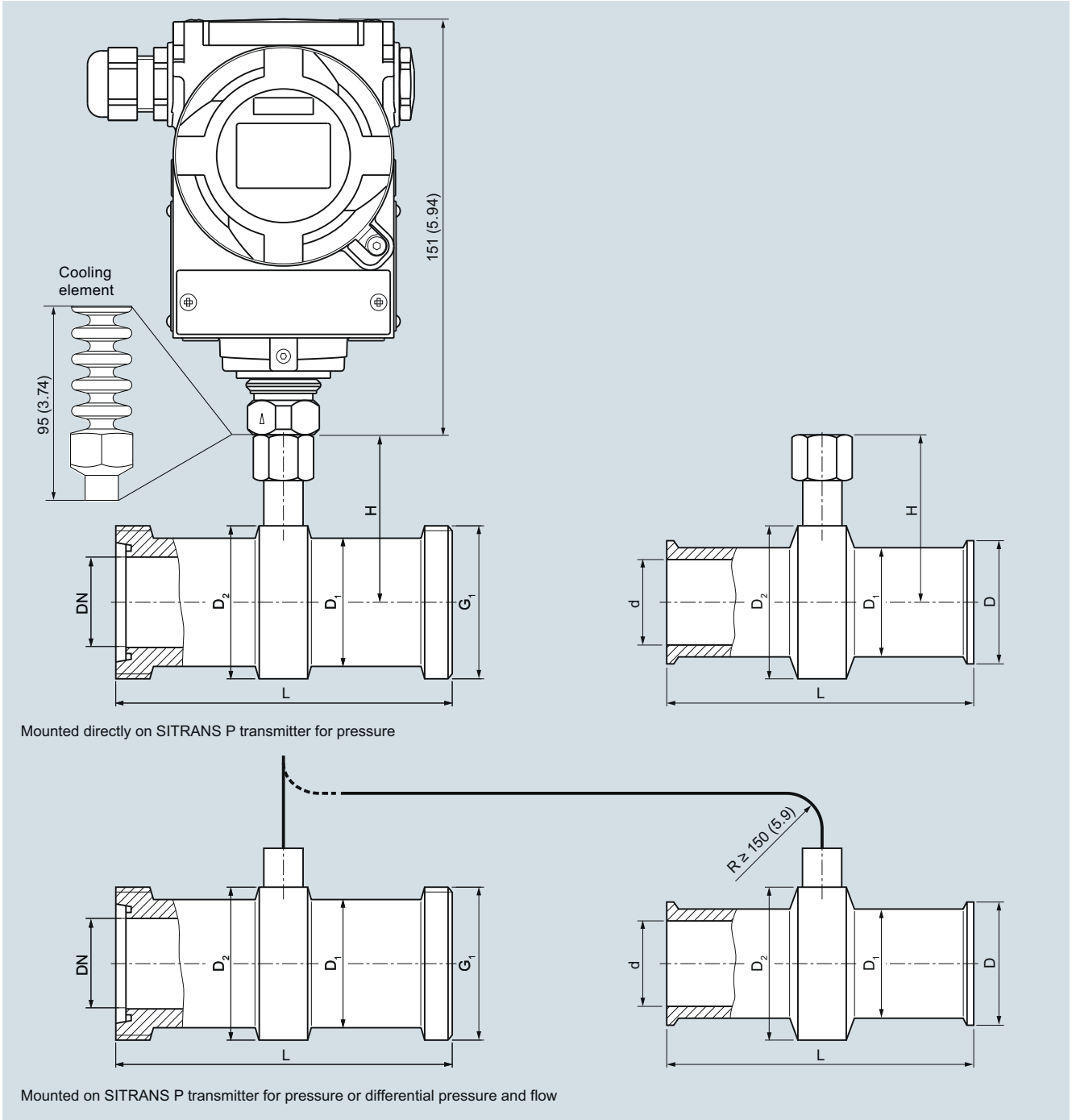
## Quick-release inline seals

| Selection and Ordering data | | Article No. Ord. code |
|---|---|---|
| **Quick-release inline seal** ↗ | | 7 M F 4 9 5 0 - |
| for SITRANS P pressure transmitters for pressure 7MF403.-... and 7MF423.-... together with Order code "V01" (vacuum-proof design) and 7MF802.-...[1]; must be ordered separately<br>Filling liquid: Food oil (FDA listed)<br>Material: Stainless steel 316L | | ■■ A 0 ■ - ■ B ■■■ |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | |
| **Nom. diam.** | **Nom. press.** | |
| • Connection to DIN 11851 with screw necks | | |
| - DN 25 | PN 40 | 2 B |
| - DN 40 | PN 40 | 2 D |
| - DN 50 | PN 25 | 2 E |
| - DN 65 | PN 25 | 2 F |
| - DN 80 | PN 25 | 2 G |
| - DN 100 | PN 25 | 2 H |
| • Clamp connection | | |
| - 1½ inch | PN 16 | 4 L |
| - 2 inch | PN 16 | 4 M |
| - 2½ inch | PN 16 | 4 N |
| - 3 inch | PN 10 | 4 P |
| Other version<br>Add Order codes and plain text:<br>Process connection: ..., Nominal diameter: ...; Nominal pressure: ... | | 9 A H 1 Y |
| **Filling liquid** | | |
| • Food oil (FDA listed) | | 7 |
| Other version<br>Add Order code and plain text:<br>Filling liquid: ... | | 9 M 1 Y |
| **Connection to transmitter** | | |
| • Direct | | 0 |
| Through capillary, length:[2] | | |
| • 1.0 m | (3.28 ft) | 2 |
| • 1.6 m | (5.25 ft) | 3 |
| • 2.5 m | (8.20 ft) | 4 |
| • 4.0 m | (13.1 ft) | 5 |
| • 6.0 m | (19.7 ft) | 6 |
| • 8.0 m | (26.25 ft) | 7 |
| • 10.0 m | (32.8 ft) | 8 |
| **Special lengths for capillaries** | | |
| • 2.0 m | | 9 N 1 C |
| • 3.0 m | | 9 N 1 E |
| • 5.0 m | | 9 N 1 G |
| • 7.0 m | | 9 N 1 J |
| • 9.0 m | | 9 N 1 L |

1) With 7MF802.-... and the measuring cells Q, S, T and U also order the vacuum-tight version.
2) Max. capillary length, see section "Technical description"

| Selection and Ordering data | Order code |
|---|---|
| ***Further designs*** | |
| Please add "**-Z**" to Article No. and specify Order code. | |
| **Remote seal nameplate**<br>Attached out of stainless steel, contains MLFB and order number of the remote seal | **B20** |
| **Quality inspection certificate (Five-step factory calibration) to IEC 60770-2** | **C11** |
| **Inspection certificate**<br>to EN 10204, section 3.1 | **C12** |
| **2.2 Certificate of FDA approval of fill oil**<br>Only in conjunction with "Food-grade oil" fill liquid (FDA listed)" | **C17** |
| **Functional safety certificate ("SIL 2") to IEC 61508**<br>(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter) | **C20** |
| **Functional safety certificate ("SIL 2/3") to IEC 61508**<br>(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter) | **C23** |
| **Special lengths for capillaries** | |
| 2.0 m (select 2.5 m capillary pipe length for order and add N1C as identifier) | **N1C** |
| 3.0 m (select 4 m capillary pipe length for order and add N1E as identifier) | **N1E** |
| 5.0 m (select 6 m capillary pipe length for order and add N1G as identifier) | **N1G** |
| 7.0 m (select 8 m capillary pipe length for order and add N1J as identifier) | **N1J** |
| 9.0 m (select 10 m capillary pipe length for order and add N1L as identifier) | **N1L** |
| **PE protective tube**<br>over the spiral protective tube (color: white) of the capillaries | |
| 1.0 m | **N20** |
| 1.6 m | **N21** |
| 2.0 m | **N22** |
| 2.5 m | **N23** |
| 3.0 m | **N24** |
| 4.0 m | **N25** |
| 5.0 m | **N26** |
| 6.0 m | **N27** |
| 7.0 m | **N28** |
| 8.0 m | **N29** |
| 9.0 m | **N30** |
| 10.0 m | **N31** |
| **Cooling element**<br>max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid. | **R22** |
| **Vacuum-proof design**<br>for use in low-pressure range for gauge and absolute pressure from the pressure series | **V01** |

## Dimensional drawings




Mounted directly on SITRANS P transmitter for pressure

Mounted on SITRANS P transmitter for pressure or differential pressure and flow

**Connection to DIN 11851 with screw necks**

| DN | Ø $D_1$ | Ø $D_2$ | H | L | $G_1$ |
|---|---|---|---|---|---|
| 25 | 38 | 52 | 68 | 128 | Rd 52x1/6 |
| 40 | 55 | 65 | 74.5 | 160 | Rd 65x1/6 |
| 50 | 68 | 78 | 81 | 170 | Rd 78x1/6 |
| 65 | 85 | 95 | 89.5 | 182 | Rd 95x1/6 |
| 80 | 110 | 110 | 97 | 182 | Rd 110x1/4 |
| 100 | 130 | 130 | 107 | 182 | Rd 110x1/4 |

**Clamp connection for pipes to BS 4825/3 and o.D. tubes**

| d | | Ø $D_1$ | | Ø $D_2$ | | H | | L | | D | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | (inch) | mm | (inch) | mm | (inch) | mm | (inch) | mm | (inch) | mm | (inch) |
| 22.2 | (1) | 38 | (1.5) | 50 | (1.97) | 67 | (2.64) | 114 | (4.49) | 50.5 | (1.98) |
| 34.9 | (1½) | 43 | (1.69) | 65 | (2.56) | 74.5 | (2.93) | 146 | (5.75) | 50.5 | (1.98) |
| 47.6 | (2) | 56 | (2.2) | 75 | (2.95) | 79.5 | (3.13) | 156 | (6.14) | 64 | (2.52) |
| 60.3 | (2½) | 68 | (2.68) | 77 | (3.03) | 80.5 | (3.17) | 156 | (6.14) | 77.5 | (3.05) |
| 73.0 | (3) | 82 | (3.23) | 91 | (3.58) | 87.5 | (3.44) | 156 | (6.14) | 91 | (3.58) |

Quick-release inline seal, dimensions in mm (inch)

## Overview

This section shows examples of typical measuring setups for using SITRANS P pressure transmitters with and without remote seals.

Equations for calculating start of scale and full scale are provided for each example.

Questionnaires are included to help you select the right combination of remote seal and pressure transmitter.

### *Installation*

Remote seals of sandwich design are fitted between the connection flange of the measuring point and a dummy flange. Remote seals of flange design are fitted directly on the connection flange of the measuring point. The respective pressure rating of the dummy flange or the flanged remote seal must be observed.

The pressure transmitter should be installed below the connection flange (and below the lower connection flange in the case of differential pressure transmitters). This arrangement must be used in the low-pressure range.

When measuring at pressures above atmospheric, the pressure transmitter can also be installed above the connection flange.

The capillaries between the remote seal and the pressure transmitter should be as short as possible to obtain a good transmission response.

### *Offset of measuring range*

If there is a difference in height between the two connection flanges when measuring with two remote seals, an additional differential pressure will result from the oil filling of the remote seal capillaries. This results in a measuring range offset which has to be taken into account when you set the pressure transmitter.

An offset in the measuring range also occurs when combining a remote seal with a transmitter if the remote seal is not installed at the same height as the transmitter.

### *Pressure transmitter output*

If the level, separation layer or density increase in closed vessels, the differential pressure and hence the output signal of the pressure transmitter also increase.

For an inverted relationship between the differential pressure and the output signal, the start-of-scale and full-scale values of the SITRANS P must be interchanged.

With open vessels, a rising pressure is usually assigned to an increasing level, separation layer or density.

### *Influence of ambient temperature*

Temperature differences between the individual capillaries and between the individual remote seals should be avoided.

Temperature variations in the area of the measuring setup cause a change in volume of the filling liquid and hence measuring errors.

### *Notes*

- For the separation layer measurement, the separation layer has to be positioned between the two spigots. Also you must make sure that the level in the container is always above the top spigot.
- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot.

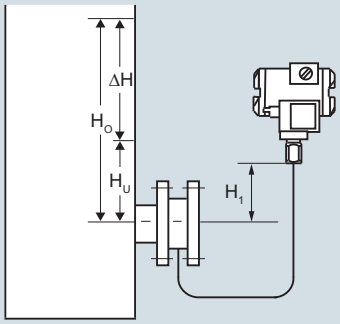
### *Possible combinations of pressure transmitters and remote seals*

| Type of installation | Pressure transmitters | Remote seals |
|---|---|---|
| A/B | 7MF4033<br>7MF4034<br>7MF4035<br>7MF8023<br>7MF8024<br>7MF8025 | 7MF4900<br>7MF4910<br>7MF4920 |
| $C_1$ and $C_2$ | 7MF4233<br>7MF4234<br>7MF4235 | 7MF4900<br>7MF4910<br>7MF4920<br>(vacuum-proof design in each case) |
| | 7MF4333<br>7MF4334<br>7MF4335 | 7MF4901<br>7MF4921 |
| D | 7MF4433<br>7MF4434<br>7MF4435<br>7MF5403<br>7MF5413 | 7MF4903<br>7MF4923 |
| E | 7MF4433<br>7MF4434<br>7MF4435<br>7MF5403<br>7MF5413 | 7MF4913 |
| G, H and J | 7MF4433<br>7MF4434<br>7MF4435<br>7MF5403<br>7MF5413 | 7MF4903<br>7MF4923 |

## Dimensional drawings

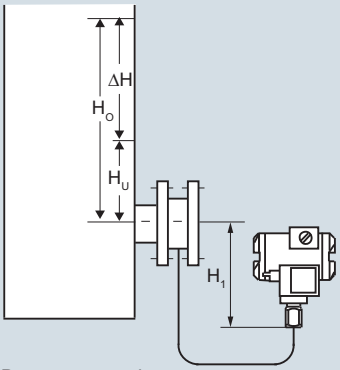
### *Types of installation for pressure and level measurements (open vessels)*

Installation type A




Pressure transmitter above the measuring point

Installation type B




Pressure transmitter below the measuring point

$H_1 \leq 7$ m (23 ft), with halocarbon oil as filling liquid only $H_1 \leq 4$ m (13.1 ft)

Installation type A

Start-of-scale: $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_1$

Full-scale: $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_1$

Installation type B

Start-of-scale: $p_{MA} = \rho_{FL} \cdot g \cdot H_U + \rho_{Oil} \cdot g \cdot H_1$

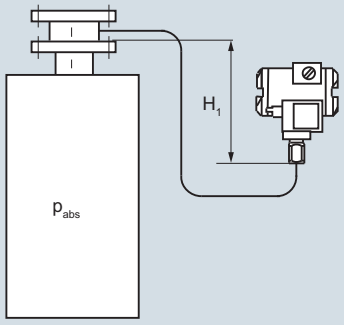
Full-scale: $p_{ME} = \rho_{FL} \cdot g \cdot H_O + \rho_{Oil} \cdot g \cdot H_1$

Legend

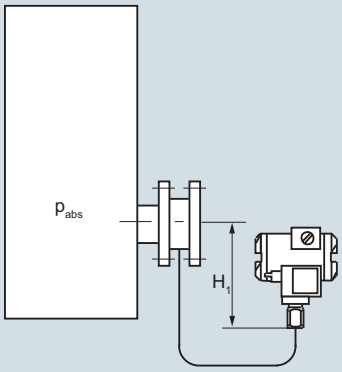
| | |
|---|---|
| $p_{MA}$ | Start-of-scale value to be set |
| $p_{ME}$ | Full-scale value to be set |
| $\rho_{FL}$ | Density of medium in vessel |
| $\rho_{Oil}$ | Density of filling oil in the capillary to the remote seal |
| g | Local acceleration due to gravity |
| $H_U$ | Start-of-scale value |
| $H_O$ | Full-scale value |
| $H_1$ | Distance between vessel flange and pressure trans. |

### *Types of installation for absolute level measurements (closed vessels)*

Installation type $C_1$




Installation type $C_2$




Pressure transmitter for absolute pressure always below the measuring point: $H_1 \geq 200$ mm (7.9 inch)

Installation type $C_1$ and $C_2$

Start-of-scale: $p_{MA} = p_{START} + \rho_{Oil} \cdot g \cdot H_1$

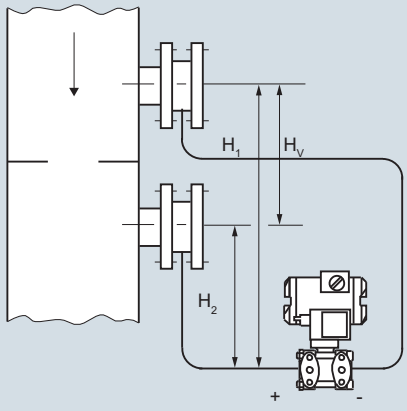
Full-scale: $p_{ME} = p_{END} + \rho_{Oil} \cdot g \cdot H_1$

Legend

| | |
|---|---|
| $p_{MA}$ | Start-of-scale value to be set |
| $p_{ME}$ | Full-scale value to be set |
| $p_{START}$ | Start-of-scale value |
| $p_{END}$ | Full-scale value |
| $\rho_{Oil}$ | Density of filling oil in the capillary to the remote seal |
| g | Local acceleration due to gravity |
| $H_1$ | Distance between vessel flange and pressure trans. |

### *Type of installation for differential pressure and flow measurements*

Installation type D Filter monitoring




Installation type D

Start-of-scale: $p_{MA} = p_{START} - \rho_{Oil} \cdot g \cdot H_V$

Full-scale: $p_{ME} = p_{END} - \rho_{Oil} \cdot g \cdot H_V$

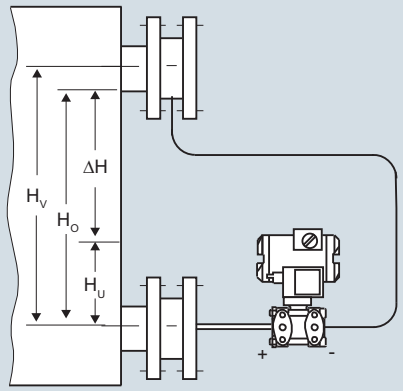
Legend

| | |
|---|---|
| $p_{MA}$ | Start-of-scale value to be set |
| $p_{ME}$ | Full-scale value to be set |
| $p_{START}$ | Start-of-scale value |
| $p_{END}$ | Full-scale value |
| $\rho_{Oil}$ | Density of filling oil in the capillary to the remote seal |
| g | Local acceleration due to gravity |
| $H_V$ | Distance between the measuring points (spigots) |

## Measuring setups with remote seals

### *Types of installation for level measurements (closed vessels)*

Installation type E




Installation type E

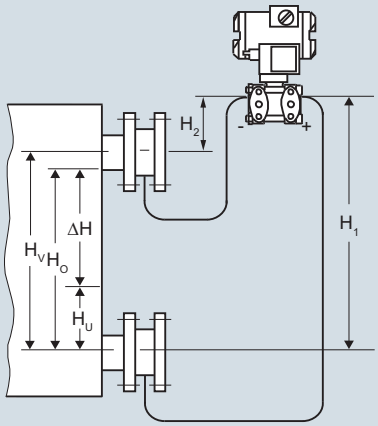
Start-of-scale: $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Full-scale: $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

Legend

| | |
|---|---|
| $p_{MA}$ | Start-of-scale value to be set |
| $p_{ME}$ | Full-scale value to be set |
| $\rho_{FL}$ | Density of medium in vessel |
| $\rho_{Oil}$ | Density of filling oil in the capillary to the remote seal |
| g | Local acceleration due to gravity |
| $H_U$ | Start-of-scale value |
| $H_O$ | Full-scale value |
| $H_V$ | Distance between the measuring points (spigots) |

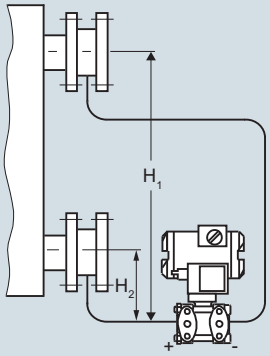
Installation type G




Pressure transmitter for differential pressure above the upper measuring point, no vacuum

$H_1 \leq 7$ m (23 ft), with halocarbon oil as filling liquid only $H_1 \leq 4$ m (13.1 ft)

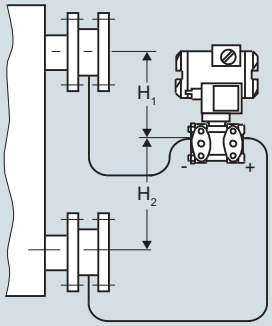
Installation type H




below the lower measuring point

Installation type for vacuum applications

Installation type J




between the measuring points, no vacuum

$H_2 \leq 7$ m (23 ft), with halocarbon oil as filling liquid only $H_2 \leq 4$ m (13.1 ft)

Installation type G, H and J

Start-of-scale: $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Full-scale: $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

Legend

| | |
|---|---|
| $p_{MA}$ | Start-of-scale value to be set |
| $p_{ME}$ | Full-scale value to be set |
| $\rho_{FL}$ | Density of medium in vessel |
| $\rho_{Oil}$ | Density of filling oil in the capillary to the remote seal |
| g | Local acceleration due to gravity |
| $H_U$ | Start-of-scale value |
| $H_O$ | Full-scale value |
| $H_V$ | Distance between the measuring points (spigots) |

## Overview

***Notes***

- For the separation layer measurement, the separation layer has to be positioned between the two spigots.

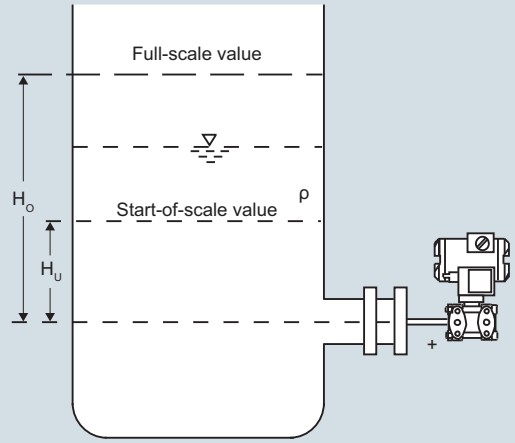
Also you must make sure that the level in the container is always above the top spigot.

- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot

## Dimensional drawings

***Pressure transmitters for differential pressure, for flanging***

Measuring setups for open containers



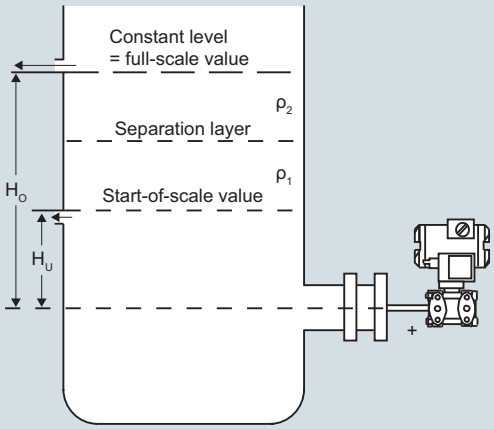

Level measurement

Start-of-scale: $p_{MA} = \rho \cdot g \cdot H_U$

Full-scale: $p_{ME} = \rho \cdot g \cdot H_O$

Legend

| | |
|---|---|
| $p_{MA}$ | Start-of-scale value to be set |
| $p_{ME}$ | Full-scale value to be set |
| ρ | Density of medium in vessel |
| g | Local acceleration due to gravity |
| $H_U$ | Start-of-scale value |
| $H_O$ | Full-scale value |



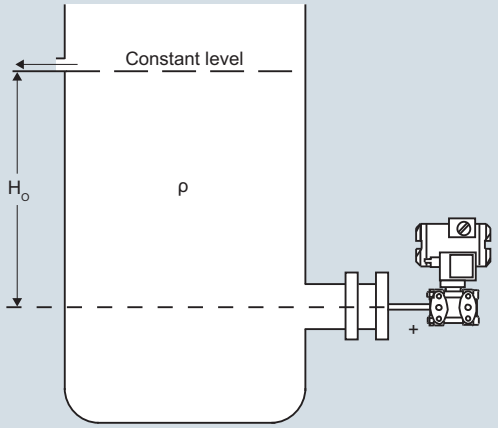

Separation layer measurement

Start-of-scale: $p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2)$

Full-scale: $p_{ME} = \rho_1 \cdot g \cdot H_O$

Legend

| | |
|---|---|
| $p_{MA}$ | Start-of-scale value to be set |
| $p_{ME}$ | Full-scale value to be set |
| $\rho_1$ | Density of heavier liquid |
| $\rho_2$ | Density of lighter liquid |
| g | Local acceleration due to gravity |
| $H_U$ | Start-of-scale value |
| $H_O$ | Full-scale value |




Density measurement

Start-of-scale: $p_{MA} = \rho_{MIN} \cdot g \cdot H_O$

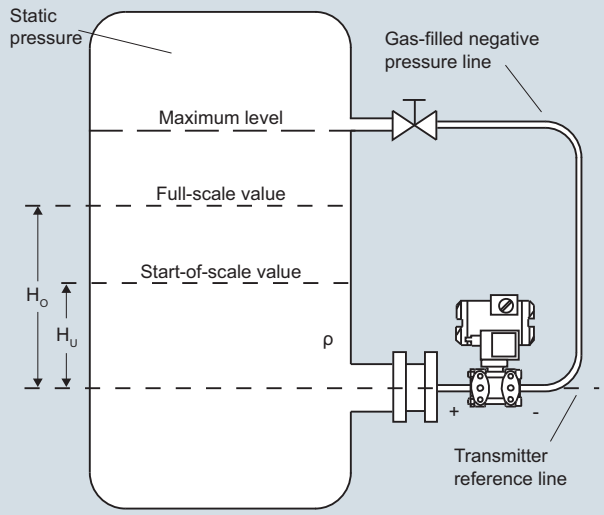
Full-scale: $p_{ME} = \rho_{MAX} \cdot g \cdot H_O$

Legende

| | |
|---|---|
| $p_{MA}$ | Start-of-scale value to be set |
| $p_{ME}$ | Full-scale value to be set |
| $\rho_{MIN}$ | Minimum density of medium in vessel |
| $\rho_{MAX}$ | Maximum density of medium in vessel |
| g | Local acceleration due to gravity |
| $H_O$ | Full-scale value in m |

## Measuring setups without remote seals

Measuring setups for closed containers



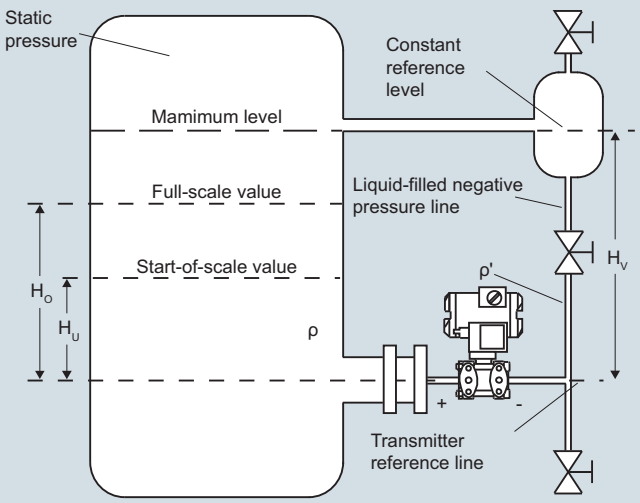

Level measurement, Version 1

Start-of-scale: $\Delta p_{MA} = \rho \cdot g \cdot H_U$

Full-scale: $\Delta pME = \rho \cdot g \cdot H_O$

Legend

| | |
|---|---|
| $\Delta p_{MA}$ | Start-of-scale value to be set |
| $\Delta p_{ME}$ | Full-scale value to be set |
| ρ | Density of medium in vessel |
| g | Local acceleration due to gravity |
| $H_U$ | Start-of-scale value |
| $H_O$ | Full-scale value |



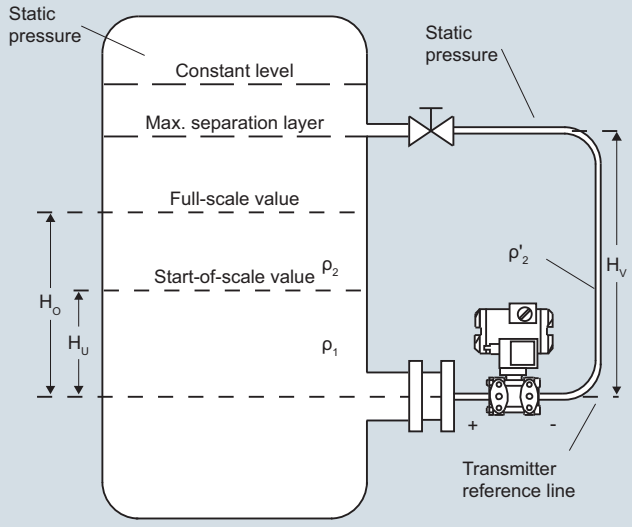

Level measurement, Version 2

Start-of-scale: $\Delta p_{MA} = g \cdot (H_U \cdot \rho - H_V \cdot \rho')$

Full-scale: $\Delta p_{ME} = g \cdot (H_O \cdot \rho - H_V \cdot \rho')$

Legend

| | |
|---|---|
| $\Delta p_{MA}$ | Start-of-scale value to be set |
| $\Delta p_{ME}$ | Full-scale value to be set |
| ρ | Density of medium in vessel |
| ρ' | Density of liquid in the negative pressure line (corresponding to the temperature existing there) |
| g | Local acceleration due to gravity |
| $H_U$ | Start-of-scale value |
| $H_O$ | Full-scale value |
| $H_V$ | Distance between the measuring points (spigots) |




Separation layer measurement

Start-of-scale: $\Delta p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2 - H_V \cdot \rho'_2)$

Full-scale: $\Delta p_{ME} = g \cdot (H_O \cdot \rho_1 - H_V \cdot \rho'_2)$

Legend

| | |
|---|---|
| $\Delta p_{MA}$ | Start-of-scale value to be set |
| $\Delta p_{ME}$ | Full-scale value to be set |
| $\rho_1$ | Density of heavier liquid with separation layer in vessel |
| $\rho_2$ | Density of lighter liquid with separation layer |
| $\rho'_2$ | Density of liquid in the negative pressure line (corresponding to the temperature existing there) |
| g | Local acceleration due to gravity |
| $H_U$ | Start-of-scale value |
| $H_O$ | Full-scale value |
| $H_V$ | Distance between the measuring points (spigots) |

* Customer:_____ Tag. No.: _____
* Plant: _____ Item No.: _____
* Ordering code:_____ Person responsible: _____
* Ordering department: _____ Phone: _____
*** Transmitter Article No. SITRANS P DSIII/P300: 7MF ☐☐☐ –1 ☐ Y ☐☐ –1 ☐☐☐**
*** Transmitter Article No. SITRANS P500: 7MF5 ☐☐☐ – ☐☐☐☐ 0 –Z V00**

**Article No. of diaphragm seal known?**

**Yes**

*** Article No. of remote seal:**
**7MF 4 9 ☐☐ – ☐☐☐☐☐ – ☐☐ –Z**
Suffixes _____
Suffixes _____

**No**

*** Or without Article No.: Process connection**
* Standard: _____
* Nominal diameter: _____
* Nominal pressure: _____
* Constructional design:
☐ Sandwich-type rem. seal
☐ Flanged remote seal
☐ Quick-release remote seal
☐ Clamp-on seal
☐ Other.: _____
* Connection:
☐ Direct connection
☐ Capillary on one side; connection to: ☐ + side ☐ – side
☐ Capillaries on both sides;
☐ Capillary length: ___ m
* Vacuum-proof design ☐ Yes ☐ No
* Wetted parts materials: _____
* Tube: ☐ No ☐ Yes, ___mm long
* Filling liquid _____
* Miscellaneous _____

**Calculation of measuring range necessary?**

**No**

*** Range to be set:**
(without calculation)
**Start-of-scale:**_____ mbar ( 4 mA)
**Full-scale:** _____ mbar (20 mA)
*** Required measuring accuracy:**
**Error:** < . % of set span per 10 V change in temperature

**Please fill in this questionnaire and enclose with every order!**
***) Values must be entered here!**

Checked: Name:
Department:
Date:

**Yes**

**Medium** _____
**Density of medium:** _____ kg/m³
*** Temperature of medium:** Normal _____ °C
Minimum_____ °C
Maximum_____ °C
*** Ambient temperature on capillaries:** Normal _____ °C
Minimum_____ °C
Maximum_____ °C
*** Ambient temperature on transmitter:** Normal _____ °C
Minimum_____ °C
Maximum_____ °C
*** Operating pressure referred to absolute zero:** ____ bar a
* Does a **vacuum** occur **during startup**? ☐ No ☐ Yes
If yes, associated temperature of medium: _____ °C
*** Installation type**, see pages 1/251 and 1/252 ☐ A ☐ B ☐ $C_1$ ☐ $C_2$ ☐ D ☐ E ☐ G ☐ H ☐ J
*** Measuring range:** With install. types A, B, $C_1$, $C_2$ and D: from ___ to ___ mbar
With install. types A, B, G, H and J: $H_U$ = ___ mm; $H_O$ = ___ mm
*** Dimensions:** With install. types A, B, $C_1$ and $C_2$: $H_1$ = ___ mm
With install. types D, G, H and J: $H_V$ = ___ mm
*** Start-of-scale value following calculation:**_____ mbar ( 4 mA)
**Full-scale value following calculation:**_____ mbar (20 mA)
**Associated span:** _____ mbar
**Error to be expected:** < . % of set span per 10 K change in temperature

SIEMENS

# Questionnaire
## for hydrostatic level measurements

1

**Order date:** _____

**Processing date:** _____

**Ordering code (customer):** _____

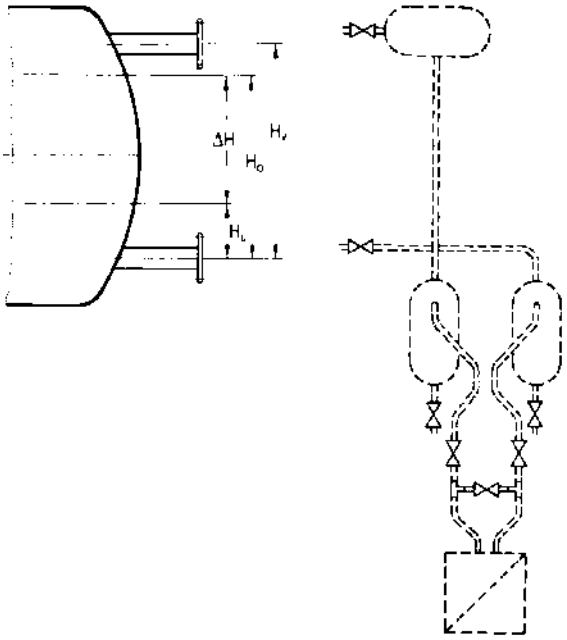
**Ordering code (supplier):** _____

**Customer reference:** _____

**Measuring point:** _____

**Position:** _____

**Dimensions:** _____




Pressure: ☐ bar

Temperature: ☐ K ☐ °C

Measuring range: ☐ cm ☐ m
(please mark with cross)

Article No. of transmitter SITRANS P DS III/P300[1]:

**7 M F 4 _ _ _ _ – _ _ _ _ _ _ _ – _ _ _ _ _ _ –Z**

**Y01**

Article No. of transmitter SITRANS P500[1]:

**7 M F 5 _ _ _ _ – _ _ _ _ _ _ _ _ 0**

The different pressures and temperatures (densities) in the vessel and in the reference column result in an offset in the start-of-scale and full-scale values.
The calibration data are determined in addition.
It is also checked whether – as a result of the range offset – the ordered transmitter is suitable for this measurement.

Please supply the following characteristic data so that we can calculate the measuring range, start-of-scale value, full-scale value and calibration data:

| | | |
|---|---|---|
| Please mark type of boiler with a cross: | Closed[1] ☐ | |
| | Open or not under pressure[2] ☐ | |
| Medium _____ | | |
| Licensed boiler pressure (absolute) | | _____ bar |
| Operating pressure (absolute) | Lowest | _____ bar |
| | Normal[3] | _____ bar |
| | Highest | _____ bar |
| Temperature of reference column (cold) | | _____ K |
| Distance between measuring points (dimension according to sketch) $H_V$ = | | _____ m |
| Measuring range[4] = start-of-scale value to full-scale value | | |
| | Start-of-scale value | $H_U$ = _____ m |
| | Full-scale value | $H_O$ = _____ m |
| Position of equalizing vessel above bottom measuring point if different from $H_V$ | | _____ m |
| Please mark pressure correction of level with a cross: | No ☐ | |
| | Yes[4] ☐ | |

[1] Reference line filled with condensation! Falling differential pressure with increasing level.
[2] Reference line without gas or filled with gas (air). Rising differential pressure with increasing level.
[3] If not specified otherwise, this value is assumed as the calculation pressure of the level meter. The input signal (differential pressure) depends on the density (pressure and temperature). The influence is practically negligible for a lowest liquid level of 20 to 30% of the distance between the measuring points.
[4] If a pressure correction of the level is required, the **measuring range must be the same as the distance between the measuring points**, and the transmitter is designed for the calculation pressure of 1 bar (absolute).Pressure correction means: the static pressure and the temperature are measured separately and calculated by a correction computer or measured-value computer.

* Customer:_____ Tag. No.: _____
* Plant: _____ Item No.: _____
* Ordering code:_____ Person responsible: _____
* Ordering department: _____ Phone: _____
*** Transmitter Article No. SITRANS P DS III/P300: 7MF ☐☐☐☐–1 ☐ Y ☐☐–1 ☐☐☐**
*** Transmitter Article No. SITRANS P500: 7MF5 ☐☐☐–☐☐☐☐ 0 –Z V00**

**Article No. of diaphragm seal known?**

**Yes**

*** Article No. of remote seal:**
**7MF 4 9 ☐☐–☐☐☐☐☐–☐☐–Z**
Suffixes _____
Suffixes _____

**No**

*** Or without Article No.: Process connection**
* Standard: _____
* Nominal diameter: _____
* Nominal pressure: _____
* Constructional design:
☐ Sandwich-type rem. seal
☐ Flanged remote seal
☐ Quick-release remote seal
☐ Clamp-on seal
☐ Other.: _____
* Connection:
☐ Direct connection
☐ Capillary on one side; connection to: ☐ + side ☐ – side
☐ Capillaries on both sides;
☐ Capillary length: ___ ft
* Vacuum-proof design ☐ Yes ☐ No
* Wetted parts materials: _____
* Tube: ☐ No ☐ Yes, __inch long
* Filling liquid _____
* Miscellaneous _____

**Calculation of measuring range necessary?**

**No**

*** Range to be set:**
(without calculation)
**Start-of-scale:** _____ psi ( 4 mA)
**Full-scale:** _____ psi (20 mA)
*** Required measuring accuracy:**
**Error:** < . % of set span per 18 °F change in temperature

**Please fill in this questionnaire and enclose with every order!**
***) Values must be entered here!**

Checked: Name:
Department:
Date:

**Yes**

**Medium** _____
**Density of medium:** _____ kg/m³
*** Temperature of medium:** Normal _____ °F
Minimum _____ °F
Maximum _____ °F
*** Ambient temperature on capillaries:** Normal _____ °F
Minimum _____ °F
Maximum _____ °F
*** Ambient temperature on transmitter:** Normal _____ °F
Minimum _____ °F
Maximum _____ °F
*** Operating pressure referred to absolute zero:** ____ $psi_{abs}$
* Does a **vacuum** occur **during startup**? ☐ No ☐ Yes
If yes, associated temperature of medium: _____ °F
*** Installation type**, see pages 1/251 and 1/252 ☐A ☐B ☐$C_1$ ☐$C_2$ ☐D ☐E ☐G ☐H ☐J
*** Measuring range:** With install. types A, B, $C_1$, $C_2$ and D: from ___ to ___ psi
With install. types A, B, G, H and J: $H_U$ = ___ inch; $H_O$ = ___ inch
*** Dimensions:** With install. types A, B, $C_1$ and $C_2$: $H_1$ = ___ inch
With install. types D, G, H and J: $H_V$ = ___ inch
*** Start-of-scale value following calculation:** _____ psi ( 4 mA)
**Full-scale value following calculation:** _____ psi (20 mA)
**Associated span:** _____ psi
**Error to be expected:** < . % of set span per 18 °F change in temperature