

ABB MEASUREMENT & ANALYTICS | DATA SHEET

# Sensyflow FMT700-P Compact

## Thermal Mass Flowmeter



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# Measurement made easy

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**Compact device without remote evaluation and supply unit**

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**Direct mass flow measurement of air**

- No additional pressure and temperature compensation required

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**High measuring accuracy over the entire measuring range**

- Measuring accuracy < 0.8 % of measured value

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**Wide measuring range of 1:60**

- Measurement up to 5000kg/h
- DN 25 to DN 200

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**Quick response time < 25 ms**

- Detection of rapid load changes on engine test benches

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**Complete system with inlet / outlet sections, flow conditioner and connection parts**

- Easy to use
- Ready for operation

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**Used in test bench applications, quality assurance, research and development**

## Overview



Sensor

Figure 1: Integral mount design

| Design   | Integral mount design  |
|--|--|
| Model  | Sensyflow FMT700-P Compact   |
| Measuring media  | Air  |
| Measuring accuracy*  | $\leq \pm 0.8\%$ of measured value, repeatability $\leq \pm 0.25\%$ of measured value  |
| Permissible measuring medium temperature $T_{\text{medium}}$ | -25 to 50 °C (-13 to 122 °F)   |
| Permissible operating pressure                               | 0.6 to 2.5 × 10 <sup>2</sup> kPa (2.5 bar abs.)  |
| Process connections  | DN 25: Quick-clamping pipe flange, aluminum with quick clamping chains / quick-clamping rings<br>DN 50 to 100: Wafer type with raised face |
| Wetted materials   | Anodized aluminum, glass sensor  |
| Power supply   | 24 V DC, $\pm 10\%$  |
| IP rating  | in accordance with EN 60529: IP 54   |
| NEMA rating  | in accordance with NEMA 12   |
| Communication  | serial, V24 / RS232C   |
| Outputs in serial production                                 |  |
| Analog outputs   | 0 to 5 V DC, 0 to 10 V DC, 0/4 to 20 mA, min. / max. alarm   |
| Digital output   | Yes  |
| Pulse / frequency output                                     | Yes  |
| Approvals and certificates                                   | Available on <a href="http://abb.com/flow">abb.com/flow</a> or on request  |

\* The stated measuring accuracy only applies under the calibration conditions in the stated measuring range.



Transport aluminum box

Figure 2: Transport aluminum box

### Note

The sensor is delivered in a robust transport aluminum box. Always use the transport aluminum box to transport the sensor.

## ... Overview

### Device description

The Sensyflow FMT700-P Compact works in accordance with the measuring principle of a hot-film anemometer. This measurement method allows for direct measurement of the gas mass flow.

Taking into account the standard density of the air, the standard volume flow can be measured without the need for additional pressure and temperature compensation.

### Sensor

The transmitter is integrated in the sensor.

The measuring system comprises two components, a sensor and a measuring section.

The sensor is designed as a meter tube and accommodates the measuring elements and an electronic transmitter circuit. The meter tube is available in six nominal diameters ranging from DN 25 to DN 200 and is installed in the measuring section by using quick-clamping connectors.

### Measuring section

The sensor is installed in a measuring section with the help of quick-clamping connectors.

The measuring section itself is made up of sufficiently dimensioned inlet and outlet sections as well as an air filter or flow conditioner.

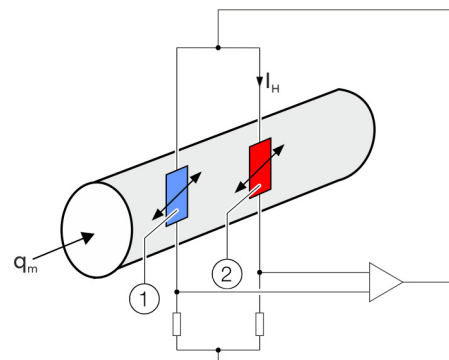
The flow conditioner can be connected to an air duct, for example, using the connection piece on the suction side. The power supply, output signals and serial interface for the sensor are connected via a connection cable.

The measuring rate is adjustable according to measuring velocity or signal damping requirements.

### Measuring principle

Thermal flow metering procedures use different ways to evaluate the flow dependent cooling of a heated resistor as measuring signal.

In a hotfilm anemometer with constant temperature difference control, the heated measurement resistor is maintained at a constant overtemperature in relation to an unheated measurement resistor inside the gas flow. The heating power required for maintaining the overtemperature depends directly on the flow rate and the material properties of the gas. With a known (and constant) gas composition the mass-flow can be determined by electronically evaluating the heater current / mass-flow curve without additional pressure and temperature compensation. Together with the standard density of the gas this results directly in the standard volume flow. Considering the high measuring range value dynamics up to 1:60, an accuracy smaller than 0.8 % of the measured value is achieved.



- |   |                                      |       |                  |
|---|--------------------------------------|-------|------------------|
| ① | Gas temperature measurement resistor | $q_m$ | Gas mass current |
| ② | Heating resistor                     | $I_H$ | Heater current   |

Figure 3: Measuring principle (simplified)

The gas flows past two temperature-sensitive resistors, measurement resistor and heating resistor, which are part of an electric bridge circuit. Due to the chosen resistance ratio, the heating resistor is heated by the heating current  $I_H$ . The measurement resistor adopts the same temperature as the gas. The heating current  $I_H$  is preset by the electronic control circuit to produce a constant temperature difference between the heated resistor and the temperature of the gas.

The electric power generated in the heating resistor precisely compensates its loss of heat to the gas flow. As this loss of heat is dependent on the number of particles which collide with the surface of the heating resistor, the heating current  $I_H$  represents a measure of the mass flow rate.

### Typical applications

Sensyflow FMT700-P Compact for air provide a unique combination of high measuring accuracy, wide measuring range and extremely fast response time. These features especially qualify them for the following application fields:

- Intake air measurements in combustion engines and fuel cells,
- Test benches for turbo chargers,
- Serial testing of flow dependent components like throttle valves, exhaust fans, air filters, etc.
- Quality assurance: Reference device for flowmeters,
- Research and development at universities and institutes.

### Notes for ordering

The measuring system consists of the following components, which must be ordered separately:

1. Sensor,
2. Connection cable for the sensor,
3. Measuring section with air filter or flow conditioner,

### Note

When using the sensor with modified measuring sections or without measuring sections, influences on measuring accuracy cannot be ruled out.

## Flowmeter sensor



Figure 4: Sensyflow FMT700-P Compact sensor

## Measuring accuracy

### Measured error

<  $\pm 0.8$  % of the measured value

### Repeatability

<  $\pm 0.25$  % of the measured value

### Effect of the measuring medium temperature

< 0.05 % of the measured value per Kelvin

### Effect of the measuring medium pressure

$\leq 0.2$  % / 100 kPa (/ bar) of the measured value

### Effect of the measuring medium humidity

A change in the relative humidity of the measuring medium to the relative humidity of the calibration medium has an influence on the measurement result. Technically, the change in humidity represents a change in the composition of the measuring medium. An increase in relative humidity compared to the calibration medium results in a positive deviation of the measured value, a decrease in relative humidity a negative. The size of the measurement error depends on the relative humidity in connection with the temperature of the measuring medium.

### Response time

$T_{63} = 25$  ms,  $T_{98} = 90$  ms

## Ambient conditions

### Storage temperature range

-30 to 85 °C (-22 to 185 °F)

### Ambient temperature

-25 to 50 °C (-13 to 122 °F)

### Measured medium temperature

-25 to 50 °C (-13 to 122 °F)

### IP rating

In accordance with EN 60529: IP 54

### NEMA IP rating

In accordance with NEMA 12

### EMC compatibility

In accordance with Table 3 DIN EN 61326,1: Use of a device only in a controlled electromagnetic environment.

### Vibration

In accordance with IEC 60068-2-6

### Shock resistance

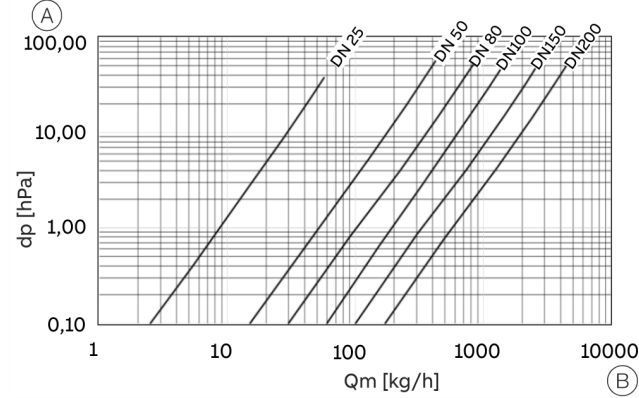
In accordance with IEC 60068-2-27

## ... Flowmeter sensor

### Operating pressure

Operating pressure  $P_{medium}$   
 0.6 to  $2.5 \times 10^2$  kPa (2.5 bar abs)

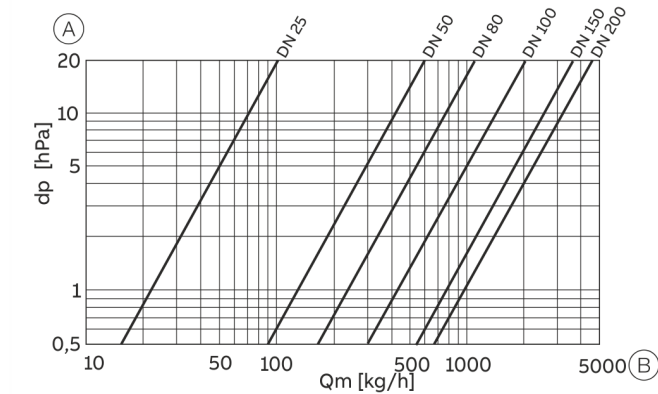
### Pressure loss sensor



(A) Pressure drop dp [hPa]      (B) Mass flow Qm [kg/h]

Figure 5: Pressure loss sensor

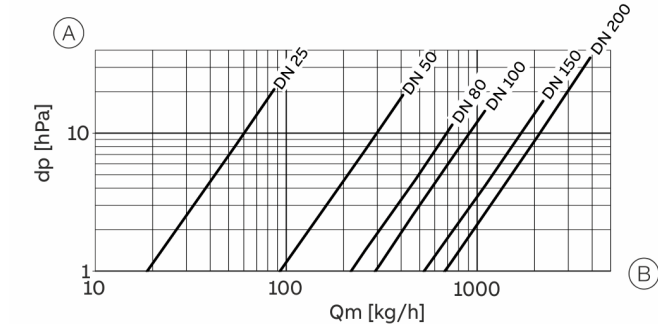
### Air filter pressure loss (open)



(A) Pressure drop dp [hPa]      (B) Mass flow Qm [kg/h]

Figure 6: Air filter pressure loss (open)

### Air filter pressure loss (closed)



(A) Pressure drop dp [hPa]      (B) Mass flow Qm [kg/h]

Figure 7: Flow conditioner / air filter pressure loss (closed)

### Measuring range table

#### Standard measuring ranges

Reference values are given for applications with air under atmospheric conditions.

The values in brackets indicate the low limit of the measuring range for which the measured value accuracy indicated is specified.

| Nominal diameter | Measuring range     |
|------------------|---------------------|
| DN 25            | 0 (1) to 60 kg/h    |
| DN 50            | 0 (8) to 500 kg/h   |
| DN 80            | 0 (15) to 900 kg/h  |
| DN 100           | 0 (25) to 1500 kg/h |
| DN 150           | 0 (50) to 3000 kg/h |
| DN 200           | 0 (80) to 5000 kg/h |

#### Upper range value

The upper range value can be adjusted.

The upper measuring range limit can be reduced at any nominal diameter by adjusting the upper range value. The outputs can then be reevaluated accordingly.

### Process connections

Quick-clamping pipe flange, aluminum with quick clamping chains / quick-clamping rings.

## Materials

### Sensor

Aluminum, black anodized

### Measuring section

DN 25 to 100: Aluminum, black anodized

DN 150 to 200: stainless steel

## Installation conditions

To achieve the provided measuring accuracy, the sensor needs to be installed in the available ABB measuring sections.

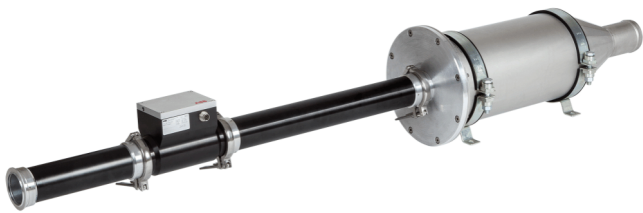


Figure 8: Standard measuring sections

The use of an ABB measuring section with an uninterrupted inlet section of  $10 \times D^*$  and an outlet section of  $5 \times D^*$  in connection with an air filter or flow conditioner complies with the calibration set and ensures measuring accuracy.

Separate components of the measuring sections are also available in the accessory product range.

\* D = Piping diameter

## Transmitter

### Features

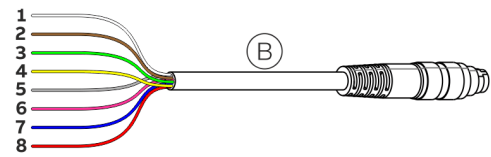
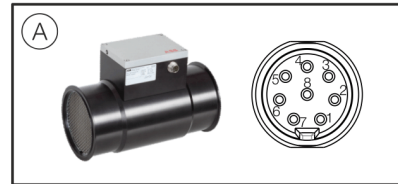
- 0 (4) to 20 mA current output or 0 to 10 (5) V analog output
- Digital output can be configured as a frequency / pulse or binary output.
- RS 232 serial interface
- Parameterization via PC software
- LED status messages and error signals

## Electrical connections

### Terminal layout

Please use the supplied cable for the electrical connection of the flowmeter sensor. It is connected to the measuring device using the plug.

Only 24 VDC supply voltage should be used.



(A) Sensor

(B) Connection cable

Figure 9: Electrical connection

| Pin    | Color  | Function / comments                     |
|--------|--------|---|
| 1      | White  | Analog output, signal (+)               |
| 2      | Brown  | RS 232C TxD – transmi data              |
| 3      | Green  | Pulse / frequency output, signal (+)    |
| 4      | Yellow | Power supply +24 V DC                   |
| 5      | Gray   | Power supply GND                        |
| 6      | Pink   | RS 232C RxD – receive data              |
| 7      | Blue   | Analog output, GND                      |
| 8      | Red    | Pulse / frequency output + RS 232C, GND |
| Shield | —      | Functional earth                        |

## ... Transmitter

### Electrical data for inputs and outputs

#### Power supply

| Integral mount design |                               |
|-----------------------|-------------------------------|
| Pin / color           | 4+ (yellow) / 5- (gray)       |
| Operating voltage     | 24 V DC ( $\pm 10\%$ )        |
| Input Current         | Peak < 1 A; operation < 0.6 A |
| Fuse                  | At least 2 A slow-blow        |
| Power consumption     | < 15 W                        |

#### Analog output

Can be optionally configured as current output (0 (4) to 20 mA) or voltage output (0 to 10 (5) V).

| Current output                  | active*                |
|---------------------------------|------------------------|
| Pin / color                     | 1+ (white) / 7- (blue) |
| Output signal                   | 0 (4) to 20 mA         |
| Signal in the event of an error | < 3.5 mA or > 22 mA    |
| Load $R_B$                      | < 500 $\Omega$         |

| Voltage output                  | Active                 |
|---------------------------------|------------------------|
| Pin / color                     | 1+ (white) / 7- (blue) |
| Output signal                   | 0 to 10 (5) V          |
| Signal in the event of an error | Min. or max.           |
| Input Current                   | < 1 mA                 |

\* When selecting the current output 0 (4) to 20 mA, the analog output supplies an active signal. The device delivers the current independently without external power supply.

#### Digital output

Can be configured as pulse / frequency outputs or binary outputs.

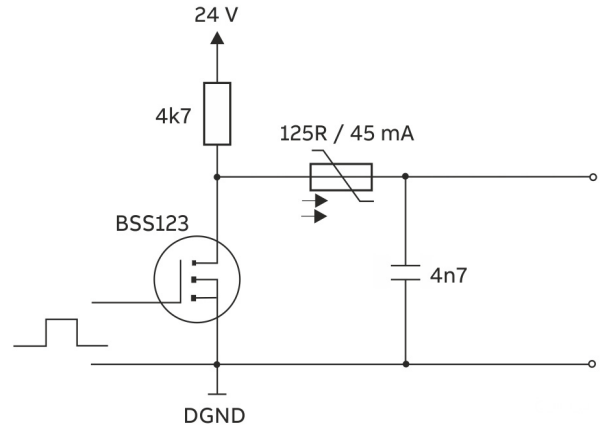


Figure 10: Connection example

The digital output offers a 24 V HIGH signal or a 0 V LOW signal. The output can be wired as active or passive.

| Digital output (passive)  |                       |
|---|-----------------------|
| Pin / color   | 3+ (green) / 8- (red) |
| $U_{max}$   | 24 V DC               |
| $I_{max}$   | -20 mA                |
| $f_{max}$   | 2500 Hz               |
| The output current must be limited to -20 mA in LOW state to guarantee an output voltage $U_a < 2.5$ V. |                       |

| Digital output (active)   |                       |
|---|-----------------------|
| Pin / color   | 3+ (green) / 8- (red) |
| $I_{max}$   | 1 mA                  |
| $f_{max}$   | 2500 Hz               |
| The output current must be limited to 1 mA in HIGH state to guarantee an output voltage $U_a > 15$ V. |                       |

#### Communication

| RS 232      |  |
|-------------|--|
| Pin / color | TxD: 2 (brown) / RxD: 6 (pink) / GND: 8- (red) |
| Baud rate   | 9600 bits/sec.                                 |
| Stop bits   | 1  |
| Parity      | None   |
| Data bits   | 8  |



### Parameterize

The Sensyflow FMT700-P Compact can simultaneously operate one analog output (current 0 / 4 to 20 mA or voltage 0 to 5 / 10 V), one digital output (frequency, pulse, alarm) and a serial RS 232 interface.

Parameterization of the measuring system can also take place via the serial interface. Using a PC or laptop, you can change the output signal used or the adjust the settings of the measuring ranges and signals.

The parameterization program is included in the standard scope of delivery.

For easier connection of the Sensyflow FMT700-P Compact in the test field, a D - SUB female connector and a USB 2.0, serial adapter including USB cable is supplied.

#### D - SUB female connector

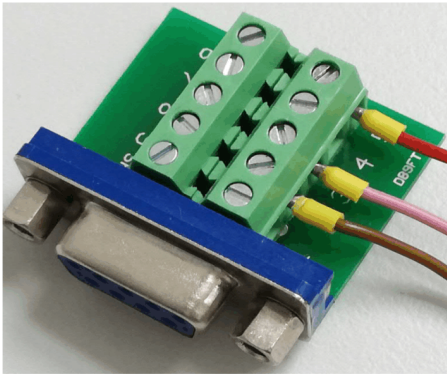


Figure 11: Female connector

#### Electrical connection D - SUB female connector

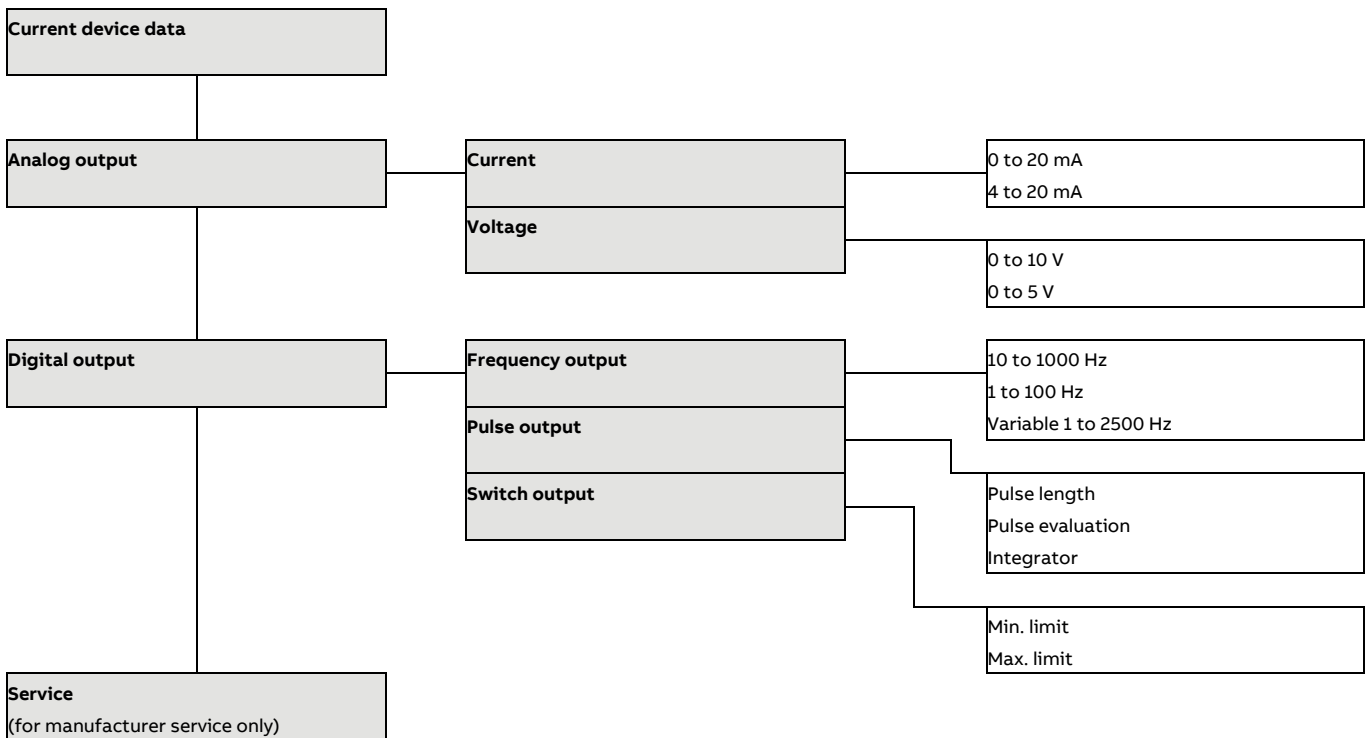
| Wire color connection cable | Terminal no. on the female connector | Signal       |
|-----------------------------|--------------------------------------|--------------|
| Brown                       | 2                                    | RS 232 / TxD |
| Pink                        | 3                                    | RS 232 / RxD |
| Red                         | 5                                    | RS 232 / GND |

#### USB 2.0, serial adapter



Figure 12: Adapter

#### Overview of parameterization program



## Dimensions

### Sensor

#### Sensyflow FMT700-P Compact, DN 25

All specified dimensions and weights are in mm (in) or kg (lb).

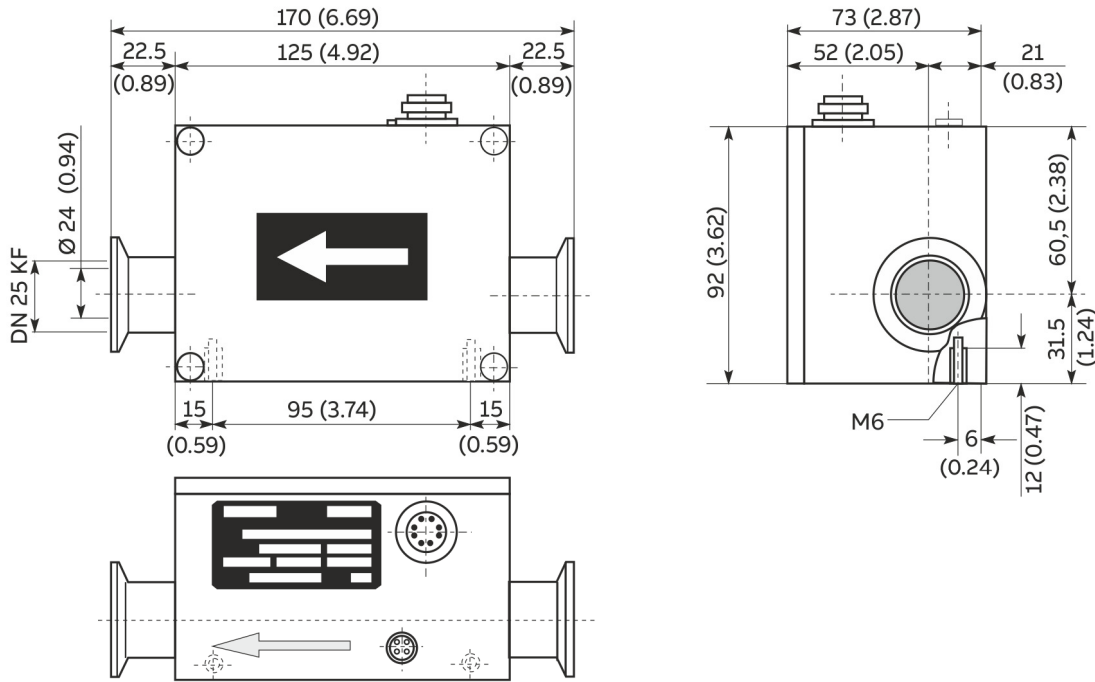


Figure 13: Dimensions

| Nominal diameter | Weight    |
|------------------|-----------|
| DN 25            | 1.1 (2.4) |

**Sensyflow FMT700-P Compact, DN 50 to DN 200**  
 All specified dimensions and weights are in mm (in) or kg (lb).

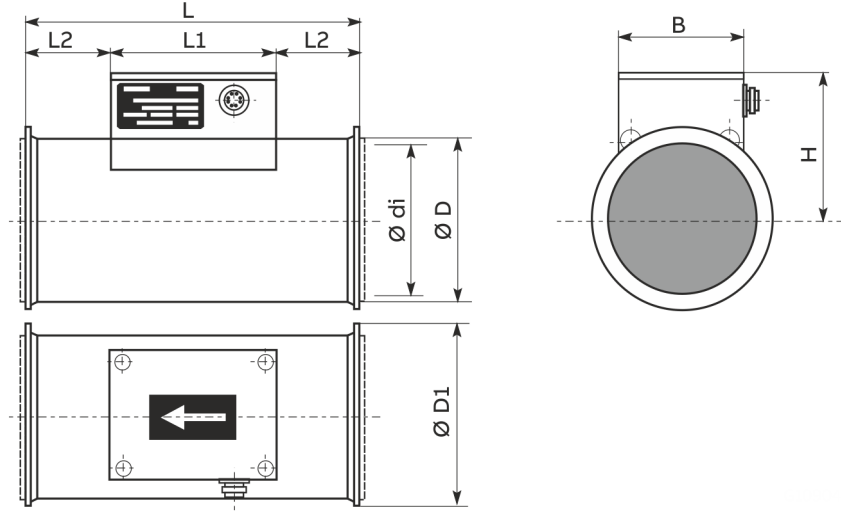


Figure 14: Sensor DN 50 to DN 200

| DN  | Ø D          | Ø D1         | Ø di       | L           | L1         | L2           | B         | H            | Weight      |
|-----|--------------|--------------|------------|-------------|------------|--------------|-----------|--------------|-------------|
| 50  | 64 (2.52)    | 80.0 (3.15)  | 58 (2.28)  | 184 (7.24)  | 125 (4.92) | 29.5 (1.16)  | 92 (3.62) | 88.0 (3.46)  | 2 (4.1)     |
| 80  | 89 (3.50)    | 108.5 (4.27) | 80 (3.15)  | 189 (7.44)  |            | 32.0 (1.26)  |           | 98.5 (3.88)  | 2.3 (5.1)   |
| 100 | 118 (4.65)   | 132.5 (5.22) | 110 (4.33) | 254 (10.00) |            | 64.5 (2.54)  |           | 114.0 (4.49) | 3.1 (6.8)   |
| 150 | 158 (6.22)   | 180.0 (7.09) | 153 (6.02) | 280 (11.02) |            | 77.5 (3.05)  |           | 136.0 (5.35) | 4.3 (9.5)   |
| 200 | 205.6 (8.09) | 240.0 (9.45) | 200 (8)    | 330 (12.99) |            | 102.5 (4.04) |           | 161.5 (6.36) | 7.9 (17.42) |

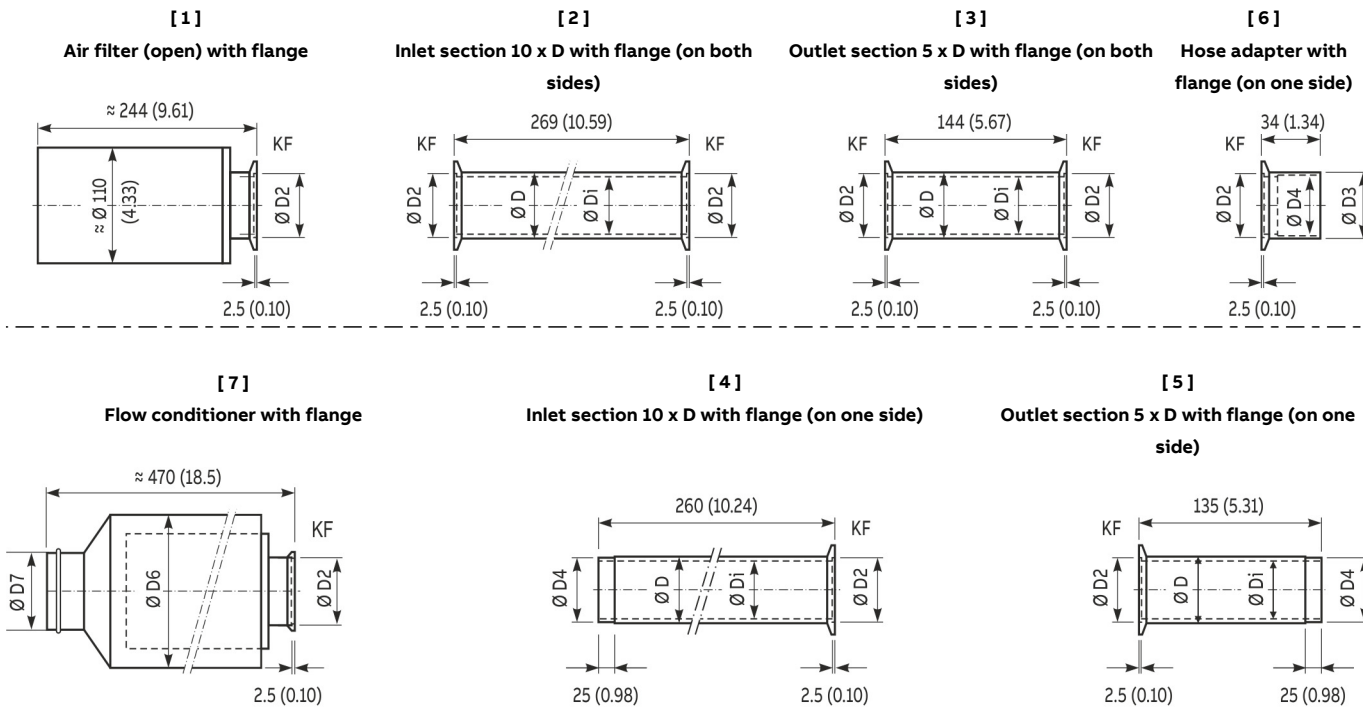
## ... Dimensions

### Accessories

#### DN 25 components

All dimensions specified in mm (in). The numbers (e.g. [ 1 ]) of the components correspond to the markings on the in the ordering information, see **Accessories** on page 19.

KF = ISO-KF flange (ISO small flange) / ZWF = wafer type (with raised face)



#### Standard measuring section

##### Measuring section 3

(including flow conditioner, closed filter)

##### Alternative measuring section 1

(concealed shown with a dashed line, including open filter, filter cartridge only)

Including the required flanges and clamping rings / clamping chains

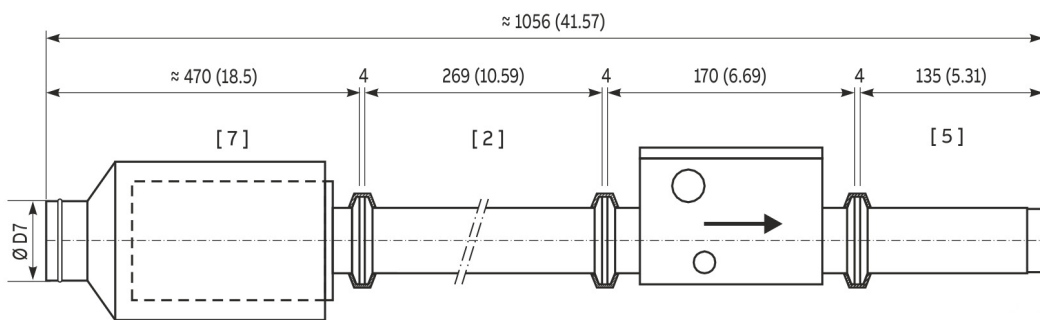


Figure 1: Component dimensions DN 25

| DN | Ø D       | Ø D2        | Ø D3      | Ø D4      | Ø D6               | Ø D7      | Ø Di      |
|----|-----------|-------------|-----------|-----------|--------------------|-----------|-----------|
| 25 | 32 (1.26) | 26.1 (1.03) | 30 (1.18) | 27 (1.06) | Approx. 150 (5.91) | 78 (3.07) | 24 (0.94) |

KF = ISO-KF flange (ISO small flange) / ZWF = wafer type (with raised face)

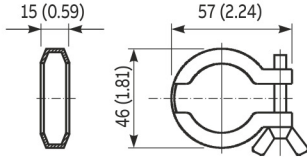
[ 12 ]

O-ring



[ 13 ]

FL special clamping ring



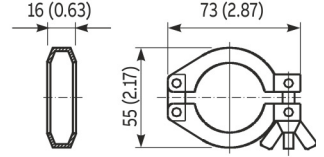
[ 11 ]

Inner centering ring



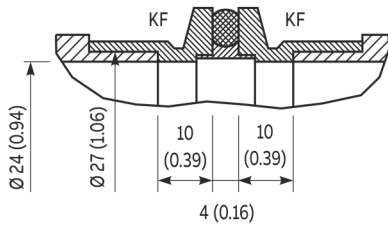
[ 14 ]

FL-Optimal AS clamping ring



[ 6 ][ 11 ] / [ 12 ] [ 6 ]

Sectional detail pipe connection (without clamping ring)



Individual planning

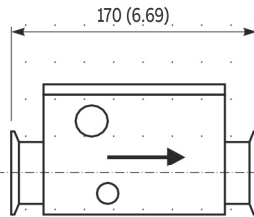


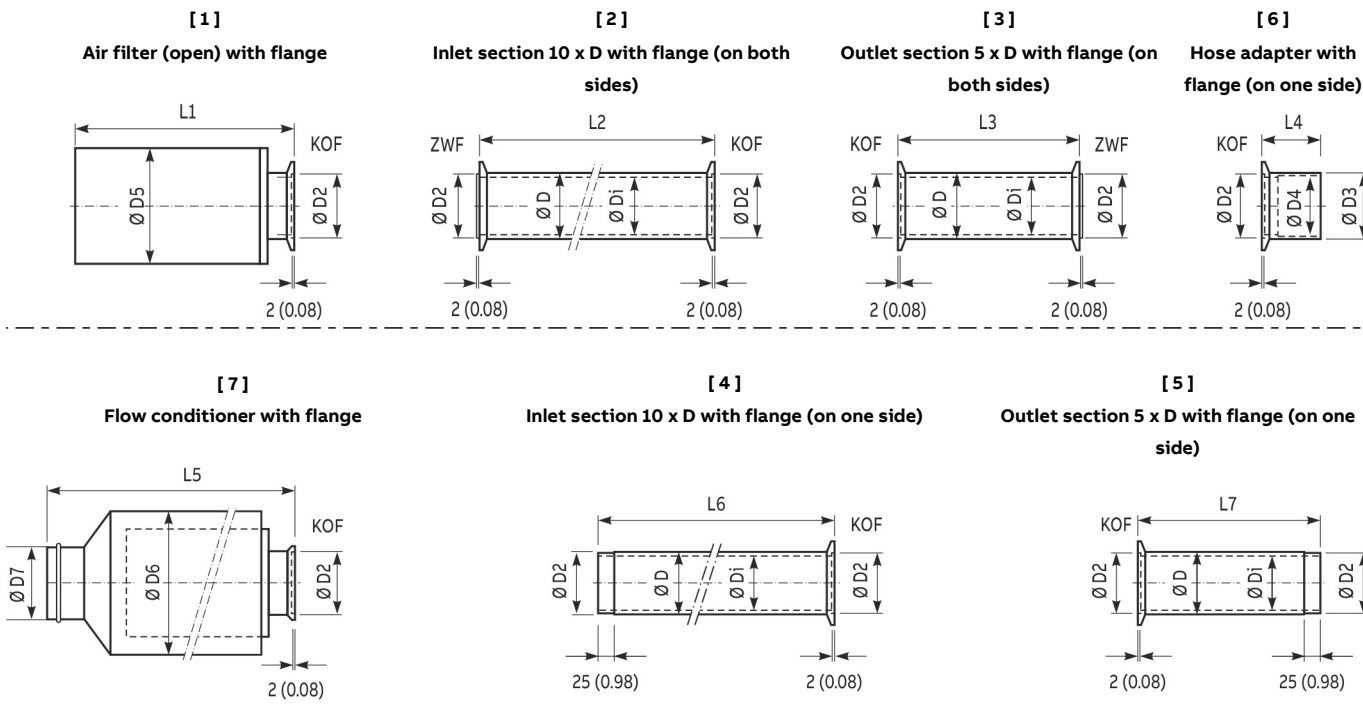
Figure 2: Accessory dimensions DN 25

## ... Dimensions

### Components DN 50 to DN 100

All dimensions specified in mm (in). The numbers (e.g. [ 1 ]) of the components correspond to the markings on the in the ordering information, see **Accessories** on page 19.

KOF = Tapered flange (with raised face and groove for O-ring) / ZWF = Wafer type (with recessed face)



### Standard measuring section

#### Measuring section 3

(including flow conditioner, closed filter)

#### Alternative measuring section 1

(concealed shown with a dashed line, including open filter, filter cartridge only)

Including the required flanges and clamping rings / clamping chains

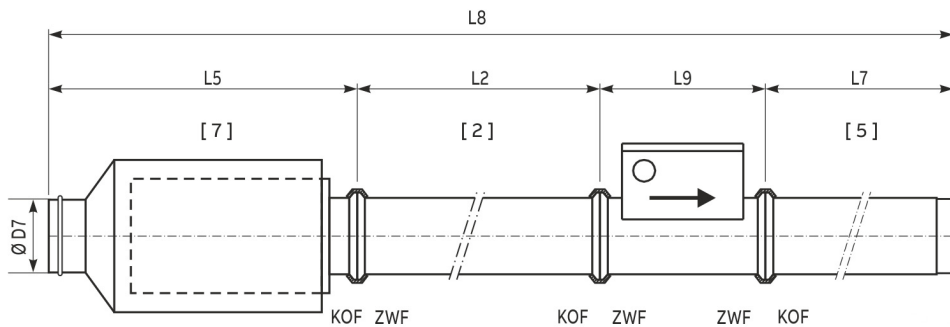
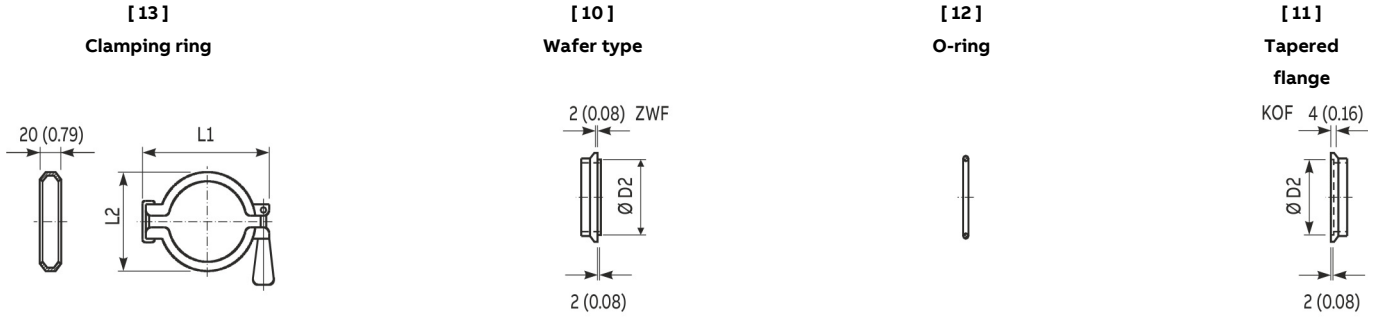


Figure 3: Component dimensions DN 50 to DN 100

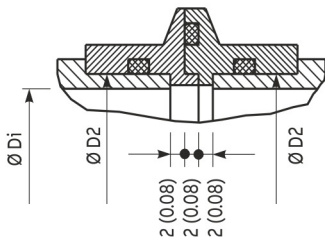
| DN  | L1                     | L2           | L3          | L4         | L5                     | L6           | L7          | L8                       | L9          |
|-----|------------------------|--------------|-------------|------------|------------------------|--------------|-------------|--------------------------|-------------|
| 50  | Approx. 356<br>(14.02) | 506 (19.92)  | 256 (10.08) | 50 (1.97)  | Approx. 660<br>(25.98) | 504 (19.84)  | 254 (10.00) | Approx. 1600<br>(62.99)  | 184 (7.24)  |
| 80  | Approx. 401<br>(15.79) | 806 (31.73)  | 406 (15.98) | 80 (3.15)  | Approx. 740<br>(29.13) | 804 (31.65)  | 404 (15.91) | Approx. 2140<br>(84.25)  | 189 (7.44)  |
| 100 | Approx. 526<br>(20.71) | 1006 (39.61) | 506 (19.92) | 100 (3.94) | Approx. 840<br>(33.07) | 1004 (39.53) | 504 (19.84) | Approx. 2610<br>(102.76) | 254 (10.00) |

| DN  | Ø D        | Ø D2       | Ø D3       | Ø D4       | Ø D5               | Ø D6                   | Ø D7       | Ø Di       |
|-----|------------|------------|------------|------------|--------------------|------------------------|------------|------------|
| 50  | 66 (2.60)  | 64 (2.52)  | 70 (2.76)  | 60 (2.36)  | Approx. 150 (5.91) | Approx. 200 (7.87)     | 78 (3.07)  | 58 (2.28)  |
| 80  | 91 (3.58)  | 89 (3.50)  | 95 (3.74)  | 85 (3.35)  | Approx. 200 (7.87) | Approx. 250 (9.84)     | 98 (3.86)  | 80 (3.15)  |
| 100 | 119 (4.69) | 118 (4.65) | 122 (4.80) | 114 (4.49) | Approx. 240 (9.45) | Approx. 300<br>(11.81) | 148 (5.83) | 110 (4.33) |

KOF = Tapered flange (with raised face and groove for O-ring) / ZWF = Wafer type (with recessed face)



**[10] [12] [11]**  
**Sectional detail pipe connection (without clamping ring)**



**Individual planning**

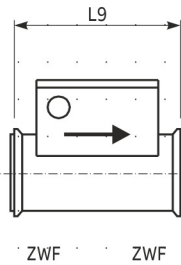


Figure 4: Accessory dimensions DN 50 to DN 100

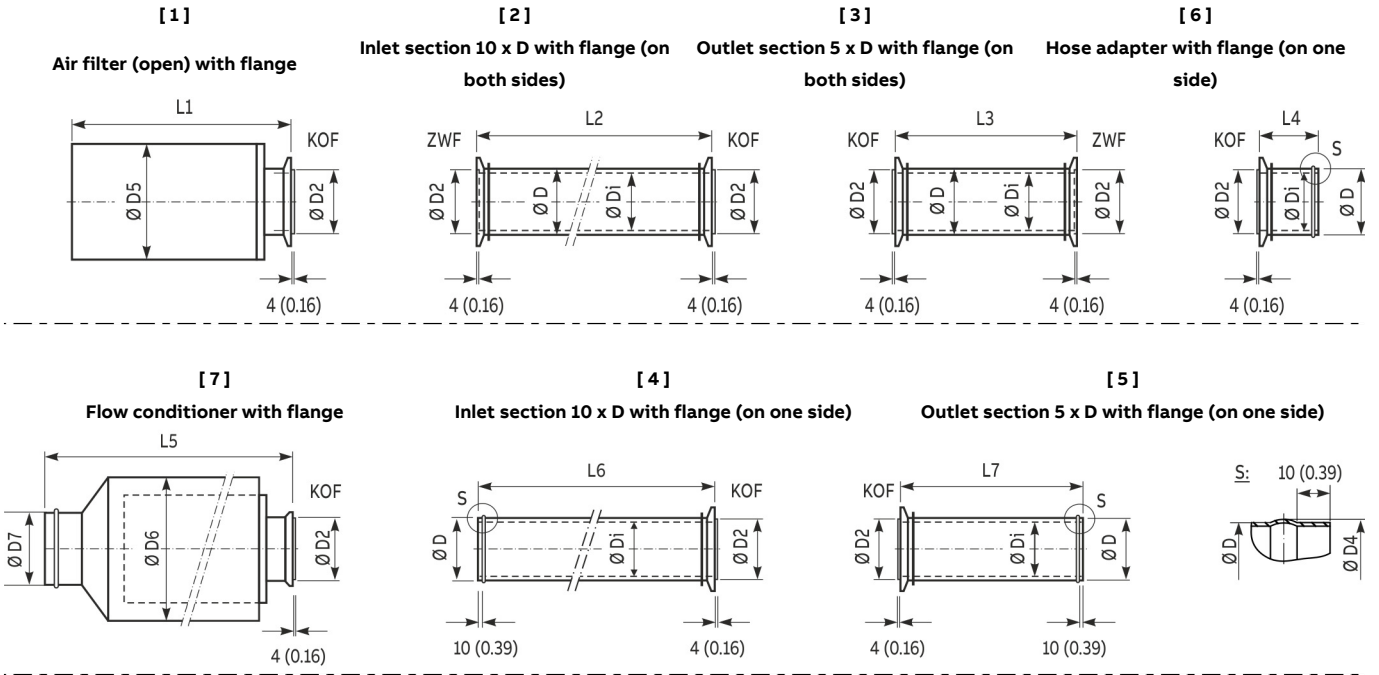
| DN  | L1         | L2         | L9          | Ø D2       | Ø Di       |
|-----|------------|------------|-------------|------------|------------|
| 50  | 102 (4.02) | 72 (2.83)  | 184 (7.24)  | 64 (2.52)  | 58 (2.28)  |
| 80  | 145 (5.71) | 114 (4.49) | 189 (7.44)  | 89 (3.50)  | 80 (3.15)  |
| 100 | 158 (6.22) | 127 (5.00) | 254 (10.00) | 118 (4.65) | 110 (4.33) |

## ... Dimensions

### Components DN 150 to DN 200

All dimensions specified in mm (in). The numbers (e.g. [ 1 ]) of the components correspond to the markings on the in the ordering information, see **Accessories** on page 19.

KF = Tapered flange (with raised face and groove for O-ring) / ZWF = Wafer type (with recessed face)



### Standard measuring section

**Measuring section 3**  
(including flow conditioner, closed filter)

**Alternative measuring section 1**  
(concealed shown with a dashed line, including open filter, filter cartridge only)

Including the required flanges and clamping rings / clamping chains

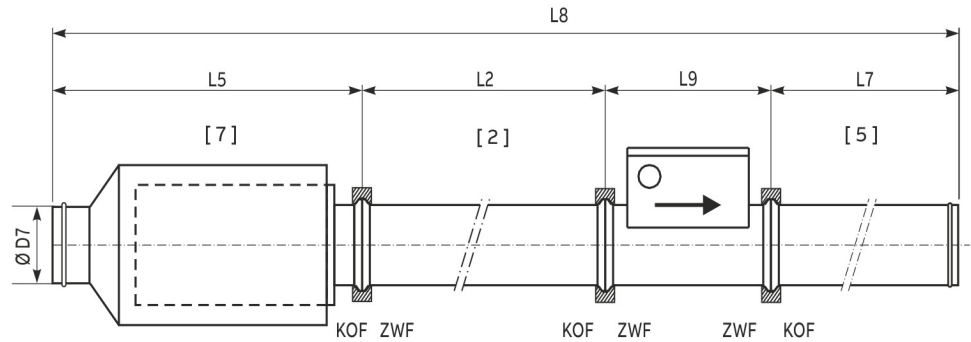


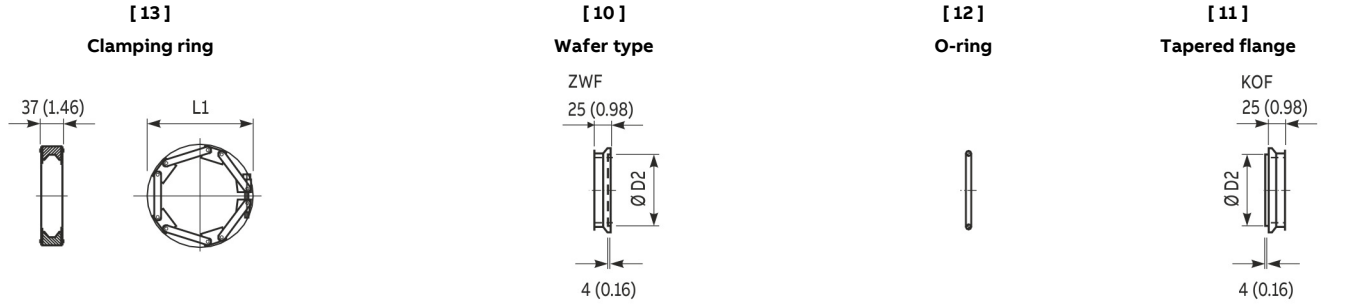
Figure 5: Component dimensions DN 150 to DN 200

| DN  | L1                     | L2           | L3           | L4         | L5                     | L6           | L7           | L8                       | L9          |
|-----|------------------------|--------------|--------------|------------|------------------------|--------------|--------------|--------------------------|-------------|
| 150 | Approx. 513<br>(20.20) | 1518 (59.76) | 768 (30.24)  | 159 (6.26) | Approx. 900<br>(35.43) | 1509 (59.41) | 759 (29.88)  | Approx. 3460<br>(136.22) | 280 (11.02) |
| 200 | Approx. 513<br>(20.20) | 2018 (79.49) | 1018 (40.08) | 159 (6.26) | Approx. 850<br>(33.46) | 2009 (79.09) | 1018 (40.08) | Approx. 4220<br>(166.14) | 330 (12.99) |

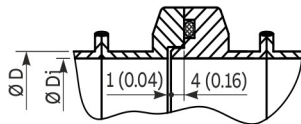
| DN  | Ø D          | Ø D2       | Ø D4       | Ø D5                | Ø D6                | Ø D7       | Ø Di       |
|-----|--------------|------------|------------|---------------------|---------------------|------------|------------|
| 150 | 151 (5.94)   | 158 (6.22) | 153 (6.02) | Approx. 300 (11.81) | Approx. 355 (13.98) | 198 (7.80) | 149 (5.87) |
| 200 | 201,5 (7.93) | 205 (8.07) | 204 (8.03) | Approx. 300 (11.81) | Approx. 355 (13.98) | 248 (9.76) | 199 (7.83) |



KOF = Tapered flange (with raised face and groove for O-ring) / ZWF = Wafer type (with recessed face)



**[10][12][11]**  
**Sectional detail pipe connection (without clamping ring)**



**Individual planning**

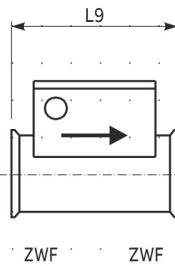


Figure 6: Accessory dimensions DN 150 to DN 200

| DN  | L1                  | L2          | L9         | Ø D2       | Ø Di                |
|-----|---------------------|-------------|------------|------------|---------------------|
| 150 | Approx. 220 (8.66)  | 280 (11.02) | 151 (5.94) | 149 (5.87) | Approx. 220 (8.66)  |
| 200 | Approx. 280 (11.02) | 330 (12.99) | 202 (7.95) | 200 (7.87) | Approx. 280 (11.02) |

## Ordering Information

### Sensyflow FMT700-P Compact

Sensor in a compact design

| <b>Base model</b>   |             |    |     |     |     |      |
|---|-------------|----|-----|-----|-----|------|
| Sensyflow FMT700-P Thermal Mass Flowmeter DN 25   | 3KXF421701V | XX | XXX | XXX | XXX | XXXX |
| Sensyflow FMT700-P Thermal Mass Flowmeter DN 50   | 3KXF421702V | XX | XXX | XXX | XXX | XXXX |
| Sensyflow FMT700-P Thermal Mass Flowmeter DN 80   | 3KXF421703V | XX | XXX | XXX | XXX | XXXX |
| Sensyflow FMT700-P Thermal Mass Flowmeter DN 100  | 3KXF421704V | XX | XXX | XXX | XXX | XXXX |
| Sensyflow FMT700-P Thermal Mass Flowmeter DN 150  | 3KXF421705V | XX | XXX | XXX | XXX | XXXX |
| Sensyflow FMT700-P Thermal Mass Flowmeter DN 200  | 3KXF421706V | XX | XXX | XXX | XXX | XXXX |
| <b>Design</b>   |             |    |     |     |     |      |
| Compact, 24V Supply voltage, Analog Output 0 to 5 V                                     |             | V1 |     |     |     |      |
| Compact, 24V Supply voltage, Analog Output 0 to 10 V                                    |             | V2 |     |     |     |      |
| Compact, 24V Supply voltage, Analog Output 0 to 20 mA, Alarm > 22 mA                    |             | A1 |     |     |     |      |
| Compact, 24V Supply voltage, Analog Output 4 to 20 mA, Alarm < 3,5 mA                   |             | A2 |     |     |     |      |
| Compact, 24V Supply voltage, Analog Output 4 to 20 mA, Alarm > 22 mA                    |             | A3 |     |     |     |      |
| <b>Operating temperature range</b>  |             |    |     |     |     |      |
| -25 to 50 °C  |             |    |     | TFA |     |      |
| <b>Operating pressure range</b>   |             |    |     |     |     |      |
| 0,6 to 2,5 bar (abs)  |             |    |     |     | PSA |      |
| <b>Measuring range mass measurement</b>   |             |    |     |     |     |      |
| 0(1) to 60, Adjustable measuring range end value (only with nominal diameter DN 25)     |             |    |     |     |     | QZA  |
| 0(8) to 500, Adjustable measuring range end value (only with nominal diameter DN 50)    |             |    |     |     |     | QZB  |
| 0(15) to 900, Adjustable measuring range end value (only with nominal diameter DN 80)   |             |    |     |     |     | QZC  |
| 0(25) to 1500, Adjustable measuring range end value (only with nominal diameter DN 100) |             |    |     |     |     | QZD  |
| 0(50) to 3000, Adjustable measuring range end value (only with nominal diameter DN 150) |             |    |     |     |     | QZE  |
| 0(80) to 5000, Adjustable measuring range end value (only with nominal diameter DN 200) |             |    |     |     |     | QZF  |
| <b>Measuring range unit mass measurement</b>  |             |    |     |     |     |      |
| kg/h  |             |    |     |     |     | QM00 |

### Additional ordering information

| <b>Sensyflow FMT700-P Compact</b>  | XXX | XX |
|--|-----|----|
| Sensyflow FMT700-P Thermal Mass Flowmeter  |     |    |
| <b>Certificates: Calibration</b>   |     |    |
| Standard factory calibration   | CMA |    |
| DAkkS certificate of calibration   | CMD |    |
| DAkkS certificate of calibration and US EPA CFR Part 1065 sensor-check certificate | CMU |    |
| <b>Documentation Language</b>  |     |    |
| German   |     | M1 |
| English  |     | M5 |

## Accessories

The numbers (eg [I]) of the components correspond to the marking of the components, see **Dimensions** on page 10.

| Description   | Order number    |
|---|-----------------|
| <b>FMT700-P Compact cable</b>   |                 |
| FMT700-P Compact transducer-cable, length 5 m   | 3KXF003450U0100 |
| FMT700-P Compact transducer-cable, length 10 m  | 3KXF003451U0100 |
| FMT700-P Compact transducer-cable, length 15 m  | 3KXF003452U0100 |
| FMT700-P Compact transducer-cable, length 30 m  | 3KXF003453U0100 |
| <b>Preferred versions FMT700-P Measuring section</b>  |                 |
| FMT700-P measuring section 1, nominal diameter DN 25  | 7962645         |
| FMT700-P measuring section 1, nominal diameter DN 50  | 7962646         |
| FMT700-P measuring section 1, nominal diameter DN 80  | 7962647         |
| FMT700-P measuring section 1, nominal diameter DN 100   | 7962648         |
| FMT700-P measuring section 1, nominal diameter DN 150   | 7962649         |
| FMT700-P measuring section 1, nominal diameter DN 200   | 7962650         |
| FMT700-P measuring section 3, nominal diameter DN 25, suction side DN 60  | 7964107         |
| FMT700-P measuring section 3, nominal diameter DN 50, suction side DN 80  | 7964108         |
| FMT700-P measuring section 3, nominal diameter DN 80, suction side DN 100   | 7964109         |
| FMT700-P measuring section 3, nominal diameter DN 100, suction side DN 150  | 7964110         |
| FMT700-P measuring section 3, nominal diameter DN 150, suction side DN 200  | 7964111         |
| FMT700-P measuring section 3, nominal diameter DN 200, suction side DN 250  | 7964112         |
| <b>FMT700-P Sensor cable [ 1 ]</b>  |                 |
| FMT700-P air filter (open) with flange, nominal diameter DN 25, 1 clamping ring                                   | 7962657         |
| FMT700-P air filter (open) with flange, nominal diameter DN 50, 1 clamping ring                                   | 7962658         |
| FMT700-P air filter (open) with flange, nominal diameter DN 80, 1 clamping ring                                   | 7962659         |
| FMT700-P air filter (open) with flange, nominal diameter DN 100, 1 clamping ring                                  | 7962660         |
| FMT700-P air filter (open) with flange, nominal diameter DN 150, 1 clamping chain                                 | 7962661         |
| FMT700-P air filter (open) with flange, nominal diameter DN 200, 1 clamping chain                                 | 7962662         |
| <b>FMT700-P Flow conditioner [ 7 ]</b>  |                 |
| FMT700-P flow conditioner with flange, nominal diameter DN 25, suction side DN 60, leak-proof, 1 clamping ring    | 7964101         |
| FMT700-P flow conditioner with flange, nominal diameter DN 50, suction side DN 80, leak-proof, 1 clamping ring    | 7964102         |
| FMT700-P flow conditioner with flange, nominal diameter DN 80, suction side DN 100, leak-proof, 1 clamping ring   | 7964103         |
| FMT700-P flow conditioner with flange, nominal diameter DN 100, suction side DN 150, leak-proof, 1 clamping ring  | 7964104         |
| FMT700-P flow conditioner with flange, nominal diameter DN 150, suction side DN 200, leak-proof, 1 clamping chain | 7964105         |
| FMT700-P flow conditioner with flange, nominal diameter DN 200, suction side DN 250, leak-proof, 1 clamping chain | 7964106         |
| <b>FMT700-P Inlet section [ 2 ]</b>   |                 |
| FMT700-P inlet section 10 x D, nominal diameter DN 25, 2 ISO KF flanges, 1 clamping ring                          | 7962663         |
| FMT700-P inlet section 10 x D, nominal diameter DN 50, 1 tapered flange, 1 intermediate flange, 1 clamping ring   | 7962664         |
| FMT700-P inlet section 10 x D, nominal diameter DN 80, 1 tapered flange, 1 intermediate flange, 1 clamping ring   | 7962665         |
| FMT700-P inlet section 10 x D, nominal diameter DN 100, 1 tapered flange, 1 intermediate flange, 1 clamping ring  | 7962666         |
| FMT700-P inlet section 10 x D, nominal diameter DN 150, 1 tapered flange, 1 intermediate flange, 1 clamping chain | 7962667         |
| FMT700-P inlet section 10 x D, nominal diameter DN 200, 1 tapered flange, 1 intermediate flange, 1 clamping chain | 7962668         |

## ... Ordering Information

| Description   | Order number |
|---|--------------|
| <b>FMT700-P Inlet section [ 4 ]</b>   |              |
| FMT700-P inlet section 10 x D, nominal diameter DN 25, 1 ISO KF flange, 1 clamping ring                           | 7962669      |
| FMT700-P inlet section 10 x D, nominal diameter DN 50, 1 tapered flange, 1 clamping ring                          | 7962670      |
| FMT700-P inlet section 10 x D, nominal diameter DN 80, 1 tapered flange, 1 clamping ring                          | 7962671      |
| FMT700-P inlet section 10 x D, nominal diameter DN 100, 1 tapered flange, 1 clamping ring                         | 7962672      |
| FMT700-P inlet section 10 x D, nominal diameter DN 150, 1 tapered flange, 1 clamping chain                        | 7962673      |
| FMT700-P inlet section 10 x D, nominal diameter DN 200, 1 tapered flange, 1 clamping chain                        | 7962674      |
| <b>FMT700-P Outlet section [ 3 ]</b>  |              |
| FMT700-P outlet section 5 x D, nominal diameter DN 25, 2 ISO KF flanges, 1 clamping ring                          | 7962675      |
| FMT700-P outlet section 5 x D, nominal diameter DN 50, 1 tapered flange, 1 intermediate flange, 1 clamping ring   | 7962676      |
| FMT700-P outlet section 5 x D, nominal diameter DN 80, 1 tapered flange, 1 intermediate flange, 1 clamping ring   | 7962677      |
| FMT700-P outlet section 5 x D, nominal diameter DN 100, 1 tapered flange, 1 intermediate flange, 1 clamping ring  | 7962678      |
| FMT700-P outlet section 5 x D, nominal diameter DN 150, 1 tapered flange, 1 intermediate flange, 1 clamping chain | 7962679      |
| FMT700-P outlet section 5 x D, nominal diameter DN 200, 1 tapered flange, 1 intermediate flange, 1 clamping chain | 7962680      |
| <b>FMT700-P Outlet section [ 5 ]</b>  |              |
| FMT700-P outlet section 5 x D, nominal diameter DN 25, 1 ISO KF flange, 1 clamping ring                           | 7962681      |
| FMT700-P outlet section 5 x D, nominal diameter DN 50, 1 tapered flange, 1 clamping ring                          | 7962682      |
| FMT700-P outlet section 5 x D, nominal diameter DN 80, 1 tapered flange, 1 clamping ring                          | 7962683      |
| FMT700-P outlet section 5 x D, nominal diameter DN 100, 1 tapered flange, 1 clamping ring                         | 7962684      |
| FMT700-P outlet section 5 x D, nominal diameter DN 150, 1 tapered flange, 1 clamping chain                        | 7962685      |
| FMT700-P outlet section 5 x D, nominal diameter DN 200, 1 tapered flange, 1 clamping chain                        | 7962686      |
| <b>FMT700-P Hose adapter [ 6 ]</b>  |              |
| FMT700-P hose adapter, nominal diameter DN 25, 1 clamping ring  | 7962687      |
| FMT700-P hose adapter, nominal diameter DN 50, 1 clamping ring  | 7962688      |
| FMT700-P hose adapter, nominal diameter DN 80, 1 clamping ring  | 7962689      |
| FMT700-P hose adapter, nominal diameter DN 100, 1 clamping ring   | 7962690      |
| FMT700-P hose adapter, nominal diameter DN 150, 1 clamping chain  | 7962691      |
| FMT700-P hose adapter, nominal diameter DN 200, 1 clamping chain  | 7962692      |
| <b>FMT700-P Tapered flange [ 11 ]</b>   |              |
| FMT700-P tapered flange, nominal diameter DN 25   | 7962700      |
| FMT700-P tapered flange, nominal diameter DN 50   | 7962701      |
| FMT700-P tapered flange, nominal diameter DN 80   | 7962702      |
| FMT700-P tapered flange, nominal diameter DN 100  | 7962703      |
| FMT700-P tapered flange, nominal diameter DN 150  | 7962704      |
| FMT700-P tapered flange, nominal diameter DN 200  | 7962705      |
| <b>FMT700-P O-Ring [ 12 ]</b>   |              |
| FMT700-P o-ring, nominal diameter DN 25, including centering rings  | 7962706      |
| FMT700-P o-ring, nominal diameter DN 50   | 7962707      |
| FMT700-P o-ring, 94 x 3, nominal diameter DN 80   | 7962708      |
| FMT700-P o-ring, 122 x 3, nominal diameter DN 100   | 7962709      |
| FMT700-P o-ring, 165 x 4, nominal diameter DN 150   | 7962710      |
| FMT700-P o-ring, 217 x 5, nominal diameter DN 200   | 7962711      |

| Description  | Order number |
|--|--------------|
| <b>FMT700-P Intermediate flange [ 10 ]</b>                 |              |
| FMT700-P intermediate flange, nominal diameter DN 25       | 7962712      |
| FMT700-P intermediate flange, nominal diameter DN 50       | 7962713      |
| FMT700-P intermediate flange, nominal diameter DN 80       | 7962714      |
| FMT700-P intermediate flange, nominal diameter DN 100      | 7962715      |
| FMT700-P intermediate flange, nominal diameter DN 150      | 7962716      |
| FMT700-P intermediate flange, nominal diameter DN 200      | 7962717      |
| <b>FMT700-P Clamping ring [ 13 ]</b>                       |              |
| FMT700-P clamping ring, nominal diameter DN 25             | 7962718      |
| FMT700-P clamping ring, nominal diameter DN 50             | 7962719      |
| FMT700-P clamping ring, nominal diameter DN 80             | 7962720      |
| FMT700-P clamping ring, nominal diameter DN 100            | 7962721      |
| <b>FMT700-P Clamping chain [ 13 ]</b>                      |              |
| FMT700-P clamping chain, nominal diameter DN 150           | 7962722      |
| FMT700-P clamping chain, nominal diameter DN 200           | 7962723      |
| <b>FMT700-P Complete flange coupling</b>                   |              |
| FMT700-P complete flange coupling, nominal diameter DN 25  | 7962724      |
| FMT700-P complete flange coupling, nominal diameter DN 50  | 7962725      |
| FMT700-P complete flange coupling, nominal diameter DN 80  | 7962726      |
| FMT700-P complete flange coupling, nominal diameter DN 100 | 7962727      |
| FMT700-P complete flange coupling, nominal diameter DN 150 | 7962728      |
| FMT700-P complete flange coupling, nominal diameter DN 200 | 7962729      |
| <b>FMT700-P Filter cartridge</b>                           |              |
| FMT700-P filter cartridge, nominal diameter DN 25          | 7962730      |
| FMT700-P filter cartridge, nominal diameter DN 50          | 7962731      |
| FMT700-P filter cartridge, nominal diameter DN 80          | 7962732      |
| FMT700-P filter cartridge, nominal diameter DN 100         | 7962733      |
| FMT700-P filter cartridge, nominal diameter DN 150         | 7962734      |
| FMT700-P filter cartridge, nominal diameter DN 200         | 7962735      |
| <b>FMT700-P Filter coupling flange</b>                     |              |
| FMT700-P filter coupling flange, nominal diameter DN 25    | 7962736      |
| FMT700-P filter coupling flange, nominal diameter DN 50    | 7962737      |
| FMT700-P filter coupling flange, nominal diameter DN 80    | 7962738      |
| FMT700-P filter coupling flange, nominal diameter DN 100   | 7962739      |
| FMT700-P filter coupling flange, nominal diameter DN 150   | 7962740      |
| FMT700-P filter coupling flange, nominal diameter DN 200   | 7962741      |

Sales



Service





## Notes



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