

ABB MEASUREMENT & ANALYTICS | DATA SHEET

# ProcessMaster FEW630

## Electromagnetic flowmeter



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## Measurement made easy

Redefining electromagnetic flowmeters for the future.

Seamlessly merging high-performance, modularity and IOT connectivity

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### Take advantage of the ultimate solution for flow measurement

- Unrivaled in its scope and applications expertise, ABB offers the world's most comprehensive range of flow measurement products. ProcessMaster FEW630 is unsurpassed in the proven measurement technique and scope of application.
- Getting the best levels of efficiency and performance from your production process requires reliable, accurate instrumentation. ProcessMaster FEW630 provides the flexibility to solve your most demanding applications, enabling previously unattainable operational and financial benefits.
- ProcessMaster FEW630 is the ultimate solution for flow measurement and management in sectors such as diverse as water, wastewater, sewage, sludge, influent and effluent.

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### For ProcessMaster FEW630, flexible doesn't mean complicated

- Take advantage of its innovative and versatile attributes to achieve inter-operability within a wide range of asset management systems. ProcessMaster FEW630 is by far the best solution for your flow measurement needs and available in sizes 25 to 3000 mm (1 to 120 in).
- ProcessMaster FEW630 delivers more than reliable and accurate measuring values. When integrated with a management solution such as ABB's Asset Master, the instrument plays a key role in maximizing process optimization.

## ProcessMaster series

The ProcessMaster FEW630 is the first choice for water and wastewater industry applications delivering best in class functionality.

| Applicability                                                                                               | FEW630 series                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water Industry</b><br>Wells, Pumping Stations, Distribution<br>Raw water, water treatment, potable water | ✓                                                                                                                                                                      |
| <b>Wastewater</b><br>Storm water, Wastewater treatment plant<br>Sludge, slurries, influent and effluent     | ✓                                                                                                                                                                      |
| <b>Minimum conductivity</b>                                                                                 | 5 µS/cm                                                                                                                                                                |
| <b>Medium temperature</b>                                                                                   | Min -5 °C (23 °F), max 80 °C (176 °F)                                                                                                                                  |
| <b>Pressure</b>                                                                                             | ≤ PN 40 / CI 300, option for high pressure                                                                                                                             |
| <b>Hazardous area</b>                                                                                       | Zone 2, Div 2<br>Zone 1, Div 1                                                                                                                                         |
| Features                                                                                                    | FEW630 series                                                                                                                                                          |
| <b>Accuracy</b>                                                                                             | 0.4 % of rate ±2 mm, Option up to 0.2 % of rate ±2 mm                                                                                                                  |
| <b>Nominal diameter</b>                                                                                     | DN 25 to 3000 (1 to 120 in)                                                                                                                                            |
| <b>Liner material</b>                                                                                       | Hard rubber (70 to 85 Shore D)                                                                                                                                         |
| <b>I/O's</b>                                                                                                | 1 x analog, 2 x digital, option for add-in modules                                                                                                                     |
| <b>Communication</b>                                                                                        | HART®, PROFIBUS DP®, PROFIBUS PA®, Modbus RTU®, Standard Ethernet (Ethernet IP®, PROFINET®, Modbus TCP®, Webserver), Ethernet-APL™ (PROFINET®, Modbus TCP®, Webserver) |
| <b>Process diagnostics</b>                                                                                  | Standard: Empty pipe, Electrode Impedance,<br>Enhanced: Gas bubbles, Conductivity, Sensor and Transmitter temperature                                                  |

## ... ProcessMaster series

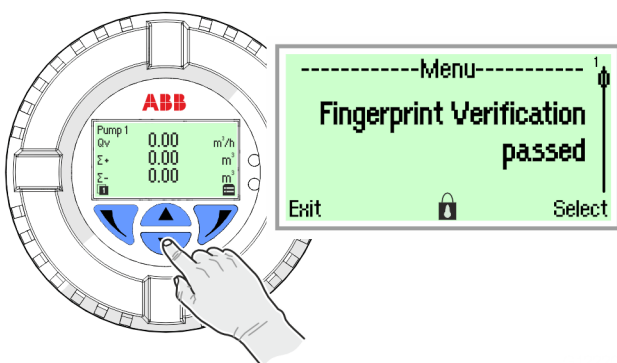
### Features and Functions

#### On-board Health Check

ProcessMaster's in-built fingerprint technology helps to ensure Sensor and Transmitter Integrity without the need to remove the flowmeter from the process. The Check provides a pass / failed result based on a comparison of the current flowmeter status to a set of reference data.

##### Benefits:

- Easy to operate
- No additional equipment required
- No training necessary
- Quick check of flowmeter integrity



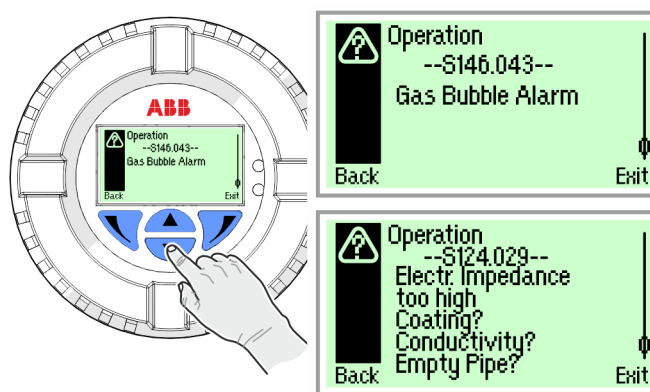
#### Diagnostics for real-life situations

Detecting critical process conditions at an early stage helps reducing unscheduled downtime and maintenance. Clear text messages simplify troubleshooting.

Device diagnostic information can be accessed without any intervention – either through the HMI or bus communication.

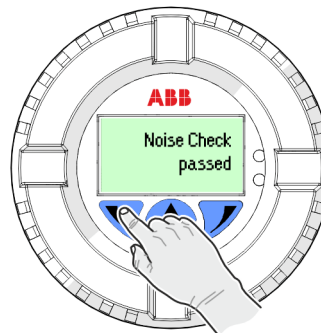
##### Benefits:

- Peace-of-mind that flowmeter is operating within its specification
- Prioritized alarms to correct most important alarm first
- Through-the-glass operation without the need to open the housing



#### Verify the Installation is correct - from day one

Improving quality and reducing cost can be a challenge if the flow measurement is unstable. A proper grounding is fundamental to an accurate electromagnetic flow measurement. ProcessMaster's in-built noise / grounding check helps getting the wiring / grounding right from day one without the need for further Tools.



### Standard functionality

#### Flowmeter sensor coil inductance

A measurement of the flowmeter sensor coil inductance can be triggered. This enables to check for the flowmeter sensor coil integrity.

#### Noise check / Grounding check

This function allows checking for noise and proper electrical grounding of the device. While the check is in progress, no flow measurement can take place.

Pre-requisites using the functionality:

- Flowmeter sensor must be completely filled
- No flow must occur in the flowmeter sensor

#### Fingerprint

The "fingerprint" database integrated in the transmitter allows for comparison of the values at the time of factory calibration or commissioning with the currently recorded values.

A quick "on-board health check" resulting in a pass / fail information can be performed.

For an in-depth verification, an external tool is available from ABB (in preparation).

#### Verification

There is an Option for an in-depth verification of the device using an external Tool from ABB.

This Tool provides a brief documentation of the Verification results allowing for a print out.

#### Electrode diagnosis

Electrode diagnosis is a continuous monitoring of the measuring electrodes for short circuit or open electrodes. In addition, the electrode Impedance versus Ground is measured. This ensures total control of the measuring electrodes integrity.

### Optional diagnostic functions

The extended diagnostics functionality package contains the following functions.

#### Gasbubble detection

Gas bubbles in the measuring medium effect the flowmeter reading and the accuracy.

Enhanced diagnostics feature the option for gas bubble detection to make the flow measurement most reliable.

There is the option for a gas bubble alarm triggered once the actual gas bubble value exceeds the threshold configured.

This alarm is shown in the HMI. The digital output flags an alarm if configured accordingly.

Pre-requisites using the functionality:

- Nominal diameter: DN 10 to DN 300 (3/8 to 12 in).
- Conductivity of the measuring medium: 20 to 20000 µS/cm.

Installation conditions:

- The flowmeter sensor can be installed either horizontally or vertically. Vertical installation is preferable.

#### Conductivity monitoring

The conductivity of the fluid can be monitored by setting minimum / maximum alarm thresholds.

Once alarm limits are exceeded, the digital output flags an alarm if configured accordingly.

The conductivity is available as 4 to 20 mA output (option card).

Pre-requisites using the functionality:

- Conductivity of the measuring medium: 20 to 20000 µS/cm.

#### Flowmeter sensor temperature

A flowmeter sensor temperature measurement can be triggered.

This enables to check for the flowmeter sensor temperature.

With flowmeter sensor temperature out of spec, the digital output flags an alarm if configured accordingly.

#### Transmitter in-house temperature

Monitoring the temperature of the electronic unit in the transmitter triggers an alarm via the digital output, if configured.

In the '...Diagnosis Values', the current temperature as well as the smallest and largest previously measured temperature is displayed.

## Overview – models

### Sensor



- ① Single-compartment transmitter housing  
 ② Dual-compartment transmitter housing

- ③ Flowmeter sensor

Figure 1: Designs

| Flowmeter sensor                                                               |                                                                                                                                                                                             |
|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Model</b>                                                                   | ProcessMaster FEW631, FEW632, FET632                                                                                                                                                        |
| <b>Housing</b>                                                                 | Integral mount design, remote mount design                                                                                                                                                  |
| <b>Measuring accuracy for liquids</b>                                          | 0.4 % of the measured value, option for 0.3 % and 0.2 % of the measured value                                                                                                               |
| <b>Permissible measuring medium temperature <math>T_{\text{medium}}</math></b> | -5 °C (23 °F) to 80 °C (176 °F)                                                                                                                                                             |
| <b>Minimum conductivity</b>                                                    | > 5 $\mu\text{S}/\text{cm}$ , (20 $\mu\text{S}/\text{cm}$ for demineralized water)                                                                                                          |
| <b>Nominal pressure rating</b>                                                 | PN 6 to 40; ASME CL 150, 300 JIS 5K, 20K, AS PN16, 35, AWWA C207 Class B, D, E                                                                                                              |
| <b>Nominal diameter</b>                                                        | DN 25 to 3000 (1 to 120 in)                                                                                                                                                                 |
| <b>Process connection</b>                                                      | Flange based on ISO, ASME, JIS, AS2129 table D, E, AWWA C207                                                                                                                                |
| <b>Materials process connection</b>                                            | Steel, stainless steel                                                                                                                                                                      |
| <b>Lining material</b>                                                         | Hard rubber (DN 25 to 3000 [1 to 120 in])                                                                                                                                                   |
| <b>Electrode material</b>                                                      | SST 1.4571 (AISI 316Ti), Hastelloy® C-22® Hastelloy® C-4 (2.4610)                                                                                                                           |
| <b>IP rating</b>                                                               | Integral mount design: IP 65 / IP 67, NEMA 4X<br>Remote mount design: IP 65 / IP 67 / IP 68 (sensor only), NEMA 4X                                                                          |
| Approvals                                                                      |                                                                                                                                                                                             |
| <b>Explosion protection</b>                                                    | ATEX / IECEx / Zone 1, 2, 21, 22<br>FM / cFM Cl 1 Div 1 ( $\leq$ DN 300), cFMus Cl 1 Div 1+2, cFMus Zone 1+2                                                                                |
| <b>Additional approvals</b>                                                    | At <a href="http://www.abb.com/flow">www.abb.com/flow</a> or at request                                                                                                                     |
| <b>Certificate of Conformity</b>                                               | Electrical Equipment per Canadian Requirements. Applicable Standards: CSA-C22.2 No. 94, ANSI/UL 61010<br>Electrical Equipment per US Requirements. Applicable Standards: FM3810, ANSI/UL 50 |

## Transmitter

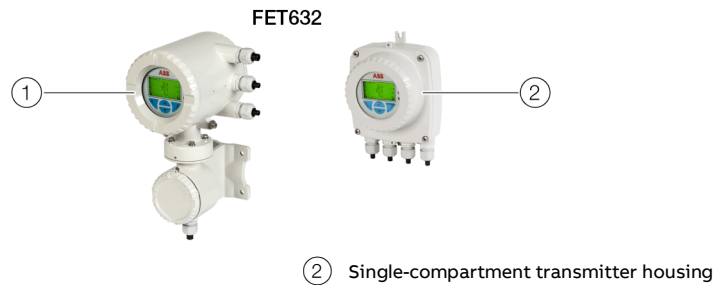


Figure 2: Designs

| Transmitter               |                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Model</b>              | FET632                                                                                                                                                                                                                                                                                                                                               |
| <b>Housing</b>            | Integral mount design, remote mount design                                                                                                                                                                                                                                                                                                           |
| <b>IP rating</b>          | IP 65 / IP 67 / NEMA 4X                                                                                                                                                                                                                                                                                                                              |
| <b>Cable length</b>       | Maximum 200 m (656 ft), remote mount design only                                                                                                                                                                                                                                                                                                     |
| <b>Power supply</b>       | 100 to 240 V AC (–15 / +10 %) 50 / 60 Hz, 16.8 to 30 V DC                                                                                                                                                                                                                                                                                            |
| <b>Outputs</b>            | Current output: 4 to 20 mA active or passive (can be configured on-site)<br>Digital output 1: passive, configurable as pulse, frequency or switch output<br>Digital output 2: passive, configurable as pulse or switch output                                                                                                                        |
| <b>Additional outputs</b> | The transmitter has two slots which can be used to insert plug-in cards to extend the outputs.<br>The following plug-in cards are available: <ul style="list-style-type: none"> <li>• Current output (passive)</li> <li>• Digital output (passive)</li> <li>• Digital input (passive):</li> <li>• 24 V DC power supply for active outputs</li> </ul> |
| <b>Communication</b>      | Standard: HART® 7.6<br>Option: PROFIBUS DP®, PROFIBUS PA®, Modbus RTU®, Modbus TCP®, EtherNet/IP®, Ethernet-APL™**, ProfiNet®                                                                                                                                                                                                                        |

\* Standard Ethernet: available with single-compartment housing

\*\* Ethernet-APL: available with single-compartment housing

| Approvals                        |                                                                                                                                                                                             |                                                                                                   |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Explosion protection</b>      | <b>Dual-compartment housing:</b><br>ATEX / IECEx / Zone 1, 2, 21, 22<br>cFMus Cl 1 Div 1+2, cFMus Zone 1+2                                                                                  | <b>Single-compartment housing:</b><br>ATEX / IECEx / Zone 2, 22<br>cFMus Cl 1 Div 2, cFMus Zone 2 |
| <b>Additional approvals</b>      | At <a href="http://www.abb.com/flow">www.abb.com/flow</a> or on request.                                                                                                                    |                                                                                                   |
| <b>Certificate of Conformity</b> | Electrical Equipment per Canadian Requirements. Applicable Standards: CSA-C22.2 No. 94, ANSI/UL 61010<br>Electrical Equipment per US Requirements. Applicable Standards: FM3810, ANSI/UL 50 |                                                                                                   |

## Overview – devices with Ex protection

Two device ranges are available in the 630 series. ProcessMaster 630 and HygienicMaster 630. Two designs (integral mount / remote mount) are available within each device range.

This results in the following variants:

- ProcessMaster FEP631, FEW631, integral mount device
- ProcessMaster FEP632, FEW632, flow sensor remote mount design
- HygienicMaster FEH631, integral mount device
- HygienicMaster FEH632, flow sensor remote mount design
- Remote transmitter FET632 for ProcessMaster / HygienicMaster

Devices suitable for use in potentially explosive atmospheres feature the corresponding Ex mark on their name plates.

Moreover, each device design has a specific model number.

The parts of the model number relating to explosion protection are listed in the following table. The complete key to model numbers is described in the device data sheet.

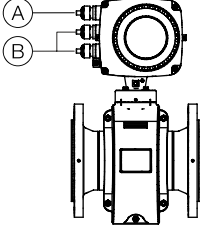
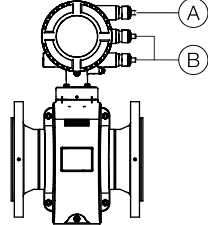
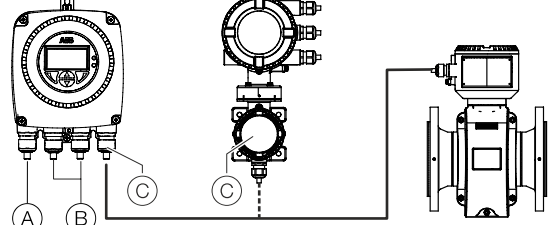
|                                                                 |               |           |           |
|-----------------------------------------------------------------|---------------|-----------|-----------|
| ProcessMaster FEP631, integral mount device                     | <b>FEP631</b> | <b>XX</b> | <b>XX</b> |
| ProcessMaster FEP632, flow sensor remote mount design           | <b>FEP632</b> |           |           |
| ProcessMaster FEW631, integral mount device                     | <b>FEW631</b> |           |           |
| ProcessMaster FEW632, flow sensor remote mount design           | <b>FEW632</b> |           |           |
| HygienicMaster FEH631, integral mount device                    | <b>FEH631</b> |           |           |
| HygienicMaster FEH632, flow sensor remote mount design          | <b>FEH632</b> |           |           |
| Remote transmitter for ProcessMaster / HygienicMaster           | <b>FET632</b> |           |           |
| <b>Explosion protection</b>                                     |               |           |           |
| Without                                                         |               | Y0        |           |
| ATEX / IECEx (Zone 1 / 21)                                      |               | A1        |           |
| ATEX / IECEx (Zone 2 / 22)                                      |               | A2        |           |
| cFMus Class I, II, III Div. 1 (Zone 1 / 21))                    |               | F1        |           |
| cFMus Class I, II, III Div. 2 (Zone 2 / 22)                     |               | F2        |           |
| NEPSI (Zone 1 / 21)                                             |               | S1        |           |
| NEPSI (Zone 2 / 22)                                             |               | S2        |           |
| <b>Design / terminal box material / cable glands</b>            |               |           |           |
| Single-compartment / aluminum / M20 x 1.5                       |               |           | S1        |
| Single-compartment / Aluminum / NPT ½ in                        |               |           | S2        |
| Dual-compartment / aluminum / M20 x 1.5                         |               |           | D1        |
| Dual-compartment / aluminum / NPT ½ in.                         |               |           | D2        |
| Remote mount / aluminum / M20 x 1.5                             |               |           | A1        |
| Remote mount / Aluminum / NPT ½ in                              |               |           | A2        |
| Field mount housing / single-compartment / aluminum / M20 x 1.5 |               |           | F1        |
| Field mount housing / single-compartment / aluminum / NPT ½ in  |               |           | F2        |
| Wall-mount housing / dual-compartment / aluminum / M20 x 1.5    |               |           | W1        |
| Wall-mount housing / dual-compartment / Aluminum / NPT ½ in     |               |           | W2        |

Table 1: Excerpt from ordering information

For more details on explosion protection coding, explosion protection device data and specific conditions operating the Ex device, please refer to:

| Link / QR Code                                                                      | Document                                                                                                                       | Link / QR Code                                                                       | Document                                                                                                            |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
|  | <b>EX Safety Instruction ATEX/IECEx</b><br><a href="SI/FEW630/FEW630/FEH630/ATEX/IECEX">SI/FEW630/FEW630/FEH630/ATEX/IECEX</a> |  | <b>EX Safety Instruction cFMus</b><br><a href="SI/FEW630/FEW630/FEH630/C-FM-US">SI/FEW630/FEW630/FEH630/C-FM-US</a> |

## Overview – Electrical connections

| Single-compartment housing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Dual-compartment housing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Single- / dual-compartment housing – Remote mount design                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |
| <p>(A) Power supply</p> <ul style="list-style-type: none"> <li>Type of protection <b>ATEX / IECEx</b>: Increased safety 'Ex e'</li> <li>Type of protection <b>cFMus</b> USA / Canada: 'non IS'</li> <li>Maximum 250 Vrms</li> <li>Terminals: 1+, 2-, L, N, </li> </ul> <p>(B) Inputs/outputs, communication</p> <ul style="list-style-type: none"> <li>Type of protection <b>ATEX / IECEx</b>: Increased safety 'Ex e'</li> <li>Type of protection <b>cFMus</b> USA / Canada: 'non IS'</li> <li>Terminals: 31, 32, Uco, V1, V2, V3, V4, 41, 42, 51, 52</li> </ul> | <p>(A) Power supply</p> <ul style="list-style-type: none"> <li>Type of protection <b>ATEX / IECEx</b>: Increased safety 'Ex e'</li> <li>Type of protection <b>cFMus</b> USA / Canada: 'non IS'</li> <li>Maximum 250 Vrms</li> <li>Terminals: 1+, 2-, L, N, </li> </ul> <p>(B) Inputs / outputs, communication</p> <ul style="list-style-type: none"> <li>Type of protection <b>ATEX / IECEx</b>: Increased safety 'Ex e' or intrinsically safety 'Ex ia'</li> <li>Type of protection <b>cFMus</b> USA / Canada: 'non IS' or 'intrinsically safe IS'.</li> <li>When installing in 'Ex ia' or 'IS', Barriers must be used.</li> <li>Terminals: 31, 32, Uco, V1, V2, V3, V4, 41, 42, 51, 52</li> </ul> | <p>(C) Signal cable (remote mount design only)</p> <ul style="list-style-type: none"> <li>Type of protection <b>ATEX / IECEx</b>: Increased safety 'Ex e'</li> <li>Type of protection <b>cFMus</b> USA / Canada: 'non IS'</li> <li>Terminals: A, B, UFE, GRN</li> </ul> |

### Note

Further information on the Ex Approval of devices can be found in the type examination certificates or the relevant certificates at [www.abb.com/flow](http://www.abb.com/flow).



Flowmeter sensor

Measuring principle

Measurements performed by the electromagnetic flowmeter are based on Faraday’s law of induction. A voltage is generated in a conductor when it moves through a magnetic field.

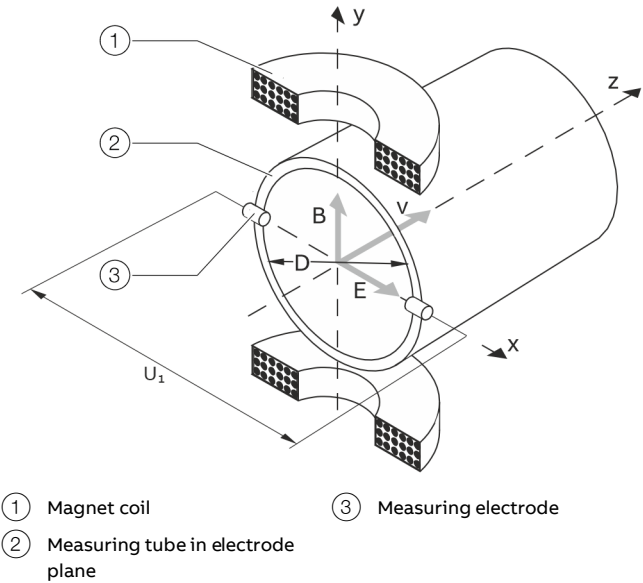


Figure 3: Electromagnetic flowmeter diagram

|                                |                                          |               |
|--------------------------------|------------------------------------------|---------------|
| $U_1 \sim B \times D \times v$ | $qv = \frac{D^2 \times \pi}{4} \times v$ | $U_1 \sim qv$ |
| $U_1$ Measuring span           | $v$ Average flow velocity                |               |
| $B$ Magnetic induction         | $qv$ Volume flow rate                    |               |
| $D$ Electrode spacing          |                                          |               |

With the device-relevant application of this measuring principle, a conductive measuring medium flows through a tube in which a magnetic field is generated perpendicular to the flow direction (see Figure 3). The voltage induced in the measuring medium is tapped by two diametrically opposed electrodes. This measurement voltage is proportional to the magnetic induction, the electrode spacing and the average medium velocity  $v$ . Taking into account that the magnetic induction and the electrode spacing are constant values results in a proportion between the measurement voltage  $U_1$  and the average medium velocity. From the calculation of the volume flow rate follows that the measurement voltage is linear and proportional to the volume flow rate.

The induced voltage is converted by the transmitter to standardized, analog and digital signals.

Measuring accuracy

Reference conditions

|                                      |                                                                                   |
|--------------------------------------|-----------------------------------------------------------------------------------|
| <b>Based on EN 29104</b>             |                                                                                   |
| Temperature of medium being measured | 20 °C (68 °F) ±2 K                                                                |
| Ambient temperature                  | 20 °C (68 °F) ±2 K                                                                |
| Power supply                         | Nominal voltage acc. to name plate<br>$U = \pm 1 \%$ ; frequency $f = \pm 1 \%$   |
| Installation conditions              | • Upstream: > 10 x DN straight section<br>• Downstream: > 5 x DN straight section |
| Warm-up phase                        | 30 minutes                                                                        |

Measurement value deviation and reproducibility

Measuring error

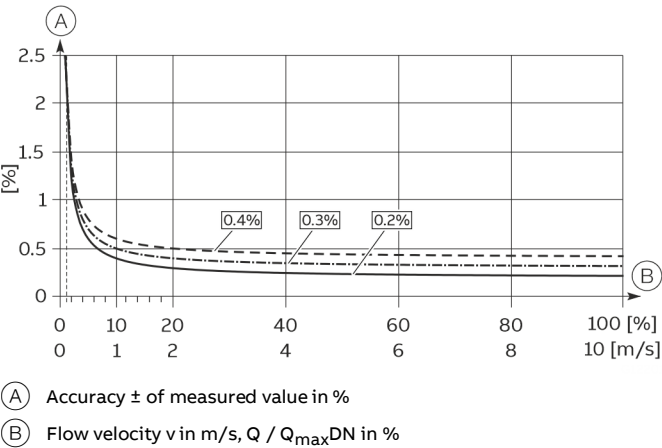


Figure 4: Measuring error

|                                                  |
|--------------------------------------------------|
| <b>Impulse output</b>                            |
| <b>Standard calibration</b>                      |
| ±0.4 % of measured value, ±0.02 % $Q_{\max}DN^*$ |
| <b>Optional calibration</b>                      |
| ±0.3 % of measured value, ±0.02 % $Q_{\max}DN^*$ |
| Or                                               |
| ±0.2 % of measured value, ±0.02 % $Q_{\max}DN^*$ |

|                                                                                |
|--------------------------------------------------------------------------------|
| <b>Current output</b>                                                          |
| Same as pulse output plus ±0.1 % of measured value ±0.01 mA                    |
| * $Q_{\max}DN$ : See table in chapter <b>Measuring range table</b> on page 12. |

Repeatability, response time

|                                                                            |                                                                                                                                                                                                  |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Repeatability</b>                                                       | <b>Response time**</b>                                                                                                                                                                           |
| ≤ 0.11 % of measured value, $t_{\text{meas}} = 100$ s, $v = 0.5$ to 10 m/s | As step function 0 to 99 %<br>$5 \tau \geq 200$ ms at 25 Hz excitation frequency<br>$5 \tau \geq 400$ ms at 12.5 Hz excitation frequency<br>$5 \tau \geq 500$ ms at 6.25 Hz excitation frequency |

\*\* Of current output with damping of 0.04 seconds.

## Permitted pipe vibration

In accordance with EN 60068-2-6

Applicable to sensors in remote mount design and sensors in integral mount design.

- Maximum deflection: 0.15 mm (0.006 in) in the frequency range of 10 to 58 Hz
- Maximum acceleration: 2 g in the frequency range of 58 to 150 Hz

## IP rating

| Model                        | Meter size  | Order code | Description                                                       |
|------------------------------|-------------|------------|-------------------------------------------------------------------|
| „IP rating“                  |             |            |                                                                   |
| FEW631,<br>FEW632,<br>FET632 | all         | 70         | IP 65 / IP 67 in accordance with EN 60529                         |
|                              | all         | 76         | IP 68 in accordance with EN 60529                                 |
|                              | DN 3 to 400 | 77         | (for remote mount design only)                                    |
|                              |             |            | Test conditions to EN 60529:                                      |
| FEW632                       | >DN 400     | 77         | Continuous submergence for 14 days (2 weeks) at 5 m (16 ft) depth |

## Signal cables

For remote mount design only.

The maximum signal cable length between flowmeter sensor and transmitter is 200 m (656 ft).

A 5 m (16.4 ft) cable is included in the scope of delivery.

If more than 5 m (16.4 ft) is required, the cable can be ordered separately – see **Accessories** on page 75.

## Temperature data

### Storage temperature range

–40 to 70 °C (–40 to 158 °F)

The temperature range offered by the device is dependent on a number of different factors.

These factors include the measuring medium temperature  $T_{\text{medium}}$ , the ambient temperature  $T_{\text{amb}}$ , operating pressure  $P_{\text{medium}}$ , liner material and the approval for explosion protection.

## Potable water approvals for model FEW6XX

| Size range                        | Liner       | NSF-61            | WRAS 23 °C        | AZ/NZS4020        | ACS                          |
|-----------------------------------|-------------|-------------------|-------------------|-------------------|------------------------------|
| DN 40 (1.5 in to DN 2400 (96 in)) | Hard rubber | Yes <sup>2)</sup> | Yes <sup>1)</sup> | Yes <sup>1)</sup> | In preparation <sup>2)</sup> |

1) Liner approval

2) Product approval

## Maximum ambient temperature depending on measuring medium temperature

### Note

- An additional document with Ex safety instructions is available for measuring systems that are used in potentially explosive atmospheres.
- Ex safety instructions are an integral part of this manual. As a result, it is crucial that the installation guidelines and connection values it lists are also observed.

The icon on the name plate indicates the following:



| Lining material | Flange material | Ambient temperature range ( $T_{\text{amb}}$ ) |                | Measuring medium temperature ( $T_{\text{medium}}$ ) |                |
|-----------------|-----------------|------------------------------------------------|----------------|------------------------------------------------------|----------------|
|                 |                 | Minimum                                        | Maximum        | Minimum                                              | Maximum        |
| Hard rubber     | Steel           | –10 °C (14 °F)                                 | 60 °C (140 °F) | –5 °C (23 °F)                                        | 80 °C (176 °F) |
| Hard rubber     | Stainless steel | –15 °C (5 °F)                                  | 60 °C (140 °F) | –5 °C (23 °F)                                        | 80 °C (176 °F) |

... Flowmeter sensor

Measuring range table

The full-scale value can be set between  $0.02 \times Q_{\max} \text{ DN}$  and  $2 \times Q_{\max} \text{ DN}$ .

| Nominal diameter |     | Lower range value                 | $Q_{\max} \text{ DN}$            | Upper range value                |
|------------------|-----|-----------------------------------|----------------------------------|----------------------------------|
| DN               | in  | $0.02 \times Q_{\max} \text{ DN}$ |                                  | $2 \times Q_{\max} \text{ DN}$   |
| 25               | 1   | 4 l/min (1.06 US gal/min)         | 200 l/min (52.8 US gal/min)      | 400 l/min (106 US gal/min)       |
| 32               | 1 ¼ | 8 l/min (2.11 US gal/min)         | 400 l/min (106 US gal/min)       | 800 l/min (211 US gal/min)       |
| 40               | 1 ½ | 12 l/min (3.17 US gal/min)        | 600 l/min (159 US gal/min)       | 1200 l/min (317 US gal/min)      |
| 50               | 2   | 1.2 m³/h (5.28 US gal/min)        | 60 m³/h (264 US gal/min)         | 120 m³/h (528 US gal/min)        |
| 65               | 2 ½ | 2.4 m³/h (10.57 US gal/min)       | 120 m³/h (528 US gal/min)        | 240 m³/h (1057 US gal/min)       |
| 80               | 3   | 3.6 m³/h (15.9 US gal/min)        | 180 m³/h (793 US gal/min)        | 360 m³/h (1585 US gal/min)       |
| 100              | 4   | 4.8 m³/h (21.1 US gal/min)        | 240 m³/h (1057 US gal/min)       | 480 m³/h (2113 US gal/min)       |
| 125              | 5   | 8.4 m³/h (37 US gal/min)          | 420 m³/h (1849 US gal/min)       | 840 m³/h (3698 US gal/min)       |
| 150              | 6   | 12 m³/h (52.8 US gal/min)         | 600 m³/h (2642 US gal/min)       | 1200 m³/h (5283 US gal/min)      |
| 200              | 8   | 21.6 m³/h (95.1 US gal/min)       | 1080 m³/h (4755 US gal/min)      | 2160 m³/h (9510 US gal/min)      |
| 250              | 10  | 36 m³/h (159 US gal/min)          | 1800 m³/h (7925 US gal/min)      | 3600 m³/h (15850 US gal/min)     |
| 300              | 12  | 48 m³/h (211 US gal/min)          | 2400 m³/h (10567 US gal/min)     | 4800 m³/h (21134 US gal/min)     |
| 350              | 14  | 66 m³/h (291 US gal/min)          | 3300 m³/h (14529 US gal/min)     | 6600 m³/h (29059 US gal/min)     |
| 400              | 16  | 90 m³/h (396 US gal/min)          | 4500 m³/h (19813 US gal/min)     | 9000 m³/h (39626 US gal/min)     |
| 450              | 18  | 120 m³/h (528 US gal/min)         | 6000 m³/h (26417 US gal/min)     | 12000 m³/h (52834 US gal/min)    |
| 500              | 20  | 132 m³/h (581 US gal/min)         | 6600 m³/h (29059 US gal/min)     | 13200 m³/h (58117 US gal/min)    |
| 600              | 24  | 192 m³/h (845 US gal/min)         | 9600 m³/h (42268 US gal/min)     | 19200 m³/h (84535 US gal/min)    |
| 700              | 28  | 264 m³/h (1162 US gal/min)        | 13200 m³/h (58118 US gal/min)    | 26400 m³/h (116236 US gal/min)   |
| 750              | 30  | 312 m³/h (1374 US gal/min)        | 15600 m³/h (68685 US gal/min)    | 31200 m³/h (137369 US gal/min)   |
| 800              | 32  | 360 m³/h (1585 US gal/min)        | 18000 m³/h (79252 US gal/min)    | 36000 m³/h (158503 US gal/min)   |
| 900              | 36  | 480 m³/h (2113 US gal/min)        | 24000 m³/h (105669 US gal/min)   | 48000 m³/h (211337 US gal/min)   |
| 1000             | 40  | 540 m³/h (2378 US gal/min)        | 27000 m³/h (118877 US gal/min)   | 54000 m³/h (237754 US gal/min)   |
| 1050             | 42  | 616 m³/h (2712 US gal/min)        | 30800 m³/h (135608 US gal/min)   | 61600 m³/h (271217 US gal/min)   |
| 1100             | 44  | 660 m³/h (3038 US gal/min)        | 33000 m³/h (151899 US gal/min)   | 66000 m³/h (290589 US gal/min)   |
| 1200             | 48  | 840 m³/h (3698 US gal/min)        | 42000 m³/h (184920 US gal/min)   | 84000 m³/h (369841 US gal/min)   |
| 1350             | 54  | 1020 m³/h (4491 US gal/min)       | 51000 m³/h (224546 US gal/min)   | 102000 m³/h (449092 US gal/min)  |
| 1400             | 54  | 1080 m³/h (4755 US gal/min)       | 54000 m³/h (237755 US gal/min)   | 108000 m³/h (475510 US gal/min)  |
| 1500             | 60  | 1260 m³/h (5548 US gal/min)       | 63000 m³/h (277381 US gal/min)   | 126000 m³/h (554761 US gal/min)  |
| 1600             | 66  | 1440 m³/h (6340 US gal/min)       | 72000 m³/h (317006 US gal/min)   | 144000 m³/h (634013 US gal/min)  |
| 1650             | 66  | 1512 m³/h (6657 US gal/min)       | 75600 m³/h (332856 US gal/min)   | 151200 m³/h (665712 US gal/min)  |
| 1800             | 72  | 1800 m³/h (7925 US gal/min)       | 90000 m³/h (396258 US gal/min)   | 180000 m³/h (792516 US gal/min)  |
| 2000             | 80  | 2280 m³/h (10039 US gal/min)      | 114000 m³/h (501927 US gal/min)  | 228000 m³/h (1003853 US gal/min) |
| 2100             | 84  | 2520 m³/h (11095 US gal/min)      | 126000 m³/h (554760 US gal/min)  | 252000 m³/h (1109520 US gal/min) |
| 2200             | 88  | 2760 m³/h (12152 US gal/min)      | 138000 m³/h (607594 US gal/min)  | 276000 m³/h (1215188 US gal/min) |
| 2300             | 92  | 3000 m³/h (13209 US gal/min)      | 150000 m³/h (660429 US gal/min)  | 300000 m³/h (1320858 US gal/min) |
| 2400             | 96  | 3240 m³/h (14265 US gal/min)      | 162000 m³/h (713263 US gal/min)  | 324000 m³/h (1426526 US gal/min) |
| 2600             | 104 | 3820 m³/h (16819 US gal/min)      | 191000 m³/h (840946 US gal/min)  | 382000 m³/h (1681892 US gal/min) |
| 2800             | 112 | 4440 m³/h (19549 US gal/min)      | 222000 m³/h (977434 US gal/min)  | 444000 m³/h (1954868 US gal/min) |
| 3000             | 120 | 5080 m³/h (22367 US gal/min)      | 254000 m³/h (1118326 US gal/min) | 508000 m³/h (2236652 US gal/min) |

## Process connections

For an overview of available process connection versions, see **Overview – models** on page 6.

## Materials

| Wetted parts                                           |                         |                                                                   |
|--------------------------------------------------------|-------------------------|-------------------------------------------------------------------|
| Part                                                   | Standard                | Option                                                            |
| Liner material                                         | Hard rubber             | —                                                                 |
| Measurement and grounding electrode for liner material |                         |                                                                   |
| Hard rubber                                            | SST 1.4571 (AISI 316Ti) | Hastelloy® C-22,<br>Hastelloy® C-4 (2.4610)<br>Others: on request |
| Grounding ring                                         | Stainless steel         | On request                                                        |

### Non-wetted parts (process connection), Design level 'A'



| DN                               | Standard           | Option          |
|----------------------------------|--------------------|-----------------|
| DN 25 to 400<br>(1 to 16 in)     | Steel (galvanized) | Stainless steel |
| DN 450 to 3000<br>(18 to 120 in) | Steel (painted)    | Stainless steel |

| EN material number | ASTM Grade | GB Material    |
|--------------------|------------|----------------|
| 1.4301             | F304       | 06Cr19Ni10     |
| 1.4404             | F316L      | 022Cr17Ni12Mo2 |
| 1.4401             | F316       | 06Cr17Ni12Mo2  |
| 1.4435             | F317L      | —              |
| 1.4541             | F321       | 06Cr18Ni11Ti   |

| EN material number | ASTM Grade | GB Material |
|--------------------|------------|-------------|
| 1.0432             | SA105      | —           |
| —                  | A537 Cl1   | 20#         |

### Sensor housing, Design level 'A'



| Part / DN                        | Material                                                                                              |
|----------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Housing</b>                   |                                                                                                       |
| DN 25 to 400<br>(1 to 16 in)     | Cast aluminum (painted)<br>Paint coat: ≥ 80 µm thick, RAL 9002                                        |
| DN 450 to 3000<br>(18 to 120 in) | Welded steel design (painted)<br>Paint coat: ≥ 80 µm thick, RAL 9002                                  |
| <b>Meter tube</b>                | Stainless steel <sup>1)</sup>                                                                         |
| <b>Terminal box</b>              | Aluminum alloy, painted, ≥ 80 µm thick, light gray, RAL 9002<br>Option: Plastic, gray white, RAL 9002 |
| <b>Cable gland<sup>1)</sup></b>  | Polyamide                                                                                             |

1) Cable gland with M 20 x 1.5 or NPT thread, to be selected via the order number.

| EN material number | ASTM Grade | GB Material    |
|--------------------|------------|----------------|
| 1.4301             | F304       | 06Cr19Ni10     |
| 1.4404             | F316L      | 022Cr17Ni12Mo2 |
| 1.4401             | F316       | 06Cr17Ni12Mo2  |
| 1.4435             | F317L      | —              |
| 1.4541             | F321       | 06Cr18Ni11Ti   |
| 1.4571             | TP316Ti    | —              |

## Material load for process connections

The limits of the permissible measuring medium temperature ( $T_{\text{medium}}$ ) and permissible pressure ( $P_{\text{medium}}$ ) are calculated on the basis of the liner and flange material used in the device (see device name plate).

### Minimum permissible operating pressure

The following table show the permissible minimum operating pressure ( $P_{\text{medium}}$ ) as a function of the measuring medium temperature ( $T_{\text{medium}}$ ) and the liner material.

### Flowmeter sensor



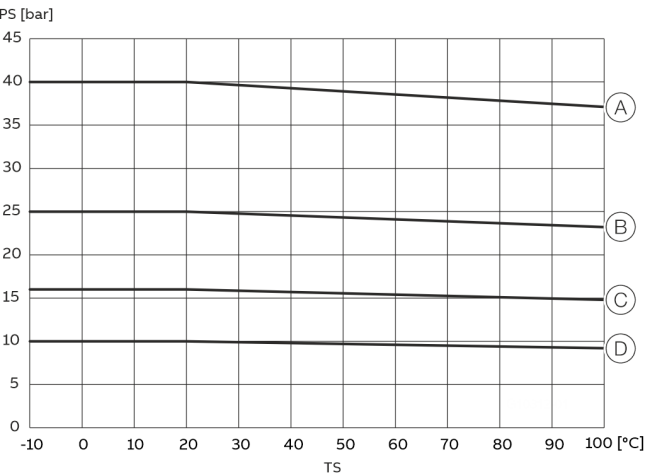
| Lining material | Nominal diameter               | $P_{\text{medium}}$<br>[mbar abs] | $T_{\text{medium}}^*$                  |
|-----------------|--------------------------------|-----------------------------------|----------------------------------------|
| Hard rubber     | DN 25 to DN 2000<br>(1 to 80") | 0                                 | < 85 °C (185 °F)<br>< 80 °C (176 °F)** |

... Flowmeter sensor

... Material load for process connections

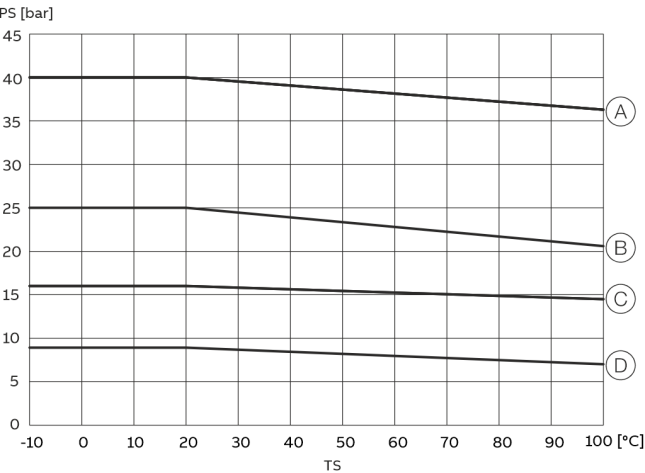
Material load diagrams

Maximum permissible operating pressure depending on medium temperature



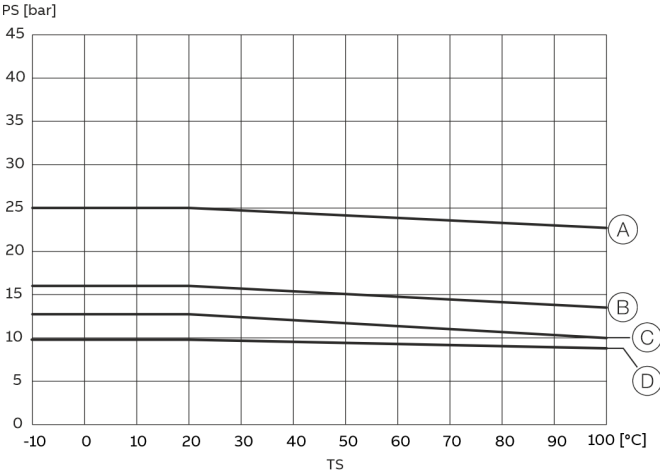
- (A) DN 25-80, PN 10-40, DN 100-150, PN 25-40, DN 200-600, PN 40
- (B) DN 100-150, PN 10-16, DN 200-600, PN 16
- (C) DN 200-600, PN 25
- (D) DN 200-600, PN 10

Figure 5: DIN flange, carbon steel, DN 25-600



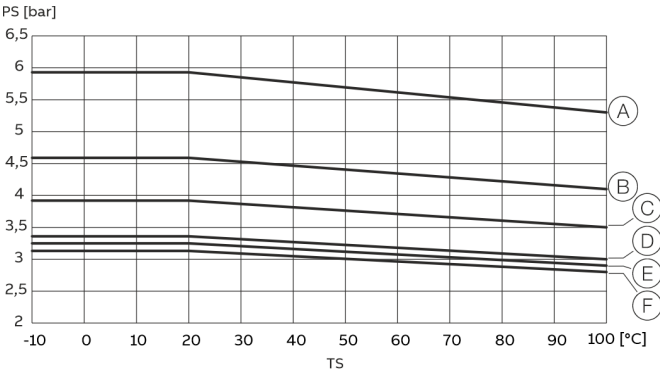
- (A) DN 200-600, PN 40
- (B) DN 600, PN 25
- (C) DN 200-400, PN 16
- (D) DN 25-40, PN 10-40

Figure 6: DIN flange, stainless steel, DN 25-600



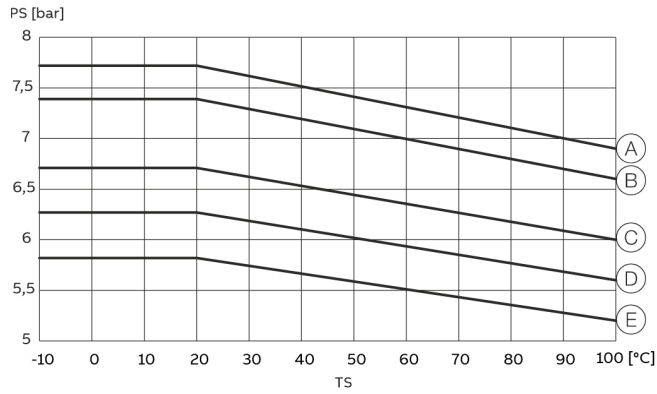
- (A) DN 200-500, PN 25
- (B) DN 450-500, PN 16
- (C) DN 600, PN 16
- (D) DN 200-500, PN 10

Figure 7: DIN flange, stainless steel, DN 200-600



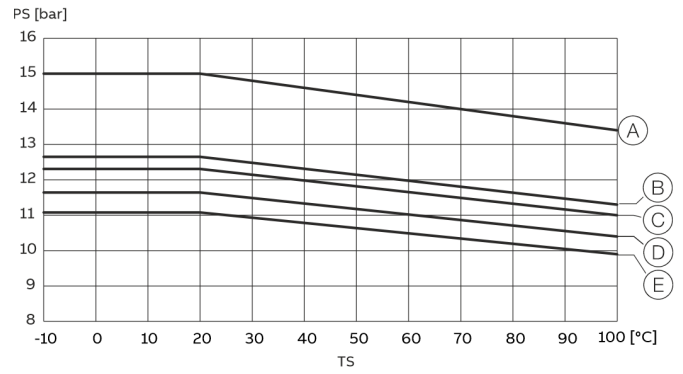
- (A) DN 700, PN 6
- (B) DN 800-1200, PN 6
- (C) DN 900-1400, PN 6
- (D) DN 2200-2400, PN 6
- (E) DN 1000-1600, PN 6
- (F) DN 1800-2000, PN 6

Figure 8: DIN flange, carbon steel, DN 700-2400, PN 6, 1 x DN lay length



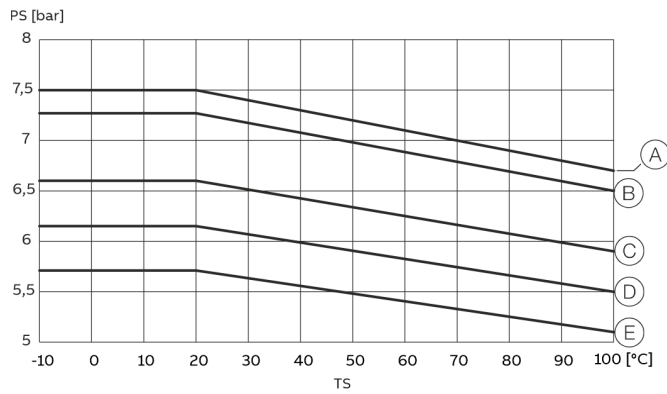
- (A) DN 1200-1400, PN 10      (D) DN 2400, PN 10  
 (B) DN 700, PN 10          (E) DN 2200, PN 10  
 (C) DN 1600, PN 10

Figure 9: DIN flange, carbon steel, DN 700-2400, PN 10, 1 x DN lay length



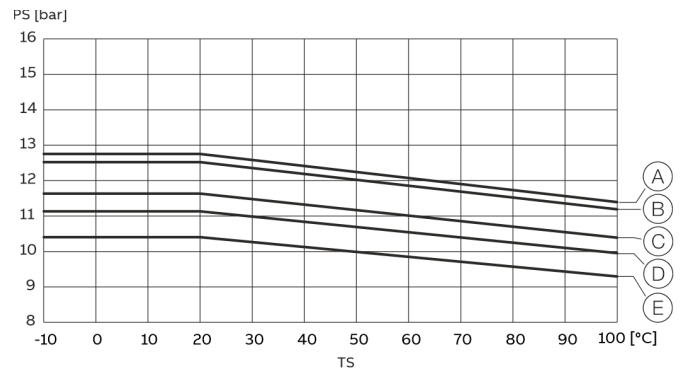
- (A) DN 700, PN 16              (D) DN 1600, PN 16  
 (B) DN 800, PN 16          (E) DN 1800, PN 16  
 (C) DN 1400, PN 16

Figure 11: DIN flange, carbon steel, DN 700-1800, PN 16, 1 x DN lay length



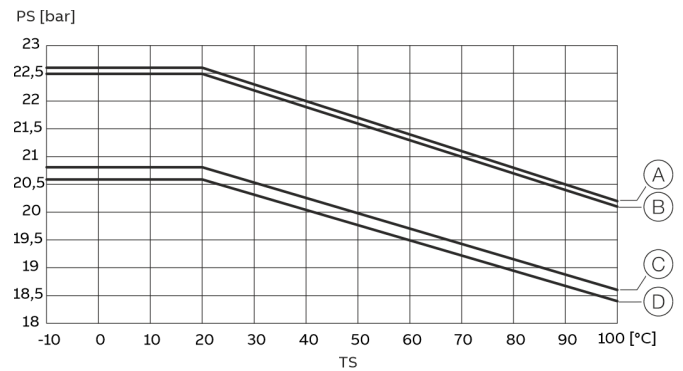
- (A) DN 800, PN 10              (D) DN 1800, PN 10  
 (B) DN 900, PN 10          (E) DN 1000, PN 10  
 (C) DN 2000, PN 10

Figure 10: DIN flange, carbon steel, DN 800-2000, PN 10, 1 x DN lay length



- (A) DN 1200, PN 16              (D) DN 1000, PN 16  
 (B) DN 900, PN 16          (E) DN 2000, PN 16  
 (C) DN 1600, PN 16

Figure 12: DIN flange, carbon steel, DN 700-2000, PN 16, 1 x DN lay length



- (A) DN 700, PN 25              (C) DN 900, PN 25  
 (B) DN 800, PN 25          (D) DN 1000, PN 25

Figure 13: DIN flange, carbon steel, DN 700-2400, PN 25, 1 x DN lay length

## ... Flowmeter sensor

## ... Material load for process connections

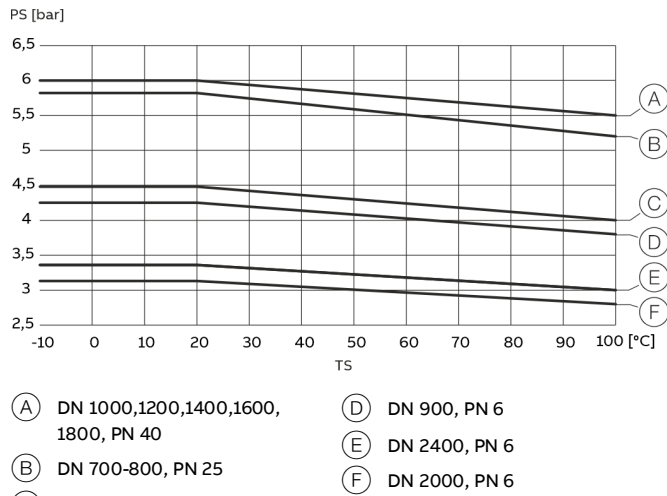


Figure 14: DIN flange, carbon steel, DN 700-2400, PN 6, 1.3 x DN lay length

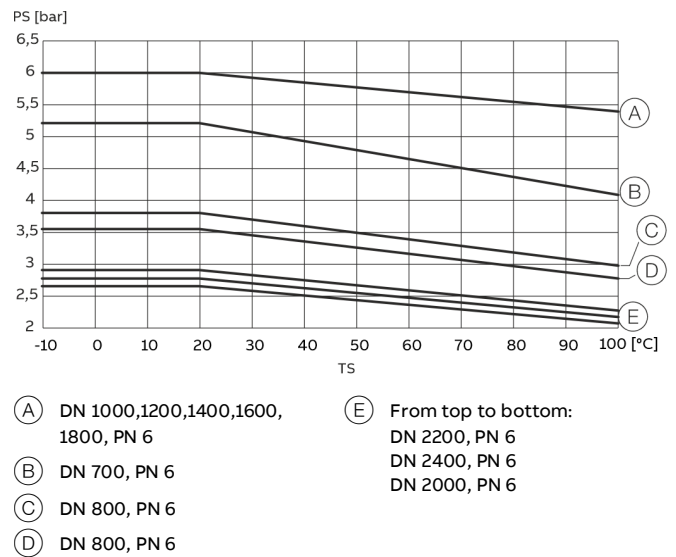


Figure 16: DIN flange, stainless steel, DN 700-2400, PN 6, 1.3 x DN lay length

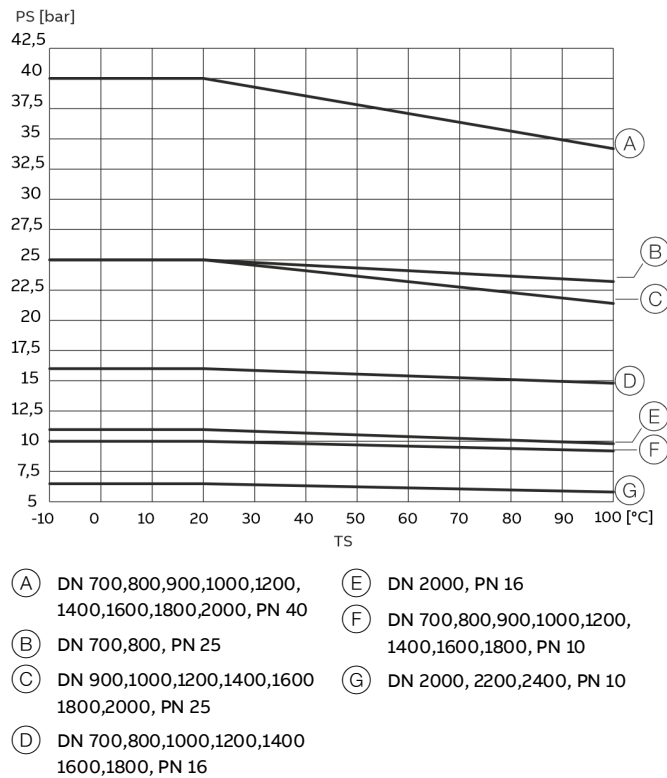


Figure 15: DIN flange, carbon steel, DN 700-2400, PN 10,16,25,40, 1.3 x DN lay length

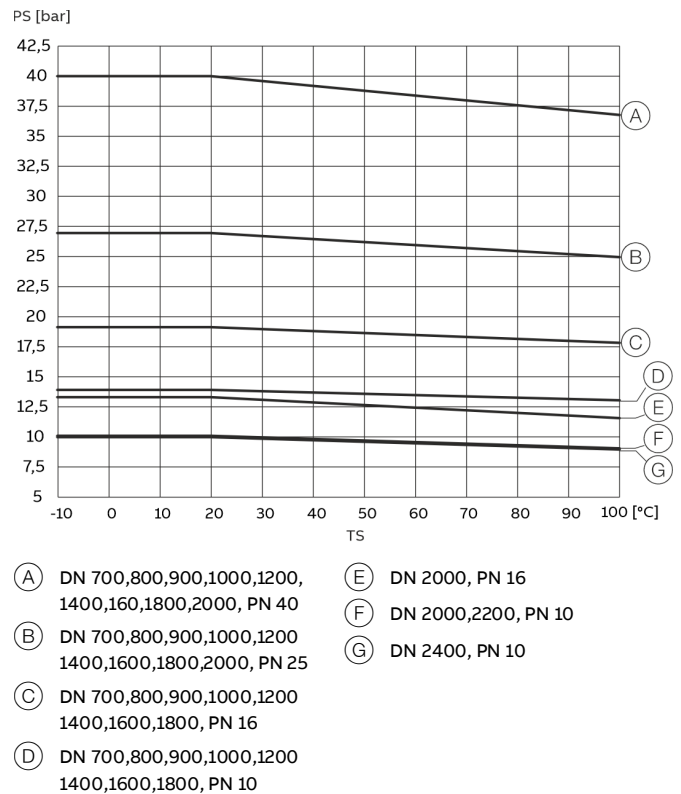


Figure 17: DIN flange, stainless steel, DN 700-2400, PN 10-40, 1.3 x DN lay length

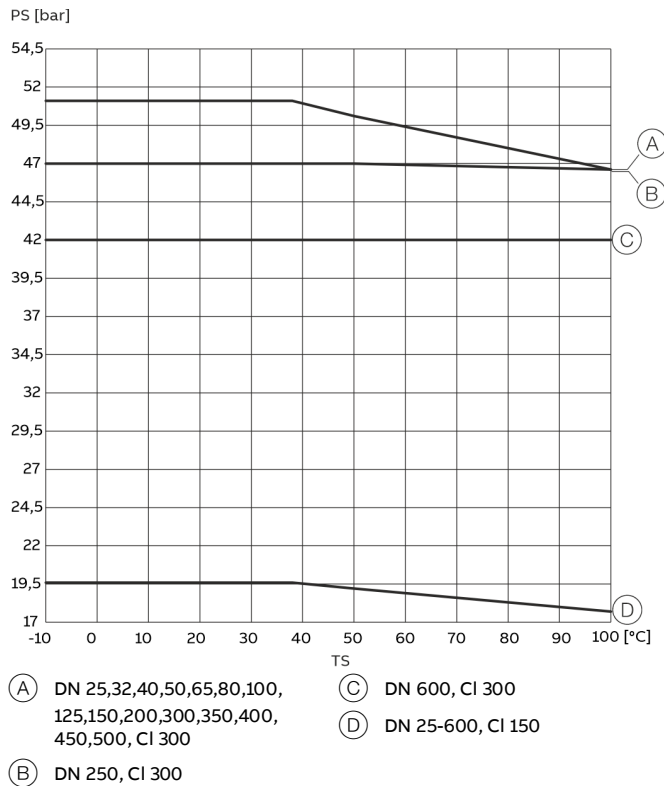


Figure 18: B16.5 ASME flange, carbon steel, DN25-600

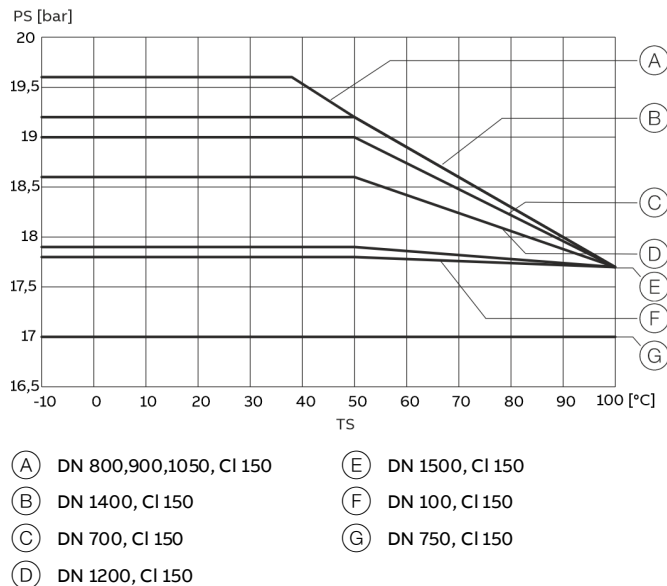


Figure 19: ASME flange, carbon steel, DN 700-1500, CI 150, B16.47 Series A, 1 x DN Lay Length

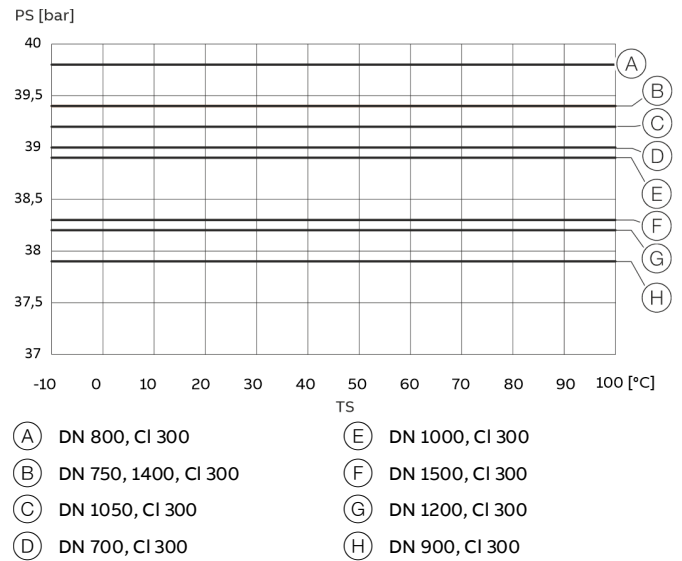


Figure 20: ASME flange, carbon steel, DN 700-1500, CI 300, B16.47 Series A, 1 x DN Lay Length

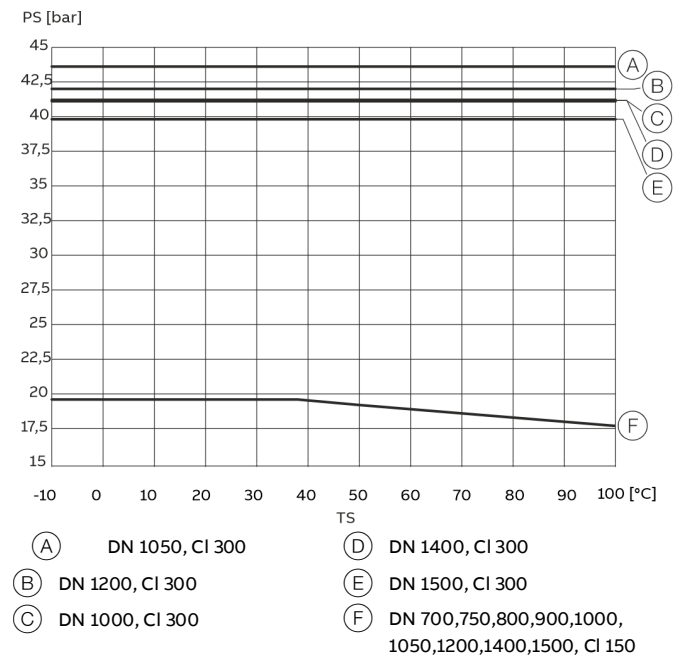


Figure 21: B16.47 Series A, ASME flange, carbon steel, DN 700-1500, 1.3 x DN lay length

## ... Flowmeter sensor

## ... Material load for process connections

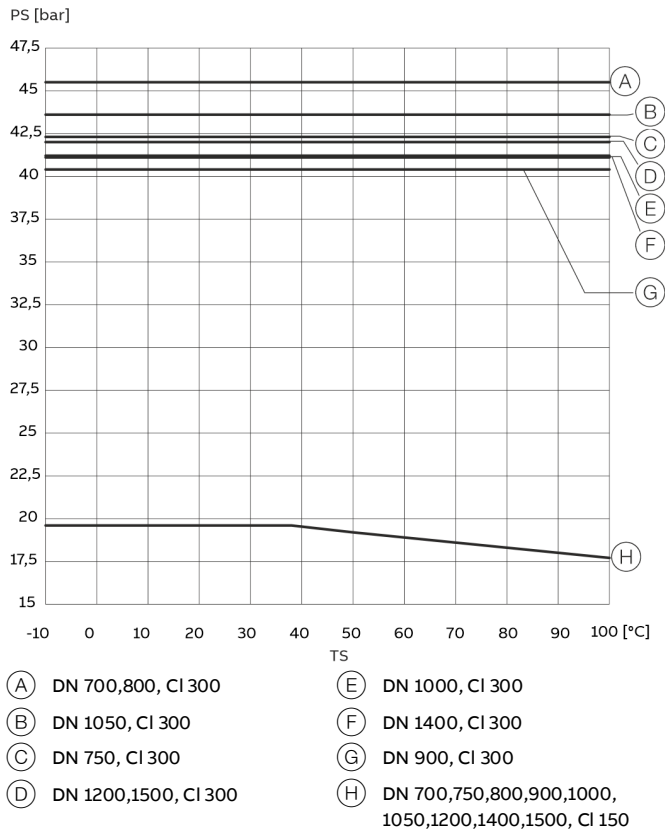


Figure 22: B16.47 Series B, ASME flange, carbon steel, DN 700-1500, 1.3 x DN lay length

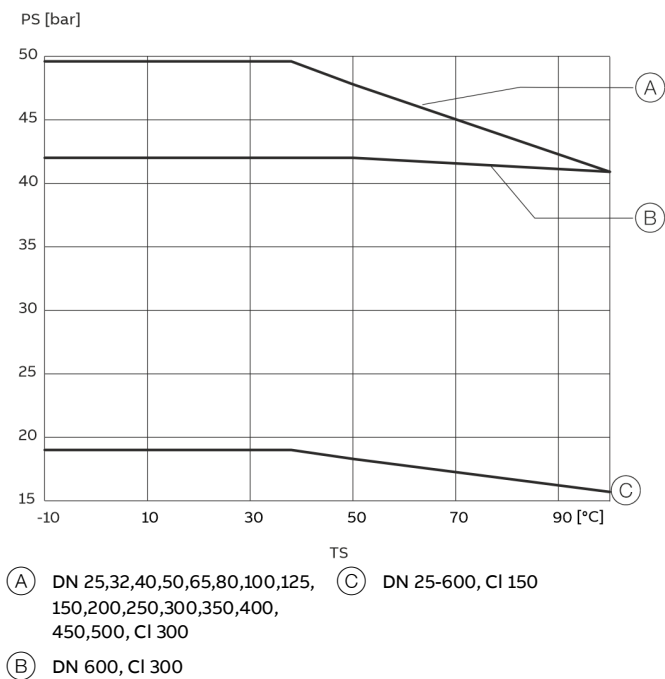


Figure 23: ASME flange B16.5, stainless steel, DN 25-600

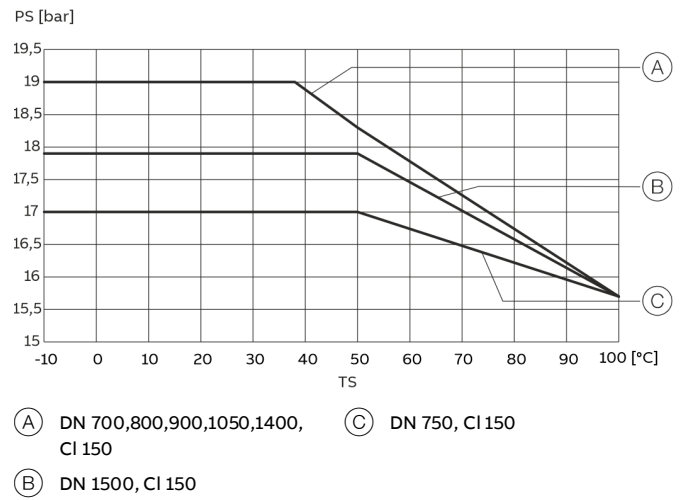


Figure 24: ASME flange, stainless steel, DN 700-1500, CI 150, B16.47 Series A, 1 x DN lay length

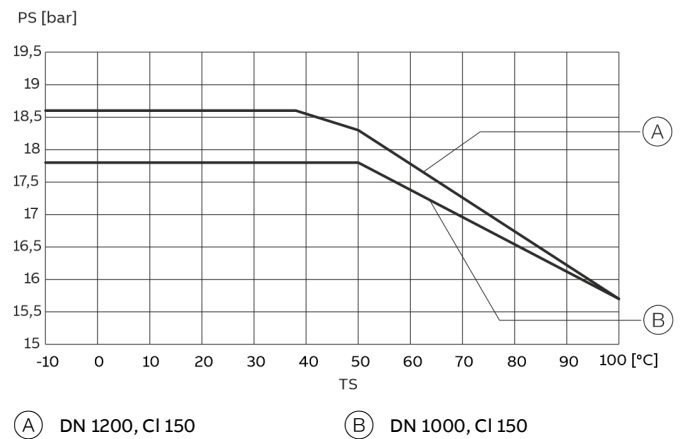
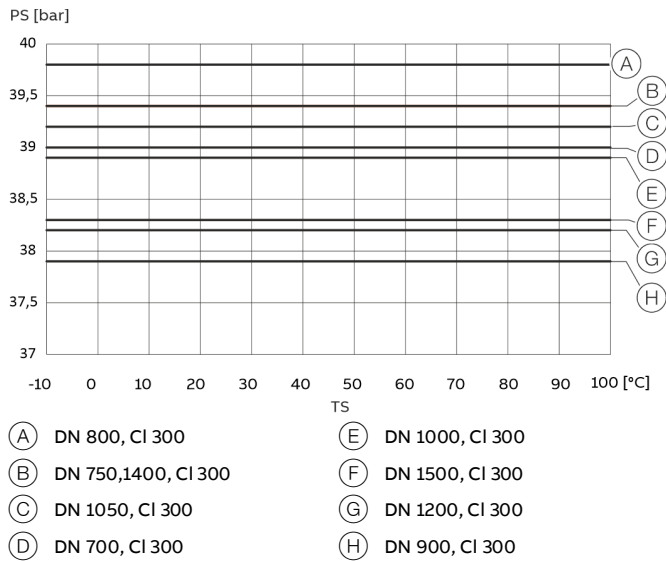
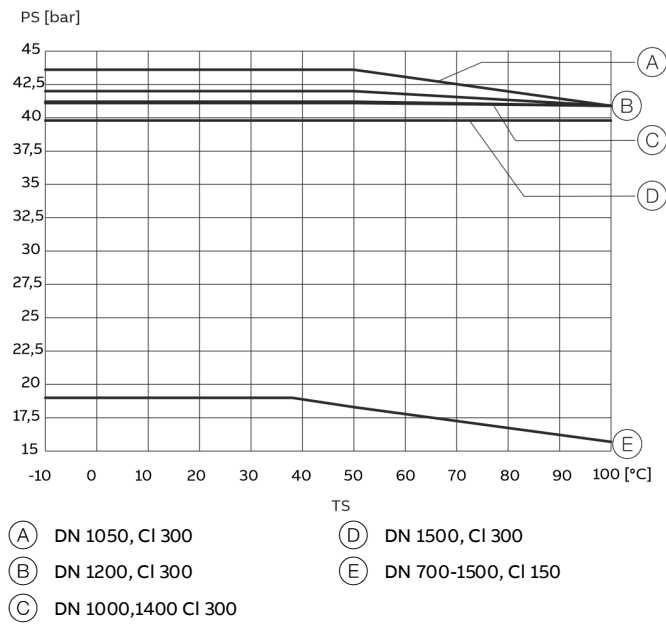


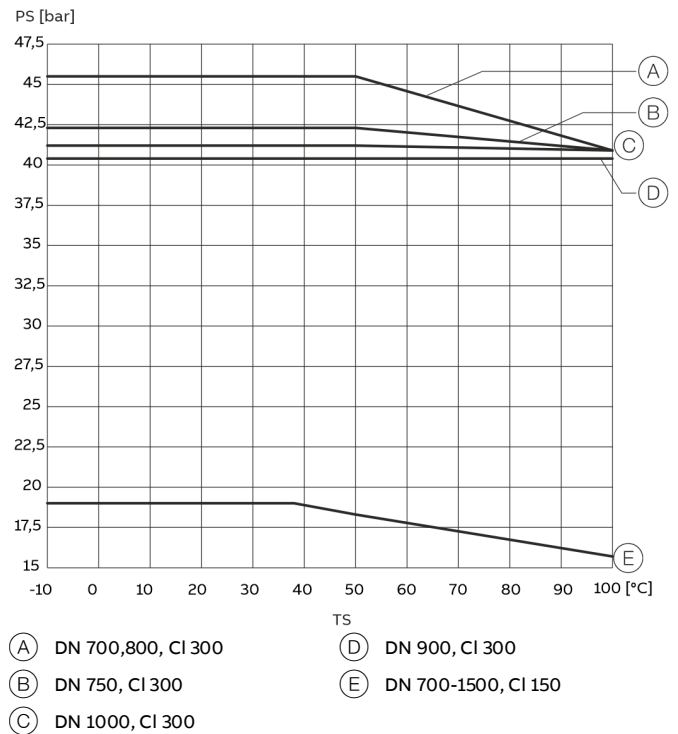
Figure 25: ASME flange, stainless steel, DN 1000-1200, CI 150, B16.47 Series A, 1 x DN lay length



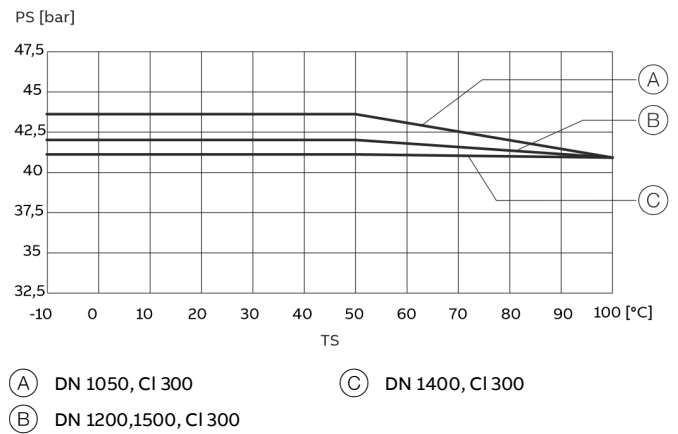
**Figure 26:** ASME flange, stainless steel, DN 700-1500, CI 300, B16.47 Series A, 1 x DN lay length



**Figure 27:** B16.47 Series A, ASME flange, stainless steel, DN 700-1500, 1.3 x DN lay length



**Figure 28:** B16.47 Series B, ASME flange, stainless steel, DN 700-1500, 1.3 x DN lay length



**Figure 29:** B16.47 Series B, ASME flange, stainless steel, DN 700-1500, 1.3 x DN lay length

## ... Flowmeter sensor

### Installation conditions

#### General

The following points must be observed during installation:

- The flow direction must correspond to the marking, if present.
- The maximum torque for all flange screws must be complied with.
- Secure flange screws and nuts against pipe vibration.
- The devices must be installed without mechanical tension (torsion, bending).
- Use gaskets made from a material that is compatible with the measuring medium and measuring medium temperature.
- Gaskets must not extend into the flow area, since possible turbulence could influence the accuracy of the device.
- The piping may not exert any inadmissible forces or torques on the device.
- Make sure that the temperature limits are not up-scaled during operation of the device.
- Make sure cavitation (e.g. caused by Valves) does not occur within the Flowmeter tube.
- Do not remove the sealing plugs in the cable glands until you are ready to install the electrical cable.
- Make sure the gaskets for the housing cover are seated correctly. Carefully seal the cover. Tighten the cover fittings.
- The transmitter with a remote mount design must be installed at a largely vibration-free location.
- Do not expose the transmitter and sensor to direct sunlight. Provide appropriate sun protection as necessary
- When installing the transmitter in a control cabinet, make sure adequate cooling is provided.

#### Devices with extended diagnostic functions

For devices with extended diagnostic functions different installation conditions may be valid.

For additional information, see **Optional diagnostic functions**.

### NOTE

#### Potential damage to device!

Improperly placed support structures can result in a deformed housing and damage to the inner solenoids. Place the support structures at the edge of the transmitter housing (see arrows in **Figure 30**).

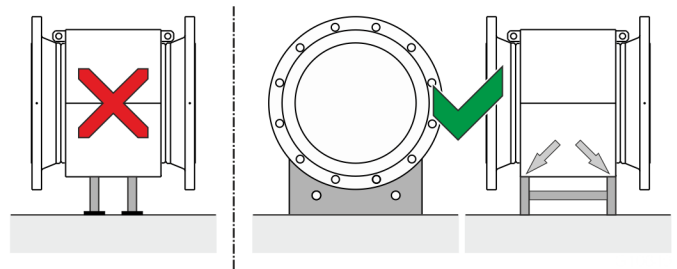


Figure 30: Support for nominal diameters greater than DN 400

Devices with nominal diameters larger than DN 400 must be mounted on a sufficiently strong foundation with support.

#### Gaskets

The following points must be observed when installing gaskets:

- To achieve the best results, make sure that the gaskets and meter tube fit concentrically.
- To make sure that the flow profile is not distorted, the gaskets may not intrude in the piping cross-section.
- The use of graphite with the flange or process connection gaskets is prohibited. This is because, in some instances, an electrically conductive coating may form on the inside of the meter tube.

### Flow direction

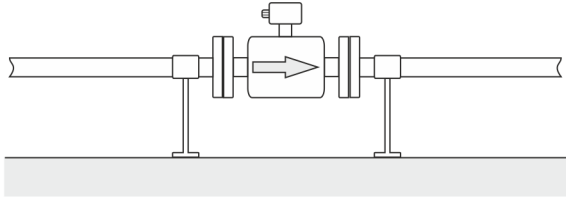


Figure 31: Flow direction

The device measures the flow rate in both flow directions. Forward flow is the factory setting, as shown in Figure 31.

### Electrode axis

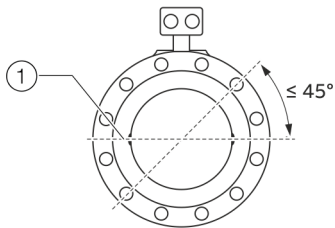


Figure 32: Orientation of the electrode axis

The electrode axis ① should be horizontal if at all possible or no more than 45° from horizontal.

### Mounting position

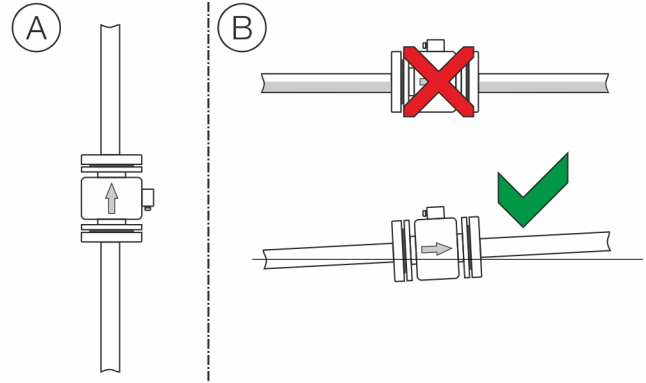
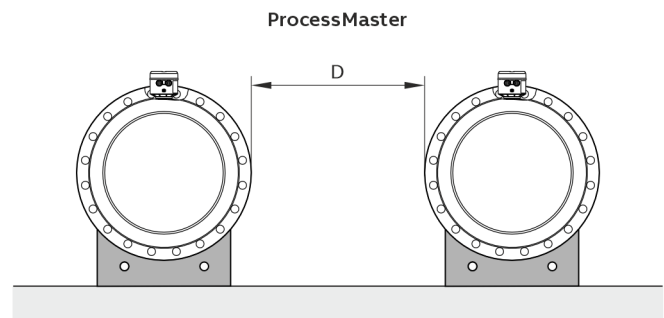


Figure 33: Mounting position

- Ⓐ Vertical installation for measuring abrasive materials, preferably with flow in upward direction.
- Ⓑ For a horizontal installation, the meter tube must always be completely filled with the measuring medium. Provide for a slight incline of the connection for degassing.

### Minimum spacing of the devices



Spacing D:  $\geq 1.0$  m (3.3 ft) for Design Level 'A'

Figure 34: Minimum spacing of the devices

- In order to prevent the devices from interfering with each other, a minimum distance as presented in **Figure 34** must be maintained between the devices.
- The sensor must not be operated in the vicinity of powerful electromagnetic fields, e.g., motors, pumps, transformers, etc. A minimum spacing of approx. 1 m (3.28 ft) must be maintained.
- For installation on or to steel parts (e.g. steel brackets), a minimum spacing of 100 mm (3.94 in) must be maintained (based on IEC801-2 and IECTC77B).

## ... Flowmeter sensor

### ... Installation conditions

#### Inlet and outlet sections

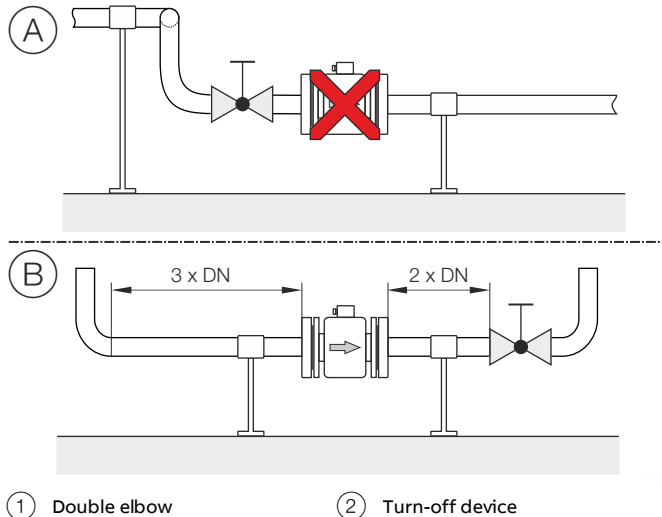


Figure 35: Inlet and outlet section, turn-off devices

The measuring principle is independent of the flow profile as long as standing eddies do not extend into the measured value formation, such as may for example occur after double elbows, in the event of tangential inflow, or where half-open gate valves are located upstream of the sensor. In such cases, measures must be put in place to normalize the flow profile.

- (A) Do not install fittings, manifolds, valves, etc., right before the flowmeter sensor.
- (B) Inlet / outlet sections: length of the straight piping upstream and downstream on the sensor.  
Experience has shown that, in most installations, straight inlet sections 3 x DN long and straight outlet sections 2 x DN long are sufficient (DN = nominal diameter of the flowmeter sensor).  
For test stands, the reference conditions of 10 x DN straight inlet and 5 x DN straight outlet must be provided, in accordance with EN 29104 / ISO 9104.  
Valves or other turn-off devices should be installed in the outlet section.  
Valve flaps must be installed so that the valve damper plate does not extend into the flowmeter sensor.  
Butterfly Valves should not be installed upstream of the Flowmeter.

#### Free inlet or outlet

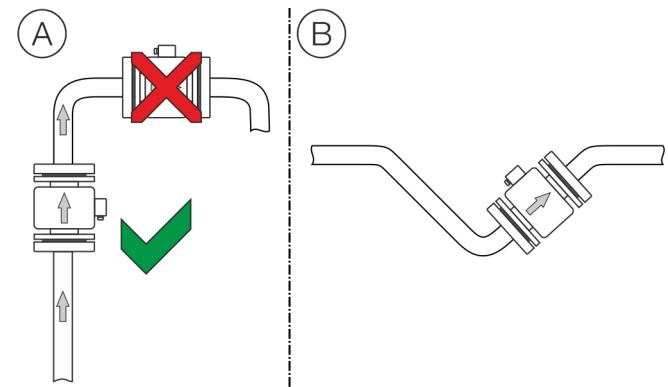


Figure 36: Free inflow and outflow

- (A) For a free outflow, do not install flowmeter at the highest point of the piping or on its outflow side, since the measuring tube may run empty, creating air bubbles.
- (B) For free inflow/outflow, provide an invert to make sure that the piping is always full

#### Mounting with heavily contaminated measuring media

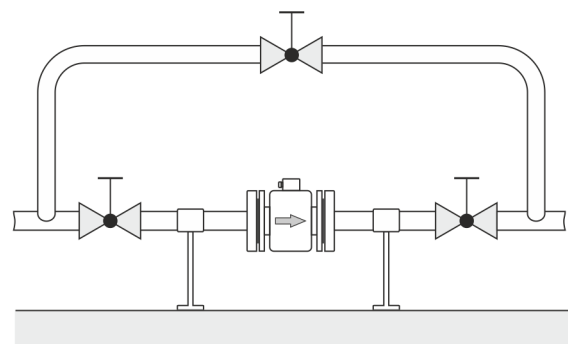


Figure 37: Bypass line

For strongly contaminated measuring media, a bypass line in accordance with the figure is recommended so that operation of the system can continue to run without interruption during mechanical cleaning.

## Grounding

The flowmeter sensor must be connected to ground potential. For technical reasons, this potential must be identical to the potential of the measuring medium. For plastic or insulated lined pipelines, the measuring medium is grounded by installing grounding rings. When there are stray potentials present in the pipeline, a grounding ring is recommended on both ends of the flowmeter sensor.

### Metal pipe with loose flanges

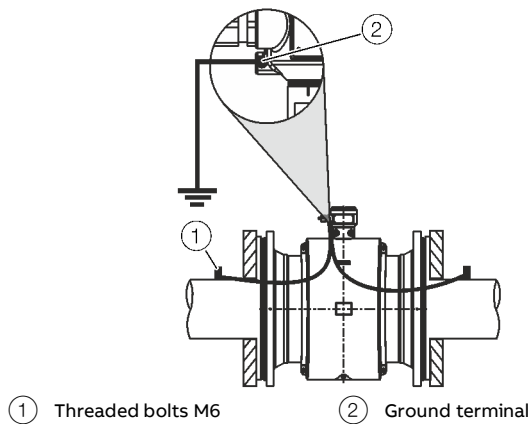


Figure 38: Metal pipe, without liner

### Metal pipe with fixed flanges

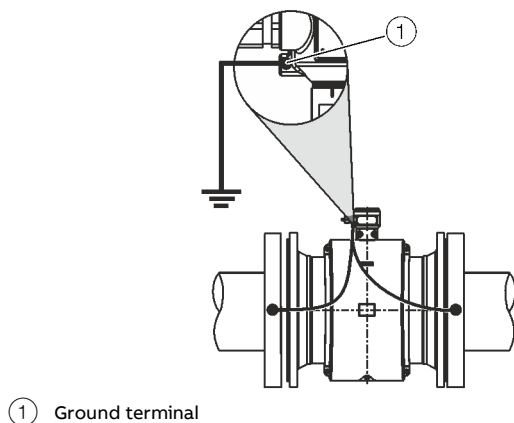


Figure 39: Metal pipe, without liner

### Plastic pipes, non-metallic pipe liner

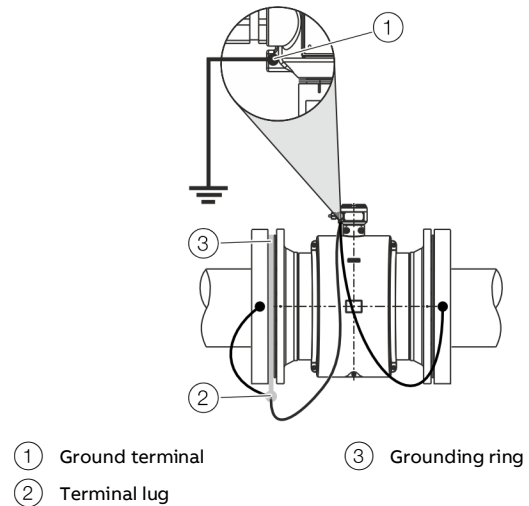


Figure 40: Plastic pipe, non-metallic pipe liner



## Dimensions

Flange DN 25 (1 in) to DN 100 (4 in), aluminum sensor housing (shell housing)

All specified dimensions and weights are in mm (in) or kg (lb). The stated weights are approximate; the maximum weight is always stated.

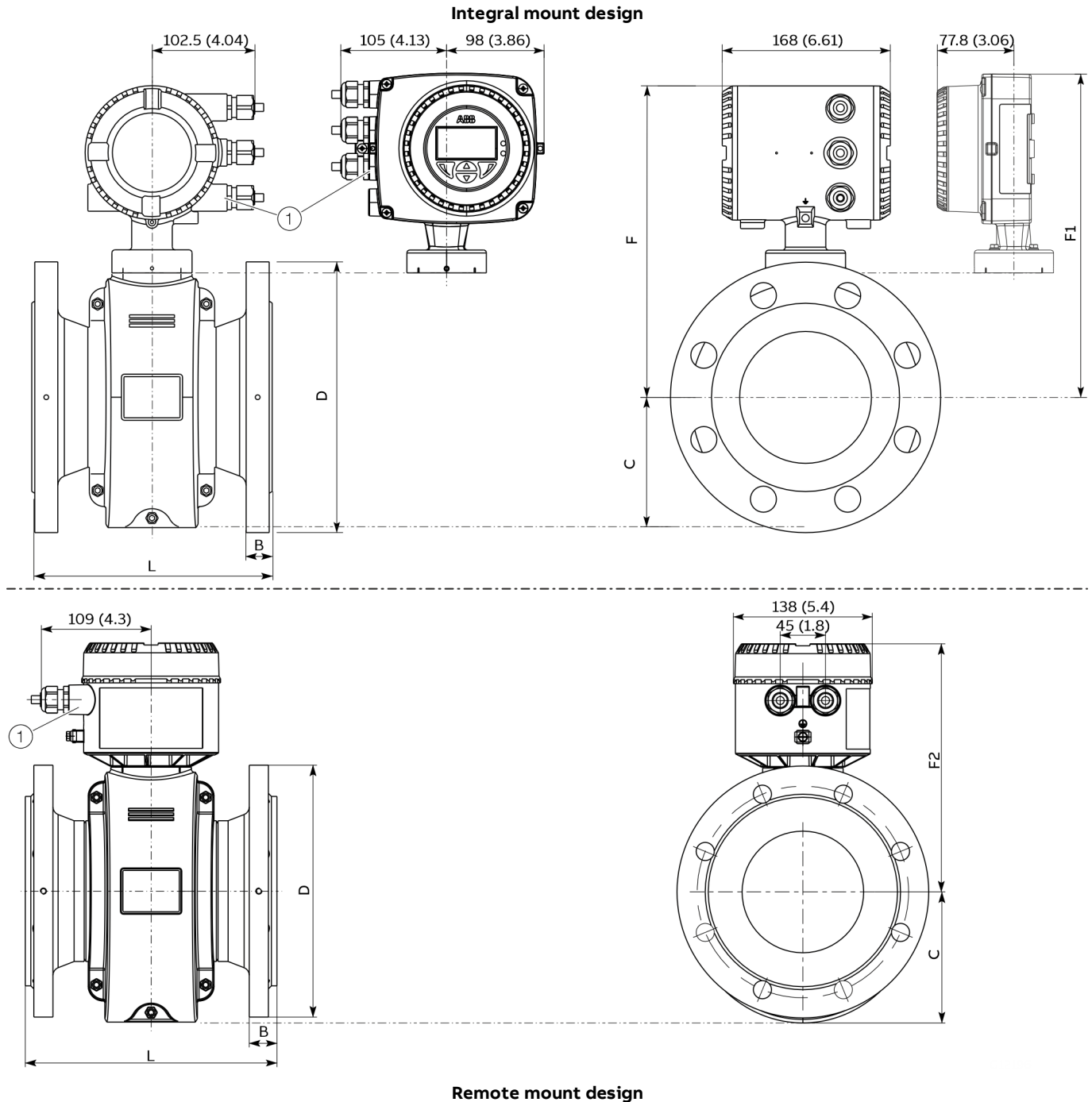


Figure 44: Integral mount design (top), remote mount design (bottom)

... Flowmeter sensor

... Dimensions

| Dimensions - Flange device DN 25 (1 in) to 100 (4 in), aluminum sensor housing (shell housing) |                    |            |                 |              |                 |                  |                  |          |             |
|------------------------------------------------------------------------------------------------|--------------------|------------|-----------------|--------------|-----------------|------------------|------------------|----------|-------------|
| Nominal diameter                                                                               | Process connection | D          | L <sup>1)</sup> | C            | F <sup>2)</sup> | F1 <sup>2)</sup> | F2 <sup>2)</sup> | Weight   |             |
|                                                                                                |                    |            |                 |              |                 |                  |                  | Integral | Remote      |
| DN 25 (1 in)                                                                                   | PN 10 to 40        | 115 (4.53) | 200 (7.87)      | 82 (3.23)    | 255 (10.04)     | 269 (10.6)       | 191 (7.52)       | 9 (20)   | 7.5 (16.5)  |
|                                                                                                | JIS5K              | 95 (3.74)  |                 |              |                 |                  |                  |          |             |
|                                                                                                | JIS10K             | 125 (4.88) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL300   | 125 (4.88) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL150   | 108 (4.25) |                 |              |                 |                  |                  |          |             |
| DN 32 (1¼ in)                                                                                  | PN 10 to 40        | 140 (5.51) | 200 (7.87)      | 92 (3.62)    | 262 (10.3)      | 276 (10.87)      | 198 (7.80)       | 10 (22)  | 8.5 (18.5)  |
|                                                                                                | JIS5K              | 115 (4.53) |                 |              |                 |                  |                  |          |             |
|                                                                                                | JIS10K             | 135 (5.31) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL300   | 135 (5.31) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL150   | 117 (4.61) |                 |              |                 |                  |                  |          |             |
| DN 40 (1½ in)                                                                                  | PN10 to 40         | 150 (5.91) | 200 (7.87)      | 92 (3.62)    | 262 (10.3)      | 276 (10.87)      | 198 (7.80)       | 11 (24)  | 9.5 (21)    |
|                                                                                                | JIS5K              | 120 (4.72) |                 |              |                 |                  |                  |          |             |
|                                                                                                | JIS10K             | 140 (5.51) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL300   | 155 (6.10) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL150   | 127 (5.00) |                 |              |                 |                  |                  |          |             |
| DN 50 (2 in)                                                                                   | PN 10 to 40        | 165 (6.5)  | 200 (7.87)      | 97.5 (3.84)  | 268 (10.55)     | 282 (11.1)       | 204 (8.0)        | 12 (26)  | 11 (24)     |
|                                                                                                | JIS5K              | 130 (5.12) |                 |              |                 |                  |                  |          |             |
|                                                                                                | JIS10K             | 155 (6.10) |                 |              |                 |                  |                  |          |             |
|                                                                                                | AS4087 PN 16       | 150 (5.91) |                 |              |                 |                  |                  |          |             |
|                                                                                                | AS4087 PN 35       | 165 (6.50) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL150   | 152 (5.98) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL300   | 165 (6.50) |                 |              |                 |                  |                  |          |             |
| DN 65 (2½ in)                                                                                  | PN10 to 40         | 185 (7.28) | 200 (7.87)      | 108.5 (4.25) | 279 (10.98)     | 293 (11.54)      | 215 (8.46)       | 13 (29)  | 11.5 (25)   |
|                                                                                                | JIS5K              | 155 (6.10) |                 |              |                 |                  |                  |          |             |
|                                                                                                | JIS10K             | 175 (6.89) |                 |              |                 |                  |                  |          |             |
|                                                                                                | AS4087 PN 16       | 165 (6.50) |                 |              |                 |                  |                  |          |             |
|                                                                                                | AS4087 PN 35       | 185 (7.28) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL150   | 178 (7.01) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL300   | 190 (7.48) |                 |              |                 |                  |                  | 15 (33)  | 13 (29)     |
| DN 80 (3 in)                                                                                   | PN10 to 40         | 200 (7.87) | 200 (7.87)      | 108.5 (4.25) | 279 (10.98)     | 293 (11.54)      | 215 (8.46)       | 17 (37)  | 15.5 (34)   |
|                                                                                                | JIS5K              | 180 (7.09) |                 |              |                 |                  |                  |          |             |
|                                                                                                | JIS10K             | 185 (7.28) |                 |              |                 |                  |                  |          |             |
|                                                                                                | AS4087 PN16        | 185 (7.28) |                 |              |                 |                  |                  |          |             |
|                                                                                                | AS4087 PN35        | 205 (8.07) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL150   | 190 (7.48) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL300   | 210 (8.28) |                 |              |                 |                  |                  | 19 (42)  | 17 (37)     |
| DN 100 (4 in)                                                                                  | PN 10 to 16        | 220 (8.66) | 250 (9.84)      | 122.5 (4.82) | 301 (11.85)     | 315 (12.4)       | 237 (9.33)       | 19 (42)  | 17.5 (38.5) |
|                                                                                                | PN 25 to 40        | 235 (9.25) |                 |              |                 |                  |                  | 23 (51)  | 21 (46)     |
|                                                                                                | JIS5K              | 200 (7.87) |                 |              |                 |                  |                  | 19 (42)  | 17 (37)     |
|                                                                                                | JIS10K             | 210 (8.27) |                 |              |                 |                  |                  | 23 (51)  | 21 (46)     |
|                                                                                                | AS4087 PN 16       | 215 (8.46) |                 |              |                 |                  |                  |          |             |
|                                                                                                | AS4087 PN 35       | 230 (9.06) |                 |              |                 |                  |                  |          |             |
|                                                                                                | ASME B16.5 CL300   | 255 (1.04) |                 |              |                 |                  |                  | 30 (66)  | 28 (62)     |
|                                                                                                | ASME B16.5 CL150   | 229 (9.00) |                 |              |                 |                  |                  | 21 (51)  | 19 (42)     |

Tolerance for L: +0 / -5 mm (+0 / -0.197 in)

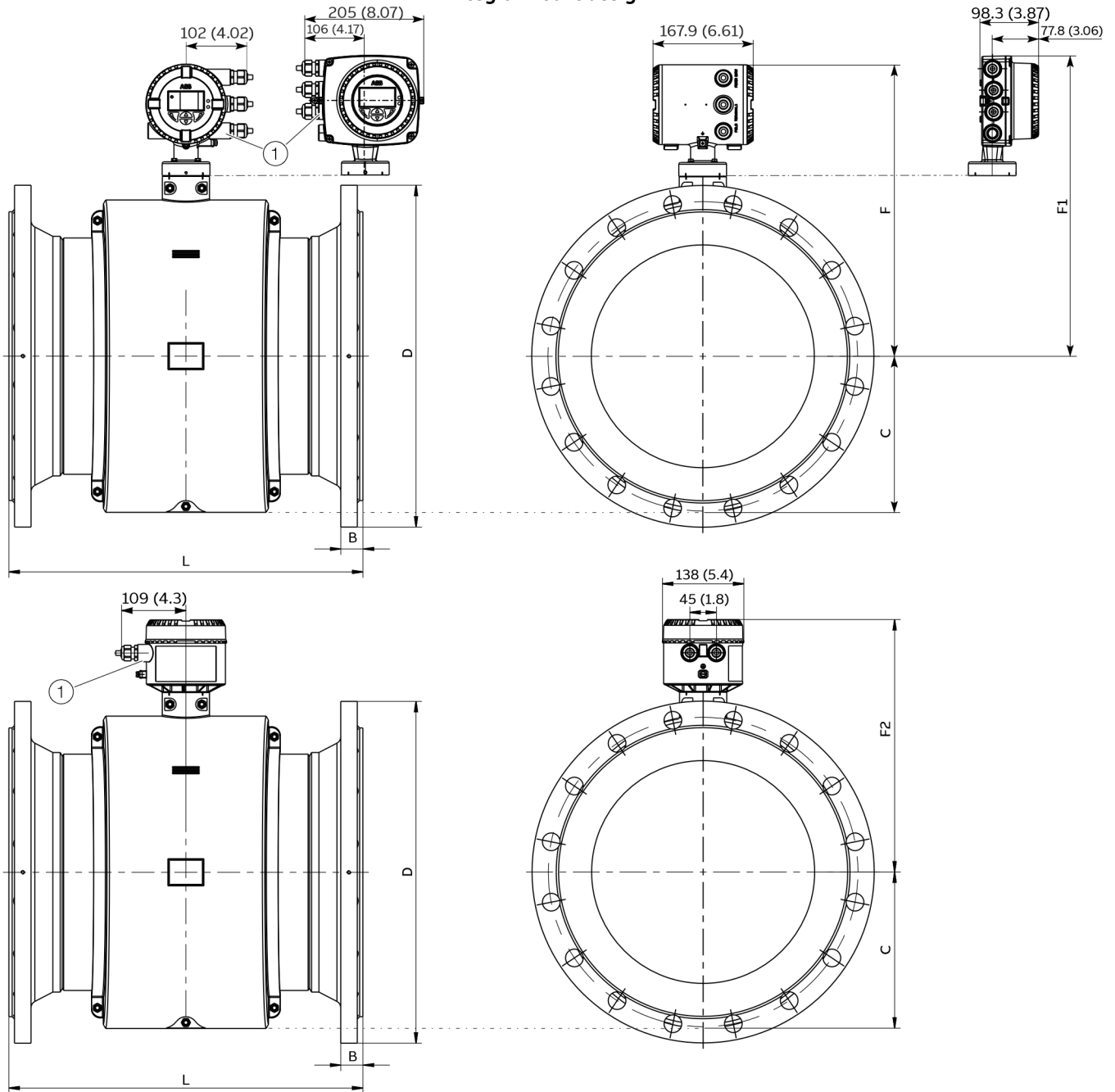
1) With grounding rings fitted, dimension L increases by 3 mm (0.118 in) per ring for size DN 25 to 2400 (1 in to 96 in)

2) Depending on the device design, the dimensions change according to the following table:

| Device design                       | Dimension F, F1   | Dimension F2      |
|-------------------------------------|-------------------|-------------------|
| Without explosion protection        | 0                 | 0                 |
| Explosion protection Zone 1, Div. 1 | +74 mm (+2.91 in) | +47 mm (+1.85 in) |
| Explosion protection Zone 2, Div. 2 | 0                 | 0                 |

**Flange DN 125 (6 in) to DN 400 (16 in), aluminum sensor housing (shell housing)**

All specified dimensions and weights are in mm (in) or kg (lb). The stated weights are approximate; the maximum weight is always stated.

**Integral mount design****Remote mount design**

① Female thread (either ½ in NPT or M20 x 1.5) refer to model coding. With ½ in NPT there will be a plug instead of the PG cable inlet.

Figure 45: Integral mount design (top), remote mount design (bottom)

## ... Flowmeter sensor

### ... Dimensions

| Dimensions - Flange device DN 125 (5 in) to DN 250 (10 in), aluminum sensor housing (shell housing) |                    |             |                 |              |                 |                  |                  |           |             |
|-----------------------------------------------------------------------------------------------------|--------------------|-------------|-----------------|--------------|-----------------|------------------|------------------|-----------|-------------|
| Nominal diameter                                                                                    | Process connection | D           | L <sup>1)</sup> | C            | F <sup>2)</sup> | F1 <sup>2)</sup> | F2 <sup>2)</sup> | Weight    |             |
|                                                                                                     |                    |             |                 |              |                 |                  |                  | Integral  | Remote      |
| DN 125 (5 in)                                                                                       | PN 10 to 16        | 250 (9.84)  | 250 (9.84)      | 130 (5.12)   | 311 (12.24)     | 325 (12.80)      | 247 (9.72)       | 22 (48)   | 20.5 (45)   |
|                                                                                                     | PN 25 to 40        | 270 (10.63) |                 |              |                 |                  |                  | 29 (64)   | 27 (59)     |
|                                                                                                     | JIS5K              | 235 (9.25)  |                 |              |                 |                  |                  | 22 (48)   | 20 (44)     |
|                                                                                                     | JIS10K             | 250 (9.84)  |                 |              |                 |                  |                  |           |             |
|                                                                                                     | ASME B16.5 CL150   | 254 (10.00) |                 |              |                 |                  |                  |           |             |
|                                                                                                     | ASME B16.5 CL300   | 280 (11.02) |                 |              |                 |                  |                  | 35 (77)   | 33 (73)     |
| DN 150 (6 in)                                                                                       | PN10 to 16         | 285 (11.22) | 300 (11.81)     | 146 (5.75)   | 358 (14.09)     | 372 (14.65)      | 294 (11.57)      | 33 (73)   | 31.5 (69.5) |
|                                                                                                     | PN 25 to 40        | 300 (11.81) |                 |              |                 |                  |                  | 39 (86)   | 37 (81)     |
|                                                                                                     | JIS5K              | 265 (10.43) |                 |              |                 |                  |                  | 33 (73)   | 31 (68)     |
|                                                                                                     | JIS10K             | 280 (11.02) |                 |              |                 |                  |                  | 33 (73)   | 31 (68)     |
|                                                                                                     | AS4087 PN 16       | 280 (11.02) |                 |              |                 |                  |                  | 33 (73)   | 31 (68)     |
|                                                                                                     | AS4087 PN 35       | 305 (11.81) |                 |              |                 |                  |                  | 39 (86)   | 37 (81)     |
|                                                                                                     | ASME B16.5 CL300   | 320 (12.60) |                 |              |                 |                  |                  | 47 (103)  | 45 (99)     |
|                                                                                                     | ASME B16.5 CL150   | 279 (10.98) |                 |              |                 |                  |                  | 33 (73)   | 31 (68)     |
| DN 200 (8 in)                                                                                       | PN 10              | 340 (13.39) | 350 (13.78)     | 170.5 (6.71) | 399 (15.71)     | 413 (16.26)      | 334 (13.15)      | 41 (90)   | 39 (86)     |
|                                                                                                     | PN 16              | 340 (13.39) |                 |              |                 |                  |                  | 41 (90)   | 39 (86)     |
|                                                                                                     | PN 25              | 360 (14.17) |                 |              |                 |                  |                  | 55 (121)  | 53 (117)    |
|                                                                                                     | PN 40              | 375 (14.76) |                 |              |                 |                  |                  | 65 (143)  | 63 (139)    |
|                                                                                                     | AS4087 PN 16       | 335 (13.19) |                 |              |                 |                  |                  | 41 (90)   | 39 (86)     |
|                                                                                                     | AS4087 PN 35       | 370 (14.57) |                 |              |                 |                  |                  | 65 (143)  | 63 (139)    |
|                                                                                                     | JIS5K              | 320 (12.60) |                 |              |                 |                  |                  | 41 (90)   | 39 (86)     |
|                                                                                                     | JIS10K             | 330 (12.99) |                 |              |                 |                  |                  | 41 (90)   | 39 (86)     |
|                                                                                                     | ASME B16.5 CL300   | 380 (14.96) |                 |              |                 |                  |                  | 72 (158)  | 70 (154)    |
|                                                                                                     | ASME B16.5 CL150   | 345 (13.58) |                 |              |                 |                  |                  | 50 (110)  | 48 (106)    |
|                                                                                                     |                    |             |                 |              |                 |                  |                  |           |             |
| DN 250 (10 in)                                                                                      | PN 10              | 395 (15.55) | 450 (17.72)     | 198 (7.80)   | 413 (16.26)     | 427 (16.81)      | 349 (13.74)      | 61 (134)  | 59 (130)    |
|                                                                                                     | PN 16              | 405 (15.94) |                 |              |                 |                  |                  | 65 (143)  | 63 (139)    |
|                                                                                                     | PN 25              | 425 (16.73) |                 |              |                 |                  |                  | 84 (185)  | 82 (180)    |
|                                                                                                     | PN 40              | 450 (17.72) |                 |              |                 |                  |                  | 95 (209)  | 93 (205)    |
|                                                                                                     | AS4087 PN 16       | 405 (15.94) |                 |              |                 |                  |                  | 65 (143)  | 63 (139)    |
|                                                                                                     | AS4087 PN 35       | 430 (16.93) |                 |              |                 |                  |                  | 95 (209)  | 93 (205)    |
|                                                                                                     | JIS5K              | 385 (15.16) |                 |              |                 |                  |                  | 65 (143)  | 63 (139)    |
|                                                                                                     | JIS10K             | 400 (15.75) |                 |              |                 |                  |                  | 65 (143)  | 63 (139)    |
|                                                                                                     | ASME B16.5 CL300   | 445 (17.52) |                 |              |                 |                  |                  | 105 (231) | 103 (227)   |
|                                                                                                     | ASME B16.5 CL150   | 405 (15.94) |                 |              |                 |                  |                  | 70 (154)  | 68 (150)    |
|                                                                                                     |                    |             |                 |              |                 |                  |                  |           |             |

Continued on next page

Tolerance for L: +0 / -5 mm (+0 / -0.197 in)^

| Dimensions - Flange device DN 300 (12 in to DN 400 (16 in), aluminum sensor housing (shell housing)) |                    |             |                 |             |                 |                  |                  |           |           |
|------------------------------------------------------------------------------------------------------|--------------------|-------------|-----------------|-------------|-----------------|------------------|------------------|-----------|-----------|
| Nominal diameter                                                                                     | Process connection | D           | L <sup>1)</sup> | C           | F <sup>2)</sup> | F1 <sup>2)</sup> | F2 <sup>2)</sup> | Weight    |           |
|                                                                                                      |                    |             |                 |             |                 |                  |                  | Integral  | Remote    |
| DN 300 (12 in)                                                                                       | PN 10              | 445 (17.52) | 500 (19.69)     | 228 (8.98)  | 436 (17.17)     | 450 (17.72)      | 372 (14.62)      | 74 (163)  | 72 (158)  |
|                                                                                                      | PN 16              | 460 (18.11) |                 |             |                 |                  |                  | 80 (176)  | 78 (172)  |
|                                                                                                      | PN 25              | 485 (19.09) |                 |             |                 |                  |                  | 100 (220) | 98 (216)  |
|                                                                                                      | JIS5K              | 430 (16.93) |                 |             |                 |                  |                  | 80 (176)  | 78 (172)  |
|                                                                                                      | JIS10K             | 445 (17.52) |                 |             |                 |                  |                  | 80 (176)  | 78 (172)  |
|                                                                                                      | AS4087 PN 16       | 455 (17.91) |                 |             |                 |                  |                  | 80 (176)  | 78 (172)  |
|                                                                                                      | AS4087 PN 35       | 490 (19.29) |                 |             |                 |                  |                  | 130 (286) | 128 (282) |
|                                                                                                      | ASME B16.5 CL300   | 520 (20.47) |                 |             |                 |                  |                  | 150 (330) | 148 (326) |
|                                                                                                      | ASME B16.5 CL150   | 485 (19.09) |                 |             |                 |                  |                  | 105 (231) | 103 (227) |
|                                                                                                      | PN 40              | 515 (20.28) | 600 (23.62)     |             |                 |                  |                  | 130 (286) | 128 (282) |
| DN 350 (14 in)                                                                                       | PN 10              | 505 (19.88) | 550 (21.65)     | 267 (10.51) | 451 (17.76)     | 465 (18.31)      | 416 (16.38)      | 95 (209)  | 93 (205)  |
|                                                                                                      | PN 16              | 520 (20.47) |                 |             |                 |                  |                  | 110 (242) | 108 (238) |
|                                                                                                      | PN 25              | 555 (21.85) |                 |             |                 |                  |                  | 145 (319) | 143 (315) |
|                                                                                                      | JIS5K              | 480 (18.90) |                 |             |                 |                  |                  | 95 (209)  | 93 (205)  |
|                                                                                                      | JIS10K             | 490 (19.29) |                 |             |                 |                  |                  | 95 (209)  | 93 (205)  |
|                                                                                                      | AS4087 PN 16       | 525 (20.67) |                 |             |                 |                  |                  | 130 (286) | 128 (282) |
|                                                                                                      | AS4087 PN 35       | 550 (21.65) |                 |             |                 |                  |                  | 185 (407) | 183 (403) |
|                                                                                                      | ASME B16.5 CL300   | 585 (23.03) |                 |             |                 |                  |                  | 140 (308) | 138 (304) |
|                                                                                                      | ASME B16.5 CL150   | 535 (21.06) |                 |             |                 |                  |                  | 105 (231) | 103 (227) |
|                                                                                                      | PN 40              | 580 (22.83) | 650 (25.59)     |             |                 |                  |                  | 195 (429) | 193 (425) |
| DN 400 (16 in)                                                                                       | PN 10              | 565 (22.24) | 600 (23.62)     | 267 (10.51) | 493 (19.41)     | 507 (19.96)      | 416 (16.38)      | 103 (227) | 101 (222) |
|                                                                                                      | PN 16              | 580 (22.83) |                 |             |                 |                  |                  | 126 (277) | 124 (273) |
|                                                                                                      | PN 25              | 620 (24.41) |                 |             |                 |                  |                  | 170 (374) | 168 (370) |
|                                                                                                      | JIS5K              | 540 (21.26) |                 |             |                 |                  |                  | 103 (227) | 101 (223) |
|                                                                                                      | JIS10K             | 560 (22.05) |                 |             |                 |                  |                  | 116 (255) | 114 (251) |
|                                                                                                      | AS4087 PN 16       | 580 (22.83) |                 |             |                 |                  |                  | 154 (339) | 152 (335) |
|                                                                                                      | AS4087 PN 35       | 610 (24.02) |                 |             |                 |                  |                  | 302 (664) | 300 (660) |
|                                                                                                      | ASME B16.5 CL300   | 650 (25.59) |                 |             |                 |                  |                  | 265 (583) | 263 (578) |
|                                                                                                      | ASME B16.5 CL150   | 600 (23.62) |                 |             |                 |                  |                  | 175 (385) | 173 (381) |
|                                                                                                      | PN 40              | 660 (25.98) | 650 (25.59)     |             |                 |                  |                  | 258 (568) | 256 (564) |

Tolerance for L: +0 / -5 mm (+0 / -0.197 in)

1) With grounding rings fitted, dimension L increases by 3 mm (0.118 in) per ring for size DN 25 to 2400 (1 in to 96 in)

2) Depending on the device design, the dimensions change according to the following table:

| Device design                       | Dimension F, F1   | Dimension F2      |
|-------------------------------------|-------------------|-------------------|
| Without explosion protection        | 0                 | 0                 |
| Explosion protection Zone 1, Div. 1 | +74 mm (+2.91 in) | +47 mm (+1.85 in) |
| Explosion protection Zone 2, Div. 2 | 0                 | 0                 |

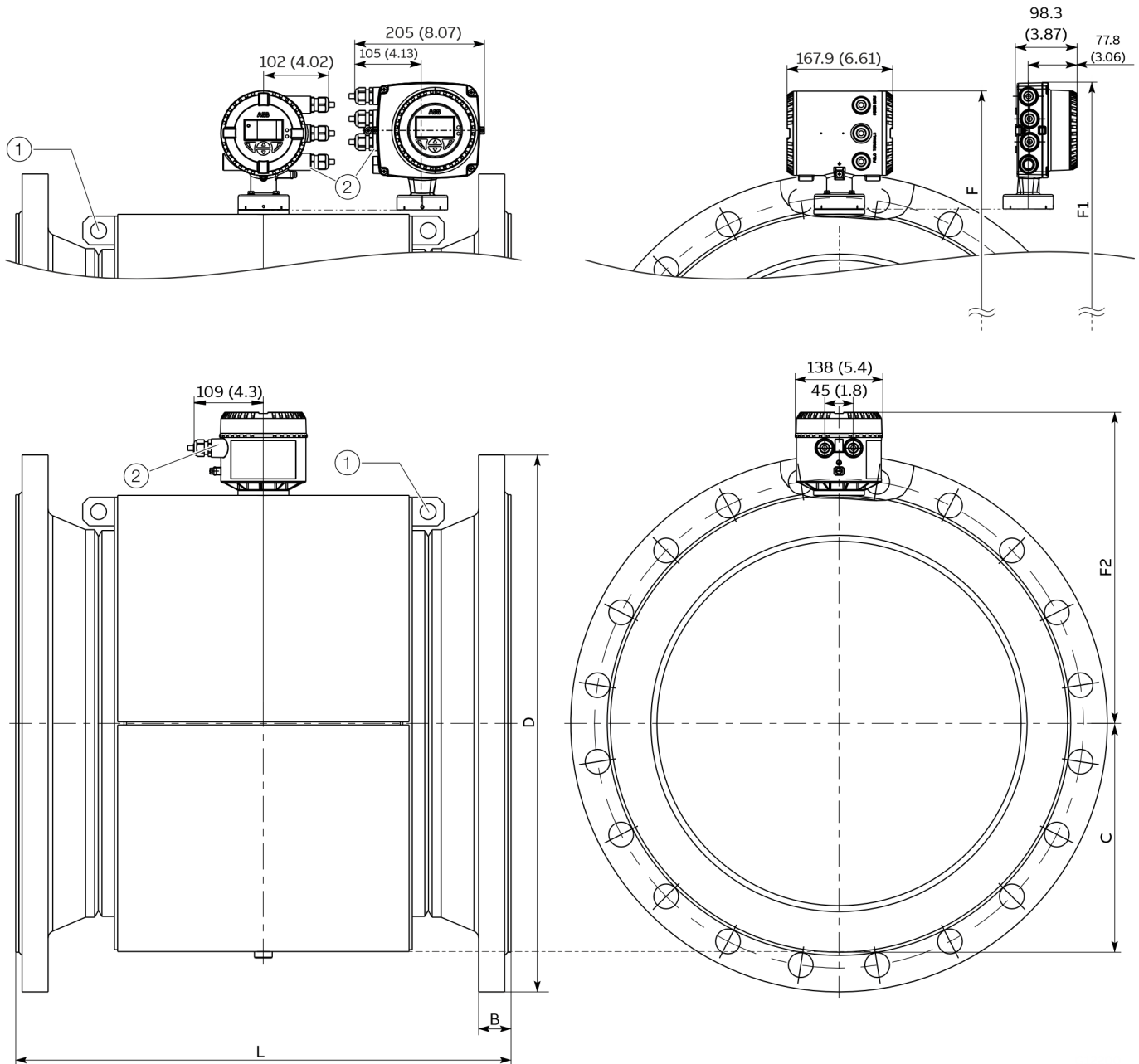
## ... Flowmeter sensor

### ... Dimensions

Flange DN 450 (18 in) to DN 600 (24 in), steel sensor housing

All specified dimensions and weights are in mm (in) or kg (lb). The stated weights are approximate; the maximum weight is always stated.

#### Integral mount design



#### Remote mount design

- ① Transport lugs
- ② Female thread (either ½ in NPT or M20 x 1.5) refer to model coding. With ½ in NPT there will be a plug instead of the PG cable inlet.

Figure 46: Integral mount design (top), remote mount design (bottom)

| Dimensions – Flange device, DN 450 (18 in) to DN 600 (24 in), steel sensor housing |                    |             |                 |             |                 |                  |                  |            |            |
|------------------------------------------------------------------------------------|--------------------|-------------|-----------------|-------------|-----------------|------------------|------------------|------------|------------|
| Nominal diameter                                                                   | Process connection | D           | L <sup>1)</sup> | C           | F <sup>2)</sup> | F1 <sup>2)</sup> | F2 <sup>2)</sup> | Weight     |            |
|                                                                                    |                    |             |                 |             |                 |                  |                  | Integral   | Remote     |
| DN 450 (18 in)                                                                     | PN 10              | 615 (24.21) | 600 (23.62)     | 514 (20.24) | 310 (12.20)     | 439 (17.28)      | 394 (15.51)      | 173 (381)  | 171 (377)  |
|                                                                                    | PN 16              | 640 (25.20) |                 |             |                 |                  |                  | 188 (414)  | 186 (410)  |
|                                                                                    | JIS5K              | 605 (23.82) |                 |             |                 |                  |                  | 165 (364)  | 163 (359)  |
|                                                                                    | JIS10K             | 620 (24.41) |                 |             |                 |                  |                  | 177 (390)  | 175 (386)  |
|                                                                                    | AS4087 PN 16       | 640 (25.20) |                 |             |                 |                  |                  | 232 (511)  | 230 (507)  |
|                                                                                    | AS4087 PN 35       | 675 (26.57) |                 |             |                 |                  |                  | 328 (723)  | 326 (718)  |
|                                                                                    | ASME B16.5 CL300   | 710 (27.95) |                 |             |                 |                  |                  | 368 (811)  | 366 (807)  |
|                                                                                    | ASME B16.5 CL150   | 635 (25.00) |                 |             |                 |                  |                  | 250 (551)  | 248 (547)  |
|                                                                                    | PN 25              | 670 (26.38) |                 |             |                 |                  |                  | 245 (540)  | 243 (536)  |
|                                                                                    | PN 40              | 685 (26.97) |                 |             |                 |                  |                  | 315 (694)  | 313 (690)  |
| DN 500 (20 in)                                                                     | PN 10              | 670 (26.38) | 600 (23.62)     | 514 (20.24) | 310 (12.20)     | 439 (17.28)      | 394 (15.51)      | 190 (418)  | 188 (413)  |
|                                                                                    | PN 16              | 715 (28.15) |                 |             |                 |                  |                  | 240 (528)  | 238 (524)  |
|                                                                                    | JIS5K              | 655 (25.79) |                 |             |                 |                  |                  |            |            |
|                                                                                    | JIS10K             | 675 (26.57) |                 |             |                 |                  |                  | 190 (418)  | 188 (413)  |
|                                                                                    | AS4087 PN 16       | 705 (27.76) |                 |             |                 |                  |                  | 290 (638)  | 288 (634)  |
|                                                                                    | AS4087 PN 35       | 735 (28.94) |                 |             |                 |                  |                  | 435 (957)  | 433 (953)  |
|                                                                                    | ASME B16.5 CL150   | 700 (27.56) |                 |             |                 |                  |                  | 300 (660)  | 298 (656)  |
|                                                                                    | ASME B16.5 CL300   | 775 (30.51) |                 |             |                 |                  |                  | 490 (1080) | 488 (1076) |
|                                                                                    | PN 25              | 730 (28.74) |                 |             |                 |                  |                  | 300 (661)  | 298 (657)  |
|                                                                                    | PN 40              | 755 (29.72) |                 |             |                 |                  |                  | 392 (864)  | 390 (860)  |
| DN 600 (24 in)                                                                     | PN 10              | 780 (30.71) | 800 (31.50)     | 565 (22.24) | 361 (14.21)     | 490 (19.29)      | 445 (17.52)      | 284 (626)  | 282 (622)  |
|                                                                                    | PN 16              | 840 (33.07) |                 |             |                 |                  |                  | 318 (700)  | 316 (695)  |
|                                                                                    | PN 25              | 845 (33.27) |                 |             |                 |                  |                  | 460 (1012) | 458 (1008) |
|                                                                                    | JIS5K              | 770 (30.31) |                 |             |                 |                  |                  | 275 (605)  | 273 (600)  |
|                                                                                    | JIS10K             | 795 (31.30) |                 |             |                 |                  |                  | 306 (673)  | 304 (668)  |
|                                                                                    | AS4087 PN 16       | 825 (32.48) |                 |             |                 |                  |                  | 382 (840)  | 380 (835)  |
|                                                                                    | AS4087 PN 35       | 850 (33.46) |                 |             |                 |                  |                  | 452 (994)  | 450 (990)  |
|                                                                                    | ASME B16.5 CL300   | 915 (36.02) |                 |             |                 |                  |                  | 550 (1210) | 548 (1205) |
|                                                                                    | ASME B16.5 CL150   | 815 (32.09) |                 |             |                 |                  |                  | 425 (935)  | 423 (930)  |
|                                                                                    | PN 40              | 890 (35.04) |                 |             |                 |                  |                  | 600 (1320) | 598 (1316) |

Tolerance for L: +0 / -5 mm (+0 / -0.197 in)

1) With grounding rings fitted, dimension L increases by 3 mm (0.118 in) per ring for size DN 25 to 2400 (1 in to 96 in)

2) Depending on the device design, the dimensions change according to the following table:

| Device design                       | Dimension F, F1   | Dimension F2      |
|-------------------------------------|-------------------|-------------------|
| Without explosion protection        | 0                 | 0                 |
| Explosion protection Zone 1, Div. 1 | +74 mm (+2.91 in) | +47 mm (+1.85 in) |
| Explosion protection Zone 2, Div. 2 | 0                 | 0                 |

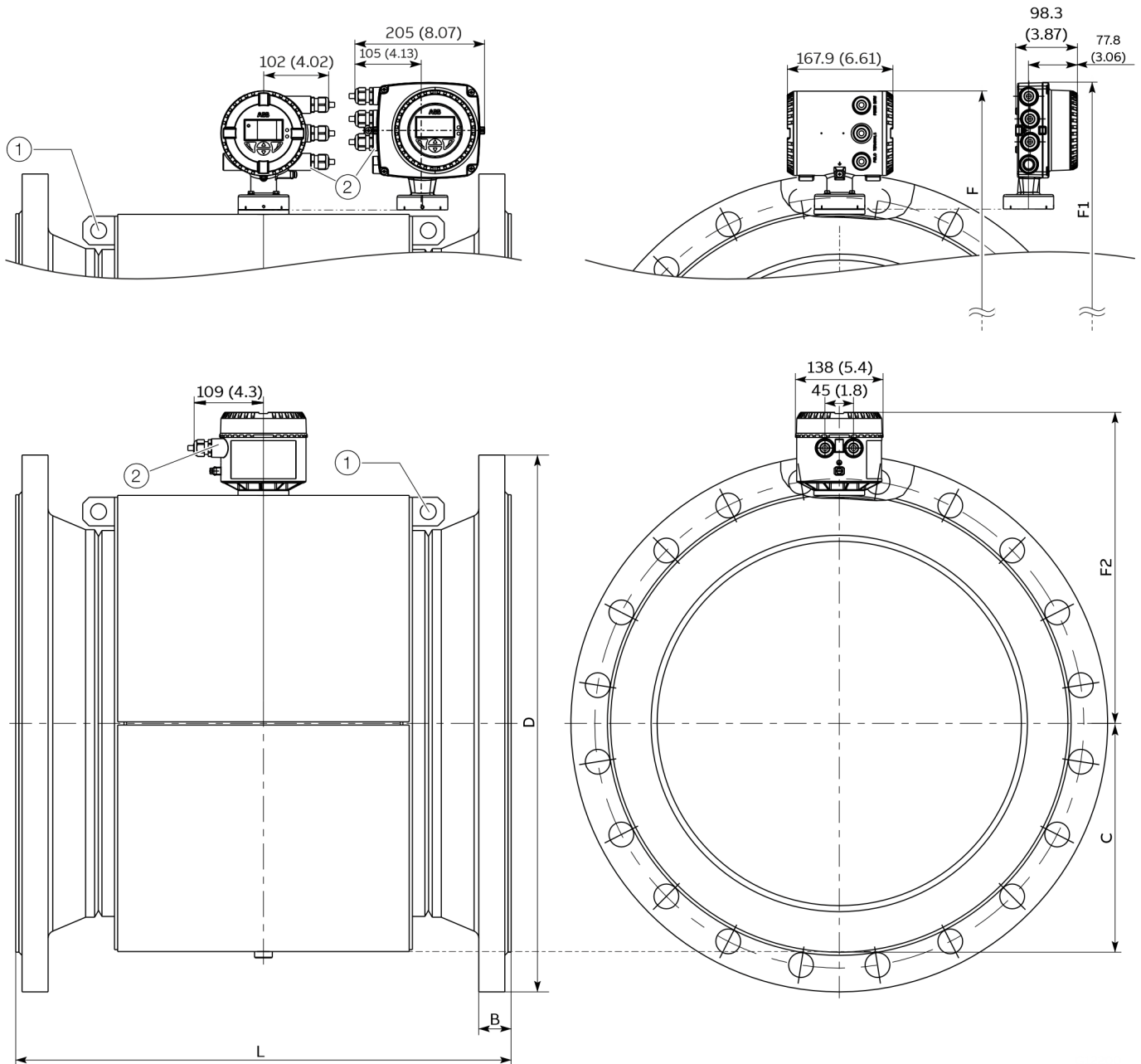
## ... Flowmeter sensor

### ... Dimensions

Flange DN 700 (28 in) to 2400 (96 in), steel sensor housing Design level 'A', Lay Length (1.3 x DN)

All specified dimensions and weights are in mm ( in) or kg (lb). The stated weights are approximate; the maximum weight is always stated.

#### Integral mount design



#### Remote mount design

- ① Transport lugs
- ② Female thread (either ½ in NPT or M20 x 1.5) refer to model coding. With ½ in NPT there will be a plug instead of the PG cable inlet.

Figure 47: Integral mount design (top), remote mount design (bottom)

| Dimensions – Flange device, DN 700 (28 in) to 2400 (96 in) steel sensor housing - Design level 'A' lay length (1.3 x DN) |                     |              |                            |             |                 |                  |                  |            |            |
|--------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|----------------------------|-------------|-----------------|------------------|------------------|------------|------------|
| Nominal<br>diameter                                                                                                      | Process connection  | D            | L (1.3 × DN) <sup>1)</sup> | C           | F <sup>2)</sup> | F1 <sup>2)</sup> | F2 <sup>2)</sup> | Weight     |            |
|                                                                                                                          |                     |              |                            |             |                 |                  |                  | Integral   | Remote     |
| DN 700 (28 in)                                                                                                           | JIS 5K              | 875 (34.45)  | 910 (35.83)                | 405 (15.94) | 596 (23.46)     | 610 (24.02)      | 534 (21.02)      | 261 (575)  | 259 (570)  |
|                                                                                                                          | JIS 10K             | 905 (35.63)  |                            |             |                 |                  |                  | 326 (718)  | 324 (713)  |
|                                                                                                                          | PN 6                | 860 (33.86)  |                            |             |                 |                  |                  | 232 (511)  | 230 (506)  |
|                                                                                                                          | PN 10               | 895 (35.24)  |                            |             |                 |                  |                  | 320 (704)  | 318 (700)  |
|                                                                                                                          | PN 16               | 910 (35.83)  |                            |             |                 |                  |                  | 440 (968)  | 438 (964)  |
|                                                                                                                          | AWWA C207 CLASS B   | 927 (36.50)  |                            |             |                 |                  |                  | 296 (652)  | 294 (647)  |
|                                                                                                                          | AWWA C207 CLASS D   | 927 (36.50)  |                            |             |                 |                  |                  | 327 (720)  | 325 (715)  |
|                                                                                                                          | AS4087 PN 16        | 910 (35.83)  |                            |             |                 |                  |                  | 404 (889)  | 402 (885)  |
|                                                                                                                          | AS2129 TABLE-D      | 910 (35.83)  |                            |             |                 |                  |                  | 308 (678)  | 306 (674)  |
|                                                                                                                          | AS2129 TABLE-E      | 910 (35.83)  |                            |             |                 |                  |                  | 382 (841)  | 380 (836)  |
|                                                                                                                          | PN 25               | 960 (37.80)  |                            |             |                 |                  |                  | 487 (1072) | 485 (1067) |
|                                                                                                                          | PN 40               | 995 (39.17)  |                            |             |                 |                  |                  | 632 (1391) | 630 (1386) |
|                                                                                                                          | AWWA C207 CLASS E   | 927 (36.50)  |                            |             |                 |                  |                  | 519 (1142) | 517 (1138) |
|                                                                                                                          | AWWA C207 CLASS F   | 1035 (40.75) |                            |             |                 |                  |                  | 764 (1681) | 762 (1677) |
|                                                                                                                          | AS4087 PN 35        | 935 (36.80)  |                            |             |                 |                  |                  | 584 (1285) | 582 (1281) |
|                                                                                                                          | ASME CL150 SERIES A | 925 (36.42)  |                            |             |                 |                  |                  | 548 (1206) | 546 (1202) |
|                                                                                                                          | ASME CL150 SERIES B | 835 (32.87)  |                            |             |                 |                  |                  | 368 (810)  | 366 (806)  |
|                                                                                                                          | ASME CL300 SERIES B | 920 (36.22)  |                            |             |                 |                  |                  | 680 (1496) | 678 (1492) |
| DN 750 (30 in)                                                                                                           | JIS 5K              | 945 (37.20)  | 990 (38.98)                | 431 (16.97) | 606 (23.86)     | 620 (24.41)      | 560 (22.05)      | 299 (658)  | 297 (654)  |
|                                                                                                                          | JIS 10K             | 970 (38.19)  |                            |             |                 |                  |                  | 375 (825)  | 373 (821)  |
|                                                                                                                          | AWWA C207 CLASS B   | 984 (38.74)  |                            |             |                 |                  |                  | 324 (713)  | 322 (709)  |
|                                                                                                                          | AWWA C207 CLASS D   | 984 (38.74)  |                            |             |                 |                  |                  | 395 (869)  | 393 (865)  |
|                                                                                                                          | AS4087 PN 16        | 995 (39.17)  |                            |             |                 |                  |                  | 516 (1136) | 514 (1131) |
|                                                                                                                          | AS2129 TABLE-D      | 995 (39.17)  |                            |             |                 |                  |                  | 390 (858)  | 388 (854)  |
|                                                                                                                          | AS2129 TABLE-E      | 995 (39.17)  |                            |             |                 |                  |                  | 503 (1107) | 501 (1103) |
|                                                                                                                          | AWWA C207 CLASS E   | 984 (38.74)  |                            |             |                 |                  |                  | 547 (1204) | 545 (1199) |
|                                                                                                                          | AWWA C207 CLASS F   | 1092 (43.99) |                            |             |                 |                  |                  | 843 (1855) | 841 (1851) |
|                                                                                                                          | AS4087 PN 35        | 1015 (39.96) |                            |             |                 |                  |                  | 713 (1569) | 711 (1565) |
|                                                                                                                          | ASME CL150 SERIES A | 985 (38.78)  |                            |             |                 |                  |                  | 593 (1305) | 591 (1301) |
|                                                                                                                          | ASME CL150 SERIES B | 885 (34.84)  |                            |             |                 |                  |                  | 368 (810)  | 366 (806)  |
|                                                                                                                          | ASME CL300 SERIES B | 990 (38.98)  |                            |             |                 |                  |                  | 797 (1754) | 795 (1749) |

Continued on next page

Tolerance for L: +0 / -5 mm (+0 / -0.197 in)

... Flowmeter sensor

... Dimensions

| Dimensions - Flange device, DN 700 (28 in) to 2400 (96 in) steel sensor housing - Design level 'A' lay length (1.3 x DN) |                     |              |                            |             |                 |                  |                  |             |             |
|--------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|----------------------------|-------------|-----------------|------------------|------------------|-------------|-------------|
| Nominal diameter                                                                                                         | Process connection  | D            | L (1.3 × DN) <sup>1)</sup> | C           | F <sup>2)</sup> | F1 <sup>2)</sup> | F2 <sup>2)</sup> | Weight      |             |
|                                                                                                                          |                     |              |                            |             |                 |                  |                  | Integral    | Remote      |
| DN 800 (32 in)                                                                                                           | JIS 5K              | 995 (39.17)  | 1040 (40.04)               | 455 (17.91) | 646 (25.43)     | 660 (25.98)      | 584 (22.99)      | 332 (731)   | 330 (726)   |
|                                                                                                                          | JIS 10K             | 1020 (40.16) |                            |             |                 |                  |                  | 417 (918)   | 415 (913)   |
|                                                                                                                          | PN 6                | 975 (38.39)  |                            |             |                 |                  |                  | 285 (627)   | 283 (623)   |
|                                                                                                                          | PN 10               | 1015 (39.96) |                            |             |                 |                  |                  | 420 (924)   | 418 (920)   |
|                                                                                                                          | PN 16               | 1025 (40.35) |                            |             |                 |                  |                  | 490 (1078)  | 488 (1074)  |
|                                                                                                                          | AWWA C207 CLASS B   | 1060 (41.73) |                            |             |                 |                  |                  | 384 (845)   | 382 (841)   |
|                                                                                                                          | AWWA C207 CLASS D   | 1060 (41.73) |                            |             |                 |                  |                  | 463 (1019)  | 461 (1015)  |
|                                                                                                                          | AS4087 PN 16        | 1060 (41.73) |                            |             |                 |                  |                  | 583 (1283)  | 581 (1279)  |
|                                                                                                                          | AS2129 TABLE-D      | 1060 (41.73) |                            |             |                 |                  |                  | 440 (968)   | 438 (964)   |
|                                                                                                                          | AS2129 TABLE-E      | 1060 (41.73) |                            |             |                 |                  |                  | 572 (1259)  | 570 (1254)  |
|                                                                                                                          | PN 25               | 1085 (42.72) |                            |             |                 |                  |                  | 643 (1415)  | 641 (1411)  |
|                                                                                                                          | PN 40               | 1140 (44.88) |                            |             |                 |                  |                  | 919 (2022)  | 917 (2018)  |
|                                                                                                                          | AWWA C207 CLASS E   | 1060 (41.73) |                            |             |                 |                  |                  | 689 (1516)  | 687 (1512)  |
|                                                                                                                          | AWWA C207 CLASS F   | 1150 (45.28) |                            |             |                 |                  |                  | 954 (2099)  | 952 (2095)  |
|                                                                                                                          | AS4087 PN 35        | 1060 (41.73) |                            |             |                 |                  |                  | 802 (1765)  | 800 (1760)  |
|                                                                                                                          | ASME CL150 SERIES A | 1060 (41.73) |                            |             |                 |                  |                  | 751 (1653)  | 749 (1648)  |
|                                                                                                                          | ASME CL150 SERIES B | 940 (37.01)  |                            |             |                 |                  |                  | 456 (1004)  | 454 (999)   |
|                                                                                                                          | ASME CL300 SERIES B | 1055 (41.54) |                            |             |                 |                  |                  | 985 (2167)  | 983 (2163)  |
| DN 900 (36 in)                                                                                                           | JIS 5K              | 1095 (43.11) | 1170 (46.06)               | 504 (19.84) | 691 (27.20)     | 705 (27.75)      | 638 (25.12)      | 428 (942)   | 426 (938)   |
|                                                                                                                          | JIS 10K             | 1120 (44.09) |                            |             |                 |                  |                  | 504 (1109)  | 502 (1105)  |
|                                                                                                                          | PN 6                | 1075 (42.32) |                            |             |                 |                  |                  | 354 (779)   | 352 (775)   |
|                                                                                                                          | PN 10               | 1115 (43.90) |                            |             |                 |                  |                  | 505 (1111)  | 503 (1107)  |
|                                                                                                                          | PN 16               | 1125 (44.29) |                            |             |                 |                  |                  | 590 (1298)  | 588 (1294)  |
|                                                                                                                          | AWWA C207 CLASS B   | 1168 (45.98) |                            |             |                 |                  |                  | 480 (1056)  | 478 (1052)  |
|                                                                                                                          | AWWA C207 CLASS D   | 1168 (45.98) |                            |             |                 |                  |                  | 556 (1224)  | 554 (1219)  |
|                                                                                                                          | AWWA C207 CLASS E   | 1168 (45.98) |                            |             |                 |                  |                  | 889 (1956)  | 887 (1952)  |
|                                                                                                                          | AWWA C207 CLASS F   | 1270 (50.00) |                            |             |                 |                  |                  | 1214 (2671) | 1212 (2667) |
|                                                                                                                          | AS4087 PN 16        | 1168 (45.98) |                            |             |                 |                  |                  | 889 (1956)  | 887 (1952)  |
|                                                                                                                          | AS2129 TABLE-D      | 1270 (50.00) |                            |             |                 |                  |                  | 1214 (2671) | 1212 (2667) |
|                                                                                                                          | AS2129 TABLE-E      | 1175 (46.26) |                            |             |                 |                  |                  | 766 (1686)  | 764 (1681)  |
|                                                                                                                          | PN 25               | 1175 (46.26) |                            |             |                 |                  |                  | 574 (1263)  | 572 (1259)  |
|                                                                                                                          | PN 40               | 1175 (46.26) |                            |             |                 |                  |                  | 753 (1657)  | 751 (1653)  |
|                                                                                                                          | AWWA C207 CLASS E   | 1185 (46.65) |                            |             |                 |                  |                  | 843 (1855)  | 841 (1851)  |
|                                                                                                                          | AWWA C207 CLASS F   | 1250 (49.21) |                            |             |                 |                  |                  | 1219 (2682) | 1217 (2678) |
|                                                                                                                          | AS4087 PN 35        | 1185 (46.65) |                            |             |                 |                  |                  | 1103 (2427) | 1101 (2423) |
|                                                                                                                          | ASME CL150 SERIES A | 1170 (46.06) |                            |             |                 |                  |                  | 1022 (2249) | 1020 (2244) |
|                                                                                                                          | ASME CL150 SERIES B | 1055 (41.54) |                            |             |                 |                  |                  | 655 (1441)  | 653 (1437)  |
|                                                                                                                          | ASME CL300 SERIES B | 1170 (46.06) |                            |             |                 |                  |                  | 1206 (2654) | 1204 (2649) |

Continued on next page

Tolerance for L: +0 / -5 mm (+0 / -0.197 in)

| Dimensions - Flange device, DN 700 (28 in) to 2400 (96 in) steel sensor housing - Design level 'A' lay length (1.3 x DN) |                     |               |                            |             |                 |                  |                  |             |             |
|--------------------------------------------------------------------------------------------------------------------------|---------------------|---------------|----------------------------|-------------|-----------------|------------------|------------------|-------------|-------------|
| Nominal diameter                                                                                                         | Process connection  | D             | L (1.3 × DN) <sup>1)</sup> | C           | F <sup>2)</sup> | F1 <sup>2)</sup> | F2 <sup>2)</sup> | Weight      |             |
|                                                                                                                          |                     |               |                            |             |                 |                  |                  | Integral    | Remote      |
| DN 1000 (40 in)                                                                                                          | JIS 5K              | 1195 (47.05)  | 1300 (51.18)               | 555 (21.85) | 746 (29.37)     | 760 (29.92)      | 685 (26.97)      | 512 (1127)  | 510 (1122)  |
|                                                                                                                          | JIS 10K             | 1235 (48.62)  |                            |             |                 |                  |                  | 643 (1415)  | 641 (1411)  |
|                                                                                                                          | PN 6                | 1175 (46.26)  |                            |             |                 |                  |                  | 460 (1012)  | 458 (1008)  |
|                                                                                                                          | PN 10               | 1230 (48.43)  |                            |             |                 |                  |                  | 690 (1518)  | 688 (1514)  |
|                                                                                                                          | PN 16               | 1255 (49.41)  |                            |             |                 |                  |                  | 850 (1870)  | 848 (1866)  |
|                                                                                                                          | AWWA C207 CLASS B   | 1289 (50.75)  |                            |             |                 |                  |                  | 578 (1272)  | 576 (1268)  |
|                                                                                                                          | AWWA C207 CLASS D   | 1289 (50.75)  |                            |             |                 |                  |                  | 735 (1617)  | 733 (1613)  |
|                                                                                                                          | AWWA C207 CLASS E   | 1289 (50.75)  |                            |             |                 |                  |                  | 1104 (2429) | 1102 (2425) |
|                                                                                                                          | AWWA C207 CLASS F   | 1378 (54.25)  |                            |             |                 |                  |                  | 1445 (3179) | 1443 (3175) |
|                                                                                                                          | AS2129 TABLE-E      | 1255 (49.41)  |                            |             |                 |                  |                  | 903 (1987)  | 901 (1983)  |
|                                                                                                                          | PN 25               | 1255 (49.41)  |                            |             |                 |                  |                  | 682 (1501)  | 680 (1496)  |
|                                                                                                                          | PN 40               | 1255 (49.41)  |                            |             |                 |                  |                  | 905 (1991)  | 903 (1987)  |
|                                                                                                                          | AWWA C207 CLASS E   | 1320 (51.97)  |                            |             |                 |                  |                  | 1095 (2409) | 1093 (2405) |
|                                                                                                                          | AWWA C207 CLASS F   | 1360 (53.54)  |                            |             |                 |                  |                  | 1486 (3270) | 1484 (3265) |
|                                                                                                                          | AS4087 PN 35        | 1275 (50.20)  |                            |             |                 |                  |                  | 1316 (2896) | 1314 (2891) |
|                                                                                                                          | ASME CL150 SERIES A | 1290 (50.79)  |                            |             |                 |                  |                  | 1221 (2687) | 1219 (2682) |
|                                                                                                                          | ASME CL300 SERIES A | 1240 (48.82)  |                            |             |                 |                  |                  | 1421 (3127) | 1419 (3122) |
|                                                                                                                          | ASME CL150 SERIES B | 1175 (46.26)  |                            |             |                 |                  |                  | 809 (1780)  | 807 (1776)  |
|                                                                                                                          | ASME CL300 SERIES B | 1275 (50.20)  |                            |             |                 |                  |                  | 1560 (3432) | 1558 (3428) |
| DN 1050 (42 in)                                                                                                          | AWWA C207 CLASS B   | 1346 (52.99)  | 1365 (53.74)               | 607 (23.90) | 771 (30.35)     | 785 (30.91)      | 737 (29.02)      | 668 (1470)  | 666 (1466)  |
|                                                                                                                          | AWWA C207 CLASS D   | 1346 (52.99)  |                            |             |                 |                  |                  | 772 (1699)  | 770 (1694)  |
|                                                                                                                          | AWWA C207 CLASS E   | 1346 (52.99)  |                            |             |                 |                  |                  | 1246 (2742) | 1244 (2737) |
|                                                                                                                          | AWWA C207 CLASS F   | 1448 (57.01)  |                            |             |                 |                  |                  | 1674 (3683) | 1672 (3679) |
|                                                                                                                          | ASME CL150 SERIES B | 1225 (48.23)  |                            |             |                 |                  |                  | 910 (2002)  | 908 (1998)  |
|                                                                                                                          | ASME CL150 SERIES A | 1345 (59.25)  |                            |             |                 |                  |                  | 1389 (3056) | 1387 (3052) |
|                                                                                                                          | ASME CL300 SERIES A | 1290 (50.79)  |                            |             |                 |                  |                  | 1626 (3578) | 1624 (3573) |
|                                                                                                                          | ASME CL300 SERIES B | 1335 (52.56)  |                            |             |                 |                  |                  | 1804 (3969) | 1802 (3965) |
| DN 1100 (44 in)                                                                                                          | JIS 5K              | 1305 (51.38)  | 1430 (56.30)               | 607 (23.90) | 771 (30.35)     | 785 (30.91)      | 737 (29.02)      | 590 (1298)  | 588 (1294)  |
|                                                                                                                          | JIS 10K             | 1345 (52.95)  |                            |             |                 |                  |                  | 770 (1694)  | 768 (1690)  |
|                                                                                                                          | AWWA C207 CLASS B   | 1403 (55.24)  |                            |             |                 |                  |                  | 700 (1540)  | 698 (1536)  |
|                                                                                                                          | AWWA C207 CLASS D   | 1403 (55.24)  |                            |             |                 |                  |                  | 891 (1961)  | 889 (1956)  |
|                                                                                                                          | AWWA C207 CLASS E   | 1403 (55.24)  |                            |             |                 |                  |                  | 1289 (2836) | 1287 (2832) |
|                                                                                                                          | AWWA C207 CLASS F   | 1505 (53.25)  |                            |             |                 |                  |                  | 1806 (3974) | 1804 (3969) |
|                                                                                                                          | PN10                | 2760 (108.66) |                            |             |                 |                  |                  | 728 (1602)  | 726 (1598)  |

Continued on next page

Tolerance for L: +0 / -5 mm (+0 / -0.197 in)

## ... Flowmeter sensor

## ... Dimensions

**Dimensions - Flange device, DN 700 (28 in) to 2400 (96 in) steel sensor housing - Design level 'A' ABB standard lay length (1.3 x DN)**

| Nominal diameter | Process connection  | D             | L (1.3 × DN) <sup>1)</sup> | C           | F <sup>2)</sup> | F1 <sup>2)</sup> | F2 <sup>2)</sup> | Weight       |             |
|------------------|---------------------|---------------|----------------------------|-------------|-----------------|------------------|------------------|--------------|-------------|
|                  |                     |               |                            |             |                 |                  |                  | Integral     | Remote      |
| DN 1200 (48 in)  | JIS 5K              | 1420 (55.91)  | 1560 (61.42)               | 660 (25.98) | 856 (33.7)      | 870 (34.25)      | 791 (31.14)      | 745 (1639)   | 743 (1635)  |
|                  | JIS 10k             | 1465. (57.68) |                            |             |                 |                  |                  | 1061 (2335)  | 1059 (2330) |
|                  | PN6                 | 1405 (55.31)  |                            |             |                 |                  |                  | 700 (1540)   | 698 (1536)  |
|                  | PN10                | 1455 (57.28)  |                            |             |                 |                  |                  | 930 (2046)   | 928 (2042)  |
|                  | PN16                | 1485 (58.46)  |                            |             |                 |                  |                  | 1120 (2464)  | 1118 (2460) |
|                  | AWWA C207 CLASS B   | 1511 (59.49)  |                            |             |                 |                  |                  | 872 (1919)   | 870 (1914)  |
|                  | AWWA C207 CLASS D   | 1511 (59.49)  |                            |             |                 |                  |                  | 1099 (2418)  | 1097 (2414) |
|                  | AWWA C207 CLASS E   | 1511 (59.49)  |                            |             |                 |                  |                  | 1557 (3426)  | 1555 (3421) |
|                  | AWWA C207 CLASS F   | 1651 (65.00)  |                            |             |                 |                  |                  | 2503 (5507)  | 2501 (5503) |
|                  | AS4087 PN16         | 1490 (58.66)  |                            |             |                 |                  |                  | 1348 (2966)  | 1346 (2962) |
|                  | AS2129 TABLE-D      | 1490 (58.66)  |                            |             |                 |                  |                  | 1118 (2460)  | 1116 (2456) |
|                  | AS2129 TABLE-E      | 1490 (58.66)  |                            |             |                 |                  |                  | 1367 (3008)  | 1365 (3003) |
|                  | PN25                | 1530 (60.24)  |                            |             |                 |                  |                  | 1654 (3639)  | 1652 (3635) |
|                  | PN40                | 1575 (62.01)  |                            |             |                 |                  |                  | 2229 (4904)2 | 2227 (4900) |
|                  | AS4087 PN35         | 1530 (60.24)  |                            |             |                 |                  |                  | 2211 (4865)  | 2209 (4860) |
|                  | ASME CL150 SERIES A | 1510 (59.45)  |                            |             |                 |                  |                  | 1802 (3965)  | 1800 (3960) |
|                  | ASME CL300 SERIES A | 1465 (57.68)  |                            |             |                 |                  |                  | 2257 (4966)  | 2255 (4961) |
|                  | ASME CL150 SERIES B | 1390 (54.72)  |                            |             |                 |                  |                  | 1178 (2592)  | 1176 (2588) |
|                  | ASME CL300 SERIES B | 1390 (54.72)  |                            |             |                 |                  |                  | 1178 (2592)  | 1176 (2588) |
| DN 1350 (54 in)  | AWWA C207 CLASS B   | 1683 (66.26)  | 1755 (69.09)               | 754 (29.69) | 941 (37.05)     | 955 (37.59)      | 888 (34.96)      | 1119 (2462)  | 1117 (2458) |
|                  | AWW A C207 CLASS D  | 1683 (66.26)  |                            |             |                 |                  |                  | 1350 (2970)  | 1348 (2966) |
|                  | AWWA C207 CLASS E   | 1683 (66.26)  |                            |             |                 |                  |                  | 2079 (4574)  | 2077 (4570) |
| DN 1400 (56 in)  | PN 6                | 1630 (64.17)  | 1820 (71.65)               | 755 (29.72) | 950 (37.4)      | 964 (37.95)      | 885 (34.84)      | 819 (1802)   | 817 (1798)  |
|                  | PN 10               | 1675 (65.94)  |                            |             |                 |                  |                  | 1210 (2662)  | 1208 (2658) |
|                  | PN 16               | 1685 (66.34)  |                            |             |                 |                  |                  | 1760 (3872)  | 1758 (3868) |
|                  | PN 25               | 1755 (69.09)  |                            |             |                 |                  |                  | 2483 (5463)  | 2481 (5459) |
|                  | PN 40               | 1795 (70.67)  |                            |             |                 |                  |                  | 3202 (7045)  | 3200 (7040) |
|                  | ASME CL150 SERIES A | 1745 (68.70)  |                            |             |                 |                  |                  | 2672 (5879)  | 2670 (5874) |
|                  | ASME CL150 SERIES B | 1600 (62.99)  |                            |             |                 |                  |                  | 1706 (3754)  | 1704 (3749) |
|                  | ASME CL300 SERIES A | 1710 (67.32)  |                            |             |                 |                  |                  | 3490 (7678)  | 3488 (7674) |
|                  | ASME CL300 SERIES B | 1765 (69.49)  |                            |             |                 |                  |                  | 3873 (8521)  | 3871 (8517) |
| DN 1500 (60 in)  | 1730 (68.11)        | 1950 (76.77)  | 1950 (76.77)               | 864 (34.02) | 1051 (41.37)    | 1065 (41.92)     | 998 (39.29)      | 1253 (2757)  | 1251 (2753) |
|                  | JIS 10K             | 1795 (70.67)  |                            |             |                 |                  |                  | 1728 (3802)  | 1726 (3798) |
|                  | ASME CL150 SERIES B | 1725 (67.91)  |                            |             |                 |                  |                  | 2255 (4961)  | 2253 (4957) |
|                  | AWWA C207 CLASS B   | 1854 (72.99)  |                            |             |                 |                  |                  | 1460 (3212)  | 1458 (3208) |
|                  | AWWA C207 CLASS D   | 1854 (72.99)  |                            |             |                 |                  |                  | 1746 (3842)  | 1744 (3837) |
|                  | AWWA C207 CLASS E   | 1854 (72.99)  |                            |             |                 |                  |                  | 2775 (6105)  | 2773 (6101) |
|                  | ASME CL150 SERIES A | 1855 (73.03)  |                            |             |                 |                  |                  | 3310 (7282)  | 3308 (7278) |
|                  | ASME CL300 SERIES A | 1810 (71.26)  |                            |             |                 |                  |                  | 4075 (8965)  | 4073 (8961) |
|                  | ASME CL300 SERIES B | 1880 (74.02)  |                            |             |                 |                  |                  | 4384 (9645)  | 4382 (9641) |

Continued on next page

Tolerance for L: +0 / -5 mm (+0 / -0.197 in)

| Dimensions - Flange device, DN 700 (28 in) to 2400 (96 in) steel sensor housing - Design level 'A' ABB standard lay length (1.3 x DN) |                    |               |                            |              |                 |                  |                  |              |              |
|---------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|----------------------------|--------------|-----------------|------------------|------------------|--------------|--------------|
| Nominal diameter                                                                                                                      | Process connection | D             | L (1.3 x DN) <sup>1)</sup> | C            | F <sup>2)</sup> | F1 <sup>2)</sup> | F2 <sup>2)</sup> | Weight       |              |
|                                                                                                                                       |                    |               |                            |              |                 |                  |                  | Integral     | Remote       |
| DN 1600 (64 in)                                                                                                                       | PN 6               | 1830 (72.05)  | 2080 (81.89)               | 865 (34.06)  | 1052 (41.42)    | 1066 (41.96)     | 999 (39.33)      | 1180 (2596)  | 1178 (2592)  |
|                                                                                                                                       | PN 10              | 1915 (75.39)  |                            |              |                 |                  |                  | 1630 (3586)  | 1628 (3582)  |
|                                                                                                                                       | PN 25              | 1975 (77.76)  |                            |              |                 |                  |                  | 2150 (4730)  | 2148 (4726)  |
|                                                                                                                                       | PN 16              | 1930 (75.98)  |                            |              |                 |                  |                  | 3373 (7421)  | 3371 (7417)  |
|                                                                                                                                       | PN 40              | 2025 (79.72)  |                            |              |                 |                  |                  | 4548 (10006) | 4546 (10002) |
| DN 1650 (66 in)                                                                                                                       | AWWA C207 CLASS B  | 2032 (80.00)  | 2145 (84.45)               | 915 (36.02)  | 1102 (43.38)    | 1116 (43.94)     | 1049 (41.29)     | 1704 (3749)  | 1702 (3745)  |
|                                                                                                                                       | AWWA C207 CLASS D  | 2032 (80.00)  |                            |              |                 |                  |                  | 2225 (4895)  | 2223 (4891)  |
| DN 1800 (72 in)                                                                                                                       | PN 6               | 2045 (80.51)  | 2340 (92.13)               | 980 (38.58)  | 1176 (46.3)     | 1190 (46.85)     | 1111 (43.74)     | 1490 (3278)  | 1488 (3274)  |
|                                                                                                                                       | PN 10              | 2115 (83.27)  |                            |              |                 |                  |                  | 2230 (4906)  | 2228 (4902)  |
|                                                                                                                                       | PN 16              | 2130 (83.86)  |                            |              |                 |                  |                  | 2900 (6380)  | 2898 (6376)  |
|                                                                                                                                       | PN 25              | 2195 (86.42)  |                            |              |                 |                  |                  | 4649 (10228) | 4647 (10224) |
|                                                                                                                                       | AWWA C207 CLASS B  | 2197 (86.50)  |                            |              |                 |                  |                  | 2009 (4420)  | 2007 (4416)  |
|                                                                                                                                       | AWWA C207 CLASS D  | 2197 (86.50)  |                            |              |                 |                  |                  | 2622 (5769)  | 2620 (5764)  |
| DN 1950 (78 in)                                                                                                                       | AWWA C207 CLASS B  | 2362 (92.99)  | 2535 (99.80)               | 1090 (42.91) | 1277 (50.27)    | 1291 (50.81)     | 1224 (48.18)     | 2615 (5753)  | 2613 (5749)  |
|                                                                                                                                       | AWWA C207 CLASS D  | 2362 (92.99)  |                            |              |                 |                  |                  | 3343 (7355)  | 3341 (7351)  |
| DN 2000 (80 in)                                                                                                                       | PN 6               | 2265 (89.17)  | 2600 (102.36)              | 1090 (42.91) | 1277 (50.27)    | 1291 (50.81)     | 1224 (48.18)     | 1850 (4070)  | 1848 (4066)  |
|                                                                                                                                       | PN 10              | 2325 (91.54)  |                            |              |                 |                  |                  | 2750 (6050)  | 2748 (6046)  |
|                                                                                                                                       | PN 16              | 2345 (92.32)  |                            |              |                 |                  |                  | 3500 (7700)  | 3498 (7696)  |
|                                                                                                                                       | PN 25              | 2425 (95.47)  |                            |              |                 |                  |                  | 6176 (13588) | 6174 (13583) |
| DN 2100 (84 in)                                                                                                                       | AWWA C207 CLASS B  | 2534 (99.76)  | 2730 (107.48)              | 1194 (47.01) | 1381 (54.37)    | 1395 (54.91)     | 1328 (52.28)     | 3037 (6682)  | 3035 (6677)  |
|                                                                                                                                       | AWWA C207 CLASS D  | 2534 (99.76)  |                            |              |                 |                  |                  | 3883 (8543)  | 3881 (8539)  |
| DN 2200 (88 in)                                                                                                                       | PN6                | 2475 (97.44)  | 2860 (112.60)              | 1194 (47.01) | 1381 (54.37)    | 1395 (54.91)     | 1328 (52.28)     | 2655 (5841)  | 2653 (5837)  |
|                                                                                                                                       | PN10               | 2550 (100.39) |                            |              |                 |                  |                  | 3763 (8279)  | 3761 (8275)  |
| DN 2400 (96 in)                                                                                                                       | PN6                | 2685 (105.71) | 3120 (122.83)              | 1294 (50.94) | 1481 (58.31)    | 1495 (58.85)     | 1428 (56.22)     | 3094 (6807)  | 3092 (6803)  |
|                                                                                                                                       | PN10               | 2760 (108.66) |                            |              |                 |                  |                  | 4531 (9969)  | 4529 (9964)  |

Tolerance for L: +0 / -5 mm (+0 / -0.197 in)

1) With grounding rings fitted, dimension L increases by 3 mm (0.118 in) per ring for size DN 25 to 2400 (1 in to 96 in)

2) Depending on the device design, the dimensions change according to the following table:

| Device design                       | Dimension F, F1   | Dimension F2      |
|-------------------------------------|-------------------|-------------------|
| Without explosion protection        | 0                 | 0                 |
| Explosion protection Zone 1, Div. 1 | +74 mm (+2.91 in) | +47 mm (+1.85 in) |
| Explosion protection Zone 2, Div. 2 | 0                 | 0                 |

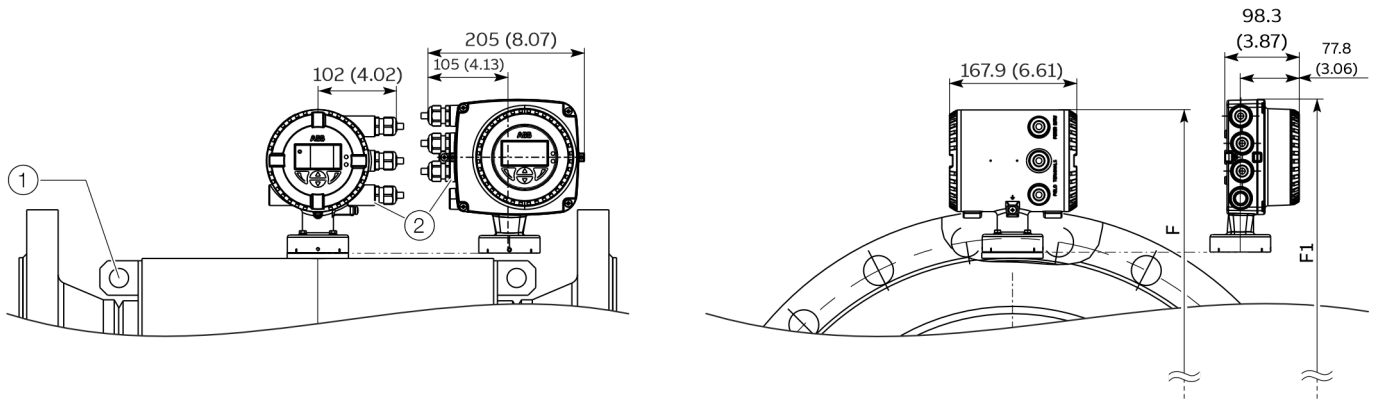
## ... Flowmeter sensor

### ... Dimensions

Flange DN 700 (28 in) to DN 1650 (66 in), steel sensor housing Design level 'A', Lay Length (1.0 x DN)

All specified dimensions and weights are in mm (in) or kg (lb). The stated weights are approximate; the maximum weight is always stated.

#### Integral mount design



#### Remote mount design

- ① Transport lugs
- ② Female thread (either ½ in NPT or M20 x 1.5) refer to model coding. With ½ in NPT there will be a plug instead of the PG cable inlet.

Figure 48: Integral mount design (top), remote mount design (bottom)

| Dimensions - Flange device DN 700 (28 in) to DN 1650 (66 in), steel sensor housing - Design level 'A' lay length (1.0 x DN) |                    |              |                          |             |                 |                  |                  |               |               |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|--------------------------|-------------|-----------------|------------------|------------------|---------------|---------------|
| Nominal diameter                                                                                                            | Process connection | D            | L (1.0×DN) <sup>1)</sup> | C           | F <sup>2)</sup> | F1 <sup>2)</sup> | F2 <sup>2)</sup> | Weight        |               |
|                                                                                                                             |                    |              |                          |             |                 |                  |                  | Integral      | Remote        |
| DN 700 (28 in)                                                                                                              | JIS 5K             | 875 (34.45)  | 700 (27.56)              | 405 (15.94) | 596 (23.46)     | 610 (24.02)      | 534 (21.02)      | 213 (469.6)   | 211 (465.2)   |
|                                                                                                                             | JIS 10K            | 905 (35.63)  |                          |             |                 |                  |                  | 251 (553.4)   | 249 (548.9)   |
|                                                                                                                             | PN 6               | 860 (33.86)  |                          |             |                 |                  |                  | 187 (412.3)   | 185 (407.9)   |
|                                                                                                                             | PN 10              | 895 (35.24)  |                          |             |                 |                  |                  | 234 (516)     | 233 (513.7)   |
|                                                                                                                             | PN 16              | 910 (35.85)  |                          |             |                 |                  |                  | 270 (595.3)   | 268 (590.8)   |
|                                                                                                                             | AWWA C207 CLASS B  | 927 (36.50)  |                          |             |                 |                  |                  | 247 (544.6)   | 245 (540.1)   |
|                                                                                                                             | AWWA C207 CLASS D  | 927 (36.50)  |                          |             |                 |                  |                  | 270 (595.3)   | 268 (590.8)   |
|                                                                                                                             | AS4087 PN 16       | 910 (35.85)  |                          |             |                 |                  |                  | 356 (784.9)   | 354 (780.4)   |
|                                                                                                                             | AS2129 TABLE-E     | 910 (35.85)  |                          |             |                 |                  |                  | 274 (604.1)   | 272 (599.7)   |
| DN 750 (30 in)                                                                                                              | JIS 5K             | 945 (37.20)  | 762 (30.0)               | 431 (16.97) | 606 (23.86)     | 620 (24.41)      | 560 (22.05)      | 245 (540.2)   | 243 (535.7)   |
|                                                                                                                             | JIS 10k            | 970 (38.19)  |                          |             |                 |                  |                  | 317 (698.9)   | 315 (694.4)   |
|                                                                                                                             | AWWA C207CLASS B   | 984 (38.74)  |                          |             |                 |                  |                  | 268 (590.9)   | 266 (586.4)   |
|                                                                                                                             | AWWA C207 CLASS D  | 984 (38.74)  |                          |             |                 |                  |                  | 322 (709.9)   | 320 (705.5)   |
|                                                                                                                             | AS4087 PN 16       | 995 (39.17)  |                          |             |                 |                  |                  | 410 (903.9)   | 408 (899.5)   |
|                                                                                                                             | AS2129 TABLE-E     | 995 (39.17)  |                          |             |                 |                  |                  | 350 (771.6)   | 348 (767.2)   |
| DN 800 (32 in)                                                                                                              | JIS 5K             | 995 (39.17)  | 800 (31.49)              | 455 (17.91) | 646 (25.43)     | 660 (25.98)      | 584 (22.99)      | 280 (617.3)   | 278 (612.9)   |
|                                                                                                                             | JIS 10k            | 1020 (40.16) |                          |             |                 |                  |                  | 328 (723.1)   | 326 (718.7)   |
|                                                                                                                             | PN 6               | 975 (38.39)  |                          |             |                 |                  |                  | 239 (526.9)   | 237 (522.5)   |
|                                                                                                                             | PN 10              | 1015 (39.96) |                          |             |                 |                  |                  | 312 (687.9)   | 310 (683.4)   |
|                                                                                                                             | AWWA C207CLASS B   | 1060 (41.73) |                          |             |                 |                  |                  | 334 (736.4)   | 332 (731.9)   |
|                                                                                                                             | AWWA C207 CLASS D  | 1060 (41.73) |                          |             |                 |                  |                  | 394 (868.7)   | 392 (864.2)   |
|                                                                                                                             | AS4087 PN 16       | 1060 (41.73) |                          |             |                 |                  |                  | 482 (1062.7)  | 480 (1058.2)  |
|                                                                                                                             | AS2129 TABLE-E     | 1060 (41.73) |                          |             |                 |                  |                  | 410 (903.9)   | 408 (899.5)   |
| DN 900 (36 in)                                                                                                              | JIS 5K             | 1095 (43.11) | 900 (35.43)              | 505 (19.88) | 696 (27.40)     | 710 (27.95)      | 635 (25.0)       | 347 (765)     | 345 (760.6)   |
|                                                                                                                             | JIS 10k            | 1120 (44.09) |                          |             |                 |                  |                  | 419 (923.8)   | 417 (919.3)   |
|                                                                                                                             | PN 6               | 1075 (42.32) |                          |             |                 |                  |                  | 300 (661.4)   | 298 (657.0)   |
|                                                                                                                             | PN 10              | 1115 (43.90) |                          |             |                 |                  |                  | 396 (873.1)   | 394 (868.6)   |
|                                                                                                                             | PN 16              | 1125 (44.29) |                          |             |                 |                  |                  | 485 (1069.3)  | 483 (1064.8)  |
|                                                                                                                             | AWWA C207 CLASS B  | 1168 (45.98) |                          |             |                 |                  |                  | 397 (875.3)   | 395 (870.8)   |
|                                                                                                                             | AWWA C207 CLASS D  | 1168 (45.98) |                          |             |                 |                  |                  | 436 (961.2)   | 434 (956.8)   |
|                                                                                                                             | AWWA C207 CLASS E  | 1168 (45.98) |                          |             |                 |                  |                  | 744 (1640.3)  | 742 (1635.8)  |
|                                                                                                                             | AWWA C207 CLASS F  | 1270 (50.00) |                          |             |                 |                  |                  | 1064 (2345.8) | 1062 (2341.3) |
|                                                                                                                             | AS4087 PN 16       | 1175 (46.26) |                          |             |                 |                  |                  | 686 (1512.4)  | 684 (1507.9)  |
|                                                                                                                             | AS2129 TABLE-E     | 1175 (46.26) |                          |             |                 |                  |                  | 580 (1278.7)  | 578 (1274.3)  |
| DN 1000 (40 in)                                                                                                             | JIS 5K             | 1195 (47.05) | 1000 (39.37)             | 555 (21.85) | 746 (29.37)     | 760 (29.92)      | 685 (26.97)      | 407 (897.3)   | 405 (892.9)   |
|                                                                                                                             | JIS 10k            | 1235 (48.62) |                          |             |                 |                  |                  | 505 (1113.4)  | 503 (1108.9)  |
|                                                                                                                             | PN 6               | 1175 (46.26) |                          |             |                 |                  |                  | 348 (767.2)   | 346 (762.8)   |
|                                                                                                                             | PN 10              | 1230 (48.43) |                          |             |                 |                  |                  | 469 (1034)    | 467(1029.5)   |
|                                                                                                                             | PN 16              | 1255 (49.91) |                          |             |                 |                  |                  | 613 (1351.5)  | 611 (1347.0)  |
|                                                                                                                             | AWWA C207 CLASS B  | 1289 (50.75) |                          |             |                 |                  |                  | 474 (1045)    | 472 (1040.6)  |
|                                                                                                                             | AWWA C207 CLASS D  | 1289 (50.75) |                          |             |                 |                  |                  | 618 (1362.5)  | 616 (1358.0)  |
|                                                                                                                             | AWWA C207 CLASS E  | 1289 (50.75) |                          |             |                 |                  |                  | 922 (2032.7)  | 920 (2028.2)  |
|                                                                                                                             | AWWA C207 CLASS F  | 1378 (54.25) |                          |             |                 |                  |                  | 1300 (2866.1) | 1298 (2861.6) |
|                                                                                                                             | AS4087 PN 16       | 1255 (49.41) |                          |             |                 |                  |                  | 740 (1631.5)  | 738 (1627.0)  |
|                                                                                                                             | AS2129 TABLE-E     | 1255 (49.41) |                          |             |                 |                  |                  | 652 (1437.5)  | 650 (1433.0)  |

Tolerance for L: +0 / -5 mm (+0 / -0.197 in)

...

Flowmeter sensor

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Dimensions

| Dimensions - Flange device, DN 700 (28 in) to DN 1650 (66 in) steel sensor housing - Design level 'A' lay length (1.0 x DN) |                    |              |                          |             |                 |                  |                  |               |               |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|--------------------------|-------------|-----------------|------------------|------------------|---------------|---------------|
| Nominal diameter                                                                                                            | Process connection | D            | L (1.0×DN) <sup>1)</sup> | C           | F <sup>2)</sup> | F1 <sup>2)</sup> | F2 <sup>2)</sup> | Weight        |               |
|                                                                                                                             |                    |              |                          |             |                 |                  |                  | Integral      | Remote        |
| DN 1050 (42 in)                                                                                                             | AWWA C207 CLASS B  | 1346 (52.99) | 1067 (42.01)             | 607 (23.90) | 771 (30.35)     | 785 (30.91)      | 737 (29.02)      | 559 (1232.4)  | 557 (1228.0)  |
|                                                                                                                             | AWWA C207 CLASS D  | 1346 (52.99) |                          |             |                 |                  |                  | 614 (1353.7)  | 612 (1349.2)  |
|                                                                                                                             | AWWA C207 CLASS E  | 1346 (52.99) |                          |             |                 |                  |                  | 1102 (2429.6) | 1100 (2425.1) |
|                                                                                                                             | AWWA C207 CLASS F  | 1448 (57.01) |                          |             |                 |                  |                  | 1522 (3355.6) | 1520 (3351.0) |
| DN 1100 (44 in)                                                                                                             | JIS 5K             | 1305 (51.38) | 1118 (44.02)             | 607 (23.90) | 771 (30.35)     | 785 (30.91)      | 737 (29.02)      | 478 (1053.8)  | 476 (1049.4)  |
|                                                                                                                             | JIS 10k            | 1345 (52.95) |                          |             |                 |                  |                  | 679 (1497)    | 677 (1492.5)  |
|                                                                                                                             | AWWA C207 CLASS B  | 1403 (55.24) |                          |             |                 |                  |                  | 605 (1333.8)  | 603 (1329.4)  |
|                                                                                                                             | AWWA C207 CLASS D  | 1403 (55.24) |                          |             |                 |                  |                  | 695 (1532.3)  | 693 (1527.8)  |
|                                                                                                                             | AWWA C207 CLASS E  | 1404 (55.26) |                          |             |                 |                  |                  | 1132 (2495.7) | 1130 (2491.2) |
| DN 1200 (48 in)                                                                                                             | JIS 5K             | 1420 (55.91) | 1200 (47.24)             | 660 (25.98) | 856 (33.7)      | 870 (34.25)      | 791 (31.14)      | 653 (1439.7)  | 651 (1435.2)  |
|                                                                                                                             | JIS 10k            | 1465 (57.68) |                          |             |                 |                  |                  | 819 (1805.6)  | 817 (1801.2)  |
|                                                                                                                             | PN 6               | 1405 (55.31) |                          |             |                 |                  |                  | 538 (1186.1)  | 536 (1181.7)  |
|                                                                                                                             | PN 10              | 1455 (57.28) |                          |             |                 |                  |                  | 753 (1660.1)  | 751 (1655.7)  |
|                                                                                                                             | PN 16              | 1485 (58.46) |                          |             |                 |                  |                  | 981 (2162.8)  | 979 (2158.3)  |
|                                                                                                                             | AWWA C207 CLASSB   | 1511 (59.49) |                          |             |                 |                  |                  | 746 (1644.7)  | 744 (1640.2)  |
|                                                                                                                             | AWWA C207CLASSD    | 1511 (59.49) |                          |             |                 |                  |                  | 886 (1953.4)  | 884 (1948.9)  |
|                                                                                                                             | AWWA C207 CLASSE   | 1511 (59.49) |                          |             |                 |                  |                  | 1389 (3062.3) | 1387 (3057.8) |
|                                                                                                                             | AWWA C207 CLASSF   | 1651 (65.00) |                          |             |                 |                  |                  | 2300 (5070.8) | 2298 (5066.2) |
|                                                                                                                             | AS4087 PN 16       | 1490 (58.66) |                          |             |                 |                  |                  | 1207 (2661.1) | 1205 (2656.5) |
|                                                                                                                             | AS2129 TABLE-E     | 1490 (58.66) |                          |             |                 |                  |                  | 1085 (2392.1) | 1083 (2387.6) |
| DN 1350 (54 in)                                                                                                             | AWWA C207 CLASS B  | 1683 (66.26) | 1350 (53.15)             | —           | —               | —                | —                | 942 (2076.8)  | 940 (2072.3)  |
|                                                                                                                             | AWWAC207 CLASS D   | 1684 (66.26) |                          |             |                 |                  |                  | 1026 (2262)   | 1024 (2257.5) |
|                                                                                                                             | AWWA C207 CLASS E  | 1685 (66.26) |                          |             |                 |                  |                  | 1834 (4043.4) | 1832 (4038.8) |
| DN 1400 (56 in)                                                                                                             | PN 6               | 1630 (64.17) | 1400 (55.11)             | 755 (29.72) | 950 (37.4)      | 964 (37.95)      | 885 (34.84)      | 774 (1706.4)  | 772 (1702.0)  |
|                                                                                                                             | PN 10              | 1675 (65.94) |                          |             |                 |                  |                  | 1080 (2381.1) | 1078 (2376.6) |
|                                                                                                                             | PN 16              | 1685 (66.34) |                          |             |                 |                  |                  | 1293 (2850.7) | 1291 (2846.1) |
| DN 1500 (60 in)                                                                                                             | JIS 5K             | 1730 (68.11) | 1524 (60.00)             | 807 (31.77) | 996 (39.21)     | 1010 (39.76)     | 937 (36.89)      | 1253 (2757)   | 1251 (2753)   |
|                                                                                                                             | JIS 10k            | 1795 (70.67) |                          |             |                 |                  |                  | 1728 (3802)   | 1726 (3798)   |
|                                                                                                                             | AWWA C207 CLASSB   | 1854 (72.99) |                          |             |                 |                  |                  | 2255 (4961)   | 2253 (4957)   |
|                                                                                                                             | AWWA C207 CLASSD   | 1854 (72.99) |                          |             |                 |                  |                  | 1460 (3212)   | 1458 (3208)   |
|                                                                                                                             | AWWA C207 CLASSE   | 1854 (72.99) |                          |             |                 |                  |                  | 1746 (3842)   | 1744 (3837)   |
| DN 1600 (64 in)                                                                                                             | PN6                | 1830 (72.05) | 1600 (62.99)             | 865 (34.06) | 1060 (41.73)    | 1074 (42.28)     | 996 (39.21)      | 2775 (6105)   | 2773 (6101)   |
|                                                                                                                             | PN10               | 1915 (75.39) |                          |             |                 |                  |                  | 3310 (7282)   | 3308 (7278)   |
| DN 1650 (66 in)                                                                                                             | AWWA C207 CLASSB   | 2032 (80.00) | 1650 (64.96)             | 915 (36.02) | —               | 1116 (43.94)     | 1006 (39.60)     | 4075 (8965)   | 4073 (8961)   |
|                                                                                                                             | AWWA C207 CLASSD   | 2033 (80.00) |                          |             |                 |                  |                  | 4384 (9645)   | 4382 (9641)   |

Tolerance for L: +0 / -5 mm (+0 / -0.197 in)

- 1) With grounding rings fitted, dimension L increases by 3 mm (0.118 in) per ring for size DN 25 to 2400 (1 in to 96 in)
- 2) Depending on the device design, the dimensions change according to the following table:

| Device design                       | Dimension F, F1   | Dimension F2      |
|-------------------------------------|-------------------|-------------------|
| Without explosion protection        | 0                 | 0                 |
| Explosion protection Zone 1, Div. 1 | +74 mm (+2.91 in) | +47 mm (+1.85 in) |
| Explosion protection Zone 2, Div. 2 | 0                 | 0                 |

## Transmitter

### Features

- 4 to 20 mA current output
- Current output in the event of an alarm can be configured to 21 to 22.6 mA (NAMUR NE43)
- Measuring range: Can be configured between 0.02 to  $2 \times Q_{\max}$  DN
- Operating mode for flow measurement can be configured
- Programmable digital output. Can be configured as frequency output, pulse output or binary output.
- Two slots for optional plug-in cards
- Damping: 0.04 to 100 s configurable (1  $\tau$ )
- Low flow cut-off: 0 to 20 % for current and pulse output
- Empty pipe detection\*
- Simulation of current and binary output (manual process execution)

\* Requirements for Empty Pipe detector function:

- The conductivity of the fluid must be  $\geq 20 \mu\text{S}/\text{cm}$
- Nominal diameter must be  $\geq \text{DN } 10$

### LCD indicator (option)

- High-contrast LCD indicator
- Display of the current flow rate as well as the total flow rate
- Application-specific visualizations which the user can select. Two operator pages can be configured to display multiple values in parallel.
- Plain text fault diagnostics
- Menu-guided parameterization with four buttons
- 'Easy Set-up' function for fast commissioning
- Parameterization of the device through the front glass with the housing closed

### Isolation of outputs

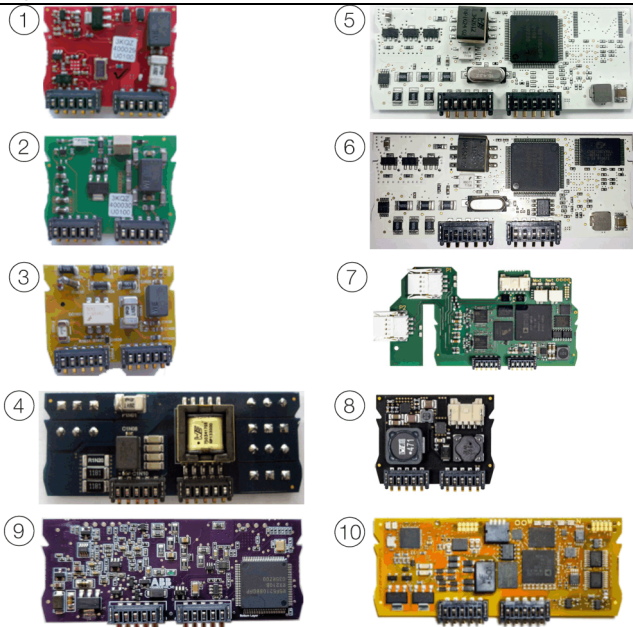
The digital output terminals 41 / 42 and 51 / 52 have a common ground.

The current output and the digital outputs are electrically isolated from each other.

### Optional plug-in cards

The transmitter has two slots (OC1, OC2) into which plug-in cards can be inserted to provide additional inputs and outputs. The slots are located on the transmitter motherboard and can be accessed after removing the front housing cover.

#### Plug-in cards



| Pos. | Description                                                                          | Quantity* |
|------|--------------------------------------------------------------------------------------|-----------|
| ①    | Current output, 4 to 20 mA passive (red)<br>Order no.: 3KQZ400029U0100               | 2         |
| ②    | Passive digital output (green)<br>Order no.: 3KQZ400030U0100                         | 1**       |
| ③    | Passive digital input (yellow)<br>Order no.: 3KQZ400032U0100                         | 1         |
| ④    | 24 V DC voltage supply (blue)<br>Order no.: 3KQZ400031U0100                          | 1         |
| ⑤    | Modbus RTU® RS485 (white)<br>Order no.: 3KQZ400028U0100                              | 1         |
| ⑥    | PROFIBUS DP® (white)<br>Order no.: 3KQZ400027U0100                                   | 1         |
| ⑦    | Standard Ethernet (various protocols) (green)<br>Order no.: 3KQZ400037U0100          | 1         |
| ⑧    | Power over Ethernet (POE) for Standard Ethernet (blue)<br>Order no.: 3KQZ400039U0100 | 1         |
| ⑨    | PROFIBUS PA® (blue)<br>Order no.: 3KQZ400061U0100                                    | 1**       |
| ⑩    | Ethernet-APL™ (various protocols) (yellow)<br>Order No.: 3KQZ400067U0100             | 1         |

\* The 'Number' column indicates the maximum number of plug-in cards of the same type that can be used.

\*\* Only one plug-in card of passive digital output type can be inserted in Pos. ②.

... Transmitter

IP rating

In accordance with EN 60529: IP 65 / IP 67, NEMA 4X

Vibration

In accordance with EN 60068-2-6

- In the 10 to 58 Hz range, maximum deflection 0.15 mm (0.006 in.)\*
- In the range from 58 to 150 Hz, maximum acceleration 2 g\*
- \* Peak load

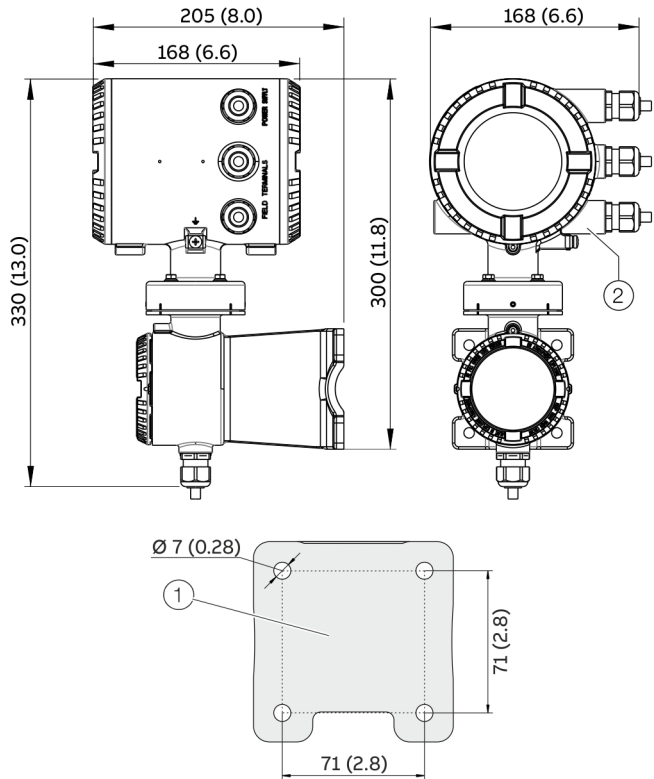
Temperature data

| Temperature data model FEW630 |                                |
|-------------------------------|--------------------------------|
| Ambient temperature           | -20 to 60 °C<br>(-4 to 140 °F) |
| Storage temperature           | -20 to 70 °C<br>(-4 to 158 °F) |

Housing design

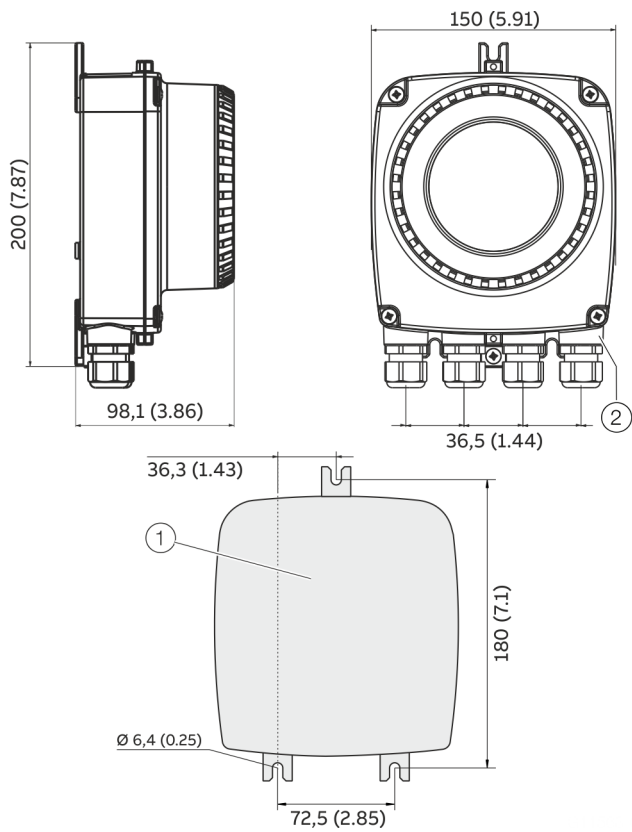
| Integral mount design |                                      |
|-----------------------|--------------------------------------|
| Housing               | Cast aluminum, painted               |
| Paint                 | ≥ 80 µm thick, RAL 9002 (gray white) |
| Cable gland           | Polyamide, M20 x 1.5 or ½ in NPT     |
| Remote mount design   |                                      |
| Housing               | Cast aluminum, painted               |
| Paint                 | ≥ 80 µm thick, RAL 9002 (gray white) |
| Cable gland           | Polyamide, M20 x 1.5 or ½ in NPT     |
| Weight                | 4.5 kg (9.92 lb)                     |

Dimensions



- ① Hole pattern for mounting holes
- ② Female thread (either ½ in NPT or M20 × 1.5), see model coding. In the case of a ½ in NPT, there is a plug instead of a cable gland.

Figure 49: Mounting dimensions dual-compartment housing

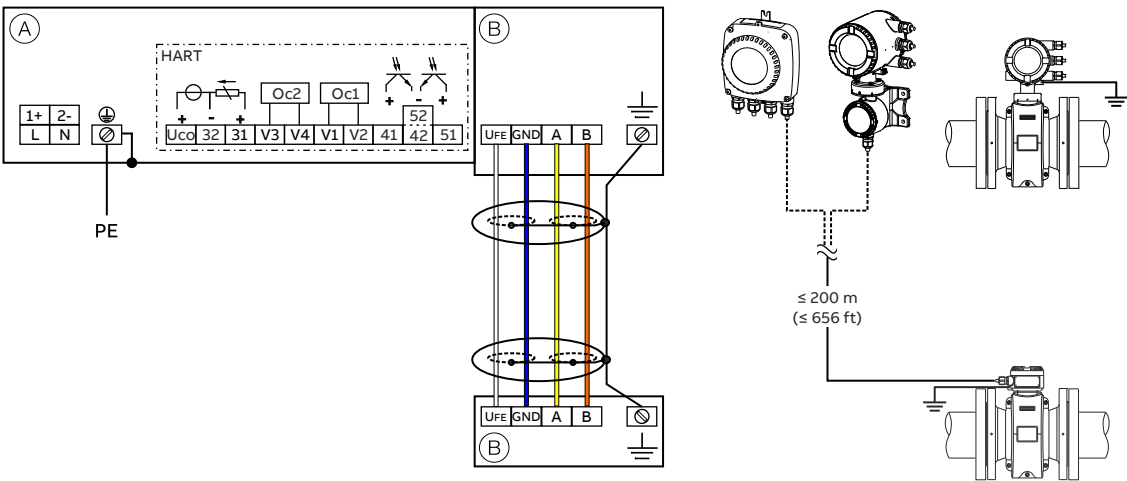


- ① Hole pattern for mounting holes
- ② Female thread (either  $\frac{1}{2}$  in NPT or M20  $\times$  1.5), see model coding. In the case of a  $\frac{1}{2}$  in NPT, there is a plug instead of a cable gland.

**Figure 50: Mounting dimensions single-compartment housing**

Electrical connections

Connection diagram



(A) Connections for power supply and inputs / outputs (B) Connections for signal cable (remote mount design only)

Figure 51: Electrical connections

**Note**  
For detailed information about grounding the transmitter and the flowmeter sensor, please refer to chapter ‘Grounding’ in the Commissioning instruction or the operating instruction.

Connections for the power supply

| AC voltage |                              |
|------------|------------------------------|
| Terminal   | Function / comments          |
| L          | Phase                        |
| N          | Neutral conductor            |
| PE /       | Protective earth (PE)        |
|            | Functional earth / shielding |
| DC voltage |                              |
| Terminal   | Function / comments          |
| 1+         | +                            |
| 2-         | -                            |
| PE /       | Protective earth (PE)        |
|            | Functional earth / shielding |

Connections for inputs and outputs

| Terminal                                                   | Function / comments                                  |
|------------------------------------------------------------|------------------------------------------------------|
| Uco / 32                                                   | Current output 4 to 20 mA- / HART® output, active or |
| 31 / 32                                                    | Current output 4 to 20 mA- / HART® output, passive   |
| 41 / 42                                                    | Passive digital output DO1                           |
| 51 / 52                                                    | Passive digital output DO2                           |
| V1 / V2                                                    | Plug-in card, slot OC1                               |
| V3 / V4                                                    | Plug-in card, slot OC2                               |
| For details, see <b>Optional plug-in cards</b> on page 41. |                                                      |

**Connecting the signal cable**  
Only for remote mount design.  
The sensor housing and transmitter housing must be connected to potential equalization.

| Terminal        | Function / comments          |
|-----------------|------------------------------|
| U <sub>FE</sub> | Sensor power supply          |
| GND             | Ground                       |
| A               | Data line                    |
| B               | Data line                    |
|                 | Functional earth / Shielding |

## Electrical data for inputs and outputs

### Power supply

#### AC power supply

|                   |                                              |
|-------------------|----------------------------------------------|
| Terminals         | L / N                                        |
| Operating voltage | 100 to 240 V AC (–15 % / +10 %), 47 to 64 Hz |
| Power consumption | $S_{\max}$ : < 20 VA                         |
| Power-up current  | 18.4 A, $t < 3$ ms                           |

#### DC voltage supply

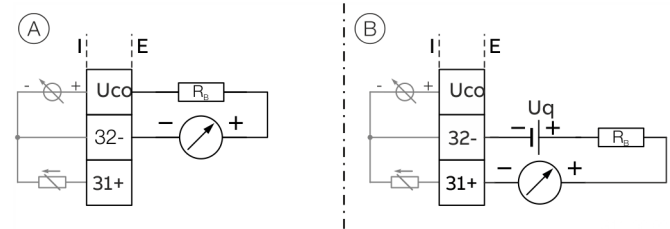
|                   |                     |
|-------------------|---------------------|
| Terminals         | 1+ / 2–             |
| Operating voltage | 16.8 to 30 V DC     |
| Ripple            | < 5 %               |
| Power consumption | $P_{\max}$ : < 20 W |
| Power-up current  | 21 A, $t < 10$ ms   |

### HART communication

For information on HART communication, refer to chapter **HART® Communication** on page 51.

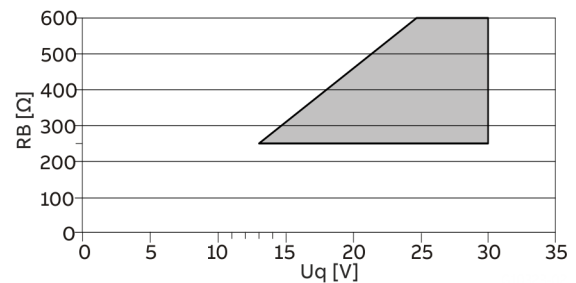
### Current output Uco / 32, 31 / 32

Can be configured for outputting mass flow and volume flow via the on-site software.



(A) Current output Uco / 32, active (B) Current output 31 / 32, passive

Figure 52: (I = internal, E = external,  $R_B$  = load)



Permissible source voltage  $U_q$  for passive outputs in relation to load resistance  $R_B$  where  $I_{\max} = 22$  mA. ■ = Permissible range

Figure 53: Source voltage for passive outputs

| Current output         | Active                                                            | Passive                                   |
|------------------------|-------------------------------------------------------------------|-------------------------------------------|
| Terminals              | Uco / 32                                                          | 31 / 32                                   |
| Output signal          | 4 to 20 mA or<br>4 to 12 to 20 mA<br>switchable                   | 4 to 20 mA                                |
| Load $R_B$             | $250 \Omega \leq R_B \leq 300 \Omega$                             | $250 \Omega \leq R_B \leq 600 \Omega$     |
| Source voltage $U_q$ * | —                                                                 | $13 \text{ V} \leq U_q \leq 30 \text{ V}$ |
| Measuring error        | < 0.1 % of measured value                                         |                                           |
| Resolution             | 0.4 $\mu\text{A}$ per digit                                       |                                           |
| Insulation             | The current output and digital outputs are electrically isolated. |                                           |

\* Source voltage  $U_q$  depends on the load  $R_B$  and must be within the permissible range.

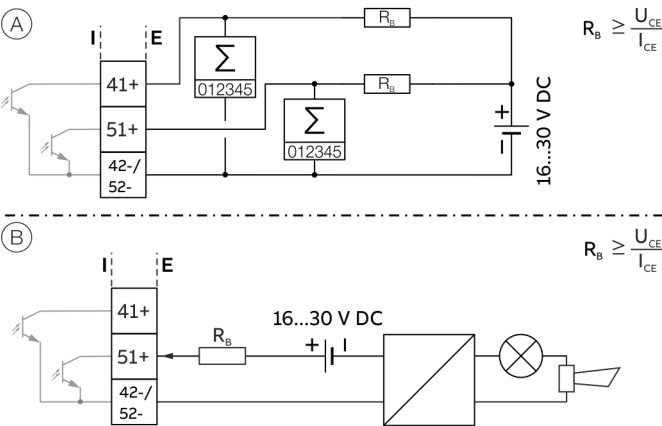
For information on communication via the HART protocol, refer to **HART® Communication** on page 51.

# ... Electrical connections

## ... Electrical data for inputs and outputs

### Digital output 41 / 42, 51 / 52 (basic device)

Can be configured as pulse, frequency or binary output via on-site software.



(A) Digital output 41 / 42, 51 / 52 passive as a pulse or frequency output  
(B) Passive digital output 51 / 52 as binary output

Figure 54: (I = internal, E = external,  $R_B$  = load)

| Pulse / frequency output (passive) |                                                                                                                                                                                              |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Terminals                          | 41 / 42, 51 / 52                                                                                                                                                                             |
| Output 'closed'                    | $0 \text{ V} \leq U_{CEH} \leq 3 \text{ V}$<br>For $f < 2.5 \text{ kHz}$ : $2 \text{ mA} < I_{CEL} < 30 \text{ mA}$<br>For $f > 2.5 \text{ kHz}$ : $10 \text{ mA} < I_{CEL} < 30 \text{ mA}$ |
| Output 'open'                      | $16 \text{ V} \leq U_{CEH} \leq 30 \text{ V DC}$<br>$0 \text{ mA} \leq I_{CEH} \leq 0.2 \text{ mA}$                                                                                          |
| $f_{\text{max}}$                   | 10.5 kHz                                                                                                                                                                                     |
| Pulse width                        | 0.05 to 2000 ms                                                                                                                                                                              |

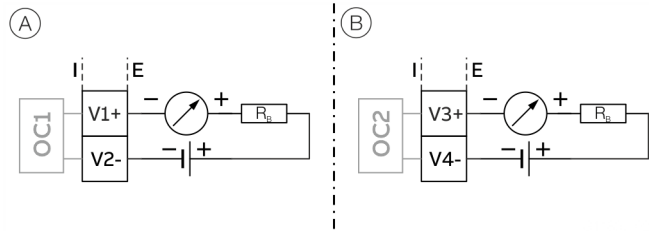
| Binary output (passive) |                                                                                                    |
|-------------------------|----------------------------------------------------------------------------------------------------|
| Terminals               | 41 / 42, 51 / 52                                                                                   |
| Output 'closed'         | $0 \text{ V} \leq U_{CEH} \leq 3 \text{ V}$<br>$2 \text{ mA} \leq I_{CEL} \leq 30 \text{ mA}$      |
| Output 'open'           | $16 \text{ V} \leq U_{CEH} \leq 3 \text{ V DC}$<br>$0 \text{ mA} \leq I_{CEH} \leq 0.2 \text{ mA}$ |
| Switching function      | Can be configured using software.                                                                  |

### Note

- Terminals 42 / 52 have common grounding. Digital outputs 41 / 42 and 51 / 52 are not electrically isolated from each other. An electrically isolated digital output can be made using a plug-in module.
- If using a mechanical counter, it is advisable to set a pulse width of  $\geq 30 \text{ ms}$  and a maximum frequency of  $f_{\text{max}} \leq 3 \text{ kHz}$ .

### Current output V1 / V2, V3 / V4 (plug-in module)

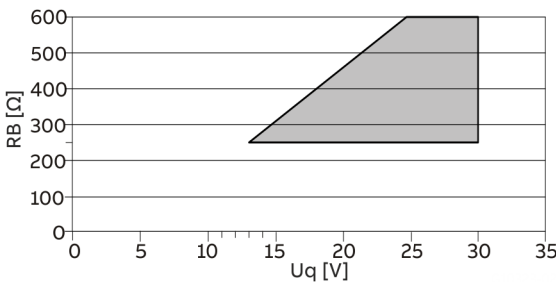
Up to two additional plug-in modules can be implemented via the 'Passive current output (red)' option module.



(A) Current output V1 / V2, passive (B) Current output V3 / V4, passive

Figure 55: (I = internal, E = external,  $R_B$  = load)

The plug-in module can be used in slot OC1 and OC2.



Permissible source voltage  $U_q$  for passive outputs in relation to load resistance  $R_B$  where  $I_{\text{max}} = 22 \text{ mA}$ .  = Permissible range

Figure 56: Source voltage for passive outputs

| Passive current output |                                           |
|------------------------|-------------------------------------------|
| Terminals              | V1 / V2, V3 / V4                          |
| Output signal          | 4 to 20 mA                                |
| Load $R_B$             | $250 \Omega \leq R_B \leq 600 \Omega$     |
| Source voltage $U_q$ * | $13 \text{ V} \leq U_q \leq 30 \text{ V}$ |
| Measuring error        | $< 0.1 \%$ of measured value              |
| Resolution             | $0.4 \mu\text{A}$ per digit               |

\* The source voltage  $U_q$  is dependent of the load  $R_B$  and must be placed in an additional area.

### Digital output V1 / V2, V3 / V4 (plug-in card)

The 'digital output passive (green)' plug-in card can be used to create **one** additional binary output.

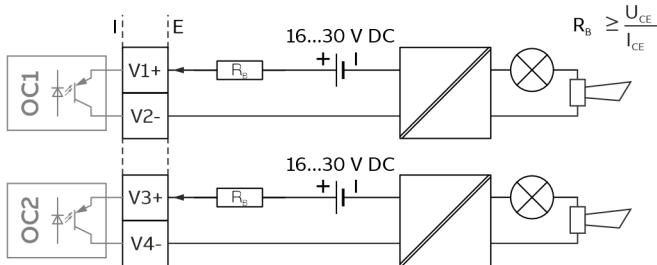


Figure 57: Plug-in card as binary output (I = internal, E = external,  $R_b$  = load)

The plug-in module can be used in slot OC1 **or** OC2.

| Binary output (passive) |                                                                                                                   |
|-------------------------|-------------------------------------------------------------------------------------------------------------------|
| Terminals               | V1 / V2, V3 / V4                                                                                                  |
| Output 'closed'         | $0 \text{ V} \leq U_{\text{CEL}} \leq 3 \text{ V}$<br>$2 \text{ mA} < I_{\text{CEL}} < 30 \text{ mA}$             |
| Output 'open'           | $16 \text{ V} \leq U_{\text{CEH}} \leq 30 \text{ V DC}$<br>$0 \text{ mA} \leq I_{\text{CEH}} \leq 0.2 \text{ mA}$ |
| Switching function      | Parameterization possible.                                                                                        |

### Note

$$I_{\text{CEL}} < 30 \text{ mA}; R_b = U_{\text{CEH}} / I_{\text{CEL}}$$

- $R_b$  depends in the inner resistance of the DCS Input Card.  $R_b$  must be installed in case the inner resistance of the DCS Input Card does not limit  $I_{\text{CE}}$  to max. 30 mA.
- With the NAMUR switch set to 'On'  $R_b$  is not required.

### Digital input V1 / V2, V3 / V4 (plug-in card)

A digital input can be implemented via the 'Passive digital input (yellow)' plug-in card.

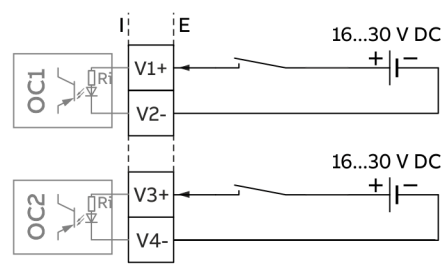


Figure 58: Plug-in card as digital input (I = internal, E = external)

The plug-in card can be used in slot OC1 **or** OC2.

| Digital input             |                                                     |
|---------------------------|-----------------------------------------------------|
| Terminals                 | V1 / V2, V3 / V4                                    |
| Input 'On'                | $16 \text{ V} \leq U_{\text{KL}} \leq 30 \text{ V}$ |
| Input 'Off'               | $0 \text{ V} \leq U_{\text{KL}} \leq 3 \text{ V}$   |
| Internal resistance $R_i$ | 6.5 k $\Omega$                                      |
| Function                  | Parameterization possible.                          |

... Electrical connections

... Electrical data for inputs and outputs

24 V DC loop power supply (plug-in card)

Use of the ‘loop power supply (blue)’ plug-in card allows a passive output on the transmitter to be used as an active output. See also **Connection examples** on page 49.

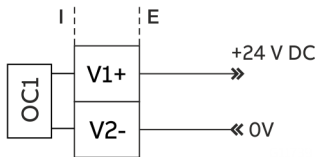


Figure 59: (I = Internal, E = External)

The plug-in card can only be used in slot OC1.

| Loop power supply 24 V DC    |                                          |
|------------------------------|------------------------------------------|
| Terminals                    | V1 / V2                                  |
| Function                     | For active connection of passive outputs |
| Output Voltage               | 24 V DC at 0 mA,<br>17 V DC at 25 mA     |
| Load rating I <sub>max</sub> | 25 mA, permanently short circuit-proof   |

Note

If the device is used in potentially explosive atmospheres, the plug-in card for the loop power supply may only be used to supply a passive output. It is not allowed, to connect it to multiple passive outputs!

Modbus® / PROFIBUS DP/PA® interface V1 / V2 (plug-in card)

A Modbus or PROFIBUS DP/PA interface can be implemented by using the ‘Modbus RTU, RS485 (white)’ or ‘PROFIBUS DP, RS485 (white)’ or ‘PROFIBUS PA, RS485 (blue)’ plug-in cards.

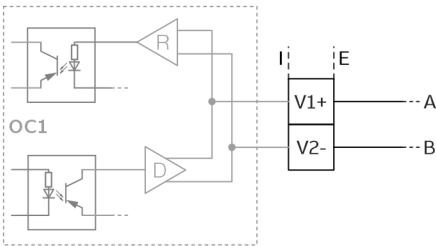


Figure 60: Plug-in card as a Modbus / PROFIBUS DP/PA interface (I = internal, E = external)

The corresponding plug-in card can only be used in slot OC1.

For information on communication through the Modbus or PROFIBUS DP/PA protocols, refer to chapters **Modbus RTU® communication** on page 51 or **PROFIBUS DP® communication** on page 52 or **PROFIBUS PA® communication** on page 54.

PROFIBUS PA connection via M12-Plug

Only in non-hazardous areas!

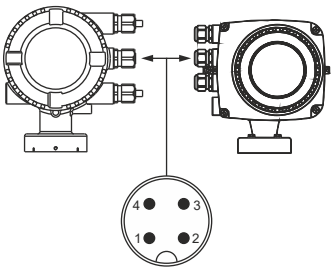


Figure 61: Pin assignment\* PROFIBUS PA M12-Plug (option)

| Pin assignment* |               |
|-----------------|---------------|
| Pin             | Function      |
| 1               | PA+           |
| 2               | Not connected |
| 3               | PA-           |
| 4               | Shield        |

\* Front view showing pin insert and pins

### Connection examples

Input and output functions are configured via the device software in accordance with the desired application.

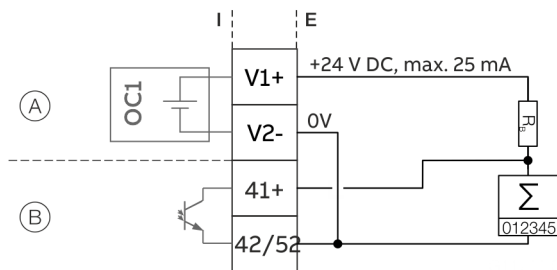
#### Digital output 41 / 42, 51 / 52, V3 / V4 active

When the 'loop power supply 24 V DC (blue)' plug-in card is used, the digital outputs on the basic device and on the option modules can also be wired as active digital outputs.

#### Note

Each 'loop power supply (blue)' plug-in card must only power one output.

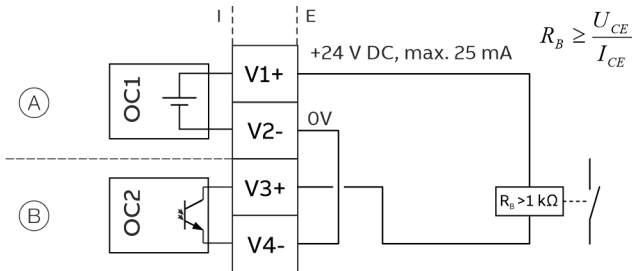
It must not be connected to two outputs (for example digital output 41 / 42 and 51 / 52)!



- (A) 'Loop power supply (blue)' plug-in card in slot 1  
(B) Digital output, digital output 41 / 42

Figure 62: Active digital output 41 / 42 (example)

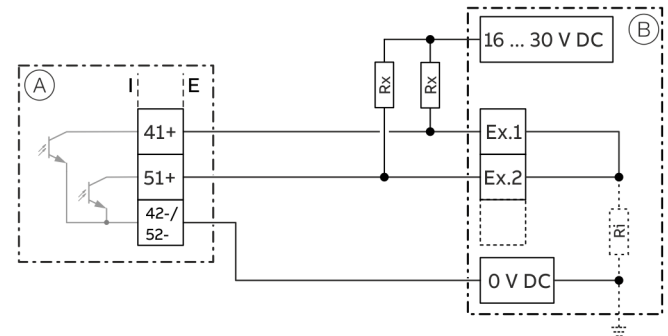
The connection example shows usage for digital output 41 / 42; the same applies to usage for digital output 51 / 52.



- (A) 'Loop power supply (blue)' plug-in card in slot 1  
(B) 'Digital output (green)' plug-in card in slot 2

Figure 63: Active digital output V3 / V4 (example)

#### Digital output 41 / 42, 51 / 52 passive on distributed control system



- (A) Transmitter  
(B) Distributed control system / Memory programmable controller
- Ex. 2 Input 2  
 $R_X$  Resistor for current limitation  
 $R_i$  Distributed control system internal resistance

Ex. 1 Input 1

Figure 64: Digital output 41 / 42 on distributed control system (example)

The  $R_X$  resistors limit the maximum current through the optoelectronic coupler of the digital outputs in the transmitter.

The maximum permissible current is 25 mA. An  $R_X$  value of 1000  $\Omega$  / 1 W is recommended at a voltage level of 24 V DC. The input on the distributed control system is reduced from 24 V DC to 0 V DC (falling edge) with '1' at the digital output.

... Electrical connections

... Electrical data for inputs and outputs

Current output V3 / V4 active

When the 'loop power supply 24 V DC, blue' plug-in card is used, the current output on the plug-in card can also be wired as the active current output.

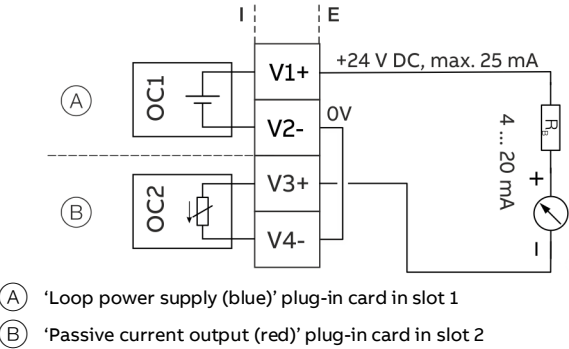


Figure 65: Active current output V3 / V4 (example)

Digital input V3 / V4 active

When the 'loop power supply 24 V DC, blue' plug-in card is used, the current output on the plug-in card can also be wired as the active current output.

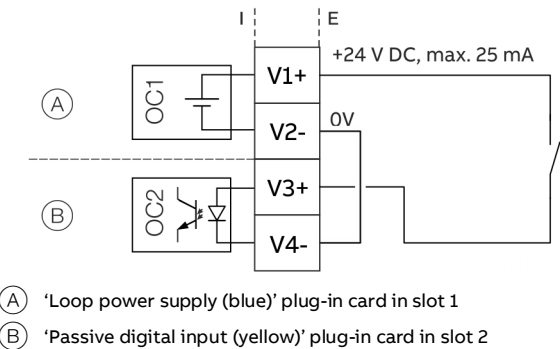


Figure 66: Active digital output V3 / V4 (example)

Connection versions digital output 41 / 42, 51 / 52

Depending on the wiring of digital outputs DO 41 / 42 and 51 / 52, they can be used parallel or only individually. The electrical isolation between the digital outputs also depends on the wiring.

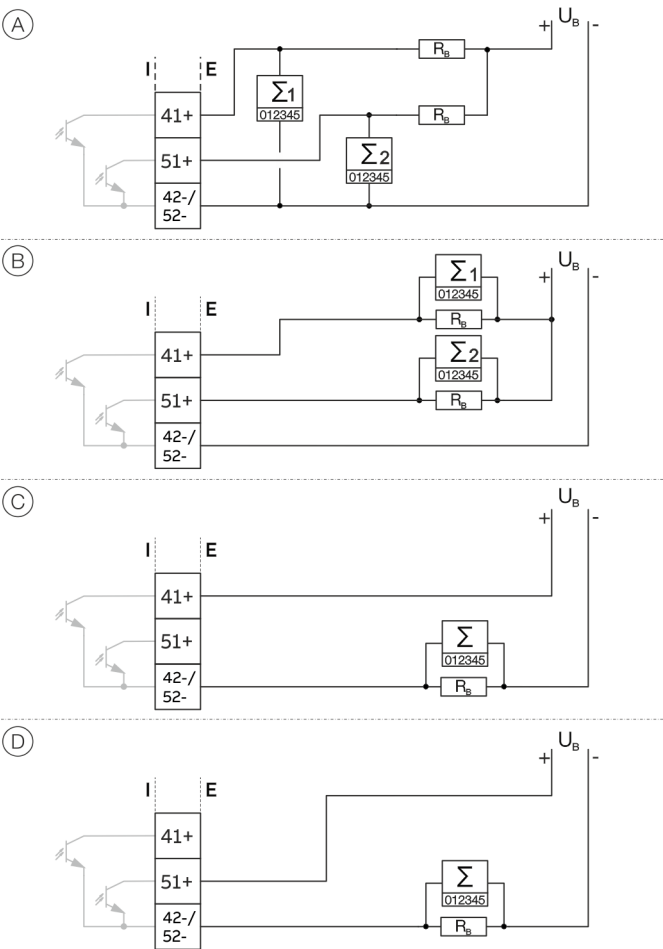


Figure 67: Connection versions digital output 41 / 42 and 51 / 52

|     | DO 41 / 42 and 51 / 52<br>can be used parallel | DO 41 / 42 and 51 / 52 electrically<br>isolated |
|-----|------------------------------------------------|-------------------------------------------------|
| (A) | Yes                                            | No                                              |
| (B) | Yes                                            | No                                              |
| (C) | No, only DO 41 / 42 can be used                | No                                              |
| (D) | No, only DO 51 / 52 can be used                | No                                              |

## Digital communication

### HART® Communication

#### Note

The HART® protocol is an unsecured protocol (in terms of IT and cyber security), as such the intended application should be assessed to ensure that this protocol is suitable before implementation.

In connection with the DTM (Device Type Manager) available to the device, communication (configuration, parameterization) can be carried out FDT 0.98 or 1.2. Other tool or system integrations (e.g. Emerson AMS / Siemens PCS7) on request.

The necessary DTMs and other files can be downloaded from [www.abb.com/flow](http://www.abb.com/flow).

#### HART output

|                      |                                                                                      |
|----------------------|--------------------------------------------------------------------------------------|
| Terminals            | Active: Uco / 32<br>Passive: 31 / 32                                                 |
| Protocol             | HART 7.6                                                                             |
| Transmission         | FSK modulation on current output 4 to 20 mA in accordance with the Bell 202 standard |
| Baud rate            | 1200 baud                                                                            |
| Signal amplitude     | Maximum 1.2 mAss                                                                     |
| Current output load  | Minimum 250 Ω                                                                        |
| Cable                | 0.25 mm <sup>2</sup> (AWG 24), twisted                                               |
| Maximum cable length | 1200 m (3937 ft)                                                                     |

#### Factory setting of the HART process variables

| HART process variable | Process value                |
|-----------------------|------------------------------|
| Primary Value (PV)    | Volume Flow in %             |
| Secondary Value (SV)  | Massflow in %                |
| Tertiary Value (TV)   | Volumeflow Totalizer Forward |
| Quaternary Value (QV) | Volumeflow Totalizer Reverse |

The process values of the HART variables can be set in the device menu.

### Modbus RTU® communication

#### Note

The Modbus® protocol is an unsecured protocol (in terms of IT and cyber security), as such the intended application should be assessed to ensure that this protocol is suitable before implementation.

Modbus is an open standard owned and administrated by an independent group of device manufacturers styled the Modbus Organization ([www.modbus.org/](http://www.modbus.org/)).

Using the Modbus protocol allows devices made by different manufacturers to exchange information via the same communication bus, without the need for any special interface devices to be used.

#### Modbus protocol

|                       |                                                                                                                                                     |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Terminals             | V1 / V2                                                                                                                                             |
| Configuration         | Via the Modbus interface or via the local operating interface in connection with a corresponding Device Type Manager (DTM)                          |
| Transmission          | Modbus RTU - RS485 serial connection                                                                                                                |
| Baud rate             | 2400, 4800, 9600, 19200, 38400, 56000, 57600, 115200 baud<br>Factory setting: 9600 baud                                                             |
| Parity                | None, even, odd<br>Factory setting: odd                                                                                                             |
| Stop bit              | One, two<br>Factory setting: One                                                                                                                    |
| IEEE format           | Little endian (LSB first), Big endian (MSB first)<br>Factory setting: Big endian<br>Big Endian -> MSB first (default)<br>Little Endian -> LSB first |
| Typical response time | < 100 ms                                                                                                                                            |
| Response delay time   | 0 to 200 ms<br>Factory setting: 10 ms                                                                                                               |

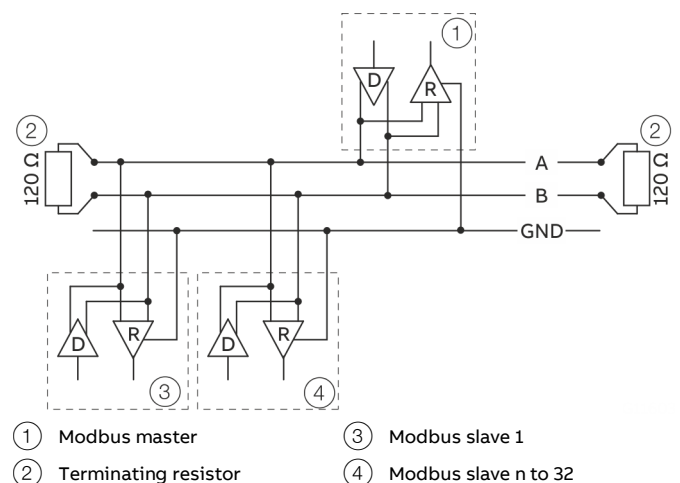


Figure 68: Communication via Modbus protocol

... Digital communication

... Modbus RTU® communication

Cable specification

The maximum permissible length is dependent on the baud rate, the cable (diameter, capacity and surge impedance), the number of loads in the device chain, and the network configuration (2-core or 4-core).

- At a baud rate of 9600 and with a conductor cross-section of at least 0.14 mm<sup>2</sup> (AWG 26), the maximum length is 1000 m (3280 ft).
- When using a 4-core cable as a 2-wire wiring system, the maximum length must be halved.
- The spur lines must be short, a maximum of 20 m (66 ft).
- When using a distributor with ‘n’ connections, each branch must have a maximum length of 40 m (131 ft) divided by ‘n.’

The maximum cable length depends on the type of cable used. The following standard values apply:

- Up to 6 m (20 ft):  
cable with standard shielding or twisted-pair cable.
- Up to 300 m (984 ft):  
double twisted-pair cable with overall foil shielding and integrated earth cable.
- Up to 1200 m (3937 ft):  
double twisted-pair cable with individual foil shielding and integrated earth cables. Example: Belden 9729 or equivalent cable.

A category 5 cable can be used for Modbus RS485 up to a maximum length of 600 m (1968 ft). For the symmetrical pairs in RS485 systems, a surge impedance of more than 100 Ω is preferred, especially at a baud rate of 19200 and above.

PROFIBUS DP® communication

Note

The PROFIBUS DP® protocol is an unsecured protocol (in terms of IT and cyber security), as such the intended application should be assessed to ensure that this protocol is suitable before implementation.

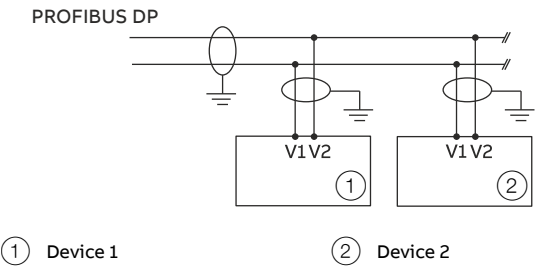


Figure 69: Communication with the PROFIBUS DP protocol

| PROFIBUS DP interface |                                                                                                                                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Terminals             | V1 / V2                                                                                                                                                            |
| Configuration         | Via the PROFIBUS DP interface or via the local operating interface in connection with a corresponding Device Type Manager (DTM)                                    |
| Transmission          | Based on IEC 61158-2                                                                                                                                               |
| Baud rate             | 9.6 kbps, 19.2 kbps, 45.45 kbps, 93.75 kbps, 187.5 kbps, 500 kbps, 1.5 Mbps<br>The baud rate is automatically detected and does not need to be configured manually |
| Device profile        | PA Profile 3.02                                                                                                                                                    |
| Bus address           | Address range 0 to 126<br>Factory setting: 126                                                                                                                     |
| Number of DP nodes    | ≤ 32, Node = Devices with / without PROFIBUS address                                                                                                               |
| Bus termination       | Bus termination required at the beginning and end of each DP segment!                                                                                              |

For commissioning purposes, you will need a device driver in EDD (Electronic Device Description) or DTM (Device Type Manager) format plus a GSD file.

You can download EDD, DTM and GSD from [www.abb.com/flow](http://www.abb.com/flow).

The files required for operation can also be downloaded from [www.profibus.com](http://www.profibus.com).

ABB provides three different GSD files which can be integrated in the system.

| ID number | GSD file name |                                  |
|-----------|---------------|----------------------------------|
| 0x9740    | PA139740.gsd  | 1xAI, 1xTOT                      |
| 0x9700    | PA139700.gsd  | 1AI                              |
| 0x3432    | ABB_3432.gsd  | 6xAI, 2xTOT, 1xAO,<br>1xDI, 1xDO |

Users decide at system integration whether to install the full range of functions or only part. Switching is made using the 'Ident Nr. Selector' parameter.

See also Parameter description in the operating instruction.

## General Information

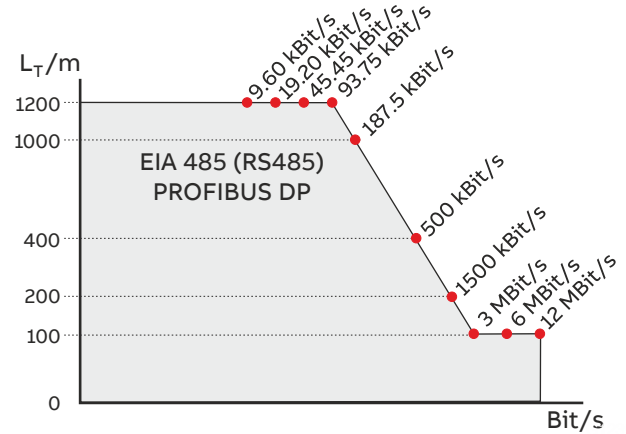


Figure 70: Bus cable length depends on the transmission rate

## Pro PROFIBUS Line

(Line = Starts at DP Master and goes to last DP/PA Slave)

- Approximately 4 to 8 DP segments through the repeater (see repeater data sheets)
- Recommended DP transfer rate 500 to 1500 kBit/s
- The slowest DP node determines the transfer rate of the DP line
- Number of PROFIBUS DP and PA nodes  $\leq 126$  (addresses 0 to 125)

## Per PROFIBUS DP segment

- Number of DP nodes  $\leq 32$   
(Node = Devices with / without PROFIBUS address)
- Bus termination required at the beginning and end of each DP segment!
- Trunk cable length ( $L_T$ ) see diagram (length dependent on transfer rate)
- Cable length of at least 1 m between two DP nodes at  $\geq 1500$  kBit/s!
- Spur cable length ( $L_S$ ), at  $\leq 1500$  kBit/s:  $L_S \leq 0.25$  m, at  $> 1500$  kBit/s:  $L_S = 0.00$  m!
- At 1500 kBit/s and ABB DP cable type A:
  - Sum of all spur cable lengths ( $L_S$ )  $\leq 6.60$  m, trunk cable length ( $L_T$ )  $> 6.60$  m, total length =  $L_T + (\sum L_S) \leq 200$  m, maximum 22 DP nodes (=  $6.60$  m / ( $0.25$  m +  $0.05$  m spare))

... Digital communication

PROFIBUS PA® communication

Note

The PROFIBUS PA® protocol is an unsecured protocol (in terms of IT and cyber security), as such the intended application should be assessed to ensure that this protocol is suitable before implementation.

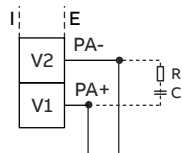


Figure 71: Communication with the PROFIBUS PA protocol

| PROFIBUS PA interface      |                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------|
| Terminals                  | V1 (PA+) / V2 (PA-)                                                                      |
| Configuration              | Via Device HMI or PROFIBUS PA-DTM or FDI package                                         |
| Transmission               | Based on IEC 61158-2                                                                     |
| Device profile             | The interface conforms to profile 3.02 (PROFIBUS standard, EN 50170, DIN 19245 [PRO 91]) |
| PROFIBUS PA ID no          | 0x3438                                                                                   |
| Alternative standard ID no | 0x9700 or 0x9740                                                                         |
| Bus cable                  | Shielded, twisted cable (acc. to IEC 61158-2, types A or B are preferred)                |

Bus topology

- Tree and/or line structure
- Bus termination: passive at both ends of the main bus line (RC element R = 100 Ω, C = 1 μF)

Voltage / current consumption

- Average current consumption: 10 mA
- In the event of an error, the integrated FDE function (=Fault Disconnection Electronic) integrated in the device is ensures that the current consumption can rise to a maximum of 13 mA.
- The upper current limit is restricted electronically.
- The voltage on the bus line must be within 9 to 32 V DC

Short circuit protection / reverse polarity protection

The Device Terminals V1 and V2, Profibus connects to, are short-circuit protected and have a reverse polarity protection.

System integration

ABB provides three different GSD files which can be integrated in the system.

| ID number | GSD file name |
|-----------|---------------|
| 0x9700    | PA139700.gsd  |
| 0x9740    | PA139740.gsd  |
| 0x3438    | ABB_3438.gsd  |

Users decide at system integration whether to install the full range of functions or only part. Switching is made using the ‘Ident Nr. Selector’ parameter.

See also Parameter description in the operating instruction.

You can download the GSD files from [www.abb.com/flow](http://www.abb.com/flow).

For additional information, see separate interface documentation.

PROFIBUS PA connection via M12-Plug  
Only in non-hazardous areas!

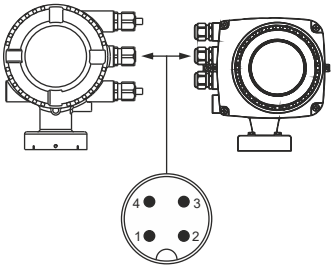


Figure 72: Pin assignment\* PROFIBUS PA M12-Plug (option)

| Pin assignment* |               |
|-----------------|---------------|
| Pin             | Function      |
| 1               | PA+           |
| 2               | Not connected |
| 3               | PA-           |
| 4               | Shield        |

\* Front view showing pin insert and pins

Standard Ethernet communication

Standard Ethernet 10/100 BASE-T/TX (IEEE802.3)

Connection via twisted-pair cable (Cat. 5-cable).

With the standard Ethernet plug-in card, the transmitter features 2 Ethernet connections.  
The network can be implemented using the ring, star or daisy chain topology.

In addition to the standard Ethernet plug-in card, a plug-in card for ‘Power over Ethernet’ is available.  
Using this card, the 24 V DC version of the flowmeter can be operated via PoE without any additional power supply.

**Note**  
You will find detailed information regarding the “Ethernet” in the interface description ‘COM/FEF630/FEH630/E/MB’.

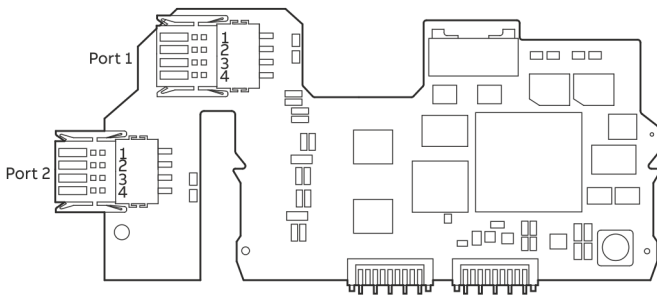


Figure 73: Plug-in card for standard Ethernet communication

Single port connection without Power over Ethernet

Standard Ethernet 10/100 BASE-T/TX (IEEE802.3) Single port connection.

| Terminal designation: |       |          |                |
|-----------------------|-------|----------|----------------|
| Connection            | Pin   | Function | Color codes    |
| 1                     | Pin 1 | RD+      | White / Orange |
|                       | Pin 2 | RD–      | Orange         |
|                       | Pin 3 | TD+      | White / Green  |
|                       | Pin 4 | TD–      | Green          |

Single port connection with Power over Ethernet

Standard Ethernet 10/100 BASE-T/TX (IEEE802.3) Single port connection.

| Terminal designation: |       |          |                |
|-----------------------|-------|----------|----------------|
| Connection            | Pin   | Function | Color codes    |
| 1                     | Pin 1 | RD+      | White / Orange |
|                       | Pin 2 | RD–      | Orange         |
|                       | Pin 3 | TD+      | White / Green  |
|                       | Pin 4 | TD–      | Green          |
| 2                     | Pin 1 | PWR+     | White / Blue   |
|                       | Pin 2 | PWR+     | Blue           |
|                       | Pin 3 | PWR–     | White / Brown  |
|                       | Pin 4 | PWR–     | Brown          |

Dual port connection without Power over Ethernet

| Terminal designation: |       |          |                |
|-----------------------|-------|----------|----------------|
| Connection            | Pin   | Function | Color codes    |
| 1                     | Pin 1 | RD+      | White / Orange |
|                       | Pin 2 | RD–      | Orange         |
|                       | Pin 3 | TD+      | White / Green  |
|                       | Pin 4 | TD–      | Green          |
| 2                     | Pin 1 | RD+      | White / Orange |
|                       | Pin 2 | RD–      | Orange         |
|                       | Pin 3 | TD+      | White / Green  |
|                       | Pin 4 | TD–      | Green          |

... Digital communication

Ethernet APL™ communication

Ethernet APL™ interface V1 / V2 (plug-in card)

An Ethernet APL interface can be implemented using the 'Ethernet APL (yellow)' plug-in card.

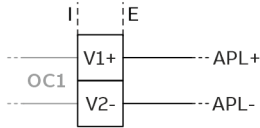


Figure 74: Plug-in card as an Ethernet APL interface (I = internal, E = external)

The corresponding plug-in card can only be used in slot OC1.

| Ethernet APL interface |                           |
|------------------------|---------------------------|
| Terminals              | V1 (APL+) / V2 (APL-)     |
| APL Power Class        | Power Load, Power Class A |
| Supply voltage         | 9,6 to 15 V DC            |
| Power consumption      | 540 mW                    |

It is recommended to use the middle cable gland to route the APL cable into the housing.

Properties of the Ethernet APL interface

- 10 Mbit/s full duplex, 2-wire Ethernet based on IEEE 802.3cg 10BASE-T1L.
- System integration with PROFINET®, Modbus TCP®, Webserver.
- Reliability, long-term stability, high precision and advanced diagnostic functions in critical processes

### Ethernet-APL™ network topology

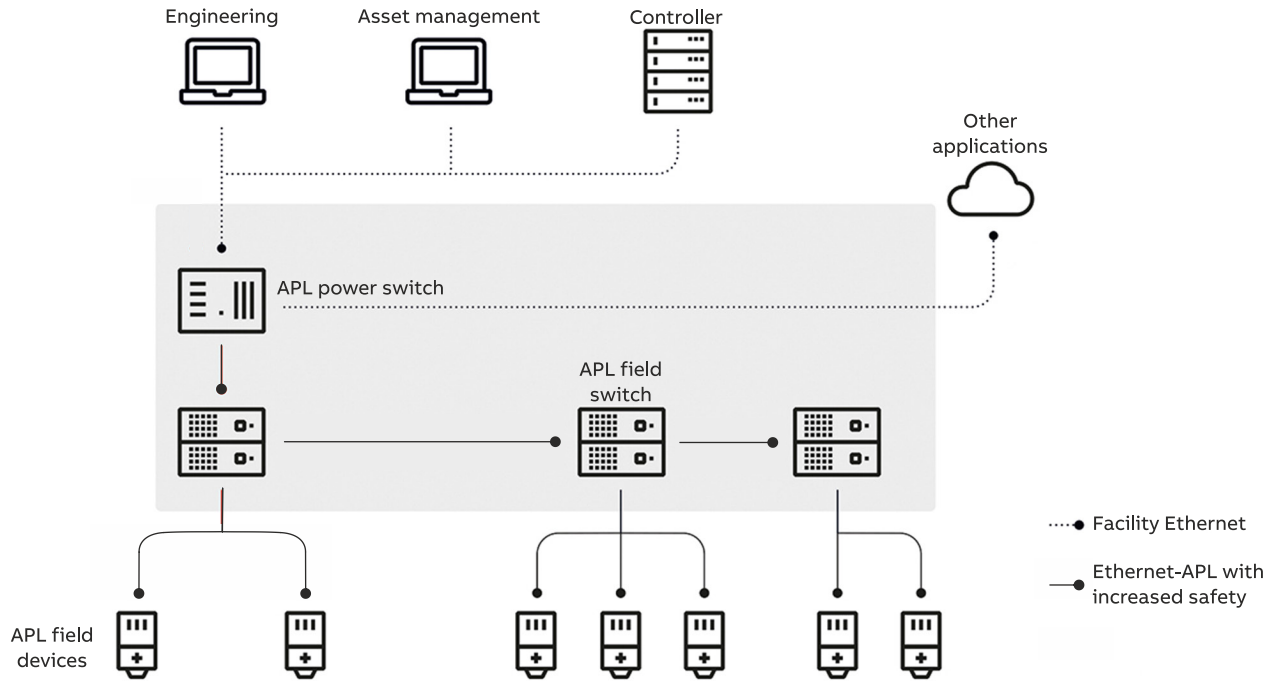


Figure 75: Exemplary Ethernet-APL topology

#### Connection to an SPE Switch (Single Pair Ethernet)

Outside of potentially explosive atmospheres, the device can be connected to a suited SPE field switch.

The device can be connected to an SPE field switch with a maximum voltage of 30 V DC and a minimum output of 1.85 watts.

The SPE field switch must support the 10BASE-T1L Standard and the PoDL power classes 10, 11 or 12 as well detect SPE field devices without an integrated PoDL module (without handshake).

A function for disabling the recognition of the power classes within the SPE Switch must be present.

#### Connection to an APL-Field-Switch

Operation of the Device must be in accordance with APL-Port Classifications:

- Within the hazardous area: SLAA or SLAC
- In safe area: SLAX
- Maximum Voltage: 15 V DC
- Minimum Power: 0,54 W

#### Ethernet APL cable specifications

- Symmetrical, shielded twisted-pair cable with a characteristic impedance of  $100\ \Omega$ ,  $\pm 20\%$  and a frequency range of 100 kHz to 20 Mhz, such as the PROFIBUS PA cable.
- Wire cross-section  $0.14$  to  $2.5\ \text{mm}^2$  (26 to 14 AWG), either as a solid wire conductor or a strand.
- The outside diameter of the cable must be from 6 to 12 mm (0.24 to 0.47in) to guarantee the seal integrity required in the cable gland.
- The reference cable type is the fieldbus cable type A, MAU type 1 and 3 specified in IEC 61158-2.

This cable meets the requirements for intrinsically safe applications as described in IEC TS 60079-47, but can also be used in non-intrinsically safe applications.

## ... Digital communication

### Protocols and ports on the Ethernet interface

Depending on the type of Ethernet communication, the device supports the following protocols:

| Standard Ethernet communication |                     |                                                        |
|---------------------------------|---------------------|--------------------------------------------------------|
| Protocol                        | Ports               | Safety                                                 |
| EtherNet/IP™                    | TCP 44818, UDP 2222 | Unsecured protocol                                     |
| Modbus TCP®                     | TCP 502             | Unsecured protocol                                     |
| PROFINET®                       | UDP 34964, 49152    | Unsecured protocol                                     |
| Webserver https                 | TCP443              | Secured protocol, security based on .x509 certificates |

| Ethernet APL™ communication |                  |                                                        |
|-----------------------------|------------------|--------------------------------------------------------|
| Protocol                    | Ports            | Safety                                                 |
| Modbus TCP®                 | TCP 502          | Unsecured protocol                                     |
| PROFINET®                   | UDP 34964, 49152 | Unsecured protocol                                     |
| Webserver https             | TCP443           | Secured protocol, security based on .x509 certificates |

All the protocols can be activated / deactivated in the HMI Menu.

#### EtherNet/IP™ and PROFINET® protocol

##### Note

The EtherNet/IP™ or PROFINET® protocols are unsecured protocols (in terms of IT or cyber security), as such the intended application should be assessed to ensure that these protocols are suitable before implementation.

The EtherNet/IP and PROFINET protocol supports cyclic communication. Process Variables, Diagnostic Data and Device Status Information can be accessed cyclically.

With PROFINET communication, the DHCP (Dynamic Host Configuration Protocol) function is not supported and PROFINET DCP (Discovery and Configuration Protocol) is used instead.

For Device Configuration a Webserver is available providing full access to all parameter and diagnostic data.

| EtherNet/IP Interface            |                                                                                                         |
|----------------------------------|---------------------------------------------------------------------------------------------------------|
| Available for                    | Standard Ethernet communication                                                                         |
| Configuration                    | Through the Webserver or the local operating Interface (Display).                                       |
| EtherNet / IP                    | 5002                                                                                                    |
| ProductCode                      |                                                                                                         |
| EDS file                         | FEW530_FEPFEH630_01_01.eds                                                                              |
| Device profile                   | Profile 0x43, Generic Device, (keyable).                                                                |
| Supporte standards and protocols | Common Industrial Protocol (CIP™)<br>Vol1, Ed 3.25<br>EtherNet/IP™ Adaptation of CIP™,<br>Vol2, Ed 1.23 |
| Cable                            | Cat 5                                                                                                   |

| PROFINET Interface               |                                                                                                                                                                                                                   |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Available for                    | <ul style="list-style-type: none"> <li>Standard Ethernet communication</li> <li>Ethernet APL™ communication</li> </ul>                                                                                            |
| Configuration                    | Via the web server or the local operating interface (display).                                                                                                                                                    |
| Device profile                   | PA Profile 4.01 Specification                                                                                                                                                                                     |
| GSDML file (Standard Ethernet)   | GSDML-V2.42-ABB_001A-3437_FLOW_EL_MAGNETIC-20220713.xml                                                                                                                                                           |
| GSDML file (Ethernet-APL™)       | GSDML-V2.45-ABB_001A-343B_FLOW_EL_MAGNETIC-20250429-154000.xml or later                                                                                                                                           |
| Device ID (Standard Ethernet)    | ABB 0x3437 or PNO 0xB332                                                                                                                                                                                          |
| Device ID (Ethernet-APL™)        | ABB 0x34B or PNO 0xB332                                                                                                                                                                                           |
| Supporte standards and protocols | Common Industrial Protocol (CIP™)<br>Vol1, Ed 3.25<br>EtherNet/IP™ Adaptation of CIP™,<br>Vol2, Ed 1.23<br>PROFINET PNO_Version V2.42<br>for standard Ethernet<br>PROFINET PNO Version V2.42<br>for Ethernet-APL™ |

## Ordering Information

### ProcessMaster FEW631

Electromagnetic Flowmeter system, integral mount (ABB Part No.: 3KXF242631V)

|                                                                  | ProcessMaster FEW631 | 7,8 | 9,10             | 11,12,13,14        | ... 85,86 |
|------------------------------------------------------------------|----------------------|-----|------------------|--------------------|-----------|
| <b>Explosion Protection Certification</b>                        |                      |     |                  |                    |           |
| Without, Flowmeter based on CE Standard                          |                      | Y0  |                  |                    |           |
| ATEX / IEC Ex (Zone 1 / 21)                                      |                      | A1  |                  |                    |           |
| ATEX / IEC Ex (Zone 2 / 22)                                      |                      | A2  |                  |                    |           |
| cFMus Class 1 Div. 1 (Zone 1 / 21)                               |                      | F1  |                  |                    |           |
| cFMus Class 1 Div. 2 (Zone 2 / 22)                               |                      | F2  |                  |                    |           |
| General Purpose FM3810, ANSI/UL 61010                            |                      | G1  |                  |                    |           |
| <b>Housing Type / Housing Material / Thread for Cable Glands</b> |                      |     |                  |                    |           |
| Single compartment / Aluminum / M20 x 1.5                        |                      |     | S1 <sup>3)</sup> |                    |           |
| Single compartment / Aluminum / NPT ½ in                         |                      |     | S2 <sup>3)</sup> |                    |           |
| Dual compartment / Aluminum / M20 x 1.5                          |                      |     | D1               |                    |           |
| Dual compartment / Aluminum / NPT ½ in                           |                      |     | D2               |                    |           |
| <b>Meter size</b>                                                |                      |     |                  |                    |           |
| DN 25 (1 in)                                                     |                      |     |                  | 0025 <sup>1)</sup> |           |
| DN 32 (1¼ in)                                                    |                      |     |                  | 0032 <sup>1)</sup> |           |
| DN 40 (1½ in)                                                    |                      |     |                  | 0040               |           |
| DN 50 (2 in)                                                     |                      |     |                  | 0050               |           |
| DN 65 (2½ in)                                                    |                      |     |                  | 0065               |           |
| DN 80 (3 in)                                                     |                      |     |                  | 0080               |           |
| DN 100 (4 in)                                                    |                      |     |                  | 0100               |           |
| DN 125 (5 in)                                                    |                      |     |                  | 0125               |           |
| DN 150 (6 in)                                                    |                      |     |                  | 0150               |           |
| DN 200 (8 in)                                                    |                      |     |                  | 0200               |           |
| DN 250 (10 in)                                                   |                      |     |                  | 0250               |           |
| DN 300 (12 in)                                                   |                      |     |                  | 0300               |           |
| DN 350 (14 in)                                                   |                      |     |                  | 0350               |           |
| DN 400 (16 in)                                                   |                      |     |                  | 0400               |           |
| DN 450 (18 in)                                                   |                      |     |                  | 0450               |           |
| DN 500 (20 in)                                                   |                      |     |                  | 0500               |           |
| DN 600 (24 in)                                                   |                      |     |                  | 0600               |           |
| DN 700 (28 in)                                                   |                      |     |                  | 0700               |           |
| DN 750 (30 in)                                                   |                      |     |                  | 0750               |           |
| DN 800 (32 in)                                                   |                      |     |                  | 0800               |           |
| DN 900 (36 in)                                                   |                      |     |                  | 0900               |           |
| DN 1000 (40 in)                                                  |                      |     |                  | 1000               |           |
| DN 1050 (42 in)                                                  |                      |     |                  | 1050               |           |

Continued on next page

## ... Ordering Information

### ... ProcessMaster FEW631

|                                                                  | ProcessMaster FEW631 | 7,8 | ... | 11,12,13,14 | 15,16            | 17,18            | ... | 85,86 |
|------------------------------------------------------------------|----------------------|-----|-----|-------------|------------------|------------------|-----|-------|
| <b>Meter size (continuation)</b>                                 |                      |     |     |             |                  |                  |     |       |
| DN 1100 (44 in)                                                  |                      |     |     | 1100        |                  |                  |     |       |
| DN 1200 (48 in)                                                  |                      |     |     | 1200        |                  |                  |     |       |
| DN 1350 (54 in)                                                  |                      |     |     | 1350        |                  |                  |     |       |
| DN 1400 (54 in)                                                  |                      |     |     | 1400        |                  |                  |     |       |
| DN 1500 (60 in)                                                  |                      |     |     | 1500        |                  |                  |     |       |
| DN 1600 (66 in)                                                  |                      |     |     | 1600        |                  |                  |     |       |
| DN 1650 (66 in)                                                  |                      |     |     | 1650        |                  |                  |     |       |
| DN 1800 (72 in)                                                  |                      |     |     | 1800        |                  |                  |     |       |
| DN 2000 (80 in)                                                  |                      |     |     | 2000        |                  |                  |     |       |
| DN 2100 (84 in)                                                  |                      |     |     | 2100        |                  |                  |     |       |
| DN 2200 (88 in)                                                  |                      |     |     | 2200        |                  |                  |     |       |
| DN 2400 (96 in)                                                  |                      |     |     | 2400        |                  |                  |     |       |
| <b>Process Connection Type</b>                                   |                      |     |     |             |                  |                  |     |       |
| EN 1092-1, DIN PN 6                                              |                      |     |     |             | S0 <sup>4)</sup> |                  |     |       |
| EN 1092-1, DIN PN 10                                             |                      |     |     |             | S1 <sup>4)</sup> |                  |     |       |
| EN 1092-1, DIN PN 16                                             |                      |     |     |             | S2 <sup>4)</sup> |                  |     |       |
| EN 1092-1, DIN PN 25                                             |                      |     |     |             | S3 <sup>4)</sup> |                  |     |       |
| EN 1092-1, DIN PN 40                                             |                      |     |     |             | S4 <sup>4)</sup> |                  |     |       |
| Flanges ASME CL 150 B16.5 up to DN 600, B16.47 series B > DN 600 |                      |     |     |             | A1 <sup>6)</sup> |                  |     |       |
| Flanges ASME CL 300 B16.5 up to DN 600, B16.47 series B > DN 600 |                      |     |     |             | A3 <sup>6)</sup> |                  |     |       |
| Flanges ASME CL 150; B16.47 series A > DN 600                    |                      |     |     |             | B1 <sup>7)</sup> |                  |     |       |
| Flanges ASME CL 300; B16.47 series A > DN 600                    |                      |     |     |             | B3               |                  |     |       |
| Flanges JIS 5K                                                   |                      |     |     |             | J2 <sup>8)</sup> |                  |     |       |
| Flanges JIS 10K                                                  |                      |     |     |             | J1 <sup>8)</sup> |                  |     |       |
| Flanges AS 4087 PN16                                             |                      |     |     |             | E1               |                  |     |       |
| Flanges AS 4087 PN35                                             |                      |     |     |             | E8               |                  |     |       |
| Flanges AS2129 table E                                           |                      |     |     |             | E4               |                  |     |       |
| Flanges AS2129 table D                                           |                      |     |     |             | E5               |                  |     |       |
| Flanges AWWA C207 Class B                                        |                      |     |     |             | C1               |                  |     |       |
| Flanges AWWA C207 Class D                                        |                      |     |     |             | C2               |                  |     |       |
| Flanges AWWA C207 Class E                                        |                      |     |     |             | C3               |                  |     |       |
| Others                                                           |                      |     |     |             | Z9               |                  |     |       |
| <b>Liner Material</b>                                            |                      |     |     |             |                  |                  |     |       |
| Hard rubber                                                      |                      |     |     |             |                  | R2 <sup>9)</sup> |     |       |
| Others                                                           |                      |     |     |             |                  | Z9               |     |       |

Continued on next page

| ProcessMaster FEW631                                                                                        | 7,8 | ... | 19               | 20               | 21 | 22               | 23 | 24,25 | 26 | 27 | 28,29 | 30                | ...              | 85,86 |
|-------------------------------------------------------------------------------------------------------------|-----|-----|------------------|------------------|----|------------------|----|-------|----|----|-------|-------------------|------------------|-------|
| <b>Process Connection Material</b>                                                                          |     |     |                  |                  |    |                  |    |       |    |    |       |                   |                  |       |
| Carbon steel                                                                                                |     |     | B <sup>10)</sup> |                  |    |                  |    |       |    |    |       |                   |                  |       |
| Stainless steel <sup>10)</sup>                                                                              |     |     | C <sup>10)</sup> |                  |    |                  |    |       |    |    |       |                   |                  |       |
| Others                                                                                                      |     |     | Z                |                  |    |                  |    |       |    |    |       |                   |                  |       |
| <b>Electrode Design</b>                                                                                     |     |     |                  |                  |    |                  |    |       |    |    |       |                   |                  |       |
| Standard                                                                                                    |     |     |                  | 1                |    |                  |    |       |    |    |       |                   |                  |       |
| Pointed head                                                                                                |     |     |                  | 5 <sup>11)</sup> |    |                  |    |       |    |    |       |                   |                  |       |
| Others                                                                                                      |     |     |                  | 9                |    |                  |    |       |    |    |       |                   |                  |       |
| <b>Measuring Electrodes Material</b>                                                                        |     |     |                  |                  |    |                  |    |       |    |    |       |                   |                  |       |
| Hast. C-4 (2.4610)                                                                                          |     |     |                  |                  | D  |                  |    |       |    |    |       |                   |                  |       |
| Stainless steel 316Ti (1.4571)                                                                              |     |     |                  |                  | S  |                  |    |       |    |    |       |                   |                  |       |
| Hast. C-22                                                                                                  |     |     |                  |                  | C  |                  |    |       |    |    |       |                   |                  |       |
| Others                                                                                                      |     |     |                  |                  | Z  |                  |    |       |    |    |       |                   |                  |       |
| <b>Grounding Electrode / Full Pipe Detection</b>                                                            |     |     |                  |                  |    |                  |    |       |    |    |       |                   |                  |       |
| No grounding electrode / No full pipe detection                                                             |     |     |                  |                  |    | 0                |    |       |    |    |       |                   |                  |       |
| Grounding electrode / No full pipe detection                                                                |     |     |                  |                  |    | 2 <sup>12)</sup> |    |       |    |    |       |                   |                  |       |
| Others                                                                                                      |     |     |                  |                  |    | 9                |    |       |    |    |       |                   |                  |       |
| <b>Grounding Accessories</b>                                                                                |     |     |                  |                  |    |                  |    |       |    |    |       |                   |                  |       |
| Without                                                                                                     |     |     |                  |                  |    |                  | A  |       |    |    |       |                   |                  |       |
| Grounding Ring (1off), stainless steel, loose Item                                                          |     |     |                  |                  |    |                  | D  |       |    |    |       |                   |                  |       |
| Grounding Ring (2off), stainless steel, loose Item                                                          |     |     |                  |                  |    |                  | E  |       |    |    |       |                   |                  |       |
| Others                                                                                                      |     |     |                  |                  |    |                  | Z  |       |    |    |       |                   |                  |       |
| <b>Protection Class Transmitter / Protection Class Sensor</b>                                               |     |     |                  |                  |    |                  |    |       |    |    |       |                   |                  |       |
| IP 67 / IP 67                                                                                               |     |     |                  |                  |    |                  |    | 70    |    |    |       |                   |                  |       |
| <b>Power Supply</b>                                                                                         |     |     |                  |                  |    |                  |    |       |    |    |       |                   |                  |       |
| 100 to 230 V AC, 50 Hz                                                                                      |     |     |                  |                  |    |                  |    |       | A  |    |       |                   |                  |       |
| 24 V DC, 50 Hz                                                                                              |     |     |                  |                  |    |                  |    |       | D  |    |       |                   |                  |       |
| 100 to 230 V AC, 60 Hz                                                                                      |     |     |                  |                  |    |                  |    |       | C  |    |       |                   |                  |       |
| 24 V DC, 60 Hz                                                                                              |     |     |                  |                  |    |                  |    |       | E  |    |       |                   |                  |       |
| <b>Display</b>                                                                                              |     |     |                  |                  |    |                  |    |       |    |    |       |                   |                  |       |
| Without                                                                                                     |     |     |                  |                  |    |                  |    |       |    | 0  |       |                   |                  |       |
| Display with Keypad                                                                                         |     |     |                  |                  |    |                  |    |       |    | 2  |       |                   |                  |       |
| <b>Outputs</b>                                                                                              |     |     |                  |                  |    |                  |    |       |    |    |       |                   |                  |       |
| 1 Current output (active or passive), 2 Digital Outputs (passive), HART                                     |     |     |                  |                  |    |                  |    |       |    |    |       | G0 <sup>13)</sup> |                  |       |
| Current output 1 (active or passive), digital output 1 & 2 (passive), HART, MODBUS RTU                      |     |     |                  |                  |    |                  |    |       |    |    |       | M1 <sup>14)</sup> |                  |       |
| Current output 1 (active or passive), digital output 1 & 2 (passive), HART, PROFIBUS DP                     |     |     |                  |                  |    |                  |    |       |    |    |       | D1 <sup>15)</sup> |                  |       |
| Current output 1 (active or passive), digital output 1 & 2 (passive), HART, 1 port Ethernet / Profinet      |     |     |                  |                  |    |                  |    |       |    |    |       | E2 <sup>16)</sup> |                  |       |
| Current output 1 (active or passive), digital output 1 & 2 (passive), HART, 2 port Ethernet / Profinet      |     |     |                  |                  |    |                  |    |       |    |    |       | E3 <sup>16)</sup> |                  |       |
| Current output 1 (active or passive), digital output 1 & 2 (passive), HART, 1 port Ethernet /Profinet + POE |     |     |                  |                  |    |                  |    |       |    |    |       | E4 <sup>16)</sup> |                  |       |
| Current output 1 (active or passive), digital output 1 & 2 (passive), HART, PROFIBUS PA                     |     |     |                  |                  |    |                  |    |       |    |    |       | P1                |                  |       |
| Current output 1 (active or passive), digital output 1 & 2 (passive), HART, Advanced Physical Layer (APL)   |     |     |                  |                  |    |                  |    |       |    |    |       | L1 <sup>34)</sup> |                  |       |
| <b>Design Level</b>                                                                                         |     |     |                  |                  |    |                  |    |       |    |    |       |                   |                  |       |
| Design Level A                                                                                              |     |     |                  |                  |    |                  |    |       |    |    |       |                   | A <sup>17)</sup> |       |

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## ... Ordering Information

### ... ProcessMaster FEW631

| ProcessMaster FEW631                                   | 7,8 | ... | 31,32,33           | 34,35,36           | 37,38 | 39,40,41 | 42,43,44 | 45,46,47           | 48,49             | 50,51 | ...               | 85,86 |
|--------------------------------------------------------|-----|-----|--------------------|--------------------|-------|----------|----------|--------------------|-------------------|-------|-------------------|-------|
| <b>Option Card 1</b>                                   |     |     |                    |                    |       |          |          |                    |                   |       |                   |       |
| Without                                                |     |     | DR0                |                    |       |          |          |                    |                   |       |                   |       |
| 1 x Digital Input                                      |     |     | DRN                |                    |       |          |          |                    |                   |       |                   |       |
| 1 x Digital Output                                     |     |     | DRG                |                    |       |          |          |                    |                   |       |                   |       |
| 24 V DC transmitter loop power supply                  |     |     | DRT                |                    |       |          |          |                    |                   |       |                   |       |
| 1 x Analog Output passive (4...20mA)                   |     |     | DRA                |                    |       |          |          |                    |                   |       |                   |       |
| Modbus RTU                                             |     |     | DRM                |                    |       |          |          |                    |                   |       |                   |       |
| PROFIBUS DP                                            |     |     | DRD                |                    |       |          |          |                    |                   |       |                   |       |
| Standard-Ethernet                                      |     |     | DR6 <sup>17)</sup> |                    |       |          |          |                    |                   |       |                   |       |
| (Ethernet IP, PROFINET, Modbus TCP, Webserver)         |     |     |                    |                    |       |          |          |                    |                   |       |                   |       |
| Ethernet-APL (PROFINET, Modbus TCP, Webserver)         |     |     | DR7 <sup>34)</sup> |                    |       |          |          |                    |                   |       |                   |       |
| Profibus PA                                            |     |     | DRP <sup>18)</sup> |                    |       |          |          |                    |                   |       |                   |       |
| <b>Option Card 2</b>                                   |     |     |                    |                    |       |          |          |                    |                   |       |                   |       |
| Without                                                |     |     |                    | DS0                |       |          |          |                    |                   |       |                   |       |
| 1 x Analog Output passive (4 to 20 mA)                 |     |     |                    | DSA                |       |          |          |                    |                   |       |                   |       |
| 1 x Digital Input                                      |     |     |                    | DSN                |       |          |          |                    |                   |       |                   |       |
| 1 x Digital Output                                     |     |     |                    | DSG                |       |          |          |                    |                   |       |                   |       |
| Module Power over Ethernet/ Modbus TCP                 |     |     |                    | DS8 <sup>20)</sup> |       |          |          |                    |                   |       |                   |       |
| <b>Usage Certifications</b>                            |     |     |                    |                    |       |          |          |                    |                   |       |                   |       |
| Without                                                |     |     |                    |                    | C0    |          |          |                    |                   |       |                   |       |
| Inspection certificate 3.1 acc. EN 10204               |     |     |                    |                    | C2    |          |          |                    |                   |       |                   |       |
| Others                                                 |     |     |                    |                    | CZ    |          |          |                    |                   |       |                   |       |
| <b>Calibration Certifications</b>                      |     |     |                    |                    |       |          |          |                    |                   |       |                   |       |
| ABB Standard                                           |     |     |                    |                    |       | CMA      |          |                    |                   |       |                   |       |
| 3rd party witnessed calibration                        |     |     |                    |                    |       | CMW      |          |                    |                   |       |                   |       |
| 5-point calibration acc. to ISO17025                   |     |     |                    |                    |       | CMD      |          |                    |                   |       |                   |       |
| <b>Other Usage Certifications</b>                      |     |     |                    |                    |       |          |          |                    |                   |       |                   |       |
| Meter tube without PED certificate                     |     |     |                    |                    |       |          | CRA      |                    |                   |       |                   |       |
| <b>Potable Water and Food &amp; Beverage Approvals</b> |     |     |                    |                    |       |          |          |                    |                   |       |                   |       |
| Without                                                |     |     |                    |                    |       |          |          | CWY                |                   |       |                   |       |
| WRAS – Cold Water approval                             |     |     |                    |                    |       |          |          | CWA                |                   |       |                   |       |
| WRAS – 50 °C Water approval                            |     |     |                    |                    |       |          |          | CWN                |                   |       |                   |       |
| WRAS – 60 °C Water approval                            |     |     |                    |                    |       |          |          | CWK                |                   |       |                   |       |
| NSF-61 meter approval                                  |     |     |                    |                    |       |          |          | CWC <sup>23)</sup> |                   |       |                   |       |
| AZ / NZS 4020                                          |     |     |                    |                    |       |          |          | CWE                |                   |       |                   |       |
| <b>Sensor Length</b>                                   |     |     |                    |                    |       |          |          |                    |                   |       |                   |       |
| ABB Standard                                           |     |     |                    |                    |       |          |          |                    | J6 <sup>21)</sup> |       |                   |       |
| 1,0 x DN length (from DN 700 and up)                   |     |     |                    |                    |       |          |          |                    | JH <sup>22)</sup> |       |                   |       |
| <b>Other Options</b>                                   |     |     |                    |                    |       |          |          |                    |                   |       |                   |       |
| Without                                                |     |     |                    |                    |       |          |          |                    |                   |       | K0                |       |
| With Gore-tex membrane                                 |     |     |                    |                    |       |          |          |                    |                   |       | KG <sup>24)</sup> |       |

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| ProcessMaster FEW631                                                             | 7,8 | ... | 52,53 | 54,55,56 | 57,58,59 | 60,61,62 | 63,64,65 | 66,67,68           | 69,70,71 | 72,73 | 74,75,76 | ...                | 85,86 |
|----------------------------------------------------------------------------------|-----|-----|-------|----------|----------|----------|----------|--------------------|----------|-------|----------|--------------------|-------|
| <b>Documentation Language</b>                                                    |     |     |       |          |          |          |          |                    |          |       |          |                    |       |
| German                                                                           |     |     | M1    |          |          |          |          |                    |          |       |          |                    |       |
| English                                                                          |     |     | M5    |          |          |          |          |                    |          |       |          |                    |       |
| Language Pack Western Europe<br>(FR, ES, IT, NL, PT, SV, FI, DK)                 |     |     | MW    |          |          |          |          |                    |          |       |          |                    |       |
| Language Pack Eastern Europe<br>(EL, CS, ET, HU, HR, LT, LV, PL, SK, SL, RO, BG) |     |     | ME    |          |          |          |          |                    |          |       |          |                    |       |
| <b>Tests and Reports</b>                                                         |     |     |       |          |          |          |          |                    |          |       |          |                    |       |
| Without                                                                          |     |     |       | CR0      |          |          |          |                    |          |       |          |                    |       |
| Pressure test acc. to DIN                                                        |     |     |       | CPD      |          |          |          |                    |          |       |          |                    |       |
| <b>Sensor housing Material</b>                                                   |     |     |       |          |          |          |          |                    |          |       |          |                    |       |
| Standard                                                                         |     |     |       |          | SMA      |          |          |                    |          |       |          |                    |       |
| <b>Configuration Type</b>                                                        |     |     |       |          |          |          |          |                    |          |       |          |                    |       |
| Parameters set to factory defaults                                               |     |     |       |          |          | NC1      |          |                    |          |       |          |                    |       |
| Parameters set customer specific                                                 |     |     |       |          |          | NCC      |          |                    |          |       |          |                    |       |
| <b>Transmitter Software Function Package</b>                                     |     |     |       |          |          |          |          |                    |          |       |          |                    |       |
| Standard                                                                         |     |     |       |          |          |          | NFS      |                    |          |       |          |                    |       |
| Enhanced diagnostics                                                             |     |     |       |          |          |          | NFE      |                    |          |       |          |                    |       |
| <b>Calibration Type</b>                                                          |     |     |       |          |          |          |          |                    |          |       |          |                    |       |
| 0.4 % Factory Calibration                                                        |     |     |       |          |          |          |          | RCD <sup>25)</sup> |          |       |          |                    |       |
| 0.3 % Factory Calibration (Option)                                               |     |     |       |          |          |          |          | RCE <sup>26)</sup> |          |       |          |                    |       |
| 0.2 % Factory Calibration (Option)                                               |     |     |       |          |          |          |          | RCB <sup>27)</sup> |          |       |          |                    |       |
| <b>Signal Cable</b>                                                              |     |     |       |          |          |          |          |                    |          |       |          |                    |       |
| Without                                                                          |     |     |       |          |          |          |          |                    | SC0      |       |          |                    |       |
| <b>Device Identification Plate</b>                                               |     |     |       |          |          |          |          |                    |          |       |          |                    |       |
| Adhesive label                                                                   |     |     |       |          |          |          |          |                    |          | TC    |          |                    |       |
| Stainless steel                                                                  |     |     |       |          |          |          |          |                    |          | T1    |          |                    |       |
| Stainless steel and TAG plate (stainless steel)                                  |     |     |       |          |          |          |          |                    |          | TS    |          |                    |       |
| Others                                                                           |     |     |       |          |          |          |          |                    |          | TZ    |          |                    |       |
| <b>Temperature Range of Installation / Ambient</b>                               |     |     |       |          |          |          |          |                    |          |       |          |                    |       |
| <b>Temperature Range</b>                                                         |     |     |       |          |          |          |          |                    |          |       |          |                    |       |
| Standard design / -20 to 60 °C (-4 to 140 °F)                                    |     |     |       |          |          |          |          |                    |          |       |          | TK1 <sup>28)</sup> |       |

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... Ordering Information

... ProcessMaster FEW631

| ProcessMaster FEW631                                                      |  |  |  |  |  |  | 7,8                 | ... | 77,78,79 | 80,81 | 82,83,84 | 85,86 |
|---------------------------------------------------------------------------|--|--|--|--|--|--|---------------------|-----|----------|-------|----------|-------|
| Number of Testpoints                                                      |  |  |  |  |  |  |                     |     |          |       |          |       |
| 2 Points                                                                  |  |  |  |  |  |  | TV2 <sup>29)</sup>  |     |          |       |          |       |
| 3 Points                                                                  |  |  |  |  |  |  | TV3 <sup>29)</sup>  |     |          |       |          |       |
| 5 Points                                                                  |  |  |  |  |  |  | TV5 <sup>30)</sup>  |     |          |       |          |       |
| Verification Capability                                                   |  |  |  |  |  |  |                     |     |          |       |          |       |
| Enabled                                                                   |  |  |  |  |  |  | V1                  |     |          |       |          |       |
| Communication options activated                                           |  |  |  |  |  |  |                     |     |          |       |          |       |
| Ethernet IP                                                               |  |  |  |  |  |  | GCE <sup>31)</sup>  |     |          |       |          |       |
| Modbus TCP                                                                |  |  |  |  |  |  | GCM <sup>31)</sup>  |     |          |       |          |       |
| Webserver                                                                 |  |  |  |  |  |  | GCW <sup>31)</sup>  |     |          |       |          |       |
| PROFINET                                                                  |  |  |  |  |  |  | GCP <sup>32)</sup>  |     |          |       |          |       |
| Connector type                                                            |  |  |  |  |  |  |                     |     |          |       |          |       |
| Without                                                                   |  |  |  |  |  |  | U0                  |     |          |       |          |       |
| 1 x M12 Plug for Ethernet 1 Port (4 Signal Leads)                         |  |  |  |  |  |  | U3 <sup>33)</sup> E |     |          |       |          |       |
| 2 x M12 Plug for Ethernet 2 Port (4 Signal Leads)                         |  |  |  |  |  |  | UF <sup>33)</sup>   |     |          |       |          |       |
| 1 x M12 Plug for Ethernet 1 Port (8 Signal Leads)                         |  |  |  |  |  |  | UG <sup>33)</sup>   |     |          |       |          |       |
| 1 x RJ45 connector with 5 m (15 ft) cable length fitted (4 Signal Leads)  |  |  |  |  |  |  | U5 <sup>33)</sup>   |     |          |       |          |       |
| 2 x RJ45 connector with 5 m (15 ft) cable length fitted (4 Signal Leads)  |  |  |  |  |  |  | UB <sup>33)</sup>   |     |          |       |          |       |
| 1 x RJ45 connector with 5 m (15 ft) cable length fitted (8 Signal Leads)  |  |  |  |  |  |  | UC <sup>33)</sup>   |     |          |       |          |       |
| 1 x RJ45 connector with 10 m (30 ft) cable length fitted (4 Signal Leads) |  |  |  |  |  |  | U6 <sup>33)</sup>   |     |          |       |          |       |
| 2 x RJ45 connector with 10 m (30 ft) cable length fitted (4 Signal Leads) |  |  |  |  |  |  | UD <sup>33)</sup>   |     |          |       |          |       |
| 1 x RJ45 connector with 10 m (30 ft) cable length fitted (8 Signal Leads) |  |  |  |  |  |  | UH <sup>33)</sup>   |     |          |       |          |       |
| 1 x RJ45 connector with 15 m (49 ft) cable length fitted (4 Signal Leads) |  |  |  |  |  |  | U7 <sup>33)</sup>   |     |          |       |          |       |
| 2 x RJ45 connector with 15 m (49 ft) cable length fitted (4 Signal Leads) |  |  |  |  |  |  | UJ <sup>33)</sup>   |     |          |       |          |       |
| 1 x RJ45 connector with 15 m (49 ft) cable length fitted (8 Signal Leads) |  |  |  |  |  |  | UK <sup>33)</sup>   |     |          |       |          |       |
| 1 x RJ45 connector with 20 m (66 ft) cable length fitted (4 Signal Leads) |  |  |  |  |  |  | U8 <sup>33)</sup>   |     |          |       |          |       |
| 2 x RJ45 connector with 20 m (66 ft) cable length fitted (4 Signal Leads) |  |  |  |  |  |  | UN <sup>33)</sup>   |     |          |       |          |       |
| 1 x RJ45 connector with 20 m (66 ft) cable length fitted (8 Signal Leads) |  |  |  |  |  |  | UP <sup>33)</sup>   |     |          |       |          |       |
| Fieldbus M12x1 (for Profibus PA)                                          |  |  |  |  |  |  | UR <sup>24)</sup>   |     |          |       |          |       |

## Notes for ProcessMaster FEW631

- 1) In preparation.
- 2) FM Cl1 Div 2 available; FM Cl1 Zone 1 in preparation.
- 3) Not available with Zone 1 / Div 1.
- 4) From DN 400 (16 in) and up, sensors are equipped with flanges to DIN.  
Below DN 450 (18 in), sensor flanges are based on EN1092
- 5) Available from DN 200 (8 in).
- 6) Flange DN 15 to 600 (½ to 24 in) according to ASME B16.5.  
Flange > DN 600 (24 in) according to ASME 16.47 Serie B.
- 7) Available from DN 700 (28 in) onwards.
- 8) Available up to DN 1000 (40 in).
- 9) Hard rubber (Material: SP402).
- 10) Material: Refer to data sheet.
- 11) Available from DN 25 to 400 (1 to 16 in).
- 12) Grounding electrodes, material same as measuring electrodes material.  
Available from DN 25 to 400 (1 to 16 in).
- 13) Current output 4 to 20 mA active or 4 to 20 mA passive can be configured on site.
- 14) To be configured in conjunction with Option Card 1 = Modbus RTU.
- 15) To be configured in conjunction with Option Card 1 = Profibus DP.
- 16) To be configured in conjunction with Option Card 1 = Ethernet IP, Modbus TCP. For Ethernet IP or Modbus TCP or PROFINET, specify the option for Ethernet. Specify the communication protocol to enable under model code "Communication Options activated".
- 17) Will be specified by ABB.
- 18) Available with single compartment housing only, Non-Ex or Zone 2, Div. 2 only.
- 19) Available from Shanghai factory.
- 20) Available with single compartment housing only and with 24 V power supply specified and with Outputs Code E2, E3 or E2.
- 21) To specify for sizes DN 25 to 600 (1 to 24 in).  
Optional from DN 700 (28 in) onwards.
- 22) Default for sizes DN 700 (28 in) and onwards.
- 23) Available for DN 40 to 2400 (1½ to 96 in).
- 24) Available with Non Ex only.
- 25) 2 points calibration is Standard. If more than 2 testpoints are required, please specify 3 or 5 points with option "Number of Testpoints".
- 26) 3 or 5 test points to be specified.
- 27) Not available with size > DN 900 (36 in). 0,2% calibration assumes 3 calibration points. If more than 3 calibration points are required, specify 5 points under "Number of test points".
- 28) Max. fluid temperature with hard rubber is 80 °C (176 °F).
- 29) not available with calibration acc. ISO17025.
- 30) To be specified in conjunction with calibration acc. ISO17025.
- 31) Specify the communication protocol to enable from the factory. It can be altered on site. Ethernet Card required.
- 32) Specify the communication protocol to enable from the factory. It can be altered on site. Ethernet Card required. Not available if Ethernet (Code GCE) is specified.
- 33) Available with Non-Ex or Div 2.
- 34) Available with dual compartment housing only, Ethernet-APL is in preparation.

... Ordering Information

ProcessMaster FEW632

Electromagnetic Flowmeter system, remote mount design (ABB Part No.: 3KXF242632V)

| ProcessMaster FEW632                                             | 7,8 | 9,10             | 11,12,13,14        | ... 84,85,86 |
|------------------------------------------------------------------|-----|------------------|--------------------|--------------|
| <b>Explosion Protection Certification</b>                        |     |                  |                    |              |
| Without, Flowmeter based on CE Standard                          | Y0  |                  |                    |              |
| ATEX / IEC Ex (Zone 1 / 21)                                      | A1  |                  |                    |              |
| ATEX / IEC Ex (Zone 2 / 22)                                      | A2  |                  |                    |              |
| cFMus Class 1 Div. 1 (Zone 1 / 21)                               | F1  |                  |                    |              |
| cFMus Class 1 Div. 2 (Zone 2 / 22)                               | F2  |                  |                    |              |
| General Purpose FM3810, ANSI/UL 61010                            | G1  |                  |                    |              |
| <b>Housing Type / Housing Material / Thread for Cable Glands</b> |     |                  |                    |              |
| Remote / Plastic / M20 x 1.5                                     |     | p1 <sup>1)</sup> |                    |              |
| Remote / Plastic / NPT ½ in                                      |     | p2 <sup>1)</sup> |                    |              |
| Remote / Aluminum / M20 x 1.5                                    |     | A1               |                    |              |
| Remote / Aluminum / NPT ½ in                                     |     | A2               |                    |              |
| <b>Meter size</b>                                                |     |                  |                    |              |
| DN 25 (1 in)                                                     |     |                  | 0025 <sup>2)</sup> |              |
| DN 32 (1¼ in)                                                    |     |                  | 0032 <sup>2)</sup> |              |
| DN 40 (1½ in)                                                    |     |                  | 0040               |              |
| DN 50 (2 in)                                                     |     |                  | 0050               |              |
| DN 65 (2½ in)                                                    |     |                  | 0065               |              |
| DN 80 (3 in)                                                     |     |                  | 0080               |              |
| DN 100 (4 in)                                                    |     |                  | 0100               |              |
| DN 125 (5 in)                                                    |     |                  | 0125               |              |
| DN 150 (6 in)                                                    |     |                  | 0150               |              |
| DN 200 (8 in)                                                    |     |                  | 0200               |              |
| DN 250 (10 in)                                                   |     |                  | 0250               |              |
| DN 300 (12 in)                                                   |     |                  | 0300               |              |
| DN 350 (14 in)                                                   |     |                  | 0350               |              |
| DN 400 (16 in)                                                   |     |                  | 0400               |              |
| DN 450 (18 in)                                                   |     |                  | 0450               |              |
| DN 500 (20 in)                                                   |     |                  | 0500               |              |
| DN 600 (24 in)                                                   |     |                  | 0600               |              |
| DN 700 (28 in)                                                   |     |                  | 0700               |              |
| DN 750 (30 in)                                                   |     |                  | 0750               |              |
| DN 800 (32 in)                                                   |     |                  | 0800               |              |
| DN 900 (36 in)                                                   |     |                  | 0900               |              |
| DN 1000 (40 in)                                                  |     |                  | 1000               |              |
| DN 1050 (42 in)                                                  |     |                  | 1050               |              |

Continued on next page

|                                                                  |  | ProcessMaster FEW632 | 7,8 | ... | 11,12,13,14 | 15,16            | 17,18            | ... | 84,85,86 |
|------------------------------------------------------------------|--|----------------------|-----|-----|-------------|------------------|------------------|-----|----------|
| <b>Meter size (continuation)</b>                                 |  |                      |     |     |             |                  |                  |     |          |
| DN 1100 (44 in)                                                  |  |                      |     |     | 1100        |                  |                  |     |          |
| DN 1200 (48 in)                                                  |  |                      |     |     | 1200        |                  |                  |     |          |
| DN 1350 (54 in)                                                  |  |                      |     |     | 1350        |                  |                  |     |          |
| DN 1400 (54 in)                                                  |  |                      |     |     | 1400        |                  |                  |     |          |
| DN 1500 (60 in)                                                  |  |                      |     |     | 1500        |                  |                  |     |          |
| DN 1600 (66 in)                                                  |  |                      |     |     | 1600        |                  |                  |     |          |
| DN 1650 (66 in)                                                  |  |                      |     |     | 1650        |                  |                  |     |          |
| DN 1800 (72 in)                                                  |  |                      |     |     | 1800        |                  |                  |     |          |
| DN 2000 (80 in)                                                  |  |                      |     |     | 2000        |                  |                  |     |          |
| DN 2100 (84 in)                                                  |  |                      |     |     | 2100        |                  |                  |     |          |
| DN 2200 (88 in)                                                  |  |                      |     |     | 2200        |                  |                  |     |          |
| DN 2400 (96 in)                                                  |  |                      |     |     | 2400        |                  |                  |     |          |
| <b>Process Connection Type</b>                                   |  |                      |     |     |             |                  |                  |     |          |
| EN 1092-1, DIN PN 6                                              |  |                      |     |     |             | S0 <sup>3)</sup> |                  |     |          |
| EN 1092-1, DIN PN 10                                             |  |                      |     |     |             | S1 <sup>3)</sup> |                  |     |          |
| EN 1092-1, DIN PN 16                                             |  |                      |     |     |             | S2 <sup>3)</sup> |                  |     |          |
| EN 1092-1, DIN PN 25                                             |  |                      |     |     |             | S3 <sup>3)</sup> |                  |     |          |
| EN 1092-1, DIN PN 40                                             |  |                      |     |     |             | S4 <sup>3)</sup> |                  |     |          |
| Flanges ASME CL 150 B16.5 up to DN 600, B16.47 series B > DN 600 |  |                      |     |     |             | A1 <sup>4)</sup> |                  |     |          |
| Flanges ASME CL 300 B16.5 up to DN 600, B16.47 series B > DN 600 |  |                      |     |     |             | A3 <sup>4)</sup> |                  |     |          |
| Flanges ASME CL 150; B16.47 series A > DN 600                    |  |                      |     |     |             | B1 <sup>7)</sup> |                  |     |          |
| Flanges ASME CL 300; B16.47 series A > DN 600                    |  |                      |     |     |             | B3               |                  |     |          |
| Flanges JIS 5K                                                   |  |                      |     |     |             | J2 <sup>5)</sup> |                  |     |          |
| Flanges JIS 10K                                                  |  |                      |     |     |             | J1 <sup>5)</sup> |                  |     |          |
| Flanges AS 4087 PN16                                             |  |                      |     |     |             | E1               |                  |     |          |
| Flanges AS 4087 PN35                                             |  |                      |     |     |             | E8               |                  |     |          |
| Flanges AS2129 table E                                           |  |                      |     |     |             | E4               |                  |     |          |
| Flanges AS2129 table D                                           |  |                      |     |     |             | E5               |                  |     |          |
| Flanges AWWA C207 Class B                                        |  |                      |     |     |             | C1               |                  |     |          |
| Flanges AWWA C207 Class D                                        |  |                      |     |     |             | C2               |                  |     |          |
| Flanges AWWA C207 Class E                                        |  |                      |     |     |             | C3               |                  |     |          |
| Others                                                           |  |                      |     |     |             | Z9               |                  |     |          |
| <b>Liner Material</b>                                            |  |                      |     |     |             |                  |                  |     |          |
| Hard rubber                                                      |  |                      |     |     |             |                  | R2 <sup>6)</sup> |     |          |
| Others                                                           |  |                      |     |     |             |                  | Z9               |     |          |

Continued on next page

## ... Ordering Information

### ... ProcessMaster FEW632

| ProcessMaster FEW632                                          | 7,8 | ... | 19              | 20              | 21 | 22              | 23 | 24,25             | 26 | 27 | 28,29 | 30               | .. 84,85,86 |
|---------------------------------------------------------------|-----|-----|-----------------|-----------------|----|-----------------|----|-------------------|----|----|-------|------------------|-------------|
| <b>Process Connection Material</b>                            |     |     |                 |                 |    |                 |    |                   |    |    |       |                  |             |
| Carbon steel                                                  |     |     | B <sup>7)</sup> |                 |    |                 |    |                   |    |    |       |                  |             |
| Stainless steel <sup>10)</sup>                                |     |     | C <sup>7)</sup> |                 |    |                 |    |                   |    |    |       |                  |             |
| Others                                                        |     |     | Z               |                 |    |                 |    |                   |    |    |       |                  |             |
| <b>Electrode Design</b>                                       |     |     |                 |                 |    |                 |    |                   |    |    |       |                  |             |
| Standard                                                      |     |     |                 | 1               |    |                 |    |                   |    |    |       |                  |             |
| Pointed head                                                  |     |     |                 | 5 <sup>8)</sup> |    |                 |    |                   |    |    |       |                  |             |
| Others                                                        |     |     |                 | 9               |    |                 |    |                   |    |    |       |                  |             |
| <b>Measuring Electrodes Material</b>                          |     |     |                 |                 |    |                 |    |                   |    |    |       |                  |             |
| Hast. C-4 (2.4610)                                            |     |     |                 |                 | D  |                 |    |                   |    |    |       |                  |             |
| Stainless steel 316Ti (1.4571)                                |     |     |                 |                 | S  |                 |    |                   |    |    |       |                  |             |
| Hast. C-22                                                    |     |     |                 |                 | C  |                 |    |                   |    |    |       |                  |             |
| Others                                                        |     |     |                 |                 | Z  |                 |    |                   |    |    |       |                  |             |
| <b>Grounding Electrode / Full Pipe Detection</b>              |     |     |                 |                 |    |                 |    |                   |    |    |       |                  |             |
| No grounding electrode / No full pipe detection               |     |     |                 |                 |    | 0               |    |                   |    |    |       |                  |             |
| Grounding electrode / No full pipe detection                  |     |     |                 |                 |    | 2 <sup>9)</sup> |    |                   |    |    |       |                  |             |
| Others                                                        |     |     |                 |                 |    | 9               |    |                   |    |    |       |                  |             |
| <b>Grounding Accessories</b>                                  |     |     |                 |                 |    |                 |    |                   |    |    |       |                  |             |
| Without                                                       |     |     |                 |                 |    |                 | A  |                   |    |    |       |                  |             |
| Grounding Ring (1off), stainless steel, loose Item            |     |     |                 |                 |    |                 | D  |                   |    |    |       |                  |             |
| Grounding Ring (2off), stainless steel, loose Item            |     |     |                 |                 |    |                 | E  |                   |    |    |       |                  |             |
| Others                                                        |     |     |                 |                 |    |                 | Z  |                   |    |    |       |                  |             |
| <b>Protection Class Transmitter / Protection Class Sensor</b> |     |     |                 |                 |    |                 |    |                   |    |    |       |                  |             |
| IP 67 / IP 67                                                 |     |     |                 |                 |    |                 |    | 70                |    |    |       |                  |             |
| Standard / IP 68                                              |     |     |                 |                 |    |                 |    | 76 <sup>10)</sup> |    |    |       |                  |             |
| Standard / IP 68 cable fitted+potted                          |     |     |                 |                 |    |                 |    | 77                |    |    |       |                  |             |
| <b>Power Supply</b>                                           |     |     |                 |                 |    |                 |    |                   |    |    |       |                  |             |
| Without                                                       |     |     |                 |                 |    |                 |    |                   | Y  |    |       |                  |             |
| <b>Display</b>                                                |     |     |                 |                 |    |                 |    |                   |    |    |       |                  |             |
| Without                                                       |     |     |                 |                 |    |                 |    |                   |    | 0  |       |                  |             |
| <b>Outputs</b>                                                |     |     |                 |                 |    |                 |    |                   |    |    |       |                  |             |
| Without                                                       |     |     |                 |                 |    |                 |    |                   |    |    | Y0    |                  |             |
| <b>Design Level</b>                                           |     |     |                 |                 |    |                 |    |                   |    |    |       |                  |             |
| Design Level A                                                |     |     |                 |                 |    |                 |    |                   |    |    |       | A <sup>11)</sup> |             |

Continued on next page

| ProcessMaster FEW632 7,8 ... 31,32,33 34,35,36 37,38 39,40,41 42,43,44 45,46 47,48,49 50,51 52,53 ... 84,85,86 |  |  |     |    |  |     |     |                   |                    |                   |                  |  |
|----------------------------------------------------------------------------------------------------------------|--|--|-----|----|--|-----|-----|-------------------|--------------------|-------------------|------------------|--|
| <b>Option Card 1</b>                                                                                           |  |  | DRO |    |  |     |     |                   |                    |                   |                  |  |
| Without                                                                                                        |  |  |     |    |  |     |     |                   |                    |                   |                  |  |
| <b>Option Card 2</b>                                                                                           |  |  | DSO |    |  |     |     |                   |                    |                   |                  |  |
| Without                                                                                                        |  |  |     |    |  |     |     |                   |                    |                   |                  |  |
| <b>Usage Certifications</b>                                                                                    |  |  |     |    |  |     |     |                   |                    |                   |                  |  |
| Without                                                                                                        |  |  |     | C0 |  |     |     |                   |                    |                   |                  |  |
| Inspection certificate 3.1 acc. EN 10204                                                                       |  |  |     | C2 |  |     |     |                   |                    |                   |                  |  |
| Others                                                                                                         |  |  |     | CZ |  |     |     |                   |                    |                   |                  |  |
| <b>Calibration Certifications</b>                                                                              |  |  |     |    |  |     |     |                   |                    |                   |                  |  |
| ABB Standard                                                                                                   |  |  |     |    |  | CMA |     |                   |                    |                   |                  |  |
| 3rd party witnessed calibration                                                                                |  |  |     |    |  | CMW |     |                   |                    |                   |                  |  |
| 5-point calibration acc. to ISO17025                                                                           |  |  |     |    |  | CMD |     |                   |                    |                   |                  |  |
| <b>Other Usage Certifications</b>                                                                              |  |  |     |    |  |     |     |                   |                    |                   |                  |  |
| Meter tube without PED certificate                                                                             |  |  |     |    |  |     | CRA |                   |                    |                   |                  |  |
| <b>Power Supply Line Frequency</b>                                                                             |  |  |     |    |  |     |     |                   |                    |                   |                  |  |
| 50 Hz                                                                                                          |  |  |     |    |  |     |     | F5 <sup>12)</sup> |                    |                   |                  |  |
| 60 Hz                                                                                                          |  |  |     |    |  |     |     | F6 <sup>13)</sup> |                    |                   |                  |  |
| <b>Potable Water and Food &amp; Beverage Approvals</b>                                                         |  |  |     |    |  |     |     |                   |                    |                   |                  |  |
| Without                                                                                                        |  |  |     |    |  |     |     |                   | CWY                |                   |                  |  |
| WRAS – Cold Water approval                                                                                     |  |  |     |    |  |     |     |                   | CWA                |                   |                  |  |
| WRAS – 50 °C Water approval                                                                                    |  |  |     |    |  |     |     |                   | CWN                |                   |                  |  |
| WRAS – 60 °C Water approval                                                                                    |  |  |     |    |  |     |     |                   | CWK                |                   |                  |  |
| NSF-61 meter approval                                                                                          |  |  |     |    |  |     |     |                   | CWC <sup>14)</sup> |                   |                  |  |
| AZ / NZS 4020                                                                                                  |  |  |     |    |  |     |     |                   | CWE                |                   |                  |  |
| <b>Sensor Length</b>                                                                                           |  |  |     |    |  |     |     |                   |                    |                   |                  |  |
| ABB Standard                                                                                                   |  |  |     |    |  |     |     |                   |                    | J6 <sup>15)</sup> |                  |  |
| 1,0 x DN length (from DN 700 and up)                                                                           |  |  |     |    |  |     |     |                   |                    | JH <sup>16)</sup> |                  |  |
| <b>Other Options</b>                                                                                           |  |  |     |    |  |     |     |                   |                    |                   |                  |  |
| Without                                                                                                        |  |  |     |    |  |     |     |                   |                    |                   | K0               |  |
| With Gore-tex membrane                                                                                         |  |  |     |    |  |     |     |                   |                    |                   | KG <sup>1)</sup> |  |

Continued on next page

## ... Ordering Information

### ... ProcessMaster FEW632

| ProcessMaster FEW632                                                  | 7,8 | ... | 54,55 | 56,57,58 | 59,60,61 | 62,63,64 | 65,66,67 | 68,69,70           | 71,72,73 | 74,75 | 76,77,78           | ... 84,85,86 |
|-----------------------------------------------------------------------|-----|-----|-------|----------|----------|----------|----------|--------------------|----------|-------|--------------------|--------------|
| <b>Documentation Language</b>                                         |     |     |       |          |          |          |          |                    |          |       |                    |              |
| German                                                                |     |     | M1    |          |          |          |          |                    |          |       |                    |              |
| English                                                               |     |     | M5    |          |          |          |          |                    |          |       |                    |              |
| Language Pack Western Europe<br>(FR,ES,IT,NL,PT,SV,FI,DK)             |     |     | MW    |          |          |          |          |                    |          |       |                    |              |
| Language Pack Eastern Europe<br>(EL,CS,ET,HU,HR,LT,LV,PL,SK,SL,RO,BG) |     |     | ME    |          |          |          |          |                    |          |       |                    |              |
| <b>Tests and Reports</b>                                              |     |     |       |          |          |          |          |                    |          |       |                    |              |
| Without                                                               |     |     |       | CRO      |          |          |          |                    |          |       |                    |              |
| Pressure test acc. to DIN                                             |     |     |       | CPD      |          |          |          |                    |          |       |                    |              |
| <b>Sensor housing Material</b>                                        |     |     |       |          |          |          |          |                    |          |       |                    |              |
| Standard                                                              |     |     |       |          | SMA      |          |          |                    |          |       |                    |              |
| <b>Configuration Type</b>                                             |     |     |       |          |          |          |          |                    |          |       |                    |              |
| Parameters set to factory defaults                                    |     |     |       |          |          | NC1      |          |                    |          |       |                    |              |
| Parameters set customer specific                                      |     |     |       |          |          | NCC      |          |                    |          |       |                    |              |
| <b>Transmitter Software Function Package</b>                          |     |     |       |          |          |          |          |                    |          |       |                    |              |
| Standard                                                              |     |     |       |          |          |          | NFS      |                    |          |       |                    |              |
| Enhanced diagnostics                                                  |     |     |       |          |          |          | NFE      |                    |          |       |                    |              |
| <b>Calibration Type</b>                                               |     |     |       |          |          |          |          |                    |          |       |                    |              |
| 0.4 % Factory Calibration                                             |     |     |       |          |          |          |          | RCD <sup>17)</sup> |          |       |                    |              |
| 0.3 % Factory Calibration (Option)                                    |     |     |       |          |          |          |          | RCE <sup>18)</sup> |          |       |                    |              |
| 0.2 % Factory Calibration (Option)                                    |     |     |       |          |          |          |          | RCB <sup>19)</sup> |          |       |                    |              |
| <b>Signal Cable</b>                                                   |     |     |       |          |          |          |          |                    |          |       |                    |              |
| Without                                                               |     |     |       |          |          |          |          |                    | SC0      |       |                    |              |
| 5 m (approx. 15 ft)                                                   |     |     |       |          |          |          |          |                    | SC1      |       |                    |              |
| 10 m (approx. 30 ft)                                                  |     |     |       |          |          |          |          |                    | SC2      |       |                    |              |
| 15 m (approx. 49 ft)                                                  |     |     |       |          |          |          |          |                    | SC3      |       |                    |              |
| 20 m (approx. 66 ft)                                                  |     |     |       |          |          |          |          |                    | SC4      |       |                    |              |
| 25 m (approx. 82 ft)                                                  |     |     |       |          |          |          |          |                    | SC5      |       |                    |              |
| 30 m (approx. 98 ft)                                                  |     |     |       |          |          |          |          |                    | SC6      |       |                    |              |
| 35 m (approx. 115 ft)                                                 |     |     |       |          |          |          |          |                    | SC7      |       |                    |              |
| 40 m (approx. 131 ft)                                                 |     |     |       |          |          |          |          |                    | SC8      |       |                    |              |
| 50 m (approx. 164 ft)                                                 |     |     |       |          |          |          |          |                    | SCA      |       |                    |              |
| 60 m (approx. 197 ft)                                                 |     |     |       |          |          |          |          |                    | SCB      |       |                    |              |
| 70 m (approx. 230 ft)                                                 |     |     |       |          |          |          |          |                    | SCC      |       |                    |              |
| 80 m (approx. 262 ft)                                                 |     |     |       |          |          |          |          |                    | SCD      |       |                    |              |
| 100 m (approx. 328 ft)                                                |     |     |       |          |          |          |          |                    | SCE      |       |                    |              |
| 125 m (approx. 410 ft)                                                |     |     |       |          |          |          |          |                    | SCF      |       |                    |              |
| 150 m (approx. 492 ft)                                                |     |     |       |          |          |          |          |                    | SCG      |       |                    |              |
| 175 m (approx. 574 ft)                                                |     |     |       |          |          |          |          |                    | SCH      |       |                    |              |
| 200 m (approx. 656 ft)                                                |     |     |       |          |          |          |          |                    | SCJ      |       |                    |              |
| <b>Device Identification Plate</b>                                    |     |     |       |          |          |          |          |                    |          |       |                    |              |
| Adhesive label                                                        |     |     |       |          |          |          |          |                    |          | TC    |                    |              |
| Stainless steel                                                       |     |     |       |          |          |          |          |                    |          | T1    |                    |              |
| Stainless steel and TAG plate (stainless steel)                       |     |     |       |          |          |          |          |                    |          | TS    |                    |              |
| Others                                                                |     |     |       |          |          |          |          |                    |          | TZ    |                    |              |
| <b>Temperature Range of Installation / Ambient</b>                    |     |     |       |          |          |          |          |                    |          |       |                    |              |
| <b>Temperature Range</b>                                              |     |     |       |          |          |          |          |                    |          |       |                    |              |
| Standard design / -20 ... 60 °C (-4 ... 140 °F)                       |     |     |       |          |          |          |          |                    |          |       | TK1 <sup>20)</sup> |              |

Continued on next page

|                                        | ProcessMaster FEW632 | 7,8 | ... | 79,80,81           | 82,83 | 84,85,86           |
|----------------------------------------|----------------------|-----|-----|--------------------|-------|--------------------|
| <b>Number of Testpoints</b>            |                      |     |     |                    |       |                    |
| 2 Points                               |                      |     |     | TV2 <sup>21)</sup> |       |                    |
| 3 Points                               |                      |     |     | TV3 <sup>21)</sup> |       |                    |
| 5 Points                               |                      |     |     | TV5 <sup>22)</sup> |       |                    |
| <b>Verification Capability</b>         |                      |     |     |                    |       |                    |
| Enabled                                |                      |     |     |                    | V1    |                    |
| <b>Communication options activated</b> |                      |     |     |                    |       |                    |
| Ethernet IP                            |                      |     |     |                    |       | GCE <sup>23)</sup> |
| Modbus TCP                             |                      |     |     |                    |       | GCM <sup>23)</sup> |
| Webserver                              |                      |     |     |                    |       | GCW <sup>23)</sup> |
| PROFINET                               |                      |     |     |                    |       | GCP <sup>24)</sup> |

### Notes for ProcessMaster FEW632

- 1) Available with Non Ex only.
- 2) In preparation.
- 3) From DN450 and up, sensors are equipped with flanges to DIN. Below DN450, sensor flanges are based on EN1092.
- 4) Flange DN 15 to 600 according to ASME B16.5. Flange > DN 600 according to ASME 16.47 Serie B.
- 5) Available up to DN 1000 (40 in).
- 6) Hard rubber (Material) SP402).
- 7) Material: Refer to data sheet.
- 8) Available from DN 25 to 400.
- 9) Grounding electrodes, material same as measuring electrodes material. Available from DN 25 to 400.
- 10) Potting Kit for on-site potting (Optional) Part No.: 3KXF094102L0001.
- 11) Will be specified by ABB.
- 12) 50 Hz (to be specified in case no Tx is ordered).
- 13) 60 Hz (to be specified in case no Tx is ordered).
- 14) Available for DN 40 to 2400.
- 15) To specify for sizes DN 25 to 600. Optional from DN 700 (28 in) onwards.
- 16) Default for sizes DN 700 (28 in) and onwards.
- 17) 2 points calibration is Standard. If more than 2 testpoints are required, please specify 3 or 5 points with option 'Number of Testpoints'.
- 18) 3 or 5 test points to be specified.
- 19) Not available with size > DN 900. 0.2 % calibration assumes 3 calibration points. If more than 3 calibration points are required, specify 5 points under "Number of test points".
- 20) Max. fluid temperature with hard rubber is 80 °C (176 °F).
- 21) Not available with calibration acc. ISO17025.
- 22) To be specified in conjunction with calibration acc. ISO17025.
- 23) Specify the communication protocol to enable from the factory. It can be altered on site. Ethernet Card required.
- 24) Specify the communication protocol to enable from the factory. It can be altered on site. Ethernet Card required. Not available if Ethernet (Code GCE) is specified.

## ... Ordering Information

### ProcessMaster FET632

for ProcessMaster FEW630 Sensor

| ProcessMaster FET632                                                                                      | 7,8              | 9,10             | 11,12 | 13 | 14 | 15,16             | ... 44,45 |
|-----------------------------------------------------------------------------------------------------------|------------------|------------------|-------|----|----|-------------------|-----------|
| <b>Explosion Protection Certification</b>                                                                 |                  |                  |       |    |    |                   |           |
| Without, Flowmeter based on CE Standard                                                                   | Y0               |                  |       |    |    |                   |           |
| ATEX / IEC Ex (Zone 1 / 21)                                                                               | A1               |                  |       |    |    |                   |           |
| ATEX / IEC Ex (Zone 2 / 22)                                                                               | A2               |                  |       |    |    |                   |           |
| cFMus Class 1 Div. 1 (Zone 1 / 21)                                                                        | F1               |                  |       |    |    |                   |           |
| cFMus Class 1 Div. 2 (Zone 2 / 22)                                                                        | F2 <sup>3)</sup> |                  |       |    |    |                   |           |
| General Purpose FM3810, ANSI/UL 61010                                                                     | G1               |                  |       |    |    |                   |           |
| <b>Housing Type / Housing Material / Thread for Cable Glands</b>                                          |                  |                  |       |    |    |                   |           |
| Field-mount / Single compartment / Aluminum / 4 x M20 x 1.5                                               |                  | F1 <sup>3)</sup> |       |    |    |                   |           |
| Field-mount / Single compartment / Aluminum / 4 x NPT ½ in                                                |                  | F2 <sup>3)</sup> |       |    |    |                   |           |
| Wall-mount / Dual compartment / Aluminum / M20 x 1.5                                                      |                  | W1 <sup>3)</sup> |       |    |    |                   |           |
| Wall-mount / Dual compartment / Aluminum / NPT ½ in                                                       |                  | W2 <sup>3)</sup> |       |    |    |                   |           |
| <b>Protection Class Transmitter / Protection Class Sensor</b>                                             |                  |                  |       |    |    |                   |           |
| IP 67 / IP 67                                                                                             |                  | 70               |       |    |    |                   |           |
| <b>Power Supply</b>                                                                                       |                  |                  |       |    |    |                   |           |
| 100 to 230 V AC, 50 Hz                                                                                    |                  |                  |       | A  |    |                   |           |
| 24 V DC, 50 Hz                                                                                            |                  |                  |       | D  |    |                   |           |
| 100 to 230 V AC, 60 Hz                                                                                    |                  |                  |       | C  |    |                   |           |
| 24 V DC, 60 Hz                                                                                            |                  |                  |       | E  |    |                   |           |
| <b>Display</b>                                                                                            |                  |                  |       |    |    |                   |           |
| Without                                                                                                   |                  |                  |       |    | 0  |                   |           |
| Display with Keypad                                                                                       |                  |                  |       |    | 2  |                   |           |
| <b>Outputs</b>                                                                                            |                  |                  |       |    |    |                   |           |
| Current out (active/passive), 2x Digital out (passive), HART                                              |                  |                  |       |    |    | G0 <sup>4)</sup>  |           |
| Current out (active/passive), 2x Digital out (passive), MODBUS RTU                                        |                  |                  |       |    |    | M1 <sup>5)</sup>  |           |
| Current out (active/passive), 2x Digital out (passive), PROFIBUS DP                                       |                  |                  |       |    |    | D1 <sup>6)</sup>  |           |
| Current out (active/passive), 2x Digital out (passive), 1 Port Ethernet / Profinet                        |                  |                  |       |    |    | E2 <sup>7)</sup>  |           |
| Current out (active/passive), 2x Digital out (passive), 2 Port Ethernet / Profinet                        |                  |                  |       |    |    | E3 <sup>7)</sup>  |           |
| Current out (active/passive), 2x Digital out (passive), 1 Port Ethernet+POE / Profinet                    |                  |                  |       |    |    | E4 <sup>7)</sup>  |           |
| Current out (active/passive), 2x Digital out (passive), HART, PROFIBUS PA                                 |                  |                  |       |    |    | P1                |           |
| Current output 1 (active or passive), digital output 1 & 2 (passive), HART, Advanced Physical Layer (APL) |                  |                  |       |    |    | L1 <sup>15)</sup> |           |

Continued on next page

|                                                                               | ProcessMaster FET632 | 7,8 | ... | 17,18,19           | 20,21,22           | 23,24,25 | 26,27 | 28,29             | ...44,45 |
|-------------------------------------------------------------------------------|----------------------|-----|-----|--------------------|--------------------|----------|-------|-------------------|----------|
| <b>Option Card 1</b>                                                          |                      |     |     |                    |                    |          |       |                   |          |
| Without                                                                       |                      |     |     | DR0                |                    |          |       |                   |          |
| 1 x Digital Input                                                             |                      |     |     | DRN                |                    |          |       |                   |          |
| 1 x Digital Output                                                            |                      |     |     | DRG                |                    |          |       |                   |          |
| 24 V DC transmitter loop power supply                                         |                      |     |     | DRT                |                    |          |       |                   |          |
| 1 x Analog Output passive (4 to 20 mA)                                        |                      |     |     | DRA                |                    |          |       |                   |          |
| Modbus RTU                                                                    |                      |     |     | DRM                |                    |          |       |                   |          |
| Profibus DP                                                                   |                      |     |     | DRD                |                    |          |       |                   |          |
| Profibus PA                                                                   |                      |     |     | DRP <sup>9)</sup>  |                    |          |       |                   |          |
| Standard Ethernet (Ethernet-IP, PROFINET, Modbus TCP, Webserver)              |                      |     |     | DR6 <sup>8)</sup>  |                    |          |       |                   |          |
| Ethernet-APL (PROFINET, Modbus TCP, Webserver)                                |                      |     |     | DR7 <sup>15)</sup> |                    |          |       |                   |          |
| <b>Option Card 2</b>                                                          |                      |     |     |                    |                    |          |       |                   |          |
| Without                                                                       |                      |     |     |                    | DS0                |          |       |                   |          |
| 1 x Analog Output passive (4 to 20mA)                                         |                      |     |     |                    | DSA                |          |       |                   |          |
| 1 x Digital Input                                                             |                      |     |     |                    | DSN                |          |       |                   |          |
| 1 x Digital Output                                                            |                      |     |     |                    | DSG                |          |       |                   |          |
| Modul Power over Ethernet / Modbus                                            |                      |     |     |                    | DS8 <sup>10)</sup> |          |       |                   |          |
| <b>Potable Water and Food &amp; Beverage Approvals</b>                        |                      |     |     |                    |                    |          |       |                   |          |
| Without                                                                       |                      |     |     |                    |                    |          | CWY   |                   |          |
| <b>Other Options</b>                                                          |                      |     |     |                    |                    |          |       |                   |          |
| Without                                                                       |                      |     |     |                    |                    |          |       | K0                |          |
| With Gore-tex membrane                                                        |                      |     |     |                    |                    |          |       | KG <sup>11)</sup> |          |
| <b>Documentation Language</b>                                                 |                      |     |     |                    |                    |          |       |                   |          |
| German                                                                        |                      |     |     |                    |                    |          |       |                   | M1       |
| English                                                                       |                      |     |     |                    |                    |          |       |                   | M5       |
| Language Pack Western Europe (FR, ES, IT, NL, PT, SV, FI, DK)                 |                      |     |     |                    |                    |          |       |                   | MW       |
| Language Pack Eastern Europe (EL, CS, ET, HU, HR, LT, LV, PL, SK, SL, RO, BG) |                      |     |     |                    |                    |          |       |                   | ME       |

Continued on next page

## ... Ordering Information

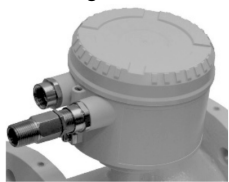
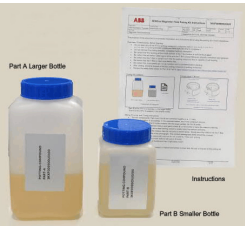
### ... ProcessMaster FET632

|                                                                           | ProcessMaster FET632 | 7,8 | ... | 30,31 | 32,33,34 | 35,36 | 37,38,39 | 40,41,42           | 43,44             |
|---------------------------------------------------------------------------|----------------------|-----|-----|-------|----------|-------|----------|--------------------|-------------------|
| <b>Device Identification Plate</b>                                        |                      |     |     |       |          |       |          |                    |                   |
| Adhesive label                                                            |                      |     |     | TC    |          |       |          |                    |                   |
| Stainless steel                                                           |                      |     |     | T1    |          |       |          |                    |                   |
| Stainless steel and TAG plate (stainless steel)                           |                      |     |     | TS    |          |       |          |                    |                   |
| Others                                                                    |                      |     |     | TZ    |          |       |          |                    |                   |
| <b>Temperature Range of Installation / Ambient Temperature Range</b>      |                      |     |     |       |          |       |          |                    |                   |
| Standard design / -20 to 60 °C (-4 to 140 °F)                             |                      |     |     |       | TK1      |       |          |                    |                   |
| <b>Remote Transmitter Mounting Kit</b>                                    |                      |     |     |       |          |       |          |                    |                   |
| Without                                                                   |                      |     |     |       |          | B0    |          |                    |                   |
| 2 in Pipe Mounting Kit for Wall-mount / Dual compartment Housing          |                      |     |     |       |          | B1    |          |                    |                   |
| 2 in Pipe Mounting Kit for Field-mount / Single compartment Housing       |                      |     |     |       |          | B2    |          |                    |                   |
| <b>Transmitter Software Function Package</b>                              |                      |     |     |       |          |       |          |                    |                   |
| Standard                                                                  |                      |     |     |       |          |       | NFS      |                    |                   |
| <b>Communication Options activated</b>                                    |                      |     |     |       |          |       |          |                    |                   |
| Ethernet IP                                                               |                      |     |     |       |          |       |          | GCE <sup>12)</sup> |                   |
| Modbus TCP                                                                |                      |     |     |       |          |       |          | GCM <sup>12)</sup> |                   |
| Webserver                                                                 |                      |     |     |       |          |       |          | GCW <sup>12)</sup> |                   |
| Profinet                                                                  |                      |     |     |       |          |       |          | GCP <sup>13)</sup> |                   |
| <b>Signal Cable</b>                                                       |                      |     |     |       |          |       |          |                    |                   |
| Without                                                                   |                      |     |     |       |          |       |          |                    | U0                |
| 1 x M12 Plug for Ethernet 1 Port (4 Signal Leads)                         |                      |     |     |       |          |       |          |                    | UE <sup>14)</sup> |
| 2 x M12 Plug for Ethernet 2 Port (4 Signal Leads)                         |                      |     |     |       |          |       |          |                    | UF <sup>14)</sup> |
| 1 x M12 Plug for Ethernet 1 Port (8 Signal Leads)                         |                      |     |     |       |          |       |          |                    | UG <sup>14)</sup> |
| 1 x RJ45 connector with 5 m (15 ft) cable length fitted (4 Signal Leads)  |                      |     |     |       |          |       |          |                    | U5 <sup>14)</sup> |
| 2 x RJ45 connector with 5 m (15 ft) cable length fitted (4 Signal Leads)  |                      |     |     |       |          |       |          |                    | UB <sup>14)</sup> |
| 1 x RJ45 connector with 5 m (15 ft) cable length fitted (8 Signal Leads)  |                      |     |     |       |          |       |          |                    | UC <sup>14)</sup> |
| 1 x RJ45 connector with 10 m (30 ft) cable length fitted (4 Signal Leads) |                      |     |     |       |          |       |          |                    | U6 <sup>14)</sup> |
| 2 x RJ45 connector with 10 m (30 ft) cable length fitted (4 Signal Leads) |                      |     |     |       |          |       |          |                    | UD <sup>14)</sup> |
| 1 x RJ45 connector with 10 m (30 ft) cable length fitted (8 Signal Leads) |                      |     |     |       |          |       |          |                    | UH <sup>14)</sup> |
| 1 x RJ45 connector with 15 m (49 ft) cable length fitted (4 Signal Leads) |                      |     |     |       |          |       |          |                    | U7 <sup>14)</sup> |
| 2 x RJ45 connector with 15 m (49 ft) cable length fitted (4 Signal Leads) |                      |     |     |       |          |       |          |                    | UJ <sup>14)</sup> |
| 1 x RJ45 connector with 15 m (49 ft) cable length fitted (8 Signal Leads) |                      |     |     |       |          |       |          |                    | UK <sup>14)</sup> |
| 1 x RJ45 connector with 20 m (66 ft) cable length fitted (4 Signal Leads) |                      |     |     |       |          |       |          |                    | U8 <sup>14)</sup> |
| 2 x RJ45 connector with 20 m (66 ft) cable length fitted (4 Signal Leads) |                      |     |     |       |          |       |          |                    | UN <sup>14)</sup> |
| 1 x RJ45 connector with 20 m (66 ft) cable length fitted (8 Signal Leads) |                      |     |     |       |          |       |          |                    | UP <sup>14)</sup> |
| FieldbusM12x1 (for Profibus PA)                                           |                      |     |     |       |          |       |          |                    | UR                |

#### Notes for remote transmitter FET632

- 1) In preparation.
- 2) FM Cl1 Div 2 available; FM Cl1 Zone 1 in preparation.
- 3) Not available with Zone 1 / Div 1.
- 4) Current output 4 to 20 mA active or 4 to 20mA passive can be configured on site.
- 5) To be configured in conjunction with Option Card 1 = Modbus RTU.
- 6) To be configured in conjunction with Option Card 1 = Profibus DP.
- 7) To be configured in conjunction with Option Card 1 = Ethernet IP, Modbus TCP. For Ethernet IP or Modbus TCP or Profinet, specify the option for Ethernet. Specify the communication protocol to enable under model code 'Communication Options activated'.
- 8) Available with single compartment housing only, Non Ex or Zone 2, Div. 2 only.
- 9) Available from Shanghai factory.
- 10) Available with single compartment housing only and with 24 V power supply specified and with Outputs Code E2, E3 or E2.
- 11) Available with Non Ex only.
- 12) Specify the communication protocol to enable from the factory. It can be altered on site. Ethernet Card required.
- 13) Specify the communication protocol to enable from the factory. It can be altered on site. Ethernet Card required. Not available if Ethernet (Code GCE) is specified.
- 14) Available with Non Ex or Div 2.
- 15) Available with dual compartment housing only, Ethernet-APL is in preparation

## Accessories

| Description                                                                                                   | Order code       |
|---------------------------------------------------------------------------------------------------------------|------------------|
| <b>Infrared service port adapter FZA100</b>                                                                   | FZA100           |
|                              |                  |
| <b>Installation set for NPT 1/2" cable gland</b><br>For sealing the cable conduit during outdoor installation | 3KXF081300L0001  |
|                              |                  |
| <b>Adapter M20x1.5 to 1/2"NPT</b>                                                                             | D365B269U01      |
|                             |                  |
| <b>Data link cable</b>                                                                                        | 3KXS360040L0003* |
|                            |                  |
| <b>Signal cable</b>                                                                                           |                  |
| 5 m (approx. 15 ft)                                                                                           | 3KQZ407123U0500  |
| 10 m (approx. 30 ft)                                                                                          | 3KQZ407123U1000  |
| 15 m (approx. 49 ft)                                                                                          | 3KQZ407123U1500  |
| 20 m (approx. 66 ft)                                                                                          | 3KQZ407123U2000  |
| 25 m (approx. 82 ft)                                                                                          | 3KQZ407123U2500  |
| 30 m (approx. 98 ft)                                                                                          | 3KQZ407123U3000  |
| 35 m (approx. 115 ft)                                                                                         | 3KQZ407123U3500  |
| 40 m (approx. 131 ft)                                                                                         | 3KQZ407123U4000  |
| 50 m (approx. 164 ft)                                                                                         | 3KQZ407123U5000  |
| 80 m (approx. 262 ft)                                                                                         | 3KQZ407123U8000  |
| 100 m (approx. 328 ft)                                                                                        | 3KQZ407123U1H00  |
| 150 m (approx. 492 ft)                                                                                        | 3KQZ407123U1F00  |
| 200 m (approx. 656 ft)                                                                                        | 3KQZ407123U2H00  |
| <b>ABB Ability Verification Tool</b>                                                                          | SRV500*          |
| <b>Potting Kit</b><br>For on-site sensor Terminalbox potting                                                  | 3KXF094102L0001  |
|                            |                  |

\* Available from ABB Service

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Sales



Service





## Notes



**Notes**



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