XA 02 E/FM42iEX2/04.26

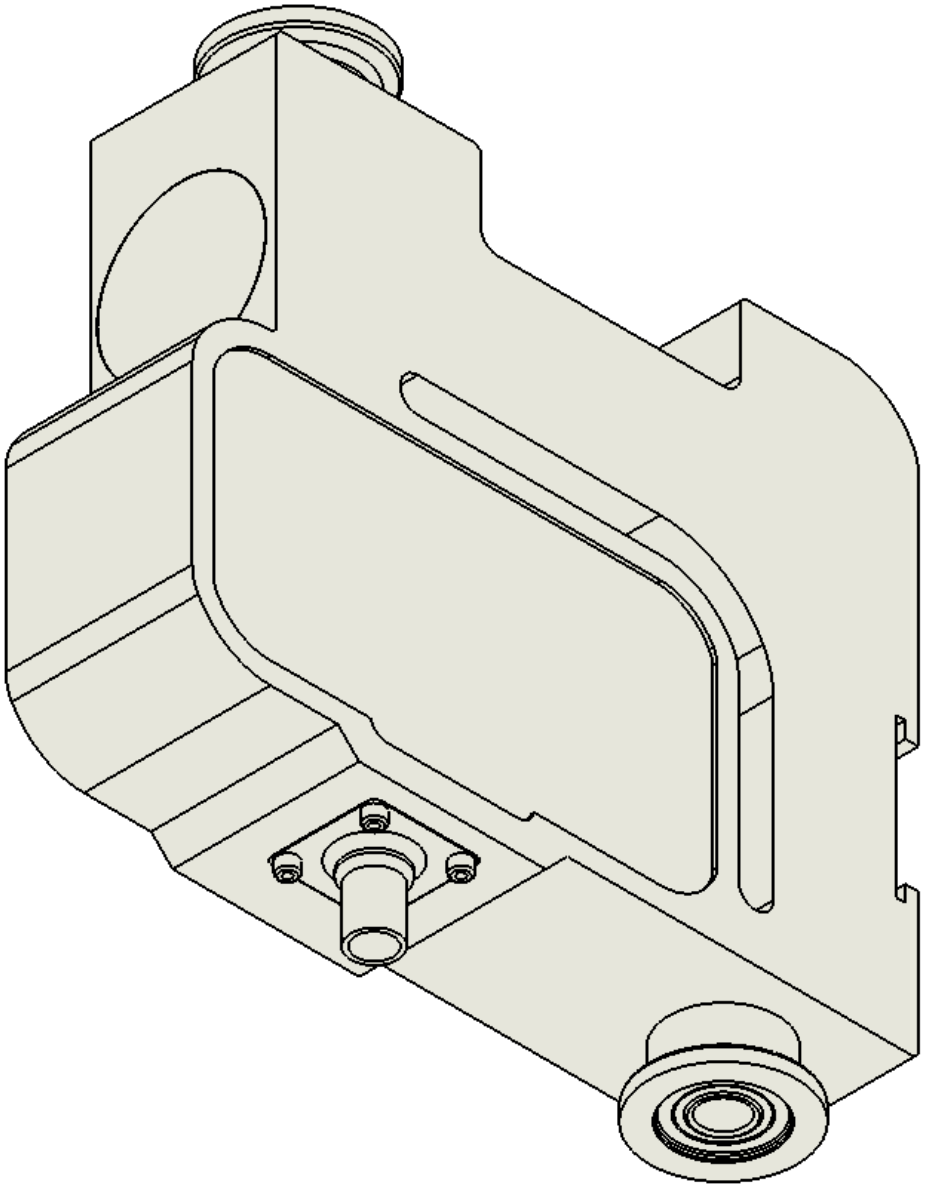
Valid starting from
Hardware V 2.1
Software V 1.29

# Flowmax® 42i

# Ultrasonic flow metering / dosing device

## Ex-documentation for the Operating manual

**According to directive 2014/34/EU**
**Ex-zone 2**



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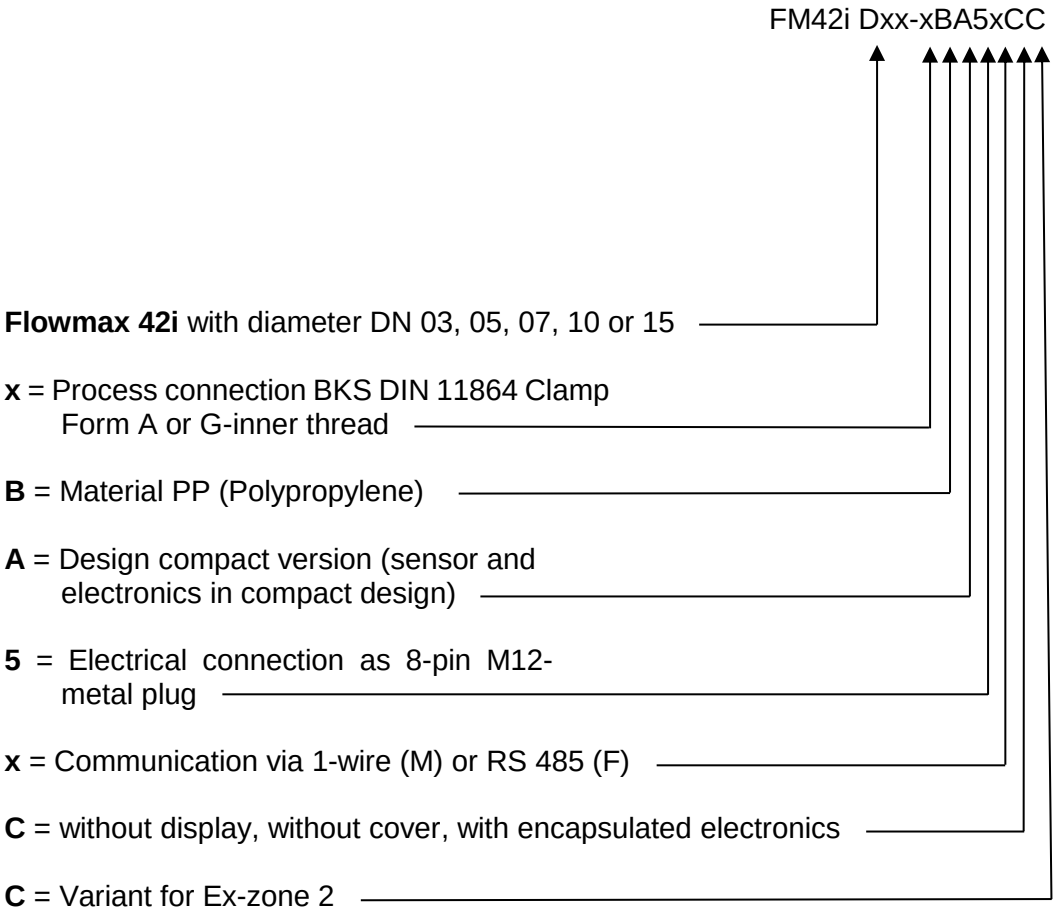
Messtechnik & Industrieberatung

# Contents

# 1. Variant code

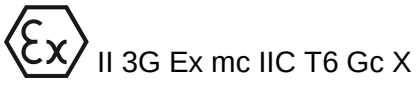
Flowmax 42i with variant code




is a device within the scope of Directive 2014/34 / EU. When used as equipment of group II, category 3G for zone 2, explosive gas atmospheres, as well as in compliance with the intended use, this flowmeter does not pose any ignition hazard of its own.
The ignition hazard analysis was carried out in accordance with Directive 2014/34 / EU. Used standards are: EN 60079-0, EN60079-18.

## 2. Labelling

The EX-labelling is




With the meaning according to directive 2014/34/EU:

Device group
**II** Equipment for use in areas outside of mining (and their surface installations which may be endangered by firedamp and/or combustible dust) which may be endangered by a potentially explosive atmosphere.

Device category
**3** normal level of safety - use in zone 2 possible

Type of explosive atmosphere
**G** Mixture of air and gases, vapours or mist

according to EN 50021:
**Ex** This symbol indicates that the electrical equipment corresponds to one or more types of protection

| Symbol: | Type of protection electrical: | Standard: |
|---|---|---|
| **mc** | Encapsulation and Protection level | EN60079-18 |

Explosion group (typical gases)
**IIC** (Hydrogen)

Maximum surface temperature
**T6** 85°C

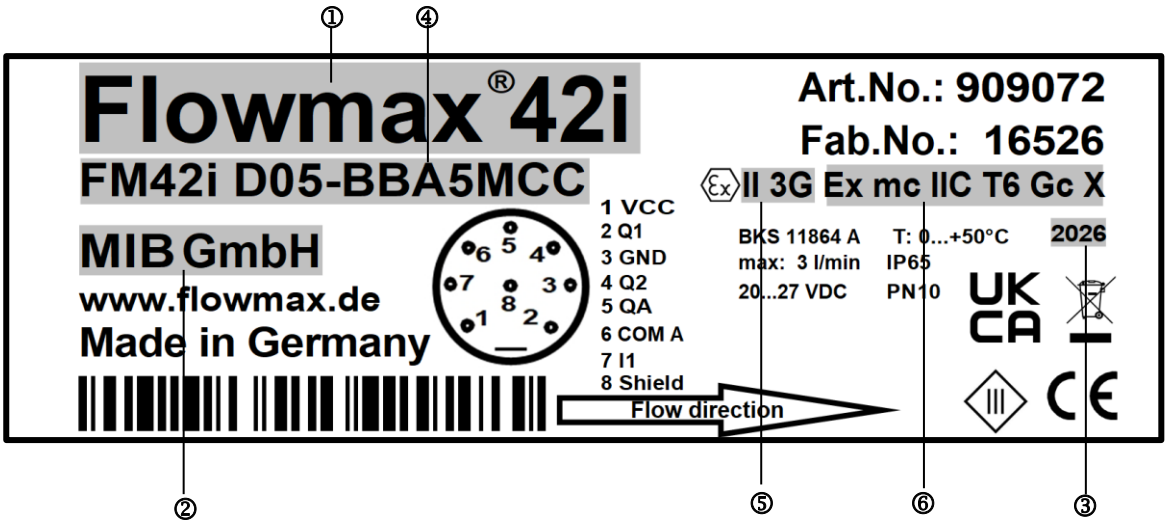
**Gc** Equipment Protection Level (EPL) corresponds to the category 3G

The symbol „**X**“ refers to special conditions such as a different ambient temperature

- The medium temperature must not exceed 50°C
- The ambient / storage temperature must not exceed 50°C
- It must not be possible to disconnect the supply voltage plug connection without tools
- Measures must be taken to avoid electrostatic charges
- The risk of mechanical hazards is classified as low

## 3. Name plate

An example of a name plate is shown below:




1 Device type
2 Manufacturer
3 Year of manufacture
4 Order-Code
5 Equipment group and category
6 Labelling of the type of protection and explosion group

## 4. Special conditions

**WARNING!**

The technical data and the following instructions must be observed..

- Use only for intended use
- Installation, electrical connection, commissioning and maintenance may only be carried out by personnel trained in explosion protection
- The instructions in the operating manual must be followed
- The supply voltage must be in the range 20...27 VDC
- It must not be possible to disconnect the supply voltage plug connection without tools
- Do not disconnect under voltage! Electrically generated sparks can ignite an explosive atmosphere. Disconnect the connecting cable outside explosive atmospheres or switch off the voltage beforehand.
- Unused electrical wires must be connected individually to unused potential-free terminal blocks
- Measures must be taken to avoid electrostatic charges

## 5. Warnings

**WARNING!**

- Assembly, electrical installation, commissioning and maintenance of the flowmeter may only be performed by trained and qualified personnel who have been instructed in explosion protection and who have been authorised by the plant operator. The qualified personnel must have read and understood the operating manual of the flowmeter including this supplementary Ex documentation and follow its instructions.
- The installer must ensure that the flowmeter is correctly connected according to the electrical connection diagrams.

## 6. Additional information

**NOTICE!**

- There are no galvanically isolating components, e.g. optocouplers or relays, in the electronics.
- There are no switching contacts.
- There are no cells or batteries.
- The energy content of the ultrasonic signal transmitters/transducers on the surface to the measuring channel and the environment is below the permissible limit values according to standard EN 60079-0.

# 7. Electrical wiring

### 8-pin plug with 1-wire communication


Figur 1: Pin code: Connection plug / socket for 8-pin version

Connector plug pin configuration defined by manufacturer.
The inputs and outputs can be reprogrammed for specific applications.

| Pin | Function | Description |
|---|---|---|
| 1 | 24 VDC | Power supply: 20...27 VDC |
| 2 | Digital output Q1<br>Functions:<br><br>1. Pulse output<br><br>2. Empty pipe output<br>3. Dosing output<br>4. Upper- or Lower limit output (limit value monitoring)<br>5. Negative flow | Digital output Q1<br>Configurable npn or pnp transistor, max. load 100mA*. Max. voltage must be less than the supply voltage.<br>Freely adjustable ranging from 0.1 to 3000 ml/pulse in 0.1 ml/pulse steps.<br>Configurable output of 0V or 24V when pipe is empty.<br>Configurable output of 0V or 24V.<br>Configurable output of 0V or 24V when reaching upper or lower limit.<br>Configurable output of 0V or 24V when liquid flows in negative direction. |
| 3 | GND | Ground: 0 V |
| 4 | Digital output Q2<br>Functions:<br><br>1. Empty pipe output<br>2. Dosing output<br>3. Pulse output<br><br>4. Upper or lower limit output (limit value monitoring)<br>5. Negative flow | Digital output Q2<br>Configurable npn or pnp transistor, max. load 100mA *. Max. voltage must be less than the supply voltage.<br>Configurable output of 0V or 24V when pipe is empty.<br>Configurable output of 0V or 24V.<br>Freely adjustable ranging from 0.1 to 3000 ml/pulse in 0.1 ml/pulse steps.<br>Configurable output of 0V or 24V when reaching upper or lower limit.<br>Configurable output of 0V or 24V when liquid flows in negative direction. |
| 5 | Analog output QA | 4...20mA; 0...20mA<br>Example: 0l/min => 4mA<br>6l/min => 20mA (depending on diameter)<br>Empty pipe Alert => 3.5mA |
| 6 | Communication | Communication interface |
| 7 | Digital input I1<br>1. Dosing input<br>2. Set offset<br>3. Reset counter<br>4. Creeping flow off | Digital input I1<br>Starts the dosage by a rising edge of 24V.<br>The Offset is set by a rising edge of 24V.<br>Reset of the counter by a rising edge of 24V.<br>Creeping suppression is deactivated as long as there are 24V at the input. |
| 8 | Shielding | EMC safety |

*it applies: for Q1 + Q2 ≤ 100mA

### 8-pin plug with RS 485 communication


Figur 2: Pin code: Connection plug / socket for 8-pin version

Connector plug pin configuration defined by manufacturer.
The inputs and outputs can be reprogrammed for specific applications.

| Pin | Function | Description |
|---|---|---|
| 1 | 24 VDC | Power supply: 20...27 VDC |
| 2 | Digital output Q1<br>Functions:<br>1. Pulse output<br>2. Empty pipe output<br>3. Dosing output<br>4. Upper or lower limit output (limit value monitoring)<br>5. Negative flow | Digital output Q1<br>Configurable npn or pnp transistor, max. load 100mA*. Max. voltage must be less than the supply voltage.<br>Freely adjustable ranging from 0.1 to 3000 ml/pulse in 0.1 ml/pulse steps.<br>Configurable output of 0V or 24V when pipe is empty.<br>Configurable output of 0V or 24V.<br>Configurable output of 0V or 24V when reaching upper or lower limit.<br>Configurable output of 0V or 24V when liquid flows in negative direction. |
| 3 | GND | Ground: 0 V |
| 4 | Digital input I1<br>1. Dosing input<br>2. Set offset<br>3. Reset counter<br>4. Creeping flow off | Digital input I1<br>Starts the dosage by a rising edge of 24V.<br>The Offset is set by a rising edge of 24V.<br>Reset of the counter by a rising edge of 24V.<br>Creeping suppression is deactivated as long as there are 24V at the input. |
| 5 | Analog output QA | 4...20mA; 0...20mA<br>Example: 0l/min => 4mA<br>6l/min => 20mA (depending on diameter)<br>Empty pipe Alert => 3.5mA |
| 6 | Communication | RS 485 A |
| 7 | Communication | RS 485 B |
| 8 | Shielding | EMC safety |

**Important!**
**The flowmeter Flowmax 42i may only be operated within the limits indicated on the nameplate and in the instruction manual/data sheet. Unauthorised operating conditions can lead to overload, damage or defects.**

**IMPORTANT!**

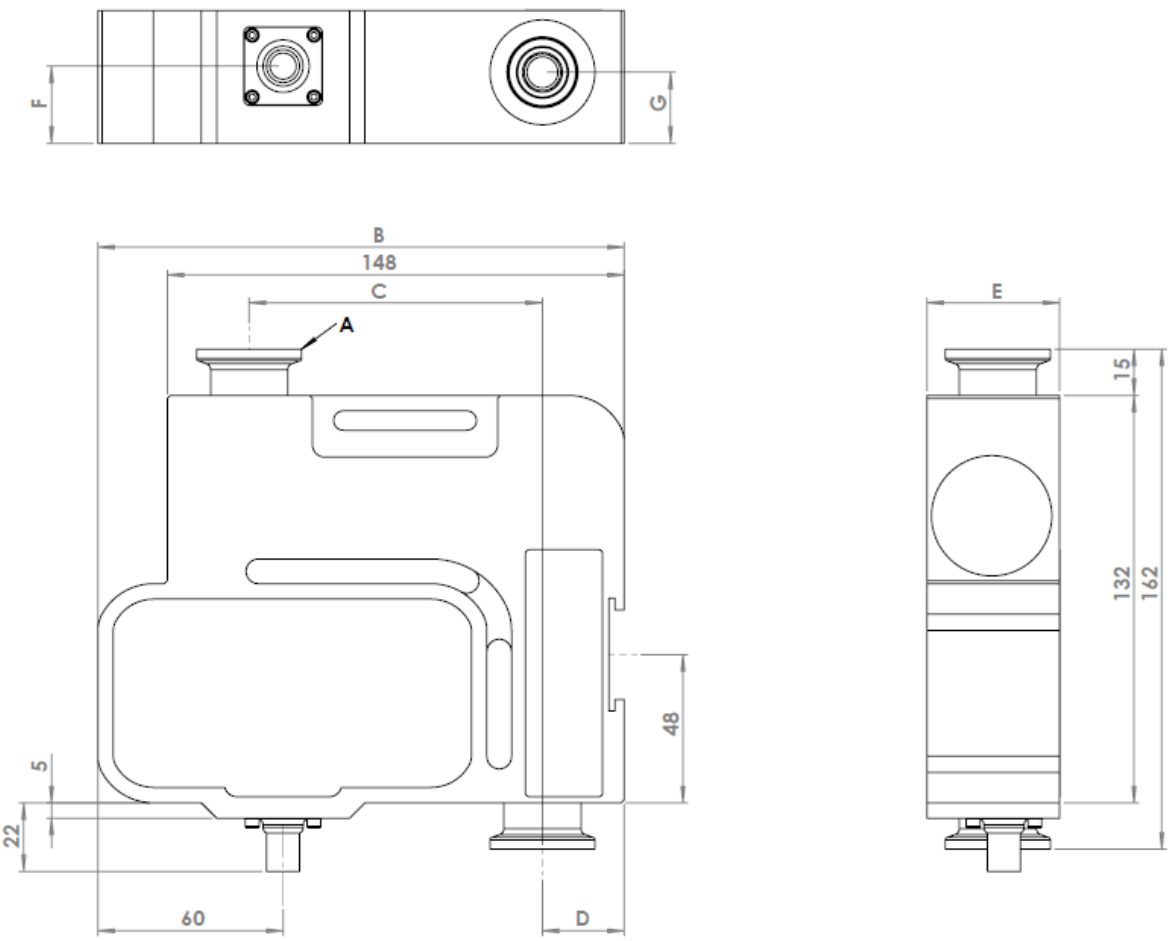
## 8. Display and user menu of FlowCon 200i

Flowmax 42i in the Ex-version has no display. To display current measured values and to set application-specific parameters, the use of the display and configuration unit FlowCon 200i is required, see operating manual FlowCon 200i. This does not have an Ex-approval and may only be used outside a hazardous area.

**WARNING!**

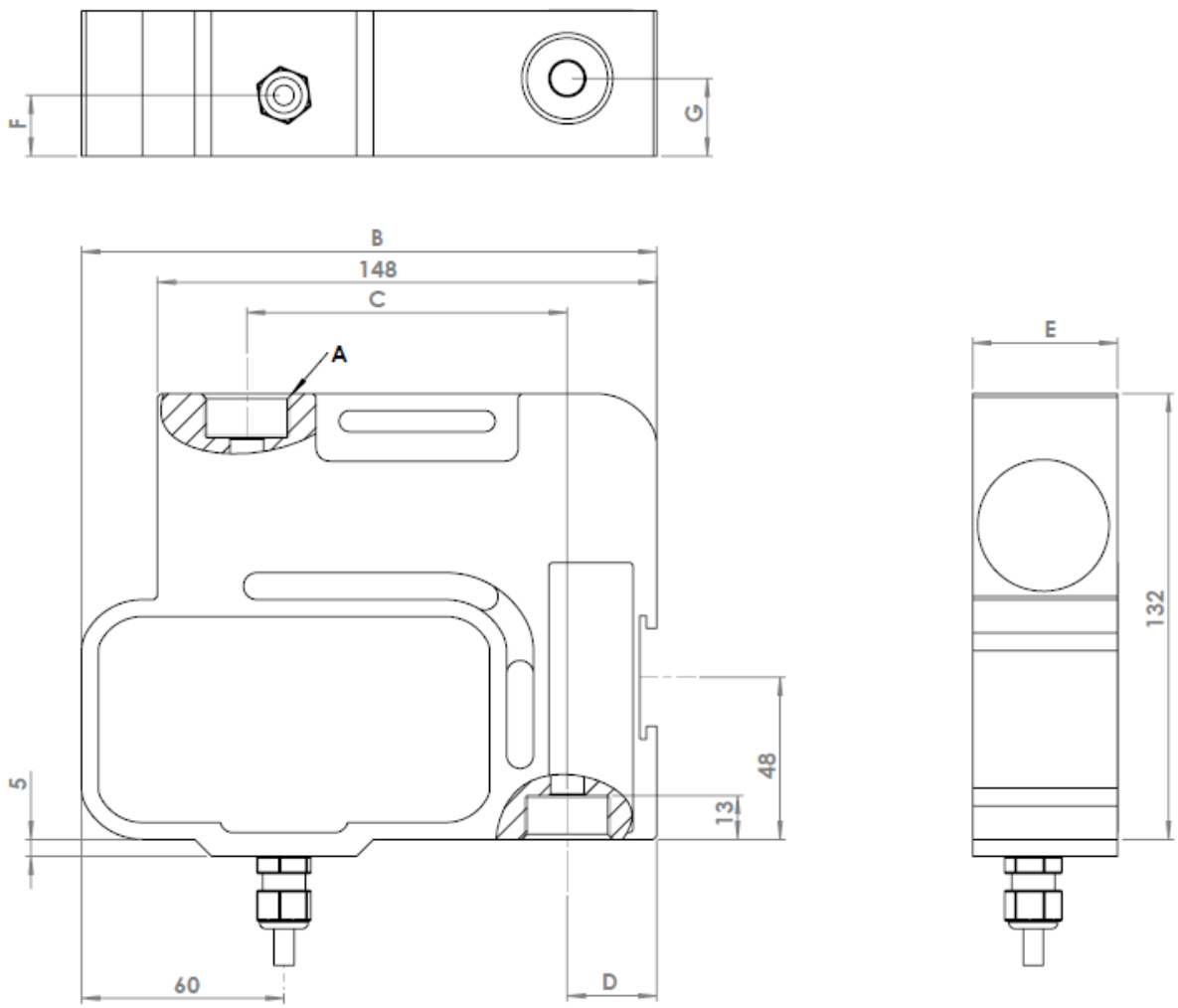
## 9. Dimensions and weight

**Process connection as clamp according to DIN 11864-4 BKS Form A**




| diameter | process connection A<br>DIN 11864-4 BKS Form A | B<br>[mm] | C<br>[mm] | D<br>[mm] | E<br>[mm] | F<br>[mm] | G<br>[mm] | weight<br>[g] |
|---|---|---|---|---|---|---|---|---|
| DN03 | DN10 | 167.5 | 98 | 25 | 43 | 25 | 23 | 910 |
| DN05 | DN10 | 167.5 | 98 | 25 | 43 | 25 | 23 | 910 |
| DN07 | DN10 | 167.5 | 98 | 25 | 43 | 25 | 23 | 910 |
| DN10 | DN10 | 170.5 | 95 | 26.5 | 43 | 25 | 23 | 910 |
| DN15 | DN15 | 175.5 | 90 | 29 | 48 | 30 | 25 | 1050 |

## Process connection as inch inner thread




| diameter | process connection A<br>inch inner thread | B<br>[mm] | C<br>[mm] | D<br>[mm] | E<br>[mm] | F<br>[mm] | G<br>[mm] | weight<br>[g] |
|---|---|---|---|---|---|---|---|---|
| DN03 | G 1/2 | 167.5 | 98 | 25 | 43 | 25 | 23 | 910 |
| DN05 | G 1/2 | 167.5 | 98 | 25 | 43 | 25 | 23 | 910 |
| DN07 | G 1/2 | 167.5 | 98 | 25 | 43 | 25 | 23 | 910 |
| DN10 | G 3/4 | 170.5 | 95 | 26.5 | 43 | 25 | 23 | 910 |
| DN15 | G1 | 175.5 | 90 | 29 | 48 | 30 | 25 | 1050 |

# 10. Technical specifications

**Housing**

| | |
|---|---|
| Medium temperature | 0...+50°C |
| Protection class | IP 65 |
| Pressure nominal | PN 10 |
| Material | PP (Polypropylene) natural<br>The risk of mechanical hazards is classified as low |

**Electronics**

| | |
|---|---|
| Power supply | 20...27VDC |
| Power consumption | at 24VDC 3.6W |
| Connection | 8-pin plug |
| Ambient temperature | 0...+50°C |
| Storage/<br>Transport temperature | 0...+50°C |
| Current output QA | 0/4...20 mA, active<br>Start and end value adjustable,<br>Ground connected to supply ground<br>Error signal according to NAMUR NE43 at 4...20mA |
| Digital output Q1/2 | Transistor circuit NPN and PNP logic, max. 100mA<br>Output voltage according to DIN 19240:<br>≤5V corresponds to LOW<br>≥12V corresponds to HIGH<br>Short-circuit proof, in case of short-circuit the output is switched off<br>Frequency 0...10kHz |
| Data interface | Communication interface |
| Sealing compound | Polyurethane potting / encapsulating resin |

The Flowmax 42i measurement system meets the general EMC immunity requirements according to CE, EN 61000-6-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6. It is in conformity with the requirements of the EC Directives and bears the CE label.

**Material specifications**

| Non-metallic housing component | Housing material | Sealing compound |
|---|---|---|
| Material | Polypropylene natural | Polyurethane |
| Colour | Natural | PU: beige<br>Hardener: brown |
| Temperature index TI (RTI) (IEC 216) | 110°C | 126°C |
| Temperature range of the application | -30…100°C | -40…125°C |
| Moisture absorption (ISO 62) | < 0.1% | 0.4% |
| Flammability (UL94) | HB | V0 |

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