XA 02 E/FM42iEX1/01.22

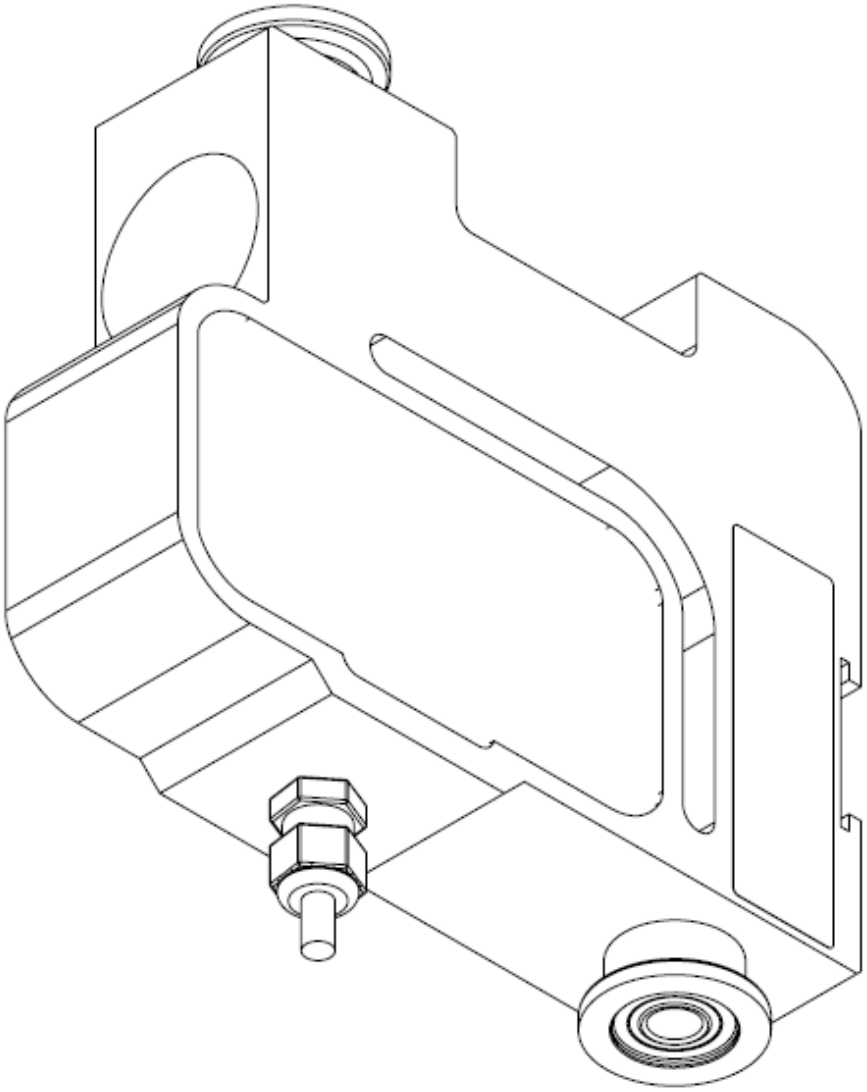
Valid starting from
Hardware V 2.1
Software V 1.29

Flowmax® 42i

Ultrasonic flow metering / dosing device

Ex-documentation for the Operating manual

According to IECEx and directive 2014/34/EU
Ex-zone 1

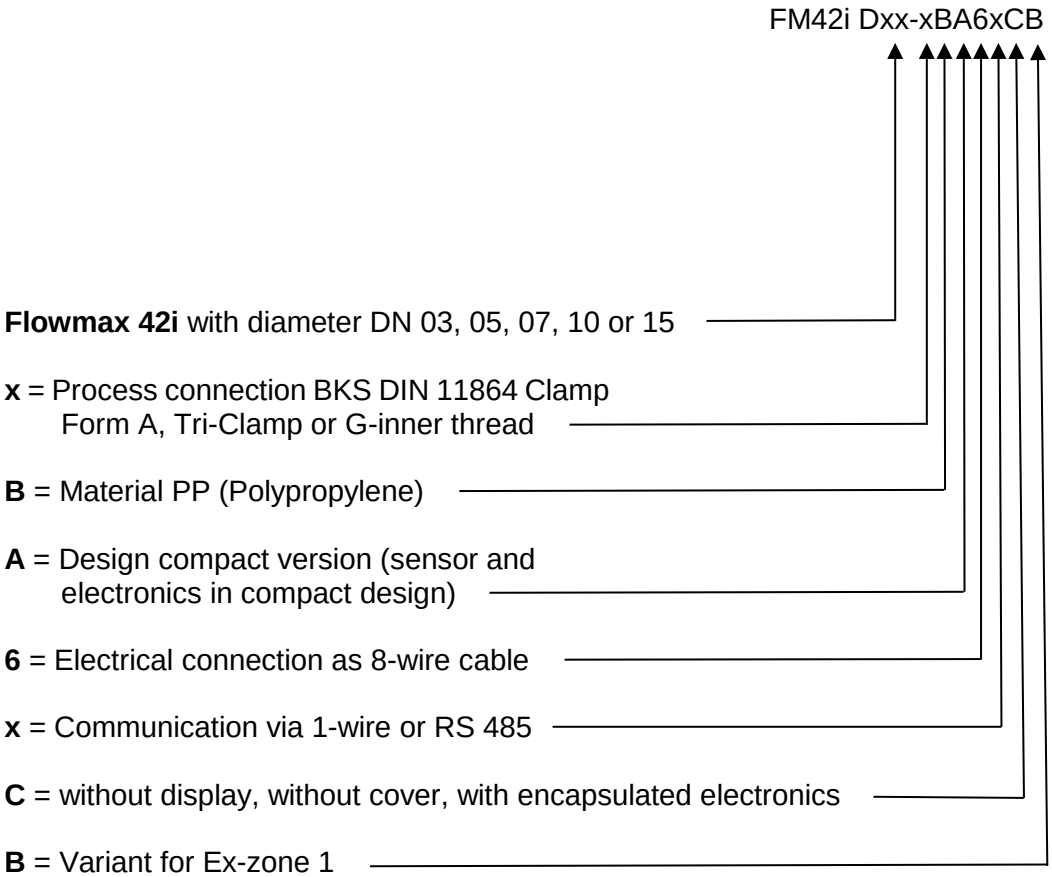


MIB GmbH
Messtechnik & Industrieberatung

Contents

1. Variant code

Flowmax 42i with variant code



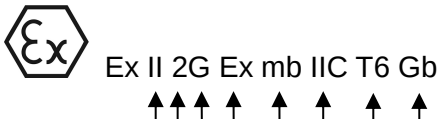
is a device within the scope of IECEx and Directive 2014/34/EU. When used as equipment of group II, category 2G for zone 1, explosive gas atmospheres, as well as under consideration of the intended use, this flowmeter does not pose any ignition hazard of its own.
The ignition hazard analysis was carried out in accordance with the IECEx and ATEX-Directive 2014/34/EU. Used standards are: EN IEC 60079-0, IEC 60079-0, EN 60079-18 IEC 60079-18.

2. Labeling

The EX-labelling is

IECEx Ex mb IIC T6 Gb
ATEX II 2G Ex mb IIC T6 Gb

with the meaning



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
2 high level of safety - use in zone 1/21, 2/22 possible

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

according to EN IEC 60079-0 / IEC 60079-0:
Ex This symbol indicates that the electrical equipment corresponds to one or more types of protection

Symbol:	Protection level and type of protection electrical:	Standard:
mb	Encapsulation	IEC 60079-18 / EN 60079-18

Explosion group (typical gases)
IIC (Acetylene)

Maximum surface temperature
T6 85°C

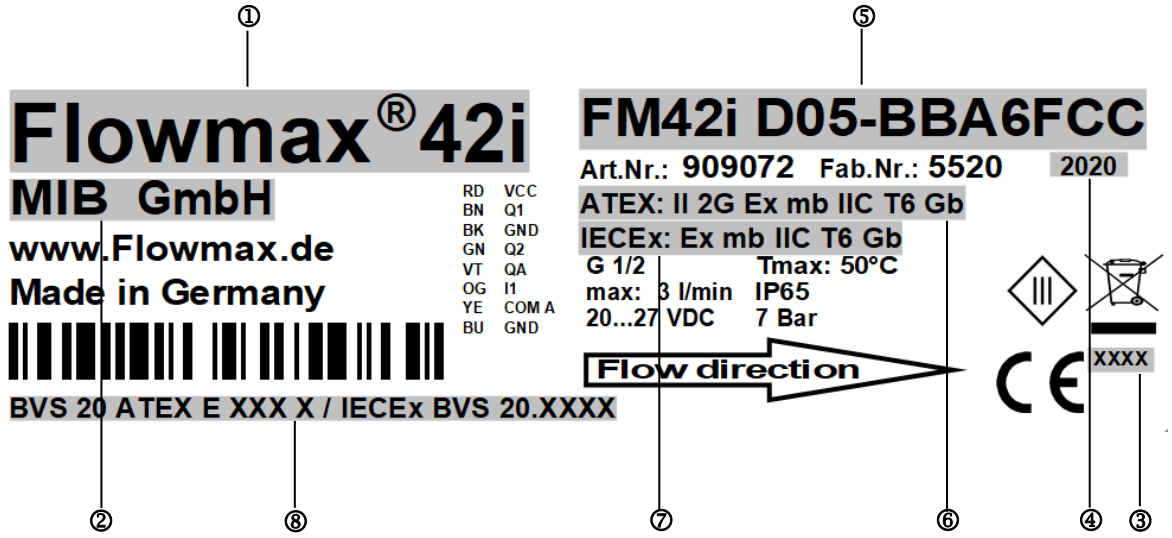
Gb Equipment Protection Level (EPL) corresponds to the category 2G

The special conditions according to chapter 4 of these Operating manual must be followed!

3. Name plate

The flowmeter is provided with a name plate and a warning notice.

An example of a name plate is shown below:



1 Device type
2 Manufacturer
3 Notified authority
4 Year of manufacture
5 Order-Code
6 ATEX Labeling
7 IECEx Labeling
8 Certificate number

The warning notice is shown below:

4. Special conditions

WARNING!

The technical data and the following instructions must be observed.

- 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.
- Measures must be taken to avoid electrostatic charges.
- The medium temperature must not exceed 50°C.
- The ambient / storage temperature must not exceed 50°C.
- The risk of mechanical hazard is classified as low.
- The measuring device must not be exposed to UV radiation.
- The measuring device must be installed such that danger of mechanical damage is avoided.
- The meter must be visually inspected for mechanical damage at regular intervals. In case of damage, the measuring device must be taken out of service immediately.

5. Warnings

WARNING!

- Use only for intended use.
- 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.
- Unused electrical wires must be connected individually to unused potential-free terminal blocks.

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 thermal protective device can be reset.
- 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 IEC 60079-0 / IEC 60079-0.

7. Electrical wiring

Cable 8-wire with 1-wire communication
Wire configuration defined by manufacturer.
The inputs and outputs can be reprogrammed for specific applications.

Colour	Function	Description
Red	24 VDC	Power supply: 20...27 VDC
Brown	Digital output Q1 Functions: 1. Pulse output 2. Empty pipe output 3. Dosing output 4. Upper- or Lower limit output (limit value monitoring) 5. Negative flow	Digital output Q1 Configurable npn or pnp transistor, max. load 100mA*. Max. voltage must be less than the supply voltage. Freely adjustable ranging from 0.1 to 3000 ml/pulse in 0.1 ml/pulse steps. Configurable output of 0V or 24V when pipe is empty. Configurable output of 0V or 24V. Configurable output of 0V or 24V when reaching upper or lower limit. Configurable output of 0V or 24V when liquid flows in negative direction.
Black	GND	Ground: 0 V
Green	Digital output Q2 Functions: 1. Empty pipe output 2. Dosing output 3. Pulse output 4. Upper or lower limit output (limit value monitoring) 5. Negative flow	Digital output Q2 Configurable npn or pnp transistor, max. load 100mA *. Max. voltage must be less than the supply voltage. Configurable output of 0V or 24V when pipe is empty. Configurable output of 0V or 24V. Freely adjustable ranging from 0.1 to 3000 ml/pulse in 0.1 ml/pulse steps. Configurable output of 0V or 24V when reaching upper or lower limit. Configurable output of 0V or 24V when liquid flows in negative direction.
Violet	Analog output QA	4...20mA; 0...20mA or 0…10V Example: 0l/min => 4mA 6l/min => 20mA (depending on diameter) Empty pipe Alert => 3.5mA
Yellow	Communication	Communication interface
Orange	Digital input I1 1. Dosing input 2. Set offset 3. Reset counter 4. Creeping flow off	Digital input I1 Starts the dosage by a rising edge of 24VDC. The Offset is set by a rising edge of 24VDC. Reset of the counter by a rising edge of 24VDC. Creeping suppression is deactivated as long as there are 24VDC at the input.
Blue	Shielding	EMC safety

*it applies: for Q1 + Q2 ≤ 100mA

Cable 8-wire with 2-wire communication
Wire configuration defined by manufacturer.
The inputs and outputs can be reprogrammed for specific applications.

Colour	Function	Description
Red	24 VDC	Power supply: 20...27 VDC
Brown	Digital output Q1 Functions: 1. Pulse output 2. Empty pipe output 3. Dosing output 4. Upper or lower limit output (limit value monitoring) 5. Negative flow	Digital output Q1 Configurable npn or pnp transistor, max. load 100mA. Max. voltage must be less than the supply voltage. Freely adjustable ranging from 0.1 to 3000 ml/pulse in 0.1 ml/pulse steps. Configurable output of 0V or 24V when pipe is empty. Configurable output of 0V or 24V. Configurable output of 0V or 24V when reaching upper or lower limit. Configurable output of 0V or 24V when liquid flows in negative direction.
Black	GND	Ground: 0 V
Violet	Analog output QA	4...20mA; 0...20mA or 0…10V Example: 0l/min => 4mA 60l/min => 20mA (depending on diameter) Empty pipe Alert => 3.5mA
Orange	Digital input I1 1. Dosing input 2. Set offset 3. Reset counter 4. Creeping flow off	Digital input I1 Starts the dosage by a rising edge of 24VDC. The Offset is set by a rising edge of 24VDC. Reset of the counter by a rising edge of 24VDC. Creeping suppression is deactivated as long as there are 24VDC at the input.
Yellow	Communication	RS 485 A
Green	Communication	RS 485 B
Blue	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.

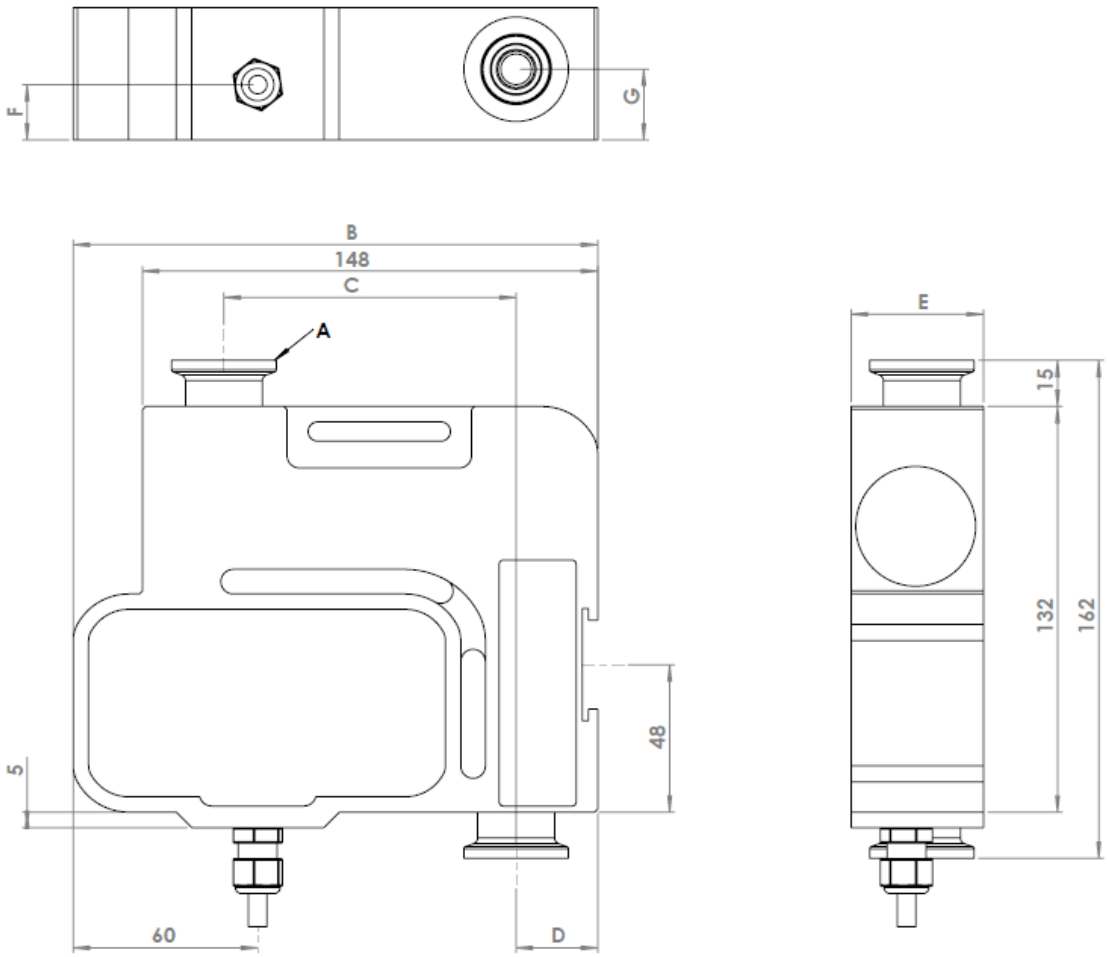
8. Display and user menu of FlowCon 200i

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!

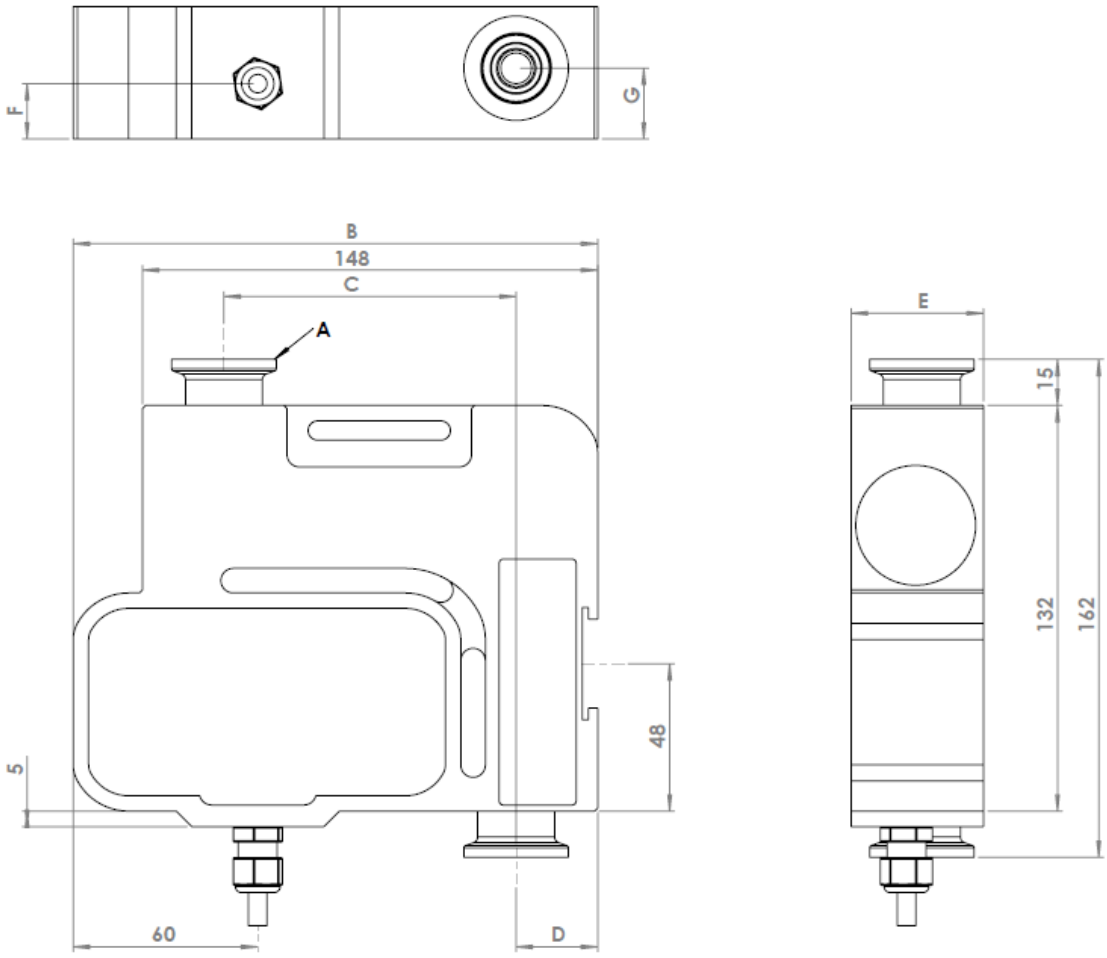
9. Dimensions and weight

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



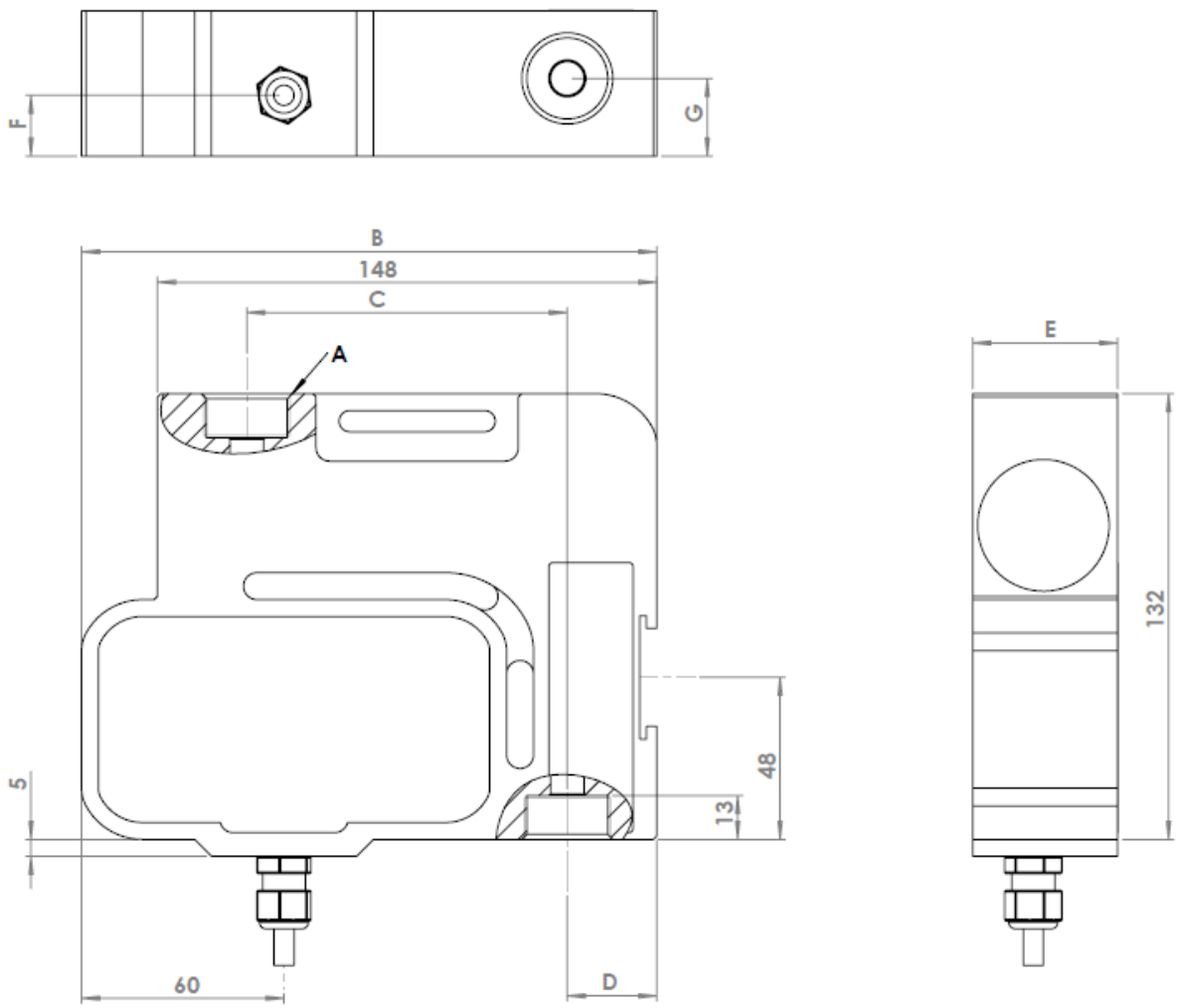
diameter	process connection A DIN 11864-4 BKS Form A	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	weight [g]
DN03	DN10	167.5	98	25	43	18	23	910
DN05	DN10	167.5	98	25	43	18	23	910
DN07	DN10	167.5	98	25	43	18	23	910
DN10	DN10	170.5	95	26.5	43	18	23	910
DN15	DN15	175.5	90	29	48	23	25	1050

Process connection as TriClamp according to DIN 32676



process connection A Tri Clamp DIN 32676	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	weight [g]	
series B D25 NW8	167,5	98	25	43	18	23	910	
series B D25 NW8	167,5	98	25	43	18	23	910	
series B D25 NW8	167,5	98	25	43	18	23	910	
series B D25 NW8	170,5	95	26,5	43	18	23	910	
series A D34 DN15	175,5	90	29	48	23	25	1050	

Process connection as inch inner thread



diameter	process connection A inch inner thread	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	weight [g]
DN03	G 1/2	167.5	98	25	43	18	23	890
DN05	G 1/2	167.5	98	25	43	18	23	890
DN07	G 1/2	167.5	98	25	43	18	23	890
DN10	G 3/4	170.5	95	26.5	43	18	23	890
DN15	G 1	175.5	90	29	48	23	25	1030

10. Technical specifications

Housing

Medium temperature	0...+50°C
Protection class	IP 65
Pressure nominal	10 Bar
Material	PP (Polypropylene)l The risk of mechanical hazards is classified as low.

Electronics

Power supply	20...27VDC
Power consumption	at 24VDC 3.6W
Connection	Cable 8-wire, a separately certified plug can be connected to the cable
Ambient temperature	0...+50°C
Storage/ Transport temperature	0...+50°C
Current output QA	0/4...20 mA or 0…10V, active Start and end value adjustable, Ground connected to supply ground Error signal according to NAMUR NE43 at 4...20mA In case of short circuit, no additional heating compared to normal operation can be detected.
Digital output Q1/2	Transistor circuit NPN and PNP logic, max. 100mA Output voltage according to DIN 19240: ≤5V corresponds to LOW ≥12V corresponds to HIGH Short-circuit proof, in case of short-circuit the output is switched off. 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 electronics	Sealing compound	Name plate / warning notice
Material	Polypropylene	Polyurethane	Metallised polyester film
Colour	Natural	PU: beige Hardener: brown	Silver
Temperature index TI (RTI) (IEC 216)	110°C		
Temperature range of the application	0…100°C	-40…125°C	-40…150°C
Moisture absorption (ISO 62)		0.4%	
Flammability (UL94)	HB	V0	

MIB GmbH
Messtechnik und Industrieberatung
Bahnhofstr. 35
D-79206 Breisach
Tel. 0049 / (0)7667 / 20 777 90
Fax 0049 / (0)7667 / 20 777 99
E-Mail: info@mib-gmbh.com
Internet: www.flowmax.de

MIB GmbH
Messtechnik & Industrieberatung