



# SI-00

## Miniature- Electromagnetic Flowmeter



## Features

- / Wetted parts out of st. steel  
1.4404, PEEK and FKM
- / Displays flow bidirectionally
- / Op. range 0. . .600 l/min in 5 sizes
- / Additional temperature  
measurement from -20. . .+80°C
- / Minimum conductivity 20 µS/cm
- / Viscosity up to 70 mm<sup>2</sup>/s at 40°C
- / Two output channels for 4. . .20 mA  
or 0. . .10 VDC, pulse or alarm
- / Including totalizer and  
batching function
- / Operating pressure up to 16 bar

## Description:

The measuring principle of the magnetic flow meter is based on Faraday's law. The flow of a conductible liquid within a magnetic field causes an electrical voltage, which is proportional to the velocity of the flow. A measuring pipe out of the very rugged plastic material PEEK is installed in the stainless steel fitting of the SI-00. This construction is suitable to isolate the liquid from the metallic fitting to make the induced measuring voltage useable. Magnetic coils located on the outside generate a magnetic field inside the measuring pipe and small stainless steel electrodes measure the voltage, which is then amplified and processed by the powerful electronic of the SI-00.

## Application:

The electromagnetic flowmeter SI-00 combines the advantage of the electromagnetic measuring principle and an ultramodern amplifier electronic to a device of the latest generation. There are no wishes left regarding easy operation and versatility of the measuring value processing. The device detects and processes the medium temperature, the actual flow and the fluid consumption. Setpoints, as well as analogue and pulse signals in different combinations are provided by the SI-00 at two output connections. The setpoints can be programmed as N.O./N.C. or window function always with adjustable hysteresis. In case of activated start-up delay the setpoints work at the normal operating condition within the programmed period of time as soon as the flow reaches 0,5% of the full scale value after switch on, to ensure that no alarm occurs if the flow value is under the threshold just because of the starting condition of the plant or machine. The analogue output can be used as 4. . .20 mA- or 0. . .10 VDC-signal and can be assigned to the temperature or to the flowrate. Zero and span are free adjustable, but the minimum measuring span has to be 20% of the full scale value. The consumption is added or subtracted (depending on the flow direction) by the SI-00 and displayed. The positive flow direction is marked with an arrow on the unit. The outputs of the SI-00 always refer to the positive direction.



The counter is reset either through external pulse, through programmable automatic reset time from one hour to eight weeks or manually by the touch of a button. One of the outputs of the SI-00 can be used to realize a batching process. In this operating mode the switching output of the SI-00 is activated to control e.g. a solenoid valve after the preset amount has passed through the flowmeter. In case of not reaching the preset amount the user can choose either to wait for further flow or to reset the counter automatically.

## Electrical Specifications:

**Supply voltage /** 18...32 VDC acc. to EN50178, SELV, PELV

**Current rating /**  
 SI-00.08: 200 mA  
 SI-00.15: 2 x 200 mA  
 SI-00.20: 2 x 200 mA  
 SI-00.25: 2 x 200 mA  
 SI-00.50a: 2 x 250 mA  
 SI-00.50b: 2 x 250 mA

**Short-circuit protection /** pulsed

**Reverse polarity protection /** yes

**Overload protection /** yes

**Voltage drop /** < 2 V

**Current consumption /**  
 SI-00.08: < 80 mA  
 SI-00.15: 95 mA;(24 V)  
 SI-00.20: 95 mA;(24 V)  
 SI-00.25: 95 mA;(24 V)  
 SI-00.50a: < 150 mA  
 SI-00.50b: < 150 mA

**Power-on delay /** 5 s

**Analogue output /** 4...20 mA or 0...10 VDC, scaleable

**Load for analogue output /**  
 max. 500 Ω for 4...20 mA,  
 min. 2000 Ω for 0...10 VDC

**Pulse output /** flow rate meter

**Pulse value /**  
 SI-00.08: 0,001...0,3 l  
 SI-00.15: 0,00001...0,30 000 m<sup>3</sup>  
 SI-00.20: 0,00001...0,50 000 m<sup>3</sup>  
 SI-00.25: 0,00001...0,100 000 m<sup>3</sup>  
 SI-00.50a: 0,0001...0,300 x 10<sup>3</sup> m<sup>3</sup>  
 SI-00.50b: 0,0001...0,600 x 10<sup>3</sup> m<sup>3</sup>

**Pulse length / (not adjustable)**  
 SI-00.08: 0,008...0,2 s  
 SI-00.15: 0,01...0,2 s  
 SI-00.20: 0,005...0,2 s  
 SI-00.25: 0,0025...0,2 s  
 SI-00.50a: 0,016...0,2 s  
 SI-00.50b: 0,008...0,2 s

**Programming options /**

SI-00.08 /15 /20 /25: Flow monitoring; volume counter; preselection counter; temperature monitoring; hysteresis / window function; start-up delay; output logic; current / voltage / pulse output; N.O./ N.C.; display can be deactivated; display unit;

SI-00.50a/ 50b: Flow monitoring; volume counter; preselection counter; temperature monitoring; hysteresis / window function; start-up delay; output logic; current / voltage / pulse output; N.O./ N.C.; display can be deactivated; display unit; empty tube detection;

**Protection class /** IP 65 / IP 67

**Insulation resist. /** >100 MΩ (500 VDC)

**EMC /** DIN EN 60947-5-9

**Electrical connection /** M12 connector; gold-plated contacts

**Display /**

**Measuring unit:** 6 LED green (l/min, m<sup>3</sup>/h, l, m<sup>3</sup>, 103, °C)

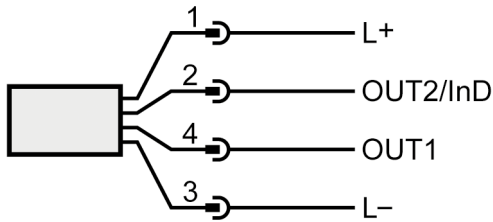
**Switching status:** 2 LED yellow

**Measured values:** 4-digit alphanumeric display

**Programming:** 4-digit alphanumeric display



## Wiring:



### Plug connection /



### OUT1 (SI-00.08 /15 /20 /25) /

4 selection options:

- switching output flow-detector
- pulse output flow
- switching output preset counter
- IO-Link

### OUT1 (SI-00.50a /50b) /

6 selection options:

- switching output empty pipe detection
- switching output flow-detector
- frequency output flow-detector
- pulse output flow
- switching output preset counter
- IO-Link

### OUT2/InD (SI-00.08 /15 /20 /25) /

5 selection options:

- switching output flow-detector
- switching output temperature-detector
- analogue output flow
- analogue output temperature
- input for an external reset signal

### OUT2/InD (SI-00.50a /50b) /

6 selection options:

- switching output empty pipe detection
- switching output flow-detector
- switching output temperature-detector
- analogue output flow
- analogue output temperature
- Input for an external reset signal

## Technical Specifications:

<b>Application /</b>	conductive liquids, fluid group 2 (DGRL) conductivity from 20 µS/cm upwards and viscosity up to 70 mm <sup>2</sup> /s at 40°C
<b>Pressure drop /</b>	max. 16 bar (max. 10 bar for SI-00.08)
<b>Medium temp. /</b>	-10...+70°C (0...+60°C for SI-00.08)
<b>Ambient temp. /</b>	-10...+60°C
<b>Storage temp. /</b>	-25...+80°C
<b>Shock resistance /</b>	DIN IEC 68-2-27: 20 g (11 ms)
<b>Vibration resistance /</b>	DIN IEC 68-2-6: 5 g (10...2000 Hz)
<b>Housing material /</b>	
SI-00.08 /15 /20 /25:	1.4404 (st. steel / 316L); PBT-GF20; PC; FKM; TPE
SI-00.50a /50b:	1.4404 (st. steel / 316L); 1.4571 (st. steel / 316Ti); PEI; FKM; PBT-GF20; TPE-U
<b>Wetted parts /</b>	
SI-00.08 /15 /20 /25:	V4A (1.4404), Viton (FKM), PEEK (Polyether-Etherketon)
SI-00.50a /50b:	V4A (1.4404), V4A (1.4571), FKM, PEEK (Polyether-Etherketon), Centellen

## Ordering Codes:

<b>Order number</b>	SI-00.	08.	0.	1
<b>SI-00 Miniature-Electromagnetic Flowmeter</b>				
<b>Process connection and operating range /</b>				
08 = G1/4"-male for 0.005...3 l/min				
15 = G1/2"-male for 0.1...25 l/min				
20 = G3/4"-male for 0.2...50 l/min				
25 = G1"-male for 0.2...100 l/min				
50a = G2"-male for 5...300 l/min				
50b = G2"-male for 5...600 l/min				
<b>Process connection, adapter /</b>				
0 = none				
2 = incl. 2 pieces adapter R1/2"-male stainless steel 1.4571 incl. gaskets for SI-00.15				
<b>Options /</b>				
0 = no option				
1 = counter plug 4-pole for M12				



# Setting range:

### Setpoint /

SI-00.08:	0.02 .. 3 l/min
SI-00.15:	0.25 .. 25 l/min
SI-00.20:	0.5 .. 50 l/min
SI-00.25:	0.7 .. 100 l/min
SI-00.50a:	6.5 .. 300 l/min
SI-00.50b:	8.0 .. 600 l/min

### Resetpoint /

SI-00.08:	0.005 .. 2.984 l/min
SI-00.15:	0.1 .. 24.9 l/min
SI-00.20:	0.2 .. 49.8 l/min
SI-00.25:	0.2 .. 99.5 l/min
SI-00.50a:	5 .. 298.5 l/min
SI-00.50b:	5 .. 597.0 l/min

### Analogue start point /

SI-00.08:	0 .. 2.4 l/min
SI-00.15:	0 .. 20 l/min
SI-00.20:	0 .. 40 l/min
SI-00.25:	0 .. 80 l/min
SI-00.50a:	0 .. 240 l/min
SI-00.50b:	0 .. 480 l/min

### Analogue end point /

SI-00.08:	0.6 .. 3 l/min
SI-00.15:	5 .. 25 l/min
SI-00.20:	10 .. 50 l/min
SI-00.25:	20 .. 100 l/min
SI-00.50a:	60 .. 300 l/min
SI-00.50b:	120 .. 600 l/min

### in steps of /

SI-00.08:	0.001 l/min
SI-00.15:	0.02 l/min
SI-00.20:	0.1 l/min
SI-00.25:	0.1 l/min
SI-00.50a:	0.5 l/min
SI-00.50b:	0.5 l/min

### Damping /

0 .. 5 sec, adjustable

### Start-up delay /

0 .. 50 sec, adjustable

### Response time /

SI-00.08:	< 0.15 s by damping 0 s
SI-00.15:	< 0.15 s by damping 0 s
SI-00.20:	< 0.15 s by damping 0 s
SI-00.25:	< 0.15 s by damping 0 s
SI-00.50a:	< 0.35 s by damping 0 s
SI-00.50b:	< 0.35 s by damping 0 s

### Process connection /

SI-00.08:	G1/4"-male
SI-00.15:	G1/2"-AG (available with adapter G3/4" or R1/2")
SI-00.20:	G3/4"-male
SI-00.25:	G1"-male
SI-00.50a:	G2"-male
SI-00.50b:	G2"-male

### Accuracy /

SI-00.08:	± (2% MW + 0.5% ME)
SI-00.15:	± (0.8% MW + 0.5% ME)
SI-00.20:	± (0.8% MW + 0.5% ME)
SI-00.25:	± (0.8% MW + 0.5% ME)
SI-00.50a:	± (0.8% MW + 0.5% ME)
SI-00.50b:	± (0.8% MW + 0.5% ME)

### Repeatability /

± 0.2% ME



## Flow Measurement:

### Display range /

SI-00.08:	-1.999...3.6 l/min
SI-00.15:	-30...+30 l/min
SI-00.20:	-60...+60 l/min
SI-00.25:	-120...+120 l/min
SI-00.50a:	-360...+360 l/min
SI-00.50b:	-720...+720 l/min

### Measuring range /

SI-00.08:	0.005...3 l/min
SI-00.15:	0.1...25 l/min
SI-00.20:	0.2...50 l/min
SI-00.25:	0.2...100 l/min
SI-00.50a:	5...300 l/min
SI-00.50b:	5...600 l/min

### Resolution /

SI-00.08:	0.001 l/min
SI-00.15:	0.02 l/min
SI-00.20:	0.1 l/min
SI-00.25:	0.1 l/min
SI-00.50a:	0.5 l/min
SI-00.50b:	0.5 l/min

## Temperature Measurement:

**Temperature range /** -20...+80°C

**Setpoint temp. /** -19.2...+80°C

**Resetpoint temp. /** -19.6...+79.6°C

Analogue start point: -20...+60°C

Analogue end point: 0...+80°C

in steps of: 0.2°C

### Response time temp. /

SI-00.08: T09 = 40 s (Q > 1 l/min)

SI-00.15: T09 = 20 s (Q > 1 l/min)

SI-00.20: T09 = 20 s (Q > 5 l/min)

SI-00.25: T09 = 20 s (Q > 5 l/min)

SI-00.50a: T09 = 3 s (Q > 15 l/min)

SI-00.50b: T09 = 3 s (Q > 15 l/min)

### Accuracy temp. /

SI-00.08: ± 1.5; 25°C (Q > 0.5 l/min)

SI-00.15: ± 2.5; 25°C (Q > 1 l/min)

SI-00.20: ± 2.5; 25°C (Q > 5 l/min)

SI-00.25: ± 2.5; 25°C (Q > 5 l/min)

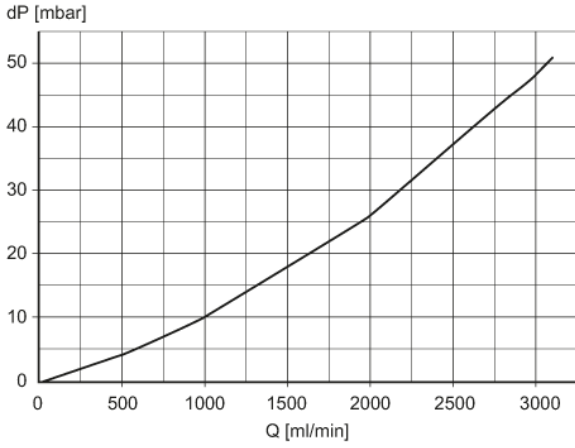
SI-00.50a: ± 1.0; 25°C (Q > 15 l/min)

SI-00.50b: ± 1.0; 25°C (Q > 15 l/min)

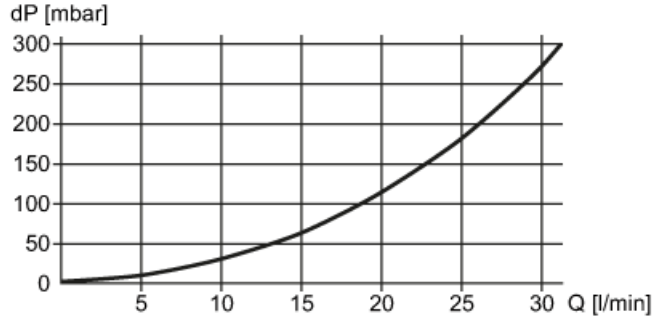


# Pressure drop curves:

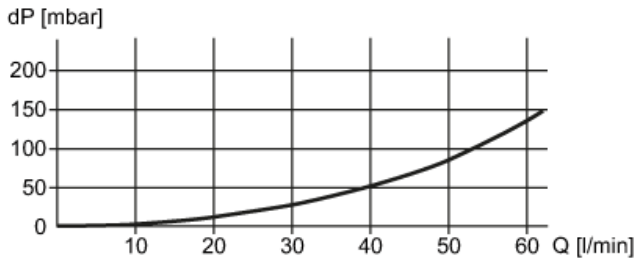
SI-00.08 /



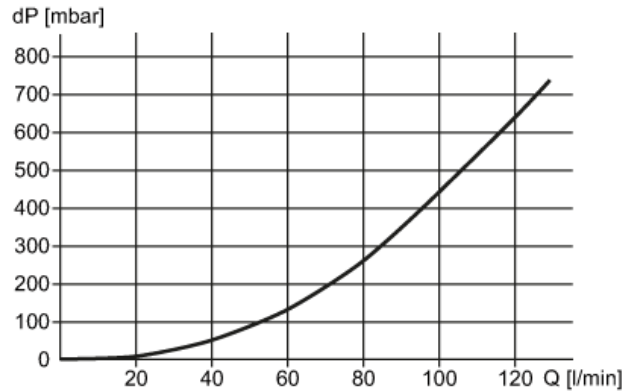
SI-00.15 /



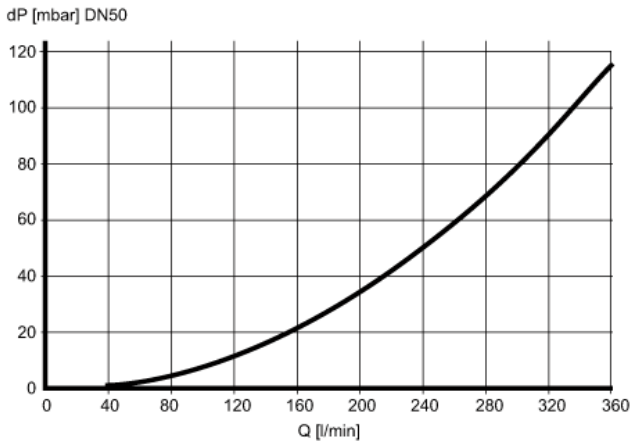
SI-00.20 /



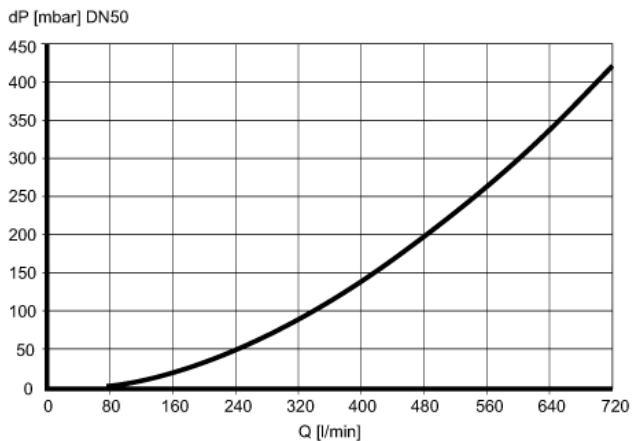
SI-00.25 /



SI-00.50a /



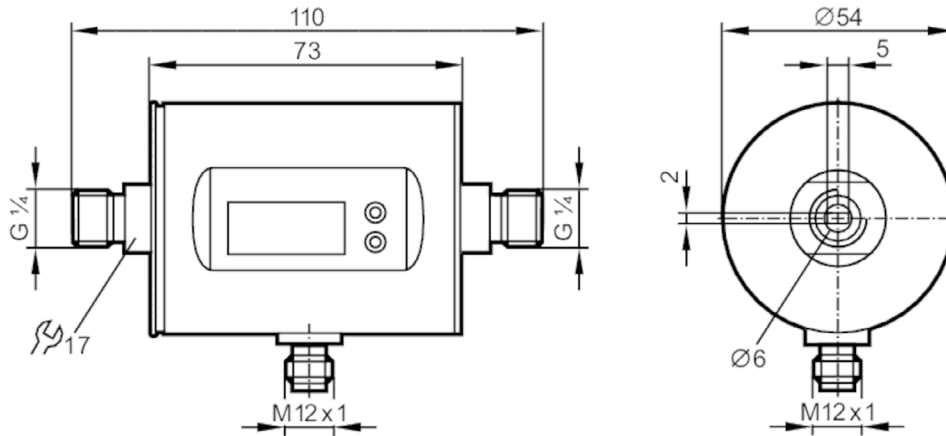
SI-00.50b /



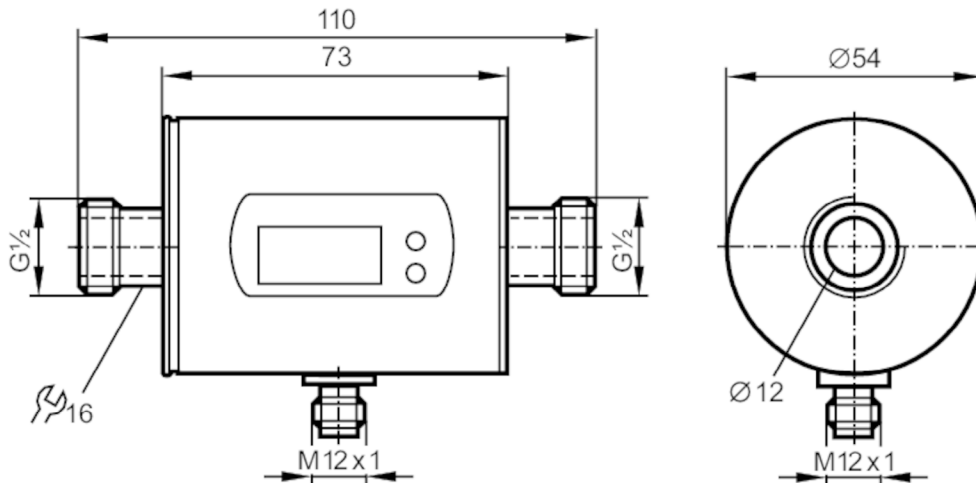


## Dimensions in mm:

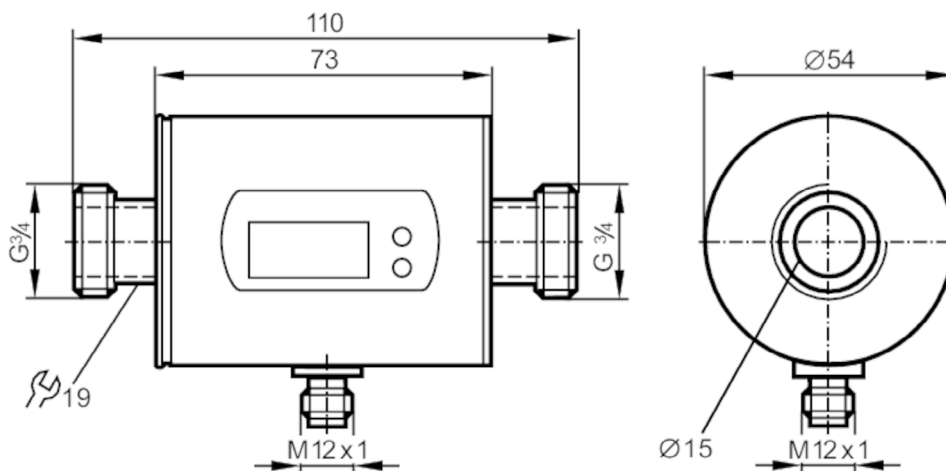
SI-00.08 /



SI-00.15 /

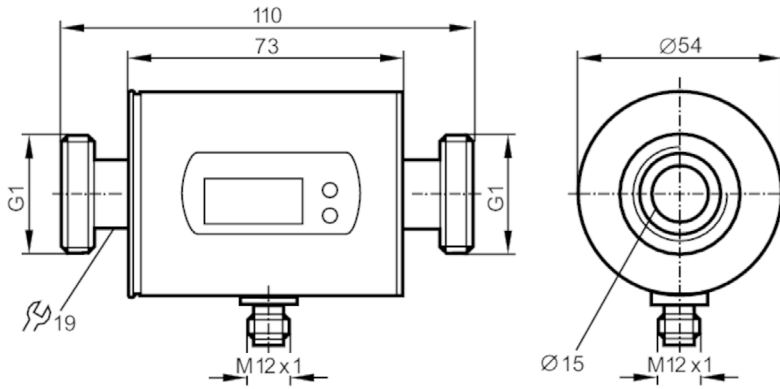


SI-00.20 /

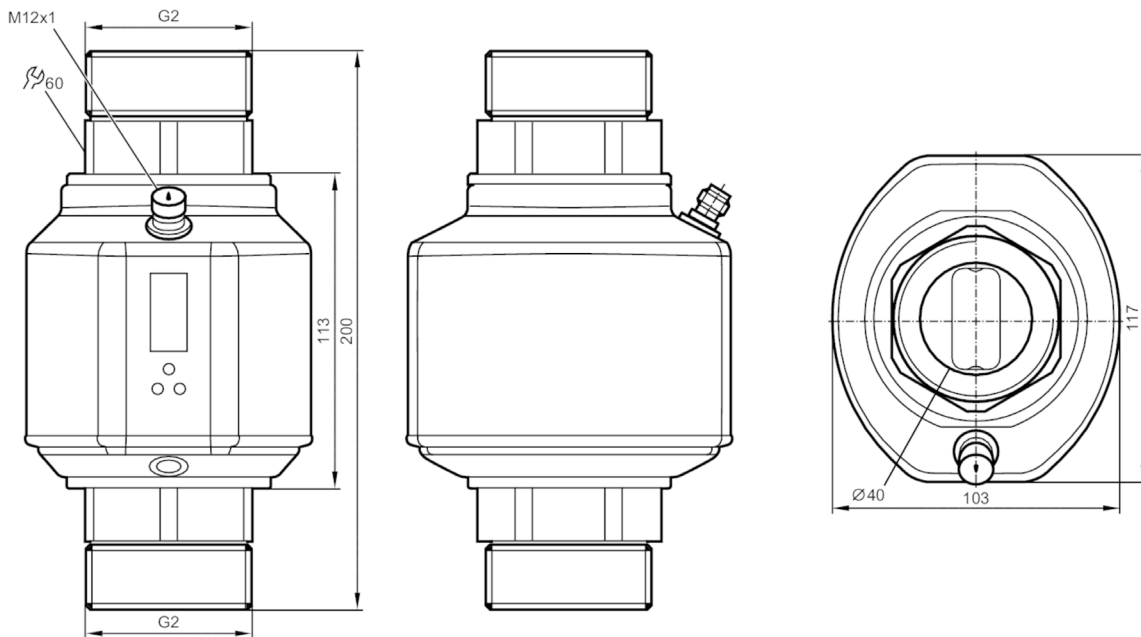




**SI-00.25 /**



**SI-00.50a /**



**SI-00.50b /**

