ifm electronic

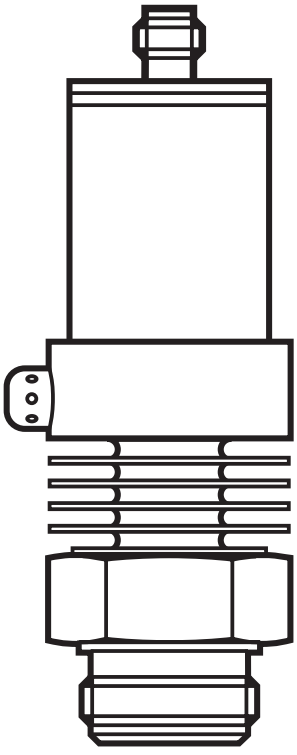
CE

Operating instructions
Electronic pressure sensor

efectorsoo

PM205x

UK



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Contents

1 Preliminary note

1.1 Symbols used

▶ Instruction

> Reaction, result

[…] Designation of buttons, switches or indications

→ Cross-reference

Important note
Non-compliance can result in malfunctions or interference.

UK

2 Safety instructions

- Read this ducument before installing the unit. Ensure that the product is suitable for your application without any restrictions.
- Non-adherence to the operating instructions or technical data can lead to personal injury and/or damage to property.
- In all applications check compliance of the product materials (→ 10 Technical data) with the media to be measured.

The Sensor shall be connected only by using any R/C (CYJV2) cord, having suitable ratings.

3 Functions and features

The pressure sensor detects the system pressure of machines and installations.

3.1 Applications

Type of pressure: relative pressure

Bestell-nummer	Messbereich		Zulässiger Überdruck		Berstdruck	
	bar	PSI	bar	PSI	bar	PSI
PM2053	-1...25	-15...363	100	1 450	350	5 070
PM2054	-0,5...10	-7...145	50	725	150	2 175
PM2055	-0,99...4,00	-14,4...58,0	30	435	100	1 450
PM2056	-0,13...2,50	-1,8...36,3	20	290	50	725
	mbar	PSI	bar	PSI	bar	PSI
PM2057	-50...1 000	-0,7...14,5	10	145	30	450
	mbar	inH2O	bar	inH2O	bar	inH2O
PM2058	-12,5...250	-5,0...100,4	10	4 000	30	12 000

MPa = bar ÷ 10 / kPa = bar × 100

Static and dynamic overpressures exceeding the indicated overload pressure are to be avoided by taking appropriate measures.
The indicated bursting pressure must not be exceeded. Even if the bursting pressure is exceeded only for a short time, the unit can be destroyed.
NOTE: Risk of injury!

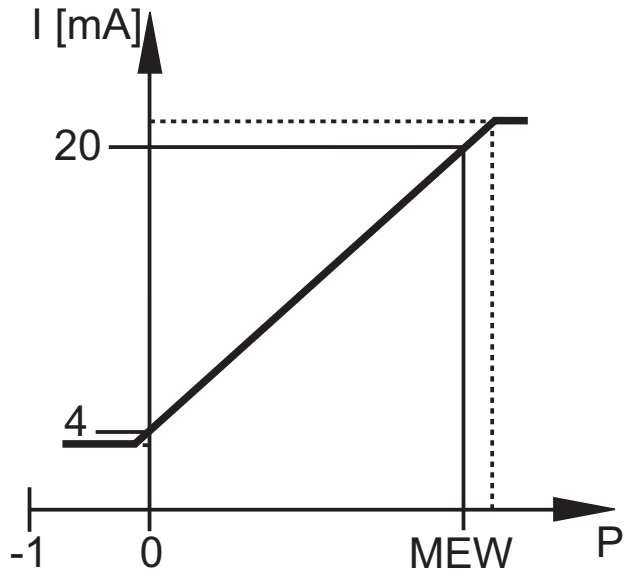
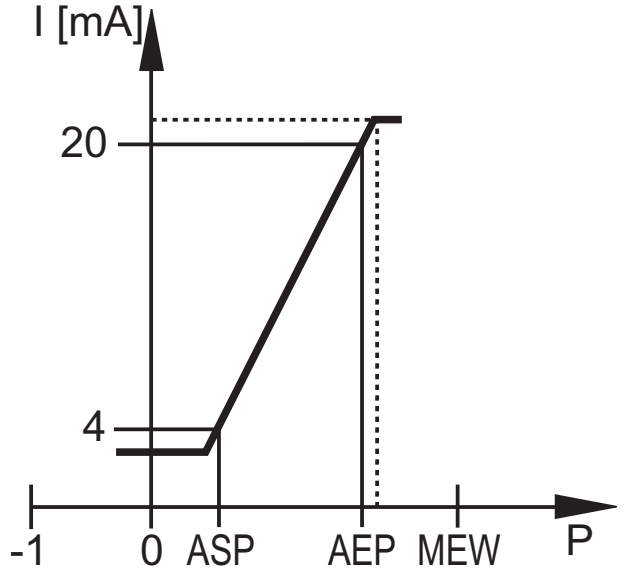
4 Function

4.1 Processing of the measured signals

The unit converts the system pressure into an analogue output signal (4...20 mA). The measuring range can be scaled to up to 25% of the finalvalue of the measuring range.

- By setting the parameter ASP you define the measured value at which the output signal is 4 mA.
- By setting the parameter AEP you define the measured value at which the output signal is 20 mA.

UK

Factory setting	Measuring range scaled
	

P = system pressure, MEW = final value of the measuring range

The output signal is between 4 and 20 mA. It is also indicated:

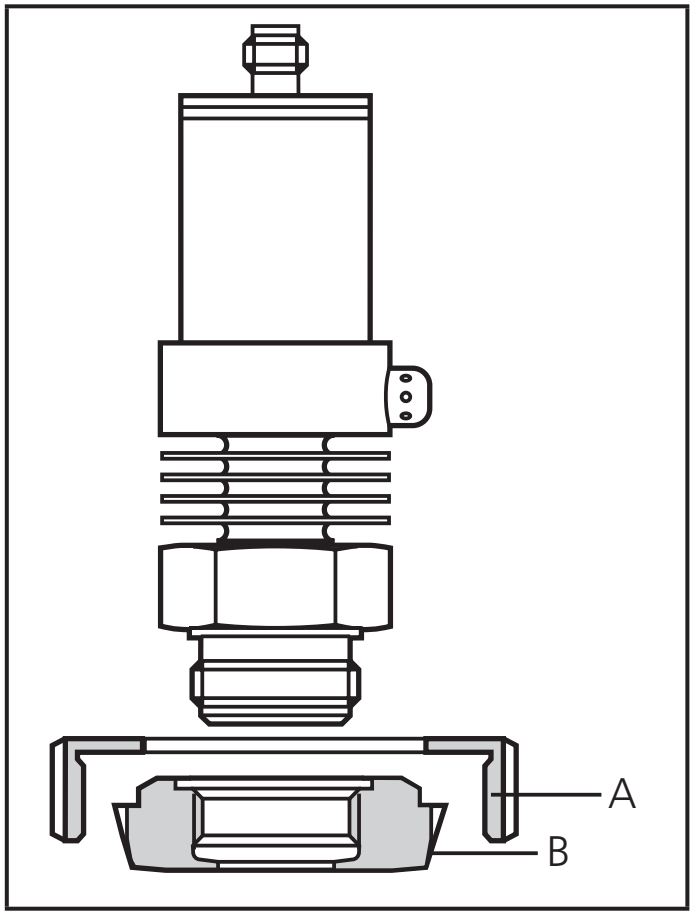
- System pressure above the measuring range: output signal > 20 mA .
- System pressure below the measuring range: output signal between 4 and 3.2 mA.

The unit is ready for operation when delivered. Factory preset: not scaled (ASP = 0 bar; AEP = 100% of the final value of the measuring range).

5 Installation

Ensure that no pressure is applied to the installation while mounting or removing the sensor.

Aseptoflex adapters ensure that the sensor can be connected to different process connections.
(The adapters have to be ordered separately as accessories.)



Mounting operation:

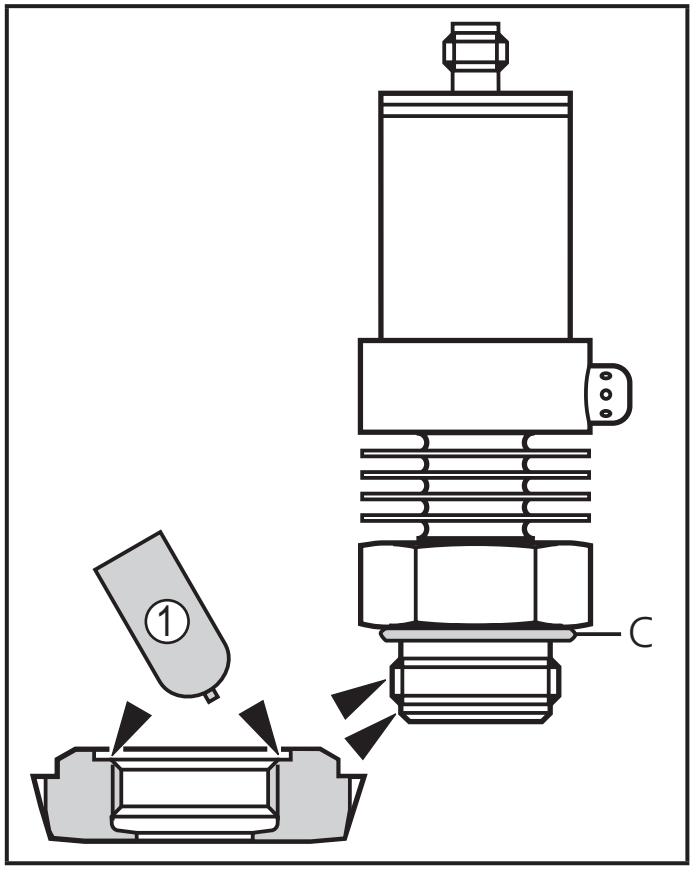
- ▶ Mount the adapter (B) to the sensor.
- ▶ Fix sensor + adapter by means of a coupling nut, a clamp flange or similar (A) to the process connection.

If it is not possible to slide the fixing element (A) down over the top of the sensor: slide it up over the bottom of the sensor before the adapter is mounted.

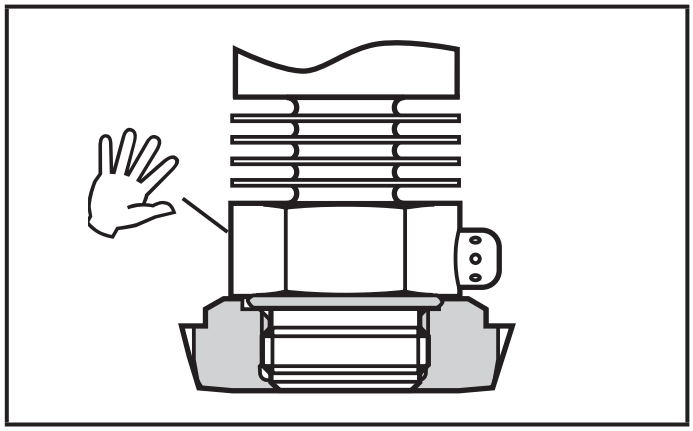
Mounting the Aseptoflex adapter

- ▶ Grease the following parts with the paste supplied (1):
  - thread and sealing areas of the unit.
  - sealing areas and O-ring of the adapter.

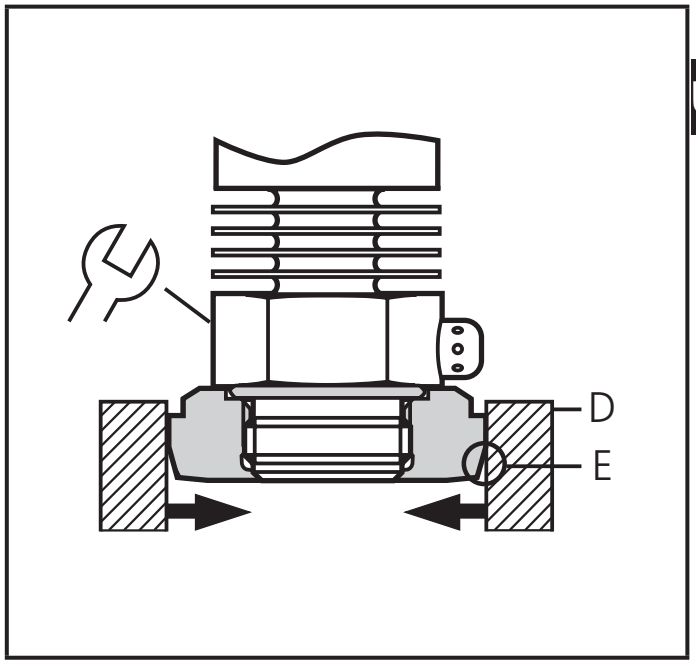
  Food-grade paste (USDA-H1 84-201) is supplied.
  Make sure that the O-ring (D) is correctly positioned.



- Screw the sensor into the adapter until it is hand-tight. Do not damage the sealing chamfers.



- Clamp sensor and adapter into a clamping device (E). Tighten the clamping device only slightly so that the adapter does not warp. The sealing chamfers (F) must not be damaged.
- Tighten the sensor using a spanner until you can feel the end stop (corresponding to a maximum tightening torque of 25 Nm / 18 ftlb). Note: Do not overtighten. This can have an adverse effect on the sealing.



NOTE: A guarantee for a long-term stable and maintenance-free fitting with no bug traps in the hygienic sealing of the metal seal (Aseptoflex connection) is only valid for once-only mounting.

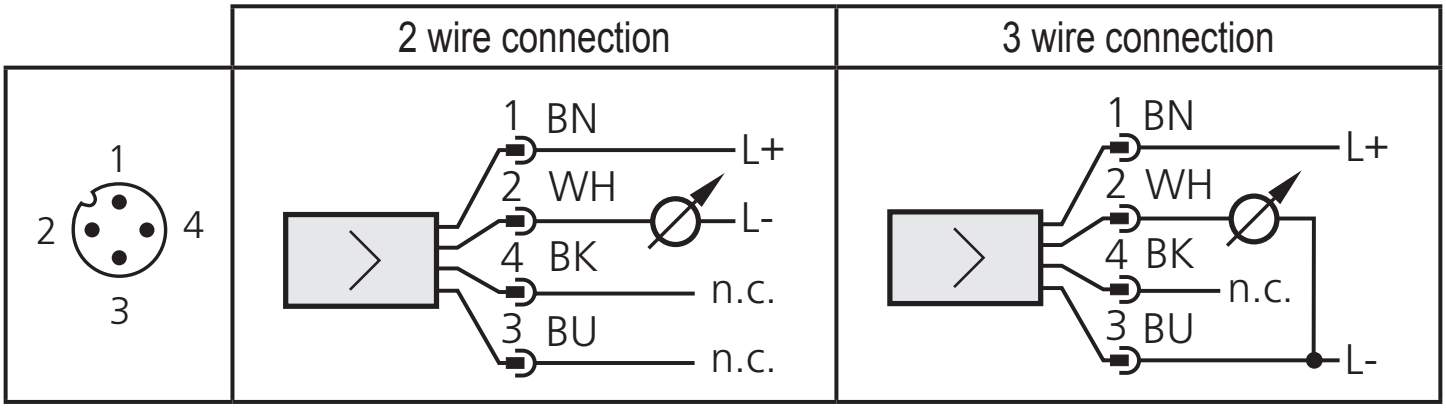
Welding adapter

First weld the adapter, then mount the sensor. Follow the instructions included with the adapter.

6 Electrical connection

The unit must be connected by a qualified electrician.
The national and international regulations for the installation of electrical equipment must be adhered to.
Voltage supply to EN50178, SELV, PELV.

▶ Disconnect power.
▶ Connect the unit as follows:



Core colours of ifm sockets:
1 = BN (brown), 2 = WH (white), 3 = BU (blue), 4 = BK (black)

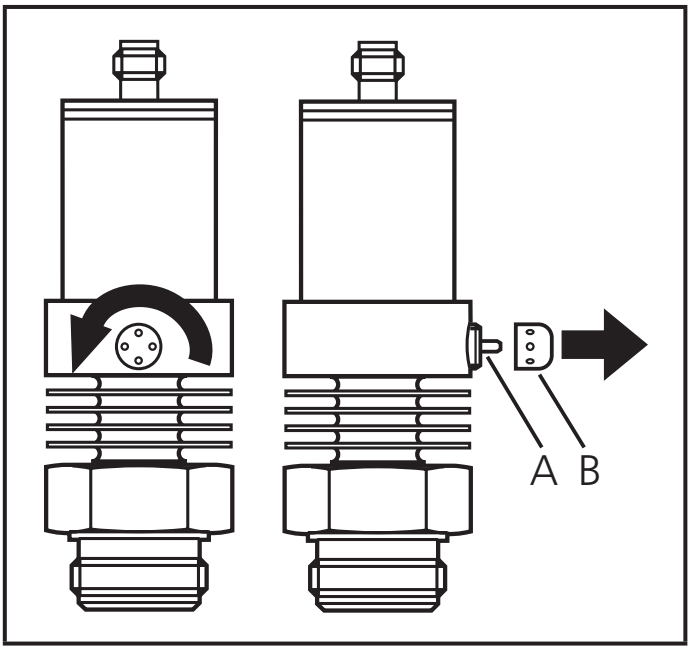
7 Operation

After power on of the supply voltage the unit is in the Run mode (= normal operation). It carries out its measurement and evaluation functions and provides an analogue signal proportional to the system pressure.

7.1 Cleaning of the filter cover

If viscous and residues producing media clog the filter cover of the sensor (and thus reduce the measuring accuracy slightly), you can clean it.

▶ Unscrew the filter cover (B) (use a pair of pliers with plastic-covered jaws for this).
▶ Clean the cover thoroughly.

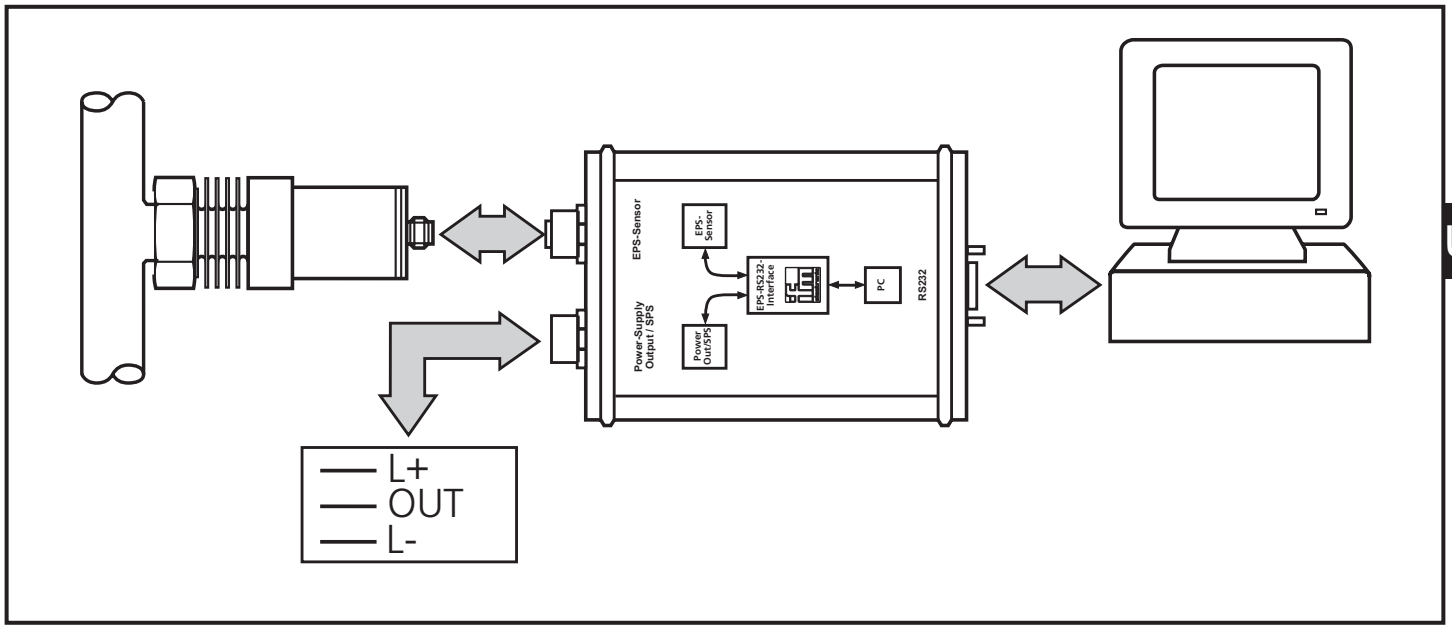


The vent (A) should only be cleaned by skilled personnel and with utmost care. Possible medium residues must not be compressed and pressed into the vent. This could clog the filter system and reduce the measuring accuracy of the sensor.

▶ Screw the filter cover again tightly.

The sensor is sufficiently protected against harsh ambient conditions (protection IP 67). The protection rating can be increased by a special accessory (order no. E30043).

8 Programming / Use with EPS RS232 interface



▶ Connect the sensor to a PC via the EPS-RS232 interface (order no. E30066).
> The sensor is supplied with operating voltage by the interface.
> It transmits its data (measured values, analogue signal and parameter settings) continuously via the interface.

It provides the following options:

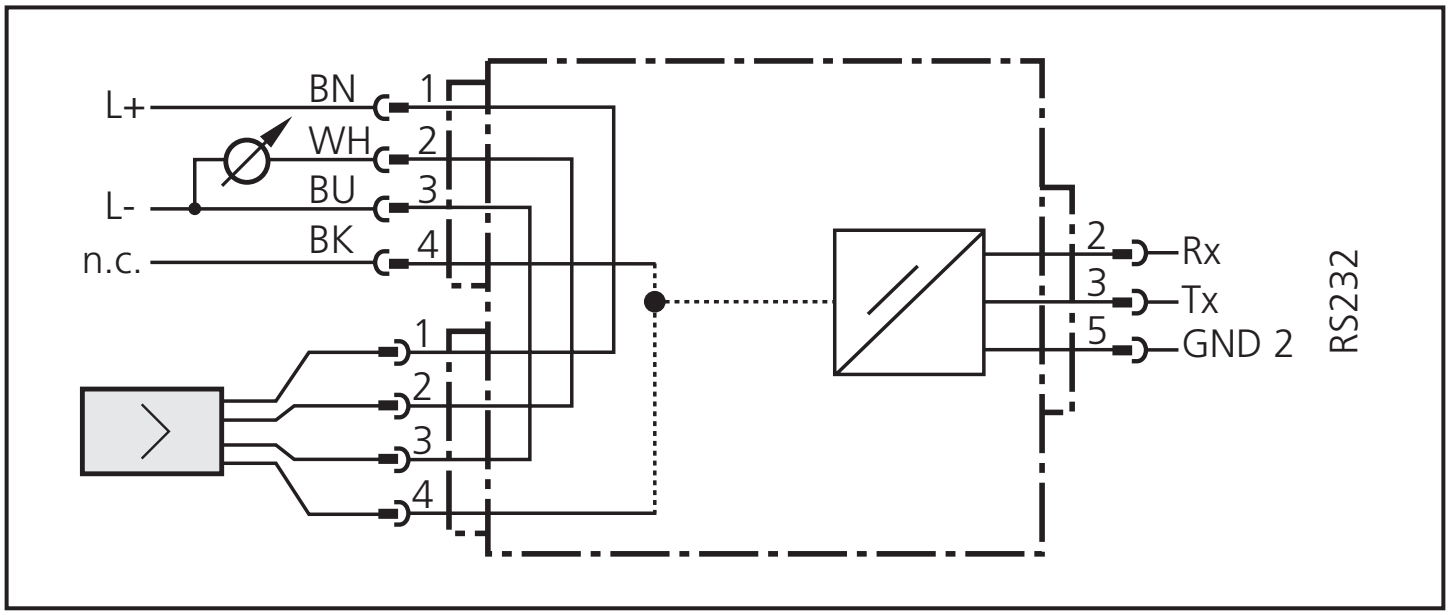
- Remote display
  Indication of the current system pressure by PC or display.
- Remote evaluation
  Output of the current analogue value.
- Programming / remote programming of the sensor
  Scaling the measuring range, damping for the analogue output, calibration of the sensor. Parameters can be set before the sensor is mounted and set up or during operation.

If you change the parameters during operation, the functioning of the plant will be affected. Ensure that plant malfunction is prevented.

8.1 Wiring of sensor and EPS interface

For use of the sensor with EPS interface prior to installation of the sensor: Use a suitable power supply (24V power supply; ifm order no. E30080).

For mobile use of the interface after installation of the sensor:
Disconnect power before connecting the unit.
Do not disconnect these connections while live.



8.2 Programming

For programming of the sensor please use the FDT service program ifm container (order no. E30110).

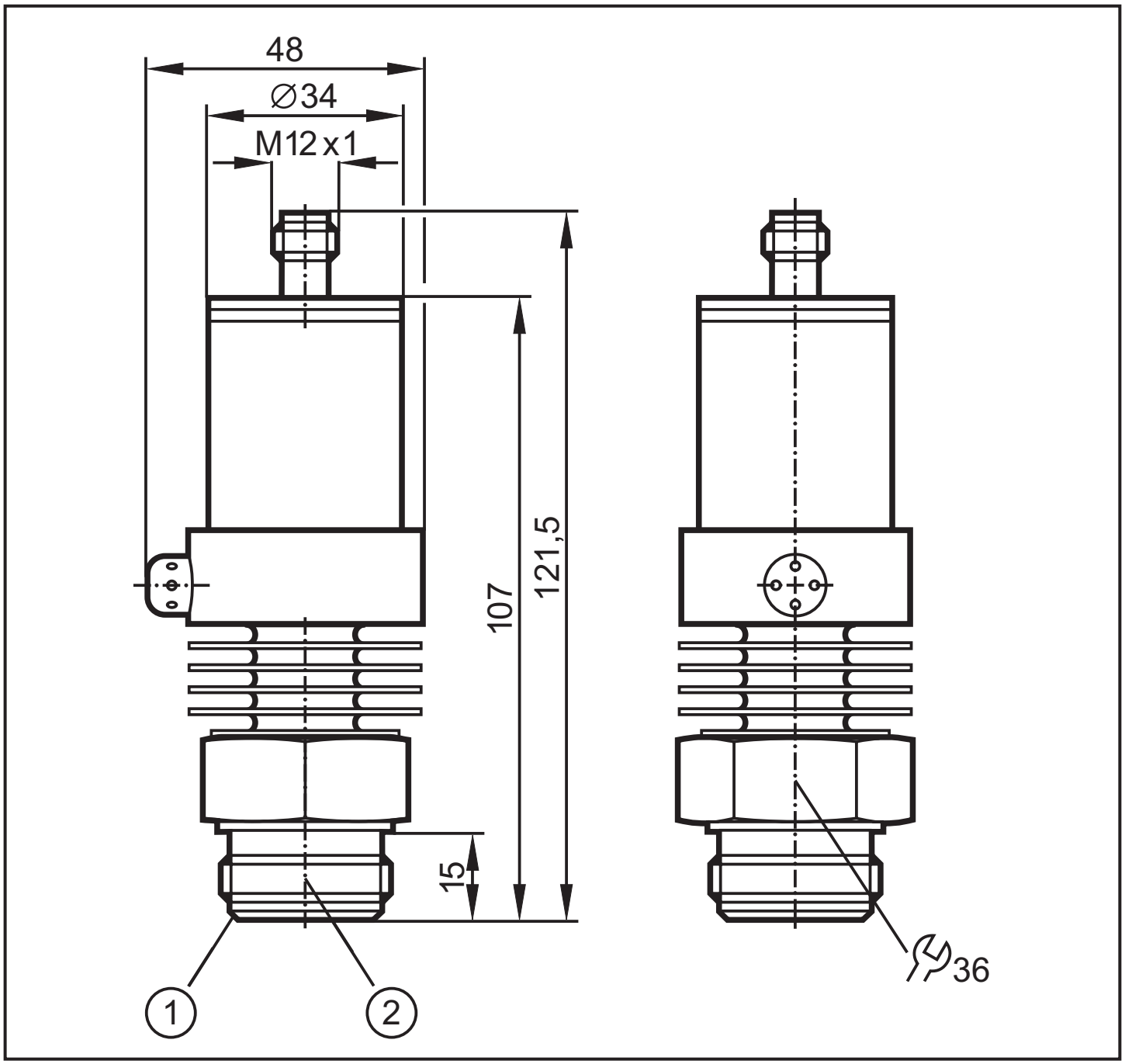
EPS RS-232 interface, FDT service program, power supply and connection cable available as a set (order no. ZZ0050).

8.3 Adjustable parameters

ASP	Analogue start point Measured value at which 4 mA is provided.
AEP	Analogue end point Measured value at which 20 mA is provided. Minimum distance between ASP and AEP = 25% of the span.
HI LO	Min-Max memory for system pressure • HI: displays the highest measured pressure. • LO: displays the lowest measured pressure.
COF	Calibration offset The internal measured value (operating value of the sensor) is offset against the real measured value. • Setting range: -5 ... +5% of the value of the span (with scaling as factory setting (ASP = 0 bar and AEP = final value of measuring range) in steps of 0.1% of the value of the span.
CAr	Calibration reset Resets the calibration set by COF.

dAA	Damping for the analogue output Pressure peaks of short duration or high frequency can be filtered out. dAA-value = response time between pressure change and change of the switching status in milliseconds (ms). • Setting range: 0 (= dAA is not active) / 0.1 s / 0.5 s / 2 s.
Uni	Display unit The measured values and values for ASP / AEP can be indicated in the following units: bar, mbar, PSI, MPa, kPa, inH2O (only PM2058), mmWS (only PM2058).
diS	Setting of the display d1 / d2 / d3 = update of the measured value every 50ms / 200ms / 600ms. The update interval only refers to the display. ph = display of the measured peak value remains for a short time (peak hold).

9 Scale drawing



Dimensions are in mm
1: Aseptoflex thread; 2: Aseptoflex sealing edge

10 Technical data

Operating voltag [V] ..... 14...30 DC
Operating voltage for EPS interface with sensor [V] ..... 15.5...30 DC
reverse polarity / overload protection
Analogue output ..... 4...20 mA
Max. load [Ω] ..... (Ub - 13) x 50
Min. response time analog output [ms] 3

Accuracy / deviation (in % of the span)[1)]
- Characteristics deviation (linearity. incl. hysteresis and repeatability)[2)] .....< ± 0.6
- Linearity.....< ± 0.5
- Hysteresis.....< ± 0.1
- Repeatability (with temperature fluctuations < 10 K).....< ± 0.1
- Long-term stability (in % of the span per year).....< ± 0.1

Temperature coefficient (TC) in the compensated temperature range 0 ... 80°C (in % of the span per 10 K)

	PM2053...PM2057	PM2058
Greatest TC of the zero point	< ± 0.1	< ± 0.1
Greatest TC of the span	< ± 0.2	< ± 0.4

Materials (wetted parts)
..... stainless steel 316L / 1.4435; surface characteristics: Ra < 0.4 / Rz 4
ceramics (99.9 % Al2 O3); PTFE
Housing materials..... stainless steel 316L / 1.4404; PEI; FPM (Viton)
Protection ..... IP 67
Protection class III
Insulation resistance [MΩ] .....> 100 (500 V DC)
Shock resistance [g] .....50 (DIN / IEC 68-2-27, 11ms)
Vibration resistance [g] .....20 (DIN / IEC 68-2-6, 10 - 2000 Hz)
Min. pressure cycles..... 100 million
Operating temperature [°C] ..... -25...80
Medium temperature [°C] ..... -25...125 (145 max. 1h)
Storage temperature [°C]..... -40...100
EMC EN 61000-4-2 ESD: .....4 / 8 KV
EN 61000-4-3 HF radiated: ..... 10 V/m
EN 61000-4-4 Burst: .....2 KV
EN 61000-4-6 HF conducted: ..... 10 V

[1)] all indications are referred to a turn down of 1:1
[2)] limit value setting to DIN 16086

10.1 Setting ranges

		ASP		AEP		ΔP
		min	max	min	max	
PM2053	bar	-1.0	18.8	5.3	25.0	0.1
	PSI	-15	272	76	363	1
	MPa	-0.10	1.88	0.53	2.50	0.01
PM2054	bar	-0.50	7.49	2.00	9.99	0.01
	PSI	-7	109	29	145	1
	kPa	-50	749	200	999	1
PM2055	bar	-0.99	1.00	0.26	4.00	0.01
	PSI	-14.4	14.5	3.7	58.0	0.1
	kPa	-99	100	26	400	1
PM2056	bar	-0.13	1.88	0.50	2.50	0.01
	PSI	-1.8	27.2	7.3	36.3	0.1
	kPa	-13	188	50	250	1
PM2057	mbar	-50	749	200	999	1
	PSI	-0.7	10.9	2.9	14.5	0.1
	kPa	-5.0	74.9	20.0	99.9	0.1
PM2058	mbar	-12.5	100.0	50.0	250.0	0.5
	kPa	-1.25	10.00	5.00	25.00	0.05
	inH_2O	-5.0	40.2	20.2	100.4	0.2
	mmWS	-125	1020	515	2550	5

ΔP = increments

More information at www.ifm.com