

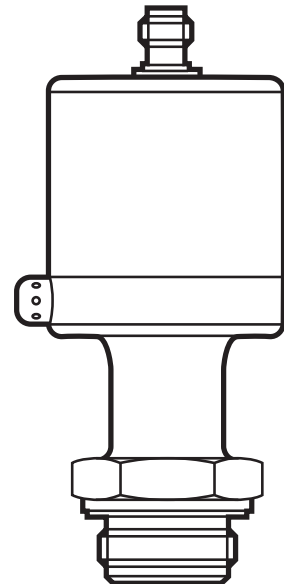


Operating instructions
Profibus PA pressure transmitter

UK

PMPxx

704485 / 00 05 / 2009



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1 Preliminary note

1. Symbols used

- ▶ Instruction
- > Reaction, result
- [...] Designation of buttons, switches or indications
- Cross-reference



Important note

Non-compliance can result in malfunctions or interference.



Information

Supplementary note.

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2 Safety instructions

- Please read this document prior to installing the unit. Ensure that the product is suitable for your application without any restrictions.
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- Check in all applications that the product materials (→ 10 Technical data) are compatible with the media to be measured.
- Adhere to the remarks for safe use in hazardous areas (→ ATEX operating instructions).

For units with cULus approval and the scope of validity cULus: The device shall be supplied from an isolating transformer having a secondary Listed fuse rated as noted in the following table.

Overcurrent protection		
Control-circuit wire size		Maximum protective device rating [A]
AWG	[mm ²]	
22	0.32	3
20	0.52	5
18	0.82	7
16	1.3	10
14	2.1	20
12	3.3	25

3 Functions and features


The unit detects the system pressure, evaluates the measured signals and outputs the process values cyclically via the integrated Profibus PA interface.

Applications


Type of pressure: Relative pressure

Order number	Measuring range		Permissible overload pressure		Bursting pressure	
	bar	PSI	bar	PSI	bar	PSI
PMP094 PMP04A	-1...10	-14.5...145	50	725	150	2 175
PMP095 PMP05A	-1...4	-14.5...58	30	435	100	1 450
PMP096 PMP06A	-0.124...2,5	-1.8...36,24	20	240	50	725
	mbar	PSI	bar	PSI	bar	PSI
PMP097 PMP07A	-50...1 000	-0.73...14.5	10	145	30	435

$$\text{MPa} = \text{bar} \div 10 / \text{kPa} = \text{bar} \times 100$$

 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!

 The unit can be operated at media temperatures up to 145°C (max. 1h) / 125°C (permanently) when used outside hazardous areas. Therefore it is suitable for all standard cleaning and sterilisation processes (CIP, SIP).

4 Function

- During operation it carries out self-tests. The diagnostic state can be read cyclically or acyclically.
- The unit can be parameterised. It supports the Profibus PA profile “Pressure Transmitter” including the extension for installation and maintenance (I&M). In addition manufacturer-specific parameters have been implemented.

5 Installation

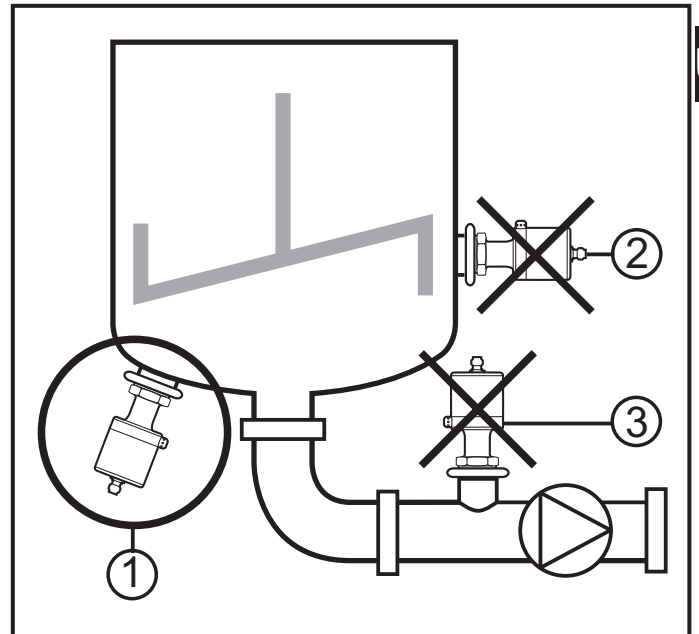


Ensure that no pressure is applied to the installation while mounting or removing the sensor.

NOTE: The fieldbus measuring value “0 digits” does not mean that no pressure is applied to the installation!

Installation location

- We recommend horizontal installation for high medium temperatures.
- To monitor a tank: If possible, mount the sensor at the bottom of the tank (1).
- Do not mount near an agitator (2), a pump (3) or in the spout of the tank (3)!

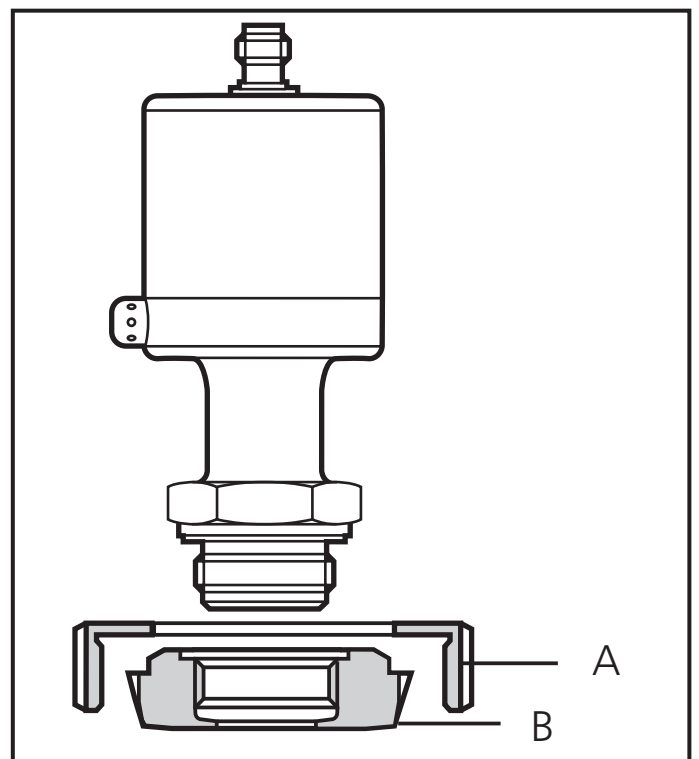


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Aseptoflex adapters ensure that the sensor can be connected to different process connections.
(The adapters have to be ordered separately as accessories.)

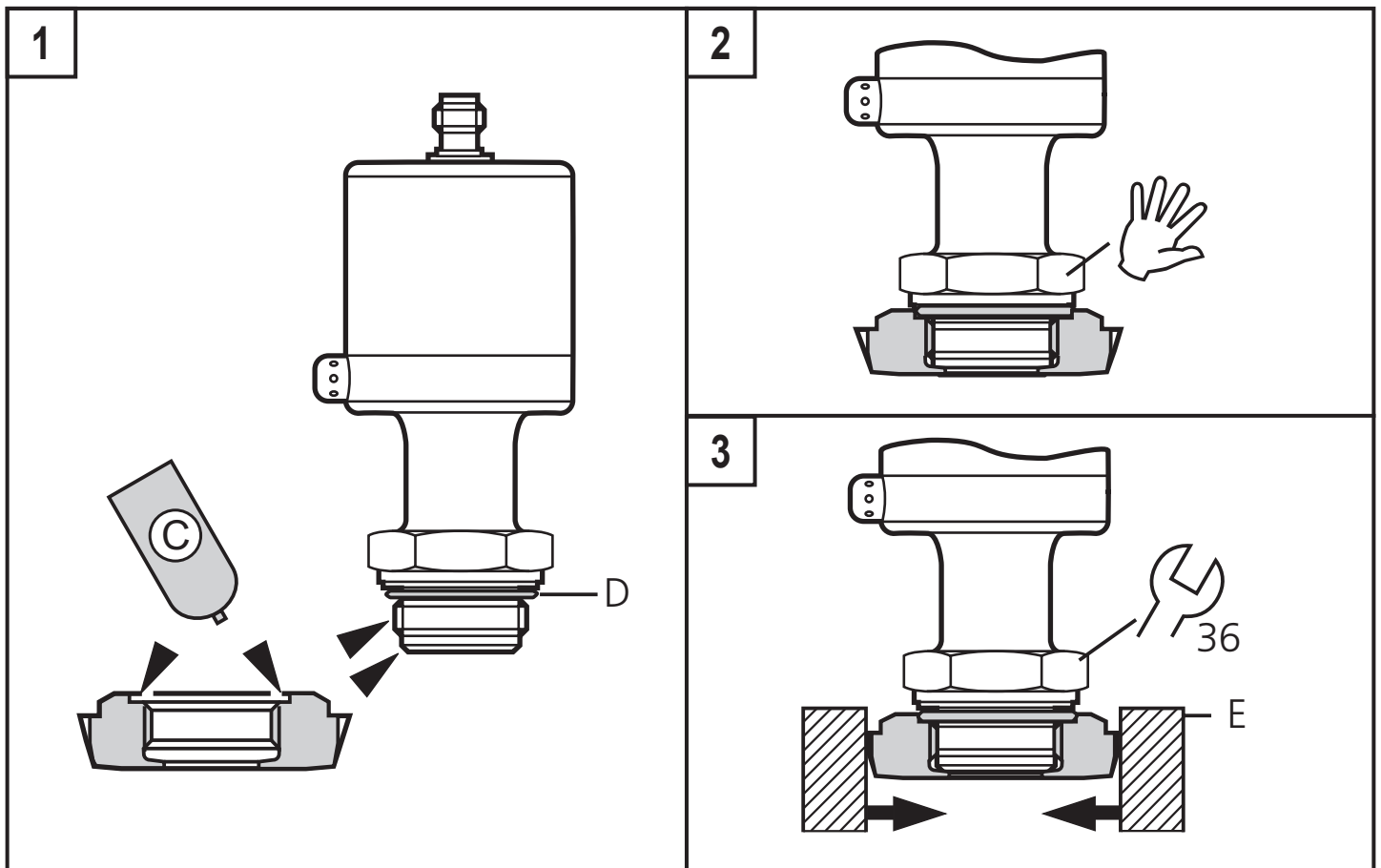
Mounting operation:

- ▶ 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 (C):
 - 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.
- ▶ 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



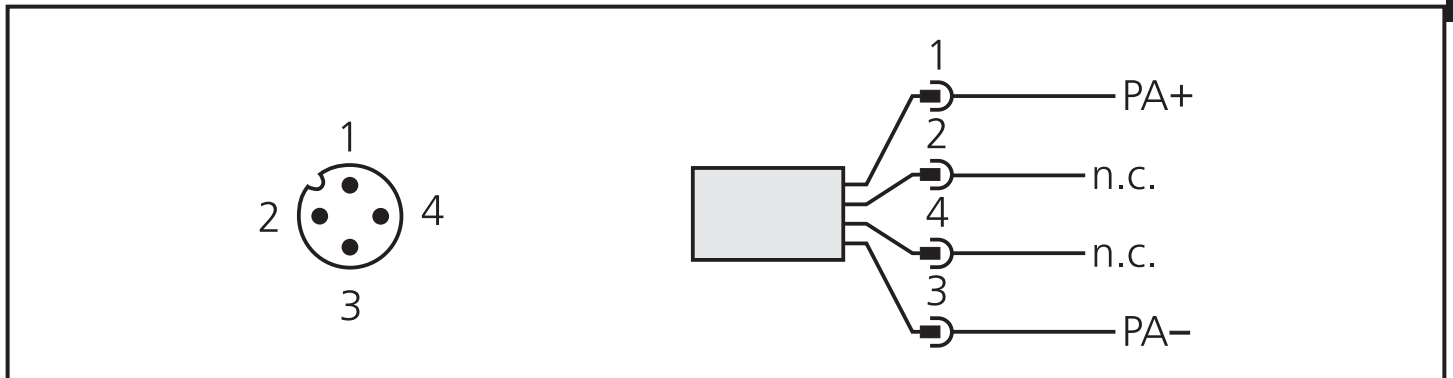
The unit must be connected by a qualified electrician.

The national and international regulations for the installation of electrical equipment must be adhered to.

Voltage supply to EN50178, SELV, PELV.

For use in hazardous areas : The regulations of FISCO (Fieldbus Intrinsically Safe Concept) must be adhered to. For details refer to the separately supplied ATEX operating instructions.

► Connect the unit to the Profibus PA network as follows:



PA = Profibus two-wire cable; n.c. = not connected

The two-wire Profibus cable is used for the energy supply as well as for the communication.

- Connection values on the fieldbus:

Bus voltage	9...32 V DC
Bus voltage in the hazardous area	9...24 V DC
Nominal current consumption	< 15.6 mA
Current consumption in case of a fault	< 21.8 mA

- The unit is protected against reverse polarity and also works reliably with reversed fieldbus connections.

Recommendation for bus cables:

- Use a two-wire twisted, screened cable.
- For installations in the hazardous area the following characteristic values must be adhered to according to the FISCO model:

Loop resistance (DC)	15...150 ohm per kilometre of cable
Inductance	0,4...1 mH per kilometre of cable
Capacitance	80...200 nF per kilometre of cable

- For maximum EMC protection, e. g. near frequency converters we recommend to connect the housing and the cable screen via an equipotential bonding conductor.
- For use in the hazardous area: Meet the requirements of the relevant standards for grounding.

Further information about the structure and grounding of the network:

- Profibus PA specification EN 50170.
- PNO guideline “Profibus PA User and Installation Guideline”.

7 Set-up

A valid bus address must be assigned to the unit so that it is recognised as a network component. The preset address 126 dec only acts for set-up in an existing network.

You need configuration software of type Profibus master class 2 for addressing.

Bus addressing / online addressing

(Unit is installed in the active bus segment)

- ▶ Create a life list of the network segment using your configuration program. The newly installed unit has been programmed by the factory with the address 126 dec. This address only acts for set-up in an existing network.
- ▶ Assign a valid address between 0 and 125 dec.



Only one non addressed unit should be connected to the running network. If two or more units with the supplied address 126 dec are installed, incorrect bus accesses will occur. The units cannot be put into correct operation!

8 Parameter setting

For parameter setting you need configuration software of type Profibus master class 2, such as SIMATIC® PDM (Process Device Manager from Siemens).

You will also need the matching object description file to access the profile-specific and the manufacturer-specific parameters:

- Device description file (DD) for SIMATIC® PDM.

You will find the file on the provided CD-ROM. Additionally it is available on the ifm homepage <http://www.ifm.com> in “Service” / “Download”.



If you change parameters during operation, the operating principle of the plant will be influenced.

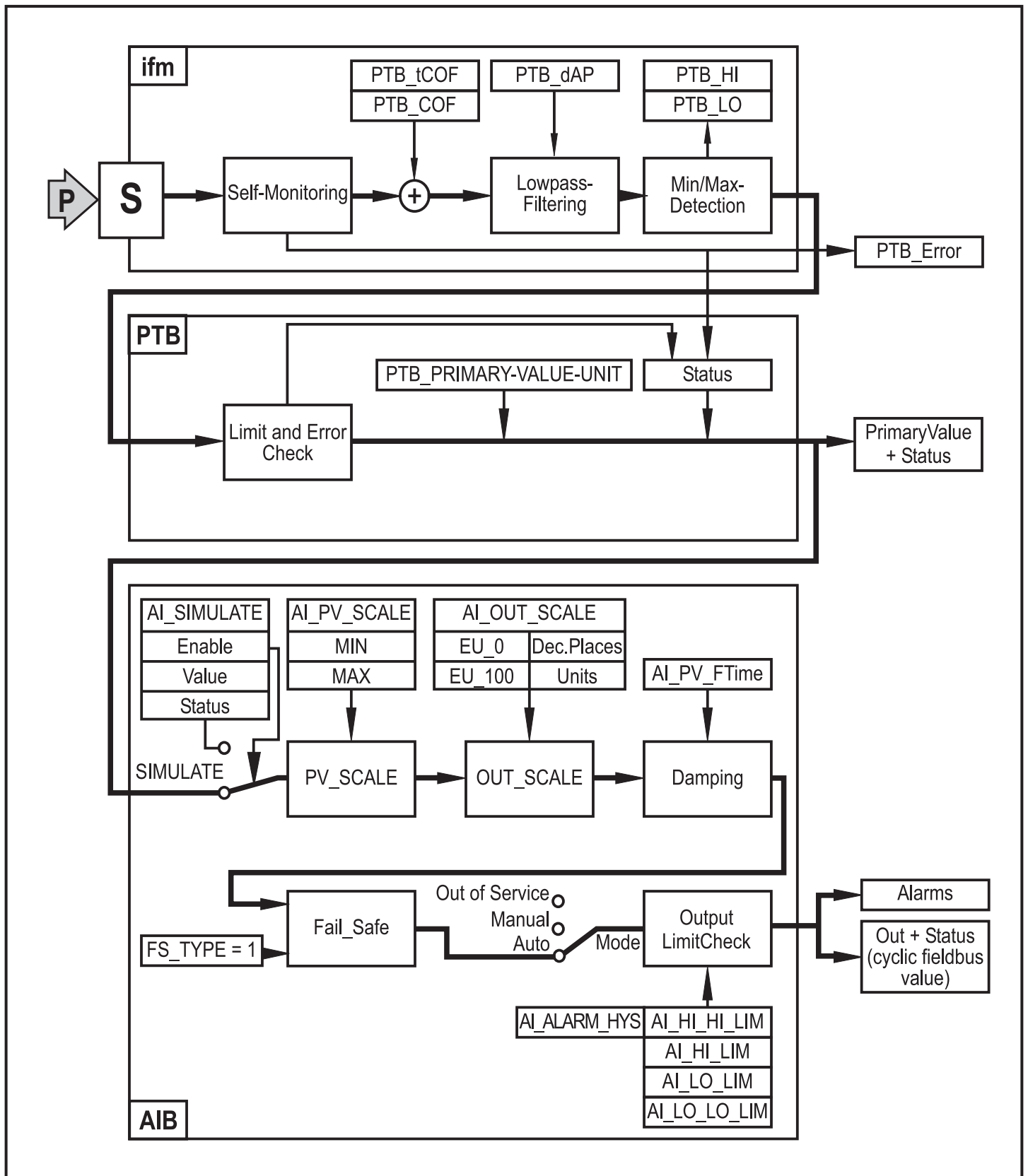
- ▶ Ensure that there will be no malfunctions in your plant.

A block model and the tables on the following pages provide an overview of the possible parameters and their meanings.

They are based on the Profibus PA profile “Pressure Transmitter” including the extension for installation and maintenance (I&M).

In addition the manufacturer-specific parameters for extended functions and for more convenient operation are available.

8.1 Block model: Pressure transmitter with Profibus PA profile 3.01



P = system pressure

S = sensor with linearisation and temperature compensation

ifm = manufacturer-specific parameters ifm electronic

PTB = pressure transducer block

AIB = analogue input block

8.2 Physical Block (PB)

Parameter	Slot	Index	Default	Size ¹⁾	Data type	Read/Write	Stor. class
PB_BLOCK_OBJECT	0	16	-	20	DS-32 ²⁾	R	C
PB_ST_REV	0	17	-	2	Unsigned16	R	N
PB_TAG_DESC	0	18	-	32	OctetString	R / W	S
PB_STRATEGY	0	19	0	2	Unsigned16	R / W	S
PB_ALERT_KEY	0	20	0	1	Unsigned8	R / W	S
PB_TARGET_MODE	0	21	-	1	Unsigned8	R / W	S
PB_MODE_BLK	0	22	-	3	DS-37 ²⁾	R	D/N/C
PB_ALARM_SUM	0	23	0,0,0,0	8	DS-42 ²⁾	R	D
PB_SOFTWARE_REVISION	0	24	-	16	VisibleString	R	C
PB_HARDWARE_REVISION	0	25	-	16	VisibleString	R	C
PB_DEVICE_MAN_ID	0	26	310d	2	Unsigned16	R	C
PB_DEVICE_ID	0	27	0A71h	16	VisibleString	R	C
PB_DEVICE_SER_NUM	0	28	-	16	VisibleString	R	C
PB_DIAGNOSIS	0	29	-	4	OctetString	R	D
PB_DIAGNOSIS_MASK	0	31	-	4	OctetString	R	C
PB_FACTORY_RESET	0	35	-	2	Unsigned16	R / W	S
PB_IDENT_NR_SELECTOR	0	40	-	1	Unsigned8	R / W	S
PB_FEATURE	0	42	-	8	DS-68 ²⁾	R	N
PB_COND_STATUS_DIAG	0	43	-	1	Unsigned8	R	S

¹⁾ in bytes

²⁾ = compound data types according to the Profibus specification "Profile for Process Control Devices" version 3.01

C = constant

N = non-volatile (value is stored in a non-volatile way)

S = static (value is stored in a non-volatile way; in case of changes in value the revision counter is incremented)

D = dynamic (dynamic value, e. g. measured value)

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8.3 Analogue Input Block (AIB)

Parameter	Slot	Index	Default	Size ¹⁾	Data type	Read/Write	Stor. class
AI_BLOCK_OBJECT	1	16	-	20	DS-32 ²⁾	R	C
AI_ST_REV	1	17	-	2	Unsigned16	R	N
AI_TAG_DESC	1	18	-	32	OctetString	R / W	S
AI_STRATEGY	1	19	0	2	Unsigned16	R / W	S
AI_ALERT_KEY	1	20	0	1	Unsigned8	R / W	S
AI_TARGET_MODE	1	21	-	1	Unsigned8	R / W	S
AI_MODE_BLK	1	22	-	3	DS-37 ²⁾	R	D/N/C
AI_ALARM_SUM	1	23	0,0,0,0	8	DS-42 ²⁾	R	D
AI_BATCH	1	24	0,0,0,0	10	DS-67 ²⁾	R / W	S
AI_OUT	1	26	-	5	101	R / W	D
AI_PV_SCALE	1	27	*)	8	Array of float	R / W	S
AI_OUT_SCALE	1	28	*)	11	DS-36 ²⁾	R / W	S
AI_LIN_TYPE	1	29	0	1	Unsigned8	R / W	S
AI_CHANNEL	1	30	-	2	Unsigned16	R / W	S
AI_PV_FTIME	1	32	0	4	Float	R / W	S
AI_ALARM_HYS	1	35	0,5%VMR	4	Float	R / W	S
AI_HI_HI_LIM	1	37	MAX	4	Float	R / W	S
AI_HI_LIM	1	39	MAX	4	Float	R / W	S
AI_LO_LIM	1	41	MIN	4	Float	R / W	S
AI_LO_LO_LIM	1	43	MIN	4	Float	R / W	S
AI_HI_HI_ALM	1	46	0	16	DS-39 ²⁾	R	D
AI_HI_ALM	1	47	0	16	DS-39 ²⁾	R	D
AI_LO_ALM	1	48	0	16	DS-39 ²⁾	R	D
AI_LO_LO_ALM	1	49	0	16	DS-39 ²⁾	R	D
AI_SIMULATE	1	50	OFF	6	DS-50 ²⁾	R / W	S

¹⁾ in bytes; ²⁾ = compound data types according to the Profibus specification "Profile for Process Control Devices" version 3.01

*) Minimum / maximum value according to the measuring range of the unit;
 default value for the unit of measurement is bar (AI_OUT_SCALE_UNIT = 1137)

C = constant

N = non-volatile (value is stored in a non-volatile way)

S = static (value is stored in a non-volatile way; in case of changes in value the revision counter is incremented)

D = dynamic (dynamic value, e. g. measured value)

VMR = final value of the measuring range; MAX = maximum value; MIN = minimum value

8.4 Pressure Transducer Block (PTB)

Parameter	Slot	Index	Default	Size ¹⁾	Data type	Read/Write	Stor. class
PTB_BLOCK_OBJECT	1	70	-	20	DS-32 ²⁾	R	C
PTB_ST_REV	1	71	-	2	Unsigned16	R	N
PTB_TAG_DESC	1	72	-	32	OctetString	R / W	S
PTB_STRATEGY	1	73	0	2	Unsigned16	R / W	S
PTB_ALERT_KEY	1	74	0	1	Unsigned8	R / W	S
PTB_TARGET_MODE	1	75	-	1	Unsigned8	R / W	S
PTB_MODE_BLK	1	76	-	3	DS-37 ²⁾	R	D/N/C
PTB_ALARM_SUM	1	77	0,0,0,0	8	DS-42 ²⁾	R	D
PTB_SENSOR_VALUE	1	78	-	4	Float	R	D
PTB_SENSOR_HI_LIM	1	79	+32000	4	Float	R	N
PTB_SENSOR_LO_LIM	1	80	-32000	4	Float	R	N
PTB_CAL_POINT_HI	1	81	+20000	4	Float	R / W	S
PTB_CAL_POINT_LO	1	82	-20000	4	Float	R / W	S
PTB_CAL_MIN_SPAN	1	83	40000	4	Float	R	N
PTB_SENSOR_UNIT	1	84	None	2	Unsigned16	R	S
PTB_TRIMMED_VALUE	1	85	-	5	101 ²⁾	R	D
PTB_SENSOR_TYPE	1	86	-	2	Unsigned16	R	N
PTB_SERIAL_NUMBER	1	87	-	4	Unsigned32	R	N
PTB_PRIMARY_VALUE	1	88	-	5	101 ²⁾	R	D
PTB_PRIMARY_VALUE_UNIT	1	89	1137 ¹⁾	2	Unsigned16	R / W	S
PTB_PRIMARY_VALUE_TYPE	1	90	0	2	Unsigned16	R / W	S
PTB_LIN_TYPE	1	103	0	1	Unsigned8	R / W	S

¹⁾ in bytes

²⁾ = compound data types according to the Profibus specification "Profile for Process Control Devices" version 3.01

C = constant

N = non-volatile (value is stored in a non-volatile way)

S = static (value is stored in a non-volatile way; in case of changes in value the revision counter is incremented)

D = dynamic (dynamic value, e. g. measured value)

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Parameter	Slot	Index	Default	Size ¹⁾	Data type	Read/Write	Stor. class
PTB_LO	1	154	20000	2	Signed16	R / W	D
PTB_HI	1	153	-20000	2	Signed16	R / W	D
PTB_DAP	1	161	0	2	Unsigned16	R / W	N
PTB_COF	1	160	0	2	Signed16	R / W	N
PTB_SPEC	1	163	0	1	Unsigned8	W	N
PTB_COD1	1	159	1000	2	Signed16	R / W	N
PTB_COD2	1	162	1000	2	Signed16	R / W	N
PTB_ERROR	1	151	0	1	Unsigned8	R / W	D
PTB_MESSAGE	1	165	0	1	Unsigned8	W	N

¹⁾ in bytes

²⁾ = compound data types according to the Profibus specification "Profile for Process Control Devices" version 3.01

C = constant

N = non-volatile (value is stored in a non-volatile way)

S = static (value is stored in a non-volatile way; in case of changes in value the revision counter is incremented)

D = dynamic (dynamic value, e. g. measured value)

8.5 VIEW_1 Parameter (VIEW)

Parameter	Slot	Index	Default	Size ¹⁾	Data type	Read/Write	Stor. class
VIEW_1_PHYSICAL_BLOCK	0	51	-	17	OctetString	R	D/N/C
VIEW_1_TRANSDUCER_BLOCK	1	254	-	18	OctetString	R	D/N/C
VIEW_1_ANALOG_INPUT_BLOCK	1	61	-	18	OctetString	R	D/N/C

¹⁾ in bytes

²⁾ = compound data types according to the Profibus specification "Profile for Process Control Devices" version 3.01

C = constant

N = non-volatile (value is stored in a non-volatile way)

S = static (value is stored in a non-volatile way; in case of changes in value the revision counter is incremented)

D = dynamic (dynamic value, e. g. measured value)

8.6 Installation and maintenance parameters (I&M parameters)

The unit supports the following I&M functionalities:

I&M0, I&M1, I&M2 and PA_I&M0.

The following parameters are available:

Parameter	R/W	Data type	Remarks
IM_SERIAL_NUMBER	R	VisibleString[16]	corr. to PB_DEVICE_SER_NUM
IM_HARDWARE_REVISION	R	Unsigned16	0xFFFF
IM_SOFTWARE_REVISION	R	Record of VisibleString[1] Unsigned08[3]	,V' 0xFF,0xFF,0xFF
IM_REV_COUNTER	R	Unsigned16	corr. to PB.ST_REV
IM_PROFILE_ID	R	Unsigned16	0x9700.
IM_PROFILE_SPECIFIC_TYPE	R	OctetString[2]	0x0101
IM_VERSION	R	Unsigned08[2]	0x0101
IM_SUPPORTED	R	OctetString[2]	0x0700
PA_IM_VERSION	R	Unsigned08[2]	0x0100
PA_IM_HARDWARE_REVISION	R	VisibleString[16]	corr. to PB_HARDWARE_REVISION
PA_IM_SOFTWARE_REVISION	R	VisibleString[16]	corr. to PB_SOFTWARE_REVISION
PA_IM_SUPPORTED	R	Unsigned08[2]	0x0100
IDENT_NUMBER	R	Unsigned16	
IM_MANUFACTURER_ID	R	Unsigned16	corr. to PB_DEVICE_MAN_ID
IM_ORDER_ID	R	VisibleString[20]	
IM_TAG_FUNCTION	R/W	VisibleString[32]	corr. to PB_TAG_DESC
IM_TAG_LOCATION	R/W	VisibleString[22]	
IM_DATE	R/W	VisibleString[16]	

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8.7 Typical parameter setting procedures

8.7.1 Zero point adjustment

The zero point of the unit can be shifted by $\pm 5\%$ of the final value of the measuring range. This function is used when the system zero point does not correspond to a pressure of 0 bar on the measuring diaphragm of the sensor (e.g. if the mounting location of the sensor deviates from the zero point level of the tank for level measurement).

There are 2 possibilities:

- PTB_COF (Calibration Offset)

Entering the requested zero point shift as a percentage value:

-5...+5% of the final value of the measuring range.

The current setting value can be determined by reading the COF parameter.

- PTB_tCOF (teach Calibration Offset)

By activating the tCOF function the current pressure on the unit is adopted as the zero value.

The new offset value can be determined by reading the COF parameter.

Note: During the teach process the pressure should be stable.

8.7.2 Damping of the signal measured

There are 2 possibilities:

- PTB_dAP

Damping by a PT1 link at the beginning of the sensor signal processing.

dAP = time constant of the damping filter. Setting range: 0.1...100 s in steps of 0.1 s.

Note: Damping influences the characteristics of the following min/max lag indicator: Fast and high pressure peaks are filtered and will no longer contribute to the min/max evaluation.

- AI_PV_FTime (Output Filter Time Constant)

Damping within the analogue input block by means of a PT1 link at the end of the sensor signal processing.

PV_FTime = time constant of the filter. Setting range 0.1...100 s in steps of 0.1 s.

8.7.3 Input of the unit of measurement for the pressure

- PTB_Primary_Value_Unit

The following units can be set:

Profibus-ID	Unit	Explanation
1137	bar	bar = 100 kPa
1141	PSI	pound-force per square inch = $0.45359237 \times 9.80665 \div 0.0254^2$ Pa
1138	mbar	millibar = 1 hPa
1132	MPa	megapascal = 10^6 PA
1133	kPa	kilopascal = 10^3 PA
1146	inH2O	inches of water column
1149	mmH2O	millimetres of water column*
1155	inHg	inches of mercury column
1157	mmHg	millimetres of mercury column
1152	ftH2O	feet of water column
1140	atm	atmosphere = 101325.0 Pa

*Only for units with a final value of the measuring range ≤ 2.5 bar.

If the unit is changed, all pressure-specific parameters will be converted and displayed in the new unit.

Note:

By changing the unit of measurement the digital output value will also change. This influences the subsequent controller.

The unit of measurement defined by means of the parameter PTB_Primary_Value_Unit serves as reference for all internal operations.

In addition, a separate output unit can be defined when scaling the outputs (→ analogue input block, parameter AI_OUT_SCALE).

8.7.4 Min/max monitoring (lag indicator function)

The highest and lowest measured pressure values are stored and can be read.

- PTB_HI (display of the highest measured value).
- PTB_LO (display of the lowest measured value).

Resetting the memory:

Activating parameters, overwriting with "0".

8.7.5 Monitoring the threshold value

In the analogue input block 4 threshold values can be set for warning / alarm and one hysteresis (parameter HYS) valid for all 4 values.

Parameter	Warning/alarm	OUT	Activation	Deactivation
LO_LO_LIM	lower alarm limit	8D hex	$OUT \leq LO_LO_LIM$	$OUT > LO_LO_LIM+HYS$
LO_LIM	lower warning limit	89 hex	$OUT \leq LO_LIM$	$OUT > LO_LIM+HYS$
HI_LIM	upper warning limit	8A hex	$OUT \geq HI_LIM$	$OUT < HI_LIM-HYS$
HI_HI_LIM	upper alarm limit	8E hex	$OUT \geq HI_HI_LIM$	$OUT < HI_HI_LIM-HYS$

If a warning / an alarm is active, this is also displayed in the ALARM_SUM parameter of the analogue input block and in the cyclical status of the process value.

8.7.6 Simulation

After parameter setting you can check the function of the unit by simulating the output values or the input value of the analogue input block (OUT).

- Simulating the output value:
 - Set the "AI_Target_Mode" parameter of the analogue input block to "MAN".
 - Activate the "AI_Out_Value" parameter and enter the requested value.
 - Terminate the simulation: Reset the "AI_Target_Mode" parameter of the analogue input block to "AUTO".
- Simulating the input value:
 - Set the "AI_Simulation_Enable" parameter of the analogue input block to "ON".
 - Activate the "AI_Simulation_Value" "AI_Simulation_Status" parameters and enter the requested value.
 - Terminate the simulation: Reset the "AI_Simulation_Enable" parameter of the analogue input block to "OFF"

All functions of the analogue input block are applied to the simulated input value.

As long as the “AI_Simulation_Enable” parameter is set to “ON”, the status of the measured value OUT changes to the following values:

Status	Description
UNCERTAIN/Simulated Value	SIMULATE=ON, SIM_STATUS=GOOD
UNCERTAIN/Last usable value	SIMULATE=ON, SIM_STATUS=BAD, before entering the simulation the OUT_STATUS=GOOD applies
UNCERTAIN/Initial value	SIMULATE=ON, SIM_STATUS=BAD, before entering the simulation, no OUT_STATUS=GOOD was reached (no last usable value available)

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9 Operation

9.1 Communication

You need a Profibus master class 1 (e. g. PLC) for the cyclical communication (Data_Exchange).

Furthermore you also need a unit master file (GSD), e.g.

- ifm_0A71.GSD (unit-specific GSD file). You will find the file on the provided CD-ROM. Additionally it is available on the ifm homepage <http://www.ifm.com> in “Service” / “Download”).
- PA139700.gsd (universal GSD file available from the Profibus user organisation).

NOTE: Before the universal GSD file is used, the unit ID has to be changed to 9700.

During operation the unit transmits a cyclical data telegram. It contains the respective process value (= current system pressure) and a corresponding status code.

The cyclical data telegram has the following structure:

Byte No.	Data	Access	Data format
0, 1, 2, 3	Output of the analogue input block (variable OUT)	Read	32-bit floating point number (IEEE-754)
4	Output of the analogue input block (variable OUT)	Read	→ following table

Status-Code [bin]								Unit state	Meaning
1	0	0	0	0	0	X	X	GOOD/OK	Everything OK
1	0	0	0	1	0	0	1	GOOD/advis. Alarm/LO	Measured value OK, LO_LIM warning of the analogue input block active.
1	0	0	0	1	0	1	0	GOOD/advis. Alarm/HI	Measured value OK, HI_LIM-warning of the analogue input block active.
1	0	0	0	1	1	0	1	GOOD/active crit. Alarm/LO	Measured value OK, LO_LO_LIM-alarm of the analogue input block active.
1	0	0	0	1	1	1	0	GOOD/active crit. Alarm/HI	Measured value OK, HI_HI_LIM-alarm of the analogue input block active.
0	1	0	0	0	1	X	X	UNCERTAIN/last usable value	Last valid value is output (fail safe mode): The Primary_Value provided by the transducer block or the value simulated in the analogue input block has the "BAD" state.
0	1	1	0	0	0	X	X	UNCERTAIN/simulated value	Simulated Value: Simulation in the analogue input block active or mode of the analogue input block = "MAN" (OUT can be set by the user).
0	1	0	0	1	1	X	X	UNCERTAIN/Initial value	Initial value is output because the Primary_Value provided by the transducer block or the value simulated by the analogue input block has the "BAD" state, and since Reset or Power-On, no value with the "GOOD" state has been available. Fail safe mode active but "last usable value" is not available.
0	0	0	1	1	1	X	X	Bad/Out of Service	System error detected. The diagnostic messages provide further information.

(x: don't care)

9.2 Diagnosis and trouble-shooting

The unit has extensive diagnostic routines in all signal processing blocks. They monitor the unit when it is switched on (power-on test) and during operation (online).

Diagnostic messages are output:

- In each cyclical data telegram following the measured value.
- In addition the EXT_DIAG bit is set in the cyclical data telegram. This bit starts the exchange of a diagnostic telegram in the master. This corresponds to the Profibus standard diagnostic code (→ following table).

The diagnostic code can also be read by acyclical access.

UK

Octet	Bit	Mnemonic	Description	Error
1	0	DIA_HW_ELECTR	Electronic hardware fault.	-
1	4	DIA_MEM_CHKSUM	Fault during memory test.	-
1	5	DIA_MEASUREMENT	Fault/measured data detection.	X
2	3	DIA_WARMSTART	Warm start is carried out.	-
2	4	DIA_COLDSTART	Cold start is carried out.	-
2	5	DIA_MAINTAINANCE	Maintenance requested.	X
2	7	IDENT_NUMBER_VIOLATION	Active if the ident number of the running cyclical data exchange does not correspond with the value in the physical block.	-

If the fault number option is active (F no. = X), the manufacturer-specific “F no.” parameter can be read. The following faults are indicated:

Error [dec]	Type of fault	Fault elimination
10	Fault during power-on memory.	<ul style="list-style-type: none"> ▶ Make a warm start. ▶ Replace the unit.
11	Fault during online memory test.	<ul style="list-style-type: none"> ▶ Make a warm start. ▶ Replace the unit.
20	Fault in the sensor electronics.	<ul style="list-style-type: none"> ▶ Make a warm start. ▶ Replace the unit.
22	Temperature compensation deficient.	<ul style="list-style-type: none"> ▶ Continue operation of unit at medium temperatures of around 23°C¹⁾. ▶ Replace the unit.

Error [dec]	Type of fault	Fault elimination
53	Measured value above operating range.	<ul style="list-style-type: none"> ▶ Decrease pressure. ▶ Replace the unit.
54	Measured value below operating range.	<ul style="list-style-type: none"> ▶ Increase pressure. ▶ Replace the unit.
73	Measurement error > 2%	<ul style="list-style-type: none"> ▶ Unit can be further operated at decreased accuracy. ▶ Check measurement diaphragm for deposits. ▶ Replace the unit.
93	Medium temperature out of operating range.	<ul style="list-style-type: none"> ▶ Keep the specified temperature range.

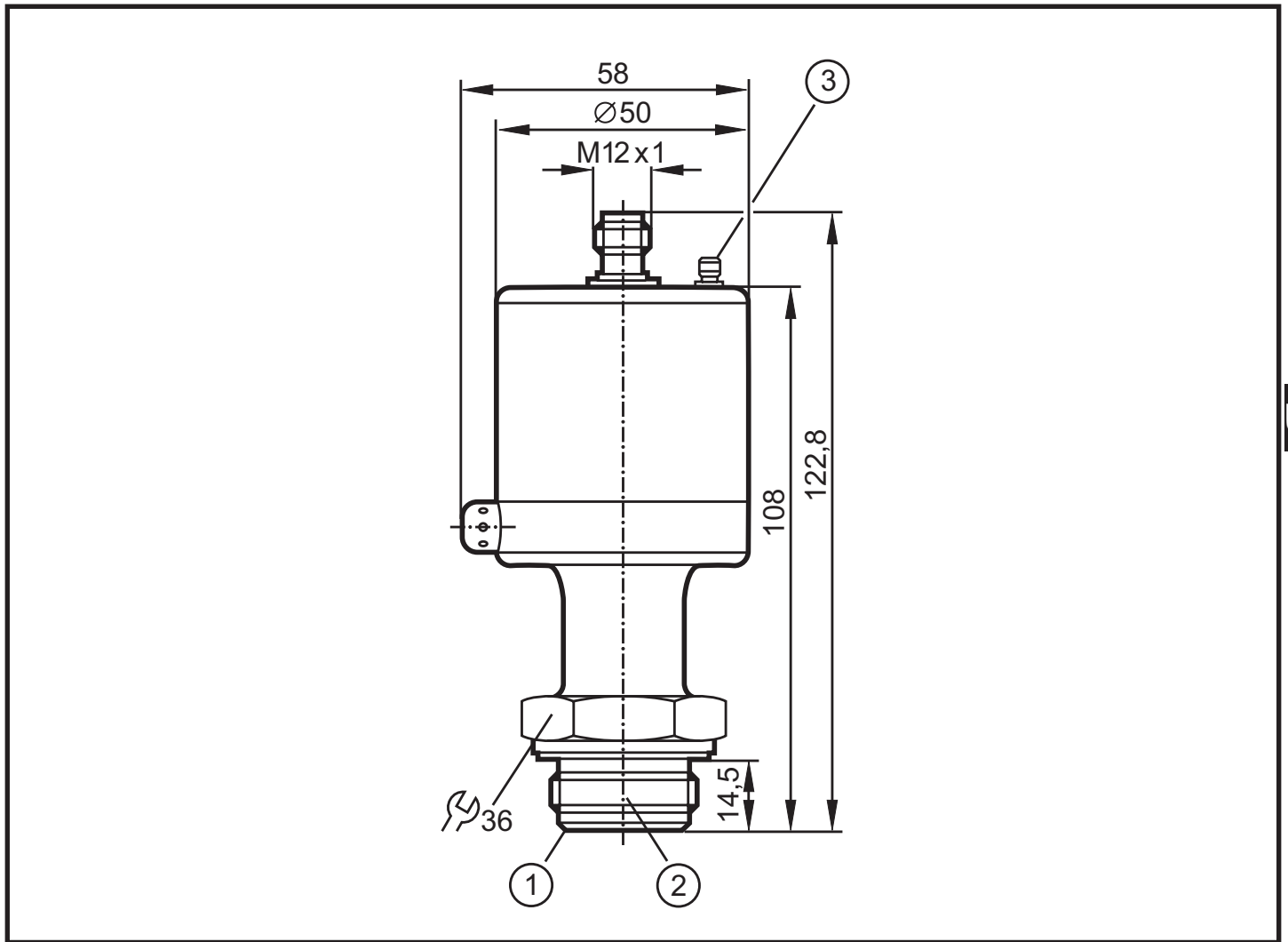
¹⁾ The temperature influence increases to the same extent as the medium temperature rises above 23°C or drops below 23°C .

A restart of the sensor can be forced by means of the Profibus “PB_FACTORY_RESET” PA profile parameter in the physical block of the sensor.

The following reset codes are available:

- Reset code [dec] 1 = factory reset
 - The sensor starts again and loads its default settings for the static and non-volatile parameters.
 - Dynamic parameters are newly initialised.
 - The address setting is not changed.
- Reset code [dec] 2506 = warm start
 - The sensor is started again. All static and non-volatile parameters are set to the value last set. Dynamic parameters are newly initialised.
 - The address setting is not changed.
- Reset Code [dec] 2712 = address reset
 - The bus address of the unit is immediately reset to 126 dec.
 - Note: an active cyclical data transfer will be interrupted.

10 Scale drawing



Dimensions are in millimeters (25.4 mm = 1 inch)

1: Aseptoflex sealing edge

2: Aseptoflex thread

3: Grounding screw (only for PMP0xA)

11 Technical data

Operating voltage [V].....	9...32 DC ¹⁾
Current consumption [mA].....	< 15.6
Max. fault current [mA]	< 21.8
Overcurrent protection: current limiting to max. fault current	
Reverse polarity protection (reliable function also in the event of reverse polarity)	
Integrated watchdog	
Measurement / display cycle time [ms]	< 70
Power-on delay time [s]	35
Accuracy/ deviation (in % of the span) ²⁾	
- Characteristics deviation ³⁾	< ± 0.2
- Hysteresis.....	< 0.15
- Linearity.....	< 0.15
- Repeatability (with temperature fluctuations < 10K).....	< ± 0.1
- Long-term stability (in % of the span per year)	< ± 0.1
- Temperature coefficients (TC) in the compensated temperature range 0 ... 70°C (in % of the span per 10 K)	
- Largest TC of the zero point / of the span	< ± 0.05 / < ± 0.15

Materials (wetted parts)
 stainless steel 316L / 1.4435, surface characteristics: Ra < 0.4 / Rz 4
 ceramics (99.9 % Al₂O₃); PTFE
 Housing materials stainless steel 316L / 1.4404; PTFE; ULTEM; Viton
 Protection rating IP 68 / IP 69K
 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)
 Pressure cycles min. 100 million
 Operating temperature

when used outside hazardous areas	-25...85°C
for PMP0xA when used in hazardous areas	T4: -20...85°C T5: -20...75°C T6: -20...60°C

Medium temperature

when used outside hazardous areas	-25 ..125°C (145°C max. 1h)
for PMP0xA when used in hazardous areas	T4: -20...85°C T5: -20...75°C T6: -20...60°C

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 61000-4-5 Surge: 0,5 / 1 kV
 EN 61000-4-6 HF conducted: 10 V

- 1) Voltage supply to EN50178, SELV, PELV
 Bus voltage in the hazardous area: 9... 24 V DC; adhere to the remarks for safe use in hazardous areas (→ ATEX operating instructions).
- 2) all indications are referred to a turn down of 1:1
- 3) linearity, incl. hysteresis and repeatability (limit value setting to DIN 16086)

Technical data and further information at
www.ifm.com → Select your country → Data sheet direct: