

Ultrasonic transmitter

SonarFox® UST 10



- Non-contact level measurement of liquid and solid media
- Maintenance-free, not subject to wear and tear
- Integrated flow calculation with 32-point linearisation
- Optional switching relay for level contact or flow function



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Application For continuous, non-contact level measurement of media with a variety of consistencies and surface characteristics. Ideal for level measurement of liquids and bulk solids.

Description The SonarFox® UST 10 level indicator uses the physical properties of ultrasonic waves to determine the level. An ultrasonic wave is emitted which is reflected by objects in the cone. The time up to the reception of the reflected echo is a measure of the distance. Since the mounting position is defined, it is possible to calculate the filling level of the medium. Type, density and temperature of the medium have no effect on the measurement – the only prerequisite is a reflecting surface. Acoustically diffuse surfaces such as foam or uneven surfaces of bulk solids are not suitable or should be tested with regard to the application. Installations or stirrers below a plane surface of the medium do not affect the measurement.

Probe selection

Probe type	01, 02	11, 12	21, 22
Measuring range	0.2 – 4 m	0.25 – 6 m	0.35 – 8 m
Low tanks < 1,000 mm	+	-	-
Tanks between 1,000 mm and 6,000 mm	o	+	-
High tanks > 6,000 mm	-	-	+
Liquids	+	+	+
Solids	+	+	+
High-viscosity or adhesive media	+	+	+
Low-viscosity media	+	+	+
Corrosive media	+	+	+
Conductive media	+	+	+
Non-conductive media	+	+	+
Foam on the medium	-	-	-

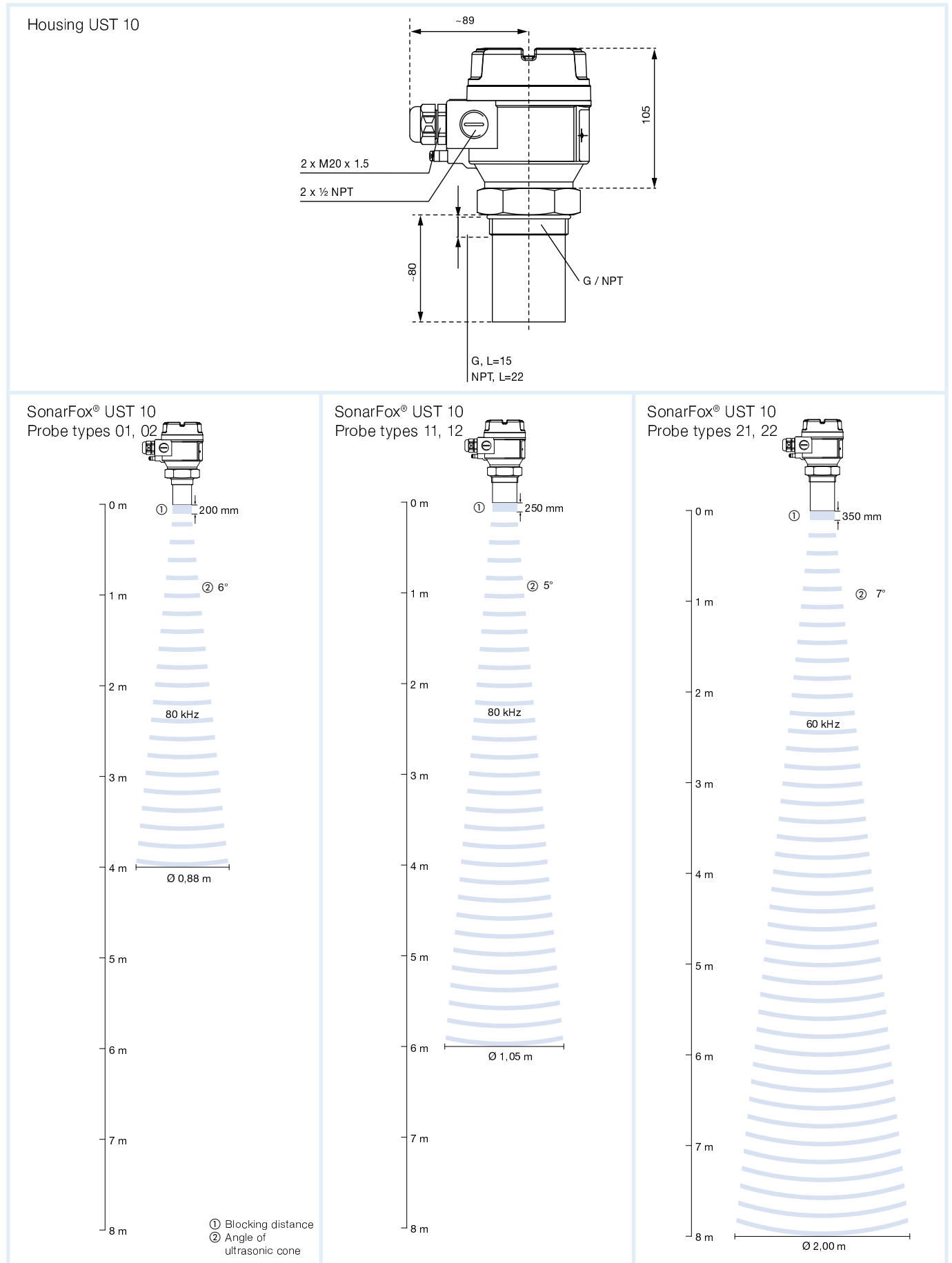
- Not suitable
- o Limited suitability
- + Suitable



See page 288 for prices.

Ultrasonic transmitter SonarFox® UST 10

Types and dimensions (mm)



Ultrasonic transmitter SonarFox® UST 10

Technical specifications

Measuring range

Max. 8,000 mm

Measuring accuracy

0.25 %

Operating temperature range

Ambient: -25/+70 °C

Medium: -30/+90 °C

Process pressure

0.5/3 bar

Supply voltage

DC 12–36 V

4–20 mA, 2-wire

Power input

48–720 mW

Delay

Adjustable 6, 10 or 30 s

Electrical connection

2 x cable gland

Option

- Local display/programming display PD 10 UST



Plug-in local display/programming display **PD 10 UST**

Part no. **56210**

DG: H, PG: 4

72.50 €

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Ordering data

DG: H, PG: 4

Price €

1	Ultrasonic transmitter	
	56200	SonarFox® UST 10
2	Display	
	O	Without local display and with window
	D	With local display and with window
3	Housing	
	K	Impact-resistant plastic IP 67 (EN 60529)
4	Probe type/measuring range/frequency/process connection	
	01	Measuring range 0.2–4 m, 80 kHz, G1½B, PVDF, IP 68
	02	Measuring range 0.2–4 m, 80 kHz, 1½ NPT, PVDF, IP 68
	11	Measuring range 0.25–6 m, 80 kHz, G2B, PVDF, IP 68
	12	Measuring range 0.25–6 m, 80 kHz, 2 NPT, PVDF, IP 68
	21	Measuring range 0.35–8 m, 60 kHz, G2B, PVDF, IP 68
	22	Measuring range 0.35–8 m, 60 kHz, 2 NPT, PVDF, IP 68
5	Maximum measuring range (L)	
	04000	Max. measuring range for types 01, 02 in mm, e.g. 4,000 mm
	06000	Max. measuring range for types 11, 12 in mm, e.g. 6,000 mm
	08000	Max. measuring range for types 21, 22 in mm, e.g. 8,000 mm
5	Output signal	
	N	4–20 mA
	R	4–20 mA, relay contact SPDT, 30 V 1 A DC / 48 V 0.5 A AC
Ordering code = stock items		56200 O K 11 06000 R

Guided micropulse level indicators

PulsFox® PMG 10



- Level measurement independent of dielectric constant or changes in pressure, temperature or density
- Reliable, accurate measurement even with foam, vapour, dust or turbulent surfaces of the medium
- Robust housing for rough ambient conditions
- Maintenance-free, not subject to wear and tear



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Application For continuous level measurement in containers, tanks or silos. Suitable for liquid, powdery, granular, electrically conductive or non-conductive media. Ideal for changing media. Also suitable for pressurised or vacuum tanks.

Description PulsFox® PMG 10 level indicators operate on the basis of the guided micropulse principle (TDR, time domain reflectometry). A micropulse is emitted along a probe. The micropulse is surrounded by an electromagnetic field. Reflections of the pulses from objects and surfaces serve as the basis of distance measurement. The pulse's propagation time is directly proportional to the distance between the probe and the surface of the medium. The reflectance of materials depends on the dielectric constant ϵ_r . Changes of the medium (e.g. vapour, dust or a turbulent surface) do not affect the measuring accuracy of this measuring principle. No recalibration is required when a different medium is used. Even if properties such as pressure, temperature and density change, the system operates with high reliability and precision. PulsFox® PMG 10 has no moving parts and is therefore maintenance-free and not subject to wear.

- Application examples**
- Cement silo
 - Liquid bitumen
 - Containers for construction materials such as mortar, plaster, gypsum
 - Silos for additional fuels such as meat and bone meal or dried sewage sludge
 - Tanks for liquefied gas such as LPG, LNG
 - Tanks facilities for ethanol fuel
 - Tank facilities for hydrochloric acid
 - Storage of intermediate products, chemical industry
 - Supply tanks for hydraulic oil
 - Condensation tanks for liquids
 - Water separators upstream of vacuum pumps
 - Small in medium tanks for raw and finished products in refineries
 - Level measurement in facilities for leachate treatment
 - Supply water tanks of turbines
 - Level measurement in bodies of water

Guided micropulse level indicators

PulsFox® PMG 10

Probe selection

	Rigid mono probe MS	Flexible mono probe MF	Flexible dual probe DF	Coax probe KX
Low tanks ≤ 1,000 mm	o	-	-	+
Tanks > 1,000 mm / ≤ 3,000 mm	+	+	+	+
Tanks > 3,000 mm / ≤ 6,000 mm	-	+	+	+
High tanks > 6,000 mm	-	+	+	-
Liquids	+	+	+	+
Solids	+	+	+	-
High-viscosity or adhesive media	+	o	-	-
Low-viscosity media	+	+	+	+
Disturbing installations/small distances	-	-	+	+
Conductive foam on the medium	+	+	-	-

- Not suitable
- o Limited suitability
- + Suitable

Technical specifications

Measuring range

MS: ≤ 3,000 mm
 MF, DF: ≤ 24,000 mm
 KX: ≤ 6,000 mm

Dielectric constant (ε_r) of medium

MS, MF: ≥ 2.1
 DF: ≥ 1.8
 KX: ≥ 1.4

Operating temperature range

Medium: -30/+200 °C
 Flange: -30/+90 °C
 (High temperature: -30/+200 °C)
 Ambient: -30/ +60 °C
 (with display: -20/+60 °C)

Process pressure

MS: PN 16 or PN 25
 MF, DF, KX: PN 16

Process connection

See technical specifications of the individual versions

Supply voltage

DC 18–35 V
 4–20 mA, 2-wire

Output signal

4–20 mA/HART, 2-wire

Housing

Aluminium die cast

Degree of protection

IP 65 (EN 60529)

Electrical connection

2 x cable gland

Option

- Local display/programming display PD 10 PMG
- Other process connections
- FEP/PFA/PP coatings



Plug-in local display/programming display

PD 10 PMG

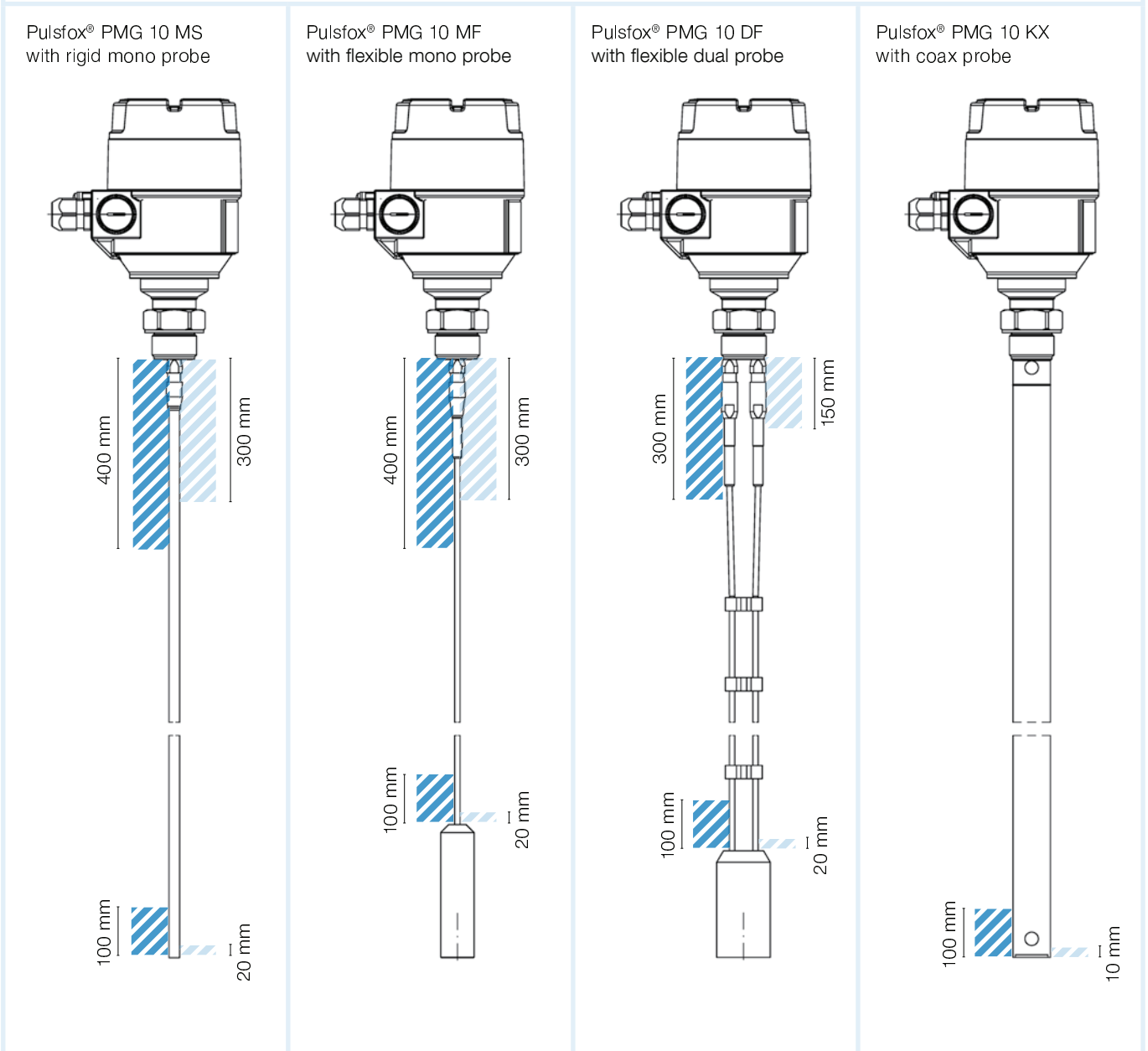
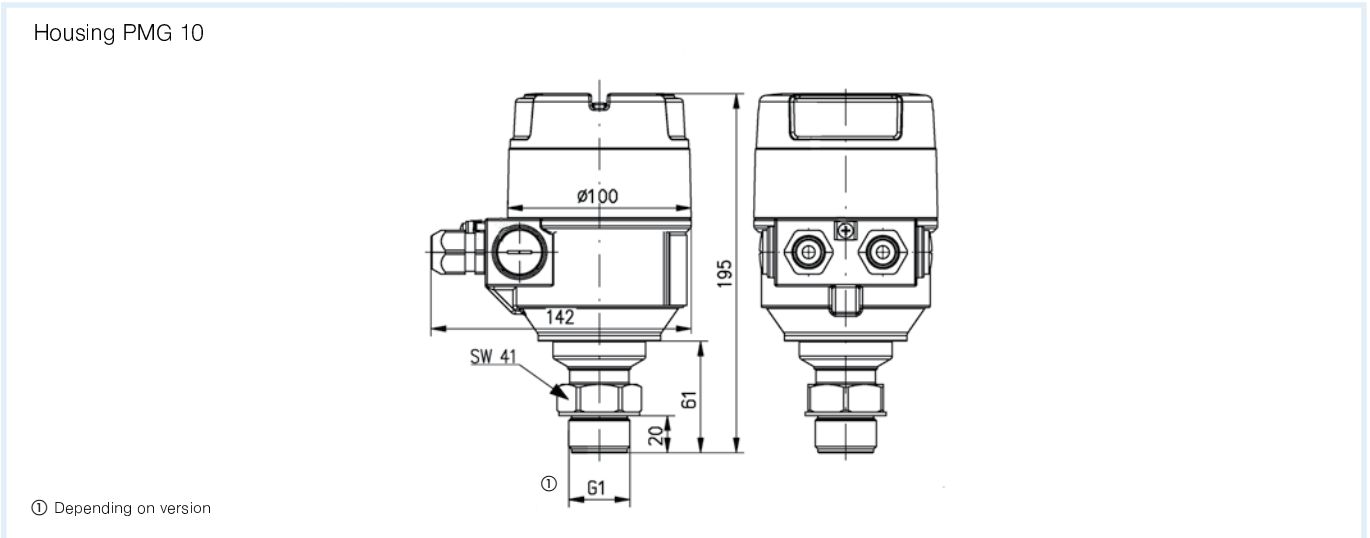
Part no. **53529**

DG: H, PG: 4

79.00 €

Guided micropulse level indicators PulsFox® PMG 10

Types and dimensions (mm)



▨ Blocking distance with a medium with ϵ_r value = 2.4

▨ Blocking distance with a medium with ϵ_r value = 80

Guided micropulse level indicator with rigid mono probe PulsFox® PMG 10 MS

- Also for high-viscosity or adhesive media
- Conductive foam does not influence the measurements

Technical specifications

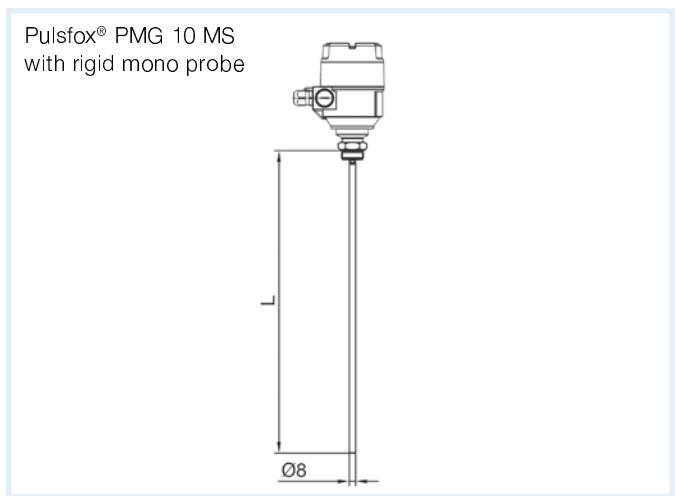
Measuring range
Max. 3,000 mm

Dielectric constant (εr) of medium
≥ 2.1

Measuring accuracy
Better than ±5 mm in the case of liquids,
±20 mm in the case of powder/solids

Probe material
Stainless steel 316 Ti

Wetted parts
Stainless steel 316 Ti, PTFE, FKM



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Ordering data

DG: H, PG: 4

Price €

1	Probe type	
	53530 Mono probe rigid PMG 10 MS	
2	Display and temperature range	
	O Without local display and without window, flange temperature max. 90 °C	
	HT Without local display and without window, flange temperature max. 200 °C	
	D With local display and with window, flange temperature max. 90 °C	
	HTD With local display and with window, flange temperature max. 200 °C	
3	Housing	
	A Aluminium die cast IP 65 (EN 60529)	
4	Process connection/probe material	
	10 G1B PN 16 / stainless steel 316 Ti	
	11 1 NPT PN 16 / stainless steel 316 Ti	
	12 G1½B PN 16 / stainless steel 316 Ti	
	13 1½ NPT PN 16 / stainless steel 316 Ti	
	54 DN 50 PN 25 / PFA coating	
	56 DN 50 PN 25 / PP coating	
5	Probe length (L)	
	03000 Length in mm, e.g. 3,000 mm	
6	Output signal and EX type	
	N 4 – 20 mA + HART / non-EX	

Ordering code

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Guided micropulse level indicator with flexible mono probe PulsFox® PMG 10 MF

- Also suitable for high tanks (> 6 m)
- Conductive foam does not influence the measurements
- Optional FEP coating for corrosive media

Technical specifications

Measuring range

Max. 24,000 mm

Dielectric constant (ϵ_r) of medium

≥ 2.1

Measuring accuracy

Better than: $\pm 0.05\%$ of probe length (min. ± 5 mm) in the case of liquids
 $\pm 0.2\%$ of probe length (min. ± 20 mm) in the case of powder/solids

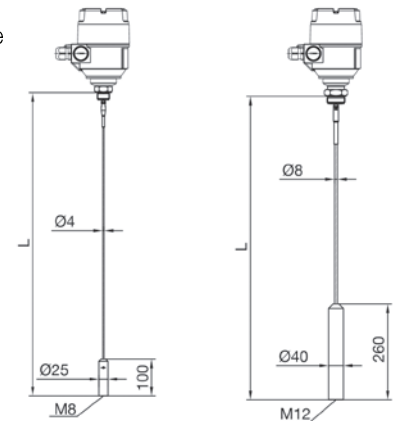
Probe material

Stainless steel 316

Wetted parts

Stainless steel 316 Ti, PTFE, FKM

Pulsfox® PMG 10 MF
with flexible
mono probe



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Ordering data

DG: H, PG: 4

Price €

1 Probe type

53532 Mono probe flexible PMG 10 MF

2 Display and temperature range

- | | |
|------------|---|
| O | Without local display and without window, flange temperature max. 90 °C |
| HT | Without local display and without window, flange temperature max. 200 °C |
| D | With local display and with window, flange temperature max. 90 °C |
| HTD | With local display and with window, flange temperature max. 200 °C |

3 Housing

A Aluminium die cast IP 65 (EN 60529)

4 Process connection/probe material

- | | | |
|-----------|--|------------|
| 30 | G1B PN16 / stainless steel 316 / 4 mm | |
| 31 | 1 NPT PN16 / stainless steel 316 / 4 mm | |
| 32 | G1½B PN16 / stainless steel 316 / 4 mm | On request |
| 33 | 1½ NPT PN16 / stainless steel 316 / 4 mm | On request |
| 34 | G1½B PN16 / stainless steel 316 / 8 mm | |
| 35 | 1½ NPT PN16 / stainless steel 316 / 8 mm | |
| 50 | G1B PN16 / FEP coating / 4 mm | |
| 51 | 1 NPT PN16 / FEP coating / 4 mm | |
| 52 | Tri-Clamp DN40 PN16 / FEP coating / 4 mm | |
| 53 | Dairy fitting / DN40 PN16 / FEP coating / 4 mm | |

5 Probe length (L)

03000 Length in mm, e.g. 3,000 mm
 Length > 3,000 mm: extra charge for each metre probe length

6 Output signal and EX type

N 4 – 20 mA + HART / non-EX

Ordering code

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Guided micropulse level indicator with flexible dual PulsFox® PMG 10 DF

- Small minimum distances
- Also suitable for high tanks (> 6 m)
- Only for non-adhesive media

Technical specifications

Measuring range

Max. 24,000 mm

Dielectric constant (εr) of medium

≥ 1.8

Measuring accuracy

Better than: ±0.05% of probe length (min. ±5 mm) in the case of liquids
 ±0.2% of probe length (min. ±20 mm) in the case of powder/solids

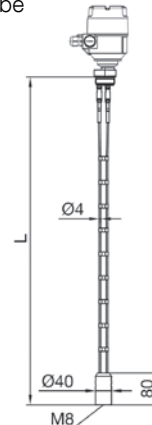
Probe material

Stainless steel 316

Wetted parts

Stainless steel 316, PTFE, FKM

Pulsfox® PMG 10 DF with flexible dual probe



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Ordering data

DG: H, PG: 4

Price €

1	Probe type	
	53536 Dual probe flexible PMG 10 DF	
2	Display and temperature range	
	O Without local display and without window, flange temperature max. 90 °C	
	HT Without local display and without window, flange temperature max. 200 °C	
	D With local display and with window, flange temperature max. 90 °C	
	HTD With local display and with window, flange temperature max. 200 °C	
3	Housing	
	A Aluminium die cast IP 65 (EN 60529)	
4	Process connection/probe material	
	40 G1½B PN 16 / stainless steel 316 / 4 mm	
	41 1½ NPT PN 16 / stainless steel 316 / 4 mm	
5	Probe length (L)	
	03000 Length in mm, e.g. 3,000 mm	
	Length > 3,000 mm: extra charge for each metre probe length	
6	Output signal and EX type	
	N 4 – 20 mA + HART / non-EX	
Ordering code		<input type="text"/>

Guided micropulse level indicator with rigid coax probe PulsFox® PMG 10 KX

- Also suitable for low tanks (< 1 m)
- No minimum distances
- Not for adhesive media

Technical specifications

Measuring range

Max. 6,000 mm

Dielectric constant (εr) of medium

≥ 1.4

Measuring accuracy

Better than: ±0.05% of probe length (min. ±5 mm) in the case of liquids

Probe material

Stainless steel 316 Ti

Wetted parts

Stainless steel 316 Ti, PTFE, FKM

Pulsfox® PMG 10 KX with coax probe



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Ordering data

DG: H, PG: 4

Price €

1	Probe type		
	53534	Coax probe PMG 10 KX	
2	Display and temperature range		
	O	Without local display and without window, flange temperature max. 90 °C	
	HT	Without local display and without window, flange temperature max. 200 °C	
	D	With local display and with window, flange temperature max. 90 °C	
	HTD	With local display and with window, flange temperature max. 200 °C	
3	Housing		
	A	Aluminium die cast IP 65 (EN 60529)	
4	Process connection/probe material		
	01	G1B PN16 / stainless steel 316 Ti	
	02	1 NPT PN16 / stainless steel 316 Ti	
	03	G1½B PN16 / stainless steel 316 Ti	On request
	04	1½ NPT PN16 / stainless steel 316 Ti	On request
5	Probe length (L)		
	03000	Length in mm, e.g. 3,000 mm Length > 3,000 mm: extra charge for each metre probe length	
6	Output signal and EX type		
	N	4–20 mA + HART / non-EX	
	Ordering code		