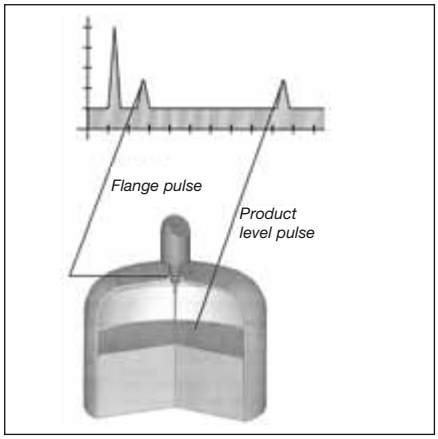
Guided micropulse level measuring systems PulsFox® Technical information/product selection

01

PMG 01

Probes



Principle of operation
PulsFox® PMG 01 level measuring systems operate on the basis of the TDR principle (time domain reflectometry). This principle uses a probe as a micropulse guide.

Electromagnetic pulses are emitted at the speed of light, reflected by the surface of the medium to be measured and received by the signal converter.

Since the speed of light is constant and independent of the gas composition in the tank, the PMG devices do not require commissioning.

The units do not have any moving parts, thus being almost maintenance-free.

Changes of the medium do not affect the measuring accuracy of the TDR principle.

The pulse´s propagation time is directly proportional to the distance between the probe and the surface of the medium.

Applications
Guided Micropulse devices are used to measure levels and interfaces of liquids, granular materials and powders.

Features

- *The measurement is unaffected by changes in dielectric constant, pressure, temperature or density.*
- *Foam, steam, dust or a turbulent surface of the medium do not affect the accuracy of the measurement.*
- *No recalibration is required when a different medium is used.*
- *A great number of different materials and process connections are available and render the system suitable for use with corrosive media or, for example, in the food industry.*

Probe selection

Rigid/flexible monoprobe type F/E	***Flexible probes type B***	***Coax probe type C***
	Typical application areas:	
➤ *Cement, limestone, aluminium* ➤ *Highly viscous liquids* ➤ *Plastic powder, e.g. PVC* ➤ *Granular plastic materials*	➤ *Granular plastic materials* ➤ *Light powders with low dielectric constant* ➤ *Alcohols* ➤ *Water supply tanks*	➤ *Tank height ≤ 6 m* ➤ *Solvents, NH_3, foam, alcohol, oil/water, separators*
	Recommended for the following applications:	
➤ *FEP coating for crystallising products* ➤ *Application with conducting foams*	***For high silos or tanks with liquids, granular materials*** ➤ *Flexible sensors up to 24 m* ➤ *For smaller tanks with little headroom*	***Only for level measurement in clean liquids*** ➤ *In turbulent or flowing liquids the sensor acts like a stilling well* ➤ *Liquid or steam jet in vicinity of probe* ➤ *Can be in contact with metal or tank wall* ➤ *For very low dielectric constants*
	Do not use:	
➤ *For small socket diameters (< DN 100)* ➤ *For high socket*	➤ *Turbulent liquids where probe cannot be anchored* ➤ *Product temperature > 240 °C*	➤ *Crystallising liquids* ➤ *Liquids containing solid matter* ➤ *Products tending to adhere* ➤ *Powders* ➤ *Viscous liquids (e.g. crude oil)*

Guided micropulse level measuring system PulsFox® PMG 01

PMG 01with rigid monoprobe

PMG 01 with flexible monoprobe

Application
For continuous level measurement in containers, tanks or silos. Suitable for electrically conducting or non-conducting liquids and bulk materials. Also suitable for pressurised or vacuum tanks.

Description
PulsFox® level measuring systems operate on the basis of the TDR principle (time domain reflectometry). The measurement is unaffected by changes in dielectric constant, pressure, temperature or density. Foam, steam, dust or a turbulent surface of the medium do not affect the accuracy of the measurement. No recalibration is required when a different medium is used.

Technical specifications

Measuring range
B/E probe ≤ 24 m
C probe ≤ 6 m
F probe ≤ 3 m
Refer to probe type for probe version

Accuracy of measurement
Liquids:
L < 15 m: ±5 mm
L ≥ 15 m: ±0.05 % of measured value
Powders/granular materials:
L < 15 m: ±20 mm
L ≥ 15 m: ±0.05 % of measured value

Refer to page 37 for Part no.

Dielectric constant (ε_r)

Monoprobe	*≥ 2.3*
Dual probe	*≥ 1.8*
Coax probe	*≥ 1.5*

Operating temperature range

Medium:	*-30 °C/ +200 °C*
Flange:	*-30 °C/ +90 °C*
Ambient:	*-30 °C/ +60 °C*
	(Ex version
	-30 °C/ +55 °C)

Process pressure
40 bar

Process connection
G1B
(for PMG 01 DF = G1½B)
Probe type/probe material
F = rigid monoprobe
Stainless steel 1.4571
B / E = 1-2 flexible probe(s):
Stainless steel 1.4401 (Ø 4 mm)
C = coax probe:
Stainless steel 1.4571
Wetted parts:
Stainless steel 1.4571/1.4401, PTFE, FPM

Supply voltage
DC 18–35 V
Ex version ≤ DC 28 V

Output signal
4–20 mA/HART, 2-wire

Housing
Aluminium die cast

Protection
IP 65 (EN 60529)

Electrical connection
Plug DIN 43650-A (IP 65)

CE conformity (EMC)
EN 50082-2, EN 50081-1

Accessories
Operating and configuration software

Options

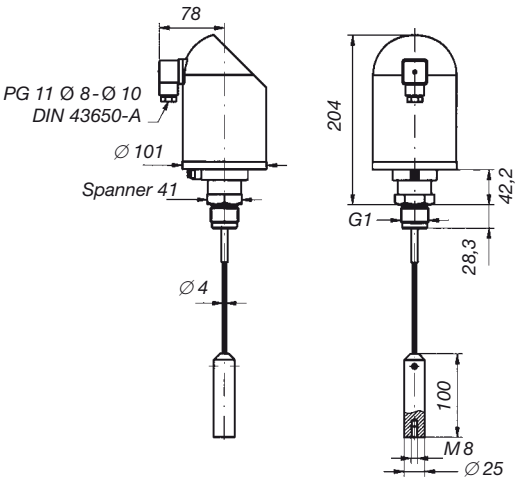
- *Ex versions*
- *Other process connections*
- *Higher pressures*
- *Other probe diameters*
- *Higher flange temperatures*
- *FEP coatings*
- *Other seal materials*
- *Digital plug-in displays*

Guided micropulse level measuring system PulsFox® PMG 01 *Types and dimensions (in mm)*

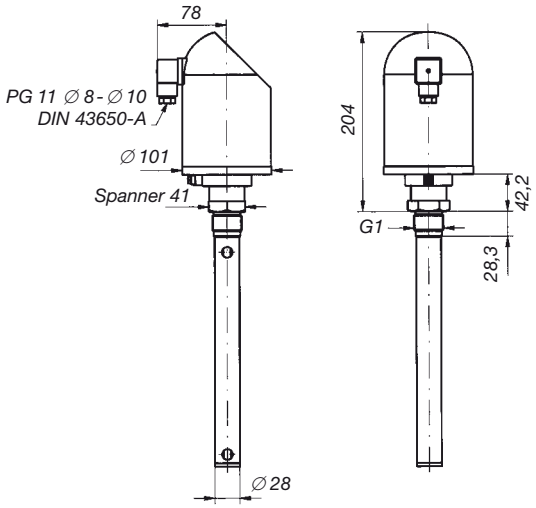
01

Housing

With flexible monoprobe and DIN plug

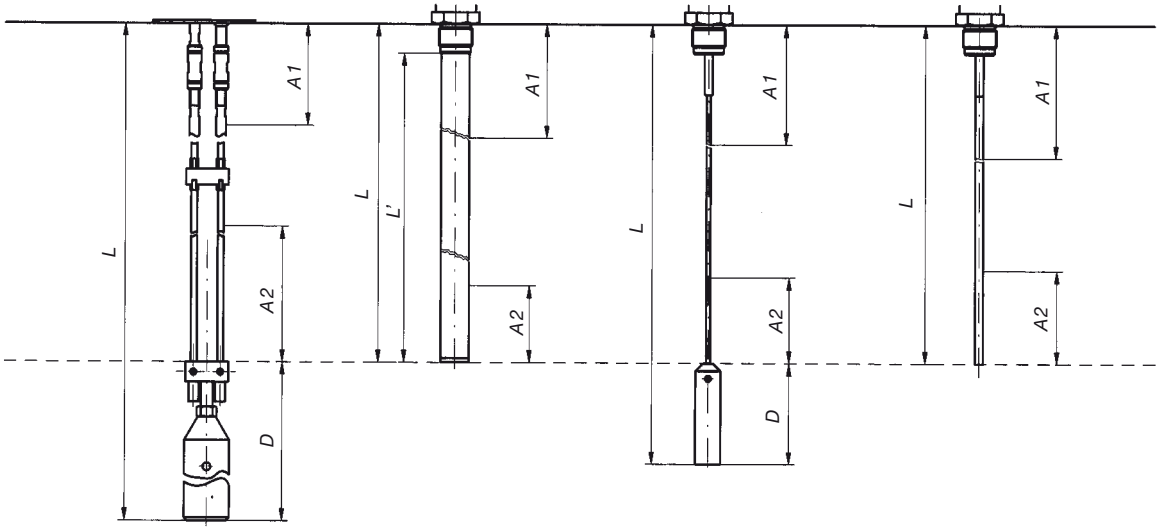


With coax probe and DIN plug



Probes

Type B flexible dual probe | *Type C coax probe* | *Type E flexible monoprobe* | *Type F rigid monoprobe*



L *= Length (**L'** = Length for coax with flange);* ***A1*** *= Upper blocking distance;*
A2 *= Lower blocking distance;* ***D*** *= range that cannot be measured*

ε_r-value	Zone	Type B	Type C	Type E	Type F
80	A1	300 mm	0 mm	400 mm	400 mm
80	A2	20 mm	10 mm	20 mm	20 mm
2	A1	330 mm	0 mm	500 mm	500 mm
2	A2	100 mm	100 mm	200 mm	200 mm
–	D	80 mm	–	100 mm	–