

## Technical Information

# Micropilot M FMR250

## Level-Radar

Smart Transmitter for continuous and non-contact level measurement in solids.

Cost-effective 4...20 mA 2-wire technology.



### Application

The Micropilot M performs continuous, non-contact level measurement especially in powdery to granular bulk solids. Additionally it can be used in liquids as well. Dust, filling noises, temperature layers and gas stratification do not affect measurement.

Typical areas of application are:

- Level measurement in tall silos with extremely dusty bulk solids e.g. cement, raw meal or animal feed.
- Applications with high temperature requirements up to 200 °C (392 °F), e.g. clinker or fly ash.
- Applications with highly abrasive bulk solids e.g. ferrite.

The FMR250 with DN80 or DN100 horn antenna for all standard applications, particularly also for small nozzle sizes.

The FMR250 with DN200 parabolic antenna offers high beam focussing of 4° and is thus ideal for applications with many installations.

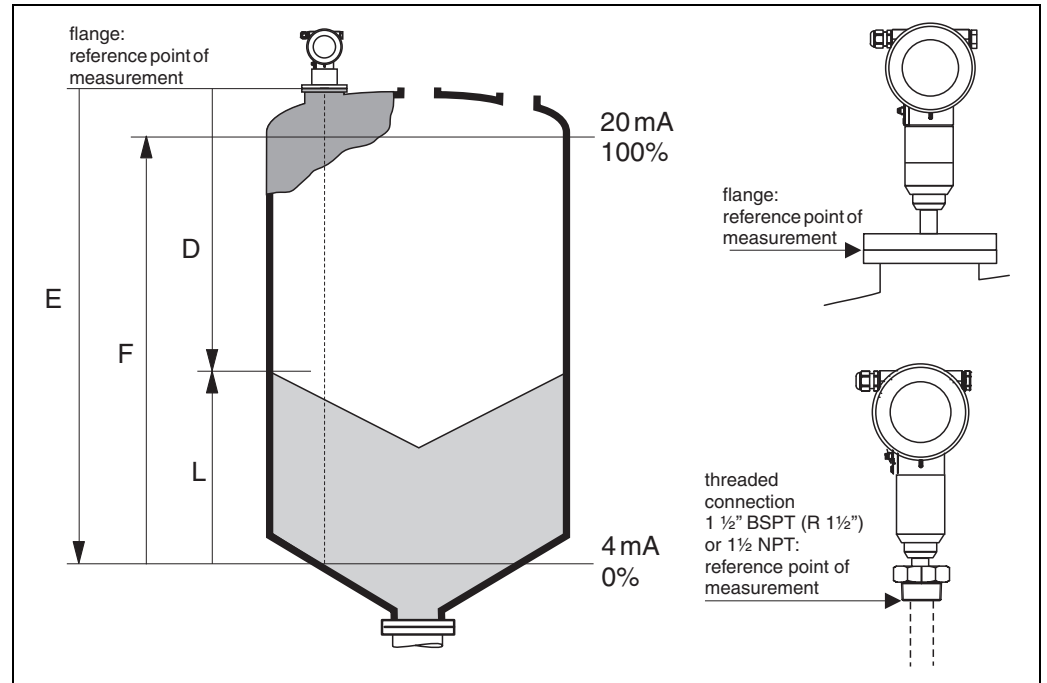
### Your benefits

- 2-wire technology, low price:  
2-wire technology reduces wiring costs and allows easy implementation into existing systems.
- Non-contact measurement:  
Measurement is almost independent from product properties.
- Easy on-site operation via menu-driven alphanumeric display.
- Easy commissioning, documentation and diagnostics via operating software (ToF Tool).
- Integrated air purge connection for extremely dusty conditions or media tending to create build-up.
- Max. measuring range 70 m (229 ft).
- Suitable for process temperatures up to 200 °C (392 °F).
- HART or PROFIBUS PA protocol.
- Optional remote display and operation.

## Function and system design

### Measuring principle

The Micropilot is a "downward-looking" measuring system, operating based on the time-of-flight method. It measures the distance from the reference point (process connection) to the product surface. Radar impulses are emitted by an antenna, reflected off the product surface and received again by the radar system.



### Input

The reflected radar impulses are received by the antenna and transmitted into the electronics. A microprocessor evaluates the signal and identifies the level echo caused by the reflection of the radar impulse at the product surface. The unambiguous signal identification is accomplished by the PulseMaster® software, based on many years of experience with time-of-flight technology.

The distance  $D$  to the product surface is proportional to the time of flight  $t$  of the impulse:

$$D = c \cdot t / 2,$$

with  $c$  being the speed of light.

Based on the known empty distance  $E$ , the level  $L$  is calculated:

$$L = E - D$$

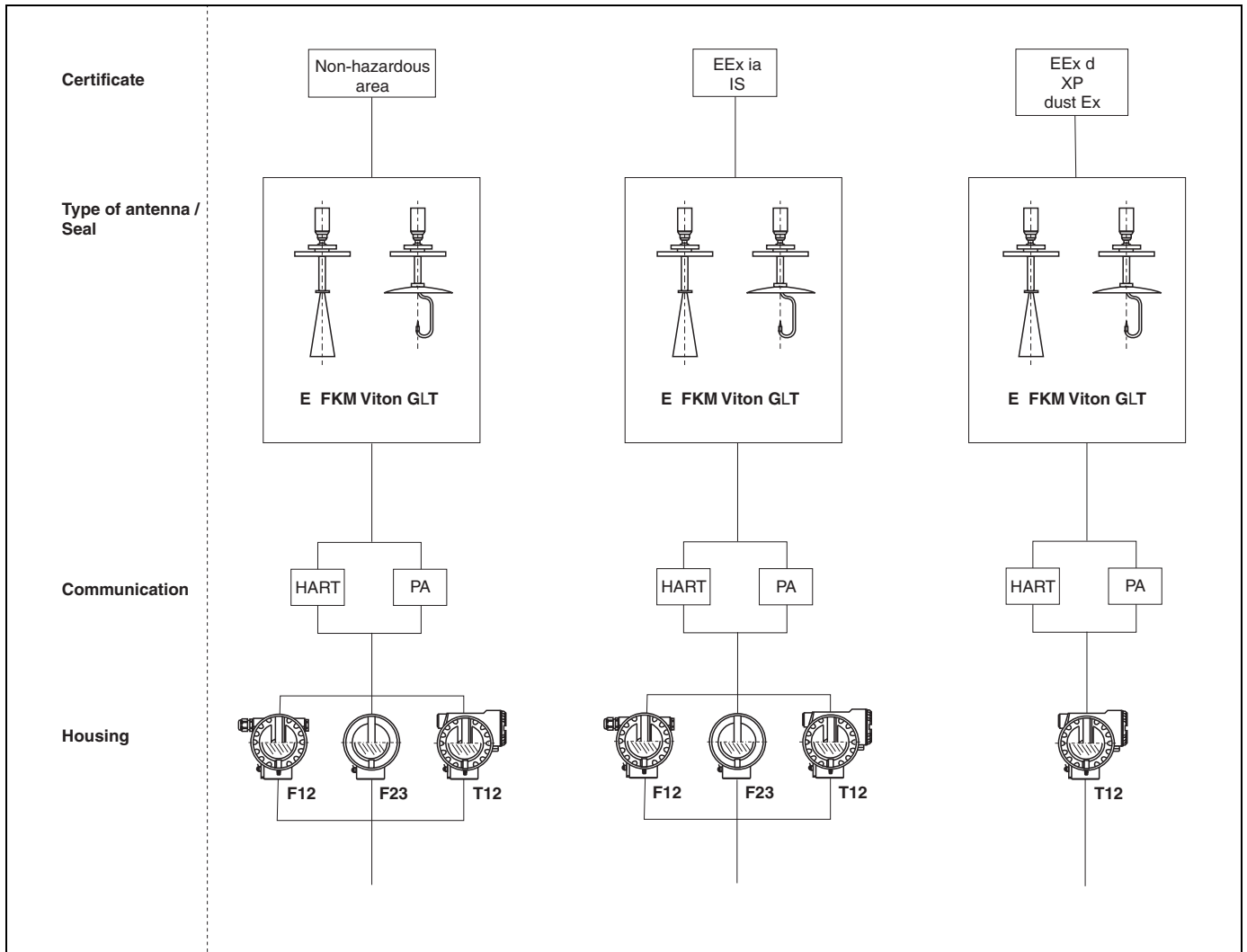
Refer to the above figure for the reference point for "E".

The Micropilot is equipped with functions to suppress interference echoes. The user can activate these functions. They ensure that interference echoes (i.e. from internals and struts) are not interpreted as level echo.

## Ordering information

Micropilot M FMR250

Instrument selection



L00-FMR250xx-16-00-00-en-001

## Ordering structure Micropilot M FMR250

<b>10</b>	<b>Approval:</b>			
	A	Non-hazardous area		
	1	ATEX II 1/2G EEx ia IIC T6		
	4	ATEX II 1/2G EEx d [ia] IIC T6		
	G	ATEX II 3G EEx nA II T6		
	B	ATEX II 1/2GD EEx ia IIC T6, Alu blind cover		
	C	ATEX II 1/2G EEx ia IIC T6, ATEX II 1/3D		
	D	ATEX II 1/2D, Alu blind cover		
	E	ATEX II 1/3D		
	S	FM IS-Cl.I/II/III Div.1 Gr.A-G		
	T	FM XP-Cl.I/II/III Div.1 Gr.A-G		
	N	CSA General Purpose		
	U	CSA IS-Cl.I/II/III Div.1 Gr.A-G		
	V	CSA XP-Cl.I/II/III Div.1 Gr.A-G		
	Y	Special version		
<b>20</b>	<b>Antenna:</b>			
	4	Horn 80mm/3"		
	5	Horn 100mm/4"		
	6	Parabolic 200mm/8"		
	9	Special version		
<b>30</b>	<b>Antenna seal; Temperature:</b>			
	E	FKM Viton GLT; -40...200°C/-40...392 °F		
	Y	Special version		
<b>40</b>	<b>Antenna extension:</b>			
	1	Not selected		
	2	250mm/10"		
	3	450mm/18"		
	9	Special version		
<b>50</b>	<b>Process connection:</b>			
	GGJ	Thread DIN2999 R1-1/2, 316L		
	GNJ	Thread ANSI NPT1-1/2, 316L		
	X3J	UNI flange DN200/8"/200A, 316L max PN1/14.5lbs/1K, compatible DN200 PN10/16, 8" 150lbs, 10K 200A		
	XCJ	Top target pos., UNI DN100/4"/100A, 316L max PN1/14.5lbs/1K, compatible DN100 PN10/16, 4" 150lbs, 10K 100A		
	XEJ	Top target pos., UNI DN200/8"/200A, 316L max PN1/14.5lbs/1K, compatible DN200 PN10/16, 8" 150lbs, 10K 200A		
	CMJ	DN80 PN10/16 B1, 316L flange EN1092-1 (DIN2527 C)		
	CQJ	DN100 PN10/16 B1, 316L flange EN1092-1 (DIN2527 C)		
	ALJ	3" 150lbs RF, 316/316L flange ANSI B16.5		
	APJ	4" 150lbs RF, 316/316L flange ANSI B16.5		
	KLJ	10K 80A RF, 316L flange JIS B2220		
	KPJ	10K 100A RF, 316L flange JIS B2220		
	YY9	Special version		
<b>60</b>	<b>Output; Operation:</b>			
	A	4-20mA HART; 4-line display VU331, envelope curve display on site		
	B	4-20mA HART; w/o display, via communication		
	K	4-20mA HART; prepared for FHX40, remote display (Accessory)		
	C	PROFIBUS PA; 4-line display VU331, envelope curve display on site		
	D	PROFIBUS PA; w/o display, via communication		
	L	PROFIBUS PA; prepared for FHX40, remote display (Accessory)		
	Y	Special version		
<b>FMR250-</b>				Product designation (part 1)



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