

**LEVEL MEASUREMENT**

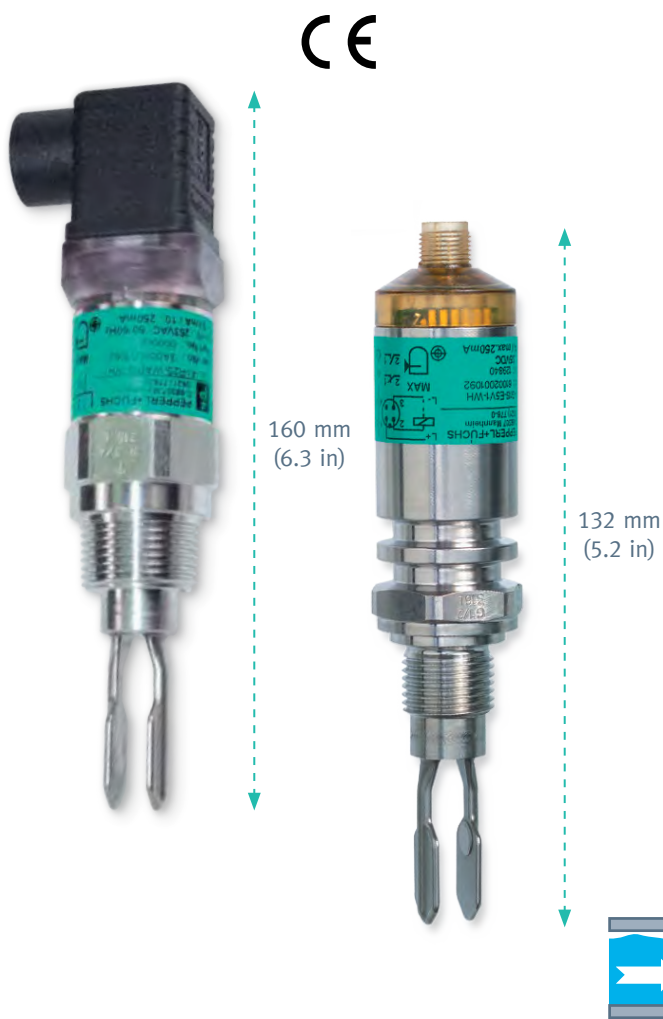
**VIBRATION AND GUIDED MICROWAVE**



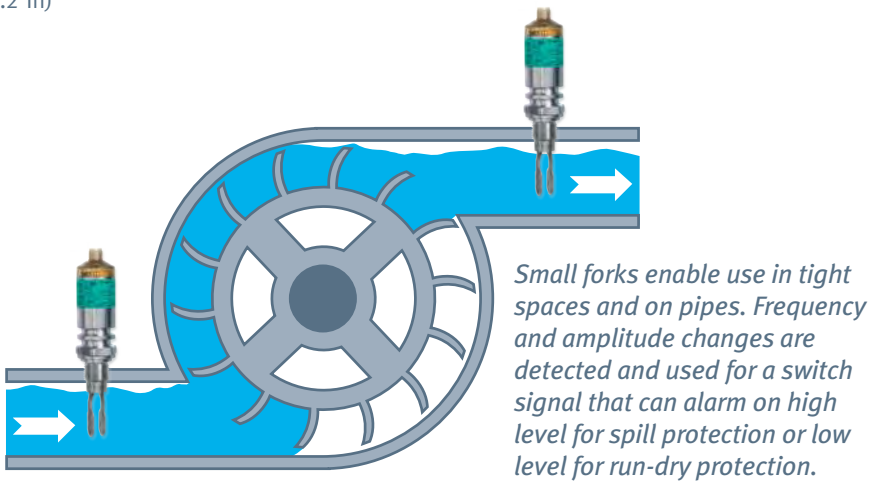
# POINT LEVEL DETECTION

## VIBRACON MINI – VIBRATION FORK TECHNOLOGY

The world's smallest vibrating fork sensor offers premium point level control performance at an affordable price. Its stainless steel construction withstands the most severe operating conditions. This versatile sensor is used in a wide range of industries, and its 1/2" and 3/4" process connections are industry standards. With AC and DC versions available, Vibracon Mini connects to any control system. Plus, there is an optional connection to AS-Interface for bus system architectures.



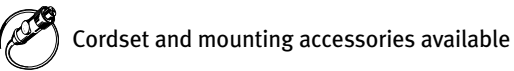
- Ideal for limited/compact spaces
- Fits pipe diameters as small as 40 mm (1.5 in)
- LED status indication
- Connections for AC, DC, and AS-Interface
- Rugged stainless steel (316L) construction
- Proven level-sensing technology
- Easily serviced electrical connections
- Application-specific accessories available
- Rotatable cable/conduit plug for easy mounting



## SPECIFICATIONS

<b>MEASUREMENT</b>		Point level
<b>MEASUREMENT PRINCIPLE</b>		Frequency shift
<b>PROCESS CONNECTION</b>	Material	316L SS
	Thread	G½, G¾, ½ NPT, ¾ NPT, R½, R¾
<b>ENCLOSURE</b>	Housing	IP65 (Type 4) plug adapter, IP67 (Type 4) V1 (M12x1)
	Probe	IP67 (Type 4)
<b>OPERATING CONDITIONS</b>	Pressure	-1 to +40 bar (-14.5 to +580 psi)
	Process temperature	-40 °C to +100 °C (-40 °F to +212 °F)
	Ambient temperature	-40 °C to +70 °C (-40 °F to +158 °F)
	Viscosity	10000 cSt
	Density	0.7 g/cm³ (44 lbs/ft³)
<b>ELECTRICAL*</b>	Connector	1/2" NPT, PG11 plug, V1 (M12 x 1 for DC)
	3-wire/DC, PNP input supply	10 - 35 VDC
	2-wire/AC input supply	19 - 253 VAC, 50/60 Hz
	AS-Interface	From AS-Interface
	Output	AC, DC, AS-Interface
	Operating time	≈0.5 s (immersed), ≈1 s (uncovered)
	Hysteresis	≈2 mm
	<b>APPROVALS</b>	
	CE, CSA, WHG	

\* Refer to complete datasheet for AS-Interface electrical specifications



Cordset and mounting accessories available

## VIBRACON MINI KEY TO MODEL NUMBER

Type	Process connection	Fork surface	Electrical connection	Special items	Approvals
	G1 BSP 1/2" (G1/2 A)	S Standard Ra < 3.2 µm	WA 2-wire AC	V1 V1 (M12 x 1) connector	WH With WHG approval/standard
	G2 BSP 3/4" (G3/4 A)		E5 3-wire DC-PNP	PG Valve connector PG11	CG CSA general-purpose
	N1 1/2" NPT		B3 AS-Interface bus system	PN Valve connector NPT 1/2"	
	R1 3/4" NPT				
	R2 BSPT 1/2" (R1/2)				
	R3 BSPT 3/4" (R3/4)				

LVL-A1 - N1 S - E5 PN - CG

Environmental processing



Food and beverage



## ADDITIONAL LEVEL TECHNOLOGIES FROM PEPPERL+FUCHS

### FLOAT SWITCHES

- Simple and inexpensive
- Mercury-free, ball and cylindrical
- Suitable for hazardous locations

#### APPLICATIONS

- Overflow detection of liquids that is simple and cost-effective



### VIBRATION LIMIT SWITCH FOR SOLIDS

- Easy setup and programming
- Maintenance-free operation
- Strong abrasion-free stainless steel construction

#### APPLICATIONS

- Level limit switch for bulk solids in material handling and storage applications





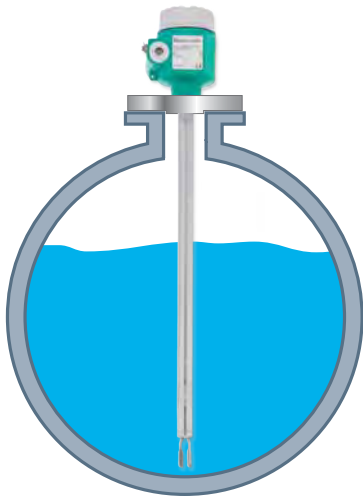
# POINT LEVEL DETECTION

## VIBRACON M-SERIES – VIBRATION FORK TECHNOLOGY

This universal vibration level sensor series has worldwide certifications for safe and hazardous areas with explosion-proof and IS approvals. It is suitable for a variety of industries including chemical, pharmaceutical, water treatment, and food processing including industry-leading 3A certification for dairy applications. The unit is impervious to temperature fluctuations, high-pressure cleaning, sterilization, and disinfection. It is not affected by alternating media, sediment build-up, abrasion, turbulence, solid or gas components, or foam. Corrosion-resistant versions are available, as well as those with customizable tube lengths.



- Accurate to +/-1 mm with repeatable 0.1 mm switch point
- Optional housings in aluminum, plastic, or stainless steel
- Accommodates a wide variety of applications with a large selection of process connections (contact factory for those not listed)
- Various electrical outputs
- FM, CSA, ATEX, EX ia, EX d approvals



Customizable tube lengths are available to accommodate a wide variety of industry applications.

Pharmaceuticals



Hazardous locations



## SPECIFICATIONS

MEASUREMENT		Point level
MEASUREMENT PRINCIPLE		Frequency shift
PROBE	Size	M1, varies with process connection M2, 148 mm to 6 m (6 in to 20 ft)
	Material	Body: aluminum, stainless steel, polyester Probe: 316L SS, Alloy C4
PROCESS CONNECTION	Material	316L SS, Alloy C4
	Seal	Varies with process connection
	Thread	G½, G¾, ½ NPT, ¾ NPT, R½, R¾
ENCLOSURE	Housing	IP66 (Type 4x)
	Probe	IP66 (Type 4x)
OPERATING CONDITIONS	Pressure	-1 to +64 bar (-14.5 to +930 psi) (non EFCTE)
	Process temperature	-40 °C to +150 °C (-40 °F to +300 °F)
	Ambient temperature	-50 °C to +70 °C (-60 °F to +158 °F)
	Accuracy	+/-1mm (+/- 0.1mm of switch point)
	Viscosity	10000 cSt
ELECTRICAL	Density/grain size	0.5 g/cm³ min (31.2 lb/ft³)/5 mm dia. (max)
	Connector	1/2" NPT for SS and plastic housing, 3/4" NPT for aluminum housing
ELECTRICAL	Output	AC, DC, NAMUR, 8/16 mA, Relay
	APPROVALS	FM, CSA, ATEX (Ex ia, Ex d), WHG overfill protection



Cordset and mounting accessories available

## VIBRACON M-SERIES KEY TO MODEL NUMBER

- Probe design  
1 Compact version  
2 Extended version  
2C Corrosion resistant coating, compact length, contact factory to configure this unit  
1H Hygienic version, compact length, contact factory to configure this unit  
2H Hygienic version, extended length, contact factory to configure this unit
- Process connection and material  
A31 ANSI 1" 150 lbs RF, 316L SS  
A6C ANSI 2" 150 lbs RF, Alloy C4 plat.  
A91 ANSI 4" 150 lbs RF, 316L SS  
N21 3/4" NPT, 316L SS  
N2C 3/4" NPT, Alloy C4/2.4610  
N31 1" NPT, 316L SS  
T51 1 1/2" triclamp ISO 2852, 316L SS  
T61 2" triclamp ISO 2852, 316L SS
- Contact factory for additional process connections
- Length, temperature spacer, and pressure-tight bushing  
AA Compact Ra<3.2 µm/80 grit  
IA 66 mm / 2.6" + temperature separator  
QA 66 mm / 2.6" + 2nd line of defense
- Housing and cable entry  
A2 Housing Alu, 4x, 3/4" NPT  
E2 Housing 316L SS, 4x 1/2" NPT  
P2 Housing Polyester, 4x 1/2" NPT
- Electrical connection  
AC FEL 51, 2-wire switch, 19...253 VAC  
E5 FEL 52, PNP 3-wire, 10...55 VDC  
WA FEL 54, relay, DPDT, 19...253 VAC, 19...55 VDC  
SI FEL 55, 8/16 mA, 11...36 VDC  
N1 FEL 56, NAMUR  
N2 FEL 58, NAMUR with pushbutton
- Optional equipment  
NA Additional options not selected  
Z3 3.1.B material, wetted parts 316L SS, Inspection Certificate EN 10204
- Certificates  
NA For non-hazardous areas  
FI FM IS CI I,II,III Div 1 Group A-G  
FX FM XP CI I,II,III Div 1 Group A-G  
FN FM NI CI I Div 2 Group A-D  
CI CSA IS CI I,II,III Div 1 Group A-G  
CX CSA XP CI I,II,III Div 1 Group A-G  
CG CSA general-purpose  
Consult factory for ATEX approvals

LVL-M 2H - N31 AA - E2 WA Z3 - FX

## ADDITIONAL LEVEL TECHNOLOGIES FROM PEPPERL+FUCHS

### HYDROSTATIC PRESSURE SENSORS

- Simple to install and configure
- Better than 0.2% accuracy

#### APPLICATIONS

- Continuous level measurement in liquids and viscous mediums
- Pressure of gasses and liquids in closed systems



### ULTRASONIC LEVEL SENSORS

- Simple to install and program
- Mapping feature for nonlinear tanks
- ATEX, FM, CSA

#### APPLICATIONS

- Continuous level measurement of liquids and bulk materials to 15 meters
- Suitable for corrosive liquids (LUC4)



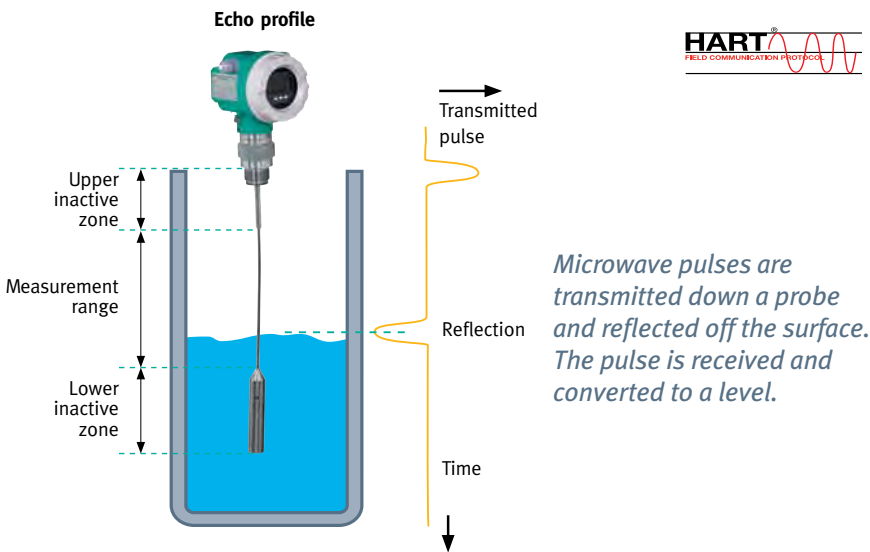


PULSCON – GUIDED MICROWAVE TECHNOLOGY

This guided-wave radar level transmitter uses time-domain reflectometry (TDR) technology to evaluate the time and width of transmitted pulses. The transmitter guides the radar pulse down a metal probe so that it is insensitive to process conditions such as tank structures, dust, temperature, humidity, and mist for precise level measurement of media, regardless of the surrounding conditions. It is available in cable, rod, and coax versions.



- Simple programming and calibration with menu-guided user display
- Echo curve display for easy commissioning and evaluation
- Measuring ranges up to 20 m (65 ft)
- Unaffected by internal tank structures such as ladders, braces, corrugated walls, or confined spaces
- Easy calibration and diagnosis with PACTware software tool
- Immune to foam, material build-up, and suspended dust
- Linearize irregular tank shapes with up to 32 values



Granular filling stations



Chemical production and storage



SPECIFICATIONS

	CABLE PROBE	ROD PROBE	COAXIAL PROBE
MEASUREMENT	Continuous		
MEASUREMENT PRINCIPLE	Guided microwave		
PROBE Length	1 - 20 m (3 - 65 ft)	0.3 - 4 m (8 - 157 in)	0.3 - 4 m (8 - 157 in)
Diameter	4 mm (1/16 in)	6 mm (1/4 in) or 16 mm (5/8 in)	21 mm (7/8 in) or 42 mm (1-11/16 in)
Side impact/tensile strength	5 kN (3/4 in NPT), 12 kN (1-1/2 in flange)	4 Nm (6 mm rod), 30 Nm (16 mm rod)	4 Nm (21 mm coax), 30 Nm (42 mm coax)
Material	304 SS	316L SS	316L SS
PROCESS CONNECTION Material	316L SS and Teflon® (1-1/2" flange only); 316 SS and PPS plastic (3/4" NPT only)		
Seal	Silicone, Viton®, EDPM, Kalrez		
ENCLOSURE Housing	IP68 (Type 4X)		
Probe	IP68 (Type 6P)		
OPERATING CONDITIONS Pressure	-1 to +40 bar (-14.5 to +580 psi)		
Process temp.	-40 °C to +150 °C (-40 °F to +300 °F)		
Ambient temp.	-40 °C to +80 °C (-40 °F to +176 °F)		
Accuracy	3 mm (for probes ≤10 m); 0.03% of range (for probes >10 m)		
Dielectric constant	1.4 min (coaxial version), 1.6 min (cable or rod version)		
Viscosity (max.)	1000 cSt	1000 cSt	(1-1/2 in flange) 500 cSt (3/4 in) 100 cSt
Grain size	<20 mm (3/4 in) dia. (max)		
ELECTRICAL Connector	See Key To Model Number		
2-wire input	Std: 16 - 36 VDC; Haz. Loc: 10 - 30 VDC		
4-wire input	85 - 250 VAC, 50/60 Hz, 10.5 - 32 VDC		
Output	4-20 mA/HART, PROFIBUS PA		
APPROVALS	CSA, ATEX (Ex em[ia], Ex ia, Ex d[ia], FM, WHG		

Teflon® and Viton® are registered trademarks of E.I. du Pont de Nemours and Company

Cordset and mounting accessories available

PULSCON KEY TO MODEL NUMBER

- Probe design**
- 1 Cable, 1/6" (4 mm) diameter, 304 SS
  - 2 Rod, 5/8" (16 mm) diameter, 316L SS
  - 3 Rod, 1/4" (6 mm) diameter, 316L SS
  - 4 Coaxial, 316L SS
- Process connection and material**
- N21 3/4" NPT, 316L SS
  - N51 1-1/2" NPT, 316L SS
  - A51 ANSI 1-1/2", 150 lbs RF, 316L SS
  - A52 ANSI 1-1/2", 300 lbs RF, 316L SS
  - A61 ANSI 2", 150 lbs RF, 316L SS
  - A62 ANSI 2", 300 lbs RF, 316L SS
  - A81 ANSI 3", 150 lbs RF, 316L SS
  - A82 ANSI 3", 300 lbs RF, 316L SS
  - A91 ANSI 4", 150 lbs RF, 316L SS
  - A92 ANSI 4", 300 lbs RF, 316L SS
  - AA1 ANSI 6", 150 lbs RF, 316L SS
  - AB1 ANSI 8", 150 lbs RF, 316L SS
- Probe Length**
- Cable probes 40 - 780 inches
  - C In. of 1/6" (4 mm) diameter cable
  - Rod probes 8 - 156 inches
  - M In. of 5/8" (16 mm) diameter single rod probe
  - R In. of 1/4" (6 mm) diameter single rod probe (78" maximum)
  - N In. of coaxial probe
- Seal**
- 1 Silicone
  - 2 Viton O-ring
  - 3 EPDM O-ring
  - 4 Kalrez O-ring
- Housing and cable entry**
- A2 Aluminum, Type 4X, 1/2" NPT electrical
  - A4 Aluminum, Type 4X, M12 PROFIBUS plug
  - T2 Aluminum, Type 4X w/separate wire compartment, 1/2" NPT electrical
  - T4 Aluminum, Type 4X w/separate wire compartment, M12 PROFIBUS plug
- Electrical connection**
- IH 2-wire, loop powered 4-20 mA w/HART
  - PA 2-wire, PROFIBUS PA
  - AH 4-wire, 9-250 VAC, 4-20 mA w/HART
  - DH 4-wire, 18-36 VAC, 4-20 mA w/HART
- Display**
- B No display
  - D Display for field operation
- Remote electronic**
- 1 Standard transmitter
  - 2 16" (400 mm) tube for electronics
  - 3 Remote electronic with 10' (3 m) cable
- Certificates**
- NA No approvals (for non-hazardous location)
  - FM FM Dust ignition proof, Cl II, Grps E-G
  - F1 FM Intrinsically safe, Cl I,II,III, Grps A-G
  - F2 FM Explosion proof, Cl I,II,III, Grps A-G
  - CG CSA General-purpose
  - CS CSA Dust ignition proof, Cl II, Grps G+coal dust
  - C1 CSA Intrinsically safe, Cl I,II,III, Grps A-D, G+coal dust
  - C2 CSA Explosion proof, Cl I,II,III, Grps A-D, G+coal dust
- Length in inches**

LTC 1 - N21 C 2 - A2 IH D 1 - NA - 100



# PROCESS AUTOMATION – PROTECTING YOUR PROCESS



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