

Radar Level Sensor

- **Non-contact measurement:** FMCW radar operating at 25 GHz in the K-Band
- **Long-range options:** Maximum range of 26.2 ft (8 m) or 65.6 ft (20 m), with a 0.98 ft (0.3 m) dead zone
- **Control-system integration:** Two-wire 4 ... 20 mA current output with HART®
- **IP67** enclosure, max operating overpressure of ~29 psi (2 bar), and an operating range of -22°F to 158°F (-30°C to 70°C)
- **Flexible local indication:** Available with or without an OLED display or sunlight-readable LCD display



About

The P25 is a non-contact FMCW antenna radar level meter designed for continuous measurement of liquids and pasty substances in tanks, containers, sumps, and open installations. Using a 25 GHz K-band signal, it is available with maximum measurement ranges of 65.6 ft (20 m). A two-wire 4 ... 20 mA output with HART® communication allows the instrument to connect with industrial control, monitoring, and configuration systems. Its covered funnel antenna helps prevent dirt, vapors, and gases from entering the antenna. Measurement is independent of the temperature and pressure of the atmosphere above the material surface.

Applications

- ✓ Water and wastewater
- ✓ Chemical and general process manufacturing
- ✓ Food, beverage, and viscous-product processing
- ✓ Industrial storage and inventory monitoring
- ✓ Utility and environmental infrastructure
- ✓ General manufacturing and process automation

Build Your Part Number

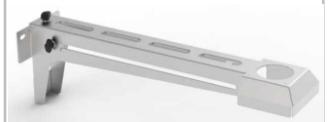
Series P100

Example: P100SM2P1CHL

Series	
P100	
Performance - select one	
S	Standard atmosphere, aluminum housing
T	Standard atmosphere, stainless steel housing, head and cover (only for Tri-Clamp connection P3)
Measuring Range - select one	
M1	0.30 ... 8.0 meters (must select P1)
M2	0.30 ... 20.0 meters (must select P2)
Process Connection - select one; see diagrams on page 5	
P1	G 1 ½" male
P2	G 2" male
P3	Tri-Clamp 2" (64mm) (must select M1)
Output - select one	
C	4...20mA with HART
Electrical Connection - select one; see diagrams on page 5	
E1	Plastic cable gland M16
E2	Plastic cable gland M20
H	Cable gland (long) for installation of protective hose over cable (see accessories for protective hose)
S	Stainless steel cable gland M16 (select for P3)
Visual Display Options - select one	
O	OLED Display
L	LCD Display
N	No Display

Note: Product Includes 1 EPDM O-Ring

Accessories – optional; will be quoted as a separate line items	
A1	Telescopic bracket
A2	EPDM O-ring
A3	Universal USB to HART converter
A5	Plastic Lock Nut (G1 ½", G 2")
A6	Stainless Steel Lock Nut (G1", G1 ½")
A8	Protecting Hose (Only for Electrical Connection H)



Technical Parameters

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Electrical	Supply Voltage	18 ... 34 VDC	
	Output Type	Current 4 ... 20 mA with HART® communication (limit values 3.9 ... 20.5 mA)	
	Current Consumption	4 ... 20 mA / max. 22 mA	
	Maximal Current Output Load Resistance	U = 24 VDC	R _{max} = 270 Ω (250Ω HART® resistor included)
		U = 22 VDC	R _{max} = 180 Ω
		U = 20 VDC	R _{max} = 90 Ω
	Current Output Error	Maximum 80µA	
	Delay Between Supply Power Rise Time and First Measurement	20 seconds	
	Status Signaling (Echo Dropout)	Adjustable 3.75 mA; 4mA; 20 mA; 22 mA; NO CHANGE	
Measuring	Separation Capacity (power leads - housing)	2 nF / 500 V AC	
	Cable	PVC 2 x 0.75 mm ² (6 ... 8 mm)	
	Basic measurement accuracy	3 mm (distance 1 m ... 8/20 m)	
		10 mm (distance 0.3 m ... 1 m)	
	Resolution	0.1 mm	
	Dead zone	30 cm	
	Adjustable Measuring Range	Minimum 200mm	
	Function Principle	FMCW	
	Measuring Frequency	25 GHz (K-Band)	
Environmental	Measuring Sensitivity	3 levels	
	Damping	1 ... 99 seconds	
	Water Protection Class	IP67	
	Operating Temperature Range	-22°F ... 158°F (-30°C ... +70°C)	
Materials	Maximum Operating Overpressure	29 PSI (2 bar)	
	Process Connection	Plastic PP	
	Housing	Aluminum allow with powder coating	
	Lid	Aluminum allow with powder coating	
	Glass Window	Polycarbonate	
	Cable Gland	Plastic - polyamide	
	Tightening Torque of Cable Gland	3 Nm	
	Weight	~0.5 kg	
Display	Type	Matrix OLED (Suitable for indoor and low-light applications) LCD (Suitable for outdoor applications particularly in direct sunlight)	
	Resolution	128 x 64 pixels	
	Height of digits	9mm	
	Number of display digits of measured values	5 digits	
	Color of Display	OLED	Yellow
		LCD	Black with white background light
	Type of Buttons	Low lift membrane	
	Ambient Temperature Range	OLED	-22°F ... 158°F (-30°C ... +70°C)
		LCD	-4°F ... 158°F (-20°C ... +70°C)
	Weight	46 grams	

Basic Features

Non-contact radar level meters with an antenna are suitable for continuous level measurement at medium and longer distances. They can be used both in various closed tanks, containers, in semi-open sumps, and in open space. Their use is suitable where their advantages are fully realized:

1. Non-contact measurement
2. Independence of measurement on temperature and atmospheric pressure above the surface
3. Possibility of measurement even in vacuum
4. Possibility of measurement even in aggressive vapors
5. Measurement is independent of medium parameters

The P25 radar level meter operates on the FMCW (frequency modulated continuous wave) principle with a frequency of 25 GHz (K-Band).

The level meter is equipped with a compact covered funnel antenna. The antenna cover prevents dirt, vapors and gases from penetrating the antenna.

The P25 is designed for measuring the level of liquid or pasty substances.

The level meter is two-wire with a current output of 4 ... 20 mA with HART® communication. Measuring range 0.3 ... 8 m or 0.3 ... 20 m.

Installation and Operation

Installation

The level meters are mounted in a vertical position in a suitable flange in the upper lid of the tank, or into the hole using the fixing nut. The tightening torque needs to be selected while taking into account the gasket used and the working overpressure in the tank.

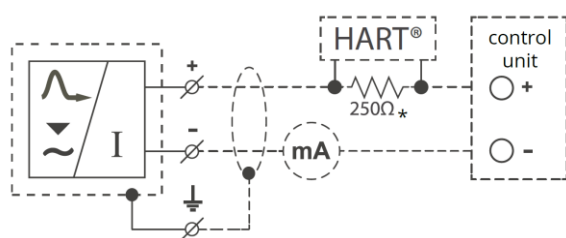
The place for installation must be chosen so that the electromagnetic wave (transmitted by the level gauge) is not affected by nearby objects (reinforcements, ladders, stirrers, etc.) or by the flow of the liquid being filled. The level gauge can be placed in a pipe extension that has a length smaller than the diameter.

If the level meter has not yet been installed, it must be stored in an intact condition with the cap tightened and the sealing plug in the cable gland.

The level meter does not require any operator to operate. During operation, the operator of the technological unit is informed about the height of the measured substance level using a display module or a follow-up device.

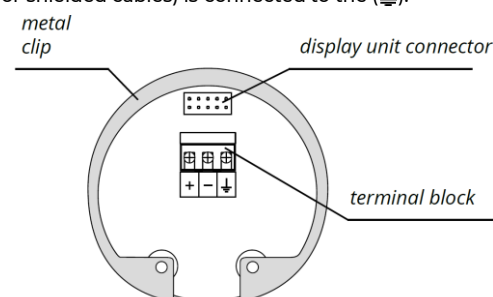
Electrical Connection

When using the M16 socket, the level meter is connected to the follow-up (evaluation) device with a suitable cable with an external diameter of 6 - 8 mm via screw terminals located under the display module. Recommended core cross-section for the current version is $2 \times 0.5 \dots 0.75 \text{ mm}^2$. The positive pole (+U) is connected to the (+) terminal, the negative pole (0 V) to the (-) terminal and the shield (only for shielded cables) is connected to the ($\perp$).



**When using HART communication*

Wiring Diagram of the P25 with current output



Inside view of the screw terminals of the P25 with current output

Setting Elements

Settings are performed using 3 buttons located on the display module. All the settings are available in the menu of the level meter.

Button **OK**

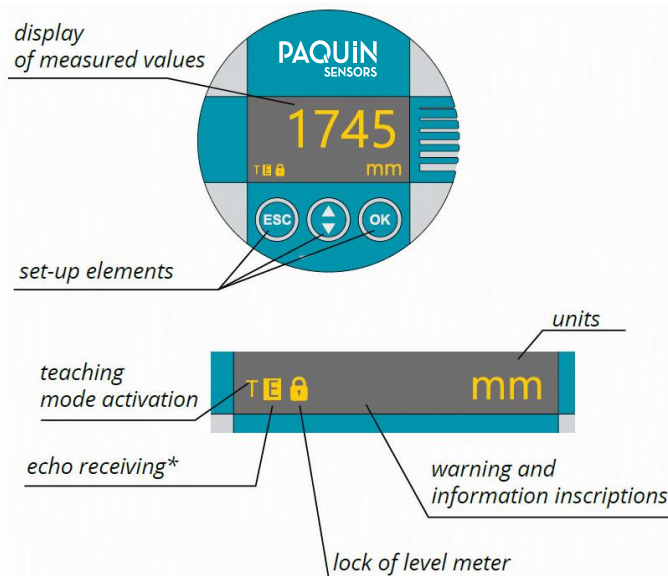
- Set-up mode access
- Confirmation of selected item in the menu
- Move the cursor in the line
- Saving of set-up data

Button **↕**

- Move in the menu
- Change of values

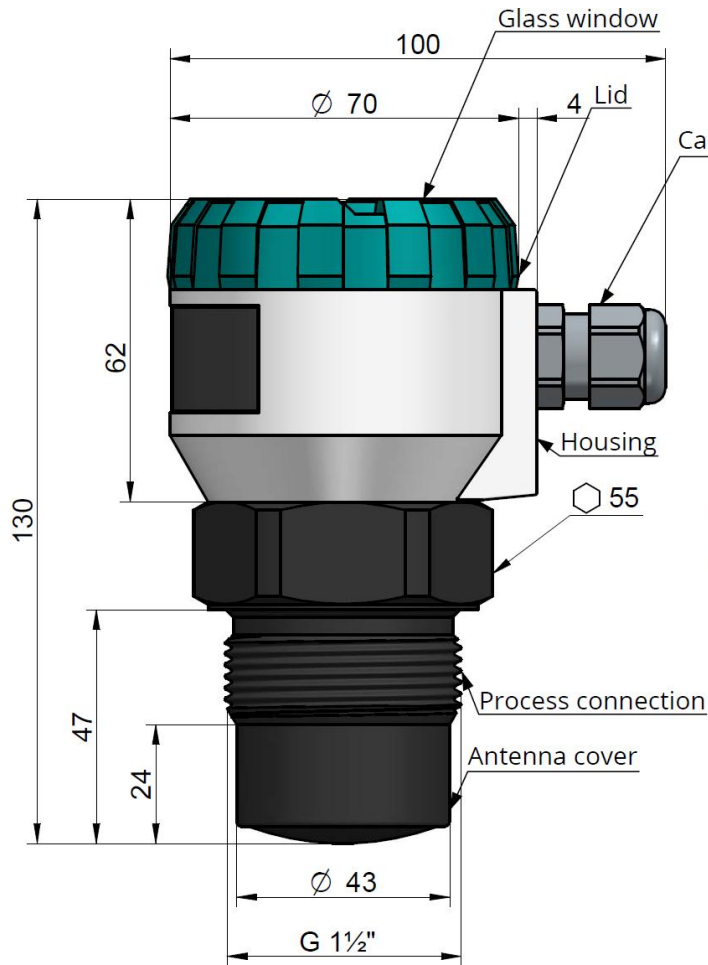
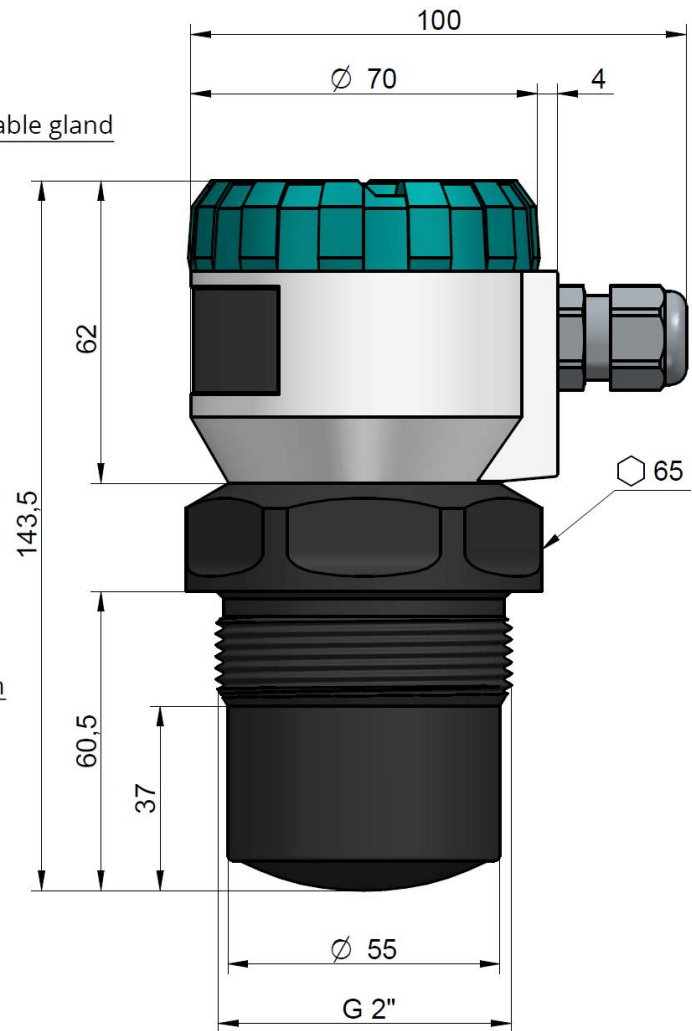
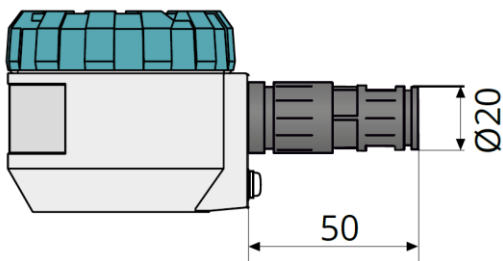
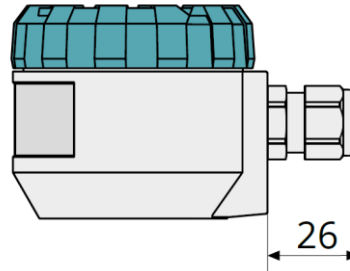
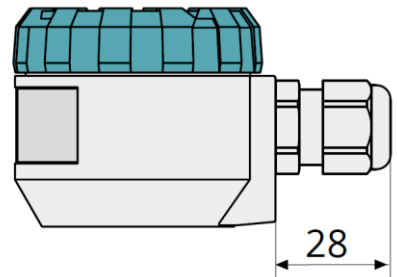
Button **ESC**

- Cancelling of carried out changes
- Shift one level up

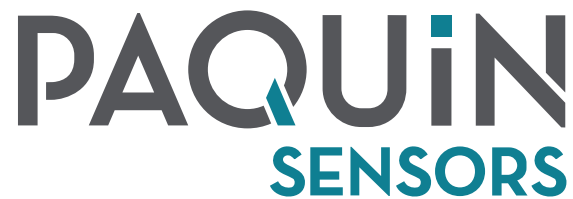


** Slow flashing while the reflected signal (echo) is received from the measured level.*

Dimensions

Measuring Range M1
 (0.30 ... 8.0 meters)

Measuring Range M2
 (0.30 ... 20.0 meters)

Plastic cable gland for protective hose

Plastic & Stainless cable gland M16

Plastic cable gland M20


Additional Information



Paquin Sensors' product portfolio is designed to provide options to fit the most diverse range of specifications.

We collaborate with our customers to match the best product technologies with your unique application requirements.

Please [contact us](#) or call +1 (800) 831-8217 anytime to discuss your needs!