



- World beating long range non-contact radar level sensor.
- Class-leading performance, range and exceptionally narrow beam angle.
- Excellent accuracy and repeatability.
- State of the art, proven, algorithms for ignoring unwanted targets (DATEM).
- Measure contents through non-conductive container walls.
- Unaffected by fog, haze, mist or rain.
- Independent of ambient temperature.
- Immune to inert gas, vapour, steam or pressure.
- Direct retrofit to Pulsar controllers.
- No extra antenna selections required no matter what the application.

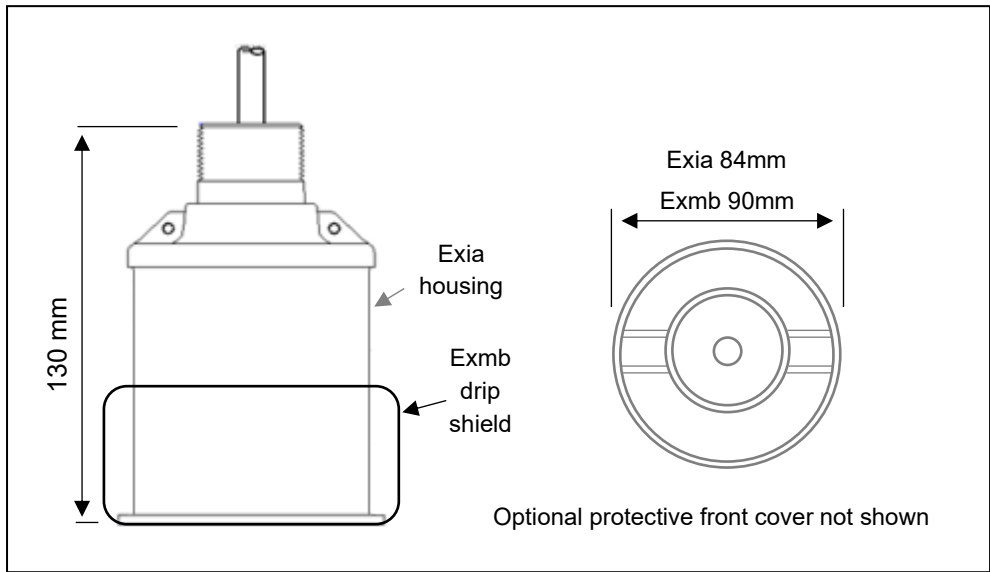
General Installation

The mmWave Radar should be installed directly above the material to be measured, at a 90° angle. Avoid positioning near the process filling or emptying areas. Check there are no obstructions between the sensor and the material. The mmWAVE Radars can be installed via the 1" BSP/NPT thread on the sensor, or with the supplied 1" BSP to M20 adapter. Installing the mmWAVE Radar outside of a closed vessel, the following must be adhered to:

- The mmWave Radar must be directed vertically downwards.
- Special permission must be granted by the appropriate national authority, to mount the mmWAVE Radar closer than 4km from any radio astronomy stations.
- The mmWAVE Radar must not be installed higher than 15m from the ground when installed within 4-40km of a radio astronomy station.
- The following table depicts the geographical location of Europe's radio astronomy stations (in alphabetical order):

Country	Station Name	Geographic Latitude	Geographic Longitude
Finland	Metsähovin	60°13'04" N	24°23'37" E
	Tuaorlan	60°24'57" N	22°26'40" E
France	Plateau de Bure	44°38'02" N	05°54'26" E
	Floirac	44°50'07" N	00°31'33" W
Germany	Effelsburg	50°31'32" N	06°52'58" E
Hungary	Penc	47°47'23" N	19°16'53" E
Italy	Medicina	44°31'26" N	11°38'46" E
	Noto	36°52'36" N	14°59'20" E
	Sardinia	39°29'35" N	09°14'42" E
Poland	Krakov—Fort Skala	50°03'13" N	19°49'27" E
Russia	Kalyazin	57°13'22" N	37°54'01" E
	Pulkovskoe	59°46'20" N	30°19'34" N
	Pushchino	54°49'14" N	37°37'41" E
	Zelenchuksaya	43°49'33" N	41°35'13" E
Spain	Pico Veleta	37°03'46" N	03°23'09" W
	Robledo	40°49'53" N	04°14'57" W
Switzerland	Bleien	47°25'38" N	08°06'44" E
Sweden	Onsala	57°23'45" N	11°55'35" E
UK	Cambridge	52°09'59" N	00°02'20" E
	Darnhall	53°09'22" N	02°32'03" W
	Jodrell Bank	53°14'10" N	02°18'26" W
	Knockin	52°47'24" N	02°59'45" W
	Pickmere	53°17'18" N	02°26'38" W

Dimensions



X Limitations on use

1. The sensor must be routinely inspected to avoid build-up of dust layers if installed in zones 20, 21 & 22 (Ex ia) and zones 21 & 22 (Ex mb).
2. Electro-static hazard – The equipment shall not be installed in a location where the external conditions are conducive to the build up of electrostatic charge. In addition, the sensor may only be wiped with a damp or anti-static cloth.
3. The outer enclosure is made from Valox 357U, a polyester / polycarbonate blend; consider the performance of this material with respect to chemicals that may be present.
4. The sensor must not be used if there are any cracks or damage to the enclosure.
5. (Ex ia) The installer shall consider the total length of cable attached to the sensor. The cable shall be considered to have parameters of 200pF/m & 1uH/m or 30uH/Q.
6. (Ex ia) The sensor shall only be connected via resistive barriers with the following specifications: Power $\geq 234\Omega$, Signal $\geq 50\Omega$ (TX & RX $\geq 50\Omega$).
7. (Ex mb) Only use fuses listed: Littlefuse 0242 100mA (blue band) $\geq 1500A$ breaking. Fuses must be located in a safe area.
8. (Exmb) The equipment shall only be installed in areas where there is a low risk of mechanical danger.

Hazardous Area Installation

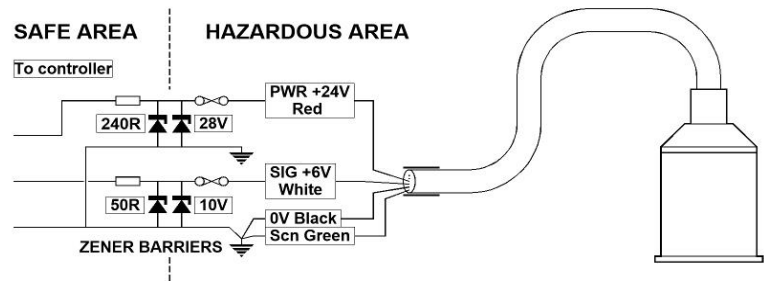
Ex ia version: This model must be connected via resistive barriers as described below:

Entity parameters are:

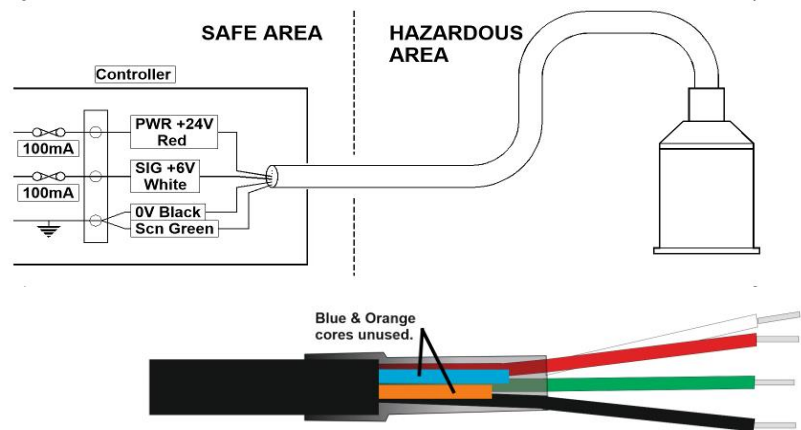
Power: $U_i = 28V$, $I_i = 120mA$, $P_i = 0.83W$. $R_S \geq 234\Omega$

Signal: $U_i = 10V$, $I_i = 200mA$, $P_i = 0.5W$. $R_S \geq 50\Omega$

Note: Barrier with rated nominal resistance of $R_s \leq 250\Omega$ is recommended for best performance.



Ex mb version: This model must be supplied from apparatus that provides protection from prospective short circuits $\geq 1500A$.



Colour	Description	Comments
Red	DC Power +Ve	+28V DC max.
White	Signal	
Black	DC 0V / ground	Connect to same point.
Green	Cable Screen	
Blue	Not used.	Hidden within cable sheath.
Orange	Not used.	Hidden within cable sheath.

EU & UK Declaration of Conformity

This declaration is issued under the sole responsibility of the manufacturer.

2014/35/EU	2016/1101	EN 61010:2010+A1:2019	Electrical safety.
2014/30/EU	2016/1091	EN 61326:2013	EMC regulations.
2014/53/EU	2017/1206	EN 302729 v2.1.1:2016	Radio, level probing radar.
2014/34/EU	2016/1107	EN 60079-0:2012+A11:2013	Ex.atmospheres, general.
		EN 60079-11:2012	Ex.atmospheres, intrinsic safety.
		EN 60079-18:2015+A1:2017	Ex.atmospheres, encapsulation.
2011/65/EU	2012/3032		Restriction, hazardous substances.

Manufacturer's Name	Pulsar Process Measurement Ltd		
Manufacturer's address	Cardinal Building, Enigma Commercial Centre, Sandy's Road, Malvern, Worcestershire, WR14 1JJ, UK.		
Apparatus	DC powered level measurement sensor utilising radar technology.		
Models	dBR-8, dBR-16.		
Type of equipment	Measurement and process control.		
Notified body	CML B.V. Hoogoorddreef 15, 1101 BA, Amsterdam, Netherlands. Notified Body No. 2776		

I declare that the apparatus named above has been tested and complies with the relevant sections of the above referenced standards & legislation.

Signed for and on behalf of;

Rev 1.3

Name & function: Tim Brown, electronics engineer.

Date: 20th April 2021

