



mmWAVE Radar (AEx mb) mmWAVE-is Radar (AEx ia / IS) Hazardous Locations (FM) Installation Guide

Full manuals available at:
www.pulsar-pm.com/instrumentation/support/downloads/manuals.aspx
M-dBR-0-001-1FM

Specification

Enclosure material	Valox 357U (PBT + PC blend).
Enclosure protection	IP68 / NEMA 6P.
Mounting connection	1" NPT male thread as standard.
Dimensions	130 x 90mm (0.42 x 0.29 ft.) maximum.
Weight	1.1kg (2.4lbs).
Measurement range	dBR8: 0.077 to 8m (0.25 to 26.25 ft.). dBR16: 0.077 to 16m (0.25 to 52.49 ft.).
Standard cable lengths	10m, 20m, 30m. Custom lengths available.
Cable extensions	3-core screened.
Maximum separation	AExmb: 500m (1,640 ft.), AExia: 300m (984 ft.)
Accuracy	±2mm
Repeatability	±1mm
Minimum distance between targets	0.15m (0.49 ft.)
Operating temperature (electronics)	-20°C to 80°C (-4°F to 176°F).
Supply voltage	DC, 10V min., 28V max.
Power consumption	0.6W typical.
Radio frequency	V-band.
Radio approval	FCC CFR47 part 15.

FCC ID Q06-xxxxxxx. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device is compliant with the FCC Code of Federal Regulations, CFR 47, part 15, sections 15.205, 15.207, 15.209 and 15.255.
The sensor must be installed directed vertically downwards when used outdoors.

Key Advantages of mmWave Radar

- World leading 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 variations of gas mixes, vapour, steam and pressure.
- Direct retrofit to Pulsar controllers.
- No extra antenna selections required no matter what the application.

Description

The mmWave dBR8 & dBR16 are new non-contact FMCW radar level measuring sensors designed to meet the requirements of today's demanding process level measurement applications for liquids and solids.

The mmWave features an innovative design, which has no extra antenna requirements, yet can offer very high performance and effective radar level sensing. It gives all the advantages associated with radar technology and offers best-in-class performance with a narrow beam-width. The range is measured from the edge of the drip-shield.

Housed with a robustly engineered enclosure, the mmWAVE Radar is designed for easy installation with any of Pulsar's many controllers (including the Ultimate, Ultra series and BlackBox) as a microwave alternative to an ultrasonic dB transducer. Using the latest versions of firmware: Ultra 7.5.1, Ultra Twin 1.5.1, BlackBox 2.1.1, Ultimate 2.1.10 and onwards, the mmWAVE radars can be programmed for use in P101 (transducer). For further information on setting up the Radar with a controller please consult Pulsar for assistance.

The mmWave range is FM certified, with 2 versions of protection, AEx ia / IS or AEx mb:

Intrinsically Safe for: Class I, Div.1, Group A,B,C & D, T4 Class II, Div.1, Group E,F & G, T4 Class III, T4 Drawing D-804-1xxx-A		Class 1, Zone 0, AEx ia IIC T4 Ga Zone 20, AEx ia IIIC T135°C Da Class 1, Zone 0, Ex ia IIC T4 Ga Zone 20, Ex ia IIIC T135°C Da FM20USxxxX FM20CAxxxxX
Restriction: If installed in zones 20, 21 or 22, routinely inspect for dust build-up. ElectroStatic Hazard: Clean only with a damp cloth.		T _{amb} = -20°C to +80°C IP68 U _i =28V, I _i =120mA, P _i =0.83W
Suitable for: Class I, Div.1, Group A,B,C & D, T4 Class II, Div.1, Group E,F & G, T4 Class III, T4		Class 1, Zone 1, AEx mb IIC T4 Gb Zone 21, AEx mb IIIC T135°C Db Class 1, Zone 1, Ex mb IIC T4 Gb Zone 21, Ex mb IIIC T135°C Db FM20USxxxX FM20CAxxxxX
Restrictions: Do not use in the presence of these groups of chemicals: Aliphatic HydroCarbons, Ketones, Esters, Alcohols or Acids. If installed in zones 21 or 22, routinely inspect for dust build-up. ElectroStatic Hazard: Clean only with a damp cloth.		T _{amb} = -20°C to +60°C IP68 Drawing D-804-1xxx-A U _m =28V

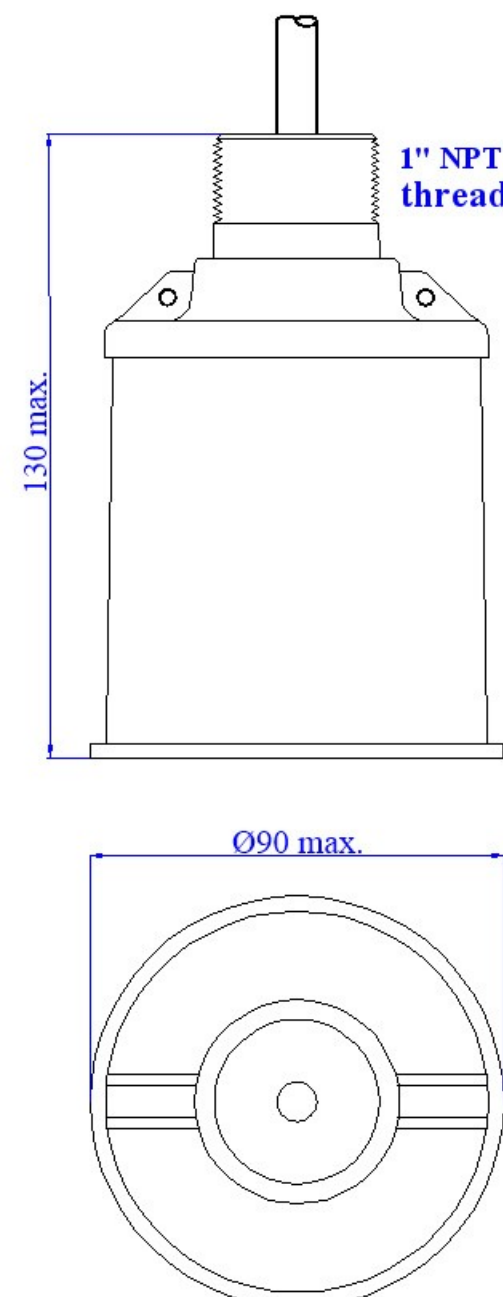
The 'X' in the certification numbers indicates that certain special conditions apply; refer to 'limitations on use', detailed later in this document.

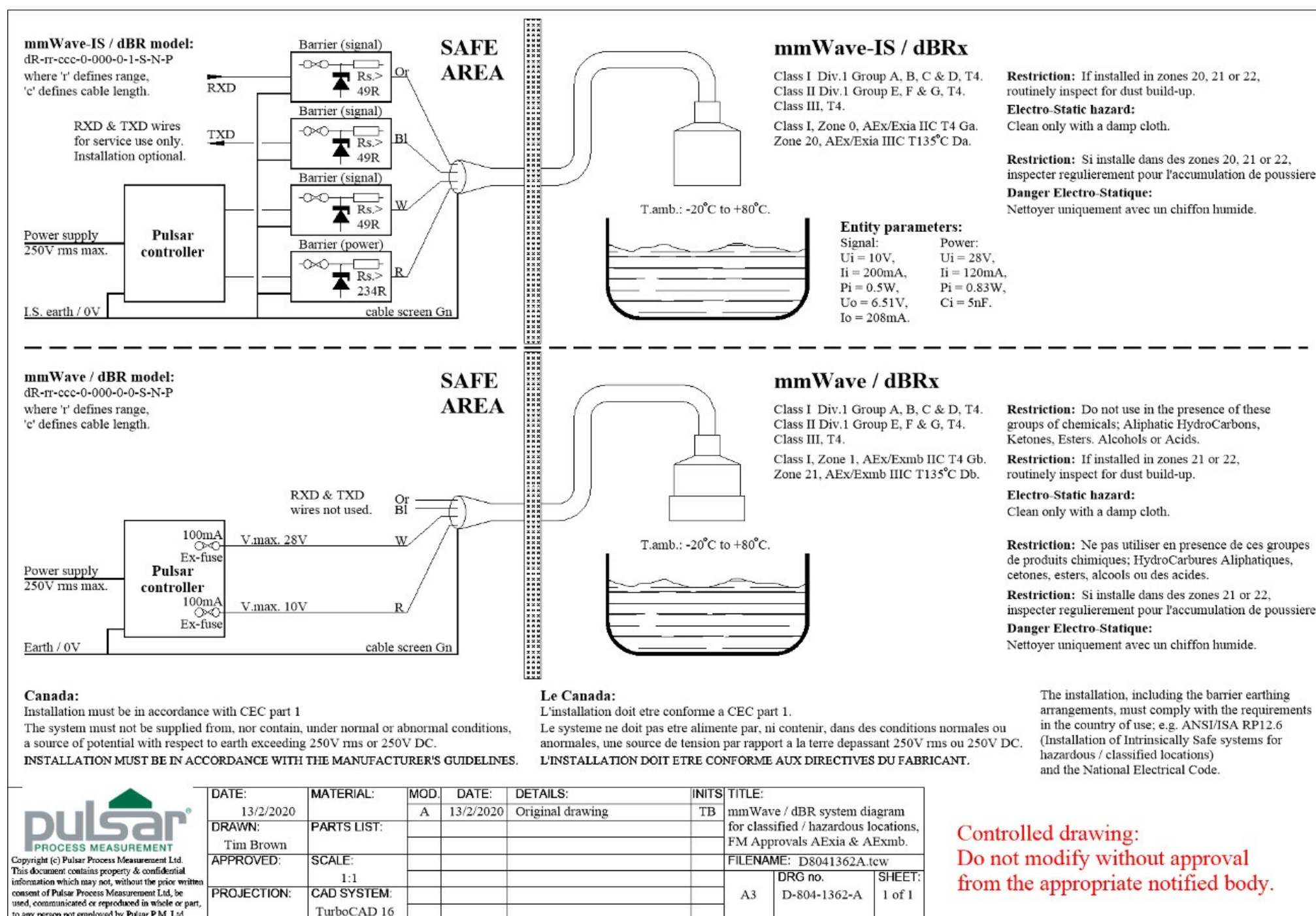
Pulsar also manufacture IECEx and ATEX certified versions.

Mounting options:

The standard enclosure features an integral 1" NPT male thread.
An M20 adapter is available to suit a range of mounting brackets.
ANSI class 150 and EN1092 / BS4504 flange mounted models are available.
Contact Pulsar for details and custom mounting requirements.

mmWave Radar Dimensions

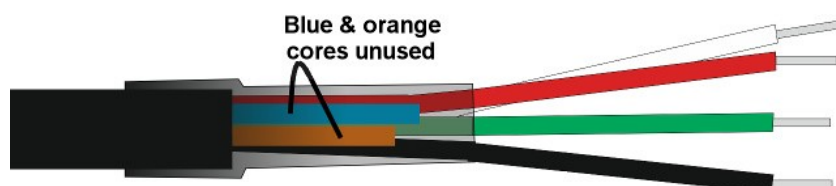




Installation

The system drawing references several regulations and criteria for use in hazardous locations. Ensure these guidelines are followed for safe and reliable operation.

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.



Color:	Description:	Use for AExia:	Use for AExmb:
Red	DC power +ve.	+28V DC max.	+28V DC max.
White	Signal.	Signal.	Signal.
Black	DC 0V / ground.	DC 0V / ground.	DC 0V / ground.
Green	Cable screen.		
Blue	TXD from sensor.	Optional for service.	Not used.
Orange	RXD into sensor.	Optional for service.	Not used.

X Limitations on use

- The sensor must be routinely inspected to avoid build-up of dust layers if installed in zones 20, 21 & 22 (AEx ia) or zones 21 & 22 (AEx mb).
- 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.
- 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.
- The sensor must not be used if there are any cracks or damage to the enclosure.
- (AEx 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.
- (AEx ia) The sensor shall only be connected via resistive barriers with the following specifications: Power $\geq 234\Omega$, Signal $\geq 49\Omega$ (TX & RX $\geq 49\Omega$).
- (AEx mb) Only use fuses listed: Littlefuse 0242 100mA (blue band) > 1500A breaking. The fuses are integral to Pulsar controllers, which must be located in a safe area.
- (AEx mb) The equipment shall only be installed in areas where there is a low risk of mechanical danger.
- (AEx mb) Do not use in the presence of these groups of chemicals: Aliphatic HydroCarbons, Ketones, Esters, Alcohols or Acids.

Disposal

Incorrect disposal can cause adverse effects to the environment. Dispose of the device components and packaging material in accordance with regional environmental regulations including those for electrical / electronic products.

Transducers/Radars

Remove power, disconnect the Transducer/Radar, cut off the electrical cable and dispose of cable and Transducer in accordance with regional environmental regulations for electrical / electronic products.

Controllers

Remove power, disconnect the Controller and remove battery (if fitted). Dispose of Controller in accordance with regional environmental regulations for electrical / electronic products.

Recycle or dispose of batteries in accordance with regional environmental regulations.

Contact Information

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