



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.:	<b>IECEX BAS 14.0031X</b>	Page 1 of 4	<u>Certificate history:</u>
Status:	<b>Current</b>	Issue No: 3	Issue 2 (2019-11-14)
Date of Issue:	2021-07-22		Issue 1 (2018-05-11)
Applicant:	<b>Guided Ultrasonics Limited</b> Wavemaker House 3 Brentwaters Business Park The Ham, Brentford, TW8 8HQ <b>United Kingdom</b>		Issue 0 (2014-11-07)
Equipment:	<b>gPIMS Sensor Type R2P-<sup>**in-EX-<sup>**mm</sup></sup>, Type M R2P-<sup>**in-EX-<sup>**mm</sup></sup> and Type CM R2P-<sup>**in-EX-<sup>**mm</sup></sup></b>		
Optional accessory:			
Type of Protection:	<b>Intrinsic Safety</b>		
Marking:	<b>Ex ia IIB T4...T3 Ga - gPIMS Sensor Type R2P-<sup>**in-EX-<sup>**mm</sup></sup> and Type CM R2P-<sup>**in-EX-<sup>**mm</sup></sup></b> <b>Ex ia IIB T4 Ga (-40°C ≤ Ta ≤ +85°C) - Type M R2P-<sup>**in-EX-<sup>**mm</sup></sup></b>		

Approved for issue on behalf of the IECEx  
Certification Body:

**R. Sinclair**

Position:

**Technical Manager**

Signature:  
(for printed version)

Date:  
(for printed version)

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Certificate issued by:

**SGS Baseefa Limited**  
**Rockhead Business Park**  
**Staden Lane**  
**Buxton, Derbyshire, SK17 9RZ**  
**United Kingdom**





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Manufacturer: **Guided Ultrasonics Limited**  
Wavemaker House  
3 Brentwaters Business Park  
The Ham  
Brentford  
TW8 8HQ  
**United Kingdom**

Manufacturing  
locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

#### STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

[IEC 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements  
Edition:7.0

[IEC 60079-11:2011](#) Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "I"  
Edition:6.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

#### TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

[GB/BAS/ExTR13.0141/00](#)

[GB/BAS/ExTR19.0222/00](#)

[GB/BAS/ExTR21.0053/00](#)

Quality Assessment Report:

[GB/BAS/QAR14.0014/04](#)



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## **EQUIPMENT:**

Equipment and systems covered by this Certificate are as follows:

The gPIMS Sensor Type R2P-\*\*-in-EX-\*\*-mm, Type M R2P-\*\*-in-EX-\*\*-mm and Type CM R2P-\*\*-in-EX-\*\*-mm (\*\* represents numeric type number related to the size of the sensor) are permanently installed monitoring system which utilises ultrasonic guide waves, sent along the length of a pipe, to non-destructively test pipes for defects or other pipe features by detecting changes in the cross section and/or stiffness of the pipe.

The gPIMS Sensor Type R2P-\*\*-in-EX-\*\*-mm consist of either a single band or a combination of two bands, that is placed around the pipe which houses the piezo electric crystals, and a permanently attached cable up to 50m long. The bands uses piezoelectric crystals to induce ultrasonic waves in to the pipe and uses the same crystals to listen for any reflected waves. The sensor is connected to the monitoring equipment via an interface located in the safe non-hazardous area.

For full description please see Annex.

## **SPECIFIC CONDITIONS OF USE: YES as shown below:**

1. Care must be taken when installing the gPIMS sensor to ensure that it is protected from any situations that could cause a build-up of static charge. The gPIMS sensor must not be installed into locations in which it could come into contact with, through normal or abnormal circumstances, fast moving dust laden air/gas or non-conductive fluids. The gPIMS sensor must be cleaned only with a damp cloth.
2. The locking nut on the equipment connector is manufactured from aluminium alloy, this part of the equipment must be protected from impact or abrasion if located in an area classified Zone 0 or 1.
3. The gPIMS Sensor Type R2P-\*\*-in-EX-\*\*-mm and Type CM R2P-\*\*-in-EX-\*\*-mm models are suitable for T4 and T3 Temperature Classifications with different ambient temperature ranges. Refer to the Certificate Schedule for the full equipment marking.



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## DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

### Variation 3.1

To permit the addition of a 22 inch variants of the gPIMS Sensor Type R2P-\*\*-EX-\*\*-mm and gPIMS Sensor Type M R2P-\*\*-EX-\*\*-mm. These are of the same construction as the other variants of the sensor and have the same input parameters.

### Variation 3.2

To permit the interconnection of two of the current sensor bands together with a dual cable assembly to form gPIMS Sensor Type R2P-\*\*-EX-\*\*-mm suitable for fitting around pipes with diameters of between 24 and 48 inches. Due to the increase in number of piezoelectric crystals connected, the C<sub>i</sub> parameter of these variants is increased. The Certificate Schedule of the certificate was revised to include details of these new variants.

### Variation 3.3

To permit the addition of gPIMS Sensor Type CM R2P \*\*in EX \*\*mm

### Variation 3.4

To permit the interconnection of two sensor bands together with a dual cable assembly to form Gpims Sensor Type CM R2P-\*\*-Ex-\*\*-mm suitable for fitting around pipes with diameters of between 24 and 48 inches.

### Variation 3.5

To permit the removal of the gPIM Sampling Module Certificate number referenced in the Certificate Schedule.

### Variation 3.6

To permit minor circuit and drawing changes, including the addition of Bill of Material drawings for each sensor core circuit not affecting the previous assessment.

ExTR: **GB/BAS/ExTR21.0053/00**

File Reference: **20/0561**

## Annex:

[IECEX BAS 14.0031X Annex.pdf](#)

The gPIMS Sensor Type R2P-\*\*in-EX-\*\*\*mm has the following Temperature Classification and associated ambient temperature ranges:

⊕ Ex II 1G Ex ia IIB T4 Ga (-40 °C ≤ T<sub>a</sub> ≤ +90 °C)

⊕ Ex II 1G Ex ia IIB T3 Ga (-40 °C ≤ T<sub>a</sub> ≤ +130 °C)

#### **gPIMS Sensor Type R2P-\*\*in-EX-\*\*\*mm Input Parameters**

Signal Pins (A, B, Y, D, F, b, H, J, K, L, h, N, R, k, T, U) each w.r.t GND (W, X, r, Z, a, t, c, d, f, g, x, l, z, m, n)

$$\begin{aligned}U_i &= \pm 18 \text{ V} \\I_i &= 127 \text{ mA} \\P_i &= 569 \text{ mW} \\C_i &= 34 \text{ nF} \\L_i &= 31 \text{ }\mu\text{H}\end{aligned}$$

Logic Pins (BB, CC, DD, EE, GG, HH) combined w.r.t. GND (FF)

$$\begin{aligned}U_i &= 5.88 \text{ V} & C_i &= 6.7 \text{ nF} \\I_i &= 143.4 \text{ mA} & L_i &= 70 \text{ }\mu\text{H} \\P_i &= 208 \text{ mW}\end{aligned}$$

The gPIMS Sensor Type M R2P-\*\*in-EX-\*\*\*mm is of a similar construction to the single band Type R2P-\*\*in-EX-\*\*\*mm but is designed to be directly connected to a certified gPIMS Sampling Module Type M or similar certified equipment in place of the integral cable. Due to the direct mounting of the gPIMS Sampling Module Ex Type M, the gPIMS Sensor Type M R2P-\*\*in-EX-\*\*\*mm has the following temperature classification and ambient temperature range:

⊕ Ex II 1G Ex ia IIB T4 Ga (-40°C ≤ T<sub>a</sub> ≤ +85°C)

#### **gPIMS Sensor Type M R2P-\*\*in-EX-\*\*\*mm Input Parameters**

Signal Pins each w.r.t GND

$$\begin{aligned}U_i &= 8.3 \text{ V} & C_i &= 12 \text{ nF} \\I_i &= 503 \text{ mA} & L_i &= 0 \\P_i &= 1044 \text{ mW}\end{aligned}$$

Logic Pins combined w.r.t. GND

$$\begin{aligned}U_i &= 5.46 \text{ V} & C_i &= 0 \\I_i &= 143.4 \text{ mA} & L_i &= 0 \\P_i &= 196 \text{ mW}\end{aligned}$$

The gPIMS Sensor Type CM R2P-\*\*in-EX-\*\*\*mm is of a similar construction to the Type R2P-\*\*in-EX-\*\*\*mm and may be provided in either the single band or dual band configuration. It is provided with an integral 50 m cable and is designed to be connected to a certified gPIMS Sampling Module Type CM or similar certified equipment.

The gPIMS Sensor Type CM R2P-\*\*in-EX-\*\*\*mm has the following Temperature Classification & associated ambient temperature ranges:

⊕ Ex II 1G Ex ia IIB T4 Ga (-40°C ≤ T<sub>a</sub> ≤ +90°C)

⊕ Ex II 1G Ex ia IIB T3 Ga (-40°C ≤ T<sub>a</sub> ≤ +130°C)

#### **gPIMS Sensor Type CM R2P-\*\*in-EX-\*\*\*mm Input Parameters**

Signal Pins each w.r.t GND

$$\begin{aligned}U_i &= 8.3 \text{ V} & C_i &= 34 \text{ nF} \\I_i &= 503 \text{ mA} & L_i &= 31 \text{ }\mu\text{H} \\P_i &= 1044 \text{ mW}\end{aligned}$$

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ANNEX to IECEx BAS 14.0031X

Issue No. 0

Date: 12 July 2021

Logic Pins combined w.r.t. GND

$U_i$	=	5.46 V	$C_i$	=	6.7 nF
$I_i$	=	143.4 mA	$L_i$	=	70 $\mu$ H
$P_i$	=	196 mW			