

1 EU - TYPE EXAMINATION CERTIFICATE

2 Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 EU - Type Examination Certificate **Baseefa14ATEX0067X – Issue 3**
Number:

3.1 In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.

4 Product: **gPIMS Sensor Type R2P-**in-EX-**mm, Type M R2P-**in-EX-**mm and
Type CM R2P-**in-EX-**mm**

5 Manufacturer: **Guided Ultrasonics Limited**

6 Address: **Wavemaker House, 3 Brentwaters Business Park, The Ham, Brentford, TW8 8HQ**

7 This re-issued certificate extends EC Type Examination Certificate No. BaseefayyATEXnnnnX to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

8 SGS Fimko Oy, Notified Body number 0598, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

8.1 The original certificate was issued by SGS Baseefa Ltd (UK Notified Body 1180). It, and any supplements previously issued by SGS Baseefa Ltd have been transferred to the supervision of SGS Fimko Oy (EU Notified Body 0598). The original certificate number is retained.

The examination and test results are recorded in confidential Report No. **See Certificate History**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0: 2018 EN 60079-11: 2012

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign “X” is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following:

 **II 1 G Ex ia IIB T4...T3 Ga - See Certificate Schedule for full marking information**

SGS Fimko Oy Customer Reference No. **6979**


Project File No. **21/0661**

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Schedule

14

Certificate Number Baseefa14ATEX0067X – Issue 3

15 Description of Product

The gPIMS Sensor Type R2P-**-EX-**-mm, Type M R2P-**-EX-**-mm and Type CM R2P-**-EX-**-mm (** represents numeric type number related to the size of the sensor) are permanently installed monitoring systems which utilise 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-**-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 use 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.

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

Ex II 1G Ex ia IIB T4 Ga ($-40^{\circ}\text{C} \leq T_a \leq +90^{\circ}\text{C}$)

Ex II 1G Ex ia IIB T3 Ga ($-40^{\circ}\text{C} \leq T_a \leq +130^{\circ}\text{C}$)

gPIMS Sensor Type R2P-**-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, I, z, m, n)

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

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

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

The gPIMS Sensor Type M R2P-**-EX-**-mm is of a similar construction to the single band Type R2P-**-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-**-EX-**-mm has the following temperature classification and ambient temperature range:

Ex II 1G Ex ia IIB T4 Ga ($-40^{\circ}\text{C} \leq T_a \leq +85^{\circ}\text{C}$)

gPIMS Sensor Type M R2P-**-EX-**-mm Input Parameters

Signal Pins each w.r.t GND

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

Logic Pins combined w.r.t. GND

$U_i = 5.88 \text{ V}$ $C_i = 0$
 $I_i = 143.4 \text{ mA}$ $L_i = 0$
 $P_i = 208 \text{ mW}$

The gPIMS Sensor Type CM R2P-**-EX-**-mm is of a similar construction to the Type R2P-**-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-**-EX-**-mm has the following Temperature Classification & associated ambient temperature ranges:

II 1G Ex ia IIB T4 Ga ($-40^{\circ}\text{C} \leq T_a \leq +90^{\circ}\text{C}$)

II 1G Ex ia IIB T3 Ga ($-40^{\circ}\text{C} \leq T_a \leq +130^{\circ}\text{C}$)

gPIMS Sensor Type CM R2P-**-EX-**-mm Input Parameters

Signal Pins each w.r.t GND

U_i	=	8.3 V	C_i	=	34 nF
I_i	=	503 mA	L_i	=	31 μH
P_i	=	1044 mW			

Logic Pins combined w.r.t. GND

U_i	=	5.88 V	C_i	=	6.7 nF
I_i	=	143.4 mA	L_i	=	70 μH
P_i	=	208 mW			

16 Report Number

GB/BAS/ExTR21.0200/00

17 Specific Conditions of Use

- 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.
- 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.
- The gPIMS Sensor Type R2P-**-EX-**-mm and Type CM R2P-**-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.

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject
1.2.7	LVD type requirements
1.2.8	Overloading of equipment (protection relays, etc.)
1.4.1	External effects
1.4.2	Aggressive substances, etc.

19 Drawings and Documents

New drawings submitted for this issue of certificate:

Number	Sheet	Issue	Date	Description
GP-0424-00	1 to 2	11	01/11/21	Connector ID Plate ATEX
GP-0653-00	1 of 1	08	01/11/21	MTS Type M – GPIMS ID Plate

Current drawings which remain unaffected by this issue:

Number	Sheet	Issue	Date	Description
GE-0022-01	1 of 1	1	30/03/2021	Bill of Materials – GPP-EX-6in-24mm-PCB-2.02
GE-0022-02	1 of 1	1	30/03/2021	Bill of Materials – GPP-EX-8in-24mm-PCB-2.02 and GPP-EX-8in-32mm-PCB-2.02
GE-0022-03	1 of 1	1	30/03/2021	Bill of Materials – GPP-EX-10in-24mm-PCB-2.01 and GPP-EX-10in-32mm-PCB-2.01
GE-0022-04	1 of 1	1	30/03/2021	Bill of Materials – GPP-EX-12in-24mm-PCB-2.01 and GPP-EX-12in-32mm-PCB-2.01
GE-0022-05	1 of 1	1	30/03/2021	Bill of Materials – GPP-EX-14in-24mm-PCB-2.01 and GPP-EX-14in-32mm-PCB-2.01
GE-0022-06	1 of 1	1	30/03/2021	Bill of Materials – GPP-EX-16in-24mm-PCB-2.01 and GPP-EX-16in-32mm-PCB-2.01
GE-0022-07	1 of 1	1	30/03/2021	Bill of Materials – GPP-EX-18in-24mm-PCB-2.03 and GPP-EX-18in-32mm-PCB-2.03
GE-0022-08	1 of 1	1	30/03/2021	Bill of Materials – GPP-EX-20in-24mm-PCB-2.02 and GPP-EX-20in-32mm-PCB-2.02
GE-0022-09	1 of 1	1	30/03/2021	Bill of Materials – GPP-EX-22in-24mm-PCB-2.03 and GPP-EX-22in-32mm-PCB-2.03
GE-0022-10	1 of 1	1	30/03/2021	Bill of Materials – GPP-EX-24in-24mm-PCB-2.01 and GPP-EX-24in-32mm-PCB-2.01
GE-0024-01	1 of 1	1.01	30/10/2020	Bill of Materials – GPP-EX-COAX16-CABLE-CONN-REV1-01
GP-0396-00	1 to 2	09	25/05/21	GPIMS (Ex) Sensor Pre-Mould
GP-0433-00	1 to 4	03	16/04/21	GPIMS (EX) General Assembly – Type R2P-**in-EX-**mm
GP-0656-00	1 to 2	03	16/04/21	GPIMS (EX) General Assembly Type M
GPP-Ex-22in-24mm-SCH-2.03	1 of 1	2.03	05/07/2019	gPIMS (Ex) flex SCH 22 INCH
GPP-Ex-22in-32mm-SCH-2.03	1 of 1	2.03	19/06/2019	gPIMS (Ex) flex SCH 22 INCH
GPP-Ex-22in-24mm-PCB-2.03	1 of 1	V2.03	4/7/19	gPIMS (Ex) Flex PCB
GPP-Ex-22in-32mm-PCB-2.03	1 of 1	V2.03	17/06/19	gPIMS (Ex) Flex PCB
GP-0827-00	1 of 2	03	06/04/21	MTS Combined Ring PCB Head 1
GP-0827-00	2 of 2	03	06/04/21	MTS Combined Ring PCB Head 2
GP-0855-00	1 of 1	03	06/04/21	gPIMS (Ex) Dual Sensor Cable Assembly – Type R2P-**IN-EX**mm
GP-0857-00	1 of 1	02	09/04/21	gPIMS (Ex) Dual Sensor Assembly – Type R2P-**IN-EX**mm
GP-0983-00	1 to 3	3	06/07/21	gPIMS (Ex) General Assembly – Type CM R2P-**in-EX-**mm
GPP-EX- DUAL CABLE HEAD 1 & 2	1 of 1	2	Jan 21	GPP-EX- Dual Cable Connector Head 1 & 2

Number	Sheet	Issue	Date	Description
GPP -Ex-DualCableHead	1 to 3	2	Jan 21	GPP -EX-DualCableHead Gerber Prints
GUL GPP-EX-DualCableHead Rev 2 BOM	1 of 1	2	Jan 2021	Bill of Materials – GPP-EX-DualCableHead
GPP-Ex-6in 24mm-SCH-2.02	1 of 1	2.02	18/05/2021	gPIMS (Ex) flex SCH 6 INCH
GPP-EX-COAX16 /CONN-BLOCK	1 of 1	1.02	Tuesday, August 20, 2019	gPIMS Collection Block, 16 Channel
GPP-Ex-Souriau-Layout-Rev5.0	1 to 3	5	03/10/2014	GPP-Ex-Souriau-Layout-Rev5.0
GP-0376-00	1 of 1	02	15/08/19	GPIMS (Ex) Sensor
GP-0421-00	1 of 1	03	15/08/19	GPIMS Sensor Connector PCB Assembly
GP-0426-00	1 of 1	07	24/10/19	GPIMS Cable Connector PCB Assembly
GP-0472-00	1 of 1	03	30/08/19	GPIMS Sensor Cable Assembly – Type R2P- **in-EX-***mm
GPP-EX-COAX16 /CABLE-BLOCK	1 of 1	1	Tuesday, November 27, 2012	gPIMS 16Chan ATEX Cable Connection Block
GP-EX-COAX16	1 – 11 of 11	1.01	3 June 2014	GP-EX-COAX16
GPD-Ex-8-14in-24-32mm-OV-2.03	1 of 1	2.03	18-Dec-2013	GPIMS (Ex) Overview 8-14inch
GPD-Ex-6in-24mm-OV-2.03	1 of 1	2.03	18-Dec-2013	GPIMS (Ex) Overview 6” 24mm
GPD-Ex-16in-24in-24-32mm-OV-2.03	1 of 1	2.03	18-Dec-2013	GPIMS (Ex) Overview 16-24inch
GPP-Ex-12in 24mm-SCH-2.01	1 of 1	2.01	13-Mar-2014	gPIMS (Ex) flex SCH 12 INCH
GPP-Ex-14in-24mm-SCH-2.01	1 of 1	2.01	13-Mar-2014	gPIMS (Ex) flex SCH 14 INCH
GPP-Ex-8in-24mm-SCH-2.01	1 of 1	2.01	13-Mar-2014	gPIMS (Ex) flex SCH 8” or 8”/2
GPP-Ex-10in 24mm-SCH-2.01	1 of 1	2.01	13-Mar-2014	gPIMS (Ex) flex SCH 10 INCH
GPP-Ex-20in 24mm-SCH-2.02	1 of 1	2.02	10-Oct-2014	gPIMS (Ex) flex SCH 20 INCH
GPP-Ex-18in 24mm-SCH-2.03	1 of 1	2.03	10-Oct-2014	gPIMS (Ex) flex SCH 18/1 INCH
GPP-Ex-16in 24mm-SCH-2.01	1 of 1	2.01	3-Apr-2013	gPIMS (Ex) flex SCH 16 INCH
GPP-Ex-24in 24mm-SCH-2.01	1 of 1	2.01	3-Apr-2013	gPIMS (Ex) flex SCH 24 INCH
GPP-Ex-8in-24mm-PCB-2.02	1 of 1	V2.02	17/12/13	gPIMS (Ex) flex PCB
GPP-Ex-24in-24mm-PCB-2.01	1 of 1	V2.01	3/4/13	gPIMS (Ex) flex PCB
GPP-Ex-6in-24mm-PCB-2.02	1 of 1	V2.02	12/08/14	gPIMS (Ex) flex PCB
GPP-Ex-14in-24mm-PCB-2.01	1 of 1	V2.01	3/4/13	gPIMS (Ex) flex PCB
GPP-Ex-10in-24mm-PCB-2.01	1 of 1	V2.01	3/4/13	gPIMS (Ex) flex PCB
GPP-Ex-16in 24mm-PCB-2.01	1 of 1	V2.01	3/4/13	gPIMS (Ex) flex PCB
GPP-Ex-12in 24mm-PCB-2.01	1 of 1	V2.01	3/4/13	gPIMS (Ex) flex PCB
GPP-Ex-18in-24mm-PCB-2.03	1 of 1	V2.03	10/10/14	gPIMS (Ex) flex PCB
GPP-Ex-20in 24mm-PCB-2.02	1 of 1	2.02	10/10/14	gPIMS (Ex) flex PCB
GPP-Ex-12in 32mm-SCH-2.01	1 of 1	2.01	2-Apr-2013	gPIMS (Ex) flex SCH 12 INCH
GPP-Ex-20in 32mm-SCH-2.02	1 of 1	2.02	8-Oct-2014	gPIMS (Ex) flex SCH 20 INCH
GPP-Ex-16in 32mm-SCH-2.01	1 of 1	2.01	2-Apr-2013	gPIMS (Ex) flex SCH 16 INCH
GPP-Ex-18in 32mm-SCH-2.03	1 of 1	2.03	8-Oct-2014	gPIMS (Ex) flex SCH 18 INCH
GPP-Ex-8in 32mm-SCH-2.02	1 of 1	2.02	13-Mar-2013	gPIMS (Ex) flex SCH 8 or 18/2

Number	Sheet	Issue	Date	Description
GPP-Ex-10in-32mm-SCH-2.01	1 of 1	2.01	2-Apr-2013	gPIMS (Ex) flex SCH 10 INCH
GPP-Ex-14in-32mm-SCH-2.01	1 of 1	2.01	2-Apr-2013	gPIMS (Ex) flex SCH 14 INCH
GPP-Ex-24in-32mm-SCH-2.01	1 of 1	2.01	2-Apr-2013	gPIMS (Ex) flex SCH 24 INCH
GPP-Ex-16in-32mm-PCB-2.01	1 of 1	V2.01	8/3/13	gPIMS (Ex) flex PCB
GPP-Ex-10in-32mm-PCB-2.01	1 of 1	V2.01	8/3/13	gPIMS (Ex) flex PCB
GPP-Ex-8in-32mm-PCB-2.02	1 of 1	V2.02	17/12/13	gPIMS (Ex) flex PCB
GPP-Ex-20in-32mm-PCB-2.02	1 of 1	V2.02	8/10/14	gPIMS (Ex) flex PCB
GPP-Ex-18in-32mm-PCB-2.03	1 of 1	V2.03	8/10/14	gPIMS (Ex) flex PCB
GPP-Ex-14in-32mm-PCB-2.01	1 of 1	V2.01	8/3/13	gPIMS (Ex) flex PCB
GPP-Ex-24in-32mm-PCB-2.01	1 of 1	V2.01	8/3/13	gPIMS (Ex) flex PCB
GPP-Ex-12in-32mm-PCB-2.01	1 of 1	V2.01	8/3/13	gPIMS (Ex) flex PCB

The above drawings are associated with IECEx BAS 14.0031X and BAS21UKEX0567X and held with IECEx BAS 14.0031X.

20 Certificate History

Certificate No.	Date	Comments
Baseefa14ATEX0067X	7 November 2014	The release of the prime certificate. The associated test and assessment against the requirements of EN 60079-0: 2012 and EN 60079-11: 2012 is documented in Certification Report No's GB/BAS/ExTR13.0141/00, Project File No's 12/0653.
Baseefa14ATEX0067X Issue 1	14 November 2019	<p>To permit: -</p> <p>i) To permit the removal of the integral cable to form the gPIMS Sensor Type M R2P-**in-EX-**mm. This variant is designed to be directly connected to the separately certified gPIMS Type M Sampling Module which is mounted to the sensor in place of the cable. This variant of the equipment has input parameters that correspond to the output parameters of the gPIMS Type M Sampling Module. The certification code for the gPIMS Sensor Type M R2P-**in-EX-**mm is: -</p> <p>Ⓔ II 1G Ex ia IIB T4 Ga (-40°C ≤ T_a ≤ +85°C)</p> <p>The Equipment's Name, Certificate Schedule and Specific Conditions of Safe Use have been updated to include details of the new variant of the equipment and its associated marking and input parameters.</p> <p>ii) To permit the gPIMS Sensor Type R2P-**in-EX-**mm to be alternatively installed in an ambient temperature of up to 130°C. As a result of this, the equipment marking of these variants were revised to:</p> <p>Ⓔ II 1G Ex ia IIB T4...T3 Ga</p> <p>The Equipment's Certificate Schedule was updated to list the following full markings for the gPIMS Sensor Type R2P-**in-EX-**mm:</p> <p>Ⓔ II 1G Ex ia IIB T4 Ga (-40°C ≤ T_a ≤ +90°C)</p> <p>Ⓔ II 1G Ex ia IIB T3 Ga (-40°C ≤ T_a ≤ +130°C)</p> <p>iii) To permit minor circuit, input parameter and drawing changes not affecting the original assessment. As a result of the drawings</p>

Certificate No.	Date	Comments
		<p>changes, several of the original drawings were replaced by new drawings.</p> <p>iv) To confirm the current designs of the gPIMS Sensor Type R2P-**-EX-**-mm & Type M R2P-**-EX-**-mm have been reviewed against the requirements of EN IEC 60079-0: 2018 in respect of the differences from EN 60079-0: 2012, and none of the differences affect the equipment</p> <p>The associated test and assessment is documented in Certification Report No. GB/BAS/ExTR19.0222/00, Project File No. 18/0278.</p>
Baseefa14ATEX0067X Issue 2	19 July 2021	<p>To permit: -</p> <p>i) 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.</p> <p>ii) 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_i parameter of these variants are increased from 23nF to 34nF. The Certificate Schedule on page 2 of the certificate was revised to include details of these new variants.</p> <p>iii) The addition of gPIMS Sensor Type CM R2P-**-EX-**-mm</p> <p>iv) 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.</p> <p>v) Removal of the gPIMS Sampling Module Certificate number referenced in the Certificate Schedule.</p> <p>vi) Minor circuit and drawing changes, including the addition of Bill of Material drawings for each sensor core circuit not affecting the previous assessment.</p> <p>The associated test and assessment is documented in Certification Report No. GB/BAS/ExTR21.0053/00, Project File No. 20/0561.</p>
Baseefa14ATEX0067X Issue 3	14 January 2022	<p>This variation allows an increase in the terminal parameters to align the logic pin terminal parameters U_i, I_i and P_i applied to the gPIMS Sensor Type M R2P-**-EX-**-mm and gPIMS Sensor Type CM R2P-**-EX-**-mm to match those applied to the gPIMS Sensor Type R2P-**-EX-**-mm. The variation also permits a slight change to the marking plate to account for additional certification marks not affecting existing certification marks. The associated test and assessment is documented in IECEx ExTR GB/BAS/ExTR21.0200/00 and held with Project No. 21/0661.</p>
For drawings applicable to each issue, see original of that issue.		