1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: **Sira 02ATEX5104X** Issue: **9**

4 Equipment: **Pulsar dB Series of Ultrasonic Transducers**

5 Applicant: **Pulsar Process Measurement Limited**

6 Address: Cardinal Building
Enigma Commercial Centre
Sandy's Road
Malvern
Worcestershire
WR14 1JJ
UK

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 plus Amendments 1 and 2 EN 50 028:1987

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

II 2GD
EEx m II T6 (Tamb = -40°C to +75°C)

Project Number 52A19911
C. Index 13

C Ellaby
Certification Officer

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Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England
Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

13 **DESCRIPTION OF EQUIPMENT**

The Pulsar dB Series of Ultrasonic Level Sensors are designed as level measurement sensors used in level measurement systems. The sensors in the series differ only in the size of transducer crystal used and the frequency of operation. The equipment comprises a printed circuit board and a piezo electric crystal transducer; these are all housed inside a plastic enclosure and then totally encapsulated. An integral cable provides the connection facilities to the external circuits.

The sensors have been assessed with the following input parameters:

Rated input voltage = 24 V
Maximum input power = 1.5 W

The sensors have no internal fuse or any other components that will guarantee its suitability for connection to a prospective short circuit current of 4000A. Such components must be provided in the external equipment to which the sensors are to be connected.

Variation 1 - This variation introduced the following changes:

i. The inclusion of the Model dB40 into the range of Pulsar dB Series of Ultrasonic Level Sensors.

Variation 2 - This variation introduced the following changes:

i. Modifications to the printed circuit board (PCB) to form a dB Mk2 circuit board.
ii. To permit he use of the dB Mk2 circuit board in all previous models within the dB series of Ultrasonic Level Sensors.
iii. The inclusion of the Model dB6 Mk2, standard, and the dB6 Mk2, threaded nose versions into the range of Pulsar dB Series of Ultrasonic Level Sensors.

Variation 3 - This variation introduced the following changes:

i. The introduction of minor changes of the printed circuit board and parts list.

Variation 4 - This variation introduced the following changes:

i. To permit the enclosure used in the construction of the sensor to be made from an alternative, plastic material.

Variation 5 - This variation introduced the following changes:

i. An alternative PCB design (db Burst Drive) to be used in the existing dB transducer range.
ii. A different method for the connection of the cable screen to earth.
iii. A change of details regarding the encapsulation used for the piezo section of the design.

Variation 6 - This variation introduced the following changes:

i. The Bill of Material drawings were modified to recognise:
   - The re-specification of suppliers, identification numbers, package types, ratings, operating temperatures etc. applicable to specified component parts.
   - The removal of specified component parts.
   - Certain specified component parts were allowed to be optional.
   - The addition of a new Bill of Material drawing.
ii. The recognition of minor label drawing modifications; these changes are administrative and do not apply to the aspects of the product that are relevant to explosion safety.

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14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

Issue	Date	Report/File No.	Comment
0	4 July 2002	R52A8397A	The release of the prime certificate.
1	20 September 2002	52A9361	The introduction of Variation 1.
2	19 November 2002	R52A8397B	Re-issued 19 November 2002 To permit report number R52A8397A to be replaced by report number R52A8397B.
3	9 February 2004	R52A11029A	Re-issued 9 February 2004 to permit the incorporation of variation 1 dated 20 September 2002 and to allow the stainless steel sleeve used in the dB3 transducer housing to be replaced by a new lower housing moulding.
4	20 September 2004	R52A11496A	The introduction of Variation 1 to certificate issued 9 February 2004.
5	04 June 2004	R52A11731A	The introduction of Variation 2 to certificate issued 9 February 2004.
6	23 September 2004	V52A12446A	The introduction of Variation 3 to certificate issued 9 February 2004.
7	18 May 2005	R52A11707A	The introduction of Variation 4 to certificate issued 9 February 2004.
8	3 March 2008	R52A17614A	This Issue covers the following changes: • All previously issued certification was rationalised into a single certificate, Issue 8, Issues 0 to 7 referenced above are only intended to reflect the history of the previous certification and have not been issued as documents in this format. • The introduction of Variation 5. • The change of company address first recognised 28 March 2007
9	12 May 2009	R52A19911A	The introduction of Variation 6.

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE **Sira 02ATEX5104X**
Issue 9

15 **SPECIAL CONDITIONS FOR SAFE USE** (denoted by X after the certificate number)

15.1 The encapsulated Type 'm' sensors in the series must be supplied from apparatus that provides protection against prospective short circuit currents of up to 4000A.

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 **CONDITIONS OF CERTIFICATION**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

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Certificate Annexe

Certificate Number: **Sira 02ATEX5104X**

Equipment: **Pulsar dB Series of Ultrasonic Transducers**

Applicant: **Pulsar Process Measurement Limited**

Issue 0

Drawing No.	Sheet	Rev.	Date	Description
D-804-0350-D	1 of 1	D	22 May 02	dB6/10, general assembly
BOM-0004-A	1 of 1	2.0	16 Apr 02	dB6/10, bill of materials
D-804-0351-C	1 of 1	C	16 Apr 02	dB15, general assembly
BOM-0005-A	1 of 1	2.0	16 Apr 02	dB15, bill of materials
BOM-0006-A	1 of 1	1.0	16 Apr 02	db3, bill of materials
D-804-0261-B	1 of 1	B	16 Apr 02	dB6/dB10/15, base
D-804-0259-K	1 of 1	K	16 Apr 02	dB6/dB10/15, top cover
D-804-0330-C	1 of 1	C	16 Apr 02	Screening can
D-804-0292-G	1 of 1	G	08 Oct 99	Circuit diagram
D-804-0453-A	1 to 5	A	25 Oct 99	dB3/6/10/15 PCB
A-705-0004-A	1 to 3	3.0	30 Mar 00	Compound specification
D-804-0513-A	1 of 1	A	06 May 01	dB3 general assembly detail
A-301-0019/20	1 to 3	5.0	11 Jan 02	dB3/6/10/15 BOM for transducer PCB
D-804-0530-A	1 of 1	B	20 Jun 02	dB3/6/10/15 ATEX transducer wraparound labels, generic
D-804-0526-C	1 of 1	C	20 Jun 02	dB3/6/10/15 ATEX transducer wraparound labels

Issue 1

Drawing No.	Sheet	Rev.	Date	Description
D-804-0537-A	1 of 1	A	18 Jul 02	DB25 Hazardous Area General Assembly
D-804-0539-C	1 of 1	C	17 Sep 02	DB25 ATEX/FM Transducer Labels
D-804-0526-F	1 of 1	F	17 Sep 02	DB3, 6, 10 & 15 ATEX/FM Transducer Labels

Issue 2

Drawing No.	Sheet	Rev.	Date	Description
D-804-0350-D	1 of 1	D	22 May 02	dB6/10, general assembly
BOM-0004-A	1 of 1	2.0	16 Apr 02	dB6/10, bill of materials
D-804-0351-C	1 of 1	C	16 Apr 02	dB15, general assembly
BOM-0005-A	1 of 1	2.0	16 Apr 02	dB15, bill of materials
BOM-0006-A	1 of 1	1.0	16 Apr 02	db3, bill of materials
D-804-0261-B	1 of 1	B	16 Apr 02	dB6/dB10/15, base
D-804-0259-K	1 of 1	K	16 Apr 02	dB6/dB10/15, top cover
D-804-0330-C	1 of 1	C	16 Apr 02	Screening can
D-804-0292-G	1 of 1	G	08 Oct 99	Circuit diagram
D-804-0453-A	1 to 5	A	25 Oct 99	dB3/6/10/15 PCB
A-705-0004-A	1 to 3	3.0	30 Mar 00	Compound specification
D-804-0513-A	1 of 1	A	06 May 01	dB3 general assembly detail
A-301-0019/20	1 to 3	5.0	11 Jan 02	dB3/6/10/15 BOM for transducer PCB
D-804-0530-B	1 of 1	B	20 Jun 02	dB3/6/10/15 ATEX transducer wraparound labels, generic
D-804-0526-C	1 of 1	C	20 Jun 02	dB3/6/10/15 ATEX transducer wraparound labels

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Certificate Annexe

Certificate Number: **Sira 02ATEX5104X**

Equipment: **Pulsar dB Series of Ultrasonic Transducers**

Applicant: **Pulsar Process Measurement Limited**

Issue 3

Drawing No.	Sheet	Rev.	Date	Description
D-804-0350-D	1 of 1	D	22 May 02	dB6/10, general assembly
BOM-0004-A	1 of 1	2.0	16 Apr 02	dB6/10, bill of materials
D-804-0351-C	1 of 1	C	16 Apr 02	dB15, general assembly
BOM-0005-A	1 of 1	2.0	16 Apr 02	dB15, bill of materials
BOM-0006-A	1 of 1	1.0	16 Apr 02	db3, bill of materials
D-804-0261-B	1 of 1	B	16 Apr 02	dB6/dB10/15, base
D-804-0259-K	1 of 1	K	16 Apr 02	dB6/dB10/15, top cover
D-804-0330-C	1 of 1	C	16 Apr 02	Screening can
D-804-0292-G	1 of 1	G	08 Oct 99	Circuit diagram
D-804-0453-A	1 to 5	A	25 Oct 99	dB3/6/10/15 PCB
A-705-0004-A	1 to 3	3.0	30 Mar 00	Compound specification
D-804-0513-B	1 of 1	B	11 Nov 03	dB3 general assembly detail
A-301-0019/20	1 to 3	5.0	11 Jan 02	dB3/6/10/15 BOM for transducer PCB
D-804-0530-B	1 of 1	B	20 Jun 02	dB3/6/10/15 ATEX transducer wraparound labels, generic
D-804-0526-C	1 of 1	C	20 Jun 02	dB3/6/10/15 ATEX transducer wraparound labels
D-804-0537-A	1 of 1	A	18 Jul 02	DB25 Hazardous Area General Assembly
D-804-0539-C	1 of 1	C	17 Sep 02	DB25 ATEX/FM Transducer Labels
D-804-0526-F	1 of 1	F	17 Sep 02	DB3, 6, 10 & 15 ATEX/FM Transducer Labels
D-804-0562-A	1 of 1	A	12 Nov 03	dB3 lower housing

Issue 4

Drawing No.	Sheet	Rev.	Date	Description
D-804-0568-B	1 of 1	B	15 Mar 04	dB40 general assembly
D-804-0569-A	1 of 1	A	27 Jan 04	dB40 ATEX/FM transducer labels
D-804-0567-A	1 of 1	A	27 Jan 04	dB40 housing base
D-804-0566-A	1 of 1	A	27 Jan 04	dB40 housing lid
BOM-00007-A	1 of 1	A	27 Jan 04	dB40 bill of materials

Issue 5

Drawing No.	Sheet	Rev.	Date	Description
D-804-0576-A	1 of 1	A	25 Feb 04	dB6 Mk2 general assembly, standard housing
D-804-0582-A	1 of 1	A	15 Mar 04	dB6 Mk2 general assembly, threaded nose housing
D-804-0581-A	1 of 1	A	16 Mar 04	Threaded transducer housing
BOM-0008-A	1 of 1	1	15 Mar 04	dB6 Mk2 bill of materials, standard housing
BOM-0010-A	1 of 1	1	15 Mar 04	dB6 Mk2 bill of materials, threaded nose housing
D-804-0570-A	1 of 1	A	30 Jan 04	dB Mk2 circuit diagram
D-804-0583-A	1 to 5	A	18 Mar 04	dB PCB Mk2
A-301-0061	1 to 3	1	18 Mar 04	Bill of materials, dB PCB Mk2

Issue 6

Drawing No.	Sheet	Rev.	Date	Description
D-804-0583-B	1 to 5	B	13 Sep 04	dB PCB Mk2
A-301-0061	1 to 3	2	14 Sep 04	Bill of materials, dB PCB Mk2

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Certificate Annexe

Certificate Number: **Sira 02ATEX5104X**

Equipment: **Pulsar dB Series of Ultrasonic Transducers**

Applicant: **Pulsar Process Measurement Limited**

Issue 7

Drawing No.	Sheet	Rev.	Date	Description
D-804-0581-C	1 of 1	C	24 Mar 05	1.5 inch threaded transducer housing for dB6 mk2
D-804-0636-A	1 of 1	A	24 Mar 05	1.5 inch threaded transducer housing for dB3
D-804-0613-B	1 of 1	B	02 Feb 05	dB transducer cap for dB3, 6, 6mk2, 10, 15 and 25
D-804-0614-A	1 of 1	A	27 Sep 04	dB6mk1, dB10 transducer base
D-804-0615-A	1 of 1	A	30 Sep 04	dB15 transducer base
D-804-0616-B	1 of 1	B	02 Feb 05	dB25 transducer housing and adapter ring
D-804-0618-A	1 of 1	A	25 Oct 04	dB40 housing
D-804-0620-B	1 of 1	B	04 Nov 04	2inch threaded transducer housing for dB6/10
D-804-0621-A	1 of 1	A	04 Nov 04	dB6mk2 transducer base

Issue 8

Drawing No.	Sheet	Rev.	Sira (Stamp Date)	Description
D-804-0774-B	1 of 1	B	25 Feb 08	dB Burst Drive ATEX Certification Schematic Diagram
DB Burst Certification BOM	1 to 3	F	25 Feb 08	DB_Burst_Certification_BOM_15_ Feb_ 2008_Rev_F.xls
D-804-0776-B	1 to 5	B	25 Feb 08	dB Burst PCB
D-804-0777-B	1 of 1	B	25 Feb 08	dB3 Burst General Assembly Detail
D-804-0782-A	1 of 1	A	25 Feb 08	dB6 mk2 Burst General Assembly Standard Housing
D-804-0778-A	1 of 1	A	25 Feb 08	dB10 Burst General Assembly
D-804-0779-A	1 of 1	A	25 Feb 08	dB15 Burst General Assembly
D-804-0780-A	1 of 1	A	25 Feb 08	dB25 Burst General Assembly
D-804-0781-B	1 of 1	B	25 Feb 08	dB40 Burst General Assembly

Issue 9

Drawing	Sheets	Rev.	Date (Sira stamp)	Description
BOM-0004-A	1 of 1	3.0	15 Apr 09	Controlled Bill of Materials dB6/10/Ultrasonic Transducer
BOM-0005-A	1 of 1	3.0	15 Apr 09	Controlled Bill of Materials dB15 Ultrasonic Transducer
BOM-0006-A	1 of 1	2.0	15 Apr 09	Controlled Bill of Materials dB3 Ultrasonic Transducer
BOM-0007-A	1 of 1	2.0	15 Apr 09	Controlled Bill of Materials dB40 Ultrasonic Transducer
BOM-0008-A	1 of 1	2.0	15 Apr 09	Controlled Bill of Materials dB6 Mk2 Ultrasonic Transducer (Standard Housing)
BOM-0010-A	1 of 1	2.0	15 Apr 09	Controlled Bill of Materials dB6 Mk2 Ultrasonic Transducer (Threaded Nose Housing)
BOM-0016-A	1 of 1	2.0	15 Apr 09	Controlled Bill of Materials dB25 Ultrasonic Transducer
A-301-0061	1 to 3	2.1	15 Apr 09	Controlled Bill of Materials Quark / dB 3-6-10-15-25-40 Transducer PCB Mk2
D-804-0526-L	1 of 1	L	15 Apr 09	dB 3, 6, 10 & 15 ATEX/FM Transducer Wraparound Labels
D-804-0530-C	1 of 1	C	15 Apr 09	Generic dB 3, 6, 10 & 15 ATEX Transducer Wraparound Labels
D-804-0569-C	1 of 1	C	15 Apr 09	dB40 ATEX/FM Transducer Labels
D-804-0837-A	1 of 1	A	15 Apr 09	dB 3, 6, 10 & 15 ATEX Transducer Wraparound Labels
D-804-0838-A	1 of 1	A	15 Apr 09	dB25 ATEX Transducer Labels
D-804-0839-A	1 of 1	A	15 Apr 09	dB40 ATEX Only Transducer Labels
D-804-0539-H	1 of 1	H	15 Apr 09	dB25 ATEX/FM Transducer Labels
A-705-0004-A	1 of 4	4.0	15 Apr 09	Compound Specification

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