



1 **EC TYPE-EXAMINATION CERTIFICATE**

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

3 Certificate Number: **Sira 07ATEX2032X** Issue: **8**

4 Equipment: **CEL-35X/IS dBadge Series Noise Dosimeter  
Brüel & Kjær Type 4448 x 002 Noise Dose Meter**

5 Applicant: **Casella CEL**

6 Address: **Regent House  
Wolseley Road  
Kempston  
Bedford MK42 7JY  
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 60079-0:2009

EN 60079-11:2007

EN 60079-26:2006

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:



I M1

II 1G

Ex ia I Ma

Ex ia IIC T2 (222°C) Ga

(T<sub>a</sub> = -20°C to +40°C)

Project Number 28782

C Ellaby  
Deputy Certification Manager

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## SCHEDULE

### EC TYPE-EXAMINATION CERTIFICATE

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#### 13 DESCRIPTION OF EQUIPMENT

The CEL-35X/IS *d*Badge Series Noise Dosimeter and Brüel & Kjær Type 4448-x-002 Noise Dose Meter is a miniature, fully integrated Noise Dosimeter used for the measurement of personal noise exposure. The series covered by this certificate are CEL-35X/IS, where X is any number from 0 to 9, and 'Type 4448 x 002 where x is any letter A, B,...'. The product is designed to be worn using a range of fixing methods, alternatively it may be mounted on a hard hat.

The device comprises a plastic enclosure that contains two printed circuit boards, an LCD display and rechargeable cells. Two rubber keys located on the sides of the product are used to control the instruments operation.

Power to the device is provided from two, internal and non-removable ½-AAA, cylindrical, nickel metal hydride cells. Two exposed contacts are located on the rear of the product for connection to a purpose designed, drop in, charger system. The charge contacts are protected from reverse current flow by three blocking diodes. The unit is not to be charged within a hazardous area. Battery charging is only permitted using charger model number CEL-6362 aka ZG-0860'.

Noise is monitored using a screw on, ½" back, electret microphone, this is a high impedance capacitive type sensor, which can be removed for replacement or product testing. Measured noise data is downloaded to a PC (in the non-Hazardous area) using an infrared cable free communication link.

**Variation 1** - This variation introduced the following changes:

- i. The replacement of the existing case with a rubberised style case with enhanced ingress protection.
- ii. The introduction of minor circuit changes which do not affect the intrinsic safety of the product.

**Variation 2** - This variation introduced the following changes:

- i. A change of cell type from a GP 33AAAH to a Shenzhen H-½ AAA 250mAh NiMH cell, with a corresponding change to the product description and temperature class.
- ii. The addition of a Condition of Certification.
- iii. The removal of the Special Conditions for Safe Use dealing with static.
- iv. The use of a Yeebo LCD with Sitronix ST7549T integrated circuit to replace the UltraChip UC1602 LCD.
- v. Recognition that the equipment complies with EN 60079-0:2009, EN 60079-11:2007 and EN 60079-26:2006. The original standards against which this certificate was issued: EN 50014:1997, EN 50020:2002, EN 50284:1999 and EN 50303:2000 have been removed from Section 9.

**Variation 3** - This variation introduced the following change:

- i. The use of an alternative LCD display, Model Type FG1003201-FENN, manufactured by Future S&T (Shenzhen) Co. Ltd., was permitted.

**Variation 4** - This variation introduced the following change:

- i. The introduction of a new label drawing to include an IECEx certificate number was recognised
- ii. A new Special Conditions for Safe Use that relates to charging was introduced; this reinforces the requirements already specified in the Description of Equipment.

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**Variation 5** - This variation introduced the following change:

- i. The introduction of an alternative label in the name of Brüel & Kjær of Denmark was approved, the product will be known as a Type 4448 Personal Sound Exposure Badge when supplied using this label. The description and conditions are amended to reflect this model.

**Variation 6** - This variation introduced the following change:

- i. The recognition that when the product is sold by Brüel & Kjær of Denmark it will now be called a Brüel & Kjær Type 4448 x 002 Noise Dose Meter instead of a Type 4448 Personal Sound Exposure Badge, the description and conditions were amended accordingly.

**Variation 7** - This variation introduced the following change:

- i. The use of Shenzhen Grepow H250 ½ AAA 250mAh cells as an alternative to the existing Shenzhen Euni H-½ AAA 250mAh cells was approved, the Condition of Certification was amended to reflect this.

## 14 DESCRIPTIVE DOCUMENTS

### 14.1 Drawings

Refer to Certificate Annexe.

### 14.2 Associated Sira Reports and Certificate History

Issue	Date	Report no.	Comment
0	26 April 2007	R52A15494A	The release of the prime certificate.
1	24 July 2009	R52A19171A	The introduction of Variation 1.
2	15 March 2010	R21075A/00	The introduction of Variation 2.
3	22 March 2011	R24470A/00	The introduction of Variation 3.
4	11 May 2011	R24677A/00	The introduction of Variation 4.
5	2 September 2011	R25854A/00	The introduction of Variation 5.
6	7 December 2011	R26593A/00	The introduction of Variation 6.
7	2 July 2012	R24677A/01 R25854A/01	Report nos. R24677A/01 and R25854A/01 replaced R24677A/00 and R25854A/00.
8	17 December 2012	R28782A/00	The introduction of Variation 7.

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

- 15.1 The CEL-35X/IS *d*Badge Series Noise Dosimeter aka Brüel & Kjær Type 4448-x-002 Noise Dose Meter shall not be used in areas where a layer of coal dust may be deposited on the enclosure.
- 15.2 The microphone shall not be removed in the hazardous area.
- 15.3 The CEL-35X/IS *d*Badge Series Noise Dosimeter aka Brüel & Kjær Type 4448-x-002 Noise Dose Meter shall only be recharged in a safe area with the chargers specified in the description.

## 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.

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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.
- 17.3 When the 250 mAh cells are soldered to the PCB, the manufacturer shall ensure that the segregation between positive and negative of  $\geq 0.5$  mm through solid insulation and  $\geq 1.5$  mm creepage is maintained on the positive terminal.

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# Certificate Annexe



Certificate No. Sira 07ATEX2032X  
Equipment: CEL-35X/IS dBadge Series Noise Dosimeter and  
Brüel & Kjær Type 4448 x 002 Noise Dose Meter  
Applicant: Casella CEL

CERTIFICATION

## Issue 0

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Description
93-193090D/IS	1 of 1	03	20 Apr 07	CEL-35x dBadge I.S PSU Board Circuit Diagram ATEX
02-193091C/IS	1 to 2	04	20 Apr 07	CEL-35x dBadge I.S PSU Board Profile & Drilled ATEX
05-193092C/IS	1 of 1	03	20 Apr 07	CEL-35x dBadge I.S PSU Board PCB S/A ATEX
17-193093A/IS	1 of 1	02	20 Apr 07	CEL-35x dBadge I.S PSU Board PCB Parts List ATEX
03-193095D/IS	1 of 1	02	20 Apr 07	CEL-35x dBadge I.S G/A ATEX
13-193096A/IS	1 of 1	03	20 Apr 07	CEL-35x dBadge I.S Information/Serial No. Label ATEX
93-193098D/IS	1 of 1	01	20 Apr 07	CEL-350 dBadge I.S – Analogue/Processor Board Circuit Diagram
02-193099C/IS	1 to 2	01	20 Apr 07	CEL-350 dBadge I.S – Analogue/Processor Board Profile & Drilled
05-193100C/IS	1 of 1	01	20 Apr 07	CEL-350 dBadge I.S - Analogue/Processor Board PCB S/A
17-193101A/IS	1 to 2	01	20 Apr 07	CEL-350 dBadge I.S - Analogue/Processor Board Parts List
17-193107A/IS	1 of 1	01	20 Apr 07	CEL-350 dBadge I.S – Microphone Information

## Issue 1

Drawing	Sheets	Rev.	Date (Sira stamp)	Description
93-193098D/IS	1 of 1	02	21 Jul 09	Analogue/Processor board Circuit Diagram
05-193100C/IS	1 of 1	02	21 Jul 09	Analogue/Processor board PCB S/A
17-193101A/IS	1 to 2	02	21 Jul 09	Analogue/Processor board Parts List
04-193118D/IS	1 of 1	02	21 Jul 09	dBadge (I.P. rated) case body S/A

## Issue 2

Drawing	Sheets	Rev.	Date (Sira stamp)	Description
93-193090D/IS	1 of 1	04	15 Mar 10	PSU Board Circuit Diagram ATEX
05-193092C/IS	1 of 1	04	15 Mar 10	PSU Board PCB S/A ATEX
17-193093A/IS	1 of 1	03	15 Mar 10	PSU Board PCB Parts List ATEX
03-193095D/IS	1 of 1	03	15 Mar 10	G/A ATEX
04-193118D/IS	1 of 1	03	15 Mar 10	dBadge (I.P. rated) case body S/A
13-193096A/IS	1 of 1	04	15 Mar 10	Information/Serial No. Label ATEX

## Issue 3

Drawing	Sheets	Rev.	Date (Sira stamp)	Description
04-193118D/IS	1 of 1	04	09 Mar 11	dBadge (I.P. rated) case body S/A

## Issue 4

Drawing No.	Sheets	Rev.	Date (Sira Stamp)	Description
13-193096A/IS	1 of 1	05	08 Apr 11	Marking

## Issue 5

Drawing	Sheets	Rev.	Date (Sira stamp)	Description
13-193267A/IS(SIRA)	1 of 1	01	02 Sep 11	B&K type 4448 Label
04-193260D/IS(SIRA)	1 of 1	01	02 Sep 11	B&K type 4448 Case body

Issue 6 No new drawings were introduced

Issue 7 No new drawings were introduced

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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](mailto:info@siracertification.com)

Web: [www.siracertification.com](http://www.siracertification.com)

# Certificate Annexe



Certificate No. Sira 07ATEX2032X

Equipment: CEL-35X/IS *d*Badge Series Noise Dosimeter and  
Brüel & Kjær Type 4448 x 002 Noise Dose Meter

CERTIFICATION

Applicant: Casella CEL

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## Issue 8

Drawing no.	Sheets	Rev.	Date (Sira stamp)	Title
04-193118D/IS	1 of 1	05	13 Dec 12	<i>d</i> Badge (I.P. rated) case body S/A
04-193260D/IS(SIRA)	1 of 1	02	13 Dec 12	B&K type 4448 Case body

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Fax: +44 (0) 1244 681330

Email: [info@siracertification.com](mailto:info@siracertification.com)

Web: [www.siracertification.com](http://www.siracertification.com)