



1 **EC TYPE-EXAMINATION CERTIFICATE**

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

3 Certificate Number: **Sira 10ATEX2189X** Issue: **3**

4 Equipment: **ToxiRAE Pro PGM-1800, PGM-1820 and PGM-1860**

5 Applicant: **Rae Systems Inc.**

6 Address: **3775 North First Street
San Jose
CA 95134
United States of America**

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 60079-26:2007

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 1G
Ex ia IIC T4 Ga
(-20°C ≤ Tamb ≤ +55°C)
ToxiRAE Pro PGM-1800 & 1860

and



II 1G
Ex ia IIC T4 Ga
(-20°C ≤ Tamb ≤ +50°C)
ToxiRAE Pro PGM-1820

Project Number 25240

C Ellaby
Deputy Certification Manager

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SCHEDULE

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13 DESCRIPTION OF EQUIPMENT

ToxiRAE Pro PGM-1800, 1820, and 1860 are personal single gas monitors for continuously display of various gas concentrations, STEL (Short Term Exposure Limit), TWA (Time Weighted Average), and Peak values as well as high, low STEL and TWA alarms.

The physical dimension of the unit is 115 x 60 x 30mm without clip and has an approximate weight of 130g. The equipment is a small handheld battery powered gas monitor, housed in a dark conductive plastic PC material partially covered with a soft thermoplastic electrically conductive material. The PGM-1800, PGM-1820 and PGM-1860 have an optional yellow rubber sleeve added to the external case to provide additional drop protection.

ToxiRAE Pro PGM-1800, 1820, and 1860 are powered via an internally fitted rechargeable Li-ion battery module that is encapsulated together with an infallible current limiting circuit. Recharging of the ToxiRAE Pro PGM-1800, 1820, and 1860 is intended to be done outside the hazardous area via the supplied connector in the base of the unit.

The unit is fitted with a different type of gas detector depending on the model type. The PGM-1800 is fitted with a 4R+PID, photo ionization gas detector. The PGM-1820 is fitted with a 4R+LEL/TC, Pellistor gas detector. The PGM-1860 is fitted with a 4R+EC, electrochemical gas detector. The various gas detectors enable the detection and measurements of various gas types. The PGM-1800 unit is also fitted with a miniature fan motor to enable movement of the gas sources around the 4R+PID sensor.

Two push buttons on the unit facilitates the access to measure levels or alarms, and the mode button makes it possible to change preset limits and settings. Audible and visual alarm indicators are included. The visual alarm comprises a Red LED bar visible from the top. An imbalanced motor produces a vibration alert when in alarm mode.

Variation 1 - This variation introduced the following changes:

- i. The recognition of the ToxiRAE Pro PGM 1820 and PGM 1860 Personal toxic gas detectors
- ii. The recognition of the optional 4R+LEL/TC Sensor used within the ToxiRAE Pro PGM-1820 and 4R+EC Sensor used within the ToxiRAE Pro PGM- PGM-1860.
- iii. As a result of this variation the Marking, product description and Special Conditions For Safe Use have been amended accordingly and a Condition Of Certification added.

Variation 2 - This variation introduced the following changes:

- i. The PCB tracking on the PGM-1800 MAIN BOARD was changed.
- ii. An external rubber sleeve, as fitted on the PGM 1820 and PGM-1860, was allowed to be fitted to the PGM-1800, the description was modified accordingly.
- iii. The revision status of drawing 904-E300-009 listed against Issue 0 in the certificate Annexe was corrected in line with report number R21635A/00.

Variation 3 - This variation introduced the following changes:

- i. Additional types of fan motor, FAULHABER, type 06154.5S and MAXON, types 349191 and 349192, were allowed to be used in for the ToxiRAE Pro PGM-1800.
- ii. The schedule drawings for the 4R+EC sensor were updated to reflect EMC issues.
- iii. Drawing C03-1008-000 was updated to include a UL flammability reference for the PCB material.

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Sira Certification Service

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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 no.	Comment
0	19 August 2010	R21635A/00 R21635C/00	The release of prime certificate.
1	12 November 2010	R21635B/00 R21635D/00	The introduction of Variation 1.
2	03 May 2011	R24829A/00	The introduction of Variation 2.
3	22 September 2011	R25240A/00	The introduction of Variation 3.

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

15.1 The ToxiRAE Pro PGM-1800, 1820, and 1860 shall only be fitted with RAE Systems battery pack type P/N: G02-3004-000.

15.2 The ToxiRAE Pro PGM-1800, 1820, and 1860 shall only be charged outside hazardous area.

15.3 No precautions against electrostatic discharge are necessary for portable equipment that has an enclosure made of plastic, metal or a combination of the two, except where a significant static-generating mechanism has been identified. Activities such as placing the item in a pocket or on a belt, operating a keypad or cleaning with a damp cloth, do not present a significant electrostatic risk. However, where a static-generating mechanism is identified, such as repeated brushing against clothing, then suitable precautions shall be taken, e.g. the use of anti-static footwear.

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.

17.3 All resistors with a surface mount package size of 0603 fitted to the main printed circuit board (G02-1000-000) shall have a value of resistance equal to or greater than 519 Ohms.

17.4 The products covered by this certificate incorporate previously certified devices, it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices, and the manufacturer shall inform Sira of any modifications of the devices that may impinge upon the explosion safety design of their products.

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Certificate Annexe

Certificate Number: Sira 10ATEX2189X
Equipment: ToxiRAE Pro PGM-1800, 1820 and 1860
Applicant: Rae Systems Inc.



Issue 0

Drawing	Sheets	Rev.	Date (Sira Stamp)	Title
904-E300-009.00	1 of 1	5	11 Aug 10	PGM-1800 Schedule doc list
904-E300-009.24	1 of 1	4	11 Aug 10	Scheduled Documents

Issue 1

Drawing	Sheets	Rev.	Date (Sira Stamp)	Title
G02-0902-ASY	1 to 3	02	11 Nov 10	PGM1820 Assembly Drawing
G02-0902-ASY(EC)	1 to 3	01	11 Nov 10	PGM1860 Assembly Drawing
G02-4003-LBL	1 of 1	4	11 Nov 10	PGM-1800 PRODUCT LABEL
G02-4005-LBL	1 of 1	2	11 Nov 10	LABEL, LI-ION BATTERY
G02-4007-LBL	1 of 1	2	11 Nov 10	PGM-1820 PRODUCT LABEL
G02-4014-LBL	1 of 1	2	11 Nov 10	PGM-1860 PRODUCT LABEL
904-E300-009.34	1 of 1	2	11 Nov 10	4R+LEL/TC Sensor schedule document list
904-E300-012.05	1 of 1	3	11 Nov 10	4R+EC Sensor schedule document list

Issue 2

Drawing	Sheets	Rev.	Date (Sira Stamp)	Title
904-E300-009.00	1 of 1	8	13 Apr. 11	PGM-1800 Schedule doc list

Issue 3

Drawing	Sheets	Rev.	Date (Sira Stamp)	Title
904-E300-009.00	1 of 1	9	16 Sep 11	PGM-1800 Schedule doc list
904-E300-012.05	1 of 1	5	16 Sep 11	4R+EC Sensor schedule document list

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