



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.: **IECEX TSA 13.0021X** issue No.:1  
Status: **Current**  
Date of Issue: **2015-11-02** Page 1 of 4

Certificate history:  
Issue No. 1 (2015-11-2)  
Issue No. 0 (2013-10-8)

Applicant: **RAE Systems Inc.**  
3775 North First Street  
San Jose  
California 95134  
**United States of America**

Electrical Apparatus: **Portable combustible and toxic gas detector Models PGM62a0x, PGM62a6x and PGM62a8x**  
Optional accessory:

Type of Protection: **Intrinsic safety 'ia'**

Marking: **With RAE LEL sensor**  
Ex ia I Ma or Ex ia IIC T4 Ga TA = -20°C ≤ Tamb ≤ +50°C  
**With Dynament LEL sensor**  
Ex ia I Ma or Ex ia d IIC T4 Gb TA = -20°C ≤ Tamb ≤ +50°C

Approved for issue on behalf of the IECEx  
Certification Body:

Debbie Wouters

Position:

Acting Quality & Certification Manager

Signature:  
(for printed version)

Date:

2 NOVEMBER 2015

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

**TestSafe Australia**  
919 Londonderry Road  
Londonderry NSW 2753  
Australia





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Manufacturer:

**RAE Systems Inc.**  
3775 North First Street  
San Jose  
California 95134  
**United States of America**

Additional Manufacturing location(s):

**RAE Systems (Shanghai)  
Inc.**

No. 990 E. Huiwang Road,  
JIADING DISTRICT  
Shanghai 201815  
China

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 electrical apparatus 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:

<b>IEC 60079-0 : 2011</b> Edition: 6.0	Explosive atmospheres - Part 0: General requirements
<b>IEC 60079-1 : 2007-04</b> Edition: 6	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
<b>IEC 60079-11 : 2011</b> Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
<b>IEC 60079-26 : 2006</b> Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga

*This Certificate **does not** indicate compliance with electrical 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 Report:

GB/SIR/ExTR14.0152/00  
GB/SIR/ExTR11.0189/00  
GB/SIR/ExTR12.0173/00

AU/TSA/ExTR13.0042/00  
GB/SIR/ExTR12.0010/00

GB/SIR/ExTR11.0156/00  
GB/SIR/ExTR12.0066/00

#### Quality Assessment Report:

NO/DNV/QAR06.0003/05

NO/DNV/QAR06.0004/05



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## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

The Model PGM62xxx is a handheld, battery powered, multiple Gas Detector for the continuous display of toxic or combustible gas concentrations. The Gas Detector is provided either with a pump to bring the air sample to the sensors or provided as a diffusion model (designated with the suffix D.) The Gas Detector is supplied by a rechargeable Battery Pack containing two or three Li-ion battery cells connected in parallel. The Li-ion Battery Pack has two variations: one with four power outputs rated from 0.80W to 1.82 W and the other with power outputs rated from 1.16 W to 1.82 W. The Battery Pack is fully encapsulated and contains safety circuits including infallible resistors and five fuses. An alternative Battery Adapter uses four replaceable AA alkaline batteries, Duracell MN1500 type only. The alkaline Battery Adapter also has two variations: one with four outputs rated from 0.78 W to 1.12 W and the other rated from 1.11 to 1.12 W. The alkaline Battery Adapter also contains safety circuits including infallible resistors and fuses. The fuses are encapsulated. Three push buttons facilitate the access to measured levels or alarms, and the mode button makes it possible to change preset limits and setting. Audible and visual alarm indicators are included. The visual alarm comprises a red LED bar visible from the top and the side. Two imbalanced motors produce a vibration alert when in alarm mode.

Refer to the Annexe for additional information.

### CONDITIONS OF CERTIFICATION: YES as shown below:

Refer to Annexe of the certificate.



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

Refer to Annexe of the certificate.



# IECEX Certificate of Conformity Annexe

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**Equipment Description:**

There are three of the Gas Detectors with the following variations:

Model	Battery pack wattage	LEL Sensor (zone)	NDIR Sensors
PGM-62a0x	1.2 W	RAE (zone 0)	No
PGM-62a6x	0.8 W	RAE (zone 0)	No
PGM-62a8x	0.8 W	Dynamment (zone 1)	Yes

The types of sensors are LEL (either catalytic bead or NDIR), electrochemical (EC), PID and Gamma. The Gas Detector has five sensor slots to accommodate sensors as follows:

Sensor Type	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5
PID					X
LEL (catalytic bead)	X				
NDIR					X
EC	X	X	X	X	X
Dual EC	X		X		X
Gamma				X	

Note: NDIR includes CO<sub>2</sub>, methane LEL and methane VOL sensors

The various models of the PGM-62a0x, PGM-62a6x and PGM-62a8x reflect sensor combinations that are unique to specific end-user applications as shown in the following table:

Model	Marking	PID	Gamma	RAE LEL	Dynamment NDIR	EC
PGM-62a0x	Ex ia I Ma Ex ia IIC T4 Ga	Optional	Optional	Optional	No	Optional
PGM-62a6x	Ex ia I Ma Ex ia IIC T4 Ga	Optional	Optional	Optional	No	Optional
PGM-62a8x	Ex ia I Ma Ex ia d IIC T4 Gb	Optional	Optional	Optional	Optional	Optional

Note: Where a = 0, 2, 4, 6, 8 or 9 to show type.  
x = blank for pump model and the following suffixes meaning:

- T to denote a unit without any combustible sensors.
- D to denote a diffusion unit with RAE LEL sensor (PGM-62a0, PGM-62a6 and PGM-62a8) or Dynamment LEL sensor (PGM-62a8).
- TD to denote a diffusion unit without any combustible sensors.

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**Drawing list pertaining to Issue 0 of this Certificate:**

Drawing/Document Number:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
310-0131-000-SCH	1	PGM-62xx FSTN LCD Protect Board	3	2011-05-06
904-E300-011.05	1	PGM62xx Internal Wiring List	1	2010-07-22
C03-0903-ASY-CSA	1	4R+EC, Sensor Module, Schedule Drawing	1	2011-04-07
C03-0910-ASY	1	Gamma Sensor, 4R+, Sensor Module	3	2011-04-13
C03-0911-ASY-CSA	1	LEL Sensor, 4R+, Sensor Module	3	2011-04-08
C03-0913-ASY	1	Dual Gas EC Sensor, 4R+, Sensor Module, H2S/CO	2	2010-11-18
C03-1002-000	7	4R+ PID Sensor Board1 (PCB Layout)	A	2009-11-12
C03-1003-000	7	4R+ PID Sensor Board2 (PCB Layout)	A	2009-11-16
C03-1004-000	7	4R+ LEL/TC Sensor Board (PCB Layout)	A	2010-04-26
C03-1008-000	13	PCB, Analog, Smart EC, 4R+ (PCB Layout)	E	2011-09-15
C03-1009-000	12	4R+ Gamma Preamplifier Board (PCB Layout)	B	2011-03-14
C03-1012-BOM-CSA	1	PCB1 Components List for 4R+ PID Sensor	6	2011-04-07
C03-1012-SCH-CSA	1	4R+ PID Sensor SCH1	7	2011-04-07
C03-1013-BOM-CSA	1	PCB2 Components List for 4R+ PID Sensor	1	2011-04-07
C03-1013-SCH-CSA	1	4R+ PID Sensor SCH2	7	2011-03-15
C03-1014-BOM	2	4R+ LEL/TC PCB BOM	1	2010-05-24
C03-1014-SCH	1	4R+ LEL/TC Sensor SCH	4	2010-04-26
C03-1018-BOM-CSA	1	4R+ EC PCB BOM	4	2011-04-02
C03-1018-SCH-CSA	1	4R+ EC, Analog Board (Schematic)	6	2011-08-01
C03-1019-BOM	2	4R+ Gamma Preamplifier Board BOM	1.0	2010-07-01
C03-1019-SCH	1	4R+ Gamma Preamplifier Board (Schematic)	4	2010-02-11
C03-1101-000	10	4R+ Gamma Filter and Amplifier Board (PCB Layout)	C	2010-02-08
C03-1102-000	11	PCB, Bias, Dual, 4R+ EC (PCB Layout)	A	2010-08-20
C03-1103-000	13	PCB, Amplifier, Dual, 4R+ EC (PCB Layout)	B	2010-09-10
C03-1107-000	11	Connect Board, 4R+ NDIR-A (PCB Layout)	B	2010-08-20
C03-1111-BOM	2	4R+ Gamma Filter and Amplifier Board BOM	1.0	2010-07-01
C03-1111-SCH	1	4R+ Gamma Filter and Amplifier Board (Schematic)	5	2010-02-05
C03-1112-BOM	2	4R+ Dual EC Bias Board BOM	1	2010-08-11
C03-1112-SCH	1	4R+ Dual EC Bias Board (Schematic)	3	2010-08-20
C03-1113-BOM	2	4R+ Dual EC Amplifier Board BOM	2	2010-08-11
C03-1113-SCH	1	4R+ Dual EC, Amplifier Board (Schematic)	3	2010-08-20
C03-1117-BOM	1	4R+ NDIR-A Connect PCB BOM	1	2010-08-20
C03-1117-SCH	1	Connect Board, 4R+ NDIR-A (Schematic)	1	2010-08-20
M01-0901-ASY	2	PGM-62xx MultiRAE2 Unit Assy	5	2012-06-27
M01-0911-ASY	2	PGM-62xx MultiRAE2 Diffusion Unit Assy	2	2012-06-27
M01-1000-000	15	MultiRAE II Main Board (PCB Layout)	D	2012-03-15
M01-1002-000	11	MultiRAEII Li Battery PCB (PCB Layout)	A	2010-02-10
M01-1003-000	11	MultiRAE II ALKBattery (PCB Layout)	B	2010-08-03

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# IECEX Certificate of Conformity Annexe

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Drawing/Document Number:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
M01-1010-BOM	3	Main PCB BOM	8	2011-04-08
M01-1010-SCH	6	MultiRAE2 Main Board ( <i>Schematic</i> )	9	2012-03-15
M01-1012-BOM-1	1	1.2W Li-Ion Battery PCB BOM	1	2011-06-15
M01-1012-SCH	1	PGM 62xx Li-Ion Battery Board ( <i>Schematic</i> )	4	2010-10-22
M01-1013-BOM-1	1	1.2W Alkaline Battery PCB BOM	1	2011-06-15
M01-1013-SCH	1	PGM 62xx Alkaline Battery Board ( <i>Schematic</i> )	2	2010-10-22
M01-1016-000-SCH	1	MultiRAE II LCD Module Protect Board ( <i>Schematic</i> )	1	2010-10-22
M01-1101-000	11	France HTP PCB of MultiRAE II ( <i>PCB Layout</i> )	A	2010-04-28
M01-1111-BOM	1	MultiRAE2 France HTP PCB BOM	1	2010-07-22
M01-1111-SCH	1	PGM 62xx France HTP Board ( <i>Schematic</i> )	1	2010-04-27
M01-1112-BOM-1	1	0.8W Li-Ion Battery PCB BOM	1	2011-06-15
M01-1112-SCH	1	PGM 62xx 0.8W Li-Ion Battery Board ( <i>Schematic</i> )	2	2010-10-22
M01-1113-BOM-1	1	0.8W Alkaline Battery PCB BOM	1	2011-06-15
M01-1113-SCH	1	0.8W Alkaline Battery Board ( <i>Schematic</i> )	2	2010-10-22
M01-3051-CSA-1	1	1.2W Li-Ion Battery Pack, PGM-62x0	1	2011-06-22
M01-3052-CSA	1	1.2W Alkaline Battery Adapter, PGM-62x0	3	2011-03-17
M01-3053-CSA-1	1	0.8W Li-Ion Battery Pack, PGM-62x0/62x8	1	2011-06-22
M01-3054-CSA	1	0.8W Alkaline Battery Adapter, PGM-62x6/62x8	2	2011-03-17
M01-SEN1-CSA	4	( <i>List of Sensors</i> )	A6	2012-04-02
M01-4001-LBL-DIF-TSA	1	Label, Diffusion, TSA, IECEx, PGM 62xx	3	2013-09-30
M01-4002-LBL-PMP-TSA	1	Label, Pump, TSA, IECEx, PGM 62xx	3	2013-09-30
M01-3055-CSA	1	0.8W Li-Ion Battery Pack, Extended Duration, PGM-62x6/62x8	2	2012-05-17
M01-3056-CSA	1	1.2W Li-Ion Battery Pack, Extended Duration, PGM-62x0	2	2012-05-17
M01-4019-LBL	1	Label, 0.8W Li-Ion Battery Pack, Extended Duration	1	2012-03-06
M01-4020-LBL	1	Label, 1.2W Li-Ion Battery Pack, Extended Duration	1	2012-03-06
M01-1004-000	11	MultiRAE II Diffusion Board ( <i>PCB Layout</i> )	A	2010-08-24
M01-1014-BOM	1	MultiRAE2 Diffusion PCB BOM	1	2011-05-26
M01-1014-SCH	1	PGM62xx Diffusion Board Buzzer LED T&H	1	2011-05-26
M01-4006-LBL	1	Label, Li-Ion Battery Pack, PGM 62x0	1	2011-03-01
M01-4007-LBL	1	Label, Alkaline Battery Adapter, PGM 62x0	3	2011-03-03
M01-4008-LBL	1	Label, Li-Ion Battery Pack, PGM 62x6/PGM62x8	1	2011-03-01
M01-4009-LBL	1	Label, Alkaline Battery Adapter, PGM 62x6/PGM62x8	2	2011-03-03

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### Conditions of Certification pertaining to Issue 0 of this Certificate:

1. It is a condition of manufacture that the products covered by this certificate incorporate previous 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 Certification Body of any modifications of the devices that may impinge upon the explosion safety design of their products.
2. It is a condition of safe use that the PGM62xxx shall only be fitted with RAE Systems Battery Pack types: M01-3051-000, M01-3053-000, M01-3055-000 or MO1-3056-000 or Battery Adapter M01-3052-000 or M01-3054-000 fitted with Duracell MN1500 batteries.
3. It is a condition of safe use that the PGM62xxx shall only be charged outside the hazardous area.
4. It is a condition of safe use that 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.

### **Variations Permitted by Issue 1:**

The introduction of the following alternative items:

- Gamma sensor assembly.
- Main board.
- Pump motor board.
- NDIR-D sensor board (digital NDIR sensors).
- Temperature sensor board.
- Diffusion temperature board.
- Combustible gas sensor.
- Updated standards revisions.

These were assessed in IECEx Test Report GB/SIR/ExTR14.0152/00 and reviewed by TestSafe.

### **Condition of Certification Relating to Issue 1:**

The conditions of certification are unchanged.

### **Drawings Relating to Issue 1:**

Drawing/Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
C03-0986-ASY	1	Sensor Module Gamma, 4R+Sensor-II	1	2013-08-08
C03-1109-000	13	4R+ NDIR-D Sensor Main Board	A	2013-06-28
C03-1119-BOM	2	4R+ Digital Sensor Main PCB BOM	1	2013-04-02
C03-1119-SCH	1	4R+ NDIR-D Sensor Board	4	2013-04-10
C03-1200-000	10	4R+ Gamma Sensor-II Separate Board	A	2013-03-13
C03-1201-000	12	4R+ Gamma Sensor-II Preamplifier	A	2013-03-13

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Drawing/Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
C03-1202-000	12	4R+ Gamma Sensor-II Filter and Amplifier Board	B	2013-06-05
C03-1211-BOM	2	4R+ Gamma Sensor-II Preamplifier Board BOM	4	2014-06-03
C03-1211-SCH	1	4R+ Gamma Sensor-II	2	2013-03-12
C03-1212-BOM	2	4R+ Gamma Sensor-II Filter and Amplifier BOM	4	2014-06-03
C03-1212-SCH	1	4R+ Gamma Sensor-II Filter and Amplifier	3	2013-07-12
M01-1000-001	15	MultiRae II Main Board	E	2013-09-17
M01-1010-SCH-01	6	MultiRAE2 Main Board	1	2013-09-17
M01-1203-000	9	MultiRAE II Pump Board	C	2013-11-08
M01-1204-000	11	Temp PCB of MultiRAE II	1	2013-12-06
M01-1205-000	11	Diffusion Temp PCB of MultiRAE II	1	2013-12-06
M01-1213-BOM	1	MultiRAE2 Pump PCB BOM	1	2013-10-17
M01-1213-CH	1	PGM62xx Pump Motor Board	2	2013-10-18
M01-1214-BOM	1	MultiRAE2 Temp Board BOM	1	2013-12-09
M01-1214-SCH	1	PGM62xx Temp Board	1	2012-12-06
M01-1215-BOM	1	MultiRAE2 Diffusion Temp Board BOM	1	2013-12-09
M01-1215-SCH	1	PGM62x0 Diffusion Temp Board	1	2013-12-06
M01-3015-ASY	1	Pump Motor Assy	1	2013-10-18
M01-SEN1-CSA	4	(List of Sensors)	A8	2014-01-15

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