1 # EC - TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3 EC - Type Examination Certificate Number: **Baseefa03ATEX0235X**

4 Equipment or Protective System: **Portable Gas Detector Type PGD2**

5 Manufacturer: **Status Scientific Controls Limited**

6 Address: **Mansfield, Nottinghamshire, NG18 5ER**

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

8 Baseefa (2001) Ltd. Notified body number 1180, in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report No. 03(C)0043

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

EN 50014:1997 + Amds 1 & 2 **EN 50020:2002**

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 equipment or protective system 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 or protective system. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include the following :

⟨Ex⟩ II 2G EEx ia IIC T3

Baseefa (2001) Ltd. Customer Reference No. 2056

Project File No. 03/0043

This certificate is granted subject to the general terms and conditions of Baseefa (2001) Ltd. It does not necessarily indicate that the equipment may be used in particular industries or circumstances.

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On behalf of
Baseefa (2001) Ltd.

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13 # Schedule

14 ## Certificate Number Baseefa03ATEX0235X

15 Description of Equipment or Protective System

The Portable Gas Detector Type PGD2 is a battery powered, hand held instrument designed to monitor the concentration of up to four gases simultaneously, the gases monitored being dependent on the particular selection of sensors fitted.

The instrument provides visual (LED) and audible alarm in the event of gas concentrations being detected above or below preset levels. In addition to the alarm functions, liquid crystal display (LCD) indicates the alarm status of each channel. This information is available for down loading to a data logger via an infra-red or optical data link in a non-hazardous area.

The instrument is also calibrated and configured via the same infrared or optical data link in a non-hazardous area.

The unit contains a semi-encapsulated battery module, display printed circuit board (pcb.), a regulator pcb., processor pcb., analogue pcb., and up to four of any of the following sensors in any suitable combination:

a. Oxygen Sensor - Oxygen deficiency (0-21% 0_2)
b. Toxic Gas Sensor e.g. Chlorine, Hydrogen Sulphide, Carbon Monoxide, Sulphur dioxide, Nitrogen Oxide, Nitrogen Dioxide, Ammonia, Hydrogen Sulphide and Nitric Oxide.
c. Flammable Gas Sensor e.g. Hydrogen

Each of the above sensors may have alternative types to cover a number of gas concentrations.

The unit also houses a piezo-electric audio alarm, LCD dot matrix display and a membrane switch panel and an optional sampling pump.

The instrument case, which is a PC/ABS blend plastic, provides the assembly with a degree of protection meeting the requirements of at least IP20. A rubber boot is to be fitted to provide mechanical protection and the avoidance of electrostatic charging.

Intrinsic safety is assured by the use of encapsulated ceramic fuses, duplicated shunt diodes (rectifier and zener) infallible resistors, mechanical protection of the piezo electric audible warning transducer and careful segregation of components, wiring and pcb tracking.

The apparatus may be fitted with:

a. one of three alternative Microprocessor p.c.bs
b. one of three alternative Alarm p.c.bs i.e. standard alarm, multifunction alarm and pump alarm.
   The multi-function alarm board circuit has the following features:

   i. Optional fibre-optic link facility
      a. Lifeline RxD Receiver - Fibre-optic system (Option 3)
      b. Lifeline TxD Transmitter - Fibre-optic system (Option 1)

   ii. Optional opto-isolated duplex link
      c. Lifeline RxD Receiver - Opto-isolator system (Option 2)
      d. Lifeline TxD Transmitter - Opto-isolator system (Option 4)

   Only one transmitter and receiver may be interconnected.

Opto-isolator RxD Receiver
U_o =3.3V
I_o = 132mA

Opto-isolator TxD Transmitter
U_i =3.3V
I_i = 132mA

c. a flameproof sensor housing Type PH1 or PH2 to Certificate No. KEMA03ATEX2248U and coded ⟨Ex⟩ II 2G EEx d IIC

The PGD2 Gas Detector may also be known as the Mentor Series Portable Gas Detector

The Gas Detector may only use the PGD/BATT Battery Module (2 D size Nickel Cadmium cells)

Charging via Fast Charge Socket
U_i = 7V
I_i = 2A

Charging via Output Socket (Terminals A w.r.t. C/B)
U_i = 7V
I_i = 0.5A

These cells may not be not be recharged in the hazardous area

16 Report Number
03(C)0043

17 Special Conditions for Safe Use

1. The rechargeable battery pack type PGD/BATT may only be recharged in the safe area
2. The enclosure is manufactured from plastic and has a surface resistivity of greater than 1 Gohm and therefore poses a risk from electrostatic ignition. The rubber boot is to be fitted to the apparatus. By virtue of its shape and design, the apparatus is not considered to be an electrostatic risk; however, the apparatus must not be installed in a position where it may be subjected to an excessive air/fluid flow or be subjected to rubbing that may cause an electrostatic build-up.
3. This apparatus is not designed for use in oxygen enriched atmospheres i.e. greater than 21% oxygen.

18 Essential Health and Safety Requirements

All relevant Essential Health and Safety Requirements are covered by the standards listed at item 9.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
SSC14/008	1	1	26.02.03	PGD Certification Flow Chart
SSC14/1	1	1	28.01.03	General Assembly
SSC14/010	1	1	24.07.03	GA of PGD in protective case
SSC14/111	1	1	22.01.03	PGD2 Block Diagram
SSC14/106	1	1	03.11.03	Regulator pcb Type 2 Circuit Diagram
SSC14/204	1	1	03.02.02	Battery Connector Flexible pcb
SSC14/206	1	1	03.11.03	Regulator pcb Artwork
SSC14/105	1	1	29.01.03	Analogue pcb Type 2 Circuit Diagram
SSC14/201	1	1	29.01.03	Analogue pcb Type 2 Artwork
SSC14/201	2	1	03.02.03	Analogue pcb Type 2 Artwork
SSC14/104	1	1	28.05.03	Microcontroller pcb Type 2 Circuit Diagram
SSC14/200	1	1	29.01.03	Microcontroller pcb Type 2 Artwork
SSC14/200	2	1	29.01.03	Microcontroller pcb Type 2 Artwork
SSC14/101	1	1	28.01.03	Microcontroller pcb Mitsubishi Version Circuit Diagram
SSC14/203	1	1	28.01.03	Microcontroller pcb Mitsubishi Version Artwork

Number	Sheet	Issue	Date	Description
SSC14/101	1	2	04.06.03	Microcontroller pcb Mitsubishi Version Circuit Diagram
SSC14/203	1	2	04.06.03	Microcontroller pcb Mitsubishi Version Artwork
SSC14/110	1	1	03.02.03	Standard Alarm pcb Circuit Diagram
SSC14/207	1	1	03.02.03	Standard Alarm pcb Artwork
SSC14/002	1	1	28.01.03	Multifunction Lens – General Assembly
SSC14/100	1	1	28.01.03	Multifunction Alarm pcb Circuit Diagram
SSC14/205	1	1	03.02.01	Multifunction Alarm pcb Artwork
SSC14/009	1	1	14.05.03	Multifunction Alarm membrane 0V connection
SSC14/003	1	1	29.01.03	Pump Lens – General Assembly
SSC14/107	1	1	29.01.03	Pump Alarm pcb Circuit Diagram
SSC14/202	1	1	03.02.01	Pump Alarm pcb Artwork
SSC14/001	2	1	28.01.03	Table of Gas Sensors
SSC14/6	1	1	29.01.03	PGD/BATT General Assembly (Nickel Cadmium)
SSC14/108	1	1	29.01.03	PGD/BATT Circuit Diagram (Nickel Cadmium)
SSC14/209	1	1	03.02.03	PGD/BATT pcb Artwork
SSC14/005	1	1	29.01.03	Encapsulated Fuse
SSC14/210	1	1	12.05.03	Rear Cover Label
SSC14/211	1	1	12.05.03	Battery Pack Label
SSC14/212	1	1	12.05.03	Front Cover Label
SSC14/213	1	2	04.11.03	Red Lens Cover Label

1 # SUPPLEMENTARY EC - TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3	Supplementary EC - Type Examination Certificate Number:	**Baseefa03ATEX0235X/1**
4	Equipment or Protective System:	**Portable Gas Detector Type PGD2**
5	Manufacturer:	**Status Scientific Controls Limited**
6	Address:	**Mansfield, Nottinghamshire, NG18 5ER**

7 This supplementary certificate extends EC – Type Examination Certificate No. Baseefa03ATEX0235X to apply to equipment or protective systems 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.

This supplementary certificate shall be held with the original certificate.

Baseefa Customer Reference No. **2056**

Project File No. **05/0397**

This certificate is granted subject to the general terms and conditions of Baseefa (2001) Ltd. It does not necessarily indicate that the equipment may be used in particular industries or circumstances.

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13 # Schedule

14 ## Certificate Number Baseefa03ATEX0235X/1

15 Description of the variation to the Equipment or Protective System

Variation 1.1

To permit the two EEx d pellistors, used to measure the concentration of flammable gasses, to be replaced by two, Infra Red, EEx d, Type MSH*** Gas Sensors, Component Certificate Number SIRA04ATEX1357U. These alternative sensors require circuit changes to the Portable Gas Detector Type PGD2, for their operation. This is achieved by replacing the original regulator circuit SSC14/106 by an alternative circuit SSC14/115 and overall reductions in the circuit capacitance on the other printed circuit boards.

Variation 1.2

To permit the reduction to capacitors C4 and C5, on the Analogue Board SSC14/105 Issue 2, and the overall reduction in the circuit capacitance on the other printed circuit boards, as introduced above, to be used within the existing Portable Gas Detectors Type PGD2 which use the EEx d pellistors. These changes do not adversely affect the existing assessment.

16 Report Number

05(C)0397

17 Special Conditions for Safe Use

None additional to those listed previously

18 Essential Health and Safety Requirements

Compliance with the Essential Health and Safety Requirements is not affected by this variation.

19 Drawings and Documents

Drawings for Variation 1.1

Number	Sheet	Issue	Date	Description
SSC14/116	1	1	15/8/05	Overall Block Diagram – IR gas sensors
SSC14/115	1	1	21/7/05	Circuit Diagram Regulator – IR gas sensors
SSC14/215	1	1	16/08/05	Regulator – IR sensors pcb Layout 130212
SSC14/1	1	2	2/6/05	General Assembly – IR gas sensors
SSC11/013	1	2	6/7/05	IR Sensors Type MSH Capacitance Limit
SSC14/105	1	2	2/9/05	Analogue Circuit Diagram C4&C5 reduced

Drawings for Variation 1.2

Number	Sheet	Issue	Date	Description
SSC14/111	1	2	15/8/05	Overall Block Diagram – Pellistors

1 # SUPPLEMENTARY EC - TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3	Supplementary EC - Type Examination Certificate Number:	**Baseefa03ATEX0235X/2**
4	Equipment or Protective System:	**Portable Gas Detector Type PGD2**
5	Manufacturer:	**Status Scientific Controls Limited**
6	Address:	**Mansfield, Nottinghamshire, NG18 5ER**

7 This supplementary certificate extends EC – Type Examination Certificate No. Baseefa03ATEX0235X to apply to equipment or protective systems 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.

This supplementary certificate shall be held with the original certificate.

Baseefa Customer Reference No. **2056**

Project File No. **06/0395**

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On behalf of
Baseefa (2001) Ltd.

13 # Schedule

14 ## Certificate Number Baseefa03ATEX0235X/2

15 Description of the variation to the Equipment or Protective System

Variation 2.1

To permit the Portable Gas Detector introduced by Variation 1.1, which uses the Infra Red, EEx d, Type MSH*** Gas Sensors, to be designated a Portable Gas Detector Type PGD3-IR. This Portable Gas Detector Type PGD3-IR may additionally contain combinations of one or two electrochemical type Oxygen / toxic sensors, thereby providing an instrument for the detection of up to four gasses.

The alternative IR regulator circuit SSC14/115 which was introduced, has various circuit and track layout changes for operational reasons.

A specific IR analogue printed circuit board SSC14/117, which has non safety related resistors R19 and R23 replaced by zero ohm resistors, is introduced for the Type PGD3-IR Detector, replacing the original SSC14/105 analogue printed circuit board, which is still retained for use on the Portable Gas Detector Type PGD2.

The original assessment is not affected by these changes and the Portable Gas Detector Type PGD3-IR is marked Ⓔx II 2G EEx ia IIC T3.

16 Report Number

None

17 Special Conditions for Safe Use

None additional to those listed previously

18 Essential Health and Safety Requirements

Compliance with the Essential Health and Safety Requirements is not affected by this variation.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
SSC14/116	1	2	15/05/2006	Overall Block Diagram – IR gas sensors - PGD3-IR
SSC14/115	1	3	23/05/2006	Circuit Diagram Regulator – IR gas sensors - PGD3-IR
SSC14/117	1	1	12/05/2006	Analogue Circuit Diagram – IR gas sensors - PGD3-IR
SSC14/215	1	3	23/05/2006	Regulator – IR sensors pcb Layout 130212 - PGD3-IR
SSC14/216	1	1	13/12/2005	Rear Cover Label - PGD3-IR
SSC14/217	1	1	19/05/2006	Front Panel Label - PGD3-IR