1 **EC TYPE-EXAMINATION CERTIFICATE**

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

3 Certificate Number: Sira 02ATEX2176X

4 Equipment: Triple Plus+

5 Applicant: Crowcon Detection Instruments Ltd

6 Address: 2 Blacklands Way
Abingdon
OX14 1DY
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 confidential report numbers R52A9131B and R52L15432B.

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:

IEC 60079-0:2000
IEC 60079-1:2003
IEC 60079-11:1999

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 2 G
Ex ib d IIC T4
T_a = -20°C to +50°C

Project Number 52L15432
Date 24 December 2002
Latest Issue 16 February 2007
C. Index 14

Form 9176 Issue 12

C Ellaby
Certification Officer

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE Sira 02ATEX2176X

Re-issued 15 October 2003 to include variation 1 dated 16 January 2003 and to permit report number R52A9131A to be replaced by report number R52A9131B.
Re-issued 16 February 2007 to Introduce the changes described in report number R52L15432B, this involves incorporating variations 1 to 9 dated 23 February 2004, 23 February 2004, 17 August 2004, 10 February 2005, 9 May 2005, 7 October 2005, 11 October 2005, 14 October 2005 and 23 May 2006 repectively.

13 **DESCRIPTION OF EQUIPMENT**

The Triple Plus+ gas detector, which may also be called a Tank-Mate or a Gaseeker, is a portable battery-powered instrument comprising the following principal sub-assemblies:

1. Nominally 6 V lead-acid battery mounted in a separate compartment
2. Triple Plus main board with an LCD on its own separate PCB mounted piggy-back to the underside – the assembly is mounted in the lid
3. Safety PCB
4. Sounder PCB and sounder
5. Up to four sensor modules

The sensor modules may be chosen from the following:

- Oxygen
- Toxic
- Biased Toxic
- Flammable
- Thermal Conductivity
- Infra-Red

The modules may be used in any combination but with a maximum of one IR module.

The circuitry is housed in an enclosure manufactured from a non-conducting plastics material, with a separate compartment for the lead-acid battery. The cover incorporates a number of pushbuttons and LEDs, it also has a window to allow viewing of the liquid crystal display. A piezo-electric alarm buzzer is incorporated into the device.

No external electrical connections are permitted while the equipment is in the hazardous area. Charging of the battery is only permitted in the non-hazardous area and the permissible battery types are:

- Yuasa NP1.2
- Yuasa IBT BT1
- Sonnenschein A506 1.25

14 **DESCRIPTIVE DOCUMENTS**

14.1 Drawing

Number	Sheet	Rev.	Date (Sira stamp)	Description
IRSM-5152-A3	1 of 1	2	09 Nov 06	IR PCB schematic
P-5109-A4	1 of 1	1	09 Nov 06	Fuse encapsulation details
P-5620-A2	1 of 1	1	09 Nov 06	Membrane keypad detail
TRP-3657-A4	1 of 1	3	15 Feb 07	Certification label
TRP-1630-CL	1 of 1	9	09 Nov 06	Main PCB Silk Screen
TRP-1630-PCA	1 of 1	9	09 Nov 06	Main PCB layer 1 artwork
TRP-1630-PCB	1 of 1	9	09 Nov 06	Main PCB layer 2 artwork
TRP-1630-PCC	1 of 1	9	09 Nov 06	Main PCB layer 3 artwork
TRP-1630-PCD	1 of 1	9	09 Nov 06	Main PCB layer 4 artwork
TRP-1636-CD	1 of 1	12	09 Nov 06	Main PCB schematic
TRP-1637-CD	1 of 1	9	09 Nov 06	Safety PCB schematic

Date 24 December 2002
Latest Issue 16 February 2007

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE Sira 02ATEX2176X

Number	Sheet	Rev.	Date (Sira stamp)	Description
TRP-1638-CD	1 of 2	5	09 Nov 06	Flammable PCB schematic
TRP-1639-CD	1 of 1	6	09 Nov 06	Toxic PCB schematic
TRP-1640-CD	1 of 1	8	09 Nov 06	Oxygen PCB schematic
TRP-1658-CPL	1 of 1	4	09 Nov 06	Safety PCB silkscreen
TRP-1658-PCA	1 of 1	4	09 Nov 06	Safety PCB solder side copper
TRP-1658-PCB	1 of 1	4	09 Nov 06	Safety PCB component side copper
TRP-1663-CD	1 of 1	8	09 Nov 06	Biased toxic schematic
TRP-1688-A3	1 of 1	8	09 Nov 06	Biased toxic PCB artwork
TRP-2317-CD	1 of 1	5	09 Nov 06	TCS PCB schematic
TRP-3638-CD	1 of 1	1	09 Nov 06	Sounder PCB schematic
TRP-3639-CL	1 of 1	1	09 Nov 06	Sounder PCB silkscreen
TRP-3639-PCA	1 of 1	1	09 Nov 06	Sounder PCB component side copper
TRP-3639-PCB	1 of 1	1	09 Nov 06	Sounder PCB solder side copper
TRP-3665-A3	1 of 1	1	09 Nov 06	Thermal conductivity sensor artwork
TRP-3669-A3	1 of 1	1	09 Nov 06	Tripleplus + DCP 2114 Detail
TRPP-3633-A1	1 to 2	1	09 Nov 06	General arrangement
TRPP-3652-A3	1 of 1	1	09 Nov 06	Block diagram
TRPP-3653-A4	1 to 3	11	09 Nov 06	Critical parts list

14.2 Report number R52A9131B and R52L15432B.

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

15.1 If the Triple Plus+ is used in the gases associated with apparatus groups IIC (i.e. hydrogen, acetylene or carbon disulphide), it shall be used such that the risk of mechanical impact to the enclosure is low.

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 report number R52A9131B and R52L15432B.

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 The following sub-assemblies covered by certification drawings to the previous production issues may also be used in the Triple Plus+:

- Oxygen Module Board
- Toxic Module Board
- Bias Toxic Module Board
- Flammable ('Explosive') Module Board
- Thermal Conductivity Module Board
- Infra-Red Module

Date 24 December 2002
Latest Issue 16 February 2007

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Certification Service

1 **EC TYPE-EXAMINATION CERTIFICATE**

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

3 Certificate Number: Sira 02ATEX2176X

4 Equipment: Triple Plus+

5 Applicant: Crowcon Detection Instruments Ltd

6 Address: 2 Blacklands Way
Abingdon
OX14 1DY
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 confidential report number R52A9131A.

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
EN 50018:2000
EN 50020:2002

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 M2 EEx ib d I
II 2G EEx ib d IIC T4

Project Number 52A9131
Date 24 December 2002
C. Index 14

M D Shearman
Certification Manager

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 02ATEX2176X

13 DESCRIPTION OF EQUIPMENT

The Triple Plus+ gas detector is a portable battery-powered instrument comprising a safety board, sounder board, main board and four gas detector modules, which may be chosen from oxygen, toxic, biased toxic, flammable, thermal conductivity and infra-red. The modules may be used in any combination but for practical reasons, certain combinations are not used.

The circuitry is housed in an enclosure manufactured from a non-conducting plastics material, with a separate compartment for the lead-acid cell. The cover incorporates a number of pushbuttons & LEDs and has a window to allow viewing of the liquid crystal display. There is also a piezo-electric alarm buzzer incorporated into the device.

No external electrical connections are permitted while the equipment is in the hazardous area. Charging of the battery is only permitted in the non-hazardous area.

14 DESCRIPTIVE DOCUMENTS

14.1

Drawing No.	Sheet	Rev	Date	Title
IRSM-5152-A3	1 of 1	1	Dec 02	IR PCB schematic
TRP-1625-A4	1 of 1	6	Dec 02	Certification label
TRP-1628-A4	1 of 1	2	Sep 92	Fuse potting
TRP-1630-PCA	1 of 1	9	Nov 02	Main PCB layer 1 artwork
TRP-1630-PCB	1 of 1	9	Nov 02	Main PCB layer 2 artwork
TRP-1630-PCC	1 of 1	9	Nov 02	Main PCB layer 3 artwork
TRP-1630-PCD	1 of 1	9	Nov 02	Main PCB layer 4 artwork
TRP-1630-CL	1 of 1	9	Nov 02	Main PCB Silk Screen
TRP-1636-CD	1 of 1	10	Nov 02	Main PCB schematic
TRP-1637-CD	1 of 1	8	Dec 02	Safety PCB schematic
TRP-1658-CPL	1 of 1	3	Dec 02	Safety PCB silkscreen
TRP-1658-PCA	1 of 1	3	Dec 02	Safety PCB solder side copper
TRP-1658-PCB	1 of 1	3	Dec 02	Safety PCB component side copper
TRP-1638-CD	1 of 1	3	Nov 02	Explosive PCB schematic
TRP-1639-CD	1 of 1	5	Nov 02	Toxic PCB schematic
TRP-1640-CD	1 of 1	5	Nov 02	Oxygen PCB schematic
TRP-1663-CD	1 of 1	5	Nov 02	Biased toxic schematic
TRP-1688-CL	1 of 1	6	Sept 02	Biased toxic PCB component location
TRP-1688-PCA	1 of 1	6	Sept 02	Biased toxic PCB component side copper
TRP-1688-PCB	1 of 1	6	Sept 02	Biased toxic PCB layer 2 copper
TRP-1688-PCC	1 of 1	6	Sept 02	Biased toxic PCB layer 3 copper
TRP-1688-PCD	1 of 1	6	Sept 02	Biased toxic PCB solder side copper
TRP-2317-CD	1 of 1	4	Nov 02	TCS PCB schematic
TRP-3638-CD	1 of 1	1	Nov 02	Sounder PCB schematic
TRP-3639-CL	1 of 1	1	Nov 02	Sounder PCB silkscreen

Date 24 December 2002

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 02ATEX2176X

14.1

Drawing No.	Sheet	Rev	Date	Title
TRP-3639-PCA	1 of 1	1	Nov 02	Sounder PCB component side copper
TRP-3639-PCB	1 of 1	1	Nov 02	Sounder PCB solder side copper
TRPP-3633-A1	1 to 2	B	Dec 02	General arrangement
TRPP-3652-A3	1 of 1	A	Oct 02	Block diagram
TRPP-3653	1 to 2	1	20 Dec 02	Critical parts list

14.2 Report No. R52A9131A

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

15.1 If the Triple Plus+ is to be used in the gases and vapours associated with apparatus groups IIB and IIC, it must be used such that the risk of mechanical impact to the enclosure is low.

15.2 The Triple Plus+ shall not be used in oxygen-enriched atmospheres, i.e. where the oxygen concentration exceeds 21% by volume

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 Report No. R52A9131A.

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 This certificate relies on the following previously-certified products. When used as part of the equipment, the key attributes listed in the table below shall still be maintained by their original certificate.

Product	Certificate number	Key attributes
Littelfuse 259-series 62mA fuse	BAS 01ATEX1278U	EEx ia IIC
E2V (formerly Marconi) IR1xxx infra-red sensing head	Sira 99ATEX1121U	EEx d I, EEx d IIC
Crowcon Sensor S01-881	Sira 02ATEX1411U	EEx d I, EEx d IIC
Crowcon Flammable Block	Sira 02ATEX1281U	EEx d I, EEx d IIC

Date 24 December 2002

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1 **EC TYPE-EXAMINATION CERTIFICATE**

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

3 Certificate Number: Sira 02ATEX2176X

4 Equipment: Triple Plus+

5 Applicant: Crowcon Detection Instruments Ltd

6 Address: 2 Blacklands Way
Abingdon
OX14 1DY
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 confidential report number R52A9131B.

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 including amendments A1 and A2
EN 50018:2000
EN 50020:2002

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 M2 EEx ib d I
II 2G EEx ib d IIC T4

Project Number 52V10622
Date 24 December 2002
Re-issued 15 October 2003
C. Index 14

C Ellaby
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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 02ATEX2176X

Re-issued 15 October 2003 to include variation 1 dated 16 January 2003 and to permit report number R52A9131A to be replaced by report number R52A9131B.

DESCRIPTION OF EQUIPMENT

The Triple Plus+ gas detector (also known as the Unitor Tank-Mate) is a portable battery-powered instrument comprising a safety board, sounder board, main board and four gas detector modules, which may be chosen from oxygen, toxic, biased toxic, flammable, thermal conductivity and infra-red. The modules may be used in any combination but for practical reasons, certain combinations are not used. The equipment uses either Yuasa NP1.2 or IBT BT1 lead-acid batteries.

The circuitry is housed in an enclosure manufactured from a non-conducting plastics material, with a separate compartment for the lead-acid cell. The cover incorporates a number of pushbuttons & LEDs and has a window to allow viewing of the liquid crystal display. There is also a piezo-electric alarm buzzer incorporated into the device.

No external electrical connections are permitted while the equipment is in the hazardous area. Charging of the battery is only permitted in the non-hazardous area.

DESCRIPTIVE DOCUMENTS

14.1 Drawings

Number	Sheet	Rev.	Date	Title
IRSM-5152-A3	1 of 1	1	Dec 02	IR PCB schematic
TRP-1625-A4	1 of 1	6	Dec 02	Certification label
TRP-1628-A4	1 of 1	2	Sep 92	Fuse potting
TRP-1630-PCA	1 of 1	9	Nov 02	Main PCB layer 1 artwork
TRP-1630-PCB	1 of 1	9	Nov 02	Main PCB layer 2 artwork
TRP-1630-PCC	1 of 1	9	Nov 02	Main PCB layer 3 artwork
TRP-1630-PCD	1 of 1	9	Nov 02	Main PCB layer 4 artwork
TRP-1630-CL	1 of 1	9	Nov 02	Main PCB Silk Screen
TRP-1636-CD	1 of 1	10	Nov 02	Main PCB schematic
TRP-1637-CD	1 of 1	9	Jan 03	Safety PCB schematic
TRP-1658-CPL	1 of 1	4	Jan 03	Safety PCB silkscreen
TRP-1658-PCA	1 of 1	4	Jan 03	Safety PCB solder side copper
TRP-1658-PCB	1 of 1	4	Jan 03	Safety PCB component side copper
TRP-1638-CD	1 of 1	3	Nov 02	Explosive PCB schematic
TRP-1639-CD	1 of 1	5	Nov 02	Toxic PCB schematic
TRP-1640-CD	1 of 1	5	Nov 02	Oxygen PCB schematic
TRP-1663-CD	1 of 1	5	Nov 02	Biased toxic schematic
TRP-1688-CL	1 of 1	6	Sept 02	Biased toxic PCB component location
TRP-1688-PCA	1 of 1	6	Sept 02	Biased toxic PCB component side copper
TRP-1688-PCB	1 of 1	6	Sept 02	Biased toxic PCB layer 2 copper
TRP-1688-PCC	1 of 1	6	Sept 02	Biased toxic PCB layer 3 copper
TRP-1688-PCD	1 of 1	6	Sept 02	Biased toxic PCB solder side copper
TRP-2317-CD	1 of 1	4	Nov 02	TCS PCB schematic

Date 24 December 2002
Re-issued 15 October 2003

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 02ATEX2176X

Number	Sheet	Rev.	Date	Title
TRP-3638-CD	1 of 1	1	Nov 02	Sounder PCB schematic
TRP-3639-CL	1 of 1	1	Nov 02	Sounder PCB silkscreen
TRP-3639-PCA	1 of 1	1	Nov 02	Sounder PCB component side copper
TRP-3639-PCB	1 of 1	1	Nov 02	Sounder PCB solder side copper
TRP-3657-A4	1 of 1	1	Jul 03	Unitor CENELEC Certification Label (Triple +)
TRPP-3633-A1	1 to 2	B	Dec 02	General arrangement
TRPP-3652-A3	1 of 1	A	Oct 02	Block diagram
TRPP-3653	1 to 2	2	10 Jan 03	Critical parts list

14.2 Report No. R52A9131B

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

15.1 If the Triple Plus+ is to be used in the gases and vapours associated with apparatus groups IIB and IIC, it shall be used such that the risk of mechanical impact to the enclosure is low.

15.2 The Triple Plus+ shall not be used in oxygen-enriched atmospheres, i.e. where the oxygen concentration exceeds 21% by volume

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 Report No. R52A9131B.

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 This certificate relies on the following previously-certified products. When used as part of the equipment, the key attributes listed in the table below shall still be maintained by their original certificate.

Product	Certificate number	Key attributes
Littelfuse 259-series 62mA fuse	BAS 01ATEX1278U	EEx ia IIC
E2V (formerly Marconi) IR1xxx infra-red sensing head	Sira 99ATEX1121U	EEx d IIC
E2V (formerly Marconi) IR1xxx infra-red sensing head	Sira 02ATEX2015U	EEx ia I
Crowcon Sensor S01-	Sira 02ATEX1411U	EEx d I, EEx d IIC
Crowcon Flammable Block	Sira 02ATEX1281U	EEx d I, EEx d IIC

Date 24 December 2002
Re-issued 15 October 2003

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EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX2176X	Dated	24 December 2002
VARIATION NUMBER	1 (ONE)	Dated	16 January 2003

VARIATION TO EQUIPMENT

To permit:

1 The introduction of minor track and component changes on the safety board

2 The critical parts list to be corrected.

DESCRIPTIVE DOCUMENTS

Number	Sheet	Re	Date	Description
TRP-1637-CD	1 of 1	9	Jan 03	Safety PCB schematic
TRP-1658-CPL	1 of 1	4	Jan 03	Safety PCB silkscreen
TRP-1658-PCA	1 of 1	4	Jan 03	Safety PCB solder side copper
TRP-1658-PCB	1 of 1	4	Jan 03	Safety PCB component side copper
TRPP-3653	1 to 2	2	10 Jan 03	Critical parts list

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No 52V9881

Report No. NA

C Ellaby
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sira
Certification Service

EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX2176X	Dated	24 December 2002
VARIATION NUMBER	2 (TWO)	Dated	11 November 2003

VARIATION TO EQUIPMENT

To permit:

1 The use of a SAFT 40RF207 Ni-MH 2.4 V 70mAh battery as an alternative to a SAFT 40RF206 Ni-Cad 2.4 V 60mAh battery

2 Minor corrections to the critical parts list

DESCRIPTIVE DOCUMENTS

Drawing number	Rev	Sheet	Date	Description
TRPP-3653	3	1 to 2	03 Nov 03	Critical parts list

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No 52V10911

Report No. N/A

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EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX2176X	Dated Re-issued	24 December 2002 15 October 2003
VARIATION NUMBER	2 (TWO)	Dated	23 February 2004

VARIATION TO EQUIPMENT

To permit:

1 The use of 1N5817 as an alternative to BYV10-20 diodes

DESCRIPTIVE DOCUMENTS

Drawing number	Rev	Sheet	Date	Description
TRPP-3653	4	1 to 2	19 Feb 04	Critical parts list

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No. 52V11592

Report No. N/A

C Ellaby
Certification Officer

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Rake Lane, Eccleston, Chester, CH4 9JN, England

EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX2176X	Dated Re-issued	24 December 2002 15 October 2003
VARIATION NUMBER	3 (THREE)	Dated	17 August 2004

VARIATION TO EQUIPMENT

To permit:

1 The value of safety resistor R15 that is used in the biased toxic sensor to be increased from 1.0 kΩ to 4.7 kΩ.

DESCRIPTIVE DOCUMENTS

Drawing number	Rev	Sheet	Date	Description
TRPP-3653	5	1 to 2	22 Jul 94	Critical parts list

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No. 52V12254

Report No. R52V12254A

C Ellaby
Certification Officer

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England

EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX2176X	Dated Re-issued	24 December 2002 15 October 2003
VARIATION NUMBER	4 (FOUR)	Dated	10 February 2005

VARIATION TO EQUIPMENT

To permit:

1 The memory chip on the toxic bias, toxic, oxygen, flammable and thermal conductivity boards to be modified, in addition, related component and track changes are recognised.

DESCRIPTIVE DOCUMENTS

Drawing number	Sheet	Rev	Date	Description
TRP-1638-CD	1 of 1	4	21 Dec 04	Explosive PCB schematic
TRP-1639-CD	1 of 1	6	23 Dec 04	Toxic PCB schematic
TRP-1640-CD	1 of 1	8	Nov 04	Oxygen PCB schematic
TRP-1663-CD	1 of 1	8	Nov 04	Biased toxic PCB schematic
TRP-1688-A3	1 of 1	8	Jan 05	Biased toxic PCB artwork
TRP-2317-CD	1 of 1	5	05 Jan 05	Thermal conductivity PCB schematic

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No. 52V12894

Report No. R52V12894A

C Ellaby
Certification Officer

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England

EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX2176X	Dated Re-issued	24 December 2002 15 October 2003
VARIATION NUMBER	5 (FIVE)	Dated	9 May 2005

VARIATION TO EQUIPMENT

To permit:

1 The introduction of a new model with a modified keypad; this model is known as the 'Gaseeker IR' and is distributed under the trade name Telegan

DESCRIPTIVE DOCUMENTS

Drawing No	Sheet	Rev	Date	Description
P-5620-A2	1 of 1	B	Apr 05	Gaseeker IR membrane keypad detail
P-5621-A4	1 of 1	A	Apr 05	Certification label

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No. 52V13441

Report No. R52V13441A

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EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX2176X	Dated Re-issued	24 December 2002 15 October 2003
VARIATION NUMBER	6 (SIX)	Dated	7 October 2005

VARIATION TO EQUIPMENT

To permit:

1 Changes to capacitor values.
2 An additional condition of certification to be introduced to limit the build to only one IR module.

DESCRIPTIVE DOCUMENTS

Drawing No	Sheet	Rev	Date	Description
TRPP-3653	1 and 2	10	Sept 05	Triple+, Critical parts list
IRSM-5152-A3	1 of 1	2	Sept 05	IR Module Circuit Diagram
TRP-1636-CD	1 of 1	11	Sept 05	Main pcb circuit diagram

ADDITIONAL CONDITIONS OF CERTIFICATION

17.4 Only one IR module may be fitted in the equipment

File No. 52A14080

Report No. R52A14080A

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EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX2176X	Dated Re-issued	24 December 2002 15 October 2003
VARIATION NUMBER	7 (SEVEN)	Dated	11 October 2005

VARIATION TO EQUIPMENT

To permit:

1 An alternative battery to be used.
2 An alternative pump motor specification to be used.
3 Encapsulated fuse material correction.

DESCRIPTIVE DOCUMENTS

Drawing No	Sheet	Rev	Date	Description
TRPP-3652-A3	1 of 1	B	Aug 05	Triple +, Block diagram
TRPP-3653	1 and 2	9	Sept 05	Triple +, Critical parts list
P5109-A4	1 of 1	1	Oct 04	Fuse encapsulation details
TRP-1625-A4	1 of 1	7	Sept 05	Triple + Label
P-5621-A4	1 of 1	C	Sept 05	Gaseeker Label

ADDITIONAL CONDITIONS OF CERTIFICATION

17.5 A battery Type Sonnenschein A506/1.2S may be used as an alternative to those assessed in the original certification and subsequent variations.

File No. 52A13667

Report No. R52A1366/A

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EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX2176X	Dated Re-issued	24 December 2002 15 October 2003
VARIATION NUMBER	8 (EIGHT)	Dated	14 October 2005

VARIATION TO EQUIPMENT

To permit:

1 The name of the model known as the 'Gaseeker IR' to be changed to 'Gaseeker', this modification is detailed on previously certified drawing number P-5621-A4 revision C.

2 The membrane keypad colours to be changed.

3 The introduction of an additional drawing view on rear of label showing track details.

DESCRIPTIVE DOCUMENTS

Drawing No	Sheet	Rev	Date	Description
P-5620-A2	1 of 1	D	July 05	Membrane keypad detail

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No. 52A13810

Report No. R52A13667A

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CERTIFICATION

TYPE EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER Sira 02ATEX2176X

VARIATION NUMBER 9 (NINE)

Dated 24 December 2002
Re-issued 15 October 2003
Dated 23 May 2006

VARIATION TO EQUIPMENT

To permit:

1 Addition of 100k Ohm resistor to main PCB and minor drawing amendments

2 Addition of 100K ohm pull-up resistor to main PCB and correct connections of C24 and C26
Label drawing changed, removal of manufacture date from printed label
TRP-1688-PCA through to PCD brought together into one drawing

DESCRIPTIVE DOCUMENTS

Number	Sheet	Rev	Date (Sira stamp)	Description
TRP-1636-CD	1	12	04 May 06	Triple + Main PCB
TRP-3657-A4	1	2	04 May 06	Generic Certification Label (Triple Plus+)
TRP-3669-A3	1	1	04 May 06	Tripleplus + DCP 2114 Detail

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No. 52A15051

Report No. R52A15051A

D R Stubbings
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Form 9221 Issue 3

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VARIATION REPORT

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Checked: **P JWalsh**
Senior Certification Engineer

Date: November 2006

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Detective Multiple Gas Detector:
variation 10 to and re-issue of Sira 02ATEX2176X

Crowcon Detection Instruments Ltd

Report No: R52L15432B
Commercially in Confidence

Certificate Number:	Sira 02ATEX2176X	**Associated report:**	R52L15432A
Current certification code:	EEx ib d I EEx ib d IIC T4 T_a = -20°C to +40°C	**New certification code:**	Ex ib d IIC T4 T_a = -20°C to +50°C
Current standards:	EN 50014:1997 EN 50018:2000 EN 50020:2002	**New standards:**	IEC 60079-0:2000 IEC 60079-1:2003 IEC 60079-11:1999

1 PROPOSED MODIFICATIONS

To permit:

1 Increase in the upper ambient temperature to 50°C

2 Introduction of R2 on the thermal conductivity sensor board as a safety component

3 Changes in component size and associated track changes on sensor boards

4 Changes to the critical parts list

5 Revised certification marking drawing to include the IECEx certification information and removal of Group I certification coding

6 The product to also be referred to ass a Tank-Mate or a Gaseeker.

2 ASSESSMENT

The ATEX certificate was based on an upgrade of a pre-ATEX certificate. As a requirement for IECEx certification, the ATEX prime certificate and all subsequent variations (including this one) were incorporated into the IECEx certification; this required the circuit to be reassessed from first principles against the relevant IEC standards. **The associated report is R52L15432A and this report should be taken as the primary assessment report for both IECEx and ATEX certification.** The drawing lists for IECEx and ATEX are identical. For simplicity, therefore, the ATEX certificate should be re-issued.

Modifications 1 has been requested by Crowcon. The remaining modifications were required for IECEx certification (see report R52L15432A). The assessments below are incorporated into R52L15432A but, where further explanations are required, these have been given. However, the assessments in sections 2.1 and following are not an essential part of the assessment, which is entirely covered in R52L15432A.

2.1 Increase in the upper ambient temperature to 50°C

This is assessed in report R52L15432A section 3.3. The following boards were modified to meet IECEx requirements:

1 bias toxic module board
2 toxic module board
3 oxygen module board
4 flammable ('explosive') module board

This was necessary because a more onerous value of thermal resistance was used for the IECEx certification based on recent test results. The ATEX certification was based on older test data no longer eligible for inclusion in IECEx assessments. However, for ATEX certification, the thermal resistance for 1206 and SoT23 devices used (175 K/W) is still appropriate and allows a T4 temperature class at 50°C ambient for power up to 1.2W:

$$[(175 \times 1.2) + 50 + 5] = 265°C$$

A safety component (R2) has been introduced into the thermal conductivity board, but this is for the purpose of protecting 1206-size resistors, so is not required for ATEX certification.

Therefore, these boards manufactured to the original design remain compatible with a T4 temperature class at the higher ambient, since the lower value of thermal resistance is acceptable for ATEX. This is reflected in a condition of certification in section 5 and permits Crowcon to use up existing stock.

2.2 Introduction of R2 on the thermal conductivity sensor board as a safety component

R2 is introduced as a safety component to protect certain low-value 1206-package devices for the reasons detailed in the previous section.

2.3 Changes in component size and associated track changes on sensor boards

Package sizes have been changed for the reason given in section 2.1 above; the artwork changes reflect this. This has no effect on compliance and the new sensor boards may be used in the existing Triple Plus device.

2.4 Changes to the critical parts list

The parts list has been updated and has been assigned jointly as the /ATEXIECEx critical parts list. There are a number of changes to this drawing, as a result of the changes listed above, all of which are evaluated in report R52L15432A.

2.5 Revised certification marking drawing to include the IECEx certificate number

The ATEX marking is changed as follows:

1 The upper ambient is raised to +50°C

2 'EEx' is replaced by 'Ex'; this is permitted by EN 60079-0:2004 and, although the Triple Plus+ is certified against an earlier issue of the General Requirements, the marking remains clear.

3 The Group I marking is removed, in accordance with a decision by the manufacturer.

3 **TESTS**: no tests were conducted as part of this project, but see R52L15432A Appendix B.

4 **MARKING:** The certification marking drawing applies to both IECEx and ATEX certification and indicates the increased ambient range.

5 **CONDITIONS OF CERTIFICATION:** The conditions are as follows:

The following condition replaces the existing condition relating to previously certified products:

The Junction Boxes 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 the Junction Boxes.

The following condition is new:

The following sub-assemblies covered by certification drawings to the previous production issues may also be used in the Triple Plus+:

- Oxygen Module Board
- Toxic Module Board
- Bias Toxic Module Board
- Flammable ('Explosive') Module Board
- Thermal Conductivity Module Board
- Infra-Red Module

sira
CERTIFICATION

6 **SPECIAL CONDITIONS FOR SAFE USE:** The conditions are as given in R52L15432A.

7 **DESCRIPTIVE DOCUMENTS:** reference report R52L15432A.

8 **ASSESSMENT AGAINST ATEX DIRECTIVE:** the modifications permit continuing compliance.

9 **INSTRUCTIONS:** the modifications do not require a change to that part of the manufacturer's instruction manual dealing with explosion safety apart from an up-date of the marking information. Crowcon have confirmed that the instructions will be revised to include the dual IECEx/ATEX marking.

10 **CONCLUSION:** this assessment indicates that the modifications detailed permit continued compliance with the listed standards.