1 **EC TYPE-EXAMINATION CERTIFICATE**

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

3 Certificate Number: Sira 03ATEX2102

4 Equipment: Detective+ Gas Detector

5 Applicant: Crowcon Detection Instruments Limited

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 R52A14778A.

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 + Amds 1 & 2
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:

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

Project Number 52A14778
Date 27 June 2003
Latest Issue 24 October 2006
C. Index 14

C Ellaby
Certification Officer

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Reissued 24 October 2006 to incorporate the changes described in report number R52A14778A, as a result variations 1 to 6 dated 22 September 2003, 8 December 2003, 23 February 2004, 11 October 2005, 26 January 2006 and 7 March 2006 respectively, together with their associated reports including report number R52A9051A, are not required.

13 DESCRIPTION OF EQUIPMENT

The Detective+ is a battery powered, transportable, multiple gas detector. There are various possible combinations of oxygen, toxic, biased toxic, thermal conductivity, flammable and infra-red sensors. A cluster of LEDs mounted on top of the instrument and an audible sounder provide alarm status. A continuous display is provided on an LCD panel mounted on the side of the instrument. The circuits are housed within an ABS enclosure, which is mounted within a steel tripod. The electronic circuits are located on two main circuit boards, with up to four daughter boards located adjacent to the gas sensors. The oxygen and toxic sensors are electrochemical and the thermal conductivity and flammable sensors are flameproof component-certified devices.

The unit is supplied from two internal battery packs each containing two 6 V lead-acid batteries and has an integral charger that may be connected to a 110 Vac or 240 Vac mains supply, depending on the factory setting of the supply voltage. Charging or replacement of the batteries is only permitted in a non-hazardous area. The unit also has a single rechargeable 2.4V back-up cell.

The Detective+ incorporates a data logger and has an RS232 port for connection to a computer interface for the downloading of data when in the non-hazardous area. A single unit can be used alone or a number linked together via the two four-pin DIN sockets located on the back of the instrument, thus providing protection for a larger area. The safety description for these interface socket is as follows:

	Intrinsically safe		**Non-intrinsically safe**
	Second Detective+ (JP6 1-3)	**Third Detective+ (JP6 4-6)**	**Computer RS232 (safe area) (JP6 9-12)**
U_i	7.05 V	7.05 V	±25 V o/c
I_i	18 mA	18 mA	
P_i	0.028 W	0.028 W	120 mW
C_i	0	0	-
L_i	0	0	-
U_o	7.05 V	7.05 V	-
I_o	18 mA	18 mA	-
P_o	0.028 W	0.028 W	-

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE Sira 03ATEX2102

14 **DESCRIPTIVE DOCUMENTS**

14.1

Drawing No.	Sheet	Rev.	Date yyyy/mm/dd	Description
DTV-1904	1 to 3	10	2006/10/06	Detective main PCB artwork
DTV-1905	1 to 2	5	2006/06/21	Voltage converter board solder side
DTV-1924-A2	1 to 2	12	2006/10	General arrangement & block diagram
DTV-1931-A2	1 of 1	3	1995/10	Battery assembly
DTV-1932-CD	1 to 2	17	2006/09	Detective main PCB schematic
DTV-1933-CD	1 of 1	7	2003/04	Voltage converter PCB schematic
DTV-1937-A3	1 of 1	4	2003/07	Converter PCB potting
DTV-2332-A3	1 of 1	3	2003/04	Interface socket label
DTV-3615-A1	1 of 1	3	2005/10	General assembly
DTVP-3244-A2	1 of 1	3	2006/04	Detective +, membrane keypad detail
DTVP-5640-A3	1 of 1	4	2006/04	IECEx certification label
DTVP-5649-A4	1 of 1	5	2006/10	Detective+ battery lead assembly
DTVP-5681	1 of 3	1	2006/03/06	Detective+ LED board schematic
DTVP-5681	2 of 3	1	2006/03/06	Detective+ LED board schematic
DTVP-5662-A4	1 to 3	1	2006/10/11	Detective+ IECEx critical parts list
IRSM-5152-A3	1 of 1	2	2005/09	IR PCB schematic
P5109-A4	1 of 1	1	2004/10	Fuse encapsulation details
TRP-1630-CL	1 of 1	9	2002/11	Triple+ PCB layer 1 silkscreen
TRP-1630-PCA	1 of 1	9	2002/11	Triple+ PCB layer 1 artwork
TRP-1630-PCB	1 of 1	9	2002/11	Triple+ PCB layer 2 artwork
TRP-1630-PCC	1 of 1	9	2002/11	Triple+ PCB layer 3 artwork
TRP-1630-PCD	1 of 1	9	2002/11	Triple+ PCB layer 4 artwork
TRP-1630-SS	1 of 1	9	2002/11	Triple+ PCB Silk Screen
TRP-1636-CD	1 of 1	12	2006/04/21	Triple+ PCB schematic
TRP-1638-CD	1 of 1	4	2004/12/21	Triple+ Flammable Sensor schematic
TRP-1639-CD	1 of 1	6	2004/12/23	Toxic PCB schematic
TRP-1640-CD	1 of 1	8	2005/01/05	Oxygen PCB schematic
TRP-1663-CD	1 of 1	8	2005/01/05	Biased toxic PCB schematic
TRP-1688-A3	1 of 1	8	2005/01/05	Biased toxic PCB ARTWORK
TRP-2317-CD	1 of 1	5	2005/01/05	Thermal conductivity PCB schematic
TRP-3665-A3	1 of 1	1	2001/13	Thermal conductivity sensor artwork
TRP-3669-A3	1 of 1	1	2006/04	Triple + Main Board Rework Detail

14.2 Report number R52A14778A

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SCHEDULE

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Sira 03ATEX2102

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

None

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 R52A14778A.

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 Gas Detectors 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 Gas Detectors.

17.4 The equipment shall only be fitted with one IR Module.

17.5 If a suitably-certified sounder is fitted, it shall be compatible the Detective+ connection port, which has the following safety description:

U_i = 0
U_o = 27.3 V
I_o = 0.047 A
P_o = 0.154 W
C_o = 88 nF
L_o = 16.095 mH

17.6 The charging voltage shall be adjusted at manufacture so as not to exceed 7.35 V at the battery connection to the 6V line.

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

- Detective main board
- Bias toxic module board
- Toxic module board
- Oxygen module board
- Flammable ('explosive') module board
- Thermal conductivity module board

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