



1 **EC TYPE-EXAMINATION CERTIFICATE**

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

3 Certificate Number: **Sira 10ATEX1089X** Issue: **1**

4 Equipment: **Toxic Gas Detectors - Models OI-5900, OI-6000, OI-6900 and OI-7000**

5 Applicant: **Otis Instruments Incorporated**

6 Address: **2200 East Villa Maria  
Bryan  
Texas 77802  
USA**

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 60079-0:2006          EN 60079-1:2007          EN 60079-11:2007          EN 60079-18:2004

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 (1) G  
Ex d mb [ia] IIB T6  
(Ta = -40°C to +54°C)

D R Stubbings BA MIET  
Certification Manager

Project Number 26904

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## SCHEDULE

### EC TYPE-EXAMINATION CERTIFICATE

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#### 13 DESCRIPTION OF EQUIPMENT

These toxic Gas Detectors comprise two, integral, explosion proof enclosures, a main enclosure (OI-4000) and a sensor enclosure (OI-2000) that threads into the OI-4000 enclosure through one of three 3/4" – 14 NPT entries. Models OI-5900, OI-6000 and OI-7000 are DC powered by means of wire connection and Model OI-6900 is battery powered by a non-rechargeable, 3.6 V, Lithium D-Cell. All models can be provided with an optional (920 MHz or 2.4 GHz) radio PWB/antenna coupler.

The OI-4000 is a cylindrical, explosion proof, aluminium alloy enclosure with an internal volume of 537 cm<sup>3</sup> and includes three entries marked 3/4" -14 NPT, a base plate that threads into the body and a cemented window cover which threads to the top of the enclosure. The base plate is secured with a threadlocking material and the cover is secured using an M4, 0.7 mm pitch, 6 mm long, stainless steel, socket cap screw. A bracket mounting plate is secured to the base of the enclosure body using three, #10-32, 1/2" long, stainless steel screws. The outside of the cover housing and outside of the body and base plate of the enclosure are powder coated. This enclosure houses two, PWBs, a control PWB (circular PWB) with an LCD display and either a relay or relay/radio board (rectangular PWB) depending on the configuration. The relay or relay/radio board mounts perpendicular to the control PWB and is secured using L brackets. The PWB assembly is secured in the enclosure using three, banana plugs/posts screwed in the base plate. If the radio option is used, an antenna coupler (AXF3S0107X 920MHz to 2.4GHz), certified to DNV-2006-OSL-ATEX-0183U, marked Ex d mb [ia] IIC and rated 250 VDC; 250 V, 50/60 Hz with an output of 2 W maximum, is screwed into one of the three 3/4" – 14 NPT entries.

The OI-2000 is a cylindrical explosion proof enclosure with an internal volume of 70 cm<sup>3</sup>, it includes a base and cap manufactured from stainless steel and incorporates a stainless steel flame arrestor press fitted into the cap. The cap and base are secured together with a threadlocking material and the base incorporates an integral cable which is potted with an epoxy potting compound. This enclosure houses a sensor PWB and is electrically connected to the control board by means of a ribbon cable.

The Model OI-5900 uses the same electronics as the Model OI-6000, but incorporates a 4-20 mA board. The Model OI-7000 and OI-6000 use the same identical control board but incorporate different firmware.

The OI-6900 Model is fitted with a battery having the following details:

D-Cell: Lithium-Thionyl Chloride (Li-SOC12)  
Rated Voltage: 3.6V  
Nominal Cap: 19Ah @ 4mA, to 2V  
Certification: U.L. Component Recognition, MH 12193

Antennas in accordance with drawings S181AH-245OS and S467XX-915S may be connected directly to the Antenna Coupler.

**Variation 1** - This variation introduced the following changes:

- i. The introduction of a new LCD display screen and associated components was approved.
- ii. The introduction of an alternative Antenna Coupler was endorsed.
- iii. An alternative battery, 3.6V Primary D-Cell Lithium Thionyl Chloride; Ratings 19Ahr @ 5mA, to 2V, was approved for use.

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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 number	Comment
0	12 January 2011	R21916A/00	The release of the prime certificate.
1	27 March 2012	R26904A/00	The introduction of Variation 1.

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

15.1 When the equipment is supplied with a non-metallic aerial [antenna] connected to the antenna coupler, this aerial shall only be cleaned only with a damp cloth.

15.2 The equipment shall be installed in such a way that the OI-2000 sensor housing is pointing down towards the ground.

**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.

# Certificate Annexe



Certificate Number: Sira 10ATEX1089X  
 Equipment: Toxic Gas Detectors - Models OI-5900, OI-6000, OI-6900 and OI-7000  
 Applicant: Otis Instruments Incorporated

## Issue 0

Drawing No	Sheets	Rev	Date (Sira stamp)	Title
163-201-147	1 of 1	0	31 Aug 10	Extrusion Cover BH Housing
201-236-01	1 of 1	0	31 Aug 10	Aluminium Specifications
208-241-01	1 to 2	A1	31 Aug 10	Enclosure, Machined OEM-OTIS
208-241-02	1 of 1	B1	31 Aug 10	Base Plate, Plain OEM-OTIS
208-241-03	1 of 1	0	31 Aug 10	Enclosure Assembly OEM-OTIS
Moore_Set_Screw	1 of 1	0	31 Aug 10	Moore_Set_Screw – Mechanical
205-231-06	1 of 1	0	31 Aug 10	Cover Plug, Glass BH Housing
205-247-07	1 of 1	0	31 Aug 10	Retaining Ring, BH Housing
205-247-08	1 of 1	0	31 Aug 10	Cover, Painted BH Housing
205-247-09	1 of 1	0	31 Aug 10	Cover Assembly, Glass, THZ-BH
208-241-00	1 to 3	C	31 Aug 10	Enclosure Top, Assembly, OEM-OTIS
208-241-00-Tolerance	1 of 1	0	31 Aug 10	Tolerance Analysis
15593000600	1 of 1	J	31 Aug 10	TL-5930/F Battery
OI-4000-Exploded	1 of 1	0	31 Aug 10	OI-4000 Enclosure Exploded View
OI-XXXX_Exploded	1 of 1	0	31 Aug 10	PCB Options – Exploded View
1-002001	1 of 1	0	31 Aug 10	OI-4000 CSA/ATEX Label
3-000147	1 to 10	1.1	31 Aug 10	Guidelines for Gen II Ex Equipment (OI-6000, OI-6900, OI-5900, OI-7000) Manual
2-390111	1 of 1	0	06 Jan 10	SCH-GEN II 900MHz 4-20mA BD
BOM 2-390111	1 of 1	0	06 Jan 10	BOM
2-390040	1 of 1	3	06 Jan 10	SCH-GEN II 2.4GHz BD
BOM 2-390040	1 of 1	3	06 Jan 10	BOM
2-390037	1 of 1	3	06 Jan 10	SCH-GEN II 900 MHz BD
BOM 2-390037	1 of 1	3	06 Jan 10	BOM
2-390034	1 to 4	5	06 Jan 10	SCH-GEN II 2.4GHz RADIO-RELAY BD
BOM 2-390034	1 of 1	5	06 Jan 10	BOM
2-390030	1 to 4	5	06 Jan 10	SCH-GEN II 900 MHz RADIO-RELAY BD
BOM 2-390030	1 of 1	5	06 Jan 10	BOM
2-390023	1 to 5	5	06 Jan 10	SCH-390 BATT-PWR CONTROL BD
BOM 2-390023	1 of 1	5	06 Jan 10	BOM
2-390002	1 of 7	2.1	06 Jan 10	SCH-GEN II CONTROL WIRED-PWR BD
2-390002	2 of 7	2.1	06 Jan 10	SCH-GEN II CONTROL WIRED-PWR BD
2-390002	3 of 7	2.1a	06 Jan 10	SCH-GEN II CONTROL WIRED-PWR BD
2-390002	4 of 7	2.1	06 Jan 10	SCH-GEN II CONTROL WIRED-PWR BD
2-390002	5 of 7	2.1	06 Jan 10	SCH-GEN II CONTROL WIRED-PWR BD
2-390002	6 of 7	2.1	06 Jan 10	SCH-GEN II CONTROL WIRED-PWR BD
2-390002	7 to 7	2.1	06 Jan 10	SCH-GEN II CONTROL WIRED-PWR BD
BOM 2-390002	1 to 2	2.1	06 Jan 10	BOM
S467XX-915S	1 to 2	N/A	31 Aug 10	900MHz-ISM Band Swivel Antenna-467 model
S181AH-245OS	1 of 1	N/A	31 Aug 10	2.4GHz Swivel Antenna 181 Model
3-000066	1 of 1	1.0	31 Aug 10	Gen II Radio Power
2-390002_BL	1 of 1	0	31 Aug 10	2-390002 Board Layout
2-390023_BL	1 of 1	0	31 Aug 10	2-390023 Board Layout
2-390030_BL	1 of 1	0	31 Aug 10	2-390030 Board Layout
2-390034_BL	1 of 1	0	31 Aug 10	2-390034 Board Layout

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## Sira Certification Service

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# Certificate Annexe

Certificate Number: Sira 10ATEX1089X  
 Equipment: Toxic Gas Detectors - Models OI-5900,  
 OI-6000, OI-6900 and OI-7000  
 Applicant: Otis Instruments Incorporated



Drawing No	Sheets	Rev	Date (Sira stamp)	Title
2-390037_BL	1 of 1	0	31 Aug 10	2-390037 Board Layout
2-390040_BL	1 of 1	0	31 Aug 10	2-390040 Board Layout
2-390111_BL	1 of 1	0	31 Aug 10	2-390111 Board Layout
OI-2000-Base (H00147)	1 of 1	1.4	31 Aug 10	CHS-GEN II Sensor Housing Base
H00148	1 of 1	1.7	06 Jan 10	GEN 2 - Sensor Housing Cap
OI-2000-Base-Potting	1 of 1	0	31 Aug 10	Potting Diagram
3-000152	1 of 1	1.0	31 Aug 10	Proceedure-2000 Ex Potting
OI-2000_Assembled	1 of 1	0	31 Aug 10	Sensor Housing-Exploded View
3-000070	1 of 1	1.0	31 Aug 10	Gen II Flame Arrestor/Sensor Housing Evaluation
OI-390-FA(1-001040)	1 of 1	0	31 Aug 10	Flame Arrestor
2-390108	1 of 1	2	31 Aug 10	SCH-GEN II SENSOR ANALOG LOW POWER EC BD
BOM 2-390108	1 of 1	2	06 Jan 10	BOM
2-390105	1 of 1	1	06 Jan 10	SCH-GEN II SENSOR DIGITAL LOW POWER BD
BOM 2-390105	1 of 1	1	06 Jan 10	BOM
2-390017	1 of 1	0	06 Jan 10	SCH-390 SENSOR ANALOG MOS BD
BOM 2-390017	1 of 1	0	06 Jan 10	BOM
2-390011	1 of 1	2	06 Jan 10	SCH-390-SENSOR ANALOG IR BD
BOM 2-390011	1 of 1	2	06 Jan 10	BOM
2-390005	1 of 1	6	06 Jan 10	SCH-390-SENSOR DIGITAL BD
BOM 2-390005	1 of 1	6	06 Jan 10	BOM
2-390005_BL	1 of 1	0	31 Aug 10	2-390005 Board Layout
2-390011_BL	1 of 1	0	31 Aug 10	2-390011 Board Layout
2-390017_BL	1 of 1	0	31 Aug 10	2-390017 Board Layout
2-390105_BL	1 of 1	0	31 Aug 10	2-390105 Board Layout
2-390108_BL	1 of 1	0	31 Aug 10	2-390108 Board Layout

## Issue 1

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
2-390034	1 to 4	8	22 Mar 12	SCH-GEN II 2.4GHz Radio Relay BD
2-390032	1 of 1	8	22 Mar 12	BOM (2.4GHz Radio Relay BD)
2-390040	1 of 1	4	22 Mar 12	SCH-GEN II 2.4GHz BD
2-390038	1 of 1	4	22 Mar 12	BOM (GEN II 2.4GHz BD)
2-390020	1 of 1	2.1	22 Mar 12	SCH-390 Sensor Analog PID BD
2-390020	1 of 1	2.1	22 Mar 12	BOM (Analog PID Board)
2-390117	1 of 1	0	22 Mar 12	SCH-GEN II sensor analog Oxygen Board
2-390115	1 of 1	0	22 Mar 12	BOM (SCH-GEN II sensor analog Oxygen Board)
2-390023	1 to 5	7.4	22 Mar 12	SCH-390 BATT-PWR CONTROL BD
2-390021	1 of 1	7.4	22 Mar 12	BOM (SCH-390 BATT-PWR CONTROL BD)
2-390002	1 to 7	3.2	22 Mar 12	SCH-GEN II CONTROL WIRED-PWR BD
2-390000	1 to 2	3.2	22 Mar 12	BOM (GEN II CONTROL WIRED-PWR BD)

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