



# 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 SIR 13.0069X** issue No.: **0** Certificate history: .....

Status: **Current**

Date of Issue: **2013-04-19** Page 1 of 4

Applicant: **Spectrex Limited**  
218 Little Falls Road  
Cedar Grove  
New Jersey 07009  
United States of America

Electrical Apparatus: **Open Path Gas Detector and SafEye Quasar 900**  
Optional accessory:

Type of Protection: **Flameproof, Increased Safety, Intrinsic Safety and Dust Protection by Enclosure**

Marking: **Ex d e ib [ib Gb] IIB + H<sub>2</sub> T4 Gb**  
**Ex tb IIIC T135°C Db**  
**Ta = -55°C to +65°C**

Approved for issue on behalf of the IECEx Certification Body: **A C Smith**

Position: **Certification Manager**

Signature:  
(for printed version)

  
2013-04-19

Date:

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](http://www.iecex.com).

Certificate issued by:

**SIRA Certification Service**  
**Rake Lane**  
**Eccleston**  
**Chester**  
**CH4 9JN**  
**United Kingdom**

**sira**  
CERTIFICATION



# IECEX Certificate of Conformity

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Manufacturer: **Spectrex Limited**  
218 Little Falls Road  
Cedar Grove  
New Jersey 07009  
**United States of America**

Additional Manufacturing location  
(s):

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 : 2007-10</b> Edition: 5	Explosive atmospheres - Part 0: Equipment - General requirements
<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 60079-31 : 2008</b> Edition: 1	Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure 't'
<b>IEC 60079-7 : 2006-07</b> Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*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/ExTR13.0101/00](#)

##### Quality Assessment Report:

[GB/SIR/QAR08.0002/03](#)



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## Schedule

### EQUIPMENT:

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

Refer to the Annexe for the description and Conditions of Manufacture

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

Refer to EQUIPMENT (continued)



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## EQUIPMENT(continued):

1. The dimensions of the flameproof joints are other than the relevant minimum or maximum values required by table 2 of IEC 60079-1:2007/EN 60079-1:2007 for IIB + H<sub>2</sub>, as detailed below

Flamepath Description	Type of joint	Minimum Width 'L' (mm)	Maximum Gap iC (mm)
Cylindrical section of spigot (both ends of Ex d compartment)	Cylindrical	15	0.08
30 mm diameter window fitted against enclosure	Flanged	10.7	0.02
39.5 mm diameter window fitted against enclosure	Flanged	10	0.02

- Gaps shall not be machined to be any larger than the values of 'i<sub>C</sub>', and widths shall not be modified to be any smaller than the values of 'L', shown in the table above
2. Connections to the I.S. port on the side of the detector enclosure shall be made via equipment which maintains the intrinsically safe levels of protection.
3. Where Um marked on the associated apparatus is less than 250V it shall be installed in accordance with one of the following:
- Where Um does not exceed 50Vac or 120Vdc, in a SELV or PELV system or,
  - Via a safety isolating transformer complying with the requirements of IEC 61588-2-6 or technically equivalent standard, or
  - Directly connected to apparatus complying with IEC 60950, IEC 61010-1, or technically equivalent standard, or
  - Fed directly from cells or batteries

**Annexe to:** IECEx SIR 13.0069X Issue 0  
**Applicant:** Spectrex Limited  
**Apparatus:** Open Path Gas Detector  
SafEye Quasar 900



The SafEye Quasar 900 Series Open Path Gas Detector, consists of four source units and one type of detector with electrical ratings as follows:

Type	Model No.	Voltage Supply Range	Peak Supply Current
Detector	QR-C-11X	18 - 32 Vdc	200 mA
Source 1	QT-C-11X	18 - 32 Vdc	220 mA
Source 2	QT-C-21X	18 - 32 Vdc	220 mA
Source 3	QT-C-31X	18 - 32 Vdc	220 mA
Source 4	QT-C-41X	18 - 32 Vdc	260 mA

The Quasar 900 Series includes four models each using the same detector with a different source to provide the ability to detect at distances of 7 - 200m.



The enclosure used for both the source and detector units of, is of cylindrical construction, made of stainless steel and has two separate chambers; one flameproof and one increased safety. The equipment is shown below in a typical mounting arrangement.

At one end of the flameproof chamber there is an end cap secured with four screws forming a spigot joint with the main enclosure. This end cap has a sapphire window in the centre which is secured from the inside with a retaining ring screwed to the enclosure; this window forms a flanged joint against the enclosure. Externally, there is a hood above the sapphire window and a permanent guard.

There is a spigot joint at the opposite end of the flameproof enclosure, formed by another end cap, with identical flamepath dimensions as those at the sapphire window end. The other side of this end cap forms part of the increased safety chamber. The two spigot joints are each secured by four M6 x 1.0 stainless steel socket head cap screws which have a minimum yield stress of 344 N/mm<sup>2</sup>.

The base of the increased safety enclosure protrudes from the flameproof enclosure end cap, has two ¾" NPT or M25 threaded entries on one side and a 3 5/8" parallel thread on the end, to which a threaded cover is attached. This threaded cover has a glass window secured from the inside by a threaded retaining ring.

The flameproof and increased safety chambers are separated by a partition with a cylindrical section filled with a non-metallic compound forming a bushing, through which there are cables for the connection of circuits between the two chambers.

Inside the flameproof chamber there are a range of PCBs, including some I.S. barriers. The outputs of these I.S. barriers are fed to an LED situated in the increased safety enclosure and on the detector units, to the I.S. port mounted on the side of the enclosure. There are also some component approved increased safety terminals inside the increased safety enclosure for connection to circuits in the flameproof enclosure and to external circuits.

The area behind the I.S. connector port is filled with non-metallic compound and forms a cemented joint. The outputs from the I.S. port are fed from the I.S. barriers and are therefore intrinsically safe.

All joints on which dust protection by enclosure depends are fitted with ethylene propylene O-rings.

**Annexe to:** IECEx SIR 13.0069X Issue 0  
**Applicant:** Spectrex Limited  
**Apparatus:** Open Path Gas Detector  
SafEye Quasar 900



The gas detectors meet level of protection IP6X and have been independently tested according to the requirements of IEC/EN 60529 to meet IPX6.

The interface board located in the equipment provides intrinsically safe outputs. The maximum voltage that can be applied to the interface board is  $U_m=32V$ .

Intrinsically safe outputs have the following parameters:-

Parameter		Channel						
		LED 1	LED 2	HART CON	RS485 +	RS485 -	5V	All combined
Uo	=	6.51V	6.51V	6.51V	6.51V	6.51V	6.51V	6.51V
Io	=	68.5mA	68.5mA	68.5mA	68.5mA	68.5mA	263mA	605.5mA
Po	=	111.5mW	111.5mW	111.5mW	111.5mW	111.5mW	428mW	0.986W
Ci	=	0 $\mu$ F	0 $\mu$ F	0 $\mu$ F	0 $\mu$ F	0 $\mu$ F	0 $\mu$ F	0 $\mu$ F
Li	=	0 $\mu$ H	0 $\mu$ H	0 $\mu$ H	0 $\mu$ H	0 $\mu$ H	0 $\mu$ H	0 $\mu$ H

These outputs connect to circuits external to the Ex d enclosure.

### Conditions Of Manufacture

- i. Each unit shall be subjected to a dielectric strength test in accordance with IEC 60079-7:2006 clause 6.1 for at least 1 second. Alternatively,  $1.2 \times$  the test voltage may be applied and maintained for at least 100 ms.
- i. The window section of each enclosure shall be subjected to a routine overpressure test at 31 bar for at least 10 s as required by clause 16.1 of IEC 60079-1:2007. There shall be no damage to the window.
- ii. The manufacturer shall provide the user/installer with an appropriate copy of the certificate for each component approved device that is fitted in the equipment.
- iii. The end user shall not have the option to change the settings of the software such that there will be an increase in power dissipation/current consumption beyond that of the models listed on the certificate.