



# IECEx Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: **IECEx ITS 20.0050X** Page 1 of 3 [Certificate history:](#)

Status: **Current** Issue No: 0

Date of Issue: 2020-10-15

Applicant: **KAISER OPTICAL SYSTEMS, INC.**  
371 Parkland Plaza  
Ann Arbor  
MI 48103  
USA  
**United States of America**

Equipment: **RXN2, RXN3 and RXN4 Analyzers including IoT versions**

Optional accessory:

Type of Protection: **Intrinsic Safety, Optical Radiation**

Marking: Ex [ia Ga] [op sh Gb] IIC  
IECEx ITS 20.0050X

Approved for issue on behalf of the IECEx  
Certification Body:

**Mark Newman**

Position:

**Certificate Officer**

Signature:  
(for printed version)

Date:

\_\_\_\_\_  
\_\_\_\_\_

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Certificate issued by:

**Intertek Testing & Certification Limited**  
**ITS House, Cleeve Road**  
**Leatherhead**  
**Surrey, KT22 7SA**  
**United Kingdom**

**intertek**



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Certificate No.: **IECEx ITS 20.0050X**

Page 2 of 3

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Manufacturer: **KAISER OPTICAL SYSTEMS, INC.**  
371 Park Land Plaza  
Ann Arbor  
MI 48103.  
**United States of America**

Additional  
manufacturing  
locations:

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 equipment 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

**IEC 60079-0:2017** Explosive atmospheres - Part 0: Equipment - General requirements  
Edition:7.0

**IEC 60079-11:2011** Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"  
Edition:6.0

**IEC 60079-28:2015** Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation  
Edition:2

This Certificate **does not** indicate compliance with 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/ITS/ExTR20.0040/00](#)

Quality Assessment Report:

[DE/TUR/QAR11.0001/03](#)



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Certificate No.: **IECEx ITS 20.0050X**

Page 3 of 3

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## EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The Kaiser Optical Systems, Inc. RXN2 RXN3 and RXN4 Analyzers consists of an enclosure fabricated from steel (painted mild steel or stainless steel) for location in a non-hazardous location housing a computer controlled spectrometer and laser for the purpose of on-line analysis of chemical processes. The enclosure may be free-standing or rack-mounted. The system provides intrinsically safe and protected optical source for connection to a probe in contact with a process in the hazardous area.

The optical fibre is protected by an intrinsically safe optical fibre breakage mechanism that is suitable for EPL Gb applications. Laser power control is suitable for use in EPL Ga applications.

Interlock Loop IS Parameters:

$U_o = 9.6 \text{ V dc}$   
 $I_o = 9.7 \text{ mA}$   
 $P_o = 23.2 \text{ mW}$   
 $C_o = 3.6 \mu\text{F}$   
 $L_o = 330 \text{ mH}$   
 $L/R \text{ Ratio} = 1.53 \text{ mH}/\Omega$

## SPECIFIC CONDITIONS OF USE: YES as shown below:

1. The fibre optic cable linking the laser output to the pilot probe shall be installed so that the minimum bend radius specified by the cable manufacturer is not exceeded.
2. Where it is necessary to monitor the process level to ensure that the optical beam is not exposed to a potentially explosive atmosphere, the devices used to monitor the level shall be intrinsically safe or classed as simple apparatus, and be installed so as to provide a fault tolerance of 2 for EPL Ga equipment or a fault tolerance on 1 for EPL Gb equipment. The functional safety of this arrangement has not been assessed as part of this certification and it is the responsibility of the installer / user to ensure that an appropriate mechanism is in place.
3. Where IS Galvanic Isolators are added to the main enclosure in order to produce IS signals to external apparatus not covered by this certification, the IS galvanic Isolators shall have an ambient working temperature upper limit of at least 55°C. The IS parameters pertaining to these isolators shall be conveyed to the user in an appropriate manner. The IS nature of any such circuits has not been assessed as part of this certification and this certificate is not to be taken as indication that these IS circuits comply with relevant requirements.

## Annex:

[Annex for IECEx Certificate of Conformity IECEx ITS 20.0050X Issue 0.pdf](#)



## Annex to IECEx Certificate of Conformity

<b>Certificate No:</b>	IECEX ITS 20.0050X	<b>Issue No. 0</b>
<b>Annex No. 1</b>		

Technical Documents			
Title:	Drawing No.:	Rev. Level:	Date:
RXN2, 4 CHANNEL, ATEX KIT	2012000	X2	12-20-2016
RXN4, ATEX KIT	2011685	X3	12-19-2016
Assembly, RXN3L, ATEX KIT	2012006	X1	07-26-2010
Block diagram, laser and AC power interlocks	2009234	R5	07-16-2010
Jumper, interlock	2007871-101	R2	12-02-2005
Integrated Invictus Interlock System	2011965	X7	03-09-2012
Laser Power control and safety interlock	4002017	X1	06-04-2009
Safety statement, RXN Invictus Laser, IS barrier, Interlock connector and probe system.	4002019	X1	06-07-2009
*IECEX Label, Base Non-Haz Zone Schematic	4005059	R2	2020-09-23
*RXN Interlock System, Laser Power Interlock, GEN II CSM	2013443	X2	2020-09-25

Item	Description	Manufacturer	Certificate No. / Standards
1	Galvanic Isolator	GM International	IECEX BVS 07.0027X IEC 60079-0 Ed.6 IEC 60079-11 Ed.6
2	Galvanic Isolator	Stahl	IECEX BVS 09.0041X IEC 60079-0 Ed.6 IEC 60079-11 Ed.6

Required Manufacturer Routine Testing		
Test	Title/Description of Test	Standard and Clause
1	The laser power interlock and fibre-breakage interlock systems operation shall be verified.	