

# EU TYPE-EXAMINATION CERTIFICATE

1. EU type-examination Certificate (Module B)
2. Equipment or Protective System intended for use in potentially explosive atmospheres (Directive 2014/34/EU)



3. EU type examination certificate Nr **ITS11ATEX17307X R.0**

4. **Product:** Optograf / RXN5 RAMAN Analyser

5. **Manufacturer:** KAISER OPTICAL SYSTEMS, INC.

**Applicant:** KAISER OPTICAL SYSTEMS, INC.

6. **Address:** 371 Parkland Plaza  
Ann Arbor  
MI 48103, USA

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7. This product and any acceptable variation thereto are specified in the schedule to this certificate and therein referred to.

8. INTERTEK ITALIA S.p.A., Notified Body n° 2575 in accordance with article 17 of the Directive 2014/34/EU of the European Parliament and Council of the 26 February 2014, certifies that the equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmosphere, given in Annex II of the Directive.

The examination and tests results are recorded in confidential technical evaluation Intertek Report Nr. 103806740LHD-003 Issue 0 dated 24<sup>th</sup> September 2021.

9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN IEC 60079-0:2018, EN 60079-2:2014, EN IEC 60079-7:2015+A1:2018, EN 60079-11:2012, EN 60079-28:2015 and EN 50495:2010 except in respect of those requirements referred to at item 16 of the Schedule.

10. If the sign X is placed after the certificate number, it indicates that the product is subject to Special Conditions for Safe Use specified in the schedule to this certificate.

11. This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12. The marking of the product shall include the following:



II 3 (2) (1) G Ex ec ic [ia Ga] [op sh Gb] pzc IIC T4 Gc

Tamb: -20°C to +50°C

**Certificate issue date**

7<sup>th</sup> October 2021

**Mark Newman**

Certification Officer  
Intertek Italia S.p.A. (NB 2575)



PDR N° 277B

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC

Signatory of EA, IAF and ILAC Mutual Recognition Agreements

This certificate has been issued by Intertek Italia S.p.A. NB 2575 on transfer from Intertek Testing & Certification Ltd. (NB 0359) using the same issued original certificate number.



This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

**Intertek Italia S.p.A.** Via Miglioli, 2/A - 20063 Cernusco sul Naviglio, Milano - Italy



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### 13. DESCRIPTION OF THE EQUIPMENT OR PROTECTIVE SYSTEM

**The Kaiser Optical Systems, Inc. Optograf /RXN5 Analyser** consists of an enclosure fabricated from steel (painted mild steel or stainless steel) protected by a purge and pressurization system and housing a computer controlled spectrometer and laser for the purpose of on-line analysis of chemical processes. The enclosure may be mounted on a fixed structure or on a trolley fitted with anti-static wheels.

The enclosure is purged and pressurized by compressed air with leakage compensation.

The system incorporates the following certified items:

Purge Solutions Inc. Cyclops Purge indicator	ExVeritas 19 ATEX 0446X
Hummel AG Cable Glands HSK-M-Ex	DMT 03 ATEX E 051X
GM International D1032 Galvanic Isolator	DMT 01 ATEX E 042X

The purging parameters are as follows:

Enclosure Purge Time	9.5 minutes
Purge Flow Rate:	1.6 cu ft/min
Minimum Overpressure:	0.4" WC
Maximum Overpressure:	13" WC
Minimum Air Supply Pressure:	1.0 psi
Maximum Air Supply Pressure:	1.5 psi
Maximum Leakage Rate	120 cu ft/hr

Interlock Loop IS Parameters:

$U_0 = 9.6 \text{ V dc}$
$I_0 = 10 \text{ mA}$
$P_0 = 24 \text{ mW}$
$C_0 = 3.6 \mu\text{F}$
$L_0 = 379 \text{ mH}$
$L/R \text{ Ratio} = 1.53 \text{ mH}/\Omega$

The optical output of the laser is connected by a fibre optical cable with fibre breakage detection mechanism to the Probe which is in contact with the process.

The probe may be any type manufactured by Kaiser Optical Systems, Inc. certified under EC Type Examination certificate ITS10ATEX17085X. Reference shall be made to the power limits specified in the probe certificate for appropriate specification of gas group and temperature class of the probe output. The probe output optical power, controlled by the Optograf RXN5, is controlled in a way that is suitable for areas requiring EPL Ga.

CE Marking shall be accompanied by the identification number of the Notified Body responsible for surveillance of production.



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### 14. DRAWINGS AND DOCUMENTS

TITLE	DOCUMENT Nr	LEVEL	DATE
*Assembly, base unit Optograf (3 sheets)	2011827	X11	03/11/2019
*Purge diagram, Optograf	2011828	X6	12/02/2011
*Block diagram, Optograf Fan Unit	2011829	X4	10/21/2011
Laser Power control and safety interlock	4002017	X1	6/4/2009
Safety statement, RXN Invictus Laser, IS Barrier, Interlock connector and probe system	4002019	X1	-
*Block Diagram, Thermal Interlock System, Optograf	2011376	X3	02/13/2014
*Block Diagram, Laser Interlock System, Optograf	2011881	X3	03/08/2021
*ATEX Label, Optograf Base in Haz Zone Schematic (2 sheets)	4002315	R5	-
*Schematic, Invictus Laser with Laser Power Interlock, Alt Scheme	2017540	X1	11/28/2017
*Optograf™ Analyzer Operations Manual	2011849	R9	-

Note: An \* is included before the title of documents that are new or revised.  
Copies of the above listed documents are kept at Intertek Italia S.p.A. archive.

### 15. SPECIAL CONDITIONS FOR SAFE USE

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 to provide a fault tolerance of 2 for category 1 equipment or fault tolerance of 1 for Category 2 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. The user shall purge the enclosure prior to start-up and upon loss of pressurization in accordance with the instructions marked on the Optograf enclosure. An appropriate means of isolation shall be provided by the user, appropriately certified for the area of use and correctly installed.
4. Parts of the enclosure may represent an electrostatic risk. Refer to the manufacturer's instruction.
5. 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



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temperature upper limit of at least 60°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.

### 16. ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

The relevant essential Health and Safety Requirements have been identified and assessed in Intertek Report Nr. 103806740LHD-003 Issue 0 dated 24<sup>th</sup> September 2021.

### 17. ROUTINE (FACTORY) TESTS

The manufacturer shall verify the enclosure leakage rate (EN 60079-2:2014 Clause 17.2).  
The operation of the purge controls shall be verified (EN 60079-2:2014 Clause 17.1).  
The operation of the fibre-breakage interlock and the optical power interlock shall be verified.

### 18. DETAIL OF CERTIFICATE CHANGES

#### **7<sup>th</sup> October 2021 (R.0):**

Performed under Intertek Report No. 103806740LHD-003 Issue 0.

- Initial release by Intertek Italia S.p.A. NB 2575 based on the assessment performed in February to September 2021 and on the certificate legal ownership transferred from Intertek Testing & Certification Ltd. (NB 0359); the same issued original certificate number is used.
- Update to certification standards.
- Correction of interlock loop IS parameters.
- Modification to the laser power interlock and associated drawing update.