Certificate of Compliance

Certificate: 2413954 **Master Contract:** 247499

Project: 80176239 **Date Issued:** 2023-07-31

Issued To: **Endress+Hauser Optical Analysis, Inc.**
371 Parkland Plaza
Ann Arbor, Michigan, 48103
United States

Attention: Nicholas Taylor

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Issued by: Daniel Ergezi

Daniel Ergezi

PRODUCTS

CLASS 2258-04 PROCESS CONTROL EQUIPMENT – Intrinsically Safe, Entity – For Hazardous Locations
CLASS 2258-84 PROCESS CONTROL EQUIPMENT – Intrinsically Safe, Entity – For Hazardous Locations – Certified to U.S. Standards

Ex ia op is IIA or IIB or IIB + H2 or IIC T3 or T4 or T6 Ga
Class I, Division 1, Groups A, B, C, D T3/T4/T6
Class I, Zone 0 AEx ia op is IIA or IIB or IIB + H2 or IIC T3 or T4 or T6 Ga
Class I, Division 1, Groups A, B, C, D T3/T4/T6

Apparatus Group	IIA		IIB Only		IIB + H_2	IIC	
Temperature Class	T3	T4	T3	T4	T3	T4	T6
Temperature Class (°C)							
Power (mW) Rxn-41 Series Probe	150	35	35	35	35	35	15
Power (mW) Rxn-40 Series Probe	150	35	35	35	35	35	15
Power (mW) Rxn-30 Series without sintered filter	150	35	35	35	35	35	15
Power (mW) Rxn-30 Series with sintered filter (20 μm)	150	35	115	35	100	35	15
Power (mW) Rxn-20 Series Probe	150	35	35	35	35	35	15

Above table includes the maximum optical power to be supplied for the probe (optical connector)

The maximum optical power is supplied to the probe by an external controller that is not covered under this certificate. The final installation shall be subjected to acceptance of local authority having jurisdiction.

The tabulated power levels refer to surface areas not exceeding 400mm^2.

Or, where the probe window is not in contact with a hazardous area:
Ex ia IIC T6 Gb

Intrinsic safety parameters are as follows:
The probe IS input parameters for the fibre breakage loop are as follows:
Ui = 9.6 V, Ii = 10 mA, Pi = 24 mW, Ci = 0, Li = 0
A temperature measurement RTD may be provided. This device is in thermal contact with the probe case adjacent to the sapphire window.
The probe IS input parameters for the temperature measurement circuit are as follows:
Ui = 10.8 V, Ii = 9 mA, Pi = 24 mW, Ci = 0, Li = 0

Rxn-41 probe and Rxn-40 probe, Rated: 20.7 MPa (3000 PSI), HART 4-20mA loop, 2V, 160mA. Intrinsically safe when connected per Drawing No. 4002396 Entity: Uo = 9.6V, Io = 10mA, Po = 24mW, Co = 3.599 uF, Lo = 379 mH, Lo/Ro = 1530 uH/ohms. IP65, Ambient temperature rating: -20°C to +40°C

Rxn-30 probe, Rated 6.9 MPa (1000 PSI), HART 4-20mA loop, 2V, 160mA. Intrinsically safe when connected per Drawing No. 4002396 Entity: Uo = 9.6V, Io = 10mA, Po = 24mW, Co = 3.599 uF, Lo = 379 mH, Lo/Ro = 1530 uH/ohms. IP65. Ambient temperature rating: -20°C to +40°C

The Rxn-20 Probe. Rated: The probe IS input parameters for the fibre breakage loop are as follows:
Ui = 9.6 V, Ii = 10 mA, Pi = 24 mW, Ci = 0, Li = 0
The probe IS input parameters for the temperature measurement circuit are as follows:
Ui = 10.8 V, Ii = 9 mA, Pi = 24 mW, Ci = 0, Li = 0
Ambient temperature rating: -20°C to +40°C

Conditions of Acceptability:

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. The fibre optic cable shall be installed in a manner such that the cable is not subjected to strain or pulling at the entry of the optical cable into to the probe assembly.
3. 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 (for EPL Ga) a fault tolerance of 2. Where the EPL required for the area of installation is lower than Ga, the reliability of the control mechanism may also be reduced. 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, commensurate with the required EPL.
4. When the probe is manufactured from Titanium, the probe shall be installed so that it cannot be subjected to impact or friction.
5. Rxn-20 probe focusing optics must not reduce the beam diameter below 3.4mm.
6. Laser power interlocks must be set for the Rxn-20 probe without focusing optics installed.

APPLICABLE REQUIREMENTS

CAN/CSA-60079-0:18	Electrical apparatus for explosive gas atmospheres – Part 0: General requirements
CAN/CSA-C22.2 No. 60079-11:14	Electrical apparatus for explosive gas atmospheres – Part 11: Intrinsic safety “i"
CAN/CSA-C22.2 No. 60079-28:16	Electrical apparatus for explosive gas atmospheres – Part 28: Protection of equipment and transmission systems using optical radiation
CAN/CSA-C22.2 No. 61010-1:18	Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements
ANSI/UL Standard 913, 8th Ed.	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations
ANSI/UL 60079-0:2019, 7th Ed.	Electrical Apparatus for Explosive Gas Atmospheres – Part 0: General Requirements
ANSI/UL 60079-11:2013, 6th Ed.	Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety “i”
ANSI/UL 60079-28-2017	Electrical apparatus for explosive gas atmospheres – Part 28: Protection of equipment and transmission systems using optical radiation
ANSI/UL 61010-1-2018 Third Edition	Safety requirements for electrical equipment for measurement, control, and laboratory use –

Part 1: General requirements

MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

- Manufacturer's name: "Endress+Hauser Optical Analysis, Inc.", or CSA Master Contract Number "247499", adjacent to the CSA Mark in lieu of manufacturer's name.
- Model number: As specified in the PRODUCTS section, above.
- Electrical ratings: As specified in the PRODUCTS section, above.
- Manufacturing date in MMYY format, or serial number, traceable to year and month of manufacture.
- The CSA Mark, as shown on the Certificate of Conformity.
- Hazardous Location designation: As specified in the PRODUCTS section, above (may be abbreviated).
- Method of Protection markings (Ex -- markings): As specified in the PRODUCTS section, above.
- Temperature code: As specified in the PRODUCTS section, above.
- The following words:
    - "Exia".
    - "WARNING: Substitution of components may impair intrinsic safety. Intrinsically safe when installed per 4002396" and the words "AVERTISSEMENT : Substitution de composants peut compromettre la sécurité intrinséque. Sécurité intrinséque est maintenue si installé selon 4002396."
- Maximum working pressure (MWP) in pascals

Method of Marking

Markings are to be permanent, such as engraved, etched, etc., to the surface of the equipment, or printed, etched, etc., onto a metal nameplate which is secured to the equipment with drive-pins, rivets, or similar engaging bottomed holes in the enclosure. If an adhesive label is used, it must be CSA approved (US certification also requires UL Recognition) for the specific surface material and/or coating, having a rated temperature appropriate for the equipment, and be suitable for indoor/outdoor applications (as required).

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Notes:

Products certified under Class C225804, C225884 have been certified under CSA's ISO/IEC 17065 accreditation with the Standards Council of Canada (SCC). www.scc.ca

Supplement to Certificate of Compliance

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The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
80176239	2023-07-31	Update to report 2413954 for new revision of scheduled drawing 4002396 to change units of length back to the initial correct units of “foot”.
80126705	2022-06-08	Evaluation for update to report 2413954 to update 2 drawing revisions, update the company name and update probe names.
80041124	2020-09-08	Evaluation for update of report 2413954 to add the PhAT Probe. Standards update from C22.2 No. 142 to CAN/CSA-C22.2 No. 61010-1-12 + Amd 1 - 18 and to CAN/CSA C22.2 No. 60079-0:19 and CAN/CSA-C22.2 No. 60079-11:1. ANSI/UL 61010-1-2018 Third Edition. In addition, optical radiation requirements evaluated to ANSI/UL & CAN/CSA C22.2 No. 60079-28.
70088606	2016-10-07	Update to Report 2413954 of WetHead probe, to update drawing 2013340 to add C22 (UNS N06022) to Material Specifications.
2627292	2013-05-23	Update to Report 2413954 to include revised drawings 2013339 and 2013340 to replace 2009762 and 2011473.
2533781	2012-06-27	Update to Report 2413954 to include revised drawing. Update includes labeling to be added on the cable.
2413954	2011-12-21	Original Certification of Pilot, WetHead, and AirHead probes as Intrinsically Safe for Hazardous Locations.