



UNITED KINGDOM CONFORMITY ASSESSMENT

1 UK TYPE EXAMINATION CERTIFICATE

2 Equipment Intended for use in Potentially Explosive Atmospheres

UKSI 2016:1107 (as amended) – Schedule 3A, Part 1

3 Certificate Number: CSAE 21UKEX1072X Issue: 0

4 Product: J22 TDLAS Gas Analyzer, J22 TDLAS Gas Analyzer SCS on Panel, J22 TDLAS Gas Analyzer Encl. SCS, J22 TDLAS Gas Analyzer Encl. SCS Heated

5 Manufacturer: SpectraSensors Inc.

6 Address: 11027 Arrow Route, Rancho Cucamonga, California, 91730, USA

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

8 CSA Group Testing UK Limited, Approved Body number 0518, in accordance with Regulation 42 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended), certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Schedule 1 of the Regulations. 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 has been assured by compliance with:

- EN IEC 60079-0:2018 EN 60079-1:2014+AC:2018-09 EN 60079-11:2012
- EN 60079-28:2015 EN ISO 80079-36:2016+AC:2019

Except in respect of those requirements listed at Section 16 of the schedule to this certificate. The above standards may not appear on the UKAS Scope of Accreditation, but have been added through flexible scope of accreditation, which is available on request.

10 If the sign 'X' is placed after the certificate number, it indicates that the product is subject to Specific Conditions of Use identified in the schedule to this certificate.

11 This UK TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Regulations apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of this product shall be in accordance with Regulation 41 and include the following:

J22 TDLAS Gas Analyzer

J22 TDLAS Gas Analyzer SCS on Panel or J22 TDLAS Gas Analyzer Encl. SCS



II 2G
Ex db ib op is IIC T4 Gb
-20°C ≤ Ta ≤ +60°C



II 2G
Ex db ib op is h IIC T4 Gb
-20°C ≤ Ta ≤ +60°C

J22 TDLAS Gas Analyzer Encl. SCS Heated



II 2G
Ex db ib op is h IIC T3 Gb
-20°C ≤ Ta ≤ +60°C

Name: J A May
Title: Director of Operations



SCHEDULE

UK TYPE EXAMINATION CERTIFICATE

CSAE 21UKEX1072X

Issue 0

13 DESCRIPTION OF PRODUCT

The core model of the J22 TDLAS Gas Analyzer consists of a flameproof electronics compartment, intrinsically safe optical head and a measurement cell.

The J22 TDLAS Gas Analyzer with Sample Conditioning System, henceforth referred to as the 'SCS', on a panel combines the J22 TDLAS Gas Analyzer with the non-electrical SCS to precondition the analyte before examination within the cell.

The J22 TDLAS Gas Analyzer with SCS in an enclosure can be configured with or without a pre-certified terminal box, heater and thermostat.

The J22 TDLAS Gas Analyzer is a laser-based gas analyzer that measures the concentration of a compound or "analyte" such as H₂O. The technology employed is Tunable Diode Laser Absorption Spectroscopy (TDLAS). The measurement output is a volumetric concentration, or ratio of a specific analyte in a gas mixture such as natural gas or air. The volumetric ratio can be converted to other units of measure using internal conversion factors and calculations.

The analyzer is comprised of a sample cell, intrinsically safe optical head and an electronics assembly platform within a pre-certified flameproof enclosure. The cell is a sealed tube through which the gas mixture flows. The cell has a gas inlet and a gas outlet. On one end of the tube is a window through which a beam of infrared laser light travels, which in turn reflects from a mirror. In this arrangement, the gas mixture does not contact the laser or any other optoelectronics. Pressure, and in some cases temperature sensors, are employed in the cell assembly to compensate for the effects of pressure and temperature changes in the gas.

The optical head is mounted on top of the cell and contains the laser, optical detector and a thermoelectric cooler to control the laser temperature. The optical head also contains the optical head electronics which are directly connected to the optoelectronics in the optical head. The optical head electronics board also communicates with the electronics assembly.

The electronics assembly is mounted on top of the optical head, within a flameproof enclosure. The electronics assembly, which can be powered by 100-240 VAC \pm 10% or 19.2-28.8 VDC source, contains the sensor electronics which connects to the optical head via the RS232 protocol through a 10-pin ribbon cable assembly. The sensor electronics and the optical head electronics operate on a 30V dc supply using the same 10-pin ribbon cable. The sensor electronics generate the laser drive signal that is sent through the optical head electronics and to the laser in the optical head. Signals from the detectors are amplified by the optical head electronics and sent to the sensor electronics where they are digitized. The sensor electronics process the digital data and sends the gas concentration measurements the electronics display and I/O modules.

The electronics assembly displays the concentration measurement on an LCD display and also has a through-the-glass 3-button keypad interface for user input. The flameproof enclosure of the electronics assembly also houses the electrical terminals for field wiring connections. The J22 comes with various analogue and digital outputs which may be employed in automation or communication systems to deliver its measurements and applicable diagnostic messages and alarms to remote devices. Additionally, the electronics assembly has a webserver which allows the user to interact with the J22 TDLAS Gas Analyzer on a standard web browser using a laptop or tablet.



SCHEDULE

UK TYPE EXAMINATION CERTIFICATE

CSAE 21UKEX1072X

Issue 0

The J22 TDLAS Gas Analyzer is used as an “extractive” measuring device, where the gas sample is extracted from a vessel or pipeline and transported to the analyzer which may be mounted up to 100m from the sample tap point. The J22 TDLAS Gas Analyzer may be configured without sample conditioning. Optional hardware is also available to condition the sample before it enters the gas analyzer. An optional IP66/Type 4X rated enclosure may be included which surrounds the “cell” and the sample conditioning system. The sample conditioning system (SCS) is required to filter and remove solid and liquid particulate and to control the flow and pressure of the gas. In some cases, an optional heater (powered independently from the analyzer) is used to control the temperature inside the enclosed SCS. An optional pressure relief valve and purge system are available. The effectiveness of this purge system has not been assessed by CSA.

The J22 TDLAS Gas Analyzer operates at near-atmospheric pressure and at an ambient temperature between negative -20 to +60 degrees centigrade. After the passing through the J22 TDLAS Gas analyzer, the sample is routed and vented to a safe location in the atmosphere or vented to a flare or other apparatus.

The equipment has been separately tested against the requirements of IEC 60529 and it meets IP66.

J22 TDLAS Gas Analyzer & J22 TDLAS Gas Analyzer SCS on Panel & J22 TDLAS Gas Analyzer Encl. SCS

Rated: 100 - 240Vac, 50/60 Hz \pm 10%, Um = 250V or 19.2 – 28.8 Vdc, max., Um 250V, 10 W.

I/01: Terminal 26 and 27, Un = 30Vdc, Um = 250Vac

I/02: Terminal 24 and 25, Un = 30Vdc, Um = 250Vac or Un = 30Vdc, In = 100mAdc/500mAac, Um = 250Vac

I/03: Terminal 22 and 23, Un = 30Vdc, Um = 250Vac or Un = 30Vdc, In = 100mAdc/500mAac, Um = 250Vac

J22 TDLAS Gas Analyzer Encl. SCS Heated

Rated: 100 - 240Vac, 50/60 Hz \pm 10%, Um = 250V or 19.2 – 28.8 Vdc, max., Um = 250V, 10 W.

Heater: 100 - 240 Vac, 50/60 Hz \pm 10%, 80 W.

I/01: Terminal 26 and 27, Un = 30Vdc, Um = 250Vac

I/02: Terminal 24 and 25, Un = 30Vdc, Um = 250Vac or Un = 30Vdc, In = 100mAdc/500mAac, Um = 250Vac

I/03: Terminal 22 and 23, Un = 30Vdc, Um = 250Vac or Un = 30Vdc, In = 100mAdc/500mAac, Um = 250Vac

Model Code Structure

J22 – ABCDEFGHIJKLMNOPQRSTUVWXYZ

A – Approval

BA - ATEX / IECEx Zone 1

B – Analyte

C – Measurement Range

D – Measurement Range 2

E – Stream Composition

F – Venting to

G – Process Wetted Materials

V - 316 Stainless Steel; FKM Seals



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DQD544.21 Issue 2 (2021-04-23)

Page 3 of 5

SCHEDULE

UK TYPE EXAMINATION CERTIFICATE

**CSAE 21UKEX1072X
Issue 0**

- H – Supply Parameters
 - A - 100-240 VAC (50/60 Hz) ± 10%
 - D – 24 VDC ± 20%
- I – Output; Input 1
- J – Output; Input 2
- K – Output; Input 3
- L – Electronics Housing
 - 1 - Coated Copper-Free Aluminum
- M – Controller Mounting
- N – Sample Conditioning System (SCS)
 - A - On Panel, Aluminum
 - B - Enclosed, 304 Stainless Steel
 - N – None
- O – Filtration
- P – Sample System Gas Connections
 - A – Imperial
 - B – Metric
- Q – Pressure Regulation
- R – Flow Meter
 - A - Armored, factory default
 - B - Armored, Krohne
 - F - Glass Tube, factory default
 - K - Glass Tube, Krohne
 - N - None
- S – Heating Options
 - 1 - Heated + Heat-Trace Boot, 100 - 240 VAC ± 10%
 - 8 – None
- T – Purge
- U – Operating Language Display
- V – Test/Certificate/Declaration
- W – Marking

Headings without sub-options are not considered critical to the design of the equipment. Where sub options are shown, these are the only options endorsed by CSA.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Reports and Certificate History

Issue	Date	Report number	Comment
0	09 July 2021	R80074463A	The release of the prime certificate.

SCHEDULE

UK TYPE EXAMINATION CERTIFICATE

**CSAE 21UKEX1072X
Issue 0**

- 15 **SPECIFIC CONDITIONS OF USE** (denoted by X after the certificate number)
 - 15.1 The flameproof joints of this equipment are other than the minimums specified in IEC/EN 60079-1 and shall not be repaired by the user.
 - 15.2 Adhesive labels and the powder coating of models of the equipment with an aluminium enclosure are non-conducting materials and may generate an ignition-capable level of electrostatic discharge under certain extreme conditions. The user should ensure that the Equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on these non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.
 - 15.3 The optional stainless-steel label tag is not bonded to earth. The maximum average capacitance of the tag determined by measurement is max. 30 pF. This shall be considered by the user to determine suitability of the equipment in a specific application.
 - 15.4 For models of the J22 TDLAS Gas Analyzer with SCS mounted within an enclosure, the inner sheath of the supply cable for the heater circuit shall be sheathed with thermoplastic, thermosetting, or elastomeric material. It shall be circular and compact. Any bedding or sheath shall be extruded. Fillers, if any, shall be non-hygroscopic. The minimum length of the cable shall exceed 3 meters.
 - 15.5 The temperature of the process medium shall be within the ambient temperature rating of the equipment.
- 16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS (REGULATIONS SCHEDULE 1)**

In addition to the Essential Health and Safety Requirements covered by the standards listed in Section 9, all other requirements are demonstrated in the relevant reports.
- 17 **PRODUCTION CONTROL**
 - 17.1 Holders of this certificate are required to comply with production control requirements defined in Schedule 3A, as applicable, and CSA Group Testing UK Regulations for Certificate Holders.
 - 17.2 The equipment covered by this certificate incorporates previously certified devices; it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices, and the manufacturer shall inform CSA UK of any modifications of the devices that may impinge upon the explosion safety design of the equipment.

Description	Certificate Number
E+H G305 and G307 Enclosures	IECEX SIR 11.0050U
Intertec SL-***THERM Block Heater	PTB 02 ATEX 1116 X and IECEX PTB 07.0055X
Intertec TA Thermostat	PTB 03 ATEX 1136 X and IECEX PTB 07.0054X
Adalet XIHS Terminal Box	DEMKO 12 ATEX 1115099U and IECEX UL 12.0019U
CMP Type 737 Adapter/Reducer	CML 18ATEX1320X and IECEX CML 18.0177X
CMP A2F Cable Gland	CML 18ATEX1321X and IECEX CML 18.0179X
Hazardous Locations Solutions Type N conduit elbow	IECEX SIR 07.0044U and Sira 07ATEX1174U
Proline 300/500 Electronics	IECEX CSA 16.0006U
Display Type DP-PA**	IECEX KEM 08.0048X