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

Certificate No.: **IECEx ITS 17.0005X**

Certificate history:
Issue 1 (2017-03-09)
Issue 0 (2017-02-09)

Status: **Current**

Issue No: 2

Date of Issue: 2019-10-22

Applicant: **Galvanic Applied Sciences Inc.**
7000 Fisher Rd, SE
Calgary, Alberta
T2H 0W3
Canada

Equipment: **H2S and Total Sulfur Analyzers**

Optional accessory:

Type of Protection: **Flameproof, intrinsically safe and op is**

Marking: Ex db [ia] ia op is IIB+H_2 T4 Gb

Tamb 0°C to +50°C

Approved for issue on behalf of the IECEx Certification Body: **P Moss**

Position: **Certification Officer**

Signature: (for printed version)

Paul Moss
2019.10.22
13:52:54
+01'00'

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 www.iecex.com or use of this QR Code.

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ITS House, Cleeve Road
Leatherhead
Surrey, KT22 7SA
United Kingdom

IECEx Certificate of Conformity

Certificate No.: **IECEx ITS 17.0005X**

Date of issue: 2019-10-22 Issue No: 2

Manufacturer: **Galvanic Applied Sciences Inc.**
7000 Fisher Rd, SE
Calgary, Alberta
T2H 0W3
Canada

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 60079-0:2011 Explosive atmospheres - Part 0: General requirements
Edition:6.0

IEC 60079-1:2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
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 Reports:

GB/ITS/ExTR17.0005/00 GB/ITS/ExTR17.0005/01 GB/ITS/ExTR17.0005/02

Quality Assessment Report:

GB/ITS/QAR14.0026/02

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

The ProTech903CE H_2S Analyzer is a hydrogen sulphide analyzer which is housed in a component approved enclosure (certificate number IECEx UL 16.0081U) with dimensions of approximately 254mm x 356mm x 152mm. It has a single glass window providing a view of an LCD screen which is supplied as part of the component approved enclosure. Both internal and external earthing points are provided. This enclosure is also fitted with a 4 channel barrier (IECEx ITS 16.0040U) which connects to a Keypad (IECEx ITS 16.0051X), Sensor Block, and Tape Encoder.

A second flameproof enclosure is utilized to house a motor which is used to drive a tape reel. This motor housing utilises a second component approved enclosure (certificate number IECEx UL 13.0039U) and an flameproof hub and shaft assembly for connecting the drive rod of the motor to the external tape reel. This enclosure is mounted to the main enclosure through the use of various approved conduit unions and stopper boxes (Certificate numbers IECEx CES 15.0012X, IECEx ITS 09.0024U and IECEx CES 10.0002U).

The equipment may be provided with optional external parts such as solenoids (IECEx LCI 07.0015X) or pressure switches (IECEx INE 13.0095X). Connection to the solenoids may also use various approved junction boxes (certificate numbers IECEx CES 15.0012U, IECEx BKI 07.0026, IECEx BVS 11.0059X or IECEx SIR 12.0106U). When these devices are fitted, conduit horizontal stopper boxes (IECEx CES 14.0019X) are to be used to connect between the devices and the enclosure.

The sensor block SA3005-00 (or SA3005-01, different LD1 used compared to SA3005-00) and tape (PT3007) encoders are housed inside sample handling enclosure located above the approved enclosure specified in paragraph 1. Sensor block is powered by connecting P2 to Terminal TB4 and Terminal TB6 of the 4 channel IS barrier (IECEx ITS 16.0040U). P1 of the sensor block is connected to P1 of the PT3007 tape encoder. Tape encoder P2 is connected to TB2 of the IS barrier. Refer to APR-000110 for intrinsically safe control drawing wiring .

The Keypad (IECEx ITS 16.0051X) is powered by TB8 of the IS barrier. The keypad is connected to a socket located at the right side of the sample handling enclosure. The socket for the keypad is marked “connect intrinsically safe keypad SA2992-zz only”

The system is available with a total sulfur furnace that converts sulfur compounds to H_2S, so that the total sulfur content of a sample gas stream can be determined. With a dual stream setup, it is possible to measure both the H_2S and the total sulfur content of the same stream on the same system. When the assembly is equipped with the total sulfur furnace it is known as either a H_2S/TS Analyzer or a TS Analyzer. The total sulfur furnace is dimensioned approximately 407mm x Ø190.5mm, and is constructed from 6061 T6 Aluminium.

The sample gas is mixed with hydrogen in a quartz reaction tube at a temperature of 900°C. At this temperature, the hydrogen reacts with all sulfur components to form H_2S, and most hydrocarbons to form methane.

The total sulfur furnace operates on AC voltage only. The temperature is controlled by modulating the power output to the furnace from the I/O board in the electronics enclosure. This modulation is setup in the application program.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- Only suitably approved Ex db IIB+H_2 Gb minimum cable glands or blanking elements with an operating ambient range of 0°C to +50°C to be used.
- No modifications to the flamepaths are permitted without consultation with the controlled documentation or notified body.
- Use only those bolts supplied with the enclosure. No cover bolts are to be omitted. Install and alternate cover bolt pattern when tightening, see recommended torque value table.
- Certification details, instructions (including any required special conditions for use) for all certified equipment installed shall be conveyed to the user in an appropriate manner.
- Avoid ignition due to impact or friction.
- The fittings and adapters SHALL NOT be loosened for alignment purposes.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
ISSUE 02:

Addition of an alternate flameproof hub and shaft assembly model SA3032 that does not require routine component overpressure testing. Update analyzer drawings to include alternate solenoid valve assemblies, change the minimum ambient rating from -20°C to 0°C, show the bi-metal thermostat as optional and add alternate thermocouple process transmitters.

ISSUE 01:

Additional models H2S/TS Analyzer and TS Analyzer

Annex:

Annex_doc_for_IEC_Ex_C_of_C_or_TR.pdf

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Routine testing:

The Explosion Proof motor hub and shaft assembly part number BA0423 as defined by drawing APR-000119 shall be routinely subjected to an overpressure test at a minimum of 300PSI (20.7bar). The period of application of the pressure shall be at least 10s. The tests are considered satisfactory if the BA0423 hub and shaft assembly withstands the pressure without suffering permanent deformation of the joints or damage to the assembly. For the routine test, it is sufficient to test the BA0423 hub and shaft assembly in an empty enclosure. A label bearing a unique number is attached to each BA0423 assembly which is recorded for an analyzer-specific check list.

NOTE: The Explosion Proof motor hub and shaft assembly part number SA3032 as defined by drawing APR-000153-1 does not require routine overpressure testing.

The Total Sulfur Furnace Housing containment system as defined by drawing APR-000129 shall be routinely subjected to an overpressure test at a minimum of 30psi (2.06bar). The period of application of the pressure shall be at least 120 seconds. The tests are considered satisfactory if no permanent deformation occurs and compliance with the applicable leakage test for a containment system with a limited release is verified.

The containment system shall:

- Be surrounded by helium at a test pressure equal to the maximum rated pressure, but no less than 1000 Pa; or,
- Be connected to a helium supply at the maximum rated pressure, but no less than 1000 Pa.

The maximum helium leakage rate shall be less than 10^{-2} Pa x l/s (10^{-4} mbar x l/s)
Records of routine tests shall be kept and maintained

Manufacturer's documents			
Title:	Drawing No.:	Rev. Level:	Date:
FPA 4000/4100 CPU Board (Pages 1-2 of 2)	APR-000013	1	JAN 14, 2017
Flameproof Control Enclosure Zone 1 ATEX/IECEx Drilling and Tapping EB0544CE	APR-000096	1	AUG 31, 2016
ProTech 903 Tape Analyzer IEC Digital Sensor Boards H2S (Pages 1-2 of 2)	APR-000097	1	OCT 18, 2016
ProTech 903 Tape Analyzer IEC Digital Sensor Boards Arsine\Phosgene (Pages 1-2 of 2)	APR-000098	1	OCT 18, 2016
ProTech 903 Tape Analyzer IEC Tape Encoder	APR-000099	2	JAN 30, 2017

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ProTech 903 CE H2S and Total Sulfur Analyzer Installation and Maintenance Manual (Pages 1-59 of 59)	APR-000105	2	FEB 28, 2017
ProTech 903 CE Analyzer Zone 1 Intrinsically Safe Wiring Control Drawing	APR-000110	0	JAN 09, 2016
ProTech 903 CE Zone 1 H2S Analyzer Interconnect Connection Location Diagram (Sheet 1 of 7)	APR-000111	0	JAN 13, 2016
ProTech 903 CE Zone 1 H2S Analyzer Signal Wiring (Sheet 2 of 7)	APR-000111	0	JAN 13, 2016
ProTech 903 CE Zone 1 H2S Analyzer Solenoid Valve Wiring (Sheet 3 of 7)	APR-000111	0	JAN 13, 2016
ProTech 903 CE Zone 1 H2S Analyzer Alarm Relays & Analog Outputs (Sheet 4 of 7)	APR-000111	0	JAN 13, 2016
ProTech 903 CE Zone 1 H2S Analyzer 24 VDC Power (Sheet 5 of 7)	APR-000111	0	JAN 13, 2017
ProTech 903 CE Zone 1 H2S Analyzer AC Power (Sheet 6 of 7)	APR-000111	0	JAN 13, 2016
ProTech 903 CE Zone 1 H2S Analyzer Pressure Switch Connection (Sheet 7 of 7)	APR-000111	0	JAN 13, 2016
Zone 1 Tape Drive Motor Enclosure Machining	APR-000112	1	JAN 20, 2017
Zone 1 Tape Drive Motor Enclosure Assembly	APR-000113	3*	JUN 28, 2018
ProTech 903 IEC Digital Sensor Board (Sheets 1-7 of 7)	APR-000115	1	FEB 02, 2017

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Protech 903 IEC Tape Encoder Board (Sheets 1-3 of 3)	APR-000116	0	JAN 12, 2017
PT3004 Assembly and Coating (Pages 1-5 of 5)	APR-000117	0	JAN 10, 2017
PT3007 Assembly and Coating (Pages 1-3 of 3)	APR-000118	0	JAN 09, 2017
Hub and Shaft Assembly BA0423	APR-000119	2	JAN 26, 2017
ProTech 903 CE Zone 1 H2S Analyzer Layout (Sheets 1-4 of 5)	APR-000120	7*	JUN 09, 2019
ProTech 903 CE Zone 1 H2S Nameplate Location (Sheet 5 of 5)	APR-000120	7*	JUN 09, 2019
ProTech 903 CE Zone 1 H2S Analyzer Nameplate	APR-000121	3*	FEB 21, 2019
903_H2S_CPU (Sheets 1-7 of 7)	APR-000122	0	JAN 14, 2017
SA2992-zz Connector Label	APR-000124	0	JAN 24, 2017
PU3003 Check Plots (Pages 1-12 of 12)	APR-000127	0	FEB 03, 2017
PU3006 Check Plots (Pages 1-4 of 4)	APR-000128	0	FEB 03, 2017
Flameproof Furnace Enclosure (Sheet 1 of 5)	APR-000129	1	FEB 27, 2017
Flameproof Furnace Enclosure Cap (Sheet 2 of 5)	APR-000129	1	FEB 27, 2017
Flameproof Furnace Enclosure Threaded Bashing (Sheet 3 of 5)	APR-000129	1	FEB 27, 2017
Flameproof Furnace Enclosure Mounting Bracket (Sheet 4 of 5)	APR-000129	1	FEB 27, 2017
Flameproof Furnace Enclosure Assembly (Sheet 5 of 5)	APR-000129	1	FEB 27, 2017

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CE Reaction Furnace Assembly (Sheets 1-2 of 2)	APR-000131	2*	JUN 29, 2018
Protech 903 CE Zone 1 H2S/TS Analyzer Layout (Sheets 1-4 of 5)	APR-000132	5*	JUL 11, 2019
Protech 903 CE Zone 1 H2S/TS Nameplate Location (Sheet 5 of 5)	APR-000132	5*	JUL 11, 2019
ProTech 903 CE Zone 1 H2S/TS Analyzer Interconnect Connection Location Diagram (Sheet 1 of 8)	APR-000133	3*	JUL 03, 2018
ProTech 903 CE Zone 1 H2S/TS Analyzer Signal Wiring (Sheet 2 of 8)	APR-000133	3*	JUL 03, 2018
ProTech 903 CE Zone 1 H2S/TS Analyzer Solenoid Valve Wiring (Sheet 3 of 8)	APR-000133	3*	JUL 03, 2018
ProTech 903 CE Zone 1 H2S/TS Analyzer Alarm Relays & Analog Outputs (Sheet 4 of 8)	APR-000133	3*	JUL 03, 2018
ProTech 903 CE Zone 1 H2S/TS Analyzer TS Furness Wiring (Sheet 5 of 8)	APR-000133	3*	JUL 03, 2018
ProTech 903 CE Zone 1 H2S/TS Analyzer TS Furnace Bill of Material (Sheet 6 of 8)	APR-000133	3*	JUL 03, 2018
ProTech 903 CE Zone 1 H2S/TS Analyzer Power Connection (Sheet 7 of 8)	APR-000133	3*	JUL 03, 2018
ProTech 903 CE Zone 1 H2S/TS Analyzer Pressure Switch Connection (Sheet 8 of 8)	APR-000133	3*	JUL 03, 2018
ProTech 903 XP Hub Assembly (Sheet 1 of 4)	APR-000153-1	0*	JUN 26, 2017

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ProTech 903 XP Hub (Sheet 2 of 4)	APR-000153-1	0*	JUL 06, 2017
ProTech 903 XP Captive Washer (Sheet 3 of 4)	APR-000153-1	0*	JUL 06, 2017
ProTech 903 XP Shaft (Sheet 4 of 4)	APR-000153-1	0*	JUN 26, 2017

* Indicates documentation which has been added or amended as per Issue 02.

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