



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.: **IECEX SIR 09.0053X** issue No.: **4**

Status: **Current**

Date of Issue: **2013-10-14** Page 1 of 5

Applicant: **Crystal Engineering Corp.**  
708 Fiero Lane, Suite 9  
San Luis Obispo  
California 93401  
**United States of America**

Certificate history:  
Issue No. 4 (2013-10-14)  
Issue No. 3 (2013-8-14)  
Issue No. 2 (2010-11-15)  
Issue No. 1 (2010-2-26)  
Issue No. 0 (2009-5-1)

Electrical Apparatus: **nVision™ Reference Pressure Recorder**  
*Optional accessory:*

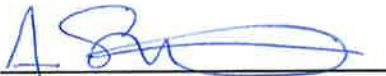
Type of Protection: **Intrinsic Safety**

Marking: Ex ia IIB T4 Ga, Ta = -20°C to +50°C  
Approved battery type Rayovac Max Plus 815  
Ex ia IIB T4 Ga, Ta = -20°C to +45°C  
Approved battery type Duracell MN1500  
Ex ia IIB T3 Ga, Ta = -20°C to +50°C  
Approved battery type Energizer E91, EN91  
Ex ia IIB T3 Ga, Ta = -20°C to +50°C  
Approved battery type Duracell MN1500

Approved for issue on behalf of the IECEx Certification Body: **A C Smith**

Position: **Certification Manager**

Signature:  
(for printed version)

  
2013-10-14

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 the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

**SIRA Certification Service**  
Rake Lane  
Eccleston  
Chester  
CH4 9JN  
United Kingdom

**sira**  
CERTIFICATION



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California 93401  
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Additional Manufacturing location  
(s):

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 electrical apparatus 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:

<b>IEC 60079-0 : 2004</b> Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
<b>IEC 60079-11 : 2006</b> Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
<b>IEC 60079-26 : 2006</b> Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga

*This Certificate **does not** indicate compliance with electrical 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/SIR/ExTR09.0024/00  
GB/SIR/ExTR13.0220/00

GB/SIR/ExTR10.0023/00  
GB/SIR/ExTR13.0290/00

GB/SIR/ExTR10.0274/00

##### Quality Assessment Report:

CA/CSA/QAR07.0004/00  
CA/CSA/QAR07.0004/03

CA/CSA/QAR07.0004/01  
NL/DEK/QAR13.0030/00

CA/CSA/QAR07.0004/02



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## Schedule

### EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The nVision™ Reference Pressure Recorder is a portable battery powered device that is used to log sensor data and calibrate process pressures and 4-20 mA transmitters. It contains an optional 2.4 GHz radio link that allows communication to the non-hazardous area. The equipment is fitted with primary batteries that are secured in place within a battery holder fixed with four corner screws to the underside of the unit.

#### Entity Parameters

RTD Module	MA20 Module
U <sub>i</sub> = 0	U <sub>i</sub> = 28 V
I <sub>i</sub> = 0	I <sub>i</sub> = 93.3 mA
P <sub>i</sub> = 0	P <sub>i</sub> = 653.3 mW
U <sub>o</sub> = 9.73 V	C <sub>i</sub> = 0.36 μF
I <sub>o</sub> = 1.6642 A	L <sub>i</sub> = 39.1 μH
P <sub>o</sub> = 1.1 W	U <sub>o</sub> = 6.6 V
C <sub>o</sub> = 0.5 μF	I <sub>o</sub> = 4.45 mA
L <sub>o</sub> = 12 μH *	P <sub>o</sub> = 7.34 mW
	C <sub>o</sub> = 0.5 μF **
	L <sub>o</sub> = 12 μH *

\* Total cable inductance between all modules

\*\* Dependant on the supply to the terminals but shall not be greater than 0.5 μF

### CONDITIONS OF CERTIFICATION: YES as shown below:

1. Parts of the enclosure may generate an ignition-capable level of electrostatic charge under certain extreme conditions. The user should ensure that the equipment is not installed or used in a location where it may be subjected to external conditions, which might cause a build-up of electrostatic charge on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.
2. The USB connector shall not be used within the hazardous atmosphere. It shall be used in the non-hazardous atmosphere with either "Safety Extra Low Voltage Circuits" (SELV) or "Protective Extra Low Voltage Circuits" (PELV). The USB connector has a U<sub>m</sub> of 6 V.



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## EQUIPMENT(continued):

The enclosure is made from a plastic material and can be fitted with a protective rubber boot. The equipment contains the following inputs, pressure, temperature (RTD) current (mA) voltage and switches. Externally the equipment comprises a membrane keypad and an LCD with a USB connector and sensor input connection facilities. The USB connection is used in the non-hazardous area for communication. It is also able to power the nVision™ Reference Pressure Recorder in the non-hazardous area. Internally the equipment contains a main PCB, a fully or partially encapsulated display/protection board and two factory fitted plug in modules. There is a choice of three types of modules, ma-V, pressure and temperature. The equipment only has space for two and so any combination of these two can occur, with the exception of the mA-V module which may only have one. The mA-V modules are marked with "MA20". The temperature modules are marked with "RTD100" the pressure modules are marked with "PM" and the maximum permitted pressure. These modules are removable by the use of a tool, however they can be changed by the user, in accordance with the instructions

### Conditions of manufacture

The Manufacturer shall comply with the following:

1. Only one MA20 module may be used in any one nVision™ Reference Pressure Recorder.
2. The manufacturer shall ensure that the fuse F1 (Littelfuse 0466.125NR) (PCA PN: 4931) has a minimum resistance of 2.78  $\Omega$  when measured at an ambient temperature not exceeding 25°C. The minimum resistance at the lower certified ambient temperature (-20°C) which is relied upon for safety is 2  $\Omega$ .
3. The equipment incorporates the following previously certified component:

Description	Certificate number	Marking
Littelfuse Safe-T-Plus 259 Series (0259.125)	IECEx BAS 10.0098U	Ex

It is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with this device, and the manufacturer shall inform Sira of any modifications of the device that may impinge upon the explosion safety design of the product.



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

<b>Issue 1 – this Issue introduced the following changes:</b>	
1	The following changes were endorsed, the product description being amended to recognise that the method of encapsulation of the display/protection board may differ depending on the build: * An alternative MA20 module design was introduced. * An alternative LCD assembly design was introduced.
<b>Issue 2 – this Issue introduced the following changes:</b>	
1	The recognition of the introduction of a barometric sensor.
<b>Issue 3 – this Issue introduced the following changes:</b>	
1	4AA Power Module modified: * Option 1 - PCA PN: 4931: - Fuse F1 changed plus potting compound - Resistor R1 changed to 2 $\Omega$ , 0.75W (was 2 $\Omega$ , 0.25W) - Active current limiting circuit added. * Option 2 - PCA PN: 5052: - Fuse F1 changed to pre-encapsulated, certified fuse - Resistor R1 changed to 3.30 $\Omega$ , 0.75 W (was 2 $\Omega$ , 0.25 W) - Active current limiting circuit added.
2	LCD Interface Adapter PN 4203-PCA is no longer manufactured and is replaced by PN 4933-PCA.
3	Additional Conditions of Manufacturer were introduced.
<b>Issue 4 – this Issue introduced the following changes:</b>	
1.	The body responsible for assessing the quality was changed from CSA to DEKRA, the QAR was added to the certificate.