



# 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 BAS 08.0034X issue No.:9

Status: **Current**

Date of Issue: 2015-06-17 Page 1 of 4

Applicant: **Hansford Sensors Limited**  
Artisan  
Hillbottom Road  
Sands Industrial Estate  
Bucks  
HP12 4HJ  
United Kingdom

### Certificate history:

Issue No. 9 (2015-6-17)  
Issue No. 8 (2013-1-15)  
Issue No. 7 (2012-10-12)  
Issue No. 6 (2012-2-2)  
Issue No. 5 (2011-1-24)  
Issue No. 4 (2009-11-30)  
Issue No. 3 (2009-2-5)  
Issue No. 2 (2008-9-18)  
Issue No. 1 (2008-7-1)  
Issue No. 0 (2008-4-12)

Electrical Apparatus: **HS-420 Series Accelerometer**  
Optional accessory: Fuse Box


Type of Protection: **Intrinsic Safety, gas and dust**

Marking: **Ex ia I Ma (-40°C ≤ Ta ≤ +60°C)**  
**Ex ia IIC T6 Ga (-40°C ≤ Ta ≤ +60°C)**  
**Ex ia IIC T80°C IP65 Da (-40°C ≤ Ta ≤ +60°C)**

Approved for issue on behalf of the IECEx Certification Body: R S Sinclair

Position: Technical Manager

Signature:  
(for printed version)

  
18 JUNE 2015.

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:

**SGS Baseefa Limited**  
Rockhead Business Park  
Staden Lane  
Buxton  
Derbyshire  
SK17 9RZ  
United Kingdom





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Manufacturer: **Hansford Sensors Limited**  
Artisan  
Hillbottom Road  
Sands Industrial Estate  
Bucks  
HP12 4HJ  
**United Kingdom**

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:

**IEC 60079-0 : 2011** Explosive atmospheres - Part 0: General requirements

Edition: 6.0

**IEC 60079-11 : 2011** Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

Edition: 6.0

*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/BAS/ExTR08.0059/00

GB/BAS/ExTR09.0014/00

GB/BAS/ExTR12.0254/00

GB/BAS/ExTR08.0112/00

GB/BAS/ExTR11.0013/00

GB/BAS/ExTR15.0175/00

GB/BAS/ExTR08.0181/00

GB/BAS/ExTR12.0005/00

### Quality Assessment Report:

GB/BAS/QAR07.0040/05



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## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

The HS-420 Series Accelerometers are designed to measure velocity or acceleration by converting the signal generated by the compression of a piezo electric crystal by a given seismic mass and output a 4 to 20mA signal proportional to velocity or acceleration to the monitoring equipment.

The accelerometer comprises a piezo electric crystal connected to a signal conditioning board all contained within a stainless steel enclosure of various shapes measuring approximately 33cm<sup>3</sup>. The enclosure is a fully welded construction.

Electrical connections are made to the apparatus either via an IP65 rated connector or via an integral cable which is encapsulated in the end of the apparatus.

For terminal parameters see Annex.

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

1. The free end of the cable on the integral cable version of the apparatus must be terminated in an appropriately certified dust proof enclosure.



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

### Variation 9.1

To permit the use of an alternative PUR cable.

To permit the use of an alternative 2-Pin connector.

The Certificate Annex (now Issue 2) was updated with the parameters for the alternative PUR cable and 2-Pin connector. For completeness, the parameters for the HS-420IT & HS-422IT Accelerometers listed on Issue 2 of the certificate were also added to the Annex.

ExTR: GB/BAS/ExTR15.0175/00

File Reference: 15/0448



The Group II version of the apparatus (excluding cable) has the following terminal parameters:

$$\begin{aligned} U_i &= 28V \\ I_i &= 115mA \\ P_i &= 0.65W \end{aligned}$$

The HS-420IT or HS-422IT Accelerometer, with an integral temperature sensor and 25m of cable has the following terminal parameters for all four electrical connections considered as a single intrinsically safe circuit:

$$\begin{aligned} U_i &= 44V \\ I_i &= 117mA \\ P_i &= 0.722W \\ C_i &= 3nF \\ L_i/R_i &= 13nH/\Omega \end{aligned}$$

The Group I version of the apparatus (excluding cable) has the following terminal parameters:

$$\begin{aligned} U_i &= 16.5V \\ P_i &= 1.74W \end{aligned}$$

The apparatus must be powered from a power limited source such as an appropriately certified fuse assembly containing a  $\leq 62mA$  fuse, 1.74W (16.5V x 62mA x 1.7).

The Group I version of the apparatus (excluding cable) has the following alternative terminal parameters:

$$\begin{aligned} U_i &= 28V \\ I_i &= 115mA \\ P_i &= 0.65W \end{aligned}$$

The capacitance and inductance to resistance ratio of the different versions have the following parameters:

	Integral Cable or 2-Pin Mill Spec Connector with cable				4-Pin M12 Connector
	Polyurethane Cable	Silicone Cable	Armoured Cable	PUR Cable	Polyurethane Cable
$C_i$	= 160pF/m	= 370pF/m	= 290pF/m	= 884pF/m	= 120pF/m
$L_i/R_i$	= 8.32 $\mu$ H/ $\Omega$	= 15.4 $\mu$ H/ $\Omega$	= 15.4 $\mu$ H/ $\Omega$	= 6.1 $\mu$ H/ $\Omega$	= 11.7 $\mu$ H/ $\Omega$