



# 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](http://www.iecex.com)

Certificate No.:	<b>IECEX BAS 08.0034X</b>	Page 1 of 4	<u>Certificate history:</u>
Status:	<b>Current</b>	Issue No: 15	Issue 14 (2021-04-13)
Date of Issue:	2021-07-14		Issue 13 (2020-09-10)
Applicant:	<b>Hansford Sensors Limited</b> Artisan Hillbottom Road Sands Industrial Estate Bucks HP12 4HJ <b>United Kingdom</b>		Issue 12 (2018-08-17)
Equipment:	<b>HS-420 Series Accelerometer</b>		Issue 11 (2017-11-01)
Optional accessory:	Fuse Box		Issue 10 (2017-05-16)
Type of Protection:	<b>Intrinsic Safety, gas and dust</b>		Issue 9 (2015-06-17)
Marking:	HS-420M & HS-422M <b>Ex ia I Ma (-40°C ≤ Ta ≤ +60°C)</b> HS-420 & HS-422 <b>Ex ia IIC T4/T6 Ga (-40°C ≤ Ta ≤ +110°C/60°C)</b> <b>Ex ia IIIC T130°C/T80°C IP65 Da (-40°C ≤ Ta ≤ +110°C/60°C)</b> HS-421I & HS-423I <b>Ex ia IIC T4/T6 Ga (-40°C ≤ Ta ≤ +105°C/55°C)</b> <b>Ex ia IIIC T130°C/T80°C IP65 Da (-40°C ≤ Ta ≤ +105°C/55°C)</b>		Issue 8 (2013-01-15)
			Issue 7 (2012-10-12)
			Issue 6 (2012-02-02)
			Issue 5 (2011-01-24)

Approved for issue on behalf of the IECEx  
Certification Body:

**R S Sinclair**

Position:

**Technical Manager**

Signature:  
(for printed version)

D BREARLEY  
Certification  
Manager

Date:

15/7/2021

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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  
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 60079-0:2017** Explosive atmospheres - Part 0: Equipment - General requirements  
Edition:7.0

**IEC 60079-11:2011** Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"  
Edition:6.0

This Certificate **does not** indicate compliance with 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/BAS/ExTR08.0059/00  
GB/BAS/ExTR09.0014/00  
GB/BAS/ExTR12.0254/00  
GB/BAS/ExTR18.0140/00  
GB/BAS/ExTR21.0106/00

GB/BAS/ExTR08.0112/00  
GB/BAS/ExTR11.0013/00  
GB/BAS/ExTR15.0175/00  
GB/BAS/ExTR20.0138/00

GB/BAS/ExTR08.0181/00  
GB/BAS/ExTR12.0005/00  
GB/BAS/ExTR17.0322/00  
GB/BAS/ExTR21.0054/00

Quality Assessment Report:

GB/BAS/QAR07.0040/09



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## **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.

The HS-420 & HS-422 Series Accelerometers are designed to measure velocity and acceleration respectively and output a 4 to 20mA output.

The HS-420IT & HS-422IT Series Accelerometers are variants of the HS-420 & HS-422 Series but also have an integral temperature sensor.

The HS-421 & HS423 Series Accelerometers are similar to the HS-420 & HS-422 Series but have an additional AC acceleration output.

For terminal parameters see Annex

## **SPECIFIC CONDITIONS OF USE: 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 15.1

This issue of the certificate confirms:

1. for Group II & III Accelerometers Models HS-421I & HS-423I:
  - an increase in Pi from 650mW to 856mW
  - a decrease in the maximum ambient temperatures from 110°C to 105°C (T4) and 60°C to 55°C (T6).
2. the current design meets the requirements of IEC 60079-0:2017.

ExTR: **GB/BAS/ExTR21.0106/00**

File Reference: **21/0287**

### Annex:

[IECEX BAS 08.0034X Annex Issue 6.pdf](#)

**HS-420 Series Accelerometer**

Input Parameters

The Group II & III versions of the HS-420 & HS-422 Series Accelerometers (excluding cable) have the following terminal parameters:

$$\begin{aligned} U_i &= 28V & C_i &= 0 \\ I_i &= 115mA & L_i &= 0 \\ P_i &= 0.65W \end{aligned}$$

The Group II & III versions of the HS-421 & HS-423 Series Accelerometers (excluding cable) have the following terminal parameters:

$$\begin{aligned} U_i &= 28V & C_i &= 0 \\ I_i &= 115mA & L_i &= 0 \\ P_i &= 0.856W \end{aligned}$$

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:

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

The Group I versions of the HS-420 & HS-422 Series Accelerometers (excluding cable) have the following terminal parameters:

$$\begin{aligned} U_i &= 16.5V & C_i &= 0 \\ P_i &= 1.74W & L_i &= 0 \end{aligned}$$

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:

$$\begin{aligned} U_i &= 28V & C_i &= 0 \\ I_i &= 115mA & L_i &= 0 \\ P_i &= 0.65W \end{aligned}$$

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

	Integral Cable or 2-Pin Mil 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
$L_i$	= 0.72 $\mu$ H/m	= 0.5 $\mu$ H/m	= 0.5 $\mu$ H/m	= 0.6 $\mu$ H/m	= 0.7 $\mu$ H/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/ $\Omega$

The above equipment is marked with the following certification markings and associated ambient temperature ranges:

Group I Accelerometers Models HS-420M, HS-420MF, HS-422M & HS-422MF:	Ex ia I Ma (-40°C ≤ T <sub>a</sub> ≤ +60°C)
Group II & III Accelerometers Models HS-420I, HS-420IT, HS-422I & HS-422IT:	Ex ia IIC T4 Ga (-40°C ≤ T <sub>a</sub> ≤ +110°C) Ex ia IIIC T130°C IP65 Da (-40°C ≤ T <sub>a</sub> ≤ +110°C)
	Ex ia IIC T6 Ga (-40°C ≤ T <sub>a</sub> ≤ +60°C) Ex ia IIIC T80°C IP65 Da (-40°C ≤ T <sub>a</sub> ≤ +60°C)
Group II & III Accelerometers Models HS-421I & HS-423I:	Ex ia IIC T4 Ga (-40°C ≤ T <sub>a</sub> ≤ +105°C) Ex ia IIIC T130°C IP65 Da (-40°C ≤ T <sub>a</sub> ≤ +105°C)
	Ex ia IIC T6 Ga (-40°C ≤ T <sub>a</sub> ≤ +55°C) Ex ia IIIC T80°C IP65 Da (-40°C ≤ T <sub>a</sub> ≤ +55°C)