1 # EC - TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3 EC - Type Examination Certificate Number: **Baseefa08ATEX0086X – Issue 7**

4 Equipment or Protective System: **HS-420 Series Accelerometer**

5 Manufacturer: **Hansford Sensors Limited**

6 Address: **Sands Industrial Estate, Bucks, HP12 4HJ**

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Baseefa, Notified Body number 1180, in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report No's. See Certificate History

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012+A11:2013 EN 60079-11:2012

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include the following :

⟨Ex⟩ II 1G Ex ia IIC T6 Ga ($-40°C \leq T_a \leq +60°C$)

⟨Ex⟩ II 1D Ex ia IIIC T80°C IP65 Da ($-40°C \leq T_a \leq +60°C$)

⟨Ex⟩ I M1 Ex ia I Ma ($-40°C \leq T_a \leq +60°C$)

Baseefa Customer Reference No. **5943**

Project File No. **15/0448**

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R S SINCLAIR
GENERAL MANAGER
On behalf of SGS Baseefa Limited

13 **Schedule**

14 **Certificate Number Baseefa08ATEX0086X – Issue 7**

15 Description of Equipment or Protective System

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 33cm3. 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 Group II version of the apparatus (excluding cable) has the following terminal parameters:

U_i = 28V
I_i = 115mA
P_i = 0.65W

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:

Ui = 44V
Ii = 117mA
Pi = 0.722W
Ci = 3nF
Li/Ri = 13nH/Ω

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

U_i = 16.5V
P_i = 1.74W

The apparatus must be powered from a power limited source such as an appropriately certified fuse assembly containing a ≤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:

U_i = 28V
I_i = 115mA
P_i =0.65W

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	= 8.32µH/Ω	= 15.4µH/Ω	= 15.4µH/Ω	= 6.1µH/Ω	= 11.7µH/Ω

16 Report Number

See Certificate History

17 Specific Conditions of Use

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

18 Essential Health and Safety Requirements

All relevant Essential Health and Safety Requirements are covered by the standards listed at item 9.

19 Drawings and Documents

New drawings submitted for this issue of certificate.

Number	Sheet	Issue	Date	Description
M06-008-F	1 to 5	F	12/06/15	General Arrangement and Product Information for Group I, Group II and Group III HS-420 & HS-422 Series Accelerometers

Current drawings also associated with this certificate.

Number	Sheet	Issue	Date	Description
M06-009-B	1 of 1	B	13/01/11	Zener Diode Arrangement HS-420 & HS-422 Series Accelerometer
M06-014-A	1 of 2	A	19.03.08	Din Rail Mounted Enclosure with a 62mA Safe-T-Fuse 259 Series F.U.W. HS-420M/HS422M Series Group I Accelerometers
M06-014-A	2 of 2	A	19.03.08	Inline Fuse with a 62mA Pico II 251 Series Fuse F.U.W. HS-420M/HS422M Series Group I Accelerometers
M06-020-C	1 to 4	C	30/08/12	General Arrangement and Product Information for Group I Fused HS-420 & HS-422 Series Accelerometer
M06-022-C	1 to 3 of 4	C	30/08/12	General Arrangement and Product Information for Group II HS-420IT & HS-422IT Series Accelerometer
M06-022-C	4 of 4	C	30/08/12	General Arrangement and Product Information for Group II and Group III HS-420IT & HS-422IT Series Accelerometer
HS420-IS	1 of 1	C	05.01.11	HS-420/HS-422 4-20mA Circuit
HS420M	1 of 1	C	14.01.11	HS-420M/HS-422M 4-20mA Circuit
HS420IT	1 of 1	D	14.01.11	HS-420IT/HS-422IT 4-20mA Circuit
P01-004	1 of 1	D	05.01.11	4-20mA PCB Track Layout
P02.004	1 of 1	D	05.01.11	4-20mA PCB Component Layout
P01-012	1 of 1	A	03.03.08	HS420I PCB for M12 Connector
P02-012	1 of 1	A	27.02.08	HS420I PCB Connector
P01-026	1 of 1	A	19.05.08	HS420M Connection PCB for M12 Connector
P02-026	1 of 1	A	19.05.08	HS420M Connection PCB
P01-027	1 of 1	B	09.09.08	HS420IT Connection PCB for M12 Connector
P02-027	1 of 1	B	09.09.08	HS420IT Connection PCB

These drawings are associated and held with IECEx BAS 08.0034X

20 Certificate History

Certificate No.	Date	Comments
Baseefa08ATEX0086X	10 April 2008	The release of the prime certificate. The associated test and assessment is documented in Test Report GB/BAS/ExTR08.0059/00.

Certificate No.	Date	Comments
Baseefa08ATEX0086/1	1 July 2008	To permit the introduction of a new mining version complete with integral fuse identified as: HS-420MFxxxyyzz or HS-422MFxxxyyzz. To permit minor non-electrical changes that do not affect the original assessment. Intrinsic safety is not affected. The associated test and assessment is documented in Test Report GB/BAS/ExTR08.0112/00.
Baseefa08ATEX0086/2	18 September 2008	To permit the introduction the HS-420IT or HS-422IT Accelerometer, with an integral temperature sensor, 25m of cable and associated electrical connections. Intrinsic safety is not affected. The associated test and assessment is documented in Test Report GB/BAS/ExTR08.0181/00.
Baseefa08ATEX0086/3	4 February 2009	To permit minor mechanical changes that do not affect the original assessment. Intrinsic safety is not affected. The associated test and assessment is documented in Test Report GB/BAS/ExTR09.0014/00.
Baseefa08ATEX0086/4	24 January 2011	To permit minor electrical changes that do not affect the original assessment. To permit minor marking changes that do not affect the original assessment. Clarification of components not fitted to PCB added to report. Intrinsic safety is not affected. The associated test and assessment is documented in Test Report GB/BAS/ExTR11.0013/00.
Baseefa08ATEX0086/5	2 February 2012	To permit the HS-420M series of the equipment (not the HS-420MF series) to be marked with alternative terminal parameters. Intrinsic safety is not affected. The associated test and assessment is documented in Test Report GB/BAS/ExTR12.0005/00.
Baseefa08ATEX0086/6	10 October 2012	To confirm that the equipment covered by this certificate also meets the requirements of EN60079-0: 2012 (IEC60079-0: 2011, Edition 6) and EN60079-11: 2012 (IEC60079-11: 2011, Edition 6) as supported by GB/BAS/ExTR12.0254/00 held on technical file IECEx BAS 07.0035X.
Baseefa08ATEX0086X Issue 7	17 June 2015	This issue of the certificate incorporates previously issued primary & supplementary certificates into one certificate and permits the following changes: To permit the use of an alternative PUR cable. To permit the use of an alternative 2-Pin connector. Intrinsic safety is not affected. The associated test and assessment is documented in Test Report GB/BAS/ExTR15.0175/00.
For drawings applicable to each issue, see original of that issue.		