

# HS-420I/M Intrinsically Safe Accelerometer

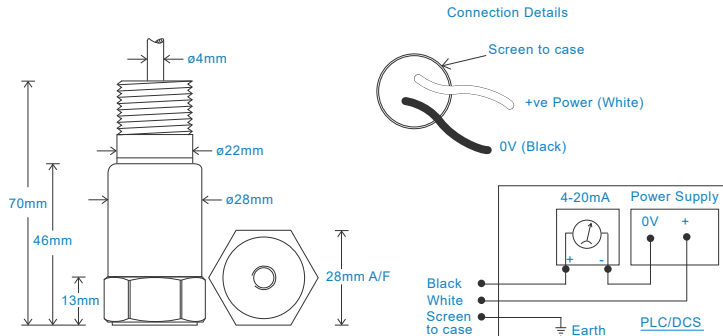
## 4-20mA velocity output via Flame Retardant Cable for use with Terminal Head

### Key Features

- Intrinsically Safe with European, USA, Australian, South African, and Indian approvals
- Approved SIL 2 and SIL 3
- For use with Terminal Head
- Customizable features

### Industries

Building services, Pulp and Paper, Mining, Metals, Utilities, Automotive, Water, Pharmaceutical



### Technical Performance

Mounted Base Resonance	5kHz min
Velocity Ranges	see: 'How To Order' table $\pm 10\%$ Nominal 80Hz at 22°C
Frequency Response	10Hz (600cpm) to 1kHz (60kcpm) $\pm 5\%$ - ISO10816
Isolation	Base isolated
Range	50g peak
Transverse Sensitivity	Less than 5%

### Mechanical

Case Material	Stainless Steel
Sensing Element/Construction	PZT/Compression
Mounting Torque	8Nm
Weight	150gms (nominal)
External Cable Length	site cable up to 1000 metres
Integral Cable Length	up to 300 mm
Cable Connections	Screw Terminals
Mounting Threads	see: 'How To Order' table

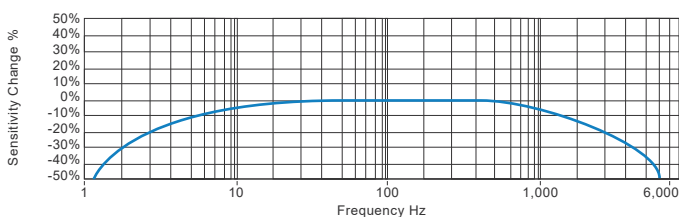
### Electrical

Current Output	4-20mA DC proportional to Velocity Range
Supply Voltage	15-30 Volts DC (for 4-20mA)
Settling Time	2 seconds
Output Impedance	Loop Resistance 600 Ohms max. at 24 Volts
Case Isolation	$>10^8$ Ohms at 500 Volts

### Environmental

Operating Temperature Range	see: attached certification details
Sealing	IP65
Maximum Shock	5000g
EMC	EN61326-1:2013

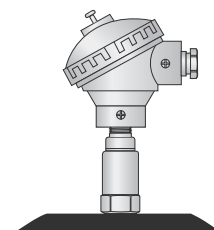
### Typical Frequency Response



### Applications

Fans, Motors, Pumps, Compressors, Centrifuges, Conveyors, Air Handlers, Gearboxes, Rolls, Dryers, Presses, Cooling, VAC, Spindles, Machine Tooling, Process Equipment

Vibration sensor should be firmly fixed to a flat surface (spot face surface may be needed to be produced and cable anchored to sensor body.)



### Certifications



This product is certified in accordance with  
UL 913, 8th Ed. Rev. December 6, 2013  
CAN/CSA C22.2 No. 157-92 (R2012) +Upd1 +Upd2



[www.hansfordsensors.com](http://www.hansfordsensors.com)  
[sales@hansfordsensors.com](mailto:sales@hansfordsensors.com)

We reserve the right to alter the specification of this product without prior notice  
TS080.24



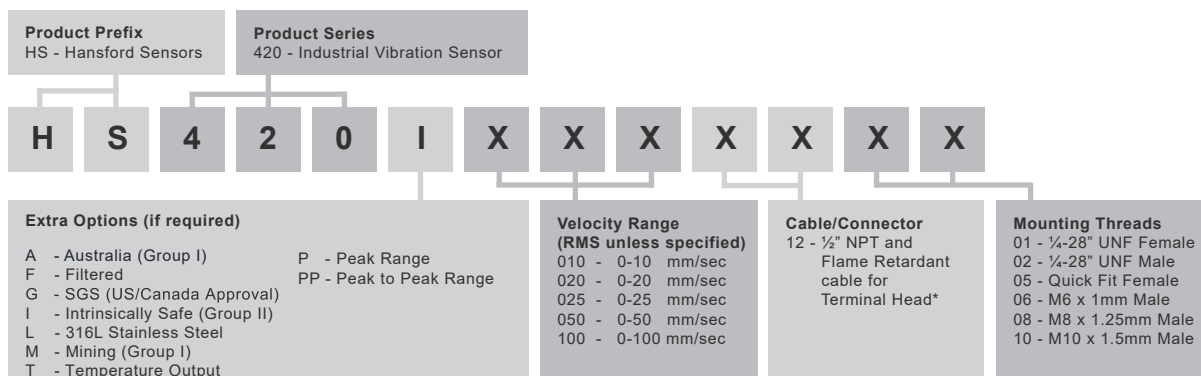
# HS-420I/M Intrinsically Safe Accelerometer

## 4-20mA velocity output via Flame Retardant Cable for use with Terminal Head

### Intrinsically Safe Requirements

Maximum Cable Length	nominal 100 metres see attached system drawings	US/Canada Approvals	Certificate No. SGSNA/18/SUW/0000231 Class I, II, III, Division 1, 2, Groups A - G, T4, -40°C to +110°C, Class I, Zone 0, AEx, ia, IIC, T4, Ga, -40°C to +110°C Zone 20, AEx, ia, IIC, T130°C, IP65, Da, -40°C to +110°C
Certificate details: Group I + II	IECEX BAS08.0034X Baseefa08ATEX0086X ⓈII 1GD Ex ia IIC T6 Ga Ex ia IIC T80°C IP65 Da ⓈI M1 Ex ia I Ma (-40°C ≤ Ta ≤ +60°C)	Barrier	1 x Pepperl + Fuchs Galvanic Isolator KFD2-STC4-Ex1, which has superseded KFD2-CR-Ex1.30300 (BAS00ATEX7164) see attached system drawings
Certificate details: Group II	ⓈII 1GD Ex ia IIC T4 Ga Ex ia IIC T130°C IP65 Da (-40°C ≤ Ta ≤ +110°C)		1 x MTL Zener Barrier MTL7787+ (BAS01ATEX7217) or Pepperl + Fuchs Zener Barrier Z787 (BAS01ATEX7005) or any other barrier that conforms to system drawings attached
Accelerometer System Certificate	Baseefa08Y0087 Ex ia IIC T6 (-40°C ≤ Ta ≤ +60°C) *On request - consult Sales Office	System Connections for Zener Barrier	see attached system drawings
		System Connections for Galvanic Isolator	see attached system drawings
Terminal Parameters	Ui = 28V, Ii = 115mA, Pi = 0.65W Group II Ui = 16.5V Pi = 0.65W or Ui = 28V Ii = 115mA Pi = 0.65W Group I	Terminal Parameters	Ui = Vmax = 28V Ii = Imax = 115mA Pi = 0.65W
500V Isolation	Units Will Pass A 500V Isolation Test	Notes:	Special conditions of safe use for Group II dust. The free end of the cable on the integral cable version of the apparatus must be terminated in an appropriately certified dust-proof enclosure. The unit has no serviceable parts.
Certified Temperature Range	Ex ia IIC T6 Ga (-40°C ≤ Ta ≤ +60°C) (Gas) Ex ia IIC T4 Ga (-40°C ≤ Ta ≤ +110°C) (Gas) Ex ia IIC T80°C IP65 Da (-40°C ≤ Ta ≤ +60°C) (Dust) Ex ia IIC T130°C IP65 Da (-40°C ≤ Ta ≤ +110°C) (Dust) Ex ia I Ma (-40°C ≤ Ta ≤ +60°C) (Mining)		
Australia Approval Group 1	IECEX ITA 10.0003X Ex ia I Ma (-40°C ≤ Ta ≤ +60°C)		
South African Approval	Certificate No. MASC MS/16-0229X Group I and II (As Baseefa/ATEX)		

### How To Order



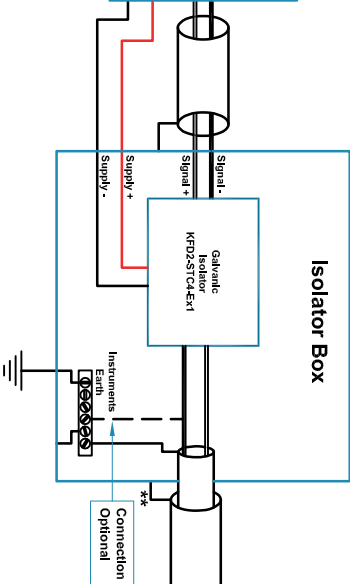
\*HS-AA042 or HS-AA052 Terminal Head to be purchased separately

Non-Hazardous Area

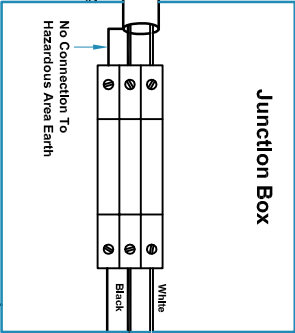
Hazardous Area

Non-hazardous area apparatus which is unspecified except that it must not be supplied from nor contain under normal or abnormal conditions, a source of potential with respect to earth in excess of 250 volts DC.

under normal conditions the potential at the connections to the galvanic isolator must not exceed 40 volts DC.



See Table 1



See Note 1 & 2

HS-420XXXX08XX or HS-4221XXX08XX Accelerometer BASATEX0086X Ex Ia IIC

\*\*Outer shield only connected to chassis via Ex approved cable gland

Table 1: Cable Parameters For Additional Cable Lengths

Table 1: Cable Parameters For Additional Cable Lengths			
Accelerometer With Integral Cable Length ≤ 10m			
Group	Capacitance µF	L/R Ratio µH/Ω	
IIC	0.097	72	
IIB	0.768	277	
IIA	2.598	585	
Accelerometer With Integral Cable Length ≤ 50m			
Group	Capacitance µF	L/R Ratio µH/Ω	
IIC	0.091	72	
IIB	0.762	277	
IIA	2.592	585	
Accelerometer With Integral Cable Length ≤ 100m			
Group	Capacitance µF	L/R Ratio µH/Ω	
IIC	0.083	72	
IIB	0.754	277	
IIA	2.584	585	

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HS-420I & HS-422I Accelerometer System

Ex ia IIC T6 (-40°C ≤ Ta ≤ +60°C)

Notes:

1. The capacitance and inductance, or inductance - to - resistance ratio (L/R) of hazardous area cable, must not exceed the values shown in Table 1.
2. The cable from the accelerometer to the junction box must not be installed in a high velocity dust laden atmosphere.
3. The installer is to perform a risk assessment in accordance with clause 10 of EN 60079-25 and install lightning protection arrestors as deemed necessary.

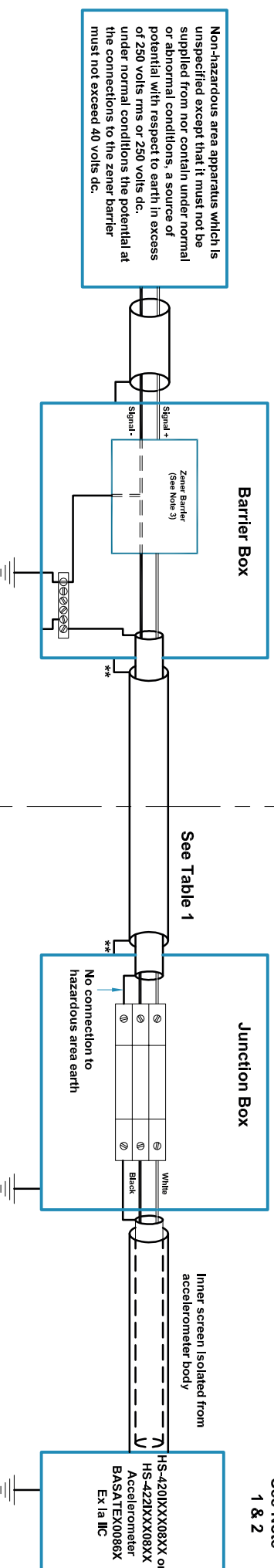
Rev No	DRF No	Date Drg	Drg By	Appd By	Material: N/A
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A	Release	17/06/10	MJS	CMH	Tolerances Unless Stated 0 or 0.0 ±0.5 0.00 ±0.15 Angle ±5°
Hansford Sensors Ltd Saunderton Business Park Haw Lane Saunderton Bucks HP14 4JE					All Dimensions in mm Unless Otherwise Stated
If In Doubt - Ask!					Scale: NTS Sheet: 1 of 1
Form Number: QF024 Issue 1					

### Non-Hazardous Area

## Hazardous Area

**See Note  
1 & 2**



**\*\*Outer shield only  
connected to chassis via  
Ex approved cable gland**

baseefa 08 Y 0087



## Baseefa Certification Schedule Drawing

*As. Wood*

**Hansford Sensors Ltd**

**HS-4201 & HS-4221**  
**Accelerometer System**  
**Baseefa08Y0087**  
**Ex ia IIC T6 (-40°C ≤ Ta ≤ +60°C)**

### Notes:

1. The capacitance and inductance, or inductance - to - resistance ratio (L/R) of hazardous area cable, must not exceed the values shown in Table 1.
2. The cable from the accelerometer to the junction box must not be installed in a high velocity dust laden atmosphere.
3. Any shunt zener diode safety barrier certified by an ec approved body to [IEE, ia] IIC having the following output parameters:  $U_o = 28V$  dc,  $I_o = 93mA$  dc,  $P_o = 0.65W$ , e.g. MTL787 to BAS01ATEX217 or Pepperl + Fuchs Z787 to BAS01ATEX005.
4. The installer is to perform a risk assessment in accordance with clause 10 of EN 60079-25 and install lightning protection arrestors as deemed necessary.

**Table 1: Cable Parameters For Additional Cable Lengths**

Accelerometer With Integral Cable Length $\leq 10\text{m}$		
Group	Capacitance $\mu\text{F}$	L/R Ratio $\mu\text{H}/\Omega$
IIC	0.081	56
IIB	0.247	168
IIA	0.662	448
Accelerometer With Integral Cable Length $\leq 50\text{m}$		
Group	Capacitance $\mu\text{F}$	L/R Ratio $\mu\text{H}/\Omega$
IIC	0.075	56
IIB	0.241	168
IIA	0.656	448
Accelerometer With Integral Cable Length $\leq 100\text{m}$		
Group	Capacitance $\mu\text{F}$	L/R Ratio $\mu\text{H}/\Omega$
IIC	0.067	56
IIB	0.233	168
IIA	0.648	448

Rev No	DRF No	Date Drq	Drq By	Appd By	Material: <span style="color: blue;">N/A</span>
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A	Release	10/03/08	MJS	CMH
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Tolerances L

0 or 0.0	±0
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Angle  $\pm 5^\circ$ 


1	2	3
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