

# HS-420I/M Intrinsically Safe Accelerometer

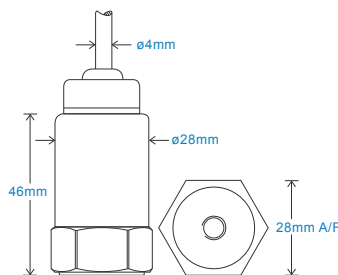
## 4-20mA velocity output via Flame Retardant Cable

### Key Features

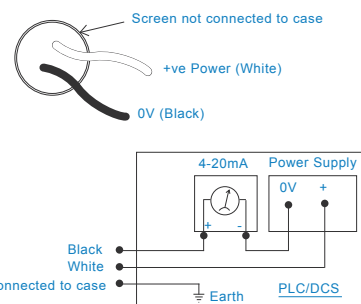
- Intrinsically Safe with European, USA, Australian, South African, and Indian approvals
- Approved SIL 2 and SIL 3
- For use with PLC/DCS systems
- Low smoke, halogen free cable

### Industries

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



### Connection Details



### 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)
Maximum Cable Length	1000 metres
Standard Cable Length	5 metres
Screened Cable	Flame Retardant - length to be specified with order
Mounting Threads	see: 'How To Order' table

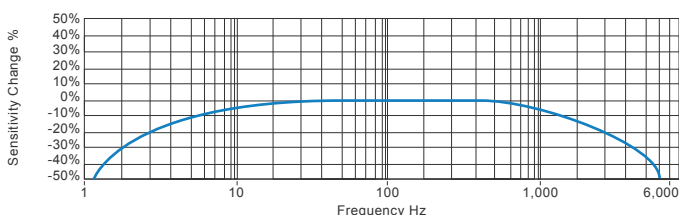
### Electrical

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

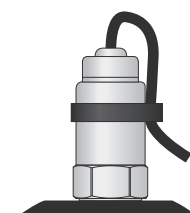
### Typical Frequency Response



### 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  
TS062.22

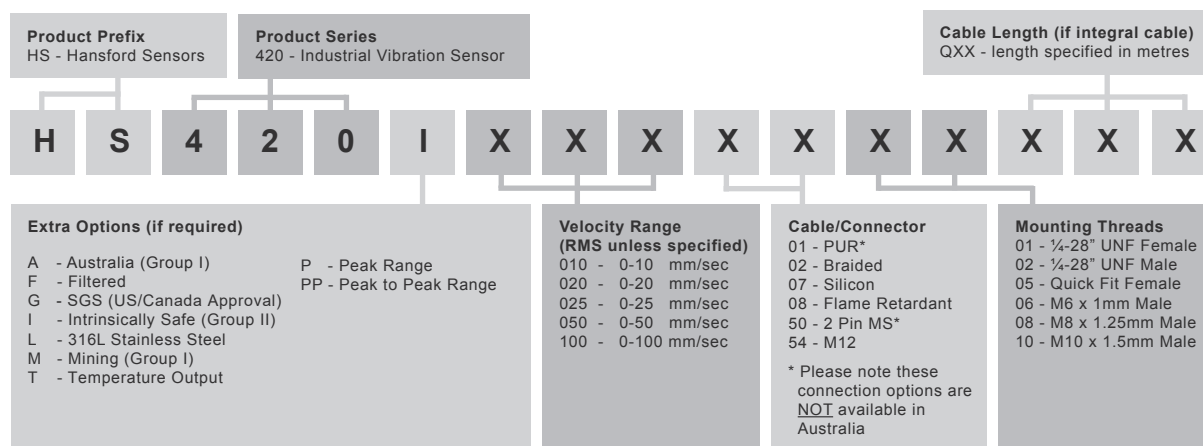


### 4-20mA velocity output via Flame Retardant Cable

## 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	
Certificate details: Group I + II	IECEX BAS08.0034X Baseefa08ATEX0086X		Zone 20, AEx, ia, IIIC, T130°C, IP65, Da, -40°C to +110°C
	Ⓜ II 1GD	Barrier	1 x Pepperl + Fuchs Galvanic Isolator
	Ex ia IIC T6 Ga		KFD2-STC4-Ex1, which has superseded
	Ex ia IIIC T80°C IP65 Da		KFD2-CR-Ex1.30300 (BAS00ATEX7164)
	Ⓜ I M1		see attached system drawings
	Ex ia I Ma (-40°C ≤ Ta ≤ +60°C)		1 x MTL Zener Barrier MTL7787+ (BAS01ATEX7217)
Certificate details: Group II	Ⓜ II 1GD		or Pepperl + Fuchs Zener Barrier
	Ex ia IIC T4 Ga		Z787 (BAS01ATEX7005) or any other barrier that
	Ex ia IIIC T130°C IP65 Da (-40°C ≤ Ta ≤ +110°C)		conforms to system drawings attached
		System Connections for Zener Barrier	see attached system drawings
Accelerometer System Certificate	Baseefa08Y0087		
	Ex ia IIC T6 (-40°C ≤ Ta ≤ +60°C) *On request - consult Sales Office	System Connections for Galvanic Isolator	see attached system drawings
		Terminal Parameters	Ui = Vmax = 28V Ii = Imax = 115mA Pi = 0.65W
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		
		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.
500V Isolation	Units Will Pass A 500V Isolation Test		
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 IIIC T80°C IP65 Da ( -40°C ≤ Ta ≤ +60°C) (Dust) Ex ia IIIC 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



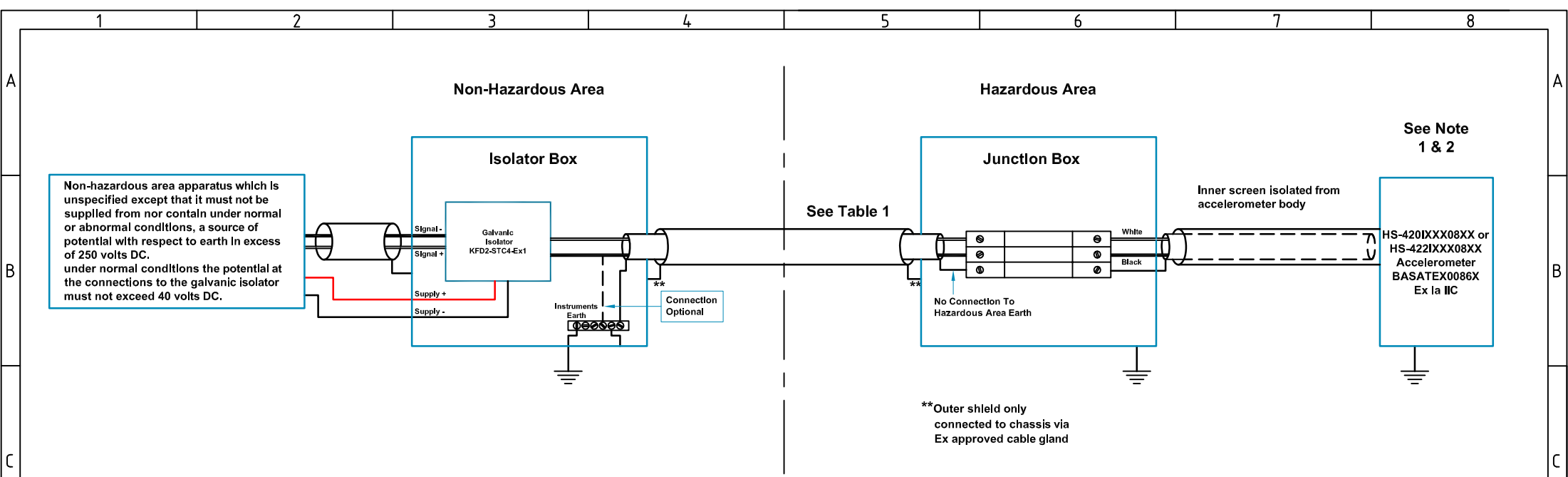


Table 1: Cable Parameters For Additional Cable Lengths

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:

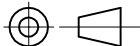
1. The capacitance and inductance, or inductance - to - resistance ratio (L/R) of hazardous area cable, must not exceed the values shown in Table 1.
2. The cable from the accelerometer to the junction box must not be installed in a high velocity dust laden atmosphere.
3. The installer is to perform a 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
A	Release	17/06/10	MJS	CMH

Material: N/A	
Tolerances Unless Stated	
0 or 0.0	±0.5
0.00	±0.15
Angle	±5°
Finish All Over Threads g6 H6	

**Hansford Sensors**  
*Excellence in Vibration Monitoring*

Hansford Sensors Ltd  
Saunderton Business Park  
Haw Lane  
Saunderton  
Bucks HP14 4JE

 **Do Not Scale**

All Dimensions In mm Unless  
Otherwise Stated

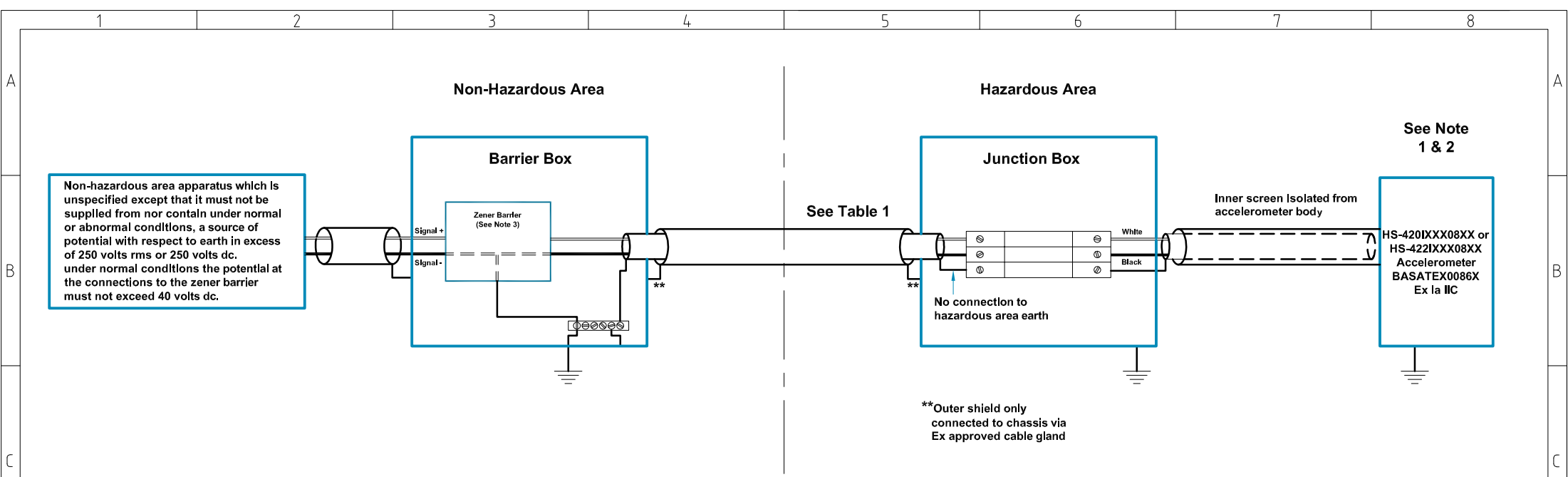
**If In Doubt - Ask!**

Description: **System Connections**  
For HS-420I & HS-422I Group II  
Accelerometers With Non Armoured  
FR Polyurethane Cable  
F.U.W. Galvanic Isolation

Drawing No: **M06-033-A**

Scale: **NTS**  
Sheet: **1 of 1**

Form Number:  
**QF024 Issue 1**



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 rms or 250 volts dc. under normal conditions the potential at the connections to the zener barrier must not exceed 40 volts dc.

See Note 1 & 2

HS-4201XXX08XX 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

Accelerometer With Integral Cable Length ≤ 10m		
Group	Capacitance µF	L/R Ratio µH/Ω
IIC	0.081	56
IIB	0.247	168
IIA	0.662	448
Accelerometer With Integral Cable Length ≤ 50m		
Group	Capacitance µF	L/R Ratio µH/Ω
IIC	0.075	56
IIB	0.241	168
IIA	0.656	448
Accelerometer With Integral Cable Length ≤ 100m		
Group	Capacitance µF	L/R Ratio µH/Ω
IIC	0.067	56
IIB	0.233	168
IIA	0.648	448



Baseefa Certification Schedule Drawing



baseefa 08 Y 0087

*[Handwritten signature]*

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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 [EEEx ia] IIC having the following output parameters: Uo = 28V dc, Io = 93mA dc, Po = 0.65W. e.g. MTL7787 to BAS01ATEX7217 or Pepperl + Fuchs Z787 to BAS01ATEX7005.
  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.

Rev No	DRF No	Date Drg	Drg By	Appd By	Material: <span>N/A</span>	 <div><b>Hansford Sensors</b> <i>Excellence in Vibration Monitoring</i></div> <div><b>Hansford Sensors Ltd</b> Saunderton Business Park Haw Lane Saunderton Bucks HP14 4JE</div>	 Do Not Scale	Description: <span>System Connections</span> For HS-420I & HS-422I Group II Accelerometers With Non Armoured FR Polyurethane Cable F.U.W. Zener Barrier	
<span>A</span>	<span>Release</span>	<span>10/03/08</span>	<span>MJS</span>	<span>CMH</span>	Tolerances Unless Stated 0 or 0.0 ±0.5 0.00 ±0.15 Angle ±5° <div><div><div>1.6</div><div>▽</div></div>Finish All Over Threads g6 H6</div>		All Dimensions In mm Unless Otherwise Stated	Drawing No: <span>M06-013-A</span>	
							<div><b>If In Doubt - Ask!</b></div>	Scale: <span>NTS</span>	Form Number: <span>QF024 Issue 1</span>
								Sheet: <span>2 of 2</span>	