

# HS-420I/M Intrinsically Safe Accelerometer

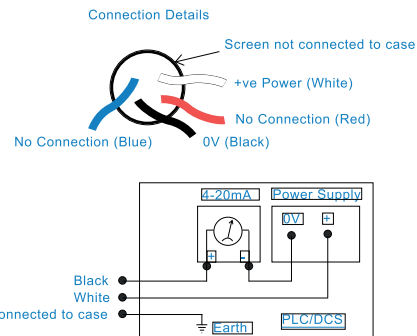
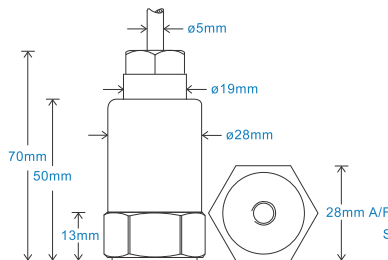
## 4-20mA velocity output via PUR Cable

### 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
- Waterproof and resistant to oil

### 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)
Maximum Cable Length	1000 metres
Standard Cable Length	5 metres
Screened Cable	PUR - length to be specified with order
Mounting Threads	see: 'How To Order' table
Submersible Depth	100 metres max (10 bar)

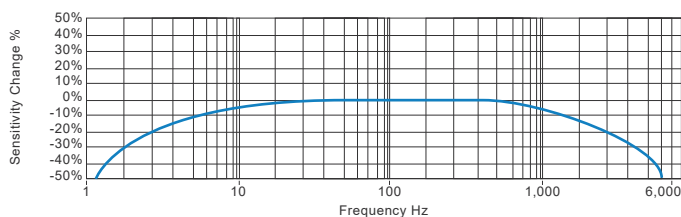
### Electrical

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	IP68
Maximum Shock	5000g
EMC	EN61326-1:2013

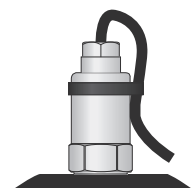
### Typical Frequency Response



### 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

TS389.20



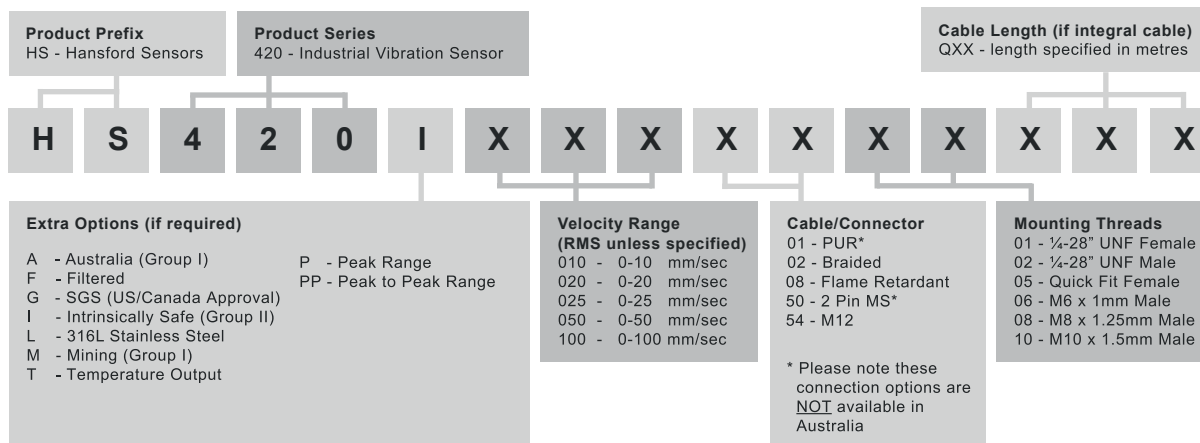
# HS-420I/M Intrinsically Safe Accelerometer

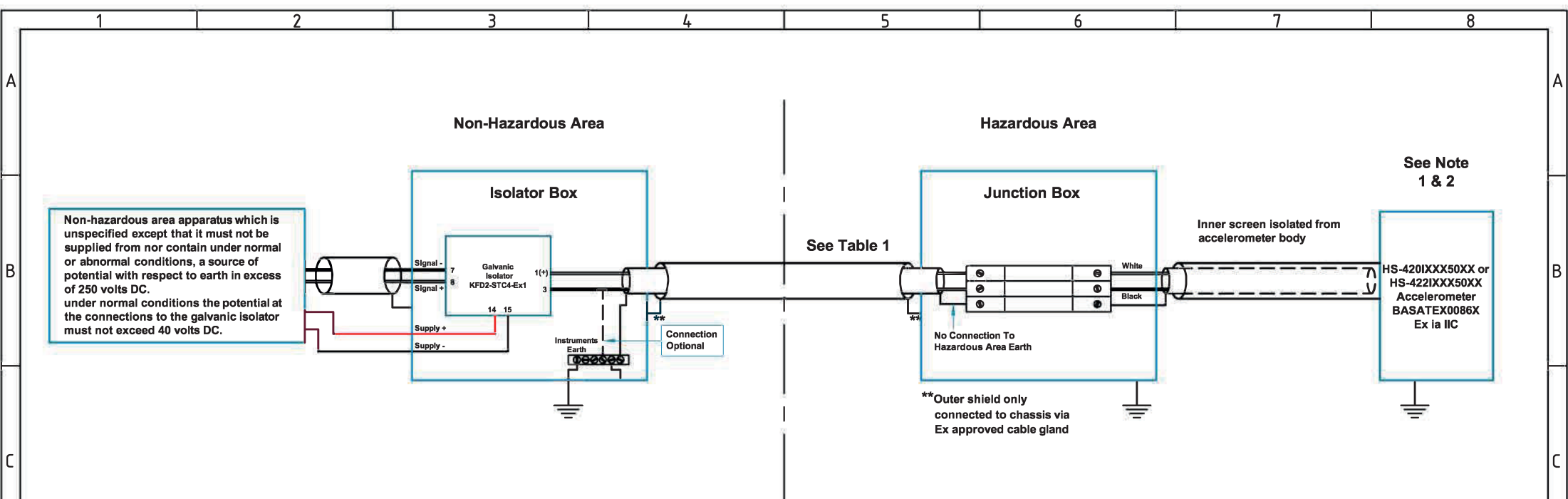
## 4-20mA velocity output via PUR Cable

### 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 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





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 Note 1 & 2

HS-420IXXX50XX or HS-422IXXX50XX Accelerometer BASATEX0086X Ex ia IIC

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

**Hansford Sensors Ltd**

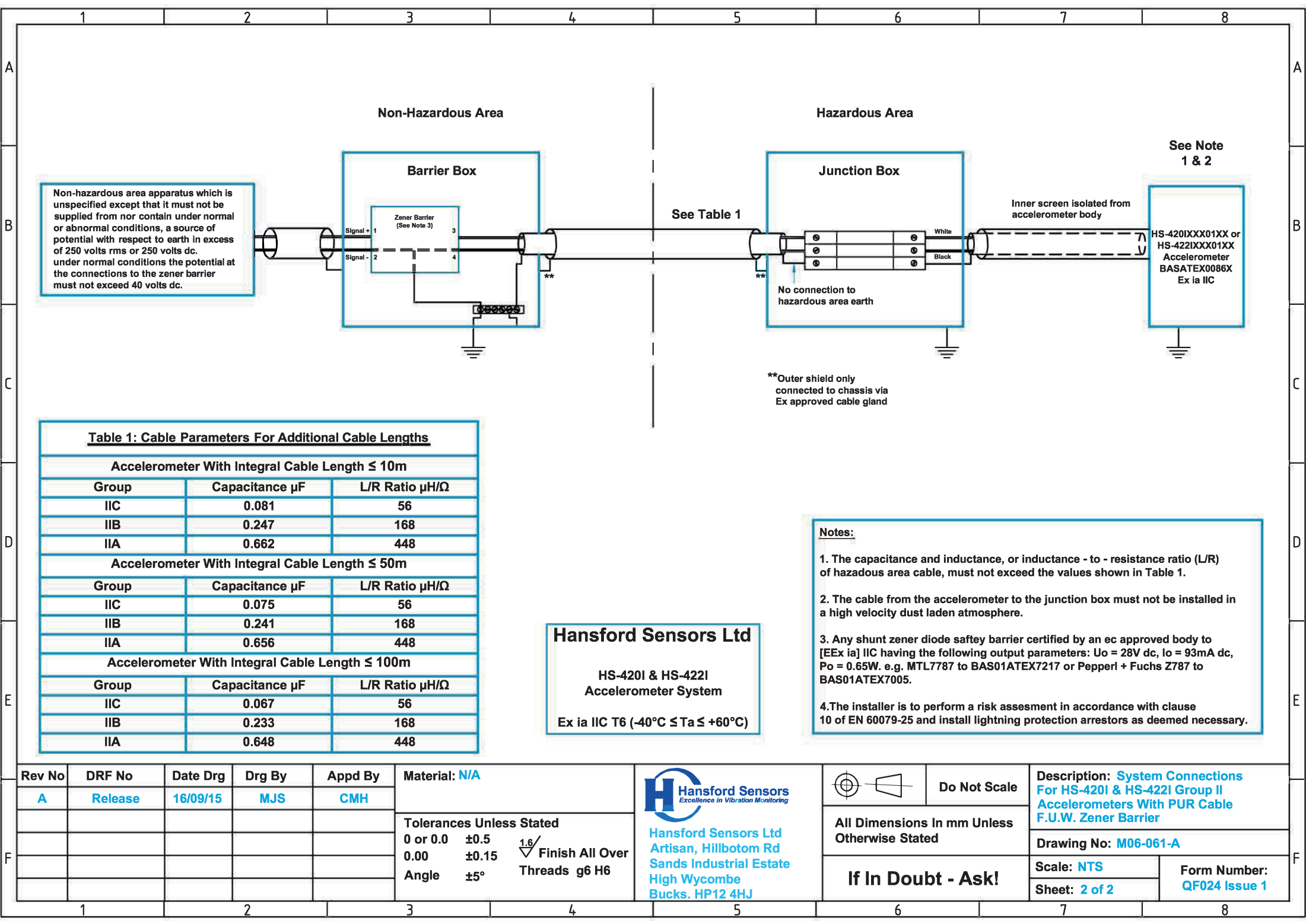
HS-420I & HS-422I Accelerometer System

Ex ia IIC T6 (-40°C ≤ Ta ≤ +60°C)

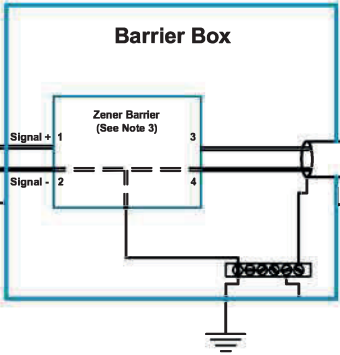
- Notes:**
- The capacitance and inductance, or inductance - to - resistance ratio (L/R) of hazardous area cable, must not exceed the values shown in Table 1.
  - The cable from the accelerometer to the junction box must not be installed in a high velocity dust laden atmosphere.
  - The installer is 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	 Hansford Sensors Ltd Artisan, Hillbottom Rd Sands Industrial Estate High Wycombe Bucks. HP12 4HJ	 Do Not Scale	Description: <b>System Connections Details</b> For HS-420I & HS-422I Group II Accelerometers With PUR Cable F.U.W. Galvanic Isolation	
A	Release	16/09/15	MJS	CMH	Tolerances Unless Stated 0 or 0.0 ±0.5 0.00 ±0.15 Angle ±5° 1.6/√ Finish All Over Threads g6 H6			Drawing No: M06-061-A	Scale: NTS
									Form Number: QF024 Issue 1

**If In Doubt - Ask!**



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.



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

See Table 1

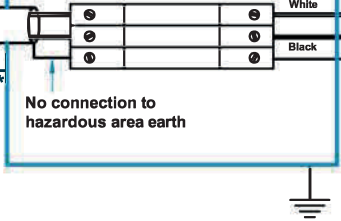


Table 1: Cable Parameters For Additional Cable Lengths

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

**Hansford Sensors Ltd**  
  
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. 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 assesment 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	 Hansford Sensors Ltd Artisan, Hillbottom Rd Sands Industrial Estate High Wycombe Bucks. HP12 4HJ	 Do Not Scale	Description: <b>System Connections For HS-420I &amp; HS-422I Group II Accelerometers With PUR Cable F.U.W. Zener Barrier</b>	
A	Release	16/09/15	MJS	CMH	Tolerances Unless Stated 0 or 0.0 ±0.5 0.00 ±0.15 Angle ±5° Finish All Over Threads g6 H6			Drawing No: M06-061-A	Scale: NTS
							All Dimensions In mm Unless Otherwise Stated		Form Number: QF024 Issue 1
							<b>If In Doubt - Ask!</b>	Sheet: 2 of 2	