# HS-100IS Intrinsically Safe Accelerometer

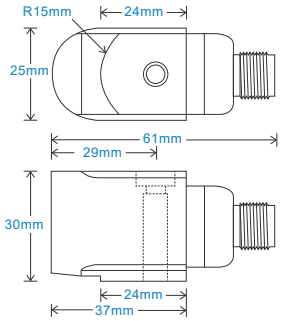
## AC acceleration output via M12 Connector

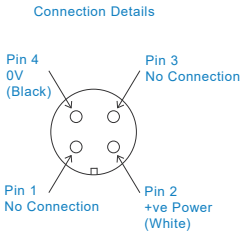
### Key Features

- Intrinsically Safe with European, USA, South African and Australian approvals
- Side entry for easy access

### Industries

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




## Technical Performance

| | |
|---|---|
| Mounted Base Resonance | see 'How To Order' table (nominal) |
| Sensitivity | see: 'How To Order' table ±10% |
| | Nominal 80Hz at 22°C |
| Frequency Response | 2Hz (120cpm) to 10kHz (600kcpm) ± 5% |
| | 1.5Hz (90cpm) to 12kHz (720kcpm) ± 10% |
| | 0.8Hz (48cpm) to 15kHz (900kcpm) ± 3dB |
| Isolation | Base isolated |
| Range | see: 'How To Order' table |
| Transverse Sensitivity | Less than 5% |

## Mechanical

| | |
|---|---|
| Case Material | Stainless Steel |
| Sensing Element/Construction | PZT/Compression |
| Mounting Torque | 8Nm |
| Mounting Bolt Provided | see: 'How To Order' table x 30mm long |
| Weight | 185gms (nominal) body only |
| Screened Cable Assembly | HS-AC010 - straight |
| | HS-AC011 - right angle |
| Mounting Threads | see: 'How To Order' table |

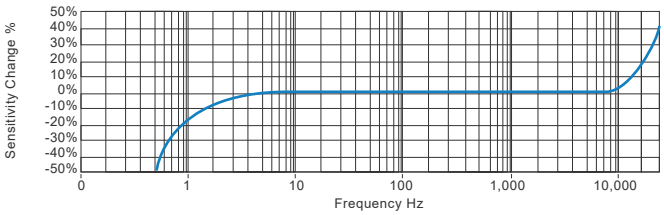
## Electrical

| | |
|---|---|
| Excitation Voltage: | 18-30Volts DC |
| Electrical Noise | 0.1mg max |
| Current Range | 0.5mA to 8mA |
| Bias Voltage | 10 - 12 Volts DC |
| Settling Time | 2 seconds |
| Output Impedance | 200 Ohms max. |
| Case Isolation | >$10^8$ Ohms at 500 Volts |

## Environmental

| | |
|---|---|
| Operating Temperature Range | see: attached certification details |
| Sealing | IP67 |
| Maximum Shock | 5000g |
| EMC | EN61326-1:2013 |

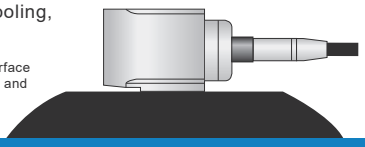
## Typical Frequency Response (at 100mV/g)




## 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

710318

Hansford Sensors
Excellence in Vibration Monitoring

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sales@hansfordsensors.com

# HS-100IS Intrinsically Safe Accelerometer

## AC acceleration output via M12 Connector

## Intrinsically Safe Requirements

| | |
|---|---|
| Maximum Cable Length | See website www.hansfordsensors.com - see attached system drawing |
| Certificate details: Group I | IECEx BAS07.0037X<br>Baseefa07ATEX0149X<br>Ⓔx I M1<br>Ex ia I Ma<br>(-55ºC ≤ Ta ≤ +110ºC) |
| Certificate details: Group II (ignition temperature 130ºC) | IECEx BAS07.0035X<br>Baseefa07ATEX0144X<br>Ⓔx II 1GD<br>Ex ia IIC T4 Ga<br>Ex ia IIIC T130ºC IP65 Da<br>(-55ºC ≤ Ta ≤ +110ºC) |
| Certificate details: Group II (ignition temperature 80ºC) | IECEx BAS07.0035X<br>Baseefa07ATEX0144X<br>Ⓔx II 1GD<br>Ex ia IIC T6 Ga<br>Ex ia IIIC T80ºC IP65 Da<br>(-55ºC ≤ Ta ≤ +60ºC) |
| Accelerometer System Certificate | Baseefa07Y0145<br>Ex ia IIC T6 (-55°C ≤ Ta ≤ +60°C)<br>Ex ia IIC T4 (-55ºC ≤ Ta ≤ +110ºC)<br>On request - consult Sales Office |
| Terminal Parameters | Ui = 28V, Ii = 93mA, Pi = 0.65W<br>Ci = 83nf<br>Li/Ri = 15.4µH/Ohm |
| 500V Isolation | Units Will Pass A 500V Isolation Test |
| Certified Temperature Range | Ex ia IIC T6 Ga (-55°C ≤ Ta ≤ +60°C) (Gas)<br>Ex ia IIIC T80°C IP65 Da (-55ºC ≤ Ta ≤ +60ºC) (Dust)<br>Ex ia IIC T4 Ga (-55°C ≤ Ta ≤ +110°C) (Gas)*<br>Ex ia IIIC T130°C IP65 Da (-55°C ≤ Ta ≤ +110°C) (Dust)*<br>Ex ia I Ma (-55°C ≤ Ta ≤ +110°C) (Mining)<br>*On request - consult Sales Office |
| Australia Approval Group I | IECEx ITA 11.0013X<br>Ex ia I Ma<br>(-55ºC ≤ Ta ≤ +110ºC) |
| US/Canada Approvals | Certificate No. USTC/15/FAI/01350<br>Class I, II, III, Division 1, 2, Groups A - G, T4, -55°C to +110°C, IP65<br>Class I, Zone 0, AEx, ia, IIC, T4, Ga, -55°C to +110°C<br>Zone 20, AEx, ia, IIIC, T130°C, IP65, Da, -55°C to +110°C<br><br>Class I, II, III, Division 1, 2, Groups A - G, T6, -55°C to +60°C<br>Class I, Zone 0, AEx, ia, IIC, T6, Ga, -55°C to +60°C<br>Zone 20, AEx, ia, IIIC, T80°C, IP65, DA, -55°C to +60°C |
| South African Approval | Certificate No. MASC S/16-0231X<br>Group II (As Baseefa/ATEX)<br>MASC M/16-0230X<br>Group I (As Baseefa/ATEX) |
| System Connections | see attached system drawings |
| Barrier | 1 x Pepperl + Fuchs Galvanic Isolator<br>KFD2-VR4-Ex1.26 (BAS02ATEX7206)<br>see attached system drawings<br>1 x MTL Zener Barrier MTL7728+ (BAS01ATEX7217)<br>or Pepperl + Fuchs Zener Barrier<br>Z728 (BAS01ATEX7005) or any other barrier that conforms to system drawings on website |

Notes: Special conditions of safe use for Group I & II. The free end of the cable on the integral cable version of the apparatus must be terminated in an appropriate dust-proof enclosure.

## Intrinsically Safe Requirements for IC3 Varitations

HS-100IC3 Variation is certified as Category 3 equipment. These sensors are only certified for use within Zones 2 & 22.

| | |
|---|---|
| Certificate Details: Group II (ignition temperature 130˚C) | IECEx BAS17.0054X<br>Baseefa7ATEX0069X<br>Ⓔx II 3G<br>Ex ic IIC T4 Ga<br>(-55˚C ≤ Ta ≤ +110˚C) |
| Certified Temperature Range | Ex ic IIC T4 Ga (-55˚C ≤ Ta ≤ +110˚C) |
| Terminal Parameters | Ui = 25.2V, Ii = 146mA, Pi = 0.92W<br>Ci = 83nf<br>Li 66µH |
| 500V Isolation | Units will pass a 500V Isolation Test |
| Special Conditions of Use: | The Ci and Li parameters listed on the equipment certificate must be taken into account when connecting this equipment. |

## How To Order

**Product Prefix**
HS - Hansford Sensors

**Product Series**
100 - Industrial Vibration Sensor

| H | S | 1 | 0 | 0 | I | S | X | X | X | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Extra Options (if required)**
A - Australia (Group I)
I - Intrinsically Safe (Group II)
L - 316L Stainless Steel
M - Mining (Group I)
S - 90° Side Exit
Y - 5% tolerance on sensitivity
IC3 - Category 3 Classification

| Sensitivity | Range | Resonant Frequency |
|---|---|---|
| 010 - 10mV/g | ±800g | 27kHz (1,620kcpm) |
| 030 - 30mV/g | ±250g | 25kHz (1,500kcpm) |
| 050 - 50mV/g | ±160g | 23kHz (1,380kcpm) |
| 100 - 100mV/g | ±80g | 21kHz (1,260kcpm) |

**Cable/Connector**
01 - PUR
02 - Braided
07 - Silicon
50 - 2 Pin MS
54 - M12

**Mounting Threads**
02 - ¼-28" UNF Male
06 - M6 x 1mm Male
08 - M8 x 1.25mm Male

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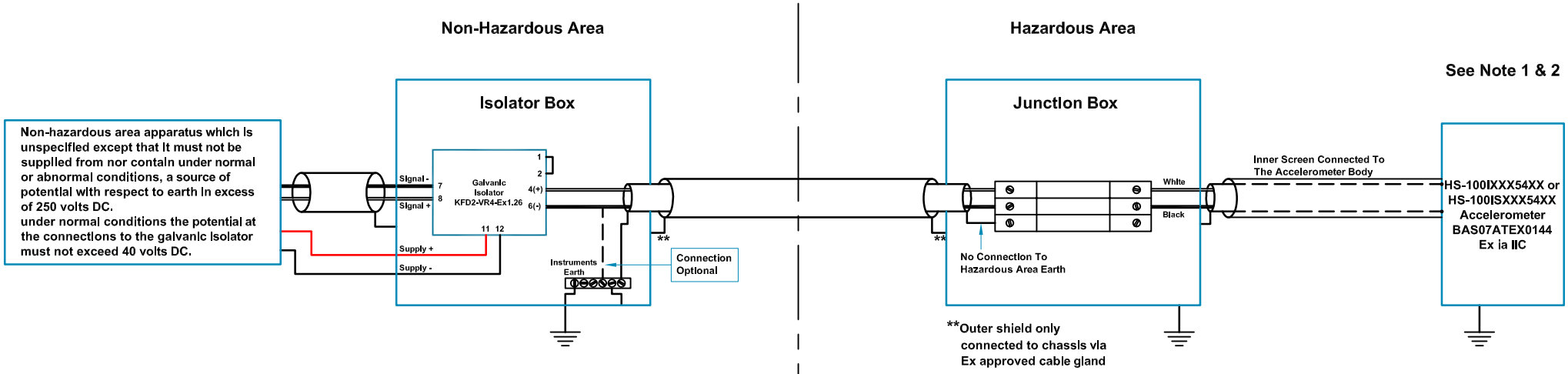


**Table 1: Cable Parameters For Additional Cable Lengths**

| Group | Capacitance µF | L/R Ratio µH/Ω |
|---|---|---|
| **Accelerometer With Integral Cable Length ≤ 10m** | | |
| IIC | 0.086 | 46 |
| IIB | 0.730 | 172 |
| IIA | 2.470 | 363 |
| **Accelerometer With Integral Cable Length ≤ 50m** | | |
| IIC | 0.051 | 46 |
| IIB | 0.695 | 172 |
| IIA | 2.435 | 363 |
| **Accelerometer With Integral Cable Length ≤ 92m** | | |
| IIC | 0.013 | 46 |
| IIB | 0.657 | 172 |
| IIA | 2.397 | 363 |

## Hansford Sensors Ltd

HS-100I or HS-100IS
Accelerometer System

Ex ia IIC T4 (-55°C ≤ Ta ≤ +110°C) or
Ex ia IIC T6 (-55°C ≤ Ta ≤ +60°C)

**Notes:**

1. The capacitance and inductance, to resistance ratio (L/R) of hazadous 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 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 |
|---|---|---|---|---|
| A | Release | 16/09/15 | MJS | CMH |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Material: N/A

Tolerances Unless Stated
0 or 0.0 ±0.5
0.00 ±0.15
Angle ±5°

1.6 Finish All Over
Threads g6 H6

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Hansford Sensors Ltd
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Sands Industrial Estate
High Wycombe
Bucks HP12 4HJ

Do Not Scale

All Dimensions In mm Unless Otherwise Stated

**If In Doubt - Ask!**

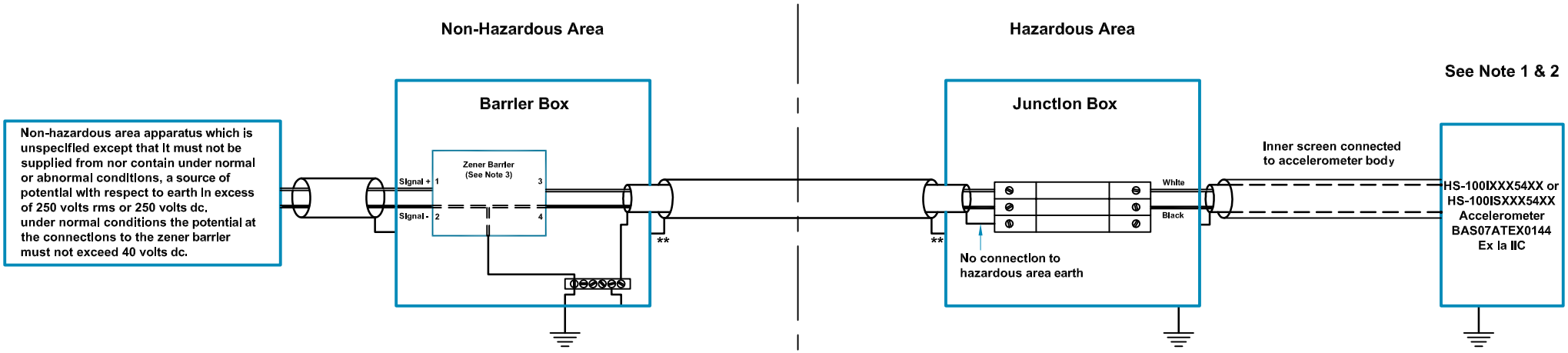
Description: System Connections For HS-100I & HS-100IS Group II Accelerometers With M12 cannector F.U.W. Galvanic Isolation

Drawing No: M06-060-A

Scale: NTS

Sheet: 1 of 2

Form Number: QF024 Issue 1




| Table 1: Cable Parameters For Additional Cable Lengths | | |
|---|---|---|
| Accelerometer With Integral Cable Length ≤ 10m | | |
| Group | Capacitance µF | L/R Ratio µH/Ω |
| IIC | 0.073 | 56 |
| IIB | 0.239 | 168 |
| IIA | 0.654 | 448 |
| Accelerometer With Integral Cable Length ≤ 50m | | |
| Group | Capacitance µF | L/R Ratio µH/Ω |
| IIC | 0.038 | 56 |
| IIB | 0.204 | 168 |
| IIA | 0.619 | 448 |
| Accelerometer With Integral Cable Length ≤ 92m | | |
| Group | Capacitance µF | L/R Ratio µH/Ω |
| IIC | 0.000 | 56 |
| IIB | 0.166 | 168 |
| IIA | 0.581 | 448 |

## Hansford Sensors Ltd

HS-100I or HS-100IS
Accelerometer System

Ex ia IIC T4 (-55°C ≤ Ta ≤ +110°C) or
Ex ia IIC T6 (-55°C ≤ Ta ≤ +60°C)

**Notes:**

1. The capacitance and inductance, to resistance ratio (L/R) of hazadous 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 single zener diode saftey barrier certified by an approved body to [Ex ia] IIC having the following output parameters: Uo = 28V dc, Io = 93mA dc, Po = 0.65W. e.g. MTL7728 to BAS01ATEX7217 or Pepperl + Fuchs Z728 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 |
|---|---|---|---|---|
| A | Release | 16/09/15 | MJS | CMH |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Material: N/A

Tolerances Unless Stated
0 or 0.0 ±0.5
0.00 ±0.15
Angle ±5°
1.6 Finish All Over
Threads g6 H6

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Description: System Connections For HS-100I & HS-100IS Group II Accelerometers With M12 connector F.U.W. Zener Barrier

Drawing No: M06-060-A

Scale: NTS

Sheet: 2 of 2

Form Number: QF024 Issue 1