



TYPE EXAMINATION CERTIFICATE

Intrinsically Safe System Intended for use in Potentially Explosive Atmospheres

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- 3 Type Examination Certificate Number: **Baseefa08Y0087**
- 4 System: **HS-420I Series Accelerometer System**
- 5 Certificate Holder: **Hansford Sensors Limited**
- 6 Address: **Saunderton, Bucks, HP14 4JE, UK**
- 7 This system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- 8 Baseefa (2001) Ltd. certifies that this system has been found to comply with the following standards
EN 60079-25: 2004
- 9 The examination and test results are recorded in confidential Report No. **08(C)0114-1**
- 10 If the sign "X" is placed after the certificate number, it indicates that the system is subject to special conditions of safe use specified in the schedule to this certificate.
- 11 This TYPE EXAMINATION CERTIFICATE relates only to the design of the specified intrinsically safe system and not to specific items of equipment therein. It is the responsibility of the system certificate holder to supply the relevant documentation to the installer of the intrinsically safe electrical system referred to in this certificate.
- The installer has the responsibility to ensure that the system conforms to the specification laid down in the Schedule to this certificate and has satisfied routine verifications and tests specified therein.
- 12 The marking of the system shall include the following :
- SYST Baseefa08Y0087 Ex ia IIC T6 (-40°C ≤ Ta ≤ +60°C)**
- This certificate may only be reproduced in its entirety, without any change, schedule included.

Baseefa Customer Reference No. **5943**

Project File No. **08/0114**

This certificate is granted subject to the general terms and conditions of Baseefa (2001) Ltd. It does not necessarily indicate that the system may be used in particular industries or circumstances.

Baseefa

Rockhead Business Park, Staden Lane,
Buxton, Derbyshire SK17 9RZ
Telephone +44 (0) 1298 766600 Fax +44 (0) 1298 766601
e-mail info@baseefa.com web site www.baseefa.com
Baseefa is a trading name of Baseefa (2001) Ltd
Registered in England No. 4305578 at the above address

DB Sinclair
PO DBREARLEY

R S SINCLAIR
DIRECTOR
On behalf of
Baseefa (2001) Ltd.



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Schedule

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Certificate Number Baseefa08Y0087

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System Description

The HS-420I Series Accelerometer System consists of a single HS-420I Series Accelerometer mounted in a Zone 0 hazardous area, connected to a single zener barrier or galvanic isolator mounted in the non-hazardous area.

1. Apparatus that may be installed in a Non Hazardous Area (Safe Area.)

- 1.1 Any Single Channel Shunt Zener Diode Safety Barrier certified by Baseefa or any Approved Body to [Ex ia] IIC having the following output parameters:

$$\begin{aligned}U_o &= 28V \\I_o &= 115mA \\P_o &= 0.65W \\Lo/Ro &\geq 15.4\mu H/\Omega\end{aligned}$$

In any safety barrier used the output current must be limited by a resistor "R" such that $I_o = U_o/R$. Barriers must be polarised and of like polarity.

Examples of suitable barriers are:

Measurement Technologies, MTL7787; BAS01ATEX7217

Pepperl & Fuchs, Z787, BAS00ATEX7164

- 1.2 Pepperl & Fuchs KFD2-CR-Ex.1.30300 Galvanic Isolator; BAS00ATEX7164 with the following combined output parameters:

$$\begin{aligned}U_o &= 26V \\I_o &= 115mA \\P_o &= 0.624W \\C_i &= 0 \\L_i &= 0\end{aligned}$$

- 1.3 The above apparatus is to be supplied from apparatus situated in the safe area which is unspecified except that it must not be supplied from nor contain in normal or abnormal conditions a source of potential with respect to earth in excess of 253 volts r.m.s. or 253 volts d.c.

2. Apparatus that may be installed in a Hazardous Area

- 2.1 A HS-420I Series Accelerometer to Certificate No. Baseefa08ATEX0086X and coded Ex ia IIC T6 ($-40^{\circ}C \leq T_a \leq +60^{\circ}C$)



3. Permissible Interconnecting Cables

3.1 Zener Barrier Configuration

The capacitance and the inductance to resistance ratio (L/R) of the hazardous area cables connecting the connector version of the HS-420I Series Accelerometer with 25m of cable to the zener barrier must not exceed the following values:

Group	Capacitance (μF)	L/R Ratio (μH/ohm)
IIC	0.080	56
IIB	0.246	168
IIA	0.661	448

The capacitance and the inductance to resistance ratio (L/R) of the hazardous area cables connecting the HS-420I Series Accelerometer with 100m of integral cable to the zener barrier must not exceed the following values:

Group	Capacitance (μF) Polyurethane Cable	Capacitance (μF) Silicone Cable	Capacitance (μF) Armoured Cable	L/R Ratio (μH/ohm)
IIC	0.067	0.046	0.054	56
IIB	0.233	0.212	0.220	168
IIA	0.648	0.627	0.635	448

The capacitance and the inductance to resistance ratio (L/R) of the hazardous area cables connecting the HS-420I Series Accelerometer with 50m of integral cable to the zener barrier must not exceed the following values:

Group	Capacitance (μF) Polyurethane Cable	Capacitance (μF) Silicone Cable	Capacitance (μF) Armoured Cable	L/R Ratio (μH/ohm)
IIC	0.075	0.064	0.068	56
IIB	0.241	0.230	0.234	168
IIA	0.656	0.645	0.649	448

The capacitance and the inductance to resistance ratio (L/R) of the hazardous area cables connecting the HS-420I Series Accelerometer with 10m of integral cable to the zener barrier must not exceed the following values:

Group	Capacitance (μF) Polyurethane Cable	Capacitance (μF) Silicone Cable	Capacitance (μF) Armoured Cable	L/R Ratio (μH/ohm)
IIC	0.081	0.079	0.080	56
IIB	0.247	0.245	0.246	168
IIA	0.662	0.660	0.661	448

3.2 Galvanic Isolator Configuration

The capacitance and the inductance to resistance ratio (L/R) of the hazardous area cables connecting the connector version of the HS-420I Series Accelerometer with 25m of cable to the Galvanic Isolator must not exceed the following values:

Group	Capacitance (μF)	L/R Ratio (μH/ohm)
IIC	0.096	72
IIB	0.767	277
IIA	2.597	585

The capacitance and the inductance to resistance ratio (L/R) of the hazardous area cables connecting the HS-420I Series Accelerometer with 100m of integral cable to the Galvanic Isolator must not exceed the following values:

Group	Capacitance (μF) Polyurethane Cable	Capacitance (μF) Silicone Cable	Capacitance (μF) Armoured Cable	L/R Ratio (μH/ohm)
IIC	0.083	0.062	0.070	72
IIB	0.754	0.773	0.741	277
IIA	2.584	2.563	2.571	585

The capacitance and the inductance to resistance ratio (L/R) of the hazardous area cables connecting the HS-420I Series Accelerometer with 50m of integral cable to the Galvanic Isolator must not exceed the following values:

Group	Capacitance (μF) Polyurethane Cable	Capacitance (μF) Silicone Cable	Capacitance (μF) Armoured Cable	L/R Ratio (μH/ohm)
IIC	0.091	0.080	0.084	72
IIB	0.762	0.751	0.755	277
IIA	2.592	2.581	2.585	585

The capacitance and the inductance to resistance ratio (L/R) of the hazardous area cables connecting the HS-420I Series Accelerometer with 10m of integral cable to the Galvanic Isolator must not exceed the following values:

Group	Capacitance (μF) Polyurethane Cable	Capacitance (μF) Silicone Cable	Capacitance (μF) Armoured Cable	L/R Ratio (μH/ohm)
IIC	0.097	0.095	0.096	72
IIB	0.768	0.766	0.767	277
IIA	2.598	2.596	2.597	585

3.3 Wiring to terminals of the safe area apparatus may be achieved by separate cables or by separate circuits within a Type A or Type B multicore cable (as defined in clause 5.3 of EN 50039) subject to the following:-

- The circuit to be individually screened when used within a Type A multicore cable.
- The peak voltage of any other circuit within a Type B multicore cable must not exceed 60V.

16 **Report**

08(C)0114-1

17 **Special Conditions for Safe Use**

None.



18 Drawings and Documents

<u>Number</u>	<u>Sheet</u>	<u>Issue</u>	<u>Date</u>	<u>Description</u>
M06-011-A	1 of 2	A	10/03/08	System Connections for HS-420I & HS-422I Group II Accelerometers with Armoured Cable F.U.W Galvanic Isolation
M06-011-A	2 of 2	A	10/03/08	System Connections for HS-420I & HS-422I Group II Accelerometers with Armoured Cable F.U.W Zener Barrier
M06-012-A	1 of 2	A	10/03/08	System Connections for HS-420I & HS-422I Group II Accelerometers with Non-Armoured Silicone Cable F.U.W Galvanic Isolation
M06-012-A	2 of 2	A	10/03/08	System Connections for HS-420I & HS-422I Group II Accelerometers with Non-Armoured Silicone Cable F.U.W Zener Barrier
M06-013-A	1 of 2	A	10/03/08	System Connections for HS-420I & HS-422I Group II Accelerometers with Non-Armoured FR Polyurethane Cable F.U.W Galvanic Isolation
M06-013-A	2 of 2	A	10/03/08	System Connections for HS-420I & HS-422I Group II Accelerometers with Non-Armoured FR Polyurethane Cable F.U.W Zener Barrier
M06-018-A	1 of 2	A	31/03/08	System Connections for HS-420I & HS-422I Group II Accelerometers with Connectors F.U.W Galvanic Isolation
M06-018-A	2 of 2	A	31/03/08	System Connections for HS-420I & HS-422I Group II Accelerometers with Connectors F.U.W Zener Barrier