1 # SUPPLEMENTARY TYPE EXAMINATION CERTIFICATE

2 **Intrinsically safe System Intended for use in Potentially Explosive Atmospheres**

3	Supplementary Type Examination Certificate Number:	**Baseefa07Y0145/1**
4	Equipment:	**HS-100 Series Accelerometer System**
5	Manufacturer:	**Hansford Sensors Ltd**
6	Address:	**Sands Industrial Estate, Bucks, HP12 4HJ**

7 This supplementary certificate extends Type Examination Certificate No. Baseefa07Y0145 to apply only to the design of the specified intrinsically safe system, and not to specific items of equipment therein, in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

This supplementary certificate shall be held with the original certificate.

This certificate may only be reproduced in its entirety, without any change, schedule included.

Baseefa Customer Reference No. **5943**

Project File No. **11/0015**

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

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On behalf of
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13 # Schedule

14 ## Certificate Number Baseefa07Y0145/1

15 Description of the variation to the Equipment

Variation 1.1

Changes to the equipment entity parameters have been reflected in the following system description.

The HS-100 Series Accelerometer System consists of a single HS-100 Series Accelerometer mounted in a Zone 0 hazardous area, connected to a single zener barrier or galvanic isolator mounted in the non-hazardous area.

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

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

U_o = 28V
I_o = 93mA
P_o = 0.65W
Lo/Ro ≥ 15.4μH/Ω

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, MTL7728; BAS01ATEX7217
Pepperl & Fuchs, Z728, BAS01ATEX7005

15.1.2 Other barriers having lower values than these are permitted

The above barriers are to be supplied from apparatus 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.

15.1.3 Pepperl & Fuchs KFD2-VR4.Ex1.26 Galvanic Isolator; BAS02ATEX7206 with the following combined output parameters:

U_o = -26.4V
I_o = 90mA
P_o = 0.57W
C_i = 0
L_i = 0

15.1.4. 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.

15.2. Apparatus that may be installed in a Hazardous Area

15.2.1 A HS-100 Series Accelerometer to BASEEFA Certificate No. Baseefa07ATEX0144X and coded Ex ia IIC T4 (-55°C ≤ Ta ≤ +110°C) or T6 (–55°C ≤ Ta ≤ +60°C).

15.3. Permissible Interconnecting Cables

There are two different configurations used with the Accelerometer in this system.

15.3.1. Zener Barrier Configuration

The capacitance and the inductance to resistance ratio (L/R) of any extra hazardous area cable connecting the HS-100 Series Accelerometer with 92m of integral cable to the zener barrier must not exceed the following values:

GROUP	CAPACITANCE (μF)	OR	L/R RATIO (μH/ohm)
IIC	0.000		56
IIB	0.166		168
IIA	0.581		448

The capacitance and the inductance to resistance ratio (L/R) of any extra hazardous area cable connecting the HS-100 Series Accelerometer with 50m of integral cable to the zener barrier must not exceed the following values:

GROUP	CAPACITANCE (μF)	OR	L/R RATIO (μH/ohm)
IIC	0.038		56
IIB	0.204		168
IIA	0.619		448

The capacitance and the inductance to resistance ratio (L/R) of any extra hazardous area cable connecting the HS-100 Series Accelerometer with 10m of integral cable to the zener barrier must not exceed the following values:

GROUP	CAPACITANCE (μF)	OR	L/R RATIO (μH/ohm)
IIC	0.073		56
IIB	0.239		168
IIA	0.654		448

15.3.2. Pepperl & Fuchs KFD2-VR4.Ex1.26

The capacitance and the inductance to resistance ratio (L/R) of any extra hazardous area cable connecting the HS-100 Series Accelerometer with 92m of integral cable to the galvanic isolator must not exceed the following values:

GROUP	CAPACITANCE (μF)	OR	L/R RATIO (μH/ohm)
IIC	0.013		46
IIB	0.657		172
IIA	2.397		363

The capacitance and the inductance to resistance ratio (L/R) of any extra hazardous area cable connecting the HS-100 Series Accelerometer with 50m of integral cable to the galvanic isolator must not exceed the following values:

GROUP	CAPACITANCE (μF)	OR	L/R RATIO (μH/ohm)
IIC	0.051		46
IIB	0.695		172
IIA	2.435		363

The capacitance and the inductance to resistance ratio (L/R) of any extra hazardous area cable connecting the HS-100 Series Accelerometer with 10m of integral cable to the galvanic isolator must not exceed the following values:

GROUP	CAPACITANCE (μF)	OR	L/R RATIO (μH/ohm)
IIC	0.086		46
IIB	0.730		172
IIA	2.470		363

15.4 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 8 of EN60079-25: 2004) subject to the following:-

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

16 Report Number

11(C)0015

17 Special Conditions for Safe Use

None

18 Essential Health and Safety Requirements

Compliance with the Essential Health and Safety Requirements is not affected by this variation.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
M06-003-B	1 of 2	B	13.01.11	System Connections for HS-100I & HS-100IS Group II Accelerometers with Armoured Cable F.U.W Galvanic Isolation
M06-003-B	2 of 2	B	13.01.11	System Connections for HS-100I & HS-100IS Group II Accelerometers with Armoured Cable F.U.W Zener Barrier
M06-004-B	1 of 2	B	13.01.11	System Connections for HS-100I & HS-100IS Group II Accelerometers with Non-Armoured PUR Cable F.U.W Galvanic Isolation
M06-004-B	2 of 2	B	13.01.11	System Connections for HS-100I & HS-100IS Group II Accelerometers with Non-Armoured PUR Cable F.U.W Zener Barrier
M06-005-B	1 of 2	B	13.01.11	System Connections for HS-100I & HS-100IS Group II Accelerometers with Non-Armoured Silicone Cable F.U.W Galvanic Isolation
M06-005-B	2 of 2	B	13.01.11	System Connections for HS-100I & HS-100IS Group II Accelerometers with Non-Armoured Silicone Cable F.U.W Zener Barrier