IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx CML 20.0070X**

Certificate history:

Status: **Current**

Issue No: 0

Date of Issue: 2020-12-22

Applicant: **H&B Sensors Ltd**
Odyssey House
Durban Road
Bognor Regis
West Sussex
PO22 9RH
United Kingdom

Equipment: **Type 55 Connection Head/Junction Box**

Optional accessory:

Type of Protection: **Flameproof and Dust Protected or Intrinsically Safe**

Marking:

Ex db IIC T6 Gb
Ex tb IIIC T85°C Db
Tamb = -40°C to +65°C

Ex db IIC T5 Gb
Ex tb IIIC T100°C Db
Tamb = -40°C to +80°C

Ex db IIC T4 Gb
Ex tb IIIC T135°C Db
Tamb = -40°C to +85°C or

Ex ia IIC T4 Ga
Ex ia IIIC T135°C Da
Tamb = -40°C to +85°C

Approved for issue on behalf of the IECEx Certification Body: **D R Stubbings BA MIET**

Position: **Technical Director**

Signature: (for printed version)

Date: 22nd December 2020

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

Eurofins E&E CML Limited
Unit 1, Newport Business Park
New Port Road
Ellesmere Port, CH65 4LZ
United Kingdom

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Certificate No.: **IECEx CML 20.0070X** Page 2 of 3

Date of issue: 2020-12-22 Issue No: 0

Manufacturer: **H&B Sensors Ltd**
Odyssey House
Durban Road
Bognor Regis
West Sussex
PO22 9RH
United Kingdom

Additional manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

IEC 60079-31:2013 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition:2

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

GB/CML/ExTR20.0229/00 GB/CML/ExTR21.0053/00

Quality Assessment Report:

GB/SIR/QAR09.0015/08

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

The Type 55 Connection Head / Junction Box is a general purpose flameproof and dust protected enclosure intended for use as a standalone junction box or for use with temperature or level sensors including RTDs, Thermocouples, Thermistors, Temperature Fuses/Switches and Level Float Switches.

The Type 55 is a cylindrical enclosure manufactured from either ADC12 aluminium or 316 stainless steel and includes a threaded cover that may include an optional silicone cemented toughened soda lime glass window. The threaded cover is secured with an M5 grub screw and has a nitrile O-ring. The enclosure incorporates two M20 x 1.5 side entries and one 1/2" BSPP bottom entry. All enclosures have the 2 x M20 and 1 x 1/2 BSP, the sensor probe entry may occupy either a M20 or ½ BSP. User cable entries can only occupy M20. The base has both an internal and external M5 x 8mm earth connection as well as two external mounting holes.

See Annex for full description and Conditions of Manufacture

SPECIFIC CONDITIONS OF USE: YES as shown below:
See Annex for Specific Conditions of Use

Annex:

Certificate Annex IECEx CML 20.0070X Issue 0_1.pdf

Annexe to:	IECEx CML 20.0070X Issue 0
Applicant:	H&B Sensors Ltd
Apparatus:	Type 55 Connection Head/Junction Box

Description

The Type 55 Connection Head / Junction Box is a general purpose flameproof and dust protected enclosure intended for use as a standalone junction box or for use with temperature or level sensors including RTDs, Thermocouples, Thermistors, Temperature Fuses/Switches and Level Float Switches.

The Type 55 is a cylindrical enclosure manufactured from either ADC12 aluminium or 316 stainless steel and includes a threaded cover that may include an optional silicone cemented toughened soda lime glass window. The threaded cover is secured with an M5 grub screw and has a nitrile O-ring. The enclosure incorporates two M20 x 1.5 side entries and one 1/2" BSPP bottom entry. All enclosures have the 2 x M20 and 1 x 1/2 BSP, the sensor probe entry may occupy either a M20 or ½ BSP. User cable entries can only occupy M20. The base has both an internal and external M5 x 8mm earth connection as well as two external mounting holes.

The sensor elements are encapsulated within a fabricated protective sheath filled with magnesium or aluminium oxide powder and sealed with resin epoxy, alternatively they are constructed from mineral insulated cable. All sensors will be directly connected to the enclosure using a threaded fitting or via a flexible cable and cable gland arrangement.

The Type 55 enclosure can be fitted with either terminal blocks, temperature transmitters or temperature indicators or a combination thereof.

When the enclosure is being used within intrinsically safe environments it can be fitted with separately certified intrinsically safe devices or terminals and marked for ‘Ex ia’ applications. These applications are to be supplied by a separately certified barrier.

Electrical ratings:

Flameproof applications:

- Terminals - Maximum of 3W (combined total)
- Transmitter or indicator module – Input parameters as per device fitted, up to a maximum of 3W.

Intrinsically safe applications:

Maximum Entity Parameters.			
Single thermocouple circuit		**2 or more thermocouple circuit (per circuit), combined total of 3W Max.**	
Ui =	30Vdc	Ui =	30 Vdc
Ii =	100mA	Ii =	100 mA
Pi =	900mW	Pi =	900mW

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Maximum Entity Parameters.			
Single thermocouple circuit		**2 or more thermocouple circuit (per circuit), combined total of 3W Max.**	
Ci =	2 nF/m x length of sensor	Ci =	2 nF/m x length of sensor
Li =	20 µH/m x length of sensor	Li =	20 µH/m x length of sensor
Uo =	1.2 V	Uo =	1.2 V
Io =	50 mA	Io =	50 mA
Po =	25 mW	Po =	25 mW
The capacitance and inductance or inductance/resistance ratio (L/R) of the hazardous area cables shall not exceed the values calculated from the C, L and L/R values permitted by the barrier, minus any Ci and Li of the sensor wiring.			

Maximum Entity Parameters			
Terminals/RTD's (per circuit), combined total of 3W Max.		Transmitter / Indicator (Max inputs as per certificate), 3W Max.	
Ui =	30V	Ui =	As per transmitter/indicator certificate
Ii =	100mA	Ii =	As per transmitter/indicator certificate
Pi =	900mW	Pi =	As per transmitter/indicator certificate
Ci =	2 nF/m x length of sensor	Ci =	As per transmitter/indicator certificate
Li =	20 µH/m x length of sensor	Li =	As per transmitter/indicator certificate
The capacitance and inductance or inductance/resistance ratio (L/R) of the hazardous area cables shall not exceed the values calculated from the C, L and L/R values permitted by the barrier, minus any Ci and Li of the transmitter and/or sensor wiring.			

Conditions of Manufacture

The following conditions are required of the manufacturing process for compliance with the certification.

General (All applications)

i. Where the product incorporates certified parts or safety critical components the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate. A copy of the separately certified transmitter/indicator certificate and instructions shall be provided with/make available for the equipment (if fitted).

Intrinsically Safe Applications

ii. The sensor circuit shall undergo an electric strength test at 500Vac test to earth for 1 minute in accordance with IEC 60079-11, clause 6.3.13. Not applicable when galvanic isolation is used.

Flameproof Applications

iii. A routine overpressure test at a minimum pressure of 18 bar shall be carried out on each cemented window/welded probe arrangement for at least 10 s in accordance with IEC 60079-1:2014, clause 15.2.3. No damage or deformation of the enclosure shall be observed, and no leakage from the continuous welded or cemented joints shall be observed. Additionally, where the welded construction of probe arrangements is not a solid weld, is outside the enclosure and is for retention only, then the testing is only required to ensure that the means of securing the probe arrangement is still in place after testing.

Note: These tests are not applicable for the solid cover, non-welded probe assemblies or welded probe assemblies which are primarily secured by other means, as these have met the exemption overpressure requirements. Where the weld is outside the enclosure and not continuous then only observation for damage / deformation needs apply.

Specific Conditions of Use

The following conditions relate to safe installation and/or use of the equipment.

General (All applications)

iv. Where the product incorporates certified parts or safety critical components the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate. A copy of the separately certified transmitter/indicator certificate and instructions shall be provided with/make available for the equipment (if fitted).

v. Although the probe sensor may be installed in a location outside the ambient temperature range, the installer/user shall ensure the enclosure is located in an area within the marked ambient temperature range.

vi. Cable entries and branching temperatures may reach 15°C above the ambient temperature, cable and entry devices shall be suitable for these temperatures. Cable glands shall be suitable for the application, e.g., Flameproof / Dust protected and have a minimum IP rating of IP64.

vii. For dust applications, under certain extreme circumstances, the non-metallic paint incorporated on the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. This is particularly important if the equipment is installed in a Zone 20 location. In addition, the equipment shall only be cleaned with a damp cloth.

viii. H&B Sensors Ltd product certificates / instructions are available for download at www.hbsensors.com

Intrinsically Safe Applications

ix. When equipment is provided with an aluminium enclosure and installed in a Zone 0, the equipment shall be installed such that the risk of impact or abrasion of the aluminium enclosure is avoided. The user shall check for damage to the exterior paint finish and replace should signs of damage be observed.

x. When marked for intrinsically safe applications, the capacitance and inductance or inductance/resistance ratio (L/R) of the hazardous area cables shall not exceed the values calculated from the C, L and L/R values permitted by the barrier, minus any Ci and Li of the transmitter and/or sensor wiring. Longer probe arrangements may incorporate a combination of the sensors and cable, when this is the case, the sensor Ci and Li shall be calculated as follows:

- Ci = 2nF/m x length of sensor + 200pF/m x length of wire
- Li = 20 µH/m x length of sensor + 1µH/m x length of wire

Flameproof Applications

vi When supplied as an empty enclosure for user connections, the internal layout and free volume shall comply with IEC 60079-1, Annex D for the IIC applications (40% of each cross-sectional area remains free).

Components covered by Ex Certificates issued to older editions of Standards

None