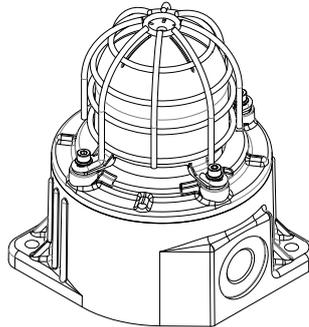


INSTRUCTION MANUAL
GNExB1X05
Flameproof Xenon Beacons
For use in Flammable Gas and Dust Atmospheres



GNExB1X05

1) Product Table

Standard	Model	Nom. Voltage	Voltage Range	Nom. Operating Current*	Max Current
ATEX / IECEX / UKEX	GNExB1X05DC012	12Vdc	10-14Vdc	437mA	587mA
	GNExB1X05DC024	24Vdc	20-28Vdc	254mA	266mA
	GNExB1X05DC048	48Vdc	42-54Vdc	158mA	175mA
	GNExB1X05AC115	115Vac	110-125Vac 50/60Hz	95mA	121mA
	GNExB1X05AC230	230Vac	220-240Vac 50/60Hz	54mA	88mA

*Rate at 1Hz

The table shows the input current taken by the various beacons.
A supply voltage variation of +/-10% outside the voltage range is permissible.
Nominal current at nominal voltage and 1Hz flash rate.
Max. rated current at worst case supply voltage and flash rate.

Table 1: Electrical Ratings.

Ensure the system power supply is capable of providing the maximum current required for all beacons. Review associated cable size, length and quantity of beacons on each circuit.

2) Warnings



- POTENTIAL ELECTROSTATIC CHARGING HAZARD
- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
- ALL ENTRIES M20 X 1.5
- IF TEMPERATURE EXCEEDS 70°C AT ENTRY OR 80°C AT BRANCHING POINT USE SUITABLE RATED CABLE AND CABLE GLANDS

See Table 1 for electrical ratings of each Unit Model

3.1) ATEX / IECEX / UKEX Ratings

Standards	
EN IEC 60079-0:2018 / IEC60079-0:2017 (Ed 7): Explosive Atmospheres - Equipment. General Requirements	
EN60079-1:2014 / IEC60079-1:2014 (Ed 7): Explosive Atmospheres - Equipment Protection by Flameproof Enclosures "d"	
EN 60079-31:2014 / IEC 60079-31:2013 (Ed 2): Explosive Atmospheres - Equipment Dust Ignition Protection by Enclosure "t"	
Ratings	
GNExB2: X05DC012 X05DC024 X05DC048 X05AC115 X05AC230	Ex db IIC Gb T6 Ta -50°C to +40°C Ex db IIC Gb T5 Ta -50°C to +55°C Ex db IIC Gb T4 Ta -50°C to +70°C Ex tb IIIC Db T110°C Ta -50°C to +70°C

3) Marking & Rating Information

All units have a rating label, which carries the following important information:-

- Unit Model.
- Voltage Range
- Nominal Voltage
- Max. Current

Certificate No. DEMKO 15ATEX1448X
IECEX UL15.0003X
UL21UKEX2136X

ATEX Mark, Equipment Group and Category:  II 2G
II 2D

CE Marking and Notified Body No.  2813

UKCA Marking and Notified Body No.  0518

4) Zones, Gas Group, Category and Temperature Classification

The units can be installed in locations with the following conditions:

Area Classification	
Zone 1	Explosive gas air mixture likely to occur in normal operation.
Zone 2	Explosive gas air mixture not likely to occur in normal operation, and if it does, it will only exist for a short time.
Zone 21	Explosive dust air mixture likely to occur in normal operation.
Zone 22	Explosive dust air mixture not likely to occur in normal operation, and if it does, it will only exist for a short time.
Gas Groupings	
Group IIA	Propane
Group IIB	Ethylene
Group IIC	Hydrogen and Acetylene
Temperature Classification for Gas Applications	
T1	450°C
T2	300°C
T3	200°C
T4	135°C
T5	100°C (Up to 55°C Ambient)
T6	85°C (Up to 40°C Ambient)
Dust Groupings (ATEX / IECEX / UKEX only)	
Group IIIA	Combustible Flyings
Group IIIB	Non-conductive Dust
Group IIIC	Conductive Dust
Maximum Surface Temperature for Dust Applications (ATEX / IECEX / UKEX only)	
GNExB2X05	110°C
Equipment Category	
2G / 2D	
Ambient Temperature Range	
-50°C to +70°C	

IP Rating
IP6X to EN/IEC60079-0 IP66 to EN60529

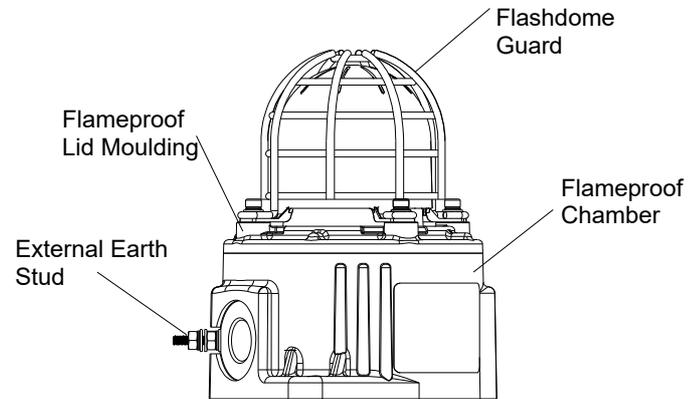
5) Special Conditions for safe use

The enclosure is non-conducting and may generate an ignition-capable level of electrostatic charges under certain extreme conditions. The user should ensure that the equipment is not installed in a location where it may be subjected to external conditions that might cause a build-up of electrostatic charges on non-conducting surfaces.

The stainless steel beacon guard is not earthed and may generate an ignition-capable level of electrostatic charges. It has a capacitance of 10pF according to EN/IEC60079-0, clause 7.5.

The flash dome guard must not be removed from the unit at any time whilst in service.

All entries must be fitted with a suitable seal at the interface with enclosure.



6) Product Mounting and Access

6.1. Location and Mounting

The location of the beacons should be made with due regard to the area over which the warning signal must be visible. They should only be fixed to services that can carry the weight of the unit.

The beacons should be securely bolted to a suitable surface using the 7mm diameter bolt holes in the base of the unit (see figure 1).

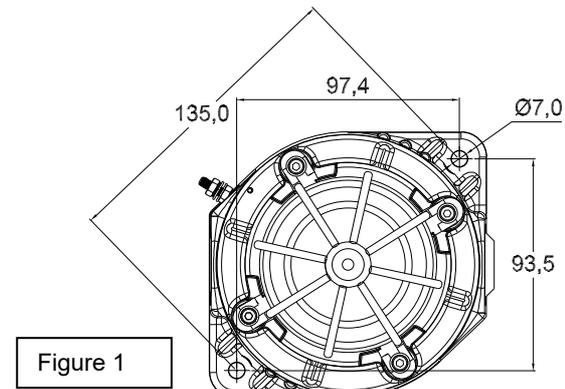


Figure 1

6.2. Access to the Flameproof Enclosure

In order to connect the electrical supply cables to the beacon it is necessary to remove the flameproof cover to gain access to the flameproof chamber. To access the Ex d chamber, loosen the M3 grub screw on the beacon cover. Open the enclosure by turning the beacon cover counter-clockwise and remove the cover taking extreme care not to damage the flameproof threads in the process (see figure 2).

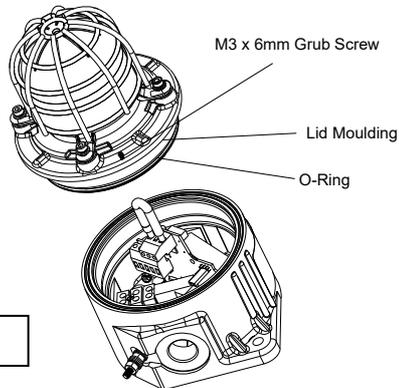


Figure 2

On completion of the installation the flameproof threaded joints should be inspected to ensure that they are clean and that they have not been damaged during installation.

Flameproof threaded joints are not intended to be repaired.

Ensure that the 'O' ring seal is in place and undamaged.

When fitting the flameproof cover ensure the thread is engaged correctly. Fully tighten the cover all the way, ensure no gap is visible between the cover and base of the beacon enclosure. Tighten the M3 grub screw.

7) Installation Requirements

7.1. Installation Standards Compliance



Attention: Disconnect from power source before installation or service to prevent electric shock.

The beacons must only be installed by suitably qualified personnel in accordance with the latest issues of the relevant standards:

EN60079-14 / IEC60079-14: Explosive atmospheres - Electrical installations design, selection and erection.

EN60079-10-1 / IEC60079-10-1: Explosive atmospheres - Classification of areas. Explosive gas atmospheres.

EN60079-10-2 / IEC60079-10-2: Explosive atmospheres - Classification of areas. Explosive dust atmospheres.

The installation of the units must also be in accordance with any local codes that may apply and should only be carried out by a competent electrical engineer who has the necessary training.

7.2. Cable Selection and Connections

When selecting the cable size, consideration must be given to the input current that each unit draws, the number of beacons on the line and the length of the cable runs. The cable size selected must have the necessary capacity to provide the input current to all of the beacons connected to the line.

Electrical connections are to be made into the terminal blocks on the PCBA. A five-way terminal block is provided on both AC and DC beacons. There are two live, two neutral and an Earth terminal for the input and output wiring on AC units. DC units have two +ve, two -ve and an S2 terminal for the input and output wiring.

Wires having a cross sectional area of up to 2.5mm² can be connected to each terminal way. If an input and output wire is required the 2-off Live/Neutral or +/- terminals can be used. If fitting 2-off wires to one terminal way the sum of the 2-off wires must be a maximum cross sectional area of 2.5mm². Strip wires to 8mm. When connecting wires to the terminals great care should be taken to dress the wires so that when the cover is inserted into the chamber the wires do not exert excess pressure on the terminal blocks. This is particularly important when using cables with large cross sectional areas such as 2.5mm².

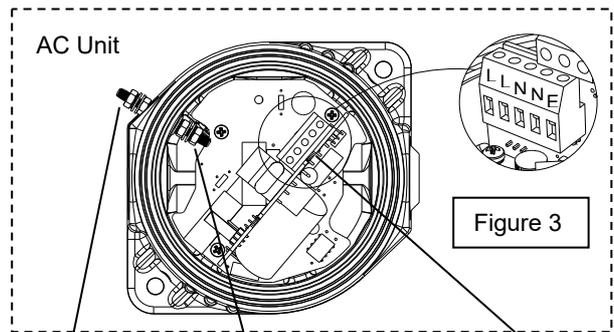


Figure 3

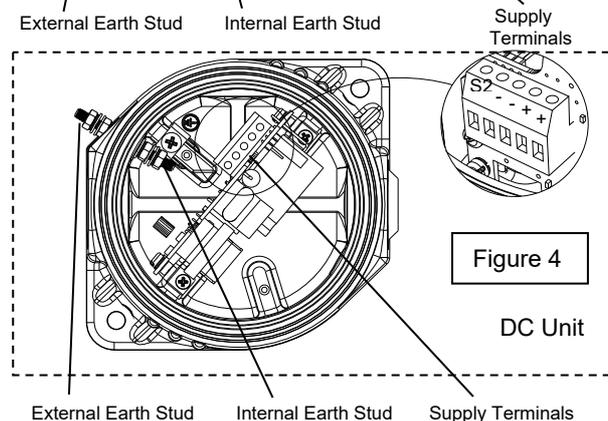


Figure 4

Earthing

Please note that for AC supply voltage product versions the Earth terminal on the PCBA does not provide an earth connection to the product enclosure. The enclosure must be independently earthed using either the external or internal earth fixing point, (see fig 3 and notes below).

Both AC and DC beacon units can be connected to an earth. The units are provided with internal and external earth terminals which are both located on the terminal chamber section of the unit (see figures 3 and 4).

Internal earthing connections on AC units should be made to the Internal Earth terminal on the PCBA. The earth conductor should be at least equal in size and rating to the incoming power conductors.

External earthing connections should be made to the M4 earth stud, using a ring crimp terminal to secure the earth conductor to the earth stud between the two M4 stainless steel flat washers, then reassemble the M4 spring washer and tighten the M4 nut to ensure that the cable lug is secured against loosening and twisting. The external earth conductor should be at least 4mm² in size.

7.3. Cable Glands, Blanking Elements and Adapters

The cable entry temperature may exceed +70°C or the cable branching point temperature may exceed 80°C at high ambient temperatures and therefore suitable heat resisting cables and cable glands must be used, rated 80°C for ambient temperatures of 55°C and rated 95°C for ambient temperatures of 70°C.

Cable Glands

The cable gland entries have an M20 x 1.5 entry thread. Only suitably rated and ATEX / IECEx / UKEX certified cable glands which must be suitable for the type of cable being used.

Blanking Plugs

When only one cable entry is used the other entry must be closed with suitably rated and ATEX / IECEx / UKEX certified blanking plugs.

For combustible dust applications, the cable entry device and blanking elements shall be in type of explosion protection and shall have an IP 6X rating.

Ingress Protection

If a high IP (Ingress Protection) rating is required then a suitable sealing washer must be fitted under the cable glands or blanking plugs.

A minimum ingress protection rating of IP6X must be maintained for installations in explosive dust atmospheres.

Adapters

The GNEx Beacon Range can be supplied with the following types of adapters:

- M20 to ½" NPT
- M20 to ¾" NPT
- M20 to M25

It is important to note that stopping plugs cannot be fitted onto adapters, only directly onto the M20 entries.

Any other adapters used must be suitably rated as per the applicable standards.

If the installation is made using conduit, openings must have a sealing fitting connected as close as practical to the wall of the enclosure, but in no case more than the size of the conduit or 50mm, whichever is the lesser.

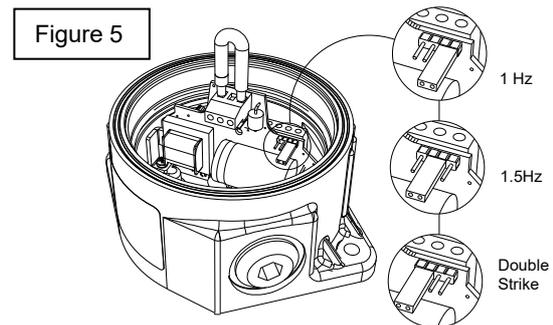
8) Flash Patterns (DC Units Only)



Warning – high-intensity light source. Avoid looking directly at the light source for extended periods of time.

The GNExB1X05 DC beacons can produce three different flash patterns as listed below. The flash patterns are set internally by the selection of pin headers. The flash pattern set can be changed externally to produce a second stage by connecting terminal S2 to –ve supply line whilst powering the +ve and –ve supply terminals.

The AC Beacons only flash at 1Hz.



Stage 1

1Hz
1.5Hz
Double Strike

Stage 2

Double Strike
Double Strike
Double Strike

Synchronised Operation

All GNExBG1X05 beacons that are connected to the same supply line will have a synchronised flash rate at one flash every second. To ensure that the units will be synchronised check that the pin header is set to 1Hz (see Figure 5).

9) End of Line Monitoring (DC Units)

On the GNExBG1X05 DC beacons, dc reverse line monitoring can be used if required. All DC units have a blocking diode fitted in their supply input lines. An end of line monitoring diode or an end of line monitoring resistor can be connected across the +ve and –ve terminals in the flameproof chamber. If an end of line resistor is used it must have a minimum resistance value of 3k3 ohms and a minimum wattage of 0.5W or a minimum resistance value of 500 ohms and a minimum wattage of 2W.

10) Maintenance, Overhaul and Repair

Maintenance, repair and overhaul of the equipment should only be carried out by suitably qualified personnel in accordance with the current relevant standards:

- EN60079-19/IEC60079-19 Explosive atmospheres - Equipment repair, overhaul and reclamation
- EN60079-17/IEC60079-17 Explosive atmospheres - Electrical installations inspection and maintenance

Units must not be opened while an explosive atmosphere is present.

Electrostatic charging hazard - Clean only with a damp cloth.

1SIL 2 Reliability Data

Reliability and Functional safety IEC/EN61508 which has been assessed and is considered suitable for use in low demand safety function:

1. Random Hardware Failures and Architectural constraints (route 2H).
2. As an unvoted item (i.e. hardware fault tolerance of 0) at SIL 2.

The product was assessed against failure modes:

- Failure respond to an input by lighting a beacon.
 - Spurious light output despite no input.
3. When employing the device in a SIL2 compliant system the user should ensure frequent or continuous automatic monitoring of continuity.

Integrity in respect of failure to function	SIL2 & SIL1
Total Failure rate	0.48 pmh
"Hazardous" failure rate (revealed)	0 pmh
"Hazardous" failure rate (unrevealed)	0.48 pmh
"Safe" failure rate (revealed)	0 pmh
"Safe" failure rate (unrevealed)	0
System type	B
Hardware Fault Tolerance	0
Diagnostic Coverage	>60%
PFD (hazardous failure)	2.1×10^{-3}
Proof Test Interval	Up to 1 year

ISSUE	MOD No.	REASON - INITIAL - DATE
C		New Format RSR 29/11/22

A

A

DC XENON GNExB1X05 UNITS

Line Monitoring

Power: +ve & -ve

B

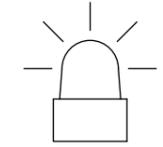
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OPTIONAL LINE MONITORING RESISTOR, CUSTOMER SUPPLIED,
RECOMMENDED MINIMUM VALUES:
500Ω MIN, 2W MIN OR 3K3Ω MIN, 0.5W MIN



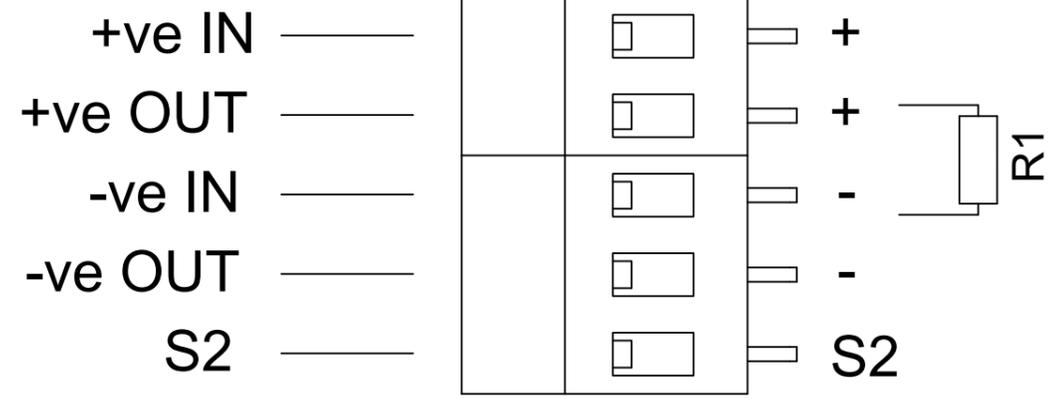
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C



D

D

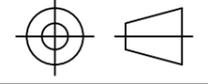


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DRAWING TO BS8888:2000 GEOMETRIC TOLERANCES TO ISO1101:1983 LINEAR DIMENSIONAL TOLS ANGULAR DIMENSIONAL TOLS	DRAWN R. RAIT	DATE 28/11/22	SURFACE FINISH	WEIGHT (Kg)	THIS DRAWING AND ANY INFORMATION OR DESCRIPTIVE MATTER THEREIN IS COMMUNICATED IN CONFIDENCE AND IS THE COPYRIGHT PROPERTY OF EUROPEAN SAFETY SYSTEMS LTD. NEITHER THE WHOLE OR ANY EXTRACT MAY BE DISCLOSED, LOANED, COPIED OR USED FOR MANUFACTURING OR TENDERING PURPOSES WITHOUT THEIR WRITTEN CONSENT. © EUROPEAN SAFETY SYSTEMS LTD. AS PER LATEST DATE OF ISSUE SHOWN ABOVE	 warning signals EUROPEAN SAFETY SYSTEMS LTD IMPRESS HOUSE MANSELL ROAD ACTON LONDON W3 7QH WWW.E2S.COM	ALL DIMENSIONS IN MM IF IN DOUBT, ASK - DO NOT SCALE		A3		
	CHECKED R.N.POTTS	DATE 28/11/22	MATERIAL	ALTERNATIVE MATERIAL			TITLE GNExB1 X05 BEACON WIRING DIAGRAMS				
	STANDARDS GNExB1 BEACONS	APPROVED R.N.POTTS	DATE 28/11/22				SCALE NTS	SHEET 1 OF 2	DRAWING NUMBER D155-06-201		

G

G

EU Declaration of Conformity



Manufacturer: European Safety Systems Ltd.
Impress House, Mansell Road, Acton
London, W3 7QH
United Kingdom

Authorised Representative: E2S Warnsignaltechnik UG
Charlottenstrasse 45-51
72764 Reutlingen
Germany

Equipment Type: GNExB1X05
GNExB2X05, GNExB2X10, GNExB2X15, GNExB2X21
GNExB2LD2
GNExJ2

Directive 2014/34/EU: Equipment and Protective Systems for use in Potentially Explosive Atmospheres (ATEX)

Notified Body for EU type Examination (Module B):	UL International Demko A/S Notified Body No.: 0539 Borupvang 5A, 2750 Ballerup, Denmark
EU-type Examination Certificate (Module B):	DEMKO 15ATEX1448X
Notified Body for Quality Assurance Notification / Conformity to EU-type based on quality assurance of the production process (Module D):	Sira Certification Service Notified Body No.: 2813 CSA Group Netherlands B.V, Utrechtseweg 310, 6812 AR, Arnhem, Netherlands
Quality Assurance Notification (Module D):	SIRA 05 ATEX M342
Provisions fulfilled by the equipment:	II 2G Ex db IIC T4...T6 Gb II 2D Ex tb IIC T80°C...T138°C Db IP6X Dust Protection to EN60079-0 / EN60079-31
Standards applied:	EN IEC 60079-0:2018 EN 60079-1: 2014 EN 60079-31: 2014

Directive 2014/30/EU: Electromagnetic Compatibility Directive (EMC)

Standards applied:	EN 61000-6-1:2007 EN 61000-6-2:2005 EN 61000-6-3:2007 / A1:2011 / AC: 2012 EN 61000-6-4:2007 / A1: 2011
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Directive 2011/65/EU: Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

The product and all the components contained within it are in accordance with the restriction of the use of hazardous substances in electrical and electronic equipment, including amendment by Directive 2015/863/EU.

Regulation (EC) 1907/2006: Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

The product and all the components contained within it are free from substances of very high concern.

Other Standards and Regulations

EN 60529:1992+A2:2013 - Degrees of protection provided by enclosures (IP code) – enclosure rated IP66/67

EU Declaration of Conformity



On behalf of European Safety Systems Ltd., I declare that, on the date the equipment accompanied by this declaration is placed on the market, the equipment conforms with all technical and regulatory requirements of the above listed directives, regulations and standards.

This Declaration is issued under the sole responsibility of the manufacturer.

A handwritten signature in black ink, appearing to read 'Martin Streetz'.

Martin Streetz
Quality Assurance Manager

Document No.: DC-037_Issue_H
Date and Place of Issue: London, 03/12/2021



UKCA Declaration of Conformity



Manufacturer: European Safety Systems Ltd.
Impress House, Mansell Road, Acton
London, W3 7QH
United Kingdom

Equipment Type: GNExB1X05
GNExB2X05, GNExB2X10, GNExB2X15, GNExB2X21
GNExB2LD2
GNExJ2

Directive UKSI 2016:1107 (as amended by UKSI 2019:696) – Schedule 3A, Part 1 : Product or Protective System Intended for use in Potentially Explosive Atmospheres (UKCA)

Notified Body for UK type Examination (Module B):	UL International (UK) Ltd Notified Body No.: 0843 Unit 1-3 Horizon Kingsland Business Park, Wade Road, Basingstoke, Hampshire RG24 8AH UK
UK-type Examination Certificate (Module B):	UL21UKEX2136X
Notified Body for Quality Assurance Notification / Conformity to EU-type based on quality assurance of the production process (Module D):	Sira Certification Service Notified Body No.: 0518 Rake Lane, Eccleston, Chester CH4 9JN, UK
Quality Assurance Notification (Module D):	CSAE 22UKQAN0046
Provisions fulfilled by the equipment:	II 2G Ex db IIC T4...T6 Gb II 2D Ex tb IIIC T80°C...T138°C Db IP6X Dust Protection to EN60079-0 / EN60079-31
Standards applied:	EN IEC 60079-0:2018 EN 60079-1: 2014 EN 60079-31: 2014

Directive 2014/30/EU: Electromagnetic Compatibility Directive (EMC)

Standards applied:	EN 61000-6-1:2007 EN 61000-6-2:2005 EN 61000-6-3:2007 / A1:2011 / AC: 2012 EN 61000-6-4:2007 / A1: 2011
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This Declaration is issued under the sole responsibility of the manufacturer.

Martin Streetz
Quality Assurance Manager

Document No.: DC-098_Issue_A
Date and Place of Issue: London, 24/02/2022

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