

IECEx Certificate of Conformity

Michelle Halliwell

INTERNATIONAL ELECTROTECHNICAL COMMISSION **IEC Certification System for Explosive Atmospheres**

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

Certificate No.: **IECEx SIR 20.0022X** Page 1 of 4

Issue No: 8 Status: Current

2025-02-21 Date of Issue:

Applicant: **Blackline Safety**

Suite 100, 803 24th Ave SE Calgary, Alberta T2G 1P5

Canada Canada

G7 EXO Model Numbers G7EXO-AZ2, G7EXO-EU2, G7EXO-NA2 and EXab-cc-dde Equipment:

Optional accessory:

Intrinsically Safe ia Type of Protection:

Marking: Ex ia IIC T3 Ga

Ta = -20°C to +50°C

Approved for issue on behalf of the IECEx

Certification Body:

Position: **Senior Director of Operations**

Signature:

(for printed version)

(for printed version)

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Certificate history: Issue 7 (2024-10-23)

Issue 6 (2024-02-01) Issue 5 (2023-06-08)

Issue 4 (2022-08-24) Issue 3 (2022-03-07)

Issue 2 (2021-03-23)

Issue 1 (2021-01-20)

Issue 0 (2020-09-17)

Certificate issued by:

CSA Group Testing UK Ltd Unit 6, Hawarden Industrial Park Hawarden, Deeside CH5 3US **United Kingdom**





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Date of issue: 2025-02-21 Issue No: 8

Manufacturer: Blackline Safety

Suite 100, 803 24th Ave SE Calgary, Alberta T2G 1P5

Canada Canada

Manufacturing Blackline Safety

locations: Suite 100, 803 24th Ave SE

Calgary, Alberta T2G 1P5

Canada Canada

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

Edition:6.0

IEC 60079-26:2014 Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga

Edition:3.0

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/CSAE/ExTR22.0050/00
 GB/SIR/ExTR20.0172/00
 GB/SIR/ExTR21.0005/00

 GB/SIR/ExTR21.0047/00
 GB/SIR/ExTR22.0115/00
 GB/SIR/ExTR23.0102/00

 GB/SIR/ExTR24.0018/00
 GB/SIR/ExTR24.0018/01
 GB/SIR/ExTR25.0012/00

Quality Assessment Report:

CA/CSA/QAR16.0006/06



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

Transportable long-term area gas monitor instrument EXO Models G7EXO-XX# and EXab-cc-dde are models of multi-gas monitors which continuously monitor toxic and combustible gas concentrations using a variety of sensor types using various measuring principles. All combustible sensor types compatible with the EXO include IR, electrochemical, MPSTM, and catalytic bead pellistor LEL sensors. The EXO Models are equipped with integrated cellular modules supporting several forms of connectivity. The EXO Models are intended for automated long-term area gas monitoring.

The housing is constructed of Aluminum (ANSI 380.0-F). The front of the monitor has an LCD Display, with buttons to change menu items. There is also an Alarm Reset switch. All models are powered by a rechargeable Lithium polymer battery. The Lithium polymer battery must be replaced and charged outside the hazardous area.

Refer to the Annexe for additional information including safety parameters

SPECIFIC CONDITIONS OF USE: YES as shown below:

| 1. | The enclosure is manufactured from Aluminium, magnesium, titanium or zirconium which may be used at the accessible surface of the |
|----|--|
| | equipment. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered when the EXO is being |
| | installed in Zone 0 locations for group II level of protection Ga. |



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

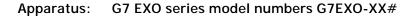
Issue 8 - This issue introduced the following change

- 1. Addition of EXOGAM (Gamma Module).
- 2. Modification of EXO Main Board.

Annex:

IECEx SIR 20.0022X Issue 8 Annexe.pdf

Applicant: Blackline Safety





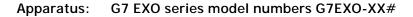
The housing is constructed of Aluminum (ANSI 380.0-F). The front of the monitor has an LCD Display, with buttons to change menu items. There is also an Alarm Reset switch. All models are powered by a rechargeable Lithium polymer battery. The Lithium polymer battery must be replaced and charged outside the hazardous area.

| G7 EXO Area Monitor Model Series Model code G7EXO-XX# | G7EXO- | XX | # | aaaaa | XXXXX |
|---|----------------|----|---|-------|-------|
| Model Family | | | | | |
| XX = World Region designation: | | · | | | |
| | | | | | |
| = Two alpha character string forming an | | | | | |
| for the target region/ country for the instrum | | | | | |
| relevant to the certified Equipment construct | ion | | | - | |
| # = Radio Technology populated: | | | | | |
| 1 = 3G | | | | | |
| 2 = LTE | | | | | |
| | | | | | |
| aaaaa = Serial Number Prefix (Output Range | e, entity | | | | |
| parameters): | | | | | |
| 35880 = High Output Range for North Ame | orica LTE | | | | |
| 35880 = High Output Range for North Ame | enca-Lie | | | | |
| 35882 = High Output Range for Europe-LT | ΓE | | | | |
| | | | | | |
| 35884 = High Output Range for Australia/I | New Zealand- | | | | |
| LTE | | | | | |
| ##### - any other five alphanymeric char | actors forming | | | | |
| ##### = any other five alphanumeric chara the prefix of the serial number are Low Outp | • | | | | |
| 35880, 35882, 35884) | out (choiddes | | | | |
| xxxxx = Serial Number Suffix - alphanumeric character string forming the suffix of the serial | | | | | ' |
| number, not relevant to the certified Equipm | _ | | | | |

| Detail | Additional Device Naming |
|----------------------|--|
| Detail Model number: | EXab-cc-dde Where: a = Series 8 - 8th 9F Future major releases b = Type N - Non-Gamma G - Gamma Future types |
| | cc = SIM Card 0199 SIM Card Carrier dd = Region NA - North America EU - Europe/UK AZ - Australia/New Zealand UA - UAE |

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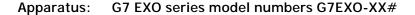


| Detail | Additional Device Naming | |
|--------|--------------------------|--|
| | Other | |
| | e = Cellular Technology | |
| | 2 - 4G/LTE | |
| | 3 - 5G | |

Product overview:

| etail Itity Parameters: | PER CONTROL DRAWING: | | | | |
|----------------------------|---|------------|--|--|--|
| inity i arameters. | IECEx Zone 0 Instructions MAN_103482 | | | | |
| | Input Entity Parameters, Group IIC (Zone 0): | | | | |
| | Parameters EXO – Input Power Port for So | nlar Panel | | | |
| | Input / Trickle Charger | olar ranci | | | |
| | gas application | | | | |
| | Terminals External Side Connector | | | | |
| | Pin 1 – Input Power | | | | |
| | Pin 2 – GND | | | | |
| | Pin 3 – Debug Port | | | | |
| | Pin 4 – Debug Port | | | | |
| | Voltage Ui 16Vdc | | | | |
| | Current Ij 687mA | | | | |
| | Power Pi 5.3W | | | | |
| | Effective internal OnF | | | | |
| | capacitance Ci | | | | |
| | Effective internal 12.48uH | | | | |
| | inductance Li | | | | |
| | Output Entity Parameters, Group IIC (Zone 0): | | | | |
| | Output Entity Parameters, Group IIC (Zone 0): Parameters EXO — Relay Outputs 1 & 2 gas application Terminals External Side Connector Pin 1 — Input for Low Side Switcl | h | | | |
| | Output Entity Parameters, Group IIC (Zone 0): Parameters EXO — Relay Outputs 1 & 2 gas application Terminals External Side Connector Pin 1 — Input for Low Side Switch Pin 2 — GND | h | | | |
| | Output Entity Parameters, Group IIC (Zone 0): Parameters EXO — Relay Outputs 1 & 2 gas application Terminals External Side Connector Pin 1 — Input for Low Side Switcl Pin 2 — GND Pin 3 — Output(20V) | h | | | |
| | Output Entity Parameters, Group IIC (Zone 0): Parameters EXO - Relay Outputs 1 & 2 gas application Terminals External Side Connector Pin 1 - Input for Low Side Switcl Pin 2 - GND Pin 3 - Output(20V) Pin 4 - Output(5V) | h | | | |
| | Output Entity Parameters, Group IIC (Zone 0): Parameters EXO - Relay Outputs 1 & 2 gas application Terminals External Side Connector Pin 1 - Input for Low Side Switcl Pin 2 - GND Pin 3 - Output(20V) Pin 4 - Output(5V) Pin 1 Input Entity Parameters | h | | | |
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| | Output Entity Parameters, Group IIC (Zone 0): Parameters EXO - Relay Outputs 1 & 2 gas application Terminals External Side Connector Pin 1 - Input for Low Side Switch Pin 2 - GND Pin 3 - Output(20V) Pin 4 - Output(5V) Pin 1 Input Entity Parameters Voltage Ui 24VDC Current Ii 3.33A | h | | | |
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| | Output Entity Parameters, Group IIC (Zone 0): Parameters EXO - Relay Outputs 1 & 2 gas application Terminals External Side Connector Pin 1 - Input for Low Side Switch Pin 2 - GND Pin 3 - Output(20V) Pin 4 - Output(5V) Pin 1 Input Entity Parameters Voltage Ui 24VDC Current Ii 3.33A Power Pi 1.25W Effective internal capacitance Ci Effective internal inductance Li Pin 3 Entity Parameters - high output models (G7EXO-XX# | | | | |

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| Detail | | | | |
|--------|---|--|--|--|
| | Co | 0.194µF | | |
| | Ro | 77.46Ω | | |
| | Lo | 495µH | | |
| | Lo/Ro | 6.39 μΗ/Ω | | |
| | Pin 3 Entity Paramete | ers – low output models (G7EXO-XX# serial# | | |
| | aaaaa; excludes serial #s 35880, 35882, 35884) | | | |
| | Uo | 20.76VDC | | |
| | lo | 93mA | | |
| | Po | 0.479W | | |
| | Со | 0.194µF | | |
| | Ro | 226Ω | | |
| | Lo | 4.1mH | | |
| | Lo/Ro | 18.2μΗ/Ω | | |
| | Pin 4 Entity Parameters – high output models (G7EXO-XX# serial: 35880, 35882, 35884) | | | |
| | Uo | 4.94VDC | | |
| | lo | 0.108A | | |
| | Po | 97mW | | |
| | Со | 100μF | | |
| | Uo/Io | 33.25Ω | | |
| | Lo | 3.05mH | | |
| | L ₀ /R ₀ | 91.7μΗ/Ω | | |
| | Pin 4 Entity Parameters – low output models (G7EXO-XX# serial# aaaaa; excludes serial #s 35880, 35882, 35884) | | | |
| | Uo | 3.6VDC | | |
| | lo | 1.21A | | |
| | Po | 3.0W | | |
| | Co | 1000μF | | |
| | Uo/Io | 1.1Ω | | |
| | Lo | 24.28µH | | |
| | L ₀ /R ₀ | 21.9μΗ/Ω | | |
| | 1 = 0. 7.0 | 1=[| | |

Full Certificate Change History

Issue 1 – this Issue introduced the following Changes:

- 1. Addition of 3 components: Rmod1, Rmod2, Dmod1 impacting power control.
- 2. The product description was amended to correct typographical errors.

Issue 2 – this Issue introduced the following Changes:

- The introduction of Satellite Module PCB, PUMP Module PCB, Addition of Single cell battery, Reduction of entity parameters for High Voltage Output, Review of conditions of manufacture and EXO G7 Hardware Implementation of approved modifications; per the content from CSA Letter of Attestation Project 80063121.
- 2. The introduction of City Tech 4P75C Pellistor Sensor for use with EXO G7; per the content from CSA Letter of Attestation Project 80067121.
- 3. The introduction of Custom Testing of Piezo with modified enclosure; per the content from CSA Custom Test Project 80061640, WO8582.

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Apparatus: G7 EXO series model numbers G7EXO-XX#



4. The introduction of revised Enclosure drawings updates for Front Enclosure, Back Enclosure, Battery Back Enclosure and Battery Front Enclosure.

5. The introduction of High Output Models and Low Output Models; with revised and new Entity Parameters; the Equipment Description was amended to include the new Serial # description which has been appended to the Existing Models.

Issue 3 – this Issue introduced the following Changes:

- 1. Evaluation to include a new pump model.
- 2. Define maximum pump parameters.

Issue 4 – this Issue introduced the following Changes:

- 1. Update to G7EXO (Schematic, BOM, PCB)
 - i. Incorporate alternates for current clamp (TIS Project: 80109743)
 - ii. Cell Zone: R312, R313
 - iii. GPS DIG1 Zone: Q402, R415, C416, C417
 - iv. DIG1 Zone: Change flash(U202,U204) to 104027 (IC FLASH 128MBIT SPI 8WPDFN) and 104052 (IC FLASH 1GBIT SPI 133MHZ 8WPDFN)
 Added R215,R212,C207,C208,C209,C210,Q200,Q203
 - v. Minor Mechanical updates to enclosure
- 2. Update to EXOSAT(Schematic, BOM, PCB)
 - i. Update EXOSAT (SCH, BOM, PCB)
 - ii. Mechanical change to board outline
- 3. Addition of CSA Letter of Attestation
 - i. Project 80070938(Alternate Potting Material)
 - ii. Project 80097624(Alternate Potting Material)
 - iii. Project 80125461(Alternate Potting Material)
- 4. Addition of IEC 60079-26:2014-10 Ed. 3.0
 - i. Equipment with Equipment Protection Level (EPL) Ga

Issue 5 – this Issue introduced the following Changes:

- The introduction of mono solar panel model JYG-5W-M as an approved accessory for use with G7EXO based on update to equipment input entity paraments.
- 2. Addition of drawing listing all approved potting materials for use with G7 EXO.
- 3. The recognition of new potting material.

Issue 6 – this Issue introduced the following Changes:

- 1. Update of model number/Unit ID nomenclature.
- Collection of revised documents supporting the update of model number/Unit ID.

Issue 7 – this Issue introduced the following Changes:

- 1. Update to EXO Transportable Combustible or Toxic Gas Detector Models G7EXO-XXX for addition of four-gas sensor module, gamma sensor accessory
- 2. Mechanical drawing updates
- 3. Update the LCD display to two 3.4" displays and further mechanical drawing updates.
- 4. Added addition Device Naming convention
- 5. Corrected year of revision of EN 60079-26:14 to EN 60076-26:15

Issue 8 – this Issue introduced the following Changes:

- 1. Addition of EXOGAM (Gamma Module).
- 2. Modification of EXO Main Board.

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