



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 SIR 20.0022X	Page 1 of 4	<u>Certificate history:</u>
Status:	Current	Issue No: 5	Issue 4 (2022-08-24)
Date of Issue:	2023-06-08		Issue 3 (2022-03-07)
Applicant:	Blackline Safety Suite 100, 803 24th Ave SE Calgary, Alberta T2G 1P5 Canada Canada		Issue 2 (2021-03-23)
Equipment:	G7 EXO model numbers G7EXO-AZ2, G7EXO-EU2, G7EXO-NA2		Issue 1 (2021-01-20)
Optional accessory:			Issue 0 (2020-09-17)
Type of Protection:	Intrinsically Safe ia		
Marking:	Ex ia IIC T3 Ga Ta = -20°C to +50°C		

Approved for issue on behalf of the IECEx
Certification Body:

Michelle Halliwell

Position:

Director Operations, UK & Industrial Europe

Signature:
(for printed version)

Date:
(for printed version)

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Certificate issued by:

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Date of issue: 2023-06-08

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Manufacturer: **Blackline Safety**
Suite 100, 803 24th Ave SE
Calgary, Alberta T2G 1P5
Canada
Canada

Manufacturing locations: **Blackline Safety**
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 60079-26:2014-10](#) 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/ExTR21.0047/00](#)

[GB/SIR/ExTR20.0172/00](#)
[GB/SIR/ExTR22.0115/00](#)

[GB/SIR/ExTR21.0005/00](#)
[GB/SIR/ExTR23.0102/00](#)

Quality Assessment Report:

[CA/CSA/QAR16.0006/05](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

Transportable long-term area gas monitor instrument G7 EXO Models G7EXO-AZ2, G7EXO-EU2 and G7EXO-NA2 are 3 models of multi-gas monitor which continuously monitor toxic and combustible gas concentrations using a variety of sensors types using various measuring principles. All combustible sensor types are compatible with G7EXO, including IR, electrochemical, MPSTM, and catalytic bead pellistor LEL sensors. The G7 EXO Models is equipped with with integrated cellular modules supporting several forms of connectivity. The G7 EXO Models are intended for automated long-term area gas monitor.

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)

This issue, Issue 5, recognises the following changes; refer to the certificate annex to view a comprehensive history:

1. 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.

Annex:

[IECEX SIR 20.0022X Issue 5 Annexe.pdf](#)

Annexe to: IECEx SIR 20.0022X Issue 5

Applicant: Blackline Safety

Apparatus: G7 EXO model numbers G7EXO-AZ2, G7EXO-EU2, G7EXO-NA2



The models G7EXO-AZ2, G7EXO-EU2 and G7EXO-NA2 share the same enclosure and firmware. Besides the different model designation on the nameplates, the differences between the models G7EXO-AZ2, G7EXO-EU2 and G7EXO-NA2 follow:

Country Dependent Cell Radio Modules

G7EXO-NA2:

MOD300 (cellular):

LTE: Band 12 (700 MHz), Band 5 (850 MHz), Band 4 (1700 MHz), Band 2 (1900 MHz)

3G: Band 5 (850 MHz), Band 2 (1900 MHz)

G7EXO-EU2:

MOD300 (cellular):

LTE: Band 20 (800 MHz), Band 3 (1800 MHz), Band 7 (2600 MHz),

2G: E-GSM 900 MHz, DCS 1800 MHz

G7EXO-AZ2:

MOD300 (cellular):

LTE: Band 28 (700 MHz), Band 8 (900 MHz), Band 3 (1800 MHz)

3G: Band 1 (2100 MHz)

All models also contain the following communications modules on the main board (EXO Main):

U400: receive only radio module, no transmission capabilities

U501: 2.4GHz BT/BLE/WiFi

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.

Product overview:

Input Entity Parameters, Group IIC (Zone 0):

Parameters	EXO – Input Power Port for Solar Panel Input / Trickle Charger gas application
Terminals	External Side Connector Pin 1 – Input Power Pin 2 – GND Pin 3 – Debug Port Pin 4 – Debug Port
Voltage U_i	16Vdc
Current I_i	687mA
Power P_i	5.3W
Effective internal capacitance C_i	0nF
Effective internal inductance L_i	12.48uH

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)

Annexe to: IECEx SIR 20.0022X Issue 5

Applicant: Blackline Safety

Apparatus: G7 EXO model numbers G7EXO-AZ2, G7EXO-EU2, G7EXO-NA2



Parameters	EXO – Relay Outputs 1 & 2 gas application
Pin 1 Input Entity Parameters	
Voltage U_i	24VDC
Current I_i	3.33A
Power P_i	1.25W
Effective internal capacitance C_i	0 μ F
Effective internal inductance L_i	0H
Pin 3 Entity Parameters - high output models (G7EXO-NA2 serial# 35880xxxxx, G7EXO-EU2 serial# 35882xxxxx, G7EXO-AZ2 serial# 35884xxxxx)	
U_o	20.76VDC
I_o	268mA
P_o	1.39W
C_o	0.194 μ F
R_o	77.46 Ω
L_o	495 μ H
L_o/R_o	6.39 μ H/ Ω
Pin 3 Entity Parameters - low output models (G7EXO-NA2 serial# 35881xxxxx, G7EXO-EU2 serial# 35883xxxxx, G7EXO-AZ2 serial# 35885xxxxx)	
U_o	20.76VDC
I_o	93mA
P_o	0.479W
C_o	0.194 μ F
R_o	226 Ω
L_o	4.1mH
L_o/R_o	18.2 μ H/ Ω
Pin 4 Entity Parameters - high output models (G7EXO-NA2 serial# 35880xxxxx, G7EXO-EU2 serial# 35882xxxxx, G7EXO-AZ2 serial# 35884xxxxx)	
U_o	4.94VDC
I_o	0.108A
P_o	97mW
C_o	100 μ F
U_o/I_o	33.25 Ω
L_o	3.05 μ H
L_o/R_o	91.7 μ H/ Ω
Pin 4 Entity Parameters - low output models (G7EXO-NA2 serial# 35881xxxxx, G7EXO-EU2 serial# 35883xxxxx, G7EXO-AZ2 serial# 35885xxxxx)	
U_o	3.6VDC
I_o	1.21A
P_o	3.0W
C_o	1000 μ F
U_o/I_o	1.1 Ω
L_o	24.28 μ H
L_o/R_o	21.9 μ H/ Ω

Annexe to: IECEx SIR 20.0022X Issue 5

Applicant: Blackline Safety

Apparatus: G7 EXO model numbers G7EXO-AZ2, G7EXO-EU2,
G7EXO-NA2



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:

1. 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.
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:

1. 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 parameters.
2. Addition of drawing listing all approved potting materials for use with G7 EXO.
3. The recognition of new potting material.