



1 **EU-TYPE EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 Certificate Number: **Sira 20ATEX2004X** Issue: **6**

4 Equipment: **G7 EXO model numbers G7EXO-AZ2, G7EXO-EU2, G7EXO-NA2**

5 Applicant: **Blackline Safety**

6 Address: **Unit 100, 803 - 24 Avenue SE
Calgary, AB T2G 1P5
Canada**

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 CSA Group Netherlands B.V., notified body number 2813 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN IEC 60079-0:2018

EN 60079-11:2012

EN 60079-26:2014-10 Ed. 3.0

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to Specific Conditions of Use identified in the schedule to this certificate.

11 This EU-Type Examination Certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:



II 1G

Ex ia IIC T3 Ga

Ta = -20°C to +50°C



Signed: M Halliwell

Title: Director of Operations

Project Number 80157604

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SCHEDULE

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13 DESCRIPTION OF EQUIPMENT

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, MPS™, 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.

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.



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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)
Pin 1 Input Entity Parameters	
Voltage U_i	24VDC
Current I_i	3.33A
Power P_i	1.25W
Effective internal capacitance C_i	0μF
Effective internal inductance L_i	0H

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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	3.05mH
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

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Variation 1 - This variation introduced the following changes:

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

Variation 2 - This variation introduced the following changes:

- i. 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.
- ii. The introduction of City Tech 4P75C Pellistor Sensor for use with EXO G7; per the content from CSA Letter of Attestation Project 80067121.
- iii. The introduction of Custom Testing of Piezo with modified enclosure; per the content from CSA Custom Test Project 80061640, WO8582.
- iv. The introduction of revised Enclosure drawings updates for Front Enclosure, Back Enclosure, Battery Back Enclosure and Battery Front Enclosure.
- v. 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.
- vi. Removal of the Condition of Manufacturer.

Variation 3 - This variation introduced the following changes:

- i. Evaluation to include a new pump model.
- ii. Define maximum pump parameters.
- iii. Removal of the Condition of Manufacturer.

Variation 4 - This variation introduced the following changes:

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

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Variation 5 - This variation introduced the following changes:

- i. 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.
- ii. Addition of drawing listing all approved potting materials for use with G7 EXO.
- iii. The recognition of new potting material.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Reports and Certificate History

Issue	Date	Report number	Comment
0	17 September 2020	R80011717A	The release of the prime certificate.
1	02 October 2020	R80057454A	Transfer of certificate Sira 20ATE2004X from Sira Certification Service to CSA Group Netherlands B.V.
2	19 February 2021	R80065288A	The introduction of Variation 1.
3	14 April 2021	R80068482A	The introduction of Variation 2.
4	07 March 2022	R80107409A	The introduction of Variation 3.
5	24 August 2022	R80118390A	The introduction of Variation 4.
6	08 June 2023	R80157605A	The introduction of Variation 5.

15 SPECIFIC CONDITIONS OF USE (denoted by X after the certificate number)

- 15.1 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.

16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 CONDITIONS OF MANUFACTURE

- 17.1 The use of this certificate is subject to the Regulations Applicable to Holders of CSA Group Netherlands B.V. certificates.
- 17.2 Holders of EU-Type Examination Certificates are required to comply with the conformity to type requirements defined in Article 13 of Directive 2014/34/EU.

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Certificate Annexe



Certificate Number: Sira 20ATEX2004X

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

Applicant: Blackline Safety

Issue 0

Drawing	Sheets	Rev.	Date	Title
SCH_102873	1 to 17	6	09 Sep 20	EXO Main
SCH_103039	1 of 1	3	09 Sep 20	EXO Antenna
SCH_103041	1 of 1	3	09 Sep 20	EXO Battery Pack
SCH_103043	1 of 1	3	09 Sep 20	EXO LCD
SCH_103045	1 of 1	2	09 Sep 20	EXO Flex LED
SCH_103063	1 of 1	1	09 Sep 20	EXO Cartridge Adaptor
SCH_103331	1 of 1	2	09 Sep 20	EXO Power Adaptor
SCH_10341	1 of 1	2	09 Sep 20	EXO Cellular Antenna
PCB_102872	1 to 6	4	09 Sep 20	EXO Main
PCB_103038	1 to 4	3	09 Sep 20	EXO Antenna
PCB_103040	1 to 4	3	09 Sep 20	EXO Battery Pack
PCB_103042	1 to 2	3	09 Sep 20	EXO LCD
PCB_103044	1 to 2	2	09 Sep 20	EXO Flex LED
PCB_103062	1 to 2	1	09 Sep 20	EXO Cartridge Adaptor
PCB_103330	1 to 6	2	09 Sep 20	EXO Power Adaptor
PCB_103451	1 of 1	2	09 Sep 20	EXO Cellular Antenna
FAB_102872	1 to 2	4	09 Sep 20	EXO Main PCB Fab
BOM_102873	1 of 1	6	09 Sep 20	EXO Main
BOM_103039	1 of 1	3	09 Sep 20	EXO Antenna
BOM_103041	1 of 1	3	09 Sep 20	EXO Battery Pack
BOM_103043	1 of 1	3	09 Sep 20	EXO LCD
BOM_103045	1 of 1	2	09 Sep 20	EXO Flex LED
BOM_103063	1 of 1	1	09 Sep 20	EXO Cartridge Adaptor
BOM_103331	1 of 1	2	09 Sep 20	EXO Power Adaptor
01696-38546	1 to 4	E	09 Sep 20	Door
01696-38547	1 to 8	E	09 Sep 20	Front Enclosure
01696-38548	1 to 6	F	09 Sep 20	Back Enclosure
01696-38549	1 to 5	E	09 Sep 20	Battery Back Enclosure
01696-38550	1 to 5	D	09 Sep 20	Battery Front Enclosure
01696-38552	1 to 4	C	09 Sep 20	Handle
01696-38557	1 to 4	B	09 Sep 20	Right Pump Cover
01696-38558	1 to 3	B	09 Sep 20	Left Pump Cover
01696-38559	1 to 5	E	09 Sep 20	Speaker
01696-38562	1 to 5	B	09 Sep 20	Right Bumper
01696-38563	1 of 1	A	09 Sep 20	Left Bumper
01696-41583	1 to 3	D	09 Sep 20	Latch
01696-41977	1 to 4	D	09 Sep 20	Keypad
01696-42130	1 of 1	E	09 Sep 20	Tripod plate
01696-42271	1 to 2	G	09 Sep 20	Window
01696-42325	1 to 3	C	09 Sep 20	Latch holder
01696-42328	1 to 3	B	09 Sep 20	Handle bumper
01696-42410	1 to 3	B	09 Sep 20	Door gas channel
01696-43709	1 of 1	A	09 Sep 20	Speaker Grill
01696-43757	1 to 3	B	09 Sep 20	Inlet Cap
01696-43764	1 of 1	C	09 Sep 20	Label alarm light front
01696-43765	1 of 1	C	09 Sep 20	Label alarm light back
01696-43766	1 of 1	C	09 Sep 20	Label alarm light right

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Certificate Number: Sira 20ATEX2004X

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

Applicant: Blackline Safety

Drawing	Sheets	Rev.	Date	Title
01696-43767	1 of 1	C	09 Sep 20	Label alarm light left
01696-43768	1 of 1	B	09 Sep 20	EXO Label Identification
01696-A14209	1 to 3	C	09 Sep 20	EXO assembly
01696-A14634	1 to 2	C	09 Sep 20	Battery pack assembly
LBL_103418	1 of 1	3	09 Sep 20	EXO Label Artwork
LBL_103475	1 of 1	0	09 Sep 20	EXO Battery Pack Label Artwork
MAN_103482	1 to 44	12	09 Sep 20	EXO Installation Manual
MAN_103744	1 of 1	1	09 Sep 20	EXO Battery Pack Installation Manual
01696-A18940	1 of 1	A	09 Sep 20	Main PCB Potting Procedure
01696-A19146	1 of 1	B	09 Sep 20	Battery PCB Potting Procedure

Issue 1 – No new drawings were introduced.

Issue 2

Drawing	Sheets	Rev.	Date (Stamp)	Title
BOM_102873r7a	1 of 1	07a	12 Oct 20	EXO Main – iS additional components
SCH_102873r7a	1 to 17	07	12 Oct 20	EXO Main

Issue 3

Drawing	Sheets	Rev.	Date (Stamp)	Title
SCH_102873	1 of 17	9	01 Mar 21	EXO Main
PCB_102872	1 to 6	5	01 Mar 21	EXO Main
BOM_102873	1 to 4	9	01 Mar 21	EXO Main
BOM_102873	1 to 4	10	01 Mar 21	EXO Main
SCH_103049	1 of 1	4	01 Mar 21	EXO SAT
SCH_103047	1 of 1	2	01 Mar 21	EXO PUMP
PCB_103048	1 to 4	3	01 Mar 21	EXO SAT
PCB_103046	1 to 2	2	01 Mar 21	EXO PUMP
BOM_103049	1 of 1	4	01 Mar 21	EXO SAT
BOM_103047	1 of 1	2	01 Mar 21	EXO PUMP
01696-A19148	1 of 1	A	01 Mar 21	EXO SAT Potting Procedure
103418	1 of 1	3	01 Mar 21	EXO IECEx label content
103418	1 of 1	5	01 Mar 21	EXO label artwork-ATEX
MAN_103482	1 to 17	7	01 Mar 21	EXO Technical User Manual
MAN_103744	1 of 1	3	01 Mar 21	EXO Battery Pack Installation Manual
SCH_102317	1 to 7	2	01 Mar 21	Loner Gas QUAD CARTRIDGE PELLISTOR Diagram
SCH_102414	1 to 7	4	01 Mar 21	G7 Quint-Gas Cartridge Block Diagram
BOM_102149	1 to 2	3	01 Mar 21	LGASQCTGP
BOM_102414	1 of 1	4a	01 Mar 21	G7 Multi-Gas Cartridge (LEL - IR, PEL; COSH; O2; AG, PID, CO2)
LGASQCTGP-02	1 of 22	2	01 Mar 21	ATEX_CONTROLLED_PCB_102145 LGASQCTGP-02-xx Pellistor
01696-49269	1 to 2	A	01 Mar 21	Absorber Pad
01696-A16222	1 to 2	F	01 Mar 21	Antenna & Speaker Sub-Assy
01696-38547	1 to 9	G	01 Mar 21	Front Enclosure
01696-38548	1 to 6	G	01 Mar 21	Back Enclosure
01696-38549	1 to 5	G	01 Mar 21	Battery Back Enclosure
01696-38550	1 to 5	E	01 Mar 21	Battery Front Enclosure

Issue 4 – No new drawings were introduced.

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Certificate Annexe



Certificate Number: Sira 20ATEX2004X

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

Applicant: Blackline Safety

Issue 5

Drawing	Sheets	Rev.	Date (Stamp)	Title
BOM_102873r	1 of 1	12	03 Aug 22	EXO main
PCB_102872	1 to 6	6	03 Aug 22	EXO main
SCH_102873	1 to 17	12	03 Aug 22	EXO main
BOM_103049	1 of 1	5	03 Aug 22	EXO satellite
PCB_103048	1 to 6	4	03 Aug 22	EXO satellite
SCH_103049	1 of 1	5	03 Aug 22	EXO satellite
MAN_103635	1 to 26	9	03 Aug 22	EXO technical user manual
01696-38547	1 to 9	H	03 Aug 22	Front enclosure
01696-38557	1 to 4	C	03 Aug 22	Right pump cover
01696-38558	1 to 3	C	03 Aug 22	Left pump cover
01696-38562	1 to 5	D	03 Aug 22	Right bumper
01696-38563	1 of 1	D	03 Aug 22	Left bumper
01696-41977	1 to 3	E	03 Aug 22	Keypad
01696-42130	1 of 1	F	03 Aug 22	Tripod plate
01696-42271	1 to 2	K	03 Aug 22	Window
01696-42328	1 to 3	C	03 Aug 22	Handle bumper
01696-43709	1 of 1	B	03 Aug 22	Speaker Grill
01696-49269	1 to 2	C	03 Aug 22	Absorber Pad
01696-65089	1 to 4	C	03 Aug 22	Diffusion Ventilated Door
01696-65108	1 to 3	D	03 Aug 22	Diffusion Door Gas Channel
01696-A16222	1 to 2	H	03 Aug 22	Antenna & Speaker Sub-Assembly

Issue 6

Drawing	Sheets	Rev.	Date (Stamp)	Title
01696-A18940	1 of 1	C	03 May 23	MAIN PCB Potting Procedure
01696-A19146	1 of 1	C	03 May 23	BATTERY PCB Potting Procedure
06196-A19148	1 of 1	B	03 May 23	SAT MODULE PCB Potting Procedure
106164	1 of 1	0	03 May 23	G7 EXO Approved Potting Materials

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