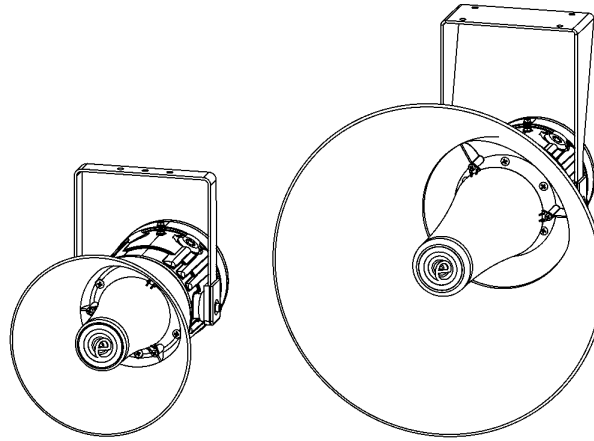


INSTRUCTION MANUAL

GNExS2

Alarm Horn Sounder

ATEX / IECEx / Class I Zone 1, 2



GNExS2F

GNExS2H

1) Product Table

Model	Nominal Input Voltage	Voltage Range	Nominal Input Current		Max. Current		Sound Pressure Level P2, dB(A)		Sound Pressure Level P3, dB(A)	
			P2	P3	P2	P3	Max*	Nom.†	Max*	Nom.†
GNExS2FDC024-A	12Vdc	10-60Vdc ATEX/IECEX 11.5-54Vdc Class Zone / UL464 / CAN/ULC-S525	289mA	356mA	324mA	740mA	120	115	123	118
	24Vdc		324mA	740mA						
	48Vdc		195mA	391mA						
GNExS2FDC024-S	24Vdc	20-28Vdc ATEX/IECEX Class Zone / UL464 / CAN/ULC-S525	324mA	740mA						
GNExS2FAC230	115Vac	100-260Vac 50/60Hz ATEX/IECEX	125mA	282mA	138mA	325mA				
	230ac		78mA	167mA						
GNExS2HDC024-A	12Vdc	10-60Vdc ATEX/IECEX 11.5-54Vdc Class Zone / UL464 / CAN/ULC-S525	289mA	356mA	324mA	740mA	124	119	127	122
	24Vdc		324mA	740mA						
	48Vdc		195mA	391mA						
GNExS2HDC024-S	24Vdc	20-28Vdc ATEX/IECEX Class Zone / UL464 / CAN/ULC-S525	324mA	740mA						
GNExS2HAC230	115Vac	100-260Vac 50/60Hz ATEX/IECEX	125mA	282mA	138mA	325mA				
	230Vac		78mA	167mA						

*Max = Tone 4
†Nom. = Tone 44

The table shows the input current taken by the various sounders.
The current levels shown above are for the 440Hz Continuous tone @ nominal input voltage at P2 and P3 power setting.
Nominal current at nominal voltage.
Max rated current at worst case supply voltage.

Table 1: Electrical Ratings.

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

2) Warnings



- DO NOT OPEN WHEN ENERGISED.
- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.
- POTENTIAL ELECTROSTATIC CHARGING HAZARD – CLEAN ONLY WITH DAMP CLOTH
- ALL ENTRIES M20 X 1.5MM.
- IF TEMPERATURE EXCEEDS 70°C AT ENTRY OR 80°C AT BRANCHING POINT USE SUITABLE RATED CABLE AND CABLE GLANDS.
- IF OPENING THE UNIT DURING MAINTENANCE OPERATIONS A CLEAN ENVIRONMENT MUST BE MAINTAINED AND ANY DUST LAYER REMOVED PRIOR TO OPENING THE UNIT.
- CONDUIT RUN MUST HAVE A SEALING FITTING CONNECTED WITHIN 50mm OF THE ENCLOSURE.

Avertissement:

NE PAS OUVRIR UN PRESENCE D'ATMOSPHERE EXPLOSIVE

DANGER POTENTIEL CHARGE ÉLECTROSTATIQUE – NETTOYER UNIQUEMENT AVEC UN CHIFFON HUMIDE

LE CONDUIT DOIT AVOIR UN RACCORD D'ÉTANCHÉITÉ RACCORDÉ À MOINS DE 50 mm DU BOÎTIER.

3) Marking & Rating Information

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

Products may have further approvals, see E2S website for further details.

3.1 ATEX / IECEx / UKEX Ratings

Standards	
EN60079-0:2018 EN IEC60079-0:2018 General Requirements EN60079-1:2014 A/C:2018 EN 60079-1:2014 ed. 7 Flameproof Enclosure 'd'	
Model No:	Rating
GNExS2FDC024-A	Ex db IIC T3 Gb for Ta -60°C to +58°C
GNExS2HDC024-A	Ex db IIC T4 Gb for Ta -60°C to +50°C
GNExS2FDC024-S	Ex db IIB T5 Gb for Ta -60°C to +58°C
GNExS2HDC024-S	Ex db IIB T6 Gb for Ta -60°C to +50°C
GNExS2FAC230-A	
GNExS2HAC230-A	

Certificate No.

SIRA 13ATEX1139X
IECEx SIR 13.0029X
CSAE 21UKEX1558X

Epsilon x
Equipment Group
and Category:



II 2G

CE Marking and
Notified Body No.



UKCA Marking and
Notified Body No.

3.2 UL Certification

GNExS2FDC024-A ; GNExS2HDC024-A ; GNExS2FDC024-S ; GNExS2HDC024-S Sounders also comply with the following standards:

UL 464 (Ed 11) – Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories.

CAN/ULC-S525 (Ed 5) – Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories.

See relevant sections further down.

The GNExS2 DC Alarm Horns comply with the following standards for hazardous locations:

3.2 Class/Division Ratings for US & Canada

Standards	
Class I UL 60079-0, UL 60079-1, CSA C22.2 No 60079-0, CSA C22.2 No 60079-1	
Class Division Ratings for US (NEC) & Canada (CEC)	
Model No:	Rating
GNExS2FDC024-A	Class I Div 2 ABCD T3 Ta -60°C to +58°C
GNExS2HDC024-A	Class I Div 2 ABCD T4 Ta -60°C to +50°C
GNExS2FDC024-S	Class I Div 2 CD T5 Ta -60°C to +58°C
GNExS2HDC024-S	Class I Div 2 CD T6 Ta -60°C to +50°C
Class Zone Ratings for US (NEC)	
Model No:	Rating
GNExS2FDC024-A	Class I Zone 1 AEx db IIC T3 Gb
GNExS2HDC024-A	Ta -60°C to +58°C
GNExS2FDC024-S	Class I Zone 1 AEx db IIC T4 Gb
GNExS2HDC024-S	Ta -60°C to +50°C
	Class I Zone 1 AEx db IIB T5 Gb
	Ta -60°C to +58°C
	Class I Zone 1 AEx db IIB T6 Gb
	Ta -60°C to +50°C
Class Zone Ratings for Canada (CEC)	
Model No:	Rating
GNExS2FDC024-A	Ex db IIC T3 Gb Ta -60°C to +58°C
GNExS2HDC024-A	Ex db IIC T4 Gb Ta -60°C to +50°C
GNExS2FDC024-S	Ex db IIB T5 Gb Ta -60°C to +58°C
GNExS2HDC024-S	Ex db IIB T6 Gb Ta -60°C to +50°C
Installation must be carried out in compliance with the National Electric Code / Canadian Electric Code	

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.
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
T6	85°C
Equipment Category	
2G	
Ambient Temperature Range	
ATEX IECEx	-60°C to +58°C
Class I Zone	-60°C to +58°C
IP Rating	
IP6X to EN/IEC60079-0	
IP66 to EN60529	

5) Special Conditions for Safe Use

Repair of the Flame Path is not permitted.

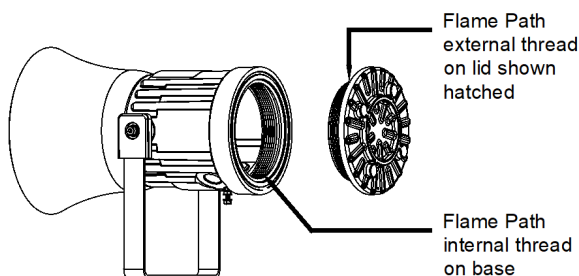


Figure 1: Flame Path.

The enclosure is non-conducting and under certain extreme conditions may generate an ignition capable level of electrostatic charge. The user shall ensure that the equipment is not installed in a location where it may be subjected to extreme conditions (such as high-pressure steam) which might cause a build-up of electrostatic charge on non-conducting surfaces.

Repair of the flameproof threaded joints and cemented joints is not permitted.

Potential electrostatic charging hazard - Clean only with a damp cloth.

The stainless steel bracket is not earthed and may generate an ignition-capable level of electrostatic charges. It has a max capacitance of 10.33pF according to CSA C22.2 NO. 60079-0 / UL 60079-0:2017, clause 7.5 or EN/IEC60079-0, clause 7.5.

6) Product Mounting and Access

6.1 Location and Mounting

The sounder should be secured to any flat surface using the three 7mm fixing holes (see figures 2 or 3). The angle can then be adjusted as required but the mounting restrictions must be observed (see outline drawings for details, D157-05-101 for GNExS2F and D157-05-151 for GNExS2H). This can be achieved by loosening the two large bracket screws in the side of the unit, which allow adjustments in steps of 18°.

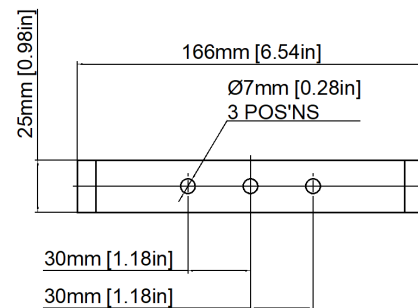


Figure 2: Fixing Location for GNExS2F Sounder.

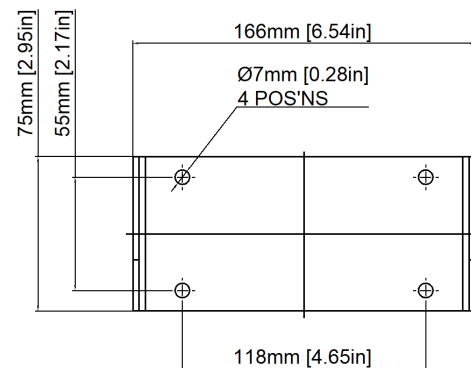


Figure 3: Fixing Location for GNExS2H Sounder.

On completion of the installation the two large bracket adjustment screws on the side of the unit must be fully tightened to ensure that the unit cannot move in service.

The enclosure provides IP66 protection and is suitable for installation in exterior locations providing it is positioned so that water cannot collect in the horn, and the cable entry is sealed.

6.2 Access to the Flameproof Enclosure



Warning – Hot surfaces. External surfaces and internal components may be hot after operation, take care when handling the equipment.

In order to connect the electrical supply cables to the sounder it is necessary to remove the flameproof cover to gain access to the flameproof chamber (see figure 3).

To access the Ex d chamber, loosen the M3 grub screw on the sounder cover. Open the enclosure by turning the sounder cover counterclockwise and remove the cover.

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

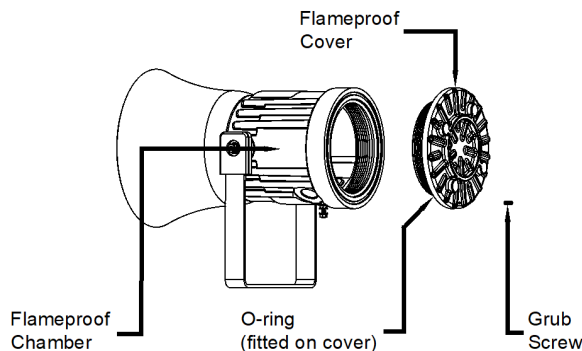


Figure 4: Accessing the Explosion Proof Enclosure.

7) Installation Requirements

7.1 Installation Standards Compliance



Warning – High voltage may be present, risk of electric shock.
DO NOT open when energised,
disconnect power before opening.

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

EN60079-14:2008 / IEC60079-14:2007 (Ed4): Electrical Installations in Hazardous Areas (other than mines).

EN60079-10-1:2009 / IEC60079-10:2008 (Ed1): Classification of Areas, Gas Atmosphere

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 (see table 1), the number of sounders 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 the sounders connected to the line.

Electrical connections are to be made into the terminal blocks on the PCBA located in the flameproof enclosure using solid

wire 0.5-4mm² / AWG 20-12 or stranded wire, sizes 0.5-2.5mm² / AWG 24-14. Wire insulation needs to be stripped 8mm. Wires may be fitted securely with crimped ferrules.

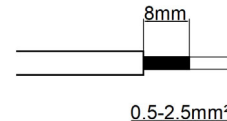


Figure 5: Wire Preparation.

Terminal screws need to be tightened down with a tightening torque of 0.45 Nm / 5 Lb-in. An 8-way terminal block is provided on the AC Sounder, and a 6-way terminal block is provided on the DC Sounder.

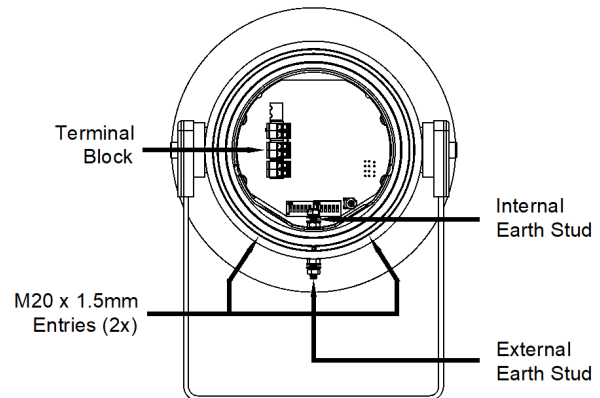


Figure 6: GNExS2 Entries and Terminal Block Location.

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.

7.3 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 6 and notes below).

Both AC and DC sounder units must be connected to an earth according to EN/IEC 60079/14. The units are provided with internal and external earth terminals which are both located on the terminal chamber section of the unit (see figure 6).

The unit has an internal earth terminal and an optional external earth terminal.

Internal earth is primary connection and external is supplementary (optional) where local code permits.

Internal earthing connections should be made to the Internal Earth terminal which allows 14AWG cable in the base of the housing using a ring crimp terminal to secure the earth conductor under the earth clamp.

The earth conductor should be at least equal in size and rating to the incoming power conductors and terminals accommodate at least 14AWG wire.

An Optional External earthing connections for equipotential bonding / supplementary earth connection, should be made to the M5 earth stud marked with label, using a ring crimp terminal to UL 486E for NEC Installations, to secure the earth

conductor to the earth stud. The external earth conductor should be at least 4mm² in size.

7.4 Cable Glands, Blanking Elements & Adapters

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.

NEC/CEC Installations.

In compliance with the National Electrical Code NFPA 70 or Canadian Electric Code CSA22.1 Potential electrostatic charging hazard - Clean only with a damp cloth.

For high ambient temperatures the cable entry temperature may exceed 60°C or the cable branching point temperature may exceed 60°C and therefore suitable heat resisting cables and cable glands must be used, with a rated service temperature at least as stated below:

Max Ambient Temperature (°C)							
Model	40	45	50	55	60	65	70
GNExS2	75	80	85	90	95	100	105

Table 2: Min. Ratings of Cables & Cable Glands.

The cable entries have an M20 x 1.5 – 6H entry thread. If the installation is made using cable glands, only suitably rated and certified cable glands must be used. They must be suitable for the type of cable being used and also meet the requirements of the current NEC/CEC installation 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.

For use in Class I Division II locations, in order to maintain the db type protection, flameproof conduit seals and/or cable glands must be used.

ATEXC/IECEX Installations.

For high ambient temperatures the cable entry temperature may exceed 70°C or the cable branching point temperature may exceed 80°C and therefore suitable heat resisting cables and cable glands must be used, with a rated service temperature at least as stated below:

Max Ambient Temperature (°C)							
Model	40	45	50	55	60	65	70
GNExS2	75	80	85	90	95	100	105

Table 2: Min. Ratings of Cables & Cable Glands.

Appropriate cable glands to be customer supplied.

The cable entries have an M20 x 1.5 – 6H entry thread. Only suitably rated and certified cable glands must be used. They must be suitable for the type of cable being used and also meet the requirements of the current installation standards EN 60079-14 / IEC60079-14.

All Installations.

When only one cable entry is used the other entries must be closed with suitably rated and certified blanking plugs as per type of approval.

Any unused cable entries must be closed with suitably rated blanking plugs.

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 sounder 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.

8) Settings

Following illustrations show the different settings available for GNExS2 Alarm Horn Sounders. See schematic diagrams D190-06-001 for DC units and D190-06-005 for AC units.

8.1 SPL Configuration

See Table 1 for product power supply and Sound Pressure Levels (SPL).

Configuration for DC Units

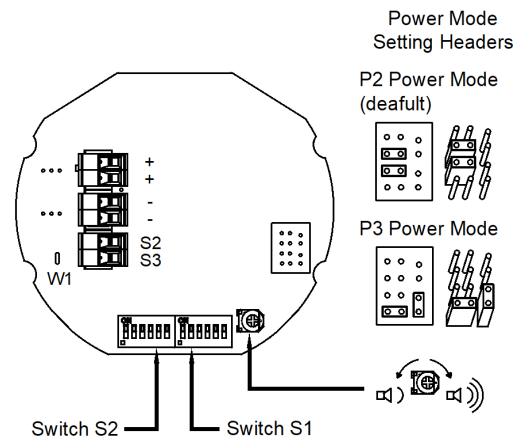


Figure 7: DC PCBA SPL Configuration.

Configuration for AC Units

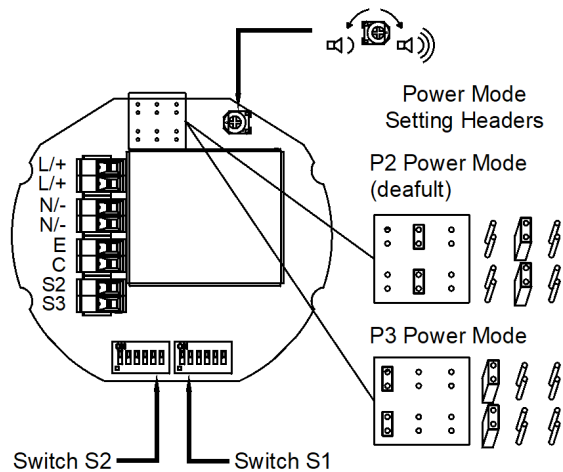


Figure 8: AC PCBA SPL Configuration.

8.2 Stage Switching Polarity (DC Units)

Switching from positive switching (default) to negative switching - DC Only.

NOTE: Max supply is 33V DC – if higher DC voltage is required, use Negative switching.

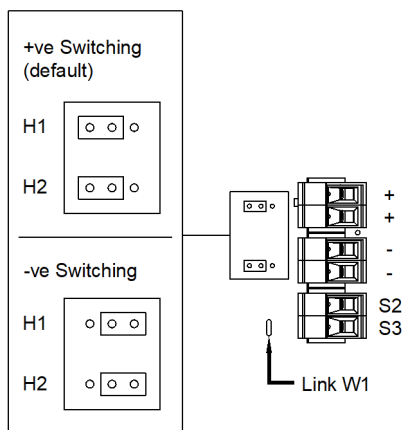


Figure 9: Stage Switching Polarity.

8.3 Tone Selection

The ExS Alarm Horn Sounders have 64 different tones that can be selected independently for the first and second stage alarms. The tones are selected by operation of the tone setting DIP switch 1 & DIP switch 2 (see figures 7 and 8) on the PCB, for stage 1 and stage 2 respectively.

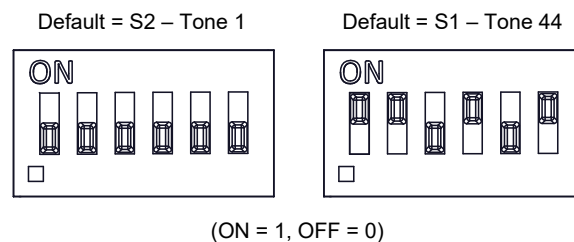


Figure 10: DIP switch configuration

The sounder can also be switched to sound the third and fourth stage alarm tones.

The tone table (D221-95-001-IS) shows the switch positions for the 64 tones on first and second stages and which tones are available for the third and fourth stages dependent on the Stage 1 DIP switch setting.

Following table (Table 3) is a summary of wiring options.

Config.	Voltage	Configuration Description	Features	Product Option Identifier
See documents D190-06-001 for DC schematic diagrams.				
1a	DC	Single Stage Configuration	- Line monitoring - Positive Switching	1
1b	DC	Two Stage Configuration	- Common Negative - Positive Switching	1
1c	DC	Three/Four Stage Configuration	- Common Negative - Positive Switching	1
2	DC	Three/Four Stages. Voltage Free 2nd, 3rd & 4th Stage Activation Configuration	- Common Positive - Customer Set H1 & H2 to Negative Switching	1
3	DC	Two Stage Configuration	- Independent Stage Input - Reverse Polarity Stage Monitoring	1
4	DC	Two Stage Configuration	Independent power input for alarm stage activation of Stage 1 & 2.	Y

			- Line monitoring available for each alarm stage – use suitable monitoring relays/modules. - Line monitoring requires common negative between each power input. - Line monitoring maximum voltage: 4Vdc. - Not to be used for reverse polarity line monitoring.	
5	DC	Two/Three Stage Voltage Free Activation Configuration		K
6	DC	Three/Four Stage Configuration	- Independent power input for alarm stage activation of Stage 1, 2 and 3 - Stage 4 can be activated via activation of Stage 2 and Stage 3 simultaneously - Line monitoring available for Stage 1, 2 & 3 alarm stage – use suitable monitoring relays/modules - Line monitoring requires common negative between each power input - Line monitoring maximum voltage: 4Vdc - Not to be used for reverse polarity line monitoring	V
See documents D190-06-005 for AC schematic diagrams.				
1a	AC	Single Stage Configuration		1
1b	AC	Three/Four Stage Configuration		1
2	AC	Two/Three Stage Voltage Free Activation Configuration		K

Table 3: Summary of Wiring Options.

9) End of Line Monitoring (DC Units)

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.

The resistor must be connected directly across the +ve and -ve terminals as shown in the following drawing. The resistor leads should be kept as short as possible. See D190-06-001 for details.

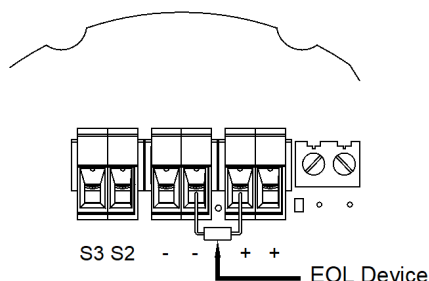


Figure 11: End of Line Resistor placement.

Note: For forward voltage polarity line monitoring the maximum voltage is 4Vdc. For wiring configuration 4 (product option Y) and configuration 6 (product option V) line monitoring requires common negative between each power

input. For monitoring voltage, the installer should allow for system cabling and voltage drops

9.1 Custom DC Multi-Stage End Of Line Monitoring

An optional 12-way terminal module is available to enable up to four alarm stages to be activated from three DC voltage output channels. The three alarm stage activation inputs can be independently monitored.

Refer to Schematic D190-06-001, Config. 6.
Specify Product option 'V' when ordering.
Spare part code for field installation: SP78-0001

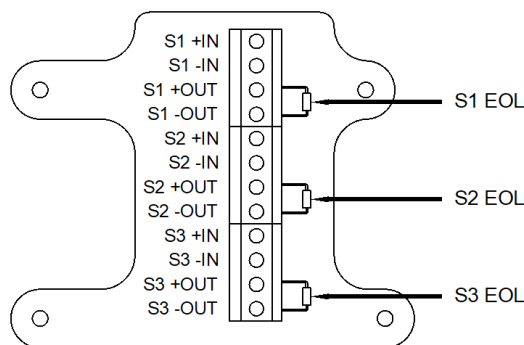


Figure 12: End of Line Resistor placement – Optional 12-Way Terminal Module.

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:

For ATEX/IECEX

EN60079-19/IEC60079-19

Explosive atmospheres – Equipment repair, overhaul and reclamation

EN 60079-17/IEC60079-17

Explosive atmospheres – Electrical installations inspection and maintenance

For NEC / CEC

UL 60079-19 Explosive atmospheres – Equipment repair, overhaul and reclamation

UL 60079-17 Explosive atmospheres – Electrical installations inspections and maintenance

Flameproof threaded joints and cemented joints are not permitted to be repaired.

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

If opening the unit during maintenance operations a clean environment must be maintained and any dust layer removed prior to opening the unit.

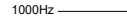
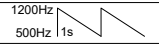
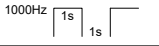
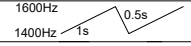
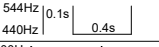
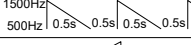
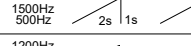
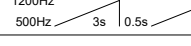
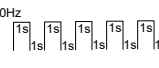
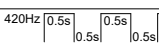
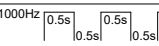
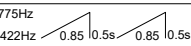
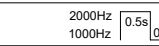
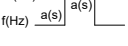
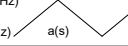
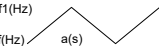
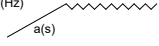
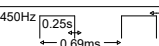
Electrostatic charging hazard - Clean only with a damp cloth.

11) SIL 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 2_H).
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 sounding sounder.
 - Spurious sound 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	0.55 pmh
"Hazardous" failure rate (revealed)	0 pmh
"Hazardous" failure rate (unrevealed)	0.55 pmh
"Safe" failure rate (revealed)	0 pmh
"Safe" failure rate (unrevealed)	0
System type	B
Hardware Fault Tolerance	0
Diagnostic Coverage	>80%
PFD (hazardous failure)	2.4×10^{-3}
Proof Test Interval	Up to 1 year

Stage 1 Set DIP SW 1 Tone No.	Tone Description	Tone Visual	Stage 1 & 2 DIP SW 1/2 Settings 1 2 3 4 5 6	Stage 3 Set DIP SW 1 (S3)	Stage 4 Set DIP SW 1 (S2 + S3)
1	1000Hz PFEER Toxic Gas		0 0 0 0 0	2	44
2	1200/500Hz @ 1Hz DIN /PFEER P.T.A.P.		1 0 0 0 0	3	44
3	1000Hz @ 0.5Hz(1s on, 1soff) PFEER Gen. Alarm		0 1 0 0 0	2	44
4	1.4KHz-1.6KHz 1s, 1.6KHz-1.4KHz 0.5s NF C 48-265		1 1 0 0 0	24	1
5	544Hz(100mS)/440Hz (400mS) NF S 32-001		0 0 1 0 0	19	1
6	1500/500Hz - (0.5s on , 0.5s off) x3 + 1s gap AS4428		1 0 1 0 0	44	1
7	500-1500Hz Sweeping 2 sec on 1 sec off AS4428		0 1 1 0 0	44	1
8	500/1200Hz @ 0.26Hz (3.3son, 0.5s off) Netherlands - NEN 2575		1 1 1 0 0	24	35
9	1000Hz (1s on, 1s off)x7 + (7s on, 1s off) IMO Code 1a		0 0 0 1 0	34	1
10	1000Hz (1s on, 1s off)x7 + (7s on, 1s off) IMO Code 1a		1 0 0 1 0	34	1
11	420Hz(0.5s on, 0.5s off)x3 + 1s gap ISO 8201 Temporal Pattern		0 1 0 1 0	1	8
12	1000Hz(0.5s on, 0.5s off)x3 + 1s gap ISO 8201 Temporal Pattern		1 1 0 1 0	1	8
13	422/775Hz - (0.85 on, 0.5 off) x3 + 1s gap NFPA - Temporal Coded		0 0 1 1 0	1	8
14	1000/2000Hz @ 1Hz Singapore		1 0 1 1 0	3	35
15	300Hz Continuous (f=300)		0 1 1 1 0	24	35
16	440Hz Continuous (f=440)		1 1 1 1 0	24	35
17	470Hz Continuous (f=470)		0 0 0 1 0	24	35
18	500Hz Continuous IMO code 2 (Low) (f=500)		1 0 0 1 0	24	35
19	554Hz Continuous (f=554)		0 1 0 1 0	24	35
20	660Hz Continuous (f=660)		1 1 0 1 0	24	35
21	800Hz IMO code 2 (High) (f=800)		0 0 1 0 1	24	35
22	1200Hz Continuous (f=1200)		1 0 1 0 1	24	35
23	2000Hz Continuous (f=2000)		0 1 1 0 1	3	35
24	2400Hz Continuous (f=2400)		1 1 1 0 1	20	35
25	440Hz @0.83Hz (50 cycles/minute) Intermittent (f=440, a=0.6, b=0.6)		0 0 0 1 1	44	8
26	470Hz @0.9Hz - 1.1s Intermittent (f=470, a=0.55, b=0.55)		1 0 0 1 1	44	8
27	470Hz @5Hz - (5 cycles/second) Intermittent (f=470, a=0.1, b=0.1)		0 1 0 1 1	44	8
28	544Hz @ 1.14Hz - 0.875s Intermittent (f=470, a=0.43, b=0.44)		1 1 0 1 1	24	8
29	655Hz @ 0.875Hz Intermittent (f=655, a=0.57, b=0.57)		0 0 1 1 1	44	8
30	660Hz @0.28Hz - 1.8sec on, 1.8sec off Intermittent (f=660, a=1.8, b=1.8)		1 0 1 1 1	24	8
31	660Hz @3.34Hz - 150mS on, 150mS off Intermittent (f=660, a=0.15, b=0.15)		0 1 1 1 1	24	8
32	745Hz @ 1Hz Intermittent (f=745, a=0.5, b=0.5)		1 1 1 1 1	24	8
33	800Hz - 0.25sec on, 1 sec off Intermittent (f=800, a=0.25, b=1)		0 0 0 0 1	24	8
34	800Hz @ 2Hz IMO code 3.a (High) Intermittent (f=800, a=0.25, b=0.25)		1 0 0 0 1	24	8
35	1000Hz @ 1Hz Intermittent (f=1000, a=0.5, b=0.5)		0 1 0 0 1	24	8
36	2400Hz @ 1Hz Intermittent (f=2400, a=0.5, b=0.5)		1 1 0 0 1	24	8
37	2900Hz @ 5Hz Intermittent (f=2900, a=0.1, b=0.1)		0 0 1 0 1	24	8
38	363/518Hz @ 1Hz Alternating (f=363, f1=518, a=0.1)		1 0 1 0 1	8	19
39	450/500Hz @ 2Hz Alternating (f=450, f1=500, a=0.25)		0 1 1 0 1	8	19
40	554/440Hz @ 1Hz Alternating (f=440, f1=554, a=0.5)		1 1 1 0 1	24	19
41	554/440Hz @ 0.625Hz Alternating (f=440, f1=554, a=0.8)		0 0 0 1 1	8	19
42	561/760Hz @0.83Hz (50 cycles/minute) Alternating (f=561, f1=760, a=0.6)		1 0 0 1 1	8	19
43	780/600Hz @ 0.96Hz Alternating (f=600, f1=780, a=0.52)		0 1 0 1 1	8	19
44	800/1000Hz @ 2Hz Alternating (f=800, f1=1000, a=0.25)		1 1 0 1 1	24	19
45	970/800Hz @ 2Hz Alternating (f=800, f1=970, a=0.25)		0 0 1 1 1	8	19
46	800/1000Hz @ 0.875Hz Alternating (f=800, f1=1000, a=0.57)		1 0 1 1 1	24	19
47	2400/2900Hz @ 2Hz Alternating (f=2400, f1=2900, a=0.25)		0 1 1 1 1	24	19
48	500/1200Hz @ 0.3Hz Sweeping (f=500, f1=1200, a=3.34)		1 1 1 1 1	24	12
49	560/1055Hz @ 0.18Hz Sweeping (f=560, f1=1055, a=5.47)		0 0 0 1 1	24	12
50	560/1055Hz @ 3.3Hz Sweeping (f=560, f1=1055, a=0.3)		1 0 0 1 1	24	12
51	600/1250Hz @ 0.125Hz Sweeping (f=600, f1=1250, a=8)		0 1 0 1 1	24	12
52	660/1200Hz @ 1Hz Sweeping (f=660, f1=1200, a=1)		1 1 0 1 1	24	12
53	800/1000Hz @ 1Hz Sweeping (f=800, f1=1000, a=1)		0 0 1 0 1	24	12
54	800/1000Hz @ 7Hz Sweeping (f=800, f1=1000, a=0.14)		1 0 1 0 1	24	12
55	800/1000Hz @ 50Hz Sweeping (f=800, f1=1000, a=0.02)		0 1 1 0 1	24	12
56	2400/2900Hz @ 7Hz Sweeping (f=2400, f1=2900, a=0.14)		1 1 1 0 1	24	12
57	2400/2900Hz @ 1Hz Sweeping (f=2400, f1=2900, a=1)		0 0 1 1 1	24	12
58	2400/2900Hz @ 50Hz Sweeping (f=2400, f1=2900, a=0.02)		1 0 1 1 1	24	12
59	2500/3000Hz @ 2Hz Sweeping (f=2500, f1=3000, a=0.5)		0 1 1 1 1	24	12
60	2500/3000Hz @ 7.7Hz Sweeping (f=2500, f1=3000, a=0.13)		1 1 1 1 1	24	12
61	800Hz Motor Siren (f=800, a=1.6)		0 0 1 1 1	24	12
62	1200Hz Motor Siren (f=1200, a=2)		1 0 1 1 1	24	12
63	2400Hz Motor Siren (f=2400, a=1.7)		0 1 1 1 1	24	12
64	Simulated Bell		1 1 1 1 1	21	12

FIRE INSTRUCTION & SERVICE MANUAL

GNEx Sounder UL464 / CAN/ULC-S525 Fire

Models: GNExS1R-DC024-A, GNExS1F-DC024-A,

GNExS2F-DC024-A, GNExS2H-DC024-A, GNExS1RDC024-S,

GNExS1FDC024-S, GNExS2FDC024-S, GNExS2HDC024-S



Attention: Installation must be carried out by an electrician in compliance with the National Electrical Code, NFPA 70, and the National Fire Alarm Signaling Code, NFPA 72 or CSA 22.1 Canadian Electrical Code, Part I. Safety Standard for Electrical Installations, Section 32. / L'installation doit exclusivement être réalisée par du personnel qualifié, conformément au code national d'électricité américain, NFPA 70, et le code national d'alarme incendie et de signalisation NFPA 72 ou CSA 22.1 Code canadien de l'électricité, première partie, norme de sécurité relative aux installations électriques, Section 32



Attention: Disconnect from power source before installation or service to prevent electric shock / Débranchez-le de la source d'alimentation avant l'installation ou l'entretien pour éviter tout choc électrique.



Attention: Do not Paint / Ne pas Peinturer

- -60°C to +70°C / -76°F to +158°F
- Units can be mounted using at least 2 of the 3-off ø7mm holes in the mounting bracket.
- GNExS1RDC024-A is approved for use as an audible signal appliance for fire alarm use – Public Mode (UL464 & CAN/ULC-S525) and produce a minimum sound pressure level of:
82.68dB(A) at 10 feet, (figures @ worst case 11.5Vdc).
- GNExS1RDC024-S is approved for use as an audible signal appliance for fire alarm use – Public Mode (UL464 & CAN/ULC-S525) and produce a minimum sound pressure level of:
84.63dB(A) at 10 feet, (figures @ worst case 20Vdc).
- GNExS1FDC024-A is approved for use as an audible signal appliance for fire alarm use – Public Mode (UL464 & CAN/ULC-S525) and produce a minimum sound pressure level of:
88.66dB(A) at 10 feet, (figures @ worst case 11.5Vdc).
- GNExS1FDC024-S is approved for use as an audible signal appliance for fire alarm use – Public Mode (UL464 & CAN/ULC-S525) and produce a minimum sound pressure level of:
91.76dB(A) at 10 feet, (figures @ worst case 20Vdc).
- GNExS2FDC024-A is approved for use as an audible signal appliance for fire alarm use – Public Mode (UL464 & CAN/ULC-S525) and produce a minimum sound pressure level of:
P2: 92.76dB(A) / P3: 93.67dB(A) at 10 feet, (figures @ worst case 11.5Vdc).
- GNExS2FDC024-S is approved for use as an audible signal appliance for fire alarm use – Public Mode (UL464 & CAN/ULC-S525) and produce a minimum sound pressure level of:
P2: 96.28dB(A) / P3: 98.04dB(A) at 10 feet, (figures @ worst case 20Vdc)
- GNExS2HDC024-A is approved for use as an audible signal appliance for fire alarm use – Public Mode (UL464 & CAN/ULC-S525) and produce a minimum sound pressure level of:
P2: 91.97dB(A) / P3: 92.28dB(A) at 10 feet, (figures @ worst case 11.5Vdc).
- GNExS2HDC024-S is approved for use as an audible signal appliance for fire alarm use – Public Mode (UL464 & CAN/ULC-S525) and produce a minimum sound pressure level of:
P2: 95.7dB(A) / P3: 97.12dB(A) at 10 feet, (figures @ worst case 20Vdc).
- For Fire Alarm applications, the Sounder Volume must be at the highest setting, (see volume control section). For fire alarm use, Tone 12 as shown below must be selected:

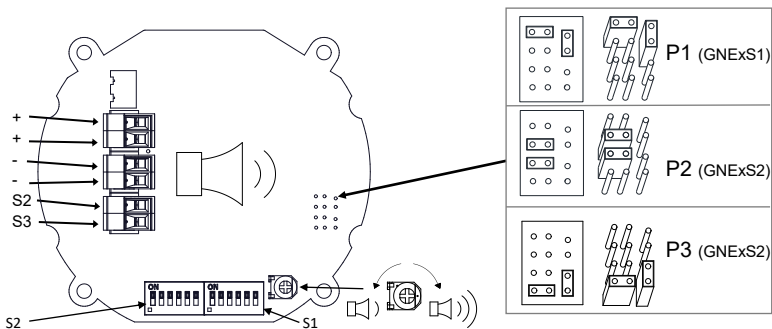
Stage 1 Set DIP SW 1 Tone No.	Tone Description	Tone Visual	Stage 1 & 2 DIP SW 1/2 Settings 1 2 3 4 5 6	Stage 3 Set DIP SW 1 (S3)	Stage 4 Set DIP SW 1 (S2 + S3)
12	1000Hz(0.5s on, 0.5s off)x3 + 1s gap ISO 8201 Temporal Pattern	1000Hz	1 1 0 1 0 0	1	8

- Connection Terminals: Pluggable, 0.2 - 2.5mm² / AWG24 - AWG12
- Terminal Tightening torque 0.4Nm
- To maintain Ingress Protection, cable entries must be fitted with suitably rated cable glands or stopping plugs
- Units can be located indoor or outdoor wet use, wall or ceiling mounted and there are no limitations on orientation
- Factory finishes are not intended to be modified

Surge Current Ratings for use in fire alarm systems

Model	Nominal Voltage	Voltage Range	Initial Peak	Initial RMS
GNExS1RDC024-A / GNExS1FDC024-A	24V dc	11.5 - 54V dc	P1: 1312mA	P1: 159mA
GNExS1RDC024-S / GNExS1FDC024-S		20 - 28V dc	P1: 1312mA	P1: 159mA
GNExS2FDC024-A / GNExS2HDC024-A		11.5 - 54V dc	P2: 1005mA / P3: 1267mA	P2: 286mA / P3: 553mA
GNExS2HDC024-S / GNExS2FDC024-S		20 - 28V dc	P2: 1005mA / P3: 1267mA	P2: 286mA / P3: 553mA

FIRE INSTRUCTION & SERVICE MANUAL
GNEx Sounder UL464 / CAN/ULC-S525 Fire
Models: GNExS1R-DC024-A, GNExS1F-DC024-A,
GNExS2F-DC024-A, GNExS2H-DC024-A, GNExS1RDC024-S,
GNExS1FDC024-S, GNExS2FDC024-S, GNExS2HDC024-S



GNExS1FDC024-A & GNExS1FDC024-S Sounder Directional Characteristics for Canadian Fire CAN/ULC-S525

OSPL	Horizontal Axis	Vertical Axis
-3dB(A)	+/-35°	+/-25°
-6dB(A)	+/-40°	+/-30°
SPL reduction at +/-90°	-2.8dB(A)	-0.9dB(A)

GNExS1RDC024-A & GNExS1RDC024-S Sounder Directional Characteristics for Canadian Fire CAN/ULC-S525

OSPL	Horizontal Axis	Vertical Axis
-3dB(A)	+/-40°	+/-40°
-6dB(A)	+/-45°	+/-45°
SPL reduction at +/-90°	-6.1dB(A)	-5.7dB(A)

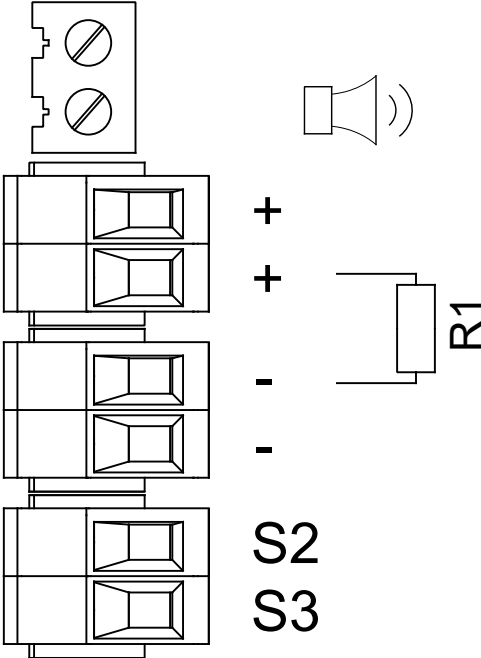
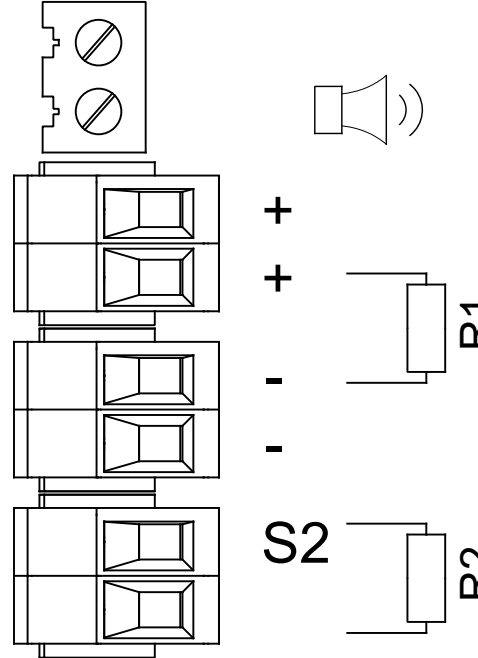
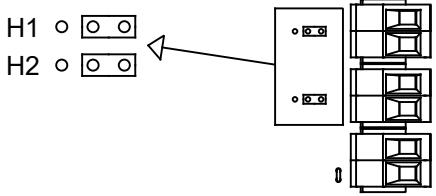
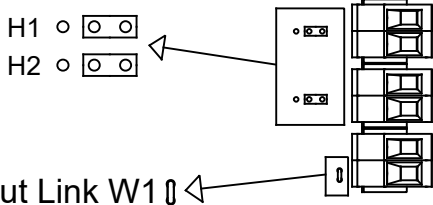
GNExS2FDC024-A & GNExS2FDC024-S Sounder Directional Characteristics for Canadian Fire CAN/ULC-S525 (P3)

OSPL	Horizontal Axis	Vertical Axis
-3dB(A)	+/-25°	+/-25°
-6dB(A)	+/-30°	+/-30°
SPL reduction at +/-90°	-3.2dB(A)	-3.1dB(A)

GNExS2HDC024-A & GNExS2HDC024-S Sounder Directional Characteristics for Canadian Fire CAN/ULC-S525 (P3)

OSPL	Horizontal Axis	Vertical Axis
-3dB(A)	+/-20°	+/-20°
-6dB(A)	+/-25°	+/-25°
SPL reduction at +/-90°	-16.4dB(A)	-15.9dB(A)

A	1	2	3	4	5	6	7	8	9	10	A	
	R1 OPTIONAL LINE MONITORING RESISTOR, CUSTOMER SUPPLIED, MINIMUM EOL RESISTOR VALUES 500Ω MIN AT 2W MIN OR 3.3KΩ MIN AT 0.5W MIN							ISSUE	MOD No.	REASON - INITIAL - DATE		
								3	ACN0153	OPTIONS Y & V MONITORING DETAILS RSR - 06/06/2024		
								4	ACN0168	OPTION R Added for reverse polarity S2 RNP - 25/02/2025		
B	Single Stage Configuration			Config.: 1a	Two Stage Configuration			Config.: 1b	Three/Four Stage Configuration		Config.: 1c	
	Line Monitoring Set to positive switching (default)				Common Negative Set to positive switching (default)				Common Negative Set to positive switching (default)			
	Stage 1: Apply Power to Stage 1 +ve & Stage 1 -ve				Stage 1: Apply Power to Stage 1 +ve & Common -ve Stage 2: Apply Power to Stage 2 +ve & Common -ve				Stage 1: Apply Power to Stage 1 +ve & Common -ve Stage 2: Apply Power to Stage 2 +ve &Common -ve Stage 3: Apply Power to Stage 3 +ve &Common -ve Stage 4: Apply Power to Stage 2 +ve, Stage 3 +ve & Common -ve			
C												

A	1	2	3	4	5	6	7	8	9	10	A
	OPTIONAL LINE MONITORING RESISTOR, CUSTOMER SUPPLIED, MINIMUM EOL RESISTOR VALUES 500Ω MIN AT 2W MIN OR 3.3KΩ MIN AT 0.5W MIN SWITCHES FOR STAGE OPERATION CUSTOMER SUPPLIED							ISSUE	MOD No.	REASON - INITIAL - DATE	
								3	ACN0153	SEE SHEET 1 RSR - 06/06/2024	
								4	ACN0168	SEE SHEET 1 RSR - 20/12/2023	
B	Three/Four Stages. Voltage Free 2nd, 3rd & 4th Stage Activation Configuration				Config.: 2	Two Stage Configuration				Config.: 3	
	Common Positive Customer Set H1 & H2 to Negative Switching (See Below)					Independent Stage Input Reverse Polarity Stage Monitoring					
	Stage 1: Apply Power to Common +ve & Stage 1 -ve Stage 2: Apply Power to Common +ve & Stage 1 -ve & connect Stage 2 -ve to Stage 1 -ve Stage 3: Apply Power to Common +ve & Stage 1 -ve & connect Stage 3 -ve to Stage 1 -ve Stage 4: Apply Power to Common +ve & Stage 1 -ve & connect Stage 2 -ve & Stage 3 -ve to Stage 1 -ve					Stage 1: Apply Power to Stage 1 +ve & Stage 1 -ve Stage 2: Apply Power to Stage 1 +ve & Stage 1 -ve & connect Stage 2 -ve to Stage 1 -ve					
C	Common +ve IN Common +ve OUT Stage 1 -ve OUT Stage 1 -ve IN Stage 2 -ve Stage 3 -ve 										C
D	Stage 1 +ve Stage 1 -ve Stage 2 -ve Stage 2 +ve 										D
E	Set H1 & H2 to -ve switching  Set H1 & H2 to -ve switching 										E
F	DRAWING TO BS8888:2000 GEOMETRIC TOLERANCES TO ISO1101:1983 LINEAR DIMENSIONAL TOLS ANGULAR DIMENSIONAL TOLS DRAWN R.S.RAIT DATE 19/01/2022 CHECKED B.ISARD DATE 19/01/2022 APPROVED R.N.POTTS DATE 19/01/2022 SURFACE FINISH WEIGHT (Kg) MATERIAL ALTERNATIVE MATERIAL 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  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 TITLE D1xS1 / D1xS2 / GNExS1 / GNExS2 / STExS1 / STExS2 DC SOUNDER WIRING DIAGRAMS SCALE NTS SHEET 2 OF 4 DRAWING NUMBER D190-06-001										F
G											G

12345678910											
SWITCHES FOR STAGE OPERATION CUSTOMER SUPPLIED							ISSUE 1	MOD No.	REASON - INITIAL - DATE INTRODUCTION RSR - 19/01/2022		
Single Stage Configuration			Config.: 1a	Three/Four Stage Configuration		Config.: 1b	Two Stage Voltage Free Activation Configuration		Config.: 2		
Stage 1: Apply Power to Stage 1 Live & Stage 1 Neutral			Stage 1: Apply Power to Live & Neutral Stage 2: Apply Power to Live & Neutral & connect Stage 2 to Common Stage 3: Apply Power to Live & Neutral & connect Stage 3 to Common Stage 4: Apply Power to Live & Neutral & connect both Stage 2 & Stage 3 to Common			Power: Live & Neutral Stage 1: Connect Stage 1 to Common Stage 2: Connect Stage 2 to Common Stage 3: Connect both Stage 1 & Stage 2 to Common					
						CUSTOM CONFIGURATION PRODUCT OPTION 'K'					
DRAWING TO BS8888:2000 GEOMETRIC TOLERANCES TO ISO1101:1993 LINEAR DIMENSIONAL TOLS ANGULAR DIMENSIONAL TOLS											
DRAWN R.S.RAIT		DATE 19/01/2022	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		e2S sounding signals		ALL DIMENSIONS IN MM IF IN DOUBT, ASK - DO NOT SCALE		A3
CHECKED B.ISARD		DATE 19/01/2022	MATERIAL				TITLE D1xS1 / D1xS2 / GNExS1 / GNExS2 / STExS1 / STExS2 AC SOUNDER WIRING DIAGRAMS				
APPROVED R.N.POTTS		DATE 19/01/2022	ALTERNATIVE MATERIAL				SCALE NTS	SHEET 1 OF 1	DRAWING NUMBER D190-06-005		

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: GNExS1, GNExS2
GNExL1, GNExL2

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

Notified Body for EU type Examination (Module B):	Sira Certification Service Notified Body No.: 2813 CSA Group Netherlands B.V, Utrechtseweg 310, 6812 AR, Arnhem, Netherlands
EU-type Examination Certificate (Module B):	Sira 13ATEX1139X
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 IIB or IIC T3, T4, T5 or T6 Gb
Standards applied:	EN 60079-0:2018 EN 60079-1:2014 A/C:2018

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 blue ink, appearing to read 'Martin Streetz'.

Martin Streetz
Quality Assurance Manager

Document No.:
Date and Place of Issue:

DC-038_Issue_F
London, 23/12/2020



UKCA Declaration of Conformity



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

Equipment Type: GNExS1, GNExS2
GNExL1, GNExL2

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):	Sira Certification Service Notified Body No.: 0518 Rake Lane, Eccleston, Chester CH4 9JN, UK
UK-type Examination Certificate (Module B):	CSAE 21UKEX1558X
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 IIB or IIC T3, T4, T5 or T6 Gb
Standards applied:	EN 60079-0:2018 EN 60079-1:2014 A/C:2018

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

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.

Martin Streetz
Quality Assurance Manager

Document No.: DC-095_Issue_A
Date and Place of Issue: London, 04/02/2022