

### 1) Introduction

The GNExL2 and GNExL1 are second generation flameproof loudspeakers which are certified to meet the requirements of the ATEX directive 94/9/EC and the IECEx scheme. The loudspeakers can be used in hazardous areas where potentially flammable atmospheres may be present. There are four versions of each loudspeaker, 8 ohm or 16 ohm and 70V/100V Line transformer. On 70V/100V line transformer units there are four output tapplings for each size of loudspeaker. The GNExL2 unit produces output levels in the 117dB(A) range and the GNExL1 unit produces output levels in the 112dB(A) range.

The loudspeakers are Group II, EPL (equipment protection level) Gb. Dependant on unit type and ambient temperature the equipment is certified 'Ex db IIC Gb' and as such may be used in Zones 1 and 2 with flammable gases and vapours with apparatus groups IIA, IIB & IIC and temperature Classifications of T1, T2, T3 and T4 dependant on ambient temperature, see marking codes in section 2.

The equipment is also certified 'Ex db IIB Gb' and as such may be used in Zones 1 and 2 with flammable gases and vapours with apparatus groups IIA & IIB and temperature Classifications of T1, T2, T3, T4, T5 and T6 dependant on ambient temperature, see marking codes in section 2.

### 2) Marking

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

Unit Type No. GNExL2 or GNExL1

Impedance: 8 ohm or 16 ohm  
70V Line or 100V Line

Codes: GNExL1

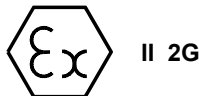
Ex db IIC T4 Gb for Ta -60°C to +50°C  
Ex db IIC T3 Gb for Ta -60°C to +70°C  
Ex db IIB T6 Gb for Ta -60°C to +50°C  
Ex db IIB T5 Gb for Ta -60°C to +65°C  
Ex db IIB T4 Gb for Ta -60°C to +70°C

Codes: GNExL2

Ex db IIC T4 Gb for Ta -60°C to +50°C  
Ex db IIC T3 Gb for Ta -60°C to +65°C  
Ex db IIB T6 Gb for Ta -60°C to +50°C  
Ex db IIB T5 Gb for Ta -60°C to +65°C

Certificate No. SIRA 13ATEX1139X  
IECEx SIR 13.0029X

Epsilon x:  
Equipment Group  
and Category:



CE Marking:  
Notified Body No.



### "Warnings"

DO NOT OPEN WHEN ENERGISED

DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

ELECTROSTATIC HAZARD - CLEAN ONLY WITH A DAMP CLOTH

IF TEMPERATURE EXCEEDS 70°C AT ENTRY OR 80°C AT BRANCHING POINT USE SUITABLY RATED CABLE AND CABLE GLANDS

Year of Construction /  
Serial No.

i.e. 20 / 1GL25000001

### 3) Type Approval Standards

The loudspeakers have an EC Type examination certificate issued by SIRA and have been approved to the following 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'

### 4) Special Conditions for Safe Use

#### 4.1) Installation

The sounders must be installed in accordance with the latest issues of the relevant parts of the EN 60079 and IEC60079 standards – Selection, Installation and maintenance of electrical apparatus for use in potentially explosive atmospheres (other than mining applications or explosive processing and manufacture):-

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

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

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.

#### 4.2) Specific Conditions

Flameproof joints shall not be repaired or modified in any way (See figures 1 & 2 for location of flameproof joints).

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.

#### 4.3) Maintenance, Repair and Overhaul

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

- EN60079-19 / IEC60079-19 : Explosive atmospheres - Equipment repair, overhaul and reclamation
- EN 60079-17/ IEC60079-17 : Explosive atmospheres - Electrical installations inspection and maintenance



**WARNING:**  
Do not open when energised.

*Electrostatic charging hazard – clean only with a damp cloth.*

*Do not open when an explosive atmosphere may be present.*

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

For options on unit repairs or replacement parts, contact E2S using the contact information in the footer of this installation manual.

#### 5) Zones, Gas Group, Category and Temperature Classification

The GNExL2 and GNExL1 sounders have been certified Ex db IIC T4 , T3 and Ex db IIB T6 , T5 ,T4 dependant on ambient temperature for full marking see section 2. This means that 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, 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

**Equipment Category:** 2G

##### Temperature Classification:

T1	450° C
T2	300° C
T3	200° C
T4	135° C
T5	100° C
T6	85° C

#### Ambient Temperature Range:

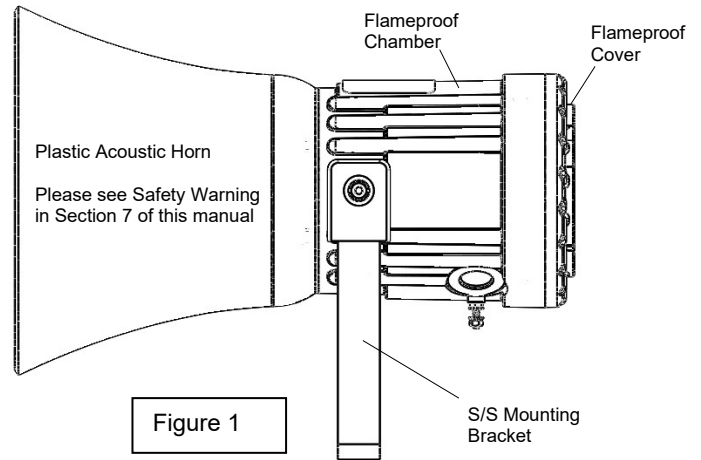
GNExL1 - For range see Marking Codes Section 2

GNExL2 - For range see Marking Codes Section 2

#### 6) Loudspeaker Location and Mounting

The location of the loudspeakers should be made with due regard to the area over which the unit must be audible. The loudspeakers should only be fixed to services that can carry the weight of the unit.

The loudspeakers should be securely bolted to a suitable surface using the 7mm diameter boltholes in the stainless steel U shaped mounting bracket (see figure 1). The angle can then be adjusted in the direction that the sound is primarily required to cover. This can be achieved by loosening the two large bracket screws in the side of the unit, which allow adjustment in steps of 18°. 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.



#### 7) Safety Warning (Electrostatic Hazard)

The acoustic horn section is made of ABS Plastic, therefore to avoid a possible ELECTROSTATIC CHARGE the unit must only be cleaned with a damp cloth.

#### 8) Access to the Flameproof Enclosure

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. To achieve by loosening the M3 Grub Screw within the flameproof cover, and then unscrew the flameproof cover, taking extreme care not to damage the flameproof joints in the process.

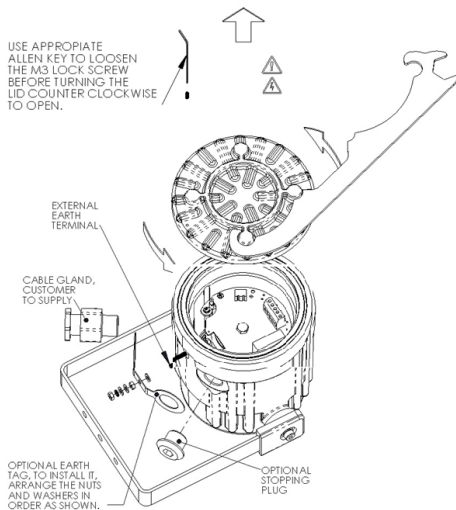


Figure 2

On completion of the cable wiring installation the flameproof joints should be inspected to ensure that they are clean and that they have not been damaged during installation. Also check that the 'O' ring seal is in place. When replacing the flameproof cover ensure that it is tighten fully with tool provided.

### 9) Power Amplifier Selection

It is important that the loudspeakers are connected to power amplifiers that have outputs that are compatible to the type of loudspeaker being used. Loudspeakers with a 70V or 100V line matching transformer fitted must be connected to a power amplifier with a 70V or 100V line output. Low impedance 8 ohm or 16 ohm loudspeakers must be connected to amplifiers with a suitable low impedance output. When selecting the cable size consideration must be given to the current that each unit draws, the number of loudspeakers on the line and the length of the cable run.

The following table shows the range of loudspeakers:-

Unit Type	Input	Wattage	Max. I/P Volts
GNExL2	100V Line	25W	100V
GNExL2	70V line	25W	70V
GNExL2	8 ohm	25W	14.14V
GNExL2	16 ohm	25W	20V
GNExL1	100V Line	15W	100V
GNExL1	70V Line	15W	70V
GNExL1	8 ohm	15W	10.95V
GNExL1	16 ohm	15W	15.49V

The above table also shows the maximum AC signal voltages at which the loudspeakers can be operated.

The current levels taken by the each loudspeaker will depend on which output tapping has been selected (see section 13 of this instruction manual). GNExL2 70V and 100V Line units have output levels of 25W, 12.5W, 6W and 2W; GNExL1 70V and 100V Line units have output levels of 15W, 7.5W, 3W and 1W.

### 10) Cable Selection

When selecting the cable size consideration must be given to the input current that each unit draws (see table 2 of 4), the number of loudspeakers 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 loudspeakers connected to the line.

**SAFETY WARNING:** If temperature exceeds 70°C at entry or 80°C at branching point use suitably rated cable and cable glands.

### 11) Earthing

Both AC and DC loudspeaker units must be connected to a good quality earth. The units are provided with external earthing terminals which are both located on the terminal chamber section of the unit (see figures 2 and 3).

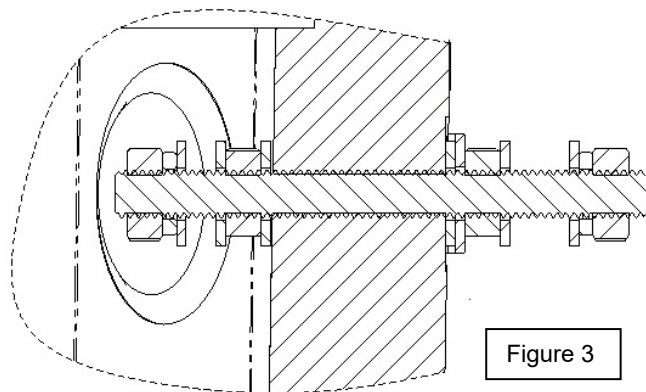


Figure 3

When using the external earth terminal a cable crimp lug must be used. The cable lug should be located between the two M4 stainless steel flat washers. The M4 stainless steel spring washer must be fixed between the outer flat washer and the M4 stainless steel nut to ensure that the cable lug is secured against loosening and twisting.

### 12) Cable Glands

The GNExL2 and GNExL1 sounders have dual cable gland entries which have an M20 x1.5 entry thread as standard. Only cable glands approved for Ex 'd' applications can be used, which must be suitable for the type of cable being used and also meet the requirements of the Ex 'd' flameproof installation standards EN 60079-14:2008 / IEC60079-14:2007.

**SAFETY WARNING:** If temperature exceeds 70°C at entry or 80°C at branching point use suitably rated cable and cable glands.

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

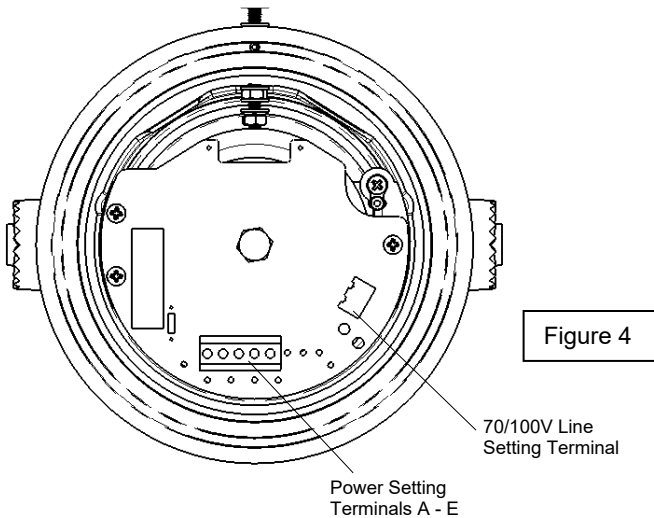
When only one cable entry is used the other one must be closed with an Ex 'd' flameproof blanking plug, which must be suitably approved for the installation requirements.

### 13) Cable Connections

The cable connections are made into the terminal blocks on the pcb assembly located in the flameproof enclosure. See section 8 of this manual for access to the flameproof enclosure. The 70V and 100V Line loudspeakers are fitted with

a five way terminal block. Terminal A is common and one of the other terminals B, C, D or E should be selected depending on what output level is required (see table below).

#### GNExL2 and GNExL1 70V and 100V Line Loudspeakers



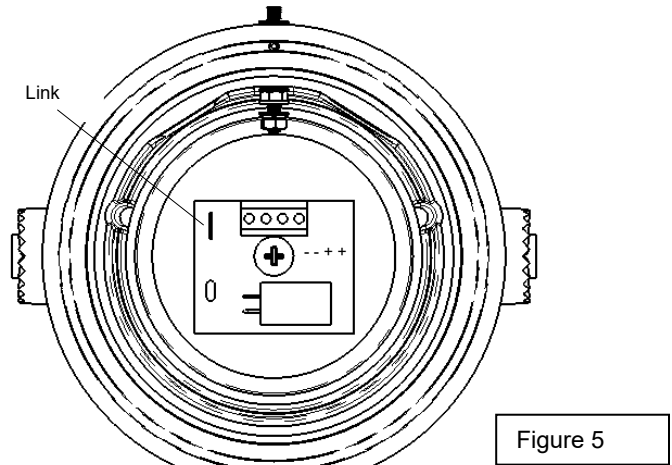
Terminals	GNExL2 (25W)	GNExL1 (15W)
A - B	25W	15W
A - C	12.5W	7.5W
A - D	6W	3W
A - E	2W	1W

A single solid or stranded wire with a cross sectional area of up to 4mm<sup>2</sup> can be connected to each terminal way or if an input and output wire is required two 2.5mm<sup>2</sup> wires can be connected to each terminal way. When connecting wires to the terminals great care should be taken to dress the wire 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 2.5mm<sup>2</sup> and above.

Wire insulation needs to be stripped 6-7mm. Wires may be fitted securely with crimped ferrules. Terminal screws need to be tightened down with a tightening torque of 0.56Nm / 5 Lb-in.

The unit will be set as standard to 100V line. But can be easily altered to 70V line by moving the red selection cable from the 100V line terminal to the 70V line terminal (see figure 4 for position).

#### GNExL2 and GNExL1 8 ohm and 16 ohm Loudspeakers



GNExL2 and GNExL1 8 ohm and 16 ohm low impedance loudspeakers have dual input terminals on the pcb assembly for input and output wiring. A cable of up to 2.5mm<sup>2</sup> can be connected to each terminal. If dc line monitoring is used cut the link on the board (see figure 5 and section 14 of this manual).

### 14) End of Line DC Monitoring

On GNExL2 and GNExL1 loudspeakers, dc line monitoring can be used if required. Both the 70V and 100V Line units and the Low Impedance units have blocking capacitors fitted. It should be noted that each loudspeaker has a 1M ohm bleed resistor connected across the blocking capacitor and this should be taken into account when selecting the value of the end of line monitoring resistance.

The end of line monitoring resistor can be connected across the terminals on the end of line unit. On the low impedance units care must be taken with the polarity of the monitoring voltage.

On 100V and 70V line units the end of line resistor used must have a minimum resistance value of 4k7 ohms and a minimum wattage of 2.5 watts

On low impedance units the end of line resistor used must have a minimum resistance value of 2k ohms and a minimum wattage of 0.5 watts or a minimum resistance value of 500 ohms and a minimum wattage of 2 watts. On the low impedance units care must be taken with the polarity of the monitoring voltage. If an end of line resistor is fitted to a unit the links on the printed circuit boards of all loudspeakers in the line must be cut for the dc blocking capacitors to be in circuit in order to dc monitor the line (see figure 5).