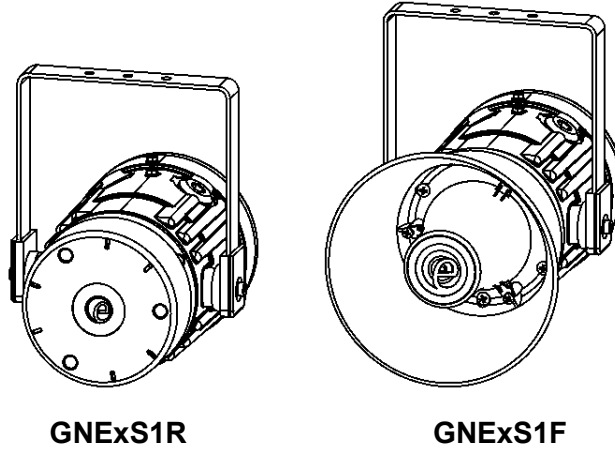


# INSTRUCTION MANUAL (ATEX / IECEx)

## GNExS1

### Alarm Horn Sounder

#### For use in Flammable Gas Atmospheres



## 1) Product Table

| Unit Type Code | Nominal Input Voltage | Voltage Range      | Nominal Input Current | Max. Current | Sound Pressure Level dB(A) |       |
|----------------|-----------------------|--------------------|-----------------------|--------------|----------------------------|-------|
|                |                       |                    |                       |              | Max*                       | Nom.† |
| GNExS1RDC024   | 12Vdc                 | 10-30Vdc           | 221mA                 | 221mA        | 110                        | 105   |
|                | 24Vdc                 |                    | 185mA                 |              |                            |       |
| GNExS1RDC048   | 48Vdc                 | 38-60Vdc           | 115mA                 | 221mA        | 110                        | 105   |
| GNExS1RAC230   | 115Vac                | 100-260Vac 50/60Hz | 73mA                  | 80mA         | 110                        | 105   |
|                | 230Vac                |                    | 48mA                  |              |                            |       |
| GNExS1FDC024   | 12Vdc                 | 10-30Vdc           | 221mA                 | 221mA        | 115                        | 110   |
|                | 24Vdc                 |                    | 185mA                 |              |                            |       |
| GNExS1FDC048   | 48Vdc                 | 38-60Vdc           | 115mA                 | 221mA        | 115                        | 110   |
| GNExS1FAC230   | 115Vac                | 100-260Vac 50/60Hz | 73mA                  | 80mA         | 115                        | 110   |
|                | 230Vac                |                    | 48mA                  |              |                            |       |

\*Max = Tone 4  
†Nom. = Tone 44

The table shows the input current taken by the various sounders.  
A supply voltage variation of +/-10% outside the voltage range is permissible.  
The current levels shown above are for the 440Hz Continuous tone @ nominal input voltage.  
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 beacons. Review associated cable size, length and quantity of beacons on each circuit.

## 2) Warnings



- DO NOT OPEN WHEN ENERGISED.
- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.
- POTENTIAL ELECTROSTATIC CHARGING HAZARD.
- 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.

## 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.

### ATEX / IECEx Ratings

| Standards   |   |
|---|---|
| EN60079-0:2018 EN IEC60079-0:2018<br>General Requirements                 |   |
| EN60079-1:2014 A/C:2018 EN 60079-1:2014 ed. 7<br>Flameproof Enclosure 'd' |   |
| Model No:   | Rating  |
| GNEExS1DC024  | Ex db IIC T4 Gb for Ta -60°C to +50°C   |
| GNEExS1DC048  | Ex db IIC T3 Gb for Ta -60°C to +70°C   |
| GNEExS1AC230  | Ex db IIB T6 Gb for Ta -60°C to +50°C<br>Ex db IIB T5 Gb for Ta -60°C to +65°C<br>Ex db IIB T4 Gb for Ta -60°C to +70°C |

Certificate No. SIRA 13ATEX1139X  
IECEx SIR 13.0029X

Epsilon x  
Equipment Group  
and Category:



II 2G

CE Marking and  
Notified Body No.



2813

## 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                       |                        |
| GNEExS1   | -60° C to +70° C       |
| IP Rating                                       |                        |
| IP6X to EN/IEC60079-0<br>IP66 to EN60529        |                        |

## 5) Special Conditions for Safe Use

Repair of the Flame Path is not permitted.

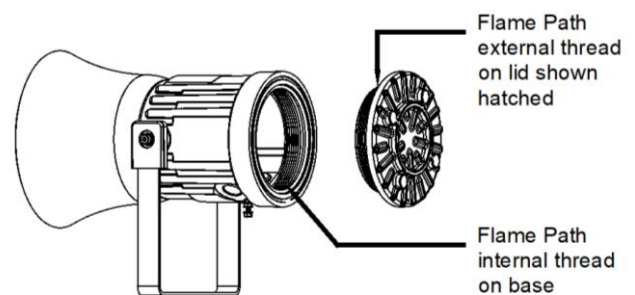


Figure 1: Flame Path.

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.

## 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 figure 2). The angle can then be adjusted as required but the mounting restrictions must be observed (see outline drawings for details, D157-05-001 for GNEExS1F and D157-05-051 for GNEExS1R). This can be achieved by loosening the two large bracket screws in the side of the unit, which allow adjustments in steps of 18°.

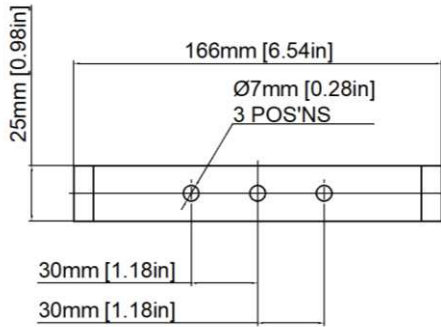


Figure 2: Fixing Location for GNEx[S1R/S1F] Sounder.

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. To achieve this 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 (see figure 3).

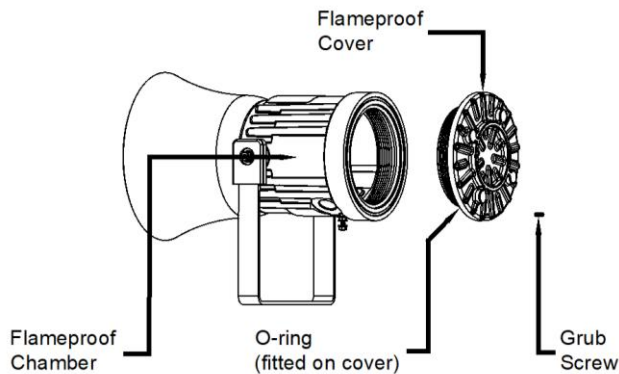


Figure 3: Accessing the Explosion Proof Enclosure.

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.

Ensure that 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. Tighten the M3 grub screw.

## 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.

ATEX / IECEx installation 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 0.5-4mm<sup>2</sup> / AWG 20-12 or stranded wire, sizes 0.5-2.5mm<sup>2</sup> / AWG 24-14. Wire insulation needs to be stripped 8mm. Wires may be fitted securely with crimped ferrules.

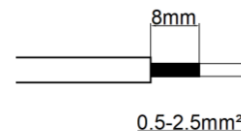


Figure 4: Wire Preparation.

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.

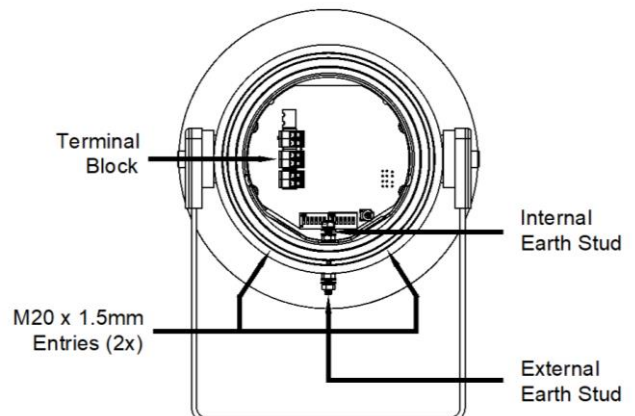


Figure 5: GNExS1 Entries and Terminal Block Location.

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 2.5mm<sup>2</sup>.

### Earthing

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 5).

Internal earthing connections should be made to the PCB terminal block or to the Internal Earth Stud of the housing using a ring crimp terminal to secure the earth conductor between the two M4 stainless steel flat washers. The earth conductor should be at least equal in size and rating to the incoming power conductors.

External earthing connections should be made to the M5 earth stud, using a ring crimp terminal to secure the earth conductor to the earth stud between the two M5 stainless steel flat washers, then reassemble the M5 spring washer and tighten the M5 nut to ensure that the cable lug is secured against loosening and twisting. The external earth conductor should be at least 4mm<sup>2</sup> in size.

### 7.3. Cable Glands, Blanking Elements & Adapters

For high ambient temperatures the cable entry or the cable branching point temperatures may exceed:

- 70°C at entry point.
- 80°C at branching point.

Therefore, suitable heat resisting cables and cable glands must be used, with a rated service temperature at least as stated in the table below:

| Max Ambient Temperature (°C) |    |    |    |    |    |    |    |
|------------------------------|----|----|----|----|----|----|----|
| Model                        | 40 | 45 | 50 | 55 | 60 | 65 | 70 |
| GNE <sub>x</sub> S1          |    | 70 | 75 | 80 | 85 | 90 | 95 |

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

### 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 ATEX / IECEx 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.

### Blanking Plugs

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 and ATEX / IECEx certified blanking plugs.

### Ingress Protection

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 GNE<sub>x</sub> 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 and ATEX / IECEx certified adapters.

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.

## 8) Settings

Following illustrations show the settings available for GNE<sub>x</sub>S1 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

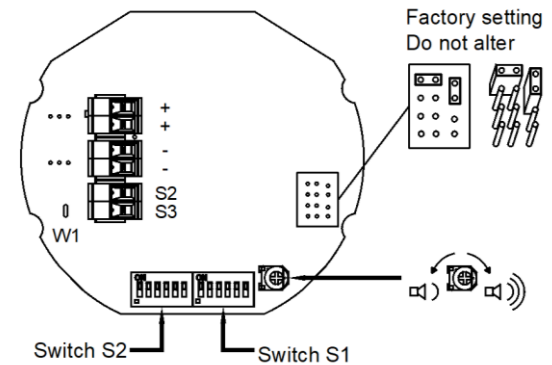


Figure 6: DC PCBA SPL Configuration.

#### Configuration for AC Units

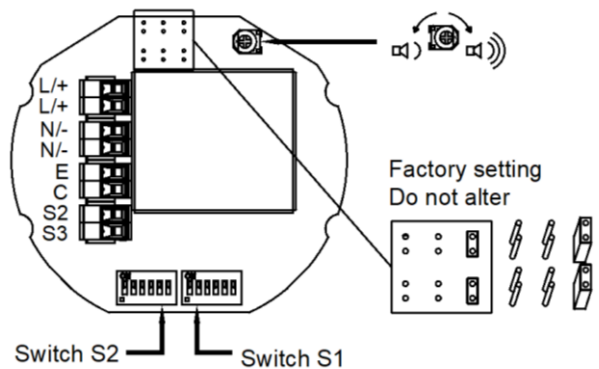


Figure 7: AC PCBA SPL Configuration.

## 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.

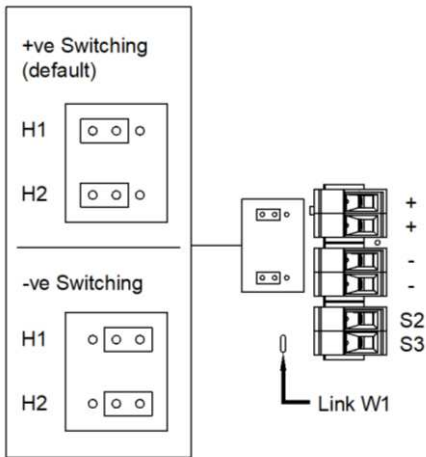
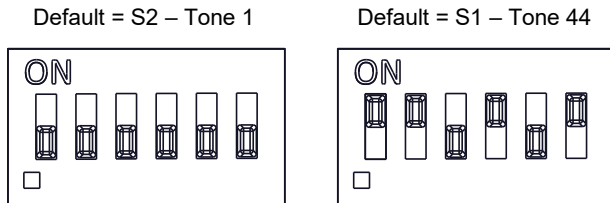


Figure 8: Stage Switching Polarity.

## 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 6 and 7) on the PCB, for stage 1 and stage 2 respectively.



(ON = 1, OFF = 0)

Figure 9: 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.

| Figure   | Voltage | Configuration   | Features   | Default Option | Special Code Identifier |
|--|---------|---|--|----------------|-------------------------|
| See documents D190-06-001 for DC schematic diagrams. |         |   |  |                |                         |
| 1a   | DC      | Single Stage Configuration  | <ul style="list-style-type: none"> <li>Line monitoring</li> <li>Positive Switching</li> </ul>  | Default        | -                       |
| 1b   | DC      | Two Stage Configuration   | <ul style="list-style-type: none"> <li>Common Negative</li> <li>Positive Switching</li> </ul>  | Default        | -                       |
| 1c   | DC      | Three/Four Stage Configuration  | <ul style="list-style-type: none"> <li>Common Negative</li> <li>Positive Switching</li> </ul>  | Default        | -                       |
| 2  | DC      | Three/Four Stages. Voltage Free 2nd, 3rd & 4th Stage Activation Configuration | <ul style="list-style-type: none"> <li>Common Positive</li> <li>Customer Set H1 &amp; H2 to Negative Switching</li> </ul>  | -              | -                       |
| 3  | DC      | Two Stage Configuration   | <ul style="list-style-type: none"> <li>Independent Stage Input</li> <li>Reverse Polarity Stage Monitoring</li> </ul>   | -              | -                       |
| 4  | DC      | Two Stage Configuration   | <ul style="list-style-type: none"> <li>Line Stage Monitoring (Use suitable monitoring relays/ modules)</li> <li>Not to be used in reverse polarity monitoring</li> </ul>                 | Custom         | Y                       |
| 5  | DC      | Two/Three Stage Voltage Free Activation Configuration                         |  | Custom         | K                       |
| 6  | DC      | Three/Four Stage Configuration  | <ul style="list-style-type: none"> <li>Independent Stage Input</li> <li>Line Stage Monitoring (Use suitable monitoring relays/ modules)</li> <li>Positive Switching (Default)</li> </ul> | Custom         | V                       |
| See documents D190-06-005 for AC schematic diagrams. |         |   |  |                |                         |
| 7a   | AC      | Single Stage Configuration  |  | Default        | -                       |
| 7b   | AC      | Three/Four Stage Configuration  |  | Default        | -                       |
| 8  | AC      | Two Stage Voltage Free Activation Configuration                               |  | Custom         | 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.

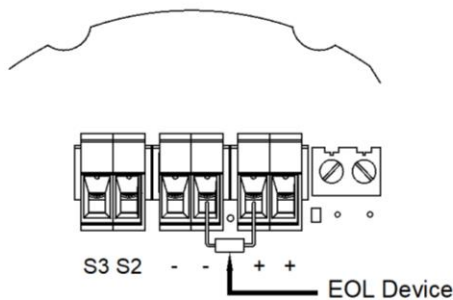


Figure 10: End of Line Resistor placement.

### 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

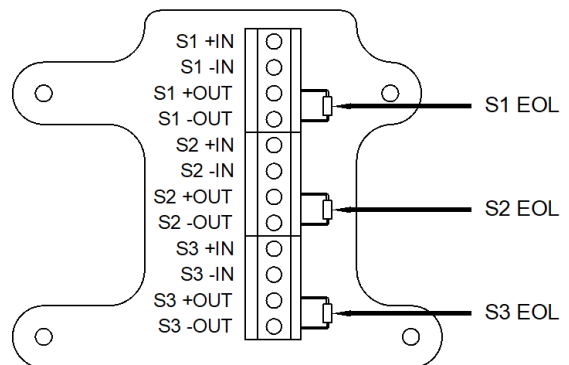


Figure 11: End of Line Resistor placement – Optional 12-Way Terminal Module.

## 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:

EN60079-19/IEC60079-19

Explosive atmospheres – Equipment repair, overhaul and reclamation

EN 60079-17/IEC60079-17

Explosive atmospheres – Electrical installations inspection 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.

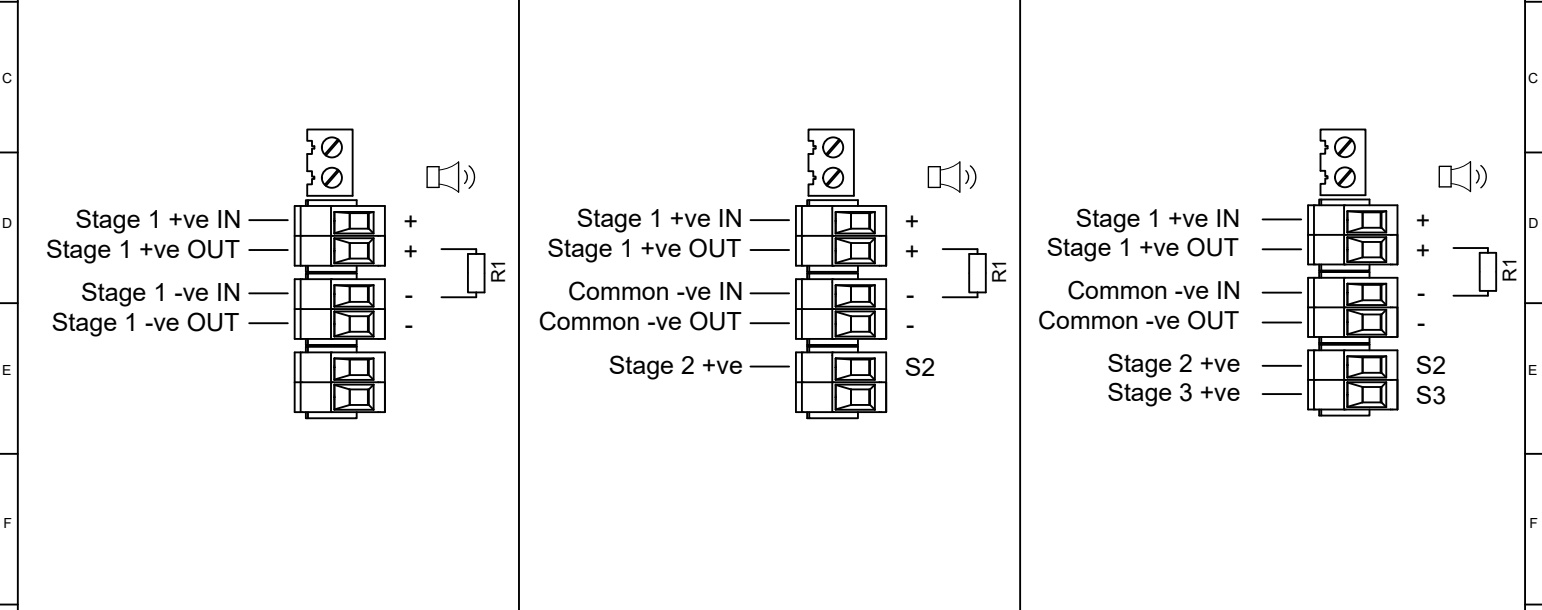
Electrostatic charging hazard - Clean only with a damp cloth.


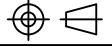

|   |   |   |   |   |   |   |       |         |                                  |  |
|---|---|---|---|---|---|---|-------|---------|----------------------------------|--|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8     | 9       | 10                               |  |
|   |   |   |   |   |   |   | ISSUE | MOD No. | REASON - INITIAL - DATE          |  |
|   |   |   |   |   |   |   | 1     |         | INTRODUCTION<br>RSR - 19/01/2022 |  |

OPTIONAL LINE MONITORING RESISTOR, CUSTOMER SUPPLIED.  
RECOMMENDED MINIMUM VALUES:  
14V MAX SYSTEM = 120Ω MIN, 2W MIN OR 1KΩ MIN, 0.5W MIN  
28V MAX SYSTEM = 470Ω MIN, 2W MIN OR 2.4KΩ MIN, 0.5W MIN



|  |             |  |             |   |             |
|--|-------------|--|-------------|---|-------------|
| Single Stage Configuration                             | Config.: 1a | Two Stage Configuration  | Config.: 1b | Three/Four Stage Configuration  | Config.: 1c |
| Line Monitoring<br>Set to positive switching (default) |             | Common Negative<br>Set to positive switching (default)   |             | Common Negative<br>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<br>Stage 2: Apply Power to Stage 2 +ve & Common -ve |             | Stage 1: Apply Power to Stage 1 +ve & Common -ve<br>Stage 2: Apply Power to Stage 2 +ve & Common -ve<br>Stage 3: Apply Power to Stage 3 +ve & Common -ve<br>Stage 4: Apply Power to Stage 2 +ve, Stage 3 +ve & Common -ve |             |




|   |           |            |                      |             |   |  |  |   |    |
|---|-----------|------------|----------------------|-------------|---|--|--|---|----|
| DRAWING TO BS8888:2000<br>GEOMETRIC TOLERANCES TO ISO1101:1983<br>LINEAR DIMENSIONAL TOLS<br>ANGULAR DIMENSIONAL TOLS | DRAWN     | DATE       | 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. | <br>warning signals<br>EUROPEAN SAFETY SYSTEMS LTD<br>IMPRESS HOUSE<br>MANSELL ROAD<br>LONDON W3 7QH<br>WWW.E2S.COM | ALL DIMENSIONS IN MM<br>IF IN DOUBT, ASK -<br>DO NOT SCALE                         |  | A3 |
|   | CHECKED   | DATE       | MATERIAL             |             |   |  | TITLE D1xS1 / D1xS2 / GNExS1 / GNExS2 / STExS1 / STExS2 DC SOUNDER WIRING DIAGRAMS |   |    |
|   | STANDARDS | DATE       | ALTERNATIVE MATERIAL |             |   |  | SCALE NTS  |   |    |
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|       |         |                                  |
|-------|---------|----------------------------------|
| ISSUE | MOD No. | REASON - INITIAL - DATE          |
| 1     |         | INTRODUCTION<br>RSR - 19/01/2022 |

OPTIONAL LINE MONITORING RESISTOR, CUSTOMER SUPPLIED.  
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28V MAX SYSTEM = 470Ω MIN, 2W MIN OR 2.4KΩ MIN, 0.5W MIN



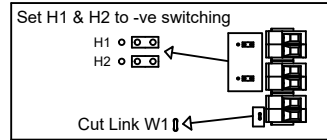
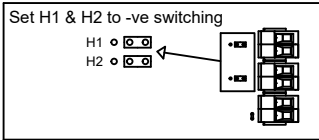
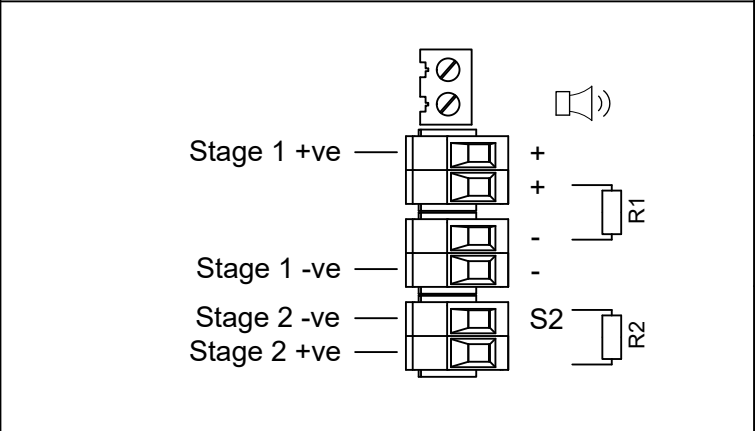
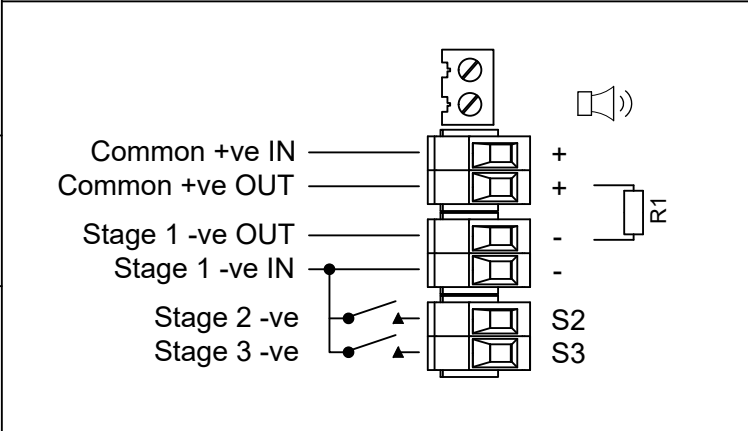
SWITCHES FOR STAGE OPERATION  
CUSTOMER SUPPLIED



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)  
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

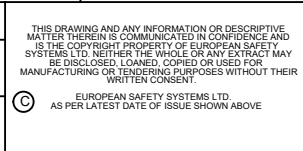
Independent Stage Input  
Reverse Polarity Stage Monitoring  
Stage 1: Apply Power to Stage 1 +ve & Stage 1 -ve  
Stage 2: Apply Power to Stage 1 +ve & Stage 1 -ve & connect Stage 2 -ve to Stage 1 -ve



|   |           |            |                |                      |
|---|-----------|------------|----------------|----------------------|
| DRAWING TO BS8888:2000<br>GEOMETRIC TOLERANCES TO ISO1101:1983<br>LINEAR DIMENSIONAL TOLS<br>ANGULAR DIMENSIONAL TOLS | DRAWN     | DATE       | SURFACE FINISH | WEIGHT (Kg)          |
|   | R.S.RAIT  | 19/01/2022 |                |                      |
|   | CHECKED   | DATE       |                |                      |
| STANDARDS<br><br>D1x  | B.ISARD   | 19/01/2022 | MATERIAL       | ALTERNATIVE MATERIAL |
|   | APPROVED  | DATE       |                |                      |
|   | R.N.POTTS | 19/01/2022 |                |                      |

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AS PER LATEST DATE OF ISSUE SHOWN ABOVE



|  |   |                            |
|--|---|----------------------------|
| ALL DIMENSIONS IN MM<br>IF IN DOUBT, ASK -<br>DO NOT SCALE                         |  | A3                         |
| TITLE D1xS1 / D1xS2 / GNExS1 / GNExS2 / STExS1 / STExS2 DC SOUNDER WIRING DIAGRAMS |   |                            |
| SCALE NTS  | SHEET 2 OF 3  | DRAWING NUMBER D190-06-001 |

|       |        |                |
|-------|--------|----------------|
| SCALE | SHEET  | DRAWING NUMBER |
| NTS   | 2 OF 3 | D190-06-001    |

|   |   |   |   |   |   |   |       |         |                                  |  |
|---|---|---|---|---|---|---|-------|---------|----------------------------------|--|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8     | 9       | 10                               |  |
|   |   |   |   |   |   |   | ISSUE | MOD No. | REASON - INITIAL - DATE          |  |
|   |   |   |   |   |   |   | 1     |         | INTRODUCTION<br>RSR - 19/01/2022 |  |

OPTIONAL LINE MONITORING RESISTOR, CUSTOMER SUPPLIED,  
RECOMMENDED MINIMUM VALUES:  
14V MAX SYSTEM = 120Ω MIN, 2W MIN OR 1KΩ MIN, 0.5W MIN  
28V MAX SYSTEM = 470Ω MIN, 2W MIN OR 2.4KΩ MIN, 0.5W MIN

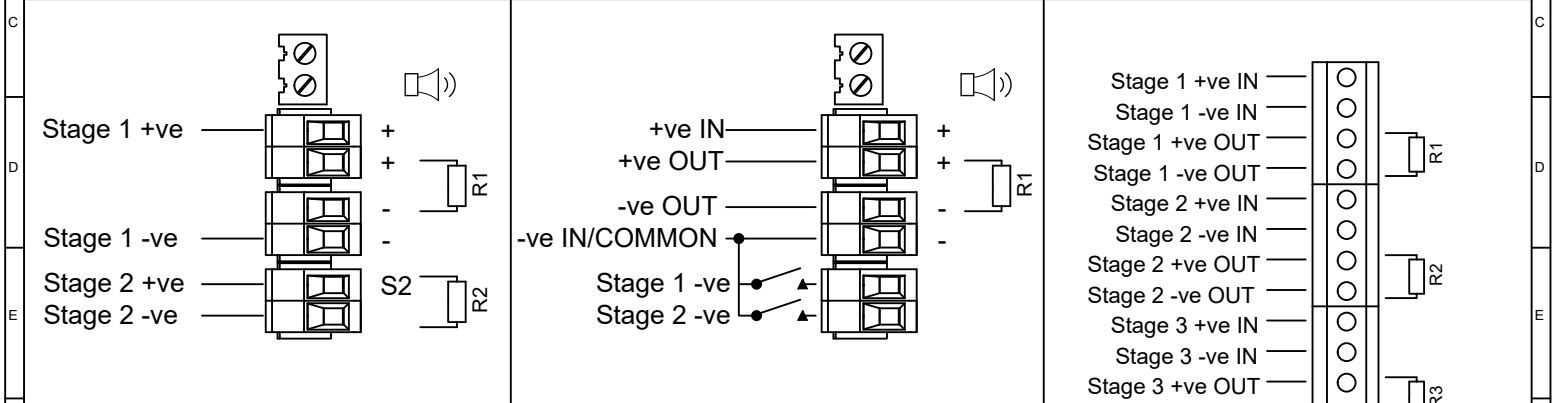
SWITCHES FOR STAGE OPERATION  
CUSTOMER SUPPLIED

|   |            |   |            |  |            |
|---|------------|---|------------|--|------------|
| Two Stage Configuration<br>Line Stage Monitoring (Use suitable monitoring relays/modules)<br>Not to be used for reverse polarity monitoring | Config.: 4 | Two/Three Stage Voltage Free Activation Configuration<br>Customer Set H1 & H2 to Negative Switching (See Below) | Config.: 5 | Three/Four Stage Configuration<br>Independent Stage Input<br>Line Stage Monitoring (use suitable monitoring relays/modules)<br>Set to positive switching (default) | Config.: 6 |
|---|------------|---|------------|--|------------|

Stage 1: Apply Power to Stage 1 +ve & Stage 1 -ve  
Stage 2: Apply Power to Stage 2 +ve & Stage 2 -ve

Power: +ve & -ve  
Stage 1: Connect Stage 1 -ve to Common -ve  
Stage 2: Connect Stage 2 -ve to Common -ve  
Stage 3: Connect both Stage 1 -ve & Stage 2 -ve to Common -ve

Stage 1: Apply Power to Stage 1 +ve & Stage 1 -ve  
Stage 2: Apply Power to Stage 2 +ve & Stage 2 -ve  
Stage 3: Apply Power to Stage 3 +ve & Stage 3 -ve  
Stage 4: Apply Power to Stage 2 +ve & Stage 2 -ve & Apply Power to Stage 3 +ve & Stage 3 -ve



Cut Link W1

**CUSTOM CONFIGURATION CONTACT E2S WHEN ORDERING**

Set H1 & H2 to -ve switching

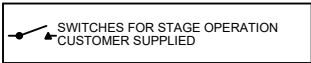
H1 ○ □  
H2 ○ □

**CUSTOM CONFIGURATION CONTACT E2S WHEN ORDERING**

(CONFIGURATION SHOWS OPTIONAL ADDITIONAL TERMINAL PCB A - PRODUCT OPTION 'V')

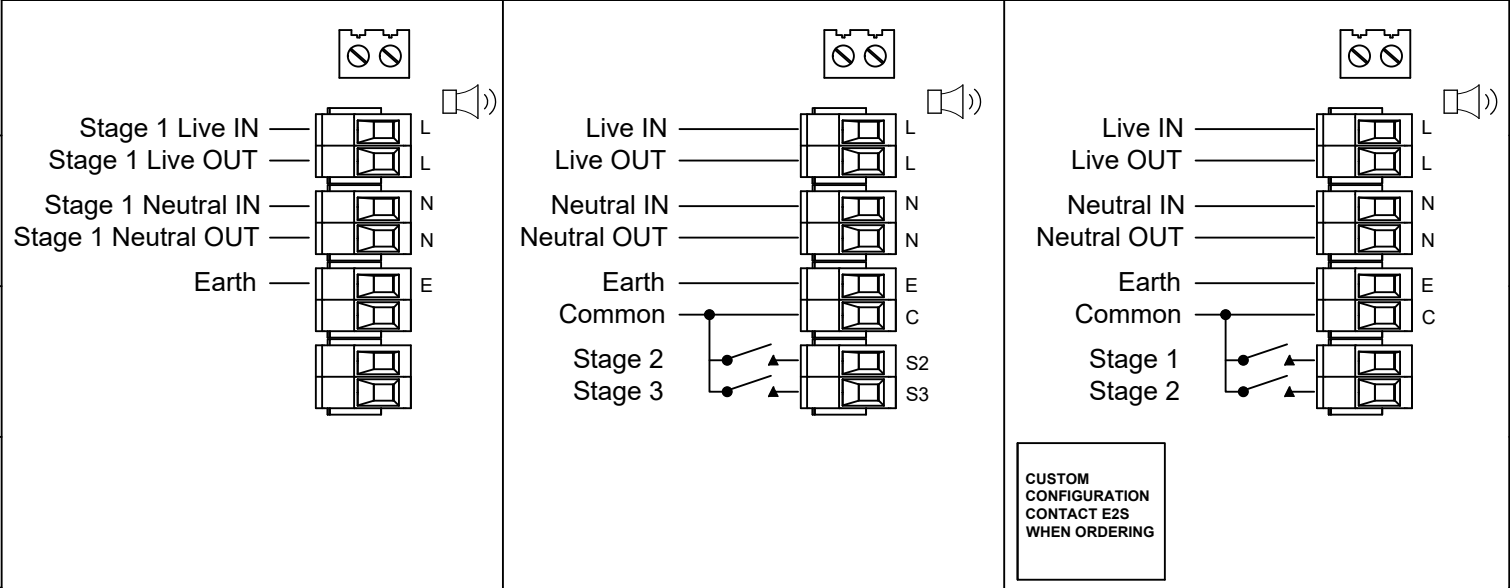
|  |           |            |                |             |          |   |   |  |        |               |
|--|-----------|------------|----------------|-------------|----------|---|---|--|--------|---------------|
| DRAWING TO BS8888:2000<br>GEOMETRIC TOLERANCES TO ISO1101:1983<br>ANGULAR DIMENSIONAL TOLS | DRAWN     | DATE       | SURFACE FINISH | WEIGHT (Kg) | 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. | <br>EUROPEAN SAFETY SYSTEMS LTD<br>IMPRESS HOUSE<br>MANSELL ROAD<br>ACTON<br>LONDON W3 7QH<br>WWW.E2S.COM | ALL DIMENSIONS IN MM<br>IF IN DOUBT, ASK -<br>DO NOT SCALE                         |        | <br><b>A3</b> |
|  | CHECKED   | DATE       |                |             |          |   |   | TITLE D1xS1 / D1xS2 / GNExS1 / GNExS2 / STExS1 / STExS2 DC SOUNDER WIRING DIAGRAMS |        |               |
|  | STANDARDS | DATE       |                |             |          |   |   | ALTERNATIVE MATERIAL   | SCALE  |               |
| D1x  | R.S.RAIT  | 19/01/2022 |                |             |          | © EUROPEAN SAFETY SYSTEMS LTD.<br>AS PER LATEST DATE OF ISSUE SHOWN ABOVE   |   | NTS  | 3 OF 3 | D190-06-001   |

| ISSUE | MOD No | REASON - INITIAL - DATE          |
|-------|--------|----------------------------------|
| 1     |        | INTRODUCTION<br>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<br>Stage 2: Apply Power to Live & Neutral & connect Stage 2 to Common<br>Stage 3: Apply Power to Live & Neutral & connect Stage 3 to Common<br>Stage 4: Apply Power to Live & Neutral & connect both Stage 2 & Stage 3 to Common | Power: Live & Neutral<br>Stage 1: Connect Stage 1 to Common<br>Stage 2: Connect Stage 2 to Common<br>Stage 3: Connect both Stage 1 & Stage 2 to Common |
|--|---|--|



**CUSTOM CONFIGURATION CONTACT E2S WHEN ORDERING**

|   |           |            |                |             |   |   |  |        |             |                      |       |
|---|-----------|------------|----------------|-------------|---|---|--|--------|-------------|----------------------|-------|
| DRAWING TO BS8888:2000<br>GEOMETRIC TOLERANCES TO ISO1101:1983<br>LINEAR DIMENSIONAL TOLS<br>ANGULAR DIMENSIONAL TOLS | DRAWN     | DATE       | 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. | <br>EUROPEAN SAFETY SYSTEMS LTD<br>IMPRESS HOUSE<br>MANSELL ROAD<br>LONDON W13 7QH<br>WWW.E2S.COM | ALL DIMENSIONS IN MM<br>IF IN DOUBT, ASK -<br>DO NOT SCALE |        | <b>A3</b>   |                      |       |
|   | CHECKED   | DATE       |                |             |   |   |  |        |             | MATERIAL             | TITLE |
|   | STANDARDS | DATE       |                |             |   |   |  |        |             | ALTERNATIVE MATERIAL | SCALE |
| D1x   | R.S.RAIT  | 19/01/2022 |                |             | © EUROPEAN SAFETY SYSTEMS LTD<br>AS PER LATEST DATE OF ISSUE SHOWN ABOVE  |   |  |        |             |                      |       |
|   | B.ISARD   | 19/01/2022 |                |             |   |   |  |        |             |                      |       |
|   | R.N.POTTS | 19/01/2022 |                |             |   |   |  |        |             |                      |       |
|   |           |            |                |             |   |   | NTS  | 1 OF 1 | D190-06-005 |                      |       |

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

# 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

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## 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<br>Notified Body No.: 2813<br>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<br>Notified Body No.: 2813<br>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<br>EN 60079-1:2014 A/C:2018  |

## Directive 2014/30/EU: Electromagnetic Compatibility Directive (EMC)

|                    |  |
|--------------------|--|
| Standards applied: | EN 61000-6-1:2007<br>EN 61000-6-2:2005<br>EN 61000-6-3:2007 / A1:2011 / AC: 2012<br>EN 61000-6-4:2007 / A1: 2011 |
|--------------------|--|

## 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



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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 black 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