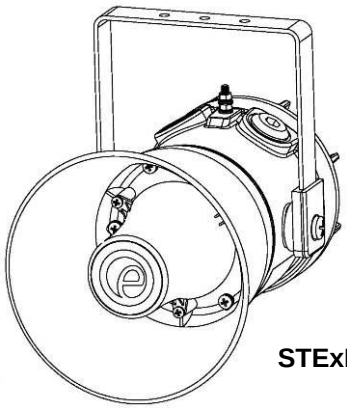
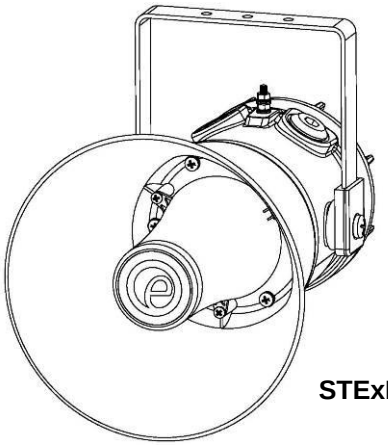
INSTRUCTION MANUAL (ATEX / IECEx)
STExL1 & STExL2 Loudspeakers
For use in Flammable Gas and Dust Atmospheres



STExL1



STExL2

1) Warnings

- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
- POTENTIAL ELECTROSTATIC CHARGING HAZARD
- ALL ENTRIES M20 X 1.5 - IF TEMPERATURE EXCEEDS 70°C AT ENTRY OR 80°C AT BRANCHING POINT USE SUITABLE RATED CABLE AND CABLE GLANDS

2) Rating & Marking Information

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

Input Voltage:

Low Impedance Units	8Ω or 16Ω
Line Voltage Units	70Vline or 100V line

STExL1 Codes:

Ex db IIC Gb T6 Ta -50°C to +55°C
Ex db IIC Gb T5 Ta -50°C to +70°C
Ex tb IIIC Db T95°C Ta -50°C to +70°C

STExL2 Codes:

Ex db IIC Gb T6 Ta -50°C to +45°C
Ex db IIC Gb T5 Ta -50°C to +60°C
Ex db IIC Gb T4 Ta -50°C to +70°C
Ex tb IIIC Db T105°C Ta -50°C to +70°C

Certificate No. DEMKO 16 ATEX 1466X
IECEx ULD 16.0017X

Epsilon x Equipment Group and Category: **II 2G** **II 2D**

CE Marking Notified Body No. **2813**

The units can be installed in locations with the following conditions:

Area Classification Gas:

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:

T1	450ºC
T2	300ºC
T3	200ºC
T4	135ºC
T5	100ºC (up to 60ºC ambient for STExL2 only)
T6	85ºC (up to 55ºC ambient for STExL1, up to 45ºC ambient for STExL2 only)

Area Classification Dust:

Zone 21	Explosive dust air mixture likely to occur in normal operation.
Zone 22	Explosive dust air mixture not likely to occur in normal operation, and if it does, it will only exist for a short time.

Dust Groupings:

Group IIIA	Combustible Flyings
Group IIIB	Non-conductive Dust
Group IIIC	Conductive Dust

Ambient Temperature Range: -50°C to +70°C

IP Rating: IP66 to EN/IEC60079-0 and EN/IEC60529

Equipment Category: 2G/D

Equipment Protection Level: Gb, Gc, Db, Dc

Maximum Surface Temperature for Dust Applications:
95ºC (STExL1)
105ºC (STExL2)

3) Type Approval Standards

The equipment carries an EC Type Examination Certificate and IECEx Certificate of Conformity, and have been certified to comply with the following standards:

EN60079-0:2012+A11:2013 / IEC60079-0:2011 (Ed 6): Explosive Atmospheres - Equipment. General requirements

EN60079-1:2014 / IEC60079-1:2014 (Ed 7): Explosive Atmospheres - Equipment protection by flameproof enclosures "d"

EN 60079-31:2014 / IEC 60079-31:2013 (Ed 2): Explosive Atmospheres - Equipment dust ignition protection by enclosure "t"

4) Installation Requirements

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

EN60079-14 / IEC60079-14: Explosive atmospheres - Electrical installations design, selection and erection

EN60079-10-1 / IEC60079-10-1: Explosive atmospheres - Classification of areas. Explosive gas atmospheres

EN60079-10-2 / IEC60079-10-2: Explosive atmospheres - Classification of areas. Explosive dust atmospheres

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.

5) Special Conditions of Use

Repair of the flamepath / flameproof joints is not permitted.

The plastic horn is not anti-static and the metallic enclosure has a non-conductive coating. These may generate an ignition-capable level of electrostatic charges under certain extreme conditions. The user should ensure that the equipment is not installed in a location where it may be subjected to external conditions that might cause a build-up of electrostatic charges on non-conducting surfaces.

Additionally, cleaning of the equipment should be done only with a damp cloth.

6) Location and Mounting

The location of the loudspeaker should be made with due regard to the area over which the warning signal must be visible/audible. They should only be fixed to surfaces that can carry the weight of the unit.

The STEx loudspeaker should be secured to any flat surface using the three 7mm fixing holes. The angle can then be adjusted as required but the mounting restrictions must be observe. See Fig 1c. This can be achieved by loosening the two large bracket screws in the side of the unit, which allow adjustments in steps of 18°. 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. See figure 1.

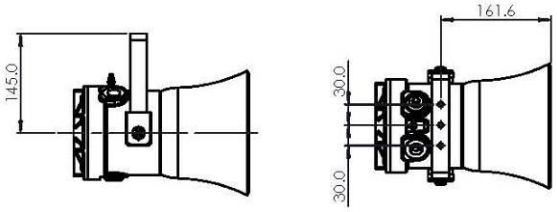


Fig 1a. Fixing Location for Small Horn

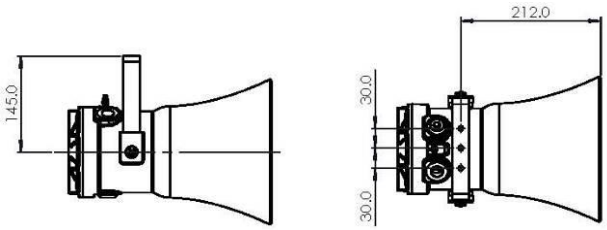


Fig 1b. Fixing Location for Large Horn

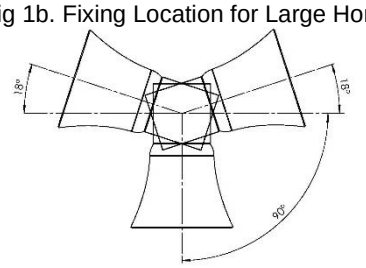


Fig. 1c Mounting Restrictions

7) Access to the Flameproof Enclosure

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

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 loudspeaker it is necessary to remove the flameproof cover to gain access to the flameproof chamber. To access the Ex d chamber, loosen the M4 grub screw on the loudspeaker cover. Open the enclosure by turning the loudspeaker cover counterclockwise and remove the cover, taking extreme care not to damage the flameproof threads in the process (See figure 2).

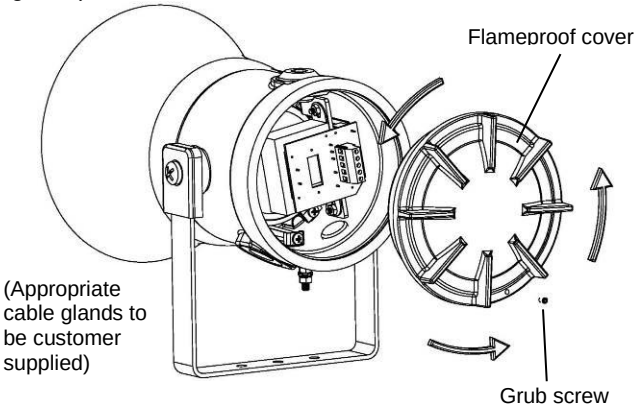


Fig. 2 Accessing the Explosion proof Enclosure.

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. Repair of the flamepath / flameproof joints is not permitted. Also check that the 'O' ring seal is in place. 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 loudspeaker enclosure. Tighten the M4 grub screw.

8) Power Supply Selection

It is important that a suitable power supply is used to run the loudspeaker. The power supply selected must have the necessary capacity to provide the input current to all of the loudspeakers

The following table shows the input current taken by the various loudspeakers:

Model No.	Input	Power (Watts)	Max. I/P Volts
STExL1R008	8Ohm	15	10.95
STExL1R016	16Ohm	15	15.49
STExL1V070	70V Line	15	70
STExL1V100	100V Line	15	100
STExL2R008	8Ohm	25	14.14
STExL2R016	16Ohm	25	20
STExL2V070	70V Line	25	70
STExL2V100	100V Line	25	100

A supply voltage variation of +/-10% outside the voltage range is permissible.

Nominal current at nominal voltage

Max rated current at worst case supply voltage and flash rate.

9) Selection of Cable. Cable Glands, Blanking Elements & Adapters

When selecting the cable size, consideration must be given to the input current that each unit draws (see table above), the number of loudspeaker 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.

For ambient temperatures over +40ºC the cable entry temperature may exceed +70ºC and therefore suitable heat resisting cables and cable glands must be used as per table below

STExL1:

Ambient Temp.	45ºC	50ºC	55ºC	60ºC	65ºC	70ºC
Min. Rating of cables and cable glands	70ºC	75ºC	80ºC	85ºC	90ºC	95ºC

STExL2:

Ambient Temp.	40ºC	45ºC	50ºC	55ºC	60ºC	65ºC	70ºC
Min. Rating of cables and cable glands	75ºC	80ºC	85ºC	90ºC	95ºC	100ºC	105ºC

The cable entries have an M20 x 1.5 – 6H entry thread. If the installation is made using cable glands, 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.

Any unused cable entries must be closed with suitably rated and ATEX / IECEx certified blanking plugs.
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.

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.

For combustible dust applications,¬ the cable entry device and blanking elements shall be in type of explosion protection and shall have an IP 6X rating.

The STEx loudspeaker 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.

10) Earthing

Both AC and DC loudspeaker 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

Internal earthing connections should be made to the Internal Earth terminal 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.

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

11) Cable Connections

Electrical connections are to be made into the terminal blocks on the PCBA located in the flameproof enclosure. See section 7 of this manual for access to the flameproof enclosure.

Wires having a cross sectional area between 0.5 mm² to 2.5mm² can be connected to each terminal way. If an input and output wire is required the 2-off Live/Neutral or +/- terminals can be used. If fitting 2-off wires to one terminal way the sum of the 2-off wires must be a maximum cross sectional area of 2.5mm². Strip wires to 8mm. Wires may also be fitted using ferrules. Terminal screws need to be tightened down with a tightening torque of 0.45 Nm / 5 Lb-in. 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.

12) 70V & 100V Line In Wiring

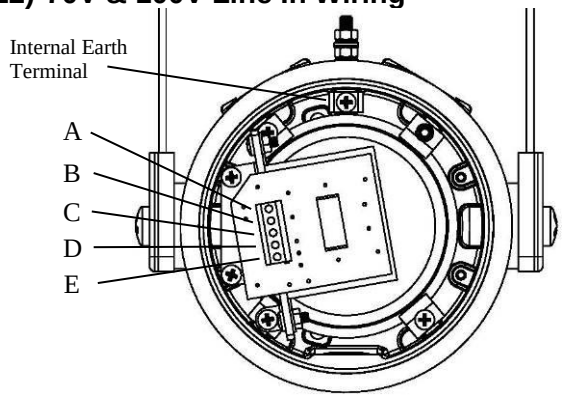


Fig. 3 Line in Terminals

The cable connections are made into the terminal blocks on the PCB assembly located in the explosion proof enclosure. See section 7 of this manual for access to the explosion proof enclosure. The 70V & 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).

Terminals	STExL2 (25W)	STExL1 (15W)
A - B	25W	15W
A - C	12.5W	7.5W
A - D	6W	3W
A - E	2W	1W

A single wire with a cross sectional area of up to 2.5mm² / AWG14 can be connected to each terminal way or if an input and output wire is required two wires can be connected to each terminal way when crimped with a ferrule. If more than one wire is fitted into a terminal a ferrule should be used to secure the wires. 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.

13) Low Impedance Wiring

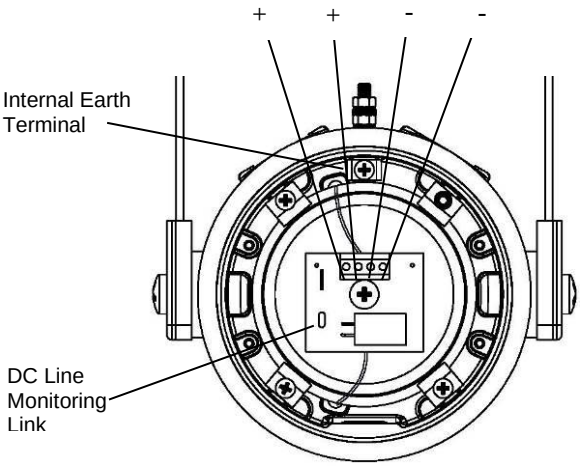


Fig. 4 Low Impedance Terminals

STExL2 and STExL1 8Ω and 16Ω low impedance loudspeakers have dual input terminals on the PCB assembly for input and output wiring. A cable of up to 4.0mm² can be connected to each terminal. If DC line monitoring is used cut the link on the board (see Fig. 4).

14) 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

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.

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

Electrostatic charging hazard - Clean only with a damp cloth.