

INSTRUCTION MANUAL (ATEX / IECEx)

BExDL25D and BExDL15D

Flameproof Loudspeakers

For use in Flammable Gas and Dust Atmospheres

1) Introduction

The BExDL25D and BExDL15D are flameproof loudspeakers which are certified to meet the requirements of the ATEX directive 94/9/EC and IECEx scheme. The loudspeakers can be used in hazardous areas where potentially flammable gas and dust atmospheres may be present. There are four versions of each loudspeaker, 8 ohm or 16 ohm and 70V or 100V Line transformer. On 70V and 100V line transformer units there are four output tapings for each size of loudspeaker. The BExDL25D unit produces output levels in the 117dB(A) range and the BExDL15D unit produces output levels in the 112dB(A) range. Both loudspeakers can be used in Zone 1 and Zone 2 areas with gases in groups IIA, IIB and IIC and temperature Classifications of T1, T2, T3 and T4. For ambient temperatures over +55°C the gas groups are limited to IIA and IIB. They can also be used in Zone 21 and Zone 22 areas for combustible dusts and have an IP rating of IP 67 and a surface temperature rating of T100°C up to +55°C and T115°C over +55°C.

2) Marking

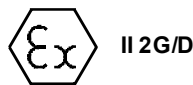
All units have a rating label, which carries the following important information:-

Unit Type No. BExDL25D or BExDL15D

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

Codes: Ex d IIC T4 for Ta -50°C to +55°C
Ex d IIB T4 for Ta -50°C to +70°C
Ex tD A21 IP67 T115°C based on max Ta of +70°C

Certificate No's KEMA 99ATEX6312
IECEx KEM 10.0003



CE Marking:
Notified Body No.



“Warnings” DO NOT OPEN WHEN AN EXPLOSIVE
GAS OR DUST ATMOSPHERE IS PRESENT

COVER BOLTS CLASS A4-80

USE HEAT RESISTING CABLES AND CABLE GLANDS
(Rated 110°C) AT AMB. TEMPERATURES OVER 40°C

Year of Construction /
Serial No. i.e. 10 / 1DL23000001

3) Type Approval Standards

The loudspeakers have EC Type Examination and IECEx certificates issued by KEMA and have been approved to the following standards:-

EN60079-0:2006	IEC60079-0:2004 (Ed4)	General Requirements
EN60079-1:2007	IEC60079-1:2007 (Ed6)	Flameproof Enclosure 'd'
EN61241-0:2006	IEC61241-0:2004 (Ed1)	Dust General Requirements
EN61241-1:2004	IEC60079-1:2004 (Ed1)	Dust Enclosures 'D'

4) Installation Requirements

The loudspeakers must be installed in accordance with the latest issues of the relevant parts of the BS EN 60079 specifications or the equivalent IEC specifications – 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)	
EN60079-10:2003	Classification of Hazardous Areas
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 had the necessary training.

5) Zones, Gas Group, Category, IP Rating and Temperature Classification

The BExDL25D and BExDL15D loudspeakers have been certified Ex d IIC T4 for Ta -50°C to +55°C and Ex d IIB T4 for Ta -50°C to +70°C for gas and Ex tD A21 IP67 T115°C based on max. Ta of +70°C for dust. This means that 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, and if it does, it will only exist for a short time.

Gas Groupings:

Group IIA	Propane
Group IIB	Ethylene
Group IIC (Up to +55°C only)	Hydrogen and Acetylene

Temperature Classification:

T1	400°C
T2	300°C
T3	200°C
T4	135°C

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, and if it does, it will only exist for a short time.

IP Rating IP67 T100°C Ta ≤ +55°C
T115°C Ta ≤ +70°C

Equipment Category: 2G/D

Ambient Temperature Range:

-50°C to +55°C Gas Groups IIA, IIB and IIC
-50°C to +70°C Gas Group IIA and IIB

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.

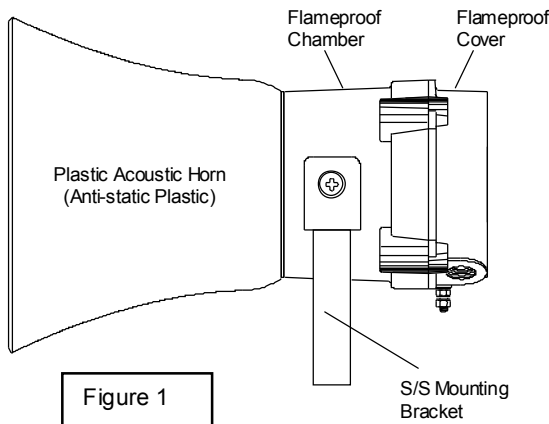


Figure 1

7) Access to the Flameproof Enclosure

In order to connect the audio supply cables to the loudspeaker it is necessary to remove the flameproof cover to gain access to the flameproof chamber. To achieve this remove the four M6 hexagon socket head screws (see figure 2) and withdraw the flameproof cover taking extreme care not to damage the flameproof joints in the process.

Note the four **M6 screws** are **Class A4-80 stainless steel** and **only screws of this category can be used on these loudspeakers**. It is therefore important that these screws and their spring washers are kept in a safe place during installation.

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 earth bonding wire between the two casting sections is secure and the 'O' ring seal is in place. When replacing the flameproof cover casting ensure that it is square with the flameproof chamber casting before inserting. Carefully push the cover in place allowing time for the air to be expelled. Only after the cover is fully in place, should the four M6 Stainless Steel A4-80 cover bolts and their spring washers be inserted and tightened down. If the cover jams while it is being inserted, carefully remove it and try again. Never use the cover bolts to force the cover into position.

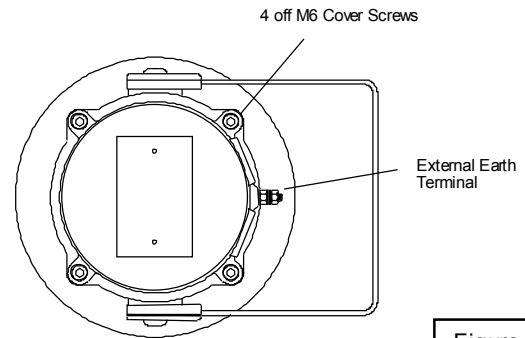


Figure 2

8) 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
BExDL25D	100V Line	25W	100V
BExDL25D	70V line	25W	70V
BExDL25D	8 ohm	25W	14.14V
BExDL25D	16 ohm	25W	20V
BExDL15D	100V Line	15W	100V
BExDL15D	70V Line	15W	70V
BExDL15D	8 ohm	15W	10.95V
BExDL15D	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). BExDL25D 70V and 100V Line units have output levels of 25W, 12.5W, 6W and 2W; BExDL15D 70V and 100V Line units have output levels of 15W, 7.5W, 3W and 1W.

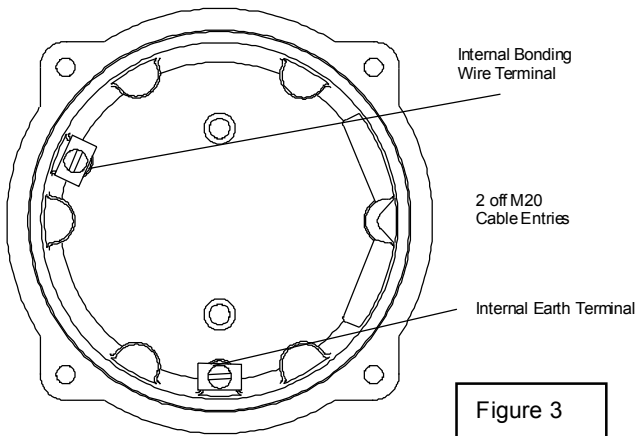
9) Cable Selection

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 runs.

SAFETY WARNING: If the loudspeakers are used at high ambient temperatures, i.e. over +40°C, then the cable entry temperature may exceed +70°C and therefore suitable heat resisting cables must be used, with a rated service temperature of at least 110°C.

10) Earthing

All loudspeakers must be connected to a good quality earth. The units are provided with internal and external earthing terminals which are both located on the flameproof cover section of the unit (see figures 2 and 3).



When using the internal earth terminal ensure that the stainless steel M4 flat washer is between the incoming earth wire and the enclosure.

When using the external earth terminal a cable crimp lug must be used. The cable lug should be located between the two M5 stainless steel flat washers. The M5 stainless steel spring washer must be fixed between the outer flat washer and the M5 stainless steel nut to ensure that the cable lug is secured against loosening and twisting.

The internal earth bonding wire ensures that a good quality earth is maintained between the flameproof chamber casting and the flameproof cover casting.

11) Cable Glands

The BExDL25D and BExDL15D loudspeakers have dual cable gland entries which have an M20 x 1.5 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 standard EN 60079-14:2008 / IEC60079-14:2007.

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.

For combustible dust applications, the cable entry device and blanking elements shall be in type of explosion protection increased safety "e" or flameproof enclosure "d" and shall have an IP 6X rating according to EN60529:1992.

SAFETY WARNING: If the loudspeakers are used at high ambient temperatures, i.e. over +40°C, then the cable entry temperature may exceed +70°C and therefore suitable heat resisting cable glands must be used, with a rated service temperature of at least 110°C.

12) Cable Connections

The cable connections are made into the terminal blocks on the pcb assembly located in the flameproof enclosure. See section 7 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).

BExDL25D and BExDL15D 70V and 100V Line Loudspeakers

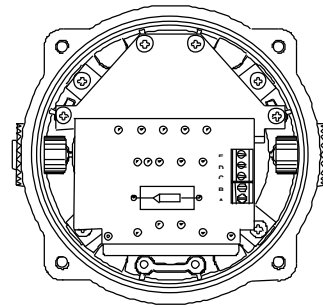


Figure 4

Terminals	BExDL25D (25W)	BExDL15D (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 4mm² can be connected to each terminal way or if an input and output wire is required two 2.5mm² 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 2.5mm² and above.

BExDL25D and BExDL15D 8 ohm and 16 ohm Loudspeakers

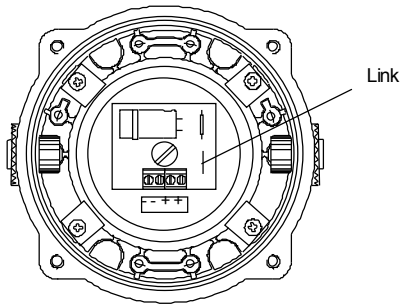


Figure 5

BExDL25D and BExDL15D 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 2.5mm² 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).

13) End of Line DC Monitoring

On BExDL25D and BExDL15D 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).

EC DECLARATION OF CONFORMITY



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

Equipment Type: BExS110D, BExS120D, BExS110E, BExS120E,
BExDS120D, BExDS110D, BExDS120E, BExDS110E,
BExL25D, BExL15D, BExL25E, BExL15E,
BExDL25D, BExDL15D, BExDL25E, BExDL15E,
BExA110D, BExA120D, BExA110E, BExA120E,
BExDA110D, BExDA120D, BExDA110E, BExDA120E,
BExTS110D, BExDTS110D, BExH120D, BExDH120D, BExL25GD, BExDL25GD

Directive 94/9/EC: Electrical and Mechanical equipment for use in explosive atmospheres (ATEX)

Notified Body for EC type Examination: KEMA Quality B.V.
Notified Body No.: 0344
Utrechtseweg 310, 6812 AR Arnhem, The Netherlands

EC-type Examination Certificate: KEMA 99ATEX6312

Notified Body for Quality Assurance Notification: Sira Certification Service
Notified Body No.: 0518
Rake Lane, Eccleston, Chester CH4 9JN, UK

Quality Assurance Notification: SIRA 05 ATEX M342

Provisions fulfilled by the equipment: II 2 G Ex d IIB or IIC T4 or
II 2 G Ex de IIB or IIC T4
II 2 D Ex tD A21 IP66 or IP67 T100 °C or T115 °C

Standards applied: EN 60079-0:2006
EN 60079-1:2007
EN 60079-7:2003
EN 61241-0:2006
EN 61241-1:2004

Directive 89/106/EEC: Construction Products Directive (CPD) – BExS110D24DC / BExS120D24DC (tones 2, 3, 9, 15, 16, 17) only

Notified Body for EC type Examination: VdS Schadensverhütung GmbH
Notified Body No.: 0786
Amsterdamer Str 172-174, 50735 Köln, Germany

EC-type Examination Certificate: 0708-CPD-20225

Standards applied: EN 54-3:2001 + A1:2002

Directive 2009/26/EC: Marine Equipment Directive (MED) – BExS110D24DC-M only

Notified Body for EC type Examination: Germanischer Lloyd SE
Notified Body No.: 0098
Brooktorkai 18, 20457 Hamburg, Germany

EC-type Examination Certificate: 19 702 - 11 HH

Standards applied: EN 54-3:2001 + A1:2002 + A2:2006
IEC 60092-504: 2001
IEC 60533: 1999

Directive 2004/108/EC: Electromagnetic Compatibility Directive (EMC)

Standards applied: EN 61000-6-1:2007
EN 61000-6-2:2005
EN 61000-6-3:2007
EN 61000-6-4:2007

The standards EN 60079-0: 2006, EN 60079-7:2003, EN 61241-0:2006 and EN 61241-1:2004 are no longer harmonized. The requirements of these standards have been checked against the harmonized standards EN 60079-0:2009, EN 60079-7:2007 and EN 60079-31:2009 and there were no major technical changes affecting the latest technical knowledge for the products listed above.

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.

A handwritten signature in black ink, appearing to read 'Martin Streetz'.

Martin Streetz
Quality Assurance Manager

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Date and Place of Issue: London, 04/07/2012
Document No: DC-001-Issue_C

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