

INSTRUCTION MANUAL (ATEX)

BExA120E and BExA110E

Flameproof / Increased Safety APPELLO Speech Sounders

1) Introduction

The BExA120E and BExA110E are second generation flameproof / increased safety Appello Speech Sounders which are certified to the European Standards EN 50014: 1992, EN 50018: 1994 and EN50019: 1994 and meet the requirements of the ATEX directive 94/9/EC. The units, which have a facility to record a message of up to 16 seconds in duration, can be used in hazardous areas where potentially flammable atmospheres may be present. The speech message can be preceded by one of nine different alarm tones (see *tone table on Page 4*). The BExA120E unit produces output levels in the 112dB(A) range and the BExA110E unit produces output levels in the 110dB(A) range. Both sounders 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.

2) Marking

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

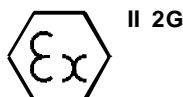
Unit Type No. BExA120E or BExA110E

Input Voltage: DC Units 24V
AC Units 230V or 115V

Code: EEx de IIC T4 (Tamb. -50 to +55°C)

Certificate No. KEMA 99ATEX6312

Epsilon x:
Gas Group and
Category:



CE Marking:
Notified Body No.



Warnings: DO NOT OPEN WHEN AN EXPLOSIVE
GAS ATMOSPHERE IS PRESENT

COVER BOLTS CLASS A4-80

USE HEAT RESISTING CABLES AND CABLE GLANDS
(Rated 95°C) AT AMB. TEMPERATURES OVER 40°C

Year of Construction /
Serial No. i.e. 02 / 1A42000001

3) Type Approval Standards

The Appello's have an EC Type examination certificate issued by KEMA and have been approved to the following standards:-

EN 50014 : 1992 + prA1 General Requirements
EN 50018 : 1994 + prA1 Flameproof Enclosure 'd'
EN 50019 : 1994 + prA1 Increased Safety 'e'

4) Installation Requirements

The units 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):-

BS EN 60079-14 : 1997 Electrical Installations in Hazardous Areas (other than mines)
BS EN 60079-10 : 1996 Classification of Hazardous Areas

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) Zones, Gas Group, Category and Temperature Classification

The BExA120E and BExA110E Appello's have been certified EEx de IIC T4 (Tamb. -50 to +55°C). 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	400°C
T2	300°C
T3	200°C
T4	135°C

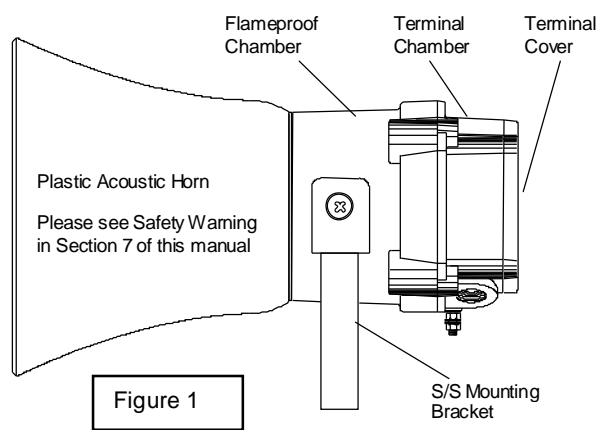
Ambient Temperature Range:

-50°C to +55°C

6) Location and Mounting

The location of the Appello Speech Sounders should be made with due regard to the area over which the warning signal must be audible. The Appello's should only be fixed to services that can carry the weight of the unit.

The units 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 sounder cannot move in service.



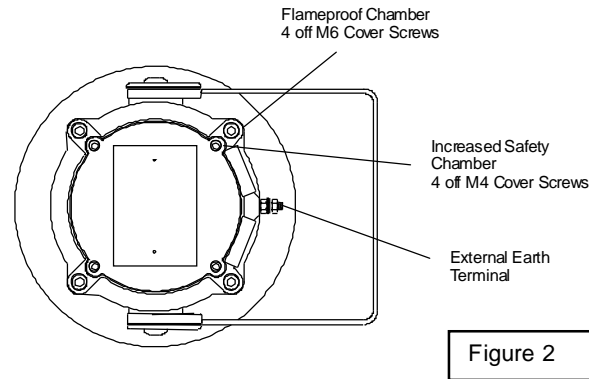
7) Safety Warning (Electrostatic Hazard)

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 record a message, adjust the output level of the unit or to set a tone, it is necessary to remove the terminal chamber section to gain access to the flameproof chamber. To achieve this remove the four M6 hexagon socket head screws (see figure 2) and withdraw the terminal chamber taking extreme care not to damage the flameproof joints in the process.

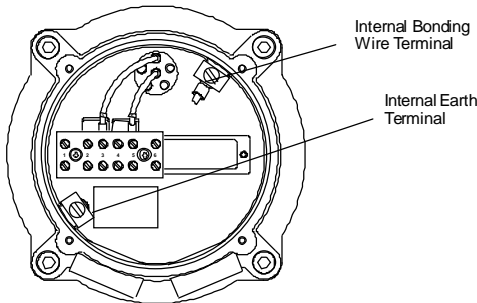
Note the four **M6 screws are Class A4-80 stainless steel and only screws of this category can be used on these sounders.** It is therefore important that these screws and their spring washers are kept in a safe place during installation.



On completion of the message recording, tone selection and output level adjustment, the flameproof joints should be inspected to ensure that they are clean and that they have not been damaged. Also check that the earth bonding wire between the two casting sections is secure and that the 'O' ring seal is in place. When replacing the terminal chamber section casting, ensure that it is square with the flameproof chamber casting before inserting. Carefully push the section in place allowing time for the air to be expelled. Only after the section 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 section jams while it is being inserted, carefully remove it and try again. Never use the M6 cover bolts to force the cover into position.

9) Access to the Increased Safety Terminal Chamber

To connect the input cables to the Appello it is necessary to remove the terminal cover to gain access to the termination chamber. To achieve this remove the four M4 hexagon socket head screws (see figure 2). The four M4 screws and their spring washers are grade A4 stainless steel and they should be kept in a safe place during installation. Before replacing the terminal cover ensure that the earth bonding wire between the two castings is secure and that the 'O' ring seal is in place. Insert the four M4 hexagon screws and their spring washers and tighten them down.



2 off M20
Cable Entries

10) Power Supply Selection

It is important that a suitable power supply is used to run the Appello's and that the cables used to connect the units to the power supply are selected to ensure that they have the necessary capacity.

The following table shows the input current taken by the various sounder units:-

Unit Type	Input Voltage	Input Current	Max. I/P Volts
BExA120E	24V DC	480mA	30V
BExA120E	230V AC	45mA	253V
BExA120E	115V AC	90mA	126V

BExA110E	24V DC	480mA	30V
BExA110E	230V AC	45mA	253V
BExA110E	115V AC	90mA	126V

The input current will vary according to the voltage input level and the frequency of the tone selected. The current values shown above are for the 554/440Hz tone @ nominal input voltage. The above table also shows the maximum voltages at which the units can be operated.

11) Cable Selection

When selecting the cable size consideration must be given to the input current that each unit draws (see table above), the number of units 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 Appello's connected to the line.

SAFETY WARNING: If the Appello's 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 95°C.

12) Earthing

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

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 wires ensure that a good quality earth is maintained between the flameproof chamber casting, the terminal section casting and the terminal cover casting.

13) Cable Glands

The BExA120E and BExA110E sounders have dual cable gland entries which have an M20 x1.5 entry thread as standard or a PG13.5 thread as a special. Only cable glands approved for Ex 'e' applications or better (i.e. Ex 'd' applications) can be used. They must be suitable for the type of cable to be used and also meet the requirements of the Ex equipment installation standard BS EN 60079-14: 1997.

SAFETY WARNING: If the Appello's 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 95°C.

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 'e' blanking plug, which must be suitably approved for the installation requirements.

14) Cable Connections

Before the Appello is installed in a hazardous area, the required message to be broadcast should be recorded on the units, see section 15 of this instruction manual.

The cable connections are made into an EEx e II approved six way terminal block which is located in the Increased Safety Area terminal chamber (see figure 3). See section 8 of this manual for access to the terminal chamber. When wiring into Increased Safety Area terminal enclosures, you are only permitted to connect one wire into each way on the terminal block. Therefore in order that Appello's can be connected in a parallel line, the terminal block is fitted with approved connecting combs so that each electrical connection has two terminals in parallel. Terminal No's. 1 and 6 must not be used on either AC or DC units. Cables with a cross-sectional area of up to 4mm² can be connected to the terminal block. Cables that have a small cross-sectional area should be fitted with crimp ferules.

The wiring connections to the Appello's are the same for both the BExA110E units and BExA120E units and are as follows:-

Terminal No's	DC Units	AC Units
2 and 3	-ve	N
4 and 5	+ve	L

15) Recording a Message

Before installing the Appello units in a hazardous area the message required to be broadcast must be recorded onto the electronics assembly in the flameproof chamber. A single message of up to 16 seconds can be recorded on each Appello unit. The message must be recorded while the unit is still in a safe area.

To record a message the Appello must be connected to an input supply voltage appropriate to the unit being used, i.e. 24V for DC units and either 230V or 115V for AC units depending on the unit voltage.

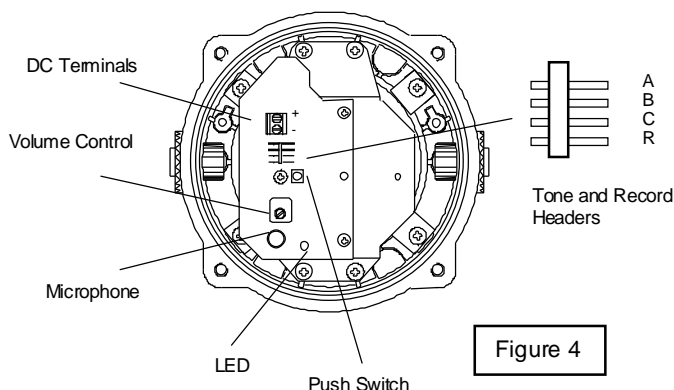
SAFETY NOTE

To maintain safety when recording a message on AC Appello units, an earth wire must be connected to the internal earth terminal and the Terminal Cover in the flameproof chamber must be in place before the supply to the unit is switched on (see figure 5).

- 1) Access the flameproof chamber (see section 8 of this instruction manual).
- 2) Set the unit to the record mode by shorting out the record header pins marked R, (see figure 4).
- 3) Switch on the power supply to the unit.
- 4) Press and hold the Push Switch while speaking into the microphone to record a message of up to 16 seconds in duration. NOTE IF THE LED INDICATOR GOES OUT BEFORE THE END OF THE RECORDING, THE MESSAGE LENGTH HAS BEEN EXCEEDED AND WILL NEED TO BE RECORDED AGAIN.
- 5) Release the push switch at the end of the message.
- 6) Switch off the power supply.
- 7) Remove the pin header from the record pins R.

- 8) Check that the message has recorded correctly by switching on the power supply and the message should play back.

BExA120E and BExA110E DC Appello Flameproof Chamber

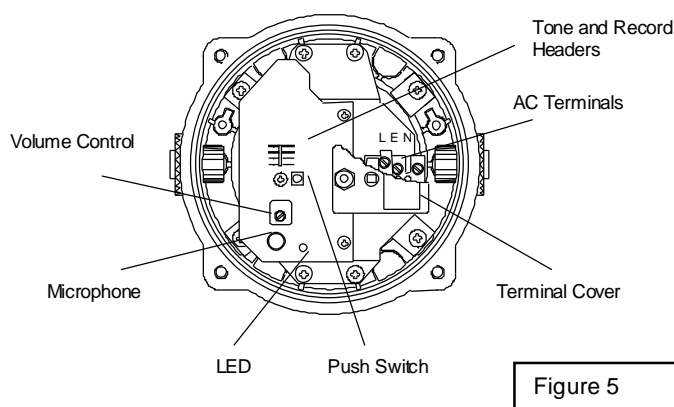


16) Tone Selection

The message can be preceded by one of nine selectable tones or by a silence period of 0.5 seconds.

To select the required tone or the silence period the header pins A B and C (see figure 4) should be patched as per the tone table on this page, see section 8 of this instruction manual for access to the flameproof enclosure.

BExA120E and BExA110E AC Appello Flameproof Chamber



17) End of Line Monitoring (DC Units)

On BExA120E and BExA110E DC Appello units, dc reverse line monitoring can be used if required. 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. **Note monitoring components must not be connected to the terminal block in the Increased Safety terminal chamber.** See section 8 of this instruction manual for access to the flameproof enclosure. If an end of line resistor is used it must have a minimum resistance value of 3k3 ohms

and a minimum wattage of 0.5 watts or a minimum resistance value of 500 ohms and a minimum wattage of 2 watts.

18) Volume Control

All BExA120E and BExA110E Appello units have a volume control to adjust the output level. To set the required output level, adjust the potentiometer on the pcb, see section 8 of this instruction manual for access to the flameproof enclosure. For maximum output level the potentiometer should be set to the fully clockwise position.

18) TONE SELECTION TABLE

Tone No.	Tone Description
1	Alternating 800/1000Hz @ 2Hz. 4 cycles
2	Slow Whoop 500/1200Hz @ 0.3Hz with 0.5 gap. 2 cycles
3	Sawtooth 1200/500Hz @ 1Hz 4 cycles
4	Alternating 544/440Hz @ 100/400mS intervals. 4 cycles
5	Continuous @ 1000Hz 2 seconds
6	Simulated Bell sound 2 seconds
7	Intermittent 1000Hz @ 0.5Hz 3 cycles
8	Australian Alert 420Hz with 0.625 sec intervals. 4 cycles
9	Australian Evacuate 500/1200Hz 3.75 sec. ON - 0.25 sec OFF 2 cycles
10	Silence 0.5sec gap