

INSTRUCTION MANUAL (ATEX)

BExCA110-05D

Flameproof Combined Appello Speech Sounder / Beacon

Important Notice: The BExCA110-05D is not for sale, re-sale, installation, or use within the United States of America as a sole, multiple, integrated, or incorporated unit.

1) Introduction

The BExCA110-05D is a second generation flameproof combined Appello speech sounder / beacon which is certified to the European Standards EN 50014: 1997 and EN 50018: 2000 and meets the requirements of the ATEX directive 94/9/EC. The Appello sounder section has the facility to record a message of up to 16 seconds in duration and the beacon section produces a synchronised visual warning signal. The unit 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 5*). The Appello sounder produces output levels in the 110dB(A) range and the beacon produces an output level of 5 joules. The unit can be used in Zone 1 and Zone 2 areas with gases in groups IIA and IIB and with Temperature Classifications of T1, T2, T3 and T4.

2) Marking

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

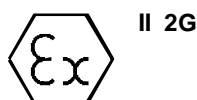
Unit Type No. BExCA110-05D

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

Code: EEx d IIB T4 (Tamb. -50 to +55°C)

Certificate No. KEMA 01ATEX2223

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
CABLEGLANDS (Rated 95°C) AT
AMB. TEMPERATURES OVER 40°C

Year of Construction /
Serial No. i.e. 02 / 1CA22000001

3) Type Approval Standards

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

EN 50014 : 1997 General Requirements
EN 50018 : 2000 Flameproof Enclosure 'd'

4) Installation Requirements

The unit 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 unit 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 BExCA110-05D unit has been certified EEx d IIB 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

Equipment Category: 2G

Temperature Classification:

T1	400°C
T2	300°C
T3	200°C
T4	135°C

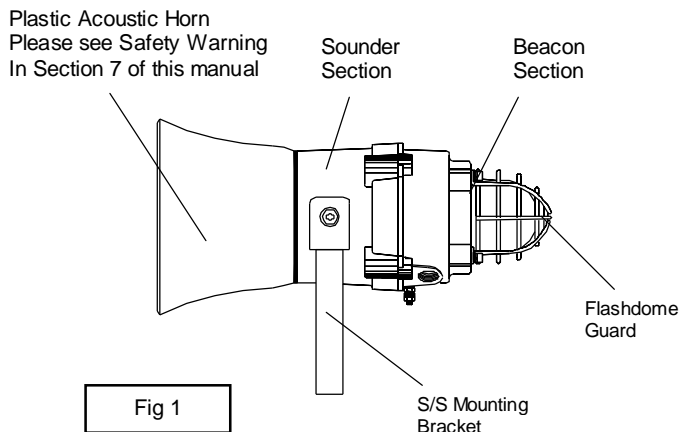
Ambient Temperature Range:

-50°C to +55°C

6) Location and Mounting

The location of the unit should be made with due regard to the area over which both the sounder and beacon warning signal must be audible and visible. The unit should only be fixed to services that can carry the weight of the unit.

The unit 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 such that its warning signals can be both heard and seen. This can be achieved by loosening the two large bracket screws in the side of the unit, which allow adjustment in steps of 18°. On completion of the installation the two large bracket adjustment screws on the side of the unit must be fully tightened to ensure that the unit cannot move in service.



7) Safety Warning (Electrostatic Hazard)

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

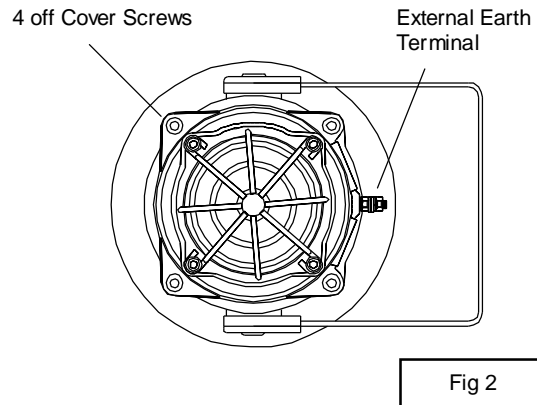
8) Access to the Flameproof Enclosure

In order to connect the electrical supply cables to the unit it is necessary to remove the beacon 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 beacon section 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 units.** 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 beacon section casting, ensure that it is square with the sounder section chamber casting before inserting. Carefully push the beacon section in place allowing time for the air to be expelled. Only after the beacon section casting is fully in place should the four M6 Stainless Steel A4-80 cover

bolts and their spring washer be inserted and tightened down. If the beacon section jams while it is being inserted, carefully remove it and try again. Never use the cover bolts to force the beacon section casting into position.



9) Power Supply Selection

It is important that a suitable power supply is used to run the unit. The power supply selected must have the necessary capacity to provide the input current to all of the units connected to the system. The sounder and beacon sections can both be wired to the same power supply or to different power supplies.

The following table shows the input current taken by the Appello sounder section and beacon section of the various units:-

Unit Type	Input Voltage	Appello Current	Max. I/P Volts
BExCA110-05D	24V DC	480mA	30V
BExCA110-05D	230V AC	45mA	253V
BExCA110-05D	115V AC	90mA	126V

Unit Type	Input Voltage	Beacon Current	Max. I/P Volts
BExCA110-05D	24V DC	300mA	30V
BExCA110-05D	230V AC	55mA	253V
BExCA110-05D	115V AC	140mA	126V

The above table also shows the maximum voltages at which the units can be operated.

Appello Sounder Section

The input current to the Appello sounder section 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.

Beacon Section

The input current to the beacon section will vary according to the voltage input level. The current levels shown above are for nominal input voltage. The 24V DC units have a converter circuit and therefore the input current level will decrease slightly as the input voltage is increased and will increase slightly as the input voltage is reduced.

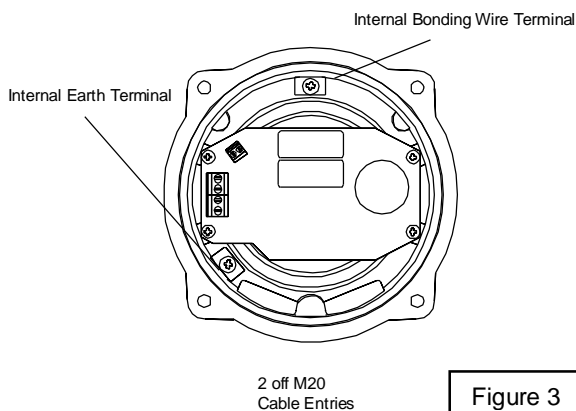
10) Cable Selection

When selecting the cable size consideration must be given to the input current that each unit draws (see table on page 2), 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 units connected to the line.

SAFETY WARNING: If the unit is 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.

11) Earthing

Both AC and DC 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 beacon 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 wire ensures that a good quality earth is maintained between the sounder section casting and the beacon section casting.

12) Cable Glands

The BExCA110-05D unit has 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 '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 BS EN 60079-14 : 1997.

SAFETY WARNING: If the unit is 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 'd' flameproof blanking plug, which must be suitably approved for the installation requirements.

13) Cable Connections

Before the Appello speech sounder is installed in a hazardous area, the required message to be broadcast should be recorded on the units, see section 14 of this instruction manual.

The combined Appello sounder / beacon unit BExCA110-05D has separate printed circuit boards in the Appello and beacon sections. The terminals for the Appello are on the electronics assembly in the Appello section and the terminals for the beacon are on the printed circuit board in the beacon section (see figures 4&5 and 6&7). See section 8 of this manual for access to the enclosure and the wiring diagrams at the end of this manual.

The Appello sounder and beacon sections can be wired to the same input supply, so that they operate simultaneously, or they can be wired to separate input supplies so they can be operated independently (see diagrams of pages 5 and 6 of this manual). If the sounder and beacon sections are connected to the same input supply, the incoming cables should be connected to the input terminals on the beacon board and the two connecting wires, that are supplied with the unit, should be used to link the supply from the interconnecting terminals on the beacon board down to the supply terminals in the Appello sounder section.

APPELLO SOUNDER CONNECTIONS

The cable connections are made into the terminal blocks on the electronic pcb assembly located in the flameproof enclosure. On the AC units a three-way fused terminal block is provided for the live and neutral mains supply lines (see figure 7). To gain access to the terminal block, remove the terminal cover by unscrewing the nylon nut. The earth terminal in the center of the three-way terminal block is provided for use when a message is being recorded, see section 14 of this instruction manual. The internal earth terminal in the cover should be used when installing the unit.

On the DC units a two-way terminal block is provided for +ve and -ve supply lines (see figure 6).

BEACON CONNECTIONS

The cable connections are made into the terminal blocks on the electronic pcb assembly located in the beacon section enclosure. A four-way terminal block is provided on both AC and DC beacons. Therefore there are two live terminals and two neutral terminals for the input and output wiring on AC units. On the DC units there are two +ve terminals and two -ve terminals for the input and output wiring.

Wires having a cross sectional area of up to 4mm² can be connected to each terminal way. When connecting wires to the terminals great care should be taken to dress the wires so that 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.

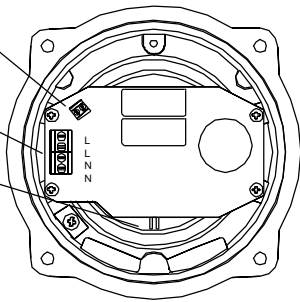
BExCS110-05D AC Beacon Section

Interconnecting Terminals to
sounder pcb (simultaneous mode of
operation)

AC Input
Terminals

Flip / Flop
Pin Header

Figure 4



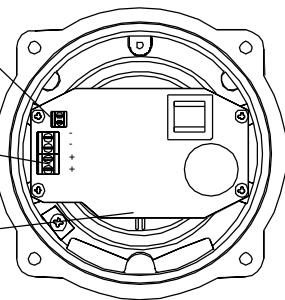
BExCS110-05D DC Beacon Section

Interconnecting Terminals to
sounder pcb (simultaneous mode of
operation)

DC Input
Terminals

Flip / Flop
Pin Header

Figure 5



- 5) Switch off the power supply.
- 6) Remove the pin header from the record pins R.
- 7) Check that the message has recorded correctly by switching on the power supply and the message should play back.

BExCA110-05D DC Appello Section

DC Terminals

Volume Control

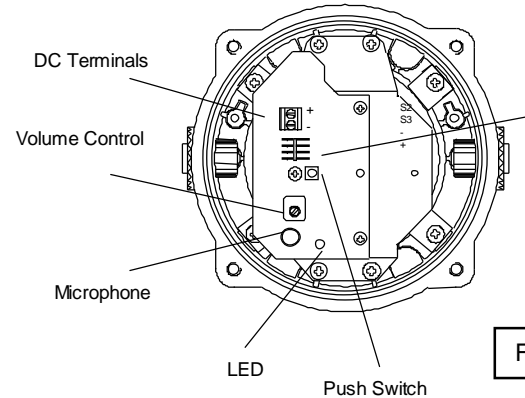
Microphone

LED

Push Switch

A
B
C
R
Tone and Record
Headers

Figure 6



BExCA110-05D AC Appello Section

Volume Control

Microphone

LED

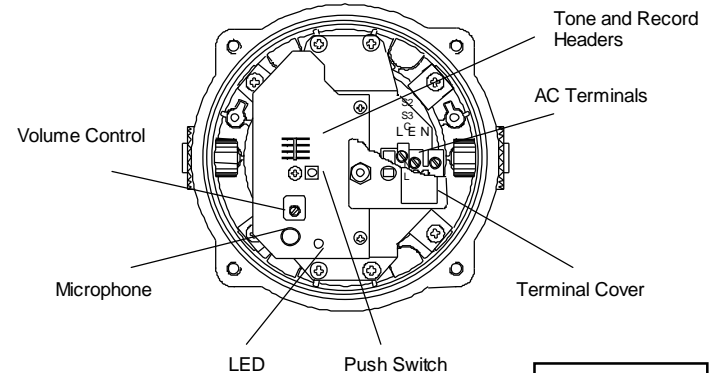
Push Switch

Tone and Record
Headers

AC Terminals

Terminal Cover

Figure 7



14) Recording a Message

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

To record a message the Appello section must be connected to an input supply voltage appropriate to the unit being used, i.e. 24V for DC units and either 230V or 115 V 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 earth terminal on the three-way terminal block and the Terminal Cover must be replaced before the supply to the unit is switched on (see figure 7).

- 1) Set the unit to the record mode by shorting out the record header pins marked R, (see figure 4).
- 2) Switch on the power supply to the unit.
- 3) 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.**
- 4) Release the push switch at the end of the message.

15) Volume Control

The BExCA110-05D Appello sounder section has a volume control to adjust the output level. To set the required output level, adjust the potentiometer on the pcb. For maximum output level the potentiometer should be set to the fully clockwise position.

16) End of Line Monitoring (DC Units)

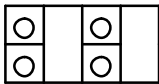
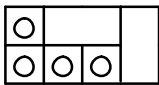
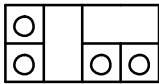
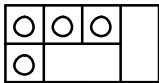
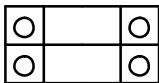
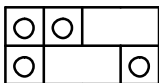
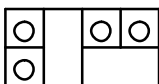
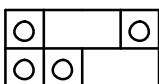
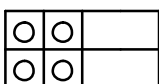
On BExCA120-05D DC units, dc reverse line monitoring can be used if required. All DC units have a blocking diode fitted in their supply input lines on both the Appello sounder section and the beacon section. An end of line monitoring diode or an end of line monitoring resistor can be connected across the +ve and -ve terminals. 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 min. wattage of 2 watts. If the Appello sounder and beacon sections are wired to separate power supplies then an end of line monitoring component can be used in each section.

17) Tone Selection

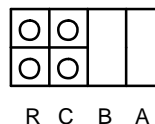
The message can be preceded by one of nine selectable tones or by a silence period of 0.5 seconds.

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.

TONE SELECTION TABLE

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

10



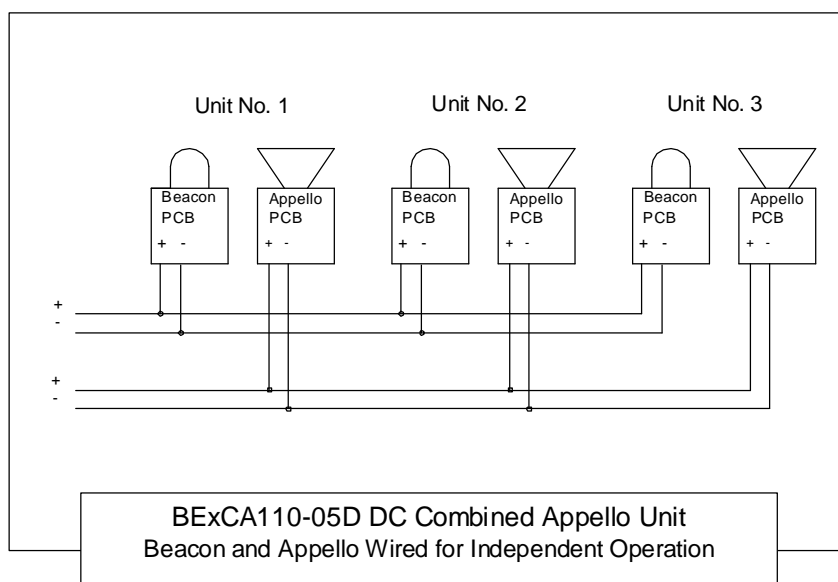
Silence 0.5sec gap
(speech only option)

18) Synchronised Operation

All BExCA110-05D units that are connected to the same supply line will have a synchronised flash rate at one flash every second. To ensure that the units will be synchronised check that the pin header is not fitted, i.e. the two header pins are not shorted together (see Figures 4 and 5).

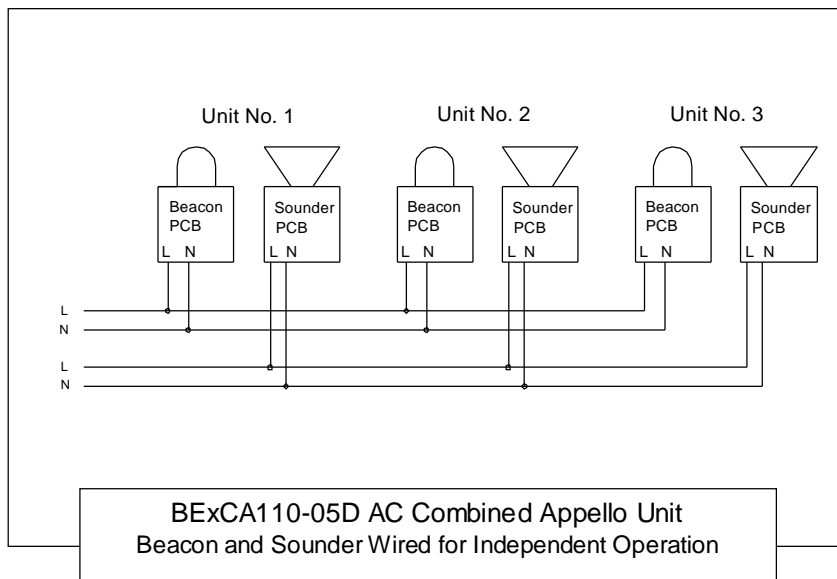
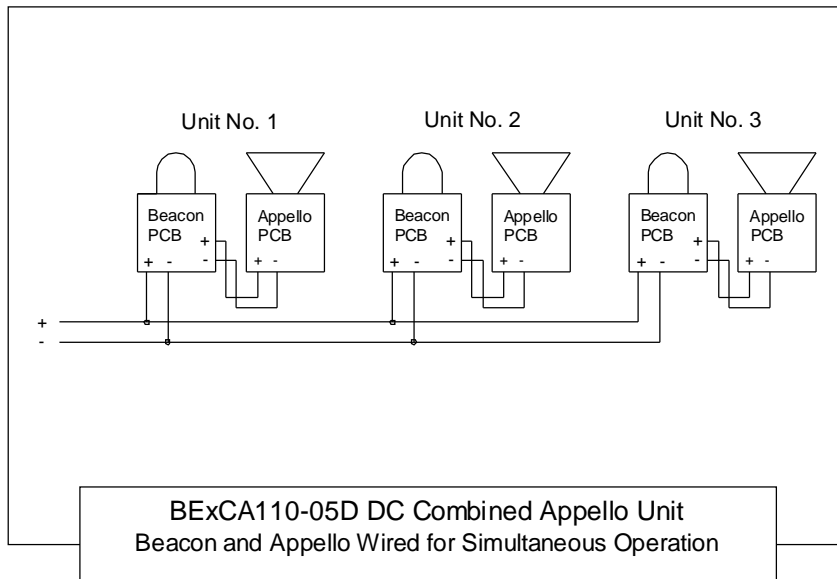
19) Flip / Flop Operation

Two units can be mounted close to each other to form a flip-flop operation, where the beacons will flash alternately. To achieve this mode of operation, fit a pin header to the flip-flop header pins on the electronics board, i.e. the two header pins are shorted together, (see figures 4 and 5) on one of the two beacons. The first flash on the beacon that has the header fitted will be delayed by ½ second. The two beacons will then flash alternately every ½ a second.



NOTE

Either the +ve or the -ve wire may be made common to both the appello and the beacon to reduce the number of cores in the cable.



NOTE
 Either the L or the N wire may be made common to both the sounder and the beacon to reduce the number of cores in the cable.

