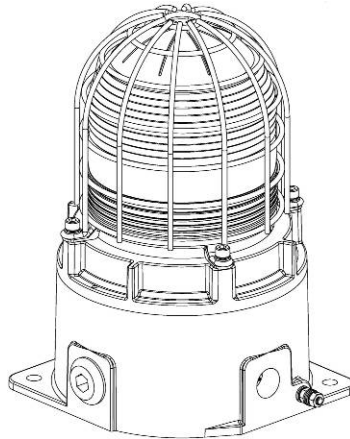


# INSTRUCTION MANUAL (ATEX / IECEx)

## STExB2X21 Flameproof Xenon Beacons

### For use in Flammable Gas and Dust Atmospheres



**STExB2X21**

### 1) Warning



- 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:-

Model No.           STExB2X21

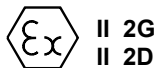
Input Voltage:     DC Units   24V or 48V  
                          AC Units   115V or 230V

STExB2X21 Codes:

Ex db IIC Gb T4 Ta -50°C to +65°C  
Ex db IIC Gb T3 Ta -50°C to +70°C  
Ex tb IIIC Db T135°C Ta -50°C to +70°C

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

Epsilon x  
Equipment Group and  
Category:



CE Marking  
Notified Body No.



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	450°C
T2	300°C
T3	200°C
T4	135°C (up to 65°C ambient for STExB2X21 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

**Maximum Surface Temperature for Dust Applications:**  
135°C

**IP Rating:** IP6X to EN/IEC60079-0 and IP66 to EN/IEC60529

**Equipment Category:** 2G/D

**Equipment Protection Level:** Gb, Gc, Db, Dc

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

### 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 beacon 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 STExB2X21 beacon can only be mounted with the beacon lens facing upwards or horizontal or positions in between. Mounting the beacon with the lens facing downward of horizontal is not permitted.

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 beacons should be made with due regard to the area over which the warning signal must be visible. They should only be fixed to services that can carry the weight of the unit.

The STEx beacons should be securely bolted to a flat surface using 9.0mm diameter bolt holes in the base of the unit. See figure 1.

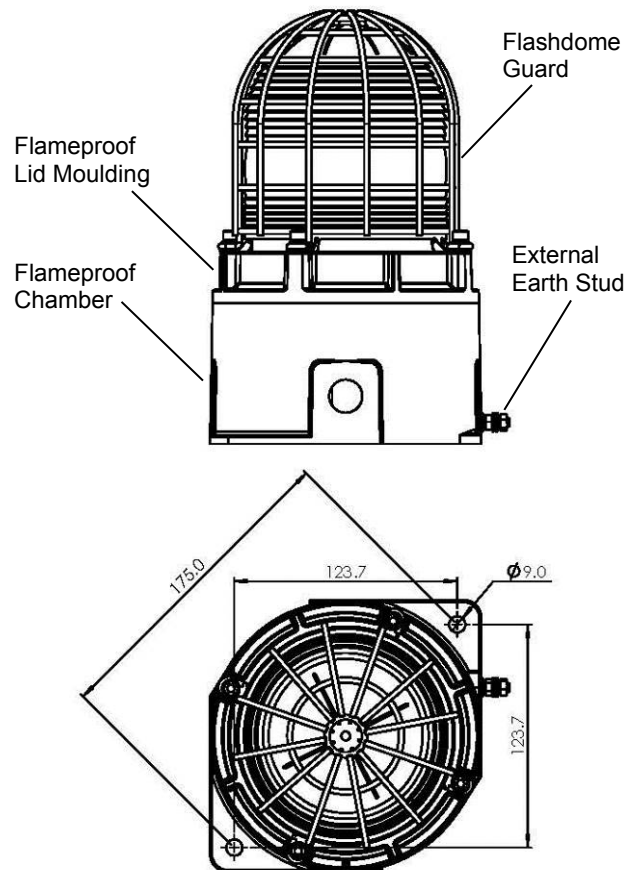


Fig. 1: Fixing Location for B2 Beacon

### 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 beacon 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 beacon cover. Open the enclosure by turning the beacon cover counterclockwise and remove the cover, taking extreme care not to damage the flameproof threads in the process (See figure 2).

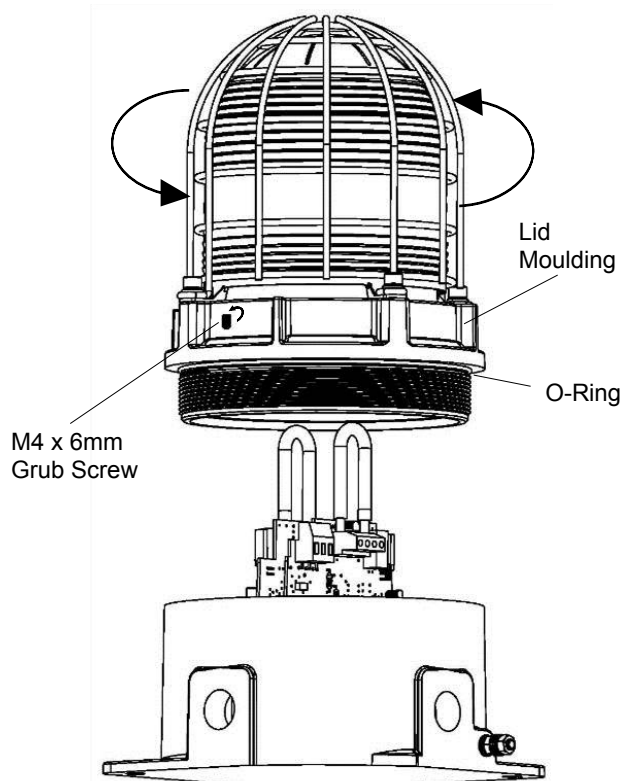


Fig. 2: Accessing the Explosion proof Enclosure

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. Flameproof threaded joints are not intended to be repaired. 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 beacon enclosure. Tighten the M4 grub screw.

## 8) Power Supply Selection

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

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

Model No.	Nominal Voltage	Voltage Range	Nominal Current
STExB2X21	24Vdc	20-28Vdc	944mA
STExB2X21	48Vdc	42-54Vdc	428mA
STExB2X21	115Vac	115Vac 50/60Hz	464mA
STExB2X21	230Vac	230Vac 50Hz	250mA

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

Nominal current at nominal voltage and 1Hz flash rate

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 beacons 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 beacons connected to the line.

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

### STExB2X21

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

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 Beacon 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 beacon 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 4mm<sup>2</sup> 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.

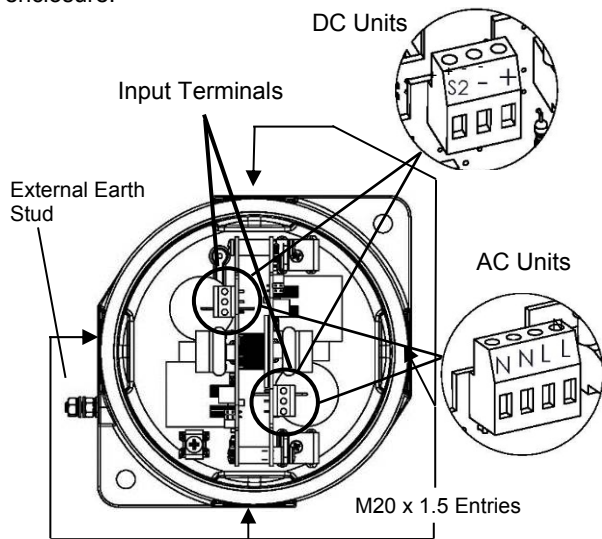


Fig. 3: STExB2X21 Entries and Terminal Block Location

Wires having a cross sectional area between 0.5 mm<sup>2</sup> to 2.5mm<sup>2</sup> 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 2.5mm<sup>2</sup>. 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 2.5mm<sup>2</sup>.

## 12) AC Wiring

2-off 4-way terminal blocks are provided on the AC Beacon. There are 4-off Live and 4-off Neutral terminals in total. The sets of 2-off terminal blocks are set up in such a way that one can be used for power input and the other power output to another beacon.

### 12.1 Wiring Diagram

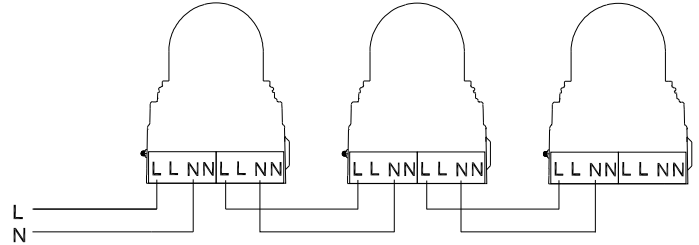


Fig. 4: STExB2X21AC Simplified Block Diagram

## 13) DC Wiring

2-off 3-way terminal blocks are provided on the DC Beacon. There are 2-off +ve, 2-off -ve terminals and 2-off S2 terminals in total. The sets of 2-off terminal blocks are set up in such a way that one can be used for power input and the other power output to another beacon.

### 13.1 Wiring Diagram

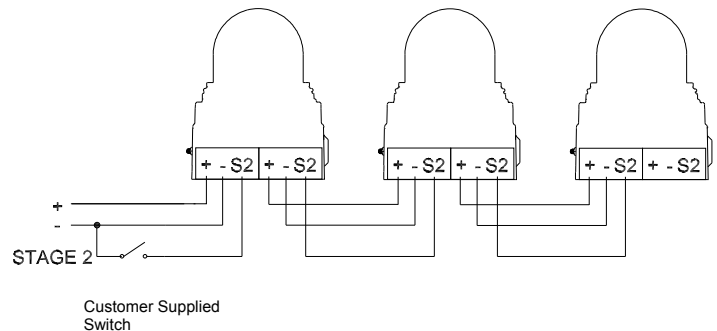


Fig. 5: STExB2X21DC Simplified Block Diagram

### 13.2 End of Line monitoring (DC Units)

On the STExB2X21 DC beacons, 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. 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.

## 14) Settings

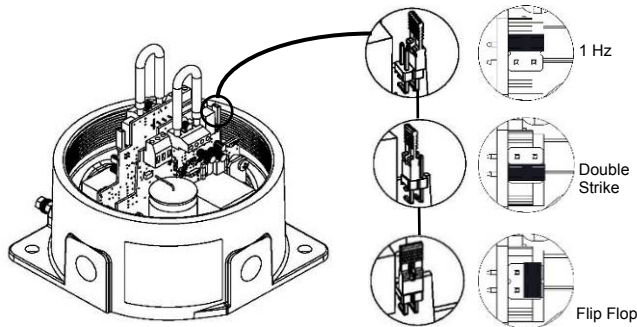
### 14.1 Flash Patterns



Warning – high-intensity light source. Avoid looking directly at the light source for extended periods of time.

The STExB2X21 beacons have two xenon tubes and can produce three different flash patterns as listed below. The flash patterns are set internally by the selection of pin headers. On the DC beacons the flash pattern set can be changed externally to produce a second stage by connecting terminal S2 to –ve supply line.

The AC beacons do not have a second stage.



Please Note: Only one of the twin PCBAs has mode header pins.

Fig. 6: Header Pin Orientation

Stage 1	Stage 2 (DC Units only)
1Hz	Double Strike
Double Strike	1Hz
Flip Flop	1Hz

### 14.1 Synchronised Operation

All STExB2X10/15 beacons that are connected to the same supply line and have the same flash pattern selected will have a synchronised flash rate, see Figure 6.

## 15) Interchangeable & Spare Parts



Warning – Hot surfaces. External surfaces and internal components may be hot after operation, take care when handling the equipment.

The beacon lens are interchangeable, contact European Safety Systems Ltd for a replacement lens available in various colours.

The guard is an integral part of the protection and must be reassembled exactly the same way as it was disassembled.

To change the lens, unscrew the M5 socket head screws and remove the M5 screws, M5 spring & flat washers.

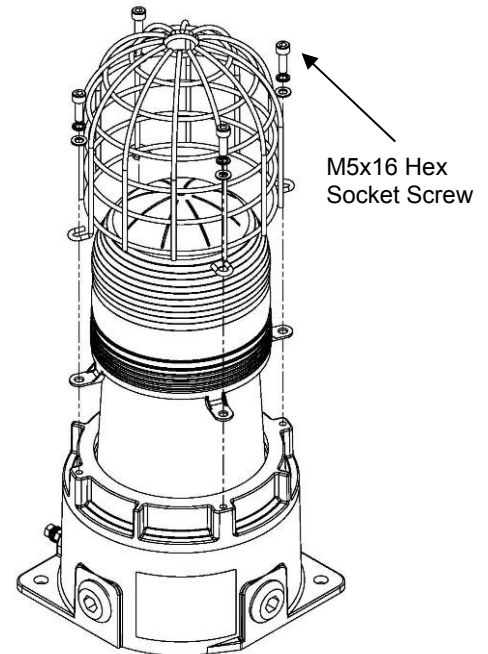


Fig 7. Removal of Lens

Remove the guard and replace the old lens with the new lens.

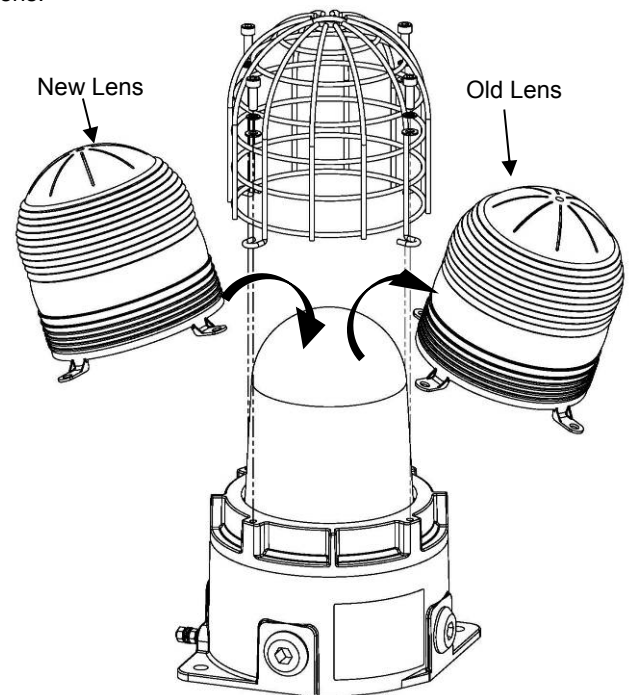


Fig 8. Changing of Lens

Fit the guard back on to the lens and casting, align the holes of the guard, lens and casting. To reattach the lens, the fixings MUST be in the order shown in figure 9.

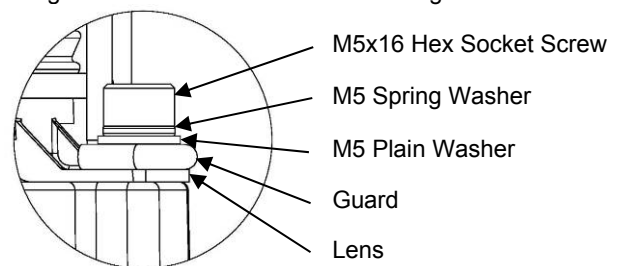


Fig 9. Lens & Guard fixings order

## 16) 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.