

1) Warnings



- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
- DO NOT OPEN WHEN ENERGISED
- POTENTIAL ELECTROSTATIC CHARGING HAZARD - CLEAN ONLY WITH A DAMP CLOTH
- DO NOT PAINT
- TO REDUCE THE RISK OF IGNITION OF HAZARDOUS ATMOSPHERES, THE FIRST CONDUIT RUN MUST HAVE A SEALING FITTING CONNECTED WITHIN 18 INCHES OF ENCLOSE. SUBSEQUENT CONDUIT RUNS 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.
- TO PREVENT IGNITION OF GROUP A, B, C AND D ATMOSPHERES - SEE INSTRUCTION FOR CHEMICAL COMPATIBILITY

Avertissement:

- NE PAS OUVRIR UN PRESENCE D'ATMOSPHERE EXPLOSIVE
- NE PAS OUVRIR ENERGIE
- DANGER POTENTIEL CHARGE ÉLECTROSTATIQUE - NETTOYER UNIQUEMENT AVEC UN CHIFFON HUMIDE
- NE PAS PEINTURER
- POUR RÉDUIRE LE RISQUE D'INFLAMMATION DES ATMOSPHÈRES DANGEREUSES, LE PREMIER CONDUIT DE CONDUIT DOIVENT AVOIR UN RACCORD D'ÉTANCHÉITÉ RACCORDÉ À MOINS DE 18 POUCHES DE L'ENFERMEMENT. POUR SUBSÉQUENT LES CONDUITES DE CONDUIT LA DISTANCE ENTRE LA SURFACE DE LA MASSE DE REMPLISSAGE AU PLUS PRÈS DE L'ENVELOPPE DOIT ÊTRE AUSSI PETITE QUE CE QUI EST RÉALISABLE MAIS EN AUCUN CAS SUPÉRIEURE À LA PLUS PETITE DES DIMENSIONS CORRESPONDANT À LA TAILLE DU CONDUIT OU À 50 MM.
- POUR PRÉVENIR L'INFLAMMATION DES ATMOSPHÈRES DES GROUPES A, B, C ET D-VOIR L'INSTRUCTION POUR LA COMPATIBILITÉ CHIMIQUE

2) Rating & Marking Information

2.1 NEC & CEC Class / Division Ratings for US / Canada

The D1xB2LD2 LED beacons comply with the following standards:

UL 1203 (Ed. 5) 2015
CSA C22.2 No. 30-M1986 (Ed. 1) 2003
CSA C22.2 No. 25 (Ed. 4) 2017
CSA C22.2 No. 205 (Ed. 3) 2017

The D1xB2LD2 LED Beacon is rated as follows:

Class I Div 1 Group ABCD T5 Ta -55°C to +80°C
Class I Div 1 Group ABCD T6 Ta -55°C to +75°C
Class II Div 1 Group EFG T5 Ta -55°C to +80°C
Class III Div 1 Ta -55°C to +80°C

Installation must be carried out in compliance with the National Electric Code / Canadian Electric Code

2.2 NEC Class / Zone ratings US

The D1xB2LD2 LED beacons comply with the following standards:

UL 60079-0-2013
UL 60079-1-2015
UL 60079-31-2015

The D1xB2LD2 LED Beacon is rated as follows:

Class I Zone 1 AEx db IIC T5 Ta -55°C to +80°C
Class I Zone 1 AEx db IIC T6 Ta -55°C to +70°C
Zone 21 AEx tb IIIC T100°C Ta -55°C to +80°C

Installation must be carried out in compliance with the National Electric Code.

2.3 CEC Class / Zone ratings Canada

The D1xB2LD2 LED beacons comply with the following standards:

CAN/CSA C22.2 No. 60079-0-2015
CAN/CSA C22.2 No. 60079-1-2016
CAN/CSA C22.2 No. 60079-31-2015

The D1xB2LD2 LED Beacon is rated as follows:

Ex db IIC T5 Ta -55°C to +80°C
Ex db IIC T6 Ta -55°C to +70°C
Ex tb IIIC T100°C Ta -55°C to +80°C

Installation must be carried out in compliance with the Canadian Electric Code

2.4 ATEX / IECEx certification

The D1xB2LD2 LED beacons comply with the following standards:

EN IEC60079-0:2018 / IEC60079-0:2017 (Ed 7)
 EN60079-1:2010 / IEC60079-1: ed. 7.0 (2014-06)
 EN60079-31:2014 / IEC60079-31:2013 ed. 2.0 (2013-11)

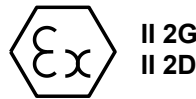
The D1xB2LD2 LED Beacon is rated as follows:

Ex db IIC T5 Gb Ta -55°C to +80°C
 Ex db IIC T6 Gb Ta -55°C to +70°C
 Ex tb IIIC T100°C Db Ta -55°C to +80°C

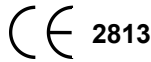
For D1xB2LD2AC230 units, the certification approval has validated continuous use up to 38°C ambient and are for transient use up to 80°C ambient

Certificate No. DEMKO 19 ATEX 2009X
 IECEx ULD 19.0006X

ATEX Mark, 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
T5	100°C
T6	85°C (up to 70°C ambient)

Dust Groupings:

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

Maximum Surface Temperature for Dust Applications:
 100°C

Equipment Category: 2G / 2D

Equipment Protection Level: Gb, Gc, Db, Dc
Ambient Temperature Range: -55°C to +80°C

2.5 Ingress Protection Ratings

The product is rated for ingress Protection as follows:

IP rating per EN60529: IP66
 Type rating per UL50E / NEMA250: 4 / 4X / 3R / 13

Suitable for exposure to Acetone, Ammonium Hydroxide, Diethyl Ether, Ethyl Acetate, Ethylene Dichloride, Furfural, n-hexane, Methyl Ethyl Ketone, Methanol, 2-NitroPropane and Toluene.

To maintain the ingress protection rating, the cable entries must be fitted with suitably rated, certified cable entry and/or blanking devices during installation.

2.6 Electrical Ratings

Model	Nom. Voltage	Voltage Range	Nom. operating current#	MaX. Operating Current
D1xB2LD2DC024	24Vdc	18-30Vdc	230mA	500mA
D1xB2LD2AC115	115Vac	110-120Vac	95mA	180mA
D1xB2LD2AC230	230Vac	220-240Vac	50mA	100mA

#Rated at 1Hz

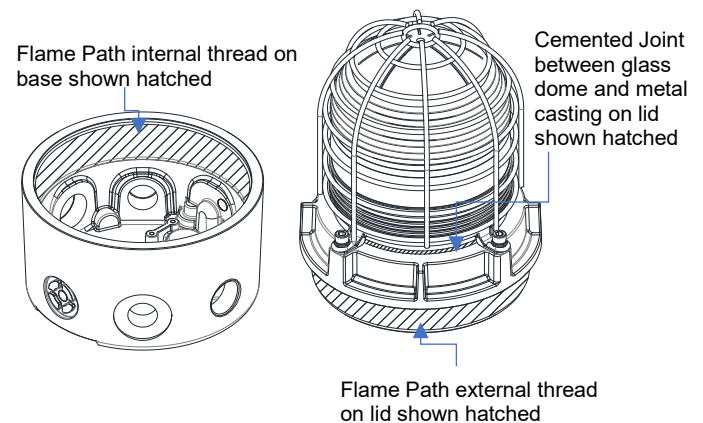
Table 1: Electrical Ratings

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

The input current will vary according to the voltage input level.

3) Special Conditions of Use

The enclosure coating is non-conductive and 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 (such as high pressure steam) which might cause a buildup of electrostatic charges on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.



4) Installation

There are no restrictions on unit orientation.

The junction box 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.

4.1 Safe Installation Requirements:

To maintain the ingress protection rating and mode of protection, the cable entries must be fitted with suitably certified cable entry and/or blanking devices during installation. If conduit is used for installation, seal conduit within 18 inches from the first enclosure, subsequent conduit runs 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 entries are fitted with adaptors they must be suitably certified for the application. Fitting of blanking elements into adaptors is not permitted.

Check that the 'O' ring seal is in place before replacing the explosionproof cover.

Lens guard must be fitted for Class Division installations.

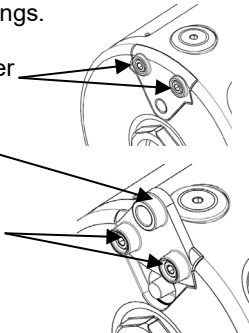
5) Location and Mounting

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

The D1xB2LD2 beacon can be mounted using one of three methods.

1. The beacon can be surface mounted by removing, rotating and reinstalling the stowed mounting lugs. These are suitable for 6mm diameter fixings.

- a. Remove 2 x M5 fasteners per mounting lug
- b. Reverse and rotate lug and reseal onto enclosure
- c. Secure lug using the 2 x M5 Fasteners



2. Alternatively the beacon can be conduit mounted using the 3/4" NPT entry on the base of the unit.
3. Additionally, the beacon can be mounted using the ratchet adjustable stainless-steel wall bracket assembly. This is available as an accessory – part code: SP77-0001.

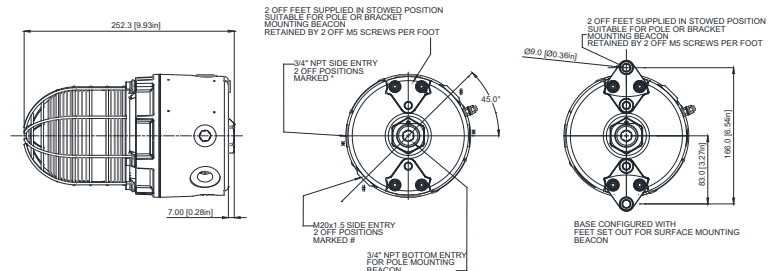


Fig. 1 Fixing Location for Beacon

6) Access to the 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 open the explosion proof enclosure. Loosen the locking grub screw in the cover and then remove the glass dome cover assembly to gain access to the chamber. This can be achieved by unscrewing the glass dome cover, taking extreme care not to damage the threads when doing so.

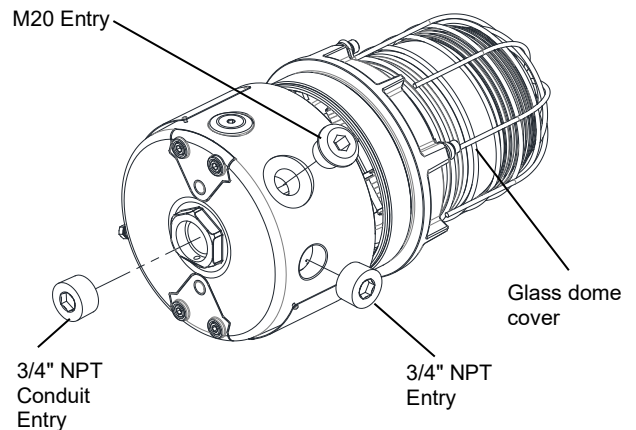


Fig. 2 Accessing the Enclosure.

On completion of the installation the flameproof threads should be inspected to ensure that they are clean and that they have not been damaged during installation. Ensure the O-ring seal is in place and undamaged.

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.

7) 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 section 12), 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.

The entries are 2-off M20 x 1.5 thread & 3-off 3/4" NPT thread

If a high IP (Ingress Protection) rating is required then a suitable sealing washer must be fitted under the cable glands or blanking plugs.

For use in explosive dust atmospheres, a minimum ingress protection rating of IP6X must be maintained.

For use in explosive gas atmospheres, a minimum ingress protection rating of IP54 must be maintained.

NPT plugs should be greased before insertion.

For high ambient temperatures the cable entry temperature or the cable branching point temperature may exceed 60°C and therefore suitable heat resisting cables and cable glands must be used, with a rated service temperature of at least the values stated below:

Max Ambient temperature (°C)	50	55	60	65	70	75	80
Req. cable gland rating (°C)	65	70	75	80	85	90	95

8) Cable Connections

The units have 2-off M20 x 1.5 threaded entries and 3-off 3/4" NPT x 14 threaded entries.

Electrical Connections are to be made into the terminal blocks using solid or stranded wire, sizes 0.5-2.5mm² / AWG 20-14. Wire insulation needs to be stripped 6-7mm. Wires may be fitted securely with crimped ferrules. Terminal screws need to be tightened down with a tightening torque of 0.4 Nm / 3.5 Lb-in.

See section 5 of this manual for access to the enclosure.

9) Wiring

6-way terminal block is provided on the beacons for power. The DC units have 2-off +ve, 2-off -ve, a stage 2, a stage 3 and an Earth terminal.

9.1 Wiring Diagrams

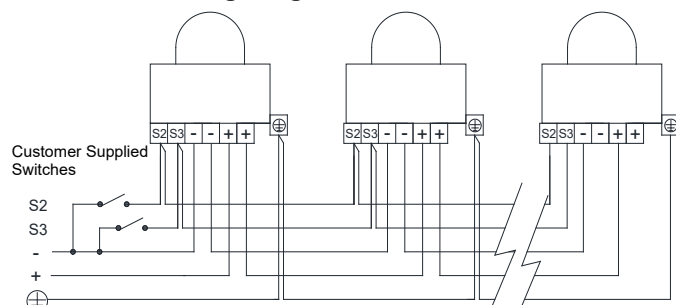


Fig. 3 D1xB2LD2DC024 Simplified Block Diagram

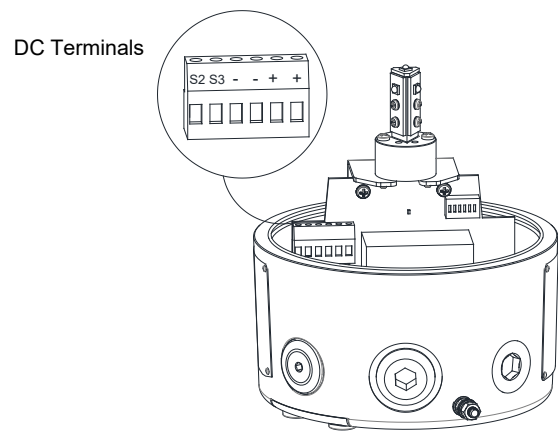


Fig. 4 D1xB2LD2DC024 Terminals

The AC units have 2-off Live, 2-off Neutral and 2-off Earth terminals.

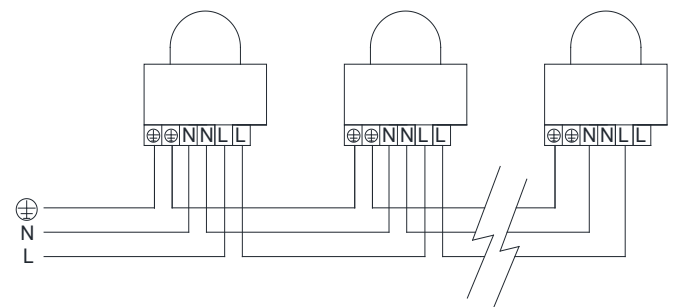


Fig. 5 D1xB2LD2AC Simplified Block Diagram

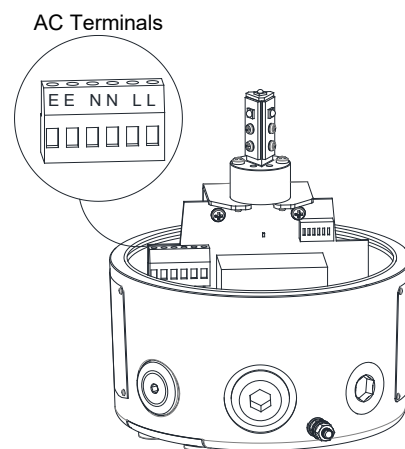


Fig. 6 D1xB2LD2AC Terminals

9.2 Line Monitoring

On the D2xB1X unit, DC reverse line monitoring can be used if required.

All DC beacons have a blocking diode fitted in their supply input lines. An end of line monitoring resistor can be connected across the +ve and -ve terminals in the explosion proof enclosure. If an end of line resistor is used it must have the following values:

Minimum resistance 3K3 Ohms Minimum Power 0.5W
 Minimum resistance 500 Ohms Minimum Power 2.0W

The resistor must be connected directly across the +ve and -ve terminals as shown in the following drawing. Form the resistor legs as shown in Fig. 7a, fit the resistor across the two terminals, as shown in Fig. 7b.

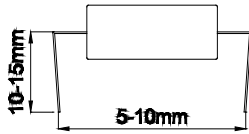


Fig. 7a End of Line Resistor Forming

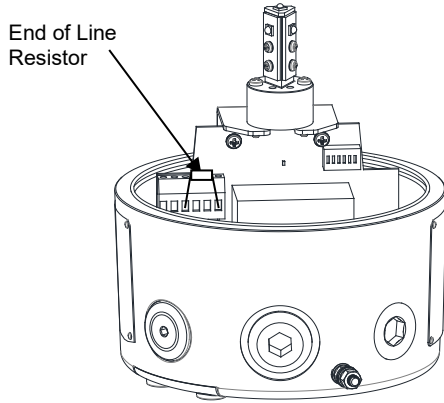


Fig. 7b End of Line Resistor Placement

10) Settings

10.1 Flash Rate Setting



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

The D1xB2LD2 beacon can produce different flash patterns as shown in Table 1. The flash patterns are selected by operation of the flash setting DIP switch on the PCB, Fig 8.

Switch Setting (123456)	S1 Mode	S2 Mode	S3 Mode
000000	Steady High Power	Flashing 1Hz	Flashing Triple Strike
000001	Steady Low Power	Flashing 1Hz	Flashing Triple Strike
100000	Flashing 1Hz	Flashing Double Strike	Flashing Triple Strike
101000	Flashing 1.5Hz	Flashing 2Hz	Flashing Double Strike
010000	Flashing 2Hz	Flashing Triple Strike	Flashing Triple Strike
110000	Flashing Double Strike	Steady High Power	Flashing Triple Strike
001000	Flashing Triple Strike	Flashing 2Hz	Flashing Double Strike

Fig. 8 Dip Switch
 1=ON; 0=OFF
 Example shown:
 100000 = Flashing 1Hz
 (Default setting)

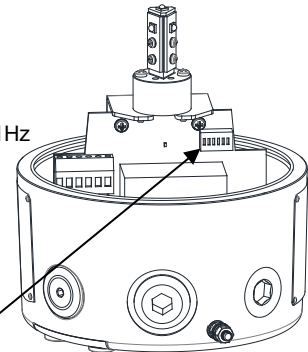
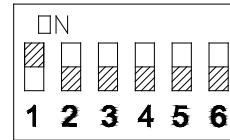


Fig. 8 DIP Switch location

11) Earthing

The unit has an external and an internal earth terminal, (please see fig 9).

Internal earthing connections should be made to the internal Earth terminal in the base of the housing using a ring crimped 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.

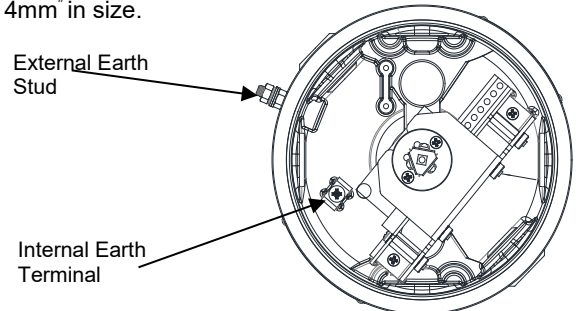


Fig. 9: Internal & External Earth Locations

12) Maintenance, Overhaul & 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

To avoid a possible ELECTROSTATIC CHARGE the unit must only be cleaned with a damp cloth.

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

Flameproof joints are not intended to be repaired.

13) 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 cover is interchangeable, contact E2S Ltd for a replacement lens cover available in various colours.

To change the lens cover, unscrew the 4-off M5 socket head screws, spring and flat washers using a 4mm Hex key. Remove the wire guard and replace the old lens cover with the new lens cover.

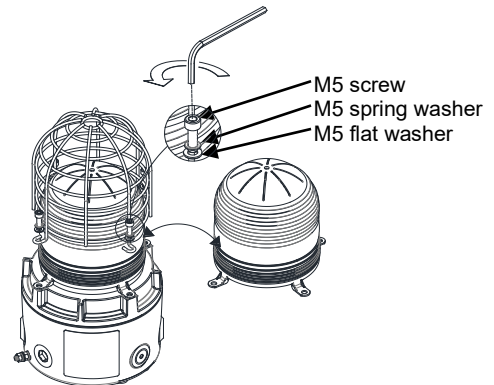


Fig. 10 Replacement of beacon lens cover

Fit the wire guard back onto the housing, over the new lens cover aligning the fixing holes of the guard, lens cover and housing. Refit the fixings to hold into place, the fixings MUST be fitted in the order shown above.