

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

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 PENINTURER

2) Rating & Marking Information

2.1 Public Mode Fire Alarm Ratings

The D2xB1LD3DC024 is certified for use as a public mode visual alarm device in accordance with UL1971 Third Edition and UL1638 Fifth Edition / CAN/ULC-S526 Fourth Edition.

For light output ratings see section 12.

For use in public-mode fire alarm systems the beacon must be installed without the wire guard or plastic lens cover.

Testing of synchronization requirements of UL1971 & UL1638 / CAN/ULC-S526 were conducted by UL using a total of 6 units connected to the same wire run. Auto-synchronization does not require the use of any external sync modules or protocols. Providing the correct cable has been selected (see section 6) an unlimited number of units will remain synchronized when powered from the same source.

2.2 Private Mode Fire Alarm Ratings

All models are approved for use as a Visual Appliance for use in Private Mode Fire Alarm Systems in accordance with UL1638 Fifth Edition / CAN/ULC-S526 Fourth Edition.

For use in private-mode fire alarm systems the beacon must be installed without the wire guard or plastic lens cover. For light output ratings see section 12.

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

The D2xB1LD3 LED beacon complies with the following standards:

UL1971 Ed. 3 2018
 UL1638 Ed. 5 2017 / CAN/ULC-S526 Ed. 4
 CSA C22.2 No. 205-17
 ANSI/ISA 12.12.01-2015
 CSA C22.2 No. 213-16

The D2xB1LD3 LED beacon is rated as follows:

Class I Div 2 ABCD T4 Ta -40°C to +50°C
 Class II Div 2 FG T6 Ta -40°C to +50°C
 Class III Div 1&2 Ta -40°C to +50°C

The certification approval has validated continuous use up to 38°C and are for transient use up to 50°C ambient.

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

2.4 NEC Class / Zone ratings US

The D2xB1LD3 LED beacon complies with the following standards:

UL 60079-0-2017
 UL 60079-15-2017
 UL 60079-31-2015

The D2xB1LD3 LED beacon is rated as follows:

Class I Zone 2 AEx nA IIC Gc T4 Ta -40°C to +50°C
 AEx tc IIIC 75°C Dc Ta -40°C to +50°C

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

2.5 CEC Class / Zone ratings Canada

The D2xB1LD3 LED beacon complies with the following standards:

CAN/CSA C22.2 No. 60079-0:2015
 CAN/CSA C22.2 No. 60079-15:2016
 CAN/CSA C22.2 No. 60079-31:2015

The D2xB1LD3 LED beacon is rated as follows:

Ex nA IIC Gc X T4 Ta -40°C to +50°C
 Ex tc IIIC 75°C Dc X Ta -40°C to +50°C

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

2.6 ATEX / IECEx certification

The D2xB1LD3 LED beacon complies with the following standards:

EN60079-0:2012+A11:2013 / IEC60079-0: ed. 6.0 (2011-06)
EN60079-15:2010 / IEC60079-15: ed. 4.0 (2010-01)
EN60079-31:2014 / IEC60079-31:2013 ed. 2.0 (2013-11)

Certificate No. DEMKO 14 ATEX 4786493904X
IECEx ULD 14.0004X

The D2xB1LD3 LED beacon is rated as follows:



II 3G Ex nA IIC T4 Gc Ta -40°C to +50°C
II 3D Ex tc IIIC 75°C Dc Ta -40°C to +50°C

CE Marking



Zones, Gas / Dust Groups and Temperature Classification

When connected to an approved system the D2XB1LD3 LED beacon may be installed in:

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.

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.

May be used with gases in groups:

Group IIA	propane
Group IIB	ethylene
Group IIC	hydrogen / acetylene

Having a temperature classification (for Gas applications) of:

T1	450°C
T2	300°C
T3	200°C
T4	135°C

May be used with Dust types:

Group IIIA	combustible flyings
Group IIIB	non-conductive dust
Group IIIC	conductive dust

Maximum Surface Temperature for Dust Applications:

75°C

Installation must be carried out in compliance with the latest issue of the following 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

2.7 Ingress Protection Ratings

The product is rated for ingress Protection as follows:

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

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

2.8 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. The current levels shown above are for the worst-case input voltage and flash setting resulting in max. current.

For detailed current ratings of the device please see Section 13.

3) Special Conditions of Use

Special Condition for safe Use as stated on the Type Examination Certificate DEMKO 14 ATEX 4786493904X / CoC/IECEx ULD 14.0004X:

When used for a Group III application, the surface of the enclosure may store electrostatic charge and become a source of ignition in applications with a low relative humidity <~30% relative humidity where the surface is relatively free of surface contamination such as dirt, dust, or oil.

Guidance on protection against the risk of ignition due to electrostatic discharge can be found in EN TR50404 and IEC TR60079-32.

End user shall adhere to the manufacturer's installation and instruction when performing housekeeping to avoid the potential for hazardous electrostatic charges during cleaning, by using a damp cloth.

To maintain the ingress protection rating and mode of protection, the cable entries must be fitted with suitably rated, certified cable entry and/or blanking devices during installation. If conduit is used for installation, seal conduit within 18 inches from the enclosure.

4) 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 D2xB1LD3 beacon should be secured to any flat surface using the two 7mm fixing holes in the feet of the base. The 2-off mounting feet supplied with the unit must first be fitted to the base using the 2-off M5 X 8mm countersunk screws provided. Additional feet are available as spare parts if required. The unit can also be pole mounted using the 3/4" NPT Entry in the centre of the base. See Fig. 1.

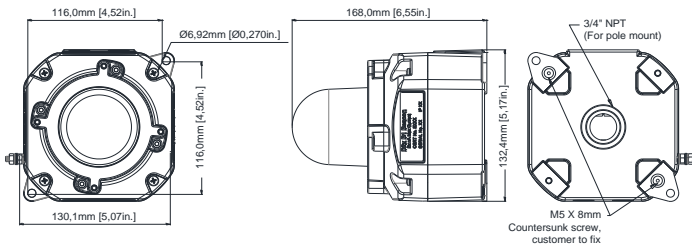


Fig. 1 Fixing Locations

5) 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.

To access the enclosure, loosen the four M4 posi pan head screws and withdraw the cover.

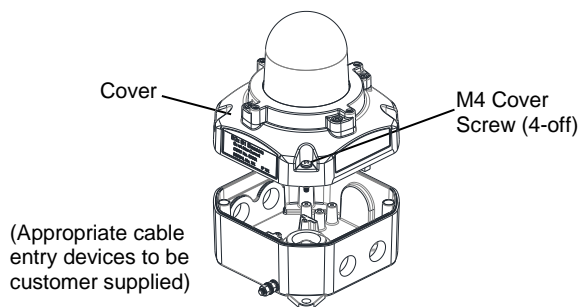


Fig. 2 Accessing the Enclosure.

To replace cover, check that the 'O' ring seal is in place. Carefully push the cover in place. Insert M4 screws with fibre washers and tighten to 3Nm torque.

6) 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 4), 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 sounders connected to the line.

When selecting the cable size consideration must be given to the voltage drop over the length of the cable run to ensure the min. input voltage at the point of use (voltage range, see section 13)

The voltage drop depends on:

- The total current draw of the devices installed on this cable run
- The wire size and total length of the cable run, determining the total resistance of this cable run
- The minimum output voltage supplied by the power supply

The voltage drop and input voltage at the point of use can be calculated as follows:

Total Wire resistance =
Wire resistance / 1000ft x length of cable run x 2
(length of cable run needs to be multiplied by two to account for two wires going to and from the unit)

Total current draw =
Current draw per unit x number of units

Voltage Drop = Total current draw x Total wire resistance

Minimum output of power supply =
Min. voltage at point of use + voltage drop

The entries are as follows:

2-off M20 x 1.5 thread, 2-off 1/2" NPT thread & 1-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.

7) Cable Connections

Electrical connections are to be made into the terminal blocks on the PCBA located in the enclosure. See section 5 of this manual for access to the enclosure.

Wires having a cross sectional area between 0.5 mm² to 2.5mm² can be connected to each terminal way. If an input and output wire is required the 2-off +/- 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 2.5mm². Strip wires to 8mm. Wires may also be fitted using ferrules. Terminal screws need to be tightened down with a tightening torque of 0.56 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 2.5mm².

8) Wiring

2-off 2-way terminal blocks are provided on the beacon for power. There are 2-off +ve & 2-off -ve terminals in total.

8.1 Wiring Diagrams

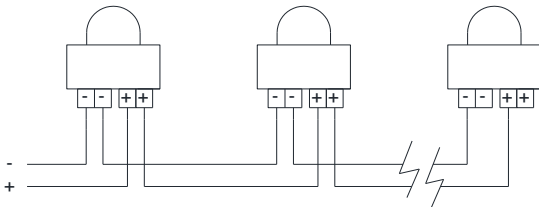


Fig. 3 D2xB1LD3 DC Simplified Block Diagram

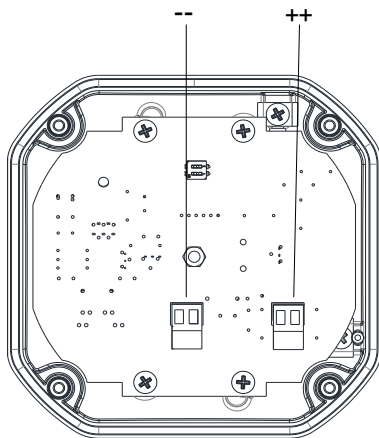


Fig. 4 D2xB1LD3 Terminals

8.2 Line Monitoring

DC reverse line monitoring can be used if required. All 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. If an end of line resistor is used it must have the following values:

24V DC applications

Minimum resistance 3K9 Ohms	Minimum Power 0.5W
Minimum resistance 1K Ohms	Minimum Power 2.0W

The resistor must be connected directly across the +ve and -ve terminals as shown in Fig. 5a, remove the +ve and -ve terminal plugs and fit the resistor across the two terminal plugs before refitting them to the PCBA as shown in Fig. 5b. A spacing of at least 1/16" (1.58mm) must be provided through air and over surfaces between uninsulated live parts.

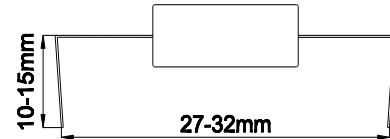


Fig. 5a End of Line Resistor Forming

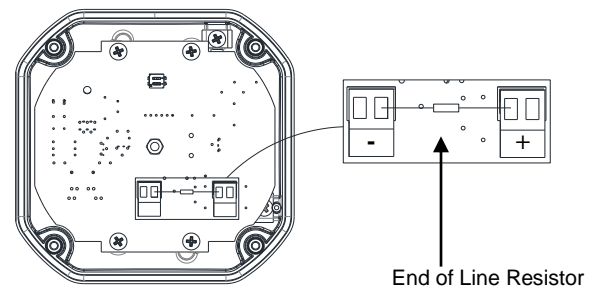


Fig. 5b End of Line Resistor Placement

9) Earthing

The unit has both internal and external earth points, (please see fig 6).

Internal earthing connections should be made to the internal earth point on the PCBA, (please see fig 6). The earth conductor should be at least equal in size and rating to the incoming power conductors. The internal earth bonding wire connects the cover earth point to the internal earth terminal in the base.

External earth 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. The external earth crimp ring should be located between the two M5 plain washers provided and securely locked down with the M5 spring washer and M5 nut.

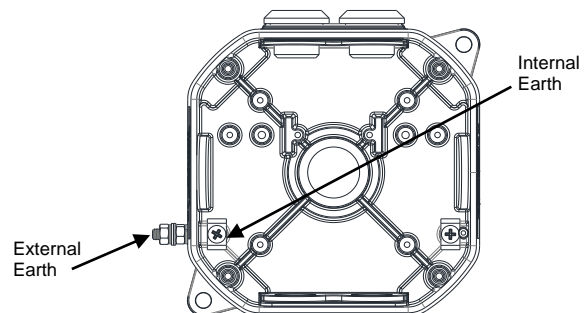


Fig 6 Earth locations

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 D2xB1LD3 beacons 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 7.

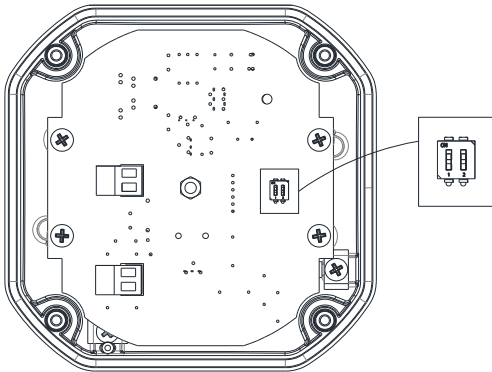


Fig. 7: DIP Switch Location

Switch Setting	Mode
00	1Hz (60FPM)
01	1.33Hz (80FPM)
10	1.5Hz (90FPM)
11	2Hz (120FPM)

1=ON; 0=OFF

Table 1: Switch Positions for Flash Patterns

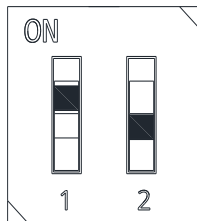


Fig. 8 Dip Switch
(Example shown: 01 = Flashing 1.33Hz)

11) 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:

IEC/EN60079-19 Explosive atmospheres - Equipment repair, overhaul and reclamation
IEC/EN60079-17 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 prior to opening the unit.

12) Light output for Fire alarm use

In order to meet the requirements for UL1971, (D2xB1LD3DC024 only when used without plastic lens cover or wire guard), the installation must be carried out to the correct NFPA standards and guidelines.

12.1 Horizontal Light Output Dispersion for wall mounting – public mode

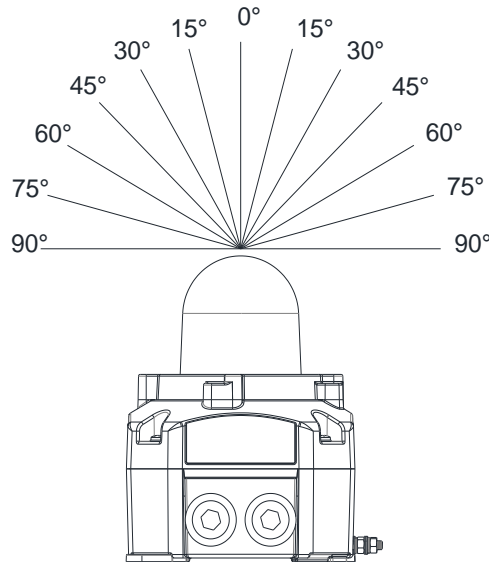


Fig. 9 – Horizontal dispersion angles for wall mounting

Table 2 - Horizontal Light Output Dispersion for Wall Mounting					
Viewing Angle	% of Rating	Intensity (cd) at 1Hz flash rate	Intensity (cd) at 1.33Hz flash rate	Intensity (cd) at 1.5Hz flash rate	Intensity (cd) at 2Hz flash rate
0°	100	80.1	77.1	77.3	82.1
5°	90	72.1	69.4	69.5	73.9
10°	90	72.1	69.4	69.5	73.9
15°	90	72.1	69.4	69.5	73.9
20°	90	72.1	69.4	69.5	73.9
25°	90	72.1	69.4	69.5	73.9
30°	75	60.1	57.8	58.0	61.6
35°	75	60.1	57.8	58.0	61.6
40°	75	60.1	57.8	58.0	61.6
45°	75	60.1	57.8	58.0	61.6
50°	55	44.1	42.4	42.5	45.2
55°	45	36.0	34.7	34.8	37.0
60°	40	32.0	30.8	30.9	32.9
65°	35	28.0	27.0	27.0	28.8
70°	35	28.0	27.0	27.0	28.8
75°	30	24.0	23.1	23.2	24.6
80°	30	24.0	23.1	23.2	24.6
85°	25	20.0	19.3	19.3	20.5
90°	25	20.0	19.3	19.3	20.5
45° Compound	24	19.2	18.5	18.5	19.7

12.2 Vertical Light Output Dispersion for wall & ceiling mounting – public mode

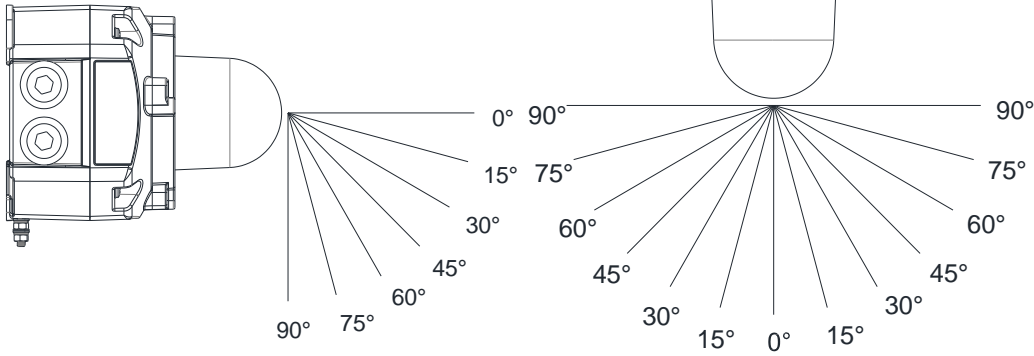


Fig 10 – Vertical dispersal angles for wall mounting X & Y planes

Fig 11 – Vertical dispersal angles for ceiling mounting X & Y planes

Table 3 – Vertical Light Output Dispersion for Wall & Ceiling Mounting					
Viewing Angle	% of Rating	Intensity (cd) at 1Hz flash rate	Intensity (cd) at 1.33Hz flash rate	Intensity (cd) at 1.5Hz flash rate	Intensity (cd) at 2Hz flash rate
0°	100	80.1	77.1	77.3	82.1
5°	90	72.1	69.4	69.5	73.9
10°	90	72.1	69.4	69.5	73.9
15°	90	72.1	69.4	69.5	73.9
20°	90	72.1	69.4	69.5	73.9
25°	90	72.1	69.4	69.5	73.9
30°	75	60.1	57.8	58.0	61.6
35°	75	60.1	57.8	58.0	61.6
40°	75	60.1	57.8	58.0	61.6
45°	75	60.1	57.8	58.0	61.6
50°	55	44.1	42.4	42.5	45.2
55°	45	36.0	34.7	34.8	37.0
60°	40	32.0	30.8	30.9	32.9
65°	35	28.0	27.0	27.0	28.8
70°	35	28.0	27.0	27.0	28.8
75°	30	24.0	23.1	23.2	24.6
80°	30	24.0	23.1	23.2	24.6
85°	25	20.0	19.3	19.3	20.5
90°	25	20.0	19.3	19.3	20.5
45° Compound	24	19.2	18.5	18.5	19.7

All light output ratings min. values as per UL 1971 / UL1638 / CAN/ULC-S526 at worst-case (min.) input voltage.

12.3 On-axis light output rating – private mode

Model	Accessories	Intensity (cd) @ 1Hz
D2xB1LD3DC024	No Guard, No Lens	112.5

13) Electrical Ratings

13.1 Operating current Consumption

Table 4 – Electrical Ratings					
Model	Nom. Voltage	Voltage Range	Flash Rate Setting	Nom. operating current [#]	Max. operating current ^{##}
D2xB1LD3DC024	24Vdc	Regulated (16-33Vdc)*	1Hz (60fpm)	153mA	465mA
			1.33Hz (80fpm)	189mA	488mA
			1.5 Hz (90fpm)	203mA	456mA
			2Hz (120fpm)	248mA	528mA

* For Public Mode or private mode Fire Alarm use

nominal rms current at nominal voltage

max. rms current at worst-case voltage in voltage range.

13.2 Surge current for Fire Alarm system use

Table 5 – Surge Currents					
Model	Nom. Voltage	Voltage Range	Flash Rate Setting	Init. Peak Surge Current*	Init. RMS Surge Current*
D2xB1LD3DC024	24Vdc	Regulated (16-33Vdc)	1Hz (60fpm)	1.18A	950mA
			1.33Hz (80fpm)	1.22A	998mA
			1.5Hz (90fpm)	1.2A	990mA
			2Hz (120fpm)	1.22A	980mA

*Surge currents at worst-case voltage in voltage range.