Clifford & Snell

# INSTALLATION & TECHNICAL INFORMATION

PLEASE READ PRIOR TO INSTALLATION



## Clifford and Snell Intrinsically Safe FD40IS & SD40IS Beacon Range

VISUAL SIGNALLING DEVICES

APPROVALS AND CONFORMITIES

SD40IS
For Translations
and Documentation
scan above.

FD40IS
For Translations
and Documentation
scan above.

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Website: www.moflash.com Email: technical@moflash.co.uk

## 1.0 Introduction

The Clifford & Snell Intrinsically Safe Beacon range of products FD40IS & SD40IS (Yodalight) are ATEX and IECEx certified. This range is approved to be installed in Group II (above ground) applications in Zones 0, 1, & 2 with gas groups IIA, IIB, IIC, and Zones 20, 21 & 22 for dust groups IIIC. Both FD40 & SD40 IS units are available in T4 temperature classifications. Both ranges are also available in 8 colour options & can be configured as multi beacon units (however each beacon will require its own barrier).

## 2.0 Intrinsically Safe Labelling

The product will have an individual serial number printed onto the product label, which is attached to the side of the beacon. An example label is shown below.




These products have been tested by notified body **Element Materials Technology**, who are UKAS accredited to BS EN ISO/IEC 17025:2005 and ISO/IEC 17065:2012. It is also a Notified Body for the ATEX Directive, UKEX/UKCA, an IECEx Certification Body and an IECEx Testing Laboratory.

The suffix X at the end of the certificate numbers indicate that there are special clauses added for safe use of these units.

## 3.0 Types of Approval and Standards Applied

The C&S FD40IS & SD40IS product has been approved to and/or conforms to the following standards:
IEC 60079-0:2017
EN IEC 60079-0:2018
IEC 60079-11:2011
EN 60079-11:2012

## 4.0 Zones, Groups and Temperature Classifications

The Clifford & Snell FD/SD40IS range is certified to the following approvals:

| | |
|---|---|
| FD40IS/X/*/RN | SD40IS/X/*/RN |
| Ⓔx II 1 G Ex ia IIC T4 Ga, | Ⓔx II 1 G Ex ia IIC T4 Ga, |
| Ⓔx II 1 D Ex ia IIIC T135°C Da. | Ⓔx II 1 D Ex ia IIIC T135°C Da. |

This means that the units can be installed in locations with the following conditions when connected to an approved system:

**Zones**

| | |
|---|---|
| Zone 0 | Explosive gas air mixture continuously present. |
| 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. |
| Zone 20 | Explosive dust air mixture is continuously present. |
| Zone 21 | Explosive dust air mixture likely to occur in normal operation. |
| Zone 22 | Explosive dust air mixture not likely to occur, and if it does, it will only exist for a short time. |

**Gas Groupings**
IIA Propane Group, IIB Ethylene Group and IIC Hydrogen and Acetylene

**Dust**
IIIA Fibres and Flying, IIIB Flour and Grain, IIIC Coal Dust and Metal Dust.

**Ambient Conditions**

| | |
|---|---|
| Operating Temperature Range: | -40°C < Ta <55°C |
| Storage Temperature Range: | -40°C < Ta <70°C |
| Max. Relative Humidity: | 95% @ 40°C |

The maximum surface temperature of an operating product will not exceed 135°C.

A Declaration of Conformity, ATEX, IECEx & UKEX Certificates are available upon request or alternately visit www.moflash.co.uk.

## 5.0 Installation

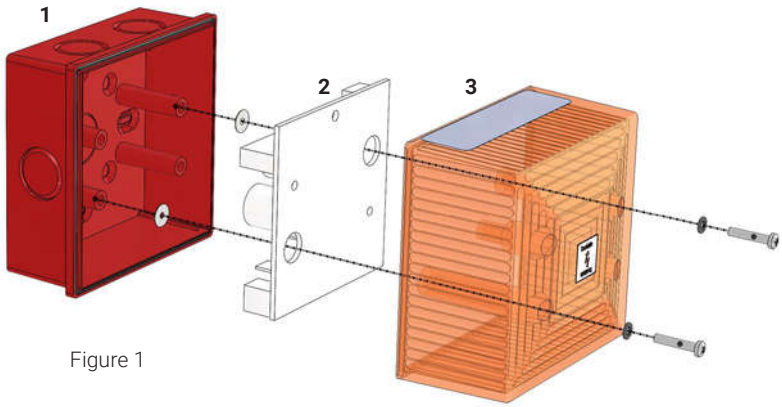



Figure 1

**Key Components**
1. Back Box
2. Beacon PCB
3. Lens

**General Requirement**
The Beacon must be installed in accordance with the latest EN60079-0 or equivalent IEC specification. A suitably rated Galvanic Isolator or Zener Barrier must also be used (one per beacon), with consideration for any local installation requirements. Installation should only be carried out by appropriately competent and qualified personnel.

- The location of the Beacon should be chosen with due regard to the area over which the signalling device must be visible.
- These units are suitable for wall or ceiling mounting.
- Environmental exposure conditions during installation should be dry. Moist or wet conditions should be avoided.
- Avoid mounting the product where it may be subjected to excessive vibration.

**Mounting**
Ensure that the power supply is disconnected prior to installation or maintenance to avoid electrical shock. The back box should be mounted to a wall, bulkhead or conduit box formed of suitable material using the back box and gasket supplied. The back box can be mounted using any of the mounting hole knock outs in the base. Max cable termination 2.5mm². To ensure IP65 rating is maintained, a correctly rated cable gland must be fitted (not supplied). Dimensional drawing can be seen on page 5.

## DIMENSIONAL DRAWING
Single Beacon

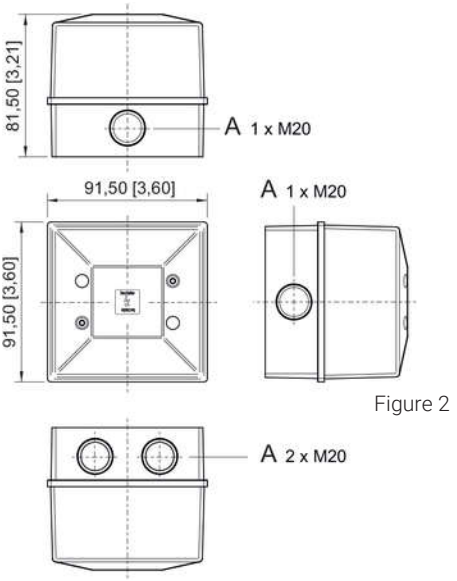
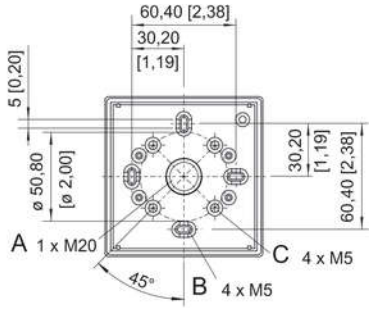



Figure 2




A = knockout hole
B = drill hole
C = knockout hole

## Double Beacon

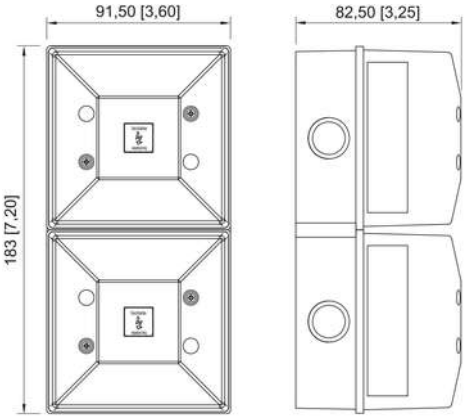



Figure 3

## Triple Beacon

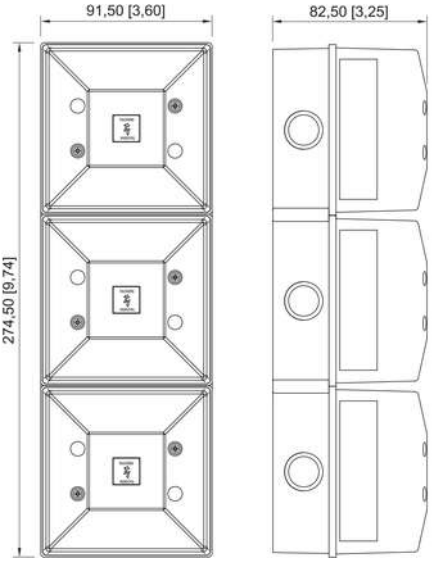



Figure 4

Quadruple Beacon

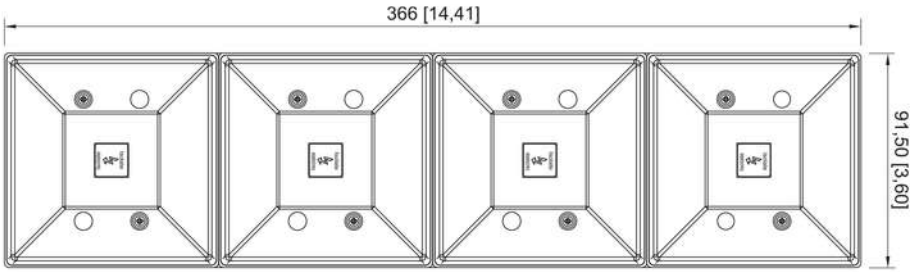
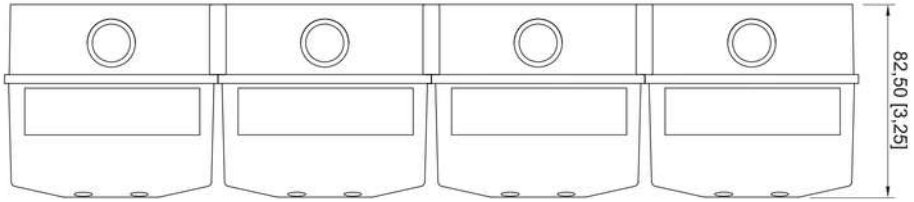



Figure 5




## 6.0 Wiring

Single unit

- Connect leads as per wiring diagram (Figure 6)
- Supply active device with power

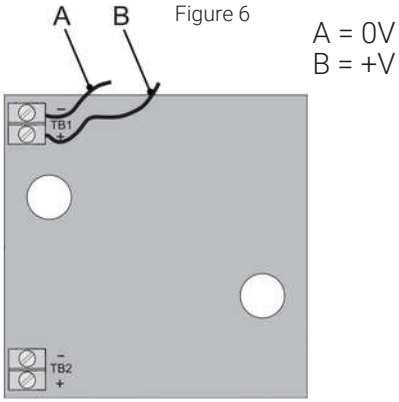



Figure 6

**WARNING:**

Explosion hazard due to selecting the wrong cables! Non-compliance could result in severe or fatal injuries.

If using separate safety barriers for multiple units, observe the cable specifications stated on the selected Zener barrier or the isolator certificate.

## Multiple Devices

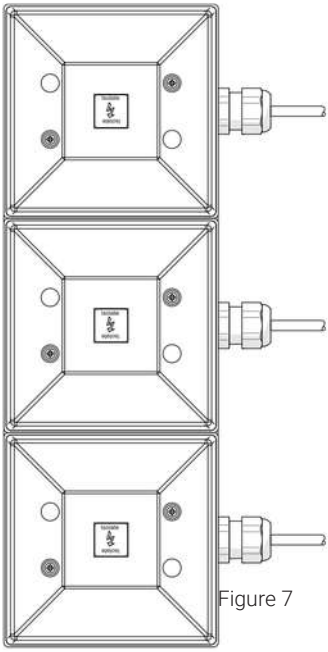


Figure 7

Each beacon on a multi unit assembly should be installed as an independent beacon. This includes separate cable entry points for each beacon as indicated in Figure 7.

For wiring connection, connect the leads according to the circuit diagram for each beacon (Figure 6)

Supply the active device with power.

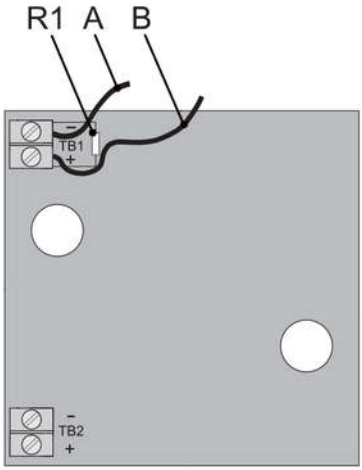
**A separate single channel Zener barrier or Galvanic Isolator MUST be used for each beacon.**

## Line Monitoring

If Line Monitoring is required, this can be achieved by using an end-of-line resistor. For this purpose, a wire-wound or metal film resistor with a resistance value of at least 750 Ohm and rated power of at least 2W or a 4700 Ohm and a rated power of at least 0.4W.

The line monitoring facility allows the integrity of the line to the beacon to be monitored through the barrier. The resistor can be fitted as per the diagram below (Figure 8).

Line monitoring is optional, and it is the responsibility of the system designer to decide if it is required.



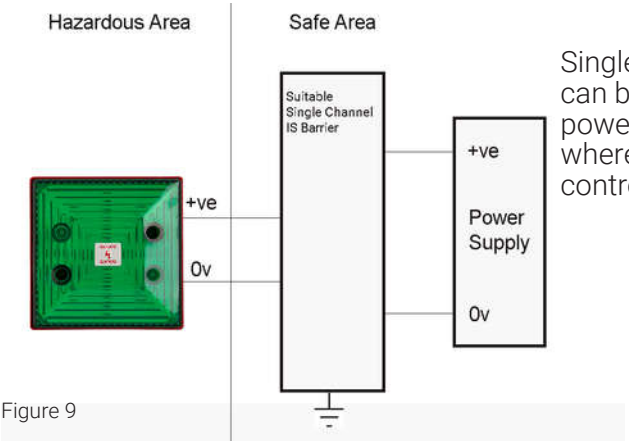

R1 - End-of-line resistor (value to be defined by system designer).
A: 0v
B: +ve

Figure 8

**Barrier/Isolator Information**
Connection into the unit must be via a suitably rated Zener Barrier or Galvanic Isolator.

**<u>If these units are powered directly without a Barrier/Isolator, the PCBs will be permanently damaged and warranty will be void.</u>**

Example of single channel barrier connection




Single barrier connections can be used for simple power supply installations, where limited functionality/ control is required.

Figure 9

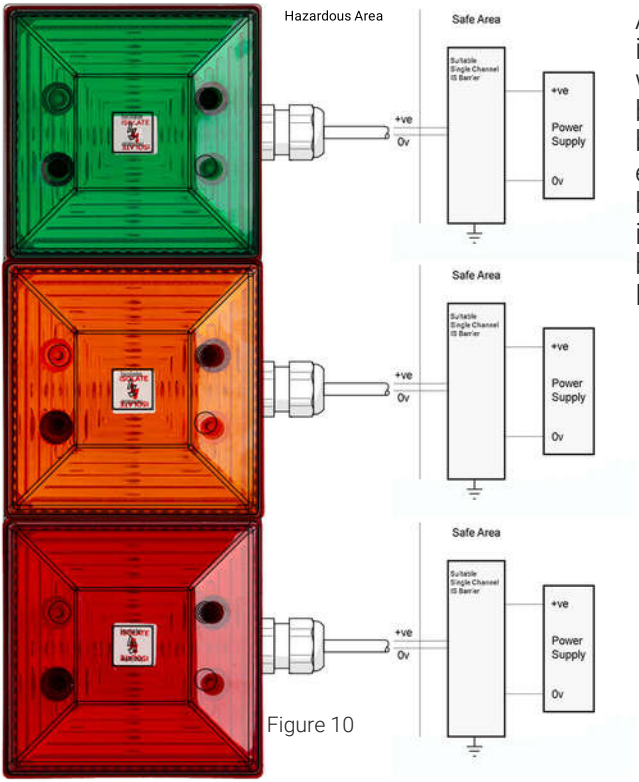



Figure 10

As stated previously in this document, when using a multiple beacon unit, each beacon must be powered by its own zener barrier and cabled in independently to each beacon as shown in Figure 10.

## Galvanic Isolators

The Galvanic Isolators have the advantage of not requiring an isolated high integrity earth to be installed, which is required for Zener Barriers. These Isolators are often more expensive per unit but may reduce installation costs as the earth is not required.

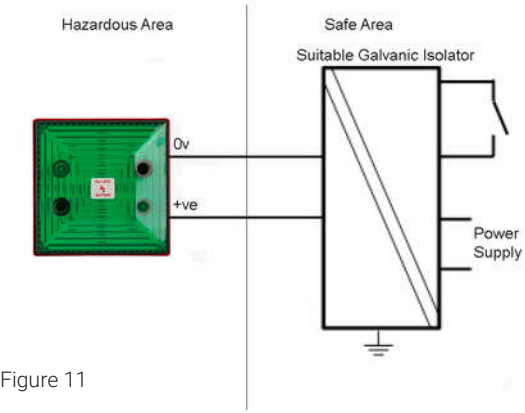



Figure 11

Single isolator connections can be used for simple power supply installations, where limited functionality/control is required.

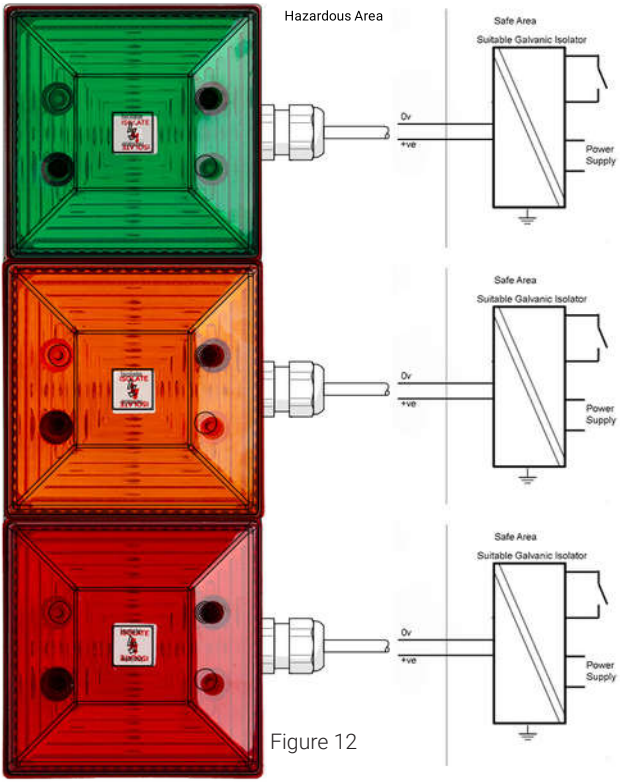



Figure 12

Figure 12 shows a multi beacon galvanic isolator example.

## 7.0 Maintenance

Little or no maintenance is required during the normal working life of the product. The C&S FD40IS & SD40IS Intrinsically Safe enclosures are resistant to most acids, alkalis and chemicals and have been designed to withstand severe weather conditions. However it is suggested that continuous supervision and periodic inspections may be required in relation to the requirements of the installation as per IEC 60079-17.

To avoid the possibility of a potential electrostatic charge build up, it is recommended that the exterior of the product is periodically wiped down with a clean damp cloth. At this point, a visual inspection is recommended to ensure that the product is in good working order and no damage has been sustained during its normal operation.

It is the responsibility of the end user to take suitable precautions to prevent exposure to aggressive chemicals that may attack metals or the polymeric materials used in the construction of this equipment.

The equipment is not intended for repair by the user. Repair of this equipment shall be carried out by the manufacturer or manufacturer's authorised agent.

## 8.0 Conditions for Use

The C&S Intrinsically Safe Signalling Range uses an enclosure rated at IP65 with suitably rated cable gland fitted (not supplied). To ensure that this rating is maintained once installed, a suitable cable gland must be used which matches this level of protection.

**Specific Conditions of Use:**

1. Clean equipment regularly to prevent dust build-up with a damp or anti-static cloth only.
2. The enclosure is non-conducting and may generate an ignition-capable level of electrostatic charge under certain extreme conditions. It is the responsibility of the user to ensure that the equipment is installed in a location where it will not be subjected to external conditions that might cause a build-up of electrostatic charge on the surface of the unit.
3. It must be ensured that the equipment is installed in accordance with IEC 60079-14 and IEC 60079-25 and that capacitance and inductance limits are not exceeded by distributed capacitance (Cc) or distributed inductance (Lc) due to cable length.
4. The maximum distributed inductance and capacitance which can be connected to the equipment via cable to be established and confirmed as less than Lo and Co respectively. Where there is non-distributed inductance or capacitance connected to the equipment, the maximum permitted shall not exceed 50 % of Lo and Co.

- **Entity Parameters:**

| | Beacon |
|---|---|
| $U_i$ | 28v |
| $I_i$ | 93mA |
| $P_i$ | 0.66W |
| $C_i$ | 0 |
| $L_i$ | 0 |
| $C_o$ | 0.083µF |
| $L_o$ | 4.11mH |

## 9.0 Technical Data

- Operating voltage: **16.2 - 26.4vDC**
- Current Consumption:

| Supply | Certified Barrier / Isolator Parameters | Current Consumption (Tone 1) |
|---|---|---|
| 24vDC | 28v/300Ω | 22mA |
| 18vDC | 28v/300Ω | 14mA |

- Line Monitoring: Yes

### Luminous Characteristics

- Light Source: 8 LED Array
- Flash Rate: 60 FPM (1Hz) (FD40IS only)
- Lens Colour: Amber, Red, Green, Opal, Blue, Clear, Yellow, Magenta

### Mechanical Data

- Cable Entries: M20

### Material

- Enclosure: ABS UL94 5VB, Flame Retardant
- Lens: Polycarbonate, UV Stable UL94 HB, FR
- Assembly Parts: Stainless Steel
- IP Rating: Up to IP65 to IEC 60529 (with suitably rated cable gland, not supplied)

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