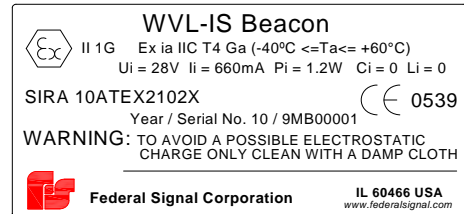




The WVL-IS beacon is CE marked for compliance with the European Explosive Atmospheres Directive 94/9/EC and the European EMC Directive 89/336/EEC

This instruction sheet describes installations which conform to EN60079:Part14:2008 Electrical Installation in Hazardous Areas. When designing systems for installation outside the UK, the local Code of Practice should be consulted.

1) The certification marking is as follows:



## 1. INTRODUCTION

The WVL-IS is an ATEX and IECEx certified intrinsically safe beacon which will produce a visual warning in a hazardous area. Red, Amber, Green and Blue output models are available.

## 2. DESCRIPTION

The device will start to flash when power is applied to terminals + and -. The beacon has two flash rates one double flash per second and two double flashes per second. The flash rate is selected by setting an internal pin header. The unit is factory set to produce two double flashes per second.

## 3. SUPPLY VOLTAGE

The WVL-IS beacon has been designed to operate in a hazardous area via 28V 660mA ATEX and IECEx certified Zener Barriers or Galvanic Isolators. The beacon may be tested or used in safe areas without a Zener Barrier or Galvanic Isolator, but at supply voltages above 16V the internal current limit will function and the brightness may be reduced. The beacon should not be continuously operated without a barrier or isolator with a supply voltage greater than 16V.

## 4. INTRINSIC SAFETY CERTIFICATION

### 4.1 ATEX certificate

The WVL-IS beacon complies with the following standards:-

EN60079-0:2006  
EN60079-11:2007  
EN60079-26:2007  
IEC60079-0:2007 (used for guidance in respect of marking)

 II 1G Ex ia IIC T4 Ga (-40°C ≤ Ta ≤ +60°C)

The EC-Type Examination Certificate SIRA 10ATEX2102X has been issued by the Notified Body Sira. This confirms compliance with the European ATEX Directive 94/9/EC for Group II, Category 1G equipment. The beacon carries the Community Mark and subject to local codes of practice, may be installed in any of the EEA member countries.

- 2) The equipment may be used in zones 0, 1 and 2 with flammable gases and vapours with apparatus groups IIA, IIB & IIC and with temperature classes T1, T2, T3 and T4.
- 3) The equipment is only certified for use in ambient temperatures in the range -40°C to +60°C and should not be used outside this range.
- 4) The certificate number has an 'X' suffix, which indicates that the certificate contains one of more special conditions for safe use. Those installing or inspecting the equipment should refer to this section of the certificate.
- 5) The equipment has not been assessed as a safety-related device (as referred to by Directive 94/9/EC Annex II, clause 1.5).
- 6) Installation of this equipment shall be carried out by suitably-trained personnel in accordance with the applicable code of practice.
- 7) Repair of this equipment shall only be carried out by the manufacturer or in accordance with the applicable code of practice.
- 8) The certification of this equipment relies on the following materials used in its construction:

Enclosure: ABS Plastic  
Lens: Polycarbonate

If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

"Aggressive substances" - e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials.

"Suitable precautions" - e.g. regular checks as part of routine inspections or establishing from the material's data sheet that it is resistant to specific chemicals.

**SPECIAL CONDITIONS FOR SAFE USE (as stated in the EC Type Examination Certificate SIRA 10ATEX2102X)**

**Conditions for WVL-IS Beacon**

The equipment has an ingress protection rating of IP65. However, if it has been supplied without cable entry devices, then the user shall ensure that the devices that are fitted will provide an ingress protection that is appropriate to the environment in which it is installed i.e. IP20 or better. If only one of the two cable entries are used, then the unused entry 'knockout' shall be left intact or fitted with a blanking device that ensures ingress protection appropriate to the environment in which it is installed i.e. IP20 or better.

The enclosure is non-conducting 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 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.

**4.2 Zones, Gas Groups and T Rating**

The WVL-IS LED beacon has been certified Ex ia IIC T4 Ga. When connected to an approved system it may be installed in:-

- 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.

Be used with gases in groups:

- Group A propane
- Group B ethylene
- Group C hydrogen

Having a temperature classification of:

- T1 450°C
- T2 300°C
- T3 200°C
- T4 135°C

**4.3 Terminals + and - power supply**

Power is supplied to the beacon via terminals + and - which have maximum input safety parameters of:

- U<sub>i</sub> = 28V
- I<sub>i</sub> = 660mA
- P<sub>i</sub> = 1.2W
- C<sub>i</sub> = 0      L<sub>i</sub> = 0

WVL-IS beacons may be powered from ATEX certified Zener barriers or galvanic isolators certified by an EC Approved Body which have output parameters equal to or less than 28V, 660mA and 1,2W

Up to three beacons can be connected in parallel and be powered from a common barrier or isolator. Parallel

connection of beacons will significantly reduce the brightness of each device.

The maximum permitted cable parameters defined by the barrier or isolator certificate must not be exceeded.

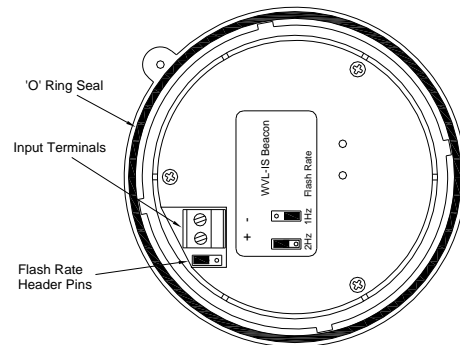


Fig 1 Location of field terminals and controls.

**5. INSTALLATION**

In addition to the certification requirements shown in section 4.2, the environmental conditions must be within the limits shown on the product specification. The beacon enclosure provides IP65 protection and is suitable for installation in an exterior location if an appropriate sealed cable entry is used. WVL-IS beacons should only be installed by trained competent personnel.

**5.1 Mounting**

The WVL-IS beacons may be secured to any flat surface by inserting two mounting screws through the back of the round base (see figure 2). The enclosure provides IP65 protection and is suitable for installation in exterior locations provided that the area around the two mounting screws through the back of the base moulding has been sealed and that suitable cable glands with the required IP rating have been used. The lens should be aimed towards the area where maximum visibility is required.

**5.2 Installation procedure**

- a. Unscrew the beacon unit security screw and remove the beacon section from the base by turning it anti-clockwise. Ensure that the 'O' ring seal remains in place.
- b. Remove the required 20mm knockout section(s) depending on system wiring and mount the base to a flat surface by inserting two screws through the back of the base.
- c. Fit the required number of 20mm cable glands or conduit entries into the base and connect the field wiring to the appropriate beacon terminals as shown in section 6 and Fig 1 of this manual.
- d. Check that the 'O' ring seal is correctly located on the beacon section (see Fig. 1) and insert the beacon section into the base. Push it fully home and turn it clockwise to align the mouldings before tightening the security screw.

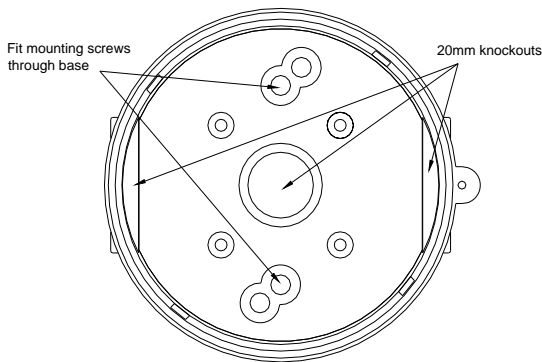


Fig 2 Mounting Beacon Base.

## 6. ELECTRICAL SYSTEM DESIGN FOR INSTALLATION IN HAZARDOUS AREAS USING ZENER BARRIERS

If the beacon is controlled by a switch in the positive supply, or the power supply is being turned on and off, only a single channel Zener barrier is required as shown in Fig 3. This circuit may also be used if the beacon is being controlled by a mechanically activated switch on the hazardous area side of the barrier. The power supply voltage should be between 20V and the maximum working voltage of the barrier. The circuit will continue to work at lower voltages, but the beacon light output level will be reduced.

If the beacon is being operated from a lower voltage power supply of say 12V or less, then a 15V 100 ohm barrier can be used which will improve the beacon light output levels at lower voltages.

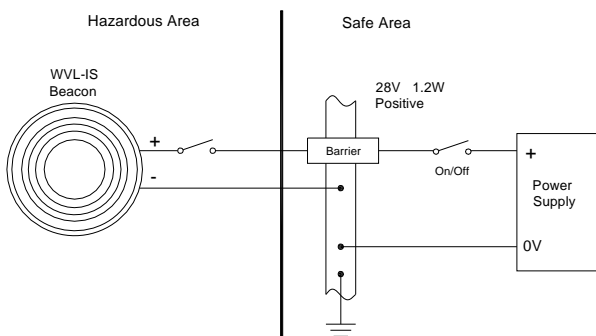


Fig 3 Using a single channel barrier.

If the beacon control switch is in the negative wire and the power supply 0V is earthed, the circuit shown in Fig 4 may be used. For simplicity the two barriers may be combined into one package. The power supply voltage should be between 21V and the maximum working voltage of the 28V barrier. The circuit will continue to work at lower voltages, but the beacon brilliance will be reduced.

## 7. ELECTRICAL SYSTEM DESIGN FOR INSTALLATION IN HAZARDOUS AREAS USING GALVANIC ISOLATORS.

Galvanic isolators do not require a high integrity earth connection. For small systems where a high integrity earth is not already available, the use of galvanic isolators often reduces the overall installation cost and simplifies design.

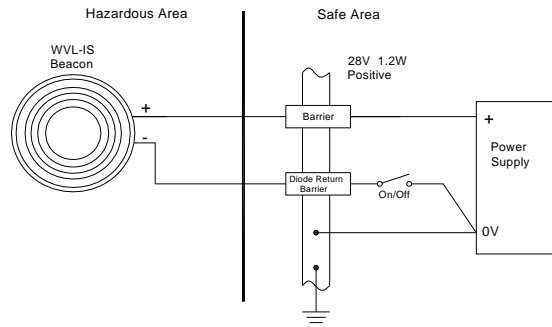


Fig 4 Single stage alarm using two channel barrier.

The WVL-IS beacon may be powered by any galvanic isolator having output parameters within the limits specified in section 4.3, which has been certified Ex ia by an EC Notified Body. The beacon may be controlled by turning the galvanic isolator on and off, or by a mechanically activated switch on the hazardous area side of the isolator.

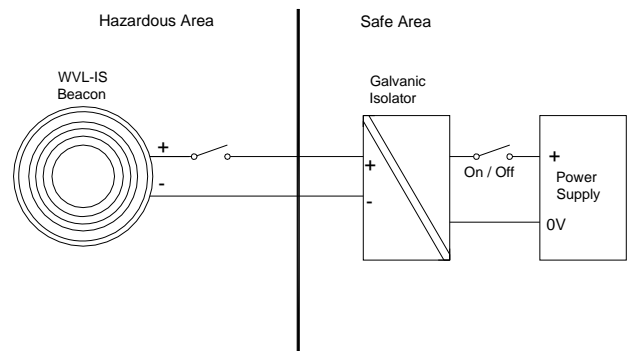


Fig 5 Basic circuit for use with a galvanic isolator.

The control arrangement will vary depending upon the isolator chosen. The galvanic isolator must be able to supply an output of 30mA at about 16V.

## 10. CABLE PARAMETERS

The maximum permitted cable parameters are as specified on the certificate of the Zener barrier or galvanic isolator that has been selected for the installation. Normally the limits are not restrictive, but care should be taken not to exceed a capacitive limit of 83nF for IIC installations when very long cables are used.

## 11. BEACON FLASH RATE

The beacon can be set to two flash rates 1 double flash per second 1Hz (slow rate) or two double flashes per second 2Hz (fast rate).

The flash rate is selected by the position of the pin header next to the input terminal block (see fig 1).

## 12. MAINTENANCE

The beacon should be regularly inspected to ensure that it has not been damaged. Frequency of inspection depends upon environmental conditions, but initially we recommend that this should be done annually.

**No attempt should be made to repair a faulty IS-mB1 beacon. Suspect beacons must be returned to Federal Signal Corporation.**

# IECEX Approval

The WVL-IS Beacon has also been approved to the IECEX scheme.

The installation requirements for WVL-IS beacons approved to the IECEX scheme are the same as the installation requirements for WVL-IS beacons approved to the ATEX directive.

Certificate No. IECEX SIR 10.0046X

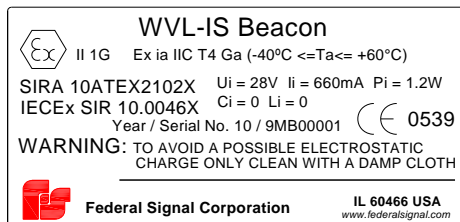
Marking: Ex ia IIC T4 Ga (Ta = -40°C to +60°C)

Standards: IEC 60079-0:2004 Edition 4  
IEC 60079-11:2006 Edition 5  
IEC 60079-26:2006 Edition 2

## CONDITIONS OF CERTIFICATION (as stated on the IECEX Certificate of Conformity IECEX SIR 10.0046X)

- The equipment has an ingress protection rating of IP65. However, if it has been supplied without a cable entry device, then the user shall ensure that the devices that are fitted will provide an ingress protection that is appropriate to the environment in which it is installed i.e. IP20 or better. If only one of the two cable entries are used, then the unused entry 'knockout' shall be left intact or fitted with a blanking device that ensures ingress protection appropriate to the environment in which it is installed i.e. IP20 or better.
- The enclosure is non-conducting 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 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.

The WVL-IS beacons are marked with the certification requirements for the ATEX and IECEX and approvals.



# FM Approval

The WVL-IS Beacon has also been FM Listed.

Marking: IS Class I, Zone 0, AEx ia IIC T4

IS Class I, Division 1, Groups A, B, C, D

See the Control Drawings D 5056 Sheets 1 and 2 for installation details and entity parameters.

