

# Installation instructions for BA390X Intrinsically Safe LED Cluster Lamp

## 1. Description

The BA390X is an intrinsically safe panel mounting cluster lamp that has ATEX, FM and IECEx certification. With a terminal voltage between 14 and 30V dc it consumes a constant 20mA and has a constant brilliance. No external current limiting resistor is required.

BA390X lamps are available with five different colour outputs, each identified by a product number suffix:

BA390R	Red;	BA390G	Green;	BA390A	Amber
BA390B	Blue;	BA390W	White.		

## 2. ATEX Intrinsic safety certification

All BA390X lamps have been issued with an EC-Type Examination Certificate BAS01ATEX1062X. This confirms compliance with the European ATEX Directive 94/9/EC for Group II, Category 1G, apparatus (Ex ia IIC T4). The lamps bear the Community Mark and, subject to local codes of practice, may be installed in any of the European Economic Area (EEA) member countries. ATEX certificates are also acceptable for installations in Switzerland.

These instructions describe installations in explosive gas atmospheres which conform with EN 60079:Part14 Electrical Installation in Hazardous Areas. When designing systems for installation outside the UK, the local Code of Practice should be consulted.

BA390X lamps employ good engineering practice to minimise the risk of injury to installers and users.

### 2.1 Power supply

When installed in a hazardous area the BA390X lamp must be powered via a certified Zener barrier or galvanic isolator from a dc supply located in the safe area.

The maximum input safety parameters for a BA390X lamp are:

$$U_i = 30V \text{ dc}$$

$$P_i = 1.3W \text{ at } 40^\circ\text{C} \text{ or } 1.2W \text{ at } 60^\circ\text{C}$$

Any Zener barrier or galvanic isolator that has been certified EEx ia by an EEC Notified Body may be used to power BA390X lamp(s). The maximum output safety parameters of the barrier or isolator must be less than the maximum input safety parameters of the lamp, and the barrier or isolator must be certified for the required gas group.

The BA390X lamp has no internal capacitance or inductance, therefore the maximum permissible cable parameters are the same as those specified for the Zener barrier or galvanic isolator powering the lamp(s).

Four system Certificates of Conformity, which are not part of the ATEX certification, provide guidance on selecting suitable devices and specify the maximum cable parameters for common barriers and isolators.

BAS Ex93C2432	Zener barriers gas group IIC
BAS Ex93C2433	Zener barriers gas group IIB
BAS Ex93C2434	Galvanic isolators gas group IIC
BAS Ex93C2435	Galvanic isolators gas group IIB

More than one BA390X lamp may be operated from one barrier or isolator, but operating lamps in parallel may reduce the brightness of each device. The amount of reduction will depend upon the type of barrier or isolator and the lamp colour. Please refer to Application Guide AG390 or BEKA sales department for more information.

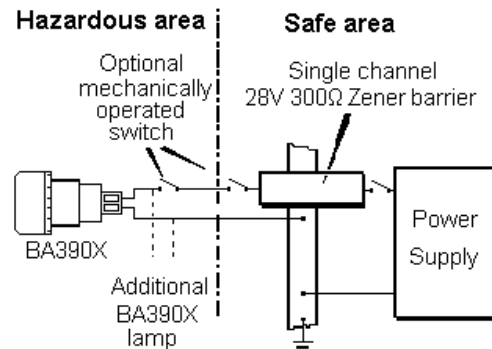


Fig 1 Typical BA390X lamp circuit

### 2.2 Zones, gas groups and T rating

The ATEX certificate permits installation 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 will only exist for a short time.

Use 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

At an ambient temperature between -40 and +60°C when powered from a barrier or isolator with a  $P_o$  of less than 1.2W.

For barriers or isolators having a  $P_o$  of between 1.2 and 1.3W the maximum ambient temperature is reduced to +40°C.

This allows BA390X lamps to be installed in all Zones and to be used with most common industrial gases.

### 3. FM intrinsic safety approval

All BA390X lamps are FM Approved intrinsically safe – file number 3022662. A copy of the FM Certificate of Compliance may be downloaded from [www.beka.co.uk](http://www.beka.co.uk) or requested from our sales office.

Installations must comply with Control Drawing CI390-12 and with ANSI / ISA RP12.06.01 *Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations*. The intrinsically safe circuit shown in the ATEX section of this instruction sheet may be used for FM installations providing that the Zener barrier or galvanic isolator is FM approved and complies with the specified FM entity parameters.

### 3.1 Classes, Divisions, Gas Groups & Temperature Rating

The FM intrinsic safety approval permits installation in Class I:

- Division 1 Where ignitable concentrations of flammable gases, vapours or liquids can exist all of the time or some of the time under normal operating conditions.
- Division 2 Where ignitable concentrations of flammable gases, vapours or liquids are not likely to exist under normal operating conditions.

Use with gases in groups:

Group A	acetylene
Group B	hydrogen
Group C	ethylene
Group D	propane

Having a temperature classification of:

T1	450°C
T2	300°C
T3	200°C
T4	135°C

At an ambient temperature between -40 and +60°C when powered from a barrier or isolator with  $U_o$  of less than 1.2W. For barriers or isolators having  $U_o$  between 1.2W and 1.3W the maximum ambient temperature is reduced to +40°C.

This allows BA390X lamps to be installed in all Divisions and to be used with most common industrial gases. The BA390X may also be used in Class I, Zone 0, Group IIA, IIB or IIC installations

### 4. FM nonincendive approval

All BA390X lamps are FM Approved nonincendive - file number 3022662 allowing indoor and outdoor installation in Class I, Division 2, Groups A, B, C & D without the need for a Zener barrier or a galvanic isolator. A copy of the FM Certificate of Compliance may be downloaded from [www.beka.co.uk](http://www.beka.co.uk) or requested from our sales office.

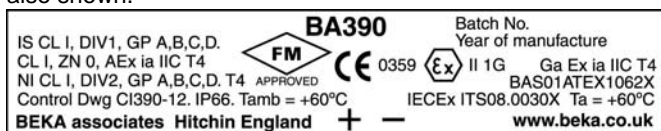
Installations should use the Nonincendive Field Wiring concept and comply with sheets 3 and 4 of BEKA Control Drawing CI390-12 and with the National Electrical Code ANSI / NFPA70.

### 5. IECEx Certification

The IECEx certificate IECEx ITS08.0030X is similar to the ATEX certification except for the ambient temperature range and maximum input power  $P_i$ . The certificate may be downloaded from [www.beka.co.uk](http://www.beka.co.uk) or requested from our sales office.

### 6. Certification Label Information

The certification label is fitted in a recess on the lamp body. It shows the ATEX certification information, year of manufacture and batch number. FM & IECEx certification information is also shown.



### 7. Installation

BA390X lamps must be installed by trained, competent personnel. Each lamp is supplied with a gasket that should be positioned between the lamp body and the front of the panel. To provide an IP66 seal between the BA390X lamp and the mounting panel:

Minimum panel thickness 2mm (0.08") Steel  
3mm (0.12") Aluminium

Outside panel finish should be smooth, free from particulate inclusions, runs, or build-up around cut-out.

Edge of panel cut-out should be deburred

BA390X securing nut should be tightened between 120 & 140 cNm (10.6 & 12.4inLb)

The rear of the lamp body has IP20 protection that may be increased to IP65 using the optional BA599 rear sealing assembly. To prevent safety being degraded, the polycarbonate lens and the nylon body should not be exposed to incompatible materials and they should be protected from impact. The ambient temperature of the lamps must remain within the certified limits.

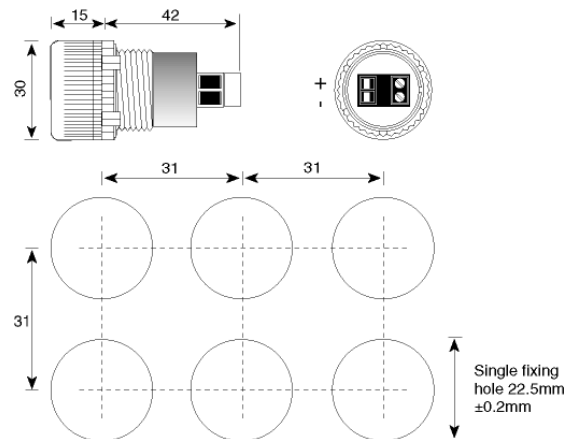


Fig 2 Dimensions

### 8. Maintenance

The mechanical condition of the lamp should be regularly checked, the frequency of inspections depends upon the environmental conditions.

### WARNING

**The lamp lens has a static dissipative coating that should only be cleaned with soap and water. Do not use abrasives and avoid inappropriate contact with solvents on the lens or body.**

### 9. Servicing

The BA390X lamp is a sealed assembly that can not be repaired. If a lamp fails it must be replaced by a new certified lamp.

### 10. Guarantee

Lamps that fail within the guarantee period should be returned to BEKA associates or to our local agent.

### 11. Customer comments

BEKA associates is always pleased to receive comments from customers about our products and services. All communications are acknowledged and whenever possible, suggestions are implemented.

### 12. Application Guide

For additional circuits and performance information please see application Guide AG390 which may be downloaded from [www.beka.co.uk](http://www.beka.co.uk) or requested from our sales office.