

Installation Instructions for BA390XS Low Current Intrinsically Safe LED Panel Lamp

1. Description

The BA390XS is an intrinsically safe low current panel mounting lamp that has IECEx, ATEX, UKEX and FM certification. It has a minimum operating voltage of 8.7V and requires an external series resistor or current limited supply to define the lamp current.

BA390XS lamps are available with five different colour outputs, each identified by a product number suffix:

BA390RS	Red;	BA390GS	Green;
BA390AS	Amber	BA390BS	Blue;
BA390WS	White.		

2. IECEx, ATEX & UKEX intrinsic safety certification

All BA390XS lamps have IECEx, ATEX & UKEX Ex ia certification for use in gas and dust atmospheres. The lamps carry both the EU community CE and the UKCA marks, subject to local codes of practice, they may be installed in any of the European Economic Area (EEA) member countries and in the UK.

These instructions describe installations which conform with EN 60079-14 *Electrical installations design, selection and erection*. When designing systems for installation outside the UK, the local Code of Practice should be consulted.

2.1 Gas hazardous areas

The ATEX certificate permits BA390XS lamps to 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 will only exist for a short time.

Used with gases in groups:

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

In gases that may be used with equipment having a temperature classification of:

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

At an ambient temperature between -20 and +60°C

This allows BA390XS lamps to be installed in all Zones and to be used with most common industrial gases.

2.2. Certification Label Information

The certification label is fitted in a recess on the lamp body. It shows the certification information, year of manufacture and batch number.

Potential Electrostatic Hazard
Clean with Damp Cloth
IS CL I, DIV1, GP A,B,C,D, APPROVED
CL I, ZN 0, AEx ia IIC T4
NI CL I, DIV2, GP A,B,C,D, T4
Control Dwg CI390-12, IP66, Tamb = +60°C
BEKA associates Hitchin England www.beka.co.uk

FM 2575 CE 0359 Batch No. Year of manufacture
BA390 II 1G Ex ia IIC T4 Ga
II 1D Ex ia IIIC 135°C Da
ITS21UKEX0093X
ITS13ATEX27822X IECEx ITS08.0030X

2.3 Dust hazardous areas

The IECEx, ATEX & UKEX certificates also permit BA390XS lamps to be installed in:

- Zone 20 explosive atmosphere in the form of a cloud of combustible dust in air is continuously present, or for long periods or frequently.
- Zone 21 explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur occasionally in normal operation.
- Zone 22 explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation, but if it does occur, will only persist for a short period.

Be used with dust in subdivisions:

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

Be used with dusts having a Minimum Ignition Temperature of:

- Dust cloud 202°C
- Dust layer on Rate 210°C
- Totaliser up to 5mm thick

- Dust layer on Rate Refer to
- Totaliser over 5mm thick. EN 60079-14

At an ambient temperature between -20 and +60°C

2.4 Special conditions for safe use

The ATEX and IECEx certificates specify special conditions for safe use to prevent the accumulation of an electrostatic charge. Each lamp carries the following warning:

Potential Electrostatic Hazard Clean with Damp Cloth

2.5 Power supply

When installed in a hazardous area a BA390XS lamp should be powered from a dc intrinsically safe voltage source such as that from a certified Zener barrier or galvanic isolator.

The maximum input safety parameters for a BA390XS lamp are:

Gas hazard	Dust hazard
Ui = 30V	30V
Ii = 159mA	159mA
Pi = 1.2W	0.683W

Any intrinsically safe power supply such as the output from an Ex ia certified Zener barrier, galvanic isolator or associated apparatus may be used to power a BA390XS lamp. The output safety parameters of the power supply must be equal to, or less than the input safety parameters of the lamp.

The BA390XS lamp has no internal capacitance or inductance, therefore the maximum permissible cable parameters are the same as those specified for the Zener barrier, galvanic isolator or associated apparatus powering the lamp.

The BA390XS is CE marked to show compliance with the European Explosive Atmospheres Directive 2014/34/EU and the European EMC Directive 2014/30/EU.

It is also UKCA marked to show compliance with UK statutory requirements Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations UKSI 2016:1107

(as amended) and with the Electromagnetic Compatibility Regulations UKSI 2016:1091 (as amended). Issue 7 8th Dec 2022

The high efficiency of these lamps enables them to provide a useful output with an input current of only a few milliamps. The BA390XS should be connected in series with a current regulator or resistor which defines the lamp current between 4 and 22mA. The value of the required current limiting resistor is:

$$\text{Resistance in k}\Omega = \frac{\text{Hazardous area voltage} - 8.7}{\text{required lamp current in mA}}$$

In the example shown in Fig 1 a BA390XS lamp is powered by an intrinsically safe multiple digital output fieldbus module. These modules have several intrinsically safe outputs, each able to supply about 4mA output. Using BA390XS panel lamps and one of these modules multiple visual status indications may be provided in a hazardous area.

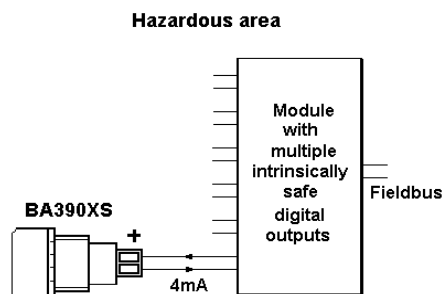


Fig 1 Typical BA390XS lamp application

3. FM intrinsic safety approval

All BA390XS 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 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*.

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

This allows BA390XS lamps to be installed in all Divisions and to be used with most common industrial gases. The BA390XS may also be used in Class I, Zone 0, Group IIA, IIB or IIC installations.

3.2 FM nonincendive approval

All BA390XS 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 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.

4. Installation

BA390XS lamps should 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 BA390XS lamp and the mounting panel:

Edge of panel cut-out should be deburred

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

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 IP66 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.

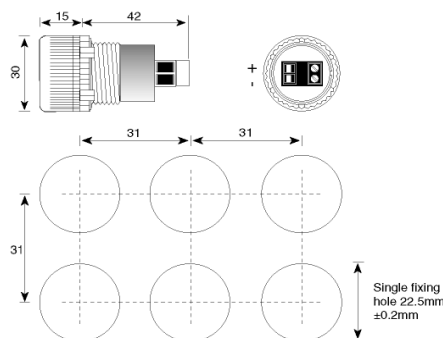


Fig 2 Dimensions

5. Maintenance

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

6. Servicing

If a BA390XS lamp fails it should be returned to BEKA associates or your local BEKA agent.

7. Guarantee

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

8. 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.

9. Application Guide

For additional information please see application guide AG390 which is downloadable from the BEKA website.