Installation instructions for BA390X Intrinsically Safe LED Panel Lamp

1. Description

The BA390X is an intrinsically safe panel mounting lamp that has IECEx, ATEX UKEX and FM certification. Each lamp has a constant brilliance and consumes a constant 20mA. 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. IECEx, ATEX & UKEX intrinsic safety certification

All BA390X 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 the local Code of Practice should be consulted.

2.1 Gas hazardous areas

The IECEx, ATEX * UKEX certificates permit BA390 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:

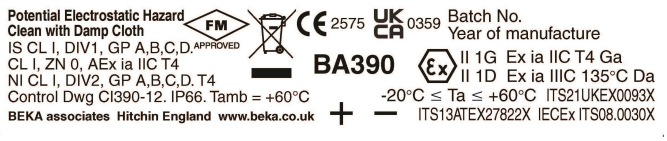
T1 450°C
T2 300°C
T3 200°C
T4 135°C

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

This allows BA390X 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.



2.3 Dust hazardous areas

The IECEx, ATEX & UKEX certificates also permit BA390X 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 Totaliser up to 5mm thick Rate 210°C

Dust layer on Totaliser over 5mm thick. Rate Refer to 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 BA390X lamp should be powered from a dc intrinsically safe voltage source such as the output from a certified Zener barrier or a galvanic isolator.

The BA390X Panel Lamps input safety parameters are:

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

The output safety parameters of the intrinsically safe supply must be equal to, or less than the input safety parameters of the BA390X Panel Lamp.

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, galavanic isolator or associated apparatus powering the lamp(s).

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.

The BA390X 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 9 22nd Oct 2025

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BA390 lamps may be turned *on* and *off* by a mechanical or solid state switch in the safe area. They may also be controlled by a hazardous area mechanically operated switch or by a certified intrinsically safe solid state switch such as the isolated alarm output on a BEKA instrument.

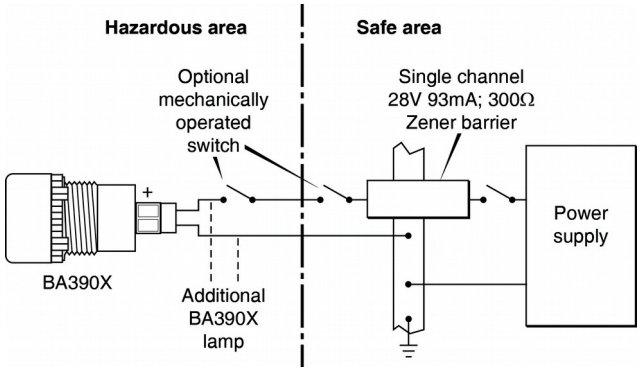

Fig 1 Typical BA390X lamp circuit

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 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 IECEx 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 Uo of less than 1.2W. For barriers or isolators having Uo 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.

3.2 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 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 NEC ANSI / NFPA70.

4. Installation
BA390X 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 BA390X 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.

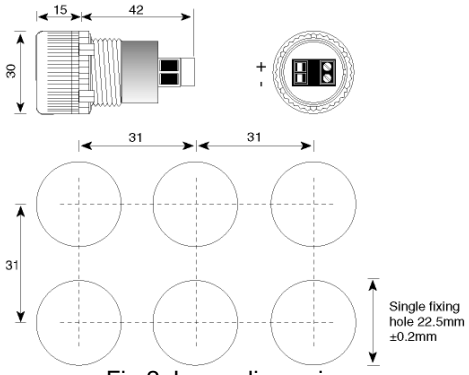

Fig 2 Lamp dimensions

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 BA390X 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 BEKA 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.

EU Declaration of Conformity

This certificate is issued for electrical apparatus BA390 & BA390S

Description
BA390 & BA390S are panel mounting, intrinsically safe LED Cluster Lamps

Manufactured by
BEKA associates Ltd, Old Charlton Road, Hitchin, Herts. UK. SG5 2DA

Council Directives this equipment complies with:

2014/34/EU (ATEX Directive)

Relating to equipment and protective systems intended for use in potentially explosive atmospheres.

Provisions of the Directive fulfilled by the equipment:

Group II Category 1G Ex ia IIC T4 Ga -20ºC ≤ Ta ≤ +60ºC
1D Ex ia IIIC T135ºC Da -20ºC ≤ Ta ≤ +60ºC

Notified Body for EU-Type examination and production
INTERTEK ITALIA SPA 2575 Via Guido Miglioli, 2/A 20063 Cernusco sul Naviglio (MI) Italy

EU-Type Examination Certificate
ITS13ATEX27822X issue 1 dated 12/06/2018

Standards used:
EN 60079-0:2012, EN 60079-11:2012
Compliant with EN IEC 60079-0:2018

2014/30/EU (EMC Directive)

Standards used:
EN 61326-1:2021

2011/65/EU (RoHS Directive) relating to hazardous substances in electronic and electrical equipment.

2015/863/EU additional substances added by amending Annex II to Directive 2011/65/EU as regards the list of restricted substances.

CE **mark first affixed in 2001**

Authorised Signatory:

Issue 13 18th August 2021
Issue 14 19th Jan 2023

Olivier Lebreton CEng MIET
Managing Director

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