FM Approvals
Member of the FM Global Group

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CERTIFICATE OF COMPLIANCE

HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

BA390 ab LED Cluster Lamp
IS / I / 1 / ABCD / T4 Ta = * – Entity; CI390-12; IP66
I / 0 / AEx ia IIC T4 Ta = * – Entity; CI390-12; IP66
NI / I / 2 / ABCD / T4 Ta = 60°C – NIFW; CI390-12; IP66
I / 2 / IIC / T4 Ta = 60°C – NIFW; CI390-12; IP66

Entity parameters;
Vmax = 30V Imax = 200mA *Pi = 1.2W Ta = 60°C or 1.3W Ta = 40°C Ci = 0 Li = 0
Nonincendive field wiring parameters
Vmax = 30V Ci = 0 Li = 0

a = colour
b = blank or alphanumeric code not affecting safety.

Special conditions of use
1. To maintain the IP66 rating the BA390 shall be installed in accordance with the mounting conditions provided on drawing numbers CI390-12.
2. The BA390 shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.

Equipment Ratings:

Intrinsically safe for Class I, Division 1, Groups A, B, C and D and for Class I Zone 0 Group IIC indoor and outdoor Hazardous (Classified) Locations when installed using the Entity concept in accordance with Control Drawing CI390-12. Nonincendive for Class I, Division 2 Groups A, B, C and D and Suitable for Class I Zone 2 Group IIC indoor and outdoor Hazardous (Classified) Locations when installed using the Nonincendive Field Wiring concept in accordance with Control Drawing CI390-12. Temperature Class T4 at an ambient of 40°C or 60°C with the power limitations defined on the Control drawing CI390-12.

FM Approved for:

BEKA associates
Hitchin, Hertfordshire SG5 2DA, United Kingdom

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This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

Class 3600	1998
Class 3610	2010
Class 3611	2004
Class 3810	2005
IEC 60529	1989

Original Project ID: 3022662 Approval Granted: February 25, 2005

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
101217	March 16, 2011		

FM Approvals LLC

Timothy J Adam
Technical Team Manager

March 16, 2011
Date

Intrinsically Safe BA390 LED Cluster Lamps

HAZARDOUS (CLASSIFIED) LOCATION | **UNCLASSIFIED LOCATION**

BA390
Class I, Division 1, Groups A, B,C, D
Class I, Zone 0, Groups IIA, IIB, IIC

SEE NOTE 3 | SEE NOTE 1

BA390_
LED CLUSTER LAMP
Entity Parameters
Terminals + & -
Ui = 30V dc
Ii = 200mA dc
Pi = 1.3W @ 40°C
1.2W @ 60°C
Ci = 0
Li = 0
SEE NOTE 5

SEE NOTE 4

UNCLASSIFIED LOCATION EQUIPMENT

SEE NOTE 2

****
* NOTE: *
* No modification to be made without *
* reference/approval from FM Approvals *
* and BEKA associates Design Department. *
****

Iss.	Date	Modification	Ckd.	Appd.
1	07.01 2005	First release		

Title: FM Approvals Control Drawing for Intrinsically Safe and Nonincendive BA390 LED Cluster Lamps

Drawn	Checked	Scale
RC		N/A

Drawing No. CI390–12
Sheet 1 of 4

Intrinsically Safe BA390 LED Cluster Lamps cont.

Notes:

1. The associated intrinsically safe barrier or galvanic isolator must be FM approved and the manufacturers' installation drawings must be followed when installing this equipment.

2. The unclassified location equipment connected to the associated intrinsically safe barrier must not use or generate more than 250V rms or 250V dc.

3. Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code ANSI/NFPA 70.

4. One single channel or one two channel associated intrinsically safe barrier or galvanic isolator with entity parameters complying with the following requirements:

Uo or Vt	equal to or less than	Ui
Io or It	equal to or less than	Ii
Po	equal to or less than	Pi*
La	equal to or greater than	Lcable + Li
Ca	equal to or greater than	Ccable + Ci

*Pi varies depending upon maximum ambient temperature.

5. 1. 2, 3 or 4 BA390 lamps connected in parallel.

6. To maintain IP66 protection between the BA390 and the mounting panel:

Minimum panel thickness should be — 2mm (0.08inches) Steel, 3mm (0.12inches) Aluminium

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

Panel cut-out diameter should be — 22.5 ±0.2 mm (0.886 ±0.008 inches)

Edges of panel cut-out should be deburred and clean

The panel securing nut should be tightened between: — 120 and 140cNm (10.6 to 12.4inLb)

Iss.	Date	Modification	Ckd.	Appd.
1	05.01 2005	First release	.	.

BEKA associates Hitchin England

Title: FM Approvals Control Drawing for Intrinsically Safe and Nonincendive BA390 LED Cluster Lamps

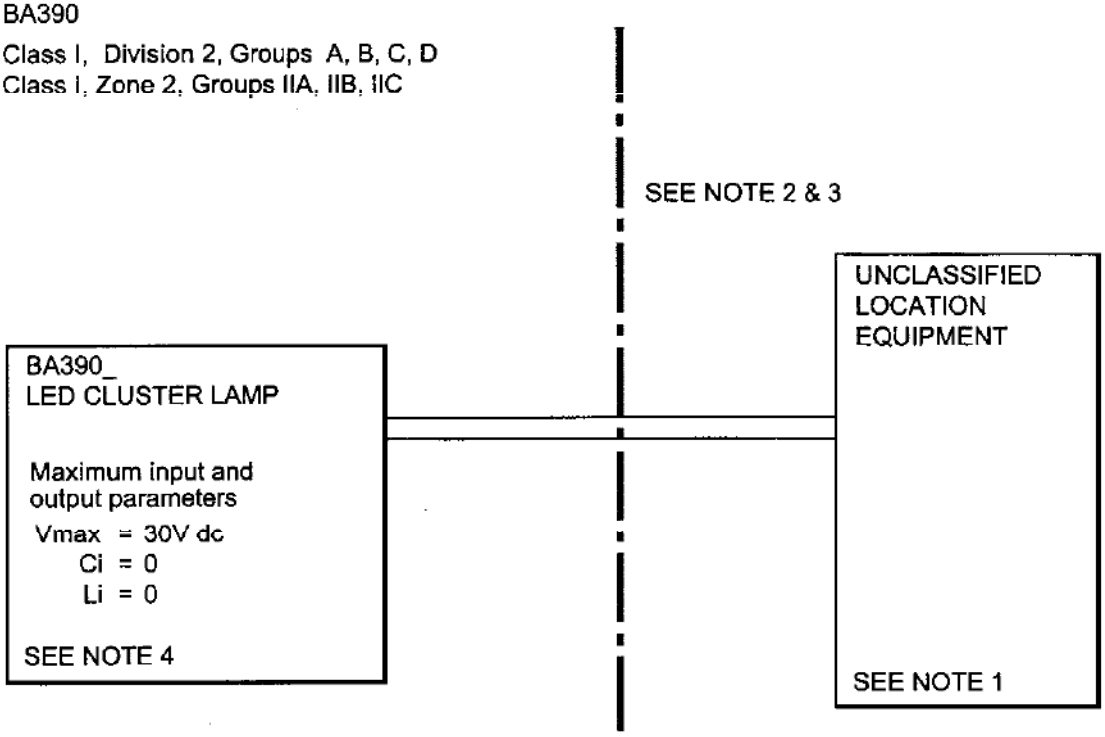
Drawn	Checked	Scale
RC		N/A

Drawing No. CI390-12
Sheet 2 of 4

Nonincendive BA390 LED Cluster Lamps

HAZARDOUS (CLASSIFIED) LOCATION | **UNCLASSIFIED LOCATION**

BA390
Class I, Division 2, Groups A, B, C, D
Class I, Zone 2, Groups IIA, IIB, IIC



Iss.	Date	Modification	Ckd.	Appd.
1	06.01.2005	First release	.	.

BEKA associates Hitchin England

Iss.	Date	Modification	Ckd.	Appd.

Title: FM Approvals Control Drawing for Intrinsically Safe and Nonincendive BA390 LED Cluster Lamps

Drawn	Checked	Scale
RC		N/A

Drawing No. CI390-12
Sheet 3 of 4

Nonincendive BA390 LED Cluster Lamps cont.

Notes:

1. The unclassified location equipment connected to the associated nonincendive field wiring apparatus must not use or generate more than 250Vrms or 250Vdc.

2. Nonincendive field wiring Installations shall be in accordance with the National Electrical Code ANSI/NFPA 70.

Voc	equal to or less than	Vmax
La	equal to or greater than	Lcable + Li
Ca	equal to or greater than	Ccable + Ci

3. The nonincendive field wiring concept allows interconnection of nonincendive field wiring apparatus with associated nonincendive field wiring apparatus using any of the wiring methods permitted for unclassified locations.

4. 1, 2, 3 or 4 BA390 lamps connected in parallel.

5. To maintain IP66 protection between the BA390 and the mounting panel:

   Minimum panel thickness should be — 2mm (0.08inches) Steel
   3mm (0.12inches) Aluminium

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

   Panel cut-out diameter should be — 22.5mm ±0.2mm
   (0.886 ±0.008inches)

   Edges of panel cut-out should be deburred and clean

   The panel securing nut should be tightened to between: — 120 and 140cNm (10.6 to 12.4inLb)

Iss.	Date	Modification	Ckd.	Appd.
1	05.01 2005	First release	.	.

BEKA associates Hitchin England

Title: FM Approvals Control Drawing for Intrinsically Safe and Nonincendive BA390 LED Cluster Lamps

Drawn	Checked	Scale
RC		N/A

Drawing No. CI390–12
Sheet 4 of 4