FM Approvals®
Member of the FM Global Group

CERTIFICATE OF COMPLIANCE

HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

BA304D-a-b-c-d-e 2-Wire 4/20mA 3½ Digit Indicator
IS / I,II,III / 1 / ABCDEFG / T4 Ta = 60°C – CI300-27; Entity; IP66, Type 4X
I / 0 / Ex ia / IIC T4 Ta = 60°C – CI300-27Entity; IP66, Type 4X
IPA / I / 2 / ABCD / T4 Ta = 60°C – CI300-27; IP66, Type 4X
I / 2 / IIC / T4 Ta = 60°C – CI300-27; IP66, Type 4X

Entity Parameters

Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (µF)	Li (mH)
1, 2, 3 & 4	32	200	1.2	0.02	0.01
12 & 13	32	159	1.2	0.03	0.01

a = Display at 4mA XXXX (with decimal point position and polarity)
b = Display at 20mA XXXX (with decimal point position and polarity)
c = Accessories Backlight, backlight with root extractor or backlight with calibrator
d = Accessories Scale Legend, Tag legend
e = Accessories Stainless Legend Plate, Pipe mounting kit

Special conditions of use
1. The BA304D shall be protected from direct exposure to sunlight.

BA324D-a-b-c-d-e 2-Wire 4/20mA 4½ Digit Indicator
IS / I,II,III / 1 / ABCDEFG / T4 Ta = 60°C – CI320-27; Entity; IP66, Type 4X
I / 0 / Ex ia / IIC T4 Ta = 60°C – CI320-27Entity; IP66, Type 4X
IPA / I,II,III / 2 / ABCDFG / T4 Ta = 60°C – CI320-27; IP66, Type 4X
I / 2 / IIC / T4 Ta = 60°C – CI320-27; IP66, Type 4X

Entity Parameters

Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (µF)	Li (mH)
1, 2, 3 & 4	32	200	1.2	0.02	0.01
12 & 13	32	159	1.2	0.03	0.01
8 & 9; or 10 & 11	32	159	1.2	0.04	0.02

a = Display at 4mA XXXX (with decimal point position and polarity)
b = Display at 20mA XXXX (with decimal point position and polarity)
c = Accessories Backlight, backlight with root extractor or backlight with calibrator
d = Accessories Scale Legend, Tag legend
e = Accessories Stainless Legend Plate, Pipe mounting kit

Special conditions of use
1. The BA324 shall be protected from direct exposure to sunlight.

Equipment Ratings:

BA304D 2-Wire 4/20mA 3 ½ Digit Indicator
Intrinsically Safe for Class I, II and III, Division 1, Groups A, B, C, D, E, F and G; and Class I, Zone 0, Group IIC Hazardous (Classified) Locations using the Entity Concept when installed in accordance with Control Drawing CI300-27.

Ignition Protected Apparatus for Class I, Division 2, Groups A, B, C and D and Class I, Zone 2, Group IIC Hazardous (Classified) Locations.

Ignition Protected Apparatus for Class II, Division 2, Groups E, F and G Hazardous (Classified) Locations

Ignition Protected Apparatus for Class III, Division 2, Hazardous (Classified) Locations.

BA324D 2-Wire 4/20mA 4½ Digit Indicator
Intrinsically Safe for Class I, Division 1, Groups A, B, C, D E, F and G; and Class I, Zone 0, Group IIC Hazardous (Classified) Locations using the Entity Concept when installed in accordance with Control Drawing CI320-27

Ignition Protected Apparatus for Class I, Division 2, Groups A, B, C and D and Class I, Zone 2, Group IIC Hazardous (Classified) Locations.

Ignition Protected Apparatus for Class II, Division 2, Groups E, F and G Hazardous (Classified) Locations

Ignition Protected Apparatus for Class III, Division 2, Hazardous (Classified) Locations.

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:

CSA-C22.2 No 157	1992
CSA C22.2 No. 25	1966
CSA C22.2 No. 213	1987
CSA C22.2 No. 94.02	2007
CSA-C22.2 No.60079-0	2002
CSA-E60079-11-02	2002
CSA C22.2 No. 1010.1	1992
CSA-C22.2 No 60529	2005

Original Project ID: 3008809

Canadian Project ID: 3032631 Approval Granted: May 28, 2008

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
080616	August 11, 2008		

FM Approvals LLC

J. E. Marquedant
Group Manager, Electrical

11 August 2008
Date

SUB-MASTER

HAZARDOUS LOCATION

Class I Division 1 Groups A, B, C & D
Class II Division 1 Groups E, F & G
Class III
or Class 1, Zone 0 or 1, Groups IIC
T4 Ta = 60°C
See Note 6

NON-HAZARDOUS LOCATION

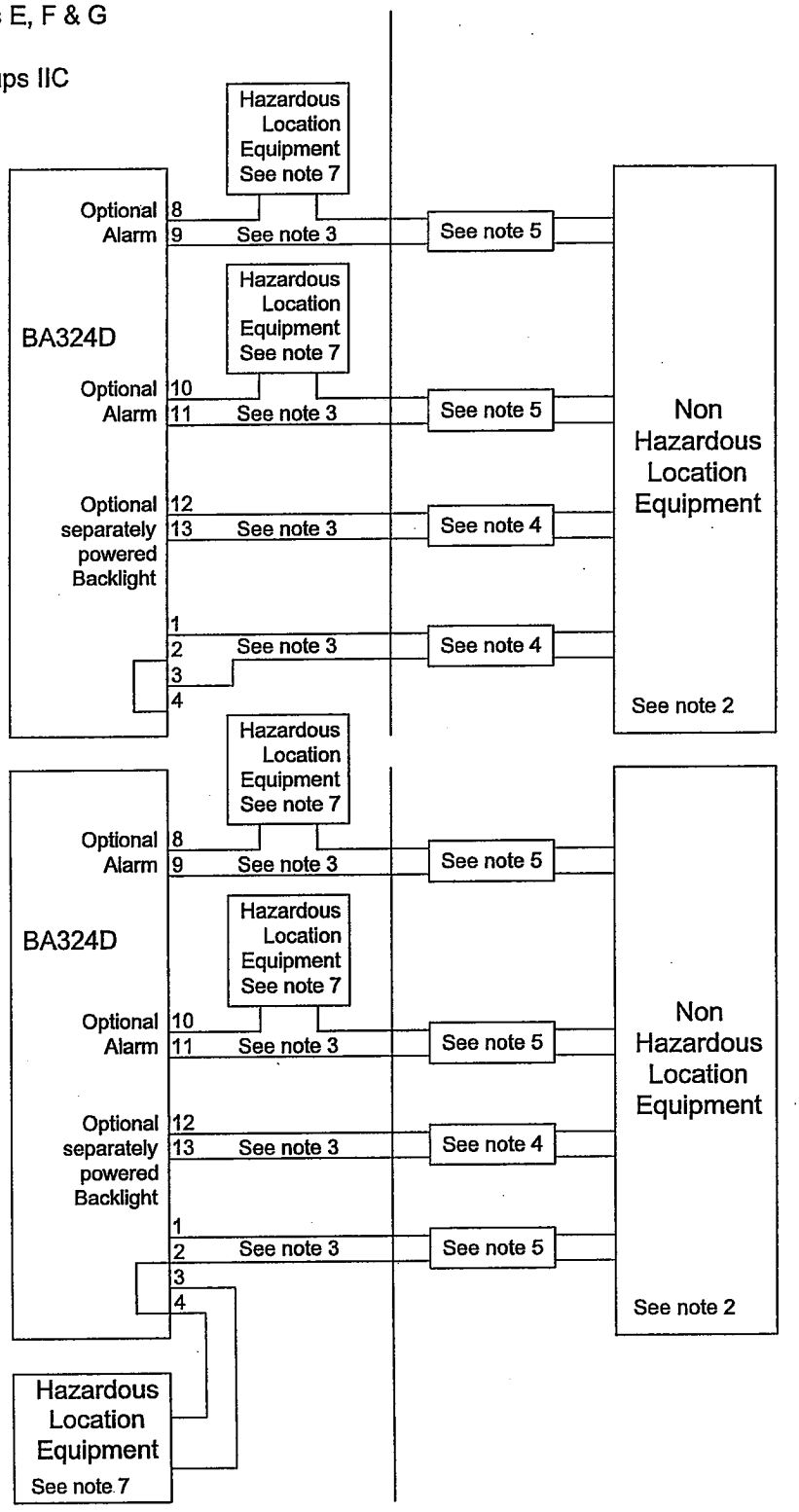
See note 1

BA324D
Entity parameters
with optional
separately powered
backlight

Terminals 1,2,3 & 4
Vmax = 32V
Imax = 200mA
Pmax = 1.2W
Ci = 0.02µF
Li = 0.01mH

Terminals 12 & 13
Vmax = 32V
Imax = 159mA
Pmax = 1.2W
Ci = 0.03µF
Li = 0.01mH

Terminals 8,9,10 & 11
Vmax = 32V
Imax = 159mA
Pmax = 1.2W
Ci = 0.04µF
Li = 0.02mH



Iss.	Date	Modification	Appd.
3	01/08	CFM requirements added.	
2	06/04	Loop powered backlight added	
1	05/00	.	

BEKA associates Hitchin England

Title: BA324D 4 1/2 DIGIT INDICATOR FACTORY MUTUAL CONTROL DRAWING

Drawn	Checked	Scale
AC		

Drawing No. C1320-27
Sheet 1 of 4

SUB - MASTER

Iss.	Date	Modification	Appd.
3	01/08	CFM requirements added.	

BEKA associates
Hitchin England

Iss.	Date	Modification	Appd.
1	05/00	.	
2	06/04	Loop powered backlight added	

HAZARDOUS LOCATION

Class I Division 1 Groups A, B, C & D
Class II Division 1 Groups E, F & G
Class III
or Class 1, Zone 0 or 1, Groups IIC
T4 Ta = 60°C
See Note 6

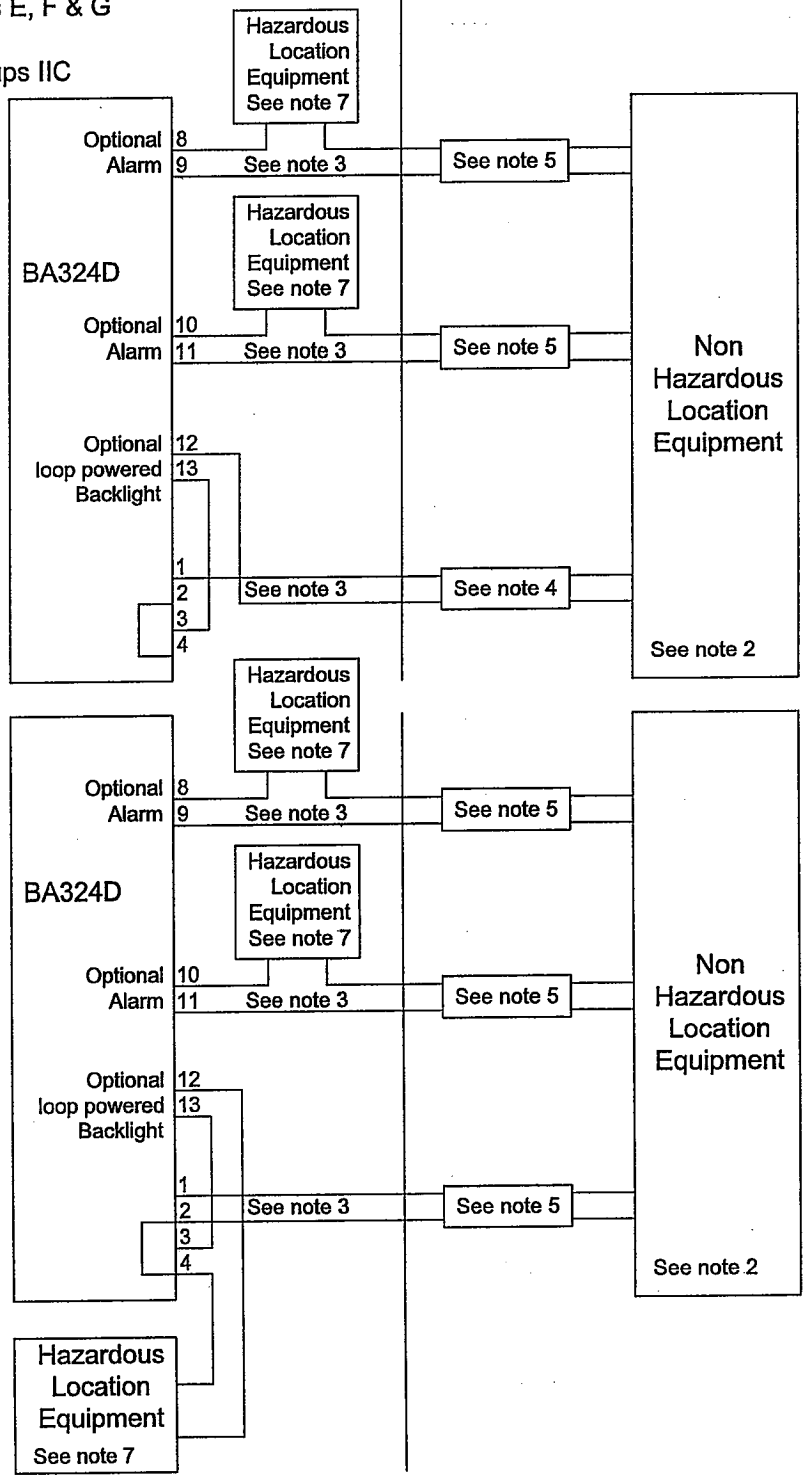
NON-HAZARDOUS LOCATION

See note 1

BA324D
Entity parameters
with optional
loop powered
backlight

Terminals 1,2,3,4,
12 & 13
Vmax = 32V
Imax = 200mA
Pmax = 1.2W
Ci = 0.05µF
Li = 0.02mH

Terminals 8,9,10 & 11
Vmax = 32V
Imax = 159mA
Pmax = 1.2W
Ci = 0.04µF
Li = 0.02mH



Notes

1. The associated protective barriers and galvanic isolators must be FMRC Approved and the manufacturer's installation drawings must be followed when installing this equipment. For installations in Canada the associated intrinsically safe barriers and galvanic isolators must be CFM or CSA approved and the manufacturers' installation drawings shall be followed when installing the equipment.

Title: BA324D 4 1/2 DIGIT INDICATOR
FACTORY MUTUAL
CONTROL DRAWING

Drawn	Checked	Scale
AC	Q.	

Drawing No. CI320-27
Sheet 2 of 4

Iss.	Date	Modification	Appd.
3	01/08	CFM requirements added.	

2. The non-hazardous location equipment connected to the associated protective barriers or galvanic isolators shall not use or generate more than 250V rms or 250V dc.

3. Wire each pair separately or together with individually grounded screens to prevent shorting between pairs. Installation should be in accordance with ANSI/ISA RP 12.6 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code ANSI/NFPA 70.
Installations in Canada shall be in accordance with the Canadian Electrical Code C22.2

4. One single channel or one two channel associated protective barrier or galvanic isolator with entity parameters meeting the following requirements :

Voc or Vt	equal to or less than	Vmax
Isc or It	equal to or less than	Imax
Po	equal to or less than	Pmax
La	equal to or greater than	Lcable + Li
Ca	equal to or greater than	Ccable + Ci

5. One single channel or one two channel associated protective barrier or galvanic isolator with entity parameters meeting the following requirements :

CAUTION : THESE REQUIREMENTS MUST BE FOLLOWED FOR NEW INSTALLATIONS OR MODIFICATIONS TO EXISTING INSTALLATIONS.

Voc or Vt	equal to or less than	The lowest Vmax of the FMRC, CFM or CSA Approved apparatus installed in the respective loop.
Isc or It	equal to or less than	The lowest Imax of the FMRC, CFM or CSA Approved apparatus installed in the respective loop.
Po	equal to or less than	The lowest Pmax of the FMRC, CFM or CSA Approved apparatus in the respective loop.
La	equal to or greater than	The sum of the cable inductances and the internal inductance of Li of each FMRC, CFM or CSA Approved apparatus installed in the respective loop.
Ca	equal to or greater than	The sum of the cable capacitance and the internal capacitance of Ci of each FMRC, CFM or CSA Approved apparatus in the respective loop.

6. If connected to AEx [ib] associated protective barrier of galvanic issolator, the BA324D is only suitable for Class I, Zone 1 or 2 hazardous locations.

7. Hazardous location equipment may be simple apparatus or FMRC Approved equipment with entity parameters meeting the requirements of **note 5.**

8. The BA324D is also FMRC and CFM Approved as non-incendive for Class I, Division 2 Groups A, B, C and D; suitable for use in Class II and III, Division 2 Groups F & G and Class I, Zone 2, Group IIC hazardous (classified) location without connection to associated protective barriers when installed per the National Electrical Code (ANSI/NFPA 70) and the voltages do not exceed 32Vdc.

Iss.	Date	Modification	Appd.
1	05/00		
2	06/04	Loop powered backlight added	

BEKA associates
Hitchin England

Title: BA324D 4 1/2 DIGIT INDICATOR
FACTORY MUTUAL
CONTROL DRAWING

Drawn	Checked	Scale
AC		

Drawing No. C1320-27
Sheet 3 of 4

9. When installed in a hazardous (classified) location the BA324D 4½ digit indicator shall be fitted with cable glands /conduit hubs selected from the following table. Metallic glands and hubs must be grounded - see note 10.

Class	Permitted gland or conduit hub
Class I	Any metallic or plastic cable gland or conduit hub that provides the required environmental protection.
Class II and III	**Crouse - Hinds Myler hubs** SSTG-1 STG-1 STAG-1 MHUB-1 **O-Z / Gedfrey Hubs** CHMG-50DT **REMKE hub** WH-1-G **Killark Glands** CMCXAA050 MCR050 MCX050

10. In addition to the supplied bonding plate, when 3 metallic glands or conduit hubs are fitted to a BA324D 4½ digit indicator, all metallic glands or conduit hubs must be connected together and grounded.

11. **CAUTION**
The BA324D 4½ digit indicator is manufactured from conductive plastic per Article 250 of the National Electrical Code the enclosure shall be grounded using the 'E' terminal on the terminal block.

12. The BA324D 4½ digit indicator should be mounted where it is shielded from direct sunlight.

Iss.	Date	Modification	Appd.
3	01/08	CFM requirements added.	

Iss.	Date	Modification	Appd.
1	05/00	.	
2	06/04	Loop powered backlight added	

Title: BA324D 4 1/2 DIGIT INDICATOR FACTORY MUTUAL CONTROL DRAWING

Drawn	Checked	Scale
AC		

Drawing No. CI320-27
Sheet 4 of 4