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:

BA304D-a-b-c-d-e. 2-Wire 4/20 mA 3 ½ Digit Indicator
IS / I,II,III / 1 / ABCDEFG / T4 Ta = 60°C — CI300-27; Entity; Type 4X, IP66
IS / I / 0 / AEx ia IIC / T4 Ta = 60°C — CI300-27; Entity; Type 4X, IP66
NI / I / 2 / ABCD / T4 Ta = 60°C; S / II,III / 2 / FG / T4 Ta = 60°C; Type 4X, IP66
NI / I / 2 / IIC / T4 Ta = 60°C; Type 4X, IP66
Entity Parameters:
Terminals 1, 2, 3 & 4:
VMax = 32 V, IMax = 200 mA, Pi = 1.2 W, Ci = 0.02 µF, Li = 0.01 mH
Terminals 12 & 13:
VMax = 32 V, IMax = 159 mA, Pi = 1.2 W, Ci = 0.03 µF, Li = 0.01 mH
a = Display at 4 mA XXXX (with decimal point position and polarity).
b = Display at 20 mA XXXX (with decimal point position and polarity).
c = Accessories Separately Powered Backlight, Loop Powered Backlight
d = Root Extractor or Calculator
e = Accessories Scale legend, Tag legend.
f = Accessories Stainless Legend Plate, Pipe mounting kit.

BA324D-a-b-c-d-e. 2-Wire 4/20 mA 4 ½ Digit Indicator
IS / I,II,III / 1 / ABCDEFG / T4 Ta = 60°C — CI320-27; Entity; Type 4X, IP66
IS / I / 0 / AEx ia IIC / T4 Ta = 60°C — CI320-27; Entity; Type 4X, IP66
NI / I / 2 / ABCD / T4 Ta = 60°C; S / II,III / 2 / FG / T4 Ta = 60°C; Type 4X, IP66
NI / I / 2 / IIC / T4 Ta = 60°C; Type 4X, IP66
Entity Parameters:
Terminals 1, 2, 3 & 4:
VMax = 32 V, IMax = 200 mA, Pi = 1.2 W, Ci = 0.02 µF, Li = 0.01 mH
Terminals 12 & 13:
VMax = 32 V, IMax = 159 mA, Pi = 1.2 W, Ci = 0.03 µF, Li = 0.01 mH

Terminals 8 & 9 or 10 & 11:
VMax = 32 V, IMax = 159 mA, Pi = 1.2 W, Ci = 0.04 µF, Li = 0.02 mH
a = Display at 4 mA XXXX (with decimal point position and polarity if negative)
b = Display at 20 mA XXXX (with decimal point position and polarity if negative)
c = Accessories Separately Powered Backlight, Loop Powered Backlight

d = Alarms
e = Tare
f = Lineariser
g = external push-buttons
h = Accessories Scale legend, Tag legend, Stainless legend plate
i = Accessories Pipe mounting kit

Equipment Ratings:

Intrinsically safe apparatus for use in Class I, II, III, Division 1, Groups A, B, C, D, E and F; Class I, Zone 0, AEx ia IIC temperature class T4 at Ta = 60°C in accordance with Entity requirements and Control Drawings CI300-27 Issue 1 and CI320-27 Issue 1; Nonincendive for use in Class I, II, III, Division 2, Groups A, B, C, D, F and G; Class I, Zone 2, Group IIC temperature class T4 at Ta = 60°C Hazardous (Classified) indoor or outdoor (Type 4X, IP66) 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:

Class 3600	1998
Class 3610	2010
Class 3611	2004
Class 3810	2005

Original Project ID: 3008809 Approval Granted: July 18, 2001

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
040527	July 8, 2004		
101217	March 16, 2011		

FM Approvals LLC

Timothy J Adam
Technical Team Manager

March 16, 2011
Date

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

BEKA associates
Hitchin England

HAZARDOUS LOCATION

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

NON-HAZARDOUS LOCATION

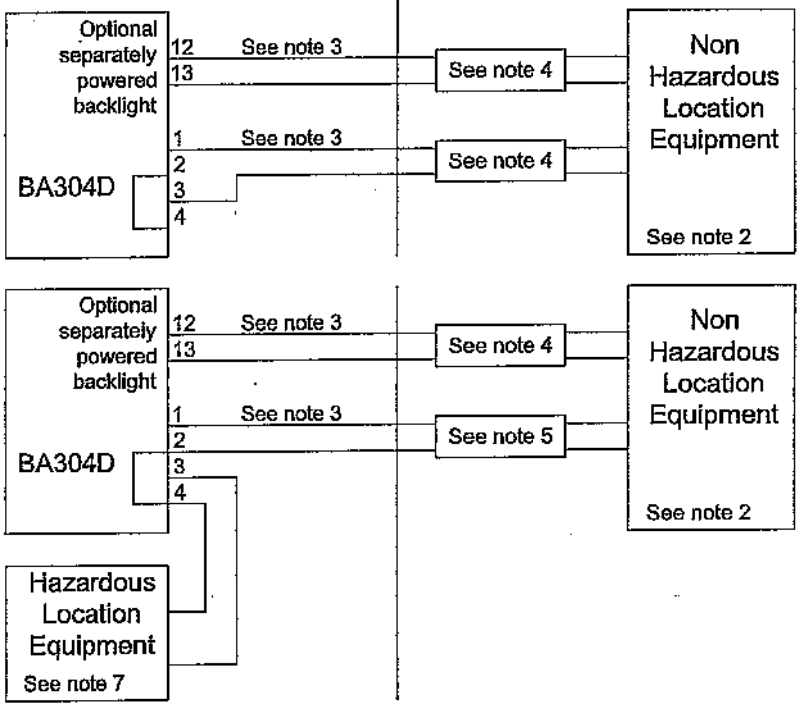
See note 1

SUB-MASTER

BA304D
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

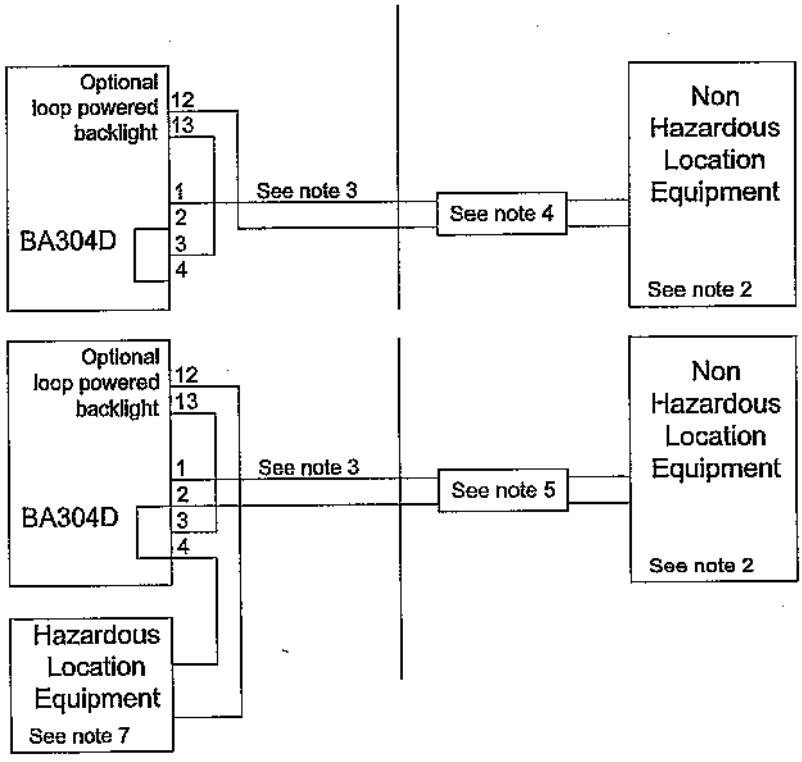
Terminals 12 & 13
Vmax = 32V
Imax = 159mA
Pmax = 1.2W
Ci = 0.03µF
Li = 0.01mH



BA304D
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



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

Title: BA304D 3 1/2 DIGIT INDICATOR
FACTORY MUTUAL
CONTROL DRAWING

Drawn	Checked	Scale
AC		

Drawing No. CI300-27
Sheet 1 of 3

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.

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 or galvanic issolator, the BA304D is only suitable for Class I, Zone 1 or 2 hazardous locations.

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: BA304D 3 1/2 DIGIT INDICATOR FACTORY MUTUAL CONTROL DRAWING

Drawn	Checked	Scale
AC		

Drawing No. C1300-27
Sheet 2 of 3

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

8. The BA304D 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 for 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.

9. When installed in a hazardous (classified) location the BA304D 3½ 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 BA304D 3½ digit indicator, all metallic glands or conduit hubs must be connected together and grounded.

11. **CAUTION**
The BA304D 3½ 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 BA304D 3½ digit indicator should be mounted where it is shielded from direct sunlight.

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

Title: BA304D 3 1/2 DIGIT INDICATOR
FACTORY MUTUAL
CONTROL DRAWING

Drawn	Checked	Scale
AC		

Drawing No. C1300-27
Sheet 3 of 3

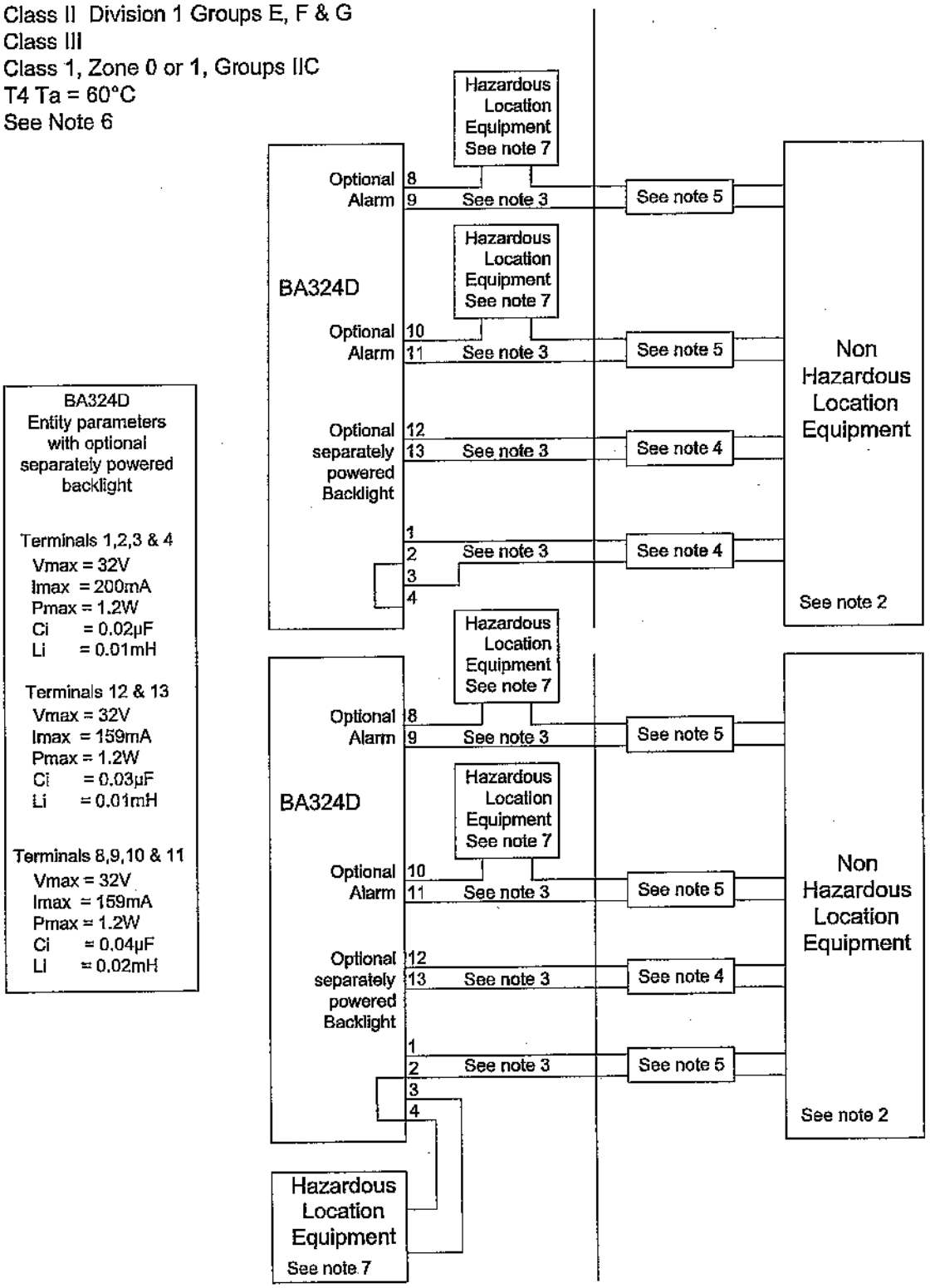
SUB-MASTER

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.	

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 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

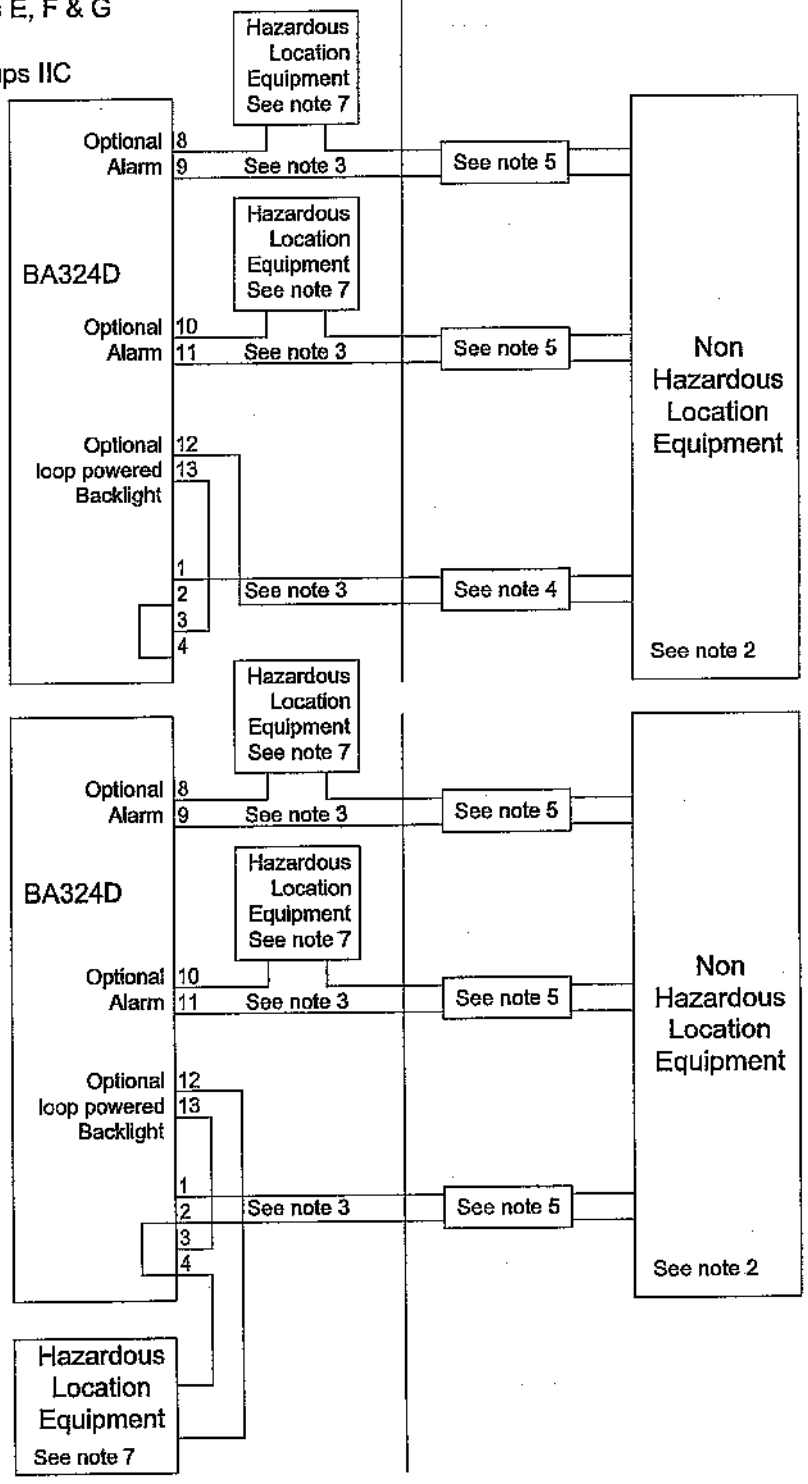
NON-HAZARDOUS LOCATION

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

SUB - MASTER

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.
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 AC | Checked | Scale

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.	
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: AC | Checked | Scale

Drawing No. CI320-27
Sheet 4 of 4