FM Approvals
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CERTIFICATE OF COMPLIANCE

HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

BA307Cabc - 4/20 mA Loop Powered 3 1/2 Digit Indicator
IS / I / 1 / ABCD / T4 Ta = 60°C - CI300-22; Entity; Type 4*
NI / I / 2 / ABCD / T4 Ta = 60°C; Type 4*

*Front panel only.
Entity parameters

Terminals	VMax (V)	IMax (mA)	PMax (W)	Ci (µF)	Li (mH)
1, 2, 3 and 4	32	200	1.2	0.02	0.01
12 and 13	32	159	1.2	0.03	0.01

a = Display at 0 mA: XXXX.
b = Display at 20 mA: XXXX (with decimal point position and polarity).
c = Accessories: backlight, root extractor or calibrator, scale card, tag strip.

Special Conditions of Use:
1. To maintain the Type 4 enclosure rating the BA307C shall be installed in accordance with the mounting conditions provided on drawing numbers CI300-32.
2. The BA307C shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.
3. The BA307C shall be protected from direct exposure to sunlight.

BA308Cabc - 4/20 mA Loop Powered 3 1/2 Digit Indicator
IS / I / 1 / ABCD / T4 Ta = 60°C - CI300-22; Entity; Type 4*
NI / I / 2 / ABCD / T4 Ta = 60°C; Type 4*

*Front panel only
Entity parameters

Terminals	VMax (V)	IMax (mA)	PMax (W)	Ci (µF)	Li (mH)
1, 2, 3 and 4	32	200	1.2	0.02	0.01
12 and 13	32	159	1.2	0.03	0.01

a = Display at 0 mA: XXXX.
b = Display at 20 mA: XXXX (with decimal point position and polarity).
c = Accessories: root extractor or calibrator, scale card, tag strip.

Special Conditions of Use:
1. To maintain the Type 4 enclosure rating the BA308C shall be installed in accordance with the mounting conditions provided on drawing numbers CI300-32.
2. The BA308C shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.
3. The BA308C shall be protected from direct exposure to sunlight.

BA327Cabcd - 4/20 mA Loop Powered 4 1/2 Digit Indicator
IS / I / 1 / ABCD / T4 Ta = 60°C - CI320-22; Entity; Type 4*
NI / I / 2 / ABCD / T4 Ta = 60°C; Type 4*

*Front panel only.
Entity parameters

Terminals	VMax (V)	IMax (mA)	PMax (W)	Ci (µF)	Li (mH)
1, 2, 3 and 4	32	200	1.2	0.02	0.01
12 and 13	32	159	1.2	0.03	0.01
8 and 9;10 and 11	32	159	1.2	0.04	0.02

a = Display mode: linear or root extracting.
b = Display at 0 mA: XXXX.
c = Display at 20 mA: XXXX (with decimal point position and polarity).
d = Accessories: backlight, alarms, tare function, lineariser, scale card, tag strip.

Special Conditions of Use:
1. To maintain the Type 4 enclosure rating the BA327C shall be installed in accordance with the mounting conditions provided on drawing numbers CI320-22.
2. The BA327C shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.
3. The BA327C shall be protected from direct exposure to sunlight.

BA328Cabcd - 4/20 mA Loop Powered 4 1/2 Digit Indicator
IS / I / 1 / ABCD / T4 Ta = 60°C - CI320-22; Entity; Type 4*
NI / I / 2 / ABCD / T4 Ta = 60°C; Type 4*

*Front panel only.
Entity parameters

Terminals	VMax (V)	IMax (mA)	PMax (W)	Ci (µF)	Li (mH)
1, 2, 3 and 4	32	200	1.2	0.02	0.01
12 and 13	32	159	1.2	0.03	0.01
8 and 9;10 and 11	32	159	1.2	0.04	0.02

a = Display mode: linear or root extracting.
b = Display at 0 mA: XXXX.
c = Display at 20 mA: XXXX (with decimal point position and polarity).
d = Accessories: alarms, tare function, lineariser, scale card, tag strip.

Special Conditions of Use:
1. To maintain the Type 4 enclosure rating the BA328C shall be installed in accordance with the mounting conditions provided on drawing numbers CI320-22.
2. The BA328C shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.
3. The BA328C shall be protected from direct exposure to sunlight.

Equipment Ratings:

BA307C & BA308C
Intrinsically safe for Class I, Division 1, groups A, B, C and D in accordance with the Entity Concept and when installed in accordance with Control Drawing CI300-22. Nonincendive for Class I, Division 2, Groups A, B, C, and D. Indoor Hazardous Locations; Temperature ClassT4 Ambient Temperature +60°C

BA327C & BA328C
Intrinsically safe for Class I, Division 1, groups A, B, C and D in accordance with the Entity Concept and when installed in accordance with Control Drawing CI320-22. Nonincendive for Class I, Division 2, Groups A, B, C, and D. Indoor Hazardous Locations; Temperature ClassT4 Ambient Temperature +60°C

FM Approved for:

BEKA associates
Hitchin, Hertfordshire, SG5 2DY, United Kingdom

FM Approvals®

Member of the FM Global Group

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

C22.2 No 157	1992
C22.2 No. 1010.1	1992
C22.2 No. 25	2004
C22.2 No. 213	2004
C22.2 No. 94.02	2007

Original Project ID: 4B3A7.AX

Canadian Project ID: 3032632 Approval Granted: December 16, 2008

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date

FM Approvals LLC

J.E. Marquedant

James E. Marquedant
Group Manager, Electrical

16 December 2008
Date

Iss.	Date	Modification	Ckd.	Appd.
3	26.05 2005	Redawn. BA327 & 328 Class II & III options removed	.	.
4	01/08	cFM requirements added. for BA327C & BA328C		

For US Installations:

HAZARDOUS (CLASSIFIED) LOCATION

BA324C LOCATIONS:
Class I, Division 1, Groups A, B,C & D
Class II, Division 1, Groups E, F & G
Class III

For Canadian Installations:

HAZARDOUS LOCATION

BA327C & BA328C LOCATIONS:
Class I, Division 1, Groups A, B,C & D

UNCLASSIFIED LOCATION

SAFE LOCATION

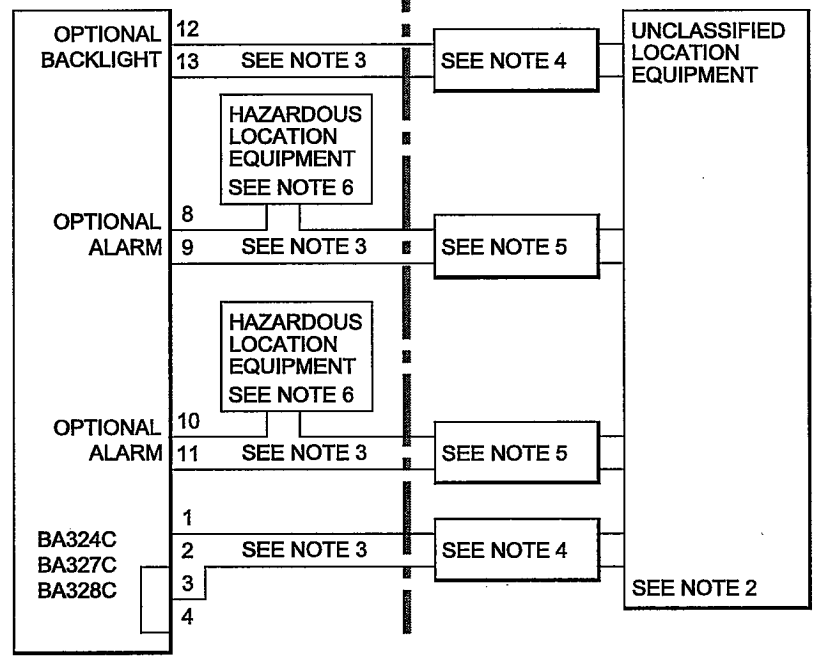
SEE NOTE 1

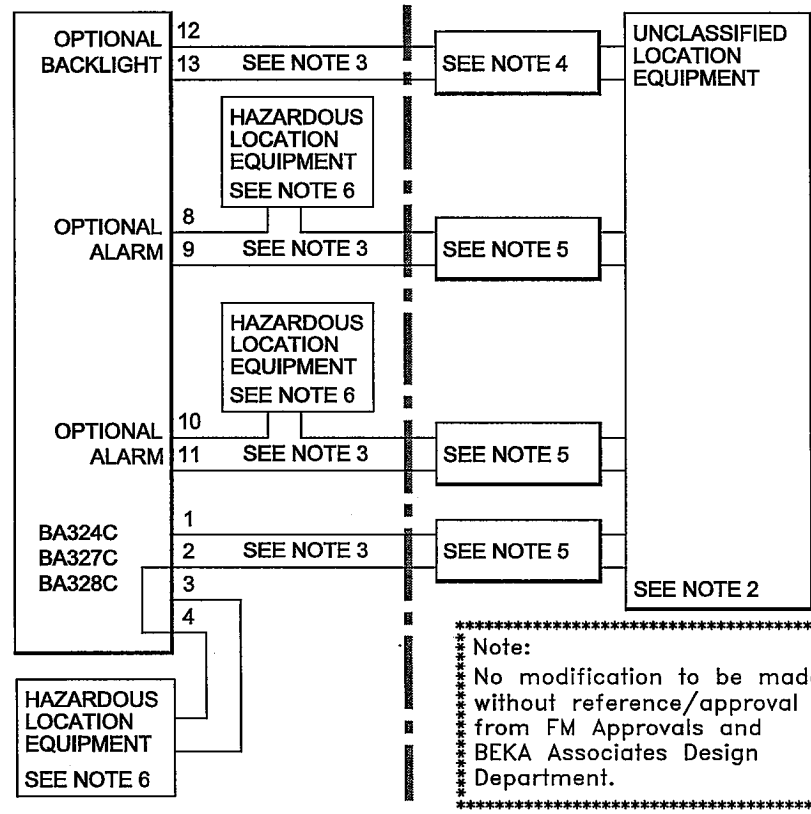
BA324C, BA327C or BA328C Entity Parameters

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 and 10 & 11
Vmax = 32V
Imax = 159mA
Pmax= 1.2W
Ci = 0.04µF
Li = 0.02mH





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Note:
No modification to be made without reference/approval from FM Approvals and BEKA Associates Design Department.
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Title

FM Control Drawing for BA324C, 327C and 328C

Drawn	Checked	Scale
RC		N/A

Drawing No. CI320-22
Sheet 1 of 3

File: CI320-22.dwg 10.11.08

Notes:

1. The associated intrinsically safe barriers or galvanic isolators must be FM approved and the manufacturers' installation drawings must be followed when installing this equipment.
   For BA327C and BA328C installations in Canada, the associated intrinsically safe barriers and galvanic isolators shall be cFM or CSA approved and the manufacturers' installation drawings shall be followed when installing the equipment.

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

3. Installation shall be in accordance with ANSI/ISA RP 12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code ANSI/NFPA 70.
   BA327C and BA328C installations in Canada shall be in accordance with the Canadian Electrical Code C22.2.

4. One single channel or one channel of a dual channel barrier or galvanic isolator with entity parameters complying with 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 channel of a dual channel barrier or galvanic isolator with entity parameters complying with 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 Approved, or for BA327C & BA328C installations in Canada, the cFM or CSA Approved apparatus installed in the respective loop.
Isc or It	equal to or less than	The lowest Imax of the FMRC Approved, or for BA327C & BA328C installations in Canada, the cFM or CSA Approved apparatus installed in the respective loop.
Po	equal to or less than	The lowest Pmax of the FMRC Approved, or for BA327C & BA328C installations in Canada, the 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 Li of each FMRC Approved, or for BA327C & BA328C installations in Canada, the 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 Ci of each FMRC Approved, or for BA327C & BA328C installations in Canada, the cFM or CSA Approved apparatus in the respective loop.

Iss.	Date	Modification	Ckd.	Appd.
3	26.05 2005	Redawn. BA327 & 328 Class II & III options removed	.	.
4	01/08	cFM requirements added. for BA327C & BA328C		

BEKA associates Hitchin England

Title: FM Control Drawing for BA324C, 327C and 328C

Drawn: RC | Checked | Scale: N/A

Drawing No. CI320-22
Sheet 2 of 3

File: CI320-22.dwg 10.11.08

6. Hazardous (classified) location equipment may be simple apparatus or FMRC Approved, or for BA327C & BA328C installations in Canada, cFM or CSA Approved equipment with entity parameters meeting the requirements of note 5.

7. The BA324C is FMRC Approved as nonincendive for Class I, II, III, Division 2, Groups A, B, C, D, E, F & G Hazardous (classified) locations without connection to associated protective barriers or galvanic isolators when installed per the National Electrical Code (ANSI/NFPA 70) and the voltages do not exceed 32V dc.

   The BA327C and BA328C are FMRC and cFM Approved as nonincendive for Class I, Division 2, Groups A, B, C & D and for Class I, Division 2, Group IIC Hazardous (classified) locations without connection to associated protective barriers or galvanic isolators when installed per the National Electrical Code (ANSI/NFPA 70) or for installations in Canada in accordance with the Canadian Electrical Code C22.2 and the voltages do not exceed 32V dc.

8. When mounting BA327C and BA328C in an enclosure to maintain Type 4 front panel rating:

   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 should be BA327C 43.5 x 90.0mm -0.00 +0.5
   (1.71 x 3.54 inches -0.00 +0.02)

   BA328C 66.2 x 136.0mm -0.0 +0.5
   (2.60 x 5.35 inches -0.00 +0.02)

   Edges of panel cut-out should be deburred and clean

   Each panel mounting clip should be tighened to between: 20 and 22cNm (1.77 to 1.95 inLb)

   Note: BA328C requires four panel clips.

Iss.	Date	Modification	Ckd.	Appd.
3	26.05 2005	Redawn. BA327 & 328 Class II & III options removed	.	.
4	01/08	cFM requirements added. for BA327C & BA328C		

BEKA associates Hitchin England

Title: FM Control Drawing for BA324C, 327C and 328C

Drawn	Checked	Scale
RC		N/A

Drawing No. Sheet 3 of 3 CI320–22

File: CI320–22.dwg 10.11.08