

CERTIFICATE OF COMPLIANCE

HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

BA304E, BA324E, BA354E 4-digit and 5-Digit Indicators and Rate Totaliser

IS / I, II, III / A, B, C, D, E, F, G / T5 Ta = 70°C – Entity; CI300-72; 4X; IP66

I / 0 / Ex ia IIC / T5 Ta = 70°C – Entity; CI300-72

NI / I / 2 / ABCD / T5 Ta = 70°C – NIFW ; CI300-73

NI / II / 2 / EFG / T5 Ta = 70°C – NIFW ; CI300-73

NI / III / T5 Ta = 70°C – NIFW ; CI300-73

I / 2 / IIC / T5 Ta = 70°C – NIFW ; CI300-73

Intrinsic Safety Parameters

Input Parameters (with the Separately power backlight option)

	Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (µF)	Li (mH)
4-20 mA input	1, 2, 3 & 4	30	200	0.84	0.013	0.01
Backlight	12 & 14	30	200	0.84	0.015	0.02
Alarm	8, 9, 10 & 11	30	200	0.84	0.024	0.01
Reset*	RS1, RS2	30	200	0.84	0.013	0.01

Input Parameters (with the Loop power backlight option)

	Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (µF)	Li (mH)
4-20mA & Loop powered backlight	1, 2, 3, 4, 12 & 14	30	200	0.84	0.013	0.01
Reset*	RS1, RS2	30	200	0.84	0.013	0.01

Output Parameters (with the Separately power backlight option)

	Terminals	Uo (V)	Io (mA)	Po (W)	Co (µF)	Lo (mH)
4-20 mA input	1, 2, 3 & 4	1.1	3	4.5m	1000	1000
Alarm	8, 9, 10 & 11	1.47	1	2.2u	1000	1000
Reset*	RS1, RS2	6	2.5	3.75m	40	1000

Output Parameters (with the Loop power backlight option)

	Terminals	Uo (V)	Io (mA)	Po (mW)	Co (µF)	Lo (mH)
4-20mA & Loop	1, 2, 3, 4, 12 & 14	1.1	3	4.5	1000	1000

powered backlight	14					
Reset*	RS1, RS2	6	2.5	3.75m	40	1000

* BA354E version only

a = Parameter not affecting safety.

BA307E, BA308E, BA327E, BA328E BA358E 4-digit and 5-Digit Indicators and Rate Totaliser

IS / I, II, III / A, B, C, D, E, F, G / T5 Ta = 70°C – Entity; CI300-72; 4X; IP66

I / O / Ex ia IIC / T5 Ta = 70°C; – Entity; CI300-72; 4X; IP66

NI / I / 2 / ABCD / T5 Ta = 70°C – NIFW ; CI300-72

NI / II / 2 / EFG / T5 Ta = 70°C – NIFW ; CI300-73

NI / III / T5 Ta = 70°C – NIFW ; CI300-73

I / 2 / IIC / T5 Ta = 70°C – NIFW ; CI300-73

Intrinsic Safety Parameters

Input Parameters (with a separately power backlight option)

	Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (µF)	Li (mH)
4-20 mA input	1, 2, 3 & 4	30	200	0.84	0.013	0.01
Backlight	12 & 14	30	200	0.84	0.015	0.02
Alarm	8, 9, 10 & 11	30	200	0.84	0.024	0.01
Reset*	RS1, RS2	30	200	0.84	0.013	0.01

Input Parameters (with a Loop power backlight option)

	Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (µF)	Li (mH)
4-20mA & Loop powered backlight	1, 2, 3, 4, 12 & 14	30	200	0.84	0.013	0.01
Reset*	RS1, RS2	30	200	0.84	0.013	0.01

Output Parameters (with a separately power backlight option)

	Terminals	Uo (V)	Io (µA)	Po (µW)	Co (µF)	Lo (mH)
4-20 mA input	1, 2, 3 & 4	1.1	3000	4.5	1000	1000
Alarm	8, 9, 10 & 11	1.47	2.2	4.0	1000	1000
Reset*	RS1, RS2	6	2.5	3.75m	40	1000

Output Parameters (with a Loop power backlight option)

	Terminals	Uo (V)	Io (mA)	Po (mW)	Co (µF)	Lo (mH)
4-20mA & Loop powered backlight	1, 2, 3, 4, 12 & 14	1.1	3	4.5	1000	1000
Reset*	RS1, RS2	6	2.5	3.75m	40	1000

* BA358E version only

a = Parameter not affecting safety.

Special conditions of use

- To maintain the Type 4X and IP66 enclosure rating the BA307E, BA308E, BA327E, BA328E and BA358E shall be installed in accordance with the mounting conditions provided on drawing numbers CI300-72 and CI300-73.
- The BA307E, BA308E, BA327E, BA328E and BA358E shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.
- The BA307E, BA308E, BA327E, BA328E, and BA358E shall be protected from direct exposure to sunlight.
- When a BA307E, BA308E, BA327E or BA328E panel mounting indicator or a BA358E panel mounting rate totaliser is located in a Class II, or III hazardous location, the instrument shall be installed as defined in note 11 of CI300-72 and the enclosure shall provide Type 4 protection.

BA307E-SS, BA327E-SS, 4-digit and 5-Digit Indicators and Rate Totaliser

IS / I / 1 / A, B, C, D / T5 Ta = 70°C – Entity; CI300-72; IP66

I / 0 / Ex ia IIC / T5 Ta = 70°C; – Entity; CI300-72; IP66

NI / 1 / 2 / ABCD / T5 Ta = 70°C – NIFW ; CI300-73

I / 2 / IIC / T5 Ta = 70°C – NIFW ; CI300-73

Intrinsic Safety Parameters

Input Parameters (with a separately power backlight option)

	Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (µF)	Li (mH)
4-20 mA input	1, 2, 3 & 4	30	200	0.84	0.013	0.01
Backlight	12 & 14	30	200	0.84	0.015	0.02
Alarm	8, 9, 10 & 11	30	200	0.84	0.024	0.01

Input Parameters (with a Loop power backlight option)

	Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (µF)	Li (mH)
4-20mA & Loop powered backlight	1, 2, 3, 4, 12 & 14	30	200	0.84	0.03	0.01

Output Parameters (with a separately power backlight option)

	Terminals	Uo (V)	Io (mA)	Po (W)	Co (µF)	Lo (mH)
4-20 mA input	1, 2, 3 & 4	1.1	3	4.5m	1000	1000
Alarm	8, 9, 10 & 11	1.1	1	2.2µ	1000	1000

Output Parameters (with a Loop power backlight option)

	Terminals	Uo (V)	Io (mA)	Po (mW)	Co (µF)	Lo (mH)
4-20mA & Loop powered backlight	1, 2, 3, 4, 12 & 14	1.1	3	4.5	1000	1000

a = Parameter not affecting safety.

Special Conditions of Use:

- To maintain the IP66 enclosure rating the BA307E-SS and BA327E shall be installed in accordance with the mounting conditions provided on drawing numbers CI300-72 and CI300-73.
- The BA307E-SS, and BA327E-SS shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.
- The BA307E-SS, and BA327E-SS shall be protected from direct exposure to sunlight.

Equipment Ratings:

BA304E, BA324E, BA354E

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 Locations when installed in accordance with the entity concept in accordance with Control Drawings CI300-72; Nonincendive for Class I, Division 2, Groups A, B, C and D and Class I, Zone 2, Group IIC, Hazardous Locations when installed in accordance with the nonincendive field wiring concept in accordance with Control Drawings CI300-73; Suitable for Class II and III, Division 2, Groups E, F and G Hazardous Locations when installed in accordance with the nonincendive field wiring concept in accordance with Control Drawings CI300-73. Temperature class T5 at an ambient of 70°C. Enclosure Type 4X and IP66.

BA307E, BA308E, BA327E, BA328E BA358E

Intrinsically safe for Class I, Division 1, Groups A, B, C and D and Class I, Zone 0, Group IIC Hazardous Locations when installed in accordance with the entity concept in accordance with Control Drawings CI300-72; Nonincendive for Class I, Division 2, Groups A, B, C and D and Class I, Zone 2, Group IIC,



Hazardous Locations when installed in accordance with the nonincendive field wiring concept in accordance with Control Drawings CI300-73. Temperature class T5 at an ambient of 70°C. Front panel Type 4X and IP66.

BA307E-SS, BA327E-SS

Intrinsically safe for Class I, Division 1, Groups A, B, C and D and Class I, Zone 0, Group IIC Hazardous (Classified) Locations when installed in accordance with the entity concept in accordance with Control Drawings CI300-72; Nonincendive for Class I, Division 2, Groups A, B, C and D and Class I, Zone 2, Group IIC, Hazardous (Classified) Locations when installed in accordance with the nonincendive field wiring concept in accordance with Control Drawings CI300-73. Temperature class T5 at an ambient of 70°C. Front panel IP66.

FM Approved for:

BEKA associates Ltd
Hitchin Herts, United Kingdom



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. 61010.1	2004
C22.2 No. 213	1987
C22.2 No. 94.02	2007
C22.2 No. 60079-0-07	2007
C22.2 E60079-11-02	2002

Original Project ID: 0003041487C

Approval Granted: April 13, 2012

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
120413	Aug 7, 2012		
121004	November 8, 2012		
3054746	March 2, 2105		

FM Approvals LLC



J. E. Marquedant
Group Manager, Electrical

2 March 2015

Date

Iss.	Date	Modification	Appd.	Ckd.	Appd.
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1	13.10.2010	New drawing			
2	27.06.2012	ATEX parameters added. Class II & Class III for 307E etc. removed.			

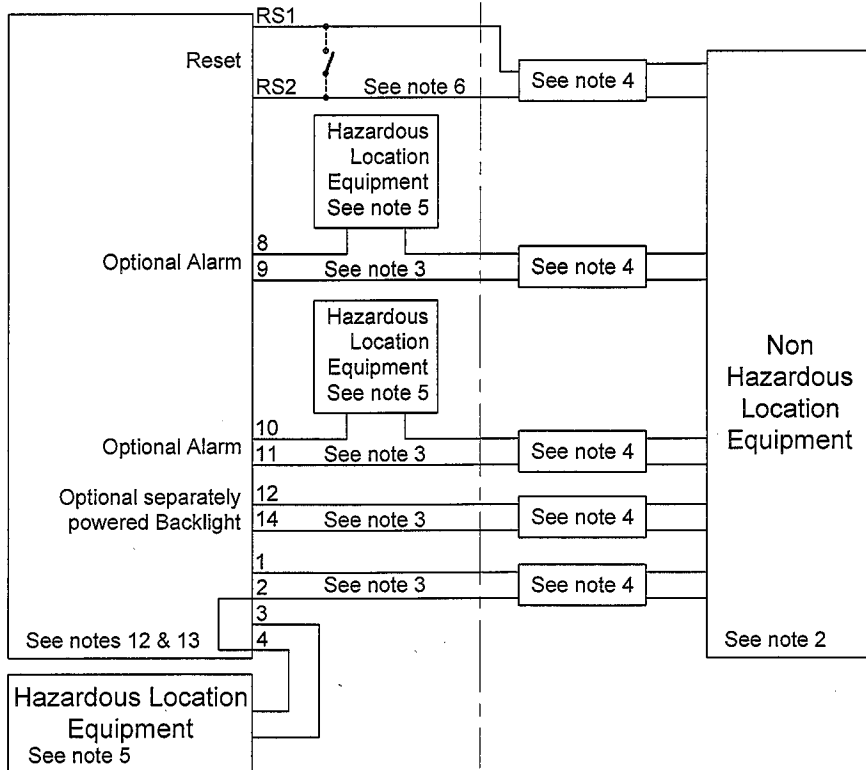
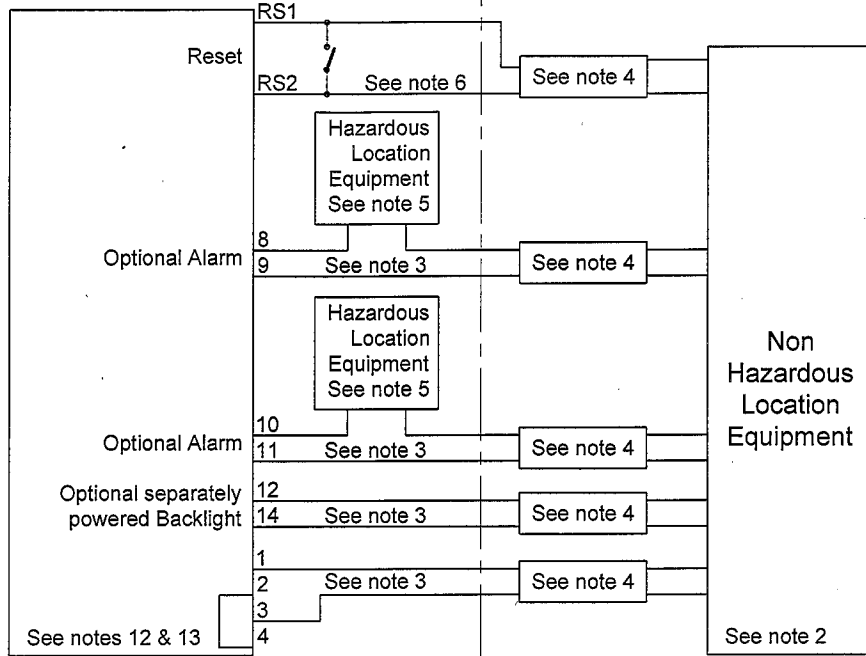
HAZARDOUS LOCATION

BA304E, BA324E & BA354E
 Class I Division 1 Groups A, B, C & D
 Class II Division 1 Groups E, F & G
 Class III
 Class I, Zone 0, Groups IIC


BA307E, BA327E, BA308E, BA328E & BA358E
 BA307E-SS & BA327E-SS
 Class I Division 1 Groups A, B, C & D
 Class I, Zone 0, Group IIC


NON-HAZARDOUS LOCATION

See notes 1 & 3



Title FM & cFM Intrinsically Safe Control Drawing for
 BA304E, BA307E, BA307E-SS & 308E 4 DIGIT INDICATORS
 BA324E, 327E, BA327E-SS & BA328E 5 DIGIT INDICATORS
 BA354E & BA358E RATE TOTALISERS

Drawn RC	Checked 	Scale -
Drawing No. Sheet 1 of 6		CI300-72

Iss.	Date	Modification	Ckd.	Appd.
3	12.12 2014	BA307E-SS & BA327E-SS ADDED		
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Iss.	Date	Modification	Ckd.	Appd.
1	13.10 2010	New drawing		
2	27.06 2012	ATEX parameters added. Class II & Class III for 307E etc. removed.		

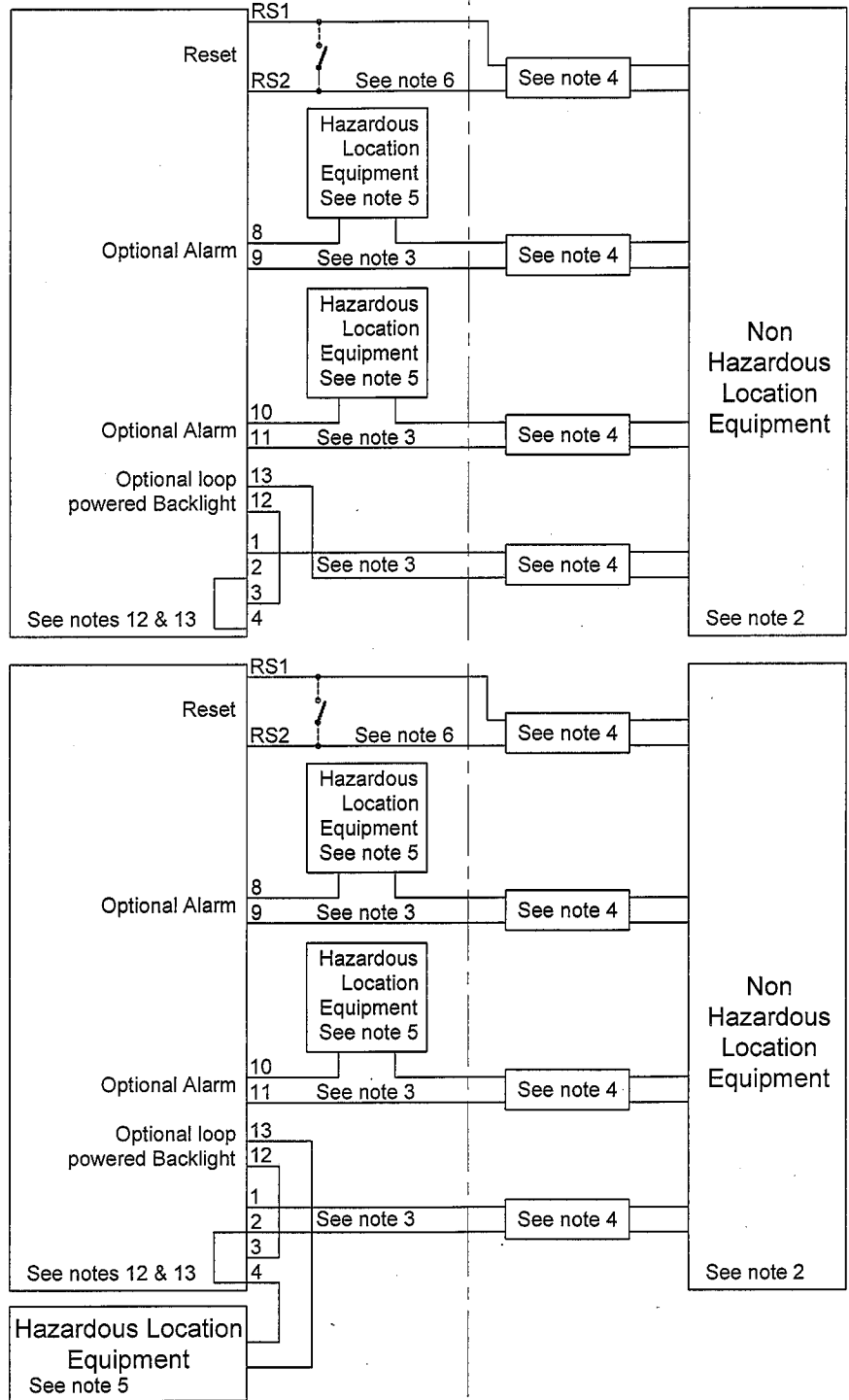
HAZARDOUS LOCATION

BA304E, BA324E & BA354E
 Class I Division 1 Groups A, B, C & D
 Class II Division 1 Groups E, F & G
 Class III
 Class I, Zone 0, Groups IIC


BA307E, BA327E, BA308E, BA328E & BA358E
 BA307E-SS & BA327E-SS
 Class I Division 1 Groups A, B, C & D
 Class I, Zone 0, Group IIC

NON-HAZARDOUS LOCATION

See notes 1 & 3



Title FM & cFM Intrinsically Safe Control Drawing for
 BA304E, BA307E, BA307E-SS & 308E 4 DIGIT INDICATORS
 BA324E, 327E, BA327E-SS & BA328E 5 DIGIT INDICATORS
 BA354E & BA358E RATE TOTALISERS

Drawn RC	Checked 	Scale -
Drawing No. Sheet 2		CI300-72

Iss.	Date	Modification	Ckd.	Appd.
1	13.10 2010	New drawing		
2	27.06 2012	ATEX parameters added. No change to this sheet		

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Notes

1. The associated protective barriers and galvanic isolators shall be FM approved and the manufacturers instructions shall be followed when installing this equipment. For installations in Canada the associated protective barriers and galvanic isolators shall be cFM or CSA approved and the manufacturers installation drawings shall be followed when installing this equipment.
2. The unclassified location equipment shall not use or generate more than 250V rms or 250V dc.
3. Installations 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. 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 complying with the following requirements:

Uo	equal or less than	The lowest Ui of the FM, cFM or CSA approved apparatus installed in the loop.
Io	equal or less than	The lowest Ii of the FM, cFM or CSA approved apparatus installed in the loop.
Po	equal or less than	The lowest Pi of the FM, cFM or CSA approved apparatus installed in the loop.
Lo	equal or greater than	The sum of the cable inductances and the internal inductances Li of each FM, cFM or CSA approved apparatus in the loop.
Co	equal or greater than	The sum of the cable capacitance and the internal capacitance Ci of each FM, cFM or CSA approved apparatus in the loop.

Title FM & cFM Intrinsically Safe Control Drawing for
BA304E, BA307E, BA307E-SS & 308E 4 DIGIT INDICATORS
BA324E, 327E, BA327E-SS & BA328E 5 DIGIT INDICATORS
BA354E & BA358E RATE TOTALISERS

Drawn RC	Checked 	Scale -
Drawing No. Sheet 3		CI300-72

Iss.	Date	Modification	Ckd.	Appd.
3	12.12 2014	BA307E-SS & BA327E-SS ADDED		
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Iss.	Date	Modification	Ckd.	Appd.
1	13.10 2010			
2	11.04 2012	ATEX parameters added. No change to this sheet		

5. Simple Apparatus as defined in the National Electrical Code ANSI/NFPA 70, or for installations in Canada by the Canadian Electrical Code C22.2 OR:

- Ui equal or greater than The highest U_o of the FM, cFM or CSA approved apparatus powering the loop.
- li equal or greater than The highest I_o of the FM, cFM or CSA approved apparatus powering the loop.
- Pi equal or greater than The highest P_o of the FM, cFM or CSA approved apparatus powering the loop.
- Lo of the FM, cFM or CSA approved apparatus powering the loop
equal or greater than The sum of the cable inductances and the internal inductances L_i of each FM, cFM or CSA approved apparatus in the loop.
- Co of the FM, cFM or CSA approved apparatus powering the loop
equal or greater than The sum of the cable capacitances and the internal capacitances C_i of each FM, cFM or CSA approved apparatus in the loop.


6. Reset terminals RS1 and RS2 are only fitted to BA354E and BA358E Rate Totalisers. They may be connected to one single channel or one two channel associated protective barrier or galvanic isolator as defined in note 4. And / or to a single pole switch complying with requirements for simple apparatus as defined in the National Electrical Code ANSI/NFPA 70, or for installations in Canada by the Canadian Electrical Code C22.2.

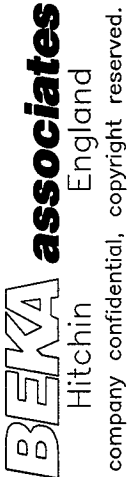
7. When installed in a hazardous (classified) location the BA304E and BA324E field mounting Indicators and the BA354 field mounting Rate Totaliser shall be fitted with cable glands / conduit hubs selected from the following table .

Metallic glands and hubs must be grounded.

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 ST-1 STA-1 SSTG-1 STG-1 STAG-1 MHUB-1 HUB 1 O-Z / Gedrey Hubs CHM-50DT CHMG-50DT REMKE hub WH-1-G Killark Glands CMCXAA050 MCR050 MCX050

Title FM & cFM Intrinsically Safe Control Drawing for
 BA304E, BA307E, BA307E-SS & 308E 4 DIGIT INDICATORS
 BA324E, 327E, BA327E-SS & BA328E 5 DIGIT INDICATORS
 BA354E & BA358E RATE TOTALISERS

Drawn RC	Checked 	Scale -
Drawing No. Sheet 4		CI300-72

Iss.	Date	13.10 2010	Modification	Ckd.	Appd.
	1	27.06 2012			
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Iss.	Date	12.12 2014	Modification	Ckd.	Appd.
3			BA307E-SS & BA327E-SS ADDED		

8. In addition to the supplied bonding plate, when 2 or 3 metallic glands or conduit hubs are fitted to a BA304E or BA324E Indicator or to a BA354E Rate Totaliser, all metallic glands or conduit hubs must be connected together and grounded.
9. **CAUTION** The BA304E, BA307E, BA308E, BA324E, BA327E and the BA328E Indicators and the BA354E and the BA358C Rate Totaliser enclosures are manufactured from conducting plastic per Article 250 of the National Electrical Code.
10. The BA304E, BA307E, BA308E, BA324E, BA327E and the BA328E Indicators and the BA354E and the BA358C Rate Totaliser shall be mounted where they are shielded from direct sunlight.
11. When mounting the BA307E, BA308E, BA327E and the BA328E panel mounting Indicators and the BA358C panel mounting Rate Totaliser 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 particles, inclusions, runs or build-ups around cut-out.

Panel cut-out for BA307E and BA327E shall be:

- 90.0 x 43.5mm -0.0 +0.5mm
- (3.54 x 1.71 inches -0.00 +0.02)

Two panel mounting clips are required and each shall be tightened to between:

- 20 & 22cNm (1.77 to 1.95inLb)

Panel cut-out for BA308E, BA328E & BA358E shall be:


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

Four panel mounting clips are required and each shall be tightened to between:

- 20 & 22cNm (1.77 to 1.95inLb)

12. BA304E, BA307E, BA307E-SS, BA308E, BA324E, BA327E, BA327E-SS & BA328E loop powered Indicators and BA354E & BA358E loop powered Rate Totalisers.

Title FM & cFM Intrinsically Safe Control Drawing for
 BA304E, BA307E, BA307E-SS & 308E 4 DIGIT INDICATORS
 BA324E, 327E, BA327E-SS & BA328E 5 DIGIT INDICATORS
 BA354E & BA358E RATE TOTALISERS

Drawn RC	Checked 	Scale -
Drawing No. Sheet 5		CI300-72

Iss.	Date	Modification	Ckd.	Appd.
2	27.06.2012	ATEX parameters added.		

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13. Safety parameters

4/20mA input terminals 1, 2, 3 & 4

4/20mA input terminals 1, 2, 3, 4, 12 & 13 & loop powered backlight.

$U_i = 30V$ $I_i = 200mA$ $P_i = 0.84W$ $U_o = 1.1V$ $I_o = 3mA$ $P_o = 4.5mW$ $C_i = 13nF$ $L_i = 0.01mH$	$U_i = 30V$ $I_i = 200mA$ $P_i = 0.84W$ $U_o = 1.1V$ $I_o = 3mA$ $P_o = 4.5mW$ $C_i = 13nF$ $L_i = 0.01mH$
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Separately powered backlight terminals 12 & 14.

Alarm terminals 8, 9, 10 and 11

$U_i = 30V$ $I_i = 200mA$ $P_i = 0.84W$ $C_i = 13nF$ $L_i = 0.01mH$	$U_i = 30V$ $I_i = 200mA$ $P_i = 0.84W$ $U_o = 1.47V$ $I_o = 1.0\mu A$ $P_o = 2.2\mu W$ $C_i = 24nF$ $L_i = 0.01mH$
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Reset terminals RS1 & RS2
BA354E & BA358E rate totaliser only.

$U_i = 30V$ $I_i = 200mA$ $P_i = 0.84W$ $U_o = 6V$ $I_o = 2.5mA$ $P_o = 3.8mW$ $C_i = 13nF$ $L_i = 0.01mH$ $C_o = 53nF$ $L_o = 0.79mH$


14. When mounting a BA307E-SS or BA327E-SS panel mounting indicator in an AEx e, AEx n, AEx p or AEx t certified enclosure, or an enclosure to maintain IP66 front panel rating, the panel cut-out shall be:

92.0 +0.8/-0.0 x 45.0 +0.6/-0.0 mm (3.62 +0.03/-0.0 x 1.77 +0.02/-0.0 inches)

4 panel mounting clamps are required and each shall be tightened to a minimum of 22cNm (1.95 inLB)

When correctly installed the BA307E-SS and BA327E-SS will not invalidate the certification of an AEx e, AEx n, AEx p or AEx t panel enclosure.

Iss.	Date	Title	Drawn	Checked	Scale
			RC		-
		FM & cFM Intrinsically Safe Control Drawing for BA304E, BA307E, BA307E-SS & 308E 4 DIGIT INDICATORS BA324E, 327E, BA327E-SS & BA328E 5 DIGIT INDICATORS BA354E & BA358E RATE TOTALISERS	Drawing No.	CI300-72	
			Sheet 6		

Iss.	Date	Modification	Appd.
3	03.10 2012	Class II & III added to BA307E BA327E, BA308E, BA328E & BA358E	
4	12.12 2014	BA307E-SS and BA327E-SS ADDED	
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Iss.	Date	Modification	Appd.
1	15.10 2010	New drawing	
2	11.04 2012	ATEX parameters added. See sheet 5	

HAZARDOUS LOCATION

See note 3

NON-HAZARDOUS LOCATION

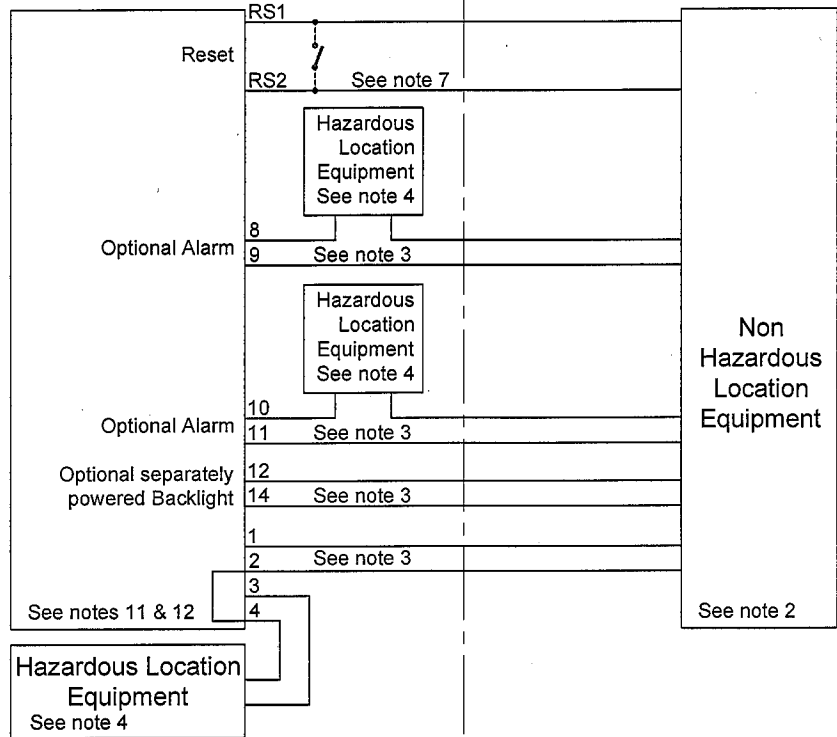
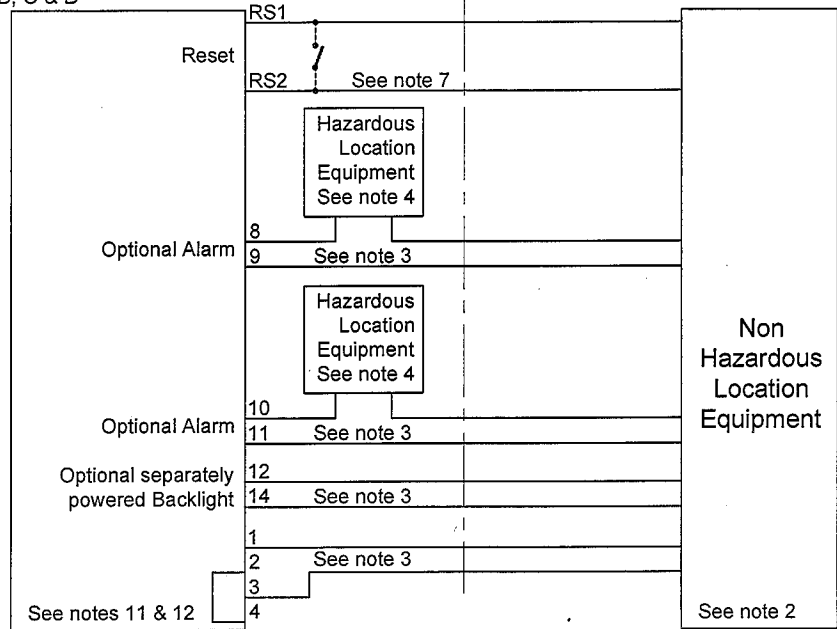
Locations

BA304E, BA324E and BA354E
 Class I, Division 2, Groups A, B, C & D
 Class II, Division 2, Groups E, F & G
 Class III
 or Class I, Zone 2, Groups IIC


BA307E, BA327E, BA308E, BA328E and BA358E
 Class I, Division 2, Groups A, B, C & D
 Class II, Division 2, Groups E, F & G
 Class III
 or Class I, Zone 2, Groups IIC


BA307E-SS and BA327E-SS
 Class I, Division 2, Groups A, B, C & D
 or Class I, Zone 2, Groups IIC

See note 1



Title FM & cFM Nonincendive Control Drawing for
 BA304E, BA307E, BA307E-SS & 308E 4 DIGIT INDICATORS
 BA324E, 327E, BA327E-SS & BA328E 5 DIGIT INDICATORS
 BA354E & BA358E RATE TOTALISERS

Drawn RC	Checked 	Scale -
Drawing No. Sheet 1 of 5		CI300-73

Iss.	Date	Modification	Ckd.	Appd.
3	03.10 2012	Class II & III added to BA307E BA327E, BA308E, BA328E & BA358E		
4	12.12 2014	BA307E-SS and BA327E-SS ADDED		
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Iss.	Date	Modification	Ckd.	Appd.
1	15.10 2010	New drawing		
2	11.04 2012	ATEX parameters added. See sheet 5		

HAZARDOUS LOCATION

See note 3

NON-HAZARDOUS LOCATION

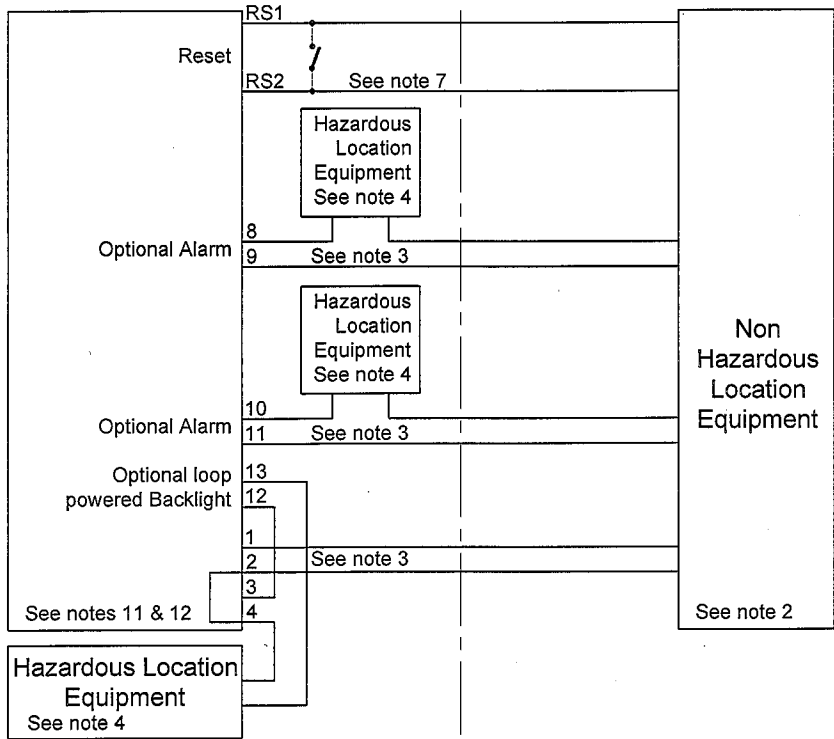
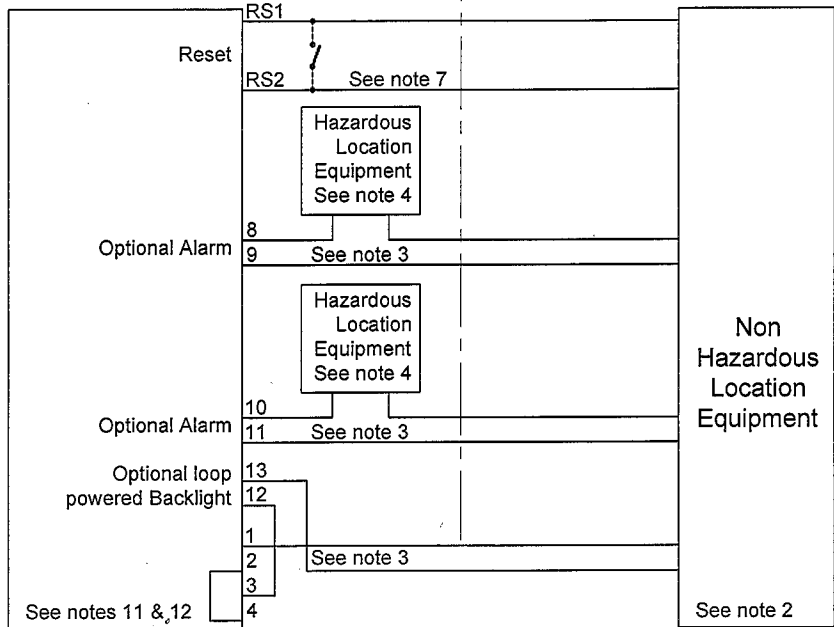
Locations

BA304E, BA324E and BA354E
 Class I, Division 2, Groups A, B, C & D
 Class II, Division 2, Groups E, F & G
 Class III
 or Class I, Zone 2, Groups IIC


BA307E, BA327E, BA308E, BA328E and BA358E
 Class I, Division 2, Groups A, B, C & D
 Class II, Division 2, Groups E, F & G
 Class III
 or Class I, Zone 2, Groups IIC

BA307E-SS and BA327E-SS
 Class I, Division 2, Groups A, B, C & D
 or Class I, Zone 2, Groups IIC

See note 1



Title FM & cFM Nonincendive Control Drawing for
 BA304E, BA307E, BA307E-SS & 308E 4 DIGIT INDICATORS
 BA324E, 327E, BA327E-SS & BA328E 5 DIGIT INDICATORS
 BA354E & BA358E RATE TOTALISERS

Drawn RC	Checked 	Scale -
Drawing No. Sheet 2		CI300-73

Iss.	Date	Modification	Ckd.	Appd.
	15.10 2010	New drawing		
2	11.04 2012	ATEX parameters added. See sheet 5		
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Iss.	Date	Modification	Ckd.	Appd.
3	03.10 2012	No change to this sheet. See sheets 1 and 2.		
4	12.12 2014	BA307E-SS and BA327E-SS ADDED		


Notes

1. The unclassified location equipment shall not use or generate more than 250V rms or 250V dc.
2. Nonincendive field wiring installations shall be in accordance with the National Electrical Code ANSI/NFPA 70. 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. Installations in Canada shall be in accordance with the Canadian Electrical Code C22.2.
3. Classified location equipment shall be FM Approved Nonincendive Field Wiring Apparatus or simple apparatus as defined in ANSI/NFPA70. For Canadian installations classified location equipment shall be cFM or CSA Approved Nonincendive Field Wiring Apparatus.
4. Simple Apparatus as defined in the National Electrical Code ANSI/NFPA 70, or for installations in Canada by the Canadian Electrical Code C22.2 or as defined in note 3.
5. When installed in a hazardous (classified) location the BA304E and BA324E field mounting Indicators and the BA354 field mounting Rate Totaliser shall be fitted with cable glands / conduit hubs selected from the following table .

Metallic glands and hubs must be grounded.

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	<p>Crouse – Hinds Myler hubs ST-1 STA-1 SSTG-1 STG-1 STAG-1 MHUB-1 HUB 1</p> <p>O-Z / Gedrey Hubs CHM-50DT CHMG-50DT</p> <p>REMKE hub WH-1-G</p> <p>Killark Glands CMCXAA050 MCR050 MCX050</p>

Title FM & cFM Nonincendive Control Drawing for
 BA304E, BA307E, BA307E-SS & 308E 4 DIGIT INDICATORS
 BA324E, 327E, BA327E-SS & BA328E 5 DIGIT INDICATORS
 BA354E & BA358E RATE TOTALISERS

Drawn RC	Checked 	Scale -
Drawing No. Sheet 3		CI300-73

Iss.	Date	Modification	Ckd.	Appd.
4	12.12 2014	BA307E-SS and BA327E-SS ADDED		

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6. When mounting the BA307E, BA308E, BA327E and the BA328E panel mounting Indicators and the BA358C panel mounting Rate Totaliser 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 particles, inclusions, runs or build-ups around cut-out.

Panel cut-out for BA307E and BA327E should be:
 90.0 x 43.5mm -0.0 +0.5mm
 (3.54 x 1.71 inches -0.00 +0.02)

Two panel mounting clips are required and each should be tightened to between:
 20 & 22cNm (1.77 to 1.95inLb)

Panel cut-out for BA308E, BA328E & BA358E should be:
 66.2 x 136.0mm-0.0 +0.5mm
 (2.60 x 5.35 inches -0.00 +0.02)

Four panel mounting clips are required and each should be tightened to between:
 20 & 22cNm (1.77 to 1.95inLb)

7. Reset terminals RS1 and RS2 are only fitted to BA354E and BA358E Rate Totalisers. They may be connected to Associated Nonincendive Field Wiring Apparatus, Nonincendive Field Wiring Apparatus or simple apparatus such as a single pole switch.

8. In addition to the supplied bonding plate, when 2 or 3 metallic glands or conduit hubs are fitted to a BA304E or BA324E Indicator or to a BA354E Rate Totaliser, all metallic glands or conduit hubs must be connected together and grounded.

9. **CAUTION** The BA304E, BA307E, BA308E, BA324E, BA327E and the BA328E Indicators and the BA354E and the BA358C Rate Totaliser enclosures are manufactured from conducting plastic per Article 250 of the National Electrical Code.

10. The BA304E, BA307E, BA308E, BA324E, BA327E and the BA328E Indicators and the BA354E and the BA358C Rate Totaliser shall be mounted where they are shielded from direct sunlight.

Iss.	Date	Modification	Ckd.	Appd.	Title	Drawn	Checked	Scale
						RC		-
1	15.10 2010	New drawing			FM & cFM Nonincendive Control Drawing for BA304E, BA307E, BA307E-SS & 308E 4 DIGIT INDICATORS BA324E, 327E, BA327E-SS & BA328E 5 DIGIT INDICATORS BA354E & BA358E RATE TOTALISERS	Drawing No.	CI300-73	
2	11.04 2012	ATEX parameters added. See sheet 5				Sheet 4		

Iss.	Date	Modification	Ckd.	Appd.
4	12.12 2014	BA307E-SS and BA327E-SS ADDED		
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Iss.	Date	Modification	Ckd.	Appd.
	11.04 2012	ATEX parameters added.		

11. Safety parameters

4/20mA input terminals 1, 2, 3 & 4

$U_i = 30V$
 $I_i = 200mA$
 $P_i = 0.84W$
 $U_o = 1.1V$
 $I_o = 3mA$
 $P_o = 4.5mW$

 $C_i = 13nF$
 $L_i = 0.01mH$

4/20mA input terminals 1, 2, 3, 4, 12 & 13 & loop powered backlight.

$U_i = 30V$
 $I_i = 200mA$
 $P_i = 0.84W$
 $U_o = 1.1V$
 $I_o = 3mA$
 $P_o = 4.5mW$

 $C_i = 13nF$
 $L_i = 0.01mH$

Separately powered backlight terminals 12 & 14.

$U_i = 30V$
 $I_i = 200mA$
 $P_i = 0.84W$

 $C_i = 13nF$
 $L_i = 0.01mH$

Alarm terminals 8, 9, 10 and 11

$U_i = 30V$
 $I_i = 200mA$
 $P_i = 0.84W$
 $U_o = 1.47V$
 $I_o = 1.0\mu A$
 $P_o = 2.2\mu W$

 $C_i = 24nF$
 $L_i = 0.01mH$

Reset terminals RS1 & RS2
BA354E & BA358E rate totaliser only.

$U_i = 30V$
 $I_i = 200mA$
 $P_i = 0.84W$
 $U_o = 6V$
 $I_o = 2.5mA$
 $P_o = 3.8mW$

 $C_i = 13nF$
 $L_i = 0.01mH$
 $C_o = 53nF$
 $L_o = 0.79mH$

12. BA304E, BA307E, BA307E-SS, BA308E, BA324E, BA327E, BA327E-SS & BA328E loop powered Indicators and BA354E & BA358E loop powered Rate Totalisers.

13. When mounting a BA307E-SS or BA327E-SS panel mounting indicator in an enclosure to maintain IP66 front panel rating, the panel cut-out shall be:

92.0 +0.8/-0.0 x 45.0 +0.6/-0.0 mm (3.62 +0.03/-0.0 x 1.77 +0.02/-0.0 inches)

4 panel mounting clamps are required and each shall be tightened to a minimum of 22cNm (1.95 inLB)

Title
FM & cFM Nonincendive Control Drawing for
BA304E, BA307E, BA307E-SS & 308E 4 DIGIT INDICATORS
BA324E, 327E, BA327E-SS & BA328E 5 DIGIT INDICATORS
BA354E & BA358E RATE TOTALISERS

Drawn
RC

Checked


Scale
-

Drawing No.
Sheet 5

CI300-73