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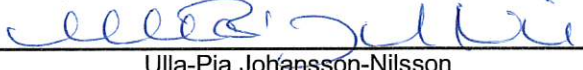
**Manufacturer:** BEKA associates Ltd  
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**Country:** United Kingdom  
**Contact:** Mr. Olivier Lebreton  
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**Party Authorized To Apply Mark:** Same as Manufacturer

**Report Issuing Office:** Intertek Testing & Certification Ltd, Cleeve Road, Leatherhead KT22 7SB, UK

**Control Number:** 4008610

**Authorized by:** \_\_\_\_\_

  
Ulla-Pia Johansson-Nilsson  
for Dean Davidson, Certification Manager



This document supersedes all previous Authorizations to Mark for the noted Report Number.

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<p><b>Standard(s):</b></p>	<p>UL 60079-0 Issued: 2013/07/26 Ed: 6 Explosive Atmospheres - Part 0: Equipment - General Requirements</p> <p>Explosive Atmospheres - Part 11: Equipment Protection By Intrinsic Safety "i" [UL 60079-11:2013 Ed.6 +R:28Mar2014]</p> <p>Explosive Atmospheres - Part 15: Equipment Protection By Type Of Protection 'N' [UL 60079-15:2013 Ed.4 +R:02Aug2013]</p> <p>Explosive Atmospheres - Part 31: Equipment Dust Ignition Protection By Enclosure "T" [UL 60079-31:2015 Ed.2]</p> <p>Explosive Atmospheres - Part 0: Equipment - General Requirements [CSA C22.2#60079-0:2015 Ed.3]</p> <p>Explosive Atmospheres - Part 11: Equipment Protection By Intrinsic Safety "i" [CSA C22.2#60079-11:2014 Ed.2]</p> <p>Explosive Atmospheres — Part 15: Equipment Protection By Type Of Protection "N" [CSA C22.2#60079-15:2016 Ed.2]</p> <p>Explosive Atmospheres - Part 31: Equipment Dust Ignition Protection By Enclosure "T" [CSA C22.2#60079-31:2015 Ed.2]</p> <p>Nonincendive Electrical Equipment For Use In Class I And II, Division 2 And Class III, Divisions 1 And 2 Hazardous (Classified) Locations [ISA 12.12.01:2016 Ed.7]</p> <p>Enclosures For Use In Class II, Division 1, Groups E, F, And G Hazardous Locations [CSA C22.2#25:2017 Ed.4]</p> <p>Nonincendive Electrical Equipment For Use In Class I And II, Division 2 And Class III, Divisions 1 And 2 Hazardous (Classified) Locations [CSA C22.2#213:2016 Ed.2]</p> <p>Safety Requirements For Electrical Equipment For Measurement, Control, And Laboratory Use – Part 1: General Requirements [UL 61010-1:2012 Ed.3+R:29Apr2016]</p> <p>Safety Requirements For Electrical Equipment For Measurement, Control, And Laboratory Use – Part 1: General Requirements (R2017) [CSA C22.2#61010-1-12:2012 Ed.3+U1;U2]</p>
<p><b>Product:</b></p>	<p>4 and 5 Digit Loop Powered Indicators and Loop Powered Rate Totaliser for use in:</p> <p>Class I Division 1 Groups A B C D T5 <math>-40^{\circ}\text{C} \leq \text{Ta} \leq +70^{\circ}\text{C}</math></p> <p>Class II Division 1 Groups E F G <math>-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}</math></p> <p>Class III Division 1 <math>-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}</math></p> <p>Class I Zone 0 AEx ia IIC T5 Ga <math>-40^{\circ}\text{C} \leq \text{Ta} \leq +70^{\circ}\text{C}</math></p> <p>Zone 20 AEx ia IIIC T80°C Da <math>-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}</math></p> <p>Ex ia IIC T5 Ga <math>-40^{\circ}\text{C} \leq \text{Ta} \leq +70^{\circ}\text{C}</math></p> <p>Ex ia IIIC T80°C Da <math>-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}</math></p> <p>Class I Zone 2 Ex nA ic IIC T5 Gc <math>-40^{\circ}\text{C} \leq \text{Ta} \leq +70^{\circ}\text{C}</math></p> <p>Zone 22 AEx ic tc IIIC T80°C Dc <math>-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}</math></p> <p>Ex nA ic IIC T5 Gc, Ex n IIC T5 Gc <math>-40^{\circ}\text{C} \leq \text{Ta} \leq +70^{\circ}\text{C}</math></p> <p>Ex ic tc IIIC T80°C Dc <math>-40^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}</math></p> <p>and</p> <p>Class I Division 2 Groups A B C D T5</p> <p>Class II Division 2 Groups F G</p> <p>Class III Division 2</p> <p><math>-40^{\circ}\text{C} \leq \text{Ta} \leq +70^{\circ}\text{C}</math></p>
<p><b>Brand Name:</b></p>	<p>BEKA</p>
<p><b>Models:</b></p>	<p>BA304G, BA324G, BA354G, BA304NG, BA324NG, BA354NG, BA307NE and BA327NE</p>

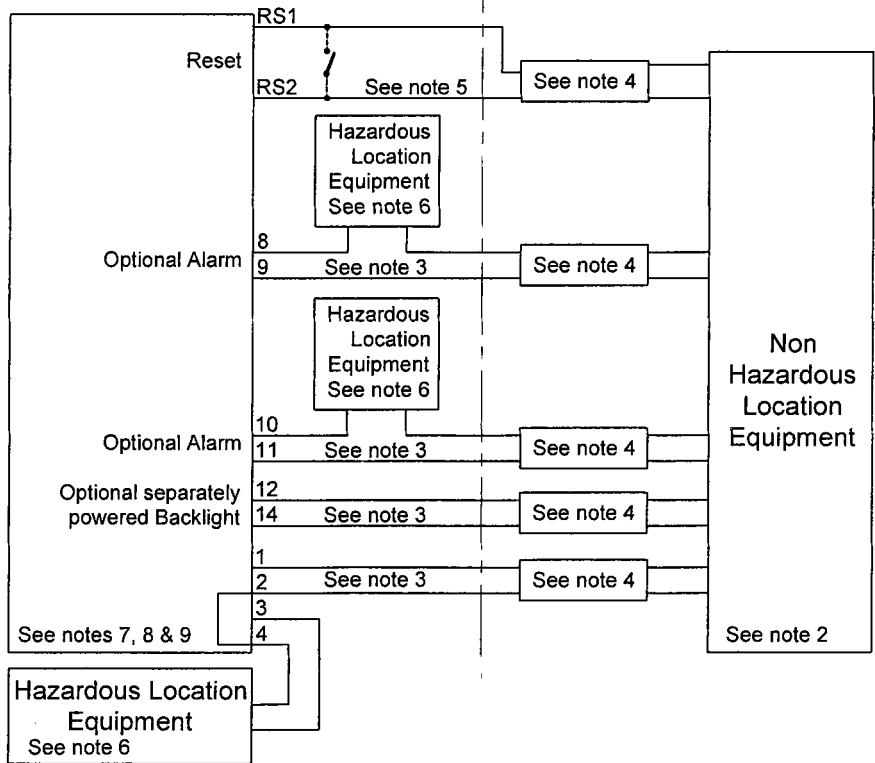
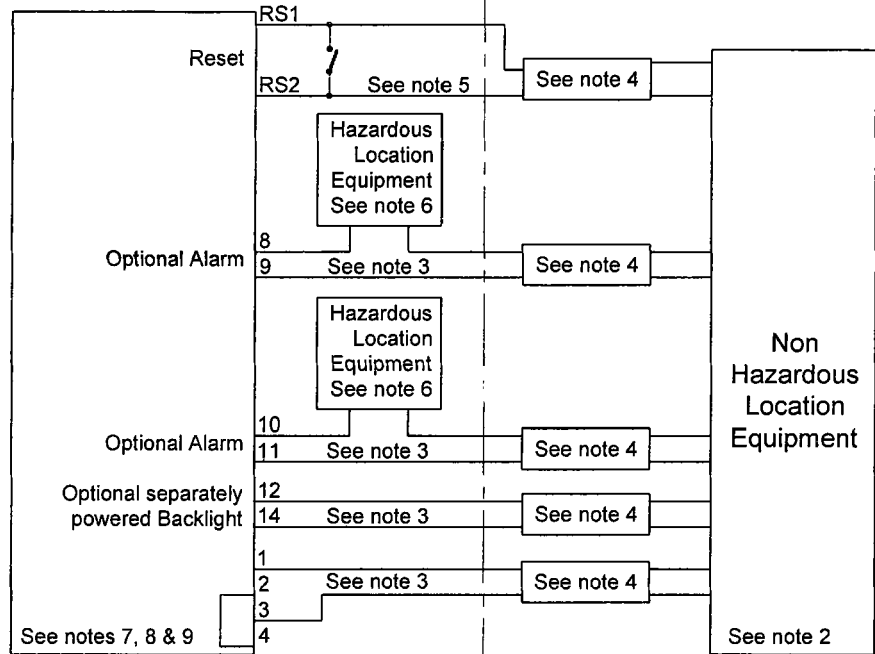


# LOOP POWERED INDICATORS AND TOTALISER WITH SEPARATELY POWERED BACKLIGHT

HAZARDOUS LOCATION

NON-HAZARDOUS LOCATION

See notes 1 & 3



Iss.	1	Date	29.11 2016	Modification	New drawing	Ckd.	<i>[Signature]</i>	Appd.	<i>[Signature]</i>
Iss.		Date		Modification		Ckd.		Appd.	

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Title  
ETL Intrinsically Safe Control Drawing for  
BA304G, BA324G LOOP POWERED INDICATORS  
BA354G LOOP POWERED RATE TOTALISER

Drawn SQ	Checked O.L	Scale -
Drawing No. Sheet 1 of 5		<b>CI300-83</b>



Iss.	1	Date	29.11 2016	Modification	New drawing	Ckd.		Appd.	
Iss.		Date		Modification		Ckd.		Appd.	

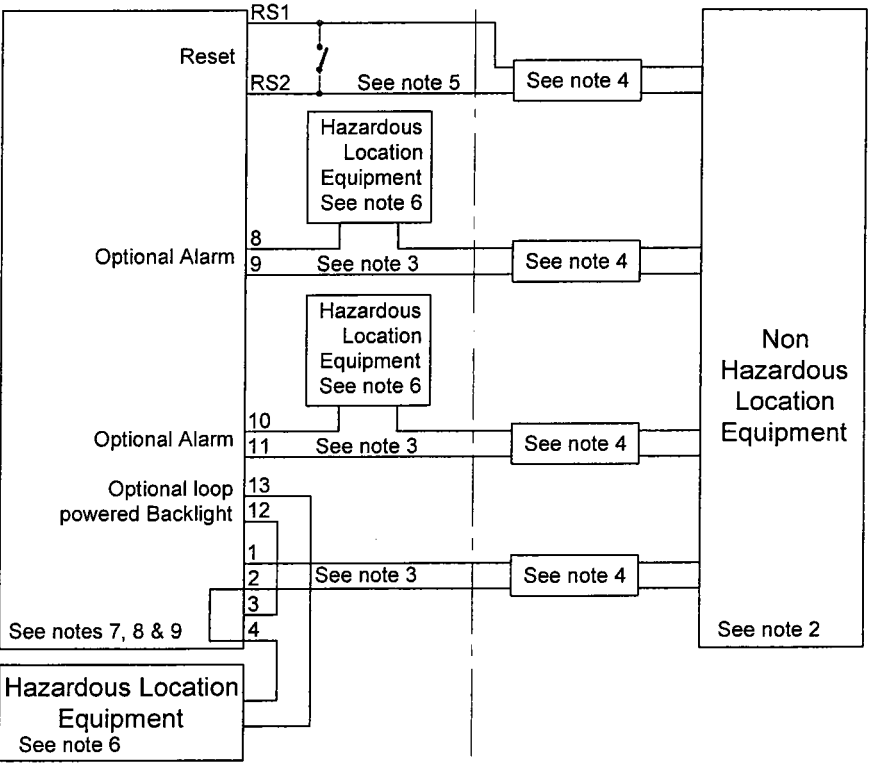
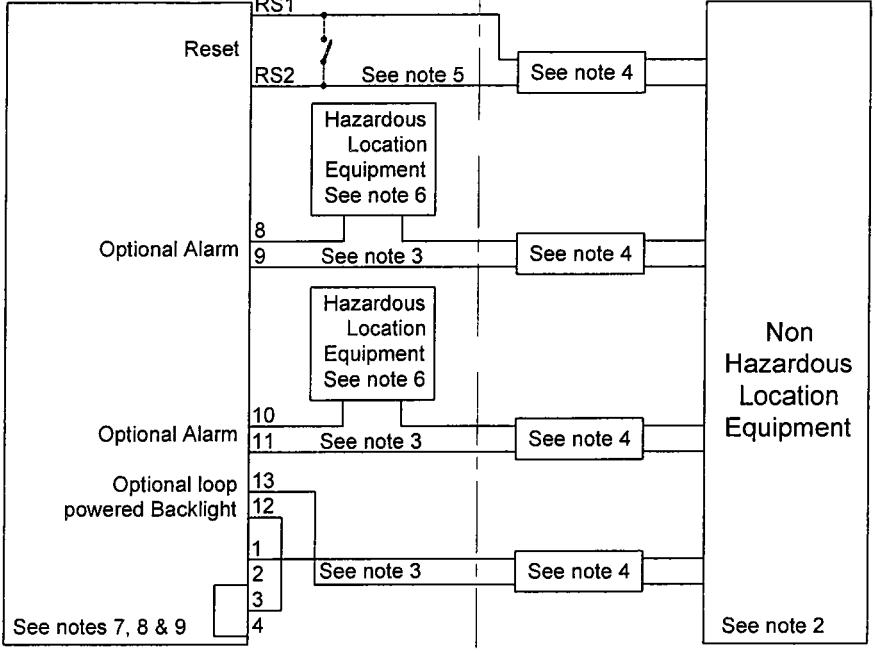
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**LOOP POWERED INDICATORS AND TOTALISER WITH LOOP POWERED BACKLIGHT**

HAZARDOUS LOCATION

NON-HAZARDOUS LOCATION

See notes 1 & 3



Title  
ETL Intrinsically Safe Control Drawing for  
BA304G, BA324G LOOP POWERED INDICATORS  
BA354G LOOP POWERED RATE TOTALISER

Drawn	SQ	Checked	OL	Scale	-
Drawing No.			C1300-83		
Sheet 2					



Iss.	1	Date	29.11 2016	Modification	New drawing	Ckd.	<i>[Signature]</i>	Appd.	<i>[Signature]</i>															
Iss.		Date		Modification		Ckd.		Appd.																
<p><b>BEKA associates</b> Hitchin England company confidential, copyright reserved.</p>																								
<p><b>Notes</b></p> <p>1. The associated protective barriers and galvanic isolators shall be NRTL 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 NRTL or CSA approved and the manufacturers installation drawings shall be followed when installing this equipment.</p> <p>2. The unclassified location equipment shall not use or generate more than 250V rms or 250V dc.</p> <p>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.</p> <p>4. One single channel or one two channel associated protective barrier or galvanic isolator with entity parameters complying with the following requirements:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 10%;"><math>U_o</math></td> <td style="width: 30%;">equal or less than</td> <td style="width: 60%;">The lowest <math>U_i</math> of the NRTL or CSA approved apparatus installed in the loop.</td> </tr> <tr> <td><math>I_o</math></td> <td>equal or less than</td> <td>The lowest <math>I_i</math> of the NRTL or CSA approved apparatus installed in the loop.</td> </tr> <tr> <td><math>P_o</math></td> <td>equal or less than</td> <td>The lowest <math>P_i</math> of the NRTL or CSA approved apparatus installed in the loop.</td> </tr> <tr> <td><math>L_o</math></td> <td>equal or greater than</td> <td>The sum of the cable inductances and the internal inductances <math>L_i</math> of each NRTL or CSA approved apparatus in the loop.</td> </tr> <tr> <td><math>C_o</math></td> <td>equal or greater than</td> <td>The sum of the cable capacitance and the internal capacitance <math>C_i</math> of each NRTL or CSA approved apparatus in the loop.</td> </tr> </table> <p>5. Reset terminals RS1 and RS2 are only fitted to BA354G Rate Totaliser. 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.</p>										$U_o$	equal or less than	The lowest $U_i$ of the NRTL or CSA approved apparatus installed in the loop.	$I_o$	equal or less than	The lowest $I_i$ of the NRTL or CSA approved apparatus installed in the loop.	$P_o$	equal or less than	The lowest $P_i$ of the NRTL or CSA approved apparatus installed in the loop.	$L_o$	equal or greater than	The sum of the cable inductances and the internal inductances $L_i$ of each NRTL or CSA approved apparatus in the loop.	$C_o$	equal or greater than	The sum of the cable capacitance and the internal capacitance $C_i$ of each NRTL or CSA approved apparatus in the loop.
$U_o$	equal or less than	The lowest $U_i$ of the NRTL or CSA approved apparatus installed in the loop.																						
$I_o$	equal or less than	The lowest $I_i$ of the NRTL or CSA approved apparatus installed in the loop.																						
$P_o$	equal or less than	The lowest $P_i$ of the NRTL or CSA approved apparatus installed in the loop.																						
$L_o$	equal or greater than	The sum of the cable inductances and the internal inductances $L_i$ of each NRTL or CSA approved apparatus in the loop.																						
$C_o$	equal or greater than	The sum of the cable capacitance and the internal capacitance $C_i$ of each NRTL or CSA approved apparatus in the loop.																						
Title				ETL Intrinsically Safe Control Drawing for BA304G, BA324G LOOP POWERED INDICATORS BA354G LOOP POWERED RATE TOTALISER			Drawn SQ		Checked QL	Scale -														
						Drawing No.		CI300-83																
						Sheet 3																		

Iss.	1	Date	29.11 2016	Modification	New drawing	Ckd.		Appd.	
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6. 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 Uo of the NRTL or CSA approved apparatus powering the loop.
- li equal or greater than The highest Io of the NRTL or CSA approved apparatus powering the loop.
- Pi equal or greater than The highest Po of the NRTL or CSA approved apparatus powering the loop.
- Lo of the NRTL or CSA approved apparatus powering the loop equal or greater than The sum of the cable inductances and the internal inductances Li of each NRTL or CSA approved apparatus in the loop.
- Co of the NRTL or CSA approved apparatus powering the loop equal or greater than The sum of the cable capacitances and the internal capacitances Ci of each NRTL or CSA approved apparatus in the loop.

7. Loop powered indicators and loop powered rate totalisers with coding and model numbers as shown in the table below.

'G' FIELD MOUNTING INSTRUMENTS

Type	Model Nos.	Division Marking	Zonal Marking	Ambient Temp.
Loop powered indicators Loop powered rate totaliser	BA304G BA324G BA354G	Gas: Class I Division 1 Groups A, B, C & D T5	Gas: Class I Zone 0 AEx ia IIC T5 Ga	-40°C to +70°C
		Dust: Class II Division 1 Groups E, F & G Class III Division 1	Dust: Zone 20 AEx ia IIIC T80°C Da	-40°C to +60°C

8. **CAUTION** The BA304G and BA324G Indicators and the BA354G Rate Totaliser enclosures are manufactured from conducting plastic per Article 250 of the National Electrical Code.

Title	ETL Intrinsically Safe Control Drawing for BA304G, BA324G LOOP POWERED INDICATORS BA354G LOOP POWERED RATE TOTALISER	Drawn	Checked	Scale
		SQ	OL	-
		Drawing No.	C1300-83	
		Sheet 4		



Iss.	1	Date	29.11 2016	Modification	New drawing	Ckd.	<i>[Signature]</i>	Appd.	<i>[Signature]</i>
Iss.		Date		Modification		Ckd.		Appd.	

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9. Safety parameters

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

- U<sub>i</sub> = 30V
- I<sub>i</sub> = 200mA
- P<sub>i</sub> = 0.84W
- U<sub>o</sub> = 1.1V
- I<sub>o</sub> = 3mA
- P<sub>o</sub> = 4.5mW
  
- C<sub>i</sub> = 5.4nF
- L<sub>i</sub> = 0.016mH
- C<sub>o</sub> = 60.6nF
- L<sub>o</sub> = 0.78mH

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

- U<sub>i</sub> = 30V
- I<sub>i</sub> = 200mA
- P<sub>i</sub> = 0.84W
- U<sub>o</sub> = 1.1V
- I<sub>o</sub> = 3mA
- P<sub>o</sub> = 4.5mW
  
- C<sub>i</sub> = 5.4nF
- L<sub>i</sub> = 0.016mH
- C<sub>o</sub> = 60.6nF
- L<sub>o</sub> = 0.78mH

Separately powered backlight terminals 12 & 14.

- U<sub>i</sub> = 30V
- I<sub>i</sub> = 200mA
- P<sub>i</sub> = 0.84W
  
- C<sub>i</sub> = 3.3nF
- L<sub>i</sub> = 0.008mH
- C<sub>o</sub> = 63nF
- L<sub>o</sub> = 0.79mH

Alarm terminals 8, 9, 10 and 11

- U<sub>i</sub> = 30V
- I<sub>i</sub> = 200mA
- P<sub>i</sub> = 0.84W
- U<sub>o</sub> = 1.47V
- I<sub>o</sub> = 1.0µA
- P<sub>o</sub> = 2.2µW
  
- C<sub>i</sub> = 0nF
- L<sub>i</sub> = 0.008mH
- C<sub>o</sub> = 66nF
- L<sub>o</sub> = 0.79mH

Reset terminals RS1 & RS2  
BA354G rate totaliser only.

- U<sub>i</sub> = 30V
- I<sub>i</sub> = 200mA
- P<sub>i</sub> = 0.84W
- U<sub>o</sub> = 6V
- I<sub>o</sub> = 2.5mA
- P<sub>o</sub> = 3.8mW
  
- C<sub>i</sub> = 0nF
- L<sub>i</sub> = 0.008mH
- C<sub>o</sub> = 66nF
- L<sub>o</sub> = 0.79mH

Title  
ETL Intrinsically Safe Control Drawing for  
BA304G, BA324G LOOP POWERED INDICATORS  
BA354G LOOP POWERED RATE TOTALISER

Drawn SQ	Checked QL	Scale —
Drawing No.		CI300-83
Sheet 5		

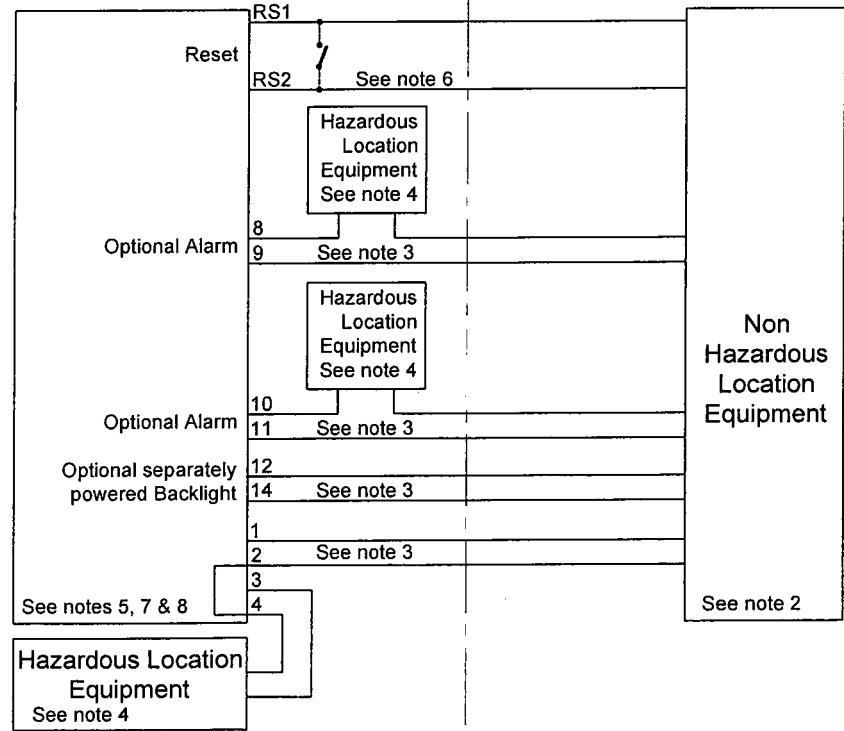
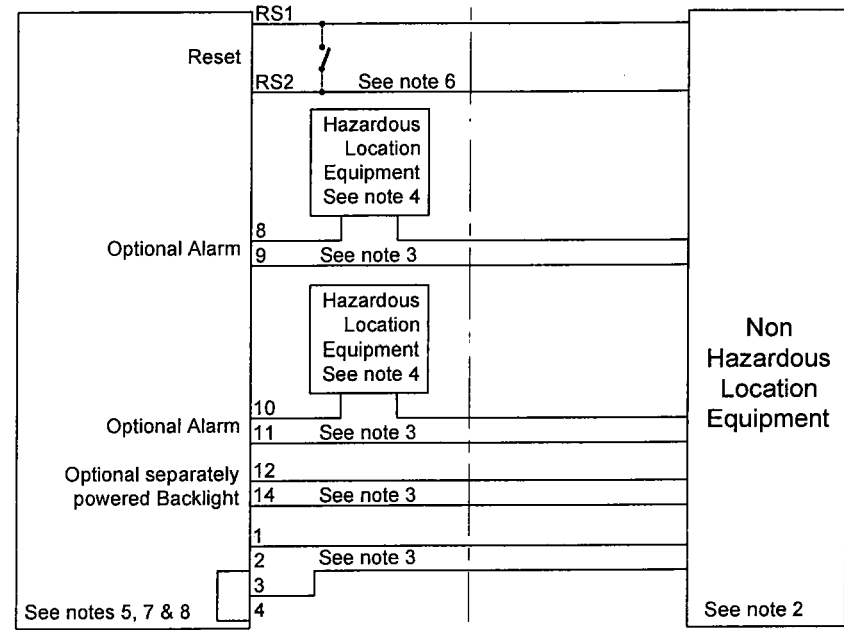


**LOOP POWERED INDICATORS & TOTALISERS WITH SEPARATELY POWERED BACKLIGHT**

Iss.	Date	Modification	Appd.
1	29.11 2016	New drawing	<i>[Signature]</i>
Iss.	Date	Modification	Appd.
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HAZARDOUS LOCATION  
See note 3

NON-HAZARDOUS LOCATION  
See note 1



Title

ETL Nonincendive Control Drawing for  
 BA304G and BA324G LOOP POWERED INDICATORS  
 BA354G LOOP POWERED RATE TOTALISERS

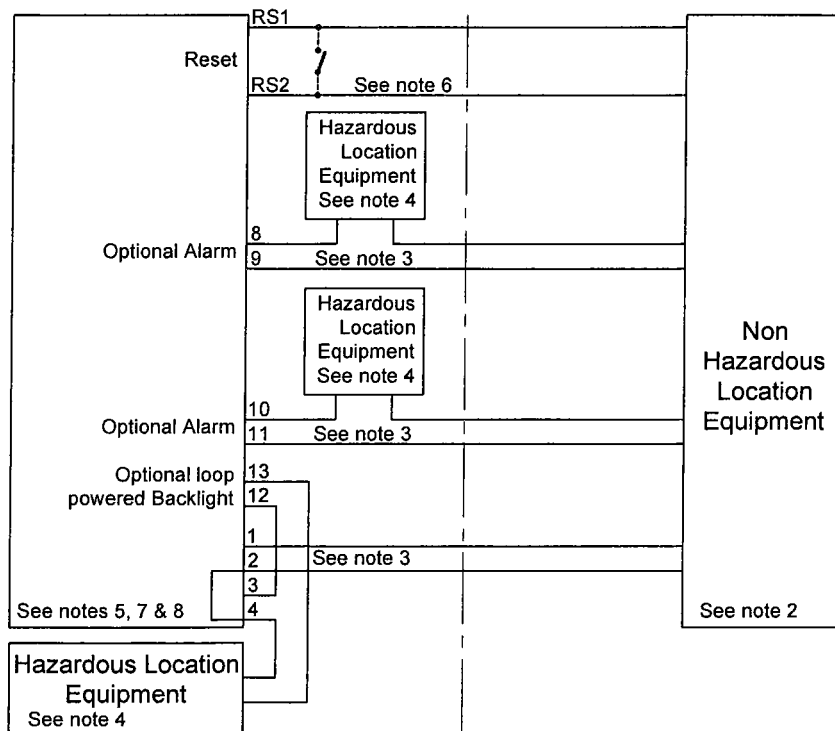
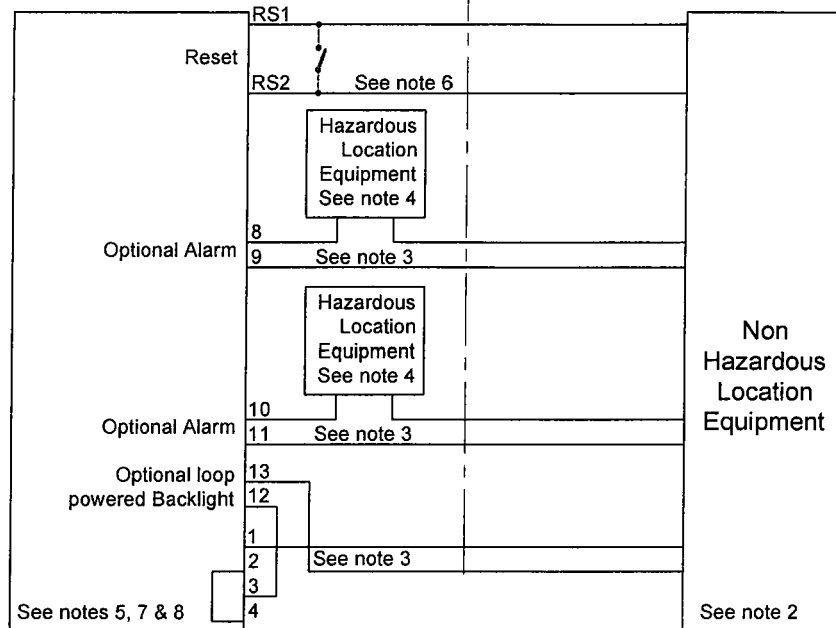
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Drawing No. CI300-84		
Sheet 1 of 4		



**LOOP POWERED INDICATORS AND TOTALISERS WITH LOOP POWERED BACKLIGHT**

**HAZARDOUS LOCATION**  
See note 3

**NON-HAZARDOUS LOCATION**  
See note 1



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Date	29.11 2016	Modification	New drawing	Ckd.	<i>[Signature]</i>	Appd.	<i>[Signature]</i>				
Iss.	1	Title									

Title  
 ETL Nonincendive Control Drawing for  
 BA304G and BA324G LOOP POWERED INDICATORS  
 BA354G LOOP POWERED RATE TOTALISERS

Drawn	SQ	Checked	QL	Scale	—
Drawing No.			C1300-84		
Sheet 2					



Iss.	1	Date	29.11 2016	Modification	New drawing	Ckd.	<i>[Signature]</i>	Appd.	<i>[Signature]</i>
Iss.		Date		Modification		Ckd.		Appd.	

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**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 NRTL Approved Nonincendive Field Wiring Apparatus or simple apparatus as defined in ANSI/NFPA70. For Canadian installations classified location equipment shall be NRTL 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. Loop powered indicators and loop powered rate totalisers with model numbers and coding as shown in the tables below.

**'G' FIELD MOUNTING INSTRUMENTS**

Type	Model Nos.	Division Marking	Zonal Marking	Ambient Temp.
Loop powered indicators Loop powered rate totaliser	BA304G BA324G BA354G	Class I Division 2 Groups A, B, C & D T5 Class II Division 2 Groups F & G Class III Division 2	None	-40°C to +70°C

6. Reset terminals RS1 and RS2 are only fitted to the BA354G Rate Totaliser. They may be connected to Associated Nonincendive Field Wiring Apparatus, Nonincendive Field Wiring Apparatus or simple apparatus such as a single pole switch.
7. **CAUTION** The BA304G, BA324G Indicators and the BA354G Rate Totaliser enclosures are manufactured from conducting plastic per Article 250 of the National Electrical Code.

Title		Drawn	Checked	Scale
ETL Nonincendive Control Drawing for BA304G and BA324G LOOP POWERED INDICATORS BA354G LOOP POWERED RATE TOTALISERS		SQ	QL	-
		Drawing No. <b>C1300-84</b>		
		Sheet 3		

Iss.	Date	Modification	Ckd.	Appd.
1	29.11 2016	New drawing		
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Iss.	Date	Modification	Ckd.	Appd.

8. Safety parameters

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

$i_i = 200\text{mA}$   
 $U_o = 1.1\text{V}$   
 $i_o = 3\text{mA}$

Separately powered backlight terminals 12 & 14.

$U_i = 30\text{V}$

Reset terminals RS1 & RS2  
 BA354G and BA354NG rate totalisers only.

$U_i = 4.3\text{V}$   
 $U_o = 6\text{V}$   
 $i_o = 2.5\text{mA}$

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

$i_i = 200\text{mA}$   
 $U_o = 1.1\text{V}$   
 $i_o = 3\text{mA}$

Alarm terminals 8, 9, 10 and 11

$U_i = 30\text{V}$   
 $i_i = 200\text{mA}$   
 $U_o = 1.47\text{V}$   
 $i_o = 1.0\mu\text{A}$

Title  
 ETL Nonincendive Control Drawing for  
 BA304G and BA324G LOOP POWERED INDICATORS  
 BA354G LOOP POWERED RATE TOTALISERS

Drawn SQ	Checked OL	Scale -
Drawing No.		CI300-84
Sheet 4		