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# CERTIFICATE OF COMPLIANCE

## HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

**BA334Dabcdef Pulse Input Rate Totaliser**

IS / I, II, III / ABCDEFG / T4 Ta = 60°C – Entity, CI330-32; Type 4X, IP66  
 I / 0 / AEx ia IIC T4 Ta = 60°C – Entity, CI330-32; Type 4X, IP66  
 NI / I / 2 / ABCD / T4 Ta = 60°C – NIFW, CI330-34; Type 4X, IP66  
 S / I / II, III / EFG / T4 Ta = 60°C – NIFW, CI330-34; Type 4X, IP66  
 I / 2 / IIC / T4 Ta = 60°C – NIFW, CI330-34; Type 4X, IP66

**Intrinsic Safety Parameters**

Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (µF)	Li (mH)	Uo (V)	Io (mA)	Po (mW)	Ca (µF)	La (mH)
1 & 2	30	100	0.7	0.02	0.02	-	-	-	-	-
3 & 4	30	100	0.7	0.02	0.02	1.1	0.5	24	1000	1000
5 & 6	30	100	0.7	0.02	0.02	10.5	9.2	24	2.39	300
7 & 8	30	100	0.7	0.02	0	3.8	1.6	2	1000	1000
A1 & A2; A3 & A4	28	200	0.84	0.04	0.03	0.7	0.0013	0.0041	1000	1000
B1 & B2	30	159	0.8	0.04	0.03	-	-	-	-	-
C1 & C2	30	100	0.7	0.002	0.008	-	-	-	-	-
P1 & P2	30	100	0.7	0.002	0.008	-	-	-	-	-

**Nonincendive Field Wiring Parameters**

Terminals	Vmax (V)	Ci (µF)	Li (mH)	Voc (V)	Isc (mA)	Ca (µF)	La (mH)
1 & 2	30	0.02	0.02	-	-	-	-
3 & 4	30	0.02	0.02	1.1	0.5	1000	1000
5 & 6	30	0.02	0.02	10.5	9.2	2.39	300
7 & 8	30	0.02	0	-	-	-	-
A1 & A2; A3 & A4	28	0.04	0.03	-	-	-	-
B1 & B2	30	0.04	0.03	-	-	-	-
C1 & C2	30	0.002	0.008	-	-	-	-
P1 & P2	30	0.002	0.008	-	-	-	-



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- a = Type
- b = Rate scaling factor.
- c = Total scaling factor.
- d = Rate timebase.
- e = accessories; backlight, alarms, pulse output, 4/20mA output external keypad
- f = other items not affecting safety.

*Special conditions of use*

1. The BA334D shall be protected from direct exposure to sunlight.

**BA338Cabcdef Pulse Input Rate Totaliser**

- IS / / / ABCD / T4 Ta = 60°C – Entity, CI330-32; Type 4X\*
  - I / 0 / AEx ia IIC T4 Ta = 60°C – Entity, CI330-32; Type 4X\*
  - NI / / / 2 / ABCD / T4 Ta = 60°C – NIFW, CI330-34; Type 4X\*
  - I / 2 / IIC / T4 Ta = 60°C – NIFW, CI330-34; Type 4X\*
- \* Front panel only

**Intrinsic Safety Parameters**

Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (µF)	Li (mH)	Uo (V)	Io (mA)	Po (mW)	Ca (µF)	La (mH)
1 & 2	30	100	0.7	0.02	0.02	-	-	-	-	-
3 & 4	30	100	0.7	0.02	0.02	1.1	0.5	24	1000	1000
5 & 6	30	100	0.7	0.02	0.02	10.5	9.2	24	2.39	300
7 & 8	30	100	0.7	0.02	0	3.8	1.6	2	1000	1000
A1 & A2; A3 & A4	28	200	0.84	0.04	0.03	0.7	0.0013	0.0041	1000	1000
B1 & B2	30	159	0.8	0.04	0.03	-	-	-	-	-
C1 & C2	30	100	0.7	0.002	0.008	-	-	-	-	-
P1 & P2	30	100	0.7	0.002	0.008	-	-	-	-	-

**Nonincendive Field Wiring Parameters**

Terminals	Vmax (V)	Ci (µF)	Li (mH)	Voc (V)	Isc (mA)	Ca (µF)	La (mH)
1 & 2	30	0.02	0.02	-	-	-	-
3 & 4	30	0.02	0.02	1.1	0.5	1000	1000
5 & 6	30	0.02	0.02	10.5	9.2	2.39	300
7 & 8	30	0.02	0	-	-	-	-
A1 & A2; A3 & A4	28	0.04	0.03	-	-	-	-
B1 & B2	30	0.04	0.03	-	-	-	-
C1 & C2	30	0.002	0.008	-	-	-	-
P1 & P2	30	0.002	0.008	-	-	-	-

- a = Type
- b = Rate scaling factor.
- c = Total scaling factor.
- d = Rate timebase.
- e = accessories; backlight, alarms, pulse output, 4/20mA output.
- f = other items not affecting safety.

*Special conditions of use*

1. To maintain the Type 4X enclosure rating the BA338C shall be installed in accordance with the mounting conditions provided on drawing numbers CI330-32 and CI330-34.
2. The BA338C shall be installed in compliance with the enclosure, mounting, spacing and



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segregation requirements of the ultimate application.

- The BA338C shall be protected from direct exposure to sunlight.

**BA364Dabcde Counter, timer, tachometer and clock**

IS / I, II, III / ABCDEFG / T4 Ta = 60°C – Entity, CI330-33; Type 4X, IP66

I / 0 / AEx ia IIC T4 Ta = 60°C – Entity, CI330-33; Type 4X, IP66

NI / I / 2 / ABCD / T4 Ta = 60°C – NIFW, CI330-35; Type 4X, IP66

S / II, III / EFG / T4 Ta = 60°C – NIFW, CI330-35; Type 4X, IP66

I / 2 / IIC / T4 Ta = 60°C – NIFW, CI330-35; Type 4X, IP66

**Intrinsic Safety Parameters**

Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (µF)	Li (mH)	Uo (V)	Io (mA)	Po (mW)	Ca (µF)	La (mH)
1 & 2	30	100	0.7	0.02	0.02	-	-	-	-	-
3 & 4	30	100	0.7	0.02	0.02	10.5	9.2	24	2.39	300
5 & 6	30	100	0.7	0.02	0.02	10.5	9.2	24	2.39	300
7 & 8	30	100	0.7	0.02	0	3.8	1.6	2	1000	1000
A1 & A2; A3 & A4	28	200	0.84	0.04	0.03	0.7	0.0013	0.0041	1000	1000
B1 & B2	30	159	0.8	0.04	0.03	-	-	-	-	-
C1 & C2	30	100	0.7	0.002	0.008	-	-	-	-	-
P1 & P2	30	100	0.7	0.002	0.008	-	-	-	-	-

**Nonincendive Field Wiring Parameters**

Terminals	Vmax (V)	Ci (µF)	Li (mH)	Voc (V)	Isc (mA)	Ca (µF)	La (mH)
1 & 2	30	0.02	0.02	-	-	-	-
3 & 4	30	0.02	0.02	10.5	9.2	2.39	300
5 & 6	30	0.02	0.02	10.5	9.2	2.39	300
7 & 8	30	0.02	0	3.8	1.6	1000	1000
A1 & A2; A3 & A4	28	0.04	0.03	-	-	-	-
B1 & B2	30	0.04	0.03	-	-	-	-
C1 & C2	30	0.002	0.008	-	-	-	-
P1 & P2	30	0.002	0.008	-	-	-	-

a = Configuration

b = Inputs

c = Calibration.

d = accessories; backlight, alarms, pulse output, 4/20mA output external keypad.

e = other items not affecting safety.

**Special conditions of use**

- The BA364D shall be protected from direct exposure to sunlight.

**BA368Cabcde Counter, timer, tachometer and clock**

IS / I / ABCD / T4 Ta = 60°C – Entity, CI330-32; Type 4X\*

I / 0 / AEx ia IIC T4 Ta = 60°C – Entity, CI330-32; Type 4X\*

NI / I / 2 / ABCD / T4 Ta = 60°C – NIFW, CI330-32; Type 4X\*

I / 2 / IIC / T4 Ta = 60°C – NIFW, CI330-32; Type 4X\*

\* Front panel only



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**Intrinsic Safety Parameters**

Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (μF)	Li (mH)	Uo (V)	Io (mA)	Po (mW)	Ca (μF)	La (mH)
1 & 2	30	100	0.7	0.02	0.02	-	-	-	-	-
3 & 4	30	100	0.7	0.02	0.02	10.5	9.2	24	2.39	300

Terminals	Ui (V)	Ii (mA)	Pi (W)	Ci (μF)	Li (mH)	Uo (V)	Io (mA)	Po (mW)	Ca (μF)	La (mH)
5 & 6	30	100	0.7	0.02	0.02	10.5	9.2	24	2.39	300
7 & 8	30	100	0.7	0.02	0	3.8	1.6	2	1000	1000
A1 & A2; A3 & A4	28	200	0.84	0.04	0.03	0.7	0.0013	0.0041	1000	1000
B1 & B2	30	159	0.8	0.04	0.03	-	-	-	-	-
C1 & C2	30	100	0.7	0.002	0.008	-	-	-	-	-
P1 & P2	30	100	0.7	0.002	0.008	-	-	-	-	-

**Nonincendive Field Wiring Parameters**

Terminals	Vmax (V)	Ci (μF)	Li (mH)	Voc (V)	Isc (mA)	Ca (μF)	La (mH)
1 & 2	30	0.02	0.02	-	-	-	-
3 & 4	30	0.02	0.02	10.5	9.2	2.39	300
5 & 6	30	0.02	0.02	10.5	9.2	2.39	300
7 & 8	30	0.02	0	3.8	1.6	1000	1000
A1 & A2; A3 & A4	28	0.04	0.03	-	-	-	-
B1 & B2	30	0.04	0.03	-	-	-	-
C1 & C2	30	0.002	0.008	-	-	-	-
P1 & P2	30	0.002	0.008	-	-	-	-

a = Configuration

b = Inputs

c = Calibration.

d = accessories; backlight, alarms, pulse output, 4/20mA output.

e = other items not affecting safety.

*Special conditions of use*

1. To maintain the Type 4X enclosure rating the BA368C shall be installed in accordance with the mounting conditions provided on drawing numbers CI330-33 and CI330-35.
2. The BA368C shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.
3. The BA368C shall be protected from direct exposure to sunlight.

**Equipment Ratings:**

**Models BA334D and BA364D**

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 when installed in accordance with the entity concept in accordance with Control Drawings CI330-32 and CI330-33; 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 CI330-34 and CI330-35; Suitable for Class II and III, Division 2, Groups E, F and G Hazardous (Classified) Locations when installed in accordance with the nonincendive field wiring concept in accordance with Control Drawings CI330-34 and CI330-35. Temperature class T4 at an ambient of 60°C. Enclosure Type 4X and



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IP66.

**Models 338C and 368C**

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 CI330-33 and CI330-34; 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 CI330-34 and CI330-35. Temperature class T4 at an ambient of 60°C. Front panel: Type 4X.

**FM Approved for:**

BEKA associates  
Hitchin, Hertfordshire SG5 2DA, United Kingdom



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
ANSI/IEC 60529	2004
NEMA 250	1991

Original Project ID: 3022309

Approval Granted: June 8, 2005

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
101217	March 16, 2011		

FM Approvals LLC

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Timothy J Adam  
Technical Team Manager

March 16, 2011

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Date

## HAZARDOUS (CLASSIFIED) LOCATION

## UNCLASSIFIED LOCATION

**BA334D LOCATIONS:**  
 Class I, Division 1, Groups A, B, C, D  
 Class II, Division 1, Groups E, F & G  
 Class III  
 Class I, Zone 0, Group IIC

**BA338C LOCATIONS:**  
 Class I, Division 1, Groups A, B, C, D  
 Class I, Zone 0, Group IIC

**BA334D & BA338C  
 Entity Parameters**

**Terminals 1 & 2**  
 U<sub>i</sub> = 30V  
 I<sub>i</sub> = 100mA dc  
 P<sub>i</sub> = 0.7W  
 C<sub>i</sub> = 0.02µF  
 L<sub>i</sub> = 0.02mH

**Terminals 7 & 8**  
 U<sub>i</sub> = 30V dc    U<sub>o</sub> = 3.8V dc  
 I<sub>i</sub> = 100mA    I<sub>o</sub> = 1.6mA dc  
 P<sub>i</sub> = 0.7W    P<sub>o</sub> = 2mW  
 C<sub>i</sub> = 0.02µF    C<sub>a</sub> = 1000µF  
 L<sub>i</sub> = 0mH    L<sub>a</sub> = 1000mH

**Terminals B1 & B2**  
 U<sub>i</sub> = 30V dc  
 I<sub>i</sub> = 159mA dc  
 P<sub>i</sub> = 0.8W  
 C<sub>i</sub> = 0.04µF  
 L<sub>i</sub> = 0.03mH

**Terminals P1 & P2**  
 U<sub>i</sub> = 30V dc  
 I<sub>i</sub> = 100mA dc  
 P<sub>i</sub> = 0.7W  
 C<sub>i</sub> = 0.02µF  
 L<sub>i</sub> = 0.02mH

**Terminals C1 & C2**  
 U<sub>i</sub> = 30V dc  
 I<sub>i</sub> = 100mA dc  
 P<sub>i</sub> = 0.7W  
 C<sub>i</sub> = 0.002µF  
 L<sub>i</sub> = 0.008mH

**Terminals 3 & 4**  
 U<sub>i</sub> = 30V dc    U<sub>o</sub> = 1.1V dc  
 I<sub>i</sub> = 100mA dc    I<sub>o</sub> = 0.5mA dc  
 P<sub>i</sub> = 0.7W    P<sub>o</sub> = 24mW  
 C<sub>i</sub> = 0.02µF    C<sub>a</sub> = 1000µF  
 L<sub>i</sub> = 0.02mH    L<sub>a</sub> = 1000mH

**Terminals 5 & 6**  
 U<sub>i</sub> = 30V dc    U<sub>o</sub> = 10.5V dc  
 I<sub>i</sub> = 100mA dc    I<sub>o</sub> = 9.2mA dc  
 P<sub>i</sub> = 0.7W    P<sub>o</sub> = 24mW  
 C<sub>i</sub> = 0.02µF    C<sub>a</sub> = 2.39µF  
 L<sub>i</sub> = 0.02mH    L<sub>a</sub> = 300mH

**Terminals A1 & A2 and A3 & A4**  
 U<sub>i</sub> = 28V dc    U<sub>o</sub> = 0.7V dc  
 I<sub>i</sub> = 200mA dc    I<sub>o</sub> = 1.3µA  
 P<sub>i</sub> = 0.84W    P<sub>o</sub> = 4.1µW  
 C<sub>i</sub> = 0.04µF    C<sub>a</sub> = 1000µF  
 L<sub>i</sub> = 0.03mH    L<sub>a</sub> = 1000mH

**BA334D**  
 SEE NOTES 8 & 10  
 OR  
**BA338C**  
 SEE NOTE 7

POWER SUPPLY 1  
 2

REMOTE RESET 7  
 8

OPTIONAL BACKLIGHT B1  
 B2

OPTIONAL PULSE OUTPUT P1  
 P2

OPTIONAL 4/20mA OUTPUT C1  
 C2

OPTIONAL ALARM A1  
 A2

OPTIONAL ALARM A3  
 A4

VOLTAGE PULSE  
 SEE NOTE 5

VOLTAGE PULSE,  
 PROXIMITY DETECTOR  
 OR SWITCH CONTACT  
 SEE NOTE 5

3 INPUT  
 4

5 INPUT  
 6

SEE NOTE 10

SEE NOTE 1

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

UNCLASSIFIED LOCATION EQUIPMENT

SEE NOTE 2

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

### INPUTS IN HAZARDOUS (CLASSIFIED) LOCATION

Appd.	
Ckd.	
Modification	
Date	
Iss.	
Modification	
Date	
Appd.	
Ckd.	
Modification	
Date	
Iss.	

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 England  
 Hitchin  
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Title  
**FM Approvals Control Drawing for intrinsically safe  
 BA334D & BA338C Externally Powered Rate Totalisers**

Drawn RC	Checked 	Scale NTS	
Drawing No. Sheet 1 of 4		<b>C1330-32</b>	

### HAZARDOUS (CLASSIFIED) LOCATION

**BA334D LOCATIONS:**  
 Class I, Division 1, Groups A, B, C, D  
 Class II, Division 1, Groups E, F & G  
 Class III  
 Class I, Zone 0, Group IIC

**BA338C LOCATIONS:**  
 Class I, Division 1, Groups A, B, C, D  
 Class I, Zone 0, Group IIC

### UNCLASSIFIED LOCATION

**BA334D & BA338C  
 Entity Parameters**

**Terminals 1 & 2**

$U_i = 30V$   
 $I_i = 100mA$  dc  
 $P_i = 0.7W$   
 $C_i = 0.02\mu F$   
 $L_i = 0.02mH$

**Terminals 7 & 8**

$U_i = 30V$  dc     $U_o = 3.8V$  dc  
 $I_i = 100mA$      $I_o = 1.6mA$  dc  
 $P_i = 0.7W$       $P_o = 2mW$   
 $C_i = 0.02\mu F$     $C_a = 1000\mu F$   
 $L_i = 0mH$          $L_a = 1000mH$

**Terminals B1 & B2**

$U_i = 30V$  dc  
 $I_i = 159mA$  dc  
 $P_i = 0.8W$   
 $C_i = 0.04\mu F$   
 $L_i = 0.03mH$

**Terminals P1 & P2**

$U_i = 30V$  dc  
 $I_i = 100mA$  dc  
 $P_i = 0.7W$   
 $C_i = 0.02\mu F$   
 $L_i = 0.02mH$

**Terminals C1 & C2**

$U_i = 30V$  dc  
 $I_i = 100mA$  dc  
 $P_i = 0.7W$   
 $C_i = 0.002\mu F$   
 $L_i = 0.008mH$

**Terminals 3 & 4**

$U_i = 30V$  dc     $U_o = 1.1V$  dc  
 $I_i = 100mA$  dc    $I_o = 0.5mA$  dc  
 $P_i = 0.7W$       $P_o = 24mW$   
 $C_i = 0.02\mu F$     $C_a = 1000\mu F$   
 $L_i = 0.02mH$      $L_a = 1000mH$

**Terminals 5 & 6**

$U_i = 30V$  dc     $U_o = 10.5V$  dc  
 $I_i = 100mA$  dc    $I_o = 9.2mA$  dc  
 $P_i = 0.7W$       $P_o = 24mW$   
 $C_i = 0.02\mu F$     $C_a = 2.39\mu F$   
 $L_i = 0.02mH$      $L_a = 300mH$

**Terminals A1 & A2 and A3 & A4**

$U_i = 28V$  dc     $U_o = 0.7V$  dc  
 $I_i = 200mA$  dc    $I_o = 1.3\mu A$   
 $P_i = 0.84W$      $P_o = 4.1\mu W$   
 $C_i = 0.04\mu F$     $C_a = 1000\mu F$   
 $L_i = 0.03mH$      $L_a = 1000mH$

**BA334D  
 SEE NOTE 8  
 OR  
 BA338C  
 SEE NOTE 7**

**POWER SUPPLY** 1 2

**REMOTE RESET** 7 8

**OPTIONAL BACKLIGHT** B1 B2

**OPTIONAL PULSE OUTPUT** P1 P2

**OPTIONAL 4/20mA OUTPUT** C1 C2

**OPTIONAL ALARM** A1 A2

**OPTIONAL ALARM** A3 A4

SEE NOTE 10

3 INPUT

4 INPUT

5 INPUT

6 INPUT

SEE NOTE 1

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

UNCLASSIFIED LOCATION EQUIPMENT

SEE NOTE 2

### INPUTS IN UNCLASSIFIED LOCATION

Iss.	1	Date	22.04 2005	Modification	First release	Appd.	
Iss.		Date		Modification		Appd.	

**BEKA associates**  
 Hitchin  
 England  
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Title  
**FM Approvals Control Drawing for intrinsically safe  
 BA334D & BA338C Externally Powered Rate Totalisers**

Drawn	RC	Checked	NTS
Drawing No.	CI330-32		
Sheet 2			



Iss.	1
Date	22.04 2005
Modification	First release
Ckd.	
Appd.	
Iss.	
Date	
Modification	
Ckd.	
Appd.	

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 HITCHIN  
 England  
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Notes:

- The associated intrinsically safe barriers or galvanic isolators must be FM approved and the manufacturers' installation drawings must be followed when installing this equipment.
- The unclassified location equipment connected to the associated intrinsically safe barriers must not use or generate more than 250V rms or 250V dc.
- Installation should 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.
- One single channel or one channel of a dual channel barrier or galvanic isolator with entity parameters complying with the following requirements:
 

U <sub>o</sub> or V <sub>t</sub>	equal to or less than	U <sub>i</sub>
I <sub>o</sub> or I <sub>t</sub>	equal to or less than	I <sub>i</sub>
P <sub>o</sub>	equal to or less than	P <sub>i</sub>
L <sub>a</sub>	equal to or greater than	L <sub>cable</sub> + L <sub>i</sub>
C <sub>a</sub>	equal to or greater than	C <sub>cable</sub> + C <sub>i</sub>
- Hazardous (classified) location equipment complying with the requirements of note 4 and the input parameters listed on Sheets 1 and 2 for Terminals 3 and 4, and 5 and 6, or simple apparatus.
- Simple apparatus or FM approved associated apparatus with contacts having entity parameters complying with the following requirements:
 

U <sub>o</sub> or V <sub>t</sub>	equal to or less than	U <sub>i</sub>
I <sub>o</sub> or I <sub>t</sub>	equal to or less than	I <sub>i</sub>
L <sub>a</sub>	equal to or greater than	L <sub>cable</sub> + L <sub>i</sub>
C <sub>a</sub>	equal to or greater than	C <sub>cable</sub> + C <sub>i</sub>
- To maintain NEMA 4X between the BA338C and the mounting panel:
 

Four panel mounting clips should be used

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                      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 tightened to between: 20 and 22cNm (1.77 to 1.95 inLb)

Cont.

Title		Drawn	Checked	Scale
FM Approvals Control Drawing for intrinsically safe BA334D & BA338C Externally Powered Rate Totalisers		RC		NTS
		Drawing No. Sheet 3	C1330-32	

Iss.	Date	Modification	Ckd.	Appd.
1	22.04 2005	First release		
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Iss.	Date	Modification	Ckd.	Appd.

8. When installed in a hazardous (classified) location the BA334D shall be fitted with cable glands / conduit hubs selected from the following table.  
Metallic glands and hubs must be grounded – see note 9.

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

9. In addition to the supplied bonding plate, when 2 or 3 metallic glands or conduit hubs are fitted to a BA334D, all metallic glands or conduit hubs must be connected together and grounded.
10. **CAUTION:** The BA334D enclosure is manufactured from conductive plastic per Article 250 of the National Electrical Code the enclosures shall be grounded using the 'E' terminal on the terminal block.
11. Circuit connections to terminals 1 & 2; 7 & 8; B1 & B2; P1 & P2; C1 & C2; A1 & A2 and A3 & A4 shall be installed as separate intrinsically safe circuits in accordance with the National Electrical Code.

Iss.	Date	Title	Drawn	Checked	Scale
1	22.04 2005	FM Approvals Control Drawing for intrinsically safe BA334D & BA338C Externally Powered Rate Totalisers	RC		NTS
			Drawing No.	CI330-32	
			Sheet 4		

## HAZARDOUS (CLASSIFIED) LOCATION

## UNCLASSIFIED LOCATION

**BA364D LOCATIONS:**  
 Class I, Division 1, Groups A, B, C, D  
 Class II, Division 1, Groups E, F & G  
 Class III  
 Class I, Zone 0, Group IIC

**BA368C LOCATIONS:**  
 Class I, Division 1, Groups A, B, C, D  
 Class I, Zone 0, Group IIC

**BA364D & BA368C Entity Parameters**

**Terminals 1 & 2**  
 Ui = 30V  
 Ii = 100mA dc  
 Pi = 0.7W  
 Ci = 0.02µF  
 Li = 0.02mH

**Terminals 7 & 8**  
 Ui = 30V dc      Uo = 3.8V dc  
 Ii = 100mA      Io = 1.6mA dc  
 Pi = 0.7W      Po = 2mW  
 Ci = 0.02µF      Ca = 1000µF  
 Li = 0mH      La = 1000mH

**Terminals B1 & B2**  
 Ui = 30V dc  
 Ii = 159mA dc  
 Pi = 0.8W  
 Ci = 0.04µF  
 Li = 0.03mH

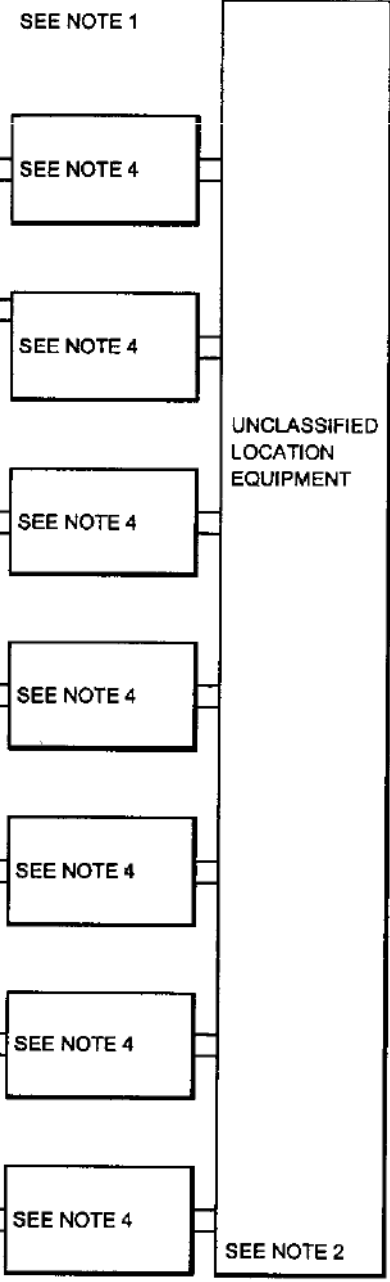
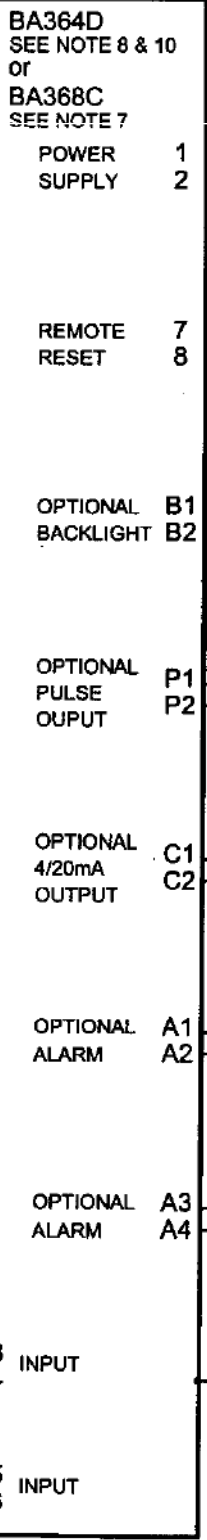
**Terminals P1 & P2**  
 Ui = 30V dc  
 Ii = 100mA dc  
 Pi = 0.7W  
 Ci = 0.02µF  
 Li = 0.02mH

**Terminals C1 & C2**  
 Ui = 30V dc  
 Ii = 100mA dc  
 Pi = 0.7W  
 Ci = 0.002µF  
 Li = 0.008mH

**Terminals 3 & 4**  
 Ui = 30V dc      Uo = 10.5V dc  
 Ii = 100mA dc      Io = 9.2mA dc  
 Pi = 0.7W      Po = 24mW  
 Ci = 0.02µF      Ca = 2.39µF  
 Li = 0.02mH      La = 300mH

**Terminals 5 & 6**  
 Ui = 30V dc      Uo = 10.5V dc  
 Ii = 100mA dc      Io = 9.2mA dc  
 Pi = 0.7W      Po = 24mW  
 Ci = 0.02µF      Ca = 2.39µF  
 Li = 0.02mH      La = 300mH

**Terminals A1 & A2 and A3 & A4**  
 Ui = 28V dc      Uo = 0.7V dc  
 Ii = 200mA dc      Io = 1.3µA  
 Pi = 0.84W      Po = 4.1µW  
 Ci = 0.04µF      Ca = 1000µA  
 Li = 0.03mH      La = 1000mH



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Date	22.04 2005
Iss.	1

### INPUTS IN HAZARDOUS (CLASSIFIED) LOCATION

	Title <b>FM Approvals Control Drawing for intrinsically safe                  BA364D &amp; BA368C Counter, Timer, Tachometer &amp; Clock</b>	Drawn RC	Checked 	Scale NTS
		Drawing No. Sheet 1 of 4 <b>C1330-33</b>		

## HAZARDOUS (CLASSIFIED) LOCATION

## UNCLASSIFIED LOCATION

**BA364D LOCATIONS:**  
 Class I, Division 1, Groups A, B, C, D  
 Class II, Division 1, Groups E, F & G  
 Class III  
 Class I, Zone 0, Group IIC

**BA368C LOCATIONS:**  
 Class I, Division 1, Groups A, B, C, D  
 Class I, Zone 0, Group IIC

**BA364D & BA368C Entity Parameters**

**Terminals 1 & 2**  
 U<sub>i</sub> = 30V  
 I<sub>i</sub> = 100mA dc  
 P<sub>i</sub> = 0.7W  
 C<sub>i</sub> = 0.02μF  
 L<sub>i</sub> = 0.02mH

**Terminals 7 & 8**  
 U<sub>i</sub> = 30V dc    U<sub>o</sub> = 3.8V dc  
 I<sub>i</sub> = 100mA    I<sub>o</sub> = 1.6mA dc  
 P<sub>i</sub> = 0.7W    P<sub>o</sub> = 2mW  
 C<sub>i</sub> = 0.02μF    C<sub>a</sub> = 1000μF  
 L<sub>i</sub> = 0mH        L<sub>a</sub> = 1000mH

**Terminals B1 & B2**  
 U<sub>i</sub> = 30V dc  
 I<sub>i</sub> = 159mA dc  
 P<sub>i</sub> = 0.8W  
 C<sub>i</sub> = 0.04μF  
 L<sub>i</sub> = 0.03mH

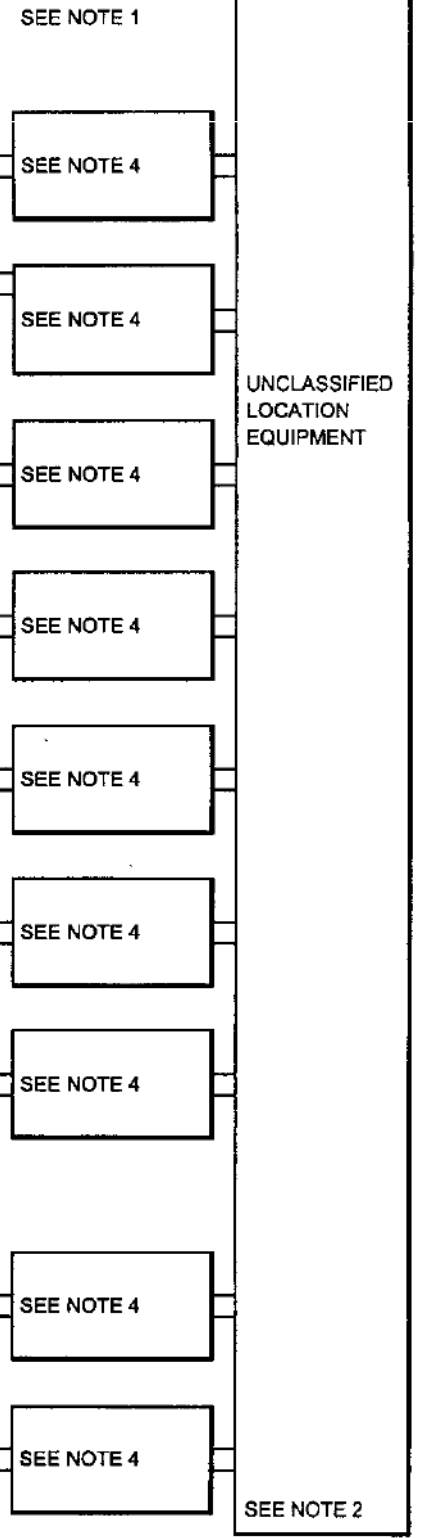
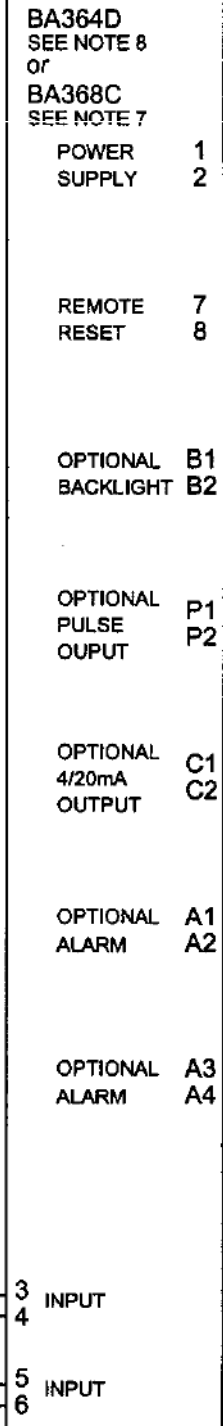
**Terminals P1 & P2**  
 U<sub>i</sub> = 30V dc  
 I<sub>i</sub> = 100mA dc  
 P<sub>i</sub> = 0.7W  
 C<sub>i</sub> = 0.02μF  
 L<sub>i</sub> = 0.02mH

**Terminals C1 & C2**  
 U<sub>i</sub> = 30V dc  
 I<sub>i</sub> = 100mA dc  
 P<sub>i</sub> = 0.7W  
 C<sub>i</sub> = 0.002μF  
 L<sub>i</sub> = 0.008mH

**Terminals 3 & 4**  
 U<sub>i</sub> = 30V dc    U<sub>o</sub> = 10.5V dc  
 I<sub>i</sub> = 100mA dc    I<sub>o</sub> = 9.2mA dc  
 P<sub>i</sub> = 0.7W        P<sub>o</sub> = 24mW  
 C<sub>i</sub> = 0.02μF     C<sub>a</sub> = 2.39μF  
 L<sub>i</sub> = 0.02mH     L<sub>a</sub> = 300mH

**Terminals 5 & 6**  
 U<sub>i</sub> = 30V dc    U<sub>o</sub> = 10.5V dc  
 I<sub>i</sub> = 100mA dc    I<sub>o</sub> = 9.2mA dc  
 P<sub>i</sub> = 0.7W        P<sub>o</sub> = 24mW  
 C<sub>i</sub> = 0.02μF     C<sub>a</sub> = 2.39μF  
 L<sub>i</sub> = 0.02mH     L<sub>a</sub> = 300mH

**Terminals A1 & A2 and A3 & A4**  
 U<sub>i</sub> = 28V dc    U<sub>o</sub> = 0.7V dc  
 I<sub>i</sub> = 200mA dc    I<sub>o</sub> = 1.3μA  
 P<sub>i</sub> = 0.64W      P<sub>o</sub> = 4.1μW  
 C<sub>i</sub> = 0.04μF     C<sub>a</sub> = 1000μA  
 L<sub>i</sub> = 0.03mH     L<sub>a</sub> = 1000mH




### INPUTS IN UNCLASSIFIED LOCATION

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**Title**  
 FM Approvals Control Drawing for intrinsically safe  
 BA364D & BA368C Counter, Timer, Tachometer & Clock

Drawn RC	Checked 	Scale NTS
Drawing No. Sheet 2		C1330-33

Iss.	Date	Modification	Ckd.	Appd.																											
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Iss.	Date	Modification	Ckd.	Appd.																											
<p>Notes:</p> <ol style="list-style-type: none"> <li>The associated intrinsically safe barriers or galvanic isolators must be FM approved and the manufacturers' installation drawings must be followed when installing this equipment.</li> <li>The unclassified location equipment connected to the associated intrinsically safe barriers must not use or generate more than 250V rms or 250V dc.</li> <li>Installation should 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.</li> <li>One single channel or one channel of a dual channel barrier or galvanic isolator with entity parameters complying with the following requirements:           <table style="margin-left: 40px;"> <tr> <td>Uo or Vt</td> <td>equal to or less than</td> <td>Ui</td> </tr> <tr> <td>Io or It</td> <td>equal to or less than</td> <td>li</td> </tr> <tr> <td>Po</td> <td>equal to or less than</td> <td>Pi</td> </tr> <tr> <td>La</td> <td>equal to or greater than</td> <td>Lcable + Li</td> </tr> <tr> <td>Ca</td> <td>equal to or greater than</td> <td>Ccable + Ci</td> </tr> </table> </li> <li>Hazardous (classified) location equipment complying with the requirements of note 4 and the input parameters listed on Sheets 1 and 2 for Terminals 3 and 4, and 5 and 6, or simple apparatus.</li> <li>Simple apparatus or FM approved associated apparatus with contacts having entity parameters complying with the following requirements:           <table style="margin-left: 40px;"> <tr> <td>Uo or Vt</td> <td>equal to or less than</td> <td>Ui</td> </tr> <tr> <td>Io or It</td> <td>equal to or less than</td> <td>li</td> </tr> <tr> <td>La</td> <td>equal to or greater than</td> <td>Lcable + Li</td> </tr> <tr> <td>Ca</td> <td>equal to or greater than</td> <td>Ccable + Ci</td> </tr> </table> </li> <li>To maintain NEMA 4X protection between the BA368C and the mounting panel:           <p>Four panel mounting clips should be used</p> <p>Minimum panel thickness should be   2mm (0.08inches) Steel              3mm (0.12inches) Aluminium</p> <p>*Outside panel finish should be smooth, free from particle inclusions, runs or build-up around cut-out.</p> <p>Panel cut-out should be                   66.2 x 136.0mm -0.0 +0.5              (2.60 x 5.35 inches -0.00 +0.02)</p> <p>Edges of panel cut-out should be deburred and clean</p> <p>Each panel mounting clip should be tightened to between: 20 and 22cNm (1.77 to 1.95 inLb)</p> </li> </ol>					Uo or Vt	equal to or less than	Ui	Io or It	equal to or less than	li	Po	equal to or less than	Pi	La	equal to or greater than	Lcable + Li	Ca	equal to or greater than	Ccable + Ci	Uo or Vt	equal to or less than	Ui	Io or It	equal to or less than	li	La	equal to or greater than	Lcable + Li	Ca	equal to or greater than	Ccable + Ci
Uo or Vt	equal to or less than	Ui																													
Io or It	equal to or less than	li																													
Po	equal to or less than	Pi																													
La	equal to or greater than	Lcable + Li																													
Ca	equal to or greater than	Ccable + Ci																													
Uo or Vt	equal to or less than	Ui																													
Io or It	equal to or less than	li																													
La	equal to or greater than	Lcable + Li																													
Ca	equal to or greater than	Ccable + Ci																													
Cont.																															
Iss.	Date	Modification	Title																												
1	22.04 2005	First release	FM Approved Control Drawing for intrinsically safe BA364D & BA368C Counter, Timer, Tachometer & Clock																												
			Drawn RC	Checked 																											
			Scale NTS																												
			Drawing No. Sheet 3	C1330-33																											

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8. When installed in a hazardous (classified) location the BA364D shall be fitted with cable glands / conduit hubs selected from the following table.  
Metallic glands and hubs must be grounded – see note 9.

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

9. In addition to the supplied bonding plate, when 2 or 3 metallic glands or conduit hubs are fitted to a BA364D, all metallic glands or conduit hubs must be connected together and grounded.
10. **CAUTION:** The BA364D enclosure is manufactured from conductive plastic per Article 250 of the National Electrical Code and enclosures shall be grounded using the 'E' terminal on the terminal block.
11. Circuit connections to terminals 1 & 2; 7 & 8; B1 & B2; P1 & P2; C1 & C2; A1 & A2 and A3 & A4 shall be installed as separate intrinsically safe circuits in accordance with the National Electrical Code.

Iss.	Date	Title	Drawn	Checked	Scale
1	22.04 2005	FM Approved Control Drawing for intrinsically safe BA364D & BA368C Counter, Timer, Tachometer & Clock	RC		NTS
			Drawing No.	C1330-33	
			Sheet 4		

## HAZARDOUS (CLASSIFIED) LOCATION

## UNCLASSIFIED LOCATION

**BA334D LOCATIONS:**  
 Class I, Division 2, Groups A, B, C, D  
 Class II, Division 2, Groups E, F & G  
 Class III  
 Class I, Zone 2, Group IIC

**BA338C LOCATIONS:**  
 Class I, Division 2, Groups A, B, C, D  
 Class I, Zone 2, Group IIC

**BA334D & BA338C**

Terminals 1 & 2  
 Vmax = 30V  
 Ci = 0.02µF  
 Li = 0.02mH

Terminals 7 & 8  
 Vmax = 30V dc    Voc = 3.8V dc  
 Ci = 0.02µF      Isc = 1.6mA  
 Li = 0mH          Ca = 1000µF  
                          La = 1000mH

Terminals B1 & B2  
 Vmax = 30V dc  
 Ci = 0.04µF  
 Li = 0.03mH

Terminals P1 & P2  
 Vmax = 30V dc  
 Ci = 0.02µF  
 Li = 0.02mH

Terminals C1 & C2  
 Vmax = 30V dc  
 Ci = 0.002µF  
 Li = 0.008mH

Terminals 3 & 4  
 Vmax = 30V dc    Voc = 1.1V dc  
 Ci = 0.02µF      Isc = 0.5mA dc  
 Li = 0.02mH      Ca = 1000µF  
                          La = 1000mH

Terminals 5 & 6  
 Vmax = 30V dc    Voc = 10.5V dc  
 Ci = 0.02µF      Isc = 9.2mA dc  
 Li = 0.02mH      Ca = 2.39µF  
                          La = 300mH

Terminals A1 & A2 and A3 & A4  
 Vmax = 28V dc  
 Ci = 0.04µF  
 Li = 0.03mH

**BA334D**  
 SEE NOTES 5 & 7  
 OR  
**BA338C**  
 SEE NOTE 4

POWER SUPPLY 1  
 SUPPLY 2

REMOTE 7  
 RESET 8

OPTIONAL BACKLIGHT B1  
 B2

OPTIONAL PULSE OUPUT P1  
 P2

OPTIONAL 4/20mA OUTPUT C1  
 C2

OPTIONAL ALARM A1  
 A2

OPTIONAL ALARM A3  
 A4

3 INPUT

4 INPUT

5 INPUT

6 INPUT

SEE NOTE 7

UNCLASSIFIED LOCATION EQUIPMENT

SEE NOTE 1 & 2

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

### INPUT IN HAZARDOUS (CLASSIFIED) LOCATION

VOLTAGE PULSE  
 SEE NOTE 3

VOLTAGE PULSE, PROXIMITY DETECTOR OR SWITCH CONTACT  
 SEE NOTE 3

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Date	22.04.2005	Title	Drawn	RC	Checked	Scale	NTS
FM Approvals Control Drawing for nonincendive BA334D & BA338C Externally Powered Rate Totalisers			Drawing No.		Sheet 1 of 4		
			C1330-34				

Iss.	1	Date	22.04 2005	Modification	First release	Ckd.		Appd.	
Iss.		Date		Modification		Ckd.		Appd.	

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**HAZARDOUS (CLASSIFIED) LOCATION**

**UNCLASSIFIED LOCATION**

**BA334D LOCATIONS:**  
Class I, Division 2, Groups A, B,C, D  
Class II, Division 2, Groups E, F & G  
Class III  
Class I, Zone 2, Group IIC

**BA338C LOCATIONS:**  
Class I, Division 2, Groups A, B,C, D  
Class I, Zone 2, Group IIC

**BA334D & BA338C**

Terminals 1 & 2  
Vmax = 30V  
Ci = 0.02µF  
Li = 0.02mH

Terminals 7 & 8  
Vmax = 30V dc    Voc = 3.8V dc  
Ci = 0.02µF    Isc = 1.6mA  
Li = 0mH        Ca = 1000µF  
La = 1000mH

Terminals B1 & B2  
Vmax = 30V dc  
Ci = 0.04µF  
Li = 0.03mH

Terminals P1 & P2  
Vmax = 30V dc  
Ci = 0.02µF  
Li = 0.02mH

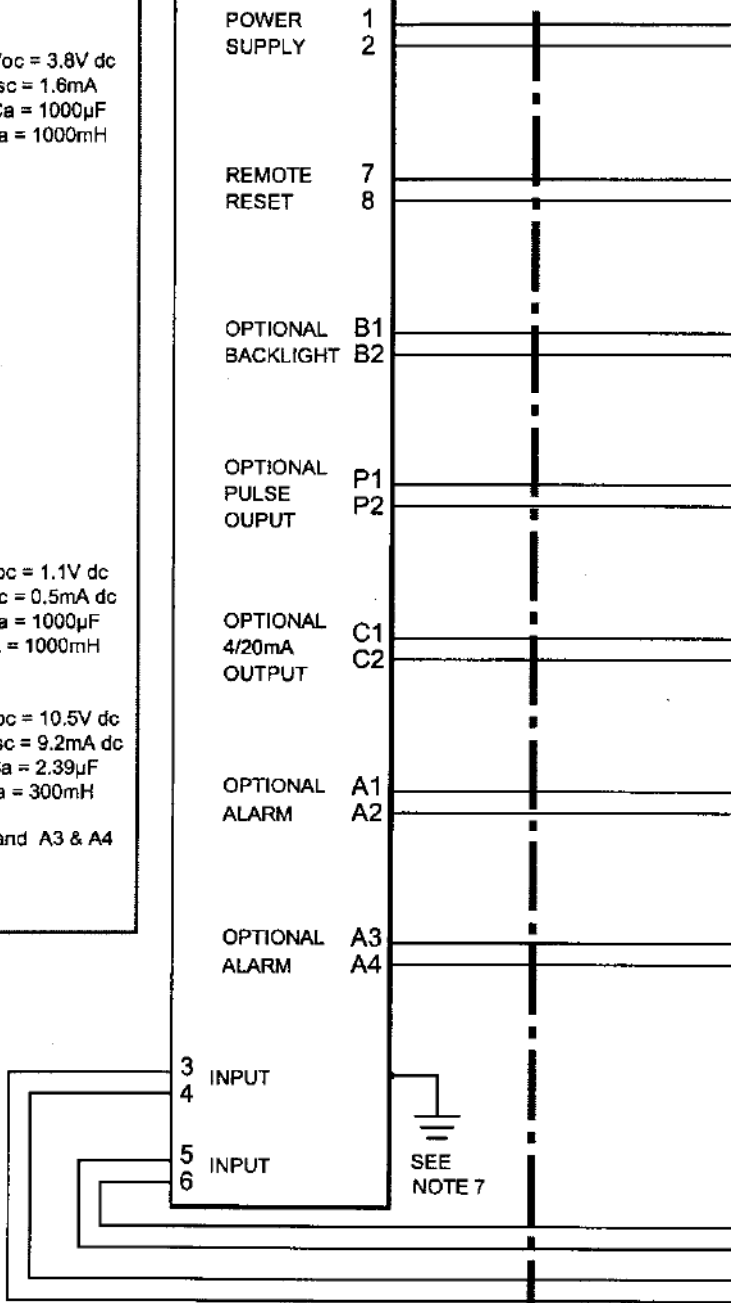
Terminals C1 & C2  
Vmax = 30V dc  
Ci = 0.002µF  
Li = 0.008mH

Terminals 3 & 4  
Vmax = 30V dc    Voc = 1.1V dc  
Ci = 0.02µF    Isc = 0.5mA dc  
Li = 0.02mH    Ca = 1000µF  
La = 1000mH

Terminals 5 & 6  
Vmax = 30V dc    Voc = 10.5V dc  
Ci = 0.02µF    Isc = 9.2mA dc  
Li = 0.02mH    Ca = 2.39µF  
La = 300mH

Terminals A1 & A2 and A3 & A4  
Vmax = 28V dc  
Ci = 0.04µF  
Li = 0.03mH

**BA334D**  
SEE NOTE 5 & 7  
OR  
**BA338C**  
SEE NOTE 4



UNCLASSIFIED LOCATION EQUIPMENT

SEE NOTE 1 & 2

**INPUT IN UNCLASSIFIED LOCATION**

Title		Drawn	Checked	Scale
FM Approvals Control Drawing for nonincendive BA334D & BA338C Externally Powered Rate Totalisers		RC	<i>[Signature]</i>	NTS
		Drawing No. Sheet 2	C1330-34	



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Date	22.04 2005
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Notes:

- 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.
- Apparatus connected to the power supply, remote reset terminals, optional backlight, inputs and to the optional outputs shall be FM Approved as Associated Nonincendive Field Wiring Apparatus and shall comply with the following requirements:

Voc	equal to or less than	Vmax
La	equal to or greater than	Lcable + Li
Ca	equal to or greater than	Ccable + Ci

- Hazardous (classified) location equipment complying with the following requirements and the input parameters listed on Sheet 1 for Terminals 3 and 4, and 5 and 6 or simple apparatus.

Voc	equal to or less than	Vmax
La	equal to or greater than	Lcable + Li
Ca	equal to or greater than	Ccable + Ci

- To maintain NEMA 4X protection between the BA338C and the mounting panel:

Four panel mounting clips should be used

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                            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 tightened to between:                    20 and 22cNm (1.77 to 1.95 inLb)

Title		Drawn	Checked	Scale
FM Approvals Control Drawing for nonincendive BA334D & BA338C Externally Powered Rate Totalisers		RC		NTS
		Drawing No.	C1330-34	
		Sheet 3		

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5. When installed in a hazardous (classified) location the BA334D shall be fitted with cable glands / conduit hubs selected from the following table.  
 Metallic glands and hubs must be grounded – see note 7.

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

6. In addition to the supplied bonding plate, when 2 or 3 metallic glands or conduit hubs are fitted to a BA334D, all metallic glands or conduit hubs must be connected together and grounded.
7. **CAUTION:** The BA334D enclosure is manufactured from conductive plastic per Article 250 of the National Electrical Code the enclosures shall be grounded using the 'E' terminal on the terminal block.
8. NIFW = Nonincendive Field Wiring; any of the wiring methods permitted for unclassified locations, as defined in the National Electrical Code ANSI/NFPA 70, may be used for this installation.

Iss.	Date	Title	Drawn	Checked	Scale
			RC		NTS
		FM Approvals Control Drawing for nonincendive BA334D & BA338C Externally Powered Rate Totalisers	Drawing No.	C1330-34	
			Sheet 4		

## HAZARDOUS (CLASSIFIED) LOCATION

## UNCLASSIFIED LOCATION

**BA364D LOCATIONS:**

Class I, Division 2, Groups A, B, C, D  
 Class II, Division 2, Groups E, F & G  
 Class III  
 Class I, Zone 2, Group IIC

**BA368C LOCATIONS:**

Class I, Division 2, Groups A, B, C, D  
 Class I, Zone 2, Group IIC

**BA364D & BA368C**

**Terminals 1 & 2**

V<sub>max</sub> = 30V  
 C<sub>i</sub> = 0.02μF  
 L<sub>i</sub> = 0.02mH

**Terminals 7 & 8**

V<sub>max</sub> = 30V dc    V<sub>oc</sub> = 3.8V dc  
 C<sub>i</sub> = 0.02μF    I<sub>sc</sub> = 1.6mA  
 L<sub>i</sub> = 0mH        C<sub>a</sub> = 1000μF  
                      L<sub>a</sub> = 1000mH

**Terminals B1 & B2**

V<sub>max</sub> = 30V dc  
 C<sub>i</sub> = 0.04μF  
 L<sub>i</sub> = 0.03mH

**Terminals P1 & P2**

V<sub>max</sub> = 30V dc  
 C<sub>i</sub> = 0.02μF  
 L<sub>i</sub> = 0.02mH

**Terminals C1 & C2**

V<sub>max</sub> = 30V dc  
 C<sub>i</sub> = 0.002μF  
 L<sub>i</sub> = 0.008mH

**Terminals 3 & 4**

V<sub>max</sub> = 30V dc    V<sub>oc</sub> = 10.5V dc  
 C<sub>i</sub> = 0.02μF    I<sub>sc</sub> = 9.2mA dc  
 L<sub>i</sub> = 0.02mH    C<sub>a</sub> = 2.39μF  
                      L<sub>a</sub> = 300mH

**Terminals 5 & 6**

V<sub>max</sub> = 30V dc    V<sub>oc</sub> = 10.5V dc  
 C<sub>i</sub> = 0.02μF    I<sub>sc</sub> = 9.2mA dc  
 L<sub>i</sub> = 0.02mH    C<sub>a</sub> = 2.39μF  
                      L<sub>a</sub> = 300mH

**Terminals A1 & A2 and A3 & A4**

V<sub>max</sub> = 28V dc  
 C<sub>i</sub> = 0.04μF  
 L<sub>i</sub> = 0.03mH

**BA364D**  
 SEE NOTE 5 & 7  
 or  
**BA368C**  
 SEE NOTE 4

POWER SUPPLY 1  
 2

REMOTE RESET 7  
 8

OPTIONAL BACKLIGHT B1  
 B2

OPTIONAL PULSE OUTPUT P1  
 P2

OPTIONAL 4/20mA OUTPUT C1  
 C2

OPTIONAL ALARM A1  
 A2

OPTIONAL ALARM A3  
 A4

VOLTAGE PULSE,  
 PROXIMITY DETECTOR  
 OR SWITCH CONTACT  
 SEE NOTE 3

VOLTAGE PULSE,  
 PROXIMITY DETECTOR  
 OR SWITCH CONTACT  
 SEE NOTE 3

3 INPUT

4 INPUT

5 INPUT

6 INPUT


SEE NOTE 7

UNCLASSIFIED LOCATION EQUIPMENT


SEE NOTE 1 & 2

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

### INPUTS IN HAZARDOUS (CLASSIFIED) LOCATION

Iss.	1	Date	22.04 2005	Modification	First release	Ckd.		Appd.	
 <p><b>BEKA associates</b>                  Hitchin England                  company confidential, copyright reserved.</p>									

Title  
 FM Approvals Control Drawing for nonincendive  
 BA364D & BA368C Counter, Timer, Tachometer & Clock

Drawn RC	Checked 	Scale NTS
Drawing No. Sheet 1 of 4		
CI330-35		

Iss.	1	Date	22.04 2005	Modification	First release	Ckd.		Appd.	
Iss.		Date		Modification		Ckd.		Appd.	

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### HAZARDOUS (CLASSIFIED) LOCATION

### UNCLASSIFIED LOCATION

**BA364D LOCATIONS:**  
Class I, Division 2, Groups A, B, C, D  
Class II, Division 2, Groups E, F & G  
Class III  
Class I, Zone 2, Group IIC

**BA368C LOCATIONS:**  
Class I, Division 2, Groups A, B, C, D  
Class I, Zone 2, Group IIC

**BA364D & BA368C**

Terminals 1 & 2  
Vmax = 30V  
Ci = 0.02µF  
Li = 0.02mH

Terminals 7 & 8  
Vmax = 30V dc Voc = 3.8V dc  
Ci = 0.02µF Isc = 1.6mA  
Li = 0mH Ca = 1000µF  
La = 1000mH

Terminals B1 & B2  
Vmax = 30V dc  
Ci = 0.04µF  
Li = 0.03mH

Terminals P1 & P2  
Vmax = 30V dc  
Ci = 0.02µF  
Li = 0.02mH

Terminals C1 & C2  
Vmax = 30V dc  
Ci = 0.002µF  
Li = 0.008mH

Terminals 3 & 4  
Vmax = 30V dc Voc = 10.5V dc  
Ci = 0.02µF Isc = 9.2mA dc  
Li = 0.02mH Ca = 2.39µF  
La = 300mH

Terminals 5 & 6  
Vmax = 30V dc Voc = 10.5V dc  
Ci = 0.02µF Isc = 9.2mA dc  
Li = 0.02mH Ca = 2.39µF  
La = 300mH

Terminals A1 & A2 and A3 & A4  
Vmax = 28V dc  
Ci = 0.04µF  
Li = 0.03mH

**BA364D**  
SEE NOTE 5 & 7  
OR  
**BA368C**  
SEE NOTE 4

POWER 1  
SUPPLY 2

REMOTE 7  
RESET 8

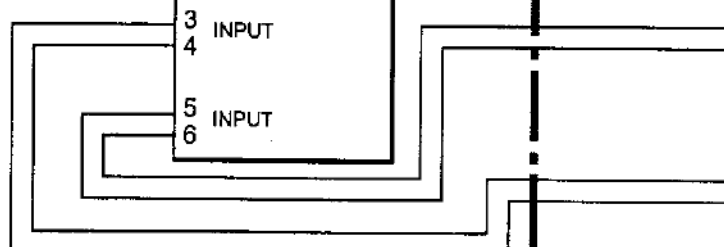
OPTIONAL BACKLIGHT B1  
B2

OPTIONAL PULSE OUTPUT P1  
P2

OPTIONAL 4/20mA OUTPUT C1  
C2

OPTIONAL ALARM A1  
A2

OPTIONAL ALARM A3  
A4



UNCLASSIFIED LOCATION EQUIPMENT

SEE NOTE 1 & 2

### INPUTS IN UNCLASSIFIED LOCATION

Title  
**FM Approvals Control Drawing for nonincendive  
BA364D & BA368C Counter, Timer, Tachometer & Clock**

Drawn	RC	Checked	Scale
			NTS
Drawing No.		C1330-35	
Sheet 2			

Iss.	1	Date	22.04 2005	Modification	First release	Appd.		Ckd.		Appd.	
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Notes:

1. 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.

2. Apparatus connected to the power supply, remote reset terminals, optional backlight, inputs and to the optional outputs shall be FM Approved as Associated Nonincendive Field Wiring Apparatus and shall comply with the following requirements:

Voc	equal to or less than	Vmax
La	equal to or greater than	Lcable + Li
Ca	equal to or greater than	Ccable + Ci

3. Hazardous (classified) location equipment complying with the following requirements and the input parameters listed on Sheet 1 for Terminals 3 and 4, and 5 and 6 or simple apparatus.

Voc	equal to or less than	Vmax
La	equal to or greater than	Lcable + Li
Ca	equal to or greater than	Ccable + Ci

4. To maintain NEMA 4X protection between the BA368C and the mounting panel:

- Four panel mounting clips should be used
- 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
  - 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 tightened to between:
  - 20 and 22cNm (1.77 to 1.95 inLb)


Title		Drawn	Checked	Scale
FM Approved Control Drawing for nonincendive BA364D & BA368C Counter, Timer, Tachometer & Clock		RC		NTS
		Drawing No.	C1330-35	
		Sheet 3		

Iss.	Date	Modification	Ckd.	Appd.
1	22.04 2005	First release		
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Iss.	Date	Modification	Ckd.	Appd.

5. When installed in a hazardous (classified) location the BA364D shall be fitted with cable glands / conduit hubs selected from the following table  
 Metallic glands and hubs must be grounded – see note 7.

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

6. In addition to the supplied bonding plate, when 2 or 3 metallic glands or conduit hubs are fitted to a BA364D, all metallic glands or conduit hubs must be connected together and grounded.
7. **CAUTION:** The BA364D enclosure is manufactured from conductive plastic per Article 250 of the National Electrical Code and enclosures shall be grounded using the 'E' terminal on the terminal block.
8. NIFW = Nonincendive Field Wiring; any of the wiring methods permitted for unclassified locations, as defined in the National Electrical Code ANSI/NFPA 70, may be used for this installation.

Date		Title		Drawn	Checked	Scale
22.04 2005		FM Approved Control Drawing for NONINCENDIVE BA364D & BA368C Counter, Timer, Tachometer & Clock		RC		NTS
Iss.	1			Drawing No. Sheet 4		C1330-35