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Member of the FM Global Group

CERTIFICATE OF COMPLIANCE

HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

BA454Da Batch Controller

IS / I, II, III / 1 / ABCDEFG / T4 Ta = 60°C – CI450-12; Entity; Type 4X, IP66
 I / 0 / Ex ia IIC T4 Ta = 60°C – CI450-12; Entity; Type 4X, IP66
 IPA / I, II, III / 2 / ABCDEFG / T4 Ta = 60°C – CI450-13; NIFW; Type 4X, IP66

Intrinsic Safety Parameters

Input Parameters

Terminals	Vmax (V)	I _{max} (mA)	Pi (W)	Ci (nF)	Li (uH)
1 & 2	28	96	0.84	15	8
11 & 12	0	0	0	15	8
13, 14, 15, 16 & 17	28	100	0.66	18	20
18, 19 & 20	0	0	0	3.6	0
S1 to S7	0	0	0	0.54	300
A1 & A2; A3 & A4; A5 & A6; A7 & A8; A9 & A10; A11 & A12	28	200	0.85	0.04	20

Output Parameters

Terminals	Voc (V)	Isc	Po (W)	Co (μF)	Lo (mH)
11 & 12	10.6	20mA	0.05	2.3	90
13, 14, 15, 16 & 17	1.1	0.12mA	<0.001	0.018	0.02
18, 19 & 20	11.7	2.4mA	0.007	1000	1000
S1 to S7	14.7	146.7mA	0.58	0.08	1.1
A1 & A2; A3 & A4 A5 & A6; A7 & A8; A9 & A10; A11 & A12	1.49	1uA	0.003	1000	1000

Nonincendive Field Wiring Parameters

Input Parameters

Terminals	Vmax (V)	I _{max} (mA)	Pi (W)	Ci (nF)	Li (uH)
1 & 2	28	-	-	15	8
13, 14, 15, 16 & 17	28	-	-	18	20
A1 & A2; A3 & A4; A5 & A6; A7 & A8; A9 & A10; A11 & A12	32	-	-	40	20

Output Parameters

Terminals	Voc (V)	Isc (mA)	Po (W)	Co (μF)	Lo (mH)
S1 to S7	14.7	146.7	-	0.08	1.1
11 & 12	10.6	20	-	2.3	90
18, 19 & 20	11.7	2.4	-	1000	1000

a = Parameter not affecting safety.

Special conditions of use

1. The BA454D shall be protected from direct exposure to sunlight.
2. Input connections shall only be made to terminals 11 and 12 or to terminals 13, 14, 15, 16 and 17. These inputs shall not be used at the same time.

BA458Ca Batch Controller

IS / I / 1 / ABCD / T4 Ta = 60°C – CI450-12; Entity: Type 4X*, IP66*

I / 0 / Ex ia IIC T4 Ta = 60°C – CI450-12; Entity: Type 4X*, IP66*

NI / I / 2 / ABCD / T4 Ta = 60°C – CI450-13: NIFW; Type 4X*, IP66*

*Front panel only

Intrinsic Safety Parameters

Input Parameters

Terminals	Vmax (V)	I _{max} (mA)	Pi (W)	Ci (nF)	Li (uH)
1 & 2	28	96	0.84	15	8
11 & 12	0	0	0	15	8
13, 14, 15, 16 & 17	28	100	0.66	18	20
18, 19 & 20	0	0	0	3.6	0
S1 to S7	0	0	0	0.54	300
A1 & A2; A3 & A4; A5 & A6; A7 & A8; A9 & A10; A11 & A12	28	200	0.85	0.04	20

Output Parameters

Terminals	V _{oc} (V)	I _{sc}	P _o (W)	C _o (uF)	L _o (mH)
11 & 12	10.6	20mA	0.05	2.3	90
13, 14, 15, 16 & 17	1.1	0.12mA	<0.001	0.018	0.02
18, 19 & 20	11.7	2.4mA	0.007	1000	1000
S1 to S7	14.7	146.7mA	0.58	0.08	1.1
A1 & A2; A3 & A4; A5 & A6; A7 & A8; A9 & A10; A11 & A12	1.49	1uA	0.003	1000	1000

Nonincendive Field Wiring Parameters

Input Parameters

Terminals	Vmax (V)	I _{max} (mA)	Pi (W)	Ci (nF)	Li (uH)
1 & 2	28	-	-	15	8
13, 14, 15, 16 & 17	28	-	-	18	20
A1 & A2; A3 & A4; A5 & A6; A7 & A8; A9 & A10; A11 & A12	32	-	-	40	20

Output Parameters

Terminals	Voc (V)	Isc (mA)	Po (W)	Co (µF)	Lo (mH)
S1 to S7	14.7	146.7	-	0.08	1.1
11 & 12	10.6	20	-	2.3	90
18, 19 & 20	11.7	2.4	-	1000	1000

a = Parameter not affecting safety.

Special conditions of use

1. To maintain the Type 4X enclosure rating the BA458C shall be installed in accordance with the mounting conditions provided on drawing numbers CI450-12 and CI450-13.
2. The BA458C shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.
3. The BA458C shall be protected from direct exposure to sunlight.
4. Input connections shall only be made to terminals 11 and 12 or to terminals 13, 14, 15, 16 and 17. These inputs shall not be used at the same time.

Equipment Ratings:

BA454D Batch Controller

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 indoor and outdoor Hazardous Locations in accordance with the Entity Concept when installed according to Control Drawing CI450-12. Nonincendive for Class I and II Division 2, Groups A, B, C, D, E, F and G; Nonincendive for Class III, Divisions 1 and 2; indoor and outdoor Hazardous Locations in accordance with the NIFW Concept when installed according to Control Drawing CI450-13. Temperature Class T4 at an ambient of 60°C

BA458C Batch Controller

Intrinsically Safe for Class I, II and III, Division 1, Groups A, B, C, and D, and Class I, Zone 0 Group IIC indoor and outdoor Hazardous Locations in accordance with the Entity Concept when installed according to Control Drawing CI450-12. Nonincendive for Class I, Division 2, Groups A, B, C, and D; indoor and outdoor Hazardous Locations in accordance with the NIFW Concept when installed according to Control Drawing CI450-13. Temperature Class T4 at an ambient of 60°C

FM Approved for:

BEKA associates Limited
Hitchin, United Kingdom

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

CSA-C22.2 No 157	1992
CSA C22.2 No. 1010.1	1992
CSA C22.2 No. 25	2004
CSA C22.2 No. 213-	2004
CSA C22.2 No. 94.02	2007
CSA C22.2 E60079-11	2002
CSA C22.2 60079-0	2007
CSA C22.2 60529	2005

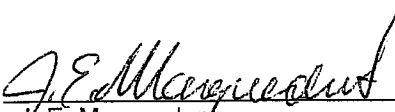
Original Project ID: 3033262C

Approval Granted: *August 28, 2009*

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
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FM Approvals LLC



J. E. Marquedant
Group Manager, Electrical

28 August 2009

Date

SUB-MASTER

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

Notes:

1. The associated intrinsically safe barriers and galvanic isolators must be FM approved and the manufacturers' installation drawings shall be followed when installing this equipment.
 For installations in Canada the associated intrinsically safe barriers and galvanic isolators must be cFM or CSA approved and the manufacturers' installation drawings shall be followed when installing the equipment.
2. The unclassified location equipment connected to the associated intrinsically safe Zener barriers or galvanic isolators shall 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. Installations in Canada shall be in accordance with the Canadian Electrical Code C22.1
4. One single channel or one channel of a dual channel associated intrinsically safe barrier or galvanic isolator with entity parameters complying with the following requirements:

Uo or Vt	equal to or less than	Ui
Io or It	equal to or less than	Ii
Lo	equal to or greater than	Lcable + Li
Co	equal to or greater than	Ccable + Ci

5. All shunt Zener diode safety barriers and diode return barriers must be of like polarity.
6. The electrical circuit and the interconnecting cables in the hazardous (classified) location must be cable of withstanding an ac test voltage of 500Vrms to ground or frame of the apparatus for one minute.
7. Hazardous (classified) location equipment may be simple apparatus as defined in the National Electrical Code or the Canadian Electrical Code e.g. mechanically activated switches OR FM Approved equipment with entity parameters complying with following requirements:

Uo or Vt	equal to or less than	Ui
Io or It	equal to or less than	Ii
Lo	equal to or greater than	Lcable + Li
Co	equal to or greater than	Ccable + Ci

Iss.	Date	Modification	Ckd.	Appd.
1	26.03 2008	First release		

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 Hitchin England
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Title FM Approvals Control Drawing for intrinsically safe BA454D & BA458C Batch Controller	Drawn RC	Checked 	Scale NTS
Drawing No. Sheet 3		CI450-12	

SUB-MASTER

6. When installed in a hazardous (classified) location the BA454D Batch Controller 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	<p>Crouse - Hinds Myler hubs SSTG-1 STG-1 STAG-1 MHUB-1</p> <p>O-Z / Gedfrey hub CHMG-50DT</p> <p>REMKE hub WH-1-G</p> <p>Killark Glands CMCXAA050 MCR050 MCX050</p>

7. In addition to the supplied bonding plate, when 2 or 3 metallic glands or conduit hubs are fitted to a BA454D Batch Controller, all metallic glands or conduit hubs must be connected together and grounded.
8. CAUTION: The BA454D and BA458C Batch Controller enclosures are 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.
9. Input connections shall only be made to terminals 11 and 12 (INPUT 1), or to terminals 13, 14, 15, 16 and 17 (INPUT 2). These inputs shall not be used at the same time.

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Iss.	Date	Modification	Ckd.	Appd.
1	04 2008	First release		

Title FM Approvals Control Drawing for nonincendive BA454D & BA458C Batch Controller	Drawn RC	Checked 	Scale NTS
		Drawing No. Sheet 3	CI450-13