

Member of the FM Global Group

FM Approvals
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# **CERTIFICATE OF COMPLIANCE**

## HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

## BA484DFabc Field Mounted Fieldbus Display

IS /1, II, III / 1 / ABCDEFG / T4 Ta =  $60^{\circ}$ C - Cl480-17; Entity; FISCO; Type 4X, IP66 1 / 0 / AEx ia IIC T4 Ta =  $60^{\circ}$ C - Cl480-17; Entity; FISCO; Type 4X, IP66 NI / I / 2 / ABCD / T4 Ta =  $60^{\circ}$ C - Cl480-18; NIFW; FNICO; Type 4X, IP66 S/ II, III / 2 / EFG / T4 Ta =  $60^{\circ}$ C - Cl480-18; NIFW; Type 4X, IP66 I / 2 / IIC / T4 Ta =  $60^{\circ}$ C - Cl480-18; NIFW; FNICO; Type 4X, IP66

## Intrinsic Safety Parameters

Input Parameters

Terminals	Concept	Ui (V)	li (mA)	Pi (W)	Ci (nF)	Li (μH)
1 & 2	FISCO	17.5	380	5.32	1	8
S1 to S7	Entity	0	0	0	540	300
A1 & A2; A3 & A4; A5 & A6; A7 & A8; A9 & A10;	Entity	28	200	0.84	40	20 ,
A11 & A12						

**Output Parameters** 

Terminals	Concept	Uo (V)	lo (mA)	Po (W)	Co (nF)	Lo
						(μH)
1 & 2	FISCO	0	0	0	-	-
S1 to S7	Entity	14.7	146.7	0.58	80	1100
A1 & A2; A3 & A4; A5 &	Entity	1.49	0.0001	0.003	_	-
A6; A7 & A8; A9 & A10;						
A11 & A12						

## Nonincendive Field Wiring Parameters

Input Parameters

Terminals	Concept	Ui (V)	li (mA)	Pi (W)	Ci (nF)	Li (μH)
1 & 2	FNICO	17.5	-	-	1	8
1 & 2	NIFW	32		_	1	8



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Terminals	Concept	Ui (V)	li (mA)	Pi (W)	Ci (nF)	Li (μH)
A1 & A2; A3 & A4; A5 &	NIFW	32	_	-	40	20
A6; A7 & A8; A9 & A10;						
A11 & A12	j					

**Output Parameters** 

Terminals	Concept	Uo (V)	lo (mA)	Po (W)	Co (nF)	Lo
						(μH)
S1 to S7	NIFW	14.7	146.7	-	80	1100

a =

Fieldbus or Profibus

b =

Blank or alarm options

c =

Parameter not affecting safety.

#### Special conditions of use

The BA484DF shall be protected from direct exposure to sunlight.

## BA488CFabc Panel Mounted Fieldbus Display

IS / I / 1 / ABCD / T4 Ta =  $60^{\circ}$ C - Cl480-17; Entity; FISCO; Type 4X\*, IP66\* I / 0 / AEx ia IIC T4 Ta =  $60^{\circ}$ C - Cl480-17; Entity; FISCO; Type 4X\*, IP66\* NI / I / 2 / ABCD / T4 Ta =  $60^{\circ}$ C - Cl480-18; NIFW; FNICO; Type 4X\*, IP66\* I / 2 / IIC / T4 Ta =  $60^{\circ}$ C - Cl480-18; NIFW; FNICO Type 4X\*, IP66\*

\*front panel only

Intrinsic Safety Parameters

Input Parameters

Terminals	Concept	Ui (V)	li (mA)	Pi (W)	Ci (nF)	Li (μH)
1 & 2	FISCO	17.5	380	5.32	1	8
S1 to S7	Entity	0	0	0	540	300
A1 & A2; A3 & A4; A5 &	Entity	28	200	0.84	40	20
A6; A7 & A8; A9 & A10;	-					
A11 & A12						

**Output Parameters** 

Terminals	Concept	Uo (V)	lo (mA)	Po (W)	Co (nF)	Lo (μH)
1 & 2	FISCO	0	0	0	-	_
S1 to S7	Entity	14.7	146.7	0.58	80	1100
A1 & A2; A3 & A4; A5 & A6; A7 & A8; A9 & A10; A11 & A12	Entity	1.49	0.0001	0.003	-	-

## Nonincendive Field Wiring Parameters

Input Parameters

Terminals	Concept	Ui (V)	li (mA)	Pi (W)	Ci (nF)	Li (µH)
1 & 2	FNICO	17.5	-	-	1	8
1 & 2	NIFW	32	-	-	1 .	8
A1 & A2; A3 & A4; A5 &	NIFW	32	-	-	40	20
A6; A7 & A8; A9 & A10;						
A11 & A12		<u> </u>				



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**Output Parameters** 

Terminals	Concept	Uo (V)	lo (mA)	Po (W)	Co (nF)	Lo
						(μH)
S1 to S7	NIFW	14.7	146.7	-	80	1100

a = Fieldbus or Profibus

b = Blank or alarm options

c = Parameter not affecting safety.

#### Special conditions of use

- 1. To maintain the IP66 rating the BA488CF shall be installed in accordance with the mounting conditions provided on drawing numbers Cl480-17 and Cl480-18.
- 2. The BA488CF shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.
- The BA488CF shall be protected from direct exposure to sunlight.

## Equipment Ratings:

BA484DFabc Field Mounted Fieldbus Display

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 or the FISCO concept in accordance with Control Drawings Cl480-17 and Cl40-18; 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 or the FNICO concept in accordance with Control Drawings Cl480-17 and Cl40-18; 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 Cl480-17 and Cl40-18. Temperature class T4 at an ambient of 60°C. Enclosure Type 4X and IP66.

## BA488CFabc Panel Mounted Fieldbus Display

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 or the FISCO concept in accordance with Control Drawings Cl480-17 and Cl40-18; 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 or the FNICO concept in accordance with Control Drawings Cl480-17 and Cl40-18. Temperature class T4 at an ambient of 60°C. Front panel Type 4X and IP66.

## 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
NEMA 250	1991
IEC 60529	1989

Original Project ID: 3022546

Approval Granted: March 30, 2005

Subsequent Revision Reports / Date Approval Amended

Report Number

Date

Report Number

Date

050427 101217 April 29, 2005 Marh 16, 2911

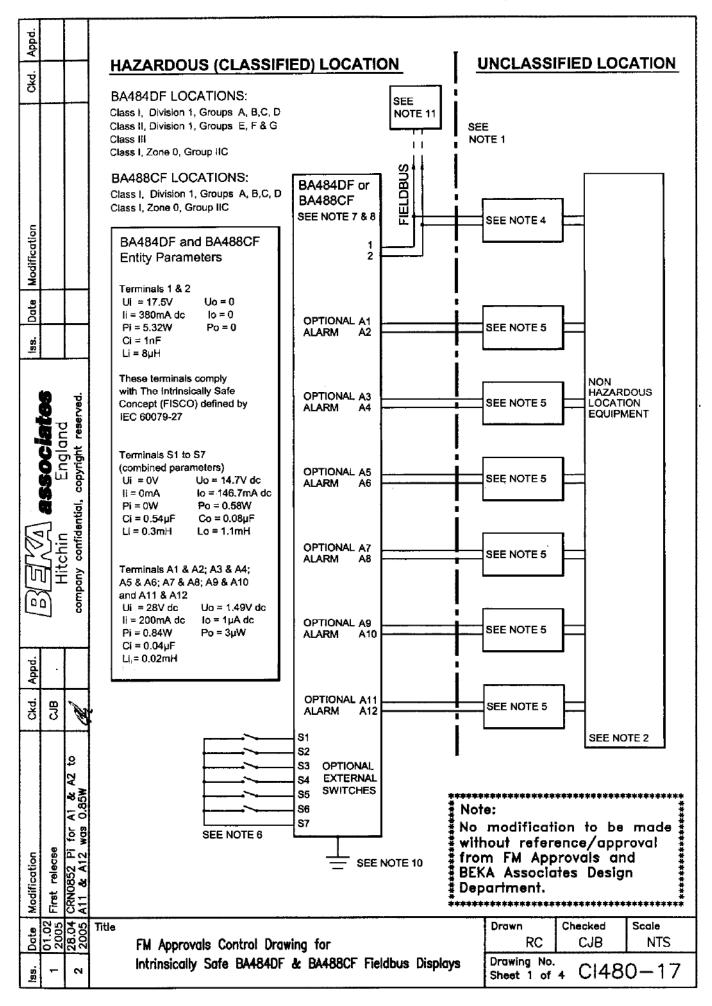
FM Approvals LLC

Timothy J Adam

Technical Team Manager

March 16, 2011

Date



Appd. Notes: The associated intrinsically safe barriers and fieldbus power supply must be FM 1. Çķģ approved and the manufacturers' installation drawings shall be followed when installing this equipment. The unclassified location equipment connected to the associated intrinsically safe 2. barriers and fieldbus power supply shall not use or generate more than 250V rms or 250V dc. Installation shall be in accordance with ANSI/ISA RP 12.06.01 "Installation of 3. Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code ANSI/NFPA 70. Modification Fieldbus power supply with FISCO compliant output (IEC6009-27) or galvanic 4. isolator with entity parameters complying with the following requirements: Ui Uo or Vt equal to or less than Date lo or It equal to or less than li equal to or less than Ρi Po Lcable + Li equal to or greater than La 8 Ca equal to or greater than Ccable + Ci One single channel or one channel of a dual channel associated intrinsically safe barrier or galvanic isolator with entity parameters complying with the following copyright reserved. requirements: England Ui Uo or Vt equal to or less than lo or It equal to or less than li Ро equal to or less than Ρi equal to or greater than Lcable + Li La equal to or greater than Ccable + Ci Ca confidential, Hazardous (classified) location equipment may be simple apparatus e.g. 6 mechanically activated switches OR FM approved equipment with entity parameters complying with following requirements: equal to or less than Ui Uo or Vt company lo or It equal to or less than łi Ρi Рο equal to or less than ם ם equal to or greater than Lcable + Li La Ca Ccable + Ci equal to or greater than , **7**. To maintain IP66 protection between the BA488CF and the mounting panel: Appd. Four panel mounting clips should be used Minimum panel thickness should be 2mm (0.08inches) Steel çá 믕 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 sheet Each panel mounting clip should be tightened to between: 20 and 22cNm (1.77 to 1.95 inLb) See release Modification **CRN0852** cont: First 28.04 Title Checked Drawn Scale Date FM Approvals Control Drawing for RC CJB NTS Intrinsically Safe BA4840F & BA488CF Fieldbus Displays Drawing No. CI480-17 Sheet 2 of 4

When installed in a hazardous (classified) location the BA484DF Fieldbus Display shall be fitted with cable glands / conduit hubs selected from the following table Metallic glands and hubs must be grounded - see note 9. Permitted gland or conduit hub Class Any metallic or plastic cable gland or conduit hub that provides Class I the required environmental protection. Modification Class II and III Crouse - Hinds Myler hubs SSTG-1 STG-1 STAG-1 MHUB-1 O-Z / Gedrey Hubs Date CHMG-50DT **REMKE** hub 33. WH-1-G Killark Glands CMCXAA050 MCR050 MCX050 In addition to the supplied bonding plate, when 2 or 3 metallic glands or conduit hubs are fitted to a BA484DF Fieldbus Display, all metallic glands or conduit hubs must be connected together and grounded. 10. CAUTION: The BA484DF and BA488CF Fieldbus Display enclosures are manufactured from conductive plastic per Article 250 of the National Electrical company confidential, Code the enclosures shall be grounded using the 'E' terminal on the terminal 11. The terminator on the Fieldbus must be FM Approved. 12. The BA484DF should be mounted where it is shielded from direct sunlight. DΩ Cont. Appd. Çkd 3

	Drawn	Checked	Scale
FM Approvals Control Drawing for	RC	CJB	NTS
Intrinsically Safe BA484DF & BA488CF Fieldbus Displays	Drawing No. Sheet 3 of	4 Cl48	0-17

sheet

CRN0852 First

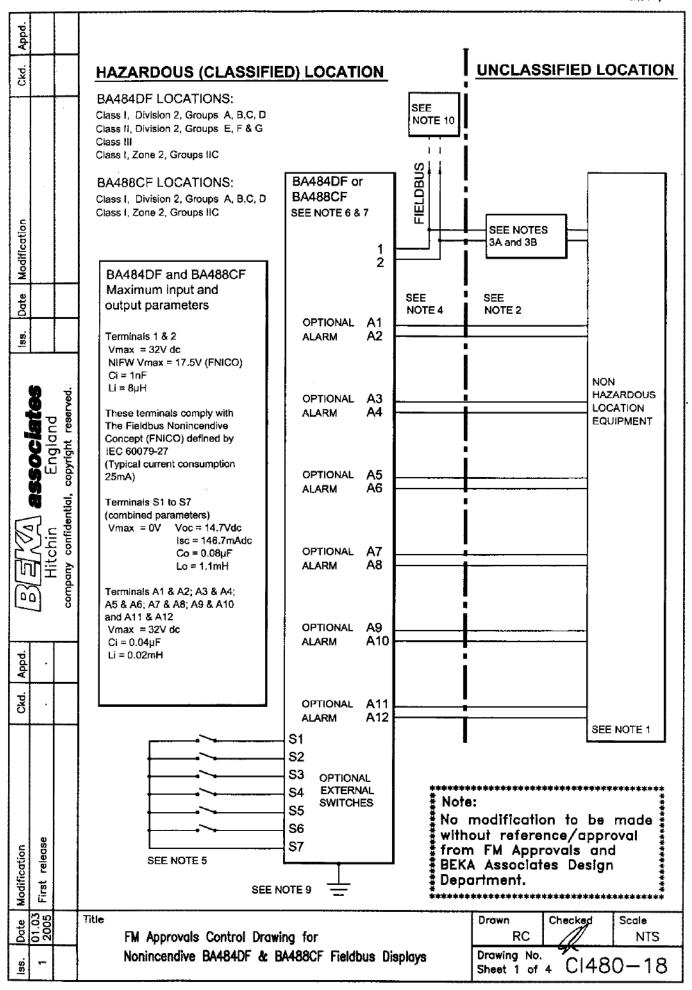
Title

28.04 28.04 2005

release

Modification

FISCO Rules  The FISCO Concept allows the interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criterion for such interconnection is that the voltage (Vmax), the current ((max) and the power (Pmax) which intrinsically safe apparatus say which intrinsically safe apparatus (supply unit), in addition the maximum unprotected residual capacitance (Ci) and inductance (Li) of each apparatus (other than terminators) connected to the Fieldbus must be least than or equal to far and 10H respective. The allowed to provide the necessary power for the Fieldbus surple to supply the bus cable has to be passive, meaning that the apparatus is not allowed to provide energy to the system, except a leakage current of 50½ for each connected device. Separately powered equipment neces galvanic isolation to ensure the intrinsically safety Fieldbus cricuit remains passive.  The cable used to interconnected to the suc sable has to be passive, meaning that the apparatus is not allowed to provide energy to the system, except a leakage current of 50½ for each connected device. Separately powered equipment neces galvanic isolation to ensure the intrinsically safety Fieldbus circuit remains passive.  The cable used to interconnect the devices eneeds to comply with the following parameters: Loop resistance Pt: 15150 Ω/Rm Inductance per unit length 10.24Indi/Rm  Capacitance per unit length 10.24Indi/Rm  The cable used to interconnect the devices eneeds to comply with the following parameters:  The cable used to interconnect t	<del>-</del> i				
FISCO Rules  The FISCO Concept allows the interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criterion for such interconnection is that the voltage (Vinx), the current (imax) and the power (Po) max) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (Uo, Voc or VI), the current (in, isc or it) and the power (Po) which can be provided by the associated apparatus (only until), and difficult in the maximum unprotected residual capacitance (Ci) and inductance (Li) of each apparatus (other than terminators) connected to the Fieldbus surpside the research or equal to fire and 10ul respectively. In each I.S. Fieldbus segment only one active source, normally the associated apparatus, is allowed to provide the necessary power for the Fieldbus system. The allowed voltage (Uo, Voc or VI) of the associated apparatus used to supply the bus cable must be limited to the range 14V/dc to 24V/dc. All other equipment connected to the bus cable has to be passive, meaning that the apparatus is not allowed to provide energy to the system, except a leakage current of 50µA for each connected device. Separately powered equipment needs galvanic isolation to ensure the intrinsically safety Fieldbus circuit remains passive.  The cable used to interconnect the devices needs to comply with the following parameters: Loop resistance R: 15150µkm Inductance per unit length C: 80200nF/km  C = C line/line+0.5 C line/screen, if both lines are floating or C = C line/line + C line/screen, if the screen is connected to one line.  Length of spuice max = 1m  Terminators  At the end of each trunk cable an FM Approved line terminator with the following parameters is suitable:  R = 90100Ω  C = 022µF  System evaluation  This number of passive devices like transmitters, actuators, connected to a single bus segment is not limited due to I.S. reasons. Furthermore, if the above rules ar	Арре				
The FISCO Concept allows the interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criterion for such interconnection is that the voltage (Vmx), the current (Imax) and the power (Pmax) which intrinsically safe apparatus can receive and remain intrinsically safe, considering fautus, must be equal to greater than the voltage (Uo, Voc or Vt), the current (Io. Isc or it) and the power (Po) which can be provided by the associated apparatus (subject with an examination of the provided provided paperatus (subject with an examination of the power (Po) which can be provided by the associated apparatus (subject with a didition the maximum unprotected residual capacitance (Ci) and inductance (I.I) of each apparatus (other than terminators) connected to the Eleidobus maximum unprotected residual capacitance (Ci) and inductance (II) of each apparatus (other than terminators) connected to the Eleidobus surface (Io) and inductance (III) of each apparatus (other than terminators) connected device. Separately one active source, normally the associated apparatus, is allowed to provide the necessary power for the Fieldobus system. The allowed voltage (IO) voc or VI) of the associated apparatus used to supply the bus cable must be limited to the range 14Vdc to 24Vdc. All other equipment connected to supply the bus cable has to be passive, meaning that the apparatus is not allowed to provide an engage to the system, and apparatus is not allowed to provide an engage to supply the bus cable has to be passive, meaning that the apparatus is not allowed to provide an engage to supply the bus cable has to be passive, meaning that the apparatus is not allowed to provide an engage to supply the bus cable has to be passive, meaning that the apparatus is not allowed to provide an engage to supply the bus cable must be limited to the range 14Vdc to 24Vdc. All other experiments and the cable in the supply apparatus is not allowed to provide an engage to apparatus.  The cable	CKd.				
apparatus not specifically examined in such combination. The criterion for such interconnection is that the voltage (Un, Noc or VI), the current (Inc.) and the power (Pmax) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (Uo, Voc or VI), the current (Inc.) so or II), and the power (Po) which can be apparatus to the associated apparatus (supply unit). In addition the maximum unprotected residual capacitance (Ci) and inductance (II) of each apparatus (other than terminators) connected to the Fieldbus must be less than or equal to 5ñ and 10uH respectively. In each I.S. Fieldbus segment only one active source, normally the associated apparatus, is allowed to provide the necessary power for the Fieldbus system. The allowed voltage (Uo, Voc or VI) of the associated apparatus used to supply the bus cable has to be passive, meaning that the apparatus is not allowed to provide energy to the system, except a leakage current of 50µA for each connected device. Separately powered equipment needs galvanic isolation to ensure the intrinsically safety Fieldbus circuit remains passive.  The cable used to interconnect the devices needs to comply with the following parameters: Loop resistance R: 15 1560½m Inductance per unit length L':0.41mH/km  Capacitance per unit length C: 80200nF/km  C' = C' line/line+0.5C' line/screen, if the screen is connected to one line. Length of spur cable: max. 30m  Length of spur cable: max. 30m  Length of spur cable: max. 31m  Terminators  At the end of each trunk cable an FM Approved line terminator with the following parameters is suitable:  R= 901001  System evaluation  The number of passive devices like transmitters, actuators, connected to a single bus segment is not limited due to 1.5. reasons. Furthermore, if the above rules are respected, the inductance and the capacitance of the cable need not be considered and will not impair the Intrinsically Safe devices with FISCO parameters not s		FISCO Rules			
VI) of the associated apparatus used to supply the bus cable must be limited to the range 14Vdc to 24Vdc. All other equipment connected to the bus cable has to be passive, meaning that the apparatus is not allowed to provide energy to the system, except a leakage current of 50μA for each connected device. Separately powered equipment needs galvanic isolation to ensure the intrinsically safety Fieldbus circuit remains passive.  The cable used to interconnect the devices needs to comply with the following parameters:  Loop resistance R*: 15150 Ω/km Inductance per unit length C*: 80200nF/km C' = C' line/line + C'line/screen, if both lines are floating or C' = C' line/line + C'line/screen, if the screen is connected to one line.  Length of spur cable: max. 30m Length of spur cable: max. 1km Length of possible trunk cable an FM Approved line terminator with the following parameters is suitable:  R= 90100Ω C = 02.2μF  System evaluation The number of passive devices like transmitters, actuators, connected to a single bus segment is not limited due to 1.S. reasons. Furthermore, if the above rules are respected, the inductance and the capacitance of the cable need not be considered and will not impair the intrinsic safety of the installation.  Notes.  1. The intrinsic safety FISCO parameters not specifically examined in combination as a system when:  Uo or Voc or Vt ≤ Vmax, lo, isc or it ≤ Imax, Po ≤ Pi.**  The proving No	Modification	apparatus not specifically examined in such combination. The crithat the voltage (Vmax), the current (Imax) and the power (Pmax apparatus can receive and remain intrinsically safe, considering than the voltage (Uo, Voc or Vt), the current (Io, Isc or it) and the provided by the associated apparatus (supply unit). In addition the capacitance (Ci) and inductance (Li) of each apparatus (other the Fieldbus must be less than or equal to 5nF and 10uH respectivel In each I.S. Fieldbus segment only one active source, normally the	terion for such ) which intrins aults, must be power (Po) whe maximum uhan terminators y. he associated	n interconne ically safe e equal or gr rhich can be improtected c) connected apparatus,	ction is eater residual I to the
1	Date	Vt) of the associated apparatus used to supply the bus cable mu	st be limited to	the range	14Vdc
each connected device. Separately powered equipment needs galvanic isolation to ensure the intrinsically safety Fledbus circuit remains passive.  The cable used to interconnect the devices needs to comply with the following parameters:  Loop resistance R*: 15150Ω/km  Inductance per unit length C*: 80200nF/km  C* = C* line/line+0.5 C* line/screen, if both lines are floating or C* = C* line/line+0.5 C* line/screen, if the screen is connected to one line.  Length of spur cable: max. 30m  Length of spur cable: max. 30m  Length of spur cable: max. 1km  Length of spuice: max = 1m  Terminators  At the end of each trunk cable an FM Approved line terminator with the following parameters is suitable:  R = 90100Ω  C = 022µF  System evaluation  The number of passive devices like transmitters, actuators, connected to a single bus segment is not limited due to 1.5. reasons. Furthermore, if the above rules are respected, the inductance and the capacitance of the cable need not be considered and will not impair the intrinsic safety of the installation.  Notes.  1. The intrinsic safety FISCO concept allows the interconnection of FM Approved Intrinsically Safe devices with FISCO parameters not specifically examined in combination as a system when:  Uo or Voc or Vt ≤ Vmax, Io, Isc or It ≤ Imax, Po ≤ Pi.*  PM Approvals Control Drawing for Intrinsically Safe BA4840F & BA4880F Fieldbus Displays  Prowing No. OLARO 1.77		apparatus is not allowed to provide energy to the system, except	a leakage cur	rrent of 50µ/	A for
The number of passive devices like transmitters, actuators, connected to a single bus segment is not limited due to I.S. reasons. Furthermore, if the above rules are respected, the inductance and the capacitance of the cable need not be considered and will not impair the intrinsic safety of the installation.  Notes.  1. The intrinsic safety FISCO concept allows the interconnection of FM Approved Intrinsically Safe devices with FISCO parameters not specifically examined in combination as a system when:  Uo or Voc or Vt ≤ Vmax, Io, Isc or It ≤ Imax, Po ≤ Pi."  Prown Checked Scale NTS  FM Approvals Control Drawing for Intrinsically Safe BA4840F & BA488CF Fieldbus Displays Drawing No. CLARO 1.77	Chin Engla confidential, copyright	intrinsically safety Fieldbus circuit remains passive. The cable used to interconnect the devices needs to comply with Loop resistance R': 15150 $\Omega$ /km Inductance per unit length L':0.41mH/km Capacitance per unit length C': 80200nF/km C' = C' line/line+0.5 C' line/screen, if both lines are floating or C' = C' line/line + C'line/screen, if the screen is connected to one Length of spur cable: max. 30m Length of trunk cable: max. 1km Length of splice: max = 1m Terminators At the end of each trunk cable an FM Approved line terminator we suitable: R= 90100 $\Omega$	the following	parameters	: .
1. The intrinsic safety FISCO concept allows the interconnection of FM Approved Intrinsically Safe devices with FISCO parameters not specifically examined in combination as a system when:  Uo or Voc or Vt ≤ Vmax, Io, Isc or It ≤ Imax, Po ≤ Pi."    1. The intrinsic safety FISCO concept allows the interconnection of FM Approved Intrinsically Safe BA484DF & BA488CF Fieldbus Displays    1. The intrinsically Safe BA484DF & BA488CF Fieldbus Displays   Drawn   Checked   Scale   RC   CJB   NTS		The number of passive devices like transmitters, actuators, conn not limited due to I.S. reasons. Furthermore, if the above rules a the capacitance of the cable need not be considered and will not	re respected, t	the inductar	ice and
Intrinsically Safe BA484DF & BA488CF Fieldbus Displays Drawing No. 01400 17	g 8	<ol> <li>The intrinsic safety FISCO concept allows the interconnect Safe devices with FISCO parameters not specifically examined in</li> </ol>			
Intrinsically Safe BA484DF & BA488CF Fieldbus Displays Drawing No. 01400 17	Date 01.02 2005 28.04 2005		<b>1</b>		1
		·· ·		4 CI48	0-17



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Appd.			Notes	<ol> <li>The unclassified location equipment connected to the associated nonincendive field wiring apparatus must not use or generate more than 250V rms or 250V dc.</li> </ol>				•		
Ckd.				<ol> <li>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.</li> </ol>				for		
uc			3A. Linear power supply A linear fieldbus power supply shall be: FM Approved Associated Nonincendive Field Wiring Apparatus installed in the unclassified location with parameters complying with the following requirements: OR				ents:			
Modification	FM Approved Nonincendive Field Wiring Apparatus installed in the classi location with parameters complying with the following requirements:					1				
					Voc La Ca	equal to or less than equal to or greater the equal to or greater the		Vmax Lcable + Ccable +		
lss. Date			3B. FNICO non-linear power supply A FNICO non-linear fieldbus power supply shall be: FM Approved Associated Nonincendive Field Wiring Apparatus installed in the unclassified location complying with the following table:		he					
	<b>associates</b> England ial, copyright reserved.					lonincendive Field Wirining with the following ta		s installed in	the classified	i
					Voc V 14 15	Maximum current for Groups AB [IIC] mA 274 199 154	M	Maximum curr Groups CD [I mA 570 531 432		
8		confidential,			17 17.5	121 112		360 319		
	i			4.	Apparatus connected to the optional alarm contacts shall be FM Approved as Associated Nonincendive Field Wiring Apparatus and shall comply with the following requirements:					
(0)		company			Voc La Ca	equal to or less than equal to or greater t equal to or greater t	han	Vmax Lcable + Ccable +		
Appd.		5. Terminals S1 to S7 shall be connected to simple apparatus or voit free contacts of FM Approved Nonincendive Field Wiring Apparatus or FM Approved Associated Nonincendive Field Wiring Apparatus installed using Division 2 wiring methods.								
Ckd.				6.		otection between the Ba		d the mounti	ng panel:	
					•	thickness should be	2mm (0.	08inches) St 12inches) Ali		
	:				build-up around					
					Panel cut-out si		(2.60 x 5	36.0mm -0.0 5.35 inches –		
ation	release					cut-out should be debu unting clip should be tween:		ean 22cNm (1.77	to 1.95 inLb)	Y
Modification	First								Cont.	
	01.03 2005		Title F	M Appr	ovals Control Drawin	ng for		Drawn RC	Checked	Scale NTS
lss.	-		•			488CF Fieldbus Displa	ys	Drawing No. Sheet 2 of	4 CI48	0-18
	<u>.                                    </u>		E.							

Appd.									
Ckd.							dbus Display wing table.		
					Class	Permitted gland or d	onduit hub		] .
Modification					Class I	Any metallic or plastic cable gland or the required environmental protection		hat provides	
					Class II and III	Crouse Hinds Myler hubs SSTG-1 STG-1 STAG-1 MHUB-1			
s. Date						O-Z / Gedrey hub CHMG-50DT			
BS.						REMKE hub WH-1-G			
	<b>lates</b> Ind reserved.					Killark Glands CMCXAA050 MCR050 MCX050	0		
	Engle copyright		<ol> <li>In addition to the supplied bonding plate, when 2 or 3 metallic glands or conduit hubs are fitted to a BA484DF Fieldbus Display, all metallic glands or conduit hubs must be connected together and grounded.</li> </ol>						
1/2/1	BAZIMA MILChin			9.	<b>CAUTION:</b> The BA484DF and BA488CF Fieldbus Display 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.				
ď	0	сош		10.	The terminator o	n the Fieldbus must be FM Approved.			
, ģ				11.	The BA484DF sl	hould be mounted where it is shielded to	from direct su	nlight.	
Ckd. Appd.							C	Cont.	
٥									
Modification	First release						•		
	01.03 2005			FM App	rovals Control Dr	rawing for	Drawn RC	Checked	Scale NTS
153.				Nonincendive BA484DF & I		k BA488CF Fieldbus Displays	Drawing No. Sheet 3 of		0-18



Appd.								
Ckd.	FNICO Rules							
Modification	The FNICO Concept allows the interconnection of intrinsically apparatus not specifically examined in such combination. The that the voltage (Vmax), the current (Imax) and the power (Pmapparatus can receive and remain intrinsically safe, considering than the voltage (Uo, Voc or Vt), the current (Io, Isc or It) and a provided by the associated apparatus (supply unit). In addition capacitance (Ci) and inductance (Li) of each apparatus (other Fieldbus must be less than or equal to 5nF and 20uH respection each I.S. Fieldbus segment only one active source, normalicallowed to provide the necessary power for the Fieldbus system Vt) of the associated apparatus used to supply the bus cable in to 17.5Vdc. All other equipment connected to the bus cable has	criterion for such interconnection is nax) which intrinsically safe and faults, must be equal or greater the power (Po) which can be a the maximum unprotected residual than terminators) connected to the vely.  By the associated apparatus, is a sm. The allowed voltage (Uo, Voc or must be limited to the range 14Vdc						
Date	apparatus is not allowed to provide energy to the system, except a leakage current of 50µA for each connected device. Separately powered equipment needs galvanic isolation to ensure the intrinsically safety Fieldbus circuit remains passive.							
- 88°.	vith the following parameters:							
BENT ASSOCI	Capacitance per unit length C': $80200$ nF/km C' = C' line/line+0.5 C' line/screen, if both lines are floating or C' = C' line/line + C'line/screen, if the screen is connected to or Length of spur cable: max. $30$ m Length of trunk cable: max. $1$ km Length of splice: max = $1$ m Terminators  At the end of each trunk cable an FM Approved line terminator suitable: $R = 90100\Omega$ $C = 02.2\mu$ F  System evaluation  The number of passive devices like transmitters, actuators, co not limited due to nonincendive reasons. Furthermore, if the a inductance and the capacitance of the cable need not be consintrinsic safety of the installation.	r with the following parameters is  onnected to a single bus segment is bove rules are respected, the						
Appd.	Notes.							
Modification Ckd.	The intrinsic safety FNICO concept allows the interconned devices with FNICO parameters not specifically examined in current Uo or Voc or Vt ≤ Vmax"							
Date 01.03 2005	Title FM Approvals Control Drawing for	Drawn Checked Scale RC NTS						
lss.	Nonincendive BA484DF & BA488CF Fieldbus Displays	Drawing No. Sheet 4 of 4 C1480-18						