Base Load Power Hub (BLPH)

IS LOOP CALCULATION

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Document Class: 3

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Rev.	Date	Description	Prepared	Reviewed	Approved

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Revision / Change Log

Rev.	Description
00	ISSUE FOR INFORMATION (IFI)

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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GENERAL NOTES

1) ACCORDING TO THE IEC 60079-14 (16.2.4) THE IS CALCULATION HAS BEEN VERIFIED TAKE IN ACCOUNT INDIVIDUALLY THE MAXIMUM PERMISSIBLE CAPACITANCE AND INDUCTANCE INSTEAD OF L/R RATIO THAT CAN BE USED OPTIONALLY.

2) ACCORDING TO IEC 60079-14 1% RULE HAS BEEN VERIFIED.
WHERE BOTH THE TOTAL INDUCTANCE AND CAPACITANCE OF ALL CONNECTED APPARATUS EXCLUDING THE CABLE IS GREATER THAN 1 % OF LO AND CO OF THE SOURCE OF POWER RESPECTIVELY, THEN THE ACCEPTABLE VALUES FOR LO AND CO SHALL BE HALVED AND THE ALLOWABLE CABLE INDUCTANCE AND CAPACITANCE ADJUSTED ACCORDINGLY.

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SMOKE DETECTOR - ICSS System				
Field Device	MFR	ZETTLER	Project Doc. Ref:	1724000821-IN-DS-00004
Interconnecting Cable	MFR	FLEI	Project Doc. Ref:	1724001170-IN-DS-00003
Safety Barrier	MFR	PEPPERL+FUCKS	Project Doc. Ref:	1724000594-IN-LIS-00036



Field Device	
Field Device Type	ZETTLER MR60TEx
Approved Certificate	ATEX
Rating	II 1G Ex-ia IIC T5
Max Allowed Voltage - V_i	28 [Vdc]
Max Allowed Current - Ii	93 [mA]
Max Allowed Power - Pi	650 [mW]
Resistance - R3	30 [ohm]
Inducatance - L3	0 [mH]
Capacitance - C3	0 [nF]

Single Pair Cable		
Manufacturer	FLEI	
Code		
Composition	1X2x0,75+ Sh	
Insulation Voltage	150/250 [V]	
Resistance - R	26	[Ω/Km]
Inducatance - L	0,9	[mH/Km]
Capacitance - C	150	[nF/Km]
L/R Ratio	Not Required	[mH/Ω]

Multi Pair Cable		
Manufacturer	N/A	
Code	N/A	
Composition	N/A	
Insulation Voltage		
Resistance - R		[Ω/Km]
Inducatance - L		[mH/Km]
Capacitance - C		[nF/Km]
L/R Ratio	Not Required	[mH/Ω]
Category Type	D	

Safety Barrier (Galvanic Type)	
Limiting Device Type	Hic2025
Approved Certificate	CESI 06 ATEX 017
Rating	II 1GD Ex-ia IIC
Max Output Voltage - V_0	25,2 [V]
Max Short Circuit - I_0	100 [mA]
Max Allowed Power - P_0	630 [mW]
Max Allowed Inductance - L_0	3,5 [mH]
Max Allowed Capacitance - C_0	100 [nF]
Max Allowed L/R Ratio	Not Required [µH/ohm]

Device TAG		Cable Length Check																Entity Matching		
		Single Pair Cable Length	Single Pair TOT Resist.	Single Pair TOT Induct.	Single Pair TOT Capacit.	Multi Pairs Cable Length	Multi Pairs TOT Resist.	Multi Pairs TOT Induct.	Multi Pairs TOT Capacit.	TOTAL Resist. R2	TOTAL Inductance L2	TOTAL Capacit. C2	TOTAL L2/R2 Ratio	Length Check $L_0 \geq L2+L3$	Length Check $C_0 \geq C2+C3$	Length Check $L_0/R_0 \geq L2/R2$	L3<1%L0 & C3<1%C0	L2+L3<L_0/2 & C2+C3<C_0/2	Voltage $V_0 \leq V_i$	Current $I_0 \leq I_i$	Power $P_0 \leq P_i$
1	950-SDZ-04201	40 [m]	1,04 [Ω]	0,036 [mH]	6 [nF]	0 [m]	0 [Ω]	0 [mH]	0 [nF]	1,04 [Ω]	0,036 [mH]	6,036 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required	PASSED	PASSED	PASSED	NOTE 1	PASSED
2	950-SDZ-04202	40 [m]	1,04 [Ω]	0,036 [mH]	6 [nF]	0 [m]	0 [Ω]	0 [mH]	0 [nF]	1,04 [Ω]	0,036 [mH]	6,036 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
3	950-SDZ-04203	28 [m]	0,728 [Ω]	0,0252 [mH]	4,2 [nF]	0 [m]	0 [Ω]	0 [mH]	0 [nF]	0,728 [Ω]	0,0252 [mH]	4,2252 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
4	950-SDZ-04204	18 [m]	0,468 [Ω]	0,0162 [mH]	2,7 [nF]	0 [m]	0 [Ω]	0 [mH]	0 [nF]	0,468 [Ω]	0,0162 [mH]	2,7162 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
5	950-SDZ-04205	12 [m]	0,312 [Ω]	0,0108 [mH]	1,8 [nF]	0 [m]	0 [Ω]	0 [mH]	0 [nF]	0,312 [Ω]	0,0108 [mH]	1,8108 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
6	950-SDZ-04206	15 [m]	0,39 [Ω]	0,0135 [mH]	2,25 [nF]	0 [m]	0 [Ω]	0 [mH]	0 [nF]	0,39 [Ω]	0,0135 [mH]	2,2635 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
7																				
8																				
9																				
10																				

(1) DESPITE MAX SHORT CIRCUIT CURRENT OF SAFETY BARRIER (Io=100 mA) IS GREATER THAN MAX ALLOWED CURRENT OF FIELD DEVICE (Ii=93 mA), THE VERIFICATION IS PASSED DUE TO THE RESISTOR 1100 ohm WHICH IS LIMITING THE CURRENT TO MAX 22.9 mA (@25,2V)

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ROSETTI MARINO

Rev. 00

Project: HOLLANDSE KUST NOORD WIND PARK Project

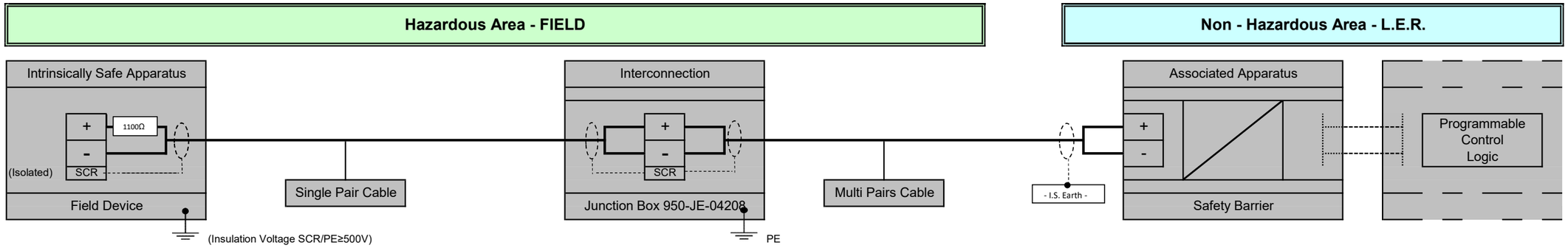
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IS LOOP CALCULATION

SMOKE DETECTOR - ICSS System

Size	Scale	Drn	Chk	App
		S.P.	M.G.	M.D.
Drawing No.			Sh.	of
123A90-DDL-IN-CA-40117			5	37

SMOKE DETECTOR - ICSS System				
Field Device	MFR	ZETTLER	Project Doc. Ref:	1724000821-IN-DS-00004
Interconnecting Cable	MFR	FLEI	Project Doc. Ref:	1724001170-IN-DS-00003
Safety Barrier	MFR	PEPPERL+FUCKS	Project Doc. Ref:	1724000594-IN-LIS-00036



Field Device	
Field Device Type	ZETTLER MR60TEx
Approved Certificate	ATEX
Rating	II 1G Ex-ia IIC T5
Max Allowed Voltage - V_i	28 [V]
Max Allowed Current - Ii	93 [mA]
Max Allowed Power - Pi	650 [mW]
Resistance - R3	30 [ohm]
Inducatance - L3	0 [mH]
Capacitance - C3	0 [nF]

Single Pair Cable		
Manufacturer	FLEI	
Code		
Composition	1X2x0,75+ Sh	
Insulation Voltage	150/250 [V]	
Resistance - R	26	[Ω/Km]
Inducatance - L	0,9	[mH/Km]
Capacitance - C	150	[nF/Km]
L/R Ratio	Not Required	[mH/Ω]

Multi Pair Cable		
Manufacturer	FLEI	
Code		
Composition	6 x2x0,75 + Sh	
Insulation Voltage	150/250 [V]	
Resistance - R	26	[Ω/Km]
Inducatance - L	0,9	[mH/Km]
Capacitance - C	150	[nF/Km]
L/R Ratio	Not Required	[mH/Ω]
Category Type	D	

Safety Barrier (Galvanic Type)	
Limiting Device Type	Hic2025
Approved Certificate	CESI 06 ATEX 017
Rating	II 1GD Ex-ia IIC
Max Output Voltage - V_0	25,2 [V]
Max Short Circuit - I_0	100 [mA]
Max Allowed Power - P_0	630 [mW]
Max Allowed Inductance - L_0	3,5 [mH]
Max Allowed Capacitance - C_0	100 [nF]
Max Allowed L/R Ratio	Not Required [µH/ohm]

Device TAG		Cable Length Check																Entity Matching		
		Single Pair Cable Length	Single Pair TOT Resist.	Single Pair TOT Induct.	Single Pair TOT Capacit.	Multi Pairs Cable Length	Multi Pairs TOT Resist.	Multi Pairs TOT Induct.	Multi Pairs TOT Capacit.	TOTAL Resist. R2	TOTAL Inductance L2	TOTAL Capacit. C2	TOTAL L2/R2 Ratio	Length Check $L_0 \geq L2+L3$	Length Check $C_0 \geq C2+C3$	Length Check $L_0/R_0 \geq L2/R2$	L3<1%L0 & C3<1%C0	L2+L3<L_0/2 & C2+C3<C_0/2	Voltage $V_0 \leq V_i$	Current $I_0 \leq I_i$	Power $P_0 \leq P_i$
1	950-SDZ-04207	30 [m]	0,78 [Ω]	0,027 [mH]	4,5 [nF]	41 [m]	1,066 [Ω]	0,0369 [mH]	6,15 [nF]	1,846 [Ω]	0,0639 [mH]	10,7139 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required	PASSED	PASSED	PASSED	NOTE 1	PASSED
2	950-SDZ-04208	30 [m]	0,78 [Ω]	0,027 [mH]	4,5 [nF]	41 [m]	1,066 [Ω]	0,0369 [mH]	6,15 [nF]	1,846 [Ω]	0,0639 [mH]	10,7139 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
3	950-SDZ-04209	30 [m]	0,78 [Ω]	0,027 [mH]	4,5 [nF]	41 [m]	1,066 [Ω]	0,0369 [mH]	6,15 [nF]	1,846 [Ω]	0,0639 [mH]	10,7139 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
4	950-SDZ-04210	9 [m]	0,234 [Ω]	0,0081 [mH]	1,35 [nF]	41 [m]	1,066 [Ω]	0,0369 [mH]	6,15 [nF]	1,3 [Ω]	0,045 [mH]	7,545 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
5	950-SDZ-04211	14 [m]	0,364 [Ω]	0,0126 [mH]	2,1 [nF]	41 [m]	1,066 [Ω]	0,0369 [mH]	6,15 [nF]	1,43 [Ω]	0,0495 [mH]	8,2995 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
6	950-SDZ-04212	18 [m]	0,468 [Ω]	0,0162 [mH]	2,7 [nF]	41 [m]	1,066 [Ω]	0,0369 [mH]	6,15 [nF]	1,534 [Ω]	0,0531 [mH]	8,9031 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
7																				
8																				
9																				
10																				

(1) DESPITE MAX SHORT CIRCUIT CURRENT OF SAFETY BARRIER (Io=100 mA) IS GREATER THAN MAX ALLOWED CURRENT OF FIELD DEVICE (Ii=93 mA), THE VERIFICATION IS PASSED DUE TO THE RESISTOR 1100 ohm WHICH IS LIMITING THE CURRENT TO MAX 22.9 mA (@25,2V)

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Project: HOLLANDSE KUST NOORD WIND PARK Project

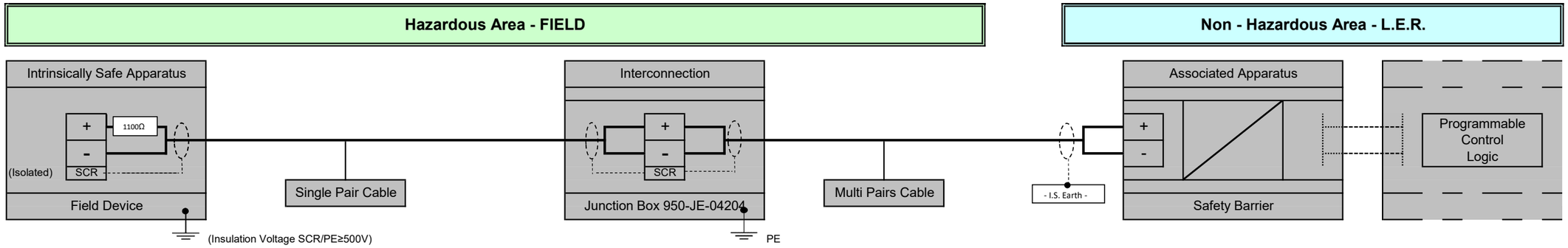
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IS LOOP CALCULATION

SMOKE DETECTOR - ICSS System

Size	Scale	Drn	Chk	App
		S.P.	M.G.	M.D.
Drawing No.			Sh.	of
123A90-DDL-IN-CA-40117			6	37

SMOKE DETECTOR - ICSS System				
Field Device	MFR	ZETTLER	Project Doc. Ref:	1724000821-IN-DS-00004
Interconnecting Cable	MFR	FLEI	Project Doc. Ref:	1724001170-IN-DS-00003
Safety Barrier	MFR	PEPPERL+FUCKS	Project Doc. Ref:	1724000594-IN-LIS-00036



Field Device	
Field Device Type	ZETTLER MR60TEx
Approved Certificate	ATEX
Rating	II 1G Ex-ia IIC T5
Max Allowed Voltage - V_i	28 [V]
Max Allowed Current - Ii	93 [mA]
Max Allowed Power - Pi	650 [mW]
Resistance - R3	30 [ohm]
Inducatance - L3	0 [mH]
Capacitance - C3	0 [nF]

Single Pair Cable		
Manufacturer	FLEI	
Code		
Composition	1X2x0,75+ Sh	
Insulation Voltage	150/250 [V]	
Resistance - R	26	[Ω/Km]
Inducatance - L	0,9	[mH/Km]
Capacitance - C	150	[nF/Km]
L/R Ratio	Not Required	[mH/Ω]

Multi Pair Cable		
Manufacturer	FLEI	
Code		
Composition	6 x2x0,75 + Sh	
Insulation Voltage	150/250 [V]	
Resistance - R	26	[Ω/Km]
Inducatance - L	0,9	[mH/Km]
Capacitance - C	150	[nF/Km]
L/R Ratio	Not Required	[mH/Ω]
Category Type	D	

Safety Barrier (Galvanic Type)	
Limiting Device Type	Hic2025
Approved Certificate	CESI 06 ATEX 017
Rating	II 1GD Ex-ia IIC
Max Output Voltage - V_0	25,2 [V]
Max Short Circuit - I_0	100 [mA]
Max Allowed Power - P_0	630 [mW]
Max Allowed Inductance - L_0	3,5 [mH]
Max Allowed Capacitance - C_0	100 [nF]
Max Allowed L/R Ratio	Not Required [µH/ohm]

Device TAG		Cable Length Check																Entity Matching		
		Single Pair Cable Length	Single Pair TOT Resist.	Single Pair TOT Induct.	Single Pair TOT Capacit.	Multi Pairs Cable Length	Multi Pairs TOT Resist.	Multi Pairs TOT Induct.	Multi Pairs TOT Capacit.	TOTAL Resist. R2	TOTAL Inductance L2	TOTAL Capacit. C2	TOTAL L2/R2 Ratio	Length Check $L_0 \geq L2+L3$	Length Check $C_0 \geq C2+C3$	Length Check $L_0/R_0 \geq L2/R2$	L3<1%L0 & C3<1%C0	L2+L3<L_0/2 & C2+C3<C_0/2	Voltage $V_0 \leq V_i$	Current $I_0 \leq I_i$	Power $P_0 \leq P_i$
1	950-SDZ-04213	25 [m]	0,65 [Ω]	0,0225 [mH]	3,75 [nF]	36 [m]	0,936 [Ω]	0,0324 [mH]	5,4 [nF]	1,586 [Ω]	0,0549 [mH]	9,2049 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required	PASSED	PASSED	PASSED	NOTE 1	PASSED
2	950-SDZ-04214	25 [m]	0,65 [Ω]	0,0225 [mH]	3,75 [nF]	36 [m]	0,936 [Ω]	0,0324 [mH]	5,4 [nF]	1,586 [Ω]	0,0549 [mH]	9,2049 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
3	950-SDZ-04215	25 [m]	0,65 [Ω]	0,0225 [mH]	3,75 [nF]	36 [m]	0,936 [Ω]	0,0324 [mH]	5,4 [nF]	1,586 [Ω]	0,0549 [mH]	9,2049 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
4	950-SDZ-04216	9 [m]	0,234 [Ω]	0,0081 [mH]	1,35 [nF]	36 [m]	0,936 [Ω]	0,0324 [mH]	5,4 [nF]	1,17 [Ω]	0,0405 [mH]	6,7905 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
5	950-SDZ-04217	14 [m]	0,364 [Ω]	0,0126 [mH]	2,1 [nF]	36 [m]	0,936 [Ω]	0,0324 [mH]	5,4 [nF]	1,3 [Ω]	0,045 [mH]	7,545 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
6	950-SDZ-04218	18 [m]	0,468 [Ω]	0,0162 [mH]	2,7 [nF]	36 [m]	0,936 [Ω]	0,0324 [mH]	5,4 [nF]	1,404 [Ω]	0,0486 [mH]	8,1486 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
7																				
8																				
9																				
10																				

(1) DESPITE MAX SHORT CIRCUIT CURRENT OF SAFETY BARRIER (Io=100 mA) IS GREATER THAN MAX ALLOWED CURRENT OF FIELD DEVICE (Ii=93 mA), THE VERIFICATION IS PASSED DUE TO THE RESISTOR 1100 ohm WHICH IS LIMITING THE CURRENT TO MAX 22.9 mA (@25,2V)

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Rev. 00

Project: HOLLANDSE KUST NOORD WIND PARK Project

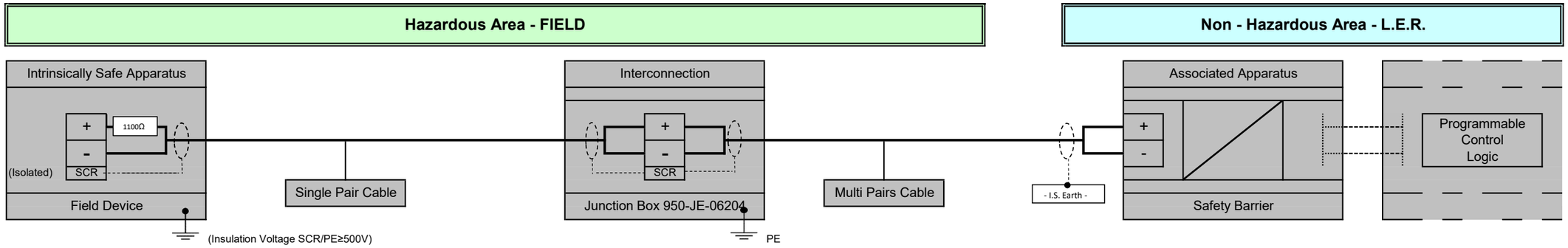
Title: Tyra Redevelopment Project

IS LOOP CALCULATION

SMOKE DETECTOR - ICSS System

Size	Scale	Drn	Chk	App
		S.P.	M.G.	M.D.
Drawing No.			Sh.	of
123A90-DDL-IN-CA-40117			7	37

SMOKE DETECTOR - ICSS System				
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Safety Barrier	MFR	PEPPERL+FUCKS	Project Doc. Ref:	1724000594-IN-LIS-00036



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Resistance - R3	30 [ohm]
Inducatance - L3	0 [mH]
Capacitance - C3	0 [nF]

Single Pair Cable			Multi Pair Cable		
Manufacturer	FLEI		Manufacturer	FLEI	
Code			Code		
Composition	1X2x0,75+ Sh		Composition	6 x2x0,75 + Sh	
Insulation Voltage	150/250 [V]		Insulation Voltage	150/250 [V]	
Resistance - R	26	[Ω/Km]	Resistance - R	26	[Ω/Km]
Inducatance - L	0,9	[mH/Km]	Inducatance - L	0,9	[mH/Km]
Capacitance - C	150	[nF/Km]	Capacitance - C	150	[nF/Km]
L/R Ratio	Not Required	[mH/Ω]	L/R Ratio	Not Required	[mH/Ω]
			Category Type	D	

Safety Barrier (Galvanic Type)	
Limiting Device Type	Hic2025
Approved Certificate	CESI 06 ATEX 017
Rating	II 1GD Ex-ia IIC
Max Output Voltage - V_0	25,2 [V]
Max Short Circuit - I_0	100 [mA]
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Max Allowed Inductance - L_0	3,5 [mH]
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Max Allowed L/R Ratio	Not Required [µH/ohm]

Device TAG		Cable Length Check																Entity Matching		
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1	950-SDZ-06201	35 [m]	0,91 [Ω]	0,0315 [mH]	5,25 [nF]	80 [m]	2,08 [Ω]	0,072 [mH]	12 [nF]	2,99 [Ω]	0,1035 [mH]	17,3535 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required	PASSED	PASSED	PASSED	NOTE 1	PASSED
2	950-SDZ-06202	35 [m]	0,91 [Ω]	0,0315 [mH]	5,25 [nF]	80 [m]	2,08 [Ω]	0,072 [mH]	12 [nF]	2,99 [Ω]	0,1035 [mH]	17,3535 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
3	950-SDZ-06203	35 [m]	0,91 [Ω]	0,0315 [mH]	5,25 [nF]	80 [m]	2,08 [Ω]	0,072 [mH]	12 [nF]	2,99 [Ω]	0,1035 [mH]	17,3535 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
4	950-SDZ-06204	18 [m]	0,468 [Ω]	0,0162 [mH]	2,7 [nF]	80 [m]	2,08 [Ω]	0,072 [mH]	12 [nF]	2,548 [Ω]	0,0882 [mH]	14,7882 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
5	950-SDZ-06205	13 [m]	0,338 [Ω]	0,0117 [mH]	1,95 [nF]	80 [m]	2,08 [Ω]	0,072 [mH]	12 [nF]	2,418 [Ω]	0,0837 [mH]	14,0337 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
6	950-SDZ-06206	9 [m]	0,234 [Ω]	0,0081 [mH]	1,35 [nF]	80 [m]	2,08 [Ω]	0,072 [mH]	12 [nF]	2,314 [Ω]	0,0801 [mH]	13,4301 [nF]	Not Required [µH/Ω]	PASSED	PASSED	Not Required		PASSED	PASSED	NOTE 1	PASSED
7																				
8																				
9																				
10																				

(1) DESPITE MAX SHORT CIRCUIT CURRENT OF SAFETY BARRIER (Io=100 mA) IS GREATER THAN MAX ALLOWED CURRENT OF FIELD DEVICE (Ii=93 mA), THE VERIFICATION IS PASSED DUE TO THE RESISTOR 1100 ohm WHICH IS LIMITING THE CURRENT TO MAX 22.9 mA (@25,2V)

CROSSWIND

ROSETTI MARINO

Rev. 00

Project: HOLLANDSE KUST NOORD WIND PARK Project

Title: Tyra Redevelopment Project

IS LOOP CALCULATION

SMOKE DETECTOR - ICSS System

Size	Scale	Drn	Chk	App
		S.P.	M.G.	M.D.
Drawing No.			Sh.	of
123A90-DDL-IN-CA-40117			8	37

ATTACHMENTS

This document undergoes an issuance cycle within EDMS "Fusionlive".
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ZETTLER MX

M600Ex Intrinsically Safe Fire Detectors

ZETTLER

M600Ex Fire Detection Range

Our sophisticated Ex system for use in hazardous atmospheres, introduces to the market a range of conventional I.S. fire detectors. In addition to the unobtrusive size and styled shape a number of design features have been incorporated including single visit to the ceiling installation and a service and maintenance detector park position.



Features

- Intelligent Universal Smoke/Heat/CO detector
- Low profile, discreet and unobtrusive
- Superior performance and reliability
- Designed for fast, easy installation
- Optional locking kit
- May be used in systems that meet BS5839 Pt 1
- Integral and remote alarm LED
- Certified to ATEX: Ex II 1GD and Cenelec: Ex ia IIC T5/ Ex iaD 20 T100°C
- Complies to EN54-7 for Smoke Detectors and EN54-5 for Heat Detectors

General

Included within the range is the High Performance Optical Smoke (HPO) Detector and a combined Carbon Monoxide and Heat Detector. The complete range has been designed to meet the requirements of BS (British Standards) and EN (European Standards) for fire detectors. The detectors also carry the new CE mark.

M600Ex Series Conventional Detectors

The M600Ex Series provides the detector part of an automatic fire detection system, as defined in BS5839 Pt1:2002. The M600Ex Series Conventional or two state detector is one that provides two output states to the controller, either 'normal' or a 'fire alarm' condition.

The detectors along with callpoints are grouped into zones, with each zone being connected to the control panel, by a two wire circuit. Each zone having a separate zone indicator at the control panel. Safety barriers are used to maintain the intrinsically safe status of the circuit under all conditions.

Application

As each type of fire detector responds to a particular 'fire product' the relative speed of response of the detector is therefore dependent upon the type of fire being detected. The range of M600Ex detectors have been designed to provide the earliest possible warning of a fire condition, with a minimum possibility of false/unwanted alarms.

As smoke is normally present at an early stage in most fires, smoke type detectors are therefore considered the most useful. When considering the type of smoke detector for the application, the probable type of fuel for the fire should be considered. For general fire detection, where there is an equal possibility of either a 'fast' or 'slow' fire developing, the intelligent high performance optical detector provides an excellent detection response.

In situations where the installation of smoke detectors would cause an unacceptable level of false alarms (i.e. kitchens, laundry areas) heat detectors may be installed. The M600Ex series provides a selection of heat detectors, from Rate of Rise to fixed temperature, because of the wide variety of applications that fire detectors are expected to cover, it is recommended that reference to BS5839 Pt1:2002 is made to aid selection.

High Performance Optical Smoke Detector MR601TEx



These detectors react to the whole range of fire products from slow smouldering fires, producing visible particles to open flaming fires producing large numbers of very hot smaller sized aerosols. It combines optical and heat detector technology to detect clear burning fire products which hitherto could only be easily detected by ion-chamber detectors.

For normal ambient conditions, the high performance optical detector behaves as a normal optical detector. Only when a rapid rise in temperature is detected does the sensitivity of the detector increase and the presence of smoke will confirm a fire condition which will be transmitted as an alarm level.

Heat Detector MD601Ex and MD611Ex



These detectors use two networked thermistors in a bridge configuration to provide a fast response, that depends both on absolute temperature and rate of rise of temperature.

The rate of rise/fixed temperature heat detectors can be used in areas where smoke sensors are unsuitable due to environmental conditions (smoke, dust etc.). Such areas include kitchens, locker rooms, canteens, garages, loading bays etc.

Enhanced Carbon Monoxide Fire and Heat Detector MDU601Ex



The MDU601Ex detector is a combined CO and Rate-of-Rise Heat detector where the sensitivity of the CO detector is enhanced in response to a fast rate of change of temperature.

Maybe used in dusty environments instead of the MR601TEx Detector

Technical Specifications

Mechanical

Detector Material:	FR110 "Bayblend" fire resistant
Dimensions:	See diagram below
Weight:	0.2 Kg detector and base (approx)
Colour:	White

Environmental

Operating Temp. Range:	-20°C to +70°C
	-10°C to +55°C (MDU601Ex only)
Storage Temp :	-25°C to +80°C
	-20°C to +55°C (MDU601Ex only)
Relative Humidity :	95% non condensing
	90% non condensing
	(MDU601Ex fonly)

Electrical

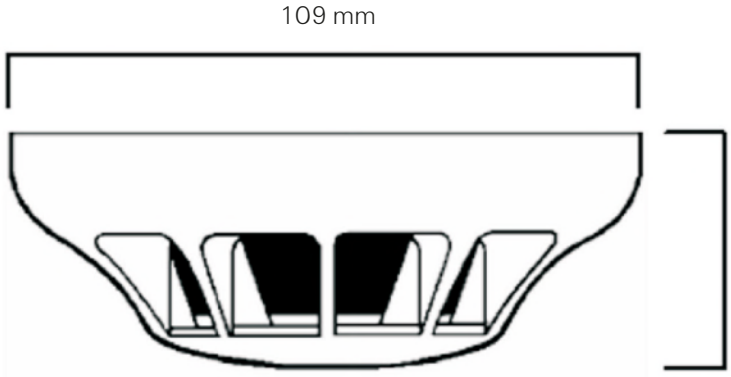
Supply Voltage:	16 to 28 vdc
Quiescent Current:	100µA typical
Alarm Current:	48 mA typical
Reset Time:	0.5 - 5 seconds
Wiring Connections:	SEM Terminal 2 x 1.5 mm^2

Electromagnetic Compatibility

ESD:	to EN50130-4
Radiated Immuntity:	to EN50130-4
Fast Transient:	to EN50130-4
Slow High Energy:	to EN50130-4
Conducted Immunity:	to EN50130-4
Emissions:	to EN61000-6-3

Approvals

These detectors have the following approvals:
LPCB Loss Prevention Certification Board VdS Verband der Sachversicherer



ZETTLER, is a leading brand of fire detection products in the European market. The ZETTLER fire detection product line includes a wide range of EN54 CPD approved fire detection products carrying approvals and cross-listings, including VdS and NF. The ZETTLER product lines are available through ZETTLER Authorised Distributors as well as many Johnson Controls offices around the world.

Tyco Fire & Security GmbH, Victor von Bruns Strasse 21, CH-8212 Neuhausen am Rheinfall, Switzerland

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Fig. 8: Conduit Junction Box
1–Fixing centre

4B-DHM deckhead mounting

The Deckhead Mounting is designed to be used in particularly damp or dirty environments. The kit is illustrated in Figure 9.

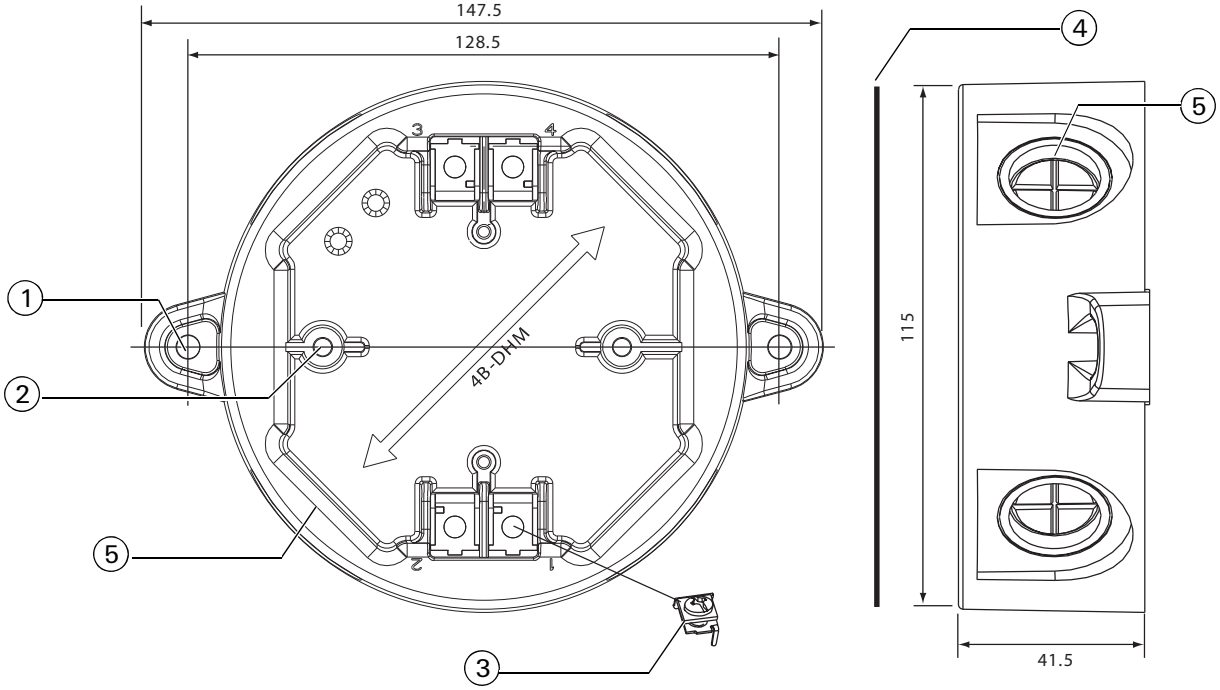


Fig. 9: 4B-DHM deckhead mounting
1–Fixing hole (x 2). 5 mm diameter
2–Detector base mounting post (x 2)
3–Base accessory terminal (only one factory fitted – more can be ordered)
4–Sealing gasket
5–Gland/conduit knockout, 4 positions. 20 or 25 mm diameter

The Deckhead Mounting Kit comprises:

- The mounting housing.
- Two self tapping posidrive pan head screws to secure the detector base.
- Sealing gasket.

4B-DHM Technical specification

- Weight: 200 g
- Material
  - Body: glass filled P.B.T.
  - Base Accessory Terminal: annealed spring steel
  - Base Accessory Terminal Screw: stainless steel
- Environmental

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- Storage Temperature: -30 °C to +75 °C
- Operating Temperature: -25 °C to +70 °C
- Relative Humidity: up to 95 % RH (non-condensing)

To install the 4B-DHM

1 Note that the item numbers in this procedure refer to Figure 9. Remove gland/conduit knockouts (Item 5) as appropriate. For the larger 25 mm diameter, a hole cutter is required.

2 Note the alignment required for detector Status Indicator LED visibility.

An arrow is embossed in the bottom of the 4B-DHM. Mount the 4B-DHM so this arrow is aligned in the direction required for visual inspection of the detector Status Indicator LED.

3 Choose a mounting position that that is flat in the area contacting the housing.

To mount using welding, now jump to the section "4B-DHM Installation – welded" on page 7. Otherwise carry on at the next step.

4 Fix the 4B-DHM to the surface by screwing through the fixing holes – item 1 in Figure 9.

For the screws, use two No. 8 x 1" countersunk zinc plated and passivated steel screws, for example.

5 Remove the backing from the sealing gasket (Item 4 in Figure 9). Carefully stick the gasket to the front surface of the 4B-DHM. Fit the gasket round the rim, so that it will form a seal with the detector base.

6 Fit the LED Apperture Plug to the base – see the section "LED aperture plug" on page 3.

7 Secure the base to the 4B-DHM using the supplied two 4.2 x 25mm self tapping posidrive pan head screws.

4B-DHM Installation – welded

You will have jumped here from Step 3 in the procedure "To install the 4B-DHM" on page 7.

The 4B-DHM can be fixed to metal surfaces using welding. Two screws are inserted into the back of the 4B-DHM. These screws are then welded to the surface.

To fix the 4B-DHM using welding

1 Position the 4B-DHM so the flat base (that contacts the mounting surface) is towards you. This position corresponds to Figure 10. The item numbers in Figure 10 are referred to in this procedure.

2 Using pliers, nibble away the thin knockout section in the circular wall (Item 4).

3 Cover the knockouts and surrounding area with high temperature masking tape. This provides protection from weld spatter. Clear the tape from over the knockouts with a knife.

4 Insert screws (not supplied) into the holes (Item 1) . Use 6.3 x 25mm (No. 14 x 1") self tapping screws.

5 Using a double sided adhesive pad (Item 2), or tape, fix the 4B-DHM to the surface.

6 Weld the screw heads to the surface. Use Mig/ Tig welding for approximately 1.5 seconds per weld. For access, use the knockouts you removed previously.

7 Remove the masking tape and clean away any deposits.

8 Jump back to Step 5 in the procedure "To install the 4B-DHM".

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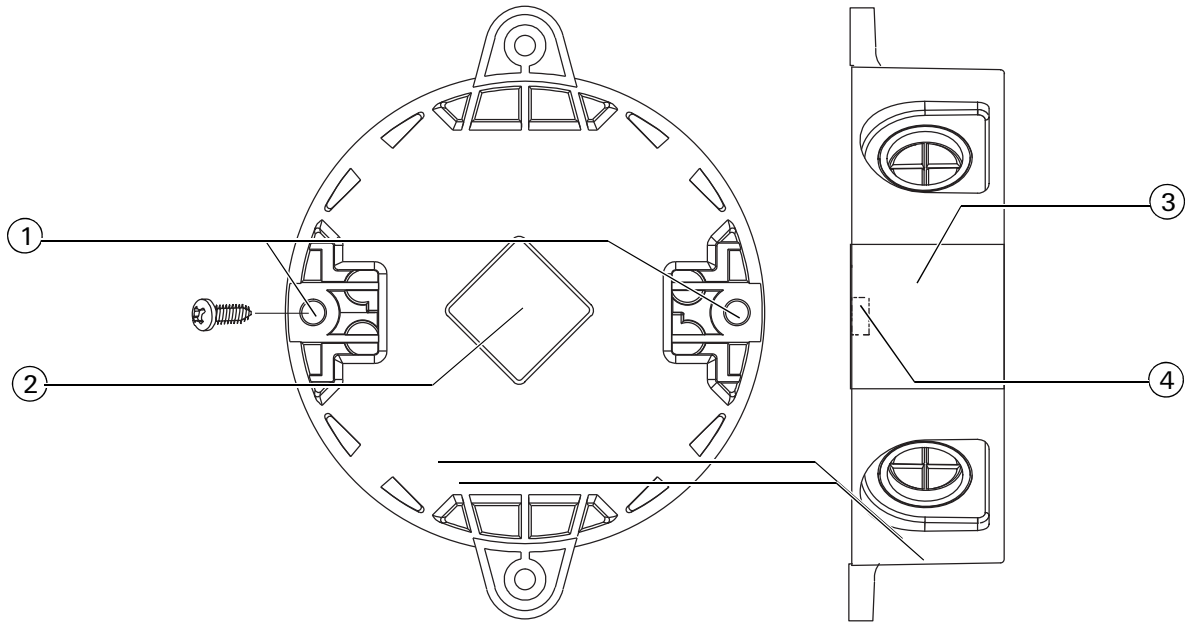


Fig. 10: 4B-DHM welding option
1–Screw holes
2–Double sided adhesive pad or tape
3–masking tape
4–Knockout

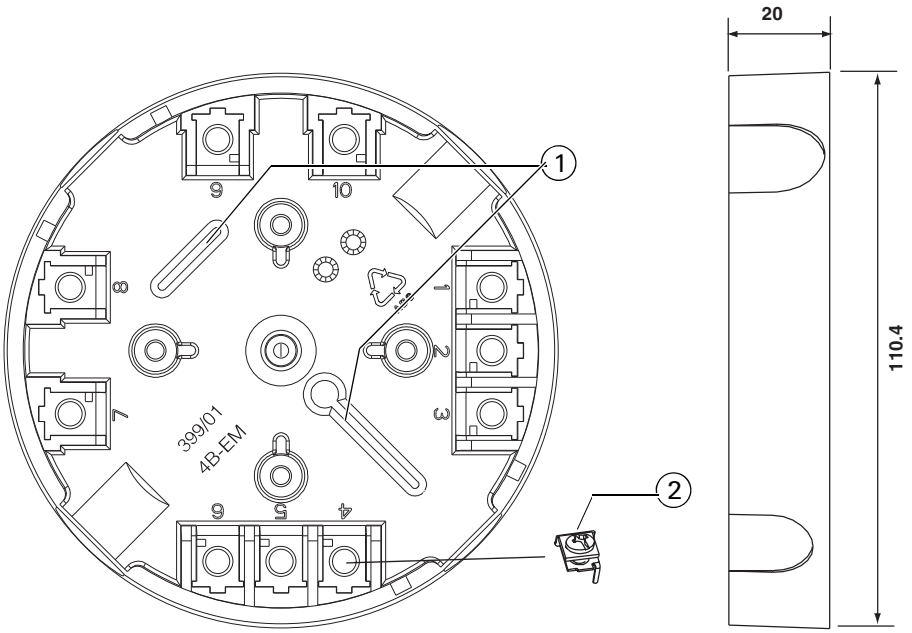


Fig. 11: 4B-EM Euro mounting box
1–Mounting slots
2–Base accessory terminal (only one factory fitted – more can be ordered)

4B-EM european mounting box

The European Mounting Box is shown in Figure 11).

This is intended for use in EC countries using 18 mm and 21 mm cable breakouts.

The housing is secured with two No. 8 x 1 inch countersunk zinc plated and passivated steel screws (or equivalent).

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1 # EU - TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU**

3 EU - Type Examination Certificate Number: **BAS01ATEX1134X – Issue 10**

3.1 In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.

4 Product: **M600Ex Series Fire Detectors**

5 Manufacturer: **Thorn Security Limited, T/A Tyco Safety Products**

6 Address: **Security House, The Summit, Hanworth Road, Sunbury-on-Thames, Middlesex, TW16 5DB United Kingdom**

7 This re-issued certificate extends EC Type Examination Certificate No. **BAS01ATEX1134X** to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

8 SGS Fimko Oy, Notified Body number 0598, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

8.1 The original certificate was issued by The Electrical Equipment Certification Service (UK Notified Body 0600). It, and any supplements previously issued by SGS Baseefa Ltd (UK Notified Body 1180) have been transferred to the supervision of SGS Fimko Oy (EU Notified Body 0598). The original certificate number is retained.

The examination and test results are recorded in confidential Report No. **See Certificate History**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 **EN 60079-11:2012**

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following:

Ex II 1GD Ex ia IIC T5 Ga Ex ia IIIB T_{200}100°C Da

SGS Fimko Oy Customer Reference No. **1747** Project File No. **23/0103**

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Tuomas Hänninen
SGS Fimko Oy

13 # Schedule

14 **Certificate Number BAS01ATEX1134X – Issue 10**

15 Description of Product

The M600Ex Series Fire Detectors comprises four models, each with a plastic enclosure containing a partially encapsulated main printed circuit board on which is mounted a sensor which varies according to the model type.

All models of the apparatus mount on either an MUB Ex or 5BEx universal base unit which provides the power and signalling external connections via screw terminals. The following models make up the M600Ex series of detectors: -

i) MR601TEx High Performance Optical Smoke Detector
ii) MD601Ex Heat Detector
iii) MD611Ex Heat Detector (single thermistor)
iv) MDU601Ex Heat and Carbon Monoxide Detector

All models of the M600Ex Series Fire Detectors have the following input parameters: -

U_i	=	28V	C_i	=	0
I_i	=	93mA	L_i	=	0
P_i	=	0.65W			

The above parameters must be derived from a linear supply (Resistive Source).

16 Report Number

See Certificate History

17 Specific Conditions of Use

1. The apparatus has a plastic enclosure which constitutes a potential electrostatic hazard. The enclosure must be cleaned only with a damp cloth and do not mount in a high velocity dust laden atmosphere.

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product:

Clause	Subject	Compliance
1.2.7	LVD type requirements	Manufacturer responsibility
1.2.8	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
1.4.1	External effects	User/Installer responsibility
1.4.2	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

New drawings submitted for this issue of certificate:

Number	Sheet	Issue	Date	Description
Models MD601Ex & MD611Ex				
CL516-052-041.Y	1 of 1	5	21-02-24	MD611Ex Heat Detector
CL516-052-051.Y	1 of 1	5	21-02-24	MD601Ex Heat Detector

Number	Sheet	Issue	Date	Description
Model MR601TEx				
CL 516-054-011.Y	1 of 2	6	21-02-24	Component List for MR601TEx High Performance Optical Detector
CL 516-054-011.Y	2 of 2	6	21-02-24	Component List for MR601TEx High Performance Optical Detector
Model MDU601Ex				
CL 516-061-001.Y	1 of 2	5	21-02-24	Component List for MDU601Ex CO + Heat Detector
CL 516-061-001.Y	2 of 2	5	21-02-24	Component List for MDU601Ex CO + Heat Detector

Current drawings which remain unaffected by this issue:

Number	Sheet	Issue	Date	Description
120.036.784	1 of 2	5	24-01-22	Cover Screened MX600Ex Series
EECS 120-036-784	1 of 1	4	08-06-15	Cover Screened MX600Ex Series
120-036-784	1 of 1	4	08-06-15	Cover Screened MX600Ex Series
EECS 120-028-212	1 of 1	3	23-04-15	Base Screened MUB Ex Series (Certified)
517-050-023	1 of 1	2	30-04-15	5BEx 5” Universal Base Ex/Exn Series
120-028-215	1 of 1	2	30-04-15	5” Base Screened Ex/Exn Series (Certified)
Model MR601TEx				
EECS 125.585.803	1 of 1	2	24-09-01	MR601T Ex Circuit Diagram (Certified)
EECS 125.585.803	2 of 2	3	24-09-01	MR601T Ex Sensor PCB Assembly (Certified)
125-165-391	1 of 7	2	25-07-01	Drilling detail for MR601T Ex PCB
125-165-391	2 of 7	2	20-8-01	Track Layer (Top Side) for MR601T Ex Sensor PCB
125-165-391	3 of 7	2	20-8-01	Inner Layer (Top Side) for MR601T Ex Sensor PCB
125-165-391	4 of 7	2	20-8-01	Track Layer (Bot. Side) for MR601T Ex Sensor PCB
516-054-011.Y	1 of 2	2	23-8-01	MR601TEx High Performance Optical Detector
516.054.011.Y	2 of 2	6	22-08-07	MR601TEx High Performance Optical Detector
Models MD601Ex & MD611Ex				
EECS125.585.804/807	1 of 1	2	27-07-01	MD601 Ex / MD611 Ex Circuit Diagram (Certified)
EECS125.585.804	2 of 2	2	21-08-01	MD601 Ex Sensor PCB Assembly (Certified)
EECS125.585.807	2 of 2	2	21-08-01	MD611 Ex Sensor PCB Assembly (Certified)
125-165-392	1 of 7	3	21-7-03	Drilling Detail for MD601 Ex PCB
125-165-392	2 of 7	2	20-8-01	Track Layer (Top Side) for MD601 Ex Sensor PCB
125-165-392	3 of 7	2	20-8-01	Inner Layer (Top Side) for MD601 Ex Sensor PCB
125-165-392	4 of 7	2	20-8-01	Track Layout (Bot. Side) for MD601 Ex Sensor PCB
516-052-051/041	1 of 2	2	13-7-01	MD601Ex & MD611Ex Heat Detector
516.052.051.Y	2 of 2	6	22-08-07	MD601Ex Heat Detector
516.052.041.Y	2 of 2	6	22-08-07	MD611Ex Heat Detector
Model MDU601Ex				
EECS125.585.806	1 of 1	3	04-10-07	MDU601 Ex Circuit Diagram (Certified)
EECS125.585.806	2 of 2	3	04-10-07	MDU601 Ex Sensor PCB Assembly (Certified)
125-165-390	1 of 7	3	21-7-03	Drilling Detail for MDU601 Ex PCB
125-165-390	2 of 7	2	20-8-01	Track Layer (Top Side) for MDU601 Ex Sensor PCB

Number	Sheet	Issue	Date	Description
125-165-390	3 of 7	2	20-8-01	Inner Layer (Top Side) for MDU601 Ex Sensor PCB
125-165-390	4 of 7	2	20-8-01	Track Layer (Bot. Side) for MDU601 Ex Sensor PCB
516-061-001.Y	1 of 2	4	1-07-06	MDU601Ex CO + Heat Detectors
516-061-001.Y	2 of 2	4	22-08-07	MDU601Ex CO + Heat Detector
MUB Ex Base				
EECS 517-050-610	1 of 1	1	7-2-02	MUB Ex Base Assembly (Certified)
(CL) EECS 517-050-610	1 of 1	1	27-2-02	Component List for MUB Ex Base Assembly (Certified)
5BEx 5" Universal Base				
CL 517-050-023	2 of 2	1	17-01-06	Component List for 5BEx 5" Universal Base Ex / Exn Series (Certified)
All M600Ex Series Fire Detector Models				
EECS 120-347-021	1 of 1	1	1-3-02	MX Blank Label

The above drawings are associated with BAS21UKEX0611X and IECEx BAS 07.0056X.

20 Certificate History

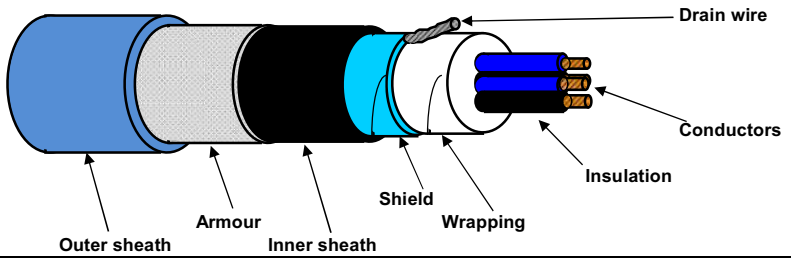
Certificate No.	Date	Comments
BAS01ATEX1134X	10 October 2001	The release of the prime certificate. The associated test and assessment is documented in Test Report no. 00(C)0997.
BAS01ATEX1134X/1	5 March 2002	This issue of the certificate is to permit the deletion of information from the base unit label and minor drawing information changes.
BAS01ATEX1134X/2	19 December 2002	This issue of the certificate is to permit a change of material used for the product identity label.
BAS01ATEX1134X/3	7 February 2006	This issue of the certificate is to permit the use of an alternative Base for the Detectors type MR601TEx, MF601Ex, MD601Ex, MD611Ex, MDU601Ex & MU601Ex. This change does not affect intrinsic safety.
BAS01ATEX1134X/4	25 April 2006	This issue of the certificate is to permit minor labelling changes that do not affect the original Intrinsic Safety assessment.
BAS01ATEX1134X/5	4 July 2006	This issue of the certificate is to permit minor labelling changes that do not affect the original Intrinsic Safety assessment.
BAS01ATEX1134X/6	29 August 2008	To confirm that the MR601TEx, MD601Ex, MD611Ex and MDU601Ex Fire Detectors have been reviewed against the requirements of EN 60079-0: 2006 and EN 60079-11: 2007 in respect of any differences from EN 50014: 1997 + Amds 1 & 2 and EN 50020: 2002 and none of the differences affect this equipment. To permit the addition of dust certification 'iaD' to the MR601TEx, MD601Ex, MD611Ex and MDU601Ex Fire Detectors in accordance with the requirements of EN 61241-0: 2006 and EN 61241-11: 2006. The apparatus is now additionally marked: - Ex iaD 20 T100°C To permit other minor drawing changes not affecting the original assessment. The associated test and assessment is documented in Test Report No: GB/BAS/ExTR07.0103/00 and GB/BAS/ExTR07.0145/00

Certificate No.	Date	Comments
BAS01ATEX1134X Issue 7	2 July 2015	This issue of the certificate incorporates the previously issued primary & supplementary certificates into one certificate and confirms the current designs have been reviewed against the requirements of EN 60079-0:2012+A11:2013 and EN 60079-11: 2012 in respect of any differences from EN 60079-0:2006 and EN 60079-11:2007and none of the differences affect this equipment. The associated test and assessment is documented in Test Report No: GB/BAS/ExTR15.0191/00. Project File is 14/0619.
BAS01ATEX1134X Issue 8	3 November 2016	At the manufacturers request the IPO of this certificate is now: Tyco Fire & Security GmbH Victor Von Bruns-Strasse 21 8212 Neuhausen am Rheinfall Schaffhausen Switzerland The Design Authority remains with: Thorn Security Limited Security House The Summit Hanworth Road Sunbury-on-Thames Middlesex TW16 5DB Other than the name and address on the marking labels (now the IPO), there are no other changes to this certificate or to the standards to which the equipment has been assessed. The associated test and assessment is documented in Test Report No: GB/BAS/ExTR16.0244/00. Project File is 16/0634
BAS01ATEX1134X Issue 9	6 June 2022	To confirm that the M600Ex Series Fire Detectors meet the requirements of EN IEC 60079-0:2018. Report No: GB/BAS/ExTR22.0097/00. Project File is 21/0316.
BAS01ATEX1134X Issue 10	20 March 2024	To permit minor product changes that do not affect the previous assessment. The associated test and assessment is documented in Test Report No: GB/SGS/ExTR23.0118/00. Project File is 23/0103.
For drawings applicable to each issue, see original of that issue.		

FLEI s.r.l.

Cu Cl.2/MGT/XLPE/OS/LSZH/SWB/LSZH 150/250 V (300 V)

1X2X0,75 - INSTRUMENT CABLE - Fire Resistant - I.S. Circuits



TECHNICAL FEATURES

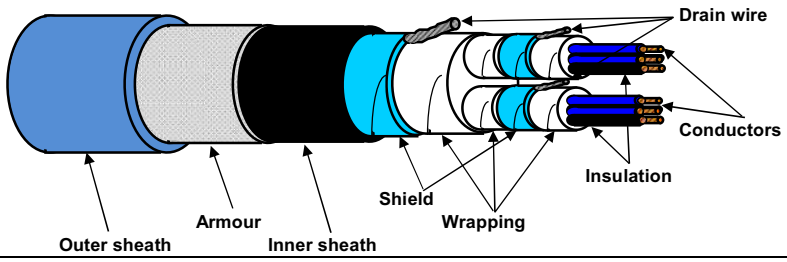
Conductors :	**7-STRANDED** plain/bare soft annealed copper wires	**IEC 60228 Class 2**
Insulation :	Mica/Glass Tape (MGT) plus XLPE, Nominal Thickness 0,5 mm	
Cores colour code :	**White - Black**	
Pair Assembling :	Not required	
Pair Wrapping:	Not required	
Drain wire :	Not required	
Pair Shield :	Not required	
Shield Insulation :	Not required	
Total Assembling :	10/1mt	
Overall Wrapping:	by polyester-PET Minimum Thickness 0,010 mm tape helically wound (overlap ≥ 25%)	
Drain wire :	7-Stranded **TINNED** annealed copper drain wire, **size 0,5 sqmm**, in continuous contact with the shield	
Overall Shield :	by Aluminium-**Al** Minimum Thickness 0,008 mm / polyester-**PET** Minimum Thickness 0,010 mm tape helically wound (overlap ≥ 25%)	
Inner sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,1 mm	
Inner sheath color code:	**Black**	
Armour :	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)	
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, moisture/abrasion/UV Resistant,	
	Average Thickness 1,2 mm	
Outer sheath color code:	**Light Blue**	
Outer printing (INKJET) :	**FLEI - 1X2X0,75 SQMM - MGT/XLPE/OS/LSZH/SWB/LSZH - 150/250 V - IEC 60331.21 -**	
(every 1000 mm)	**IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking**	
Under armour diameter :	(8,5 ± 10%) mm	
Over armour diameter :	(9,3 ± 10%) mm	
Outer diameter :	(11,7 ± 10%) mm	
Bending radius :	cable outer diameter x 10 (in fixed installation)	
Voltage Test :	1,5 kV a.c. for 5' (Between Cores) / 1,5 kV a.c. for 5' (Between Cores - Shield)	
Conductors DC Resistance :	≤ 26 Ω/km (@ 20°C)	
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)	
Mutual Capacitance :	≤ 150 nF/km	
L/R ratio :	≤ 25 µH/Ω	
Inductance :	≤ 0,9 mH/km	
Applicable Standards		
Design Guidelines :	**IEC 60092.376**	
ON COMPLETE CABLE		
Fire Resistant test :	**IEC 60331.21**	
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22	
Acid Gas generation :	IEC 60754.1/2	
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)	
Hazardous Areas :	IEC 60079.14 par.9.3.2a	
Temperature Range :		
ON INSULATION	(max +90°C) (max continuous operation temperature of conductors)	
	(max +250°C) (max conductors temperature during short-circuit for 5 seconds)	
ON COMPLETE CABLE		
During Operation :	(-20°C up to +90°C) (in fixed installation)	
During installation :	(- 5°C up to +50°C)	
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner sheath together with correct ATEX approved equipment or accessories.**	

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	06/05/2024	Messa			
Checked :	06/05/2024	Spaccasassi			
Approved :	06/05/2024	Cucinotta			

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Cu Cl.2/MGT/XLPE/IS/OS/LSZH/SWB/LSZH 150/250 V (300 V)

6X2X0,75 - INSTRUMENT CABLE - Fire Resistant - I.S. Circuits



TECHNICAL FEATURES

Conductors :	**7-STRANDED** plain/bare soft annealed copper wires **IEC 60228 Class 2**
Insulation :	Mica/Glass Tape (MGT) plus XLPE, Nominal Thickness 0,5 mm
Cores colour code :	**White - Black (each core NUMBERED for PAIR identification)**
Pair Assembling :	10/1mt
Pair Wrapping:	by polyester-PET Minimum Thickness 0,010 mm tape helically wound (overlap ≥ 25%)
Drain wire :	7-Stranded **TINNED** annealed copper drain wire, **size 0,5 sqmm**, in continuous contact with the shield
Pair Shield :	by Aluminium-**Al** Minimum Thickness 0,008 mm / polyester-**PET** Minimum Thickness 0,010 mm tape helically wound (overlap ≥ 25%)
Shield Insulation :	by polyester-PET Minimum Thickness 0,010 mm tape helically wound (overlap ≥ 25%)
Total Assembling :	3/1mt
Overall Wrapping:	by polyester-PET Minimum Thickness 0,010 mm tape helically wound (overlap ≥ 25%)
Drain wire :	7-Stranded **TINNED** annealed copper drain wire, **size 0,5 sqmm**, in continuous contact with the shield
Overall Shield :	by Aluminium-**Al** Minimum Thickness 0,008 mm / polyester-**PET** Minimum Thickness 0,010 mm tape helically wound (overlap ≥ 25%)
Inner sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,5 mm
Inner sheath color code:	**Black**
Armour :	Galvanized Steel Wire Braid Armour (coverage ≥ 90%)
Outer sheath :	Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, moisture/abrasion/UV Resistant, Average Thickness 1,7 mm
Outer sheath color code:	**Light Blue**
Outer printing (INKJET) :	**FLEI - 6X2X0,75 SQMM - MGT/XLPE/IS/OS/LSZH/SWB/LSZH - 150/250 V - IEC 60331.21 -**
(every 1000 mm)	**IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking**
Under armour diameter :	(20,6 ± 10%) mm
Over armour diameter :	(21,8 ± 10%) mm
Outer diameter :	(25,2 ± 10%) mm
Bending radius :	cable outer diameter x 10 (in fixed installation)
Voltage Test :	1,5 kV a.c. for 5' (Between Cores) / 1,5 kV a.c. for 5' (Between Cores - Shield)
Conductors DC Resistance :	≤ 26 Ω/km (@ 20°C)
Insulation Resistance :	≥ 1000 MΩ x Km (@ 20°C)
Mutual Capacitance :	≤ 150 nF/km
L/R ratio :	≤ 25 µH/Ω
Inductance :	≤ 0,9 mH/km
Applicable Standards	
Design Guidelines :	**IEC 60092.376**
ON COMPLETE CABLE	
Fire Resistant test :	**IEC 60331.21**
Flame Retardant test :	IEC 60332.1.2 - IEC 60332.3.22
Acid Gas generation :	IEC 60754.1/2
Smoke density/Light Transmittance :	IEC 61034.2 (LT ≥ 60%)
Hazardous Areas :	IEC 60079.14 par.9.3.2a
Temperature Range :	
ON INSULATION	(max +90°C) (max continuous operation temperature of conductors)
	(max +250°C) (max conductors temperature during short-circuit for 5 seconds)
ON COMPLETE CABLE	
During Operation :	(-20°C up to +90°C) (in fixed installation)
During installation :	(- 5°C up to +50°C)
Note :	**To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner sheath together with correct ATEX approved equipment or accessories.**

Office	Date	Sign	Rev.	Date	Sign
Drawn by :	06/05/2024	Messa			
Checked :	06/05/2024	Spaccasassi			
Approved :	06/05/2024	Cucinotta			

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Base Load Power Hub (BLPH)

INTEGRATED CONTROL AND SAFETY SYSTEM (ICSS)

ATEX REGISTER

Document Number: 1724000594-IN-LIS-00036

Document Class: 2

USED VALUES FOR I.S. VERIFICATION: REF. SH. 11

02	12/12/2024	Accepted for Construction (AFC)	A.Giorgetti	A.Berra	S.Corradi
01	30/08/2024	Issue for Review (IFR)	A.Giorgetti	A.Berra	S.Corradi
00	04/07/2024	Issue for Review (IFR)	A.Giorgetti	A.Berra	S.Corradi
Rev.	Date	Description	Prepared	Reviewed	Approved

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		00	01						
1	Cover	X	X	X					
2	Table of Contents	X	X	X					
3	Revision / Change Log	X	X	X					
4	ATEX Register	X	X	X					
ATT.1	Device datasheet - 321423_eng	X	X	-					
ATT.2	Type Examination Certificate - cert0909a	X	X	-					
ATT.3	EU-Declaration of conformity - DOC-4563B	X	X	-					

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Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ISSUE FOR REVIEW (IFR)
02	ACCEPTED FOR CONSTRUCTION (AFC)

HOLDS LIST

No.	Description
1.	-
2.	-
3.	-
4.	-

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No.	Revision	Tag Number	Description	Location	Manufacturer	Model Type Catalogue Number	Serial Number	ATEX Certification Marking	Reference Document	ATEX Certificate Number	Installation Zone	Notes / Comments	P.O.	Vendor	Skid / Package	Barrier Calculation Ref.	Non-Electrical Equipment	Special Conditions of safe use Applicable
1	02	BR01	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503292	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
2	02	BR02	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503507	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
3	02	BR03	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503304	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
4	02	BR04	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 3669121	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
5	02	BR05	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 3669155	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
6	02	BR06	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503312	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
7	02	BR07	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503498	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
8	02	BR08	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503425	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
9	02	BR09	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 3669137	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
10	02	BR10	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 3669167	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
11	02	BR11	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503324	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
12	02	BR12	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503518	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
13	02	BR13	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 3669159	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
14	02	BR14	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503328	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
15	02	BR15	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503336	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
16	02	BR16	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503320	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
17	02	BR17	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503546	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
18	02	BR18	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503506	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
19	02	BR19	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503344	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
20	02	BR20	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503047	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
21	02	BR21	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 3669328	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
22	02	BR22	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503421	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
23	02	BR23	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 3668858	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
24	02	BR24	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503514	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
25	02	BR25	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503316	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
26	02	BR26	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503352	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
27	02	BR27	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 3672207	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
28	02	BR28	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503511	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
29	02	BR29	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503356	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO
30	02	BR30	IS Barrier for AI	Room 400, Cabinet B400-FGS-003	Pepperl+Fuchs	HiC2025	4000017 0503340	CESI 06 ATEX 017	1724000594-IN-DA-00010 1724000594-IN-DG-00021	cert0909a	Safe Area	Interface with IS Device	1724000594 123A90A	Yokogawa	FGS	-	NO	NO

ATTACHMENT-1



SMART Transmitter Power Supply
HiC2025

- 1-channel isolated barrier
- 24 V DC supply (bus powered)
- Input for 2-wire SMART transmitters and current sources
- Output for 4 mA ... 20 mA or 1 V ... 5 V
- Low power dissipation
- Up to SIL 2 (SC 3) acc. to IEC/EN 61508

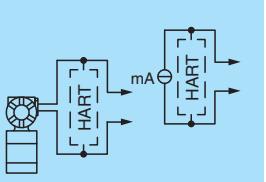
Function

This isolated barrier is used for intrinsic safety applications.
The device supplies 2-wire transmitters in the hazardous area, and can also be used with current sources.
It transfers the analog input signal to the safe area as an isolated current value.
Bi-directional communication is supported for SMART transmitters that use current modulation to transmit data and voltage modulation to receive data.
The output is selected as a current source, current sink, or voltage source via DIP switches.
This device mounts on a HiC Termination Board.

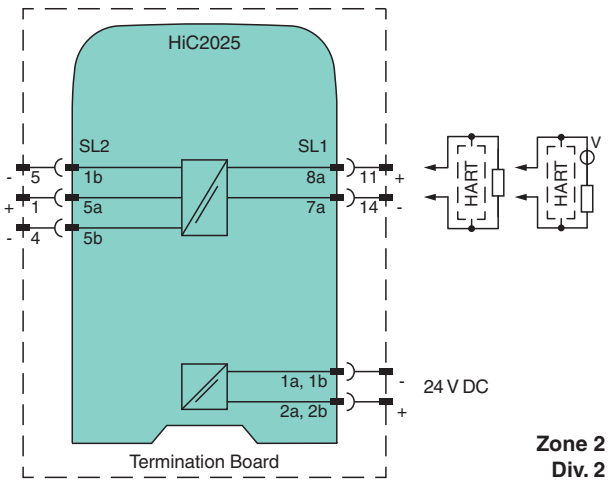
Application

The device supports the following SMART protocols:
- HART
- BRAIN

Connection



Zone 0, 1, 2
Div. 1, 2



Zone 2
Div. 2

Technical Data

General specifications	
Signal type	Analog input

Release date: 2023-06-01 Date of issue: 2023-06-01 Filename: 321423_eng.pdf

Technical Data

Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Systematic capability (SC)		SC 3
Supply		
Connection		SL1: 1a, 1b(-); 2a, 2b(+)
Rated voltage	U_r	19 ... 30 V DC bus powered via Termination Board
Ripple		≤ 10 %
Rated current	I_r	≤ 45 mA at 24 V and 20 mA source mode output
Power dissipation		≤ 800 mW
Power consumption		≤ 1.1 W
Input		
Connection side		field side
Connection		SL2: 5a(+), 1b(-); 5a(+), 5b(-)
Input signal		4 ... 20 mA limited to approx. 26 mA
Voltage drop		approx. 5 V on SL2: 5a(+), 1b(-)
Available voltage		≥ 15 V at 20 mA , ≥ 18 V at 4 mA on SL2: 5a(+), 5b(-)
Output		
Connection side		control side
Connection		SL1: 8a(+), 7a(-)
Load		0 ... 350 Ω (source mode)
Output signal		source mode: 4 ... 20 mA or 1 ... 5 V (internal resistor: 250 Ω, 0.1 %) sink mode: 4 ... 20 mA, operating voltage 10 ... 30 V For additional internal or external loads the voltage drop has to be considered, e. g. 250 Ω x 20 mA = 5 V.
Ripple		20 mV $_{rms}$
Transfer characteristics		
Deviation		at 20 °C (68 °F) < 0.1 % of full scale, incl. non-linearity and hysteresis (source mode and sink mode 4 ... 20 mA) ≤ ± 0.2 % incl. non-linearity and hysteresis (source mode 1 ... 5 V)
Influence of ambient temperature		< 2 µA/K (-20 ... 70 °C (-4 ... 158 °F)); < 4 µA/K (-40 ... -20 °C (-40 ... -4 °F)) (source mode and sink mode 4 ... 20mA) < 0.5 mV/K (-20 ... 70 °C (-4 ... 158 °F)); < 1 mV/K (-40 ... -20 °C (-40 ... -4 °F)) (source mode 1...5 V)
Frequency range		field side into the control side: bandwidth with 0.5 V_{pp} signal 0 ... 3 kHz (-3 dB) control side into the field side: bandwidth with 0.5 V_{pp} signal 0 ... 3 kHz (-3 dB)
Settling time		≤ 50 ms
Rise time/fall time		≤ 10 ms
Galvanic isolation		
Input/Output		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/power supply		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Output/power supply		basic insulation according to IEC/EN 61010-1, rated insulation voltage 60 V_{eff}
Indicators/settings		
Display elements		LED
Control elements		DIP switch
Configuration		via DIP switches
Labeling		space for labeling at the front
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
Conformity		
Electromagnetic compatibility		NE 21:2017 EN 61326-3-2:2018 For further information see system description.
Degree of protection		IEC 60529:2001
Protection against electrical shock		UL 61010-1:2012
Ambient conditions		

Release date: 2023-06-01 Date of issue: 2023-06-01 Filename: 321423_eng.pdf

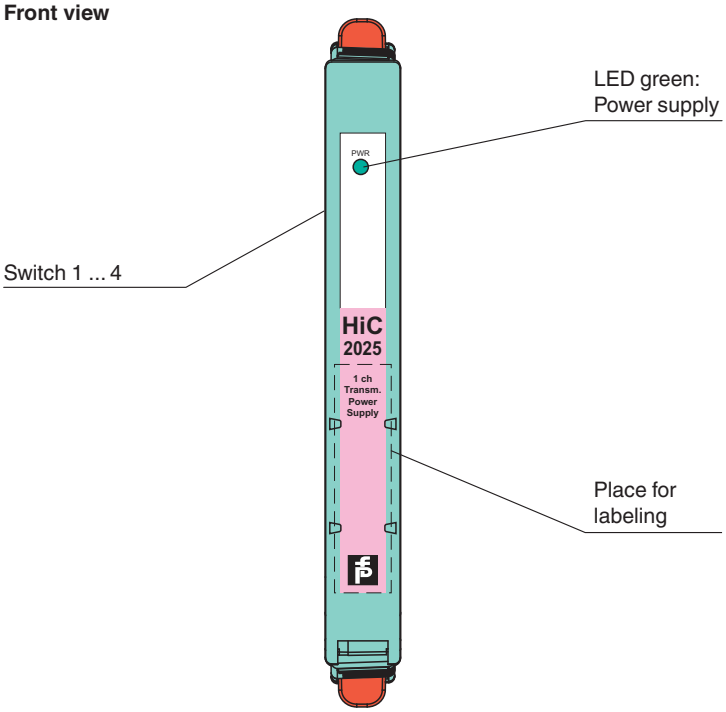
Technical Data

Ambient temperature		-40 ... 70 °C (-40 ... 158 °F)
Mechanical specifications		
Degree of protection		IP20
Mass		approx. 100 g
Dimensions		12.5 x 106 x 128 mm (0.5 x 4.2 x 5.1 inch) (W x H x D)
Mounting		on termination board
Coding		pin 1 and 3 trimmed For further information see system description.
Data for application in connection with hazardous areas		
EU-type examination certificate		CESI 06 ATEX 017
Marking		Ⓔx II (1)G [Ex ia Ga] IIC Ⓔx II (1)D [Ex ia Da] IIIC Ⓔx I (M1) [Ex ia Ma] I
Input		Ex ia
Supply		
Maximum safe voltage	U_m	250 V AC (Attention! U_m is no rated voltage.)
Equipment		SL2: 5a(+), 5b(-)
Voltage	U_o	25.2 V
Current	I_o	100 mA
Power	P_o	630 mW
Internal capacitance	C_i	5.7 nF
Internal inductance	L_i	negligible
Equipment		SL2: 5a(+), 1b(-)
Voltage	U_i	30 V
Current	I_i	128 mA
Voltage	U_o	7.2 V
Current	I_o	100 mA
Power	P_o	25 mW
Internal capacitance	C_i	5.7 nF
Internal inductance	L_i	negligible
Certificate		CESI 19 ATEX 027 X
Marking		Ⓔx II 3G Ex ec IIC T4 Gc
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-7:2015
International approvals		
FM approval		
FM certificate		FM 19 US 0122 X , FM 19 CA 0065 X
Control drawing		116-0470 (cFMus)
UL approval		E106378
Control drawing		116-0458 (cULus)
IECEx approval		
IECEx certificate		IECEx CES 06.0002X
IECEx marking		[Ex ia Ga] IIC , [Ex ia Da] IIIC , [Ex ia Ma] I Ex ec IIC T4 Gc
General information		
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com.

Release date: 2023-06-01 Date of issue: 2023-06-01 Filename: 321423_eng.pdf

Assembly

Front view



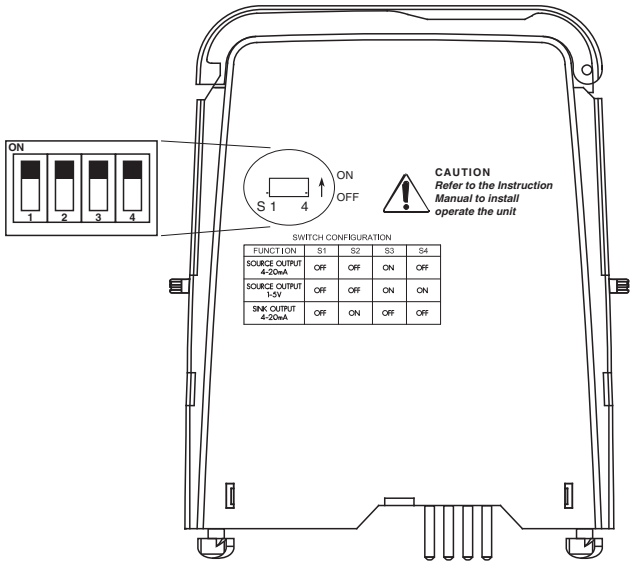
Configuration

Configure the device in the following way:
- Push the red Quick Lok Bars on each side of the device in the upper position.
- Remove the device from termination board.
- Set the switches according to the figure in the **Configuration** section.

Note
The pins for this device are trimmed to polarize it according to its safety parameters. Do not change the setting. For further information see system description.

Release date: 2023-06-01 Date of issue: 2023-06-01 Filename: 321423_eng.pdf

Configuration



Switch position

Function	S1	S2	S3	S4
Current source 4 mA ... 20 mA	OFF	OFF	ON	OFF
Voltage source 1 V ... 5 V	OFF	OFF	ON	ON
Current sink 4 mA ... 20 mA	OFF	ON	OFF	OFF

Factory setting: current source 4 mA ... 20 mA

Release date: 2023-06-01 Date of issue: 2023-06-01 Filename: 321423_eng.pdf

ATTACHMENT-2

CESI S.p.A.
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I-20134 Milano - Italy
Tel: +39 02 21251
Fax: +39 02 21255440
e-mail: info@cesi.it
www.cesi.it

Schema di certificazione

CERTIFICATE

[1] SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE

[2] **Equipment or Protective System intended for use in potentially explosive atmospheres Directive 2014/34/EU**

[3] Supplementary EU-Type Examination Certificate number:

CESI 06 ATEX 017 /02

[4] Product: Galvanically isolated barrier type: **HiC2025, HiC2025A** and **HiC2031**

[5] Manufacturer: **Pepperl+Fuchs GmbH**

[6] Address: **Lilienthalstrasse 200, 68307 - Mannheim - Germany**

[7] This supplementary certificate extends EC–Type Examination Certificate CESI 06 ATEX 017 to apply to products designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to..

[8] CESI, notified body n. 0722 in accordance with Article 17 of the Directive 2014/34/EU of the Parliament and Council of 26 February 2014, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report n. EX-B9011911.

[9] In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016

[10] If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

[11] This EU-TYPE EXAMINATION CERTIFICATE relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

[12] The marking of the equipment or protective system shall include the following:

I (M1) [Ex ia Ma] I
II (1) G [Ex ia Ga] IIC
II (1) D [Ex ia Da] IIIC

This certificate may only be reproduced in its entirety and without any change, schedule included.

Date 14.06.2019 - Translation issued the 14th 06.2019

Prepared	**Verified**	**Approved**
Guido Prazzoli	Mirko Balaz	Roberto Piccin

CESI S.p.A.
Testing & Certification Division
Business Area Certification
Il Responsabile
(Roberto Piccin)

ACCREDIA
PRD N. 018B
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

[13] **Schedule**

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 06 ATEX 017 /02**

[15] **Description of the variation to the product**

Variation 2.1: Constructive modifications concerning the improvement of the thermal dissipation of the infallible components, considering the maximum service temperature of +94 °C.
Variation 2.2: Extended the ambient temperature range from -20 °C ÷ +60°C up to -40 °C ÷ +70 °C.
Variation 2.3: Added new alternative I.S. components.
Variation 2.4: Added a new device called HiC2025A with new safety parameters.
Variation 2.5: The product denomination has been updated, introducing asterisks at the end of name.
Variation 2.6: Standards updating.
Variation 2.7: Update to Directive 2014/34/EU.

Description of equipment

The SMART Transmitter Power Supply **HiC2025**, **HiC2025A** and SMART Current Driver **HiC2031** are, galvanically isolated, associated apparatus.
The **HiC2025** and HiC2025A devices are suitable for supply/interface signal transmitter placed in hazardous area and transfer the analog signal to a safe area. The hazardous area connections *(Input circuit)* are for "Sink Input" *(2-wire transmitters)* or 4-wire transmitters.
The **HiC2031** device is suitable to repeat a current signal coming from a safe area to drive smart I/P converter, valve actuator and displays placed in hazardous area.
For all equipmet, a SMART digital communication can be superimposed on the measurement signal of the transmitter, as input or output and can be transferred in both directions.
The products have a plastic enclosure, the boards are equipped with two DIN 41612 B/3 connectors, suitable for direct insertion in the ATEX certified Termination Boards HiC series, produced by Pepperl+Fuchs.
For particular variants, the equipment's name can be extended with additional characters at the end of the name *(es. HiC2025(A)** or HiC2031**)*. These variants do not change the function or the type of protection of the products in any way.
The equipment has been, previously, assessed and marked in compliance with the following standards: EN 60079-0:2009, EN 60079-11:2007, EN60079-26: 2007, EN 61241-11:2006 and EN 50303:2000.
With this Supplement the products are re-assessed and marked on the basis of the standards:
EN 60079-0:2012/A11:2013 and EN 60079-11:2012

Electrical characteristics

Non-intrinsically safe circuits

Um:	250 Vac
Power supply *[connettor SL1 pins: 2a,2b (+) and 1a,1b (-)]:*	Un: 24 Vdc *(19 ÷ 30 Vdc)*
Analog Input/Output *[connector SL1 pins: 8a (+) and 7a (-)]:*	Un: up to 30 Vdc
Tamb.:	from -40 °C up to +70 °C

*Intrinsically safe circuits – equipment **HiC2025***

Connector SL2 pins	Uo	Io	Po	Gas Groups	Co (µF)	Lo (mH)	Lo/Ro (µH/Ω)
5a(+); 5b(-)	25.2 V	100 mA	630 mW	IIC	0.100	3.5	55
				IIB	0.81	14	222
				IIA	2.8	28	444
				I	4.14	46	743

Ci = 5.7nF Li = negligible Output characteristic: linear.

This certificate may only be reproduced in its entirety and without any change, schedule included.

[13] **Schedule**

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 06 ATEX 017 /02**

Electrical characteristics *(continue)*

Intrinsically safe circuits – equipment ***HiC2025***

Connector SL2 pins	Uo / Ui	Io / Ii	Po	Gas Groups	Co (µF)	Lo (mH)	Lo/Ro (µH/Ω)
5a(+); 1b(-) 7a(-)	7.2 V	100 mA	25 mW	IIC	13.49	3.5	27
				IIB	239	14	108
	30 V	128 mA		IIA	1000	28	216
				I	1000	46	356

Ci = 5.7nF Li = negligible Output characteristic: diodes blocking barrier.

Intrinsically safe circuits – equipment ***HiC2025A***

Connector SL2 pins	Uo	Io	Po	Gas Groups	Co (µF)	Lo (mH)	Lo/Ro (µH/Ω)
5a(+); 5b(-)	25.2 V	93 mA	586 mW	IIC	0.100	4.1	61
				IIB	0.81	16.4	244
				IIA	2.8	32.8	488
				I	4.14	53.9	800

Ci = 5.7nF Li = negligible Output characteristic: linear.

Connector SL2 pins	Uo / Ui	Io / Ii	Po	Gas Groups	Co (µF)	Lo (mH)	Lo/Ro (mH/Ω)
5a(+); 1b(-) 7a(-)	1 V	100 mA	25 mW	IIC	100	3.5	1.4
				IIB	1000	14	5.6
	30 V	128 mA		IIA	1000	28	11.2
				I	1000	46	18

Ci = 5.7nF Li = negligible Output characteristic: diodes blocking barrier.

Intrinsically safe circuits – equipment ***HiC2031***

Connector SL2 pins	Uo	Io	Po	Gas Groups	Co (µF)	Lo (mH)	Lo/Ro (µH/Ω)
5a(+); 5b(-)	25.2 V	100 mA	630 mW	IIC	0.100	3.5	55
				IIB	0.81	14	222
				IIA	2.8	28	444
				I	4.14	46	743

Ci = 5.7nF Li = negligible Output characteristic: linear.

Note: External circuits with both inductance and capacitance

The above maximum Lo and Co parameters apply where:
- the total Ci of the external circuit (excluding the cable) is < 1% of the Co value or
- the total Li of the external circuit (excluding the cable) is < 1% of the Lo value.

The above Lo and Co parameters shall reduce to 50% when both of the two conditions below are given:
- the total Li of the external circuit (excluding the cable) > 1% of the Lo value and
- the total Ci of the external circuit (excluding the cable) > 1% of the Co value.

The reduced capacitance of the external circuit (including cable) shall not be greater than 1 µF for Groups I, IIA, IIB and 600 nF for Group IIC.

The intrinsically safe systems shall be realized according to EN 60079-25 standard. The interconnection with active intrinsically safe transmitters must also respect the output parameters of these transmitters.

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[13] # Schedule

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 06 ATEX 017 /02**

Warning label
None

[16] **Report n.** EX-B9011911

Routine tests
The Manufacturer shall carry out the routine tests provided to clause 27 on the of EN 60079-0 standard and furthermore, the tests prescribed in clause 11.2 of the EN 60079-11 standard.

[17] **Special conditions for safe use**
None

[18] **Essential Health and Safety Requirements**
Compliance with the Essential Health and Safety Requirements is not affected by these variations and are assured by compliance to the following standards:

- EN 60079-0:2012+A11:2013 – Explosive atmospheres – Part 0: Equipment – General requirements.
- EN 60079-11:2012 - Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i".

In addition, the following EHSRs *(ref. ANNEX II of the Directive)* are considered relevant for this product:

Clause	Subject	Compliance
1.2.7.	Protection against other hazards	Manufacturer responsibility
1.2.8	Overloading of equipment	User/Installer responsibility
1.4.	Hazards arising from external effects	User/Installer responsibility

[19] **Descriptive documents** (prot. EX-B9011917)

- n.366-0029CE-00B Description	pages 40	date	2018.11.29
- n.366-0029CE-01B Schematic	sheets 2	date	2018.11.29
- n.366-0029CE-02B Bill of material	pages 12	date	2018.11.29
- n.366-0029CE-03B Component set up	sheets 4	date	2018.11.29
- n.366-0029CE-05B Layouts multilayer	sheets 4	date	2018.11.29
- n.366-0029CE-06B Transformer	pages 3	date	2018.11.29
- n.366-0029CE-09B Instructions	pages 3	date	2018.11.29
- n.366-0029CE-10B Type Label	pages 6	date	2018.11.29
- n.CAR-0051 Conformity Assessment Report	pages 6	date	2018.11.29

One copy of all documents is kept in CESI files.

Certificate hystory

Issue N°	Issue Date	Summary description of variation
02	14/06/2019	Constructive modifications, considering the maximum service temperature of +94 °C; extended the ambient temperature range; new alternative I.S. components; new device HiC2025A; updated the product denomination; conformity to European standards EN60079-0:2012+A1:2013 and EN60079-11:2012
01	31/05/2011	Conformity to new edition of harmonized European standards; added Group I equipment marking; circuital modifications barrier HiC2031; minor changes to the non-intrinsically safe circuit; change Manufacturer address
00	22/03/2006	First Issue of the Certificate

This certificate may only be reproduced in its entirety and without any change, schedule included.

EU-Declaration of conformity

EU-Konformitätserklärung

en/de

ATTACHMENT-3

Pepperl+Fuchs SE
Lilienthalstraße 200
68307 Mannheim
Germany
Phone +49 621 776-0
Fax +49 621 776-1000

No. / *Nr.*: DOC-4563B
Date / *Datum*: 2022-01-20

Copyright Pepperl+Fuchs
www.pepperl-fuchs.com

PEPPERL+FUCHS

Declaration of conformity / *Konformitätserklärung*

We, Pepperl+Fuchs SE declare under our sole responsibility that the **products** listed below are in conformity with the listed **European Directives** and **standards**.

*Die Pepperl+Fuchs SE erklärt hiermit in alleiniger Verantwortung, dass die unten gelisteten **Produkte** den genannten **Europäischen Richtlinien** und **Normen** entsprechen.*

Products / *Produkte*

Product / *Produkt*	**Item number**	**Description** / *Beschreibung*
HIC2025	321423	Smart Transmitter
HIC2025A	321425	Smart Transmitter
HIC2025Y1	70147235	Transmitter power supply
HIC2031	321426	Smart Valve Isolator

Directives and Standards / *Richtlinien und Normen*

EU-Directive *EU-Richtlinie*	**Standards** *Normen*
ATEX 2014/34/EU (L96/309-356)	EN 60079-11:2012-01 EN 60079-7:2015-12 EN IEC 60079-0/AC:2020-02 EN IEC 60079-0:2018-07 EN IEC 60079-7/A1:2018-01
EMC 2014/30/EU (L96/79-106)	EN 61326-1:2013-01
RoHS 2011/65/EU (L174/88-110)	EN IEC 63000:2018-12

Affixed CE Marking / *Angebrachte CE-Kennzeichnung*

CE 0102

Signatures / *Unterschriften*

Mannheim, 2022-01-20

ppa. Michael Kessler
Executive Vice President
Components & Technology

i.V. Udo Körner
Continuation Manager
Value Engineering

ANNEX EMC

The products listed above fulfill the immunity test requirements for equipment intended for use in industrial locations.

Die oben gelisteten Produkte erfüllen die Störfestigkeits-Prüfanforderungen an Betriebsmittel, die zum Gebrauch in industriellen Bereichen vorgesehen sind.

ANNEX ATEX

Notified Body QM-System / Notifizierte Stelle des QM-Systems
Physikalisch Technische Bundesanstalt (0102)
Bundesallee 100
38116 Braunschweig
Germany

Marking and Certificates / ***Kennzeichnung und Zertifikate***

Marking *Kennzeichnung*	Certificate *Zertifikat*	Issuer ID *Aussteller* ID
Ex I (M1) Ex II (1) D Ex II (1) G	CESI 06 ATEX 017	0722
Ex II 3 G	CESI 19 ATEX 027X	CES

Key for Issuer ID / ***Schlüssel zur Aussteller ID***

ID	**Issuer** / *Aussteller*
0722	CESI Via Rubattino 54 20134 Milan Italy
CES	CESI Via Rubattino 54 20134 Milan Italy

Pepperl+Fuchs SE declares that the products are only affected by minor or formal changes with respect to the new edition of the standards. These changes are not relevant for compliance with the essential health and safety requirements. The products still comply with the ATEX Directive. This declaration is also valid if the marking and the certificates of the listed devices correspond to previous editions of standards.

Die Pepperl+Fuchs SE erklärt hiermit, dass die Produkte nur von kleineren oder formalen Änderungen in Bezug auf die neue Ausgabe der Normen betroffen sind. Diese Änderungen sind nicht relevant für die Konformität mit den wesentlichen Gesundheits- und Sicherheitsanforderungen. Die Produkte erfüllen nach wie vor die ATEX-Richtlinie. Diese Erklärung gilt auch, wenn die Kennzeichnung und die Zertifikate der aufgeführten Geräte vorangegangenen Normenständen entsprechen.