

# 1 UK-TYPE EXAMINATION CERTIFICATE

2 Safety Device, Controlling Device or Regulating Device intended for use outside a potentially explosive atmosphere but required for or contributing to the safe functioning of Product and Protective Systems with respect to the risks of explosion

UKSI 2016:1107 (as amended) – Schedule 3A, Part 1

3 UK-Type Examination BAS21UKEX0426

Certificate Number:

4 Product: Dual Channel Smart Fire Detector Isolator Type KFD0-CS-Ex\*.54/56

5 Manufacturer: Pepperl+Fuchs SE

6 Address: Lilienthalstrasse 200, 68307 Mannheim, Germany

- 7 This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- SGS Baseefa, Approved Body number 1180, in accordance with Regulation 43 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended), 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 Schedule 1 of the Regulations.

The examination and test results are recorded in confidential Report No. 21(C)0161

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 UK-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Regulations 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:

**(a)** II (1) G [Ex ia Ga] IIC  $(-20^{\circ}\text{C} \le \text{Ta} \le +60^{\circ}\text{C})$ 

**(a)** II (1) D [Ex ia Da] IIIC  $(-20^{\circ}\text{C} \le \text{Ta} \le +60^{\circ}\text{C})$ 

E I (M1) [Ex ia Ma] I  $(-20^{\circ}\text{C} \le \text{Ta} \le +60^{\circ}\text{C})$ 

SGS Baseefa Customer Reference No. 0808

Project File No. 21/0161

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R S SINCLAIR
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited



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13 Schedule

Certificate Number BAS00UKEX0426

## 15 Description of Product

The Dual Channel Smart Fire Detector Isolator Type KFD0-CS-Ex\*.54/56 is designed to provide a galvanically isolated interface to enable to the connection of equipment located in a hazardous area with equipment located in a non-hazardous area by providing galvanic isolation and limiting to intrinsically safe levels the voltage and current into the hazardous area

The equipment comprises a number of electronic components, including transformers, fuses, resistors and zener diodes, all mounted on a single printed circuit board and housed within a plastic enclosure fitted with terminals for external connections.

The segregation of the hazardous area circuits meets the requirements for 250V.

#### **Input / Output Parameters**

# KFD0-CS-Ex2.54 and KFD0-CS-Ex2.54-Y1, -Y3 or -Y207412 - Dual Channel

Non-hazardous Area Terminals

(Terminals 11 & 12 and terminals 8, 9 & 10)

 $U_m = 253V$ 

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The apparatus is designed to operate from a d.c. supply of up to 40V on the above terminals.

## Hazardous Area Terminals

(Terminals 1 w.r.t. 2 and 4 w.r.t. 5)

 $U_{\rm o} = 28V$   $C_{\rm i} = 5.64 {\rm nF}$   $I_{\rm o} = 93 {\rm mA}$   $L_{\rm i} = 0$  $P_{\rm o} = 653 {\rm mW}$ 

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to output terminals of the apparatus must not exceed the following values:

#### Hazardous Area Terminals

(Terminals 1 w.r.t. 2 and 4 w.r.t. 5)

GROUP	CAPACITANCE	INDUCTANCE OF		L/R RATIO
	(µF)	(mH)		(µH/ohm)
IIC	0.077	4.3		55
IIB	0.64	17		199
IIA	2.14	35		431
I	3.39	51		671

#### NOTE:

The above parameters apply when one of the two conditions below is given:

- the total  $L_i$  of the external circuit (excluding the cable) is < 1% of the  $L_o$  value or
- the total  $C_i$  of the external circuit (excluding the cable) is < 1% of the  $C_o$  value.

The above parameters are reduced to 50% when both of the two conditions below are given:

- the total  $L_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $L_o$  value and
- the total  $C_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $C_o$  value.

Note: the reduced capacitance of the external circuit (including cable) shall not be greater than  $1\mu F$  for Groups I, IIA & IIB and 600nF for Group IIC.



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## KFD0-CS-Ex1.54 and KFD0-CS-Ex1.54-Y1, -Y3 or -Y207411 - Single Channel

Non-hazardous Area Terminals

(Terminals 11 & 12)

 $U_{\rm m} = 253 \, {\rm V}$ 

The apparatus is designed to operate from a d.c. supply of up to 40V on the above terminals.

#### Hazardous Area Terminals

(Terminals 1 w.r.t. 2)

$$U_{\rm o} = 28V$$
  $C_{\rm i} = 5.64 {\rm nF}$   
 $I_{\rm o} = 93 {\rm mA}$   $L_{\rm i} = 0$   
 $P_{\rm o} = 653 {\rm mW}$ 

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to output terminals of the apparatus must not exceed the following values:

### **Hazardous Area Terminals**

(Terminal 1 w.r.t. 2)

GROUP	CAPACITANCE (uF)	INDUCTANCE (mH)	OR	L/R RATIO (µH/ohm)
IIC	0.077	4.3		55
IIB	0.64	17		199
IIA	2.14	35		431
I	3.39	51		671

#### NOTE:

The above parameters apply when one of the two conditions below is given:

- the total  $L_i$  of the external circuit (excluding the cable) is < 1% of the  $L_0$  value or
- the total  $C_i$  of the external circuit (excluding the cable) is < 1% of the  $C_o$  value.

The above parameters are reduced to 50% when both of the two conditions below are given:

- the total  $L_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $L_o$  value and
- the total  $C_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $C_o$  value.

Note: the reduced capacitance of the external circuit (including cable) shall not be greater than  $1\mu F$  for Groups I, IIA & IIB and 600nF for Group IIC.

#### KFD0-CS-Ex2.54-Y2 or -Y72222 - Dual Channel

Non-hazardous Area Terminals

(Terminals 11 & 12 and terminals 8, 9 & 10)

$$U_m = 253V$$

The apparatus is designed to operate from a d.c. supply of up to 40V on the above terminals.

#### **Hazardous Area Terminals**

(Terminals 1 w.r.t. 2 and 4 w.r.t. 5)

$$U_{\rm o} = 25.2 \text{V}$$
  $C_{\rm i} = 5.64 \text{nF}$   
 $I_{\rm o} = 43 \text{mA}$   $L_{\rm i} = 0$   
 $P_{\rm o} = 271 \text{mW}$ 

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to output terminals of the apparatus must not exceed the following values:

## **Hazardous Area Terminals**

(Terminals 1 w.r.t. 2 and 4 w.r.t. 5)

GROUP	CAPACITANCE	INDUCTANCE	OR	L/R RATIO
	(µF)	(mH)		(µH/ohm)
IIC	0.101	19.6		138
IIB	0.81	72		508
IIA	2.89	153		964
I	4.14	233		1452

#### NOTE:

The above parameters apply when one of the two conditions below is given:

- the total  $L_i$  of the external circuit (excluding the cable) is < 1% of the  $L_o$  value or
- the total  $C_i$  of the external circuit (excluding the cable) is < 1% of the  $C_o$  value.

The above parameters are reduced to 50% when both of the two conditions below are given:

- the total  $L_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $L_o$  value and
- the total  $C_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $C_o$  value.

Note: the reduced capacitance of the external circuit (including cable) shall not be greater than  $1\mu F$  for Groups I, IIA & IIB and 600nF for Group IIC.

#### KFD0-CS-Ex1.54-Y2 or -Y72221 - Single Channel

Non-hazardous Area Terminals

(terminals 11 & 12)

$$U_m = 253V$$

The apparatus is designed to operate from a d.c. supply of up to 40V on the above terminals.

## **Hazardous Area Terminals**

(Terminal 1 w.r.t. 2)

$$U_{\rm o} = 25.2 \text{V}$$
  $C_{\rm i} = 5.64 \text{nF}$   
 $I_{\rm o} = 43 \text{mA}$   $L_{\rm i} = 0$   
 $P_{\rm o} = 271 \text{mW}$ 

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to output terminals of the apparatus must not exceed the following values:

## <u>Hazardous Area Terminals</u>

(Terminal 1 w.r.t. 2)

GROUP	CAPACITANCE	INDUCTANCE	OR	OR L/R RATIO	
	(µF)	(mH)		(µH/ohm)	
IIC	0.101	19.6		138	
IIB	0.81	72		508	
IIA	2.89	153		964	
I	4.14	233		1452	

## NOTE:

The above parameters apply when one of the two conditions below is given:

- the total  $L_i$  of the external circuit (excluding the cable) is < 1% of the  $L_0$  value or
- the total  $C_i$  of the external circuit (excluding the cable) is < 1% of the  $C_o$  value.

The above parameters are reduced to 50% when both of the two conditions below are given:

- the total  $L_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $L_o$  value and
- the total  $C_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $C_o$  value.



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Note: the reduced capacitance of the external circuit (including cable) shall not be greater than  $1\mu F$  for Groups I, IIA & IIB and 600nF for Group IIC.

## KFD0-CS-Ex2.56 - Dual Channel

Hazardous Area Terminals

(Terminals 1 w.r.t. 2 and 4 w.r.t. 5)

 $U_{\rm o} = 21V$   $C_{\rm i} = 5.64 {\rm nF}$   $I_{\rm o} = 252 {\rm mA}$   $L_{\rm i} = 0$  $P_{\rm o} = 1.323 {\rm W}$ 

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to output terminals of the apparatus must not exceed the following values:

Hazardous Area Terminals

(Terminals 1 w.r.t. 2 and 4 w.r.t. 5)

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR	L/R RATIO (µH/ohm)
IIC	0.182	0.56		26.9
IIB	1.264	2.24		107.6
IIA	4.774	4.48		215.3
I	6.294	7.35		353.2

#### NOTE:

The above parameters apply when one of the two conditions below is given:

- the total  $L_i$  of the external circuit (excluding the cable) is < 1% of the  $L_0$  value or
- the total  $C_i$  of the external circuit (excluding the cable) is < 1% of the  $C_o$  value.

The above parameters are reduced to 50% when both of the two conditions below are given:

- the total  $L_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $L_0$  value and
- the total  $C_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $C_o$  value.

Note: the reduced capacitance of the external circuit (including cable) shall not be greater than  $1\mu F$  for Groups I, IIA & IIB and 600nF for Group IIC.

## KFD0-CS-Ex1.56 - Single Channel

**Hazardous Area Terminals** 

(Terminals 1 w.r.t. 2)

 $U_{\rm o} = 21V$   $C_{\rm i} = 5.64 {\rm nF}$   $I_{\rm o} = 252 {\rm mA}$   $L_{\rm i} = 0$  $P_{\rm o} = 1.323 {\rm W}$ 

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to output terminals of the apparatus must not exceed the following values:

# Hazardous Area Terminals

(Terminals 1 w.r.t. 2)

GROUP	CAPACITANCE	INDUCTANCE	OR	L/R RATIO
	(μF)	(mH)		(µH/ohm)
IIC	0.182	0.56		26.9
IIB	1.264	2.24		107.6
IIA	4.774	4.48		215.3
I	6.294	7.35		353.2

#### NOTE:

The above parameters apply when one of the two conditions below is given:

- the total  $L_i$  of the external circuit (excluding the cable) is < 1% of the  $L_o$  value or
- the total  $C_i$  of the external circuit (excluding the cable) is < 1% of the  $C_o$  value.

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The above parameters are reduced to 50% when both of the two conditions below are given:

- the total  $L_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $L_o$  value and
- the total  $C_i$  of the external circuit (excluding the cable)  $\geq 1\%$  of the  $C_o$  value.

Note: the reduced capacitance of the external circuit (including cable) shall not be greater than  $1\mu F$  for Groups I, IIA & IIB and 600nF for Group IIC.

## 16 Report Number

21(C)0161

## 17 Specific Conditions of Use

None

## 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, and conformity is demonstrated in the report:

Clause	Subject
1.2.7	LVD type requirements
1.2.8	Overloading of equipment (protection relays, etc.)
1.4.1	External effects
1.4.2	Aggressive substances, etc.

## 19 Drawings and Documents

Number	Sheet	Issue	Date	Description
16-1555CM-10	1 & 2	0	2021-Apr-12	Additional Marking Requirements for UKCA
For all other drawings see	BAS00AT	EX7087		