



[1] **EU – TYPE EXAMINATION CERTIFICATE**

[2] Equipment or Protective Systems Intended for use in Potentially Explosive Atmospheres
Directive 2014/34/EU.

[3] EU-Type Examination Certificate Number: **FIDI 21 ATEX 0091X** Issue: **1**

[4] Product: **Isolated barrier**
Type: **KFD0-SD2-Ex* and KFD2-SLD-Ex***

[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 documents therein referred to.

[8] FIDITAS Ltd., Notified Body number 2829 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 of the Directive.

The examination and test results are recorded in confidential Report No: **FIDI 21 CR 077**

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

EN IEC 60079-0:2018 EN IEC 60079-7:2015+A1:2018 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 Specific Conditions of Use specified in the schedule to this certificate.

[11] This EU-Type Examination Certificate relates only to the design, examination and test of the specified product in accordance with Annex III. Further requirements of the Directive apply to the manufacturing process and supply of this products. These are not covered by this certificate.

[12] The marking of the product shall include the following:

 **II 3 (1) G Ex ec [ia Ga] IIC T4 Gc**
II (1) D [Ex ia Da] IIIC
I (M1) [Ex ia Ma] I

Our ref.: 21.CRT.311

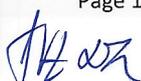
Date: 16.05.2022



FIDITAS Ltd.
Certification department

Approved:


Marino Kelava, M.E.Eng.





[13]

SCHEDULE

[14] **EU – TYPE EXAMINATION CERTIFICATE No.:** **FIDI 21 ATEX 0091X**

[15] **Description of product**

These isolated barriers are used for intrinsic safety applications. They supply power to solenoids, LEDs and audible alarms located in a hazardous area. These devices are controlled with a loop powered signal or a bus powered logic signal.

The devices are designed as associated apparatuses and can be installed in the non-hazardous area or in areas requiring EPL Gc equipment. The devices are associated apparatuses for areas requiring EPL Ga, Da or Ma equipment.

The voltage and current at the output terminals are limited to intrinsically safe levels. The hazardous area circuits are galvanically isolated from all other circuits up to a peak value of 375 V.

Type designation

KFD0-SD2-Ex#.1045*

KFD0-SD2-Ex#.1245*

KFD0-SD2-Ex#.1545*

KFD2-SLD-Ex#.1045*

KFD2-SLD-Ex#.1245*

KFD2-SLD-Ex#.1545*

“#” = “1” or “2” depending on the number of channels

“*” = “-Y” followed by numeric signs (e.g. -Y1). This “*” is optional and is used to describe different versions of a module. These differences do not affect intrinsic safety.

Non-intrinsically safe circuits:

Inputs (all types):

Connection: Terminals 7, 8 for Channel 1 and Terminals 8, 9 for Channel 2

Rated Voltage: 0...30 V DC

Maximum Voltage Um: 253 V

Power Supply (only KFD2-SLD-Ex*):

Connection: Terminals 14 and 15 resp. Power Rail contacts

Rated Voltage: 18 ...30 V DC

Maximum Voltage Um: 253 V

Collective error messaging (only KFD2-SLD-Ex*):

Connection: Power Rail contact PR4

Maximum Voltage Um: 253 V



Intrinsically safe circuits:

Output circuits:

Connection: Terminals 1, 2, 3 for Channel 1 and Terminals 4, 5, 6 for Channel 2

KFD0-SD2-Ex1.1045*, KFD0-SD2-Ex2.1045*,
KFD2-SLD-Ex1.1045*, KFD2-SLD-Ex2.1045*:

Maximum values per channel: U_0 = 25.2 V
 I_0 = 93 mA
 P_0 = 586 mW
Characteristic: linear
 C_i = negligible
 L_i = negligible

Type of protection	Ex ia resp. ib			
	I	IIA	IIB/IIIC	IIC
Maximum permissible external inductance L_0	53.95 mH	32.88 mH	16.44 mH	4.11 mH
Maximum permissible external capacitance C_0	4.15 μ F	2.9 μ F	820 nF	107 nF
Maximum L/R ratio	796 μ H/ Ω	485 μ H/ Ω	242 μ H/ Ω	60 μ H/ Ω

Note:

The above parameters of capacitance and inductance apply when one of the two conditions below is met:

- 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_0 value.

The above parameters for capacitance and inductance are reduced to 50 % when both of the two conditions below are met:

- the total L_i of the external circuit (excluding the cable) is \geq 1 % of the L_0 value and
- the total C_i of the external circuit (excluding the cable) is \geq 1 % of the C_0 value.

The reduced capacitance of the external circuit (including cable) shall not be greater than 1 μ F for I, IIA.

KFD0-SD2-Ex1.1245*, KFD0-SD2-Ex2.1245*,
KFD2-SLD-Ex1.1245*, KFD2-SLD-Ex2.1245*:

Maximum values per channel: U_0 = 25.2 V
 I_0 = 110 mA
 P_0 = 693 mW
Characteristic: linear
 C_i = negligible
 L_i = negligible

Type of protection	Ex ia resp. ib			
	I	IIA	IIB/IIIC	IIC
Maximum permissible external inductance L_0	38.56 mH	23.5 mH	11.75 mH	2.93 mH
Maximum permissible external capacitance C_0	4.15 μ F	2.9 μ F	820 nF	107 nF
Maximum L/R ratio	673 μ H/ Ω	410 μ H/ Ω	205 μ H/ Ω	51 μ H/ Ω



Note:

The above parameters of capacitance and inductance apply when one of the two conditions below is met:

- 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 for capacitance and inductance are reduced to 50 % when both of the two conditions below are met:

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

The reduced capacitance of the external circuit (including cable) shall not be greater than $1\mu\text{F}$ for I, IIA.

KFD0-SD2-Ex1.1545*, KFD0-SD2-Ex2.1545*,
KFD2-SLD-Ex1.1545*, KFD2-SLD-Ex2.1545*:

Maximum values per channel:	U_o	= 25.2 V	or alternatively:	U_o	= 25.2 V
	I_o	= 52 mA		I_o	= 153 mA
	P_o	= 850 mW		P_o	= 960 mW
	R_i	= 167 Ω		Characteristic:	linear
	Characteristic:	angular		C_i	= negligible
	C_i	= negligible		L_i	= negligible
	L_i	= negligible			

Type of protection (valid for angular and linear characteristic)	Ex ia resp. ib			
	I	IIA	IIB/IIIC	IIC
Maximum permissible external inductance L_o	19.4 mH	11.8 mH	5.9 mH	1.2 mH
Maximum permissible external capacitance C_o	4.15 μF	2.9 μF	820 nF	107 nF
Maximum L/R ratio	486 $\mu\text{H}/\Omega$	296 $\mu\text{H}/\Omega$	148 $\mu\text{H}/\Omega$	37 $\mu\text{H}/\Omega$

Note:

The above parameters of capacitance and inductance apply when one of the two conditions below is met:

- 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 for capacitance and inductance are reduced to 50 % when both of the two conditions below are met:

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

The reduced capacitance of the external circuit (including cable) shall not be greater than $1\mu\text{F}$ for I, IIA

Rated data:

Single channel versions: $T_{amb} = -40^\circ\text{C}$ to $+70^\circ\text{C}$

Dual channel versions: $T_{amb} = -40^\circ\text{C}$ to $+60^\circ\text{C} / +70^\circ\text{C}$

(extended ambient temperature range up to 70°C , refer to the manual for necessary mounting conditions)

KFD2-SLD-Ex2.1545 both switches set to bus powered: -40°C to $+70^\circ\text{C}$

Ingress protection: IP20



[16] Confidential Report No. FIDI 21 CR 077

[16.1] Routine testing

The manufacturer shall carry out routine test for the infallible transformer according to EN 60079-11.

[17] Specific Conditions of Use

- The device must be installed and operated only in a controlled environment that ensures a pollution degree 2 (or better) according to EN IEC 60664-1.
- The device must be installed and operated only in an environment of overvoltage category II (or better) according to EN IEC 60664-1.
- Additional requirements for installation in areas requiring Equipment Protection Level Gc:
The device must be installed and operated only in the surrounding enclosure that
 - complies with the requirements for surrounding enclosures according to EN IEC 60079-0,
 - is rated with the degree of protection IP54 according to EN 60529.

[18] Essential Health and Safety Requirements

Covered by the conformity with harmonized standards listed under item 9.

[19] Drawings and Documents

Title:	Drawing No.:	Rev. level:	Date:
Description, Calculations (46 pages)	16-1561FI-00	-	14.09.2021
Schematics (6 pages)	16-1561FI-01	-	14.09.2021
Relevant Components (6 pages)	16-1561FI-02	-	14.09.2021
Component Set-Up (2 pages)	16-1561FI-03	-	14.09.2021
Enclosure / Housing (1 pages)	16-1561FI-04	-	14.09.2021
Layouts, Multilayer (6 pages)	16-1561FI-05	-	14.09.2021
Transformer (2 pages)	16-1561FI-06	-	14.09.2021
Instructions (2 pages)	16-1561FI-09	-	14.09.2021
Label / Marking (1 pages)	16-1561FI-10	-	14.09.2021