

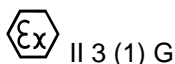
UK Type Examination Certificate CML 22UKEX2328X Issue 0**United Kingdom Conformity Assessment**

- 1 Product or Protective System Intended for use in Potentially Explosive Atmospheres UKSI 2016:1107 (as amended) – Schedule 3A, Part 1
- 2 Equipment **Isolated Barrier KFD0-SD2-Ex* and KFD2-SLD-Ex***
- 3 Manufacturer **Pepperl+Fuchs SE**
- 4 Address **Lilienthalstrasse 200,
68307 Mannheim,
Germany**
- 5 The equipment is specified in the description of this certificate and the documents to which it refers.
- 6 Eurofins E&E CML Limited, Newport Business Park, New Port Road, Ellesmere Port, CH65 4LZ, United Kingdom, Approved Body Number 2503, 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 equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Schedule 1 of the Regulations.

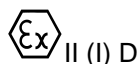
The examination and test results are recorded in the confidential reports listed in Section 12.
- 7 If an 'X' suffix appears after the certificate number, it indicates that the equipment is subject to specific conditions of use (affecting correct installation or safe use). These are specified in Section 14.
- 8 This UK Type Examination certificate relates only to the design and construction of the specified equipment. Further requirements of the Regulations apply to the manufacturing process and supply of the product. These are not covered by this certificate.
- 9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the confidential report, has been demonstrated through compliance with the following documents:

EN IEC 60079-0:2018 EN 60079-7:2015+A1:2018 EN 60079-11:2012

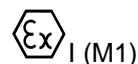
- 10 The equipment shall be marked with the following:



Ex ec [ia Ga] IIC T4 Gc



[Ex ia Da] IIIC



[Ex ia Ma] I





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11 Description

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



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Intrinsically safe circuits:

Output circuits:

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

KFDO-SD2-EX1.1045*, KFD0-SD2-EX2.1045*,
KFD2-SLD-EX1.1045*, KFD2-SLD-EX2.1045*:

Maximum values per channel: Uo= 25.2V
 Io = 93 mA
 Po = 586 mW
 Characteristic: linear
 Ci = negligible
 Li= negligible

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

Note:

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

- The total Li of the external circuit (excluding the cable) is <1 % of the Lo value or
- The total Ci of the external circuit (excluding the cable) is < 1 % of the Co value.

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

- the total Li of the external circuit (excluding the cable) is > 1 % of the Lo value and
- the total Ci of the external circuit (excluding the cable) is > 1 % of the Co value.

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



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KFDO-SD2-EX1.1245*, KFDO-SD2-EX2.1245*,
KFD2-SLD-EX1.1245*, KFD2-SLD-EX2.1245*:

Maximum values per channel:

Uo = 25.2 V
Io = 110 mA
Po = 693 mW

Characteristic: linear

Ci = negligible
Li = negligible

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

Note:

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

- The total Li of the external circuit (excluding the cable) is < 1 % of the Lo value or
- The total Ci of the external circuit (excluding the cable) is < 1 % of the Co value.

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

- the total Li of the external circuit (excluding the cable) is > 1 % of the Lo value and
- the total Ci of the external circuit (excluding the cable) is > 1 % of the Co value.

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

KFD0-5D2-Ex1.1545*, KFD0-SD2-Ex2.1545*,
KFD2-SLD-EX1.1545, KFD2-SLD-EX2.1545:

Maximum values per channel:	Uo	= 25.2 V	or alternatively:	Uo	= 25.2 V
	Io	= 52 mA		Io	= 153 mA
	Po	= 850 mW		Po	= 960 mW
	Ri	= 167 Ω		Characteristic:	linear
	Characteristic	angular		Ci	= negligible
	Ci	= negligible		Li	= negligible
	Li	= negligible			



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Type of protection	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 μ F	2.9 μ F	820 nF	107 nF
Maximum L/R ratio	486 μ H/ Ω	296 μ H/ Ω	148 μ H/ Ω	37 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 > 1 % of the L_o value and
- the total C_i of the external circuit (excluding the cable) is > 1 % of the C_o value.

The reduced capacitance of the external circuit (including cable) shall not be greater than 1 μ 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: $- 40^{\circ}\text{C}$ to $+ 70^{\circ}\text{C}$

Ingress protection: IP20

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	06 Jul 2022	R14112CJ/00	Issue of the prime certificate. FIDI 21ATEX0091X, Issue 1 is attached and shall be referred to in conjunction with this certificate.

Note: Drawings that describe the equipment are listed or referred to in the Annex.



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13 Conditions of Manufacture

The following conditions are required of the manufacturing process for compliance with the certification.

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

14 Specific Conditions of Use

The following conditions relate to safe installation and/or use of the equipment.

- i. 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.
- ii. The device must be installed and operated only in an environment of overvoltage category II (or better) according to EN IEC 60664-1.
- iii. 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.

Certificate Annex

Certificate Number CML 22UKEX2328X
Equipment Isolated Barrier KFD0-SD2-Ex* and KFD2-SLD-Ex*
Manufacturer Pepperl+Fuchs SE



The following documents describe the equipment defined in this certificate:

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For drawings describing the equipment, refer to attached certificate FIDI 21ATEX0091X. In addition to the drawings listed on FIDI 21ATEX0091X, the following drawings include the additional marking required for this UK Type Examination certification:

Drawing No	Sheets	Rev	Approved date	Title
16-1555CM-10	1 to 2	0		Additional Marking Requirements for UKCA