

# CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** FM17US0334X
3. **Equipment:** KFD Series Transformer Isolated Devices  
**(Type Reference and Name)**
4. **Name of Listing Company:** Pepperl+Fuchs GmbH
5. **Address of Listing Company:** Lillenthalstrasse 200  
Mannheim D-68307  
Germany
6. The examination and test results are recorded in confidential report number:  

1Z2A1.AX dated 28<sup>th</sup> March, 1995
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:  

FM Class 3600:2011, FM Class 3610:2015, FM Class 3611:2016, FM Class 3810:2017,
8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.
10. **Equipment Ratings:**  

Intrinsically safe outputs for connection to Class I, II and III, Division 1, Groups A, B, C, D, E, F and G, Entity when in installed in accordance with drawing number 116-0129 (116-0440 for the KFD2-CD-Ex1.32-a).  
Nonincendive for use in Class I, Division 2 Groups A, B, C and D, temperature class T4,  $-20^{\circ}\text{C} \leq T_a \leq 60^{\circ}\text{C}$   
( $-20^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$  for the KFD2-CD-Ex1.32-a).

## Certificate issued by:

  
\_\_\_\_\_  
J.E. Marquedant  
Manager, Electrical Systems

8 February 2018  
\_\_\_\_\_  
Date

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA  
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11. The marking of the equipment shall include:

Intrinsically safe "Entity" connections for Class I, II, III, Division 1, Groups A, B, C, D, E, F & G;  
 Nonincendive for use in Class I, Division 2, Groups A, B, C and D;  
 T4 when installed per P+F Control Drawing 116-0129 (116-0440 for KFD2-CD-Ex1.32-a).

12. **Description of Equipment:**

The transformer-isolated associated apparatus limit energy in electrical circuits to intrinsically safe levels.

The modules are housed within polymeric enclosures providing IP20 ingress protection. Mounting is by way of DIN rail. Electrical connections are via screw terminals or Power Rail

The isolators are rated for operation over 20 to 35 Vdc. Rated operating ambient temperature range is -20°C to 60°C (-20°C to 70°C for the KFD2-CD-Ex1.32-a).

Applicable models and entity parameters are as follows:

Type	$V_{oc}$ (V)	$I_{sc}$ (mA)	$V_t$ (V)	$I_t$ (mA)	$C_a$ ( $\mu F$ )	$L_a$ (mH)
Potentiometer Amplifiers:						
<b>KFD2-PT2-Ex1-a</b> , where a = 1 to 5 or blank	–	–	10.4	31.4	2.53	36.07
<b>KFD2-PT2-Ex1-Y98312</b>	–	–	10.4	46	2.53	17.23
<b>KFD2-PT2-Ex1-1-Y107265</b>	–	–	10.4	46	2.53	17.23
<b>KFD2-PT2-Ex1-2-Y107266</b>	–	–	10.4	46	2.53	17.23
<b>KFD2-PT2-Ex1-3-Y107267</b>	–	–	10.4	46	2.53	17.23
<b>KFD2-PT2-Ex1-4-Y107268</b>	–	–	10.4	46	2.53	17.23
<b>KFD2-PT2-Ex1-5-Y107269</b>	–	–	10.4	46	2.53	17.23
<b>KFD2-PT2-Ex1-6-Y112844</b>	–	–	10.4	46	2.53	17.23
	4.3	22.0	–	–	0.099	2.82
Single-Channel Smart Current Driver:						
<b>KFD2-SCD-Ex1.LK</b>	25.2	93.0	–	–	0.107	4.30
Single-Channel Voltage Repeaters:						
<b>KFD2-VR-Ex1.18</b>	18.0	4.2	–	–	0.309	492
<b>KFD2-VR-Ex1.19</b>	18.0	4.2	–	–	0.309	492
<b>KFD2-VR-Ex1.19-Y109129</b>	15.5	7.2	–	–	0.309	492

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Type	V <sub>oc</sub> (V)	I <sub>sc</sub> (mA)	V <sub>t</sub> (V)	I <sub>t</sub> (mA)	C <sub>a</sub> (μF)	L <sub>a</sub> (mH)
Single-Channel Current/Voltage Driver						
<b>KFD2-CD-Ex1.32-a</b> , where a = 0 to 25 or blank						
a = blank or 1 through 8	25.2	93.0	–	–	2.90(Gp D,F,G ) 0.82(Gp C,E) 0.107(Gp A,B)	32.88(Gp D,F,G) 16.44(Gp C,E) 4.11(Gp A,B)
a = 9 through 25	25.2	95.0	-	-	2.90(Gp D,F,G) 0.82(Gp C,E) 0.107(Gp A,B)	31.51(Gp D,F,G) 15.75(Gp C,E) 3.93(Gp A,B)

**13. Specific Conditions of Use:**

- (1) The Transformer Isolators shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.
- (2) For the model KFD2-CD-Ex1.32-a, the enclosure shall meet the requirements of IP20, and shall be installed in a location which provides at least pollution degree 2. When installed in a Division 2 location, the enclosure shall be installed in a tool-secured cabinet.

**14. Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

**15. Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

**16. Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
28 <sup>th</sup> March 1995	Original Issue
3 <sup>rd</sup> November 1995	Supplement 1: Report Reference: 1Z2A1.AXrev951016 dated 3 <sup>rd</sup> November 1995 Description of Change: Addition of Approval for Class I, Division 2
22 <sup>nd</sup> August 1997	Supplement 2: Report Reference: 1Z2A1.AXrev970813 dated 22 <sup>nd</sup> August 1997 Description of Change: Correction to Approval Guide Listing
10 <sup>th</sup> June 2013	Supplement 3: Report Reference: 1Z2A1.AXrev130521 dated 10 <sup>th</sup> June 2013 Description of Change: Partial de-listing of Approved products

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10 <sup>th</sup> June 2015	<u>Supplement 4:</u> Report Reference: 3049791 dated 10 <sup>th</sup> June 2015 Description of Change: Re-examination to FM Class 3610, 2010
27 <sup>th</sup> November 2017	<u>Supplement 5:</u> Report Reference: RR211726 dated 27 <sup>th</sup> November 2017 Description of Change: Re-listing of model KFD2-CD-Ex1.32a, de-listing of invalid model number KFD2-SD-Ex1.10100. Removal of previously de-listed model KFD2-CR-Ex1.30-340. Removal of KFD0-CS-Ex 1.51P, separately addressed under Project ID / Certificate 3003045, from Certificate
8 <sup>th</sup> February 2018	<u>Supplement 6:</u> Report Reference: 3063575 dated 8 <sup>th</sup> February 2018 Description of Change: Design changes to model #KFD2-CD-Ex1.32-a. FM 3600, FM 3610, FM 3611, and FM 3810 have been updated to the latest editions. Corrected the company address to the Mannheim, Germany location.

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