

[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: **EXA 17 ATEX 0076X** Issue: **1**

[4] Product: **Solenoid Drivers**
Type: **KFD2-SLD-Ex1.13100***

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

[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] Ex-Agencija, Notified Body number 2465 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.: **EXA 17CR086**

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 60079-0:2012 +A11:2013 **EN 60079-7:2015** **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 IIB Ga] IIC T4 Gc
II (1) D [Ex ia Da] IIIC
I (M1) [Ex ia Ma] I

Date: 19.10.2017

PB.17.TC.474



Ex-Agencija
Department of equipment certification
Approved by:

Stipo Đerek, dipl.ing.el.



[13]

SCHEDULE[14] **EU - TYPE EXAMINATION CERTIFICATE No.:** EXA 17 ATEX 0076X[15] **Description of product**

The dual channel Solenoid Driver type KFD2-SLD-Ex1.13100 is designed as associated apparatus to be installed in the non-hazardous area or in areas requiring EPL Gc equipment.

The device has intrinsically safe signal outputs in type of protection Ex ia for explosion groups I, IIA, IIB and explosion group IIIC. The hazardous area circuits are galvanically isolated from each other and from the non-hazardous area circuits.

This device supplies power to drive high current solenoid valves that are located in the hazardous area. The device has two outputs but it provides only one active output at a time. The two outputs are controlled with a logic signal applied on the two inputs (input-1 controls output-1 and input-2 controls output-2).

Device is powered by a standard 24 V DC source. It provides galvanic isolation between hazardous area and safe area circuits. In the hazardous area, it provides galvanic isolation of 60 V between the two outputs.

The area of application for the equipment is limited to closed (locked) electrical locations.

Type designation

KFD2-SLD-Ex1.13100*

- The asterisks shown in the type code can be replaced by a combination of tokens, indicating different versions that have no influence on the approval.

Electrical data**Safe Area connections:****Power Supply:**

Connection: 3 pole removable terminals (14+,15-) or Power Rail (PR1[+], PR2[-])
Rated Voltage: 19...30 V DC
Maximum Voltage Um: 60 V

Inputs:

Connection: 3 pole removable terminals for ch 1 (7+, 8-)
3 pole removable terminals for ch 2 (10+, 11-)
Rated Voltage: 0...30 V DC
Maximum Voltage Um: 60 V

Error Output:

Connection: Power Rail (PR4)
Rated Voltage: 19...30 V DC
Maximum Voltage Um: 60 V

Hazardous Area connections:
Connection:

Output ch 1: 3 pole removable terminals (1+, 2-/3-)
 Output ch 2: 3 pole removable terminals (4+, 5-/6-)

Maximum values: $U_o = 22.2 \text{ V}$
 $I_o = 360 \text{ mA}$
 $P_o = 1990 \text{ mW}$
 $C_i = 0$
 $L_i = 0$
 linear characteristic

Group	IIB / IIIC	IIA	I
Co	0.7 μF	2.5 μF	3.7 μF
Lo	1.05 mH	2.19 mH	3.6 mH
Lo/Ro	71.0 $\mu\text{H}/\Omega$	142.0 $\mu\text{H}/\Omega$	233.0 $\mu\text{H}/\Omega$

The above parameters for 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) $> 1\%$ of the L_o value and
- the total C_i of the external circuit (excluding the cable) $> 1\%$ of the C_o value.

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

Rated data:

Tamb = -20 °C to +60 °C

Ingress protection: IP20

[16] Confidential Report No. EXA 17CR086

[16.1] Routine testing

The manufacturer shall carry out the following routine test:

Routine test for infallible transformer: Dielectric strength test between input and output windings of transformers T100 and T200 with a voltage of $\geq 1500 \text{ VAC}$ for 60 s or $\geq 1800 \text{ VAC}$ for at least 1 s.

[17] Specific Conditions of Use
Installation in areas requiring category 3G/EPL Gc equipment:

- The device must be installed and operated only in an environment of overvoltage category II (or better) according to EN 60664-1.
- The device must be installed and operated only in a controlled environment that ensures a pollution degree 2 (or better) according to EN 60664-1.
- The device must be installed and operated only in surrounding enclosures that
 - o comply with the requirements for surrounding enclosures according to EN 60079-0,
 - o are rated with the degree of protection IP54 according to EN 60529.
- Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.
- Only use operating elements in the absence of a potentially explosive atmosphere.

[18] Essential Health and Safety Requirements

Covered by the standards listed at item 9.

[19] Drawings and Documents

Title:	Drawing No.:	Rev. level:	Date:
Description, Calculations (30 pages)	16-1364EX-00	-	06.10.2017
Schematics (3 pages)	16-1364EX-01	-	21.07.2017
Components list (3 pages)	16-1364EX-02	-	21.07.2017
Component Layout (4 pages)	16-1364EX-03	-	21.07.2017
Enclosure mechanical detail (1 page)	16-1364EX-04	-	21.07.2017
PCB layout (8 pages)	16-1364EX-05	-	21.07.2017
Transformer (3 pages)	16-1364EX-06	-	21.07.2017
Assembling notes (2 pages)	16-1364EX-07	-	21.07.2017
Instructions (2 pages)	16-1364EX-09	-	21.07.2017
Type Label (2 pages)	16-1364EX-10	-	06.10.2017