[1] # EU-TYPE EXAMINATION CERTIFICATE

[2] **Equipment or Protective System intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU**

[3] EU-Type Examination Certificate Number: **UL 24 ATEX 3300X Rev. 1**

[4] Product : **Voltage Repeater. Models: KCD2-VR4-Ex1(.SP)*, KCD2-VR4-Ex1.2(.SP)*, KCD2-VR4-Ex1.B(.SP)*, KCD2-VR4-Ex1.B2(.SP)***

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

[6] Address : **Lilienthalstrasse 200, 68307 Mannheim, Germany**

[7] This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

[8] UL International Demko A/S, notified body number 0539 in accordance with Article 17 of the 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 to the Directive.
The examination and test results are recorded in the confidential report no. **DK/ULD/ExTR24.0035/01.**

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

EN IEC 60079-0:2018
EN 60079-7:2015
EN 60079-7:2015/A11:2024
IEC 60079-11, Edition 7.0
EN IEC 60079-0:2018/A11:2024
EN IEC 60079-7:2015/A1:2018
EN 60079-11:2012

Where additional criteria beyond those given here have been used, they are listed at item 18 in 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" listed under item 17 of this certificate.

[11] This EU-Type Examination Certificate relates only to the technical design of the specified product in accordance with the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by the certificate.

[12] The marking of the product shall include the following (marking is provided in the Schedule as a part of item 15, if applicable):

II 3 (1) G Ex ec [ia Ga] IIC T4 Gc

II (1) D [Ex ia Da] IIIC

I (M1) [Ex ia Ma] I

Certification Manager
Thomas Wilson

This is to certify that the sample(s) of the Product described herein ("Certified Product") has been investigated and found in compliance with the Standard(s) indicated on this Certificate, in accordance with the ATEX Product Certification Program Requirements. This certificate and test results obtained apply only to the product sample(s) submitted by the Manufacturer. UL did not select the sample(s) or determine whether the sample(s) provided were representative of other manufactured product. UL has not established Follow-Up Service or other surveillance of the product. The Manufacturer is solely and fully responsible for conformity of all product to all applicable Standards, specifications, requirements or Directives. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

Date of issue: 2025-05-06
Re-issued: 2026-04-09

Notified Body UL International Demko A/S, Borupvang 5A, 2750 Ballerup, Denmark
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[15] Description of Product

The Voltage Repeater types KCD2-VR4-Ex1(.2)(.SP)* and KCD2-VR4-Ex1.B(2)(.SP)* are designed to restrict the transfer of energy from unspecified non-hazardous area apparatus to intrinsically safe vibration sensors, displacement probes and accelerometers located in the hazardous area, and provide galvanic isolation between the hazardous and non-hazardous area circuits.

The apparatus provides a floating output to power a vibration sensor, displacement probe or an accelerometer in a hazardous area, and transfers the signal from the sensor to the non-hazardous area. The terminal plugs and sockets are numbered and colour coded to make incorrect connections improbable.

The device is powered at nominal 24V dc either via screw/spring terminals or through the Power-Rail.

The devices are designed as associated apparatus and can be installed in the non-hazardous area or in areas requiring EPL Gc equipment. The devices are associated apparatus 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 circuit is galvanically isolated from the non-hazardous area circuit.

Performance testing

The optical radiation output of the product with respect to explosion protection, according to Annex II clause 1.3.1 of the Directive 2014/34/EU is covered in this certificate based on Exception 1) to the scope of EN 60079-28:2015 .

Nomenclature

Example	KCD2	-VR4	-Ex1	.B	2	.SP	*
	I	II	III	IV	V	VI	VII

I	KCD2	Housing Style
II	-VR4	Model Designator – Voltage Repeater
III	-Ex1	Single Channel
IV	Blank	Standard Version RIA fitted
	.B	Standard Version OPTO fitted
V	2	Terminals 3 & 4 not fitted
VI	Blank	Screw terminals
	.SP	Spring Terminals
VII	*	additional characters not relevant to certification.

Temperature range:

-40°C ≤ Ta ≤ +70°C (may be changed to any temperature range within these limits.)

Electrical data

Power Supply:
Connection: Terminals 9 and 10 / Power Rail contacts
Rated Voltage: 19 to 30 V DC, 60-40mA, 1.2W max.
Maximum Voltage Um: 250 V

Output:
Connection: Terminals 5 and 6
Rated Voltage: 0 to +/- 30 V DC
Maximum Voltage Um: 250 V

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Hazardous Area Connections:

Input Circuits:
KCD2-VR4-Ex1(.SP)*, KCD2-VR4-Ex1.B(.SP)*

Connection:	Terminals 1(4) and 2 (with no external link between terminals 3 and 4) In order to maintain the parameters below ensure any external wire link to terminal 3 is removed
	Maximum values: Uo = 1.1 V Io = 0.12 mA Po = 0.031 mW Ri = 9900 Ω Characteristic: linear Ui = 30 V Ci = 0 Li = 0

Although the apparatus itself does not comply with the simple apparatus requirements of clause 5.5 of IEC 60079-11:2023, when these hazardous area terminals are connected in an intrinsically safe circuit the internal energy, voltage and current of the interface will not add more than the values specified in clause 5.5 to the parameters of the circuit into which it is connected.

Maximum values for individually occurring external reactances according to EN 60079-11:

Type of protection	Ex ia			
	I	IIA	IIB / IIIC	IIC
Maximum permissible external inductance Lo	1000 mH	1000 mH	1000 mH	1000 mH
Maximum permissible external capacitance Co	1000 µF	1000 µF	1000 µF	100 µF
Maximum L/R ratio	1000 µH / Ω	1000 µH / Ω	1000 µH / Ω	1000 µH / Ω

Note:
The above parameters apply when 1 of the 2 conditions below is given:
- 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 are reduced to 50 % when both of the 2 conditions below are given:
- 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 1 uF for I, IIA, IIB / IIIC and 600 nF for IIC.

Connection:	All terminals 1,2, 3, 4 (or terminals 1 and 2 with an external link between 3 and 4)		
Maximum values:	Uo = 26.3 V Io = 32.4 mA Po = 596 mW Ri = 203 Ω Characteristic: angular Ci = 0 Li = 0	or alternatively:	Uo = 26.3 V Io = 121.3 mA Po = 763 mW Ri = 203 Ω Characteristic: linear Ci = 0 Li = 0

Maximum values for individually occurring external reactances according to EN 60079-11:

Type of protection	Ex ia			
	I	IIA	IIB / IIIC	IIC
Maximum permissible external inductance Lo	31.7 mH	19.3 mH	9.6 mH	2.4 mH
Maximum permissible external capacitance Co	4.4 µF	2.51 µF	740 nF	97 nF
Maximum L/R ratio	547 µH / Ω	333 µH / Ω	166 µH / Ω	41.7 µH / Ω

Note:
The above parameters apply when 1 of the 2 conditions below is given:
- 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 are reduced to 50 % when both of the 2 conditions below are given:
- 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 1 uF for I, IIA, IIB / IIIC and 600 nF for IIC.

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KCD2-VR4-Ex1.2(.SP)*, KCD2-VR4-Ex1.B2(.SP)*

Connection:	Terminals 1 and 2		
Maximum values:	Uo = 26.3 V Io = 32.4 mA Po = 596 mW Ri = 203 Ω Characteristic: angular Ci = 0 Li = 0	or alternatively:	Uo = 26.3 V Io = 121.3mA Po = 763 mW Ri = 203 Ω Characteristic: linear Ci = 0 Li = 0

Maximum values for individually occurring external reactances according to EN 60079-11:

Type of protection	Ex ia			
	I	IIA	IIB / IIIC	IIC
Maximum permissible external inductance Lo	31.7 mH	19.3 mH	9.6 mH	2.4 mH
Maximum permissible external capacitance Co	4.4 µF	2.51 µF	740 nF	97 nF
Maximum L/R ratio	547 µH / Ω	333 µH / Ω	166 µH / Ω	41.7 µH / Ω

Note:
The above parameters apply when 1 of the 2 conditions below is given:
- 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 are reduced to 50 % when both of the 2 conditions below are given:
- 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 1 uF for I, IIA, IIB / IIIC and 600 nF for IIC.

The intrinsically safe input circuits are safely isolated from all other circuits up to a peak value of the nominal voltage of 375 V.

Routine tests
The protective transformers used in the associated apparatus are to be subjected to an alternating current potential as indicated in the following table for at least 60 s. Alternatively, the test may be carried out at 1.2 times the test voltage, but with a reduced duration of at least 1 s.

The applied voltage shall remain constant during the test. The current flowing during the test shall not increase above that which is expected from the design of the circuit and shall not exceed 5 mA r.m.s. at any time.

During these tests, there shall be no breakdown of insulation between windings.

Where applied	RMS test voltage
Between input and output windings (T001 = Pins 9,11 to Pins 1,3)	1500 V

[16] Descriptive Documents
The scheduled drawings are listed in the report no. provided under item no. [8] on page 1 of this EU-Type Examination Certificate.

[17] Specific conditions of use:

- 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.

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 the surrounding enclosures according to EN IEC 60079-0, is 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.

Additional requirements for Associated Apparatus:

- When installed in a non-hazardous area the device may be used up to an altitude of 4250 m.

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[18] Essential Health and Safety Requirements
The Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9.

The manufacturer shall inform the notified body concerning all modifications to the technical documentation as described in Annex III to Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014.

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