1 # EU - TYPE EXAMINATION CERTIFICATE

2 **Safety Device, Controlling Device or Regulating Device intended for use outside a potentially explosive atmosphere but required for or contributing to the safe functioning of Equipment and Protective Systems with respect to the risks of explosion**
Directive 2014/34/EU

3 EU - Type Examination Certificate Number: **BAS02ATEX7203X – Issue 4**

3.1 In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.

4 Product: **Transformer Isolated Output Driver Type KFD2-CD-Ex1.32-****

5 Manufacturer: **Pepperl + Fuchs GmbH**

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

7 This re-issued certificate extends EC Type Examination Certificate No. BAS02ATEX7203 to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

8 The original certificate was issued by The Electrical Equipment Certification Service, Notified Body Number 0600, which retains responsibility for its original documentation. SGS Baseefa, Notified Body Number 1180, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, is responsible only for the additional work relating to this re-issued certificate and any other supplementary certificate it has issued.

The examination and test results are recorded in confidential Report No. **See Certificate History**

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

EN 60079-0:2012+A11:2013 **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 the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following :

Ⓔx II (1) G [Ex ia Ga] IIC (-20°C ≤ Ta ≤ +60°C / +70°C)

Ⓔx II (1) D [Ex ia Da] IIIC (-20°C ≤ Ta ≤ +60°C / +70°C)

Ⓔx I (M1) [Ex ia Ma] I (-20°C ≤ Ta ≤ +60°C / +70°C)

SGS Baseefa Customer Reference No. **0808** Project File No. **17/0654**

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A BELLMAN
Certification Manager

R S SINCLAIR
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

13 # Schedule

14 ## Certificate Number BAS02ATEX7203X – Issue 4

15 Description of Product

The Transformer Isolated Output Driver Type KFD2-CD-Ex1.32-** is designed to restrict the transfer of energy from unspecified non-hazardous area equipment to intrinsically safe converters located in a hazardous area and provides galvanic isolation between the hazardous area and non-hazardous area circuits.

The equipment comprises a number of electronic components, including transformers, fuses, resistors and zener diodes, all mounted on a single printed circuit board and housed within a plastic enclosure fitted with terminals for external connections.

The equipment has various options which are identified in the type name by the **. These options permit the unit to convert the input signal to output signal from current to current, current to voltage, voltage to current or voltage to voltage in any combination of voltage and current types i.e.

Output Current (= 0 to 8)**	**Output Voltage (** = 9 to 25)**
0-20mA	0-5V
4-20mA	1-5V
	0-10V
	2-10V

The segregation of the hazardous area circuits meets the requirements for 250V.

Input / Output Parameters
All types
Terminal 7 to 11 and Power Rail:

$U_m = 250V$

The equipment is designed to operate from a d.c. supply of up to 40V.

Type KFD2-CD-Ex1.32- (where ** = 0-8), Current Output**
Terminal 1 w.r.t 2:

$U_o = 25.2V$ $I_o = 93mA$ $P_o = 586mW$ $C_i = 0$ $L_i = 0$

The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the hazardous area load for either current or voltage types must not exceed the following values:

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR	L/R RATIO (µH/ohm)
IIC	0.107	4.11		60
IIB / IIIC	0.82	16.44		242
IIA	2.90	32.88		484
I	4.20	53.95		795

NOTE:
The above parameters apply when one of the two conditions below is given:
- 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 are reduced to 50% when both of the two conditions below are given:
- 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.

Note: the reduced capacitance of the external circuit (including cable) shall not be greater than 1µF for Groups I, IIA & IIB / IIIC and 600nF for Group IIC.

Type KFD2-CD-Ex1.32- (where ** = 9-25), Voltage Output**
Terminal 1 w.r.t 2:

U_o = 25.2V I_o = 95mA P_o = 590mW C_i = 0 L_i = 0

The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the hazardous area load for either current or voltage types must not exceed the following values:

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR	L/R RATIO (µH/ohm)
IIC	0.107	3.93		58
IIB / IIIC	0.82	15.75		232
IIA	2.90	31.51		464
I	4.20	51.70		762

NOTE:
The above parameters apply when one of the two conditions below is given:
- 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 are reduced to 50% when both of the two conditions below are given:
- 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.

Note: the reduced capacitance of the external circuit (including cable) shall not be greater than 1µF for Groups I, IIA & IIB / IIIC and 600nF for Group IIC.

16 Report Number

See Certificate History

17 Specific Conditions of Use

1. The safety device must be installed in a controlled environment with a pollution level limited to pollution degree 2 (or better) or be installed within an enclosure providing a degree of protection of at least IP54 according to EN 60529 & EN 60079-0; provision shall be made to ensure that the non-hazardous area connections are limited to overvoltage category II as defined in EN 60664-1.

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product:

Clause	Subject	Compliance
1.2.7	LVD type requirements	Manufacturer responsibility
1.2.8	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
1.4.1	External effects	User/Installer responsibility
1.4.2	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

New drawings submitted for this issue of certificate:

Number	Sheet	Issue	Date	Description
266-002BS-D	1 of 1	D	2017-Nov-06	Summary
266-002BS-01D	1 & 2	D	2017-Oct-30	Schematic
266-002BS-02D	1 – 6	D	2017-Nov-06	Safety Relevant Components
266-002BS-03D	1 of 1	D	2017-Sep-25	Component Overlay
266-002BS-05D	1 – 6	D	2017-Nov-06	Printed Circuit Board Details
266-002BS-06D	1 – 4	D	2017-Sep-11	Transformer Details
266-002BS-10D	1 – 3	D	2017-Feb-17	Type Labels
16-0706IE-04D	1 – 14	D	2016-Mar-30	Mechanical Parts

All drawings are common to and held with IECEx BAS 05.0041X.

20 Certificate History

Certificate No.	Date	Comments
BAS02ATEX7203	28 June 2002	The release of the prime certificate. The associated test and assessment is documented in Test Report 02(C)0139.
BAS02ATEX7203/1	21 December 2010	To permit: - Minor drawing and PCB layout changes - To confirm that the equipment covered by this certificate has been reviewed against the requirements of EN 60079-0:2006, and EN 60079-11:2007 in respect of the differences from EN 50014:1997 + Amds 1 & 2 and EN 50020:1994 and that none of these differences affect this equipment. - The equipment is also considered suitable for Group I applications and has additionally been assessed against the relevant requirements of EN 61241-11:2006 and the following additional marking may be applied: **Ex I (M1) [Ex ia] I** **Ex II (1)D [Ex iaD]** Report No. GB/BAS/ExTR10.0289/00. Project File No. 10/0767.
BAS02ATEX7203 Issue 2	28 April 2015	This issue incorporates previously issued primary and supplementary certificates into one certificate, permits changes to the transformer and confirms that the equipment covered by this certificate has been reviewed against the requirements of EN 60079-0:2012+A11:2013 and EN 60079-11:2012 in respect of the differences from EN 60079-0:2006 and EN 60079-11:2007 and that none of these differences, with the exception of marking, affect this equipment. The equipment is now marked: **Ex II (1)G [Ex ia Ga] IIC** **Ex II (1)D [Ex ia Da] IIIC** **Ex I (M1) [Ex ia Ma] I** Test Report No. GB/BAS/ExTR15.0023/00 Project File No. 15/0069.

Certificate No.	Date	Comments
BAS02ATEX7203 Issue 3	15 November 2016	To permit the use of alternative components, other minor drawing changes and correction of the drawings list. Test Report No. GB/BAS/ExTR16.0291/00. Project File No. 16/0060.
BAS02ATEX7203X Issue 4	25 June 2018	To permit minor changes to the transformer, the introduction of an alternative schematic and PCB layout (with two build options, *Construction 1 & Construction 2*) and updating of the parameters. The upper ambient temperature range has been extended to +70°C. A specific condition of use now applies that states that the safety device must be installed in a controlled environment with suitably reduced pollution levels. Test Report No. GB/BAS/ExTR17.0314/00. Project File No. 17/0654.
For drawings applicable to each issue, see original of that issue.		