

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 **Baseefa06ATEX0092X– Issue 4**
Number:

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: **Type KCD2-SR-Ex*.* Switch Amplifier**

5 Manufacturer: **Pepperl+Fuchs SE**

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

7 This re-issued certificate extends EC Type Examination Certificate No. Baseefa06ATEX0092 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 SGS Fimko Oy, Notified Body number 0598, 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 to the Directive.

8.1 The original certificate was issued by SGS Baseefa Ltd (UK Notified Body 1180). It, and any supplements previously issued by SGS Baseefa Ltd have been transferred to the supervision of SGS Fimko Oy (EU Notified Body 0598). The original certificate number is retained.

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 IEC 60079-0:2018 + AC2020 EN 60079-7:2015 + A1:2018 EN 60079-11:2012 EN IEC 60079-15:2019

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:

See Schedule

SGS Fimko Oy Customer Reference No. **0808**

Project File No. **20/0416**

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Authorised Signatory for SGS Fimko Oy

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Schedule

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Certificate Number Baseefa06ATEX0092X

15 Description of Product

The Type KCD2-SR-Ex*. * Switch Amplifier is designed as associated apparatus and can be installed in the non-hazardous area or in a Zone 2 hazardous area. The Switch Amplifiers transfer digital signals from the hazardous area to unspecified apparatus located in the non-hazardous area or Zone 2 hazardous area. The voltage and current passed further to the hazardous area are limited to intrinsically safe levels and have linear characteristics. Up to two hazardous area channels fitted are galvanically isolated from the non-hazardous area (Zone 2) circuit using transformers.

The Type KCD2-SR-Ex*. * Switch Amplifier comprise a number of electronic components, including isolating transformers, fuses, zener diodes and resistors all mounted on a single printed circuit board and housed in a plastic enclosure with polarised plug-in screw or spring (denoted with an “.SP” suffix) terminals for hazardous and non-hazardous area connections. The non-hazardous area connections are via relay contacts with configuration switches allowing the setting of the direction of operation and lead monitoring. LED indication is provided for power-on and channel status.

There are three models of the Type KCD2-SR-Ex*. * Switch Amplifier:

- Type KCD2-SR-Ex2(.SP) Two Channel Switch Amplifier,
- Type KCD2-SR-Ex1(.SP) Single Channel Amplifier and
- Type KCD2-SR-Ex1.LB(.SP) Single Channel Switch Amplifier.

The Types KCD2-SR-Ex1(.SP) & KCD2-SR-Ex1.LB(.SP) are depopulated versions of the Type KCD2-SR-Ex2(.SP) with only one hazardous area channel. The type code of KCD2-SR-Ex*. * Switch Amplifier may be followed by additional alphanumeric signs (e.g. -Y1) to indicate special version. This does not affect the type of protection.

The Type KCD2-SR-Ex*. * Switch Amplifier is marked as follows:

⊕ II 3 (1) G	Ex ec nC [ia Ga] IIC T4 Gc	(-40°C ≤ Ta ≤ +70°C)
⊕ II (1) D	[Ex ia Da] IIIC	(-40°C ≤ Ta ≤ +70°C)
⊕ I (M1)	[Ex ia Ma] I	(-40°C ≤ Ta ≤ +70°C)

Input/Output Parameters

Non-Hazardous Area (Zone 2) Terminals 9 & 10 and Power Rail Connections PR1 & PR2

$U_m = 253V$ r.m.s.

The circuit connected to non-hazardous area (Zone 2) terminals 9 & 10 or Power Rail Connections PR1 & PR2 is designed to operate from a d.c. supply voltage of 19-30V.

Non-Hazardous Area (Zone 2) Terminals 5 & 6 and 7 & 8

$U_m = 253V$ r.m.s.

For installation in non-hazardous area:

Non-hazardous area terminals 5 & 6 (Channel 1) and 7 & 8 (Channel 2) are connected to relay contacts which can switch up to 253V r.m.s & 2A r.m.s, 126.5V r.m.s. & 4A r.m.s. or 30Vdc & 2A dc.

For installation in a Zone 2 hazardous area:

Non-hazardous area terminals 5 & 6 (Channel 1) and 7 & 8 (Channel 2) are connected to relay contacts which can switch up to 50V r.m.s & 2A r.m.s, or 30Vdc & 2A dc.

Power Rail Connections PR4 (Fault Bus)

$U_m = 40V$ d.c.

The circuit connected to Power Rail Connection PR4 is designed to operate from a d.c. supply voltage up to 30V.

Hazardous Area Terminals 1 w.r.t. 2 (Channel 1) or
Hazardous Area Terminals 3 w.r.t. 4 (Channel 2 – KCD2-SR-Ex2 model only)

$$\begin{aligned} U_o &= 10.5V \\ I_o &= 13mA^* \\ P_o &= 34mW^* \\ C_i &= 0 \\ L_i &= 0 \end{aligned}$$

* Note:

I_o and P_o are changed to lower values with this issue.

KCD2-SR-Ex2*: The intrinsically safe input circuits are not galvanically isolated from each other. The non-intrinsically safe circuits are galvanically isolated from the intrinsically safe circuits.

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to output terminals of either channel must not exceed the following values:

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR	L/R RATIO ($\mu H/ohm$)
IIC	2.41	210		1000
IIB/IIIC	16.8	840		4100
IIA	75	1,000		8200
I	95	1,000		13600

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) \geq 1% of the L_o value and
- the total C_i of the external circuit (excluding the cable) \geq 1% of the C_o value.

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

Hazardous Area Terminals 1 & 3 w.r.t. 2 & 4 (Channel 1 and Channel 2)

$$\begin{aligned} U_o &= 10.5V \\ I_o &= 26mA \\ P_o &= 68mW \\ C_i &= 0 \\ L_i &= 0 \end{aligned}$$

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to output terminals of either channel must not exceed the following values:

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR	L/R RATIO ($\mu H/ohm$)
IIC	2.41	52		500
IIB/IIIC	16.8	210		2050
IIA	75	420		4100
I	95	500		6800

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) $\geq 1\%$ of the L_o value and
- the total C_i of the external circuit (excluding the cable) $\geq 1\%$ of the C_o value.

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

16 Report Number

See Certificate History

17 Specific Conditions of Use

For installation in non-hazardous area:

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

For installation in zone 2 hazardous area:

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

The device must be installed and operated only in surrounding enclosures that:

- comply with the requirements for surrounding enclosures according to IEC/EN 60079-0,
- are rated with the degree of protection IP54 according to IEC/EN 60529

Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.

Only use the DIP-switches when a potentially explosive atmosphere is not present.

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, and conformity is demonstrated in the report:

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
16-0533BS C	1 of 1	C	2021-Feb-03	Summary – KCD2-SR-Ex*
16-0533BS-00C	1 – 38	C	2020-Dec-18	Description – KCD2-SR-Ex*
16-0533BS-01C	1 & 2	C	2020-Jun-03	Schematic – KCD2-SR-(Ex)1(-)(Ex)2)(.LB)
16-0533BS-02C	1 & 2	C	2020-Dec-18	Bill of Materials – KCD2-SR-Ex*
16-0533BS-03C	1 of 1	C	2020-Jun-03	Assembly Drawing - KCD2-SR-((Ex)1)(-)(Ex)2)(.LB)(-*)
16-0533BS-05C	1 – 4	C	2020-Jun-03	PCB Layout – KCD2-SR-((Ex)1)(-)(Ex)2)(.LB)(-*)
16-0533BS-06C	1 – 3	C	2020-Jun-03	Transformer – KCD2-SR-Ex*
16-0533BS-09C	1 & 2	C	2020-Dec-18	Instructions – KCD2-SR-Ex*

Number	Sheet	Issue	Date	Description
16-0533BS-10C	1 of 1	C	2021-Feb-03	Type Label – KCD2-SR-Ex*
16-0533UL-04C	1 & 2	C	2020-Jun-03	Housing – KCD2-SR-Ex*

Current drawings which remain unaffected by this issue:

All drawings are replaced by those stated above.

All drawings are common to BAS21UKEX0011X and held with IECEx BAS 06.0025X.

20 Certificate History

Certificate No.	Date	Comments
Baseefa06ATEX0092	1 June 2006	The release of the prime certificate. The associated test and assessment against the requirements of EN 60079-0:2004, EN 50020:2002, EN 60079-26:2004, IEC 61241-0:2004 & EN 61241-11:2005 is documented in Test Report No. 05(C)0856/1. Project File No. 05/0856.
Baseefa06ATEX0092/1	29 November 2006	To permit minor transformer design changes. Project File No. 06/0971.
Baseefa06ATEX0092/2	1 March 2012	To permit the use of spring terminal plugs, these units are identified with a “.SP” suffix, and to additionally confirm that the equipment meets the requirements of EN 60079-0:2009 & EN 60079-11:2007. Report No. GB/BAS/ExTR12.0043/00. Project File No. 11/0857.
Baseefa06ATEX0092 Issue 3	5 March 2018	This issue of the certificate incorporates previously issued primary & supplementary certificates into one certificate and confirms the current design meets the requirements of EN 60079-0:2012+A11:2013 & EN 60079-11:2012. The equipment description has had minor changes and Group IIIC has also been added to the load parameter tables. Report No. GB/BAS/ExTR18.0047/00. Project File No. 17/0873.
Baseefa06ATEX0092 Issue 4	1 March 2021	This issue permits the introduction of an alternative schematic together with an alternative PCB layout, an increase in the upper ambient maximum to +70°C, confirms the current design meets the requirements of EN IEC 60079-0:2018 and additionally introduces Zone 2 certification (coded Ex ec nC [ia Ga] Gc). The new circuitry has resulted in a change to the terminal parameters; these new parameters are shown in the equipment description. The new design may also be used in zone 2 hazardous areas. Report No. GB/BAS/ExTR21.0032/00. Project File No. 20/0416.
For drawings applicable to each issue, see original of that issue.		