



Mining And Surface Certification (Pty) Ltd

2015/021934/07



Certificate Number: MASC MS/17-0861
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IA – CERTIFICATE

(Supplement 1 – Supplemented for revision as per ARP 0108)

IN TERMS OF REGULATION 21.17.2 OF THE MINERALS ACT (INCORPORATION THE MINE HEALTH AND SAFETY ACT) AND REGULATION 9 (1) OF THE ELECTRICAL MACHINERY REGULATIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT

Ex – Type Examination

Certificate number:

MASC MS/17-0861

Equipment:

Type KFD2-(S)CD2-Ex*.LK Transformer Isolated Driver

Serial No:

(See “Conditions of Certification”)

Requested by:

Pepperl+Fuchs (Pty) Ltd

Address:

1st fl Zerwick Forum
8 Glen Eagle Office Park
Cnr Monument Rd and Braambos St
Glen Erasmia, Kempton Park 1619
South Africa

Manufacturer:

Pepperl+Fuchs AG

Address:

Lilienthalstrasse 200
68307 Mannheim
Germany

DESCRIPTION:

The Type KFD2-SCD2-Ex*.LK Transformer Isolated Driver is a two-channel safety device designed to provide a galvanically isolated interface to enable the connection of equipment located in a hazardous area with equipment located in a non-hazardous area by providing galvanic isolation and limiting the voltage and current into the hazardous area to intrinsically safe levels.

The equipment comprises a number of electronics 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 following variants are covered by this certificate:

KFD2-SCD2-Ex1.LK(-Y*)

KFD2-SCD2-Ex2.LK(-Y*)

The safety devices are marked:

[Ex ia Ga] IIC (-40°C ≤ Ta ≤ +60°C/+70°C)

[Ex ia Da] IIIC (-40°C ≤ Ta ≤ +60°C/+70°C)

[Ex ia Ma] I (-40°C ≤ Ta ≤ +60°C/+70°C)

Ex ec IIC T4 Gc (-40°C ≤ Ta ≤ +60°C/+70°C)

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

/ Additional Information...

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Mining And Surface Certification (Pty) Ltd Reg No: 2015/021934/07

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Additional information:
Input / Output Parameters

Terminal 7 to 12, 14 & 15 and Power Rail terminals 1, 2 & 4:

KFD2-SCD2-Ex1.LK only: Terminal 7 to 9, 14 & 15 and Power Rail terminals 1, 2 & 4:

Um = 250V

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

KFD2-SCD2-Ex2.LK: Terminals 1, 2 & 3 (Ch 1) and 4, 5 & 6 (Ch 2):

KFD2-SCD2-Ex1.LK: Terminals 1, 2 & 3:

Uo = 25.2V Io = 93mA Po = 585.3mW Ci = 1.05nF Li = 0

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

GROUP	CAPACITANCE (μ F)	INDUCTANCE (mH)	L/R RATIO (μ H/ohm)
IIC	0.1059	4.11	60.7
IIB/IIIC	0.818	16.47	242.9
IIA	2.890	32.95	485.9
I	4.790	54.06	797.3

The above parameters apply when one of the two 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 two conditions below are given:

- the total Li of the external circuit (excluding the cable) \geq 1% of the Lo value and
- the total Co of the external circuit (excluding the cable) \geq 1% of the Co value.

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

This certificate also covers the installation of the Type KFD2-SCD2-Ex*.LK Transformer Isolated Driver in a Category 3 / Zone 2 location.

Electrical data (Ex ec)

Supply circuit:
(Terminals 14[+], 15[-] or
Power Rail contacts)

19 – 30Vdc

/ . Input...

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Input:

(Terminals 8 & 9 [+], 7[-]) 0/4-20mA signal (up to 30V max)
(Terminals 11 & 12 [+], 10[-]) 0/4-20mA signal (up to 30V max)

Output:

(Terminals 1[+], 2[-]) 0/4-20mA signal (100Ω-650Ω load)
(Terminals 4[+], 5[-]) 0/4-20mA signal (100Ω-650Ω load)
(Terminals 3[+], 2[-]) 0/4-20mA signal (0Ω-550Ω load)
(Terminals 6[+], 5[-]) 0/4-20mA signal (0Ω-550Ω load)
or
The maximum values for the intrinsically safe circuits have to be taken from the Ex ia Input / Output parameters above.

MARKING:

BASEEFA marking remains applicable. The following MASC Certificate number (IA number) must be additionally applied to the equipment.

IA No: MASC MS/17-0861

COMPLIANCE:

The equipment as described above and in MASC letter 17-0861 – R1 is hereby certified "Explosion Protected" [Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I (-20°C ≤ Ta ≤ +60°C) and is suitable for use in hazardous locations as stated below and as tested, assessed and inspected in accordance with the relevant requirements of SANS / IEC Standards:

The evaluation was conducted according to the requirements of:

- i) SANS (IEC) 60079-0 : 2019 "Explosive atmospheres – Part 0: Equipment — General requirements"
- ii) SANS (IEC) 60079-11 : 2012 "Explosive atmospheres – Part 11: Equipment protection by intrinsic safety 'i'"
- iii) SANS (IEC) 60079-7 : 2019 "Explosive atmospheres – Part 7: Equipment protection by increased safety 'e'"

			<i>/.</i> Location...
Location	Zone *0, 1 & 2 Zone *20, 21 & 22	Gas Surface / Mining (As Applicable) Dust (As Applicable)	
Hazard Frequency	---	Continuous as could occur under normal operating conditions in hazardous area (*Outputs only)	
Environment	Group I Group IIC Group IIIC	Methane and Coal dust (As Applicable) Propane to Hydrogen / Acetylene (As Applicable) Dust (Metallic & non-metallic) (As Applicable)	
Service/Ambient Temperature	-20°C to +60°C		

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The use of apparatus in hazardous locations is subject to the following provisions as applicable, which shall be adhered to:

- i. SANS 10086 requirements;
- ii. Any conditions mentioned in the above document;
- iii. Codes of Practice enforced in terms of Regulations 21.17.2 of Minerals Act, by Chief Inspector of Mines;
- iv. Any restrictions and conditions enforced by Chief Inspectors of Mines, Principal Inspector (Group I equipment) of Chief Inspector of Factories (Group II equipment);
- v. Any relevant requirements of the MHS Act or the OHS Act.

CONDITIONS OF MANUFACTURE:

- None

SPECIAL CONDITIONS OF USE (X):

- The safety device must be installed in a controlled environment with a pollution level limited to pollution degree 2 (or better) and be installed within an enclosure providing a degree of protection of at least IP54 according to IEC 60529 & IEC 600079-0; provision shall be made to ensure that the non-hazardous area connections is limited to overvoltage category I / II as defined in IEC 60664-1.

CONDITIONS OF CERTIFICATION:

1. This Certificate remains valid based of the QAR/QAN and no more than 3 years.
2. The apparatus must be additionally marked with the MASC marking details above.
3. This approval only covers the equipment as certified above and does not include any scheduled additions or variations / amendments / new issues to the certificate(s), made after the above date.
4. The equipment does not need to be re-tested when used on the conditions and with such restrictions as prescribed by BASEEFA and in this approval.
5. The BASEEFA certification must remain valid.
6. The extent of the requirements in the ARP 0108 (or regulations) and SANS 10108 on the certification of the equipment must remain unchanged.
7. The Ex quality assurance notification/report for the equipment must remain valid.



M. I. Gumede
TECHNICAL OFFICER



D. P. Visser
TECHNICAL SPECIALIST

Mining And Surface Certification

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*MASC takes no responsibility for any non-conformances, exclusions or any results / assessments not in compliance with the standards. By marking the equipment in accordance with the documentation / standard, the manufacturer attests on his own responsibility that the equipment has been constructed in accordance with the applicable requirements of the relevant standards and that the routine verifications and routine tests have been successfully completed and the product complies with the documentation and standard(s).
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