



Mining And Surface Certification (Pty) Ltd

2015/021934/07



Certificate Number: MASC MS/17-0870

Issue: 25 April 2017

Expire: 25 April 2020

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IA – CERTIFICATE

(Review required by MASC 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:

Equipment:

Serial No:

MASC MS/17-0870

Type KFD2-CD-Ex1.32-** Transformer Isolated Output Driver
(See “Conditions of Certification”)

Requested by:

Address:

Pepperl+Fuchs (Pty) Ltd
1st fl Zerwick Forum
8 Glen Eagle Office Park
Cnr Monument Rd and Braambos St
Glen Erasmia, Kempton Park 1619
South Africa

Manufacturer:

Address:

Pepperl+Fuchs GmbH
Lilienthalstrasse 200
68307 Mannheim
Germany

DESCRIPTION:

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

The Type KFD2-CD-Ex1.32-** Transformer Isolated Output Driver comprises a number of electrical components, including isolating transformers, fuses, resistors and zener diodes all mounted onto a single printed circuit board (PCB) and housed within a plastic enclosure with plug-in terminals.

The apparatus comes in various options which are identified by the **.

The option permits 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 the following voltage and current type:-

Output Current (** = 0 to 8): 0-20mA & 4-20mA

Output Voltage (** = 9 to 25): 0-5V, 1-5V, 0-10V & 2-10V

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

Terminals 7,8,9,10 & 11 and Power Rail Connector

U_m = 253V

/ . The apparatus...

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

Directors: Roelof Viljoen & Francois du Toit

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

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The apparatus is designed to operate from a d.c. supply voltage of up to 35V.

Type KFD2-CD-Ex1.32-** - (where ** = 0 to 8) Current Output Version
Terminals 1 & 2

$U_o = 25.2V$
 $I_o = 93mA$
 $P_o = 0.586W$
 $C_i = 0$
 $L_i = 0$

Type KFD2-CD-Ex1.32-** - (where ** = 9 to 25) Voltage Output Version
Terminals 1 & 2

$U_o = 25.2V$
 $I_o = 95mA$
 $P_o = 0.586W$
 $C_i = 0$
 $L_i = 0$

The capacitance and either the inductance or the inductance to resistance ratio (L_o/R_o) of the load connected to the output terminals 1 and 2 (for either current or voltage versions) must not exceed the following values:

GROUP	CAPACITANCE in μF	INDUCTANCE in mH	OR	L/R RATIO in $\mu H/\Omega$
IIC	0.107	4.12		59
IIB	0.82	17.04		237
IIA	2.90	34.58		475
I	4.2	26		779

Note: The above load parameters apply where:

1. The external circuit contains no combined lumped inductance L_i and capacitance C_i greater than 1% of the above values.
- or 2. The inductance and capacitance are distributed as in a cable.
- or 3. The external circuit contains only lumped inductance or only lumped capacitance in combination with a cable.

In all other situations, e.g. the external circuit contains combined lumped inductance and capacitance, up to 50% of each of the L and C values is allowed.

MARKING:

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

IA No: MASC MS/17-0870

/ . COMPLIANCE...

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COMPLIANCE:

The equipment as described above and in MASC letter 17-0870 is hereby certified "Explosion Protected" [Ex ia Ga] IIC, [Ex ia Da] IIC , [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 : 2012 "Explosive atmospheres – Part 0: Equipment — General requirements"
- ii) SANS (IEC) 60079-11 : 2012 "Explosive atmospheres – Part 11: Equipment protection by intrinsic safety 'i'"

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	

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):

- None

/ . CONDITIONS...

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CONDITIONS OF CERTIFICATION:

1. This Certificate remains valid based on a three yearly review covered by an official MASC letter.
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 SGS and in this approval.
5. The SGS 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.



**A. Koekemoer
TECHNICAL SPECIALIST**



**F du Toit
TECHNICAL SPECIALIST**

Mining And Surface Certification

This document is issued based on Mining And Surface Certification's Standard Contract terms and conditions available on request.

While every endeavour is made to ensure that a test / assessment is representative and accurately performed, and that a report is accurate in the quoted results and conclusions drawn from the test / assessment, MASC or its members/employees shall in no way be liable for any error made in carrying out the test / assessment or for any erroneous statement, whether in fact or in opinion, contained in a report issued pursuant to a test / assessment.

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).

This document is only for use and application in South Africa. It is issued based on National interpretations and accepted practises.

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