



Mining And Surface Certification (Pty) Ltd

2015/021934/07



Certificate Number: MASC MS/17-0877

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IA – CERTIFICATE

(Supplement 2 – 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:

Equipment:

Serial No:

Requested by:

Address:

Manufacturer:

Address:

MASC MS/17-0877

Transformer Isolated Repeater / Power Supply

Type KFD2-VR4-Ex1.26

(See “Conditions of Certification”)

Pepperl+Fuchs (Pty) Ltd

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8 Glen Eagle Office Park

Cnr Monument Rd and Braambos St

Glen Erasmia, Kempton Park 1619

South Africa

Pepperl+Fuchs SE

Lilienthalstrasse 200

68307 Mannheim

Germany

DESCRIPTION:

The Transformer Isolated Repeater / Power Supply Type KFD2-VR4-Ex1.26 is designed to restrict the transfer of energy from unspecified non-hazardous area apparatus to intrinsically safe vibration sensors located in the hazardous area, and provide galvanic isolation between the hazardous and non-hazardous area circuits.

The Transformer Isolated Repeater / Power Supply Type KFD2-VR4-Ex1.26 comprises a number of electronic components, including isolating transformers, fuses, resistors and zener diodes all mounted on a single printed circuit board (PCB) and housed within a plastic enclosure with plug-in terminals.

The apparatus provides a floating output to power a vibration sensor or an accelerometer in a hazardous area, and transfers the signal from the sensor to the non-hazardous area.

The screw terminals and the plugs and sockets are numbered and color coded to make incorrect connections improbable.

Type KFD2-VR4-Ex1.26 Transformer Isolated Repeater / Power Supply
Non-Hazardous Area Terminals 7, 8, 11 & 12 and Power Rail Connector

U_m = 250V

/ The apparatus...

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

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The apparatus is designed to operate from a d.c. supply of up to 40V on the above terminals.

Hazardous Area Terminals

U_o = -26.4V C_i = 0
 I_o = 90mA L_i = 0
 P_o = 0.57W

Hazardous Area Terminals 5, 3, 1 w.r.t. 4 & Terminals 6, 2 w.r.t. 4:

U_o = -25.2V C_i = 0
 I_o = 90mA L_i = 0
 P_o = 0.57W

Hazardous Area Terminals 2, 6 wrt 4

U_o = 1.2V C_i = 0
 I_o = 0.12mA L_i = 0
 P_o = 0.036mW

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

Hazardous Area Terminals 1, 3, 5 wrt 4

(Alternatively, all hazardous area terminals combined)

GROUP	CAPACITANCE in μF	INDUCTANCE in mH	OR	L/R RATIO in $\mu\text{H}/\Omega$
IIC	0.096	4.59		59
IIB	0.74	18.82		239
IIA	2.48	38.36		478
I	3.95	54.95		785

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 Group IIB and 600nF for Group IIC.

Hazardous Area terminals 2, 6 wrt 4

GROUP	CAPACITANCE in μF	INDUCTANCE in mH	OR	L/R RATIO in $\mu\text{H}/\Omega$
IIC	100	1000		1000
IIB	1000	1000		1000
IIA	1000	1000		1000
I	1000	1000		1000

/. The above...

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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 $1\mu F$ for Group IIB and $600nF$ for Group IIC.

MARKING:

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

IA No: MASC MS/17-0877

COMPLIANCE:

The equipment as described above and in MASC letter 17-0877 – R2 is hereby certified “Explosion Protected” [Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I $-20^{\circ}C \leq T_a \leq +60^{\circ}C$ 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	$-20^{\circ}C$ to $+60^{\circ}C$	

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...

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SPECIAL CONDITIONS OF USE (X):

- None

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 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.



S. Jordaan
TECHNICAL SPECIALIST



C. Welthagen
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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