



Mining And Surface Certification (Pty) Ltd

2015/021934/07



Issue Date: 02 May 2018
Expiry Date: 02 May 2021

IA Certificate Number: **MASC MS/18-0958**
Our ref: 18-0958

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IA – CERTIFICATE

(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)

Galvanically Isolated Barrier types KCD2-STC-Ex1.(SP) and KCD2-SCD-Ex1.(SP)

This document is based on and must be read in conjunction with IECEx CES 06.0001 certificate. Further to your request, we have evaluated the supplied documentation.

The following is applicable:

Description	Detail
Requested By :	Pepperl+Fuchs (Pty) Ltd 1st fl Zerwick Forum, Glen Eagle Office Park, Cnr Monument Rd and Braambos St, Glen Erasmia, Kempton Park 1619, South Africa
Equipment :	Galvanically Isolated Barrier
Manufacturer :	Pepperl+Fuchs GmbH Lilienthalstraße 200, 68307 Mannheim , Germany
Additional Manufacturing location:	Pepperl + Fuchs PTE Ltd P + F Building, 18 Ayer Rajah Crescent, Singapore 139942, Singapore
Model(s) / Type(s) :	KCD2-STC-Ex1.(SP) and KCD2-SCD-Ex1.(SP)
Rating :	[Ex ia Ma] I [Ex ia Ga] IIC [Ex ia Da] IIIC
Certification body :	Centro Elettrotecnico Sperimentale Italiano S.p.A. (CESI)
Type Certificate No :	IECEx CES 06.0001
Variations/Issue/Amendment :	1
Assessment Report No :	IT/CES/ExTR06.0001/01 IT/CES/ExTR06.0001/02
Quality Assurance report (QAR) / Notification (QAN) :	DE/PTB/QAR06.0007/04 DE/PTB/QAR06.0008/08

Standards:	- IEC 60079-0	(2007)	“General requirements”
	- IEC 60079-11	(2006)	“Equipment protection by intrinsic safety ‘i’”
	- IEC 60079-26	(2006)	“Equipment with equipment protection level (EPL) Ga”
	- IEC 61241-11	(2005)	“Protection by intrinsic safety ‘iD’”

/. The evaluation...

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The evaluation was conducted according to the requirements of:

- **SANS (IEC) 60079-0 : 2009 “Explosive atmospheres – Part 0: Equipment — General requirements”**
- **SANS (IEC) 60079-11 : 2007 “Explosive atmospheres – Part 11: Equipment protection by intrinsic safety ‘i’”**
- **SANS (IEC) 60079-26 : 2007 “Explosive atmospheres – Part 26: Equipment with equipment protection level (EPL) Ga”**
- **SANS (IEC) 61241-11 : 2007 “Electrical apparatus for use in the presence of combustible dust – Part 11: Protection by intrinsic safety ‘iD’”**

COMPLIANCE:

The equipment as described below is hereby certified “Explosion Protected” “[Ex ia Ma] I, [Ex ia Ga] IIC, [Ex ia Da] IIIC” 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:

Location	Zone *0, 1 & 2	Gas Surface / Mining (Underground)
Hazard Frequency	---	Intermittent as could occur under normal operating conditions in hazardous area (*Outputs only)
Environment	Group I Group IIC Group IIIC	Methane and coal dust Propane to Hydrogen/Acetylene Conductive dust
Service/Ambient Temperature	(-20°C ≤ Ta ≤ +60°C)	

DESCRIPTION OF EQUIPMENT (According to CESI Certificate):

The SMART transmitter power supply KCD2-STC-Ex1 and SMART repeater KCD2-SCD-Ex1 are associated apparatus according to IEC 60079-11. The SMART transmitter power supply KCD2-STC-Ex1 provides SMART transmitters with power in field (hazardous) area and transfers the 4mA ... 20mA (or proportional 1V ... 5V) analogue values in the control (safe) area up to 375Vdc. The SMART transmitter power supply KCD2-STC-Ex1 can profit of a separate input to passively sense a 4mA ... 20mA signal coming from an active source and transfer it to the safe area. Only one input at time must be used. On both configurations digital signals may be superimposed on the analogue values in the field (hazardous) or control (safe) area and may be transferred in both directions.

Electrical characteristics of module

Non intrinsically safe circuits

- U_m: 250 V_{rms}
- T_{amb}: -20°C ≤ T_a ≤ +60°C
- Rated voltage U_n: (19 ÷ 30 Vdc)
 - either on supply voltage pull out connector or on Power-Rail (collective power distribution system on DIN rail).

The galvanically isolated barrier **KC..** series (KCD2-**STC**-Ex1, KCD2-**STC**-Ex1.SP, KCD2-**SCD**-Ex1 and KCD2-**SCD**-Ex1.SP) is a group of associated apparatus suitable to interface intrinsic safety apparatus placed in hazardous area.

The modules KCD2-**STC**-.. are suitable to supply 4 ÷ 20mA SMART transmitter and the modules KCD2-**SCD**-.. are suitable to drive 4 ÷ 20mA I/P devices (current to pressure converter).

/. Each module...

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Each module is mounted inside a plastic housing (IP20) and it is fitted with terminal blocks for electrical connections as:

- KCD2-**STC**-Ex1 and KCD2-**SCD**-Ex1 modules are equipped with screw terminal blocks;
- KCD2-**STC**-Ex1.SP and KCD2-**SCD**-Ex1.SP modules (new version) equipped with spring terminal blocks

Electrical characteristic

Non-intrinsically safe circuits (SL1 connector)

- U_m : 250Vac Supply rated voltage U_n : 19 ÷ 30Vdc
- T_{amb} : $-20^{\circ}C \leq T_a \leq +60^{\circ}C$

Intrinsically safe circuits barrier **KCD2-STC-..** and **KCD2-SCD-..**

Terminals	U_o	I_o	P_o	Group of Gas	C_o (μF)	L_o (mH)	L_o/R_o (μH/Ω)
1(+); 2(-)	25,2V	100mA	630mW	IIC	0.1	3.5	55
				IIB	0.81	14	222
				IIA	2.8	28	444
				I	4.14	46	743

$C_i = 5.7nF$ $L_i =$ negligible Output characteristic: linear.

Intrinsically safe circuits barrier **KCD2-STC-Ex1** and **KCD2-STC-Ex1.SP** only

Terminals	U_o	I_o	P_o	Group of Gas	C_o (μF)	L_o (mH)	L_o/R_o (μH/Ω)
	U_i	I_i					
3(+); 4(-)	7.2V	100mA	25mW	IIC	13.49	3.5	27
				IIB	239	14	108
	30V	128ma		IIA	1000	28	216
				I	1000	46	356

$C_i = 5.7nF$ $L_i =$ negligible Output characteristic: linear + diodes blocking

The intrinsically safe systems shall be realized according to IEC(SANS) 60079-25 standard. The interconnection with active intrinsically safe transmitters must also respect the output parameters of these transmitters.

Note (1) - Circuits with both inductance and capacitance

The above maximum C_o and L_o parameters apply where:

- the total inductance or capacitance of the external circuit (combined with C and L respectively) is less than 1% of the above values (cable excluded);

or - the inductance and capacitance are distributed as in a cable.

In all other situations e.g. the external circuit contains combined inductance and capacitance, where both are greater than 1% of the allowed value (excluding the cable), allow up to 50% of each of the L and C values as applicable

/. Note (2)...

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Note (2) - Dust protection

The barriers **KCD2-STC-..** and **KCD2-SCD-..** meets the spark ignition energy level requirements for Groups IIC or IIB apparatus.

MARKING:

CESI marking remains applicable and the marking for the relevant models will be as above. The following MASC Certificate number (IA number) must be additionally applied to the equipment.

IA No: MASC MS/18-0958

CONDITIONS OF MANUFACTURE:

- None

SPECIAL CONDITIONS OF USE (X):

- None

CONDITIONS OF CERTIFICATION:

1. This IA Certificate covers all units sold from the date of this document to 02 May 2021.
2. As per ARP 0108 a three yearly review is required on this IA Certificate.
3. The apparatus must be additionally marked with the MASC marking details above.
4. 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.
5. The equipment does not need to be re-tested when used on the conditions and with such restrictions as prescribed by CESI and in this approval.
6. The CESI certification must remain valid.
7. The extent of the requirements in the ARP 0108 (or regulations) and SANS 10108 on the certification of the equipment must remain unchanged.
8. The Ex quality assurance notification/report for the equipment must remain valid.

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.

/ . CONCLUSION...

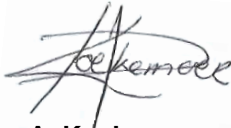
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CONCLUSION:

From the above and the selective examination of the documentation, nothing contrary to the requirements of the applicable standards was found, provided that the equipment / component is used as described in the above document / certificate and according to the MASC conditions below. A MASC IA certificate is issued based on the work done by CESI.

The routine tests for production units according to the CESI Certificate must be complied with (if applicable).

Yours faithfully



A. Koekemoer
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).

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