

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

ANZEx Scheme

Certificate of Conformity

Certificate No: **ANZEx 13.2004** Issue: **0 25 February 2013** Original Issue

Applicant: **Pepperl+Fuchs GmbH**
Lilienthalstrasse 200
68307 Mannheim
GERMANY

Electrical Equipment: **KFD2-STC(V)4-Ex1(.2O)...**
Smart Transmitter Isolator

Type of Protection and Marking Code: **[Ex ia Ma] I**
-20 °C ≤ Ta ≤ +60 °C
ANZEx 13.2004

Manufactured by: **Pepperl+Fuchs GmbH** **Pepperl+Fuchs Pte Ltd**
Lilienthalstrasse 200 **P+F Building**
68307 Mannheim **18 Ayer Rajah Crescent**
GERMANY **SINGAPORE 139942**

The certification database located at <http://www.anzex.com.au> shows the currency of this certificate.

Issued by:



Safety in Mines, Testing and Research Station
2 Smith Street, REDBANK QLD 4301, Australia
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www.jas-anz.org/register

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This certificate is granted subject to the conditions as set out in Standards Australia/Standards New Zealand P-008 Ex Mark Management Committee Publication MP87.1.

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0: 2007 **Explosive atmospheres**
Part 0: Equipment – General requirements

IEC 60079-11: 2006 **Explosive atmospheres**
Part 11: Equipment protection by intrinsic safety “i”

This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.

The equipment listed has successfully met the examination and test requirements as recorded in

Test Report No. and Issuing Body: **UK/BAS/03/1051, UK/BAS/04/0566, GB/BAS/ExTR06.0084/00, GB/BAS/ExTR08.0046/00, GB/BAS/ExTR10.0301/00; Baseefa NI13/0002; Simtars**

Quality Assessment Report No. and Issuing Body: **DE/PTB/QAR06.0007, DE/PTB/QAR06.0008; PTB**

File Reference: **12/0126**



Signed for and on behalf of issuing authority

Principal Engineer - Certification
Engineering, Testing and Certification Centre

Position

25 February 2013

Date of issue

This certificate is not transferable, remains the property of the issuing body and must be returned in the event of its being revoked or not renewed.

Certificate No: ANZEx 13.2004 Issue: 0

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Equipment:

The KFD2-STC(V)4-Ex1(.2O)... Smart Transmitter Isolator is designed to provide galvanic isolation between intrinsically safe circuits in a hazardous area and circuits in a safe area and limit voltage and current into the hazardous area to intrinsically safe levels.

The apparatus comprises a number of electrical 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 use of 'C' or 'V' in the type description specifies Current source / sink or Voltage respectively.

Options following 'Ex1' in the type description are:

- .2O (Dual non-hazardous area output)
- Y... (Current sink - used with 'C')
- 1 (5 Volt - used with 'V')
- 2 (10 Volt - used with 'V')

The apparatus is designed to operate from a DC supply of up to 35V on terminals 7 to 12, 14 and 15, and power rail connector terminals 1 and 2. The segregation of the hazardous area circuits meets the requirements for 250V.

Drawings:

Drawing No.	Drawing Title	Revision No.	Drawn/ Revision Date
266-014BS-01S (4 Sheets)	Schematic KFD2-CR4-Ex1(.2O)... KFD2-STC(V)4-Ex1(.2O)...	S	2010-Oct-14
266-014BS-02A (9 Sheets)	Components KFD2-CR4-Ex1(.2O)... & KFD2-STC(V)4-Ex1(.2O)(.H)...	A	2006-May-15

(Drawing list continued next page)

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Drawing No.	Drawing Title	Revision No.	Drawn/ Revision Date
266-014BS-03S (Sheet 1 of 2)	Assembly –top KFD2-CR4-Ex1(.2O)... KFD2-STC(V)4-Ex1(.2O)...	S	2010-Oct-14
266-014BS-03S (Sheet 2 of 2)	Assembly –bottom KFD2-CR4-Ex1(.2O)... KFD2-STC(V)4-Ex1(.2O)...	S	2010-Oct-14
266-014BS-04S (Sheets 1 and 2 of 14)	Moulded Transformer Housing KFD2-CR4-Ex1(.2O)... KFD2-STC(V)4-Ex1(.2O)(.H)...	S	2010-Oct-14
266-014BS-04S (Sheets 3 and 4 of 14)	Toroidal Housing KFD2-CR4-Ex1(.2O)... KFD2-STC(V)4-Ex1(.2O)(.H)...	S	2010-Oct-14
266-014BS-04S (Sheets 5 to 14 of 14)	KF – Housing 15 Term. KFD2-CR4-Ex1(.2O)... KFD2-STC(V)4-Ex1(.2O)(.H)...	S	2010-Oct-14
266-014BS-05S (Sheets 1 to 5 of 8)	Main Printed Circuit Board KFD2-CR4-Ex1(.2O)... KFD2-STC(V)4-Ex1(.2O)(.H)...	S	2010-Oct-14
266-014BS-05S (Sheet 6 of 8)	Transformer mounting plinth PCB KFD2-CR4-Ex1(.2O)... KFD2-STC(V)4-Ex1(.2O)(.H)...	S	2010-Oct-14
266-014BS-05S (Sheet 7 of 8)	Zener diode 6-way array PCB KFD2-CR4-Ex1(.2O)... KFD2-STC(V)4-Ex1(.2O)(.H)...	S	2010-Oct-14
266-014BS-05S (Sheet 8 of 8)	Zener diode 4-way array PCB KFD2-CR4-Ex1(.2O)... KFD2-STC(V)4-Ex1(.2O)(.H)...	S	2010-Oct-14
266-014BS-06S (Sheets 1 and 2 of 6)	Transformer details for T101 & T201 KFD2-CR4-Ex1(.2O)... KFD2-STC(V)4-Ex1(.2O)...	S	2010-Oct-14

(Drawing list continued next page)

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Drawing No.	Drawing Title	Revision No.	Drawn/ Revision Date
266-014BS-06S (Sheets 3 and 4 of 6)	Transformer details for T102 & 202 KFD2-CR4-Ex1.2O... KFD2-STC(V)4-Ex1.2O...	S	2010-Oct-14
266-014BS-06S (Sheets 5 and 6 of 6)	Transformer details for T102 KFD2-CR4-Ex1 KFD2-STC(V)4-Ex1	S	2010-Oct-14
266-014BS-07S (2 Sheets)	Printed Circuit Board Lacquering details KFD2-CR4-Ex1(.2O)... & KFD2-STC(V)4-Ex1(.2O)(.H)...	S	2010-Oct-14
266-0014SI-10 (2 Sheets)	Type Label KFD2-STC(V)4-Ex1(.2)(.H)...	-	2013-Feb-20

Additional Information:

The following entity parameters shall be observed:

Type KFD2-STC(V)4-Ex1. and Type KFD2-STC(V)4-Ex1.2O

For terminals 7 to 12, 14 and 15, and power rail terminals 1 & 2:
 $U_m = 250V$

For Terminals 1 and 3:
 $U_o = 25.4V$ $I_o = 86.8mA$ $P_o = 551mW$ $C_i = 12nF$ $L_i = 0$

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 (μF)	Inductance (mH)	or	L/R Ratio ($\mu H/\Omega$)
I	4.3	29		833

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For Terminals 3 and 2 (& 5):

$U_o = 3.5V$ $I_o = 74mA$ $P_o = 64mW$ $U_i = 30V$ $I_i = 115mA$ $C_i = 0$ $L_i = 0$

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 (μF)	Inductance (mH)	or	L/R Ratio ($\mu H/\Omega$)
I	1000	42		7207

For Terminals 1, 2 (& 5) and 3:

$U_o = 25.4V$ $I_o = 115mA$ $P_o = 0.584W$ $C_i = 12nF$ $L_i = 0$

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 (μF)	Inductance (mH)	or	L/R Ratio ($\mu H/\Omega$)
I	4.3	17		639

For Terminals 6 and 5 (&2):

$U_o = 8.7V$ $I_o = 0$ $C_o = 5.9\mu F$ $U_i = 30V$ $I_i = 115mA$ $C_i = 0$ $L_i = 0$

Type KFD2-STC4-Ex1.H and Type KFD2-STC4-Ex1.20.H

For terminals 7 to 12, 14 and 15, and power rail terminals 1 & 2:

$U_m = 250V$

For Terminals 1 and 3:

$U_o = 27.2V$ $I_o = 93mA$ $P_o = 0.632W$ $C_i = 12nF$ $L_i = 0$

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 (μF)	Inductance (mH)	or	L/R Ratio ($\mu H/\Omega$)
I	4.0	51.9		687

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For Terminals 3 and 2 (& 5):

$U_o = 3.5V$ $I_o = 73mA$ $P_o = 64mW$ $U_i = 30V$ $I_i = 117mA$ $C_i = 0$ $L_i = 0$

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 (μF)	Inductance (mH)	or	L/R Ratio ($\mu H/\Omega$)
I	1000	42		7207

For Terminals 1, 2 (& 5) and 3:

$U_o = 27.2V$ $I_o = 117mA$ $P_o = 0.639W$ $C_i = 12nF$ $L_i = 0$

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 (μF)	Inductance (mH)	or	L/R Ratio ($\mu H/\Omega$)
I	4.0	30		409

For Terminals 6 and 5 (&2):

$U_o = 8.7V$ $I_o = 0$ $C_o = 5.9\mu F$ $U_i = 30V$ $I_i = 117mA$ $C_i = 0$ $L_i = 0$

Notes:

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

Routine testing of the transformer shall be carried out in accordance with clause 11.2 of IEC 60079-11: 2006.

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