

Certification of

EXPLOSION PROTECTED ELECTRICAL EQUIPMENT

AUSEx Scheme

This certificate is granted subject to the conditions as set out in Standards Australia Miscellaneous Publication MP 69 and the Procedure (Doc Q7134) of the scheme.

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

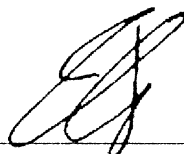
- | | |
|-------------------------|--|
| AS 2380.1 - 1989 | Electrical equipment for explosive atmospheres – Explosion-protection techniques
Part 1: General requirements (Including Amendment 1, 1998) |
| AS 2380.7 - 1987 | Electrical equipment for explosive atmospheres – Explosion-protection techniques
Part 7: Intrinsic safety i |

This certificate does not ensure compliance with electrical safety and performance requirements other than those included in the standards listed above.

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

Test Report No: **NI04/0019**

File Reference: **04/0183**



Signed for and on behalf of issuing authority

Manager
Engineering, Testing and Certification Centre
Position

10 December 2004

Date of issue

This certificate and schedule may not be reproduced except in full

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: Ex 2244X Issue: 2

Issued by:



Simtars
Queensland Government

Department of Resources and
Natural Resources and Mines

Engineering, Testing and Certification Centre
2 Smith Street, REDBANK QLD 4301, Australia
Postal Address: PO Box 467, GOODNA QLD 4300, Australia
Phone: + 61 7 3810 6381 Fax: + 61 7 3810 6366

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Schedule

Equipment:

The K...-Series Isolated Switch Amplifiers are designed to be mounted in a safe area to transfer signals out of a hazardous area. The apparatus is DC powered with single and dual channel inputs from the hazardous area and either one or two relay outputs to the safe area. Isolation is achieved through the use of an infallible transformer and either optical coupling devices for the ..Ex2.2S model or relays for the other models.

Table 1 lists models in the series, which differ primarily in the number of channels:

Table 1: K... - Series Isolated Switch Amplifiers

Model Number	I.S. Output Channels	Relay Outputs
KFD2-SR2-Ex1.W	1	1
KFD2-SR2-Ex1.W LB	1	2
KFD2-SR2-Ex2.W	2	2
KFD2-SR2-Ex2.2S	2	2
*KFD2-SR2-Ex2.W.SM	2	2

*Model included in this supplementary certificate

This supplementary certificate covers the following modifications to the equipment:

- Addition of two optional optical coupling devices for use in all models
- Addition of a new model KFD2-SR2-Ex2.W.SM which is identical to the KFD2-SR2-Ex2.W except for updated firmware
- Addition of Group IIA and IIB entity parameters (refer Table 3) for all models

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Addendum to Certificate No. Ex 2244X

Issue: 2

Date of Issue: 10 December 2004

Drawings:

Drawings associated with this supplementary issue of the certificate:

Drawing No.	Drawing Title	Revision No.	Drawn/ Revision Date
16-493SA-01B (Sheets 1 and 2 of 2)	Schematic K'D'-SR'-Ex' W.' Version 2	-	2004-July-05
16-493SA-02B	Relevant Components K'D'-SR'-Ex' W.'	-	2004-July-05
16-493SA-03B (Sheet 1 of 2)	Component Set Up K'D'-SR'-Ex' W.' Version 1 side B	-	2004-July-05
16-493SA-03B (Sheet 2 of 2)	Component Set Up K'D'-SR'-Ex' W.' Version 2 side B	-	2004-July-05
16-493SA-04B (Sheet 1 of 2)	Mechanical drawing Optocoupler Inner housing	-	2004-Jul-05
16-493SA-04B (Sheet 2 of 2)	Mechanical drawing Optocoupler Outer housing	-	2004-Jul-05
16-493SA-05B (Sheet 1 of 4)	Layout K'D'-SR'-Ex' W.' TOP	-	2004-July-05
16-493SA-05B (Sheet 2 of 4)	Layout K'D'-SR'-Ex' W.' Bottom	-	2004-July-05
16-493SA-05B (Sheet 3 of 4)	Layout K'D'-SR'-Ex' W.' TOP side no solder resist lacquer	-	2004-July-05
16-493SA-05B (Sheet 4 of 4)	Layout K'D'-SR'-Ex' W.' BOTTOM side no solder resist lacquer	-	2004-July-05
16-493SA-07B	Assembly Optocoupler	-	2004-Jul-05
16-493SA-10B (Sheets 1 and 2 of 2)	type label KFD2-SRS-Ex2 W.SM	-	2004-Dec-07

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Addendum to Certificate No.: Ex 2244X
 Issue 2
 Date of Issue 10 December 2004

Drawings associated with Issue 1 of the certificate:

Drawing No.	Drawing Title	Revision No.	Drawn/ Revision Date
16-315SA-07A (Sheet 1 of 5)	1. Supplement KFD2-SR2-Ex*.*	-	05.03.02
16-315SA-07A (Sheets 2 to 5 of 5)	Erganzung für Australien K*D*-SR*-Ex*.W*	-	05.03.02
16-315SA-08	ATEX - Antragszeichnung KFD2-SR2-EX*.* IS-block Diagram	-	14.03.01
16-315SA-09 (Sheets 1 and 2 of 2)	ATEX - Antragszeichnung KFD2-SR2-Ex*.* Schematics	-	14.03.01
16-315PT-10	ATEX - Antragszeichnung KFD2-SR2-Ex*.* Assembly drawing side B	-	9/2/01
16-315PT-11 (Sheet 1 of 2)	ATEX - Antragszeichnung KFD2-SR2-Ex*.* Copper layout side B	-	9/2/01
16-315PT-11 (Sheet 2 of 2)	ATEX - Antragszeichnung KFD2-SR2-Ex*.* Copper layout side A	-	-
16-333SA-07A (Sheets 1 to 4 of 4)	1. Supplement KFD2-SR2-Ex2.2S	-	05.03.02
16-333SA-08	ATEX - Antragszeichnung KFD2-SR2-EX2.2S IS-block Diagram	-	14.03.01
16-333SA-09 (Sheets 1 and 2 of 2)	ATEX - Antragszeichnung KFD2-SR2-Ex2.2S Schematics	-	14.03.01
16-333PT-10	ATEX - Antragszeichnung KFD2-SR2-Ex2.2S Assembly drawing side B	-	9/2/01

(Drawing list continued next page)

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Drawing No.	Drawing Title	Revision No.	Drawn/ Revision Date
16-333PT-11 (Sheet 1 of 2)	ATEX - Antragszeichnung KFD2-SR2-Ex2.2S Copper layout side B	-	9/2/01
16-333PT-11 (Sheet 2 of 2)	ATEX - Antragszeichnung KFD2-SR2-Ex2.2S Copper layout side A	-	-
16-345-11 (Sheet 1 of 8)	Antragszeichnung Approval Drawing Gehäuse KF -15pol. symm. Housing KF -15pol.symm. Mit Trennsteg / with sepection bar	-	12.08.99
16-345-11 (Sheets 2 to 8 of 8)	Antragszeichnung Approval Drawing Gehäuse KF -15pol. symm. Housing KF -15pol.symm. Mit Trennsteg / with sepection bar	-	-
04-9709 Ind. A (Sheet 1 of 2)	Bez.: Layoutvorlage Typ: KH/KF 2/3 links	A	18.11.96
04-9709 Ind. A (Sheet 2 of 2)	Bez.: Bohrplan und Umriss B-Seite Typ: K	A	18.11.96
16-315SA-10	Typelabel Example - SAA Approval K***-SR2-***	-	2002-May-17

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Issue: 2

Date of Issue: 10 December 2004

Drawings associated with the original issue of the certificate:

Drawing No.	Drawing Title	Revision No.	Drawn/ Revision Date
16-219PT-27 (2 Sheets)	1.Nachtrag zu Ex-94.C.2086 KHD.....Ex..W..	-	25.01.95
16-219PT-32 (2 Sheets)	1 Nachtrag zu Ex-94.C.2086 Trennschaltverstärker KHD.....Ex..W..	-	26.01.95
16-219PT-33 (2 Sheets)	1.Nachtrag zu Ex-92.C.2086 KHD.....Ex..W..	-	26.01.95
16-219PT-34	1 Nachtrag zu Ex-94.C.2086 KHD.....Ex..W..	-	26.01.95
16-219PT-35	1.Nachtrag zu Ex-94.C.2086 KHD.....Ex..W..	-	26.01.95
16-219PT-37	PTB-Antrag (Schaltplan) 2.NT zu Ex-94.C.2086 K.D2-SR2-Ex2.W	-	16.11.95
16-219PT-38	PTB-Antrag (Aufbau) 2.NT zu Ex-94.C.2086 K.D2-SR2-Ex2.W	-	16.11.95
16-219PT-39	PTB-Antrag (Schaltplan) 2.NT zu Ex-94.C.2086 K.D2-SR2-Ex1.LB	-	16.11.95
16-219PT-40	PTB-Antrag (Aufbau) 2.NT zu Ex-94.C.2086 K.D2-SR2-Ex1.W.LB	-	16.11.95
16-219PT-41	PTB-Antrag (Schaltplan) 2.NT zu Ex-94.C.2086 K.D2-SR2-Ex1.W	-	16.11.95
16-219PT-42	PTB-Antrag (Aufbau) 2.NT zu Ex-94.C.2086 K.D2-SR2-Ex1.W	-	16.11.95
16-219PT-43	PTB-Antrag (Layout A) 2.NT zu Ex-94.C.2086 K.D2-SR2-Ex..W..	-	16.11.95

(Drawing list continued next page)

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Drawing No.	Drawing Title	Revision No.	Drawn/ Revision Date
16-219PT-44	PTB-Antrag (Layout B) 2.NT zu Ex-94.C.2086 K.D2-SR2-Ex..W..	-	16.11.95
16-219SA-29	Lacquering Instruction KFD2-SR2-Ex ^{1,XX}	-	25.02.00
16-219SA-25	SA-Approval KHA-...-Ex..W..	-	Nov.11.96
16-219SA-26A	SA-Approval KHA-...-Ex..W..	-	June 11,99
16-244PT-03 A (2 Sheets)	PTB-Antrag K.D.-SR2-Ex...	-	26.11.96
16-244PT-04	PTB-Antrag K.D.-SR2-Ex...	0	08.10.96
16-244PT-05 (2 Sheets)	PTB-Antrag K.D.-SR2-Ex...	-	08.10.96
16-244PT-06A (2 Sheets)	PTB-Antrag K.D.-SR2-Ex...	-	11.06.99
16-244PT-07A (2 Sheets)	PTB-Antrag K.D.-SR2-Ex...	-	11.06.99
16-244PT-11	PTB-Antrag K.D.-SR2-EX...	0	16.10.96
16-244PT-12	PTB-Antrag K.D.-SR2-EX...	0	16.10.96
16-244PT-13	PTB-Antrag K.D.-SR2-EX...	0	16.10.96
16-244PT-14	PTB-Antrag B-Seite K.D.-SR2-EX...	-	24.10.96
16-244PT-15	PTB-Antrag A-Seite K.D.-SR2-EX...	A	26.11.96

(Drawing list continued next page)

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Drawing No.	Drawing Title	Revision No.	Drawn/ Revision Date
16-244PT-16	PTB-Antrag K.D.-SR2-EX...	0	23.9.96
16-244PT-17	PTB-Antrag K.D.-SR2-EX...	0	23.9.96
16-244SA-01	Lacquering KFD2-SR2-Ex2.2S	-	21.03.00
16-266SA-08	SA-Approval KFD0-RO-Ex2***	-	08.09.99
16-266SA-09 (Sheets 1 to 3 of 3)	SA-Approval KFD0-RO-Ex2***	-	08.09.99
16-219SA-27A (Sheets 1 and 2 of 2)	SA-APPROVAL (type label) Kxxx-SR2-xxx	0	30.05.00
(9 Sheets)	QT OPTOELECTRONICS Heavy duty optocouplers CNW 11AV-1/2/3	-	-

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Conditions of Certification:

Entity parameters listed below shall be observed:

$$U_m = 40 \text{ VDC}$$

Table 2: Entity parameters for Group I and IIC

ENTITY PARAMETERS									
APPARATUS	CONFIG	U_o (V)	I_o (mA)	GROUP I			GROUP IIC		
				C_o (μ F)	L_o (mH)	L/R (μ H/ Ω)	C_o (μ F)	L_o (mH)	L/R (μ H/ Ω)
KFD2-SR2-Ex1.W	A(1/2-3)	10.76	13.25	46	900	1231	1.95	190	886
KFD2-SR2-Ex1.W.LB	A(1/2-3)	10.76	13.25	46	900	1231	1.95	190	886
KFD2-SR2-Ex2.W	A(1/2-3)	10.76	13.25	46	900	1231	1.95	190	886
	B(4/5-6)	10.76	13.25	46	900	1231	1.95	190	886
KFD2-SR2-Ex2.2S	A(1/2-3)	10.76	13.25	46	900	1231	1.95	190	886
	B(4/5-6)	10.76	13.25	46	900	1231	1.95	190	886
KFD2-SR2-Ex2.W.SM	A(1/2-3)	10.76	13.25	46	900	1231	1.95	190	886
	B(4/5-6)	10.76	13.25	46	900	1231	1.95	190	886

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Table 3: Entity parameters for Group IIA and IIB

ENTITY PARAMETERS									
APPARATUS	CONFIG	U_o (V)	I_o (mA)	GROUP IIA			GROUP IIB		
				C_o (μ F)	L_o (mH)	L/R (μ H/ Ω)	C_o (μ F)	L_o (mH)	L/R (μ H/ Ω)
KFD2-SR2-Ex1.W	A(1/2-3)	10.76	13.25	15.6	1000	1231	5.85	1000	1231
KFD2-SR2-Ex1.W.LB	A(1/2-3)	10.76	13.25	15.6	1000	1231	5.85	1000	1231
KFD2-SR2-Ex2.W	A(1/2-3)	10.76	13.25	15.6	1000	1231	5.85	1000	1231
	B(4/5-6)	10.76	13.25	15.6	1000	1231	5.85	1000	1231
KFD2-SR2-Ex2.2S	A(1/2-3)	10.76	13.25	15.6	1000	1231	5.85	1000	1231
	B(4/5-6)	10.76	13.25	15.6	1000	1231	5.85	1000	1231
KFD2-SR2-Ex2.W.SM	A(1/2-3)	10.76	13.25	15.6	1000	1231	5.85	1000	1231
	B(4/5-6)	10.76	13.25	15.6	1000	1231	5.85	1000	1231

Configuration Legend

Config	Description
A(n-m)	Single Channel (Ch A) - terminal 'n' with respect to terminal 'm'
B(n-m)	Single Channel (Ch B) - terminal 'n' with respect to terminal 'm'

Additional Information:

A routine test shall be carried out on each completed barrier to check correct operation of the diodes and value of the current limiting resistance.

The equipment was tested with the combination of maximum permissible Group I inductance and capacitance connected to confirm the assigned values.

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