Certification Service

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: Sira 02ATEX3419

4 Equipment: TX6649 25Ah UPS Power Supply

5 Applicant: Trolex Ltd

6 Address: Newby Rd
Hazel Grove
Stockport
Cheshire
SK7 5DY
UK

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number R52A8386A.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 plus Amendments 1 and 2
EN 50020:2002
EN 50017:1998
EN 50019:1994
EN 50303:2000

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

I M1 and I M2(M1) (see section 13)
EEx eq[ia] I/EEx ia I (Ta = -20°C to + 55°C)
(where I M2(M1) EEx eq[ia] I applies when the equipment is operating on mains power and I M1 EEx ia I applies when it is operating on battery back up)

M D Shearman
Certification Manager

Project Number 52A8386
Date 28 April 2003
C. Index 16

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 02ATEX3419

13 **DESCRIPTION OF EQUIPMENT**

The TX6649 Un-interruptable Power Supply (UPS) incorporates a modified TX6641 Intrinsically Safe Power Supply Chassis (certificate no. Sira 01ATEX2229X) housed inside a metal enclosure that is powder filled and sealed, it also features a larger enclosure that includes a battery compartment. The battery compartment is a totally separate part of the main enclosure and is not powder filled. A battery timer switch circuit board is located in the powder filled part of the enclosure. The battery timer switch circuit detects if the battery is being used to supply power and can switch off the power after a pre-determined length of time.

Only the 0.5A and 1.0A versions of the TX6641 Chassis are used for the UPSs.

The TX6649 uses two 25Ah batteries, these provide power to equipment located in a hazardous area if the mains power supply fails or is turned off for safety reasons.

When mains powered, this equipment is deemed to be Category M2(M1) equipment, when battery powered, this equipment is deemed to be Category M1 equipment, however, overall the equipment is deemed to be Category M1.

The electrical output parameters are as follows:

I.S. Output Terminals +V and 0 V

7.5 V PSU

Uo=7.7 V for the following current options (A)	Short circuit current, Io (A)	Max output Power, Po (W)	Lo/Ro Ratio (μH/Ω)	Capacitance, Co, 7.7 V output (μF)
0.5	0.997	5.13	80.68	913.7
1.0	1.8	9.27	44.63	587.2

12 V PSU

Uo=12.35 V for the following current options (A)	Short circuit current, Io (A)	Max output Power, Po (W)	Lo/Ro Ratio (μH/Ω)	Capacitance, Co, 12.35 V output (μF)
0.5	0.997	5.8	80.68	32
1.0	1.8	10.45	44.63	32

Output terminals C1 (V_sig) and C2 (0 V)

Ui	=	16.5 V	Co	=	10 μF
Uo	=	13.65 V	Lo	=	700 mH
Io	=	25mA	Lo/Ro	=	5470 μH/ohm
Po	=	85.2 mW			
Ci	=	12 nF			
Li	=	0			

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EC TYPE-EXAMINATION CERTIFICATE

Sira 02ATEX3419

Output terminals C3 (I_sig) and C2 (0 V)

Ui	=	16.5 V	Ci	=	12 nF
Pi	=	0.3 W	Li	=	0
Uo	=	13.65 V	Co	=	10 µF
Io	=	213.6 mA, transient	Lo	=	9.4 mH
Io	=	105.4 mA, continuous	Lo/Ro	=	312 µH/ohm
Po	=	1.25 W			

Relay contact terminals P1 (common), P2 (Normally closed) and P3 (Normally open)

Ui	=	90 V
Ii	=	0.25 A
Pi	=	3.0 W

Switch terminals T1 and T2

Connect to a volt free switch

Ui	=	0 V
Ii	=	0 A
Pi	=	0 W

Mains input terminal

There are three input supply options available namely Um = 230 Vrms or 110 Vrms or 24 Vrms.

14 **DESCRIPTIVE DOCUMENTS**

14.1

Drawing No.	Sheet	Rev.	Date	Title
P5531-02-05	1 of 1	A	08 Apr 03	TX6649 series PSU, general arrangement
P5531.65	1 of 1	B	18 Nov 02	IS output terminal board, PCB artwork, UPS
P5531.49	1 of 1	B	18 Nov 02	Mains input terminal board, PCB artwork
P5531.61	1 of 2	C	15 Apr 03	Power supply, certified circuit diagram and parts list
P5531.61	2 of 2	B	08 Apr 03	Power supply, certified circuit diagram and parts list
P5531.62.01	1 of 1	B	18 Oct 02	PCB bottom layer
P5531.62.02	1 of 1	B	18 Oct 02	PCB bottom overlay
P5531.62.03	1 of 1	B	18 Oct 02	PCB inner layer 1
P5531.62.04	1 of 1	B	18 Oct 02	PCB inner layer 2
P5531.62.05	1 of 1	B	18 Oct 02	PCB Top layer
P5531.62.06	1 of 1	B	18 Oct 02	PCB Top overlay
P5531.108	1 of 1	A	07 Apr 03	Fuse, potted
P5531.09	1 of 1	A	26 Mar 03	Certification labelling
P5531-10	1 and 2	C	20 Nov 02	Battery timer switch certified circuit diagram and parts list
P5531.05	1 of 1	C	04 Sep 02	Battery timer switch PCB artwork
P5093.27	1 of 1	C	21 Jan 97	Reed relay (RL1)
P5531-83	1 of 1	A	21 Nov 02	Relay details (RL2) battery switching
P5531.04	1 of 1	C	16 Jan 02	Transformer, 110V, 230V
P5531.04.01	1 of 1	C	16 Jan 02	Transformer, 24V

Date 28 April 2003

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 02ATEX3419

14.2 Report No. R52A8386A

15 **SPECIAL CONDITIONS FOR SAFE USE** (denoted by X after the certificate number)

None

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in Report No. R52A8386A.

17 **CONDITIONS OF CERTIFICATION**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

17.3 Any labels that are affixed to the printed circuit board, e.g. QA labels, shall not be placed on any of the electrical components in the equipment.

17.4 The mains transformer shall be subjected to and be able to withstand a routine test voltage of at least 2500 V applied between primary and secondary windings and at least 1500 V applied between all windings and the core or screen.

Date 28 April 2003

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EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX3419	Dated	28 April 2003
VARIATION NUMBER	1 (ONE)	Dated	25 June 2003

VARIATION TO EQUIPMENT

To permit:

1 The circuits to be modified to allow the equipment to be powered from a nominal 55 Vdc power source as an alternative to the mains power supply; therefore, the input voltage, Um, for this version is changed to 55 Vdc.

2 The use of a re-settable regulator circuit that resets the crowbar circuits if they are triggered by electrical noise or spurious transients.

3 The breaking current value, In, of fuses F1 and F4 to be increased to 5 A.

4 The value of fuse F8 to be increased to 250 mA, in addition, the power rating of resistor R40 is raised to 2 W.

DESCRIPTIVE DOCUMENTS

Number	Sheet	Rev	Date	Description
P5531.61*	1 and 2	D	03 Jun 03	UPS Master circuit diagram and parts list
P5531.62.01	1 of 1	C	12 Jun 03	PCB bottom layer
P5531.62.02	1 of 1	C	12 Jun 03	PCB bottom overlay
P5531.62.03	1 of 1	C	12 Jun 03	UPS, PCB inner layer 1
P5531.62.04	1 of 1	C	12 Jun 03	PCB inner layer 2
P5531.62.05	1 of 1	C	12 Jun 03	PCB Top layer
P5531.62.06	1 of 1	C	12 Jun 03	PCB Top overlay
P5531-09	1 of 1	B	17 Jun 03	Certification labelling
P5531.107	1 and 2	A	11 Mar 03	Input regulator and reset circuit diagram, and parts list
P5531.106	1 of 1	A	04 Jun 03	Regulator reset PCB
P5531-02-01	1 of 1	C	16 Jun 03	General arrangement, Chassis
P5531-108	1 of 1	B	12 Jun 03	Fuse potted

* Page 1 of this drawing has been amended by Sira on 16 June 2003.

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No 52A9995

Report No. R52A9995A

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EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX3419	Dated	28 April 2003
VARIATION NUMBER	2 (TWO)	Dated	3 November 2004

VARIATION TO EQUIPMENT

To permit:

1 The crowbar circuits to be modified to increase the operational voltage and speed, the value of the output resistor R26 has been also changed; the electrical parameters for the power supplies are modified as follows:

7.5 V PSU (8.5 V o/p crowbar)	Short circuit current, I_o in A	Max output Power, P_o in W	L_o/R_o Ratio in µH/Ω	Capacitance, C_o in µF
0.5 A	0.873	5.28	72.69	646
1.0 A	1.76	10.63	36.17	560

12.0 V PSU (13.0 V o/p crowbar)	Short circuit current, I_o in A	Max output Power, P_o in W	L_o/R_o Ratio in µH/Ω	Capacitance, C_o in µF
0.5 A	0.873	6.33	72.6	32.0
1.0 A	1.76	12.73	36.17	30.29

DESCRIPTIVE DOCUMENTS

Number	Sheet	Rev.	Date	Description
P5531.61	1 of 2	F	27 Apr 04	UPS circuit diagram
P5531.61	1 of 2	F	27 Apr 04	UPS circuit parts list

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No. 52A11948

Report No. R52A11948A

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EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX3419	Dated	28 April 2003
VARIATION NUMBER	3 (THREE)	Dated	3 November 2004

VARIATION TO EQUIPMENT

To permit:

1 The introduction of a revised printed circuit board (PCB) that incorporates salvage modifications that include the removal of two capacitors and the connection of a third capacitor using insulated wire links.

2 The introduction of salvage modifications to the re-settable regulator.

DESCRIPTIVE DOCUMENTS

Number	Sheet	Rev.	Date	Description
P5531-120	1 of 1	A	08 Jan 04	P5531.62 Issue C PCB salvage modifications
P5531-123	1 of 1	A	11 Mar 04	P5531.03 salvage modifications
P5531.61*	1 and 2	F	27 Apr 04	UPS, master certified circuit diagram and parts list
P5531.62.01	1 of 1	D	18 Nov 03	PCB bottom layer
P5531.62.02	1 of 1	D	18 Nov 03	PCB bottom overlay
P5531.62.03	1 of 1	D	18 Nov 03	PCB inner layer 1
P5531.62.04	1 of 1	D	18 Nov 03	PCB inner layer 2
P5531.62.05	1 of 1	D	18 Nov 03	PCB top layer
P5531.62.06	1 of 1	D	18 Nov 03	PCB top overlay
P5531.122	1 of 1	A	06 Feb 04	Input regulator and reset salvage schematic excluding 1.8A version
P5531-111	1 of 1	C	07 Oct 03	Input regulator and reset PCB salvage drawing excluding 1.8A version

* This drawing was originally introduced in variation 2 (TWO).

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No. 52A11035

Report No. R52A11035A

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EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 02ATEX3419	Dated	28 April 2003
VARIATION NUMBER	4 (FOUR)	Dated	4 April 2005

VARIATION TO EQUIPMENT

To permit:

1 The re-settable regulator to be modified.

DESCRIPTIVE DOCUMENTS

Number	Sheet	Rev.	Date	Description
P5531-106	1 of 1	B	15 Jan 04	Regulator reset PCB
P5531-107	1 and 2	C	20 Nov 03	Input regulator and reset PCB circuit diagram and parts list

ADDITIONAL CONDITIONS OF CERTIFICATION

None

File No. 52A13139

Report No. R52A13139A

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