Aufbauübersicht für Elektrogeräte und Maschinen
Data form for electrical equipment and machinery

Auftraggeber / Applicant:	(57396) XP Power LLC, Suite 150, 1241 E Dyer Rd, Santa Ana, CA 92705, USA.
Fertigungsstätte / Production facility:	(72220) ABES TECHNOLOGY CO LTD. 3 LANE 891, SEC 1 ZHANGSHUI RD, XIUSHUI HSIANG 504 CHANGHUA HSIEN, TAIWAN
Geräteart / Type of equipment:	Power Supply (for building-in)
Typenbezeichnung / Type/model:	ECP225PSXX, (where XX can be number 12 to 48 to indicate the main output voltage, may be also followed by suffix "SF" for single fuse)
Seriennr. / Serial no.:	--
Nennspannung/Frequenz / Rated voltage/frequency **:**	100-240 V~, 50/60 Hz
Nennaufnahme/Nennstrom / Rated input power/current:	3.0 A
Anschlußdaten-Hydraulik: / Connection to hydraulic power:	N/A
Anschlußdaten-Pneumatik / Connection to pneumatic power:	N/A
Anschlußdaten-Wasser / Connection to water installation:	N/A
Gewicht / weight:	0.35 Kg
Lärmemission / noise emission (dB A):	

Ausführung / Construction:	**Ortsfest**	Stationary	☐
	Ortsveränderlich	Portable	☐
	Handgerät	Hand-held	☐
	Einbaugerät	Open-frame	☒
Schutzklasse / Protection class:	**Schutzklasse I: Schutzleiteranschluß**	PE-connection	☒ end system dependant
	Schutzklasse II: Schutzisoliert	Double insulation	☐
	Schutzklasse III: Schutzkleinspannung/ interne Stromversorgung	SELV/internally powered	☐
Schutzart / Degree of protection against liquids (IP):	**IP** X0		☒
Anschlußart / Supply connection:	**Feste Anschlußleitung**	Non detachable cord	☐
	Fester Anschluß	Permanent connection	☐
	Gerätesteckvorrichtung	Appliance inlet	☐
		Connector	☒
Netzbetriebsart / Rated operation:	**Dauerbetrieb**	Continuous operation	☒
	Aussetzbetrieb	Intermittent operation	☐
	Kurzzeitbetrieb	Short time operation	☐

Material: **a)Gehäuse /** Enclosure .

b) Leiterplatten / p.c.b. Rated 130°C

Zusätzliche Angaben für Laser, Klassifizierung nach EN 60825 / Additional information for Laser equipment, classification according to EN 60825

Typ / Type: N/A, no laser equipment used.

Klasse / Class:

Wellenlänge / Wavelength:

Pulsdauer / Pulse duration:

Ausgangsleistung / Output power:

SAN DIEGO TÜV SÜD PRODUCT SERVICE

Prüfbericht Nr. / Test Report No.: SI1300486-000

Projektleiter / Project manager:
Mandy Zhao

Ort / Place: TÜV SÜD America , San Diego, CA USA

Datum / Date: 2013-01-18

Stempel und Unterschrift /
Seal and signature

Mandy Zhao

Aufbauübersicht für Elektrogeräte und Maschinen
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Approved models and Output Rating(s):

Model Number	MAX OUTPUT RATING			
	Convection cooling		Force cooling	
	Voltage (VDC)	Current (A)	Voltage (VDC)	Current (A)
ECP225PS12	12	12.5	12	18.75
ECP225PS15	15	10.0	15	15.0
ECP225PS24	24	6.25	24	9.38
ECP225PS28	28	5.36	28	8.04
ECP225PS48	48	3.1	48	4.69
An external forced air cooling, min. 13 cfm, towards dut, located at input connector with a distance of 4 cm shall be provided at end product.				

Conditions of Acceptability:

When installing the equipment, all requirements of the standards and the manufacturer's specifications must be met.

The models require:

- A suitable electrical and fire enclosure must be provided in the end use equipment.
- Proper bonding to the end-product main protective earthing terminal is required when the power supply is installed in the end product.
- When installed in end product, the clearance and creeepage distance between the related circuitry of the power supply and accessible parts shall meet the standard(s) requirements. Hi-pot test, touch current test and ground bond test shall be conducted at end product.
- Some models have output at hazardous energy level, additional evaluation and compliance at end product.
- The proper warning to service persons should be marked on the end product when the power supply has a fuse in the neutral of the primary circuit.

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Aufbauübersicht für Elektrogeräte und Maschinen
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Sicherheitsrelevante Bautelle: (Schalter, Temperaturregler, Heizkörper, Stecker, Fassungen, Leitungen, Kondensatoren, Motoren und sonstige Wicklungen z.B. Transformatoren, Magnetspulen)
(Not-Aus Geräte, 2-Handsteuerungen, Verriegelungsschalter, Sicherheits-Lichtschranken, Sicherheitsventile, Programmierbare Steuerungen-SPS, hydraulische Steuerungen, pneumatische Steuerungen .....)
Safety relevant components: (switch, temperature regulator, heating element, plug, socket, wiring, capacitor, motors and other components with windings e.g. transformers, coils)
(emergency off devices, 2-hand-control-devices, interlock switches, safety light barriers, safety valves, programmable electronic controllers - PLC, hydraulic controllers, pneumatic controllers.....)

object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
1.Primary Connector (CN1)	Long Chu Electronics co., ltd.	P101	Rated 7A, 250V, min. 85°C (Internal Connection only).	UL 1977, IEC 60950	UL, --
2. Secondary Connector (CN2,CN3) (SELV)	Long Chu Electronics co., ltd.	P101	Rated min. 12 A, min. 48 V, min. 85°C	UL 1977, IEC 60950	UL, --
3. Fuses (F1, F2)	Cooper Bussmann	SS-5 Series	Rated T3.15 A, 250 V, 105°C, soldered to PWB	UL 248 IEC 60127	UL, VDE
4. Thermistor (TH1)	Interchangeable	Interchangeable	NTC. Rated 240 V, 150°C, 10 ohm, Iss min. 5 A.	--	--, Tested in unit
5. Bridge Diodes (BD1)	Interchangeable	Interchangeable	Rated voltage (rms) 800 V, min. 15 A, 150°C.	--	--, Tested in unit
6. X-Capacitors (CX1)	Carli Electronics Co., Ltd.	MPX Series	Rated max. 0.68uF, min. 275 V, min. 100°C, marked "X2".	UL 60384-14, IEC 60384-14, 2nd edition	UL, VDE
7. Y-Capacitors (CY1, CY2,CY3) - Optional	TDK Corp	CD	Rated max. 1000 pF, min. 250 Vac, 125°C, marked "Y1".	UL 60384-14, IEC 60384-14, 2nd edition	UL, VDE
8. Y-Capacitors (CY7, CY8,CY9)	TDK Corp	CD	Rated max. 1000 pF, min. 250 Vac, 125°C, marked "Y1".	UL 60384-14, IEC 60384-14, 2nd edition	UL, VDE
9. Electrolytic Capacitor (C1) (PRI)	Interchangeable	Interchangeable	Rated 150 uF, min. 420 V, 105°C. Provided with integral pressure relief.	--	--, Tested in unit.
10. MOSFET (Q1, Q2, Q3) (PRI)	Interchangeable	Interchangeable	Rated min. 500 V, Mounted to Heat Sink 2 using screw.	--	--, Tested in unit.

SAN DIEGO TÜV SÜD PRODUCT SERVICE

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(emergency off devices, 2-hand-control-devices, interlock switches, safety light barriers, safety valves, programmable electronic controllers - PLC, hydraulic controllers, pneumatic controllers.....)

object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
11. Optical Isolators (IC3, IC4)	Lite-On	LTV-817 Series (LTV-817, LTV-817M, LTV-817S)	Double protection, isolation voltage min. 5000 V	UL 1577, IEC 60747, IEC 60950-1	UL, VDE
11a. Optical Isolators (IC3, IC4) (Alternate)	NEC	PS2561 Series	Double protection, isolation voltage min. 5000 V	UL 1577, IEC 60747, IEC 60950-1	UL, VDE
11b. Optical Isolators (IC3, IC4) (Alternate)	Vishay	TCET1100-TCET1105 Series	Double protection, isolation voltage min. 5000 V	UL 1577, IEC 60747, IEC 60950-1	UL, VDE
11c. Optical Isolators (IC3, IC4) (Alternate)	Fairchild Semiconductor	H11A817A or H11A817B or H11A817C	Double protection, isolation voltage min. 4420 V	UL 1577, IEC 60747, IEC 60950-1	UL, VDE
11d. Optical Isolators (IC3, IC4) (Alternate)	Sharp	PC817	Double protection, isolation voltage min. 5000 V	UL 1577, IEC 60747, IEC 60950-1	UL, VDE
11e. Optical Isolators (IC3, IC4) (Alternate)	Toshiba	TLP781, TLP781F	Double protection, isolation voltage min. 5000 V	UL 1577, IEC 60747, IEC 60950-1	UL, VDE
11f. Optical Isolators (IC3, IC4) (Alternate)	Toshiba	TLP621 Series	Double protection, isolation voltage min. 5000 V	UL 1577, IEC 60747, IEC 60950-1	UL, VDE
11g. Optical Isolators (IC3, IC4) (Alternate)	Toshiba	TLP421 Series	Double protection, isolation voltage min. 5000 V	UL 1577, IEC 60747, IEC 60950-1	UL, VDE
11h. Optical Isolators (IC3, IC4) (Alternate)	Toshiba	TLP721 or TLP721F Series	Double protection, isolation voltage min. 4000 V	UL 1577, IEC 60747, IEC 60950-1	UL, VDE

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Safety relevant components: (switch, temperature regulator, heating element, plug, socket, wiring, capacitor, motors and other components with windings e.g. transformers, coils)
(emergency off devices, 2-hand-control-devices, interlock switches, safety light barriers, safety valves, programmable electronic controllers - PLC, hydraulic controllers, pneumatic controllers.....)

object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
12. Transformer (TR1)	Yu Jing	11026-201H401713 or 225-12 (for model ECP225PS12), 11026-201H401812 or 225-15 (for model ECP225PS15), 11026-201H401912 or 225-24 (for model ECP225PS24), 11026-201H402012 or	Insulation system: SBI4.2, Class B, See Enclosures4-01. 4-02, 4-03, 4-04, 4-05 for details.	UL1446	UL, --
		225-28 (for model ECP225PS28), 11026-201H402112 or 225-48 (for model ECP225PS48)			
12-1. Core	Interchangeable	Interchangeable	Ferrite. Overall 40 x 32 x 14 mm	--	--, Tested in unit.
12-2. Bobbin	Sumitomo Bakelite	PM-9820 or PM-9630	Phenolic, min. thickness 0.75 mm, V-0, 150°C.	UL94, UL746C	UL, --
12-3. Insulation tape	3M	1350F-1	Min. 130°C, polyester film tape.	UL510	UL, --
12-4. Winding wire (pin 1 -2, pin 7 – 8, pin 9 – 10, pin 11 – 12)	Interchangeable	Interchangeable	Rated min. 130 °C.	UL1446	UL, --

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Safety relevant components: (switch, temperature regulator, heating element, plug, socket, wiring, capacitor, motors and other components with windings e.g. transformers, coils)
(emergency off devices, 2-hand-control-devices, interlock switches, safety light barriers, safety valves, programmable electronic controllers - PLC, hydraulic controllers, pneumatic controllers.....)

object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
12-5. triple insulated wire (pin 5 – pin 6)	Fukukawa Electric	TEX-E	Rated min. 130 °C.	UL 2353, IEC60950-1	UL, --
12-5b. Triple insulated wire (pin 5 – pin 6) (Alternate)	Totoku Electronic	TIW-2X	Rated min. 130 °C.	UL 2353, IEC60950-1	UL, --
12-6. Tubing	Great Holding Industrial	TFL	Rated min. 200 °C.	UL 224	UL, --
12-7. Varnish	Hitachi Chemical	WP-2952F-2G	Min. 130°C	UL1446	UL, --
13. Inductor L2	Ain Hsin Electronics	T16*9*5-C	Rated min. 130°C. Refer to enclosure 4-06 for details.	--	--, Tested in unit
13-1. Core	Interchangeable	Interchangeable	Ferrite. Overall dimension 20 by 12 by 10 mm.	--	--, Tested in unit
13-2. Coil	Interchangeable	Interchangeable	Rated min. 130°C	UL1446	UL, --
13a. Inductor L2 (Alternate)	Newline Universal Corp	T16*9*5+C	Rated min. 130°C. Refer to enclosure 4-07 for details.	--	--, Tested in unit
13a-1. Core	Interchangeable	Interchangeable	Ferrite. Overall dimension 20 by 12 by 10 mm.	--	--, Tested in unit
13a-2. Coil	Interchangeable	Interchangeable	Rated min. 130°C	UL1446	UL, --
14. Inductor L3	Newline Universal Corp	T50-26B	Rated min. 130°C. Refer to enclosure 4-08 for details.	--	--, Tested in unit
14-1. Core	Interchangeable	Interchangeable	Ferrite. Overall dimension 16 by 4.5 by 10 mm.	--	--, Tested in unit

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(Not-Aus Geräte, 2-Handsteuerungen, Verriegelungsschalter, Sicherheits-Lichtschranken, Sicherheitsventile, Programmierbare Steuerungen-SPS, hydraulische Steuerungen, pneumatische Steuerungen .....)
Safety relevant components: (switch, temperature regulator, heating element, plug, socket, wiring, capacitor, motors and other components with windings e.g. transformers, coils)
(emergency off devices, 2-hand-control-devices, interlock switches, safety light barriers, safety valves, programmable electronic controllers - PLC, hydraulic controllers, pneumatic controllers.....)

object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
14-2. Coil	Interchangeable	Interchangeable	Rated min. 130°C	UL1446	UL, --
14a. Inductor L3 (Alternate)	Ain Hsin Electronics	T50-26B	Rated min. 130°C. Refer to enclosure 4-09 for details.	--	--, Tested in unit
14a-1. Core	Interchangeable	Interchangeable	Ferrite. Overall dimension 16 by 4.5 by 11 mm.	--	--, Tested in unit
14a-2. Coil	Interchangeable	Interchangeable	Rated min. 130°C	UL1446	UL, --
15. Inductor L4	Ain Hsin Electronics	PQ-2620 or 225L-200	Rated min. 130°C. Refer to enclosure 4-10 for details.	--	--, Tested in unit
15-1. Core	Interchangeable	Interchangeable	Ferrite. Overall dimension 30 by 23 by 21.5 mm.	--	--, Tested in unit
15-2. Coil	Interchangeable	Interchangeable	Rated min. 130°C	UL1446	UL, --
15-3. Bobbin	Sumitomo Bakelite	PM-9630	Phenolic, min. thickness 0.75 mm, V-0, 150°C.	UL94, UL746C	UL, --
15-4. Insulation tape	3M	1350F-1	Min. 130°C, polyester film tape.	UL 510	UL, --
15-4a. Insulation tape (Alternate)	Jingjiang Yahua Pressure Sensitive Glue	CT	Min. 130°C, polyester film tape.	UL 510	UL, --
15-5. Varnish	Interchangeable	Interchangeable	Rated min. 130°C	UL1446	UL, --
15-6. Tubing	Interchangeable	Interchangeable	Rated min. 130°C	UL 224	UL, --
15a. Inductor L4 (Alternate)	Newline Universal Corp	PQ-2620 or 225L-200	Rated min. 130°C. Refer to enclosure 4-13 for details.	--	--, Tested in unit

SAN DIEGO TÜV SÜD PRODUCT SERVICE

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(emergency off devices, 2-hand-control-devices, interlock switches, safety light barriers, safety valves, programmable electronic controllers - PLC, hydraulic controllers, pneumatic controllers.....)

object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
15a-1. Core	Interchangeable	Interchangeable	Ferrite. Overall dimension 29 by 31.5 by 21 mm.	--	--, Tested in unit
15a-2. Coil	Interchangeable	Interchangeable	Rated min. 130°C	UL1446	UL, --
15a-3. Bobbin	Chang Chun Plastics	T375J	Phenolic, min. thickness 0.75 mm, V-0, 150°C.	UL94, UL746C	UL, --
15a-4. Insulation tape	3M	1350F-1	Min. 130°C, polyester film tape.	UL 510	UL, --
15a-5. Varnish	Interchangeable	Interchangeable	Rated min. 130°C	UL1446	UL, --
15a-6. Tubing	Interchangeable	Interchangeable	Rated min. 130°C	UL 224	UL, --
16. Bleed resistors (R1, R2)	Interchangeable	Interchangeable	Max. 620 kOhm.	--	--, --
17. Current sensing resistors (R9, R14, R21, R28)	Interchangeable	Interchangeable	R9: Nominal 50 mohm; R14: Nominal 2.2 Kohm; R21: Nominal 4.7 ohm; R28: Nominal 1 Kohm.	--	--, --
18. PWB	Interchangeable	Interchangeable	Rated min. V-1, 130°C.	UL 796	UL, --
19. Insulating Tubing/Sleeving	Interchangeable	Interchangeable	FEP, PTFE, PVC, TFE, neoprene, polyimide or marked VW-1; min. 80°C, min. 240V	--	UL, --
20. Heat Sink 1 (PRI)	Interchangeable	Aluminum	Overall approx. 4 by 2 cm, min. 3 mm thick.	--	--, Tested in unit.

SAN DIEGO TÜV SÜD PRODUCT

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Safety relevant components: (switch, temperature regulator, heating element, plug, socket, wiring, capacitor, motors and other components with windings e.g. transformers, coils)
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object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
21. Heat Sink 2 (PRI)	Interchangeable	Aluminum	Overall approx. 5.8 by 1.15 cm, min. 2 mm thick.	--	--, Tested in unit.
22. Label	RONG TAY EMBOSSING PRINTING ART FACTORY	RT-05	Rated at min. 85°C.	UL969, IEC/UL60950-1	UL, --

SAN DIEGO TÜV SÜD PRODUCT SERVICE

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America

CERTIFICATE

No. B 13 10 57396 229

Holder of Certificate: **XP Power LLC.**
1241 East Dyer Road, Suite 150
Santa Ana CA 92705
USA

Production Facility(ies): 72220, 71712

Certification Mark:

Product: **Power supply (Power Supply)**

Model(s): **ECP225PSXX Series, (Where XX is any number between 12-48 designating output voltage), may also be provided with suffix "SF" or "3x5".**

Parameters:

Rated Input Voltage:	100-240 V AC,
Rated Input Current:	3.0 A
Rated input frequency:	50/60 Hz
Rated Output Ratings:	See attachment for output ratings.
Protection Class:	I
Temperature, Ambient:	50°C at 100% load and 70°C at 50% load.

See attachment for further information.

Tested according to: EN 60601-1:2006

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

Test report no.: SI1302598-100

600013

Date, 2013-10-14
Page 1 of 3

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America

ATTACHMENT TO CERTIFICATE NO. B 13 10 57396 229
FOR XP POWER LLC

POWER SUPPLY

Product Description

Products covered are open frame power supplies intended for building-in to be used with Medical Electrical Equipment.

Model Differences

All models in the Model ECP225PSXX Series are identical with exception to the Mains Transformer TR1, and minor secondary components that allow for different output voltage ratings. See below for output ratings for up to 50°C and forced cooling airflow from a 15 CFM fan:

Model Name (Convection cooling)
ECP225PS12: 12 Vdc, 12.5 A
ECP225PS15: 15 Vdc, 10.0 A
ECP225PS24: 24 Vdc, 6.25 A
ECP225PS28: 28 Vdc, 5.36 A
ECP225PS48: 48 Vdc, 3.1 A

Model Name (Forced cooling)
ECP225PS12: 12 Vdc, 18.75 A
ECP225PS15: 15 Vdc, 15.0 A
ECP225PS24: 24 Vdc, 9.38 A
ECP225PS28: 28 Vdc, 8.04 A
ECP225PS48: 48 Vdc, 4.69 A

Additional suffix "SF" denotes units provided with only a single line side fuse;
Additional suffix "3x5" denotes extended PCB with no change in the PCB traces. Refer to Enclosure 5-01 for 2.5x5 PCB size and 5-02 for 3x5 PCB size.

UCB_F_12.02 2012-02

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America

ATTACHMENT TO CERTIFICATE NO. B 13 10 57396 229
FOR XP POWER LLC

Conditions of Acceptability:
When installing the equipment, all requirements of the standards and the manufacturer's specifications must be met.

- Note: No default COAs exist for 60601
- The component shall be considered for compliance with the Marking (clause 7) and Separation (clause 8) requirements as part of the end use application evaluation.
- Power supply provides the following MOPP (means of patient protection): 2MOPP based upon a working voltage 240 Vrms, 500 Vpk between Primary to Secondary, 1MOPP based upon a working voltage 240 Vrms, 375 Vpk between Primary and Earth/Enclosure, and 1MOPP based upon a working voltage 240 Vrms (input voltage) between Secondary and Earth/Enclosure
- This power supply has been evaluated as a continuous operation, ordinary equipment and has not been evaluated for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide. The output circuits have not been evaluated for direct patient connection (Type B, BF or CF).
- The end product shall ensure that the requirements related to accompanying documents, clause 7.9, are met.
- The available voltage for the secondary outputs does not exceed 25 Vac or 60 Vdc, under normal and single fault conditions.
- The Dielectric Strength Test conducted on this power supply was based upon a maximum working voltage of: Primary-Earthed Dead Metal (Class I units): 375 Vpk, 240 Vrms; Primary-SEC: 500 Vpk, 240 Vrms
- Protective bonding testing shall be considered in the end product application.
- The need for Marking Durability and Marking Legibility Testing shall be considered as part of the end product installation.
- Fire/ Mechanical/ Electrical Enclosure to be provided as part of the end product.
- The products were tested on a 20 A branch circuit. If used on a branch circuit greater than this, additional testing may be necessary.
- Temperature, Leakage Current, Protective Earthing, Dielectric Voltage Withstand, and Interruption of the Power Supply tests should be considered as part of the end product evaluation.
- Unit to be suitably earthed as part of the end product.
- Q1 Heatsink considered live and should not be earthed.
- End product shall provide necessary creepage and clearance for 250Vrms from input connector pins to mounting means
- Power supply fuse was provided with limited breaking capacity and was evaluated for installation where the maximum fault current was limited. End product shall ensure the power supply is used in applications where the limited breaking capacity does not result in unacceptable risk.
- The input/output connectors are not acceptable for field connections, they are only intended for factory wiring inside the end-use product.
- Consideration should be given to measuring the temperature on power electronic components and transformer windings when the power supply is installed in the end-use equipment. The end-use product shall ensure that the power supply is used within its ratings.
- Considerations to the applied parts requirement, to be conducted as end-product
- The product was submitted and tested for use at the manufacturer's recommended ambient temperature (Tmra) of 50°C at Full Load and 70°C at Half Load.

UCB_F_12.02 2012-02