

**CB TEST CERTIFICATE CERTIFICAT D'ESSAI OC**Product  
Produit

AC/DC and DC/DC switching power supply

Name and address of the applicant  
Nom et adresse du demandeurBel Fuse Inc.  
206 Van Vorst St.  
Jersey City, NJ 07302  
USAName and address of the manufacturer  
Nom et adresse du fabricantBel Fuse Inc.  
206 Van Vorst St.  
Jersey City, NJ 07302  
USAName and address of the factory  
Nom et adresse de l'usineBel Power Solutions, s.r.o.  
Areal ZTS 924  
01841 Dubnica nad Vahom  
SlovakiaNote: When more than one factory, please report on page 2  
Note: Lorsque il y plus d'une usine, veuillez utiliser la deuxième page Additional information on page 2Ratings and principal characteristics  
Valeurs nominales et caractéristiques principales

Input: 200 – 240 Vac, 1.9 – 2.1 A, 50/60 Hz

Trademark (if any)  
Marque de fabrique (si elle existe)Type of Manufacturer's Testing Laboratories used  
Type de programme du laboratoire d'essais constructeur

LKP Series

Model / Type Ref.  
Ref. De typeAdditional information (if necessary may also be reported on page 2)  
Les informations complémentaires (si nécessaire, peuvent être indiqués sur la deuxième pageOutput:  
One or two output ; 28.25 Vdc Max. ; 20 A Max. ; Output power: 280 W Max. Additional information on page 2A sample of the product was tested and found to be in conformity with  
Un échantillon de ce produit a été essayé et a été considéré conforme à la

IEC 62368-1:2018

As shown in the Test Report Ref. No. which forms part of this Certificate

392852

Comme indiqué dans le Rapport de tests numéro de référence qui constitue partie de ce Certificat

This CB Test Certificate is issued by the National Certification Body  
Ce Certificat de test OC est établi par l'Organisme National de CertificationPhilip Pedersen vei 11,  
NO-1366 Lysaker, Norway

Date: 23-07-2020

Signature: Juan Z. Saussey  
Certification Department

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Note: Lorsque il y a plus d'une usine, veuillez utiliser la deuxième page Additional information on page 2Ratings and principal characteristics  
Valeurs nominales et caractéristiques principalesInput: 100 – 240 Vac, 2.2 – 2.3 A or 2.2 – 2.4 A, 50/60 Hz / 95 – 300 Vdc,  
2.2 – 2.3 A or 2.2 – 2.4 ATrademark (if any)  
Marque de fabrique (si elle existe)Type of Manufacturer's Testing Laboratories used  
Type de programme du laboratoire d'essais constructeur

LS Series

Model / Type Ref.  
Ref. De typeAdditional information (if necessary may also be reported on page 2)  
Les informations complémentaires (si nécessaire, peuvent être indiqués sur la deuxième page

Output

One or two output ; 28.25 Vdc Max. ; 20 A Max. ; Output power: 100 W Max.

 Additional information on page 2

A sample of the product was tested and found to be in conformity with

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Note: Lorsque il y a plus d'une usine, veuillez utiliser la deuxième page Additional information on page 2Ratings and principal characteristics  
Valeurs nominales et caractéristiques principalesInput: 100 – 240 Vac, 2.2 – 2.3 A or 2.2 – 2.4 A, 50/60 Hz / 88 – 300 Vdc,  
2.2 – 2.3 A or 2.2 – 2.4 ATrademark (if any)  
Marque de fabrique (si elle existe)Type of Manufacturer's Testing Laboratories used  
Type de programme du laboratoire d'essais constructeur

LK Series

Model / Type Ref.  
Ref. De typeAdditional information (if necessary may also be reported on page 2)  
Les informations complémentaires (si nécessaire, peuvent être indiqués sur la deuxième page

Output

One or two output ; 28.25 Vdc Max. ; 20 A Max. ; Output power: 150 W Max.

 Additional information on page 2

A sample of the product was tested and found to be in conformity with

Un échantillon de ce produit a été essayé et a été considéré conforme à la

IEC 62368-1:2018

As shown in the Test Report Ref. No. which forms part of this Certificate

392852

Comme indiqué dans le Rapport des essais numéro de référence qui constitue partie de ce Certificat

This CB Test Certificate is issued by the National Certification Body

Ce Certificat de test OC est établi par l'Organisme National de Certification


Philip Pedersen vei 11,  
NO-1366 Lysaker, Norway

Date: 23-07-2020

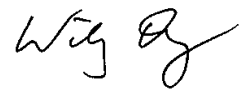
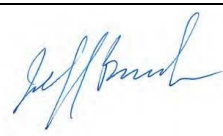
Signature: Juan Z. Saussey  
Certification Department



<b>TEST REPORT</b> <b>IEC 62368-1</b> <b>Audio/video, information and communication technology equipment</b> <b>Part 1: Safety requirements</b>	
Report Number.....	: 392852
Date of issue .....	: July 22, 2020
Total number of pages.....	: 81
Name of Testing Laboratory preparing the Report.....	Nemko USA Inc. 2210 Faraday Ave. Suite 150, Carlsbad, CA 92008, USA
Applicant's name .....	: Bel Fuse Inc.
Address .....	: 206 Van Vorst St., Jersey City, NJ 07302, USA
<b>Test specification:</b>	
Standard.....	: IEC 62368-1: 2018
Test procedure.....	: CB Scheme
Non-standard test method.....	: N/A
Test Report Form No. ....	: IEC62368_1C
Test Report Form(s) Originator .....	: UL(US)
Master TRF .....	: Dated 2019-01-17
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<b>General disclaimer:</b>	
<p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.</p>	

<b>Test item description</b> ..... :	AC/DC and DC/DC switching power supply
<b>Trade Mark</b> ..... :	 <small>a bel group</small>
<b>Manufacturer</b> ..... :	Same as Applicant
<b>Model/Type reference</b> ..... :	LKP, LK, LS Series For further information, please refer to General Product Information.
<b>Ratings</b> ..... :	<u>Input</u> LKP series: 200 – 240 Vac, 1.9 – 2.1 A, 50/60 Hz ; LK series : 100 – 240 Vac, 2.2 – 2.3 A or 2.2 – 2.4 A, 50/60 Hz / 88 – 300 Vdc, 2.2 – 2.3 A or 2.2 – 2.4 A ; LS series : 100 – 240 Vac, 2.2 – 2.3 A or 2.2 – 2.4 A, 50/60 Hz / 95 – 300 Vdc, 2.2 – 2.3 A or 2.2 – 2.4 A  <u>Output</u> One or two output ; 28.25 Vdc Max. ; 20 A Max. ; Output power: LKP: 280 W Max., LK : 150 W Max., LS : 100 W Max.  For further information, please refer to General Product Information.

**Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):**

<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	Nemko USA Inc.	
<b>Testing location/ address</b> ..... :		2210 Faraday Ave. Suite 150, Carlsbad, CA 92008, USA	
<b>Tested by (name, function, signature)</b> ..... :		Willy Ong (Project Handler)	
<b>Approved by (name, function, signature)</b> .. :		Jeff Busch (Verifier)	

**Testing procedure: CTF Stage 1:**

<b>Testing location/ address</b> ..... :		
<b>Tested by (name, function, signature)</b> ..... :		
<b>Approved by (name, function, signature)</b> .. :		

**Testing procedure: CTF Stage 2:**

<b>Testing location/ address</b> ..... :		
<b>Tested by (name + signature)</b> ..... :		
<b>Witnessed by (name, function, signature)</b> . :		

<b>Approved by (name, function, signature).. :</b>			
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 3:</b>		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 4:</b>		
<b>Testing location/ address..... :</b>			
<b>Tested by (name, function, signature)..... :</b>			
<b>Witnessed by (name, function, signature). :</b>			
<b>Approved by (name, function, signature).. :</b>			
<b>Supervised by (name, function, signature) :</b>			

**List of Attachments (including a total number of pages in each attachment):**

Attachment 1: Europe Group National Differences and National Differences according to EN 62368-1:2020 +A11:2020 (23 pages)

Attachment 2: National Differences: USA and Canada according to IEC 62368-1:2018 3<sup>rd</sup> ed. (8 pages)

Attachment 3: Photos and Miscellaneous documents (16 pages)

Attachment 4: PWB Thermal cycling test reports (29 pages)

**Summary of testing:**

This report is an upgrade from IEC 60950-1, 2nd edition + Am 1:2009 + Am 2:2013 to IEC 62368-1:2018.

The test data accepted in this test report was originally generated and published as part of a previous evaluation to IEC 60950-1:2005 +Am1:2009 +Am2:2013. (Main CB Report Ref. No. 286430 with CB Certificate Ref. No. NO87304. Additional test data is added based on IEC 62368-1; refer to test tables.

The equipment is a component, switch mode power supply without PFC with variable input voltage of (ES3/ES2/ES1/PS3) and DC voltage output (ES1/PS3) for building-in.

Intended location: The equipment is to be installed in the end product where the suitability of installation is to be evaluated in the end product.

Safety Instructions: Instructions shall be supplied in a language suitable for the country into which the product is to be sold.

Maximum operating temperatures: Equipment for building-in. Heating test was conducted monitoring the internal components temperature. Accessibility to high component temperature must be considered on end system equipment.

Equipment markings: Identification marking (trade-mark and model name) are marked on the equipment. However, the durability test was not considered because the equipment is a component level product for building-in. Therefore, the marked surface is not to be located in an external area where it is likely to be cleaned with cleaning solution, rubbed, etc.

The unit tested is a prototype with all possible options and worst case of the models when necessary. The following tests have been performed with acceptable results.

**Tests performed (name of test and test clause):**

Original Tests per IEC 60950-1:

- 1) Input Test ..... 1.6.2
- 2) Durability Test ..... 1.17.11
- 3) Capacitance Discharge Test ..... 2.1.1.7
- 4) SELV Reliability Test ..... 2.2
- 5) Protective Bonding Test ..... 2.6.3.4
- 6) Humidity Test ..... 2.9.2
- 7) Working Voltage Measurement ..... 2.10.2
- 8) Hazardous Voltage Measurement ..... 2.10.2
- 9) Heating Test ..... 4.5.1
- 10) Touch Current Test ..... 5.1
- 11) Electric Strength Test ..... 5.2.2
- 12) Component Failure Test ..... 5.3
- 13) Abnormal Operation Test ..... 5.3
- 14) PS Output Overload and Short Test ..... 5.3

**Testing location:**

See page 2

<p><u>Updated tables in this Report:</u></p> <p>5.2 Classification of electrical energy sources</p> <p>5.4.1.8 Determination of working Voltage measurement</p> <p>5.4.2, 5.4.3 Minimum clearances/creepage distances</p> <p>5.4.8 Humidity</p> <p>5.4.9 Electric Strength tests</p> <p>5.5.2.2 Stored discharge on capacitors</p> <p>5.6.6 Resistance of protective conductors and terminations</p> <p>5.7.5 Earthed accessible conductive part (Prospective touch voltage, touch current and protective conductor current)</p> <p>6.2.2 Power source circuit classifications</p> <p>5.4.1.4, 9.3, B.1.5, B.2.6 – Temperature measurements</p> <p>B.2.5 Input</p> <p>B.3, B.4 Abnormal operating and fault condition tests</p> <p>T.2- Mechanical test</p>	
<p><b>Summary of compliance with National Differences (List of countries addressed):</b></p> <p>The list of countries recognizing the CB Scheme is actively updated on the <a href="http://iecee.org">iecee.org</a> website.</p> <p>All CENELEC members according to EN 62368-1:2020+A11:2020.</p> <p>All National Differences listed in the IEC Online Bulletin are covered by the Common Modifications, Special National Conditions, National Differences, and the National Requirements noted above except for the following countries which are documented in National Differences Appendixes attached to this report.</p> <p>Canada/USA</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements of IEC 62368-1:2018; EN 62368-1:2020+A11:2020.</b></p>	



**Copy of marking plate:**

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBS that own these marks.

<b>AC-DC Converter</b>		<b>LK4301-7R</b>	
Input: $\sim$ 100 - 240 V, 2.3 A, 50 - 60 Hz		B 02403205	
Output: $\equiv$ 12 V, 12 A		U00000	
		V 105	
		L 16W1522	
		Made in Slovakia	
 POWER SOLUTIONS & PROTECTION	 MELCHER The Power Partners.	IP 30	
		 C US	

<b>AC-DC Converter</b>		<b>LK4501-7R</b>	
Input: $\sim$ 100 - 240 V, 2.3 A, 50 - 60 Hz		B 02403205	
Output: $\equiv$ 15 V, 10 A		U00000	
		V 105	
		L 16W1522	
		Made in Slovakia	
 POWER SOLUTIONS & PROTECTION	 MELCHER The Power Partners.	IP 30	
		 C US	

<b>AC-DC Converter</b>		<b>LK5320-7R</b>	
Input: $\sim$ 100 - 240 V, 2.4 A, 50 - 60 Hz		B 02403205	
Output 1: $\equiv$ 12 V, 6 A		U00000	
Output 2: $\equiv$ 12 V, 6 A		V 105	
		L 16W 1522	
		Made in Slovakia	
 POWER SOLUTIONS & PROTECTION	 MELCHER The Power Partners.	IP 30	
		 C US	

<b>AC-DC Converter</b>		<b>LK5540-7R</b>	
Input: $\sim$ 100 - 240 V, 2.4 A, 50 - 60 Hz		B 02403205	
Output 1: $\equiv$ 15 V, 5 A		U00000	
Output 2: $\equiv$ 15 V, 5 A		V 105	
		L 16W 1522	
		Made in Slovakia	
 POWER SOLUTIONS & PROTECTION	 MELCHER The Power Partners.	IP 30	
		 C US	

<b>AC-DC Converter</b>		<b>LKP5660-6R</b>	
Input: $\sim$ 187 - 240 V, 2.1 A, 50 - 60 Hz		B 02403205	
Output 1: $\equiv$ 24 V, 5.2 A		U00000	
Output 2: $\equiv$ 24 V, 5.2 A		V 104	
		L 16W1522	
		Made in Slovakia	
 POWER SOLUTIONS & PROTECTION	 MELCHER The Power Partners.	IP 30	
		 C US	



<p><b>Calibration</b></p>	<p>All instruments used in the tests given in this test report are calibrated and traceable to national or international standards. Further information about traceability will be given on request.</p>
<p><b>Measurement uncertainty</b></p>	<p>Measurement uncertainties are calculated for all instruments and instrument set-ups given in this report. Calculations are based on the principles given in the standard EA-4/02 (Dec. 1999), IEC Guide 115:2007, and other relevant internal Nemko-procedures. Further information about measurement uncertainties will be given on request.</p>
<p><b>Evaluation of results</b></p>	<p>If not explicitly stated otherwise in the standard, the test is passed if the measured value is equal to or below (above) the limit line, regardless of the measurement uncertainty. If the measured value is above (below) the limit line, the test is not passed - ref IEC Guide 115:2007. The instrumentation accuracy is within limits agreed by IECCE-CTL.</p>

<b>Test item particulars:</b>	
<b>Product group</b> .....	<input type="checkbox"/> end product <input checked="" type="checkbox"/> built-in component
<b>Classification of use by</b> .....	<input checked="" type="checkbox"/> Ordinary person <input type="checkbox"/> Children likely present <input checked="" type="checkbox"/> Instructed person <input checked="" type="checkbox"/> Skilled person
<b>Supply connection</b> .....	<input checked="" type="checkbox"/> AC mains <input checked="" type="checkbox"/> DC mains <input type="checkbox"/> not mains connected: <input type="checkbox"/> ES1 <input type="checkbox"/> ES2 <input type="checkbox"/> ES3
<b>Supply tolerance</b> .....	<input type="checkbox"/> +10%/-10% For AC mains <input type="checkbox"/> +20%/-15% <input type="checkbox"/> +16.7%/ -20% <input checked="" type="checkbox"/> LK and LS series: 85 – 264Vac / 88 – 300Vdc LKP series: 180 – 255Vac
<b>Supply connection – type</b> .....	<input type="checkbox"/> pluggable equipment type A - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> direct plug-in <input type="checkbox"/> pluggable equipment type B - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> permanent connection <input checked="" type="checkbox"/> mating connector provided, equipment for building-in, further evaluated at end use equipment <input type="checkbox"/> other:
<b>Considered current rating of protective device</b> .....	<input type="checkbox"/> 40 Location: <input type="checkbox"/> building <input type="checkbox"/> equipment <input checked="" type="checkbox"/> N/A – to be evaluated at end use
<b>Equipment mobility</b> .....	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> direct plug-in <input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> wall/ceiling-mounted <input type="checkbox"/> SRME/rack-mounted <input type="checkbox"/> other:
<b>Overvoltage category (OVC)</b> .....	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input checked="" type="checkbox"/> other: DC powered
<b>Class of equipment</b> .....	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified <input type="checkbox"/>
<b>Special installation location</b> .....	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> restricted access area <input type="checkbox"/> outdoor location <input type="checkbox"/>
<b>Pollution degree (PD)</b> .....	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
<b>Manufacturer’s specified T<sub>ma</sub></b> .....	71 °C maximum <input type="checkbox"/> Outdoor: minimum    °C
<b>IP protection class</b> .....	<input type="checkbox"/> IPX0 <input type="checkbox"/> IP20 <input checked="" type="checkbox"/> IP30 except with Option R, D and V with potentiometer adjustment
<b>Power systems</b> .....	<input checked="" type="checkbox"/> TN <input checked="" type="checkbox"/> TT <input checked="" type="checkbox"/> IT -    V <sub>L-L</sub> <input type="checkbox"/> not AC mains
<b>Altitude during operation (m)</b> .....	<input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> 5000 m
<b>Altitude of test laboratory (m)</b> .....	<input type="checkbox"/> 2000 m or less <input checked="" type="checkbox"/> 300 m
<b>Mass of equipment (kg)</b> .....	Approximately 1.2 kg

<b>Possible test case verdicts:</b> - test case does not apply to the test object ... : N/A - test object does meet the requirement ..... : P (Pass) - test object does not meet the requirement .... : F (Fail)	
<b>Testing:</b> Date of receipt of test item ..... : October 2015, April 2020 Date (s) of performance of tests..... : October 2015, May 2020	
<b>General remarks:</b> "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC62368-1:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>Not applicable</b>
<b>When differences exist; they shall be identified in the General product information section.</b>	
<b>Name and address of factory (ies) .....</b>	Bel Power Solutions s.r.o Areal ZTS 924 01841 Dubnica nad Vahom SLOVAKIA

**General product information and other remarks:**

Functional description:

The input voltage is fed via an input fuse, an input filter, a rectifier and an inrush current limiter to a single transistor boost converter. This converter provides a sinusoidal input current (IEC/EN 61000-3-2, class D equipment) and sources a capacitor with a voltage of 360-370 VDC. This capacitor sources a single transistor forward converter.

Each output is powered by a separate secondary winding on the main transformer. The resultant voltages are rectified and their ripples smoothed by a power choke and outputs filter. The control logic senses the main output voltage Uo1 and generates, with respect to the maximum admissible output currents, the control signal for the primary switching transistor. The second output of double output units is controlled by the main output but has independent current limiting. If the main output is driven into current limitation, the second output voltage will fall as well and vice versa. An auxiliary converter delivers the voltages for all main functions.

**Model Differences:**

Three different main PCB's are used. For single output K and S models, double output K and S models and LKP models. The main transformers feature an UL recognized isolation system (MF1 or MH1). The transformers are equal for each output voltage in S/K 4xxx and S/K5xxx models and LKP models.

**Ratings:**

Type	Input, A			Output ,DC		Total Output Power (W) Max.
	V	A	Hz	Output 1	Output 2	
LKP 5000	200 – 240	1.9 – 2.1	50/60	Max. 28.5 V, Max. 5.8 A	Max. 28.5 V, Max. 5.8 A	280

There are two outputs.

If you put them in parallel you can provide one output with max. output current. (LKP 5660)

If you put them in series you can provide one output with max. output voltage. (LKP 5740)

Alternatively both models can have a base plate instead of the heat sink.

LK 4000	100 – 240 Vac 88 – 300 Vdc	2.2 – 2.3 A	50/60 Hz	2 – 28.25 Vdc Max. 20 A	N/A	150
LK 5000	100 – 240 Vac 88 – 300 Vdc	2.2 – 2.4 A	50/60 Hz	2 – 28.25 Vdc Max. 6 A	2 – 28.25 Vdc Max. 6 A	150
LS 4000	100 – 240 Vac 95 – 300 Vdc	2.2 – 2.3 A	50/60 Hz	2 – 28.25 Vdc Max. 16 A	N/A	100
LS 5000	100 – 240Vac 95 – 300 Vdc	2.2 – 2.4 A	50/60 Hz	2 – 28.25 Vdc Max. 4.2 A	2 – 28.25 Vdc Max. 4.2 A	100

There are two outputs in x5000.

If you put them in series you can provide one output with max. output voltage 56.5V. (LK574x-7R).

Model differences: The S version has a smaller heat sink version than the K version. Alternatively both models can have a base plate for mounting to another heat sink in the end product instead of the heat sink. Refer to list of safety critical components.

**Nomenclature:** ab cdee-fgg (e.g.: LK 5660-6ER)

“ab” can be:	Means input voltage range and describes the series:	
LK	The S-version is smaller than the K-version.	
LS	The S-version has a smaller heatsink, and less power. Input voltage ranges: 88-300Vdc or 100-240Vac	
LKP	Input voltage 200-240Vac, but 250W power output.	

“c” can be:	And means:	“d” can be:	And means output voltage:
4	One output	0,1,2	5.1Vdc
5	Two outputs	3	12 Vdc
6 or higher	Customer specific models: Some only with mechanical changes (e.g. other front plate, other LED’s, and so on), some with other output voltages (e.g.: 13 V), and there are some with smaller input voltage range but up to 280 W output power. Not safety Relevant.	4,5	15 Vdc
		6	24 Vdc
		7,8	Customer specific products with output voltages between 2 and 28,25Vd.c.
		may be followed by 01...99	Other specifications for single output models.
“ee” can be:	And means (for models with two outputs; except customer specific models):	“f” can be:	And means ambient range:
20	12Vdc; 12Vdc	-5	up to 51°C
40	15Vdc; 15Vdc	-6	up to 60°C
60	24Vdc; 24Vdc	-7	-25 to 71°C
	Customer specific products may have different output rating.	-9	-40 to 71°C
70 – 99	Other specifications and additional features	-0, -1, -2, -3 or -4	Customer specific models
“gg” can be:	And means auxiliary functions and options:		
E <sup>1</sup>	Inrush current limitation		
R <sup>2</sup>	Output voltage control input		
P <sup>2</sup>	Potential meter(output voltage adjustment)		
D <sup>3</sup>	Save data signal(D0...DD, to be specified)		
V <sup>3,4</sup>	ACFAIL signal (V2,V3)		
T	Current sharing		
B1	Cooling plate standard case		
B2	Cooling plate for long case 220mm		
K	H15S2 connector replaced by H15S4 (only models with 5 V output)		
1...Option E is available for all models, mandatory for all -9 model types			
2...Feature R excludes option P and vice versa.			
3...Option D excludes option V and vice versa.			
4... Option V is available for LK/LS 4000 types with 5 V outputs.			

**CONDITIONS OF ACCEPTABILITY (Considerations used to test a component or sub-assembly):**

Model(s) require:

- 1) The products were tested on a 20 A (USA) and a 16 A (IEC) branch circuit in series. External circuit breaker did not open during the testing. The unit is approved for TN mains star connections and mains with 230 Vac phase to phase voltages.
- 2) All secondary output circuits are separated from mains by reinforced insulation and rated ES1 energy levels for one output. Both outputs together exceed the limit of 240 VA in LKP models.
- 3) The input and output connector was evaluated for factory wiring.
- 4) The power supply is rated class I. The power supply shall be properly bonded to the main protective bonding termination in the end product. The earth leakage current is below 3.5 mA.
- 5) The equipment has been evaluated for use in a Pollution Degree 2 and overvoltage category II environment and a maximum altitude of 2000 m.
- 6) Max. ambient temperature is 71°C for -7 models, 60°C for -6 models, 51°C for -5 models. Refer to nomenclature.
- 7) Disconnect device is considered end product evaluation.
- 8) Transformers TR1 (main board), TR81(auxiliary converter board) provide reinforced insulation primary to secondary.
- 9) Unit fulfils requirements for fire enclosure.

OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS				
Clause	Possible Hazard			
5	Electrically-caused injury			
Class and Energy Source (e.g. ES3: Primary circuit)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
ES3: Primary circuits (AC mains); Secondary circuits (DC mains)	Instructed, Skilled	Clearance / Creepage distance complies with 5.4.2 and 5.4.3	Protective earth bonding conductor complies with 5.6.4	N/A
ES3: Input pins upon removal of Supply Cord	Instructed, Skilled	N/A	N/A	Complies with 5.5.2.2 under normal, abnormal and component fault conditions (with load board)  Warning provide on installation instruction for touch input terminal after detached input voltage (without load board)
ES3: Input circuit (components: transformer)	Instructed, Skilled	N/A	N/A	Transformer (TR1, TR81)  Complies with Annex G.5.3, G13
ES3: Input circuit (components: bridging capacitors)	Instructed, Skilled	N/A	Protective earth conductor	Certified X2 or Y2 capacitors (C2, C3, C4, C5, C6, C7, C8)  Complies with Annex G.11
ES3: Primary/Secondary circuits	Ordinary, Instructed	Insulation sheet located between PCBs and metal chassis: Output of transformers	Protective earth bonding conductor complies with 5.6.4	N/A



		complies with 5.4.4.		
ES1: DC outputs	Instructed, Skilled	N/A	N/A	To be provided at end product
6	Electrically-caused fire			
Class and Energy Source (e.g. PS2: 100 Watt circuit)	Material part (e.g. Printed board)	Safeguards		
		B	1 <sup>st</sup> S	2 <sup>nd</sup> S
PS3: Input circuits	Printed wire board	Complies with 6.3.1*)	The PWB base material with flammability category V-0 material	Metal enclosure
PS3: Input circuits	Wire insulation and tube	Complies with 6.3.1*)	The wire insulation and tubing are rated VW-1 or FT1	Metal enclosure
PS3: Input circuits	Transformer (TR1, TR71, TR72)	Complies with 6.3.1*)	The transformers comply with Annex G.5.3	Metal enclosure
PS3: Input circuits and transformer outputs	Small parts mounted on PWB	Complies with 6.3.1*)	Mounted on base material with flammability category V-0 material	Metal enclosure
PS3: Output circuits	Small parts mounted on PWB	Complies with 6.3.1*)	Mounted on base material with flammability category V-0 material	Metal enclosure
*) No ignition, Components inside of fire enclosure which measured temperature <300°C during test, refer to table 5.4.1.4, 9.3, B.1.5, B.2.6.				
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
Electrolyte	Instructed, Skilled	Metal enclosure	--	--
8	Mechanically-caused injury			
Class and Energy Source (e.g. MS3: Plastic fan blades)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
MS1: Sharp edges and corners	Instructed, Skilled	N/A	N/A	N/A
MS1: less than 7 kg	Instructed, Skilled	N/A	N/A	N/A
9	Thermal burn			

Class and Energy Source (e.g. TS1: Keyboard caps)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
TS3: Internal circuit components	Instructed, skilled	*)	*)	*)
TS1: Enclosure	Ordinary person	*)	*)	*)
*) Equipment for building-in. Safeguard must be evaluated in the end product.				
10	Radiation			
Class and Energy Source (e.g. RS1: PMP sound output)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
RS1 (LED is for signal indicator only and the equipment is for building-in)	Instructed, Skilled	N/A	N/A	N/A
Supplementary Information: "B" – Basic Safeguard; "S" – Supplementary Safeguard; "R" – Reinforced Safeguard				