

## DESCRIPTION

## PRODUCT COVERED:

USR, CNR - Linear Power Supply, Models HBB5-3/OVP, HBB15-1.5, HBB24-1.2, HBB512, followed by suffix -A. Suffixes after the first hyphen may be replaced by -5XX or -7XX where X is 0-9. Model name may be followed by "G" or SXXX or SXXXG indicating non-safety critical options.

## ELECTRICAL RATINGS:

Model	Input			Output (dc)	
	V	A	Hz	V	# A
HBB5-3/OVP	100,120/220,230-240	1/0.5	50/60	5 -5	3 3
HBB15-1.5	100,120/220,230-240	1/0.5	50/60	12 or 15 -12 or -15	1.7 or 1.5 1.7 or 1.5
HBB24-1.2	100,120/220,230-240	1.5/0.75	50/60	24 -24	1.2 1.2
HBB512	100,120/220,230-240	1/0.5	50/60	5 9-15	3 1.2

Note: # - Derate rated current output by 10% for 50 Hz input supply.

## ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

Use - For use only in (or with) Applicant's Information Technology Equipment, where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Special Considerations - The following items are considerations that were used when evaluating this product.

**USR/CNR indicates investigation to the U.S. and Canadian (Bi-National) Standard for Safety of Information Technology Equipment, CSA C22.2 No. 60950-1 \* UL60950-1, First Edition, dated April 1, 2003.**

The equipment is considered: For building in Class I (earthed), pluggable Type A or B, intended for use on a TN power system.

Conditions of Acceptability - When installed in the end-use equipment, consideration shall be given to the following:

1. **This component has been judged on the basis of the required spacings in the Standard for Safety of Information Technology Equipment, CSA/UL60950-1, First Edition, dated April 1, 2003, Sub-clause 2.10 which would cover the component itself if submitted for Listing.**
2. The products were tested on a 20 A branch circuit. If used on a branch circuit greater than this, additional testing may be necessary.
3. All secondary output circuits for all models are SELV and are not hazardous energy levels.
4. The terminals and connectors have not been evaluated for field wiring.
5. The power supply shall be properly bonded to the main protective earthing termination in the end product.
6. Magnetic device (e.g. transformer) T1 employ(s) an (OBJY3) electrical insulation system designated Class B.
7. The equipment has been evaluated for use in Pollution Degree 2 environment.
8. A suitable Electrical and Fire enclosure shall be provided.
9. Abnormal Tests were conducted with a UL Listed time delay fuse rated as follows and connected in the ungrounded conductor circuit.

<u>Model</u>	<u>Supply Voltage (V)</u>	<u>Fuse Rating (A)</u>
HBB5-3/OVP	100,120/220,230-240	1/0.5
HBB15-1.5	100,120/220,230-240	1/0.5
HBB24-1.2	100,120/220,230-240	1.5/0.75
HBB512	100,120/220,230-240	1/0.5

10. Bonding terminal provided on this equipment have not been evaluated as protective earthing terminals.
11. These power supplies have been evaluated for use in 25°C and 50°C ambient in accordance with the manufacturer's specifications. The units were loaded to 100% of normal rated load for 25°C and 50°C at 60 Hz, 10% derated at 50 Hz. All models are convection cooled.
12. The maximum working voltage present is 282 V rms; 400 V pk. The Electric Strength Test in the end product shall be based on this value.

Product	Linear AC/DC Power Supplies
Applicant	Bel Fuse Inc. 206 Van Vorst St. Jersey City, NJ 07302 USA
Manufacturer	Bel Fuse Inc. 206 Van Vorst St. Jersey City, NJ 07302 USA
Factory	BPS Asia Pacific Electronics (Shenzhen) Co., Ltd. Building# 6, Nanming Road, Gongming Town Huahong Xintong Industrial Park, Guangming District 518108 Shenzhen China <input type="checkbox"/> See next page(s)
Ratings	1.0/1.0/0.5/0.5/0.5 A, 100/120/220/230/240Vac 50/60Hz
Trade mark	 a bel group
Model / Type Ref.	HBB5-3/OVP; HBB15-1.5
Principal characteristics	Model name may be followed by suffix –A. Model name may be followed by “G” or SXXX or SXXXG where X is from 0-9, indicating non-safety critical options. <input type="checkbox"/> See next page(s)
A sample of the product was tested and found to be in conformity with	OFF EN 60950-1:2006;A11;A1;A12;A2
Validity	This certificate documents conformity with the standards shown, and also applies as license for use of Nemkos name and certification mark. The certificate and license is valid as long as the applicable conditions are complied with, and provided that any changes to the product are notified to Nemko for acceptance prior to implementation. New standards or amendments to the standards may imply that the product design must be updated and/or that re-testing and re-certification is necessary.
Additional information	<input type="checkbox"/> See next page(s)  The abovementioned certified equipment complies with current regulatory requirements regarding electrical safety in Norway and other EU/EEA member states, as far as this can be checked. Compliance with requirements regarding building-in, protection against electric shock and Electromagnetic Compatibility (EMC) must be checked when the equipment is built-in a completed product or forms a part of a complete system.
Additional model(s)	<input checked="" type="checkbox"/> See next page(s)

Date of issue 12-10-2015



Okhyun Jeon  
Certification Department

Product	Linear AC/DC Power Supplies
Pos. No	1
Model / Type Ref.	HBB24-1.2
Trade mark (if different from page 1)	
Rating	1.5/1.5/0.75/0.75/0.75 A, 100/120/220/230/240Vac 50/60 Hz
Principal characteristics	Model name may be followed by suffix -A. Model name may be followed by "G" or SXXX or SXXXG where X is from 0-9, indicating non-safety critical options.
Product	Linear AC/DC Power Supplies
Pos. No	2
Model / Type Ref.	HBB512
Trade mark (if different from page 1)	
Rating	2.0/2.0/1.0/1.0/1.0 A 100/120/220/230/240Vac 50/60Hz
Principal characteristics	Model name may be followed by suffix -A. Model name may be followed by "G" or SXXX or SXXXG where X is from 0-9, indicating non-safety critical options.

Date of issue 12-10-2015



Okhyun Jeon  
Certification Department

**Nemko AS**  
Gaustadalléen 30, P.O. Box 73 Blindern, 0314 Oslo, Norway  
TEL +47 22 96 03 30 FAX +47 22 96 05 50 EMAIL info@nemko.com  
ENTERPRISE NUMBER NO974404532

**CB TEST CERTIFICATE CERTIFICAT D'ESSAI OC**Product  
ProduitName and address of the applicant  
Nom et adresse du demandeurName and address of the manufacturer  
Nom et adresse du fabricantName and address of the factory  
Nom et adresse de l'usineNote: When more than one factory, please report on page 2  
Note: Lorsque il y plus d'une usine, veuillez utiliser la deuxième pageRatings and principal characteristics  
Valeurs nominales et caractéristiques principalesTrademark (if any)  
Marque de fabrique (si elle existe)Type of Manufacturer's Testing Laboratories used  
Type de programme du laboratoire d'essais constructeurModel / 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 pageA 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 laAs shown in the Test Report Ref. No. which forms part of this Certificate  
Comme indiqué dans le Rapport desais numéro de référence qui constitue partie de ce CertificatThis CB Test Certificate is issued by the National Certification Body  
Ce Certificat desai OC est établi par l'Organisme **National de Certification**

Linear AC/DC Power Supplies

Bel Fuse Inc.  
206 Van Vorst St.  
Jersey City, NJ 07302  
USABel Fuse Inc.  
206 Van Vorst St.  
Jersey City, NJ 07302  
USABPS Asia Pacific Electronics (Shenzhen) Co., Ltd.  
Building# 6, Nanming Road, Gongming Town Huahong  
Xintong Industrial Park, Guangming District  
518108 Shenzhen  
China Additional information on page 2

1.0/1.0/0.5/0.5/0.5 A, 100/120/220/230/240Vac 50/60Hz



HBB5-3/OVP; HBB15-1.5

Model name may be followed by suffix -A. Model name may be followed by "G" or SXXX or SXXXG where X is from 0-9, indicating non-safety critical options.

 Additional information on page 2

IEC 60950-1(ed.2);am1;am2

292159

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518108 Shenzhen  
China Additional information on page 2

2.0/2.0/1.0/1.0/1.0 A 100/120/220/230/240Vac 50/60Hz



HBB512

Model name may be followed by suffix -A. Model name may be followed by "G" or SXXX or SXXXG where X is from 0-9, indicating non-safety critical options.

 Additional information on page 2

IEC 60950-1(ed.2);am1;am2

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Nom et adresse du demandeurName and address of the manufacturer  
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Xintong Industrial Park, Guangming District  
518108 Shenzhen  
China Additional information on page 2

1.5/1.5/0.75/0.75/0.75 A, 100/120/220/230/240Vac 50/60Hz



HBB24-1.2

Model name may be followed by suffix -A. Model name may be followed by  
"G" or SXXX or SXXXG where X is from 0-9, indicating non-safety critical  
options. Additional information on page 2


IEC 60950-1(ed.2);am1;am2



292159





<p><b>TEST REPORT</b></p> <p><b>IEC 60950-1</b></p> <p><b>Information technology equipment – Safety –</b></p> <p><b>Part 1: General requirements</b></p>	
<b>Report Number</b> .....	292159
Date of issue.....	8 October 2015
Total number of pages .....	42
<b>Applicant's name</b> .....	Bel Fuse Inc.
Address .....	206 Van Vorst St., Jersey City, NJ 07302
<b>Test specification:</b>	
Standard .....	IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013
Test procedure .....	CB-Scheme
Non-standard test method .....	N/A
<b>Test Report Form No.</b> .....	IEC60950_1F
Test Report Form(s) Originator.....	SGS Fimko Ltd
Master TRF.....	Dated 2014-02
<p><b>Copyright © 2014 IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components (IECEE System). All rights reserved.</b></p> <p>This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.</p> <p><b>This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.</b></p>	
<b>General disclaimer:</b>	
<p>The test results presented in this report relate only to the object tested. 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> .....:	Linear AC/DC Power Supplies
Trade Mark .....	 <small>a bel group</small>
Manufacturer .....	Same as Applicant
Model/Type reference.....:	Models HBB5-3-OVP, HBB15-1.5, HBB24-1.2 and HBB512, maybe followed by suffix –A. Model name may be followed by “G” or SXXX or SXXXG where X is from 0-9, indicating non-safety critical options.
Ratings .....	HBB5-3/OVP: 1.0/1.0/0.5/0.5/0.5 A, 100/120/220/230/240Vac HBB15-1.5: 1.0/1.0/0.5/0.5/0.5 A, 100/120/220/230/240Vac HBB24-1.2: 1.5/1.5/0.75/0.75/0.75 A, 100/120/220/230/240Vac HBB512: 2.0/2.0/1.0/1.0/1.0 A 100/120/220/230/240Vac Frequency for all models: 50/60 Hz

<b>Testing procedure and testing location:</b>		
<hr/>		
<b>CB Testing Laboratory:</b>	<b>Nemko USA Inc.</b>	
Testing location/ address.....:	<b>2210 Faraday Ave. Suite 150, Carlsbad, CA 92008, USA</b>	
<hr/>		
<b>Associated CB Testing Laboratory:</b>		
Testing location/ address.....:		
Tested by (name + signature).....:	Eli Madrigal	
Approved by (name + signature).....:	Jeff Busch	

<b>Report History:</b>
Original report

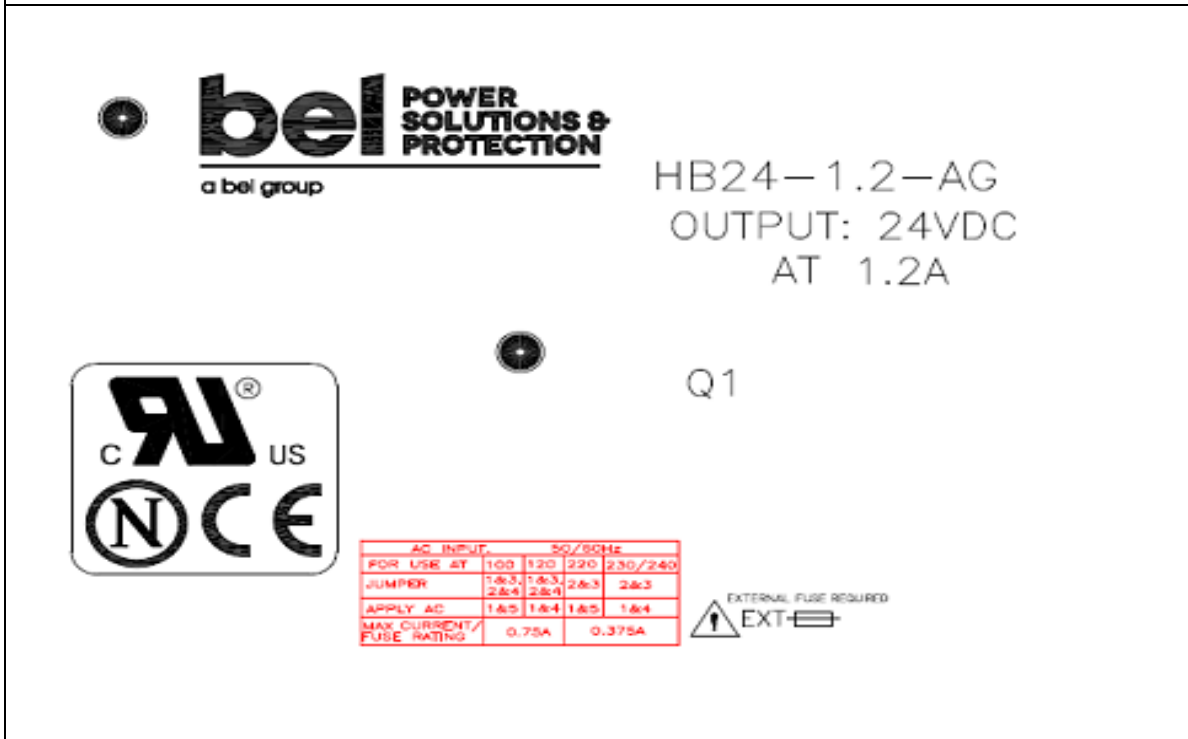
<b>List of Attachments (including a total number of pages in each attachment):</b>
<p><b>Attachment 1:</b> European Group Differences and National Deviations ..... 82 pages          Documented deviations contain individual national documents for several European countries that are included in the European Group Deviations. The European Group Difference: EN60950:2006/A11:2009/A:2010/A12:2011/A2:2013 are considered “Normative”. The individual national documents (Denmark, Finland, Germany, Ireland, Norway, Spain, Sweden, Switzerland and United Kingdom) are considered “informative” and included at the manufacturer’s request.</p> <p><b>Attachment 2:</b> Miscellaneous Documentation, e.g. Photos, PWB Layout, Schematic etc. .... 13 pages          (Not for publication – Engineering use only)</p>

Summary of testing	
General	All comments relate to all models, unless specifically stated.
Power supply	These equipment are open frame, Class I AC/DC Linear power supplies with universal AC input and single DC voltage output for building-in. This report covers multiple models and all comments / tests apply to all models unless otherwise indicated. Testing was conducted on various models as indicated.
1.5, 3.2.5; Power supply cord set.	A power supply cord set is not provided with the power supply. A power supply cord set, complying with the national regulations of the country in which the product is to be sold, shall be provided with the end-use equipment.
1.7.2; Safety instructions.	Instructions and equipment markings related to safety are to be provided in a language, which is acceptable in the country in which the equipment is to be sold. English language verified.
1.7.2.4; IT power distribution systems.	The equipment complies with the requirements for connection to the Norwegian IT power systems. The following information should be given (but is not required) in the installation instruction: "This product is also designed for IT power system with Phase to Phase voltage 230V."
2.7.4; Number and location of protective devices.	In Norway, IT power distribution system is used. Equipment with a single protective device is accepted in Norway. Other countries may have additional requirements.
2.7.6; Warning to service personnel.	After operation of the protective device, the equipment is still under voltage if it is connected to an IT-power system. A warning is required for service personnel. Norway does not require this warning.
5.2: Electric Strength test	Increased test voltages for Basic insulation applied to the equipment, based on measured working voltages.

<b>Summary of testing:</b>	
<p><b>Tests performed</b> (name of test and test clause):</p> <ul style="list-style-type: none"> <li>1) Input Test ..... 1.6.2</li> <li>2) Durability Test ..... 1.17.11</li> <li>3) SELV Reliability Test ..... 2.2</li> <li>4) Protective Bonding Test ..... 2.6.3.4</li> <li>5) Humidity Test ..... 2.9.2</li> <li>6) Working Voltage Measurement ..... 2.10.2</li> <li>7) Hazardous Voltage Measurement ..... 2.10.2</li> <li>8) Heating Test ..... 4.5.1</li> <li>9) Touch Current Test ..... 5.1</li> <li>10) Electric Strength Test ..... 5.2.2</li> <li>11) Component Failure Test ..... 5.3</li> <li>12) Abnormal Operation Test ..... 5.3</li> <li>13) PS Output Overload and Short Test ..... 5.3</li> <li>14) Transformer Overload Test ..... 5.3</li> </ul>	<p><b>Testing location:</b> See page 2</p>

<b>Summary of compliance with National Differences:</b>
<p><b>List of countries addressed</b></p> <p>Austria (AT), Australia (AU), Canada (CA), China (CN), Denmark (DK), Finland (FI), Germany (DE), Ireland (IE), Israel (IS), Korea (KR), Norway (NO), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), United Kingdom (GB), United States of America (US)</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements of:</b> EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013</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 Certification Bodies that own these marks.



<b>Calibration</b>	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.
<b>Measurement uncertainty</b>	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, Nemko routine L227 and other relevant internal Nemko-procedures. Further information about measurement uncertainties will be given on request.
<b>Evaluation of results</b>	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, and Nemko routine L220. The instrumentation accuracy is within limits agreed by IECCE-CTL (ref. Nemko routine L227).

<b>Test item particulars:</b>	
Equipment mobility .....	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains .....	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> type A <input type="checkbox"/> type B <input checked="" type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input type="checkbox"/> not directly connected to the mains
Operating condition .....	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location .....	<input checked="" type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location
Over voltage category (OVC) .....	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Mains supply tolerance (%) or absolute mains supply values .....	-10%, +6%
Tested for IT power systems .....	<input checked="" type="checkbox"/> Yes (Norway only) <input type="checkbox"/> No
IT testing, phase-phase voltage (V) .....	230
Class of equipment .....	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A) .....	To be evaluated at end use
Pollution degree (PD) .....	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class .....	IPX0 (Not evaluated for ingress of water)
Altitude during operation (m) .....	2000 m
Altitude of test laboratory (m) .....	38 m, sea level
Mass of equipment (kg) .....	2.0 kg
Temperature, Ambient (°C) .....	50 °C

<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
Date (s) of performance of tests .....	October 2015

**General remarks:**

"(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  comma /  point is used as the decimal separator.**

**Manufacturer's Declaration per sub-clause 6.2.5 of IEC 60950-1:**

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>N/A</b>
---	---

**When differences exist; they shall be identified in the General product information section.**

**Name and address of factory (ies)..... :** BPS Asia Pacific Electronics (Shenzhen) Co., Ltd.  
 Building# 6, Nanming Road, Gongming Town  
 Huahong Xintong Industrial Park  
 Guangming District  
 518108 Shenzhen  
 PEOPLE'S REPUBLIC OF CHINA

**General product information:**

This test report is based on a TUV SUD test report Ref. No. 095-1000015269-000 dated: 12/10/2010 with appended CB cert Ref. No. DE 3-58872 dated: 12/17/2010.

This test report includes additional evaluation of the power supply to the requirements of IT power systems. The report includes an upgrade to IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013.

For continuity, data from the original TUV report is included in this report, along with the additional evaluation referenced.

These linear power supply models are open frame AC/DC linear power supplies. They have been evaluated for use in a maximum operating temperature of 50°C Convection Cooled. The units were tested with 100% of normal rated load at 60Hz input and load is derated by 10% at 50 Hz

**Model Differences:**  
 All models are constructed the same with the exception of minor secondary components and different output voltages.

**Additional Electrical Rating Information:**

Model	Input AC			Output #1		Output #2	
	Vac	A	Hz	Vdc	A	Vdc	A
HBB5-3/OVP	100/120 220/230/240	1.0 0.5	50/60	5	3	-5	3
HBB15-1.5	100/120 220/230/240	1.0 0.5	50/60	12 or 15	1.7 or 1.5	-12 or 15	1.7 or 1.5
HBB24-1.2	100/120 220/230/240	1.5 0.75	50/60	24	1.2	-24	1.2
HBB512	100/120 220/230/240	2.0 1.0	50/60	5	3	12 or 15	1.2

**CONDITIONS OF ACCEPTABILITY:**

When installed in the end use equipment, the following are among the considerations to be made:

All models require:

- 1) A suitable electrical fire enclosure at end use.
- 2) A reliable ground (Protective Earth) connection at end use.
- 3) External fusing as specified in the installation instructions

**Abbreviations used in the report:**

- normal conditions .....	N.C.	- single fault conditions.....	S.F.C
- functional insulation.....	OP	- basic insulation .....	BI
- double insulation .....	DI	- supplementary insulation .....	SI
- between parts of opposite polarity .....	BOP	- reinforced insulation.....	RI
Indicate used abbreviations (if any): .....None			



# ***Declaration of Conformity***

## ***CE MARKING***

We, **Bel Fuse Inc., 206 Van Vorst St., Jersey City, New Jersey, USA 07302** declare under our sole responsibility that the products;

**Power Supply Model: Linear Power Supplies (BB Case); HBB5-3-OVP, HBB15-1.5, HBB24-1.2 and HBB512, maybe followed by suffix –A. Model name may be followed by “G” or SXXX or SXXXG where X is from 0-9, indicating non-safety critical options.**

to which this declaration relates, is/are in compliance with the following document(s):

Quality Standard(s): **ISO 9001, EN 29001**

Directive: **DIR 2014/35/EU, Low Voltage Directive**

Product Safety Standard(s): **EN 60950-1: 2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013**  
(Licensed by a Notified Body to the European Union )

Directive: **DIR 2011/65/EU, ROHS Directive**  
**EN50581:2012**

These component level power supplies are intended exclusively for inclusion within other equipment by an industrial assembly operation or by professional installers per the Installation Instructions provided with the units. The power supplies are considered Class I and must be connected to a reliable earth grounding system. All models without suffix “G” at the end of the model name are not compliant to ROHS directive.



\_\_\_\_\_  
(Manufacturer)

Editha S. Vergara  
Director, Safety and Environmental  
Compliance

**Santa Clara, CA,USA**  
(Place)

**Dec. 1, 2016**  
(Date)