Certificate of Compliance

Certificate: 70045767 **Master Contract:** 170351

Project: 70045767 **Date Issued:** 2015-09-08

Issued to: **Bel Fuse Inc.**
206 Van Vorst St
Jersey City, New Jersey 07302
USA

Attention: Editha S. Vergara

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Issued by: Juan-Carlos Olivera
Juan-Carlos Olivera, MSc.

PRODUCTS
CLASS – 5311 11 - POWER SUPPLIES - Component Type (CSA 60950-1-07-2nd Ed)
CLASS – 5311 91 - POWER SUPPLIES - Component Type (UL 60950-1-2nd Ed) - Certified to U.S. Stds

For details related to rating, size, configuration, etc. reference should be made to the CSA Certification Record or the descriptive report.

Component type power supplies intended for use with Information Technology and Business Equipment, where the suitability of the combination is to be determined by CSA Group.

AC-DC/DC-DC Switching Power Supplies, Model LOK 4 Series; rated Input: 100-240 V ac, 1.3 A, 47-63 Hz; or 90-250 Vdc, 0.8 A; Output as follows:

Model	Output Voltage, Vdc	Output Current, A
LOK4001-2RLD	5.1	5.2
LOK4301-2R	12	4.0
LOK4140-2RLD	12 -12.84 [1)] to 15	3.6
LOK4601-2R	24	2.0

LOK4240-2RLD	24 - 25.7 [1] to 30	1.8
LOK4801-2R	48	1.0
LOK4740-2RLD	48-51.4 [1] to 60	0.9
Notes: 1) Battery charger and LOK 4001-2RLD. 2) Up to 70ºC with derating		

Typical Model Designation with Additional Ratings:

LOK 4 601 - 2 RLD
I II III IV V

I – Model Series: LOK 4

II – Output Voltage:
001= 5.1 V dc
301= 12 V dc
601= 24 V dc
801= 48 V dc
140= 12-15 V Battery charger
240= 24-30 V Battery charger
740= 48-60 V Battery charger
02-99= Other voltages or specs.

III – Operating Case Temperature Range Maximum (Tc):
-2[1] = -10…80ºC

IV – Options Suffix (may be combined):
R = Output voltage control input
L[1] = Rectangular output characteristic
D[1] = Output OK signal
F = Built-in second fuse(Option)
K = K system connector
F = Fuse F2 is installed

Notes:

1. Any combination of input voltage and output voltages shown above creates a valid model number
2. X suffix may be letters and/or numbers denoting non-safety-critical options (unless described otherwise in the report).
3. Component type power supplies intended for use with Information Technology and Business Equipment, where the suitability of the combination is to be determined by CSA Group.
4. The operating ambient temperature range was changed to the maximum operating case temperature range Tc.

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APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No 60950-1-07, +Am.1:2011 +Am.2:2014	–	Information Technology Equipment - Safety - Part 1: General Requirements
UL 60950-1-2014	–	Information Technology Equipment - Safety - Part 1: General Requirements

CONDITIONS OF ACCEPTABILITY

1. The power supply shall be installed in compliance with the enclosure, mounting, spacing, casualty and segregation requirements of the ultimate application.

2. All secondary output circuits are SELV and are not hazardous energy level. The outputs are separated from the input by reinforced insulation Method 1.

3. The connectors are not acceptable for field wiring and are only intended for connection to internal wiring inside the end use machine. The acceptability of these connectors relative to secureness, insulation materials, and temperature shall be considered.

4. The transformer (TR1), which employs a Class B (130°C) insulation system, should be given special consideration during the end-use heating test because of temperatures achieved during component level tests at room ambient (a temperature rise of 73K was measured).

5. The unit was tested on 15A branch circuit. If used on a branch circuit greater than this, additional testing may be necessary.

6. The power supply shall be properly bonded to the main protective earthing termination in the end product.

7. These power supplies shall not be connected to Centralized DC Power Supply.

8. Special spacing consideration should be given to the end-use product as the spacings between the unit and mounting surface have not been evaluated.

Supplement to Certificate of Compliance

Certificate: 70045767 **Master Contract:** 170351

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
70045767	2015-09-08	AC-DC/DC-DC Switching Power Supplies, Model LOK 4 Series. (C/US) (transferred from 173688 - 2213528 and upgraded to include Am1 and Am2).

CERTIFICATE

No. P15220362

Order No. 292916

Product	AC/DC or DC/DC Switching Power Supply
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	Bel Power Solutions, s.r.o. Areal ZTS 924 Dubnica nad Vahom 01841 Slovakia ☐ See next page(s)
Ratings	Input: 100-240Vac, 1.3A 50-60Hz or 90-250 Vdc, 0.8A
Trade mark	bel POWER SOLUTIONS & PROTECTION a bel group
Model / Type Ref.	LOK 4000 Series
Principal characteristics	The explanation of the model name see the test report ☐ 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	☐ 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)	☐ See next page(s)

Date of issue 19-10-2015

Juan Z. Kleppenes

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

Ref. Certif. No.

NO88835

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI DACCEPTATION MUTUELLE DE CERTIFICATS DESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE CERTIFICAT D'ESSAI OC

Product Produit	AC/DC or DC/DC switching power supply
Name and address of the applicant Nom et adresse du demandeur	Bel Fuse Inc. 206 Van Vorst St. Jersey City, NJ 07302 USA
Name and address of the manufacturer Nom et adresse du fabricant	Bel Fuse Inc. 206 Van Vorst St. Jersey City, NJ 07302 USA
Name and address of the factory Nom et adresse de l'usine Note: When more than one factory, please report on page 2 Note: Lorsque il y plus d'une usine, veuillez utiliser la deuxième page	Bel Power Solutions, s.r.o. Areal ZTS 924 Dubnica nad Vahom 01841 Slovakia ☐ Additional information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	Input: 100-240Vac, 1.3A 50-60Hz or 90-250 Vdc, 0.8A
Trademark (if any) Marque de fabrique (si elle existe)	bel POWER SOLUTIONS & PROTECTION a bel group
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	
Model / Type Ref. Ref. De type	LOK 4000 Series
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiqués sur la deuxième page	The explanation of the model name see the test report ☐ 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 60950-1(ed.2);am1;am2
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport dessais numéro de référence qui constitue partie de ce Certificat	292916

This CB Test Certificate is issued by the National Certification Body
Ce Certificat dessai OC est établi par l'Organisme **National de Certification**

Nemko

Gaustadalléen 30
NO-0373 Oslo, Norway

Date: 19-10-2015

Signature: Juan Z. Kleppenes
Certification Department

Test Report issued under the responsibility of

www.nemko.com

TEST REPORT

IEC 60950-1

Information technology equipment – Safety – Part 1: General requirements

Report Number.....:	292916
Date of issue.....:	15 October 2015
Total number of pages.....	46 pages
Applicant's name.....:	Bel Fuse Inc.
Address .....:	206 Van Vorst St., Jersey City, NJ 07302
Test specification:	
Standard .....:	IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013
Test procedure.....:	CB-Scheme
Non-standard test method .....:	N/A
Test Report Form No. .....:	IEC60950_1F
Test Report Form(s) Originator.....:	SGS Fimko Ltd
Master TRF.....:	Dated 2014-02

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.

General disclaimer:

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.

Test item description.....:	AC/DC or DC/DC switching power supply
Trade Mark .....:	bel POWER SOLUTIONS & PROTECTION a bel group
Manufacturer.....:	Same as Applicant
Model/Type reference.....:	LOK 4000 Series (See General Product information for additional details)
Ratings .....:	Input: 1.3 A, 100 - 240 Vac, 50-60 Hz or 0.8 A, 90 - 250Vdc

Testing procedure and testing location:

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

Report History:
Original report

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

Attachment 1: 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.

Attachment 2: Miscellaneous Documentation, e.g. Photos, PWB Layout, Schematic etc. .....23 pages
(Not for publication – Engineering use only)

Summary of testing	
General	All comments relate to all models, unless specifically stated.
Power supply	The equipment is an enclosed, Class I switch mode power supply 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.

Summary of testing: (continued)	
Tests performed (name of test and test clause)**:** 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

Summary of compliance with National Differences:

List of countries addressed

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)

☒ **The product fulfils the requirements of** EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013.

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.

Test item particulars:	
Equipment mobility ..... :	[] movable [] hand-held [] transportable [] stationary [**X**] for building-in [] direct plug-in
Connection to the mains..... :	[] pluggable equipment [] type A [] type B [] permanent connection [] detachable power supply cord [] non-detachable power supply cord [] not directly connected to the mains [**X**] For building-in, compliance at end use
Operating condition ..... :	[**X**] continuous [] rated operating / resting time:
Access location ..... :	[**X**] operator accessible, for building-in [] restricted access location
Over voltage category (OVC) ..... :	[] OVC I [**X**] OVC II [] OVC III [] OVC IV [] other:
Mains supply tolerance (%) or absolute mains supply values ..... :	AC Input: -10%, +10% (90 to 264 Vac) DC Input: 90 – 250Vdc (0% tolerance)
Tested for IT power systems ..... :	[**X**] Yes (Norway only) AC Unit only [ ] No
IT testing, phase-phase voltage (V) ..... :	230
Class of equipment ..... :	[**X**] Class I [] Class II [] Class III [] Not classified
Considered current rating of protective device as part of the building installation (A) ..... :	20 A for Norts America, 16 A Europe
Pollution degree (PD) ..... :	[] PD 1 [**X**] PD 2 [] 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) ..... :	0.33 kg
Temperature, Ambient (°C)..... :	80ºC maximum case operating temperature (Tc)

Possible test case verdicts:	
- 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)

Testing..... :	
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 IECEE 02:	
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 . :	☐ **Yes** ☒ **N/A**
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) .....:	Bel Power Solutions, s.r.o. ArealZTS Dubnica n.Vahom c.924 01841 Dubnica nad Vahom SLOVAKIA

General product information:

This test report is based on a TUV SUD test report Ref. No. SI1300016144-000 with appended CB cert Ref. No. DE3-500371. The report also 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 models are DIN-rail mountable AC-DC (DC-DC) converters designed to be used as rectifiers or battery chargers.

Additional Ratings, OUTPUT:

Model	Output Voltage, Vdc	Output Current, A
LOK4001-2RLD	5.1	5.2
LOK4301-2R	12	4.0
LOK4140-2RLD	12 -12.84 1) to 15	3.6
LOK4601-2R	24	2.0
LOK4240-2RLD	24 - 25.7 1) to 30	1.8
LOK4801-2R	48	1.0
LOK4740-2RLD	48-51.4 1) to 60	0.9
Notes: 1) Battery charger and LOK 4001-2RLD. 2) Up to 70ºC with derating		

Typical Model Designation with Additional Ratings:

LOK 4 601 - 2 RLD
I II III IV V

I – Model Series: LOK 4

II – Output Voltage:
001= 5.1 V dc
301= 12 V dc
601= 24 V dc
801= 48 V dc
140= 12-15 V Battery charger
240= 24-30 V Battery charger
740= 48-60 V Battery charger
02-99= Other voltages or specs.

III – Operating Case Temperature Range Maximum (Tc):
-2 1) = -10…80ºC

IV – Options Suffix (may be combined):
R = Output voltage control input
L 1) = Rectangular output characteristic
D 1) = Output OK signal
F = Built-in second fuse(Option)
K = K system connector
F = Fuse F2 is installed

Note: Any combination of input voltage and output voltages shown above creates a valid model number.