Certificate of Compliance

Certificate: 70027618 **Master Contract:** 170351

Project: 70027618 **Date Issued:** April 09, 2015

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 - C531111 - POWER SUPPLIES-Component Type (CSA 60950-1-07-2nd Ed)
CLASS - C531191 - 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.

DC-DC Converter; Models 24IBX15-50-0, 24IBX15-50-0Z, 36IBX15-50-0 and 36IBX15-50-0Z. Model designation may be followed by suffix G which indicates ROHS compliance.

Electrical Rating:

Model	DC Input		DC Output	
	V	A	V	A
36IBX15-50-0, 36IBX15-50-0Z	24 to 160	5	50-160	2.25

24IBX15-50-0, 24IBX15-50-0Z	15.4 to 160	7.5	50-160	1.6

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. Subject models are to be installed by trained service personnel, as per manufacturer's specifications.
2. The power supplies have been evaluated for use in a Pollution Degree 2 environment.
3. Unit is intended to be supplied from an isolated secondary circuit and has been evaluated for functional insulation.
4. Abnormal and Component Failure Tests were conducted with the power supply input protected by an external fuse, rated 8 A, 250 V for 36IBX and 10 A, 250 V for 24 IBX. If a fuse rated greater than it was used on testing, additional testing may be required.
5. The units were tested for zero tolerance input voltage.
6. Special enclosure consideration should be given to the end-use installation. The end-use product should be reviewed to determine whether accessibility requirements are met for the end-use product.
7. Subject models were tested for use at the maximum case temperature (Tc) permitted by the manufacturer's specification of: 120°C Tc* points for open frame and 100°C for close frame. The units were tested with air-cooling applied from output to input.

   Open frame Units: *Tc is located at SH100 coil or D105 case.
   Close frame Units: *Tc is located at center of metal case.
8. Outputs for all models are non-SELV operating at hazardous energy levels (>240 VA).
9. Output pins are to be connected only to internal wiring in the end system as per manufacturer specifications.
10. Suitable fire and electrical enclosure shall be provided in the end system.

Supplement to Certificate of Compliance

Certificate: 70027618 **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
70027618	Apr 9 2015	DC-DC Converter; Models 24IBX15-50-0, 24IBX15-50-0Z, 36IBX15-50-0 and 36IBX15-50-0Z. (C/US) (transferred from 173688 - 2619006 and upgraded to include Am2)

CERTIFICATE

No. P15219787

Order No. 284342

Product	DC/DC Converter
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 01841 Dubnica nad Vahom Slovakia ☐ See next page(s)
Ratings	16.8 to 160 Vdc, 7.5 A
Trade mark	bel POWER SOLUTIONS & PROTECTION a bel group
Model / Type Ref.	24IBX15-50-0, 24IBX15-50-0Z
Principal characteristics	Where model name may be followed by suffix 'G' indicating RoHS version ☐ 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 13-05-2015

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

CERTIFICATE

No. P15219787

Order No. 284342

Product	DC/DC Converter
Pos. No	1
Model / Type Ref.	36IBX15-50-0, 36IBX15-50-0Z
Trade mark (if different from page 1)	
Rating	25.2 to 160 Vdc, 5 A
Principal characteristics	Where model name may be followed by suffix 'G' indicating RoHS version

Date of issue 13-05-2015

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

Ref. Certif. No.

NO86689

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	DC/DC Converter
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 01841 Dubnica nad Vahom Slovakia ☐ Additional information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	6.8 to 160 Vdc, 7.5 A
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	24IBX15-50-0, 24IBX15-50-0Z
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiqués sur la deuxième page	Where model name may be followed by suffix 'G' indicating RoHS version ☐ 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	284342

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: 13-05-2015

Signature: Okhyun Jeon
Certification Department

Ref. Certif. No.

NO86690

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	DC/DC Converter
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 01841 Dubnica nad Vahom Slovakia ☐ Additional information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	25.2 to 160 Vdc, 5 A
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	36IBX15-50-0, 36IBX15-50-0Z
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiqués sur la deuxième page	Where model name may be followed by suffix 'G' indicating RoHS version ☐ 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	284342

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: 13-05-2015

Signature: Okhyun Jeon
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. ..... :	**284342**
Date of issue ..... :	11 May, 2015
Total number of pages	51
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

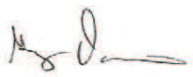
This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

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 ..... :	DC/DC Converter
Trade Mark ..... :	bel POWER SOLUTIONS & PROTECTION a bel group
Manufacturer..... :	Same as Applicant
Model/Type reference ..... :	24IBX15-50-0, 24IBX15-50-0Z, 36IBX15-50-0, 36IBX15-50-0Z (may be followed by suffix 'G' indicating RoHS version)
Ratings..... :	24IBX15-50-0, 24IBX15-50-0Z: 16.8 to 160 Vdc, 7.5 A 36IBX15-50-0, 36IBX15-50-0Z: 25.2 to 160 Vdc, 5 A

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) ..... :		George Daverin	
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 ..... 76 pages Documented deviations contain individual national documents for several European countries that are already documented in the European Group Deviations. The European Group Differences: EN 60950-1:2006/A11:2009/A1:2010/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. ..... 8 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, switch mode power supply with universal DC input and multiple DC voltage outputs 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.
4.5 Thermal Requirements	Subject models were tested for use at the maximum case temperature (Tc) permitted by the manufacturer’s specification of: 120°C Tc* points for open frame and 100°C for close frame. The units were tested with air-cooling applied from output to input. Open frame Units: *Tc is located at SH100 coil or D105 case. Close frame Units: *Tc is located at center of metal case.
5.3 Component failure	Abnormal and Component Failure Tests were conducted with the power supply input protected by an external fuse, rated 8 A, 250 V for 36IBX and 10 A, 250 V for 24 IBX. If a fuse rated greater than it was used on testing, additional testing may be required.

Summary of testing:	
Tests performed (name of test and test clause)**:** 1) Input Test (Clause 1.6.2) 2) Durability Test (Clause 1.17.13) 3) Humidity Test (Clause 2.9.2) 4) Heating Test (Clause 4.5.1) 5) Electric Strength Test (Clause 5.2.2) 6) Component Failure Test (Clause 5.3) 7) Abnormal Operation Test (Clause 5.3) 8) PS Output Overload and Short Test (Clause 5.3)	**Testing location:** See page 2

Summary of compliance with National Differences:

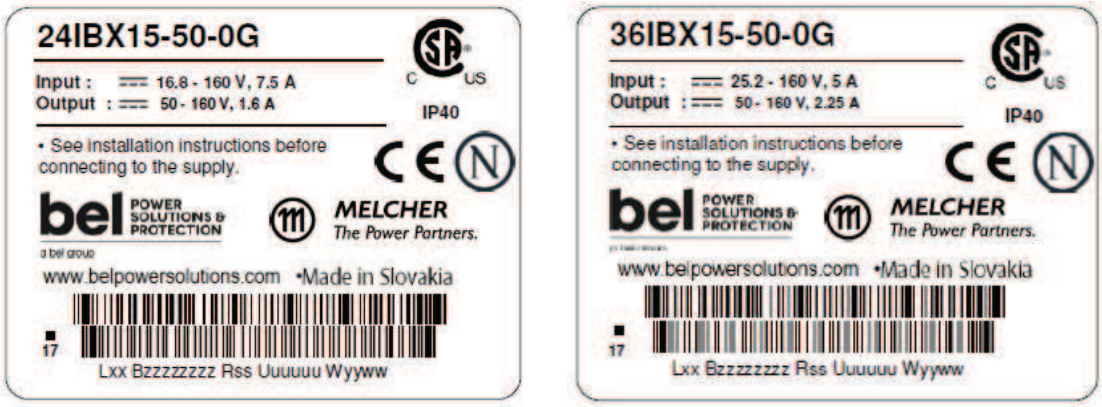
List of countries addressed

Austria (AT), Australia (AU), Canada (CA), 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.



Calibration	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.
Measurement uncertainty	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.
Evaluation of results	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 IECEE-CTL (ref. Nemko routine L227).

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 [**X**] not directly connected to the mains [**X**] Specific DC Input Connector provided
Operating condition ..... :	[**X**] continuous [] rated operating / resting time:
Access location ..... :	[] operator accessible [] restricted access location
Over voltage category (OVC) ..... :	[] OVC I [] OVC II [] OVC III [] OVC IV [**X**] other: DC Powered
Mains supply tolerance (%) or absolute mains supply values ..... :	N/A
Tested for IT power systems ..... :	[] Yes [**X**] No
IT testing, phase-phase voltage (V) ..... :	N/A
Class of equipment ..... :	[ ] Class I (at end use) [] Class II [] Class III [**X**] Not classified
Considered current rating of protective device as part of the building installation (A) ..... :	To be evaluated at end use
Pollution degree (PD) ..... :	[] PD 1 [**X**] PD 2 [] PD 3
IP protection class ..... :	IPX0
Altitude during operation (m) ..... :	2000 m
Altitude of test laboratory (m) ..... :	94 m
Mass of equipment (kg) ..... :	0.08 kg (open frame), 0.32 kg (closed frame)
Temperature, Case (°C)..... :	120°C (open frame max.), 100°C (closed frame max.)

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 ..... :	April, 2015
Date (s) of performance of tests..... :	May, 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 ☒ Not applicable
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. SI1300016119-000 with appended CB cert Ref. No. DE 3 -500261, evaluated to the requirements of IEC 60950-1:2005 2nd ed. + A1:2009.
This test report includes an evaluation upgrade to the requirements of IEC 60950-1:2005 2nd ed. + A1:2009 +A2:2013, an addition of a new trade mark and a re-evaluation and addition of notes to table 1.5.1.
For continuity, data from the original TUV report is included in this report, along with the additional evaluation referenced.
Models 24IBX and 36IBX are power regulators. They are designed to be soldered on to printed circuit boards or plugged into end-user sockets. The unit is provided with metal case and bottom side covered with laminated plate. Functional insulation is maintained between input to output and input/output to case.

Model Differences:
36IBX15-50-0ZG is base model
36IBX15-50-0G is exactly the same as 36IBX15-50-0ZG except it is a closed frame while 36IBX15-50-0ZG is open frame.
Model 24IBX Series is exactly the same as 36IBX except for the input voltage range and lower output current
Model 24IBX15-50-0G is exactly the same as 24IBX15-50-0ZG except it is a closed frame while 24IBX15-50-0ZG is open frame.
Additional Rating Information:

Model	DC Input		DC Output	
	V	A	V	A
36IBX15-50-0, 36IBX15-50-0Z	25.2.0 to 160	5.0	50-160	2.25
24IBX15-50-0, 24IBX15-50-0Z	16.8 to 160	7.5	50-160	1.60

Conditions of Acceptability:

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

The following must be evaluated at end use:

1) Subject models are to be installed by trained service personnel, as per manufacturer's specifications.
2) The power supplies have been evaluated for use in a Pollution Degree 2 environment.
3) Unit is intended to be supplied from an isolated secondary circuit and has been evaluated for functional insulation.
4) Abnormal and Component Failure Tests were conducted with the power supply input protected by an external fuse, rated 8 A, 250 V for 36IBX and 10 A, 250 V for 24 IBX. If a fuse rated greater than it was used on testing, additional testing may be required.
5) The units were tested for zero tolerance input voltage.
6) Special enclosure consideration should be given to the end-use installation. The end-use product should be reviewed to determine whether accessibility requirements are met for the end-use product.
7) Subject models were tested for use at the maximum case temperature (Tc) permitted by the manufacturer's specification of: 120°C Tc* points for open frame and 100°C for close frame. The units were tested with air-cooling applied from output to input.

   Open frame Units: *Tc is located at SH100 coil or D105 case

   Close frame Units: *Tc is located at center of metal case
8) Outputs for all models are non-SELV operating at hazardous energy levels (>240 VA).
9) Output pins are to be connected only to internal wiring in the end system as per manufacturer specifications.
10) Suitable fire and electrical enclosure shall be provided in the end system.

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