Ref. Certif. No.

CA/26135/CSA

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

CB TEST CERTIFICATE

Product	AC-DC Converter
Name and address of the applicant	Bel Fuse Inc. 206 Van Vorst St., Jersey City, NJ 07302, USA
Name and address of the manufacturer	Bel Fuse Inc. 206 Van Vorst St., Jersey City, NJ 07302, USA
Name and address of the factory Note: *When more than one factory, please report on page 2*	Bel Power Solutions, s.r.o. Areal ZTS Dubnica nad Vahom c.924 01841 Dubnica nad Vahom, SLOVAKIA ☒ Additional Information on page 2
Ratings and principal characteristics	Input: 100 – 240 Vac, 50/60Hz, 2.0 A See page 3 for complete ratings
Trademark / Brand (if any)	bel POWER SOLUTIONS & PROTECTION a bel group
Customer's Testing Facility (CTF) Stage used	CTF Stage 3
Model / Type Ref.	MAP55 Series and MAP40-1005 See page 3 for complete Model / Type Ref.
Additional information (if necessary may also be reported on page 2)	Additionally evaluated t the requirements of EN 62368-1:2020 + A11:2020 ☐ Additional Information on page 2
A sample of the product was tested and found to be in conformity with	IEC 62368-1: 2018
As shown in the Test Report Ref. No. which forms part of this Certificate	CB 170351 - 80060211

This CB Test Certificate is issued by the National Certification Body

CSA GROUP™

CSA Group
178 Rexdale Boulevard
Toronto, ON M9W 1R3 Canada

Date: 2020-12-10

Signature: Ze Guo

Name and address of the factory

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

Ratings and principal characteristics & Model / Type Ref.

Electrical rating:

Model	Output #1		Output #2		Output #3		Output #4		Output Power (W)	
	Vdc	A	Vdc	A	Vdc	A	Vdc	A	w/o fan	W/ fan
MAP40-1005	5	8	—	—	—	—	—	—	40	—
MAP55-1012	12 or 15	5 4	—	—	—	—	—	—	50	60 a)
MAP55-1024	24 or 28	2.4 2.2	—	—	—	—	—	—	50	60 a)
MAP55-4000	-12	1	-5	1	12	3	5	6	c)	55 b)
MAP55-4001	12	1	-12	1	24	1.5	5	6	c)	55 b)
MAP55-4002	12	1	-12	1	12	3	5	6	c)	55 b)
MAP55-4003	-15	1	-5	1	15	2.5	5	6	c)	55 b)
MAP55-4004	15	1	-15	1	24	1.5	5	6	c)	55 b)
MAP55-S104	-15	0.5	15	2.3	5	6	—	—	35	55 b)
MAP55-S106	-12	1	-5	1	12	3	5	6	c)	55 b)
MAP55-S108	12	1	-12	1	24	1.5	5	6	c)	55 b)
MAP55-S135	-12	1	-5	1	12	3	5	6	c)	55 b)

a) With 150 LFM (linear feet per minute) air-cooling
b) With 200 LFM (linear feet per minute) air-cooling
c) Maximum total output power rated 45 W @40 °C ambient operating temperature for models with no cover and 40 W for models with cover (C or D option).
Note: All models maybe followed by the following suffix or combination of suffixes: C, D, NC, M, G, SXXX or SXXXG where X is from 0 to 9, denoting non-safety critical items.
1) Suffix “C”, “D” denotes unit with additional cover
2) “M” denotes metric hardware
3) “NC” denotes unit with no chassis
4) ”G”, “SXXX”, ”SXXXG” denotes non-safety critical options

Additional information (if necessary)

Date: 2020-12-10 Signature: Ze Guo

Test Report issued under the responsibility of:

TEST REPORT
IEC 62368-1
Audio/video, information and communication technology equipment
Part 1: Safety requirements

Report Number..... :	CB 170351 - 80060211
Date of issue ..... :	2020-12-10
Total number of pages..... :	73
Name of Testing Laboratory preparing the Report..... :	CSA Group Testing & Certification Inc. (Richmond)
Applicant's name ..... :	Bel Fuse Inc.
Address ..... :	206 Van Vorst St., Jersey City, NJ 07302, USA
Test specification:	
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

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

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 Converter
Trade Mark..... :	bel POWER SOLUTIONS & PROTECTION a bel group
Manufacturer..... :	Same as Applicant
Model/Type reference..... :	MAP55 Series and MAP40-1005 See General Product information for Model Name Details
Ratings..... :	Input: 100 – 240 Vac, 50/60Hz, 2.0 A See general product information

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

☐	**CB Testing Laboratory:**	CSA Group Testing & Certification Inc. (Richmond)	
Testing location/ address..... :		13799 Commerce Parkway, Richmond BC V6N 2N9, Canada	
Tested by (name, function, signature)..... :			
Approved by (name, function, signature).. :			
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address..... :			
Tested by (name, function, signature)..... :			
Approved by (name, function, signature).. :			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address..... :			
Tested by (name + signature)..... :			
Witnessed by (name, function, signature). :			
Approved by (name, function, signature).. :			
☒	**Testing procedure: CTF Stage 3:**	Bel Power Solutions, s.r.o.	
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address..... :		Areal ZTS 924 Dubnica nad Vahom 01841 Slovakia	
Tested by (name, function, signature)..... :		Editha Vergara / Compliance Team Leader	
Witnessed by (name, function, signature). :		Sam Lem, Certifier	
Approved by (name, function, signature).. :		Jason Cleary, Certifier	
Supervised by (name, function, signature) :		Josef Kellermeier, Team Lead Safety	

List of Attachments (including a total number of pages in each attachment):				
1	European group differences and national differences + National Differences: USA and Canada	(	44 pages	)
2	Photographs	(	4 pages	)
3	Misc. (Installation Instruction, Component Documentation, Magnetics, Drawings, etc.)	(	39 pages	)
	(Not for publication – Engineering use only)			

Summary of testing:

This test report is based on a Nemko test report reference no. 295106, with appended CB Certificate Ref. No. NO89137, evaluated to the requirements to IEC 60950-1:2005+Am1:2009+Am2:2013. For continuity, data from the original Nemko report is included in this report. Additional testing was required for this evaluation to the requirements of IEC 62368-1:2018.

The equipment is a component, switch mode power supply with mating connector for AC input (ES3/PS3) and DC voltage outputs (ES1/PS2) 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 marked surface is not to be located an external area where it is likely to be cleaned with cleaning solution, rubbed, etc. Therefore, the durability test was not considered because the equipment is a component level product for building-in.

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

Tests performed (name of test and test clause):	**Testing location:**
5.2 – Classification of electrical energy sources 5.4.1.4, 9.3, B.1.5, B.2.6 – Temperature measurements 5.4.1.8 – Working voltage measurement 5.4.2, 5.4.3 – Minimum clearances/creepage distances 5.4.8 – Humidity conditioning 5.4.9 – Electric strength test 5.5.2.2 – Stored discharge on capacitors 5.6.6 – Resistance of protective conductors and terminations 5.7 – Prospective touch voltage, touch current and protective conductor current 5.7.4 – Unearthed accessible parts 5.7.5 – Earthed accessible conductive part 6.2.2 – Power source circuit classifications B.2.5 – Input test B.3, B.4 – Abnormal operating and fault condition tests	Bel Power Solutions, s.r.o. Areal ZTS 924 Dubnica nad Vahom 01841 Slovakia

Summary of compliance with National Differences (List of countries addressed):

CENELEC member countries (EU group differences): Austria (AT), Belgium (BE), Bulgaria (BG), Croatia (HR), Cyprus (CY), the Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), Former Yugoslav Republic of Macedonia (MK), France (FR), Germany (DE), Greece (GR), Hungary (HU), Iceland (IS), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), the Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), Turkey (TR)and the United Kingdom (GB).

Australia (AU), Canada (CA), Japan (JP), New Zealand (NZ), Singapore (SG), United States (US)

☒ **The product fulfils the requirements of national and group differences according to EN 62368-1:2020+A11:2020**

☒ **The product fulfils the requirements of national differences according to CSA C22.2 No. 62368-1-19, UL 62368-1, 3r edition**

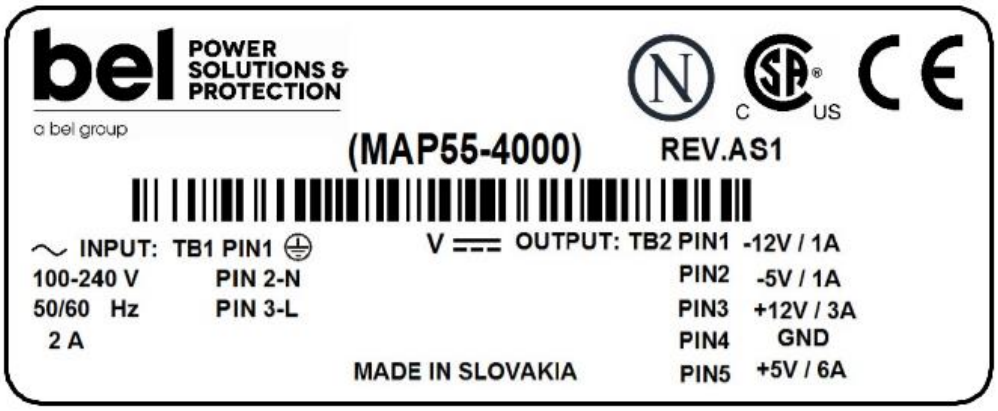
☒ **The product fulfils the requirements of national differences according to AS/NZS 62368.1:2018**

☒ **The product fulfils the requirements of national differences according to J62368-1 (H30)**

☒ **The product fulfils the requirements of national differences according to BS EN IEC 62368-1:2020+A11:2020**

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.



Test item particulars:	
Product group ..... :	☐ end product ☒ built-in component
Classification of use by ..... :	☐ Ordinary person ☐ Children likely present ☒ Instructed person ☒ Skilled person
Supply connection ..... :	☒ AC mains ☐ DC mains (regulated source) ☐ not mains connected: ☐ ES1 ☐ ES2 ☐ ES3
Supply tolerance ..... :	☒ +10%/-10% ☐ +20%/-15% ☐ + %/ - % ☐ None:
Supply connection – type ..... :	☐ pluggable equipment type A - ☐ non-detachable supply cord ☐ appliance coupler ☐ direct plug-in ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☒ permanent connection ☒ mating connector ☐ other:
Considered current rating of protective device ..... :	☒ 20 A for North America, 16 A for Europe Location: ☒ building ☐ equipment ☐ N/A
Equipment mobility ..... :	☐ movable ☐ hand-held ☐ transportable ☐ direct plug-in ☐ stationary ☒ for building-in ☐ wall/ceiling-mounted ☐ SRME/rack-mounted ☐ other:
Overvoltage category (OVC) ..... :	☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV ☐ other:
Class of equipment ..... :	☒ Class I ☐ Class II ☐ Class III ☐ Not classified ☐
Special installation location ..... :	☒ N/A ☐ restricted access area ☐ outdoor location ☐
Pollution degree (PD) ..... :	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified T_{ma} ..... :	50°C maximum ambient ☐ Outdoor: minimum °C
IP protection class ..... :	☒ IPX0 ☐ IP
Power systems ..... :	☒ TN ☒ TT ☒ IT - 230 V $_{L-L}$ (Norway only) ☐ not AC mains
Altitude during operation (m) ..... :	☒ 2000 m or less ☐ m
Altitude of test laboratory (m) ..... :	☐ 2000 m or less ☒ 242 m
Mass of equipment (kg) ..... :	0.55 kg

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, August 2020
Date (s) of performance of tests..... :	October 2015, August 2020
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 4.2.5 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.** Areal ZTS Dubnica nad Vahom c.924 01841 Dubnica nad Vahom **SLOVAKIA** **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 and other remarks:

Edition 1: 2020-12-10; CSA report No. CB170351 – 80060211 (Richmond)
Issued by Sylvain Lefebvre (mentee) and Sam Lem (Mentor); Reviewed by Jason Cleary

CB Certificate CA/26135/CSA issued.

Summary: Evaluation of power supply models MAP55 Series and MAP40-1005.

Description:

Switching power supply models MAP55 Series and MAP40-1005 are component type open-frame power supplies for building-in. Some of the models are provided with U-shape aluminium chassis or cover. The units were evaluated with convection cooling and with 150 or 200 LFM (linear feet per minute) air-cooling. Maximum output power is de-rated with convection cooling. See additional information electrical rating for details.

Electrical rating:

Model	Output #1		Output #2		Output #3		Output #4		Output Power (W)	
	Vdc	A	Vdc	A	Vdc	A	Vdc	A	w/o fan	W/ fan
MAP40-1005	5	8	—	—	—	—	—	—	40	—
MAP55-1012	12 or 15	5 4	—	—	—	—	—	—	50	60 a)
MAP55-1024	24 or 28	2.4 2.2	—	—	—	—	—	—	50	60 a)
MAP55-4000	-12	1	-5	1	12	3	5	6	c)	55 b)
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MAP55-4002	12	1	-12	1	12	3	5	6	c)	55 b)
MAP55-4003	-15	1	-5	1	15	2.5	5	6	c)	55 b)
MAP55-4004	15	1	-15	1	24	1.5	5	6	c)	55 b)
MAP55-S104	-15	0.5	15	2.3	5	6	—	—	35	55 b)
MAP55-S106	-12	1	-5	1	12	3	5	6	c)	55 b)
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MAP55-S135	-12	1	-5	1	12	3	5	6	c)	55 b)

a) With 150 LFM (linear feet per minute) air-cooling
b) With 200 LFM (linear feet per minute) air-cooling
c) Maximum total output power rated 45 W @40 °C ambient operating temperature for models with no cover and 40 W for models with cover (C or D option).
Note: All models maybe followed by the following suffix or combination of suffixes: C, D, NC, M, G, SXXX or SXXXG where X is from 0 to 9, denoting non-safety critical items.
1) Suffix “C”, “D” denotes unit with additional cover
2) “M” denotes metric hardware
3) “NC” denotes unit with no chassis
4) ”G”, “SXXX”, ”SXXXG” denotes non-safety critical options

Model Differences –

All models are the same except for the output ratings and power transformer, T1.

Additional application considerations – (Considerations used to test a component or sub-assembly) –

1. The power supply is to be installed in the end product where the suitability of installation is to be evaluated in the end product.
2. Evaluated as Class I (earthed equipment). Reliable earth connection shall be provided in the end use installation.
3. Evaluated for use in a Pollution Degree 2 environment.

4. The product was evaluated at maximum operating temperature of 50°C ambient, with air cooling at full output power or maximum 40°C ambient, convection cooling at derated output load. Accessibility to high component temperature must be considered on end system equipment.
5. Temperature tests shall be considered for specific installation conditions in the end system.
6. Suitability of enclosure provided with the equipment as a FIRE, MECHANICAL and ELECTRICAL enclosure is to be determined in the end system.
7. The secondary outputs are ES1 at PS2/PS3. Accessibility is to be determined in the end system.
8. The input/output connector is only intended for connection to a mating connector of internal wiring inside the end system.
9. The unit was tested on a listed 20A branch circuit. Additional evaluation may be needed if used on higher current branch circuit.
10. The ground path from the input connector to the PSU case meets protective bonding and has been evaluated at 40 A.
11. Safety isolating transformer T1 employ an insulation system designated Class F.