



Test Report issued under the responsibility of:



<b>TEST REPORT</b> <b>IEC 60950-1</b> <b>Information technology equipment – Safety –</b> <b>Part 1: General requirements</b>	
Report Number .....	T223-0534/16
Date of issue .....	2016-11-10
Total number of pages.....	971 pages
Applicant's name .....	Traco Power Solutions Ltd.
Address .....	Whitemill Industrial Estate Wexford, White Mill Road, Y35 YH66, Ireland
<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
Test Report Form No.....	IEC60950_1F
Test Report Form(s) Originator.....	SGS Fimko Ltd
Master TRF .....	Dated 2014-02
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<b>General disclaimer:</b>	
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.	

<b>Test item description .....</b>	DIN rail power supply	
<b>Trade Mark .....</b>	TRACO POWER	
<b>Manufacturer.....</b>	Traco Power Solutions Ltd. Whitemill Industrial Estate Wexford, White Mill Road, Y35 YH66, Ireland	
<b>Model/Type reference.....</b>	TRACO POWER Model reference	Manufacturer Model reference
	TBLC06-105	006ECO181
	TBLC06-112	006ECO182
	TBLC06-124	006ECO184
	TBLC15-105	015ECO181
	TBLC15-112	015ECO182
	TBLC15-124	015ECO184
	TBLC25-105	025ECO181
	TBLC25-112	025ECO182
	TBLC25-124	025ECO184
	TBLC50-112	050ECO182
	TBLC50-124	050ECO184
	TBLC75-112	075ECO182
	TBLC75-124	075ECO184
	TBLC90-112	090ECO182
	TBLC90-124	090ECO184
	Each model may be followed by suffix "xx" where each "x" can be 'a-z' or '-0-9' for traceability only, no impact on safety"	

<b>Ratings .....</b> :	<b>Input:</b> TBLC06-105: 100-240 Vac; 0,15 - 0,09 A; 50/60 Hz TBLC06-112: 100-240 Vac; 0,14 - 0,08 A; 50/60 Hz TBLC06-124: 100-240 Vac; 0,15 - 0,08 A; 50/60 Hz TBLC15-105: 100-240 Vac; 0,3 - 0,17 A; 50/60 Hz TBLC15-112: 100-240 Vac; 0,33 - 0,18 A; 50/60 Hz TBLC15-124: 100-240 Vac; 0,35 - 0,2 A; 50/60 Hz TBLC25-105: 100-240 Vac; 0,5 - 0,27 A; 50-60 Hz TBLC25-112: 100-240 Vac; 0,6 - 0,33 A; 50/60 Hz TBLC25-124: 100-240 Vac; 0,55 - 0,3 A; 50/60 Hz TBLC50-112: 100-240 Vac; 1,1 - 0,6 A; 50/60 Hz TBLC50-124: 100-240 Vac; 1,1 - 0,6 A; 50/60 Hz TBLC75-112: 100-240 Vac; 1,8 - 1,0 A; 50/60 Hz TBLC75-124: 100-240 Vac; 1,8 - 1,0 A; 50/60 Hz TBLC90-112: 100-240 Vac; 2,1 - 1,1 A; 50/60 Hz TBLC90-124: 100-240 Vac; 2,1 - 1,1 A; 50/60 Hz  <b>Output:</b> TBLC06-105: 5 Vdc; 1,2 A; 6 W TBLC06-112: 12 Vdc; 0,5 A; 6 W TBLC06-124: 24 Vdc; 0,25 A; 6 W TBLC15-105: 5 Vdc; 2,4 A; 12 W TBLC15-112: 12 Vdc; 1,25 A; 15 W TBLC15-124: 24 Vdc; 0,63 A; 15 W TBLC25-105: 5 Vdc; 4 A; 20 W TBLC25-112: 12 Vdc; 2 A; 24 W TBLC25-124: 24 Vdc; 1,05 A; 25 W TBLC50-112: 12 Vdc; 4 A; 48 W TBLC50-124: 24 Vdc; 2,1 A; 50 W TBLC75-112: 12 Vdc; 6,0 A; 72 W TBLC75-124: 24 Vdc; 3,1 A; 75 W TBLC90-112: 12 Vdc; 7,5 A; 90 W TBLC90-124: 24 Vdc; 3,75 A; 90 W
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<b>Testing procedure and testing location:</b>		
<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	SIQ Ljubljana Testing Laboratory is accredited by Slovenian Accreditation, Reg. No.: LP-009
<b>Testing location/ address .....</b>		Tržaška c. 2, SI-1000 Ljubljana Slovenia
<input type="checkbox"/>	<b>Associated CB Testing Laboratory:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature).....</b>		Luka Košir 
<b>Approved by (name + signature).....</b>		Boštjan Glavič 
<input type="checkbox"/>	<b>Testing procedure: TMP/CTF Stage 1:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature).....</b>		
<b>Approved by (name + signature).....</b>		
<input type="checkbox"/>	<b>Testing procedure: WMT/CTF Stage 2:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature).....</b>		
<b>Witnessed by (name + signature) .....</b>		
<b>Approved by (name + signature).....</b>		
<input type="checkbox"/>	<b>Testing procedure: SMT/CTF Stage 3 or 4:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature).....</b>		
<b>Witnessed by (name + signature) .....</b>		
<b>Approved by (name + signature).....</b>		
<b>Supervised by (name + signature).....</b>		

**List of Attachments:**

1. National Differences – Enclosure No. 1 (41 pages)
2. European Group Differences and National Differences according to EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011 – Enclosure No. 1a (21 pages)
3. Pictures – Enclosure No. 2 (48 pages)
4. Schematics, Layouts, Transformer data - Enclosure No. 3 (204 pages)
5. Additional testing and evaluation according to UL508 – Enclosure No. 4 (49 pages)
6. Additional testing and evaluation according to IEC 60335-1 – Enclosure No. 5 (133 pages)
7. Additional testing and evaluation according to IEC 61558-1 & IEC61558-2-16 – Enclosure No. 6 (97 pages)
8. Additional testing and evaluation according to UL1310 – Enclosure No. 7 (97 pages)

**Summary of testing:**

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

- 1.6.2 Input Test
- 1.7.11 Durability
- 2.1.1.5 Energy hazard Test
- 2.1.1.7 Capacitance Discharge Test
- 2.2.2 SELV: Hazard Voltage (Circuit) Measurement Test
- 2.2.3 SELV Reliability testing
- 2.4 Limited Current Circuit (Bridging components)
- 2.5 Limited Power Source
- 2.9.2 Humidity Test
- 2.10.2 Working Voltage measurement on PCB and Transformer
- 2.10.3/2.10.4 Clearance and Creepage distance measurement
- 2.10.5 Distance Through Insulation measurement
- 2.10.5.6 Thin Sheet Material (barriers)
- 4.2.2-4.2.4 Steady force test, 10N
- 4.2.7 Stress relief test; heat test (°C/7 h)
- 4.5.2 Heating (Temperature) Test
- 4.5.5 Resistance to abnormal heat (Ball pressure test)
- 5.1 Touch Current

**Testing location:**

**SIQ Ljubljana, Tržaška c. 2, SI-1000 Ljubljana, Slovenia**

<p><b>5.2 Electric Strength Test</b></p> <p><b>5.3 Abnormal Operating Tests foreseeable misuse:</b></p> <p><b>SELV reliability and failure in the voltage regulation</b></p> <p><b>Functional insulation,</b></p> <p><b>Component faults</b></p> <p><b>Overload and short at the outputs , Air holes closed</b></p>	
<p><b>Summary of compliance with National Differences</b></p> <p><b>List of countries addressed:</b></p> <p>Argentina**, Australia, Austria***, Bahrain**, Belarus**, Belgium***, Brazil**, Bulgaria***, Canada, China, Cyprus***, Colombia**, Croatia**, Czech Republic***, Denmark***, Finland***, France***, Germany***, Greece***, Hungary***, India**, Indonesia**, Iran**, Ireland***, Israel, Italy***, Japan*, Kazakhstan**, Kenya**, Korea, Lybia**, Malaysia**, Mexico**, Netherlands***, New Zealand*, Norway***, Pakistan**, Poland***, Portugal***, Romania***, Russian Federation**, Saudi Arabia**, Serbia**, Singapore**, Slovakia***, Slovenia***, South Africa**, Spain***, Sweden, Switzerland, Thailand**, Turkey***, Ukraine**, United Arab Emirates**, United Kingdom, Uruguay**, USA, Vietnam**</p> <p>* No national differences to IEC 60950-1:2005 (2<sup>nd</sup> edition) (+ A1 + A2) declared</p> <p>** No national differences to IEC 60950-1:2005 (2<sup>nd</sup> edition) + A1 + A2 or IEC 60950-1:2001 (1<sup>st</sup> edition) declared</p> <p>*** EU group differences</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements of EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011 (see Enclosure No. 1a).</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.

Marking provided on the front side of enclosure:

<p>TBLC06-105</p> <p>Output 5 VDC 1.2 A</p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p>TBLC 06-105 Power Supply 6 W</p> <p>Input 100-240 VAC 50/60 Hz 0.15-0.09 A</p>	<p>TBLC06-112</p> <p>Output 12 VDC 0.5 A</p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p>TBLC 06-112 Power Supply 6 W</p> <p>Input 100-240 VAC 50/60 Hz 0.14-0.08 A</p>	<p>TBLC06-124</p> <p>Output 24 VDC 0.25 A</p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p>TBLC 06-124 Power Supply 6 W</p> <p>Input 100-240 VAC 50/60 Hz 0.15-0.08 A</p>
<p>TBLC15-105</p> <p>Output 5 VDC 2.4 A</p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p>TBLC 15-105 Power Supply 12 W</p> <p>Input 100-240 VAC, 50/60 Hz 0.3-0.17 A</p>	<p>TBLC15-112</p> <p>Output 12 VDC 1.25 A</p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p>TBLC 15-112 Power Supply 15 W</p> <p>Input 100-240 VAC, 50/60 Hz 0.33-0.18 A</p>	<p>TBLC15-124</p> <p>Output 24 VDC 0.63 A</p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p>TBLC 15-124 Power Supply 15 W</p> <p>Input 100-240 VAC, 50/60 Hz 0.35-0.2 A</p>

<p><b>TBLC25-105</b></p> <p>Output 5 VDC 4 A</p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p><b>TBLC 25-105</b> Power Supply 20 W</p> <p>Input 100-240 VAC, 50/60 Hz 0.5-0.27 A</p>	<p><b>TBLC25-112</b></p> <p>Output 12 VDC 2 A</p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p><b>TBLC 25-112</b> Power Supply 24 W</p> <p>Input 100-240 VAC, 50/60 Hz 0.6-0.33 A</p>	<p><b>TBLC25-124</b></p> <p>Output 24 VDC 1.05 A</p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p><b>TBLC 25-124</b> Power Supply 25 W</p> <p>Input 100-240 VAC, 50/60 Hz 0.55-0.3 A</p>
<p><b>TBLC50-112</b></p> <p>Output 12 VDC 4 A</p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p><b>TBLC 50-112</b> Power Supply 48 W</p> <p>Input 100-240 VAC, 1.1-0.6 A 50/60 Hz</p>	<p><b>TBLC50-124</b></p> <p>Output 24 VDC 2.1 A</p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p><b>TBLC 50-124</b> Power Supply 50 W</p> <p>Input 100-240 VAC, 1.1-0.6 A 50/60 Hz</p>	
<p><b>TBLC75-112</b></p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p>Power Supply 72 W</p> <p><b>TBLC 75-112</b></p> <p>Input 100-240 VAC, 50/60 Hz 1.8-1.0 A</p> <p>Output 12 VDC 6.0A</p>	<p><b>TBLC75-124</b></p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p>Power Supply 75 W</p> <p><b>TBLC 75-124</b></p> <p>Input 100-240 VAC, 50/60 Hz 1.8-1.0 A</p> <p>Output 24 VDC 3.1 A</p>	
<p><b>TBLC90-112</b></p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p>Power Supply 90 W</p> <p><b>TBLC 90-112</b></p> <p>Input 100-240 VAC, 50/60 Hz 2.1-1.1 A</p> <p>Output 12 VDC 7.5 A</p>	<p><b>TBLC90-124</b></p> <p>DC ON</p> <p><b>TRACO POWER</b></p> <p>Power Supply 90 W</p> <p><b>TBLC 90-124</b></p> <p>Input 100-240 VAC, 50/60 Hz 2.1-1.1 A</p> <p>Output 24 VDC 3.75 A</p>	

<b>Test item particulars</b> .....:	
<b>Equipment mobility</b> .....:	<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
<b>Connection to the mains</b> .....:	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> type A <input type="checkbox"/> type B <input type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input checked="" type="checkbox"/> not directly connected to the mains
<b>Operating condition</b> .....:	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
<b>Access location</b> .....	<input type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location <input checked="" type="checkbox"/> service access area
<b>Over voltage 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 type="checkbox"/> other:
<b>Mains supply tolerance (%) or absolute mains supply values</b> .....	85-264 Vac
<b>Tested for IT power systems</b> .....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>IT testing, phase-phase voltage (V)</b> .....	230 V phase-phase (Norway)
<b>Class of equipment</b> .....	<input type="checkbox"/> Class I <input checked="" type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified (unit for building-in)
<b>Considered current rating of protective device as part of the building installation (A)</b> .....	16 A (for Europe), 20 A (for Canada and US)
<b>Pollution degree (PD)</b> .....	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
<b>IP protection class</b> .....	IP20
<b>Altitude during operation (m)</b> .....	TBLC06-xxx, TBLC15-xxx, TBLC25-xxx, TBLC90-xxx: Up to 5000m TBLC50-xxx, TBLC75-xxx: Up to 4800m
<b>Altitude of test laboratory (m)</b> .....	300
<b>Mass of equipment (kg)</b> .....	TBLC06-xxx: 0,06 TBLC15-xxx: 0,08 TBLC25-xxx: 0,12 TBLC50-xxx: 0,18 TBLC75-xxx: 0,23 TBLC90-xxx: 0,30

**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.....**: 2016-04-01, 2016-04-22, 2016-07-04**Date(s) of performance of tests .....**: From 2016-05-05 to 2015-10-18**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 IEC60950:**

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) .....** : Traco Power Solutions Ltd.  
 Whitemill Industrial Estate Wexford, White Mill Road, Y35 YH66, Ireland

**General product information:**

**Information about the Product:**

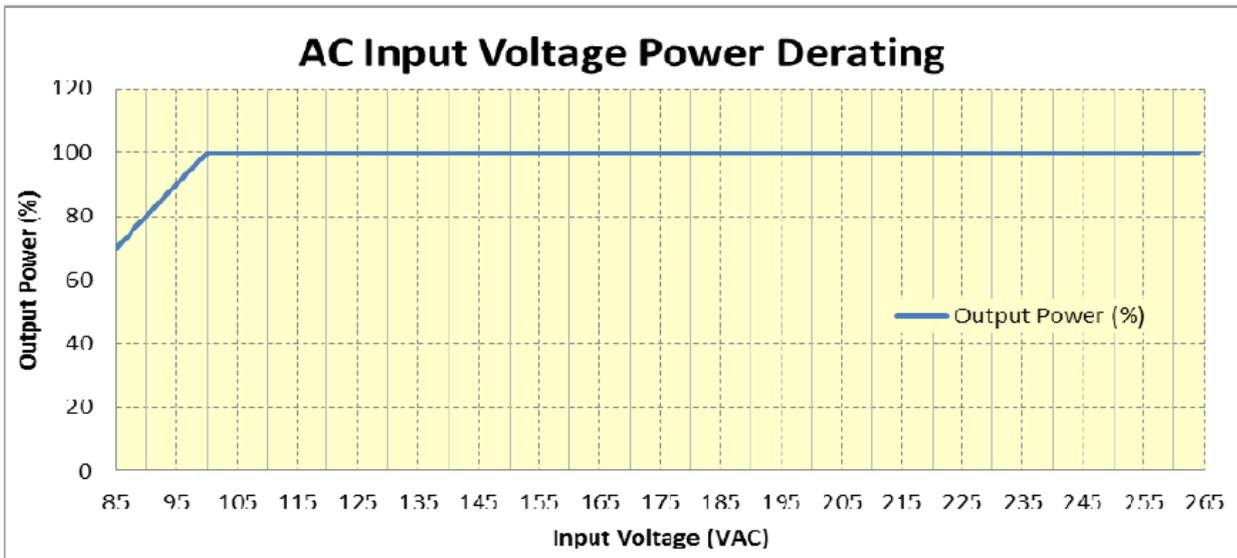
The equipment is a switching power supply (DIN rail type) for the use in Information Technology Equipment. The unit is intended for building-in. The EUT contains primary circuit and secondary SELV circuit which does not represent hazardous energy circuit.

Units output:

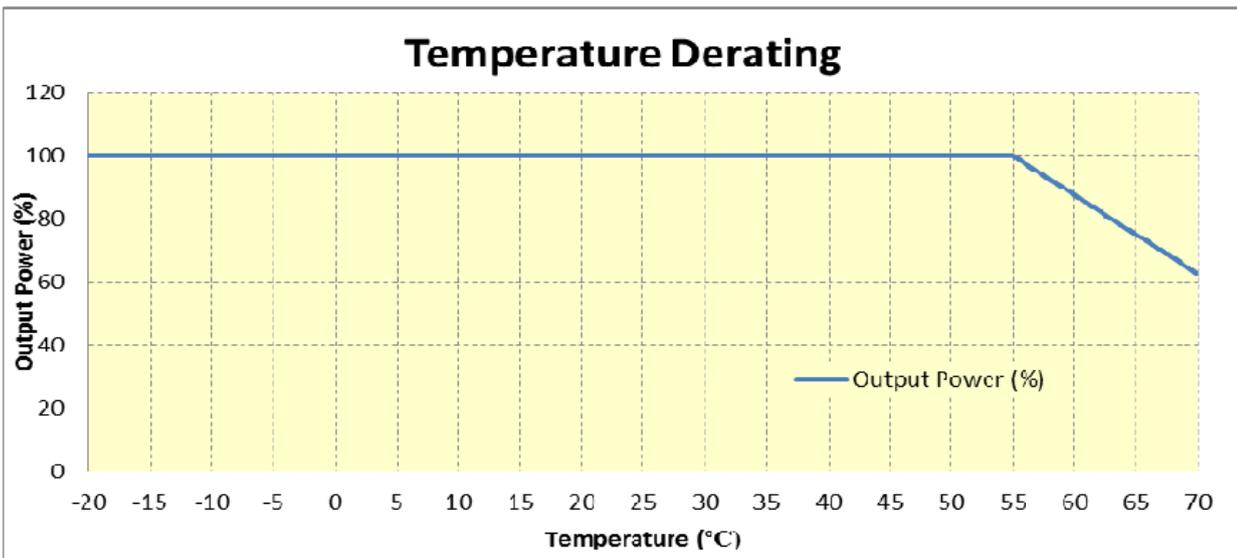
- TBLC15-105: 5 VDC; 2,4 A; 12 W;
- TBLC15-112: 12 VDC; 1,25 A; 15 W;
- TBLC15-124: 24 VDC; 0,63 A; 15 W;
- TBLC25-105: 5 VDC; 4 A; 20 W;
- TBLC25-112: 12 VDC; 2 A; 24 W;
- TBLC25-124: 24 VDC; 1,05 A; 25 W;
- TBLC50-112: 12 VDC; 4 A; 48 W;
- TBLC50-124: 24 VDC; 2,1 A; 50W;
- TBLC75-112: 12 VDC; 6,0 A; 72 W;
- TBLC75-124: 24 VDC; 3,1 A; 75 W;
- TBLC90-112: 12 VDC; 7,5 A; 90 W;
- TBLC90-124: 24 VDC; 3,75 A; 90 W

All units are provided with trimmer potentiometer for factory fine output voltage adjustment.

Input power derating:  
 TBLCxxxx-xx series have automatic output power derating when input voltage is <100 Vac as shown below.



Output power derating:  
 - operating temperature range: -25°C to +55°C, full load  
 - operating temperature above +55°C to +70°C, output load derate linearly as shown below



Instruction for safe use according to IEC 60335-1 shall be provided with the end product.

**Explanation of the test program:**

The component was tested according to the standard IEC 60950-1:2005 (2nd Edition) + A1:2009 + A2:2013 and/or EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011.

Additionally the component was also evaluated according to the standards CSA C22.2 No. 60950-1:2007 + A1:2011 + A2:2014 and UL60950-1:2007 (2nd Edition) + A1:2011 + A2:2014 and fulfils the requirements of these standards.

Unit was also investigated and found to be in compliance with clearance and creepage distance requirements of the standard IEC/EN 62477-1:2012 +A11:2014 for OVC II and altitude of 5000m. Output was classified as DVC A. DVC A means that output meets SELV limits for an area of contact equal to human hand under dry condition.

1. The products were tested to be suitable for connection to  $\leq 20A$  (USA) branch circuit or a  $\leq 16A$  branch circuit in series. The unit is approved for TN mains star connections and IT mains with 100-230 Vac phase to phase voltage.
2. All unit are provided internally with one fuse F1 in line.
3. Secondary output is separated from mains by reinforced insulation and rated SELV and is non-hazardous energy levels. Unit is for building-in.
4. The disconnect device is end product consideration.
5. The input and output terminals and connectors are suitable for factory and field wiring.
6. The transformers designated TR1 or TR2 provides reinforced insulation. These transformers are built up to fulfil the requirement of insulation class B (TBLC06-xxx, TBLC15-xxx, TBLC25-xxx, TBLC50-xxx) or class F (TBLC75-xxx, TBLC90-xxx) and provide in addition an UR (OBJY2) insulation system (see also list of safety critical components).
7. The equipment has been evaluated for use in a Pollution Degree 2, overvoltage category II environment and a maximum altitude of 4800m (TBLC50-xxx, TBLC75-xxx) and 5000m (TBLC06-xxx, TBLC15-xxx, TBLC25-xxx, TBLC90-xxx).
8. A suitable Electrical and Fire enclosure shall be provided in the end equipment.
9. The product was evaluated for rated load operation for temperatures up to 55°C and for derated output load for temperature range from 55°C to 70°C, where output power linearly derates from 100% to 60% of rated load (2,5%/°C above 55°C). The temperature test was performed 50 mm above bench, 50 mm below top surface without forced air cooling.