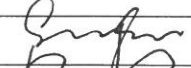





Test Report issued under the responsibility of:



TEST REPORT IEC 60950-1 Information technology equipment – Safety – Part 1: General requirements	
Report Number	15078410 002
Date of issue	2016-06-27
Total number of pages	31
Applicant's name	TDK-Lambda Corp. Nagaoka Technical Center
Address	2704-1 Settaya-machi, Nagaoka-shi, Niigata, 940-1195, JAPAN
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
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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		Switching Power Supply	
Trade Mark		TDK-Lambda	
Manufacturer.....		Same as applicant	
Model/Type reference		ZWS30B- abcd (a = 3, 5, 12, 15, 24 or 36; b = / or blank; c = L, A or blank; d = blank, CO2, FG or FV)	
Ratings		AC input: See the model list on page 8 for details DC output: See the model list on page 8 for details	
Testing procedure and testing location:			
<input checked="" type="checkbox"/>	CB Testing Laboratory:	TÜV Rheinland (Shanghai) Co., Ltd.	
Testing location/ address		No.177, 178, Lane 777, West Guangzhong Road Zhabei District Shanghai CHINA	
<input type="checkbox"/>	Associated CB Testing Laboratory:		
Testing location/ address			
Tested by (name + signature)		Sunny Sun	
Approved by (name + signature)		Roy Chen	
<input type="checkbox"/>	Testing procedure: TMP/CTF Stage 1:		
Testing location/ address			
Tested by (name + signature)			
Approved by (name + signature)			
<input type="checkbox"/>	Testing procedure: WMT/CTF Stage 2:		
Testing location/ address			
Tested by (name + signature)			
Witnessed by (name + signature)			
Approved by (name + signature)			
<input type="checkbox"/>	Testing procedure: SMT/CTF Stage 3 or 4:		
Testing location/ address			
Tested by (name + signature)			
Witnessed by (name + signature)			
Approved by (name + signature)			
Supervised by (name + signature).....			

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

- ATTACHMENT 1 - Technical documentation (1 page)
- ATTACHMENT 2 - Photo documentation (3 pages)
- ATTACHMENT 3 - National Differences (56 pages)

Note: Total number of pages in each attachment is indicated in individual attachment.

Summary of testing:

The maximum specified operation ambient temperature is 70°C.

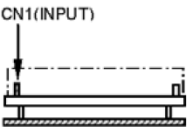

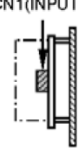


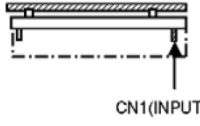
Specified ambient temperature for operation is according to manufacturer’s specification.(see chart of convection cooling on following page)

Unless otherwise specified, throughout this report, the tests were performed on models ZWS30B-36/A to represent other similar models.

The load conditions used during testing: Maximum normal load according to sub-clause 1.2.2.1 for this equipment is the operation with the maximum specified DC-load with maximum power condition according to the manufacturer specified.

The equipment is operated up to 3000m above sea level as declared by manufacturer. Clearances have been evaluated according to IEC 60664-1 table A.2 with a multiplication factor of 1.14 throughout this report.

Mouting position:

(MOUNTING A)	(MOUNTING B)	(MOUNTING C)	(MOUNTING D)	(MOUNTING E)	(MOUNTING F)
<p>(STANDARD MOUNTING)</p> 					

Derating Curve for ZWS30B-abcd (a = 3, 5, 12, 15, 24):

ZWS30B

OUTPUT DERATING

*COOLING: CONVECTION COOLING

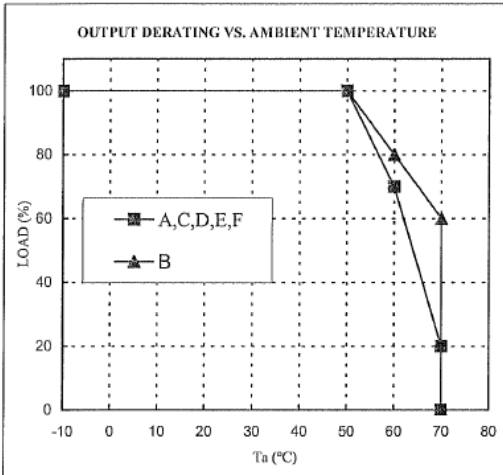
Ta (°C)	LOADING CONDITION(%)	
	Mounting A, C, D, E, F	Mounting B
-10~50	100	100
60	70	80
70	20	60

*COOLING: FORCED AIR COOLING

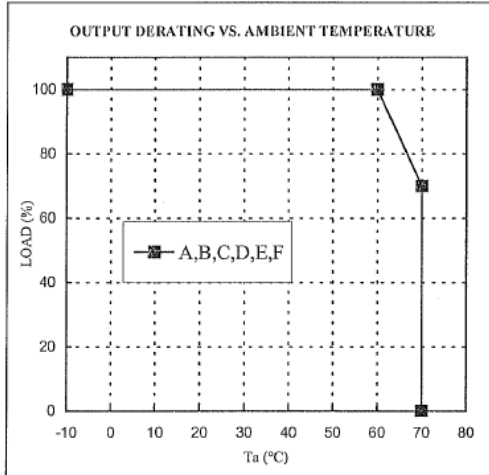
Ta (°C)	LOADING CONDITION(%)	
	All Mounting (A,B,C,D,E,F)	
-10~60	100	
70	70	

Air Velocity ≥ 0.7m/s: Air must flow through component side.

*COOLING: CONVECTION COOLING



*COOLING: FORCED AIR COOLING



ZWS30B/A

OUTPUT DERATING

*COOLING: CONVECTION COOLING

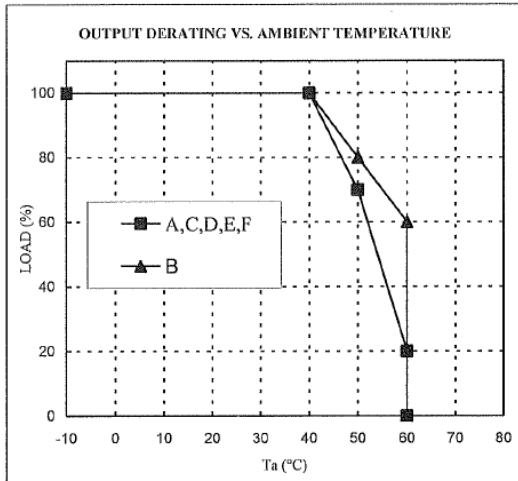
Ta (°C)	LOADING CONDITION(%)	
	Mounting A, C, D, E, F	Mounting B
-10~40	100	100
50	70	80
60	20	60

*COOLING: FORCED AIR COOLING

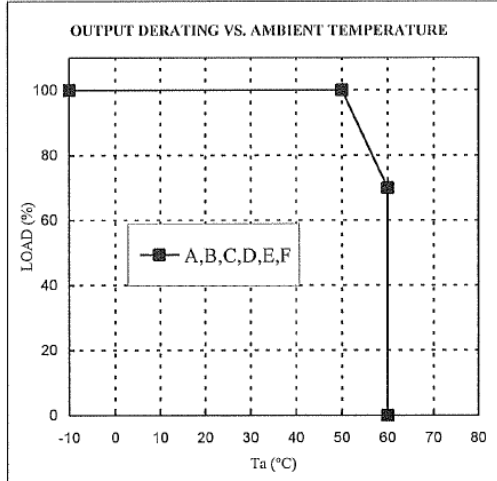
Ta (°C)	LOADING CONDITION(%)	
	All Mounting (A,B,C,D,E,F)	
-10~50	100	
60	70	

Air Velocity ≥ 0.7m/s: Air must flow through component side.

*COOLING: CONVECTION COOLING



*COOLING: FORCED AIR COOLING



ZWS30B/L

OUTPUT DERATING

*COOLING: CONVECTION COOLING

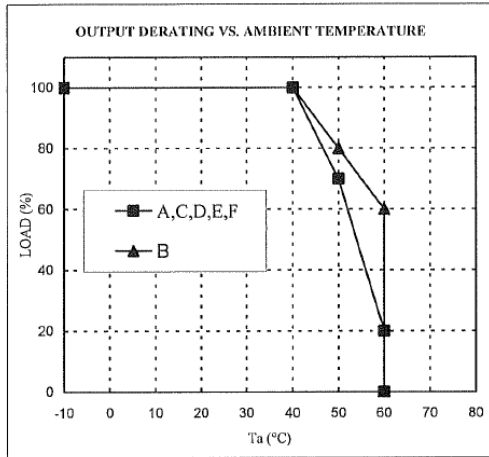
Ta (°C)	LOADING CONDITION(%)	
	Mounting A, C, D, E, F	Mounting B
-10~40	100	100
50	70	80
60	20	60

*COOLING: FORCED AIR COOLING

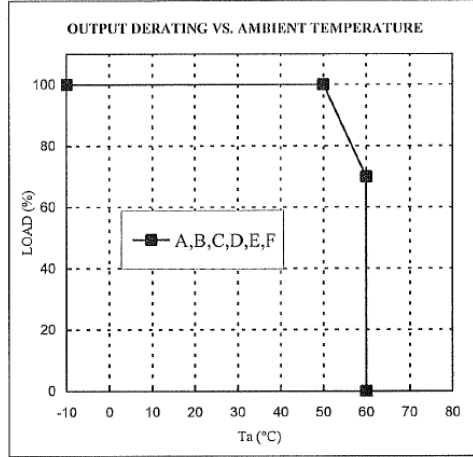
Ta (°C)	LOADING CONDITION(%)	
	All Mounting (A,B,C,D,E,F)	
-10~50	100	
60	70	

Air Velocity ≥ 0.7m/s; Air must flow through component side.

*COOLING: CONVECTION COOLING



*COOLING: FORCED AIR COOLING



Derating Curve for ZWS30B-36:

ZWS30B-36

OUTPUT DERATING

*COOLING: CONVECTION COOLING

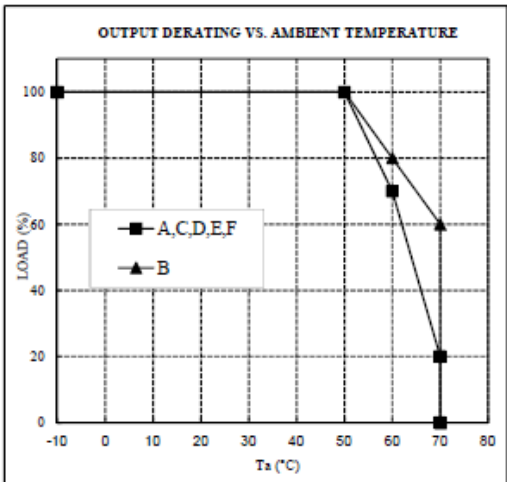
Ta (°C)	LOADING CONDITION(%)	
	Mounting A, C, D, E, F	Mounting B
-10 to 50	100	100
60	70	80
70	20	60

*COOLING: FORCED AIR COOLING

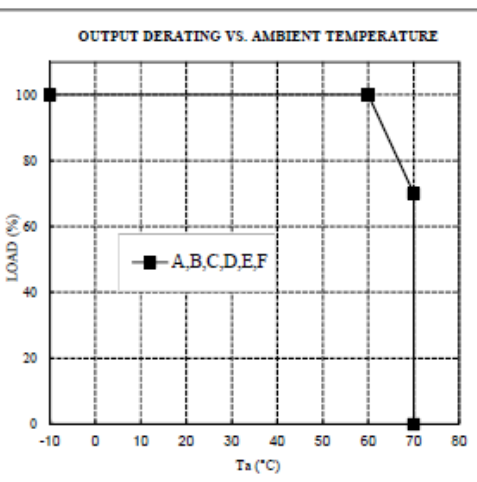
Ta (°C)	LOADING CONDITION(%)	
	All Mounting (A,B,C,D,E,F)	
-10 to 60	100	
70	70	

Air Velocity ≥ 0.7m/s; Air must flow through component side.

*COOLING: CONVECTION COOLING



*COOLING: FORCED AIR COOLING



ZWS30B-36/A

OUTPUT DERATING

*COOLING: CONVECTION COOLING

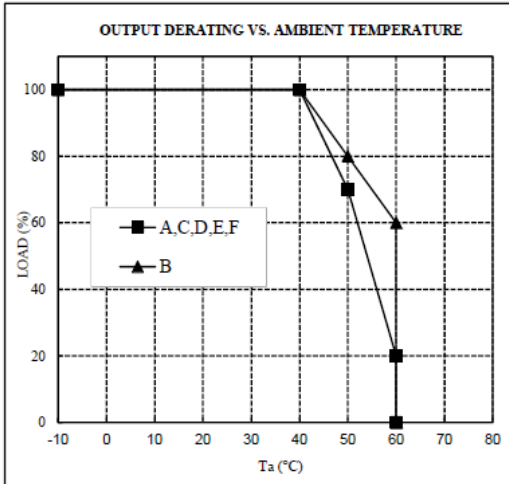
Ta (°C)	LOADING CONDITION(%)	
	Mounting A, C, D, E, F	Mounting B
-10 to 40	100	100
50	70	80
60	20	60

*COOLING: FORCED AIR COOLING

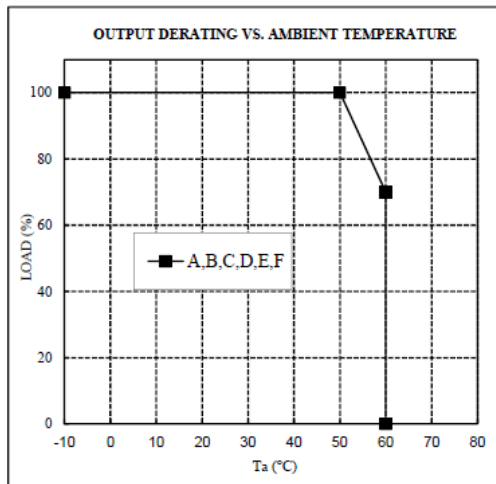
Ta (°C)	LOADING CONDITION(%)
	All Mounting (A,B,C,D,E,F)
-10 to 50	100
60	70

Air Velocity ≥ 0.7m/s: Air must flow through component side.

*COOLING: CONVECTION COOLING



*COOLING: FORCED AIR COOLING



Tests performed (name of test and test clause):		Testing location: No.177, 178, Lane 777, West Guangzhong Road Zhabei District Shanghai CHINA
Clause	Test description	
1.6.2	Input Current	
2.1.1.5	Energy hazards	
2.2.2	Voltages under normal conditions	
2.2.3	Voltages under fault conditions	
2.10.2	Determination of working voltage	
2.10.3 & 2.10.4	Clearances, creepage distances	
4.5.2	Temperature tests	
5.2	Electric strength	
5.3	Abnormal operating and fault conditions	
Annex C	Transformers	

Summary of compliance with National Differences

List of countries addressed:

EU Group Differences, EU Special National Conditions, AR, AU, AT, BY, BE, CA, CN, CZ, DK, FI, FR, DE, HU, IN, IL, IT, JP, KR, MY, NZ, NO, PL, RU, RO, SA, RS, SG, SK, SI, ES, SE, CH, TR, UA, GB, US

Explanation of used codes:

AR = Argentina**; AU = Australia**; AT = Austria*; BY = Belarus**; BE = Belgium*/**;
CA = Canada; CN = China**; CZ = Czech Republic*/**; DK = Denmark*; FI = Finland*/**;
FR = France*/**; DE = Germany*/**; HU = Hungary*/**; IN = India**; IL = Israel**; IT = Italy*;
JP = Japan**; KR = Korea, Republic Of**; MY = Malaysia**; NZ = New Zealand**; NO = Norway*/**;
PL = Poland*/**; RU = Russian Federation**; RO = Romania*/**; SA = Saudi Arabia**;
RS = Serbia Republic Of**; SG = Singapore**; SK = Slovakia*/**; SI = Slovenia*/**; ES = Spain*/**;
SE = Sweden*; CH = Switzerland*/**; TR = Turkey*/**; UA = Ukraine**;
GB = United Kingdom*; US = United States of America

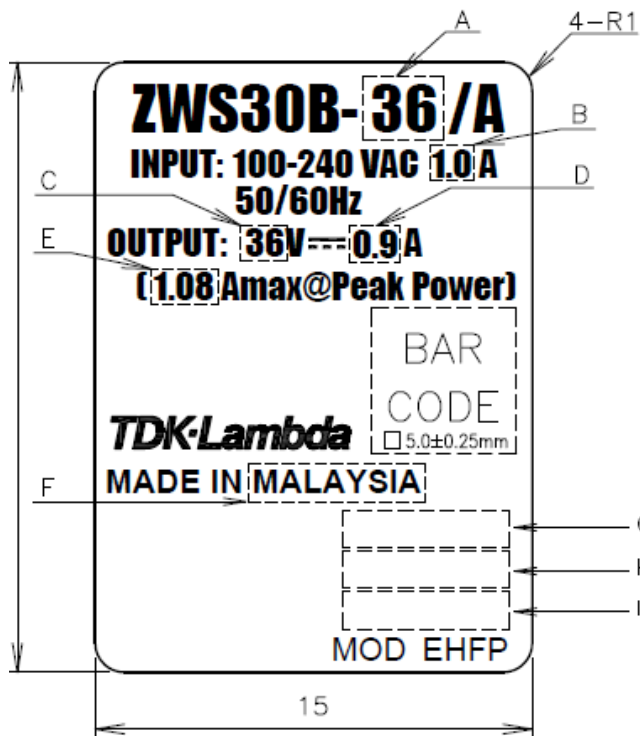
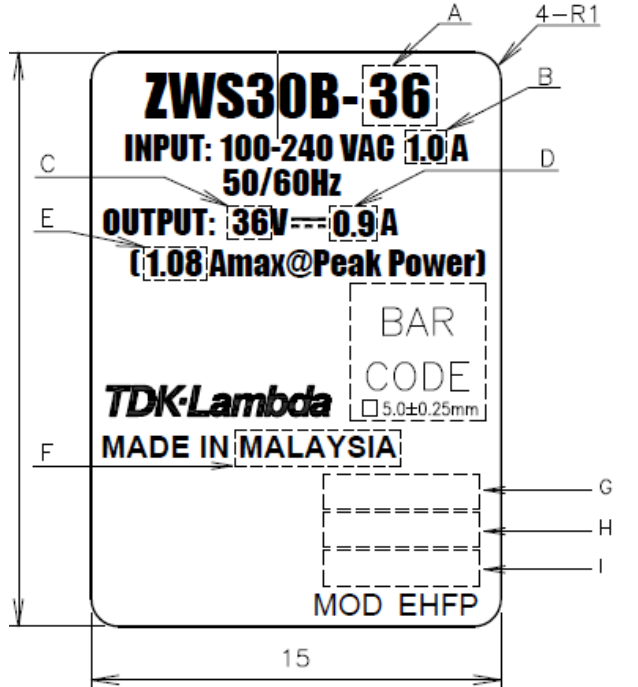
Note(s):
Countries outside the CB Scheme membership may also accept this report.
* Only applicable for Group Differences (if any). See attachment 2 for details.
** No National Differences Declared

The product fulfils the requirements of EN 60950-1:2006+A11+A1+A12+A2, UL 60950-1:2007 R10.14 and CAN/CSA C22.2 No. 60950-1-07+A1:2011+A2:2014.

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.

<Representative>



Test item particulars	: See below
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 checked="" type="checkbox"/> pluggable equipment <input checked="" 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 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 type="checkbox"/> operator accessible <input checked="" 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%
Tested for IT power systems	: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
IT testing, phase-phase voltage (V)	: For Norway, 230V
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)	: 16 (20 for US/CSA)
Pollution degree (PD)	: <input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	: IPX0
Altitude during operation (m)	: Up to 3000
Altitude of test laboratory (m)	: Approx 50
Mass of equipment (kg)	: ≈0.2kg Max. (with chassis and cover)
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	: 03.05.2016
Date(s) of performance of tests	: 20.05.2016 to 27.05.2016
General remarks:	
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See ATTACHMENT #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.</p>	
Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> 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) :

1. Wuxi TDK-Lambda Electronics Co., Ltd.
No. 6 Xing Chuang Er Lu, Wuxi, Jiangsu 214028,
P. R. China
2. TDK-Lambda Malaysia Sdn. Bhd.
Lot 2 & 3, Batu 9 3/4 Kawasan Perindustrian,
Bandar Baru Jaya Gading, 26070 Kuantan
Pahang Malaysia
3. Zhangjiagang Hua Yang Electronics Co., Ltd.
Zhao Feng Industrial Zone, Leyu Town,
Zhangjiagang, Jiangsu 215622, P. R. China
4. ALPS Logistics Facilities Co. Ltd.
593-1 Nishi – Ohashi, Tsukuba – shi, Ibaraki,
305-0831, Japan

General product information:

Refer to original test report 15078410 001

For rating differences between the models see below tables:

Model	Rated input	Minimal output	Rated output (typical)	Maximum output
ZWS30B-3bcd	AC 100-240V, 0.5A, 50-60Hz	2.97Vd.c.	3.3Vd.c.	3.63Vd.c.
		6A	6A	5.45A
ZWS30B-5bcd	AC 100-240V, 0.65A, 50-60Hz	4.5Vd.c.	5Vd.c.	5.5Vd.c.
		6A	6A	5.45A
ZWS30B-12bcd	AC 100-240V, 0.65A, 50-60Hz	10.8Vd.c.	12Vd.c.	13.2Vd.c.
		2.5A	2.5A	2.27A
ZWS30B-15bcd	AC 100-240V, 0.65A, 50-60Hz	13.5Vd.c.	15Vd.c.	16.5Vd.c.
		2.0A	2.0A	1.82A
ZWS30B-24bcd	AC 100-240V, 0.65A, 50-60Hz	21.6Vd.c.	24Vd.c.	26.4Vd.c.
		1.3A	1.3A	1.18A
ZWS30B-36bcd	AC 100-240V, 1.0A, 50-60Hz	32.4Vd.c.	36Vd.c.	39.6Vd.c.
		0.9A	0.9A	0.82A

Remark: Operating temp.: up to +70°C (operating temperature depending on equipment's load, mounting position, for details refer to instruction manual).

Description of change(s):

1. Add model ZWS30B-36**bcd**, which is identical to model ZWS30B except the output rating.
2. Correct the de-rating curve on test report no. 15078410 001.
3. Update national difference for all countries.
4. Add alternative Fuse (F1) Mfg.: CONQUER, type: UDA-A series and X-Capacitor (C1) Mfg.: EUROPTRONIC, type: MPX2 series and Mfg.: OKAYA, type: LE series.

For the above described change(s) the following was considered to be necessary:

Change	Testing	Comments
1.	See "Tests performed" on page 7	See following clauses and appended tables for details.
2.	N/A	See pages 3-6 for details.
3.	N/A	See attachment 3 for details.
4.	N/A	See table 1.5.1 in bold for details.

Definition of variable(s):

ZWS30B-**abcd**

Variable:	Range of variable:	Content:
a	3, 5, 12, 15, 24 or 36	Denotes for different output voltage
b	/ or blank	--
c	L, A or blank	stands for Blank : Standard type; /L : With chassis; /A : With chassis and cover)
d	blank ,CO2, FG or FV	stands for Blank : Standard type; CO2: coating of both sides of PCB for functional purpose; FG: low leakage current; FV: fixed output voltage without adjustable voltage (VR51)

History of amendments and modifications:

Ref. No. 15078410 001, dated 17 June, 2015 (original test report)

Ref. No. 15078410 002, dated 27 June, 2016 (1st modification)

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
-Short-circuited	s-c	-No component damage	NCD
-Open-circuited	o-c	-Component damage	CD
-Overloaded	o-l	-Test repeated, similar result	RT
-Internal protection operated	IP	-No indication of dielectric breakdown	NB
-Input	i/p	-Cheesecloth remained intact	NC
-Output	o/p	-Tissue paper remained intact	NT
-Constant temperatures were obtained	CT	-The unit can recover auto when removing the abnormal condition	RA

Indicate used abbreviations (if any)