



Ref. Certif. No.

DE 2-040461

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

CB TEST CERTIFICATE

Product	Switching Power Supply
Name and address of the applicant	TDK-Lambda (China) Electronics Co., Ltd. No.95, Zhujiang Road, Xinwu District Wuxi, 214028 Jiangsu, P.R. China
Name and address of the manufacturer	TDK-Lambda (China) Electronics Co., Ltd. No.95, Zhujiang Road, Xinwu District Wuxi, 214028 Jiangsu, P.R. China
Name and address of the factory	See additional page(s)
Ratings and principal characteristics	Rated Input: 100-240 Vac, 50-60 Hz, for CUS800My-zxxxxxxx, CME800Ay-zxxxxxxx: 8.0 A or 9.5 A for CUS1000My-zxxxxxxx, CME1000Ay-zxxxxxxx: 9.5 A or 11.8 A
Trademark (if any)	TDK-Lambda
Customer's Testing Facility (CTF) Stage used	N/A
Model / Type Ref.	CUS800My-zxxxxxxx, CME800Ay-zxxxxxxx, CUS1000My-zxxxxxxx, CME1000Ay-zxxxxxxx (y = blank; z = 12,24,36,48; xxxxxxx = /CO, /CO2, /G, /SF, /CQC other alphanumeric character, symbol or blank)
Additional information (if necessary may also be reported on page 2)	The risk management requirements of the standard were not addressed. The Usability evaluation has not been addressed. For model differences, refer to the test report.
A sample of the product was tested and found to be in conformity with	IEC 60601-1:2005+A1+A2
As shown in the Test Report Ref. No. which forms part of this Certificate	CN23WOWH 001

This CB Test Certificate is issued by the National Certification Body



TÜV Rheinland LGA Products GmbH
Tillystr. 2, 90431 Nürnberg, Germany
Phone + 49 221 806-1371
Fax + 49 221 806-3935
Mail: cert-validity@de.tuv.com
Web : www.tuv.com

Date: 2023-11-15

Signature:

Hongyan Yu

1. TDK-Lambda (China) Electronics
Co., Ltd.
No.95, Zhujiang Road, Xinwu District
Wuxi
214028 Jiangsu, P.R. China
2. TDK-Lambda Malaysia Sdn. Bhd.
PLO 33, Kawasan Perindustrian Senai
81400 Senai, Johor
Malaysia

Additional information (if necessary)

Report Ref. No. : CN23WOWH 001

Date: 2023-11-15

Signature:



Hongyan Yu



Test Report issued under the responsibility of:



TEST REPORT IEC 60601-1 Medical Electrical Equipment Part 1: General requirements for basic safety and essential performance	
Report Number.....	CN23WOWH 001
Date of issue.....	2023-11-06
Total number of pages	216 (excluding report attachments, see page 3)
Name of Testing Laboratory preparing the Report.....	TÜV Rheinland (Shanghai) Co. Ltd.
Applicant's name.....	TDK-Lambda (China) Electronics Co., Ltd
Address.....	No. 95, Zhujiang Road, Xinwu District, Wuxi, 214028 Jiangsu, P.R. China
Test specification:	
Standard	IEC 60601-1:2005, IEC 60601-1:2005/AMD1:2012, IEC 60601-1:2005/AMD2:2020
Test procedure	CB Scheme
Non-standard test method	N/A
TRF template used	IECEE OD-2020-F1:2020, Ed.1.3
Test Report Form No.....	IEC60601_1U
Test Report Form(s) Originator....	UL(US)
Master TRF.....	2023-08-24
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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 IECEE 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 NCB. 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(s) :	TDK-Lambda	
Manufacturer :	Same as applicant	
Model/Type reference :	CUS800My-zxxxxxxx, CME800Ay-zxxxxxxx, CUS1000My-zxxxxxxx, CME1000Ay-zxxxxxxx (y = blank; z = 12,24,36,48; xxxxxx = /CO, /CO2, /G, /SF, /CQC other alphanumeric character, symbol or blank)	
Ratings :	See the model list on page 8-9 for details	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	TÜV Rheinland (Shanghai) Co. Ltd.
Testing location/ address:		No.177, 178, Lane 777 West Guangzhong Road, Jing'an District, Shanghai, China
Tested by (name, function, signature):		Hope Chen / Assistant Project Engineer <i>Hope Chen</i>
Approved by (name, function, signature) ...:		Jiali Ni / Reviewer <i>Jiali Ni</i>
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	N/A
Testing location/ address:		
Tested by (name, function, signature):		
Approved by (name, function, signature) ...:		
<input type="checkbox"/>	Testing procedure: CTF Stage 2:	N/A
Testing location/ address:		
Tested by (name, function, signature):		
Witnessed by (name, function, signature) ..:		
Approved by (name, function, signature) ...:		
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	N/A
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	N/A
Testing location/ address:		
Tested by (name, function, signature):		
Witnessed by (name, function, signature) ..:		
Approved by (name, function, signature) ...:		
Supervised by (name, function, signature) :		

<p>List of Attachments (including a total number of pages in each attachment):</p> <ul style="list-style-type: none"> - ATTACHMENT 1 – National Differences (19 pages) - ATTACHMENT 2 – Photo Documentation (16 pages) <p>Note: Total number of pages in each attachment indicated in individual attachment.</p>	
<p>Summary of testing:</p>	
<p>Tests performed (name of test and test clause):</p> <p>All applicable tests as described in Test Case and Measurement Sections performed on models CUS1000M-12, CUS1000M-24, CUS1000M-36, CUS1000M-48, CUS800M-12, CUS800M-24, CUS800M-36, and CUS800M-48 to represent others.</p> <p>The equipment has been evaluated for ambient temperature up to 70 °C.</p> <p>Specified ambient temperature for operation is according to manufacturer's specification.</p> <p>The load conditions used during testing: Maximum normal load for this equipment is the operation with the maximum specified DC load with maximum power condition according to the manufacturer specified.</p> <p>Mounting Direction: Mounting A be used to represent others.</p> <p>The equipment is operated up to 5000m above sea level as declared by manufacturer.</p> <p>Clearances have been evaluated according to IEC 60601-1 table 8 with a multiplication factor of 1.29 throughout this report.</p> <p>The test samples are pre-production without serial numbers.</p>	<p>Testing location:</p> <p>See page 2.</p>
<p>Summary of compliance with National Differences (List of countries addressed):</p> <p>US, CA.</p> <p>Explanation of used codes: US=United States of America, CA=Canada.</p> <p><input checked="" type="checkbox"/> The product fulfils the requirements of</p> <p>EN 60601-1:2006+A1:2013+A12:2014+A2:2021</p> <p>ANSI/AAMI ES60601-1:2005+A2:2010(R 2012)+A1:2012+A2:2021</p> <p>CAN/CSA-C22.2 No. 60601-1:14+A2:22</p>	

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:

Procedure number, issue date and title:

Evaluation of Measurement Uncertainty in Laboratory and Decision Rule (Ref. No. MS-0007539, issued date: Jul. 28, 2023).

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

Statement not required by the standard used for type testing

(Note: When IEC or ISO standard requires a statement concerning the uncertainty of the measurement systems used for tests, this should be reported above. The informative text in parenthesis should be delete in both cases after selecting the applicable option)

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>

<p>CUS800M-12 INPUT: 100 - 240VAC - 9,5 A 50 - 60Hz OUTPUT : 12 V == 6,7 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CME1000A-12 INPUT: 100 - 240VAC - 9,5 A 50 - 60Hz OUTPUT : 12 V == 6,7 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CME800A-12 INPUT: 100 - 240VAC - 8,0 A 50 - 60Hz OUTPUT : 12 V == 5,67 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CUS1000M-12 INPUT: 100 - 240VAC - 9,5 A 50 - 60Hz OUTPUT : 12 V == 6,7 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>
<p>CUS800M-24 INPUT: 100 - 240VAC - 9,5 A 50 - 60Hz OUTPUT : 24 V == 3,34 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CME1000A-24 INPUT: 100 - 240VAC - 11,0 A 50 - 60Hz OUTPUT : 24 V == 4,17 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CME800A-24 INPUT: 100 - 240VAC - 9,5 A 50 - 60Hz OUTPUT : 24 V == 3,34 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CUS1000M-24 INPUT: 100 - 240VAC - 11,0 A 50 - 60Hz OUTPUT : 24 V == 4,17 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>
<p>CUS800M-36 INPUT: 100 - 240VAC - 9,5 A 50 - 60Hz OUTPUT : 36 V == 2,22 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CME1000A-36 INPUT: 100 - 240VAC - 11,0 A 50 - 60Hz OUTPUT : 36 V == 2,78 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CME800A-36 INPUT: 100 - 240VAC - 9,5 A 50 - 60Hz OUTPUT : 36 V == 2,22 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CUS1000M-36 INPUT: 100 - 240VAC - 11,0 A 50 - 60Hz OUTPUT : 36 V == 2,78 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>
<p>CUS800M-48 INPUT: 100 - 240VAC - 9,5 A 50 - 60Hz OUTPUT : 48 V == 1,67 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CME1000A-48 INPUT: 100 - 240VAC - 11,0 A 50 - 60Hz OUTPUT : 48 V == 2,0,9 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CME800A-48 INPUT: 100 - 240VAC - 9,5 A 50 - 60Hz OUTPUT : 48 V == 1,67 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>	<p>CUS1000M-48 INPUT: 100 - 240VAC - 11,0 A 50 - 60Hz OUTPUT : 48 V == 2,0,9 A</p> <p>EU: TDK-Lambda Germany GmbH, Karlshof-Str.49, 77855 Achern UK: TDK-Lambda UK, Devon EX24 9ES, UK email: lambda@tdk.com/manual</p>

Test item particulars	For class I ME equipment and a built-in switching mode power supply	
Classification of installation and use	Fixed	
Supply Connection	Primary connector	
Device type (component/sub-assembly/ equipment/ system)	Sub-assembly	
Intended use (Including type of patient, application location)	By other methods validated described by the manufacturer	
Mode of operation	Continuous	
Accessories and detachable parts included	None	
Other options include	None	
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 was not evaluated for the requirement.....	N/E (collateral standards only)	
- test object does not meet the requirement.....	F (Fail)	
Abbreviations used in the report		
- normal condition.....	N.C.	- single fault condition : S.F.C.
- means of Operator protection	MOOP	- means of Patient protection ... : MOPP
Testing		
Date of receipt of test item	2023-09-01	
Date (s) of performance of tests	2023-09-02 to 2023-09-28	
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 <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 IEC60061-1:		
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.....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Not applicable	
When differences exist; they shall be identified in the General product information section.		
Name and address of factory (ies)	1. TDK-Lambda (China) Electronics Co., Ltd. No. 95, Zhujiang Road, Xinwu District, Wuxi 214028 Jiangsu P.R. China 2. TDK-Lambda Malaysia Sdn. Bhd. PLO 33, Kawasan Perindustrian Senai 81400 Senai, Johor Malaysia	

General product information and other remarks:

The PSU is a component type switching mode power supplies intended for use with the earthed construction medical equipment.

For earthed construction (Class I), the PSU need to be reliably earthed and professionally installed and fixed with metal screws.

Model CME800Ay-zxxxxxxx is identical to model CUS800My-zxxxxxxx except for model name.

Model CME1000Ay-zxxxxxxx is identical to model CUS1000My-zxxxxxxx except for model name.

All models are identical, except for the optional chassis, cover, turns of Transformer and the rating of some components that results in different output ratings. See Model List below for details. All models are identical, except of the optional chassis, cover, turns of Transformer and the rating of some components which results in different output ratings. See Model List below for details.

CUS800M series and CUS1000M series have same PCB and circuit topology. Compared to CUS1000M series, CUS800M series have no additional heatsink on PFC heatsink for D1 and SCR1 and no additional busbar on bottom side. CUS800M series and CUS1000M series have different heatsinks for output rectifier components.

Additional Information

- This PSU subject to this evaluation is not a medical device or system on its own right, but a component intended for building into such. Risk assessment was therefore not subject of this investigation. It shall be carried out for final medical electrical equipment or system.
- The insulation system of the PSU was evaluated for compliance with the **MEANS OF PATIENT PROTECTION** (MOPP).
- Compliance with IEC / EN 60601-1-2 shall be evaluated during the end system evaluation.
- The product is for building-in equipment, the overall compliance shall be investigated in the complete medical electrical equipment or system, in particular:
 - Mechanical enclosure
 - Electrical enclosure
 - Fire enclosure
- Some components are **pre-certified**, which have been evaluated according to the relevant requirements of IEC 60601-1, are employed in this product.
- The equipment does not have circuits for direct connection to the patient and not is intended for use in the presence of flammable anesthetic mixtures with air, oxygen or nitrous oxide.
- The input circuit includes one fuse (F1A) in the Line conductor and the other fuse (F1B) is optional in neutral conductor. Consideration shall be given in the end-use product regarding addition of the second fuse having the same or better characteristics in order to comply with fusing requirements of Clause 8.11.5 of the standard.

Definition of various:

Variable:	Suffix	Description
y	blank	Denotes for standard model
z	12,24,36,48	Denotes for output voltage
xxxxxx x	blank	Denotes for standard model
	/CO	Denotes for single side PWB Coating
	/CO2	Denotes for double side PWB Coating
	/SF	Denotes for single fuse
	/G	Denotes for low earth Leakage current
	/CQC	Denotes for CQC approval
	other alphanumeric character, symbol	For market purposes, no construction differences and no safety impact.

Note: These suffixes may be used together (e.g. /G, /GCO).

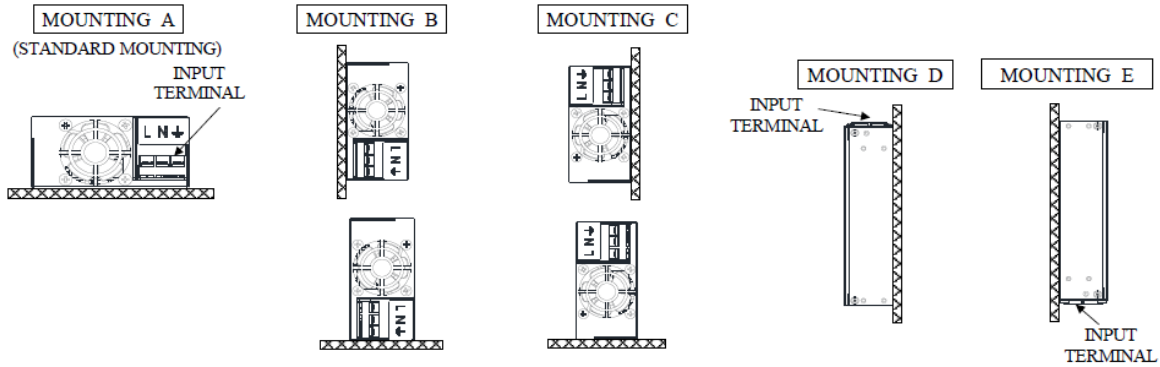
For rating differences between the models see below tables:

Series Model	I/p voltage (Vac)	Freq (Hz)	I/p current (A)	Output Channel	Minimal output	Rated output (typical)	Maximum output
Forced air by build-in intake fan							
CUS800M-12xxxxxxx CME800A-12xxxxxxx	100-240	50-60	8.0	Main output	10.8Vdc	12Vdc	12.6 Vdc
					10.8Vdc~12.6Vdc , Normal: 56.7A & 680.4W max. Peak: 66.7A & 800.4W max. (Dynamic)		
				Standby mode power (optional)	4.8Vdc	5Vdc	5.2Vdc
					2A	2A	1.9A
CUS800M-24xxxxxxx CME800A-24xxxxxxx	100-240	50-60	9.5	Main output	21.6 Vdc	24Vdc	25.9 Vdc
					21.6Vdc~25.9Vdc , Normal: 33.4A & 801.6W max.		
				Standby mode power (optional)	4.8Vdc	5Vdc	5.2Vdc
					2A	2A	1.9A
CUS800M-36xxxxxxx CME800A-36xxxxxxx	100-240	50-60	9.5	Main output	32.4 Vdc	36 Vdc	38.8Vdc
					32.4Vdc~38.8Vdc , Normal: 22.2A & 799.2W max.		
				Standby mode power (optional)	4.8Vdc	5Vdc	5.2Vdc
					2A	2A	1.9A
CUS800M-48xxxxxxx CME800A-48xxxxxxx	100-240	50-60	9.5	Main output	43.2Vdc	48 Vdc	51.8Vdc
					43.2Vdc~51.8Vdc , Normal: 16.7A & 801.6W max.		
				Standby mode power (optional)	4.8Vdc	5Vdc	5.2Vdc
					2A	2A	1.9A
Remark 1: Operating temp.: up to +70°C (operating temperature depending on equipment's load, mounting position, for details refer to instruction manual).							

For rating differences between the models see below tables:

Series Model	I/p voltage (Vac)	Freq (Hz)	I/p current (A)	Output Channel	Minimal output	Rated output (typical)	Maximum output
Forced air by build-in intake fan							
CUS1000M-12xxxxxxx CME1000A-12xxxxxxx	100-240	50-60	9.5	Main output	10.8Vdc	12Vdc	12.6 Vdc
					10.8Vdc~12.6Vdc , Normal: 66.7A & 800.4W max. Peak: 83.4A & 1000.8W max. (Dynamic)		
				Standby mode power (optional)	4.8Vdc	5Vdc	5.2Vdc
					2A	2A	1.9A
CUS1000M-24xxxxxxx CME1000A-24xxxxxxx	100-240	50-60	11.8	Main output	21.6 Vdc	24Vdc	25.9 Vdc
					21.6Vdc~25.9Vdc , Normal: 41.7A & 1000.8W max.		
				Standby mode power (optional)	4.8Vdc	5Vdc	5.2Vdc
					2A	2A	1.9A
CUS1000M-36xxxxxxx CME1000A-36xxxxxxx	100-240	50-60	11.8	Main output	32.4 Vdc	36 Vdc	38.8Vdc
					32.4Vdc~38.8Vdc , Normal: 27.8A & 1000.8W max.		
				Standby mode power (optional)	4.8Vdc	5Vdc	5.2Vdc
					2A	2A	1.9A
CUS1000M-48xxxxxxx CME1000A-48xxxxxxx	100-240	50-60	11.8	Main output	43.2Vdc	48 Vdc	51.8Vdc
					43.2Vdc~51.8Vdc , Normal: 20.9A & 1003.2W max.		
				Standby mode power (optional)	4.8Vdc	5Vdc	5.2Vdc
					2A	2A	1.9A
Remark 1: Operating temp.: up to +70°C (operating temperature depending on equipment's load, mounting position, for details refer to instruction manual).							

Mounting position:

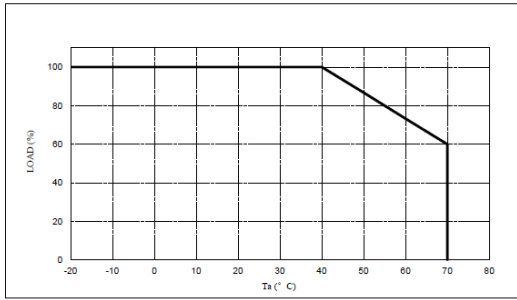


Derating Curve:

Model: CUS800M-12/24/36/48

MODEL: CUS800M-12/24/36/48

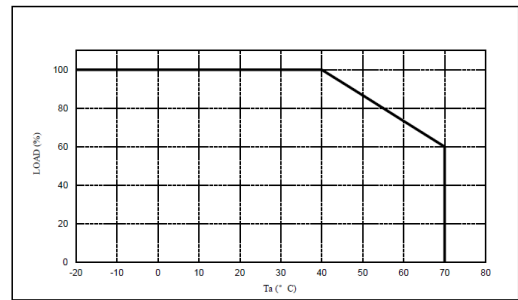
Ta (°C)	LOAD (%)
-20 ~ +40	100
50	86.7
60	73.3
70	60



Model: CUS1000M-12/24/36/48

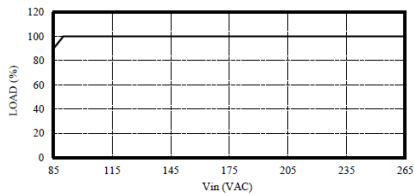
MODEL: CUS1000M-12/24/36/48

Ta (°C)	LOAD (%)
-20 ~ +40	100
50	86.7
60	73.3
70	60



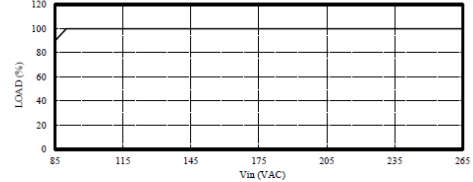
OUTPUT DERATING VERSUS INPUT VOLTAGE

INPUT VOLTAGE (VAC)	LOAD (%)
85	90
90~265	100



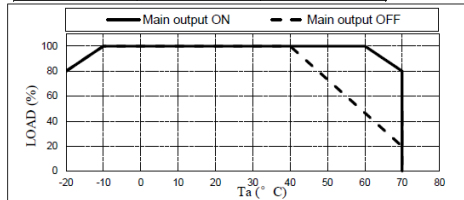
OUTPUT DERATING VERSUS INPUT VOLTAGE

INPUT VOLTAGE (VAC)	LOAD (%)
85	90
90~265	100



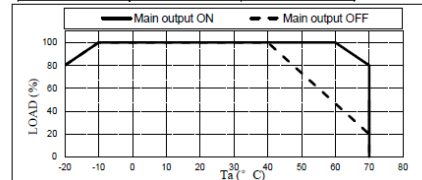
STANDBY SUPPLY OUTPUT DERATING VERSUS OPERATING AMBIENT TEMPERATURE (Ta)

Ta (°C)	LOAD (%)	
	Main output ON	Main output OFF
-20	80	80
-10	100	100
-10 ~ 40	100	100
60	100	46.7
70	80	20



STANDBY SUPPLY OUTPUT DERATING VERSUS OPERATING AMBIENT TEMPERATURE (Ta)

Ta (°C)	LOAD (%)	
	Main output ON	Main output OFF
-20	80	80
-10	100	100
-10 ~ 40	100	100
60	100	46.7
70	80	20



IEC 60601-1			
Clause	Requirement + Test	Result - Remark	Verdict

INSULATION DIAGRAM

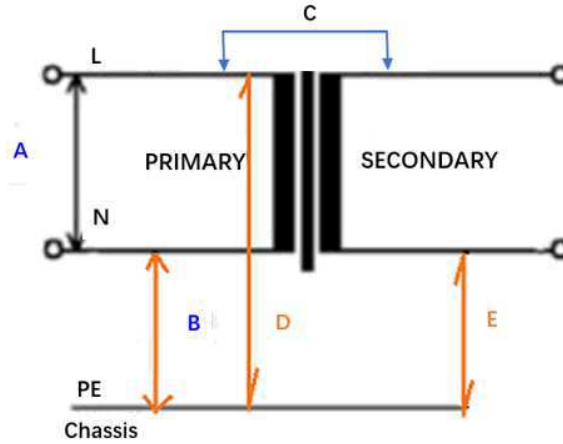


TABLE: INSULATION DIAGRAM										Pass
Pollution degree					2					—
Overvoltage category					II					—
Altitude					5000					—
Additional details on parts considered as applied parts					<input checked="" type="checkbox"/> None <input type="checkbox"/> Areas _____ (See Clause 4.6 for details)					—
Area	Number and type of Means of Protection: MOOP, MOPP	CTI	Working voltage		Required creepage (mm)	Required clearance (mm)	Measured creepage (mm)	Measured clearance (mm)	Remarks	
			V _{rms}	V _{pk}						
A	1MOOP	IIIb	240	340	2.6 (acc. to Table 16)	3.0 (2.0x1.48) (acc. to Table 8&13)	4.9	4.9	L to N before fuse	
A	1MOOP	IIIb	240	340			3.1	3.1	Primary traces under fuse	
B&D	1MOPP	IIIb	240	340	4.0 (acc. to Table 12)	3.3 (2.5x1.29) (acc. to Table 8&12)	4.9	4.9	L/N to GND	
B&D	1MOPP	IIIb	240	340			5.3	5.3	Trace under Y-Cap C2	
B&D	1MOPP	IIIb	240	340			7.3	7.3	Trace under Y-Cap C4/C5	
B&D	1MOPP	IIIb	240	340			5.3	5.3	Trace under Y-Cap C62	

IEC 60601-1									
Clause	Requirement + Test					Result - Remark			Verdict
B&D	1MOPP	IIIb	240	340			6.7	6.7	Trace under Y-Cap C53/C54
C	2MOPP	IIIb	240	340	8.0 (acc. to Table 12)	6.5 (5.0x1.29) (acc. to Table 8&12)	8.5	8.5	Trace under opto-couplers
C	2MOPP	IIIb	271	460	12.0 (acc. to Table 12)	9.1 (7.0x1.29) (acc. to Table 8&12)	30.0	30.0	Primary pin to Secondary pin under under T1 (Ext.)
C	2MOPP	IIIb	271	460	12.0 (acc. to Table 12)	9.1 (7.0x1.29) (acc. to Table 8&12)	12.6	12.6	Primary to secondary of T1(Int.)
C	2MOPP	IIIb	364	584	12.0 (acc. to Table 12)	9.1 (7.0x1.29) (acc. to Table 8&12)	12.5	12.5	Primary pin to Secondary pin under under T2 (Ext.)
C	2MOPP	IIIb	364	584	12.0 (acc. to Table 12)	9.1 (7.0x1.29) (acc. to Table 8&12)	TIW*	TIW*	Primary to secondary of T2 (Int.)
E	1MOPP	IIIb	240**	340**	4.0 (acc. to Table 12)	3.3 (1.2x1.29) (acc. to Table 8&12)	4.5	4.5	Secondary circuits to GND

Supplementary Information:

For clearance and creepage did not describe as above are far larger than limit.

For all modules.

*The approved TIW used in secondary side of the T2. See table 8.10 for details.

**Required by customer.

Location	Peak voltage (V)	RMS voltage (V)	Frequency (Hz)	Comments
For model CUS1000M-48 (51.8Vdc, loaded19.37A)				
T1 Pin 5 to Pin 1, 2	408	232	76kHz	--
T1 Pin 5 to Pin 3	460	271	76kHz	Max.RMS voltage& Max Peak voltage
T1 Pin 5 to Pin 4	412	198	76kHz	--
T1 Pin 8 to Pin 1, 2	324	156	76kHz	--
T1 Pin 8 to Pin 3	340	156	76kHz	--
T1 Pin 8 to Pin 4	376	169	76kHz	--
T2 Pin 5 to Pin 2	412	310	125kHz	--
T2 Pin 5 to Pin 3	436	310	125kHz	--

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Clause	Requirement + Test			Result - Remark	Verdict
T2 Pin 6 to Pin 2	564	359	125kHz	Max.RMS voltage& Max Peak voltage	
T2 Pin 6 to Pin 3	556	354	125kHz	--	
T2 Pin 7 to Pin 2	364	173	125kHz	--	
T2 Pin 7 to Pin 3	364	173	125kHz	--	
T2 Pin 8 to Pin 2	436	176	125kHz	--	
T2 Pin 8 to Pin 3	408	174	125kHz	--	
PC101 Pin 1 to Pin 3	396	189	60Hz	--	
PC101 Pin 1 to Pin 4	400	190	60Hz	--	
PC101 Pin 2 to Pin 3	400	190	60Hz	--	
PC101 Pin 2 to Pin 4	396	189	60Hz	--	
PC103 Pin 1 to Pin 3	432	218	60Hz	--	
PC103 Pin 1 to Pin 4	432	218	60Hz	--	
PC103 Pin 2 to Pin 3	440	220	60Hz	--	
PC103 Pin 2 to Pin 4	440	220	60Hz	--	
PC104 Pin 1 to Pin 3	446	222	60Hz	--	
PC104 Pin 1 to Pin 4	446	222	60Hz	--	
PC104 Pin 2 to Pin 3	448	224	60Hz	--	
PC104 Pin 2 to Pin 4	448	224	60Hz	--	
PC105 Pin 1 to Pin 3	396	190	60Hz	--	
PC105 Pin 1 to Pin 4	396	190	60Hz	--	
PC105 Pin 2 to Pin 3	400	190	60Hz	--	
PC105 Pin 2 to Pin 4	400	190	60Hz	--	
PC106 Pin 1 to Pin 3	400	192	60Hz	--	
PC106 Pin 1 to Pin 4	400	192	60Hz	--	
PC106 Pin 2 to Pin 3	404	194	60Hz	--	
PC106 Pin 2 to Pin 4	404	194	60Hz	--	
For model CUS1000M-36(38.8Vdc, loaded 25.80A)					
T1 Pin 5 to Pin 1, 2	396	236	77kHz	--	
T1 Pin 5 to Pin 3	432	264	77kHz	Max.RMS voltage& Max Peak voltage	
T1 Pin 5 to Pin 4	376	209	77kHz	--	
T1 Pin 8 to Pin 1, 2	312	162	77kHz	--	
T1 Pin 8 to Pin 3	320	161	77kHz	--	
T1 Pin 8 to Pin 4	352	171	77kHz	--	

IEC 60601-1					
Clause	Requirement + Test	Result - Remark			Verdict
T2 Pin 5 to Pin 2	412	314	125kHz	--	
T2 Pin 5 to Pin 3	440	316	125kHz	--	
T2 Pin 6 to Pin 2	572	363	125kHz	Max.RMS voltage& Max Peak voltage	
T2 Pin 6 to Pin 3	560	357	125kHz	--	
T2 Pin 7 to Pin 2	360	170	125kHz	--	
T2 Pin 7 to Pin 3	364	170	125kHz	--	
T2 Pin 8 to Pin 2	424	172	125kHz	--	
T2 Pin 8 to Pin 3	400	171	125kHz	--	
PC101 Pin 1 to Pin 3	396	190	60Hz	--	
PC101 Pin 1 to Pin 4	394	188	60Hz	--	
PC101 Pin 2 to Pin 3	394	188	60Hz	--	
PC101 Pin 2 to Pin 4	396	190	60Hz	--	
PC103 Pin 1 to Pin 3	430	216	60Hz	--	
PC103 Pin 1 to Pin 4	430	216	60Hz	--	
PC103 Pin 2 to Pin 3	432	218	60Hz	--	
PC103 Pin 2 to Pin 4	432	218	60Hz	--	
PC104 Pin 1 to Pin 3	436	222	60Hz	--	
PC104 Pin 1 to Pin 4	436	222	60Hz	--	
PC104 Pin 2 to Pin 3	440	224	60Hz	--	
PC104 Pin 2 to Pin 4	440	224	60Hz	--	
PC105 Pin 1 to Pin 3	394	188	60Hz	--	
PC105 Pin 1 to Pin 4	394	188	60Hz	--	
PC105 Pin 2 to Pin 3	392	186	60Hz	--	
PC105 Pin 2 to Pin 4	392	186	60Hz	--	
PC106 Pin 1 to Pin 3	396	192	60Hz	--	
PC106 Pin 1 to Pin 4	396	192	60Hz	--	
PC106 Pin 2 to Pin 3	394	190	60Hz	--	
PC106 Pin 2 to Pin 4	394	190	60Hz	--	
For model CUS1000M-24(25.9Vdc, loaded 38.65A)					
T1 Pin 5 to Pin 1, 2	388	240	76kHz	--	
T1 Pin 5 to Pin 3	412	258	76kHz	Max.RMS voltage& Max Peak voltage	
T1 Pin 5 to Pin 4	372	221	76kHz	--	
T1 Pin 8 to Pin 1, 2	300	165	76kHz	--	

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Clause	Requirement + Test	Result - Remark			Verdict
T1 Pin 8 to Pin 3	292	163	76kHz	--	
T1 Pin 8 to Pin 4	324	170	76kHz	--	
T2 Pin 5 to Pin 2	416	314	124kHz	--	
T2 Pin 5 to Pin 3	440	314	124kHz	--	
T2 Pin 6 to Pin 2	572	363	124kHz		Max.RMS voltage& Max Peak voltage
T2 Pin 6 to Pin 3	568	358	124kHz	--	
T2 Pin 7 to Pin 2	360	170	124kHz	--	
T2 Pin 7 to Pin 3	364	170	124kHz	--	
T2 Pin 8 to Pin 2	424	173	124kHz	--	
T2 Pin 8 to Pin 3	404	171	124kHz	--	
PC101 Pin 1 to Pin 3	392	188	60Hz	--	
PC101 Pin 1 to Pin 4	392	188	60Hz	--	
PC101 Pin 2 to Pin 3	390	186	60Hz	--	
PC101 Pin 2 to Pin 4	390	186	60Hz	--	
PC103 Pin 1 to Pin 3	428	212	60Hz	--	
PC103 Pin 1 to Pin 4	428	212	60Hz	--	
PC103 Pin 2 to Pin 3	424	210	60Hz	--	
PC103 Pin 2 to Pin 4	424	210	60Hz	--	
PC104 Pin 1 to Pin 3	440	220	60Hz	--	
PC104 Pin 1 to Pin 4	440	220	60Hz	--	
PC104 Pin 2 to Pin 3	442	222	60Hz	--	
PC104 Pin 2 to Pin 4	442	222	60Hz	--	
PC105 Pin 1 to Pin 3	394	188	60Hz	--	
PC105 Pin 1 to Pin 4	394	188	60Hz	--	
PC105 Pin 2 to Pin 3	392	187	60Hz	--	
PC105 Pin 2 to Pin 4	392	187	60Hz	--	
PC106 Pin 1 to Pin 3	396	191	60Hz	--	
PC106 Pin 1 to Pin 4	396	191	60Hz	--	
PC106 Pin 2 to Pin 3	394	190	60Hz	--	
PC106 Pin 2 to Pin 4	394	190	60Hz	--	
For model CUS1000M-12 (12.6Vdc, loaded 63.53A)					
T1 Pin 5 to Pin 1, 2	396	244	74kHz	--	
T1 Pin 5 to Pin 3	408	251	74kHz		Max.RMS voltage& Max Peak voltage

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Clause	Requirement + Test	Result - Remark			Verdict
T1 Pin 5 to Pin 4	384	233	74kHz	--	
T1 Pin 8 to Pin 1, 2	292	166	74kHz	--	
T1 Pin 8 to Pin 3	288	165	74kHz	--	
T1 Pin 8 to Pin 4	308	169	70kHz	--	
T2 Pin 5 to Pin 2	416	312	126kHz	--	
T2 Pin 5 to Pin 3	436	312	126kHz	--	
T2 Pin 6 to Pin 2	584	364	126kHz	Max.RMS voltage& Max Peak voltage	
T2 Pin 6 to Pin 3	576	358	126kHz	--	
T2 Pin 7 to Pin 2	356	170	126kHz	--	
T2 Pin 7 to Pin 3	364	170	126kHz	--	
T2 Pin 8 to Pin 2	436	170	126kHz	--	
T2 Pin 8 to Pin 3	416	170	126kHz	--	
PC101 Pin 1 to Pin 3	394	186	60Hz	--	
PC101 Pin 1 to Pin 4	394	186	60Hz	--	
PC101 Pin 2 to Pin 3	396	187	60Hz	--	
PC101 Pin 2 to Pin 4	396	187	60Hz	--	
PC103 Pin 1 to Pin 3	432	219	60Hz	--	
PC103 Pin 1 to Pin 4	432	219	60Hz	--	
PC103 Pin 2 to Pin 3	432	220	60Hz	--	
PC103 Pin 2 to Pin 4	432	220	60Hz	--	
PC104 Pin 1 to Pin 3	440	222	60Hz	--	
PC104 Pin 1 to Pin 4	442	223	60Hz	--	
PC104 Pin 2 to Pin 3	442	223	60Hz	--	
PC104 Pin 2 to Pin 4	444	224	60Hz	--	
PC105 Pin 1 to Pin 3	396	188	60Hz	--	
PC105 Pin 1 to Pin 4	396	188	60Hz	--	
PC105 Pin 2 to Pin 3	394	187	60Hz	--	
PC105 Pin 2 to Pin 4	394	187	60Hz	--	
PC106 Pin 1 to Pin 3	398	190	60Hz	--	
PC106 Pin 1 to Pin 4	398	190	60Hz	--	
PC106 Pin 2 to Pin 3	402	192	60Hz	--	
PC106 Pin 2 to Pin 4	402	192	60Hz	--	
For model CUS1000M-12 (12Vdc, loaded 66.7A)					
T1 Pin 5 to Pin 1, 2	396	243	74kHz	--	

IEC 60601-1				
Clause	Requirement + Test		Result - Remark	Verdict
T1 Pin 5 to Pin 3	404	250	74kHz	Max.RMS voltage& Max Peak voltage
T1 Pin 5 to Pin 4	382	232	74kHz	--
T1 Pin 8 to Pin 1, 2	288	163	74kHz	--
T1 Pin 8 to Pin 3	284	162	74kHz	--
T1 Pin 8 to Pin 4	300	164	70kHz	--
T2 Pin 5 to Pin 2	412	311	126kHz	--
T2 Pin 5 to Pin 3	436	311	126kHz	--
T2 Pin 6 to Pin 2	576	360	126kHz	Max.RMS voltage& Max Peak voltage
T2 Pin 6 to Pin 3	560	355	126kHz	--
T2 Pin 7 to Pin 2	352	170	126kHz	--
T2 Pin 7 to Pin 3	360	170	126kHz	--
T2 Pin 8 to Pin 2	434	170	126kHz	--
T2 Pin 8 to Pin 3	410	170	126kHz	--
PC101 Pin 1 to Pin 3	394	186	60Hz	--
PC101 Pin 1 to Pin 4	394	186	60Hz	--
PC101 Pin 2 to Pin 3	395	186	60Hz	--
PC101 Pin 2 to Pin 4	395	186	60Hz	--
PC103 Pin 1 to Pin 3	430	218	60Hz	--
PC103 Pin 1 to Pin 4	430	218	60Hz	--
PC103 Pin 2 to Pin 3	432	220	60Hz	--
PC103 Pin 2 to Pin 4	432	220	60Hz	--
PC104 Pin 1 to Pin 3	440	222	60Hz	--
PC104 Pin 1 to Pin 4	440	222	60Hz	--
PC104 Pin 2 to Pin 3	442	223	60Hz	--
PC104 Pin 2 to Pin 4	442	223	60Hz	--
PC105 Pin 1 to Pin 3	394	186	60Hz	--
PC105 Pin 1 to Pin 4	394	186	60Hz	--
PC105 Pin 2 to Pin 3	394	186	60Hz	--
PC105 Pin 2 to Pin 4	394	186	60Hz	--
PC106 Pin 1 to Pin 3	398	190	60Hz	--
PC106 Pin 1 to Pin 4	398	190	60Hz	--
PC106 Pin 2 to Pin 3	400	191	60Hz	--
PC106 Pin 2 to Pin 4	400	191	60Hz	--

IEC 60601-1			
Clause	Requirement + Test	Result - Remark	Verdict

INSULATION DIAGRAM CONVENTIONS and GUIDANCE:

A measured value must be provided in the value columns for the device under evaluation. The symbol > (greater than sign) must not be used. Switch-mode power supplies must be re-evaluated in the device under evaluation therefore N/A must not be used with a generic statement that the component is certified.

Insulation diagram is a graphical representation of equipment insulation barriers, protective impedance and protective earthing. If feasible, use the following conventions to generate the diagram:

- All isolation barriers are identified by letters between separate parts of diagram, for example separate transformer windings, optocouplers, wire insulation, creepage and clearance distances.
- Parts connected to earth with large dots are protectively earthed. Other connections to earth are functional
- Applied parts are extended beyond the equipment enclosure and terminated with an arrow.
- Parts accessible to the operator only are extended outside of the enclosure but are not terminated with an arrow.