



Test Report issued under the responsibility of:

TEST REPORT
IEC 60950-1
Information technology equipment – Safety –
Part 1: General requirements

Report Number.: 50283316 001
Date of issue: 2019-09-26
Total number of pages.....: 132 (excluding attachments, refer to page 3)

Name of Testing Laboratory TÜV Rheinland Shanghai Co., Ltd.
preparing the Report: No.177, 178, Lane 777 West Guangzhong Road, Jing'an District,
Shanghai, China

Applicant's name.....: WUXI TDK-LAMBDA ELECTRONICS CO LTD
Address: Lot 115 High-Tech Zone Wuxi Jiangsu, P. R. China

Test specification:
Standard: IEC 60950-1:2005, AMD1:2009, AMD2:2013
Test procedure.....: CB Scheme
Non-standard test method.....: N/A

Test Report Form No.....: IEC60950_1G
Test Report Form(s) Originator.....: SGS Fimko Ltd
Master TRF: Dated 2019-07-02

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Test item description	Switching Power Supply	
Trade Mark	TDK-Lambda	
Manufacturer	Same as applicant	
Model/Type reference	CUS600My-zxxxxxxx , CME600Ay-zxxxxxxx (y = blank; z = 12, 19, 24, 28, 32, 36 or 48; xxxxxxx =/ADJ, /T, /J, /M, /C, /C2, /SF, /G, /EF, other alphanumeric character, symbol or blank) Refer to page 12 for definition of variables	
Ratings	AC input: 100-240V, 50-60Hz, 4.5A or 7.0A DC output: See the model list on pages 9-11 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)		Johnson Ma/ Technical Expert
Approved by (name, function, signature) ...		Sunny Sun/ Technical Reviewer
<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 + 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) :		

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

- ATTACHMENT - National Differences (52 pages)
- ATTACHMENT - Technical documentation (35 pages)
- ATTACHMENT - Photo documentation (12 pages)

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

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

All applicable tests as described in Test Case and Measurement Sections were performed on models CUS600M-12, CUS600M-19, CUS600M-28, CUS600M-32 and CUS600M-48 to represent others.

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 and Forced air cooling on following).

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.

Mounting Direction: Mounting A and B be used to represent others.

Air speed is same between EUT with EF construction and forced air cooling condition, and select EF construction for temperature testing covered forced air cooling condition.

The product is to be operated up to 5000m above sea level, the minimum clearances were multiplied by the factor given in Table A.2 of IEC 60664-1: 1.48.

The test samples are pre-production without serial numbers.

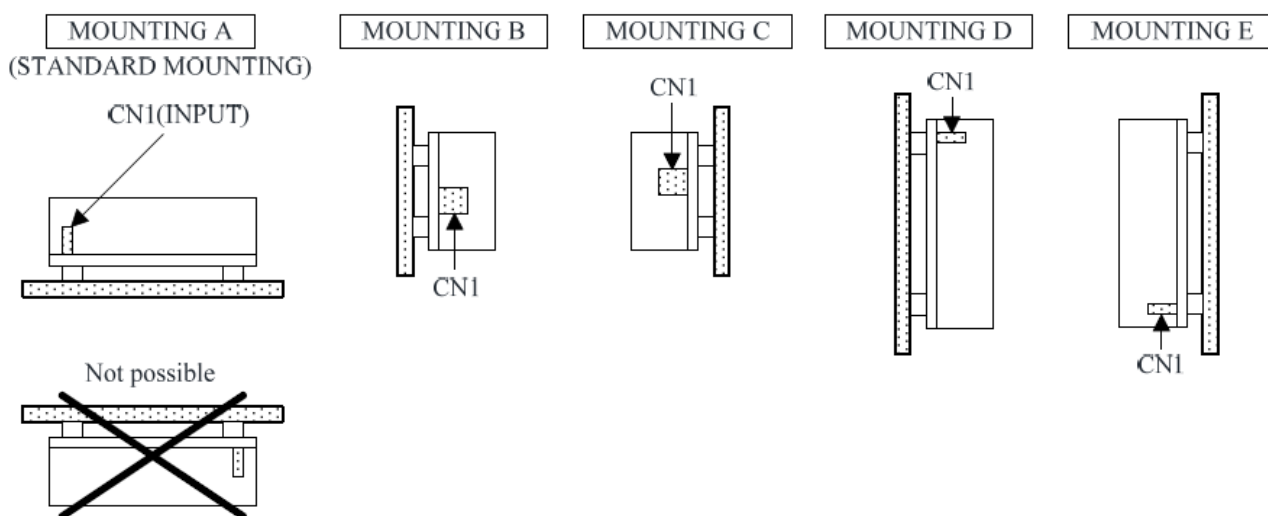
Uncertainty:

When determining for test conclusion, measurement uncertainty of tests has been considered.

The determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

Testing location:

TÜV Rheinland Shanghai Co., Ltd.
No.177, 178, Lane 777 West
Guangzhong Road, Jing'an District,
Shanghai, China

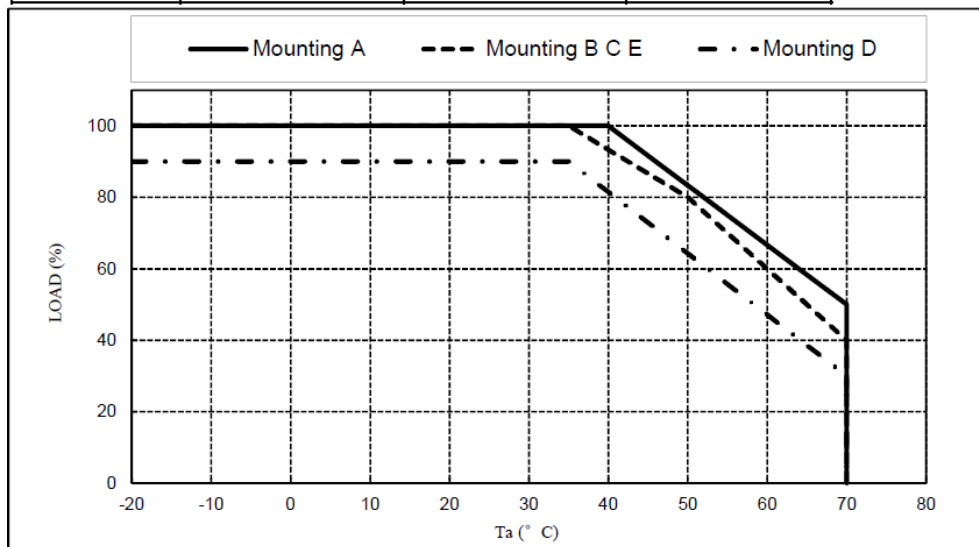
MOUNTING DIRECTIONS

Derating Curve:

Convection cooling condition:

Condition A: Main output is derating according the following, standby mode power is no load.

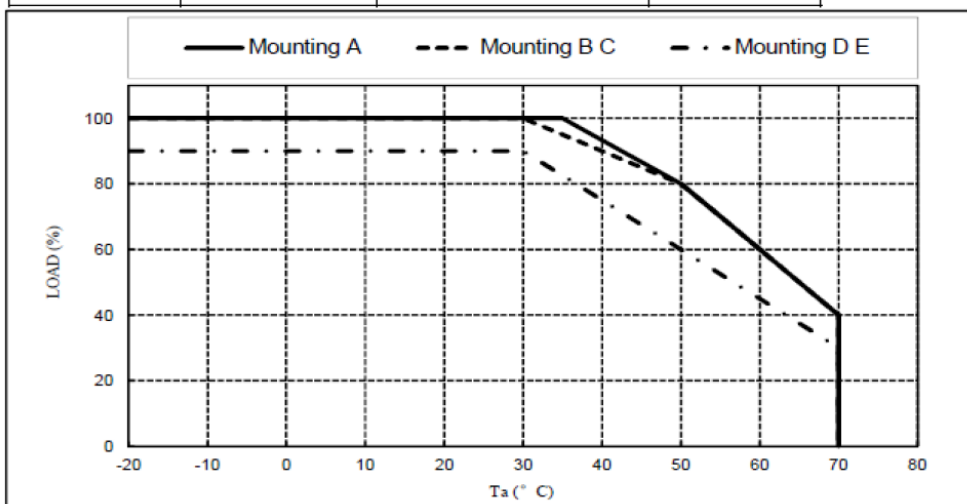
Ta (°C)	Mounting A	Mounting B C E	Mounting D
	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +35	100	100	90
40	100	93.3	81.4
50	83.3	80	64.3
60	66.7	60	47.1
70	50	40	30



Condition B: Main output and standby mode power is derating according the following.

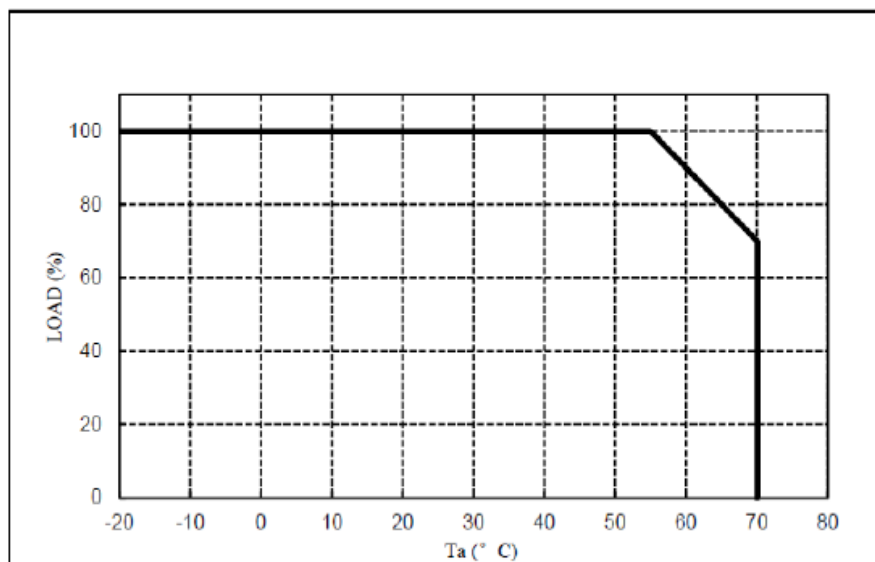
MODEL: ALL MODELS

Ta (°C)	Mounting A	Mounting B C	Mounting D E
	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +30	100	100	90
35	100	95	82.5
40	93.3	90	75
50	80	80	60
60	60	60	45
70	40	40	30



Forced air cooling condition:

Ta (°C)	LOAD (%)
-20 - +55	100
60	93.4
70	70

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

EU Group Differences, EU Special National Conditions, AU, CA, JP, NZ, US

Explanation of used codes:

AU = Australia; CA = Canada; JP = Japan; NZ = New Zealand; US = United States of America

Note(s):

Countries outside the CB Scheme membership may also accept this report.

The product fulfils the requirements of

IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am2:2013,

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>

Marking for CUS600M series

CUS600M - 12
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 12 V $\overline{\text{---}}$ 50 A


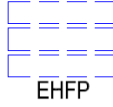


EHFP

BAR CODE
□5.0mm

TDK·Lambda
MADE IN CHINA

CUS600M - 19
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 19 V $\overline{\text{---}}$ 31.6 A


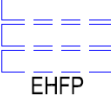


EHFP

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TDK·Lambda
MADE IN CHINA

CUS600M - 24
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 24 V $\overline{\text{---}}$ 25 A


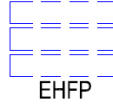


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TDK·Lambda
MADE IN CHINA

CUS600M - 28
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 28 V $\overline{\text{---}}$ 21.5 A


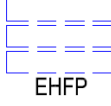


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TDK·Lambda
MADE IN CHINA

CUS600M - 32
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 32 V $\overline{\text{---}}$ 18.8 A





EHFP

BAR CODE
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TDK·Lambda
MADE IN CHINA

CUS600M - 36
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 36 V $\overline{\text{---}}$ 16.7 A


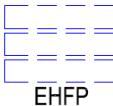


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TDK·Lambda
MADE IN CHINA

CUS600M - 48
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 48 V $\overline{\text{---}}$ 12.6 A



EHFP



BAR CODE
□5.0mm

TDK·Lambda
MADE IN CHINA

Cont.



Marking for CME600A series

CME600A-12
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 12 V $\overline{=}$ 50 A



TDK·Lambda
 MADE IN CHINA

CME600A - 19
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 19 V $\overline{=}$ 31.6 A

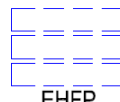

TDK·Lambda
 MADE IN CHINA

CME600A - 24
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 24 V $\overline{=}$ 25 A



TDK·Lambda
 MADE IN CHINA

CME600A - 28
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 28 V $\overline{=}$ 21.5 A

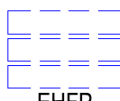

TDK·Lambda
 MADE IN CHINA

CME600A - 32
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 32 V $\overline{=}$ 18.8 A



TDK·Lambda
 MADE IN CHINA

CME600A - 36
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 36 V $\overline{=}$ 16.7 A

TDK·Lambda
 MADE IN CHINA

CME600A - 48
INPUT : 100 - 240VAC ~ 7.0 A
50 - 60Hz
OUTPUT : 48 V $\overline{=}$ 12.6 A

TDK·Lambda
 MADE IN CHINA

Remark: The rating labels of all models have the same design except for the model designation.

Test item particulars	
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 type="checkbox"/> type A <input type="checkbox"/> type B <input checked="" 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 Note: shall be evaluated in the final system.
Operating condition.....	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location	<input type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location <input checked="" type="checkbox"/> Building-in equipment, shall be evaluated in the final system.
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 type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IT testing, phase-phase voltage (V)	N/A
Class of equipment	<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input checked="" 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 5000
Altitude of test laboratory (m)	Less than 2000
Mass of equipment (kg)	< 7
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	: 2019-06-01
Date (s) of performance of tests.....	: 2019-06-01 to 2019-08-19
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 IEC60950-1:							
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. Wuxi TDK-Lambda Electronics Co., Ltd. No. 6 Xing Chuang Er Lu Wuxi, Jiangsu 214028, P. R. China 2. Zhangjiagang Hua Yang Electronics Co., Ltd. Zhao Feng Industrial Zone, Leyu Town, Zhangjiagang, Jiangsu 215622, P. R. China		
General product information:							
The PSU is a component type switching mode power supplies intended for the earthed construction or non-earthed construction of medical equipment.							
-For earthed construction (Class I), the PSU need to be reliably earthed and professionally installed and fixed with metal screws.							
-For non-earthed construction (Class II), no earthing connection is required. The PSU need to be fixed so, that it is insulated from any unearthed accessible conductive part by reinforced insulation.							
Model CME600Ay-zxxxxxxx is identical to model CUS600My-zxxxxxxx except for model name.							
All models are identical, except for 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.							
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
Convection cooling condition							
CUS600My-12xxxxxxx CME600Ay-12xxxxxxx	100-240	50-60	4.5	Main output	10.8Vdc	12Vdc	12.9Vdc
					10.8Vdc – 12.9Vdc Normal Rating: 33.4A, 400.8W Max. Peak Rating: 50A, 600W Max. (Dynamic)		
				Standby power (Optional)	5Vdc (Rated) 2A (Rated)		
CUS600My-19xxxxxxx CME600Ay-19xxxxxxx	100-240	50-60	4.5	Main output	17.1Vdc	19Vdc	20.5Vdc
					17.1Vdc – 20.5Vdc Normal Rating: 21.1A, 400.9W Max. Peak Rating: 31.6A, 600.4W Max. (Dynamic)		
				Standby power (Optional)	5Vdc (Rated) 2A (Rated)		
CUS600My-24xxxxxxx CME600Ay-24xxxxxxx	100-240	50-60	4.5	Main output	21.6Vdc	24Vdc	25.9Vdc
					21.6Vdc – 25.9Vdc, Normal Rating: 16.7A, 400.8W Max. Peak Rating: 25A, 600W Max. (Dynamic)		

				Standby power (Optional)	5Vdc (Rated)		
					2A (Rated)		
CUS600My-28xxxxxxx CME600Ay-28xxxxxxx	100-240	50-60	4.5	Main output	25.2Vdc	28Vdc	30.2Vdc
					25.2Vdc – 30.2Vdc, Normal Rating: 14.3A, 400.4W Max. Peak Rating: 21.5A, 602W Max. (Dynamic)		
				Standby power (Optional)	5Vdc (Rated)		
					2A (Rated)		
CUS600My-32xxxxxxx CME600Ay-32xxxxxxx	100-240	50-60	4.5	Main output	28.8Vdc	32Vdc	34.5Vdc
					28.8Vdc – 34.5Vdc, Normal Rating: 12.5A, 400W Max. Peak Rating: 18.8A, 601.6W Max. (Dynamic)		
				Standby power (Optional)	5Vdc (Rated)		
					2A (Rated)		
CUS600My-36xxxxxxx CME600Ay-36xxxxxxx	100-240	50-60	4.5	Main output	32.4Vdc	36Vdc	38.8Vdc
					32.4Vdc – 38.8Vdc, Normal Rating: 11.1A, 399.6W Max. Peak Rating: 16.7A, 601.2W Max. (Dynamic)		
				Standby power (Optional)	5 Vdc (Rated)		
					2 A (Rated)		
CUS600My-48xxxxxxx CME600Ay-48xxxxxxx	100-240	50-60	4.5	Main output	43.2 Vdc	48 Vdc	51.8 Vdc
					43.2Vdc – 51.8Vdc, Normal Rating: 8.4A, 403.2W Max, Peak Rating: 12.6A, 604.8W Max. (Dynamic)		
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
Forced air cooling condition (airflow: air velocity 2.7m/s & air volume 28.6CFM)							
CUS600My-12xxxxxxx CME600Ay-12xxxxxxx	100-240	50-60	7.0	Main output	10.8Vdc	12Vdc	12.9Vdc
					50A	50A	46.6A
				Standby power (Optional)	5Vdc (Rated)		
					2A (Rated)		
CUS600My-19xxxxxxx CME600Ay-19xxxxxxx	100-240	50-60	7.0	Main output	17.1Vdc	19Vdc	20.5Vdc
					31.6A	31.6A	29.3A
				Standby power (Optional)	5Vdc (Rated)		
					2A (Rated)		
CUS600My-24xxxxxxx CME600Ay-24xxxxxxx	100-240	50-60	7.0	Main output	21.6Vdc	24Vdc	25.9Vdc
					25A	25A	23.2A
				Standby power (Optional)	5Vdc (Rated)		
					2A (Rated)		

CUS600My-28xxxxxx CME600Ay-28xxxxxx	100-240	50-60	7.0	Main output	25.2Vdc	28Vdc	30.2Vdc
					21.5A	21.5A	20.0A
				Standby power (Optional)	5Vdc (Rated)		
					2A (Rated)		
CUS600My-32xxxxxx CME600Ay-32xxxxxx	100-240	50-60	7.0	Main output	28.8Vdc	32Vdc	34.5Vdc
					18.8A	18.8A	17.5A
				Standby power (Optional)	5Vdc (Rated)		
					2A (Rated)		
CUS600My-36xxxxxx CME600Ay-36xxxxxx	100-240	50-60	7.0	Main output	32.4Vdc	36Vdc	38.8Vdc
					16.7A	16.7A	15.5A
				Standby power (Optional)	5Vdc (Rated)		
					2A (Rated)		
CUS600My-48xxxxxx CME600Ay-48xxxxxx	100-240	50-60	7.0	Main output	43.2Vdc	48Vdc	51.8Vdc
					12.6A	12.6A	11.7A
				Standby power (Optional)	5Vdc (Rated)		
					2A (Rated)		
<p>Remark:</p> <p>Operating temp.: up to +70°C (operating temperature depending on equipment's load, mounting position, for details refer to instruction manual). / EF the standby current (2A) is including the fan current (0.3A).</p>							

Additional Information

- The product is for building-in equipment, the overall compliance shall be investigated in the complete medical electrical equipment or system, in particular:
 - Fire enclosure
 - Mechanical enclosure
 - Electrical enclosure
- Some components are **pre-certified**, which have been evaluated according to the relevant requirements of IEC 60950-1, are employed in this product. Their suitability of use has been checked according to subclauses 1.5.1 and 1.5.2.
- The outputs of the product is SELV, which exceed 240 VA. The end used equipment will provide the proper means of restricting operator access to output of the product.
- 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.
- The metal enclosure of Class II equipment should be evaluated by end system.
- The equipment is operated up to 5000m above sea level as declared by manufacturer. Clearances have been evaluated according to IEC 60664-1:1992 table A.2 with a multiplication factor of 1.48 throughout this report.
- Recommend by manufacturer as below:

The components listed in the following table must not exceed the temperatures given. To determine the component temperatures the heating test must be conducted in accordance with the requirements of the standard in question. Consideration should also be given to the requirements of other safety standards. Test requirements include: PSU to be fitted in its end-use equipment and operated under the most adverse conditions permitted in the end-use equipment handbook/specification and which will result in the highest

temperatures in the PSU. To determine the most adverse conditions consideration should be given to the end use equipment maximum operating ambient, the PSU loading and input voltage, ventilation, end use equipment orientation, the position of doors & covers etc. Temperatures should be monitored using type K fine wire thermocouples (secured with cyanoacrylate adhesive or similar) placed on the hottest part of the component (out of any direct airflow) and the equipment should be run until all temperatures have stabilized.

Circuit Ref.	Description	Max. Temperature (°C)
CN1	Input Connector	105
C1	X Capacitor	100
L2	Common Mode Choke Winding	130
C5, C52	Y Capacitor	125
BD1	Bridge Diode	150
L4	Boost Choke Winding	155
C6	Boost Capacitor	105
Q1	Boost FET	150
T1	Main Transformer Winding	130
T2	Standby Transformer Winding	130
PC103, PC106	Opto-Coupler	110
C51A, C51B, 51C, C51D, C51E, C51F	Electrolytic Capacitors	105 (12V,32V,36V,48V) 125 (19V,24V,28V)
C61	Electrolytic Capacitor	105

Note:

PSU = Power Supply Unit

Markings and Instructions:

- The installation instruction is provided in English, information regarding:
 - Electrical specification
 - Maximum operating temperature
- Fuse Identification (See subclause 1.7.6): F1A/F1B T10A/ 250V

Definition of variable(s):

(y = blank; z = 12, 19, 24, 28, 32, 36 or 48; xxxxxxx = /ADJ, /T, /J, /M, /C, /C2, /SF, /G, /EF, other alphanumeric character, symbol or blank)

Variable:	Range of variable:	Content:
y	blank	-
z	12, 19, 24, 28, 32, 36 or 48	Denoting output voltage from 12 Vdc to 48 Vdc.
xxxxxxx	blank	Denoting for Standard model
	/ADJ	Denoting output adjustable
	/T	Denoting terminal block connector
	/J	Denoting JST connector
	/M	Denoting molex connector
	/C	Denoting single side PWB coating
	/C2	Denoting double side PWB coating
/SF	Denoting single fuse	

	/G	Denoting low earth leakage current
	/EF	Denoting end fan
	other alphanumeric character, symbol	Used for market purposes, no construction differences and no safety impact.
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)		