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TDK·Lambda CUS500M1 Series

3 x 5” 500W AC-DC Power Supplies

https://product.tdk.com/en/power/cus-m
www.emea.lambda.tdk.com/cus500m





Medical Industrial Test LED COMM Broadcast

The compact CUS500M1 is packaged in the industry standard 3x5” footprint and can deliver 500W when forced air cooled or 300W convection cooled with a 500W peak. Certified to Medical & ITE safety standards, the CUS500M1 can used in both Class I & Class II (no ground wire) applications(1). An enclosed model (/EF suffix) is available with an internal fan.

Features	Benefits
• 300W (500W Peak) Convection Cooled	• Quiet Operation
• 500W with Forced Air	• Can Utilize System Airflow or Integrated Fan
• Medical Certifications (2 x MOPP)	• Suitable for B and BF Type Medical Equipment
• Class B Conducted and Radiated EMI	• Easier System EMC Compliance
• Suitable for Class I and Class II installations (1)	• Flexible Utilization
• Compact 3 x 5 x 1.46” Size	• Space Saving in End Equipment
• Enclosure and end fan models	• Versatile Application

Model Selector

Model	Nominal Output Voltage (V)	Output Adjustment (V)	Maximum Current Convection (A)	Maximum Current Forced Air (A)	Peak Current (A)	Maximum Power Convection (W)	Maximum Power Forced Air (W)
CUS500M1-12	12	None	25.0	41.7	41.7	300	500.4
CUS500M1-19	19	None	15.8	26.4	26.4	300.2	501.6
CUS500M1-24	24	None	12.5	20.9	20.9	300	501.6
CUS500M1-28	28	None	10.7	17.9	17.9	299.6	501.2
CUS500M1-32	32	None	9.4	15.7	15.7	300.8	502.4
CUS500M1-36	36	None	8.3	13.9	13.9	298.8	500.4
CUS500M1-48	48	None	6.3	10.5	10.5	302.4	504.0

CUS500M1-	12	/	EF

Output voltage 12, 19, 24, 28, 32, 36, 48

blank	Open frame construction
/EF	Enclosed with end fan (exhaust air)

Other options are available, please contact sales

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Specifications

Model		CUS500M1
Input		
Input Voltage range	Vac	85 - 265 (See derating curves)
Input Frequency	Hz	47 - 63
Input Current (110/230Vac)	A	< 5.0 / 2.5 (500W)
Inrush Current at 230Vac (typ) (Cold Start)	A	<50
Leakage Current	uA	<200 at 265Vac 60Hz
Touch Current (Enclosure Leakage)	uA	<100
Power Factor (115/230Vac)	-	0.99 / 0.94
Harmonic Compliance	-	Meets IEC61000-3-2 Class A
No Load Power Consumption	W	-
Hold Up Time (typ) at 115Vac Input	ms	22 at 300W load, 14 at 500W load
Efficiency	%	Up to 96
Conducted & Radiated EMI (Class I only [1])	-	EN55032/EN55011-B (See installation / instruction manual for conditions)
Immunity (Class I only [1])	-	Compliant with EN60601-1-2;2015 (Ed4), see immunity table
Insulation Class	-	Construction suitable for Class I or Class II installation [1]
Safety Agency Certifications	-	IEC/EN/UL62368-1 and 60601-1, ES60601-1, CE Mark (LVD, EMC and RoHS)

Note:

(1) Class II operation may require additional EMC filtering, contact factory for assistance.

Immunity

Test	Standard	Test Level	Criteria	Notes [1]
ESD	EN61000-4-2	4	A	-
Radiated Susceptibility	EN61000-4-3	3	A	Includes proximity field requirements of EN60601-1-2:2015
Electrical Fast Transient Burst	EN61000-4-4	4	A	(AC Port, 5kHz and 100kHz)
Surge	EN61000-4-5	3	A	-
Conducted Susceptibility	EN61000-4-6	3	A	-
Magnetic fields	EN61000-4-8	4	A	-
Voltage Dips and Input Interuptions	EN61000-4-11 Class 3 Industrial, incl EN55024 (100Vac)	0% for 1/2 cycle	A	-
		0% for 1 cycle	A/B	A up to 280W, B above 280W
		40% for 10/12 cycles	A/B	A up to 180W, B above 180W
		70% for 25/30 cycles	A/B	A up to 440W, B above 440W
		80% for 250/300 cycles	A	-
		0% for 250/300 cycles	B	-
	EN61000-4-11 Class 3 Industrial, incl EN55024 (240Vac)	0% for 1/2 cycle	A	-
		0% for 1 cycle	A/B	A up to 280W, B above 280W
		40% for 10/12 cycles	A/B	-
		70% for 25/30 cycles	A	-
		80% for 250/300 cycles	A	-
		0% for 250/300 cycles	B	-
	EN60601-1-2:2015 (100Vac)	0% for 1/2 cycle	A	Customer to consider essential performance of end equipment
		0% for 1 cycle	A/B	A up to 280W, B above 280W
		70% for 25/30 cycles	A	A up to 440W, B above 440W
		0% for 250/300 cycles	B	-
	EN60601-1-2:2015 (240Vac)	0% for 1/2 cycle	A	Customer to consider essential performance of end equipment
		0% for 1 cycle	A/B	A up to 280W, B above 280W
		70% for 25/30 cycles	A	-
		0% for 250/300 cycles	B	Customer to consider essential performance of end equipment
SEMI F47 Line Dip	SEMI F47	-	-	At input voltages > 200Vac

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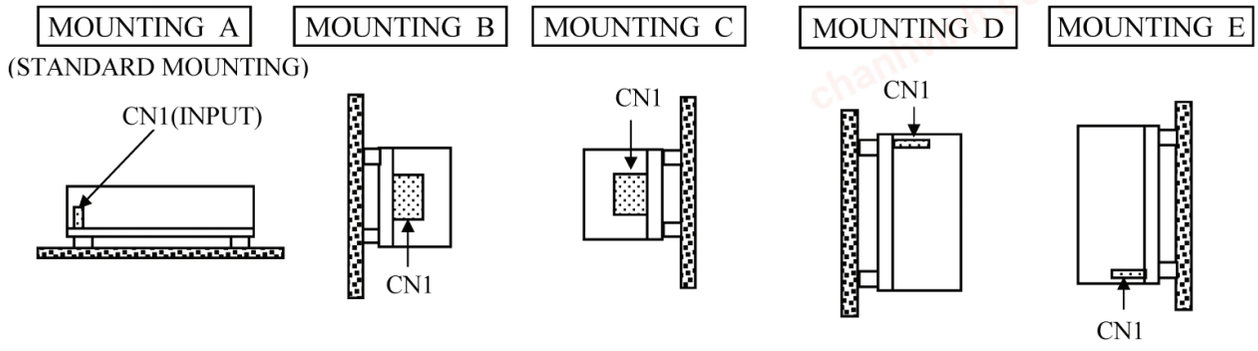
Specifications

Model		CUS500M1
Output		
Line Regulation	%	0.5 (85 - 265Vac)
Load Regulation	%	1 (0 - 100% load)
External Load Capacitance	uF	12-19V: 10,000, 24V: 8,000, 28V: 4,000, 32-36V: 3,000, 48V: 2,500
Ripple & Noise	mV	12V: 240, 19V - 28V: 360, 32V - 48V: 480
Temperature Coefficient	%/°C	±0.02
Minimum Load	-	No minimum load required
Overcurrent Protection	%	>105. Hiccup mode, automatic recovery
Overvoltage Protection	V	12V: 13.8-16.2, 19V: 21.8-25.7, 24V: 27.6-32.4, 28V:32.2-37.8, 32V: 36.8-43.2, 36V: 41.4-48.6, 48V: 55.2-64.8 Latching (unit shutdown), cycle AC input to reset
Overtemperature Protection	-	Latching (unit shutdown), cycle AC input to reset
Remote Sense	-	-
Remote On/Off	-	-
Power Good	-	-
Standby Voltage	-	-
Parallel Operation	-	Not possible
Series Operation	-	Possible, see installation manual
Environmental		
Operating Temperature (-25°C start-up)	°C	-20 to +70, see derating curves below
Storage Temperature	°C	-40 to +85
Operating Humidity (non condensing)	%RH	10 - 95
Cooling	-	Convection cooling or forced air (2.7m/s)
Altitude	m	5,000. Operating, transportation and storage
Withstand Voltage (For 1 minute)	Vac	Input to Ground 2,000 (1xMOPP), Input to Output 4,000 (2xMOPP), Output to Ground 1500 (1xMOPP)
Isolation Resistance	MΩ	>100 at 25°C, 70%RH & 500VDC
Vibration (Non Operating)	-	10-55Hz (1 min sweep). Maximum 19.6m/s^2, 1 hour each
Shock	-	<196m/s^2
Other		
Weight (Typ)	g	Open frame: 450, /EF: 790
Size (LxWxH)	mm	Open frame: 127 x 76.2 x 37, /EF: 157 x 85 x 42.5
Size (LxWxH)	Inches	Open frame: 5 x 3 x 1.46, /EF: 6.18 x 3.35 x 1.67
Connectors	-	Input: JST VHR-5N, Output: M4 screws
Warranty	yrs	5

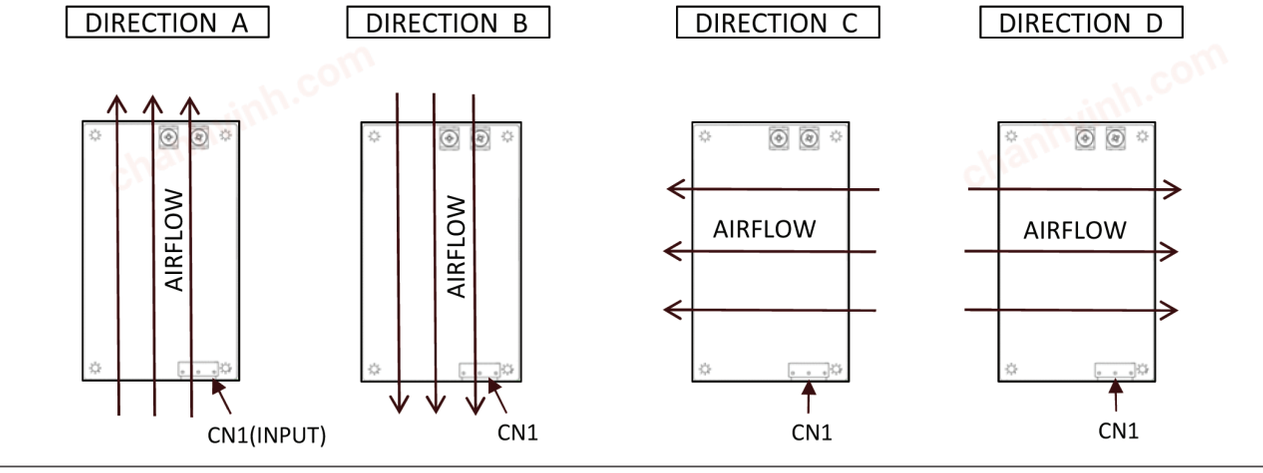
Notes:
See website for detailed specifications, test methods and installation manual
Specification parameters apply at 25°C ambient temperature unless otherwise stated.

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Mounting Orientation



Airflow Direction

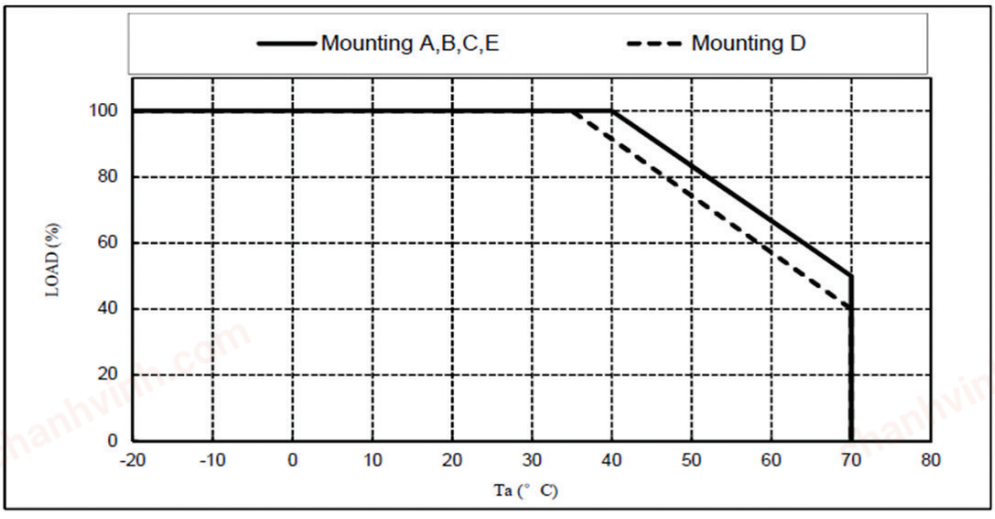


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Convection Cooling CUS500M1

(Additional derating applies below 115Vac input)

Ta (°C)	Mounting A B C E	Mounting D
	LOAD (%)	LOAD (%)
-20 - +35	100	100
40	100	91.4
50	83.3	74.3
60	66.7	57.1
70	50	40

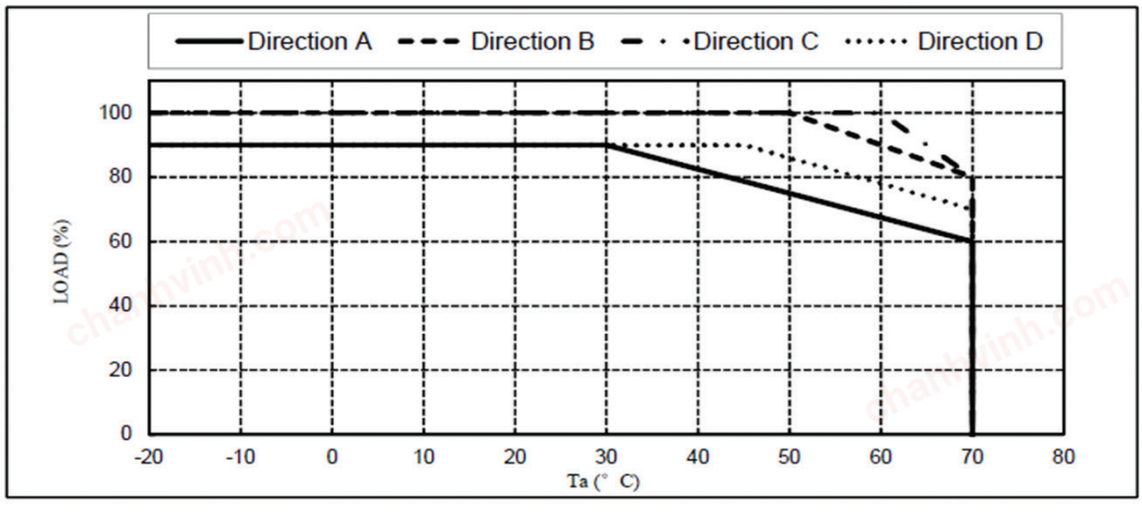


Forced Air Cooling CUS500M1-12 (2.7m/s)

(Additional derating applies below 115Vac input)

MODEL: CUS500M1-12

Ta (°C)	Direction A	Direction B	Direction C	Direction D
	LOAD (%)	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +30	90	100	100	90
40	82.5	100	100	90
45	78.8	100	100	90
50	75	100	100	86
60	67.5	90	100	78
70	60	80	80	70



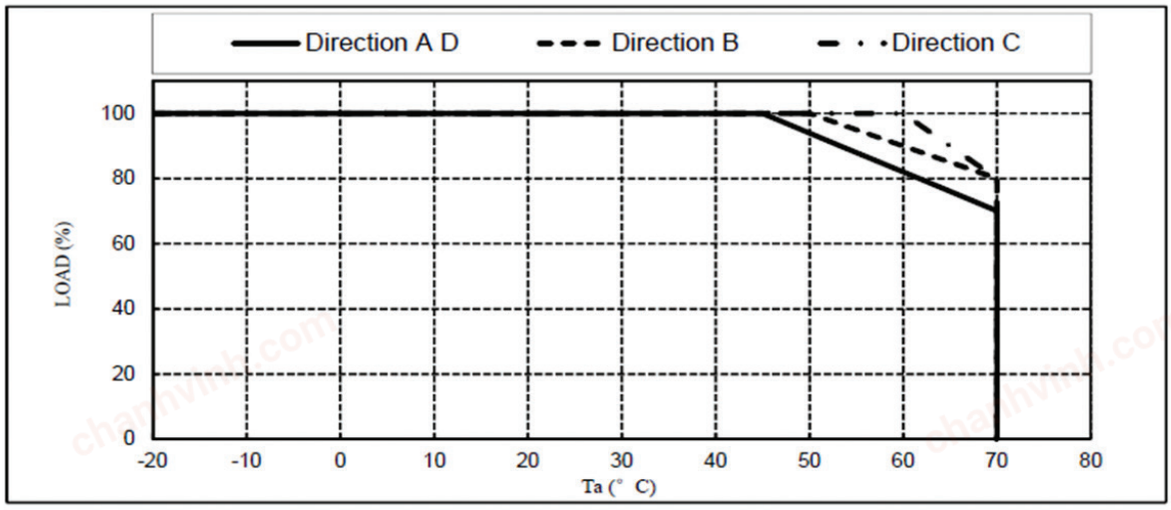
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Forced Air Cooling CUS500M1-19 to -48 (2.7m/s)

(Additional derating applies below 115Vac input)

MODEL: CUS500M1-19/24/28/32/36/48

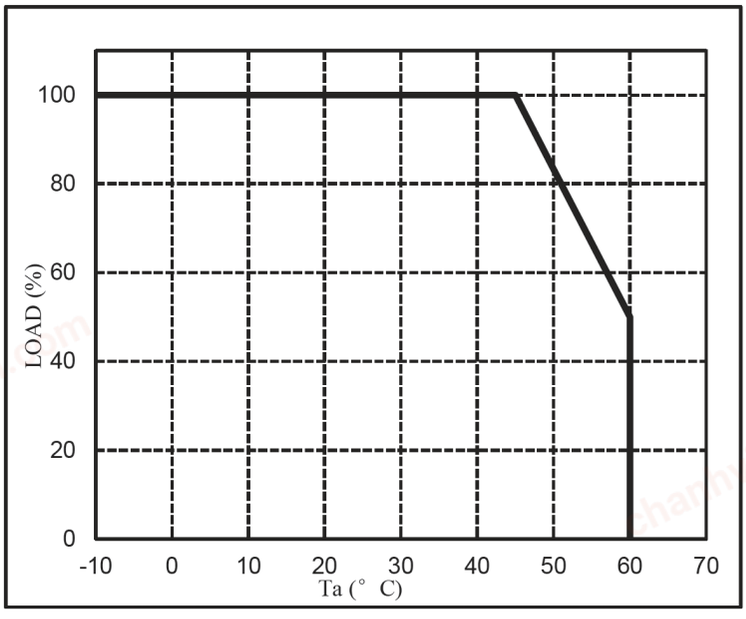
Ta (°C)	Direction A D LOAD (%)	Direction B LOAD (%)	Direction C LOAD (%)
-20 - +45	100	100	100
50	94	100	100
60	82	90	100
70	70	80	80



CUS500M1-xx/EF (End Fan)

(All models, all conditions)

Ta (°C)	LOAD (%)
-10 - +45	100
50	83.3
60	50

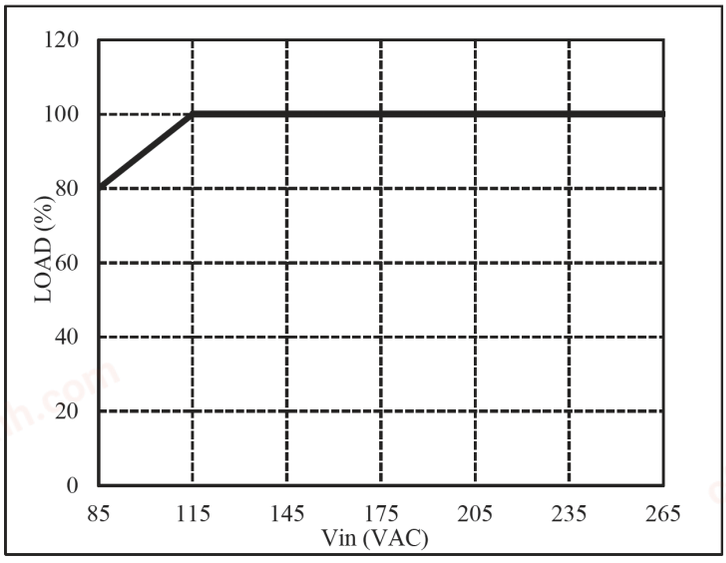


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Derating versus Input Voltage

(All models, all conditions)

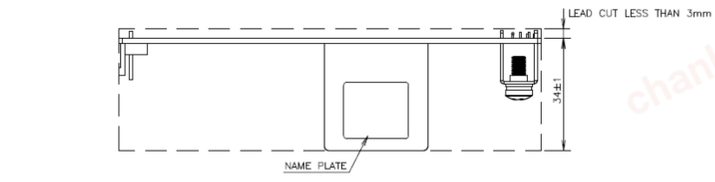
INPUT VOLTAGE (VAC)	LOAD (%)
85	80
115~265	100

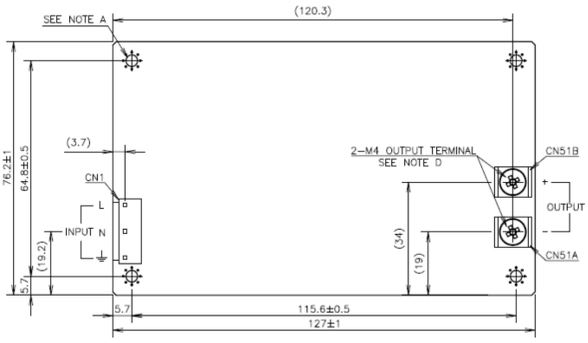


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Mechanical Specification

Outline Drawing CUS500M1 Open Frame Unit





NAME PLATE (SCALE:3/2)



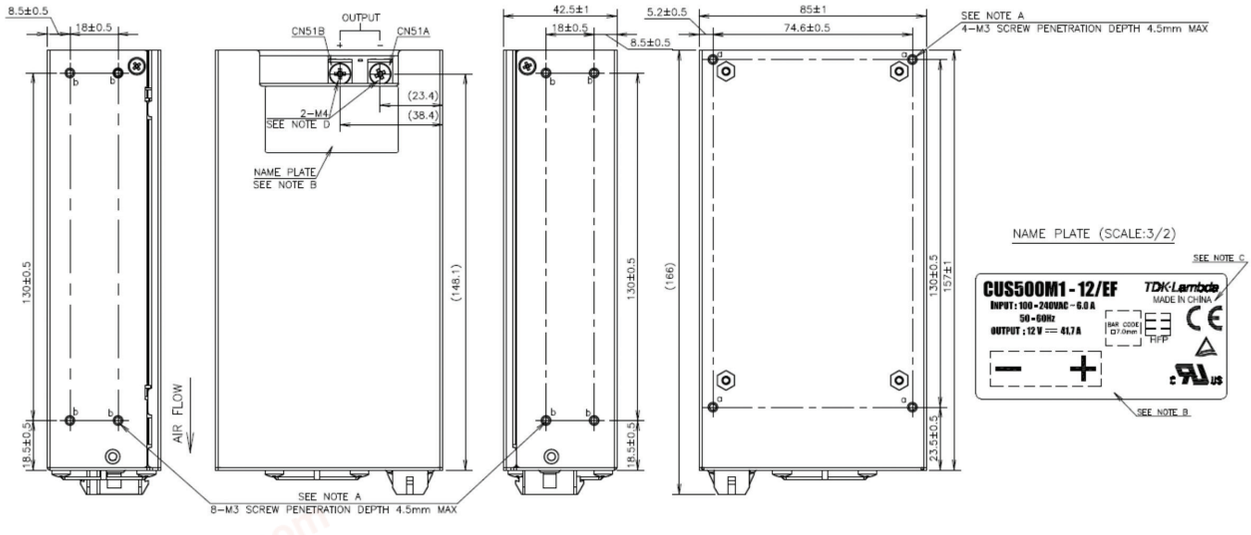
CONNECTORS USED:

PART DESCRIPTION	PART NAME	HOUSING	QTY	CONTACT	QTY	CRIMPING TOOL	MANUFACT.
CN1	B3P5-VH(LF)(SN)	VHR-5N	1	SVH-41T-P1.1	3	YC-930R, YC931R	J.S.T
CN51A/CN51B	M4 OUTPUT TERMINAL	———	2	———	—	———	—

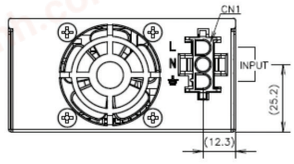
(HOUSINGS, PINS & TOOL ARE NOT INCLUDED WITH THE PRODUCT.)

NOTE:
A: 4–ø3.5 HOLES ARE FOR CUSTOMER'S CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION AND EMI SPEC.
B: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, AND MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
D: M4 SCREWS FOR OUTPUT TERMINAL(2), RECOMMENDED TORQUE: 1.18N·m(12kgf·cm) MAX

Outline Drawings CUS500M1 End Fan



NAME PLATE (SCALE:3/2)



CONNECTORS USED:

PART DESCRIPTION		PART NAME	MANUFACT.	QTY
CN1	HOUSING	350767-1	TE Connectivity	1
	TERMINAL PINS	350218-1	TE Connectivity	3
CN51A/CN51B		M4 TERMINAL		2

RECOMMENDED MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

PART DESCRIPTION		PART NAME	MANUFACT.	QTY
CN1	SOCKET HOUSING	350766-1	TE Connectivity	1
	TERMINAL PINS	350536-1		3
	HAND CRIMPING TOOL	91500-1		—

NOTE:
A: 12–M3 TAPPED & STANDOFF HOLES FOR CUSTOMER'S CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION AND EMI SPEC. RECOMMENDED TORQUE : 0.49N·m(5kgf·cm).
B: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, AND MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
D: M4 SCREWS(2) FOR O/P TB, RECOMMENDED TORQUE: 1.18N·m(12kgf·cm) MAX

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TDK-Lambda France SAS
Tel: +33 1 60 12 71 65
tlf.fr-powersolutions@tdk.com
www.emea.lambda.tdk.com/fr



Italy Sales Office
Tel: +39 02 61 29 38 63
tlf.it-powersolutions@tdk.com
www.emea.lambda.tdk.com/it



Netherlands
tlf.nl-powersolutions@tdk.com
www.emea.lambda.tdk.com/nl



TDK-Lambda Germany GmbH
Tel: +49 7841 666 0
tlg.powersolutions@tdk.com
www.emea.lambda.tdk.com/de



Austria Sales Office
Tel: +43 2256 655 84
tlg.at-powersolutions@tdk.com
www.emea.lambda.tdk.com/at



Switzerland Sales Office
Tel: +41 44 850 53 53
tlg.ch-powersolutions@tdk.com
www.emea.lambda.tdk.com/ch



Nordic Sales Office
Tel: +45 8853 8086
tlg.dk-powersolutions@tdk.com
www.emea.lambda.tdk.com/dk



TDK-Lambda UK Ltd.
Tel: +44 (0) 12 71 85 66 66
tlu.powersolutions@tdk.com
www.emea.lambda.tdk.com/uk



TDK-Lambda Ltd.
Tel: +9 723 902 4333
tli.powersolutions@tdk.com
www.emea.lambda.tdk.com/il-en



TDK-Lambda Americas
Tel: +1 800-LAMBDA-4 or 1-800-526-2324
tla.powersolutions@tdk.com
www.us.lambda.tdk.com



TDK Electronics do Brasil Ltda
Tel: +55 11 3289-9599
sales.br@tdk-electronics.tdk.com
www.tdk-electronics.tdk.com/en



TDK-Lambda Corporation
Tel: +81-3-6778-1113
www.jp.lambda.tdk.com



TDK-Lambda (China) Electronics Co. Ltd.
Tel: +86 21 6485-0777
tlc.powersolutions@tdk.com
www.lambda.tdk.com.cn



TDK-Lambda Singapore Pte Ltd.
Tel: +65 6251 7211
tls.marketing@tdk.com
www.sg.lambda.tdk.com



TDK India Private Limited, Power Supply Division
Tel: +91 80 4039-0660
mathew.philip@tdk.com
www.sg.lambda.tdk.com

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