TDK·Lambda CUS600M and CUS600M1 Series

3 x 5” 600W AC-DC Power Supplies

https://product.tdk.com/en/power/cus-m
www.emea.lambda.tdk.com/cus600m

Medical Industrial Test LED COMM Broadcast

The compact CUS600M is packaged in the industry standard 3x5” footprint and can deliver 600W with forced air or 400W with a 600W peak power with convection cooling. With Medical & ITE certifications, the unit can used in both Class I & Class II (no ground wire) applications(1). A 5V 2A standby voltage, remote on/off, remote sense and a Power Good signal is standard on the CUS600M. Options include an internal fan and output adjustment. The CUS600M1 models offer a reduced feature set for cost optimization.

Features	Benefits
• 400W (600W Peak) Convection Cooled	• Quiet Operation
• 600W 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 Utilisation
• Compact 3 x 5 x 1.46” Size	• Space Saving in End Equipment
• Enclosure & Other Options	• Versatile Application

Model Selector

Model	Nominal Output Voltage (V)	Output Adjustment (V) (Specify /ADJ option suffix*) (2)	Maximum Current Convection (A)	Maximum Current Forced Air (A)	Peak Current (A)	Maximum Power Convection (W)	Maximum Power Forced Air (W)
CUS600M-12	12	11.7 - 12.9	33.4	50.0	50.0	400.8	600.0
CUS600M-19	19	18.5 - 20.5	21.1	31.6	31.6	400.9	600.4
CUS600M-24	24	23.4 - 25.9	16.7	25.0	25.0	400.8	600.0
CUS600M-28	28	27.3 - 30.2	14.3	21.5	21.5	400.4	602.0
CUS600M-32	32	31.2 - 34.5	12.5	18.8	18.8	400.0	601.6
CUS600M-36	36	35.1 - 38.8	11.1	16.7	16.7	399.6	601.2
CUS600M-48	48	46.8 - 51.8	8.4	12.6	12.6	403.2	604.8

CUS600M- | **12** | **/** | **EF**

Features	CUS600M-	CUS600M1-
Standby Voltage	Yes	Not Available
Remote On/Off		
Remote Sense		
Power Good Signal		

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

blank	Open frame construction
/EF	Enclosed with end fan (exhaust air)*
/ADJ	Output adjustment potentiometer**
/SF	Single input fuse in line**

* /EF model has /ADJ included (CUS600M only)
** Not available for CUS600M1 models
Other options are available, please contact sales

Specifications

Model		CUS600M
Input		
Input Voltage Range (Operating)	Vac	85 - 265 (See derating curves)
Nominal Input Voltage Range	Vac	100 - 240 (Note: Safety certified for 90-264Vac only)
Input Frequency	Hz	47 - 63
Input Current (110/230Vac)	A	< 6.0 / 3.0 (600W)
Inrush Current at 230Vac (typ) (Cold Start)	A	<50
Leakage Current	uA	<200uA at 265Vac 60Hz
Touch Current (Enclosure Leakage)	uA	<100
Power Factor (115/230Vac)	-	0.99 / 0.95
Harmonic Compliance	-	Meets IEC61000-3-2 Class A
No Load Power Consumption	W	<0.5W at 230Vac (Remote off and no load on 5Vsb)
Hold Up Time (typ) at 115Vac Input	ms	>22ms 400W load, >14ms 600W 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 Certifications and Markings	-	IEC/EN/UL62368-1, 60601-1, ES60601-1 and 60950-1. CE Mark and UKCA Mark

Immunity

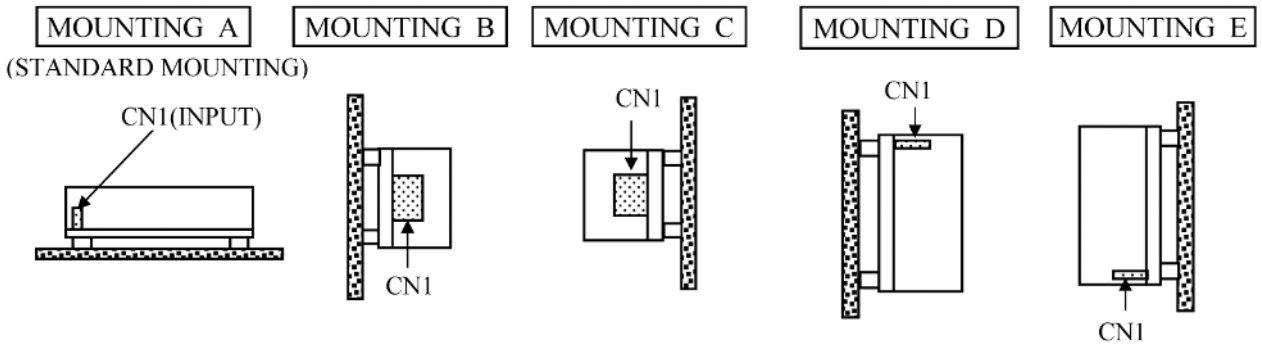
Test	Standard	Test Level	Criteria	Notes [1] (the power stated below is total power (main power + fan output))
ESD	EN61000-4-2	4	A	-
Radiated Susceptibility	EN61000-4-3	3	A	Includes proximity field requirements of EN60601-1-2:2015
Electrical Fast Transient Burst	EN61000-4-4	4	A	(AC Port, 5kHz and 100kHz)
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 330W, B above 330W
		40% for 10/12 cycles	A/B	A up to 210W, B above 210W
		70% for 25/30 cycles	A/B	A up to 500W, B above 500W
		80% for 250/300 cycles	A/B	A up to 570W, B above 570W
		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 330W, B above 330W
		40% for 10/12 cycles	A/B	A up to 570W, B above 570W
		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 330W, B above 330W
		70% for 25/30 cycles	A/B	A up to 500W, B above 500W
		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 330W, B above 330W
		70% for 25/30 cycles	A	-
		0% for 250/300 cycles	B	-
SEMI F47 Line Dip	SEMI F47	-	-	At input voltages > 200Vac

Specifications

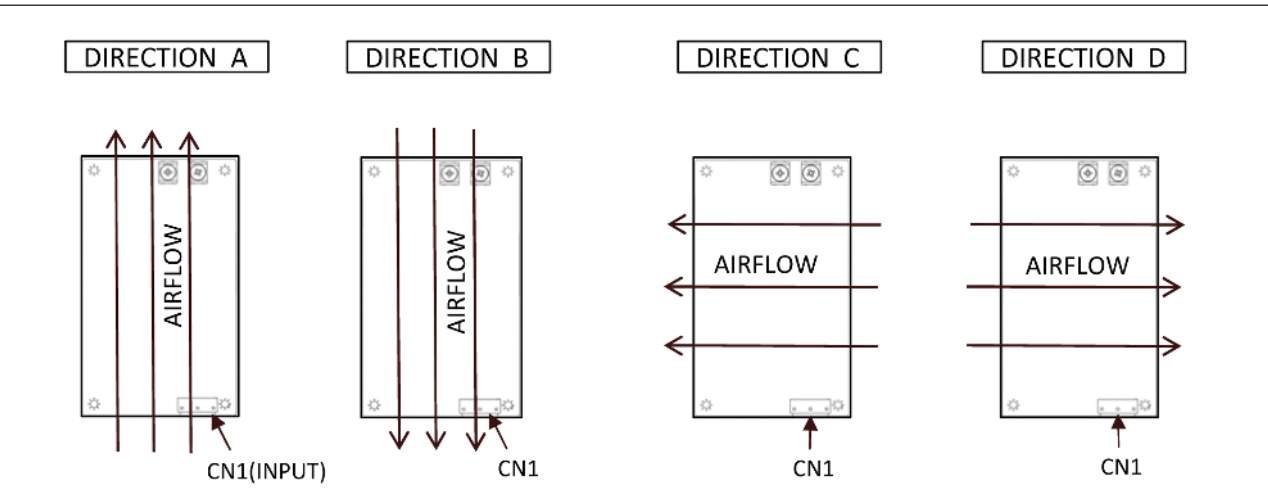
Model		CUS600M
Output		
Line Regulation	%	0.5% (85 - 265Vac)
Load Regulation	%	1% (0 - 100% load)
Ripple & Noise	mV	12V: 240mV, 19V - 28V: 360mV, 32V - 48V: 480mV
Temperature Coefficient	%/°C	±0.02%/°C
Minimum Load	-	No minimum load required
Overcurrent Protection	%	>105%. Hiccup mode, automatic recovery
Overvoltage Protection	-	Latching (unit shutdown), cycle AC input to reset
Overtemperature Protection	-	Latching (unit shutdown), cycle AC input to reset
Remote Sense	-	0.5V total compensation (2)
Remote On/Off	-	Opto-isolated. Inhibit: Low = ON, High = OFF (2)
Power Good	-	Combined AC Fail and DC OK opto isolated signal (2)
Standby Voltage	-	Open frame version: 5V 2A, /EF version 5V 1.5A (2)
Parallel Operation	-	Not possible
Environmental		
Operating Temperature	°C	-20°C to +70°C, see derating curves below
Storage Temperature	°C	-40°C to +85°C
Operating Humidity (non condensing)	%RH	10 - 95%RH
Cooling	-	Convection cooling or forced air (2.7m/s). (/EF version, air exits from fan end)
Altitude	m	5,000m. Operating, transportation and storage
Withstand Voltage (For 1 minute)	Vac	Input to Ground 2kVAC (1xMOPP), Input to Output 4kVAC (2xMOPP), Output to Ground 1.5kVAC (1xMOPP)
Isolation Resistance	MΩ	>100MΩ at 25°C, 70%RH Output - FG 500VDC
Vibration (Non Operating)	-	10-55Hz (1 min sweep). Maximum 19.6m/s^2; x, y, z for 1 hour each
Shock	-	<196m/s^2
Other		
Weight (Typ)	g	Open frame: 470, /EF: 790
Size (LxWxH)	mm	Open frame: 127 x 76.2 x37, /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, Standby: JST XHP-2, Signals: JST PHDR-08VS
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.
(1) Class II operation may require additional EMC filtering, contact factory for assistance.
(2) Not available on the CUS600M1 models, see model selector

Mounting Orientation



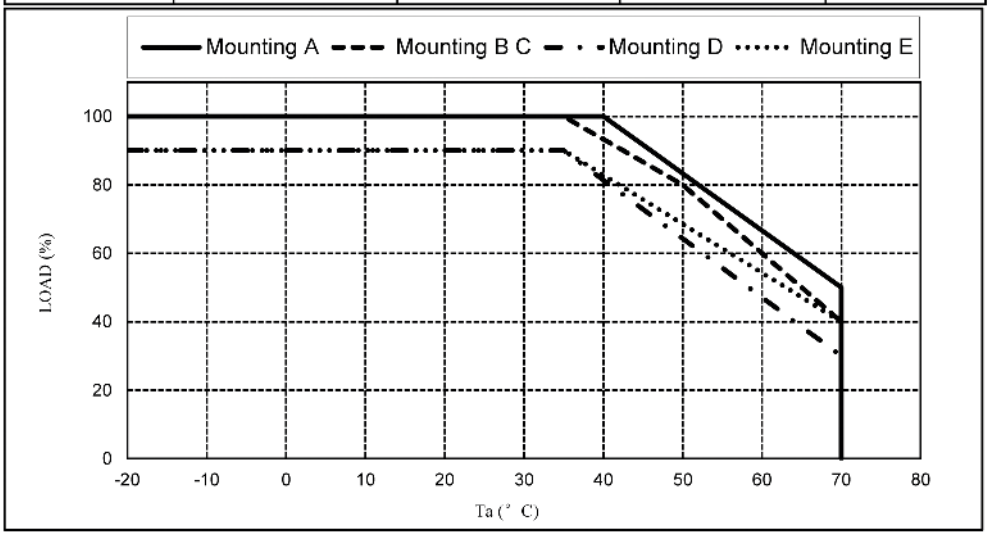
Airflow Direction



Convection Cooling CUS600M-12

(Zero load on Standby Voltage. Wide range input. Additional derating applies below 115Vac input)

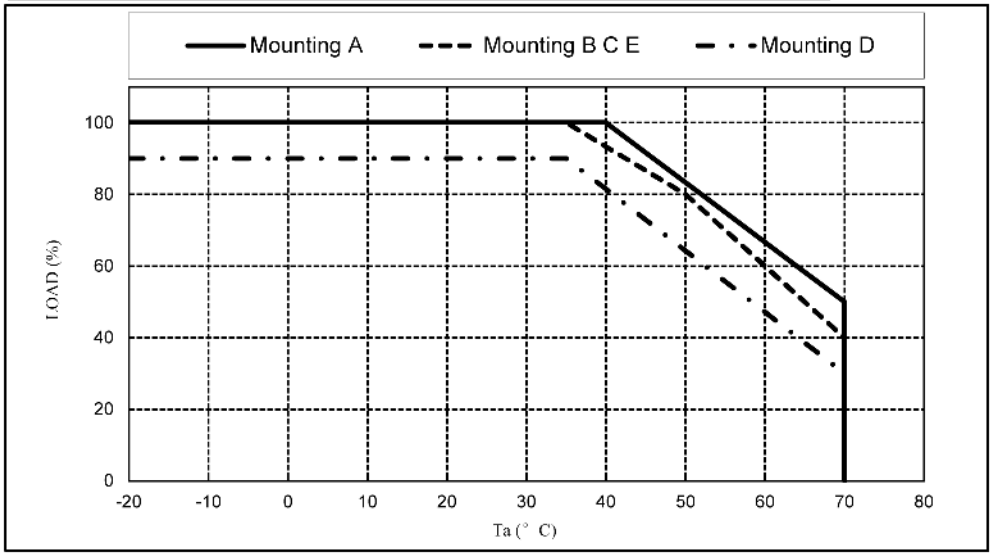
Ta (°C)	Mounting A	Mounting B C	Mounting D	Mounting E
	LOAD (%)	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +35	100	100	90	90
40	100	93.3	81.4	82.9
50	83.3	80	64.3	68.6
60	66.7	60	47.1	54.3
70	50	40	30	40



Convection Cooling CUS600M-19 to -48

(Zero load on the Standby Voltage output. Wide range input. Additional derating applies below 115Vac input)

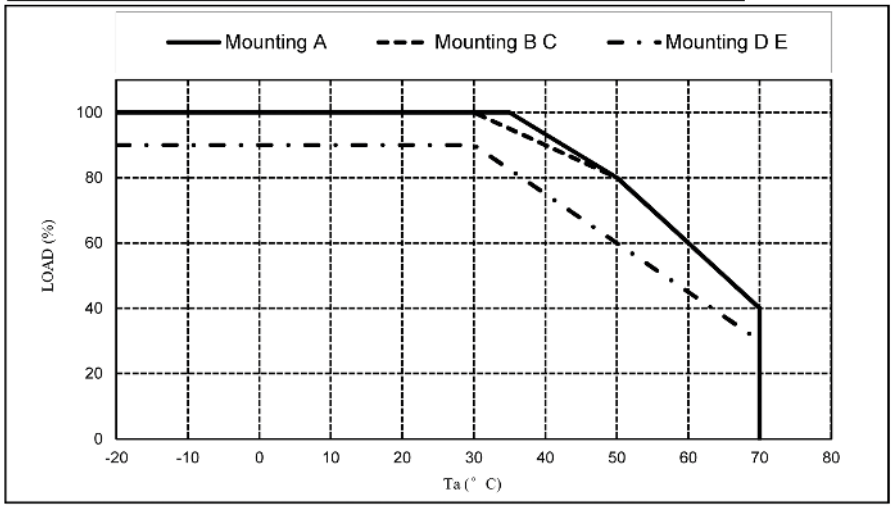
Ta (°C)	Mounting A	Mounting B C E	Mounting D
	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +35	100	100	90
40	100	93.3	81.4
50	83.3	80	64.3
60	66.7	60	47.1
70	50	40	30



Convection Cooling (All models)

(Loading applied on the Standby Voltage output. Wide range input. Additional derating applies below 115Vac input)

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

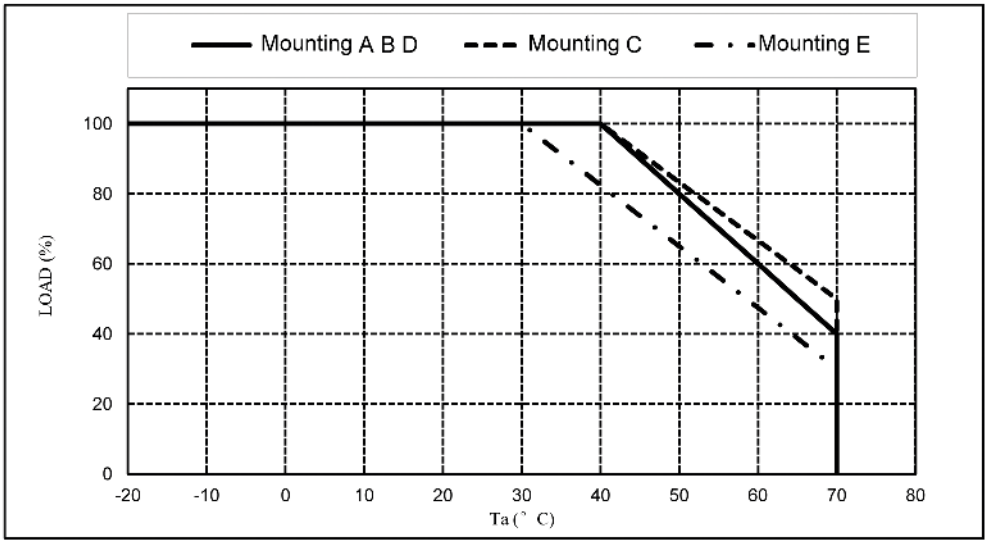


Convection Cooling CUS600M-12

(Loading applied on the Standby Voltage output. 176 - 265Vac input. Additional derating applies below 115Vac input)

MODEL: CUS600M-12

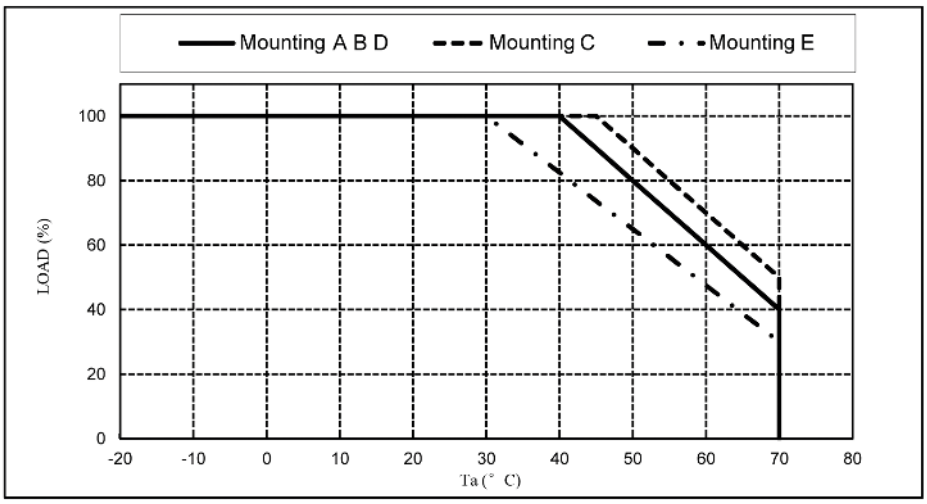
Ta (°C)	Mounting A B D	Mounting C	Mounting E
	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +30	100	100	100
40	100	100	82.5
50	80	83.3	65
60	60	66.7	47.5
70	40	50	30



Convection Cooling CUS600M-19 to -48V

(Loading applied on the Standby Voltage output. 176 - 265Vac input. Additional derating applies below 115Vac input)

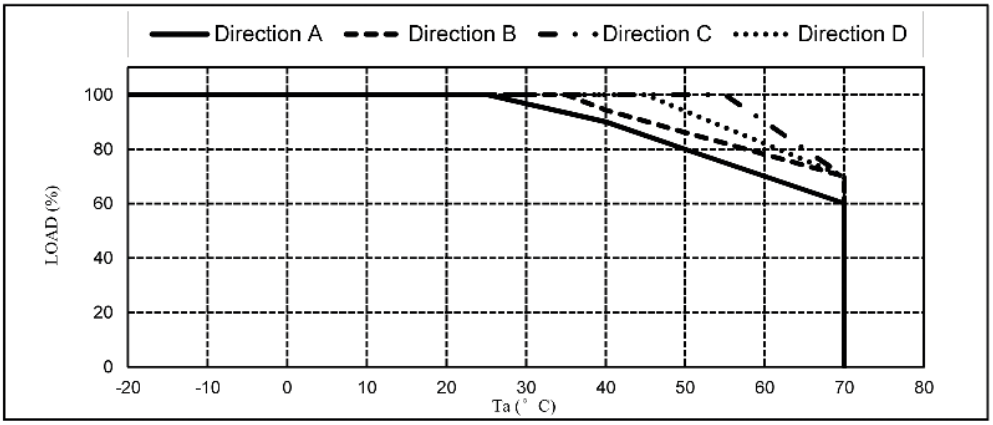
Ta (°C)	Mounting A B D	Mounting C	Mounting E
	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +30	100	100	100
40	100	100	82.5
45	90	100	73.8
50	80	90	65
60	60	70	47.5
70	40	50	30



Forced Air Cooling CUS600M-12 (2.7m/s)

(Loading applied on the Standby Voltage output. Wide range input. Additional derating applies below 115Vac input)

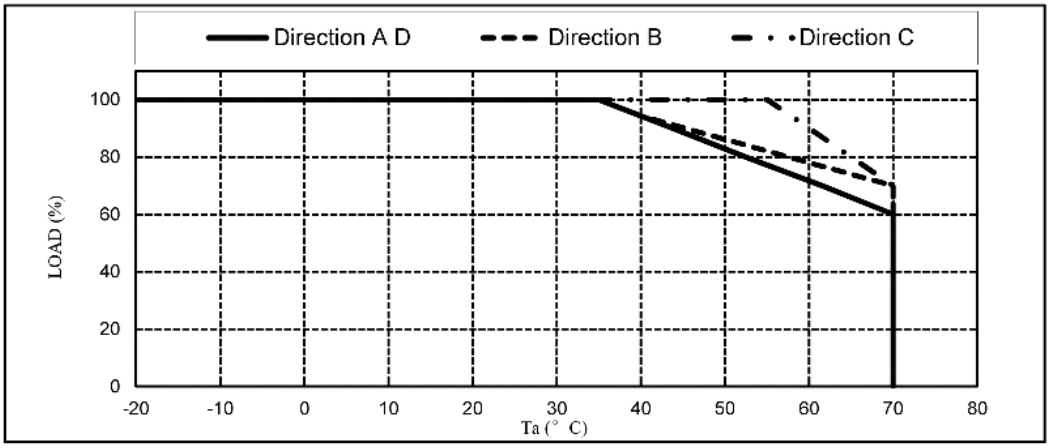
Ta (°C)	Direction A	Direction B	Direction C	Direction D
	LOAD (%)	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +25	100	100	100	100
35	93.3	100	100	100
40	90	94.3	100	100
45	85	90.2	100	100
50	80	86.2	100	94
55	75	82.1	100	88
60	70	78	90	82
70	60	70	70	70



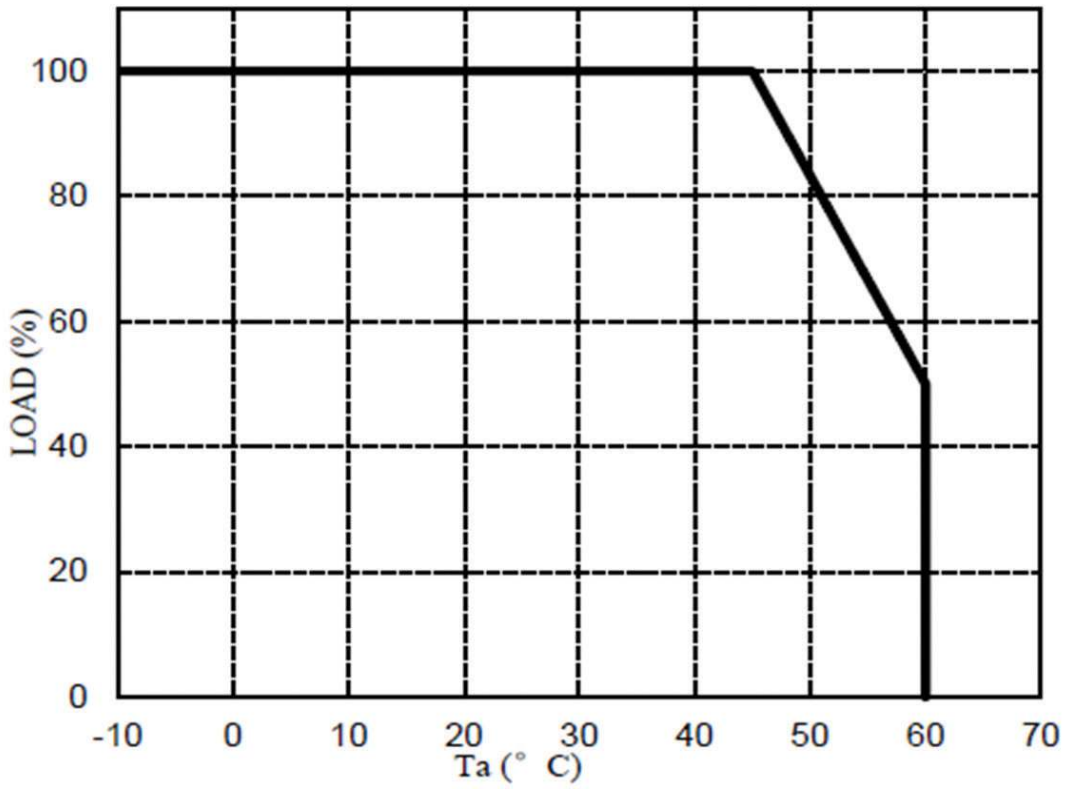
Forced Air Cooling CUS600M-19 to -48 (2.7m/s)

(Loading applied on the Standby Voltage output. Wide range input. Additional derating applies below 115Vac input)

Ta (°C)	Direction A D	Direction B	Direction C
	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +35	100	100	100
40	94.3	94.3	100
50	82.8	86.2	100
55	77.1	82.1	100
60	71.4	78	90
70	60	70	70



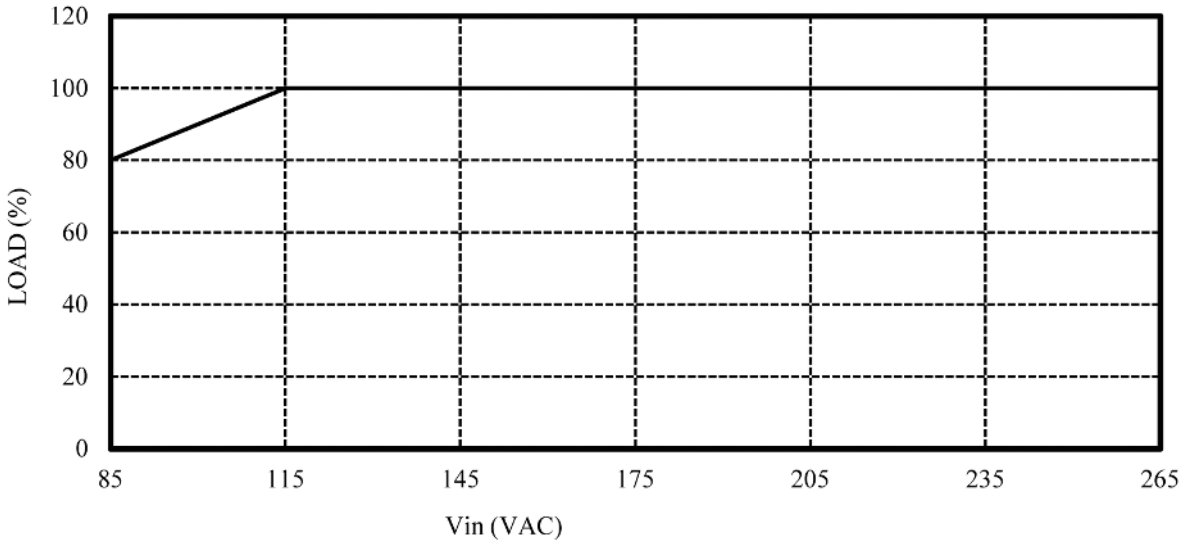
CUS600M-xx/EF (End Fan)



Derating versus Input Voltage

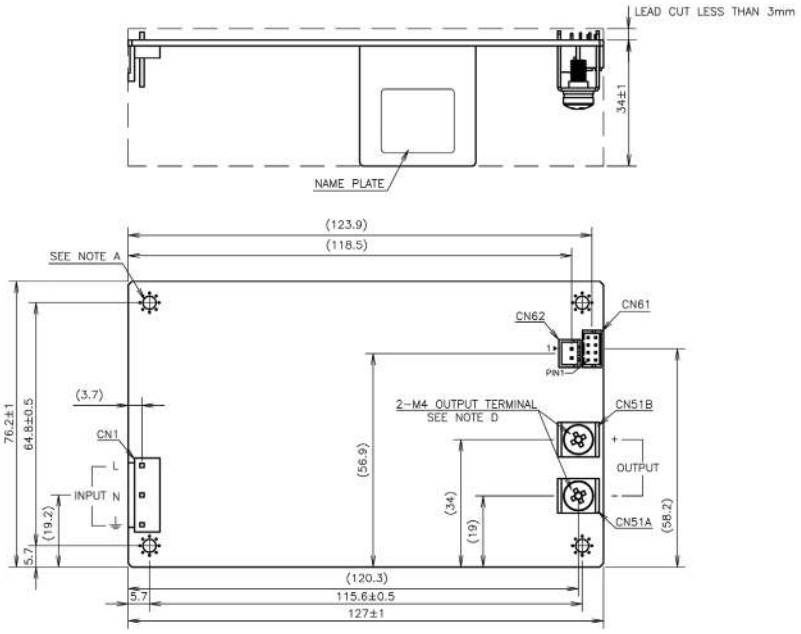
(All models, all conditions)

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



Mechanical Specification

Outline Drawing CUS600M Open Frame Unit



PIN CONFIGURATION AND FUNCTIONS OF CN61

CN61

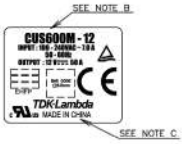
PIN No.	FUNCTION
1	STBY+: STANDBY SUPPLY + (5V+)
2	STBY−: STANDBY SUPPLY − (5V−)
3	S+: REMOTE SENSE+
4	S−: REMOTE SENSE−
5	NO CONNECTION
6	PG: POWER GOOD SIGNAL
7	R+: REMOTE ON/OFF TERMINAL +
8	R−: REMOTE ON/OFF TERMINAL −

PIN CONFIGURATION AND FUNCTION OF CN62

CN62

PIN No.	FUNCTION
1	STBY+: STANDBY SUPPLY + (5V+)
2	STBY−: STANDBY SUPPLY − (5V−)

NAME PLATE (SCALE:3/2)



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

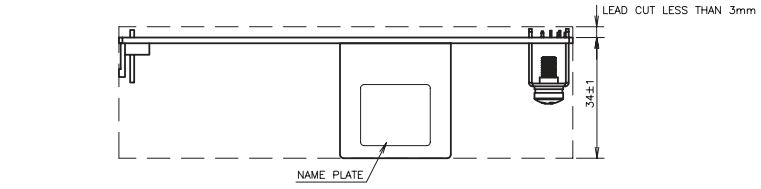
CONNECTORS USED:

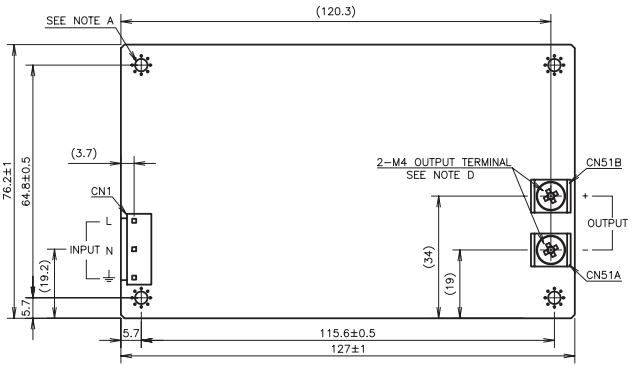
PART DESCRIPTION	PART NAME	HOUSING	QTY	CONTACT	QTY	CRIMPING TOOL	MANUFACT.
CN1	B3P5−VH(LF)(SN)	VHR−5N	1	SVH−41T−P1.1	3	YC−930R, YC931R	J.S.T
CN51A/CN51B	M4 OUTPUT TERMINAL	———	2	———	—	———	——
CN61	B8B−PHDSS(LF)(SN)	PHDR−08VS	1	SPHD−001T−P0.5	8	YC−610R, YC611R	J.S.T
CN62	B2B−XH−A(LF)(SN)	XHP−2	1	SXH−001T−P0.6	2	YC−110R, YC111R	J.S.T

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

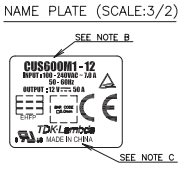
Mechanical Specification

Outline Drawing CUS600M1 Open Frame Unit





NAME PLATE (SCALE:3/2)



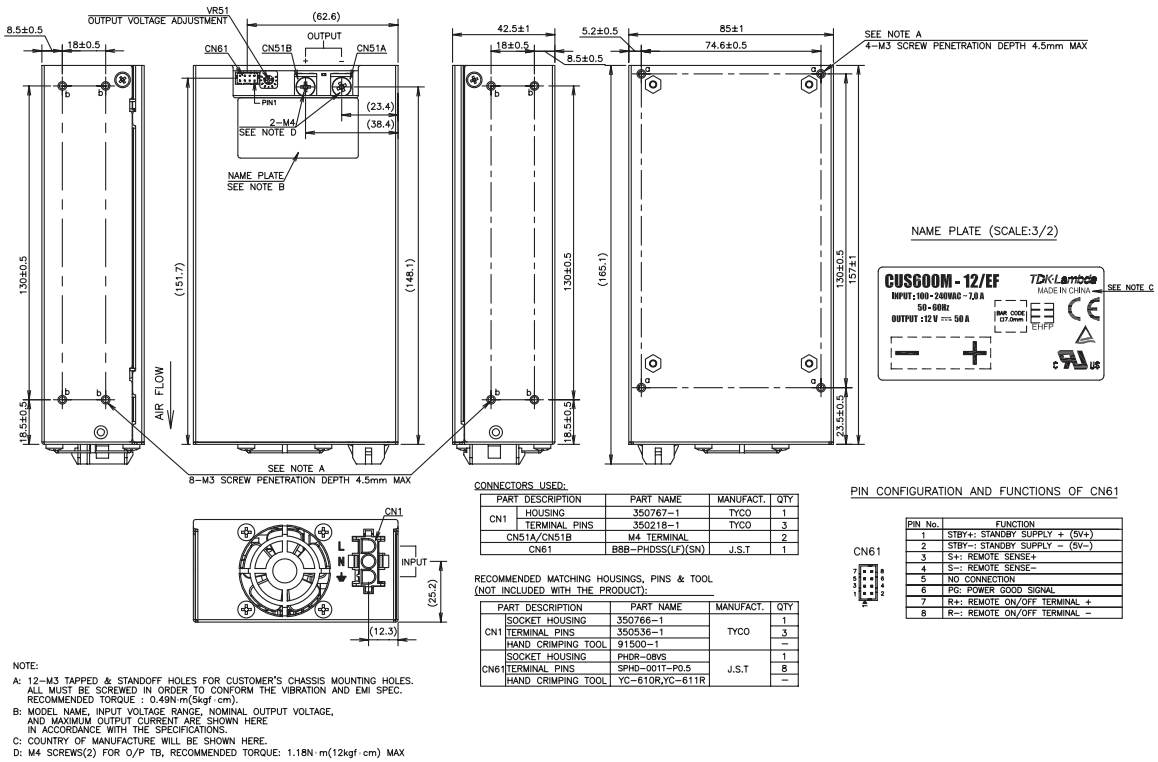
NOTE:
A: 4−ø3.5 HOLES ARE FOR CUSTOMER'S CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION AND EMI SPEC.
B: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, AND MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
C: COUNTRY OF MANUFACTURE WILL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

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.)

Outline Drawing CUS600M/EF (End Fan)



CONNECTORS USED:

PART DESCRIPTION		PART NAME	MANUFACT.	QTY
CN1	HOUSING	350767-1	TYCO	1
	TERMINAL PINS	350218-1	TYCO	3
CN51A/CN51B		M4 TERMINAL		2
CN61		B8B-PHDSS(LF)(SN)	J.S.T	1

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

PART DESCRIPTION		PART NAME	MANUFACT.	QTY
CN1	SOCKET HOUSING	350766-1	TYCO	1
	TERMINAL PINS	350536-1		3
	HAND CRIMPING TOOL	91500-1		—
CN61	SOCKET HOUSING	PHDR-08VS	J.S.T	1
	TERMINAL PINS	SPHD-001T-P0.5		8
	HAND CRIMPING TOOL	YC-610R,YC-611R		—

PIN CONFIGURATION AND FUNCTIONS OF CN61

CN61

PIN No.	FUNCTION
1	STBY+: STANDBY SUPPLY + (5V+)
2	STBY−: STANDBY SUPPLY − (5V−)
3	S+: REMOTE SENSE+
4	S−: REMOTE SENSE−
5	NO CONNECTION
6	PG: POWER GOOD SIGNAL
7	R+: REMOTE ON/OFF TERMINAL +
8	R−: REMOTE ON/OFF TERMINAL −

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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