Series OMEGA

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400-800

WATTS

POWER SUPPLY AC/DC

SINGLE OR MULTIPLE OUTPUT

Flexible modular design

Programmable outputs**

Power factor correction***

Universal input 85-264 VAC*

EMI EN55022 curve B(1)

Guarantee 3 years

* Consult Techical Sales for maximum power available
**See programmable modules
***Models MML400PFC, MML600, MML800
(1)option on certain models

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INPUT

Input protection	internal fuse	
Thermal protection	standard	
Switching frequency	100KHz	
Input with PFC : (MML400PFC, MML600, MML800)		
Input voltage range	85*-264VAC	
Inrush current (peak)	MML400PFC MML600 MML800	< 35A < 20A < 55A
Power factor	> 0.9	
Start up time (max.)	MML400PFC MML600,800	< 700 msec < 1500 msec
Inrush current	MML400PFC MML600 MML800	< 35A < 20A <55A
Start up time (max.)	MML400	< 900 msec

GENERAL

Power	400 to 800W
Efficiency	< 73% Line & configuration dependent
Voltage isolation :	
Input-output	3.0KV RMS
Input-ground	1.5KV RMS
Output-ground	500VDC
Input/output resistance	30Mohms/ 500VDC
AC power fail	Opto isolated input standard on MML600, 800, MML400PFC
Inhibit	Opto isolated input standard on MML600, 800, MML400PFC

ENVIRONMENTAL

Operating temperature	0°C at + 70°C
Derating	400W and 800W : 100% upto 50°C then 2.5%/°C 600W : 100% upto 45°C then 2%/°C
Operating/storage humidity (non condensing)	5% to 95% HR
Operating/storage pressure	1030 to 680 millibars
EMC	EN 55022 class A or B configuration dependent

OUTLINE SPECIFICATION

OUTPUT

Module table (nominal output values)

Type of module	A	B	C	D	E	F	G	H	J	K	L
Slot width (1 slot = 23 mm)	2	1	1	1	1	2	2	1	2	1	3
Output voltage	5V	5V	12V	24V	12V/12V	12V	24V	24V/24V	48V	12V/12V	5
Adjustment range	2-6V	2-6V	5-15V	12-28V	5-15V	5-15V	12-28V	12-28V	25-60V	5-15V	2-6V
Output current	60A	25A	12A	7A	6A[2]	24A	15A	3,5A[2]	10A	6A[2]	100
Load regulation (0-100%)	0.1%	0.1%	0.1%	0.1%	0.5%[1]	0.1%	0.1%	0.5%[1]	0.1%	0.5%	0.2%
Adjustment	Multi turn potentiometer										
Setting accuracy	±1%										
Temperature coefficient	0.02%/°C										
Line regulation	0.1% for ±20% of nominal mains										
Ripple & noise (PARD)	50mV or 1% whichever is greater (A B C D F G J L). 1% typical twin o/p Note 4										
Transient response	Max.deviation <7.5% of set volts recovering to 1% within 300 microseconds										
Overcurrent protection	Non foldback/fold back option										
Overvoltage protection	Tracking 120% of set voltage on A B C D EF G L fixed on E H K										
Remote sense	0,5 volts total (not E H K)										
Output isolation	500 VDC / ground										

1. 10 - 100% load
2. Total current shared between both outputs
3. Modules E H K have fixed overvoltage clamp, typcially 18V for E and K, 35V for H
4. 50mV up to 6A/channel, 10mV up to 1A/channel (K module only)

PROGRAMMABLE MODULES (Series BP and DP)

Omega programmable modules offer ideal flexible solutions for ATE applications. Because of their compatibility with all standard Omega modules they can be combined within the same power supply giving total output power of up to 800 Watts.

MODE OF PROGRAMMING

Resistance voltage programming	Resistance 1KΩ/V Voltage 0-5V
Current programming	A voltage of 0-5 volts on the current control pins will programme current limit from 10%
-	100% of full load

SIGNAL CONTROL (on certain modules)

"Enable"	Logic input referenced to V out -VE
"Power good"	Open collector, ouput voltage within +/- 10% of programmed value. Transistor on. Sink capability 1mA + <1V

GENERAL

Power	150W (derating 2W/°C >25°C for BP). Please consult Technical Sales
Dimensions	23mm per module
Operating temperature	0-50°C no derating 50-70°C derating 2.5%/°C
Programming accuracy Voltage Current	 ± 0,1% ± 10%
Minimum load	To achieve voltages of <1V external bleed current of 500mA of 500mA required
Overcurrent protection	non-programmable 105-130% I nom programmable 10-110% I nom
Overvoltage protection	115%-125% tracking
Remote sense	0.25V max. each line

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TABLE OF PROGRAMMABLE MODULES

		Series BP						Series DP							
Modules		BP1	BP2	BP3	BP4	BP5	BP6	DP1	DP2	DP3	DP4	DP5	DP6	DP7	DP8
Output voltage (V)		0.15V - 6V						0.25V - 30V (DP3 : 0.25 - 15V)							
Current (A)		0-25	25	25	0-25	0-25	20	0-5	7	2	0-5	0-5	0-2	7	7
Voltage programming	1kΩ/ V	●	●		●	●	●	●	●			●		●	●
	0-5V	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Current programming (0-5V)		●			●	●		●			●	●	●		
OVP	tracking	ext.	ext.			ext.	int.	ext.	ext.		int.	ext.	int.		
	fixed			int.	int.					int.				ext.	ext.
Signal options	ENABLE		●			●			●			●		●	
	OUTPUT GOOD		●						●						
Line regulation		± 15 mV						± 15 mV							
Load regulation		± 15 mV						± 15 mV							
Ripple & noise		60 mV						200 mV							

OPTIONS

OPTIONS PRIMARY

(Standard on MML600, 800)

Mains fail
Isolated signal from opto-coupler. Ouput signal can sink a maximum of 10mA to allow a 5 milli-second hold-up from activation of mains signal until power supply drops out of limit

Converter inhibit
Power supply inhibited by applying 7.5mA through an opto-isolated input
MML400 PFC Inhibit - TTL lo (0.4) to inhibit 0.4-60V max to turn on from an internal isolated (5V, 40mA) supply. This supply may be used as an additional output if required for inhibit function

MML400 PFC Mains Fail - Open collector output can be connected to any external voltage up to 60V

OPTIONS SECONDARY

Starpoint
Single wire interconnect forces parallelled modules to share current at greater than 15% load, modules share within 6% of current determined by current limit sharing

"Power good"
Detects output voltage high or low (+/-10%) from set output volts

SECONDARY OPTIONS (continued)

Inhibit / Enable
Factory configurable for module inhibit/enable - hi or lo. Pin is connected to 0 volts or +VE ouput to effect control

VME
AC fail, system reset, powergood compatible with VME bus (modules A B & L)

Output connections via 4 pin molex

Suffix	Function
Y5	"Starpoint" + starpoint and module good
Y6	"Power good" + Inhibit (hi or lo)
Y7	"Power good" + Enable (active hi)
Y8	"Power good" + Enable (active lo)

CASE OPTIONS

U Case:
An alternative case form is available with the output terminal along the 127mm dimension and opposite the mains input and fan (not available on MML800). (example MML400U)

DD Case:
600W version available in a 127 x 127 x 241mm case (example MML600DD).

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TABLE OF STANDARD MODELS

Model	Case	Maximum power	Output N°1		Output N°2		Output N°3		Output N°4		Output N°5		Module line up	Number of slots
		Watts	Volts	Amp.	Volts	Amp.	Volts	Amp.	Volts	Amp.	Volts	Amp.		
MML 400 B1	400	360	5	60									A	2
MML 400 C1	400	400	5	80									A + B (Parallel)	3
MML 400 B2	400	400	24	15									G	2
MML 400 B3	400	360	12	24									F	2
MML 400 D1	400	400	5	60	12	12	12	12					A + C + C	4
MML 400 E1	400	400	5	60	12	12	12	12	24	7			A + C + C + D	5
MML 400 E2	400	400	5	60	12	12	12	12	5	12			A + C + C + B	5
MML 400 PFC B1	400	360	5	60									A	2
MML 400 PFC C1	400	400	5	80									A + B (Parallel)	3
MML 400 PFC B2	400	400	24	15									G	2
MML 400 PFC B3	400	360	12	24									F	2
MML 400 PFC D1	400	400	5	60	12	12	12	12					A + C + C	4
MML 400 PFC E1	400	400	5	60	12	12	12	12	24	7			A + C + C + D	5
MML 400 PFC E2	400	400	5	60	12	12	12	12	5	12			A + C + C + B	5
MML 600 T1	600	600	5	120									A + A (Parallel)	4
MML 600 T2	600	600	24	25									G + G (Parallel)	4
MML 600 T4	600	600	48	12.5									J + J (Parallel)	4
MML 600 T5	600	600	5	60	12	12	12	12					A + C + C	4
MML 600 U3	600	600	5	80	12	12	12	12					A + B (Par) + C + C	5
MML 800 V1	800	800	24	30									G + G (Parallel)	4
MML 800 V2	800	800	48	16.5									J + J (Parallel)	4

NB: All outputs are user adjustable over the range shown in the module table. However, it may not be possible to draw full o/p power of an individual module if the total power exceeds the converter power. Request Omega application note No. 2 for futher details.

CONFIGURED (MODULAR) UNITS

If you cannot find a standard Omega unit which fully meets your requirements, the Lambda UK Technical Sales support team will create a customised modular unit utilising the standard modules. If your requirements are straightforward you can configure the unit yourself. First list all required output voltage and current ratings (all outputs are fully floating - hence polarity can be ignored), multiply the voltage and current together to calculate power in watts for each output. Add together all the output powers to arrive at the total wattage in this example the total power is 366W.

Volts	Amps	Watts
28	3,25	91
5	25	125
5	6	30
12	4	48
24	3	72
Total power :		**366**

Now proceed as follows:

1. Select either 400, 600 or 800 watt converter. In the example a 400 watt would be required.

2. Now refer to the module table and select a unit to meet the requirements of the first output in the example, this is 28 volts at 3.25 amps, so a 'D' module would be suitable. Prefix this with the required voltage (in this case 28). This gives the module specification as 28D.

Volts	Amps	Watts	Module	Number of slots
28	3,25	91	D	1
5	25	125	B	1
5	6	30	B	1
12	4	48	C	1
24	3	72	D	1

N.B. : One slot width = 23 mm

4. Now list the converter followed by the modules selected in descending order of current rating

Example : MML 400 5B 5B 12C 28D 24D.

This is the part number of your customised unit

In addition there are options available for either the converter or each of the modules separately, consult the options table for details. If you need the converter or primary option, enter an 'X' after the converter i.e. MML400 X. If you need the parallelling option on the 28 volt output enter Y5 after the module i.e. MML400 X 5B5B12C28DY524D

TABLE OF DIMENSIONS

Model	Number of slots	A (mm)	B (mm)	Weight (kg)
MML400	2	212	156	1,6
MML400PFC	2	212	156	1,6
MML600	2	257	202	2,35
MML400	3	235	179	1,8
MML400PFC	3	235	179	1,8
MML600	3	280	225	2,55
MML400	4	257	202	2,0
MML400PFC	4	257	202	2,0
MML600	4	303	248	2,75
MML800	4	329	283	3,8
MML400	5	280	225	2,2
MML400PFC	5	280	225	2,2
MML400U/PFC	5	280	104	2,2
MML600	5	326	271	2,95
MML600U	5	326	150	2,95
MML800	5	352	306	4,0
MML600	6	349	294	3,15
MML800	6	375	329	4,2
MML800	7	398	352	4,4
MML800	8	421	375	4,6

Refer to module table for slot width

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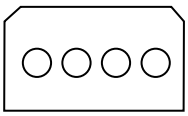
CONNECTIONS

Input	terminal block with 6-32 screws (400/400PFC) 8-32 screws (600/800)
DC Outputs	Screw terminals (M6 slot 46mm modules) (M4 1 slot 23mm) (M3 twin modules)
Remote Sense	Screw terminals M3
Primary options	Molex housing 50-37-5043 (PIN 08-70-1040)
Secondary options	Molex 39-01-2040 (PIN 39-00-0032)

PRIMARY OPTIONS

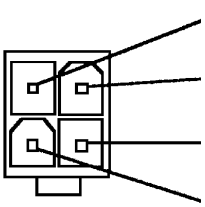


Pin N° 4 3 2 1

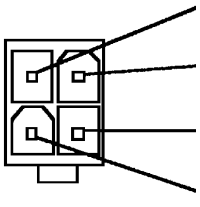
MML400, 600 :
Pin 4 Powerfail -
Pin 3 Powerfail +
Pin 2 Inhibit +
Pin 1 Inhibit -

MML 400PFC, X2 MML800 :
Pin 4 0V
Pin 3 Mains fail
Pin 2 5V
Pin 1 Inhibit

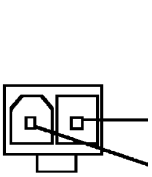
SECONDARY OPTIONS Y5



SECONDARY OPTIONS Y6, Y7 AND Y8



OPTIONS VME



OMEGA DC INPUT SERIES

Model	Case	Length	Max. power	Output N°1		Output N°2		Output N°3		Output N°4		
			Watts	Volts	Amp.	Volts	Amp.	Volts	Amp.	Volts	Amp.	Modules
MML 400 DCB1	600	258	360	5	60							A
MML 400 DCC1	600	281	400	5	80							A + B (Parallel)
MML 400 DCB2	600	258	400	24	15							G
MML 400 DCB3	600	258	360	12	24							F
MML 400 DCD1	600	304	400	5	60	12	12	12	12			A + C + C
MML 400 DCE1	600	327	400	5	60	12	12	12	12	24	7	A + C + C + D
MML 400 DCE2	600	327	400	5	60	12	12	12	12	5	12	A + C + C + B

INPUT

Input voltage range	36-190VDC
Inrush current	tba
Input protection	fuse
Thermal protection	standard

PRIMARY/SECONDARY CASE OPTIONS

see MML 600AC

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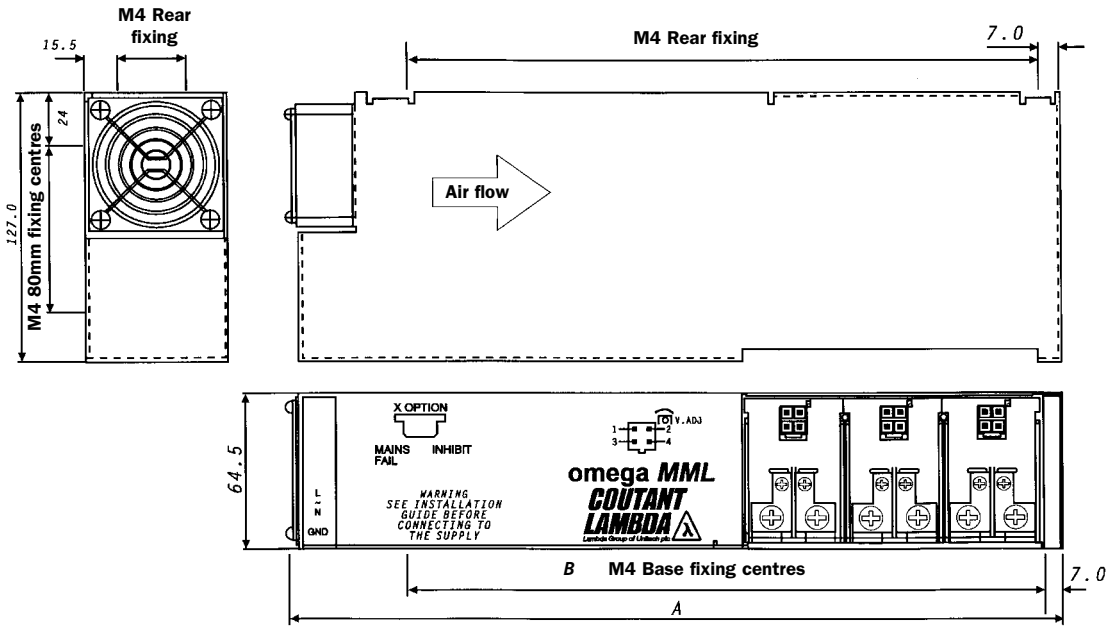
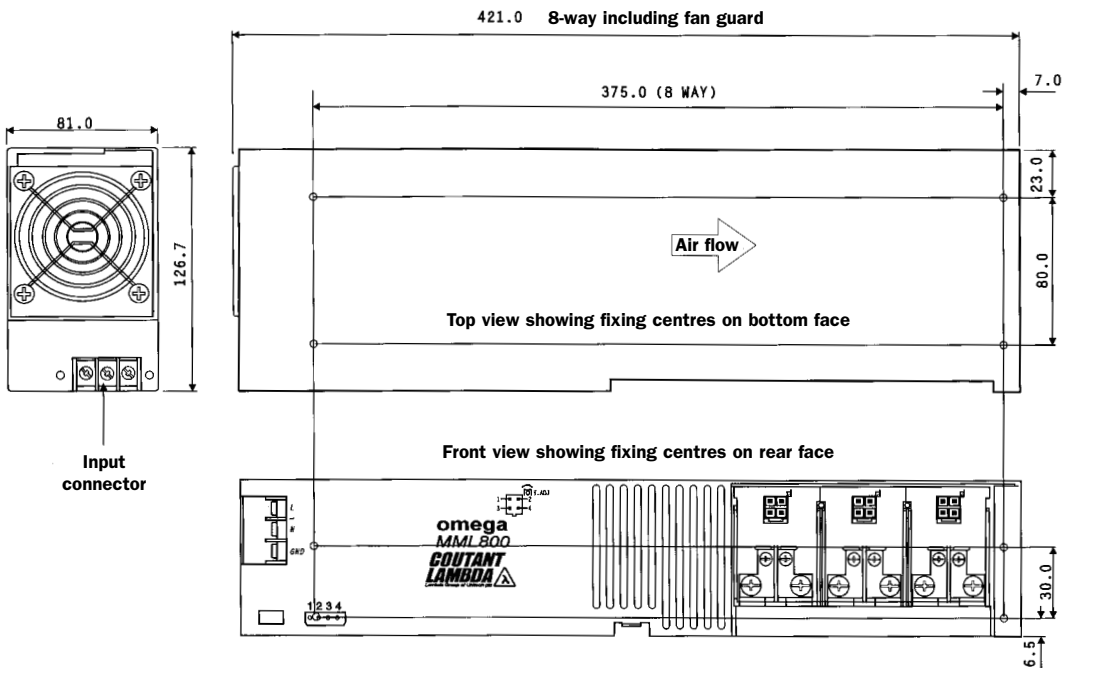
CASES 400 - 600

IMPORTANT: Maximum penetration of mounting screws not to exceed 5mm



CASE 800

IMPORTANT: Maximum penetration of mounting screws not to exceed 5mm



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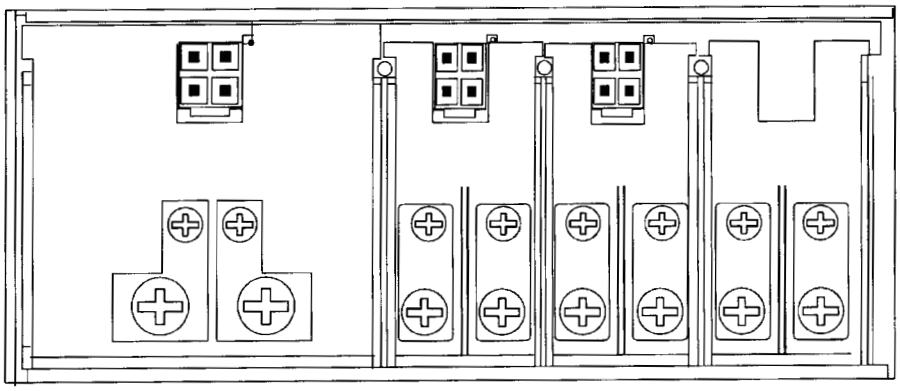
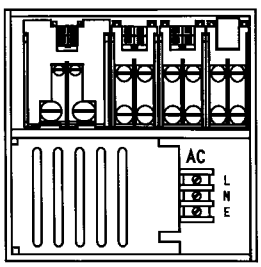
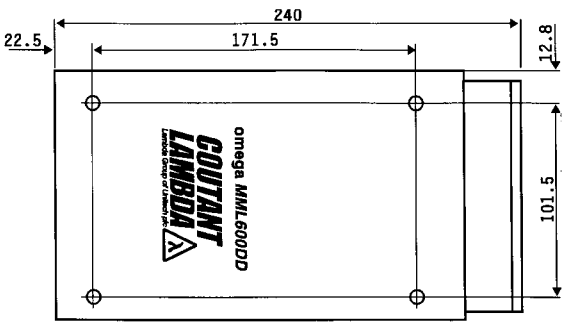
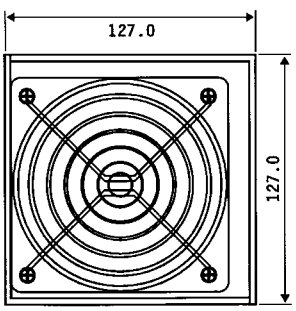
CASE U

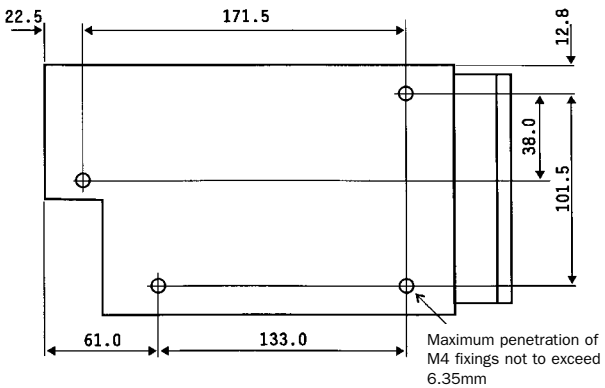


CASE 600DD









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