

## Input Parameters

NOMINAL INPUT VOLTAGE RANGE	94.5 - 240VAC or 133-330VDC
MAX. INPUT VOLTAGE RANGE	85-264VAC or 120-360VDC
INPUT FREQUENCY	47-63Hz
MAXIMUM INPUT CURRENT	5A AC or 3.4A DC
INRUSH CURRENT	<50 AMPS

## Output Parameters

### Adjustment and Derating.

The Sirius 250 series is designed to provide a max output power of 250W at nominal output voltages. The following procedure must be used to ensure the PSU is operated within its ratings:

- Calculate user power for each module (volts x amps).
- Add all the individual module powers together. The total power must not exceed the value given in the following tables.
- Calculate secondary transformer turns x amps for each module. (See outputs table for transformer secondary turns).
- Add all the module turns x amps together and this must not exceed 75AT.
- If necessary reduce the loading until the conditions are met, ie. power and ampere-turns maxima.

### OUTPUTS

Cooling, Output Power and Output Current Limitations

i) Power limitation method.

Integral Fan Cooling (all orientations)			
Normal Airflow (air into unit at input end)			Reverse Airflow (air into unit at output end)
Top Fan with Molex (TM)	End Fan with Molex (EM)	End Fan with IEC (EI & EIF)	End Fan with IEC (EIR & EIFR)
245W	250W	250W	210W

Customers Airflow (all orientations) (NM)			
Normal Airflow (air into unit at input end)		Reverse Airflow (air into unit at output end)	
2.5 m/s	3 m/s	2.5 m/s	3 m/s
220W *	230W	175W	200W

\* Output 2, 3.3V, is derated to 15A from 16A.

ii) Temperature Measurement Method:

The following method must be used for determining the safe operation of PSU's with the LM option (open frame). It may be used as an alternate method to (i) above, for determining the safe operation of NM option PSU's.

For PSU's cooled by customer supplied airflow the components listed in the table below must not exceed the temperatures given (including when the end use equipment is operated at its maximum permitted ambient), consequently the maximum temperature rise permitted is given by the temperature given in the table minus the T<sub>mra</sub> (maximum ambient) of the end use environment (maximum permitted T<sub>mra</sub> is 50°C). All other ratings given in this handbook remain unchanged except that the maximum output power is 250W.

To determine the component temperatures tests must be conducted in accordance with the requirements of IEC/EN/UL/CSA60950-1, Clause 4.5. Consideration should also be given to the requirements of other safety standards. Note: Max. temperatures given are as required by EN60950-1 or to provide satisfactory reliability, whichever is the lower.

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 maximum operating ambient, PSU loading and input voltage, ventilation, 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 and the equipment should be run until all temperatures have stabilised.

Circuit Ref	Description	Max Temp (°C)
TX1	Power transformer primary, secondary and core	130
TX2	Drive transformer windings	110
L1 & L6	Choke winding	110
L12	Choke winding and core	120
-	All other choke windings	115
F1	Input fuse end cap and clip	100
C1 & C18	X capacitors	100
C5	Reservoir electrolytic capacitor	85
-	Electrolytic capacitors < 10mm diameter	90
-	Electrolytic capacitors >- 10mm diameter	95

See component layout drawing on page 4

## Output Ratings

Module	Output Range	Current	Turns	Short Circuit Current (*3)	Min setting for Hazardous Energy (*4)
5/3 base	5.0 - 5.7V	35A(*2)	1T	80A	3V
	2.7 - 3.5V	16A	1T	80A	-
5/12 base	5.0 - 5.7V	35A(*2)	1T	80A	3V
	11 - 16V	8A (12A peak)	4T	20A	-
5 base	5 - 5.7V	35A(*2)	1T	80A	3V
24 base	23-28V	10A(*2)	4T	20A	12V
	A	4.5 - 5.5V	10A	2T	40A
B	11 - 15V	8A	4T	20A	-
C	16 - 28V	4A	8T	10A	-
D	4.5 - 5.5V	5A	2T	40A	-
	2.7 - 3.9V	5A	2T	40A	-
E	4.5 - 5.5V	5A	2T	40A	-
	9 - 15V	4A	4T	20A	-
F	4.5 - 5.5V	5A	2T	40A	-
	16 - 28V	2A	7T	11.5A	-
G	9 - 15V	4.5A	4T	20A	-
	9 - 15V	4.5A	4T	20A	-
H	9 - 15V	4A	4T	20A	-
	16 - 28V	2A	7T	11.5A	-
J	16 - 28V	2A	7T	11.5A	-
	16 - 28V	2A	7T	11.5A	-
L	1.8 - 3.9V	10A	2T	40A	-
M	4.5 - 5.5V	5A	2T	40A	-
	4.5 - 5.5V	5A	2T	40A	-
N	11 - 14.5V	8A	4T	20A	-

\*2 = A minimum load of 10% is required on these outputs.

\*3 = Maximum current if output is short circuited, within 1 minute current limit changes to 'hiccup' mode to give a lower average current.

\*4 = It may not be possible to set the output this low.

## Important safety instructions

### Servicing

These products are not customer serviceable. Repairs may only be carried out by Lambda UK or their authorised agents. These products are not authorised for use as critical components in nuclear control systems, life support systems or equipment for use in hazardous environments without the express written approval of the Managing Director of Coutant Lambda Ltd.

### Energy and Voltage Hazards

Certain modules are capable of providing hazardous energy (240VA) according to output voltage setting. Final equipment manufacturers must provide protection to service personnel against inadvertent contact with these module output terminals. If set such that hazardous energy can occur then the module terminals or connections must not be user accessible. Non-seriesed outputs that are earthed in the end use equipment are SELV. If outputs are not earthed they must be considered hazardous, as a single fault in the secondary may make them exceed the SELV limits between output and earth. If any output is non-SELV then all outputs become non-SELV. Outputs connected in series may produce non-SELV levels, and this must be taken into account in the end-use application.

### Approval Limitations: Use in North America (AC units only)

When this product is used on 180VAC-250VAC mains with no neutral, connect the two live wires to L (live) and N (neutral) terminals on the input connector. In this instance double pole fusing is required.

### High Voltage Warning

Dangerous voltages present within the power supply. Do not remove covers.

### External Hot Surfaces

Section 6 of the Health and Safety at Work Act requires that manufacturers have an obligation to protect service engineers as well as users. In order to comply with this, a label must be fitted to these products which is clearly visible to service personnel accessing the overall equipment, and which legibly warns that surfaces of these products may be hot and must not be touched when the products are in operation.

### Safety Class of Protection

These products are designed for the following parameters: Material Group IIIb, Pollution Degree 2, Overvoltage Category II, Class 1 (earthed), Indoor use as part of an overall equipment such that the product is accessible to service engineers only.

### Safety Earthing Screw

On products with an enclosure, special safety earthing screws are used which connect the cover to the chassis. They must not be removed.

## Safety approvals

These products carry the following approvals:

UL60950-1 and CSA22.2 No 60950-1 - UL Recognised. C-UL for Canada.

IEC/EN60950-1 - CE mark.

CE marking when applied to any Sirius product, indicates compliance with the Low Voltage Directive (2006/95/EC) In that it complies with EN60950-1.

## Input markings and symbols

**MOLEX MARKINGS**

alternating current (a.c.).

direct current (d.c.).

danger, shock hazard.

caution, refer to supplementary documents.

## Environmental parameters

### Operation

Temperature 0 to 50°C (derating 2.5%°C above 50°C to 65°C -Not covered by approvals).  
Humidity 5 to 95% RH non-condensing. Air Pressure 78kPa to 106kPa.  
Altitude -200m to 3000m

### Storage and Transportation

Temperature -40°C to +85°C. Humidity 5% to 95% RH non-condensing.  
Air Pressure 54kpa to 106kpa. Altitude -200m to 5000m.

### Vibration and shock

10-200Hz @ 1.5G sinewave, 20G for 15 minutes in 3 axes random vibration / 3000 bumps, 10G (16mS) half sinewave.

### Cooling

These units may be mounted in any orientation, unless stated otherwise. The airflow around the power supply air inlets and outlets must not be impeded when it is fitted in the end use application.

## Level of insulation

Dielectric Strength testing is carried out as follows:

Primary mains circuit to earth 2.25-2.35 KVDC;

\*Primary mains circuits to transformer core 4.25-4.35 KVDC;

\*Primary mains circuits to secondary 4.25-4.35 KVDC.

Outputs to each other and to earth are isolated to 100 VDC except:

i) Output 1 and output 2 on the 5/3 and 5/12 base boards.

ii) Outputs of twin D module to each other.

\*Important Note: This test is not possible with Y capacitors fitted to the unit as damage to these capacitors will occur. It is also necessary to short circuit the outputs together and to earth.

## EMC performance

**Emissions :** EN55022 Conducted RFI-Class A or B (depending on product - Consult Technical Sales). Radiated RFI - Class A. EN61000-3-2 - Pass - Class A and D. EN61000-3-3 - Pass

**Immunity:** EN61000-4-2 - Level 4 Criteria B EN61000-4-3 - Level 3 Criteria B

EN61000-4-4 - Level 4 Criteria B EN61000-4-5 - Level 3 Criteria B (installation class 3)

EN61000-4-6 - Level 3 Criteria B

EN61000-4-11 - Pass VDE 0160 - Class 2 (Clause 7.3.1.1.)

## General installation instructions

i) The Sirius family of component power supplies is designed for use within other equipment or enclosures which restrict access to authorised competent personnel only. For safe installation and operation of this product, carefully follow the instructions below.

ii) The unit cover/chassis is designed to protect skilled personnel from hazards. They must not be used as part of the external covers of any equipment where they may be accessible to operators, since under full load conditions, part or parts of the unit chassis may reach temperatures in excess of those considered safe for operator access. On units with end fans and IEC 60320 connector, the fan and connector end of the unit is permitted to be user accessible, this also applies to the top fan on units where this is fitted.

Enclosures made with punched ventilation grilles are not to be user accessible.

iii) The mains switch, where fitted, is a single pole device and must not be used as the main disconnect device. The IEC 60320 mains appliance coupler is intended to be the main disconnect device for the Sirius power supply. The switch is marked 'I' and 'O'. The 'I' indicates on and 'O' indicates off.

CAUTION: Where the IEC 60320 is fused, then it is double-pole/neutral fused. When the fused IEC inlet is fitted, the IEC input must not be user or externally accessible in the end use equipment.

iv) These products are Class 1 and must therefore be reliably earthed and professionally installed in accordance with the prevailing electrical wiring regulations and the safety standards covered herein.

v) These products are IPX0 and chemicals/solvents, cleaning agents and other liquids must not be used.

## Mechanical parameters

**DO NOT USE MOUNTING SCREWS WHICH PENETRATE THE UNIT BY MORE THAN 4.5 MM.**

Weight 2 Kg dependent upon configuration.

Maximum screw torque for customer fixings 0.9Nm

## Connection details

### Input Connections

Input tabs - 6.3mm x 0.8mm, tin plated brass, rated 15A.

Internal fuse (F1) 5 x 20mm, F6.3AH/250V.

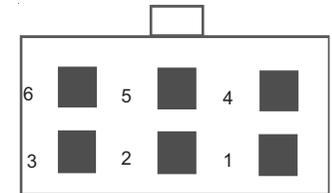
### Output Connections

Output Connector Ratings: 6.35mm fastons are rated at 15A.

## Customer Signals

Customer signals are available via 6-way connector (PCB reference J9) adjacent to output 1 terminals. A connector kit (Molex housing 90142 and Molex crimp pins 90119-2109) is supplied with each PSU. Pin designations for this connector are as follows :

PIN	FUNCTION
1	Inhibit
2	A/C Fail
3	Ch2 -ve sense
4	Ch2 +ve sense
5	Ch1 -ve sense
6	Ch1 +ve sense



### Inhibit (Pin1)

Connecting Pin1 (Inhibit) to Pin5 (Ch1 -ve sense) via open-collector driver or relay/switch contact shuts off all DC outputs (cooling fan continues to operate).

Pin1 is internally pulled high via 2K2 resistor to approximately 5Volts with respect to Pin5.

### AC Fail (Pin2)

Pin2 (AC Fail) is an open-collector output referenced to Pin5 (Ch1 -ve sense) that is normally low and goes high at least 5mS before DC outputs are lost.

Maximum sink current is 50mA, maximum external open circuit voltage is 45V.

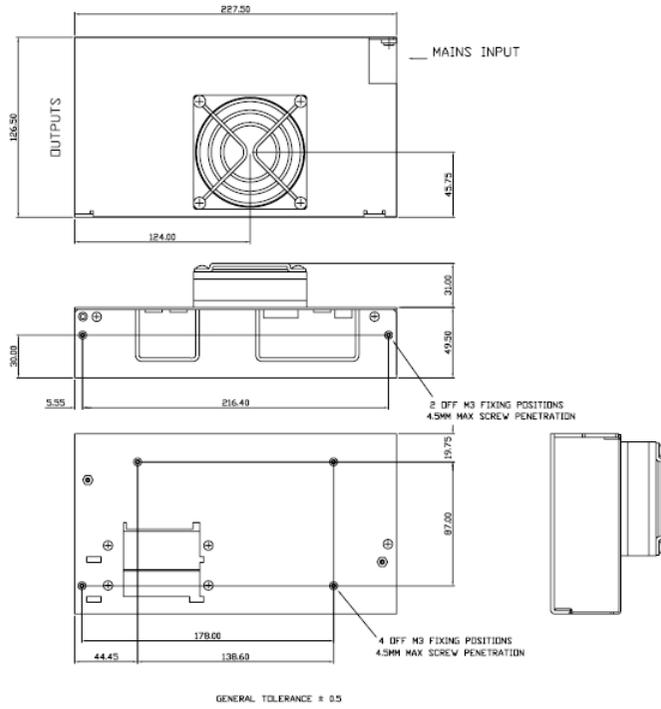
### Ch1 / Ch2 sense (Pins3,4,5,6)

Connecting sense terminals to the load will compensate for power cable voltage drop under load conditions. With sense terminals connected, the voltage drop along any power cable should not be allowed to exceed 0.5volts.

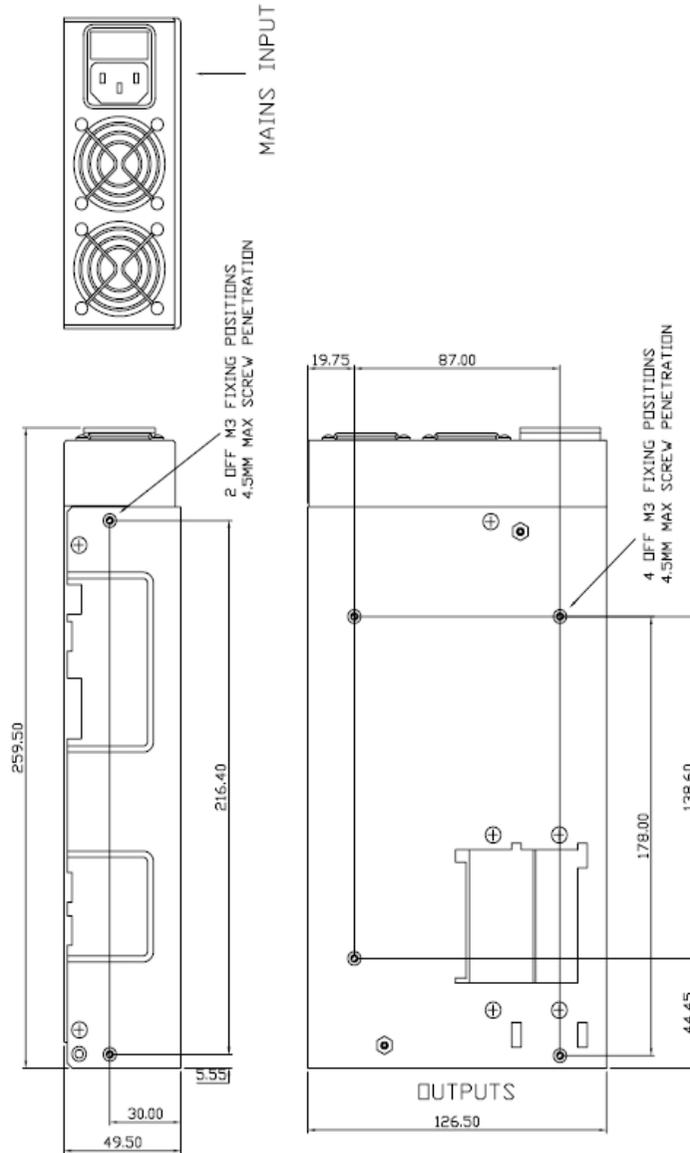
The sense terminals can be left unconnected if remote sense is not required (sense terminals are internally connected via a 10 ohm resistor to the corresponding power terminal).

Sense cables should be connected as twisted pairs (+ve and -ve sense) with at least 1 twist per centimetre and sense cable harness should be kept separate from the power cable harness wherever possible.

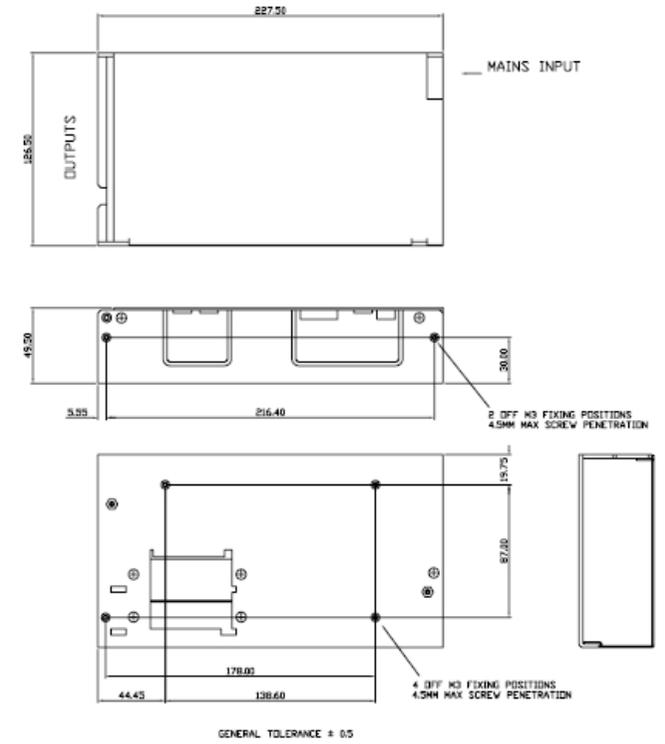
Sirius 250 Outline Drawing - Top Mounted Fan



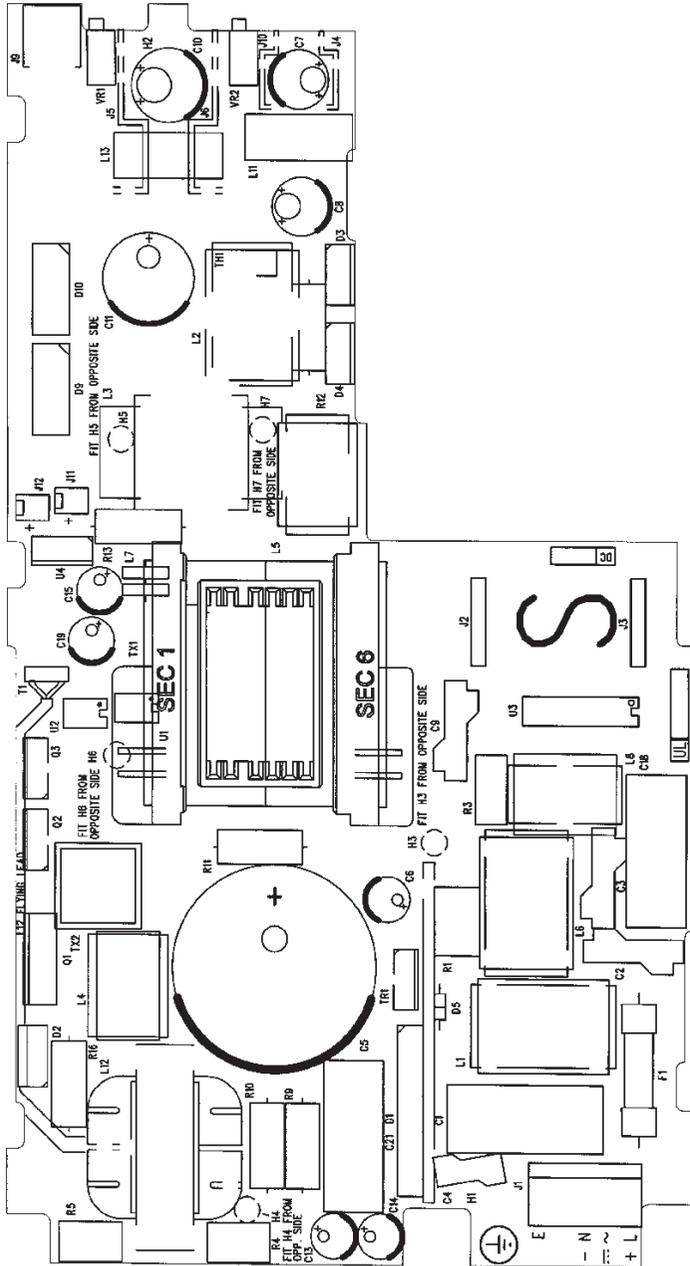
Sirius 250 Outline Drawing - End Mounted Fan



Sirius 250 Outline Drawing - No Fan



Component Layout Drawing



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