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CSS500 SERIES USER MANUAL

December 10, 2012

General Safety Instructions

This is an open type switch mode power supply for use in applications meeting Pollution Degree 2 environment. A suitable mechanical and fire enclosure must be provided by the end use equipment for shock hazard protection, fire protection and protection from hazardous energy levels.



READ SAFETY INSTRUCTIONS carefully before working on the unit.



HIGH VOLTAGE WARNING: Dangerous voltages are present in the power supply.

1. Do not install, test or operate this unit near water and do not spill any liquid on it.
2. Do not operate this unit unless it is in a secure position.

This unit must be installed and put into service by authorized competent personnel only who are fully conversant with the hazards of AC line operated equipment and with the particular dangers associated with switch mode power supplies.

The output power taken from the power supply must not exceed the rating stated on the power supply label. Refer to typical rating on power supply label for product's real output.

In case of defect, this unit must be returned to the manufacturer.

Safety Agency Certifications

CSS500-xx, /S, /T versions

These units are approved to UL 60601-1 1st Edition, CSA 601.1-M90, IEC 60601-1:1988+A1+A2 and EN 60601-1:1990+A1+A2. EMC should be evaluated to IEC/EN 60601-1-2 in the final system.

CSS500-xx/l, /Sl, /Tl versions

These units are approved to UL 60950-1 2nd Edition, CSA 60950-1-07 and EN 60950-1:2006+A11.

Environmental Specifications

Storage and Transportation: -10°C to 85°C, 10% to 95%RH

Operating: 70°C max ambient, IPX0, Continuous, Class I, NOT evaluated as AP/APG equipment.

Input Rating

100-240 VAC, 6-2.5 A, 50/60 Hz

Output Rating

Model	Output Voltage	Maximum Current Convection	Maximum Power Convection	Maximum Current Forced Air	Maximum Power Forced Air
CSS500-12	12V	30A	360W	41.67A	500W
CSS500-24	24V	15A	360W	20.84A	500W
CSS500-30	30V	12A	360W	16.67A	500W
CSS500-36	36V	10A	360W	13.89A	500W
CSS500-48	48V	7.5A	360W	10.42A	500W
CSS500-54	54V	6.67A	360W	9.26A	500W
CSS500-57	57V	6.32A	360W	8.78A	500W

Connections

CN1 See outline drawings

CN2

Mates with J.S.T. housing XHP-2, terminals: SXH-001T-P0.6; 28-22 AWG

Pin 1 5Vsb

Pin 2 Common 0V (V-)

CN3

Mates with J.S.T. housing XHP-6, terminals SXH-001T-P0.6; 28-22 AWG

Pin 1 Current Share

Pin 2 Remote On/Off

Pin 3 Common 0V (V-)

Pin 4 +5Vsb

Pin 5 - Sense

Pin 6 + Sense

CN4 See outline drawings

CN5

Mates with Molex housing 90142-0006 & terminals: 90119-0109. (The 2 pin version 90123-0102 can also be used)

Pin 1 Fan Fault

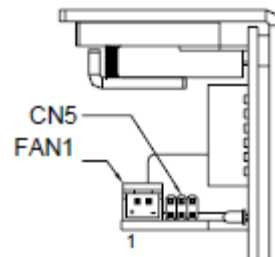
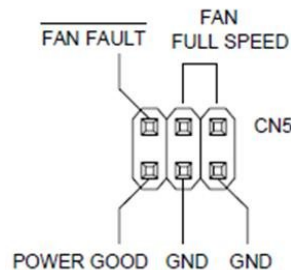
Pin 2 Power Good

Pin 3 Fan Full Speed

Pin 4 Common 0V

Pin 5 Fan Full Speed

Pin 6 Common 0V (V-)



FAN 1 (Fixed Voltage)

Mates with J.S.T. housing XHP-2, terminals: SXH-001T-P0.6; 28-22 AWG

Pin 1 +12V fan

Pin 2 Common 0V (V-)

FAN 2 (Speed controlled)

Mates with J.S.T. housing XHP-2, terminals: SXH-001T-P0.6; 28-22 AWG

Pin 1 +12V fan

Pin 2 Common 0V (V-)

5Vsb (StandBy Output)

The 5Vsb is always “ON”, even when the power supply inhibit is activated. Note that when the supply is inhibited or is used with convection cooling, the output must be de-rated to 5V 0.25A. The 5Vsb return is via Common 0V (V-) terminal.

Remote On/Off

The CSS500 can be remotely turned on or off with either an external voltage (Vext) or closed contact.

Output inhibited (OFF) Short pin 2 to pin 3 or $0 < V_{ext} < 0.5V$
Output enabled (ON) Open circuit (floating) or $3.5 < V_{ext} < 5.25V$

The Remote On/Off return is via the Common 0V (V-) terminal.

Power Good Signal

An open collector signal indicates if the DC output of the CSS500 is good. An internal pull up resistor is fitted, tied to the 5Vsb. The maximum sink current is 0.5mA. The Power Good Signal return is via the Common 0V (V-) terminal.

High = Output good
Low = Output faulty

Fan Fault Signal

An open collector signal indicates if the fan is operating normally. An internal pull up resistor is fitted, tied to the 5Vsb. The maximum sink current is 0.5mA. The Fan Fault Signal return is via the Common 0V (V-) terminal.

High = Fan operating normally
Low = Fan faulty

Fan Connection & Fan Speed Control

The FAN 1 or FAN 2 connectors can be used to power an external 12VDC fan and supply up to 1A. FAN 1 provides a fixed 12V output. FAN 2 provides a variable voltage derived from a sophisticated fan controller turning on the fan as needed and adjusting its speed according to the cooling requirements.

The FAN 2 speed controller can be over-ridden by applying a jumper on across pins 3 & 5 on CN5.

Current Share (Parallel Operation)

Up to four units may be connected in parallel for either increased output power or for redundant operation and will share within 10% at full load. For best performance, the output voltages should all be set to the same value.

Connect the current share pins together, and ensure that the output cables to the load are the same wire gauge and length.

Remote Sense

To compensate for up to 0.25V voltage drop in each of the output cables, connect + sense to + load and – sense to – load. Twist sense wires together to reduce noise pick up. If remote sense is not used, connect + sense to V+ and – sense to V–.

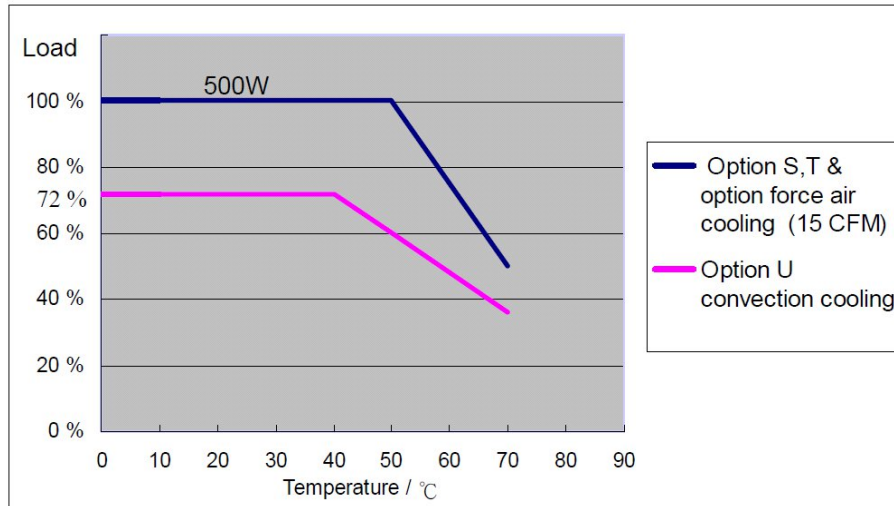
Output Potentiometer

The output potentiometer is fitted for factory adjustment only.

Operating Temperature and Cooling

If the internal fan is specified (/T or /S option) or forced air is applied, then the CSS500 will operate as per the blue line.

If the CSS500 is used without the internal fan option and in still air (U channel version), then derate the unit according to the pink line.



The recommended direction of the external air should be over the input terminal block, exiting over the output terminal block. The minimum recommended air volume for the correct cooling is 15CFM. If the internal fan is fitted, leave a minimum of 2” (50mm) clearance on intake and exhaust to avoid restricting airflow.

To ensure unit reliability and to avoid over temperature shutdown, monitor temperature at the following locations:

Component	Recommended Max. Temperature
HS1 near Q2	95 °C
HS3 in between Q6 and Q7	95 °C
T2 coil	100 °C

Dielectric Withstand (hipot)

Before applying a test voltage, ensure the following connections are jumpered:

L to N, + Output to – Output

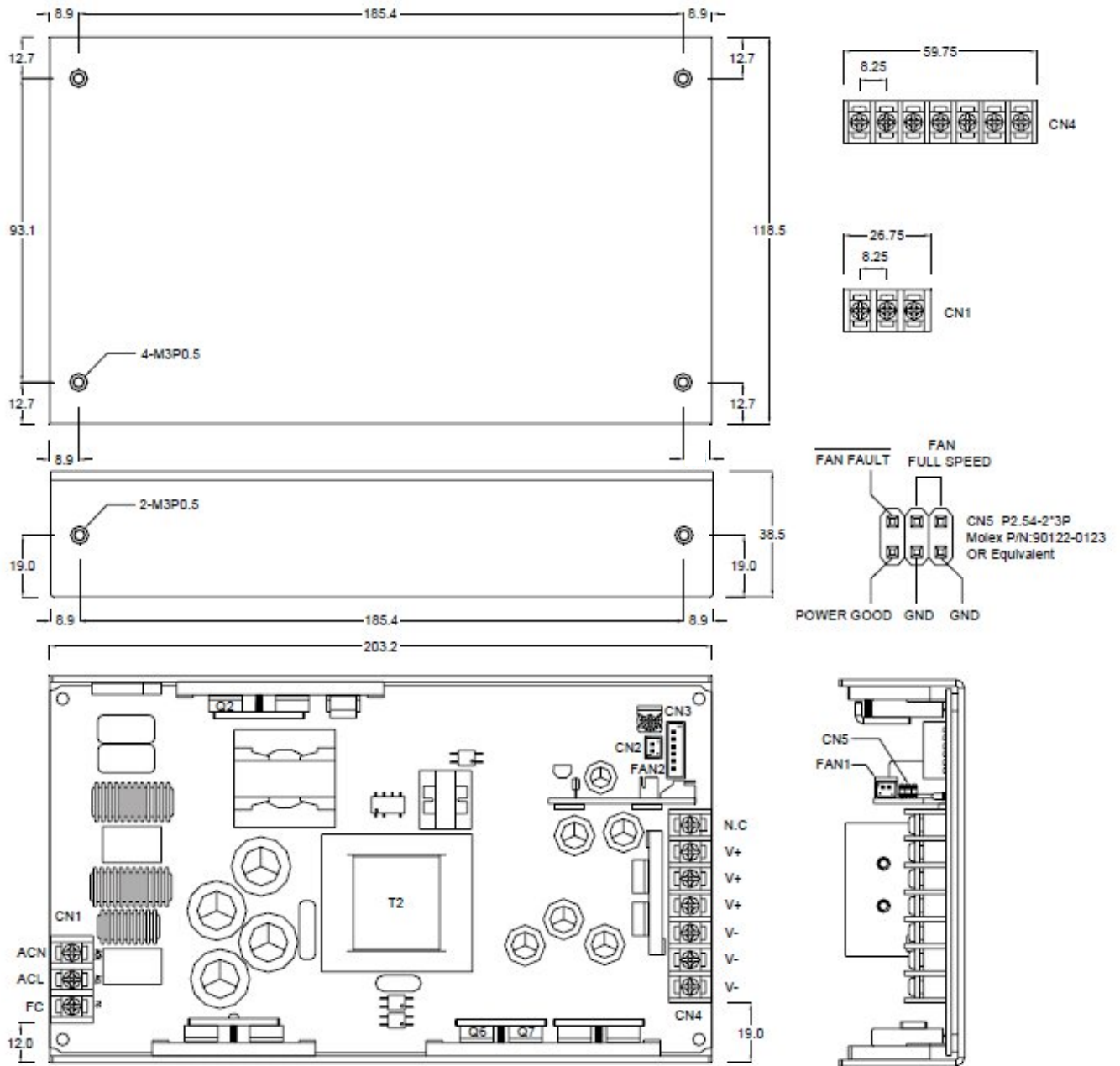
/I version (non medical)

Primary to Secondary 4,242VDC
 Primary to Chassis 2,121VDC
 Secondary to Chassis 707VDC

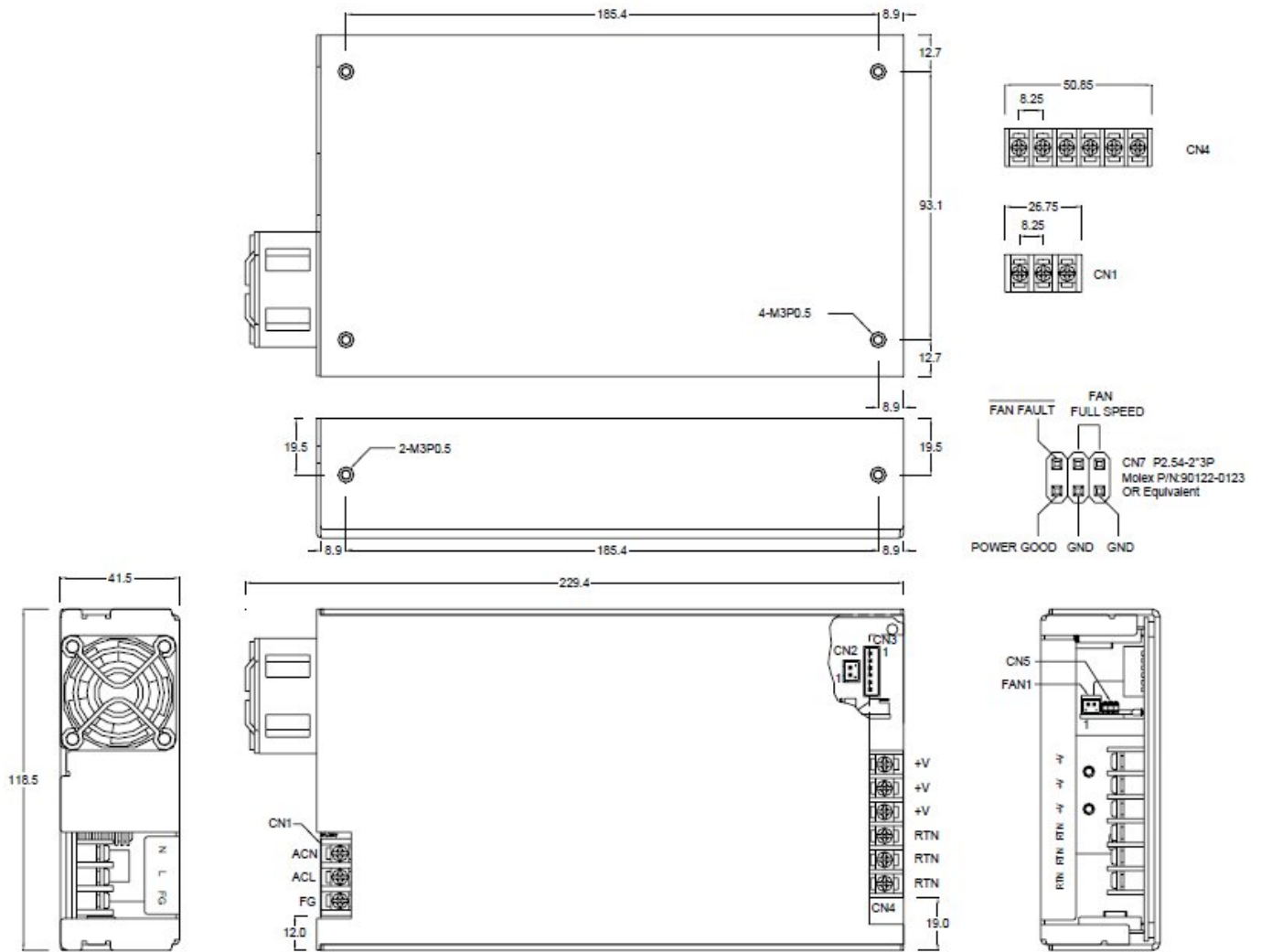
Medical version

Primary to Secondary 5,656VDC
 Primary to Chassis 2,121VDC
 Secondary to Chassis 707VDC

Outline Drawing – U channel version



Outline Drawing – End fan channel version (/S)



Outline Drawing – Top Fan Version (T)

