



- EN60950-1 2<sup>nd</sup> Ed. AND EN60601-1 2<sup>nd</sup> & 3<sup>rd</sup> Ed.
- Up to 1008W in <1U chassis
- Efficiency >92%
- SEMI F47 Compliant
- 2 MOPP (Means of Patient Protection)
- Optional I<sup>2</sup>C Communications
- Optional ORing



Premium Single

### POWER SUPPLY DESIGN EXCELLENCE

Powerstax is a leader in the power density race with its ultra efficient Premium Single Series NM0501 & NM1001 AC-DC industrial & medical power supplies. The convection cooled NM0501 delivers a massive 504W in an open-frame U-channel form factor while the fully enclosed NM1001 achieves 1008W with its built-in variable speed fans.

Offering 24V, 36V or 48V with a wide adjustment range and with both EN60950-1 & EN60601-1 with 2 MOPP approvals, Premium Single Series

are suitable for use in a wide range industrial and medical applications including patient contact equipment. NM0501 is particularly suitable for acoustically sensitive environments.

Optional features include an I<sup>2</sup>C serial communications interface as well as an ORing Function for N+1 redundancy. Conformal coating and ruggedisation for harsh environments are also available.

STANDARD MODEL	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT POWER <sup>1</sup>	ADJUSTMENT RANGE <sup>2</sup>	FORMAT	COOLING
NM0501-090-240	24.0V	21.0A	504W	19-28V 14-28V	U-Channel	Convection
NM0501-090-360	36.0V	14.0A	504W	26-40V 20-40V	U-Channel	Convection
NM0501-090-480	48.0V	10.5A	504W	36-58V 29-58V	U-Channel	Convection
NM1001-090-240	24.0V	42.0A	1008W	19-28V 14-28V	Enclosed	Internal Fan
NM1001-090-360	36.0V	28.0A	1008W	26-40V 20-40V	Enclosed	Internal Fan
NM1001-090-480	48.0V	21.0A	1008W	36-58V 29-58V	Enclosed	Internal Fan

Notes:

1. See derating curves.
2. First range is setpoint using multiturn potentiometer, second range is via remote trim.

OTHER MEDICAL POWER SUPPLIES  
NM060 to 60W  
NM125 to 125W  
NM350 to 350W  
MEDISTAX to 1340W



Premium Single

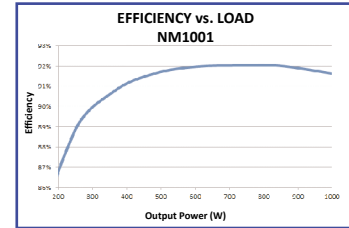
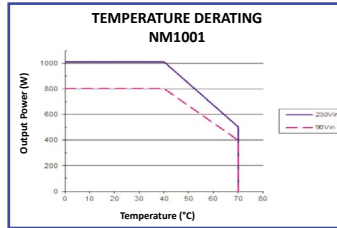
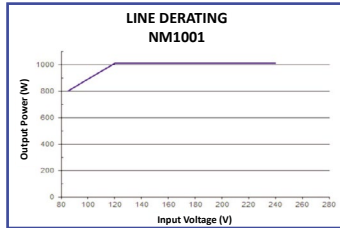
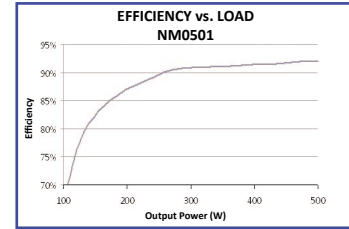
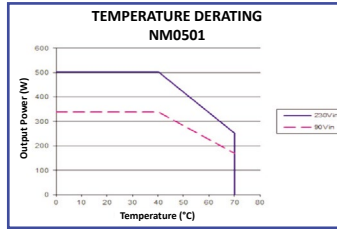
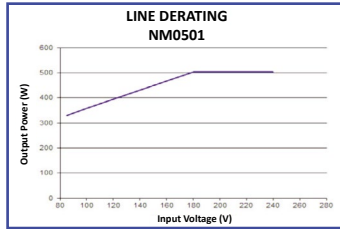
INPUT SPECIFICATIONS	NM0501	NM1001
Input Voltage	85-264VAC   120-380VDC	
Input Frequency	47-440Hz   DC	
Input Current	5A max.	10A max.
Input Protection	F8A HRC - line & neutral	F12A HRC - line & neutral
Inrush Current (cold start)	25A @ 230VAC	
Leakage Current	300µA @ 250VAC (100µA optional)	
Undervoltage Protection	65-74VAC Lockout	

OUTPUT SPECIFICATIONS	24Vnom	36Vnom	48Vnom
Voltage Set-point (typical)	±1.0% Vout nom. (at full load)		
Line Regulation	±0.5% (±10% line variation)		
Load Regulation	±0.2% (25-75% load variation)		
Efficiency	>92% (230VAC, 1008W @ 24V/48V)		
Transient Response	2.5% deviation / 500µS settling time (25-75% load variation)		
Rise Time / Overshoot	3-5mS / 2% max.		
Turn-on Delay	500-800mS from supply on / 10mS from remote on		
Remote Sense	0.5V		
Holdup	>17mS (Vnom, full load)		
Current Limit	105-130% (straight line with hiccup activation at <30% of Vnom)		
Ripple & Noise (20MHz)	240mV pk-pk	360mV pk-pk	480mV pk-pk
Overvoltage Protection	33-37V, latch off	44-52V, latch off	61-69V, latch off

GENERAL & ENVIRONMENTAL SPECIFICATIONS	
Temperature Range	-40°C to +70°C operating, -40°C to +85°C storage
Humidity	5-95%RH non-condensing
Cooling	Free air convection or external forced air
Standby Supply	12V @ 300mA
Safety Standards	UL/EN/IEC60950-1 2 <sup>nd</sup> Ed.   UL/EN/IEC60601-1 2 <sup>nd</sup> & 3 <sup>rd</sup> Ed. (MOPP)
Isolation Voltage	4000VACrms input/output 1500VACrms input/chassis 1500VACrms output/chassis
isolation Resistance	100MΩ / 500VDC
EMI	<b>Emissions</b> EN55011 - conducted & radiated, level B EN55022 - conducted & radiated, level B FCC20780 - conducted & radiated, level B EN61000-3-2 - harmonic distortion, class A EN61000-3-3 - flicker & fluctuations <b>Immunity</b> EN61000-4-2 - esd, level 2 EN61000-4-3 - radiated, level 3 EN61000-4-4 - fast transients, level 3 EN61000-4-5 - input line surges, level 3 EN61000-4-6 - conducted, level 3 EN61000-4-11 - dips SEMI F47 - dips & drop-outs (>160VAC in)
Shock & Vibration	55G (MIL810G)
MTBF	550,000 hours @ 40°C (Telcordia SR332 ground benign)



### DERATING & EFFICIENCY CURVES

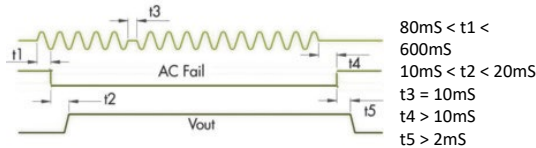


Premium Single

### ALARM & CONTROL SIGNALS

#### AC FAIL SIGNAL (ACFAIL)

The AC Mains Fail warning is an opto-isolated signal with a maximum sink current of 4mA. During normal operation the transistor is ON. When the input voltage is lost or goes below 80VAC, the transistor is turned OFF at least 10mS before loss of output regulation (at nominal Vout or below).



#### POWER GOOD (PG+ / PG-)

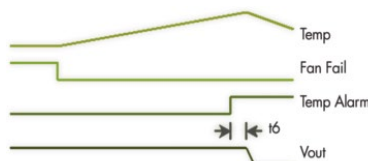
An internal comparator monitors the output voltage and determines whether it is within normal operation limits. Maximum collector current is 2mA and maximum Collector voltage is 30V. When the output voltage is within normal limits, the PowerGood signal is activated (transistor ON).

#### ENABLE (EN+ / EN-)

A contact closure between EN+ and EN- enables the the main output.

#### TEMPERATURE ALARM (OTP)

An open collector signal indicating that excessive temperature has been reached due to fan failure or operation beyond ratings. This signal is activated at least 10ms prior to unit shutdown.



#### FAN FAIL

An open collector signal indicating that at least one of the fans has failed. This does not cause power supply shutdown. The power supply will continue to operate until 10ms after the temperature alarm signal is generated.

#### VTRIM

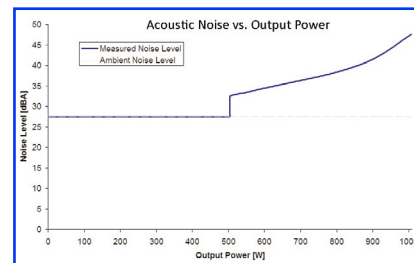
This input allows remote adjustment of the output voltage.

#### ITRIM

This input allows programming of the output current lime.

#### ACOUSTIC NOISE CURVE (NM1001)

The NM1001 models employ a variable speed cooling fan. It is switched off completely at low powers and only switches on when output power reaches 500W. From 500W to 1008W fan speed increases proportionately. The resulting acoustic noise is shown in the graph below.



#### I<sup>2</sup>C SERIAL CUMMUNICATIONS (OPTION)

An optional I<sup>2</sup>C serial communications interface can be fitted to these powers supplies.

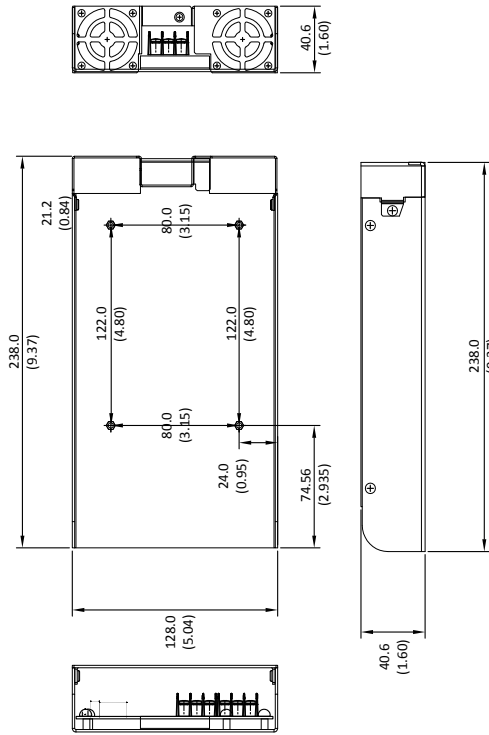
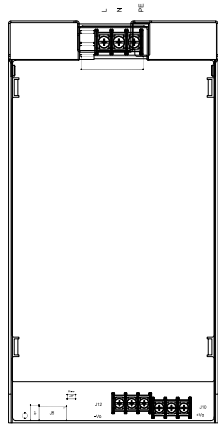
#### ORing FUNCTION (OPTION)

An optional ORing circuit enables these power supplies to operate in a fully N+1 redundant configuration.

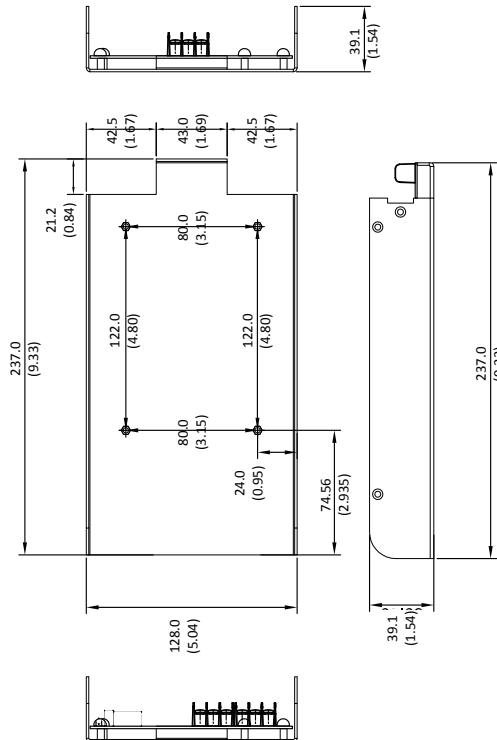
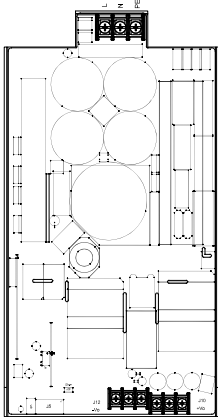


### MECHANICALS

#### NM1001



#### NM0501



**Mounting Holes**  
4 x M4 threaded PEMS in base. 6mm max. screw penetration.

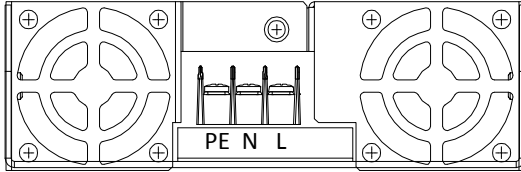
All dimensions in mm (inches)

Premium Single



### CONNECTION DETAILS

#### INPUT END VIEW (NM1001 SHOWN)



#### Input Connector

Barrier Strip - 0.375" pitch - 3 position - Molex - 38720-750

#### Output Connectors (x2)

Barrier Strip - 0.325" pitch - 3 position - Tyco - 2-1437667-5  
Maximum current - 20A per terminal

**Signal Connector:** Molex - 87831-1420 - 2mm pitch - 14 position

**Signal Mating Connector:** Molex - 51110-1451 (locking) or 51110-1450 (non-locking), 50394 (terminals)

#### I<sup>2</sup>C/PMBUS INTERFACE (Option)

The I<sup>2</sup>C PMBus compatible interface can be used for monitoring the output voltage and current. It can also be used to manage real time data for the PSU. For full details on PM Bus please contact sales@powerstax.com.

#### PMBus Connector (PL1)

Molex - 87833-0831

#### PMBus Mating Connector

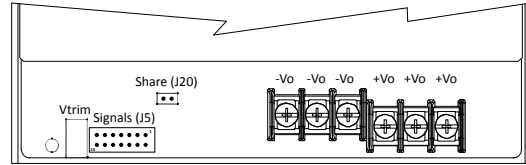
Locking Molex - 51110-0860 (locking) or 51110-0850 (non-locking), 50394 (terminals)

### PARALLEL OPERATION

Premium Single units can be connected in parallel for higher current applications or for N+1 operation when the 'ORing' option has been specified. To connect in parallel the outputs must first be trimmed to within 5mV of each other and then a header must be fitted to the 'share' jumper J20 (shown opposite).

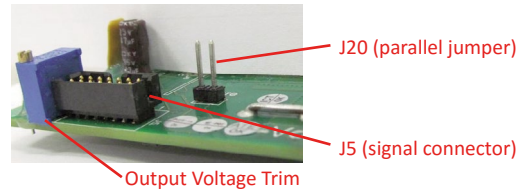
A recommended jumper is HARWIN part M7567-05.

#### OUTPUT TOP VIEW



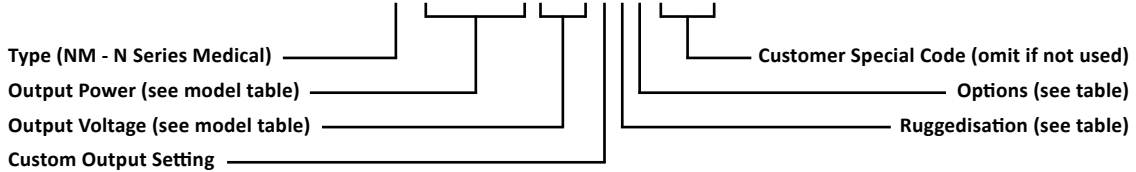
#### SIGNAL CONNECTOR PINOUT (J5)

1	EN+	8	Common
2	EN-	9	Vtrim
3	PG+	10	Sense -Ve
4	PG-	11	Sense +Ve
5	12V Standby	12	Fan Fail
6	AC Fail	13	Itrim
7	OTP	14	Common



### MODEL NUMBER CONFIGURATION GUIDE

NMwww-xxx-yyy-zzzz



OUTPUT SETTING	
C	Custom Setting
-	Default Voltage

RUGGEDISATION	
C	Conformal Coating
R	Rugged
S	Conformal Coating & Rugged
0	No options

OPTIONS	
1	I <sup>2</sup> C/PMBus
2	ORing Function
3	I <sup>2</sup> C/PMBus + ORing Function
4	Low Leakage (100µA)
5	I <sup>2</sup> C/PMBus + 100µA Leakage
6	ORing Function + Low Leakage
7	I <sup>2</sup> C/PMBus + ORing Function + Low Leakage
0	No options

#### Output Settings

Units are shipped with nominal output voltages unless custom setting is specified. Powerstax can custom set units to exact customer requirements anywhere within the setpoint adjustment range given in the model table.

All specifications are typical at nominal line input, full load and 25°C unless otherwise stated.

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