NEVO+600S-4-4-4-4

- Industrial Approvals
- Pre-Configured
-V Range (18V to 58V)

600 watt in the palm of your hand

The NEVO+600S-4-4-4-4 is a pre-configured Industrial Modular power supply which delivers a full 600 watts without de-rating for line voltages ≥ 120VAC making it the ultimate power solution for products destined for the global market. Through the implementation of a fan control circuit the NEVO+ also features reduced fan noise. The NEVO+ delivers up to 600 watts from a 600 gram 5" x 3" x 1U package and consists of an input module together with four isolated output modules. The series carry full UL60950 safety approvals and comply with EN61000-3, EN61000-4 and EN550022-B EMC standards.

MAIN FEATURES:

- ✓ **No Line de-rating ≥ 120VAC**
- ✓ **Reduced fan noise**
- ✓ **600 watt output**
- ✓ **5" x 3" x 1U footprint**
- ✓ **Adjustable output voltage**
- ✓ **Industrial approvals**
- ✓ **High reliability**
- ✓ **High efficiency – up to 89%**
- ✓ **Only 0.6kg – 100W/kg**
- ✓ **High power density (25W/in^3)**
- ✓ **Remote current/voltage programming**
- ✓ **Current output signal**
- ✓ **Accurate current sharing**
- ✓ **5V 200mA bias supply**
- ✓ **RoHS compliant**
- ✓ **Field configurable**
- ✓ **Two year warranty**

SYSTEM SPECIFICATIONS

INPUT ELECTRICAL

Parameter		Details	Min	Typ	Max	Units
AC Input Voltage		Nominal range is 100Vrms to 240Vrms	85		264	Vrms
AC Input Frequency		Contact factory for 400Hz operation	47	50/60	63	Hz
DC Input Voltage		Medical	120		370	Vdc
Power Rating		See graphs for deratings			600	Watts
Input Current		600 Watts output at 180Vrms input			6	A
Inrush Current		265Vrms (cold start)			20	A
Fusing		5 x 20 Fast acting			8	A
Input Current Limit		Maintains power factor		8		A
Efficiency		See graphs		86	89	%
Idle Power		All outputs fitted and enabled		28		Watts
Idle Power		All outputs fitted and disabled		21		Watts
Power Factor		Typical value for 300 Watts output at 240Vrms input		0.96	0.99	
Holdup		600 Watts output at 180Vrms input	17	20	21	mS
UVLO		Turn on only	78		84	Vrms
Over Temperature		Internally monitored, Latching	115		125	°C
Reliability		40°C 80% load			2	FPMH
SIGNALS	Bias Voltage		4.8	5	5.2	V
	Bias Current		0		200	mA
	Power Good Voltage	PNP open collector with internal 10k pull down resistor	8	10	15	V
	Power Good Current		0		20	mA
	Inhibit Voltage		2		15	V
	Inhibit Current	10k ohm input impedance	0.2		1.5	mA
	Global Inhibit Voltage		3		15	V
	Global Inhibit Current	5k ohm input impedance	0.6		3	mA
	AC_OK Voltage		1		4	V
	AC_OK Current		-10		20	mA
	AC_OK Warning		5			mS

SYSTEM OUTPUT ELECTRICAL

Maximum System Current	Achieved when all four outputs are connected in parallel			12.5	A
Maximum System Voltage	Achieved when all four outputs are connected in series			240	V

NOTES:
1. Refer to the user manual when connecting units in series and/or in parallel.
2. All specifications are believed to be correct at time of publication and are subject to change without notice.

INDIVIDUAL OUTPUT ELECTRICAL

Parameter	Details	Min	Typ	Max	Units
Output Voltage Range	See table for limits	18	48	60	V
Rated Current				3.75	A
Average Output Power				150	Watts
Peak Output Power	See graph, < 5 seconds 50% duty cycle			225	Watts
Initial Voltage Accuracy	Factory set units	-0.5		0.5	%
Manual Voltage Adjust	11 turn potentiometer		3.6		V/turn
Load Regulation	Measured at sense terminals	-300		300	mV
Line Regulation	Measured at sense terminals	-0.1		0.1	%Vnom
Cross Regulation	Measured at sense terminals	-0.2		0.2	%Vnom
Minimum Load				0	Watts
Temperature Coefficient		-0.02		0.02	%/°C
Ripple and Noise	20MHz BW, pk-pk			1	%Vnom
Transient Response	25% to 75% load transient at 0.5A/uS Recovery to within 10% of Vset			3 100	V uS
Turn On Rise Time	Monotonic 10% to 90%	1.5		3.5	mS
Turn On Overshoot				0.1	%/Vset
Turn On Delay	AC to PG		600	750	mS
	EN to PG		15	20	mS
Current Share Accuracy				5	%Imax
Open Sense Offset	Open sense, voltage offset due to bias currents			2	%Vnom
Holdup Voltage				50	V
Isolation to Ground	Each terminal			250	V
Over Current Protection	% of rated current	105		125	%Irated
Reverse Current Protection	% of rated current	-6		0	%Irated
Short Circuit Protection (Hiccup Mode)	Period Duty cycle Voltage threshold (Measured at sense terminals)		125 3 3.5		mS % V
Over Voltage Protection	Latching		36		V
Over Temperature Protection	Internally monitored, Latching	115		125	°C
Sense Cable Protection	Positive	-3		3	V
	Negative			2	V
Power Good Threshold	Low threshold only		90		%Vset
Current Output Signal	$I_{SIG} = 0.6 + I_{OUT} / (I_{RATED} * 1.25)$	0		110	%Irated
Current Limit Control	$I_{LMT} = (V_{CTRL} - 0.6) * I_{RATED} * 1.25$	0		110	%Irated
Remote Voltage Control	$V_{OUT} = V_{SET} ((1.8 - V_{CTRL}) / 0.6)$	0		300	%Vset
Bias Supply	10mA max	4.5	5	5.2	V
Reliability	40°C 80% load			1	FPMH
Warranty				2	Years
Wire Size		20	18	10	AWG
Weight			60		Grams
Size	60mm x 35mm x 17mm				

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Patents pending

INSTALLATION			
Parameter	Details	Parameter	Details
Equipment Class	I	Flammability Rating	94V-2
Installation Category	II	IP Rating	IP10
Pollution Degree	2	RoHS Compliance	2002/95/EC
Material Group	IIb (Indoor use only)		

RELIABILITY				
Component	Details	Min	Max	Units
Fan	Mag Lev Std		2.7	FPMH
Input	Excluding Fan		2	FPMH
Output	See individual output datasheets		1	FPMH
Warranty			2	Years

SAFETY				
Parameter	Details	Min	Max	Units
Isolation Voltage	Input to Output		4000	Vac
	Input to Chassis		1500	Vac
	Output to Chassis		250	Vdc
	Output to Output		250	Vdc
Isolation Clearance	Primary to Secondary (Reinforced)	7		mm
	Primary to Chassis (Basic)	2.5		mm
Isolation Creepage	Primary to Secondary (Reinforced)	12		mm
	Primary to Chassis (Basic)	4		mm
Leakage Current	Medical: 265Vac, 63Hz, 25°C		1500	uA

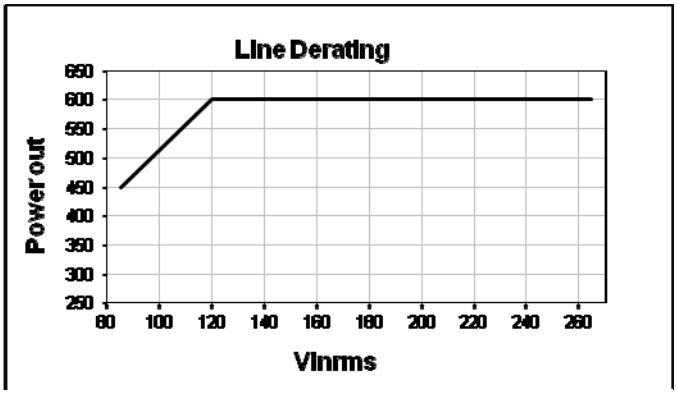
ENVIRONMENTAL					
	Parameter	Details	Min	Max	Units
Storage	Temperature		-40	+85	°C
	Humidity	Relative, non-condensing	5	95	%
	Altitude		-200	5000	m
	Air Pressure		54	106	kPa
Operation	Temperature	Full Power Derate input and output at 2.5% / °C	-20 50	50 70	°C °C
	Humidity	Relative, non-condensing	5	95	%
	Altitude	(-200 to 2000m for UL60601-1)	-200	3000	m
	Noise Level	Measured 1m from fan intake		45	dBA
	Shock	3000 bumps at 10G (16mS) half sine wave			
	Vibration	1.5G 10 to 200Hz sine wave, 20G for 15min in 3 axes random vibration			

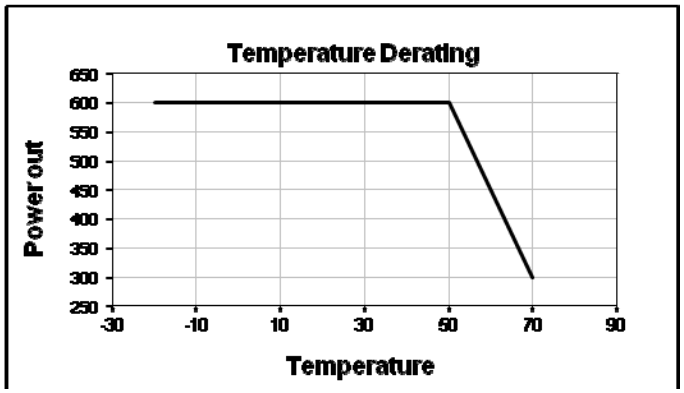
EMC			
	Parameter	Standard	Level
Emissions	Radiated Electric Field	EN55011, EN55022, FCC	B
	Conducted Emissions	EN55011, EN55022, FCC	B
	Harmonic Distortion	EN61000-3-2	Compliant
	Flicker & Fluctuation	EN61000-3-3	Compliant
Immunity	Electrostatic Discharge	EN61000-4-2 (15kV air, 8kV contact)	4
	Radiated RFI	EN61000-4-3 (10 V/m)	3
	Fast Transient Burst	EN61000-4-4 (4kV)	4
	Input Line Surges	EN61000-4-5 (1kV L-N, 2kV L-E)	3
	Conducted RFI	EN61000-4-6 (10V)	4
	Power Freq. Magnetic Field	EN61000-4-8 (10A/m)	3
	Voltage Dips	EN61000-4-11 (EN55024)	Compliant

MECHANICAL	
Parameter	Details
Size	77.7mm x 133.7mm x 41mm (all external dimensions ± 1.0mm)
Weight	360 gram + 60 gram per output module
Mounting	Bottom or Side mounting (See diagram for details)

AGENCY APPROVALS			
Standard	Details	Standard	Details
IEC/EN60601-1	UL: E316486		
UL60601-1	UL: E316486		
CSA-C22.2 No.60601-1-03			
CE Mark	LVD 73/23/EEC		
CB certificate and report available on request			

INPUT ELECTRICAL GRAPHS





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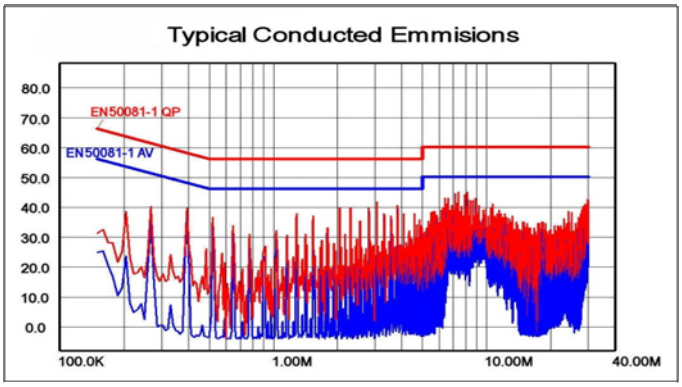
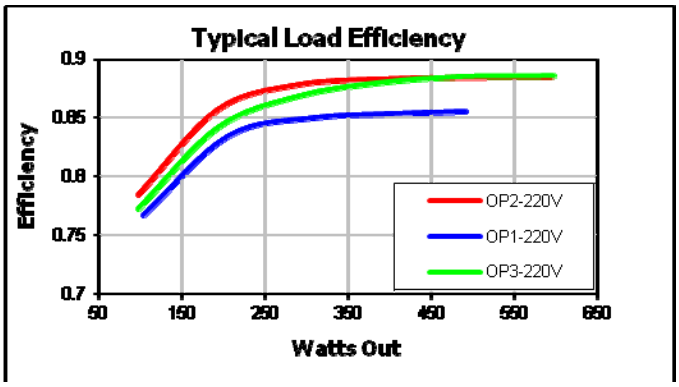
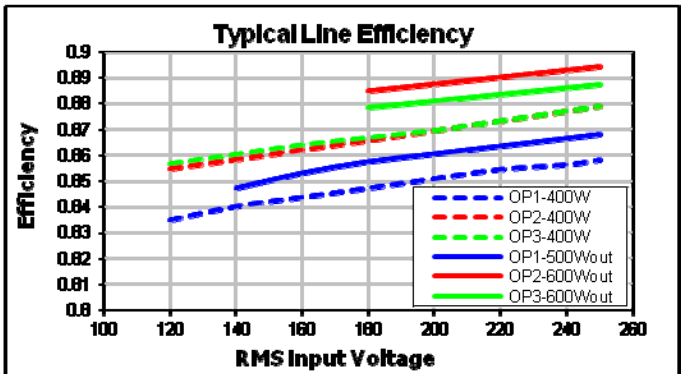
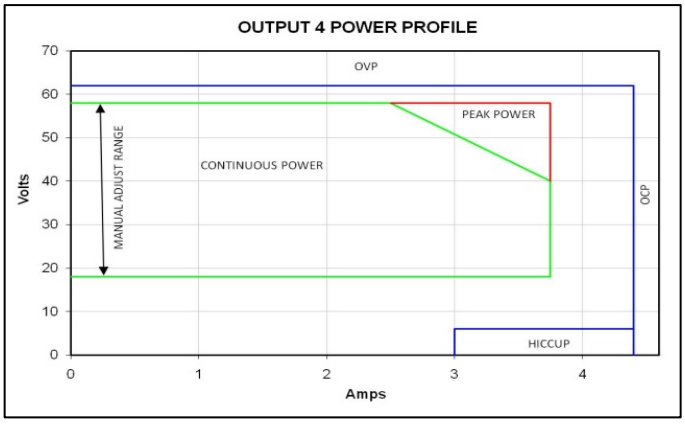
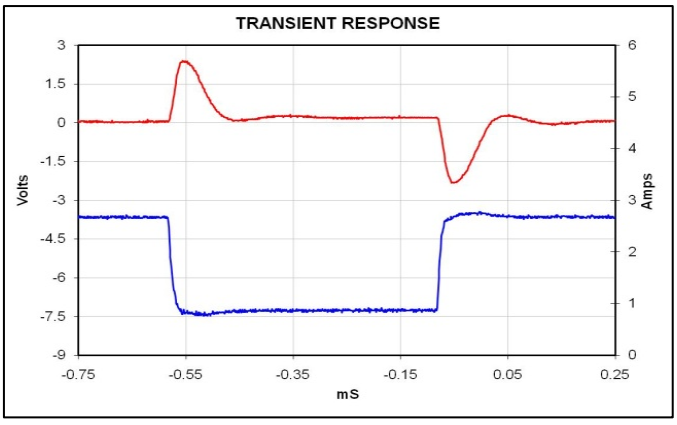


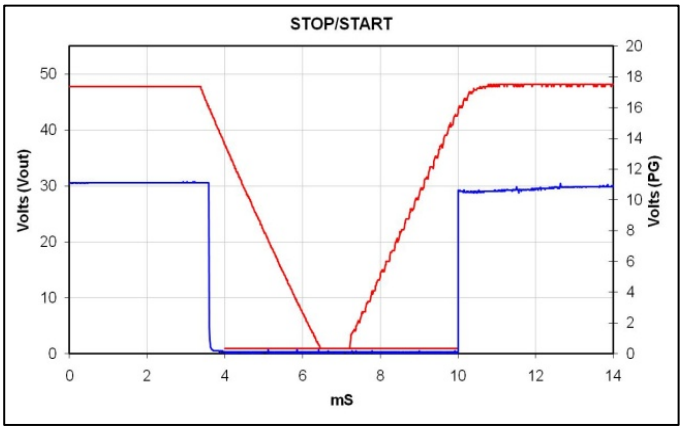


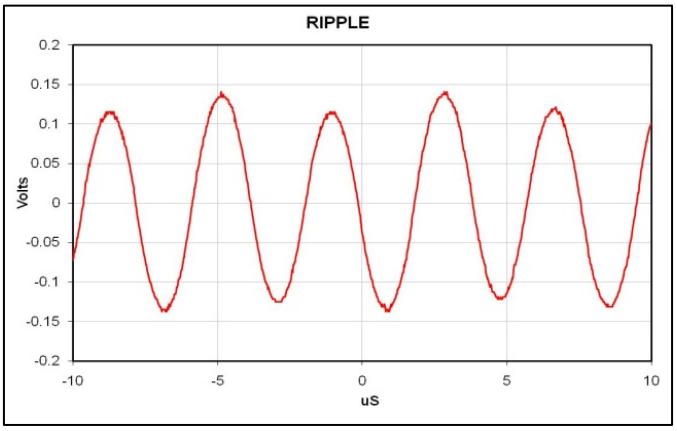


OUTPUT ELECTRICAL GRAPHS









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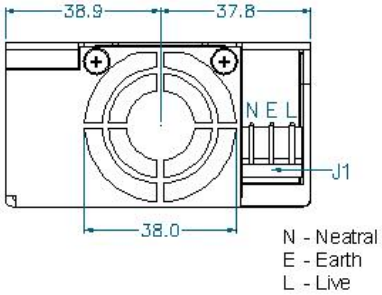
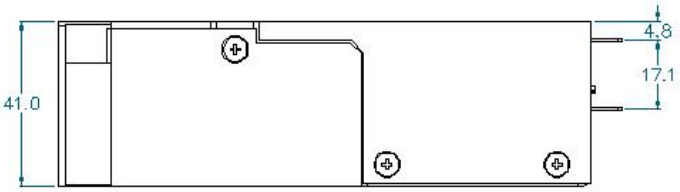
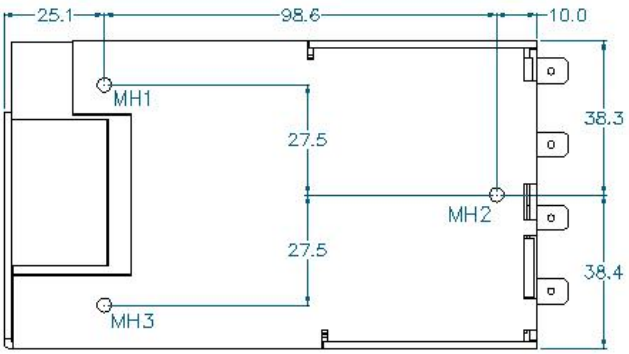
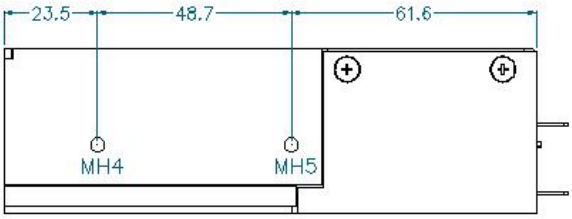
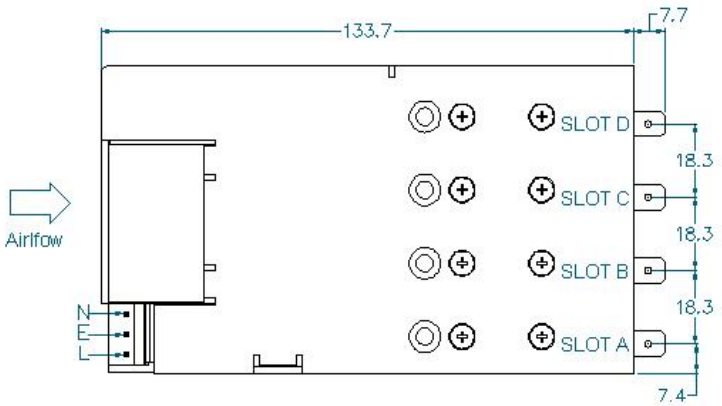
MECHANICAL DIMENSIONS AND MOUNTING SCREWS











SCREWS	
MH1, MH2, MH3, MH4, MH5	
Screw type	M4
Tightening	Tighten to 1.5 Nm
Penetration depth	4.00mm max including chassis
OUTPUT MODULES x 8	
Screw type	M3x5, C/Sink, Posi, Stainless Steel
Tightening	Tighten to 0.75 Nm
Penetration depth	Defined by screw
CHASSIS x 5	
Screw type	M3x5, C/Sink, Posi, Stainless Steel
Tightening	Tighten to 0.75 Nm
Penetration depth	Defined by screw
FAN x 2	
Screw type	M3x24, C/Sink, Posi, Stainless Steel
Tightening	Tighten to 0.75 Nm
Penetration depth	Defined by screw

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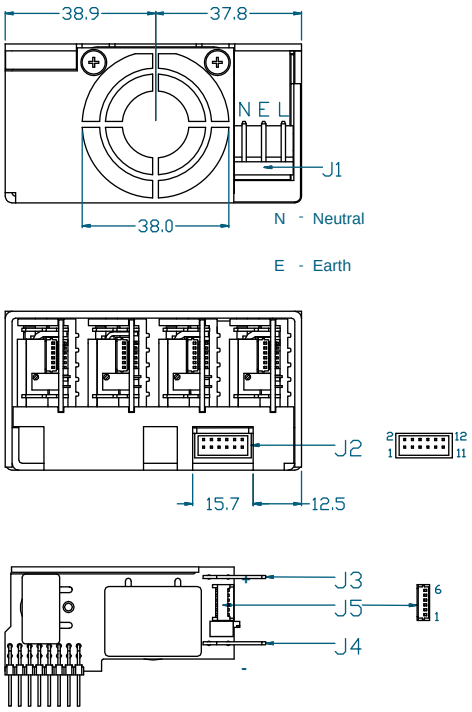
CONNECTORS

PINOUTS		
J1		
Circuit	**Details**	
1	Live	
2	Earth	
3	Neutral	
J2		
Circuit	**Details**	
1	Power Good	Slot A
2	Inhibit	
3	Power Good	Slot B
4	Inhibit	
5	Power Good	Slot C
6	Inhibit	
7	Power Good	Slot D
8	Inhibit	
9	Global Inhibit	
10	AC OK	
11	+5V 200mA Bias Supply	
12	COM	
J5		
Circuit	**Details**	
1	-Sense	
2	+Sense	
3	Voltage Control	
4	Current Control / Share / Out	
5	COM	
6	+5V local bias supply	



J3
Positive Output
J4
Negative Output

REF.	DETAILS	MANUFACTURER		TERMINAL
J1	MAINS INPUT: 3 Pin, 5.08mm, with Friction Lock, 18-24 AWG	MOLEX		8701031
J2	GLOBAL SIGNALS: 12 Pin, 2mm, with Friction Lock, 24-30 AWG	MOLEX		503948051
J2	IDT ALTERNATIVE FOR J2	MOLEX		0875681263
J3/4(1)	OUTPUT POWER TERMINAL: TAB SIZE 6.35mmx0.8mm	VARIOUS		VARIOUS
J5	OUTPUT SIGNALS: 6 Pin, 1.25mm, with Friction lock, 28-32 AWG	MOLEX	1510210600	50058800

Notes
1. Terminal and Wire current rating must exceed maximum short circuit output current. Eg. Output 1 = 25A*1.25 = 31.25Amps
2. Direct equivalents may be used for any connector parts
3. All cables must be rated 105°C min, equivalent to UL1015

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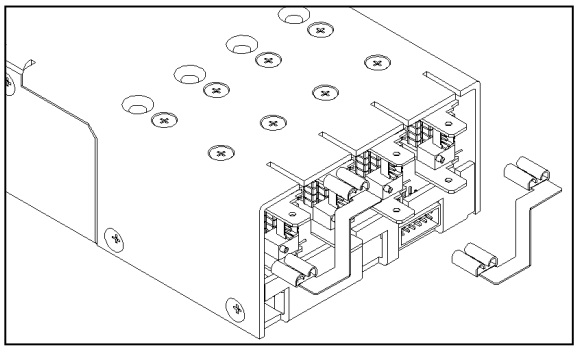
Seriesed outputs

NEVO output modules of the same type can be seriesed in any number to achieve higher output voltages, even across multiple chassis. Below is an illustration of a mechanical connection to series connect two output modules in Slot A and B with a series connector shown separately. For example if there is a requirement for 80Vdc it can be achieved by connecting two OP4 outputs in series. By repeating steps 1 to 5 above insert two OP4 output modules, one each in Slot A and B (or any other slot as the configuration requires). Adjust each of the OP4 output modules to 40Vdc as per step 5. Connect the two OP4 output modules in series using the series connector. The series connector connect the negative output of the OP4 output module in Slot A to the positive output of the OP4 output module in Slot B. Measure the output voltage between the positive output terminal of OP4 output module in Slot A and the negative output terminal of OP4 output module in Slot B. You should measure 80Vdc. For more information on how to connect two or more modules in series please see the 'Seriesed Outputs' section in the Nevo Series Installation Notes.



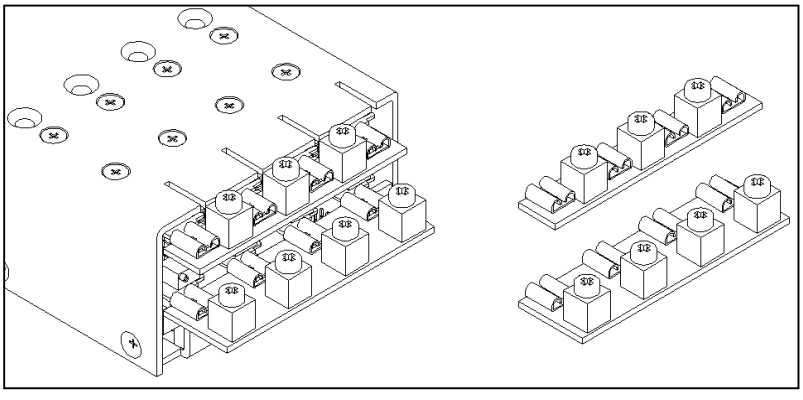
WARNING!

Energy and voltage hazards may arise when individual modules are seriesed. When safe energy and voltage levels are exceeded ensure that an appropriate warning label is affixed to the power supply in a manner that service personnel will always notice it. See the Safety section for more details.

Paralleled outputs

NEVO output modules of the same type can be paralleled in any number within the same chassis to achieve higher output currents. For best performance, the output voltages of each paralleled module should be adjusted as close as possible. For more accurate current sharing J5.4 on each of the modules where accurate sharing is desired, needs to be connected together. To achieve this connection Vox Power has a range of sharing links available. Please discuss your requirements with your distributor or with Vox Power before ordering your unit. For more information on how to connect two or more modules in parallel please see the 'Paralleled Outputs' section in the Nevo Series Installation Notes following this section.

Below is an illustration of a mechanical connection to parallel connect four modules and the connector shown separately to the right. Connector sets to connect 2, 3 and 4 modules in parallel are available from Vox Power.



WARNING!

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