NEVO+600M

MEDICAL DATASHEET

AC/DC Modular Configurable PSU



600W
Powerful

5" x 3" x 1.61"
Small

600g
Light

600 Watts in the palm of your hand.

The NEVO+600M configurable power supply is the smallest in its class, the ultimate power solution for demanding medical applications where size, power density and weight are vital factors. Weighing only 600 grams, the compact 5" x 3" x 1.61" package delivers up to 600 Watts, equating to a power density of 25 Watts per cubic inch.

The input module can accommodate up to four isolated output modules, ranging from 75W dual output to 150W or 300W single output, which can easily be configured into a high power 5"x 3" single output power supply or a multiple output power supply with up to eight isolated outputs. A low noise fan option is available for use in even the quietest of environments.

3 YEAR WARRANTY

MAIN FEATURES & BENEFITS

- Powerful 600 Watt
- Small 5" x 3" x 1.61", 25W/in^3
- Weighs only 600g when fully configured
- User & field configurable
- Up to 8 isolated outputs
- 300W dual slot output modules
- Wide output voltage adjust range
- Remote current/voltage programming
- Constant current & voltage operation
- Efficiency up to 90%
- Intelligent fan control for optimised airflow
- Parallel & series connection of modules
- Accurate current sharing
- Standard 5V 1A bias supply
- Low noise fan option
- Series tracker & I^{2}C options
- Supplier & technology consolidation
- 24-hour samples from distribution
- Instant fully safety approved power solutions based on proven technology
- Approved to latest safety standards: IEC/UL60601-3rd Ed & IEC/UL60601-1-2 4th Ed (EMC)
- Expert technical support
- 3 year warranty

APPLICATIONS

MEDICAL · LAB & ANALYSIS · DISPLAY · LED · LASER · ROBOTICS · COMM

- Medical & diagnostic equipment
- Test & Measurement equipment
- Robotics
- Oil & Gas
- Telecommunications
- Laboratory & Analysis equipment
- Display
- Avionics
- Lasers
- LED lighting
- Retrofit of legacy PSUs

SAFETY UL COMPLIANT · SAFETY CE COMPLIANT · ENVIRONMENTAL Conflict Minerals COMPLIANT · ENVIRONMENTAL Proposition 65 COMPLIANT · ENVIRONMENTAL REACH COMPLIANT · ENVIRONMENTAL RoHS Directive (EU) 2015/863 COMPLIANT · ENVIRONMENTAL SCIP COMPLIANT · ENVIRONMENTAL TSCA COMPLIANT · ENVIRONMENTAL GreenSoft Technology, Inc. VERIFIED

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SPECIFICATIONS

All specifications are measured @ TA= 25°C, rated input & rated load unless otherwise stated.

INPUT MODULE SPECIFICATIONS

Parameter	Details	Min	Typical	Max	Units
AC Input Voltage	Nominal range is $100V_{RMS}$ to $240V_{RMS}$	85		264	V_{RMS}
AC Input Frequency	Contact factory for 400Hz operation.	47	50/60	63	Hz
DC Input Voltage	Not covered by safety approvals. Contact Vox Power.	120		300	V_{DC}
Output Power Rating	De-rate linearly from 600Watts at $120V_{RMS}$ to 450Watts at $85V_{RMS}$			600	Watts
Input Current	600Watts output at 120 V_{RMS} input			6	Amps
Input Current Limit	Maintains power factor		8		Amps
Inrush Current	$265V_{RMS}$, 25°C (cold start)			20	Amps
Fusing	Live line fused (5x20 Fast acting)			8	Amps
Efficiency	See graphs		86	89	%
No load Power consumption	All outputs fitted and disabled/enabled		21/28		Watts
Power Factor	Typical value for 300 Watts output at 240Vrms input		0.96	0.99	
Holdup	600Watts output at $120V_{RMS}$ input	17	20	21	mS
UVP	Turn on under voltage protection	78		84	V_{RMS}
Over temperature	Internally monitored.	115		125	°C
Reliability [1]	Input module			1.207	FPMH
	Fan			2.7	FPMH
Warranty	Standard terms and conditions apply			3	Years
Size	133.7 (L) x 77.7 (W) x 41.0 (H). See diagram for tolerance details				mm
Weight	360 + 60 per output module				Grams
Note 1.	30°C base & ambient, 100% load, SR332 Issue 2 Method I, Case 3, Ground, Fixed, Controlled				

GLOBAL SIGNALS SPECIFICATIONS

Parameter	Details	Min	Typical	Max	Units
Bias Voltage	One isolated Bias Output available	4.8	5	5.2	Volts
Bias Current	Hiccup type current limit	0		1	Amps
AC_OK Voltage	Low output level	0	0.2	1	Volts
	High output level	3.5	4.5	5.2	
AC_OK Current		-10		20	mA
Power Good Voltage	Low output level. internal 10kΩ pull down.	0	0	0	Volts
	High output level. PNP open collector.	8	10	15	
Power Good Current	Open collector output. Current source only. All Slots.			20	mA
Global Inhibit Voltage	Low input level	0		1	Volts
	High input level	3		15	
Global Inhibit Current	5k input impedance.	0.6		3	mA
Inhibit Voltage	Low input level. All slots.	0		1	Volts
	High input level. All slots.	2.5		15	
Inhibit Current	10k input impedance. All slots.	0.25		1.5	mA

OUTPUT MODULE SPECIFICATION SUMMARY

MODEL	Output Voltage			Output Current	Rated Power	Peak [4] Power	Load Reg.	Line Reg.	Cross Reg.	Ripple & Noise	FPMH [1]	Feature Set [2]
	Min.	**Nom.**	Max.									
OP1	1.5V	**5V**	7.5V	25A	125W	187.5W	±50mV	±5mV	±10mV	$50mV_{PP}$	0.5	ABCDEFG
OP1D	0V	**5V**	7.5V	25A	125W	187.5W	±50mV	±5mV	±10mV	$50mV_{PP}$	0.5	ABCDEFGI
OP2	4.5V	**12V**	15V	15A	150W	225W	±100mV	±12mV	±24mV	$120mV_{PP}$	0.5	ABCDEFG
OP2D	0V	**12V**	15V	15A	150W	225W	±100mV	±12mV	±24mV	$120mV_{PP}$	0.5	ABCDEFGI
OP3	9V	**24V**	30V	7.5A	150W	225W	±150mV	±24mV	±48mV	$240mV_{PP}$	0.5	ABCDEFG
OP3D	0V	**24V**	30V	7.5A	150W	225W	±150mV	±24mV	±48mV	$240mV_{PP}$	0.5	ABCDEFGI
OP4	18V	**48V**	58V	3.75A	150W	217.5W	±300mV	±48mV	±96mV	$480mV_{PP}$	0.5	ABCDEFG
OP4D	0V	**48V**	58V	3.75A	150W	217.5W	±300mV	±48mV	±96mV	$480mV_{PP}$	0.5	ABCDEFGI
OP5	3.3V	**12V**	15V	5A	2x 75W	2x 75W	±50mV	±12mV	±24mV	$240mV_{PP}$	0.75	AFG
OPA2[3]	4.5V	**12V**	15V	25A	300W	375W	±100mV	±12mV	±24mV	$120mV_{PP}$	0.5	ABCDEFGH
OPA2D[3]	0V	**12V**	15V	25A	300W	375W	±100mV	±12mV	±24mV	$120mV_{PP}$	0.5	ABCDEFGHI
OPA3[3]	9V	**24V**	30V	15A	300W	450W	±150mV	±24mV	±48mV	$240mV_{PP}$	0.5	ABCDEFGH
OPA3D[3]	0V	**24V**	30V	15A	300W	450W	±150mV	±24mV	±48mV	$240mV_{PP}$	0.5	ABCDEFGHI

Note 1. Output module, 30°C base, 100% load, SR332 issue 2 Method I, Case 3, Ground, Fixed, Controlled

Note 2. A = Remote Sense, B = External Voltage control, C = External constant current control, D = Current output signal, E = Current share, F =Over Voltage protection, G = Over Temperature Protection, H = Dual Slot module, I = PMBus interface

Note 3. Can only be used with NEVO+600 chassis with date codes from 2048 onwards. e.g. 2048C080000 can use A2 or A3 module, 2047C089999 and before cannot use A2 or A3 module.

Note 4. Individual Output Module Peak Power available < 5 seconds @ 50% duty cycle, Overall Input Module power must remain within specified limits.

Note 5. Minimum Output levels achievable when using V-control and I-control may be >0 due to the minimum on-time of the PWM controllers

SAFETY SPECIFICATIONS

Parameter	Details	Typical	Max	Units
Isolation Voltages	Input to Output (2 MOPP). Do not perform test on assembled unit[1]		4000	V_{AC}
	Input to Chassis (1 MOPP)		1500	V_{AC}
	Global signals (J2) to Output/Chassis		250	V_{DC}
	Output to Output/Chassis (Standard modules)		250	V_{DC}
Earth Leakage Current	Normal condition, 264Vac, 63Hz, 25°C	209	300	uA
Touch Leakage Current	Output to Earth. Standard modules 264Vac, 63Hz, 25°C NC/SFC	13/209	20/250	uA
Patient Leakage Current	Standard modules 264Vac, 63Hz, 25°C NC/SFC[2]		-----	uA

Note 1. Testing an assembled unit to $4000V_{AC}$ may cause damage. Please refer to application note (APN-002) on Vox Power website or contact Vox Power representative.
Note 2. Not Applicable

INSTALLATION SPECIFICATIONS

Parameter	Details	Parameter	Details
Equipment class	I	Flammability Rating	94V-2
Overvoltage category	II	Ingress protection rating	IP10
Material Group	IIIb (indoor use only)	ROHS compliance	2011/65/EU & 2015/863/EU
Pollution degree	2	Intended usage environment	Home Healthcare

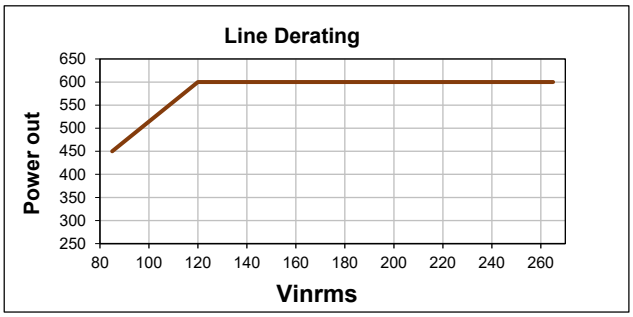
ENVIRONMENTAL SPECIFICATIONS						
Parameter	Details	Non-Operational		Operational		Units
		Min	Max	Min	Max	
Air Temperature	Operational limits subject to appropriate de-ratings	-40	+85	-20	70	℃
Humidity	Relative, non-condensing	5	95	5	95	%
Altitude		-200	5000	-200	3000	m
Air Pressure		52	106	69	106	kPa
Noise Level	Variable. Measured 1m from fan intake.	-	-	36	62	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					

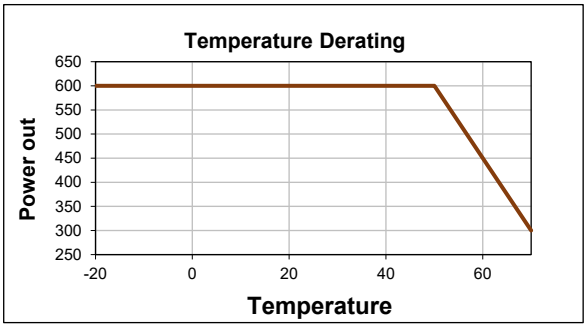
ELECTROMAGNETIC COMPLIANCE – EMISSIONS		
Phenomenon	Basic EMC Standard	Test Details
Radiated emissions, electric field	EN55011/32, FCC	Class B compliant
Conducted emissions	EN55011/32, FCC part 15, CISPR 32/11	Class B compliant
Harmonic Distortion	IEC61000-3-2	Compliant
Flicker & Fluctuation	IEC61000-3-3	Compliant

ELECTROMAGNETIC COMPLIANCE – IMMUNITY		
Phenomenon	Basic EMC Standard	Test Details
Electrostatic discharge	IEC61000-4-2	Test level 4: 15kV air, 8kV contact
Radiated RF EM fields	IEC61000-4-3	Test Level 3: (10V/m, 80MHz-2.7GHz) sine wave AM 80% 1kHz
Proximity fields from RF wireless communications equipment	IEC61000-4-3	Test levels as per IEC60601-1-2:2014 Table 9
Electrical Fast Transients/bursts	IEC61000-4-4	Test Level 3: (2kV Power, 1kV I/O) 5kHz(ed3) & 100kHz(ed4)
Surges	IEC61000-4-5	Test Level 3: 1kV L-N, 2kV L/N-E
Conducted disturbances induced by RF fields	IEC61000-4-6	Test Level 3: 10V, 0.15 to 80Mhz sine wave AM 80% 1kHz
Power Frequency Magnetic Fields	IEC61000-4-8	Test level 4: 30A/m 50Hz
Voltage Dips	IEC61000-4-11& SEMI-F47-0706 [2]	0% 10ms, 0% 20ms, 80% 1s, 80% 10s, 90% continuous (Criterion A) 70% 0.5s, 40% 0.2s (Criterion A at 240V and Criterion B at 100V)
Voltage interruptions	IEC61000-4-11	0% 250/300 cycle as per IEC60601-1-2:2014 (Criterion B)

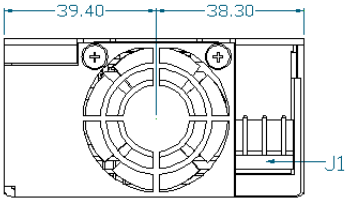
Notes:
1. Criterion A = No degradation of performance or loss of function.
   Criterion B = Temporary degradation of performance or loss of function is allowed, provided the function is self-recoverable.
   Criterion C = Temporary loss of function is allowed but requires operator intervention to recover.
2. Tested at nominal range (100V to 240V). Line deratings applied where appropriate.

AGENCY APPROVALS		
Standard	Details	File
IEC 60601-1:2005 + CORR1 2006 + CORR2: 2007 + A1:2012	Medical electrical equipment Part 1: General requirements for basic safety and essential performance	UL: E316486
EN60601-1:2006 + A11:2011 + A1:2013 + A12:2014	Medical electrical equipment Part 1: General requirements for basic safety and essential performance	
CAN/CSA-C22.2 No. 60601-1 (2008)	Medical Electrical Equipment Part 1: General Requirements for Basic Safety and Essential Performance	
ANSI/AAMI ES60601-1 (2005 + C1:09 + A2:10)	Medical Electrical Equipment Part 1: General Requirements for Basic Safety and Essential Performance	
CE MARK	LVD 2014/35/EU, EMC 2014/30/EU, RoHs 2011/65/EU & 2015/863/EU	
CB certificate and report available on request		

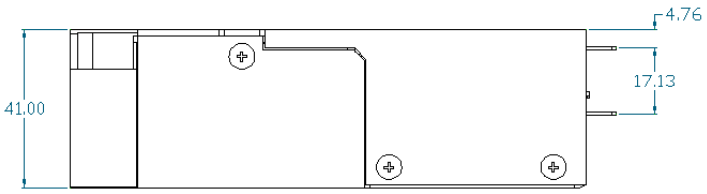


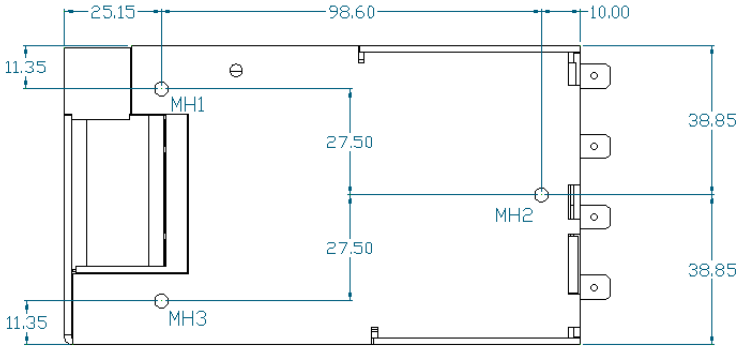


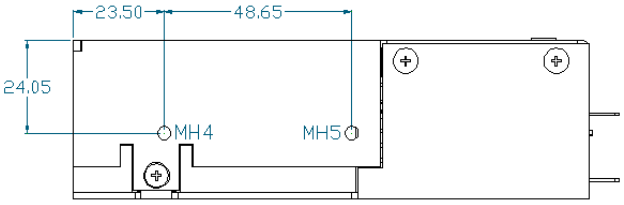
MECHANICAL DIMENSIONS AND MOUNTING SCREWS

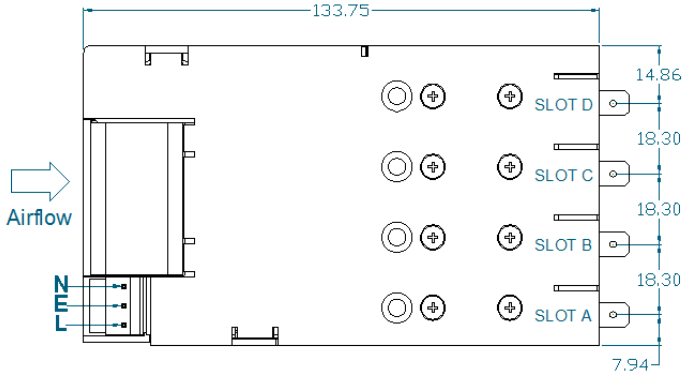


N - Neutral
E - Earth
L - Live



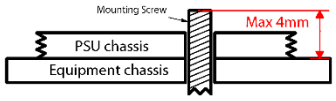






SCREWS	
MH1, MH2, MH3, MH4, MH5	
Screw type	M4
Tightening	Tighten to 0.5 Nm [1]
Penetration depth	4.00mm max including chassis

Mounting Screw Penetration Depth



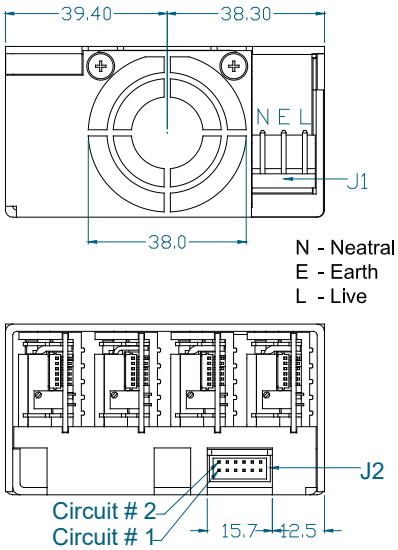
OUTPUT MODULES x 8	
Screw type	M3x5, C/Sink, Posi, Stainless Steel
Tightening	Tighten to 0.50 Nm [1]
Penetration depth	Defined by screw
CHASSIS x 5	
Screw type	M3x5, C/Sink, Posi, Stainless Steel
Tightening	Tighten to 0.50 Nm [1]
Penetration depth	Defined by screw
FAN x 2	
Screw type	M3x30, C/Sink, Posi, Stainless Steel
Tightening	Tighten to 0.50 Nm [1]
Penetration depth	Defined by screw

1. Torque settings are for general reference only. The torque settings shown in the datasheet are the insert manufacturers recommended values.

Airflow direction cannot be reversed

CONNECTORS

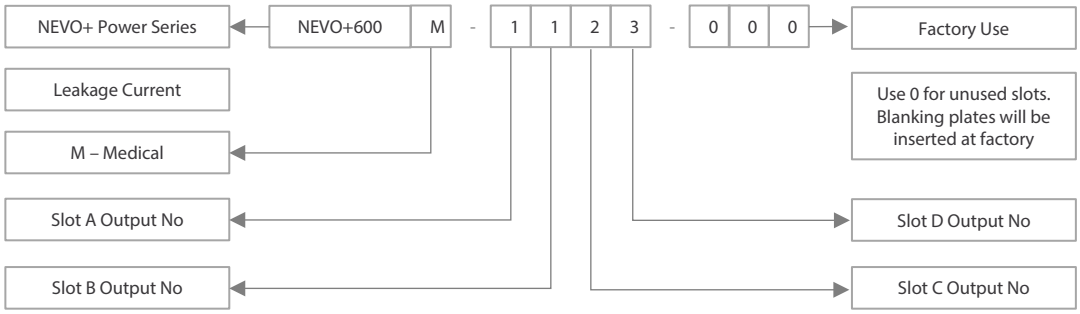
PINOUTS J1		
Circuit	Details	
1	Live	
2	Earth	
3	Neutral	
J2		
Circuit	Details	
1	Power good	Slot A
2	Inhibit	
3	Power good	Slot B
4	Inhibit	
5	Power good	Slot C
6	Inhibit	
7	Power good	Slot D
8	Inhibit	
9	Global inhibit	
10	AC OK	
11	+5V 1A bias supply	
12	COM	



REF.	DETAILS	MANUFACTURER	HOUSING	TERMINAL
J1	MAINS INPUT: 3 Pin, 5.08mm, with Friction Lock, 18-24 AWG	MOLEX	10013036	0008701031
J2	GLOBAL SIGNALS: 12 Pin, 2mm, without Friction Lock, 24-30 AWG	MOLEX	511101251	0503948051

Notes
1. Direct equivalents may be used for any connector parts

PART NUMBERING SYSTEM



Our design team will assist with value-add requirement if an application requires standard/non-standard accessories or non-nominal voltage settings. Once approved, the factory will issue a 3 or 4 digit code for your specific configuration which can be used for all future orders of the same configuration. When ordering an input unit with no outputs inserted, simply order NEVO+600M.

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