NEVO+1200M

MEDICAL DATA SHEET

AC/DC Modular Configurable PSU

1200W
Powerful
6″ x 6″ x 1.61″
Small
1.2kg
Light

The Ultimate 1200 Watt Configurable Solution

The NEVO+1200M is the smallest in its class and the ultimate power solution for medical applications where size, weight, low standby power and primary side inhibit are vital factors and delivers up to 1200 Watts from a 1.2kg 6″ x 6″ x 1.61″ package. Each configured unit consists of an input module with up to eight output modules, where any combination of outputs can be fitted to create a power solution with up to sixteen isolated outputs. Standard features include intelligent fan control, wide output voltage adjust capability and primary side shutdown with standby power consumption of less than 3 Watts. A low noise fan option with virtually silent operation is also available, which allows you to use this innovative power supply in even the quietest of environments. The series carries full IEC/UL60601-1 3rd edition & IEC/UL60601-1-2 4th edition safety approvals, complies with EN61000 Immunity, EN55022-B EMC Standards and features market leading specifications and design in application support.

MAIN FEATURES

- Up to 1200 Watts of output power
- Primary side remote on/off function
- Standby power ≤ 3 Watts
- 6″ x 6″ x 1.61″ footprint
- Low noise fan option
- IEC/UL60601-1 Ed. 3 & -1-2 Ed. 4 (EMC)
- Industry leading power density (21W/in^3)
- Lightest modular design – only 1.2kg – 1000Watts/kg
- Efficiency up to 89%
- Remote current / voltage programming
- Accurate current sharing
- Parallel and series connection of modules
- 2 x 5V 1A bias supply
- Field configurable
- RoHS compliant
- 3 Year warranty

APPLICATIONS

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

CUSTOMER BENEFITS

- Fast time to market
- 24 hrs samples from distribution
- Safety & EMC certified
- World class engineering support
- Proven technology
- Eliminates custom design costs
- Field replaceable
- Low cost of ownership
- Technology consolidation
- Supplier consolidation

SPECIFICATIONS

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		370	V_{DC}
Output Power Rating	De-rate linearly from 1200Watts at 120V_{RMS} to 850Watts at 85V_{RMS}			1200	Watts
Input Current	1200Watts output at 120V_{RMS} input			12	Amps
Input Current Limit	Maintains power factor		14		Amps
Inrush Current	265V_{RMS}, 25°C (cold start)			40	Amps
Fusing	Live line fused (5x20 Fast acting)			12.5	Amps
Efficiency	See graphs		86	89	%
No load Power consumption	All outputs fitted and disabled/enabled		32/46		Watts
Standby Power	Latched off state, 120Vrms		2.5		Watts
Power Factor			0.96	0.99	
Holdup	1200Watts 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			1.62	FPMH
	Fan (2 Fans per unit)			2.7	FPMH
Warranty	Standard terms and conditions apply			3	Years
Size	154.5 (L) x 152.4 (W) x 41.0 (H). See diagram for tolerance details				mm
Weight	720 + 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	Two isolated Bias Outputs available	4.8	5	5.2	Volts
Bias Current	Hiccup type current limit	0		1	Amps
AC_OK Voltage	Low output level High output level	0 3.5	0.2 4.5	1 5.2	Volts
AC_OK Current		-10		20	mA
Power Good Voltage	Low output level. internal 10kΩ pull down. High output level. PNP open collector.	0 8	0 10	0 15	Volts
Power Good Current	Open collector output. Current source only. All Slots.			20	mA
Global Inhibit Voltage	Low input level High input level	0 3		1 15	Volts
Global Inhibit Current	5k input impedance.	0.6		3	mA
Inhibit Voltage	Low input level. All slots. High input level. All slots.	0 2.5		1 15	Volts
Inhibit Current	10k input impedance. All slots.	0.25		1.5	mA
Primary Bias voltage	Medically Isolated	4.8	5	5.2	Volts
Primary Bias current	Hiccup type current limit			0.5	Amps
Primary Remote On/Off	Negative Edge Triggered, Refer to User Manual		5		Volts

OUTPUT MODULE SPECIFICATION SUMMARY

MODEL	Output Voltage			Output Current	Rated Power	Peak 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
OP2	4.5V	**12V**	15V	15A	150W	225W	±100mV	±12mV	±24mV	120mV_{PP}	0.5	ABCDEFG
OP3	9V	**24V**	30V	7.5A	150W	225W	±150mV	±24mV	±48mV	240mV_{PP}	0.5	ABCDEFG
OP4	18V	**48V**	58V	3.75A	150W	217.5W	±300mV	±48mV	±96mV	480mV_{PP}	0.5	ABCDEFG
OP5	3.3V	**12V**	15V	5A	2x 75W	2x 75W	±50mV	±12mV	±24mV	240mV_{PP}	0.75	AFG
OP8	23.2V	**24V**	24.7V	3.125A	2x 75W	2x 75W	±100mV	±24mV	±48mV	480mV_{PP}	0.75	AFG
OPA2	4.5V	**12V**	15V	25A	300W	375W	±100mV	±12mV	±24mV	120mV_{PP}	0.5	ABCDEFGH
OPA3	9V	**24V**	30V	15A	300W	450W	±150mV	±24mV	±48mV	240mV_{PP}	0.5	ABCDEFGH

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

SAFETY SPECIFICATIONS

Parameter	Details	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	300	uA
Touch Leakage Current	Standard modules NC/SFC	20/200	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	°C
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.	-	-	42	65	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	EN55011/22, FCC	Class A compliant (See note for Class B)
Conducted emissions	EN55011/22, FCC part 15, CISPR 22/11	Class B compliant
Harmonic Distortion	IEC61000-3-2	Compliant
Flicker & Fluctuation	IEC61000-3-3	Compliant

Note: To meet Class B radiated emissions the end user should add ferrites to I/P and O/P cables. Consult Vox Power for details.

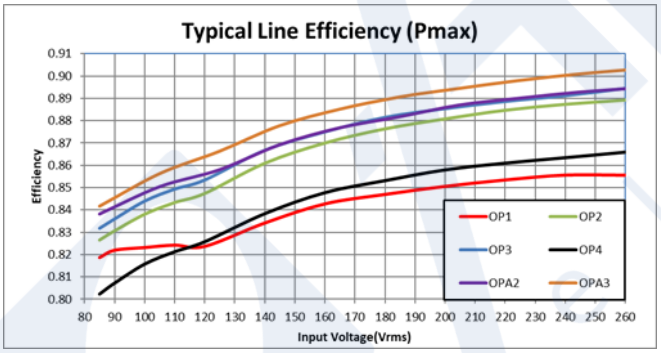
ELECTROMAGNETIC COMPLIANCE – IMMUNITY

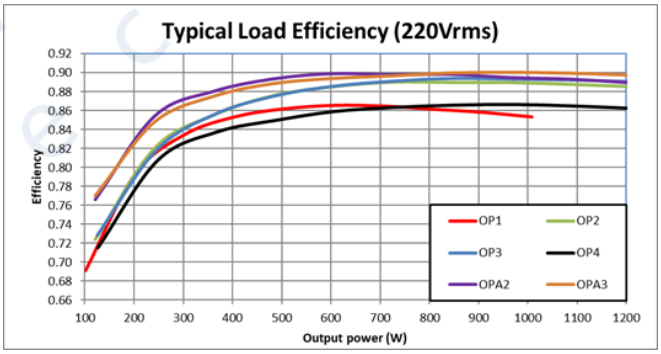
Phenomenon	Basic EMC Standard	Test Details
Electrostatic discharge	IEC61000-4-2	Test level 4: 15kV air, 8kV contact
Radiated RF EM fields	IEC61000-4-3	Test Level 3: (10V/m, 80MHz-2.7GHz) sine wave AM 80% 1kHz
Proximity fields from RF wireless communications equipment	IEC61000-4-3	Test levels as per IEC60601-1-2:2014 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-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)

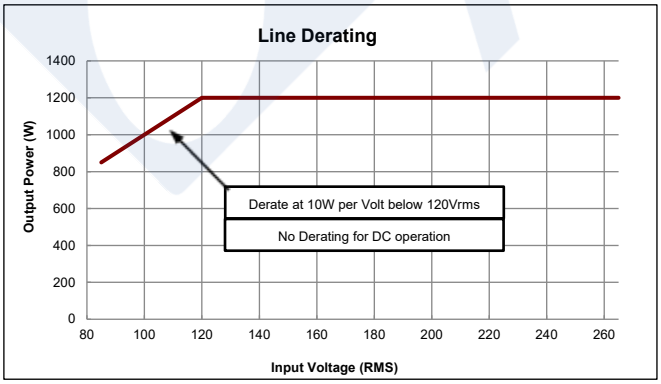
Notes:
1. Criterion A = No degradation of performance or loss of function.
   Criterion B = Temporary degradation of performance or loss of function is allowed, provided the function is self-recoverable.
   Criterion C = Temporary loss of function is allowed but requires operator intervention to recover.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

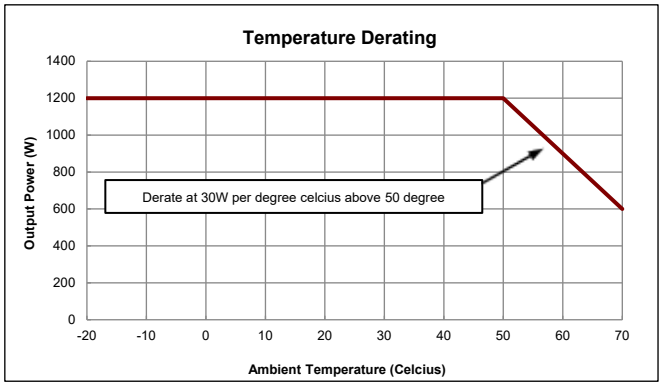
AGENCY APPROVALS

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	
CB certificate and report available on request		

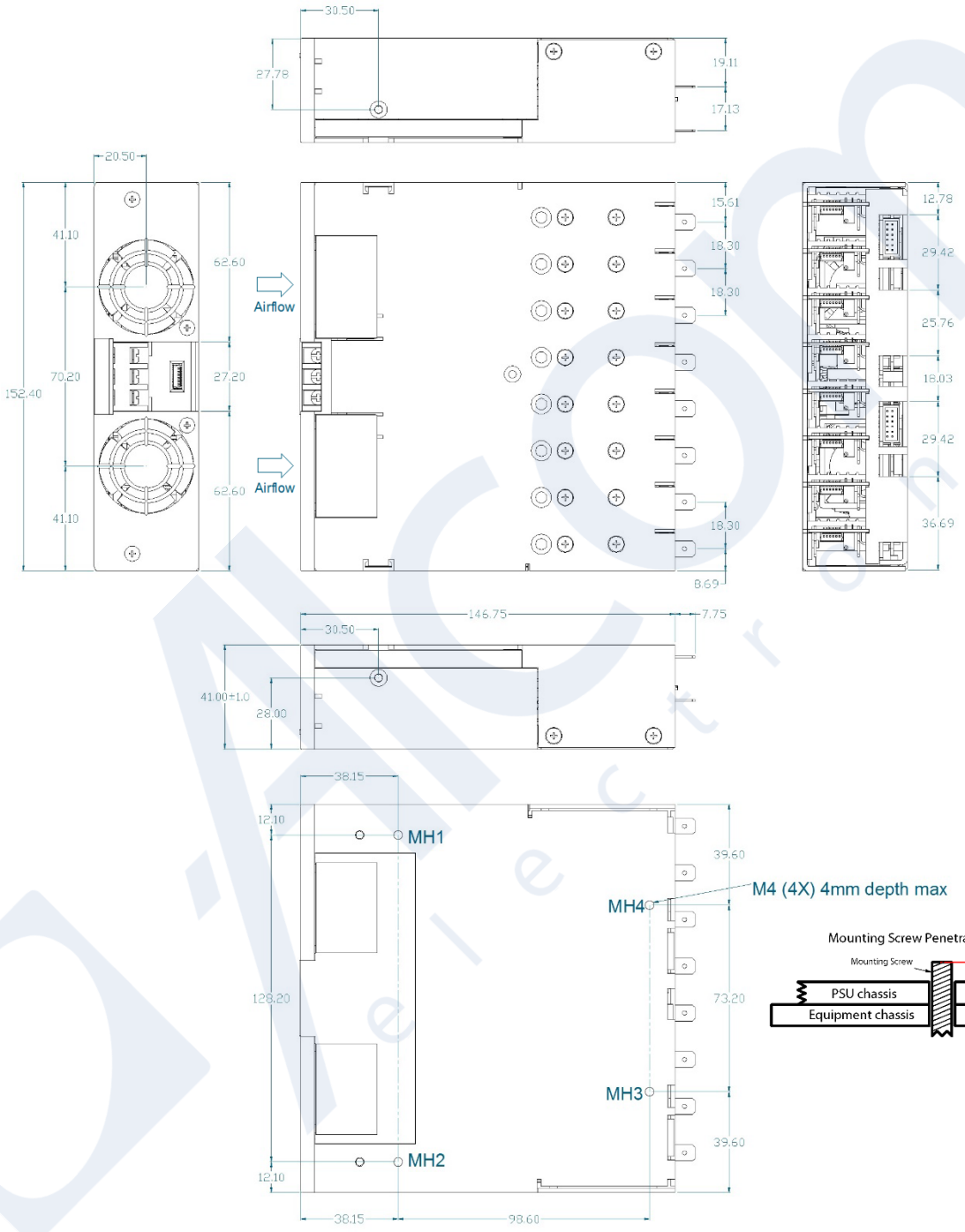








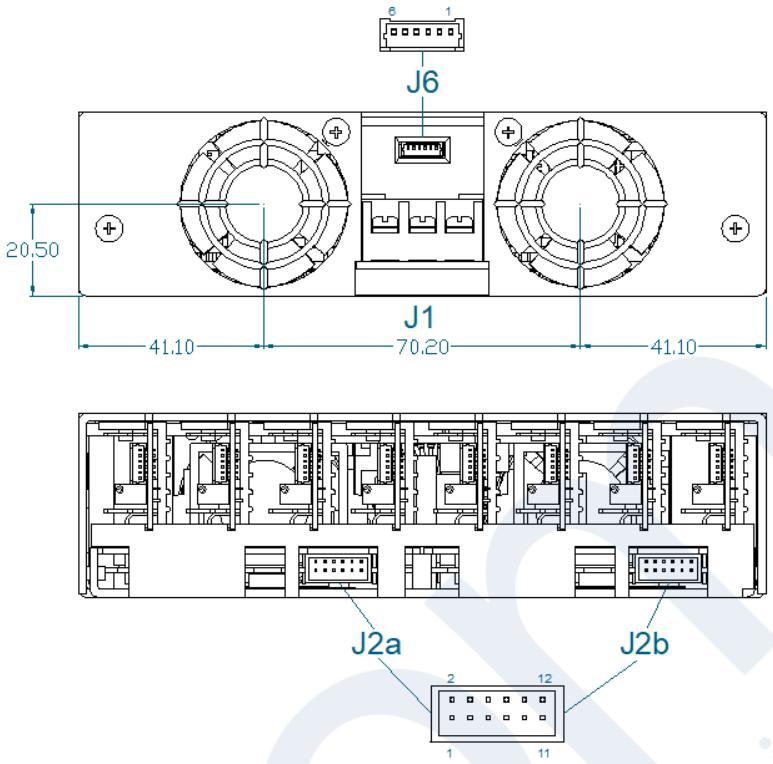
MECHANICAL DIMENSIONS AND MOUNTING			
SCREWS			
LOCATION	DETAILS	PENETRATION	TIGHTENING
MOUNTING	M4	4mm max, including chassis	0.5 NM
OUTPUT MODULES	M3 x 5, Countersink Posi, 16 Places	Defined by screw	0.5 NM
CHASSIS LID AND FACEPLATE	M3 x 5, Countersink Posi, 9 Places M3 x 30, Countersink Posi, 2 Places	Defined by screw	0.5 NM
Torque settings are for general reference only. The torque settings shown are the insert manufacturers recommended values.			



TOLERANCES unless otherwise stated - All dimensions in mm and according to DIN 2768-1/-2 CLASS C
Airflow direction cannot be reversed

CONNECTORS

PINOUTS		
J1		
Circuit	**Details**	
1	Live	
2	Earth	
3	Neutral	
J2a/b		
Circuit	**Details**	
1	Power Good	Slot A and E
2	Inhibit	
3	Power Good	Slot B and F
4	Inhibit	
5	Power Good	Slot C and G
6	Inhibit	
7	Power Good	Slot D and H
8	Inhibit	
9	Global Inhibit	
10	AC OK	
11	+5V 1A Bias Supply	
12	COM	
J6		
1	Common	
2	+5V 500mA Bias	
3	Shut Down	
4	Reserved	
5	Reserved	
6	Reserved	

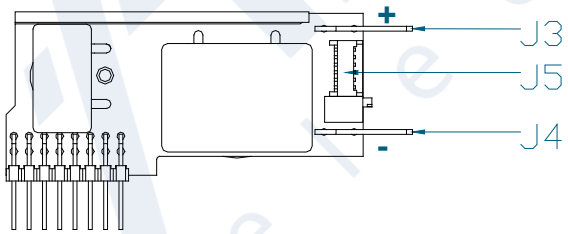


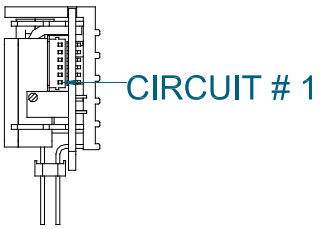
REF.	DETAILS	MANUFACTURER	HOUSING	TERMINAL
J1	MAINS INPUT: 3 Pin, Barrier, 6-32 Steel Screws, 0.8 NM or 7IN LB Torque Cable 14-18AWG, 300V, 16A, 105°C, use appropriately rated fork or ring terminal.	MOLEX		
J2a/b	GLOBAL SIGNALS: 12 Pin, 2mm, without Friction Lock, 24-30 AWG	MOLEX	511101251	503948051
J6	INPUT BIAS: OUTPUT SIGNALS: 6 Pin, 1.25mm, with Friction lock, 28-32 AWG	MOLEX	510210600	500588000

Notes
1. Direct equivalents may be used for any connector parts.
2. All cables must be rated 105°C min, equivalent to UL1015

SINGLE OUTPUT MODULE CONNECTORS

PINOUTS	
J3	
Circuit	**Details**
1	Positive output
J4	
Circuit	**Details**
1	Negative output
J5	
Circuit	**Details**
1	-Sense
2	+Sense
3	Voltage control
4	Current control / share / out
5	COM
6	+5V local bias supply

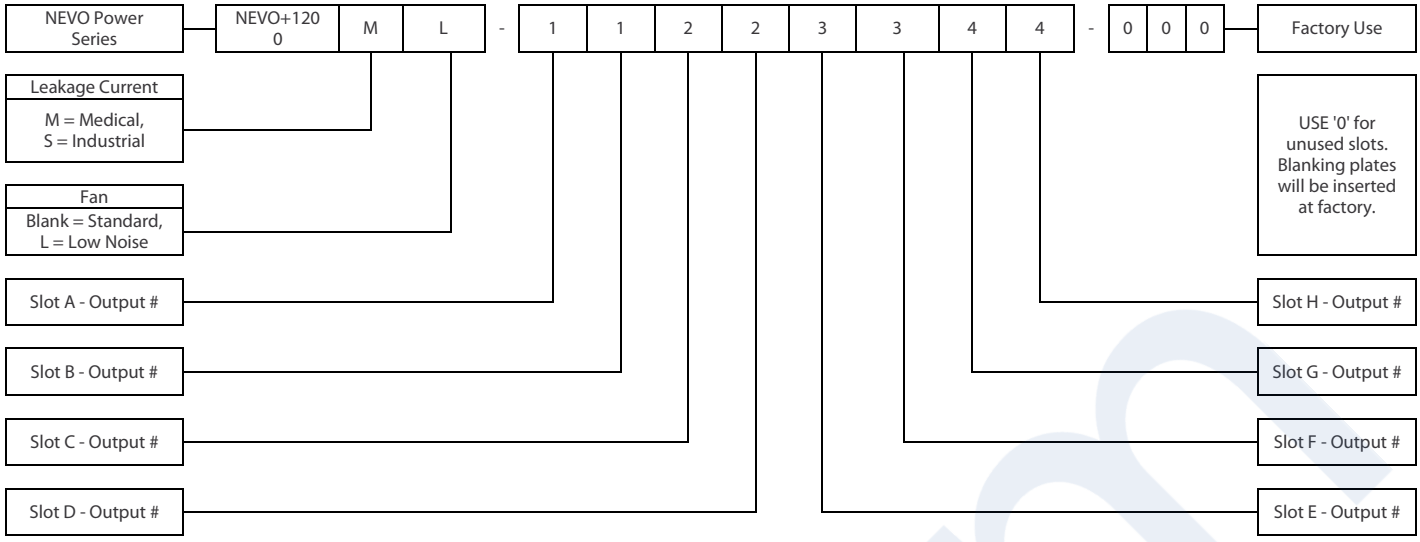




REF.	DETAILS	MANUFACTURER	HOUSING	TERMINAL
J1	MAINS INPUT: 3 Pin, 5.08mm, with Friction Lock, 18-24 AWG	MOLEX	10013036	0008701031
J2	GLOBAL SIGNALS: 12 Pin, 2mm, without Friction Lock, 24-30 AWG	MOLEX	511101251	0503948051
J3/4(1)	OUTPUT POWER TERMINAL: TAB SIZE 6.35mmx0.8mm	VARIOUS		VARIOUS
J5	OUTPUT SIGNALS: 6 Pin, 1.25mm, with Friction lock, 28-32 AWG	MOLEX	0510210600	0500588000

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

PART NUMBERS AND ORDERING INFORMATION



Industrial input module has ITE approvals (IEC60950 & IEC62368), Medical input module has medical approvals (IEC60601)
Contact your Distributor or Vox Power for special configuration requirements. The factory may allocate a 3 digit suffix to identify such requirements.
When ordering an input unit with no outputs inserted, use NEVO+1200M/ML or NEVO+1200S/SL.