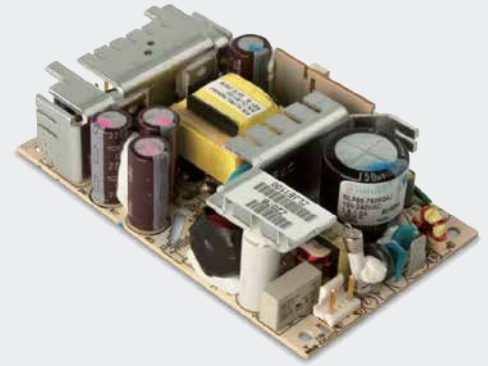


ARTESYN NLP65-M SERIES

Single, Dual and Triple Output



Advanced Energy's Artesyn NLP65-M series of open-frame AC-DC power supplies comprises six single, dual and triple output models, covering standard voltages from -15 V to 24 V. All six models accept a universal input of 85—264 Vac and feature medical safety approvals, with a very low safety ground leakage current of less than 95 microamps. Comprehensive overvoltage and short-circuit protection is provided as standard. NLP65-M series power supplies provide 65 watts of output power with free air convection cooling and 75 watts with 20 CFM of forced air. Less than 1U high, they are ideal for a wide variety of medical, laboratory and dental applications such as centrifuges, incubators and infusion pumps.

DATA SHEET

Total Power:

65 W

Input Voltage:

85 - 264 Vac

of Outputs:

Single, Dual, Triple

SPECIAL FEATURES

- 85 VAC to 264 VAC universal input range
- Harmonic current correction as standard
- Maximum component height 1.26 inches
- UL, CSA and VDE safety approvals
- Overvoltage and short circuit protection
- 5 x 3 x 1.26 inch (127.0 x 76.2 x 32 mm) footprint
- Available RoHS compliant
- Two year warranty

SAFETY

- UL60601-1/CAN/CSA-C22.2 No. 60601-1-M90
- VDE License No. 121949 under EN60601-1/IEC60601-1

ELECTRICAL SPECIFICATIONS

Input		
Input voltage range	Universal input (see Note 2)	85 - 264 Vac
Input frequency range		47 - 63 Hz
Input current (cold start)	120 Vac 230 Vac	120 Vac 230 Vac
Safety ground leakage current	264 Vac, 60 Hz	95 μ A
Input current	120 Vac 230 Vac	1.05 A rms 0.51 A rms
Input fuse		250 Vac, 3.15 A
Output		
Output power	Natural convection	65 W max.
Total regulation (line and load)		See table
Rise time	At turn-on	1.0 s, max
Transient response	Main output 25% step at 0.1 A/ μ s	5.0% max. dev., 1ms recovery to 1.0%
Temperature co-efficient		\pm 0.02%/ $^{\circ}$ C
Oversvoltage protection	Main outputs	125%, \pm 0%
Short circuit protection	Cyclic operation	Yes

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

EMC CHARACTERISTICS

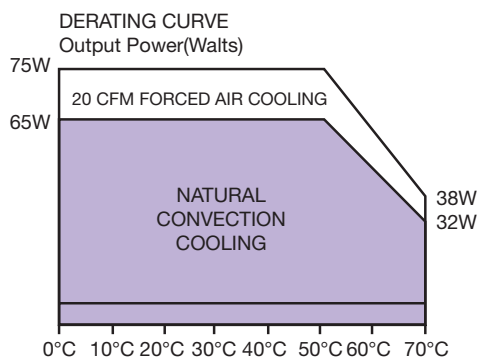
Conducted emissions	EN55022, FCC part 15	Level A
Radiated emissions	EN55022, FCC part 15	Level A
ESD air	EN61000-4-2, level 3	Perf. criteria 1
ESD contact	EN61000-4-2, level 4	Perf. criteria 1
Surge	EN61000-4-5, level 3	Perf. criteria 1
Fast transients	EN61000-4-4, level 3	Perf. criteria 1
Radiated immunity	EN61000-4-3, level 3	Perf. criteria 2
Conducted immunity	EN61000-4-6, level 3	Perf. criteria 2

GENERAL SPECIFICATIONS

Hold-up time	120 Vac, 60 Hz	16 ms @ 65 W
Efficiency	120 Vac, 65 W	72% typical
Isolation voltage	Input/output Input/chassis	4000 Vac 1500 Vac
Switching frequency	Fixed	100 kHz, ±5 kHz
Approvals and standards	EN60601-1, IEC60601-1	
Weight	283 g (10 oz)	
MTBF demonstrated	MIL-HDBK-217F	150,000 hours

ENVIRONMENTAL SPECIFICATIONS

Thermal performance	Operating (See derating curve)	0 °C to +70 °C
	Non-operating	-40 °C to +85 °C
	0 °C to 50 °C, ambient, convection cooled	65 W
	50 °C - 70 °C ambient, convection cooled	Derate to 50% load
	Peak (0 °C to 50 °C, 60 s)	See table
Relative humidity	Non-condensing	5 to 95% RH
Altitude	Operating	10,000 feet max.
	Non-operating	30,000 feet max.
Vibration (See Note 5)	5-500 Hz	2.4 G rms approx.
Shock	per MIL-STD-810E	516.4 Part IV



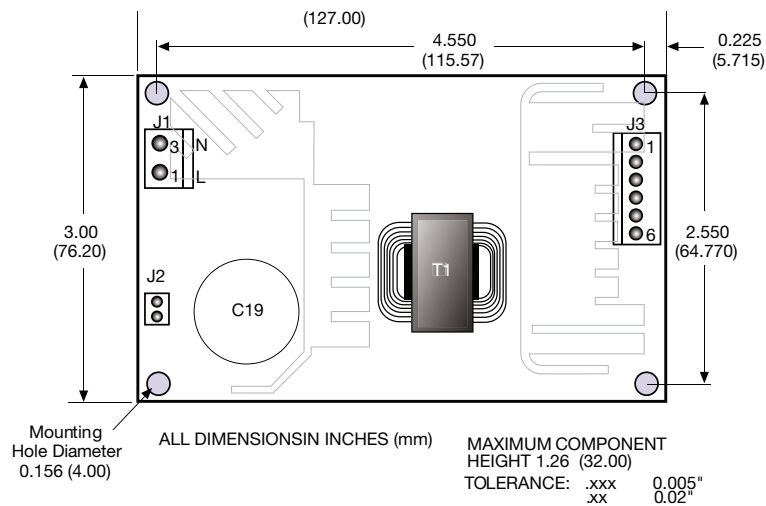
ORDERING INFORMATION

Output Voltage	Output Current			Ripple ⁽⁴⁾	Total Regulation ⁽⁶⁾	Model Number ^(11,12)
	Max ⁽¹⁾	Peak ⁽³⁾	Fan ⁽¹⁰⁾			
+5 V	7 A	9.1 A	8 A	50 mV	± 2.0%	NLP65-9908J
+12 V	2.5 A	3.3 A	3 A	150 mV	± 5.0%	
-12 V	0.5 A	0.81 A	1 A	120 mV	± 5.0%	
+5 V	7 A	9.1 A	8 A	50 mV	± 2.0%	NLP65-9920J
+24 V	2 A	2.6 A	2 A	240 mV	± 5.0%	
+5 V	7 A	9.1 A	8 A	50 mV	± 2.0%	NLP65-9929J
+12 V	2.5 A	3.3 A	3 A	150 mV	± 5.0%	
+12 V	5.4 A	7 A	6.5 A	120 mV	± 2.0%	NLP65-9912J
+15 V	4.4 A	5.7 A	5.3 A	150 mV	± 2.0%	NLP65-9915J
+24 V	2.7 A	3.5 A	3.5 A	240 mV	± 2.0%	NLP65-9924J

Notes

1. Natural convection cooling. Models NLP65-9929J, and NLP65-9908J must not exceed 62.5 Watts continuous output power with natural convection. Model NLP65-9920J not to exceed 65 Watts continuous output power with natural convection.
2. When the input voltage is less than 90 Vac the operating temperature range is 0 °C to +40 °C. The ripple and regulation specifications may not be met.
3. Peak output current lasting less than 60 seconds with duty cycle less than 5%. During peak loading, output voltage may exceed total regulation limits.
4. Figure is peak-to-peak for convection power rating. Output noise measurements are made across a 20 MHz bandwidth using a 6 inch twisted pair, terminated with a 10 µF electrolytic capacitor and a 0.1 µF ceramic capacitor.
5. Three orthogonal axes, random vibration 10 minutes for each axes, 2.4 G rms 5 Hz to 500 Hz.
6. To maintain stated regulation then:
For single output units: $I \geq 0.2 \text{ A}$ I max.
For multiple output units: $0.25 \leq I(A)/I(B) \leq 5$, for $I(A) \geq 0.2 \text{ A}$ I(A) max.
7. For optimum reliability, no part of the heatsink should exceed 120°C, and no semiconductor case temperature should exceed 130°C.
8. CAUTION: Allow a minimum of 1 second after disconnecting line power when making thermal measurements.
9. This product is a Component Power Supply and is only for inclusion by professional installers within other equipment and must not be operated as a standalone product. EMC compliance to appropriate standards must be verified at the system level. This product is for sale to OEMs and System Integrators, including through Distribution Channels. It is not intended for sale to End Users.
10. Maximum continuous output power for all multiple output models must not exceed 75 Watts with 20 CFM forced air cooling at 50°C.
11. The 'J' suffix indicates that these parts are Pb-free (RoHS 6/6) compliant.
12. NOTICE: Some models do not support all options. Please contact your local Artesyn Embedded Power representative or use the on-line model number search tool at <http://www.artesyn.com> to find a suitable alternative.
13. This product is a Component Power Supply and is only for inclusion by professional installers within other equipment and must not be operated as a standalone product. EMC compliance to appropriate standards must be verified at the system level. This product is for sale to OEMs and System Integrators, including through Distribution Channels. It is not intended for sale to End Users.

MECHANICAL DRAWING



INPUT PIN CONNECTIONS

J1	
Pin 1	AC Line
Pin 2	No Pin
Pin 3	AC Neutral
J2	
Pin 1	Safety Ground

OUTPUT PIN CONNECTIONS

J3	SINGLE	DUAL	TRIPLE
Pin 1	No Connection	V (B)	V (B)
Pin 2	V (A)	V (A)	V (A)
Pin 3	V (A)	V (A)	V (A)
Pin 4	Return	Return	Return
Pin 5	Return	Return	Return
Pin 6	No Connection	No Pin	V (C)

INPUT AND OUTPUT CONNECTORS

MATING CONNECTORS

AC (J1)	Molex 26-60-4030 type or equivalent	Molex 09-50-3031 or equivalent with Molex 08-52-0113 or equivalent crimp terminals
DC (J3)	Molex 26-60-4060 or equivalent	Molex 09-50-3061 with Molex 2478 phosphor bronze crimp terminals or equivalent.



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ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE

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