

# NLP65 SERIES

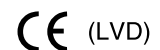
AC/DC Single & Multi Output: 65 Watts

LOW TO MEDIUM POWER AC/DC POWER SUPPLIES | 65-75 W AC/DC Universal Input Switch Mode Power Supplies | 1

- 5.0 x 3.0 inch card and 1.26 inch package (1U applications)
- Smallest industry standard package
- EN61000-3-2 compliance option (HCC)
- Overvoltage and short circuit protection
- 65 W with free air convection cooling
- EN55022, EN55011 conducted emissions level B
- EN61000-4-2,-3,-4, -5, -6 immunity compliant
- Enclosure and cover kit options
- Available RoHS compliant



The NLP65 series is a 65 W universal input ac-dc power supply on a 5 x 3 inch card with a maximum component height of 1.26 inches for use in 1U applications. Each model has the option of input harmonic current correction in the same package size making the series ideal for product designs that will need to comply with EN61000-3-2 legislation. The NLP65 provides 65 W of output power with free air convection cooling which can be boosted to 75 W with 20 CFM of air. The NLP65, with full international safety approval and the CE mark, meets conducted emissions EN55022 level B and has immunity compliance to EN61000-4-2,-3,-4, -5, -6. The series is available in a factory installed enclosure with an IEC connector and output connector on flying leads plus a cover kit for self-installation is also available as an accessory. The NLP65 series is designed for use in low power data networking, computer and telecom applications such as hubs, routers, POS terminals, internet servers, cable modems and PABX's. This list is not exclusive as the generic feature set of the NLP65 series with industry standard output configurations provides a solution for most low power applications including many industrial applications.



**2 YEAR WARRANTY**

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

## SPECIFICATIONS

### OUTPUT SPECIFICATIONS

|                                  |  |   |
|----------------------------------|--|---|
| Total regulation (Line and load) | Main output<br>Auxiliary outputs       | ±2.0%<br>±5.0%  |
| Rise time                        | At turn-on                             | 1.0 s, max.   |
| Transient response               | Main output<br>25% step<br>at 0.1 A/µs | 5.0% or 250 mV<br>max. dev., 1ms max.<br>recovery to 1% |
| Temperature coefficient          |  | ±0.02%/°C   |
| Overvoltage protection           | Main outputs                           | 125%, ±10%  |
| Short circuit protection         | Cyclic operation                       | Continuous  |
| Minimum output current           | Single and multiple                    | (See Note 6)  |

### INPUT SPECIFICATIONS

|                                  |  |  |
|----------------------------------|--|--|
| Input voltage range              | Universal input,<br>(See Note 2)<br>NLP65-76xx<br>version only                         | 85-264 Vac<br>120-370Vdc                             |
| Input frequency range            |  | 47-63 Hz   |
| Input surge current (cold start) | 120 Vac<br>230 Vac   | 17 A max.<br>32 A max.                               |
| Safety ground leakage current    | 120 Vac, 60 Hz<br>230 Vac, 50 Hz   | 0.7 mA<br>1.4 mA                                     |
| Input current                    | 120 Vac, with PFC<br>230 Vac, with PFC<br>120 Vac, without PFC<br>230 Vac, without PFC | 1.05 A rms<br>0.51 A rms<br>1.40 A rms<br>0.80 A rms |
| Input fuse                       | UL/IEC127  | 250 Vac S 3.15 A                                     |

### EMC CHARACTERISTICS (11,12)

|                     |                      |                  |
|---------------------|----------------------|------------------|
| Conducted emissions | EN55022, FCC part 15 | Level B          |
| 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 |

### EMC CHARACTERISTICS (continued) (11,12)

|                    |                      |                  |
|--------------------|----------------------|------------------|
| 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<br>230 Vac, 50 Hz | 16 ms @ 65 W<br>78 ms @ 65 W                                      |
| Efficiency                                | 120 Vac, 65 W                    | 72% typical   |
| Isolation voltage                         | Input/output<br>Input/chassis    | 3000 Vac<br>1500 Vac  |
| Switching frequency                       | Fixed                            | 100 kHz, ±5 kHz   |
| Approvals and standards (See Notes 9, 13) |                                  | EN60950, VDE0805<br>IEC950, UL1950, CCC60950<br>CSA C22.2 No. 950 |
| Weight                                    |                                  | 283 g (10 oz)   |
| MTBF                                      | MIL-HDBK-217F                    | 150,000 hours min.  |

### GENERAL SPECIFICATIONS

|  |   |  |
|--|---|--|
| Thermal performance (See Notes 1, 3, 10) | Operating ambient,<br>(See derating curve)<br>Non-operating<br>50 °C to 70 °C ambient,<br>convection cooled<br>0 °C to 50 °C, ambient,<br>convection cooled<br>0 °C to 50 °C ambient,<br>20 CFM forced air (See Note 10)<br>Peak (0 °C to +50 °C, 60 s) | 0 °C to +70 °C<br>-40 °C to +85 °C<br>Derate to<br>50% load<br>65 W<br>75 W<br>See table |
| Relative humidity                        | Non-condensing  | 5% to 95% RH   |
| Altitude                                 | Operating<br>Non-operating  | 10,000 feet max.<br>30,000 feet max.   |
| Vibration (See Note 5)                   | 5-500 Hz  | 2.4 G rms peak   |
| Shock                                    | per MIL-STD-810E  | 516.4 Part IV  |

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LOW TO MEDIUM POWER AC/DC POWER SUPPLIES

65-75 W AC/DC Universal Input Switch Mode Power Supplies

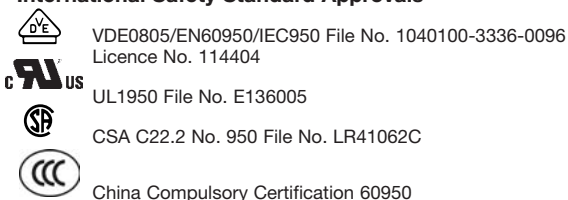
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| OUTPUT VOLTAGE          | OUTPUT CURRENT |          |          | RIPPLE (4) | TOTAL REGULATION (6) | NON-HARMONIC CORRECTED | HARMONIC CORRECTED | GROUND PIN (12,14,16,17) |
|-------------------------|----------------|----------|----------|------------|----------------------|------------------------|--------------------|--------------------------|
|                         | MAX (1)        | PEAK (3) | FAN (10) |            |                      |                        |                    |                          |
| +5 V (I <sub>A</sub> )  | 7.5 A          | 9.1 A    | 8 A      | 50 mV      | ±2.0%                | NLP65-7608J            | NLP65-9608J        | NLP65-X608GJ             |
| +12 V (I <sub>B</sub> ) | 2.5 A          | 3.3 A    | 3 A      | 150 mV     | ±5.0%                |                        |                    |                          |
| -12 V                   | 0.65 A         | 0.81 A   | 0.8 A    | 120 mV     | ±5.0%                |                        |                    |                          |
| +5 V (I <sub>A</sub> )  | 7.5 A          | 9.1 A    | 8 A      | 50 mV      | ±2.0%                | NLP65-7610J            | NLP65-9610J        | NLP65-X610GJ             |
| +15 V (I <sub>B</sub> ) | 2.2 A          | 2.9 A    | 2.5 A    | 150 mV     | ±5.0%                |                        |                    |                          |
| -15 V                   | 0.65 A         | 0.85 A   | 0.8 A    | 150 mV     | ±5.0%                |                        |                    |                          |
| +5 V (I <sub>A</sub> )  | 7 A            | 9.1 A    | 8 A      | 50 mV      | ±2.0%                | NLP65-7620J            | NLP65-9620J        | NLP65-X620GJ             |
| +24 V (I <sub>B</sub> ) | 2 A            | 2.6 A    | 2 A      | 240 mV     | ±5.0%                |                        |                    |                          |
| +5 V (I <sub>A</sub> )  | 7 A            | 9.1 A    | 8 A      | 50 mV      | ±2.0%                | NLP65-7629J            | NLP65-9629J        | NLP65-X629GJ             |
| +12 V (I <sub>B</sub> ) | 2.5 A          | 3.3 A    | 3 A      | 150 mV     | ±5.0%                |                        |                    |                          |
| +5 V                    | 10 A           | 13 A     | 12 A     | 50 mV      | ±2.0%                | NLP65-7605J            | NLP65-9605J        | NLP65-X605GJ             |
| +12 V                   | 5.4 A          | 7 A      | 6.5 A    | 120 mV     | ±2.0%                | NLP65-7612J            | NLP65-9612J        | NLP65-X612GJ             |
| +15 V                   | 4.4 A          | 5.7 A    | 5.3 A    | 150 mV     | ±2.0%                | NLP65-7615J            | NLP65-9615J        | NLP65-X615GJ             |
| +24 V                   | 2.7 A          | 3.5 A    | 3.5 A    | 240 mV     | ±2.0%                | NLP65-7624J            | NLP65-9624J        | NLP65-X624GJ             |

## Notes

- Natural convection cooling. Models NLP65-X629J, NLP65-X608J, NLP65-X610J must not exceed 62.5 Watts continuous output power with natural convection. Model NLP65-X620J not to exceed 65 Watts continuous output power with natural convection. Model NLP65-763V3J must not exceed 33 Watts continuous output power.
- 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.
- Peak output current lasting less than 60 seconds with duty cycle less than 5%. During peak loading, output voltage may exceed total regulation limits.
- 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.
- Three orthogonal axes, random vibration 10 minutes for each axes, 2.4 G rms 5 Hz to 500 Hz.
- A minimum load on the main output is required for proper start up. For multiple outputs and single +5V output, the minimum load on the +5 V is 0.2 A. For single outputs greater than +5 V the minimum load is 0.1 A. To maintain stated regulation then:  
for single output units  
 $I \geq 0.2 \text{ A}$   
for multiple output units  
 $0.25 \leq I(A)/I(B) \leq 5$ , for  $I(A) \geq 0.2 \text{ A}$ .
- For optimum reliability, no part of the heatsink should exceed 120 °C, and no semiconductor case temperature should exceed 130 °C.
- CAUTION: Allow a minimum of 1 second after disconnecting line power when making thermal measurements.
- This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.
- Maximum continuous output power for all multiple output models must not exceed 75 Watts with 20 CFM forced air cooling.
- Conducted and radiated emissions testing were performed using the standard EN55022 set-up with a stand alone NLP65 unit placed on a grounded metal plate with a line choke on the AC input and ground wires (i.e. the wires are looped through an EMI suppression toroid). For system compliance it is usually necessary to install an 'off-the-shelf' AC inlet with an integral line filter in the system chassis or to install a line choke on the input wires as close as possible to AC entry point of the system chassis. Please contact the applications group at Artesyn for assistance with EMI compliance.
- The NLP65 units with the suffix 'G' is the ground pin and ground choke option. J2, L6 and JP10 are included. J2 is a safety agency approved grounding pin, L6 is a ground choke and JP10 is a jumper. This option is intended for use in non-metallic chassis applications where grounding is not possible via the mounting screws. The ground choke is provided to assist system EMC compliance. When performing conducted emissions testing on stand alone units, the 'G' option is required to meet level B. To order simply add the suffix 'G' to the standard model number, e.g. NLP65-7608GJ, NLP65-9608GJ. This option is available for both the PFC and non-PFC versions.
- All models require a minimum mounting stand-off of 0.25 inches (6.35 mm) in the end use product.
- These standard models are available with an enclosure. To order an enclosed version, see model numbering options below.
- No PFC version, EN61000-3-2 is not applicable to this model.
- The 'J' suffix indicates that these parts are Pb-free (RoHS 6/6) compliant. TSE RoHS 5/6 (non Pb-free) compliant versions may be available on special request, please contact your local sales representative for details.
- NOTICE: Some models do not support all options. Please contact your local Artesyn representative or use the on-line model number search tool at <http://www.artesyn.com/powergroup/products.htm> to find a suitable alternative.

## International Safety Standard Approvals



## Model Numbering Options

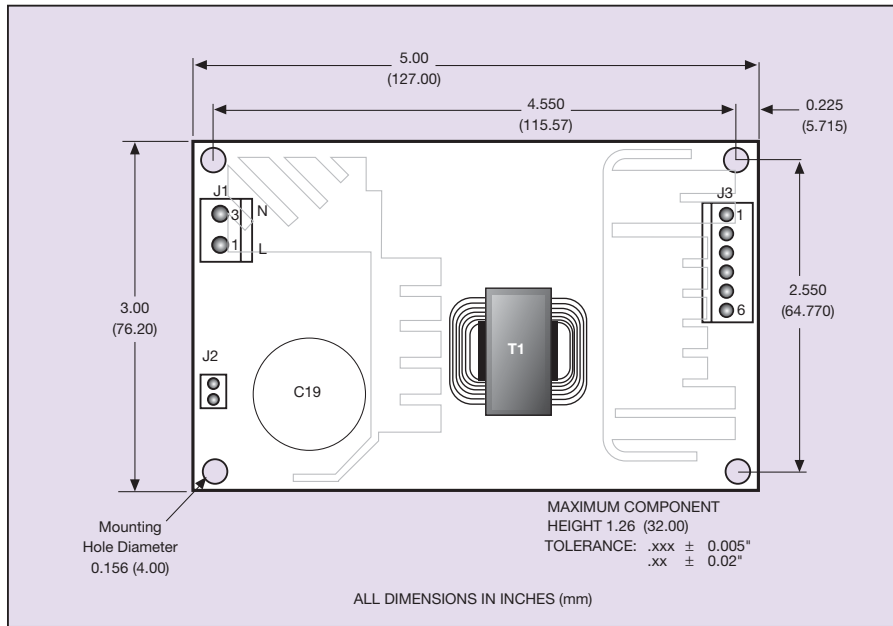
- The enclosure version includes: IEC connector, on/off switch, wire harness output connector and fitted cover. To order, please add the suffix 'E' the model number, e.g. NLP65-X608EJ. See NLP65 enclosure for details.
- A Safety earth ground pin and ground choke are available as an option. To order, please add the suffix 'G' the model number, e.g. NLP65-X608GJ.
- To order a snap-on cover (unfitted), order the part number NLP65C.
- To order a mounting bracket (unfitted), order the part number NLP65MB.

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AC/DC Single & Multi Output: 65 Watts

## Mechanical Notes

A All dimensions are in inches (mm).



| INPUT PIN CONNECTIONS   |               |
|-------------------------|---------------|
| J1                      |               |
| Pin 1                   | AC Line       |
| Pin 2                   | No Pin        |
| Pin 3                   | AC Neutral    |
| J2 (ON 'G' SUFFIX ONLY) |               |
| Pin 1                   | Safety Ground |

| OUTPUT PIN CONNECTIONS |                   |               |        |        |
|------------------------|-------------------|---------------|--------|--------|
| J3                     | SINGLE -XX05 ONLY | SINGLE        | DUAL   | TRIPLE |
| Pin 1                  | V (A)             | No Connection | V (B)  | V (B)  |
| Pin 2                  | V (A)             | V (A)         | V (A)  | V (A)  |
| Pin 3                  | V (A)             | V (A)         | V (A)  | V (A)  |
| Pin 4                  | Return            | Return        | Return | Return |
| Pin 5                  | Return            | Return        | Return | Return |
| Pin 6                  | Return            | No Connection | N/C    | V (C)  |

### Input and output connectors

**AC (J1) connector type**  
Molex 26-60-4030 type.

**DC (J3) connector type**  
Molex 26-60-4060 type.

### Mating connectors

**AC (J1) mating connector type**  
Molex 09-50-3031 or equivalent with Molex 08-50-0105 or equivalent crimp terminals.

**DC (J3) mating connector type**  
Molex 09-50-3061 with Molex 2478 phosphor bronze crimp terminals or equivalent.

**Note:** The input and output connectors are the same as those used on NFS40, NFN40, NAL40, NAN40 and NLP40.

