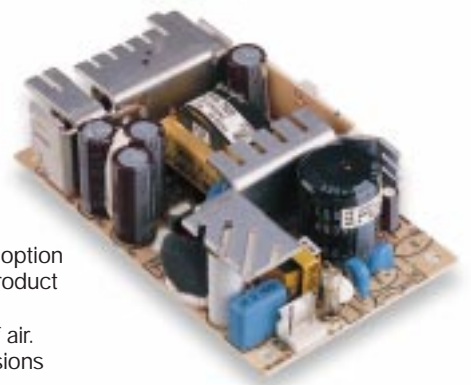


# NLP65 Series

Single, dual and triple output

- 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
- 65W 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



The NLP65 series is a 65W 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 65W of output power with free air convection cooling which can be boosted to 75W with 20CFM 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.

CE (LVD)

2 YEAR WARRANTY

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

## SPECIFICATIONS

### OUTPUT SPECIFICATIONS

|                                     |                                       |  |
|-------------------------------------|---------------------------------------|--|
| Total regulation<br>(Line and load) | Main output<br>Auxiliary outputs      | ±2.0%<br>±5.0%   |
| Rise time                           | At turn-on                            | 1.0s, max.   |
| Transient response                  | Main output<br>25% step<br>at 0.1A/μs | 5.0% or 250mV<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 to 264VAC<br>120 to 370VDC                    |
| Input frequency range               |  | 47Hz to 63Hz                                     |
| Input surge current<br>(cold start) | 120VAC<br>230VAC   | 17A max.<br>32A max.                             |
| Safety ground<br>leakage current    | 120VAC, 60Hz<br>230VAC, 50Hz   | 0.7mA<br>1.4mA                                   |
| Input current                       | 120VAC, with PFC<br>230VAC, with PFC<br>120VAC, without PFC<br>230VAC, without PFC | 1.05A rms<br>0.51A rms<br>1.40A rms<br>0.80A rms |
| Input fuse                          | UL/IEC127  | 250VAC S 3.15A                                   |

### 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                                    | 120VAC, 60Hz<br>230VAC, 50Hz  | 16ms @ 65W<br>78ms @ 65W                                      |
| Efficiency                                      | 120VAC, 65W                   | 72% typical   |
| Isolation voltage                               | Input/output<br>Input/chassis | 3000VAC<br>1500VAC  |
| Switching frequency                             | Fixed                         | 100kHz, ±5kHz   |
| Approvals and<br>standards<br>(See Notes 9, 13) |                               | EN60950, VDE0805<br>IEC950, UL1950, BABT<br>CSA C22.2 No. 950 |
| Weight  |                               | 283g (10 oz)  |
| MTBF  | MIL-HDBK-217F                 | 150,000 hours min.  |

### GENERAL SPECIFICATIONS

|   |   |  |
|---|---|--|
| Thermal performance<br>(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>20CFM forced air (See Note 10)<br>Peak (0°C to +50°C, 60s) | 0°C to +70°C<br>-40°C to +85°C<br>Derate to<br>50% load<br>65W<br>75W<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)                      | 5Hz to 500Hz  | 2.4G rms peak  |
| Shock                                       | per MIL-STD-810E  | 516.4 Part IV  |

# NLP65 Series

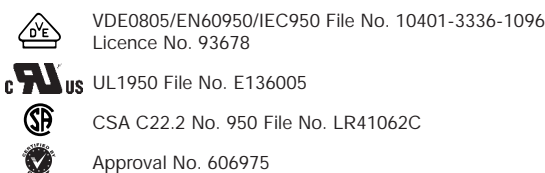
Single, dual and triple output

| OUTPUT<br>VOLTAGE      | OUTPUT CURRENT |          |          | RIPPLE (4) | TOTAL<br>REGULATION (6) | NON-HARMONIC<br>CORRECTED | HARMONIC<br>CORRECTED | GROUND<br>PIN (12, 14) |
|------------------------|----------------|----------|----------|------------|-------------------------|---------------------------|-----------------------|------------------------|
|                        | MAX (1)        | PEAK (3) | FAN (10) |            |                         |                           |                       |                        |
| +5V (I <sub>A</sub> )  | 7.5A           | 9.1A     | 8.0A     | 50mV       | ±2.0%                   | NLP65-7608                | NLP65-9608            | NLP65-X608G            |
| +12V (I <sub>B</sub> ) | 2.5A           | 3.3A     | 3.0A     | 150mV      | ±5.0%                   |                           |                       |                        |
| -12V                   | 0.65A          | 0.81A    | 0.8A     | 120mV      | ±5.0%                   |                           |                       |                        |
| +5V (I <sub>A</sub> )  | 7.5A           | 9.1A     | 8.0A     | 50mV       | ±2.0%                   | NLP65-7610                | NLP65-9610            | NLP65-X610G            |
| +15V (I <sub>B</sub> ) | 2.2A           | 2.9A     | 2.5A     | 150mV      | ±5.0%                   |                           |                       |                        |
| -15V                   | 0.65A          | 0.85A    | 0.8A     | 150mV      | ±5.0%                   |                           |                       |                        |
| +5V (I <sub>A</sub> )  | 7.0A           | 9.1A     | 8.0A     | 50mV       | ±2.0%                   | NLP65-7620                | NLP65-9620            | NLP65-X620G            |
| +24V (I <sub>B</sub> ) | 2.0A           | 2.6A     | 2.0A     | 240mV      | ±5.0%                   |                           |                       |                        |
| +5V (I <sub>A</sub> )  | 7.0A           | 9.1A     | 8.0A     | 50mV       | ±2.0%                   | NLP65-7629                | NLP65-9629            | NLP65-X629G            |
| +12V (I <sub>B</sub> ) | 2.5A           | 3.3A     | 3.0A     | 150mV      | ±5.0%                   |                           |                       |                        |
| +5V                    | 10.0A          | 13.0A    | 12.0A    | 50mV       | ±2.0%                   | NLP65-7605                | NLP65-9605            | NLP65-X605G            |
| +12V                   | 5.4A           | 7.0A     | 6.5A     | 120mV      | ±2.0%                   | NLP65-7612                | NLP65-9612            | NLP65-X612G            |
| +15V                   | 4.4A           | 5.7A     | 5.3A     | 150mV      | ±2.0%                   | NLP65-7615                | NLP65-9615            | NLP65-X615G            |
| +24V                   | 2.7A           | 3.5A     | 3.5A     | 240mV      | ±2.0%                   | NLP65-7624                | NLP65-9624            | NLP65-X624G            |

## Notes

- Natural convection cooling. Models NLP65-X629, NLP65-X608, NLP65-X610 must not exceed 62.5 Watts continuous output power with natural convection. Model NLP65-X620 not to exceed 65 Watts continuous output power with natural convection. Model NLP65-763V3 must not exceed 33 Watts continuous output power.
- When the input voltage is less than 90VAC 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 20MHz bandwidth using a 6 inch twisted pair, terminated with a 10µF electrolytic capacitor and a 0.1µF ceramic capacitor.
- Three orthogonal axes, random vibration 10 minutes for each axes, 2.4G rms 5Hz to 500Hz.
- 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 +5V is 0.2A. For single outputs greater than +5V the minimum load is 0.1A. To maintain stated regulation then:  
for single output units  
 $I \geq 0.2A$   
for multiple output units  
 $0.25 \leq I(A)/I(B) \leq 5$ , for  $I(A) \geq 0.2A$ .
- 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 20CFM 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. NLP65-7608G, NLP65-9608G. This option is available for both the PFC and non-PFC versions.
- All models require a minimum mounting stand-off of 0.25 inches (6.35mm) 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.

## 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' to the end of the model number, e.g. NLP65-X608E. 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' to the end of the model number, e.g. NLP65-X608G.
- To order a snap-on cover (unfitted), order the part number NLP65C.
- To order a mounting bracket (unfitted), order the part number NLP65MB.

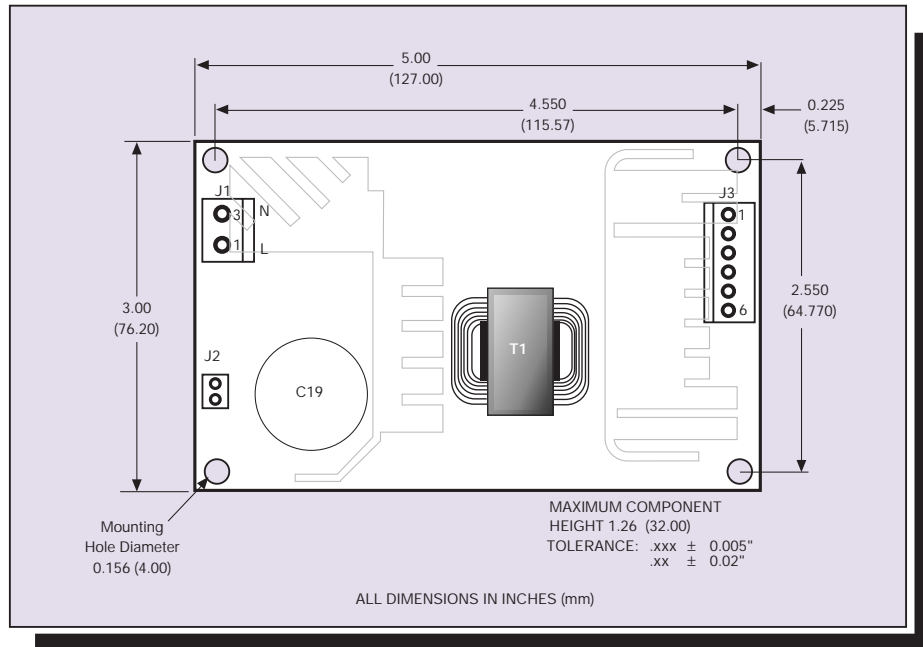
# NLP65 Series

Single, dual and triple output

For the most current data and application support visit [www.artesyn.com/powergroup/products.htm](http://www.artesyn.com/powergroup/products.htm)

## Mechanical Notes

A All dimensions are in inches (mm).



| INPUT<br>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.

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

## 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.

