

# NLP70 Series

## Triple output



LOW TO MEDIUM POWER AC/DC POWER SUPPLIES | 70 W AC/DC Universal Input Switch Mode Power Supplies

1

- Provides up to 10.5 A on either 3.3 V or 5 V
- 5.5 x 3.0 inch card and 1.26 inch package (1U applications)
- 3.3 V, 5 V and 12 V triple
- EN61000-3-2 compliant
- Overvoltage and short circuit protection
- EN55022, EN55011 conducted emissions level B
- EN61000-4-2, -3, -4, -5, -6 immunity compliant
- Mounting holes as per NLP65 series, easy upgrade
- Available RoHS compliant



CE (LVD)

2 YEAR WARRANTY

The NLP70-9693J is a 70 W (with forced air) universal input ac-dc power supply on a 5.5 x 3 inch card with a maximum component height of 1.26 inches for use in 1U applications. The model has input harmonic current correction making the series ideal for product designs that need to comply with EN61000-3-2 legislation. The NLP70 provides 52.5 W of output power with free air convection cooling which can be boosted to 70 W with 20 CFM of air. The NLP70, 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 NLP70 series is designed for use in low power data networking, computer and telecom applications using 3.3 V or 5 V logic. The NLP70 can provide the same current on either the 3.3 V or 5 V channel making it ideal for applications using a mixture of 3.3V and 5V logic or for applications in transition from 5 V to 3.3 V logic.

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

### SPECIFICATIONS

#### OUTPUT SPECIFICATIONS

|                                  |                                        |                                                            |
|----------------------------------|----------------------------------------|------------------------------------------------------------|
| Total regulation (line and load) | 3.3 V and 5 V<br>12 V                  | ±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., 1 ms max.<br>recovery to 1.0% |
| Temperature coefficient          |                                        | ±0.02%/°C                                                  |
| Overvoltage protection           | Main outputs                           | 125%, ±10%                                                 |
| Short circuit protection         | Cyclic operation                       | Continuous                                                 |
| Minimum output current           |                                        | (See Note 6)                                               |

#### INPUT SPECIFICATIONS

|                                  |                                        |                          |
|----------------------------------|----------------------------------------|--------------------------|
| Input voltage range              | Universal input                        | 90-264 Vac               |
| 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 | 1.05 A rms<br>0.55 A rms |
| Input fuse                       | UL/IEC127                              | 250 Vac S 3.15 A         |

#### EMC CHARACTERISTICS <sup>(10)</sup>

|                     |                      |         |
|---------------------|----------------------|---------|
| Conducted emissions | EN55022, FCC part 15 | Level B |
| Radiated emissions  | EN55022, FCC part 15 | Level A |
| ESD air             | EN61000-4-2, level 3 |         |
| ESD contact         | EN61000-4-2, level 4 |         |
| Surge               | EN61000-4-5, level 3 |         |
| Fast transients     | EN61000-4-4, level 3 |         |
| Radiated immunity   | EN61000-4-3, level 3 |         |

#### GENERAL SPECIFICATIONS

|                                          |                                    |                                                         |
|------------------------------------------|------------------------------------|---------------------------------------------------------|
| Hold-up time                             | 120 Vac @ 60 Hz<br>230 Vac @ 50 Hz | 16 ms @ 55 W<br>78 ms @ 55 W                            |
| Efficiency                               | 120 Vac, 65 W                      | 70% 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 8, 9) |                                    | EN60950, VDE0805<br>IEC950, UL1950<br>CSA C22.2 No. 950 |
| Weight                                   |                                    | 300 g (10.7 oz)                                         |
| MTBF                                     | MIL-HDBK-217F                      | 150,000 hours min.                                      |

#### ENVIRONMENTAL SPECIFICATIONS

|                                             |                                                                                                                                                                                                                                            |                                                                                         |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Thermal performance (See Notes 1, 2, 3, 11) | Operating ambient, (See derating curve)<br>Non-operating<br>50 °C to 70 °C ambient, convection cooled<br>0 °C to 50 °C ambient, convection cooled<br>0 °C to 50 °C ambient, 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 50% load<br>52.5 W<br>70 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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2

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

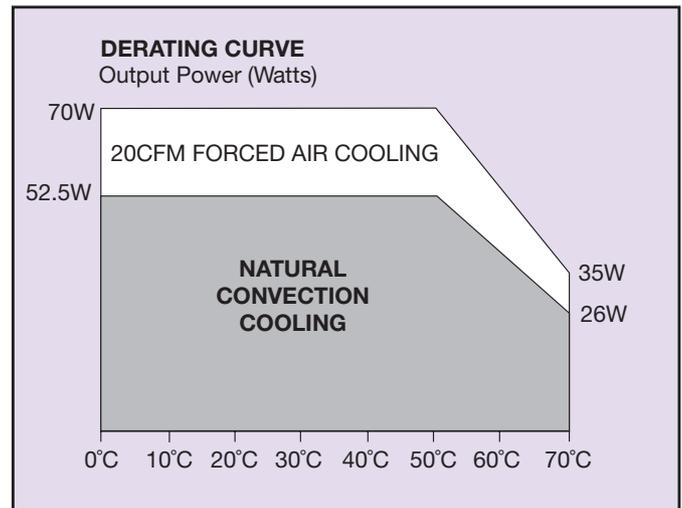
| OUTPUT VOLTAGE           | OUTPUT CURRENT |         |          | RIPPLE (4) | TOTAL REGULATION (6) | MODEL NUMBER (13,14) |
|--------------------------|----------------|---------|----------|------------|----------------------|----------------------|
|                          | TYP. (1)       | AIR (2) | PEAK (3) |            |                      |                      |
| +5 V (I <sub>A</sub> )   | 10.5 A         | 13 A    | 14 A     | 50 mV      | ±2.0%                | NLP70-9693J          |
| +3.3 V (I <sub>B</sub> ) | 10.5 A         | 13 A    | 14 A     | 50 mV      | ±2.0%                |                      |
| +12 V (12)               | 0.65 A         | 0.8 A   | 0.8 A    | 120 mV     | ±5.0%                |                      |

### Notes

- Free air convection cooling.  
I<sub>5</sub> = 10.5 A max.; I<sub>3,3</sub> = 10.5 A max.; I<sub>3,3</sub> + I<sub>5</sub> < 10.6 A; Po = 52.5 W max.
- 20 CFM forced air.  
I<sub>3,3</sub> = 13 A max.; I<sub>5,5</sub> = 13 A max.; I<sub>3,3</sub> + I<sub>5</sub> < 15 A; Po = 70 W max.
- 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.
- To maintain stated regulation then:  
I<sub>12</sub> / I<sub>A</sub> ≤ 2 and I<sub>A</sub> ≥ 0.1 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.
- Conducted and radiated emissions testing were performed using the standard EN55022 set-up with a stand alone NLP70-9693J 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.
- All models require a minimum mounting stand-off of 0.25 inches (6.35 mm) in the end use product.
- 12 V is a floating output and can be referenced negative or positive.
- 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.

| INPUT PIN CONNECTIONS |               |
|-----------------------|---------------|
| J1                    |               |
| Pin 1                 | AC Line       |
| Pin 2                 | No Pin        |
| Pin 3                 | AC Neutral    |
| J2                    |               |
| Pin 1                 | Safety Ground |

| OUTPUT PIN CONNECTIONS |            |
|------------------------|------------|
| J5 FUNCTION            |            |
| Pin 1                  | 3.3V       |
| Pin 2                  | 3.3V       |
| Pin 3                  | Return     |
| Pin 4                  | Return     |
| Pin 5                  | Return     |
| Pin 6                  | 5V         |
| Pin 7                  | 5V         |
| J3 FUNCTION            |            |
| Pin 1                  | 12V Return |
| Pin 2                  | 12V (12)   |



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3

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### Input and output connectors

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

**DC (J3) connector type**  
Molex 26-60-4020 type.

**DC (J5) connector type**  
Molex 26-60-4070 type.

### Mating connectors

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

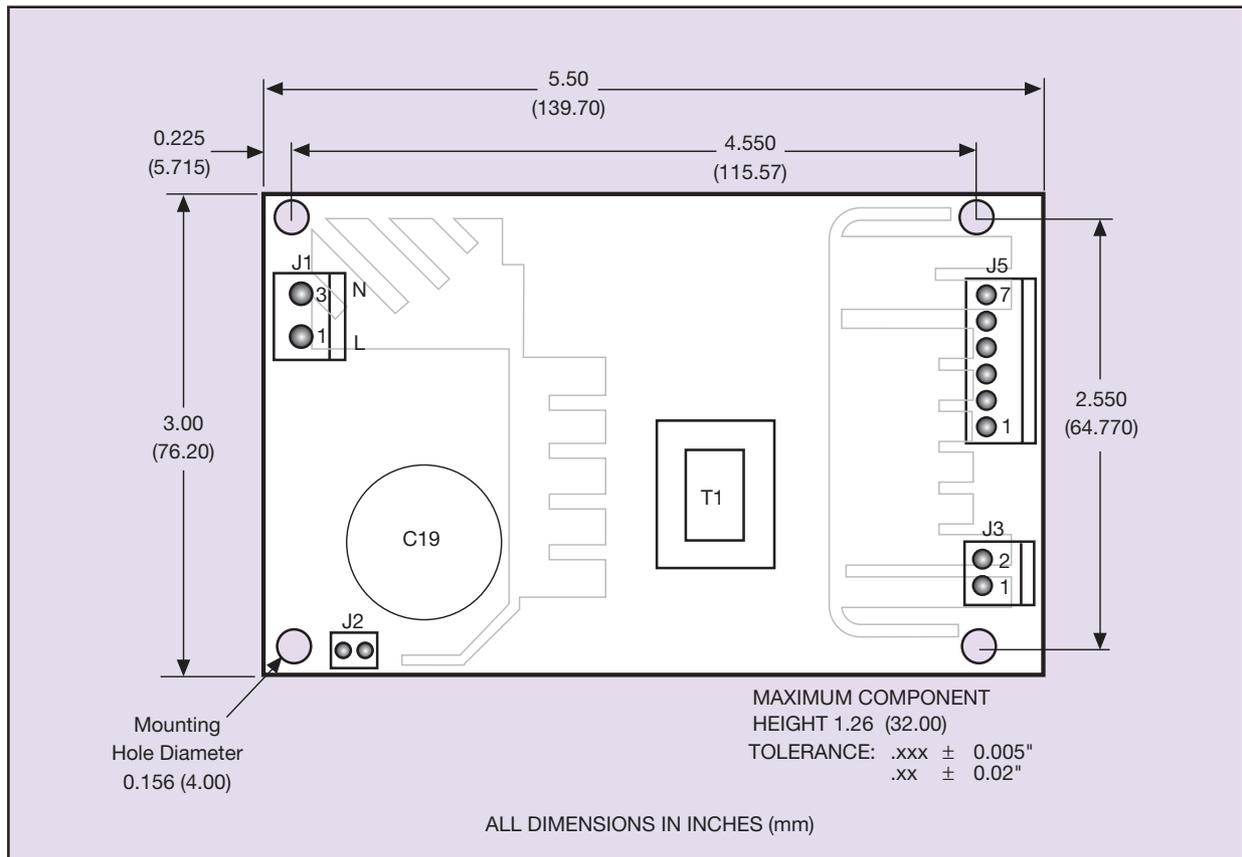
**DC (J3) mating connector type**  
Molex 09-50-3021 with Molex 2478 phosphor bronze crimp terminals or equivalent.

**DC (J5) mating connector type**  
Molex 09-50-3071 with Molex phosphor bronze crimp terminals or equivalent.

**Note:** The input and output connectors are the same as those used on NFS40, NAL40, NAN40, NLP40 and NLP65.

**Earth (J2) connector type**  
Male 0.250 quick disconnect type.

**Earth (J2) mating connector type**  
Molex 90028.



### International Safety Standard Approvals



VDE0805/EN60950/IEC950 File No. 10401-3336-0143  
Licence No. 117595



UL1950 File No. E136005



CSA C22.2 No. 950 File No. LR41062

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