# ARTESYN NLP250-DC SERIES

Single Output

Advanced Energy's Artesyn NLP250-DC series high-density, open-frame switching power supply is designed to operate directly from a -48 Vdc telecom central office power bus and supports a wide input voltage range of -38 to -60 Vdc. It can deliver 250 watts of continuous power with forced air to support battery backup and high-availability applications. The NLP250-DC features a compact 4 x 7 inch footprint – identical to AC models to facilitate a drop-in alternative for OEMs – and offers a low-profile component height of 1.5 inches to support a variety of 1U telecom applications.

DATA SHEET

**Total Power:**

250 W

**Input Voltage:**

-38 to -60 Vac

**# of Outputs:**

Single

## SPECIAL FEATURES

- -48 Vdc input
- 250 W on main channel with forced air
- Low profile fits 1U applications
- U-Channel for maximum thermal performance
- 5 V standby output
- 12 V fan output
- Integrated control and monitoring features
- Overcurrent, overvoltage and overtemperature protection
- Compliance to EN55022-B conducted noise standard
- RoHS compliant
- Two year warranty

## SAFETY

- VDE0805/EN60950-1
- IEC950/IEC60950-1
- UL/cUL 60950-1
- CSA-C22.2 60950-1
- CB Certificate
- CE Mark (LVD)

## ELECTRICAL SPECIFICATIONS

| Input | | |
|---|---|---|
| Input voltage range | -48 Vdc Nominal | -38 to -60 Vdc |
| Input surge current | 60 Vdc (cold start) | 40 A max. |
| Input voltage protection | Reverse polarity protected | |
| Input current | -48 Vdc @ 250 W | 7 A |
| Input fuse | UL/IEC127 | T6.4 AH, 250 Vac |
| **Output** | | |
| Maximum power | 200 LFM forced air | 250 watts |
| Total regulation<br>(line and load) | Main output<br>Auxiliary outputs | ± 2.0%<br>± 5.0% |
| Turn-on delay | -48 Vdc input | 2.0 s max. |
| Transient response | Main output<br>50 - 100%<br>Step at 0.5 A/µs | 5.0% or 250 mV<br>max. dev., 1 ms max<br>recovery to 1% |
| Temperature coefficient | | ±0.04%/°C |
| Overvoltage protection | Main output | 115%, ± 5% |
| Short circuit protection | Cyclic operation | Continuous |
| Minimum output current | Singles | 0 A |
| Auxiliary outputs<br>(See Note 8, page 3) | 5 Vsb<br>12 V (fan) | 5 V @ 1.0 A<br>12 V @ 1.5 A |

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

| EMC Characteristics [5] | | |
|---|---|---|
| Conducted emissions | EN55022, FCC part 15 CISPR22, GR-1089 CORE, ETSi 300-386 | Level B |
| ESD air | EN61000-4-2 | Level 3 |
| ESD contact | EN61000-4-2 | Level 3 |
| Radiated immunity | EN61000-4-3 | Level 3 |
| Fast transients | EN61000-4-4 | Level 3 |
| Surge | EN61000-4-5 | Level 3 |
| Conducted immunity | EN61000-4-6 | Level 3 |
| **General Specifications** | | |
| Hold-up time | -48 Vdc input | 4 ms @ 250 W |
| Efficiency | -48 Vdc @ 250 W | 85% typ. |
| Isolation voltage | Input/output<br>Input/chassis | 1500 Vdc<br>1500 Vdc |
| Safety approvals (see note 6, page 3) | UL/cUL UL60950-1, VDE EN60950-1, CAN/CSA22.2 No. 60950-1 | |
| Weight | | 650g (22 oz) |
| MTBF (@25 °C) | Telcordia SR-332 | 317,000 hours min. |

## ENVIRONMENTAL SPECIFICATIONS

| | | |
|---|---|---|
| Thermal performance | Operating ambient, | -50 °C to +70 °C |
| | (See derating curve) | |
| | Non-operating | -40 °C to +85 °C |
| | 0 °C to 50 °C ambient, | 250 W |
| | 200 LFM forced air<br>250 LFM with cover | |
| | 0 °C to 50 °C ambient | 175 W |
| | Convection cooled | |
| | 50 °C to 70 °C ambient, | Derate linearly |
| | Convection cooled | to 50% load |
| Relative humidity | Non-condensing | Per GR-63-Core |
| Altitude | Operating | 10,000 feet max. |
| | Non-operating | 30,000 feet max. |
| Vibration | 5-100 Hz | Per GR-63-Core |
| Shock | Per GR-63-Core | Zone 4 |

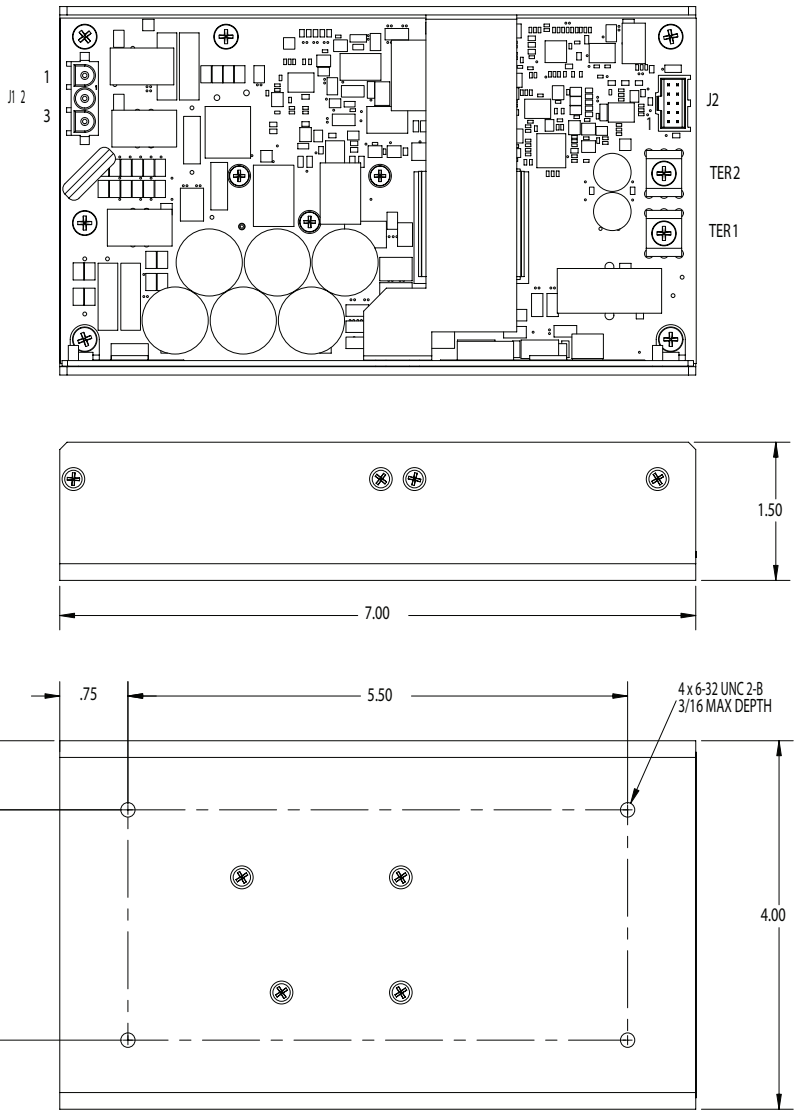
## ORDERING INFORMATION

| Output Voltage | Output Current | | | Ripple [3] | Total Regulation | Model Numbers [9,10] |
|---|---|---|---|---|---|---|
| | Min | Max (free air) [1,4] | Max (forced air) [2,4] | | | |
| 12 V | 0 A | 14.6 A | 21 A | 120 mV | ± 2.0% | NLP250N-48S12J |

Notes

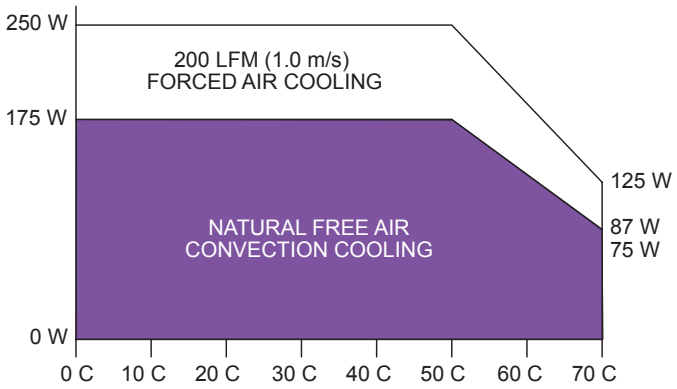
1. Free air convection. Maximum continuous output power not to exceed 175 W. Refer to Figure 1 for the derating curve.
2. 200 LFM (250 LFM with cover) forced air cooling from the longer side. Maximum continuous output power not to exceed 250 W.
3. Figure is peak-to-peak for room temperature rating. Output noise measurements are made across a 20 MHz bandwidth using a 6 inch twisted pair, terminated with a 10 µF tantalum capacitor and a 0.1 µF ceramic capacitor.
4. CAUTION: Allow a minimum of 1 second after disconnecting line power when making thermal measurements. For optimum reliability no part of the heatsink should exceed 115 °C and no semi-conductor case temperature should exceed 120 °C.
5. No external filtering required during conducted emissions testing but some applications may require additional filtering to achieve system compliance. Compliance with radiated EMI specifications may require mounting in a suitable enclosure.
6. This product is only for inclusion by professional installers within other equipment and must not be operated as a standalone product.
7. 5 V sb (standby) output is available whenever DC input is present, regardless of remote ON/OFF signal status. 12 V (fan) present when main output is present.
8. The 'J' suffix indicates that these parts are Pb-free (RoHS 6/6) compliant.
9. NOTICE: Please contact your local Emerson representative or visit our website at http://www.PowerConversion.com.
10. 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.

## MECHANICAL DRAWING




Derating Curve

Output Power (Watts)



## CONNECTOR AND MATING CONNECTOR TYPES

| Connector | Type | Mating Connector Type |
|---|---|---|
| J1 | Molex 10-84-5030 (4202 series) | Molex 50-84-1035 (42021 series) or equivalent with Molex 02-08-1001 (42024 series) or equivalent crimp terminals |
| J2 | Molex | Molex 90142-0010<br>Molex 90119-2110 crimp terminals |
| TER1<br>TER2 | Terminal block | Terminal block contains #6-32 screw with clamp washer suitable for wire size 12-22 awg (0.5-2.5 mm2). Max Torque tp 1.36 Nm (12 in.lb) |

## PIN CONNECTIONS

| J1 | |
|---|---|
| Pin 1 | -48 Vdc |
| Pin 2 | Ground |
| Pin 3 | Return |
| **J2** | |
| Pin 1 | N/C |
| Pin 2 | -V0 Remote Sense |
| Pin 3 | +V0 Remote Sense; Load compensation for 0.2 V to 0.5 V drop at load (sense point) |
| Pin 4 | 5 V Standby |
| Pin 5 | Signal Common (RTN): 5 V standby and 12 V fans |
| Pin 6 | 12 V DC Fan Voltage |
| Pin 7 | Signal Common (RTN): 5 V standby and 12 V fans |
| Pin 8 | Inhibit: A closed contact (Low) will shut down PSU main output within 200 ms (typical) |
| Pin 9 | DC Power Good: Vo > -8% of nominal = Logic High, Out of Regulation = Logic Low |
| | |
| TER1 | +12 V |
| TER2 | GND |

## 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.

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