NV-Power NV-175

175/180/200W Configurable ac/dc power supply.

Features
- High efficiency
- Low profile
- High power density
- Temperature controlled fan option
- 3 year warranty

Benefits
- Minimises heat in system
- Fits 1U applications
- Reduces space requirement
- Reduces system noise
- Low cost of ownership

Input

- Input Voltage: 90-264Vac
- Input Frequency: 45 - 63Hz (440Hz with reduced PFC - consult sales office)
- Earth Leakage Current: 123μA at 120Vac (60Hz), 257μA max at 240Vac (60Hz)

Available Outputs

<table>
<thead>
<tr>
<th>Channel 1</th>
<th>Adjustment Range</th>
<th>Channel 2</th>
<th>Adjustment Range</th>
<th>Channel 3</th>
<th>Adjustment Range</th>
<th>Channel 4</th>
<th>Adjustment Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5V / 25A</td>
<td>5 - 5.5V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fixed</td>
</tr>
<tr>
<td>T</td>
<td>12V / 15A</td>
<td>12 - 15V</td>
<td>5V / 10A</td>
<td>3.3 - 5.5V</td>
<td></td>
<td></td>
<td>Fixed</td>
</tr>
<tr>
<td>G</td>
<td>24V / 7.5A</td>
<td>24 - 28V</td>
<td>5V / 8A</td>
<td>3.3 - 5.5V</td>
<td></td>
<td></td>
<td>Fixed</td>
</tr>
</tbody>
</table>

Other output options are available, please contact sales office with your requirements.

Isolation

- Input to Output: 2 x MOOPs (3rd edition 60601) 4.3kVdc
- Input to Earth: 1 x MOOP (3rd edition 60601) 1.5kVac, 2.3kVdc
- Output to Earth: 200Vdc
Output Specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>NV1-1T000</th>
<th>NV1-453TT</th>
<th>NV1-453TT-N3</th>
<th>NV1-453FF</th>
<th>NV1-453FF-N3</th>
<th>NV1-4G5FF-N3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn on time</td>
<td>1.5s max</td>
<td>1.5s max</td>
<td>1.5s max</td>
<td>1.5s max</td>
<td>1.5s max</td>
<td>1.5s max</td>
</tr>
<tr>
<td>Efficiency</td>
<td>up to 90%</td>
<td>up to 90%</td>
<td>up to 90%</td>
<td>up to 90%</td>
<td>up to 90%</td>
<td>up to 90%</td>
</tr>
<tr>
<td>Hold up</td>
<td>16ms min</td>
<td>16ms min</td>
<td>16ms min</td>
<td>16ms min</td>
<td>16ms min</td>
<td>16ms min</td>
</tr>
<tr>
<td>Ripple and Noise</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Voltage Accuracy</td>
<td>±1%</td>
<td>±1%</td>
<td>±1%</td>
<td>±1%</td>
<td>±1%</td>
<td>±1%</td>
</tr>
<tr>
<td>Remote Sense</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Minimum Load</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Total Regulation</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Transient Response</td>
<td>&lt;4%</td>
<td>&lt;4%</td>
<td>&lt;4%</td>
<td>&lt;4%</td>
<td>&lt;4%</td>
<td>&lt;4%</td>
</tr>
<tr>
<td>Recovery</td>
<td>500µs</td>
<td>500µs</td>
<td>500µs</td>
<td>500µs</td>
<td>500µs</td>
<td>500µs</td>
</tr>
<tr>
<td>Over Voltage Protection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Short Circuit Protection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Over Temperature Protection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Peak Output Power</td>
<td>200W</td>
<td>200W</td>
<td>200W</td>
<td>200W</td>
<td>200W</td>
<td>200W</td>
</tr>
<tr>
<td>Ch1 Good Signal</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Additional variants available: Built to Order - see "How to create a product description"
Global Signals (-N, -N1 and -N2 option models)

Remote on/off  
TTL logic level high inhibits all outputs (except Standby).

Power Good  
Open collector output (referenced to PSU 0V). Turns on to indicate ac supply is good and output 1 is within regulation.

Standby Supply  
Isolated supply, not affected by remote on/off.
- N option = 5V / 2A (2.5A peak)
- N1 Option = 12V / 1A
- N2 Option = 13.5V / 1A

Global Signals (-N3 and -N4 option models)

ATX Remote on/off  
TTL logic level high or open circuit inhibits all outputs (except Standby).

ATX Power Good  
Logic high indicates ac supply is good and output 1 is within regulation.

Standby Supply  
Common 0V with power supply. Not affected by ATX remote on/off.
- N3 option = 5V / 2A
- N4 Option = 12V / 1A


<table>
<thead>
<tr>
<th>Electrostatic Discharge</th>
<th>EN61000-4-2</th>
<th>Level 4</th>
<th>EN61000-4-2</th>
<th>Level 4</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electromagnetic Field</td>
<td>EN61000-4-3</td>
<td>Level 3</td>
<td>EN61000-4-3</td>
<td>Level 3</td>
<td>A</td>
</tr>
<tr>
<td>Fast / Burst Transient</td>
<td>EN61000-4-4</td>
<td>Level 4</td>
<td>EN61000-4-4</td>
<td>Level 4</td>
<td>A</td>
</tr>
<tr>
<td>Surge Immunity</td>
<td>EN61000-4-5</td>
<td>Level 3</td>
<td>EN61000-4-5</td>
<td>Level 3</td>
<td>A</td>
</tr>
<tr>
<td>Conducted RF Immunity</td>
<td>EN61000-4-6</td>
<td>Level 3</td>
<td>EN61000-4-6</td>
<td>Level 3</td>
<td>A</td>
</tr>
<tr>
<td>Power Frequency Magnetic Field</td>
<td>EN61000-4-8</td>
<td>Level 4</td>
<td>EN61000-4-8</td>
<td>Level 4</td>
<td>A</td>
</tr>
<tr>
<td>Voltage Dips, Variations, Interruptions</td>
<td>EN61000-4-11</td>
<td>Class 3</td>
<td>EN61000-4-11</td>
<td>Class 3</td>
<td>A</td>
</tr>
</tbody>
</table>

Criteria B for 5 sec interruption and dips to 40% for 5 cycles below 154Vac nominal input.


| Radiated Electric Field | EN55011, EN55032 | (as per CISPR.11/22) Class B, FCC47 part 15 subpart B | EN55011, EN55032 | (as per CISPR.11/22) Class B, FCC47 part 15 subpart B | A |
| Conducted Emissions     | EN55011, EN55032 | (as per CISPR.11/22) Class B, FCC47 part 15 subpart B | EN55011, EN55032 | (as per CISPR.11/22) Class B, FCC47 part 15 subpart B | A |
| Conducted Harmonics     | EN61000-3-2 | Class A | EN61000-3-2 | Class A | A |
| Flicker                 | EN61000-3-3 | Compliant - d,max only | EN61000-3-3 | Compliant - d,max only | A |

Environment

| Temperature | 0°C to 50°C operational, -40°C to 70°C storage (max 12 months). Full load, with either -F option fitted or 2m/s air blown from input to output (approximately 10CFM) |
| Derating    | 50°C to 70°C derate each output by 2.5% per °C |
| Low Temp Startup | -20°C |
| Humidity    | 5 - 95% RH non condensing |
| Shock       | ±3 x 30g shocks in each plane, total 18 shocks
30g shock = 11ms (++/-0.5msec), half sine
Conforms to MIL-STD-810E/F, Method 516.5, Pro I, IV, VI |
| Vibration   | Single axis 10 - 500 Hz at 2g (sweep and enduracte at resonance) in all 3 planes
Conforms to EN60068-2-6, IEC68-2-6
Conforms to MIL-STD-810E, Method 514.4, Pro I, Cat 1.9 |
| Altitude    | 3000 metres operational |
| Pollution   | Degree 2, Material group IIIb |

Approvals / Accreditations

| IEC/EN 62368-1, UL62368-1 / CSA 22.2 No 62368-1 | File E135494 |
| IEC/EN 60950-1, UL60950-1 / CSA 22.2 No 60950-1 | File E135494 |
| IEC/EN 60601-1, UL/CSA 60601-1, ANSI/AAMI ES60601-1 | File E349807 |
| CAN/CSA-C22.2 No 60601-1-08 | File E349807 |
| IEC/EN61010 | File E331788 |
| CE Mark (EN62368-1) | Low Voltage Directive (LVD), electromagnetic compatibility (EMC) and Restriction of Hazardous Substances (RoHS) |
| CB certificate and Report available on request | Please check with technical sales for status of approvals |

Designed and manufactured under the control of ISO9001 and ISO13485 (including risk management).
Outline & Connection Drawings

Top View
NV175 models without cover

Top View
NV175-N & NV175-Nx models without cover

Side View
NV175 models without cover or chassis

End View

Notes:
1. All customer fixings M3
2. Maximum thread penetration 4.5mm
3. Maximum torque 0.9Nm
4. All tolerances +/-0.5mm

Input and output connectors are not included with the product. They are available from TDK-Lambda.

Part Number Contents
94910 1 off input connector and 3 crimps
94911 1 off output connector and 24 crimps
Outline & Connection Drawings

Top View
NV175-C models

Side View
NV175-C & NV175-U models

Bottom View
NV175-C & NV175-U models

Top View
NV175-N-C & NV175-Nx-C models

Side View
NV175-N-C, NV175-Nx-C, NV175-N-U & NV175-Nx-U models

Bottom View
NV175-N-C, NV175-Nx-C, NV175-N-U & NV175-Nx-U models

NV-175 units with fan (-F or -I)

Without global option

With global option

Top View

Side View

Bottom View

Other dimensions same as cases without fans (above)

Notes:
1. All customer fixings M3
2. Maximum thread penetration 4.5mm
3. Maximum torque 0.9Nm
4. All tolerances +/-0.5mm
Medical

180-200W Configurable Medical power supply.

Features

• High efficiency
• Low profile
• Low earth leakage and Class B EMC
• 2 x MOPPs isolation
• 3 year warranty

Benefits

• Minimises heat in system
• Fits 1U applications
• Simplifies system design, reduces cost
• Simplifies system design
• Low cost of ownership

Input

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
<td>90-264Vac (100 - 240Vac nominal)</td>
</tr>
<tr>
<td>Input Harmonics</td>
<td>EN61000-3-2 compliant</td>
</tr>
<tr>
<td>Input Fuse</td>
<td>EN61000-3-2 compliant (not user accessible)</td>
</tr>
<tr>
<td>Earth Leakage Current</td>
<td>123µA at 120Vac (60Hz), 257µA max at 240Vac (60Hz)</td>
</tr>
<tr>
<td>Worst case leakage current</td>
<td>less than 300µA at 264Vac, 63Hz (normal condition, 0.5mA Single Fault Condition)</td>
</tr>
</tbody>
</table>

Isolation

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input to Output</td>
<td>2 x MOPPs (3rd edition 60601) 4kVac</td>
</tr>
<tr>
<td>Input to Earth</td>
<td>1 x MOOP (3rd edition 60601) 1.5kVac, 2.3kVdc</td>
</tr>
<tr>
<td>Output to Earth</td>
<td>200Vdc</td>
</tr>
</tbody>
</table>

Quick Selector - example configurations

<table>
<thead>
<tr>
<th>Model</th>
<th>Ch1 Voltage</th>
<th>Ch3 Voltage</th>
<th>Ch4 Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>NV1-1T000-M</td>
<td>12V / 15A</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>NV1-1G000-M</td>
<td>24V / 7.5A</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>NV1-3G0TT-M</td>
<td>24V / 7.5A</td>
<td>12V / 5A</td>
<td>-12V / 1A</td>
</tr>
<tr>
<td>NV1-3G0FF-M</td>
<td>24V / 7.5A</td>
<td>15V / 5A</td>
<td>-15V / 1A</td>
</tr>
</tbody>
</table>

How To Create A Product Description

1. Confirm availability of created product with TDK-Lambda.
2. For negative output channel 3, follow chosen letter by 'Y'. For example, TY channel 3 = -12V / 5A.
3. For positive output channel 4, follow chosen letter by 'P'. For example, TP channel 4 = +12V / 1A.

Input Fuse

- Fast acting (not user accessible)

Earth Leakage Current

- 123µA at 120Vac (60Hz), 257µA max at 240Vac (60Hz)
- Worst case leakage current is less than 300µA at 264Vac, 63Hz (normal condition, 0.5mA Single Fault Condition)
- Lower leakage versions available, contact sales office for details

Input

- 2 x MOPPs (3rd edition 60601)
- 4kVac

Isolation

- Input to Output
- 2 x MOPPs (3rd edition 60601)
- 4kVac

Input to Earth

- 1 x MOOP (3rd edition 60601)
- 1.5kVac, 2.3kVdc

Output to Earth

- 200Vdc

How to Create a Product Description

1. Number of outputs
2. Ch1, Ch3, Ch4
3. Letter / number from ‘Available Outputs’ table to represent output voltage

Medical

- Medical with 4kVac (2 x MOPPs) input to output isolation

Industrial

- X Test
- Broadcast

Test

- Renewable

Comms

- Medical
- Industrial
- Test
- Broadcast
- Comms
- Renewable

Renewable

- Medical
- Industrial
- Test
- Broadcast
- Comms
- Renewable
### Environment

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>0°C to 50°C operational, -40°C to 70°C storage (max 12 months).</td>
</tr>
<tr>
<td>Full load, with either ‘-F’ option fitted or 2m/s air blown from input to output (approximately 10CFM)</td>
<td></td>
</tr>
<tr>
<td>Derating</td>
<td>50°C to 65°C derate each output by 2.5% per °C</td>
</tr>
<tr>
<td>Low Temp Startup</td>
<td>-20°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>5 - 95% RH non condensing</td>
</tr>
<tr>
<td>Shock</td>
<td>±3 x 30g shocks in each plane, total 18 shocks</td>
</tr>
<tr>
<td>Conforms to MIL-STD-810E/F 1, 4, 6, VI</td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td>Single axis 10 - 500 Hz at 2g (sweep and endurance at resonance) in all 3 planes</td>
</tr>
<tr>
<td>Conforms to EN60068-2-6, IEC68-2-6.</td>
<td></td>
</tr>
<tr>
<td>Conforms to MIL-STD-810E, Method 514.4, Pro I, Cat 1, 9</td>
<td></td>
</tr>
<tr>
<td>Altitude</td>
<td>3000 metres operational (4000m for NV1-1G000-M for 60601-1 3rd edition)</td>
</tr>
<tr>
<td>Pollution</td>
<td>Degree 2, Material group IIIB</td>
</tr>
</tbody>
</table>

### Immunity

**Criteria**

- **Electrostatic Discharge**
  - EN61000-4-2: Level 4
  - Air discharge 15kV, Contact discharge 8kV. Not applicable to open frame units
  - A
- **Electromagnetic Field**
  - EN61000-4-3: Level 3
  - 12V/m
  - A
- **Fast / Burst Transient**
  - EN61000-4-4: Level 4
  - ac input tested to 4.4kV
  - dc output tested to 2.2kV
  - A
- **Surge Immunity**
  - EN61000-4-5: Level 3
  - Common mode - 2.2kV, Differential - 1.1kV
  - A
- **Conducted RF Immunity**
  - EN61000-4-6: Level 3
  - 12V
  - A
- **Power Frequency Magnetic Field**
  - EN61000-4-8: Level 3
  - 30A/m
  - A
- **Voltage Dips, Variations, Interruptions**
  - EN61000-4-11: Class 3
  - Criteria B for 5 sec interruption and dips to 40% for 5 cycles below 154Vac nominal input
  - A

### Emissions

**Criteria**

- **Radiated Electric Field**
  - EN55011, EN55032: (as per CISPR.11/22) Class B, FCC47 part 15 subpart B
  - see application note for details. Additional filtering required for IEC inlet version.
  - A
- **Conducted Emissions**
  - EN55011, EN55032: (as per CISPR.11/22) Class B, FCC47 part 15 subpart B
  - A
- **Conducted Harmonics**
  - EN61000-3-2: Class A
  - A
- **Flicker**
  - EN61000-3-3: Compliant - dmax only
  - A

### Available Outputs

<table>
<thead>
<tr>
<th>Channel</th>
<th>Adjustment Range</th>
<th>Channel 2</th>
<th>Adjustment Range</th>
<th>Channel 3</th>
<th>Adjustment Range</th>
<th>Channel 4</th>
<th>Adjustment Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>12V / 15A</td>
<td>T</td>
<td>12V / 5A</td>
<td>T</td>
<td>-12V / 1A</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>15V / 12A</td>
<td>F</td>
<td>15V / 5A</td>
<td>F</td>
<td>-15V / 1A</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>24V / 7.5A</td>
<td>G</td>
<td>24V / 2.5A</td>
<td>G</td>
<td>-12V / 2A</td>
<td>Fixed</td>
<td></td>
</tr>
</tbody>
</table>

1. Follow letters in red by ‘Y’ for negative output channel 3.
2. Follow letters in red by ‘P’ for positive output channel 4.
3. 12 - 12.5V if 24V channel 3 fitted.
4. 14.5 - 15V if 24V channel 3 fitted.
5. 24 - 26V if 24V channel 3 fitted.
6. 1.5A max with ‘-F’ or ‘-I’ option.

### Output Specification

- **Turn on time**
  - 1.5s max
  - at 90Vac and 100% rated output power

- **Efficiency**
  - up to 90%
  - configuration dependent

- **Hold up**
  - 16ms min
  - at 90Vac

- **Ripple and Noise**
  - <1%
  - (or 50mV if higher) pk-pk, using EIAJ test method & 20MHz bandwidth

- **Voltage Accuracy**
  - ±1%
  - ±4% for Channel 4 with ‘T’ or ‘F’ type outputs, +4/-3% for all other channel 4.

- **Remote Sense**
  - Yes
  - Channel 1. Max 0.5V total line drop

- **Minimum Load**
  - No
  - on any output

- **Total Regulation**
  - 1%
  - (or 50mV if greater)
  - Including Line (for 90-264Vac input change), Load (for 0-100% load change) and Cross (for 0-100% load change on any other output) regulation.

- **Transient Response**
  - <4%
  - of set voltage for 50% load change
  - (in 50µs within the range 25-100% load)

- **Recovery**
  - 500µs
  - for recovery to 1% of set voltage

- **Over Voltage Protection**
  - Yes
  - See Application Notes for details

- **Short Circuit Protection**
  - Yes

- **Peak Output Power**
  - 200W
  - Single output units with 12V, 15V or 24V (T, F or G). Average output power must not exceed 180W over any 5 minute period

- **Ch1 Good Signal**
  - Yes
  - Provides a Logic ‘Low’ signal after Channel 1 output is within 90% (±5%) of nominal
**Approvals / Accreditations**

<table>
<thead>
<tr>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC/EN 62368-1, UL62368-1 / CSA 22.2 No 62368-1</td>
<td>File E135494</td>
</tr>
<tr>
<td>IEC/EN 60950-1, UL60950-1 / CSA 22.2 No 60950-1</td>
<td>File E135494</td>
</tr>
<tr>
<td>IEC/EN 60601-1, UL/CSA 60601-1, ANSI/AAMI ES60601-1</td>
<td>File E349607</td>
</tr>
<tr>
<td>CAN/CSA-C22.2 No 60601-1-08</td>
<td></td>
</tr>
<tr>
<td>IEC/EN61010</td>
<td>Designed to meet</td>
</tr>
<tr>
<td>CE Mark (EN62368-1)</td>
<td>Low Voltage Directive (LVD), electromagnetic compatibility (EMC) and Restriction of Hazardous Substances (RoHS)</td>
</tr>
<tr>
<td>CB certificate and Report available on request</td>
<td></td>
</tr>
<tr>
<td>Notes: 1. All customer fixings M3</td>
<td></td>
</tr>
<tr>
<td>2. Maximum thread penetration 4.5mm</td>
<td></td>
</tr>
<tr>
<td>3. Maximum torque 0.9Nm</td>
<td></td>
</tr>
<tr>
<td>4. All tolerances +/-0.5mm</td>
<td></td>
</tr>
</tbody>
</table>

**Mating Parts (Molex or Equivalent)**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Contents</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1</td>
<td>1 off input connector</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3 crimps</td>
<td></td>
</tr>
<tr>
<td>J2</td>
<td>1 off output connector</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>20 crimps</td>
<td></td>
</tr>
<tr>
<td>94910</td>
<td></td>
<td></td>
</tr>
<tr>
<td>94680</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Input and output connectors are not included with the product. They are available from TDK-Lambda**

**Design and manufacturing under the control of ISO9001 and ISO13485 (including risk management).**
Medical

Features

• High efficiency
• Low profile
• Dual fusing
• 2 x MOPP isolation
• 3 year warranty

Benefits

• Minimises heat in system
• Fits 1U applications
• Simplifies system design, reduces cost
• Simplifies system design
• Low cost of ownership

Input

- Input Voltage: 90-264Vac (100 - 240Vac nominal)
- Input Frequency: 45 - 63Hz
- Input Harmonics: EN61000-3-2 compliant
- Input Fuse: Dual fused, Fast acting (not user accessible)
- Earth Leakage Current: 80µA at 120Vac (60Hz), 170µA max at 240Vac (60Hz)
  Worst case leakage current is less than 200µA at 264Vac, 63Hz (normal condition, 0.33mA Single Fault Condition)

Input Specification

- Turn on time: 2s max at 90Vac and 100% rated output power
- Efficiency: up to 90%
- Hold up: 16ms min at 90Vac
- Ripple and Noise: <1% (or 50mV if higher) pk-pk, using EIAJ test method & 20MHz bandwidth
- Voltage Accuracy: ±1%
- Remote Sense: Yes Channel 1. Max 0.5V total line drop
- Minimum Load: No on any output
- Total Regulation: 1% (or 50mV if greater) Including Line (for 90-264Vac input change) and Load (for 0-100% load change)
- Transient Response: <4% of set voltage for 50% load change (in 50µs within the range 25-100% load)
- Recovery: 500µs for recovery to 1% of set voltage
- Over Voltage Protection: Yes 120-135% of Vout. Remove ac for 10 seconds then reapply to restart unit
- Short Circuit Protection: Yes
- Over Temperature Protection: Yes
- Output Power: 180W
Environment

Temperature  
0°C to 50°C operational, -40°C to 85°C storage (max 12 months).  
Full load, with 2m/s air blown from input to output (approximately 10CFM)

Derating  
50°C to 70°C derate each output by 2.5% per °C  
with 2m/s air blown from input to output

Low Temp Startup  
-20°C

Humidity  
5 - 95% RH non condensing

Shock  
±3 x 30g shocks in each plane, total 18 shocks  
30g shock = 11ms (+/-0.5msec), half sine  
Conforms to MIL-STD-810E/F, Method 516.5, Pro I, IV, VI

Vibration  
Single axis 10 - 500 Hz at 2g (sweep and endurance at resonance) in all 3 planes  
Conforms to EN60068-2-6, IEC68-2-6  
Conforms to MIL-STD-810E, Method 514.4, Pro I, Cat 1,9

Altitude  
5000 metres operational  
(3000 metres for medical approval, 4000m for 60601-1 3rd edition)

Pollution  
Degree 2, Material group IIIb  
Conforms to EN61000-6-3:2007, EN60601-1-2:2007  
Radiated Electric Field  
EN55011, EN55032 (as per CISPR.11/22) Class B, FCC47 part 15 subpart B  
see application note for details

Global Interface Signals

<table>
<thead>
<tr>
<th>Standby</th>
<th>PSU good signal</th>
<th>Logic level to enable main output</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>12V / 0.2A</td>
<td>Power good</td>
</tr>
<tr>
<td>S1</td>
<td>12V / 0.2A</td>
<td>Power good</td>
</tr>
<tr>
<td>S2</td>
<td>12V / 0.2A</td>
<td>Channel 1 good</td>
</tr>
<tr>
<td>S3</td>
<td>12V / 0.2A</td>
<td>Channel 1 good</td>
</tr>
<tr>
<td>S5</td>
<td>5V / 0.5A</td>
<td>Power good</td>
</tr>
</tbody>
</table>

Power good = logic low signal to indicate when ac supply is good and output 1 is within regulation  
Channel 1 good = logic low signal to indicate when output 1 is within regulation

Approvals / Accreditations

IEC/EN 62368-1, UL62368-1 / CSA 22.2 No 62368-1  
File E135494

IEC/EN 60950-1, UL60950-1 / CSA 22.2 No 60950-1  
File E135494

IEC/EN 60601-1, UL/CSA 60601-1, ANSI/AAMI ES60601-1  
CAN/CSA-C22.2 No 60601-1-08  
File E349607

CE Mark (EN62368-1)  
Low Voltage Directive (LVD), electromagnetic compatibility (EMC) and Restriction of Hazardous Substances (RoHS)

CB certificate and Report available on request  
Please check with technical sales for status of approvals

Criteria B for 5 sec interruption and dips to 40% for 5 cycles below 154Vac nominal input

<table>
<thead>
<tr>
<th>Electrostatic Discharge</th>
<th>EN61000-4-2</th>
<th>Level 3</th>
<th>Air discharge 8kV, Contact discharge 6kV. Not applicable to open frame units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electromagnetic Field</td>
<td>EN61000-4-3</td>
<td>Level 3</td>
<td>12V/m</td>
</tr>
</tbody>
</table>
| Fast / Burst Transient  | EN61000-4-4 | Level 4 | ac input tested to 4.4kV  
dc output tested to 2.2kV                                                   |
| Surge Immunity          | EN61000-4-5 | Level 3 | Common mode - 2.2kV, Differential - 1.1kV                                 |
| Conducted RF Immunity   | EN61000-4-6 | Level 3 | 12V                                                                     |
| Power Frequency Magnetic Field | EN61000-4-8 | Level 4 | 30A/m                                                                    |
| Voltage Dips, Variations, Interruptions | EN61000-4-11 | Class 3 | Criteria B for 5 sec interruption and dips to 40% for 5 cycles below 154Vac nominal input |


| Radiated Electric Field | EN55011, EN55032 | (as per CISPR.11/22) Class B, FCC47 part 15 subpart B  
see application note for details |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducted Emissions</td>
<td>EN55011, EN55032</td>
<td>(as per CISPR.11/22) Class B, FCC47 part 15 subpart B</td>
</tr>
<tr>
<td>Conducted Harmonics</td>
<td>EN61000-3-2</td>
<td>Class A</td>
</tr>
<tr>
<td>Flicker</td>
<td>EN61000-3-3</td>
<td>Compliant - d_{max} only</td>
</tr>
</tbody>
</table>
### Output Connector J1

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do not connect</td>
<td>10</td>
<td>Standby</td>
</tr>
<tr>
<td>2</td>
<td>Do not connect</td>
<td>11</td>
<td>Do not connect</td>
</tr>
<tr>
<td>3</td>
<td>Do not connect</td>
<td>12</td>
<td>0V (DC return)</td>
</tr>
<tr>
<td>4</td>
<td>+V output</td>
<td>13</td>
<td>0V (DC return)</td>
</tr>
<tr>
<td>5</td>
<td>+V output</td>
<td>14</td>
<td>0V (DC return)</td>
</tr>
<tr>
<td>6</td>
<td>Sense</td>
<td>15</td>
<td>Sense</td>
</tr>
<tr>
<td>7</td>
<td>Power good</td>
<td>16</td>
<td>+V output</td>
</tr>
<tr>
<td>8</td>
<td>+V output</td>
<td>17</td>
<td>+V output</td>
</tr>
<tr>
<td>9</td>
<td>Remote on/off</td>
<td>18</td>
<td>Remote on/off</td>
</tr>
</tbody>
</table>

### Mating parts (Molex or equivalent)

<table>
<thead>
<tr>
<th>Conn</th>
<th>Housing</th>
<th>Pins</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1</td>
<td>J2</td>
<td>R08-52-0113</td>
</tr>
<tr>
<td></td>
<td></td>
<td>08-54-0151</td>
</tr>
</tbody>
</table>

### Notes:

1. All customer fixings M3
2. Maximum thread penetration 4.5mm
3. Maximum torque 0.9Nm
4. All tolerances +/-0.5mm

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Input and output connectors are not included with the product. They are available from TDK-Lambda

1 off input connector and 3 crimps part number is 94910.
1 off output connector and 20 crimps part number is 94668