Medical Industrial Test Broadcast Comms Renewable

# 180-200W Configurable Medical power supply.

| Features | Benefits |
|---|---|
| • High Efficiency | Minimises heat in system |
| • Low Profile | Fits 1U Applications |
| • Low Earth Leakage and Class B EMC | Simplifies system design, reduces cost |
| • 2 x MOPPs isolation | Simplifies system design |
| • 3 Year Warranty | Low cost of ownership |


## Input

| | | | |
|---|---|---|---|
| Input Voltage | 90-264Vac<br>(100 - 240Vac nominal) | Input Frequency | 45 - 63Hz |
| Input Harmonics | EN61000-3-2 compliant | Power Factor | 0.97 typical |
| Input Fuse | Fast acting (not user accessible) | Inrush Current | <40A at 25°C and 230Vac (cold start) |
| Earth Leakage Current | 123µA at 120Vac (60Hz), 257µA max at 240Vac (60Hz)<br>Worst case leakage current is less than 300µA at 264Vac, 63Hz (normal condition, 0.5mA Single Fault Condition)<br>Lower leakage versions available, contact sales office for details | | |

## Isolation

| | | | |
|---|---|---|---|
| Input to Output | 2 x MOPPs (3rd edition 60601)<br>4kVac | type tested to 4kVac (equivalent to 5.7kVdc), production tested to 4.3kVdc | |
| Input to Earth | 1.5kVac, 2.3kVdc | Output to Earth | 200Vdc |

## QUICK SELECTOR - example configurations

Additional variants available, see "How to Create a Product Description"

| Model | Ch1 | Ch3 | Ch4 |
|---|---|---|---|
| NV1-1T000-M | 12V / 15A | - | - |
| NV1-1G000-M | 24V / 7.5A | - | - |
| NV1-3G0TT-M | 24V / 7.5A | 12V / 5A | -12V / 1A |
| NV1-3G0FF-M | 24V / 7.5A | 15V / 5A | -15V / 1A |

## How To Create A Product Description

Confirm availability of created product with TDK-Lambda

| NV1- | #o/p | Ch1 | 0 | $Ch3_2$ | $Ch4_3$ | Case Option | -M | Connector Option |
|---|---|---|---|---|---|---|---|---|

**Blank** standard, vertical connector
**-R** Right angled connector (see handbook for 'R' connection and mechanical details)

Number of outputs

**Ch1, Ch3, Ch4** Letter / number from 'Available Outputs' table to represent output voltage

**M**edical with 4kVac (2 x MOPPs) input to output isolation

**Blank** no case
**-C** U chassis + cover
**-U** U chassis
**-F** End fan + case[1]
**-I** End fan + case + IEC inlet[1]

1. Needs 0H, 3H, 5H, TH or FH type channel 4.
   The fan speed is temperature dependent, ensuring optimum cooling and lowest audible noise.
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.

## Available Outputs

Other output options are available, please contact factory with your requirements

| Channel 1 | | Adjustment Range | Channel 2 | Channel 3[1] | | Adjustment Range | Channel 4[2] | | Adjustment Range |
|---|---|---|---|---|---|---|---|---|---|
| T | 12V / 15A | 12 - 15V[3] | Not available | T | 12V / 5A | 12 - 15V | T | -12V / 1A | Fixed |
| F | 15V / 12A | 12 - 15V[4] | | F | 15V / 5A | 12 - 15V | F | -15V / 1A | Fixed |
| | | | | G | 24V / 2.5A | 18 - 24V | 3HP | +3.3V / 2A[6] | Fixed |
| G | 24V / 7.5A | 24 - 28V[5] | | 0 | Omit | | 5HP | +5V / 2A[6] | Fixed |
| | | | | | | | TH | -12V / 2A[6] | Fixed |
| | | | | | | | FH | -15V / 2A[6] | Fixed |
| | | | | | | | 0H | Fan supply only | |
| | | | | | | | 0 | Omit | |

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% | 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 | |
| Over Temperature 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 |

## Environment

| | |
|---|---|
| Temperature | 0°C to 50°C operational, -40°C to 70°C storage (max 12 months).<br>Full load, with either '-F' option fitted or 2m/s air blown from input to output (approximately 10CFM) |
| Derating | 50°C to 65°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<br>30g shock = 11ms (+/-0.5msec), half sine<br>Conforms to EN60068-2-27, EN60068-2-47, IEC68-2-27, IEC68-2-47, JIS C0041-1987.<br>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<br>Conforms to EN60068-2-6, IEC68-2-6<br>Conforms to MIL-STD-810E, Method 514.4, Pro I, Cat 1,9 |
| Altitude | 3000 metres operational |
| Pollution | Degree 2, Material group IIIb |

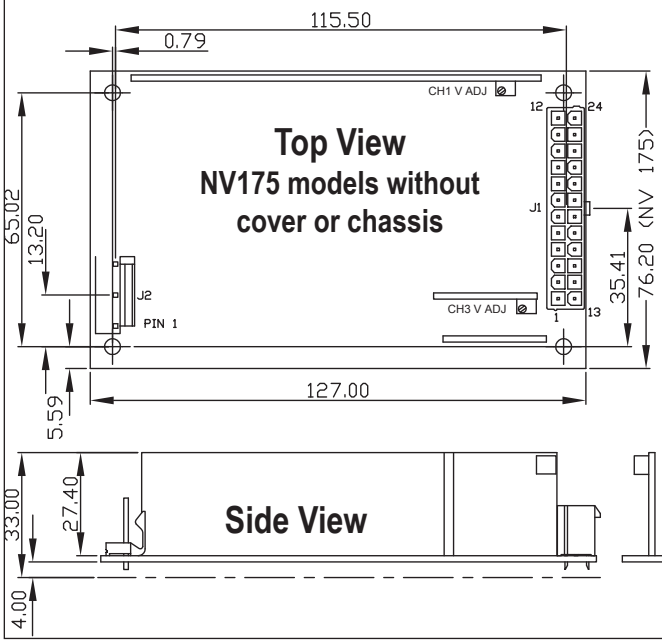
## Immunity EN61000-6-2:2005, EN60601-1-2:2001

| | | | | 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<br>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 4 | 30A/m | A |
| Voltage Dips, Variations, Interruptions | EN61000-4-11 | Class 3 | Criteria B for 5 sec interruption | A |

## Emissions EN61000-6-3:2007, EN60601-1-2:2001

| | | |
|---|---|---|
| Radiated Electric Field | EN55011, EN55022 | (as per CISPR.11/22) Class B, FCC47 part 15 subpart B<br>see application note for details. Additional filtering required for IEC inlet version. |
| Conducted Emissions | EN55011, EN55022 | (as per CISPR.11/22) Class B, FCC47 part 15 subpart B |
| Conducted Harmonics | EN61000-3-2 | Class A |
| Flicker | EN61000-3-3 | Compliant - $d_{max}$ only |

| Safety Approvals | Notes |
|---|---|
| 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<br>CAN/CSA-C22.2 No 60601-1-08 | File E349607 |
| IEC/EN61010 | Designed to meet |
| CE Mark (EN60950-1) | LV Directive 2006/95/EC |
| CB certificate and Report available on request | *Please check with technical sales for status of approvals* |




MATING PARTS (MOLEX OR EQUIVALENT)

| CONN | HOUSING | PINS |
|---|---|---|
| J1 | 39-01-2245 | 44476-3112 |
| J2 | 09-50-8051 | 08-52-0113 |

J1

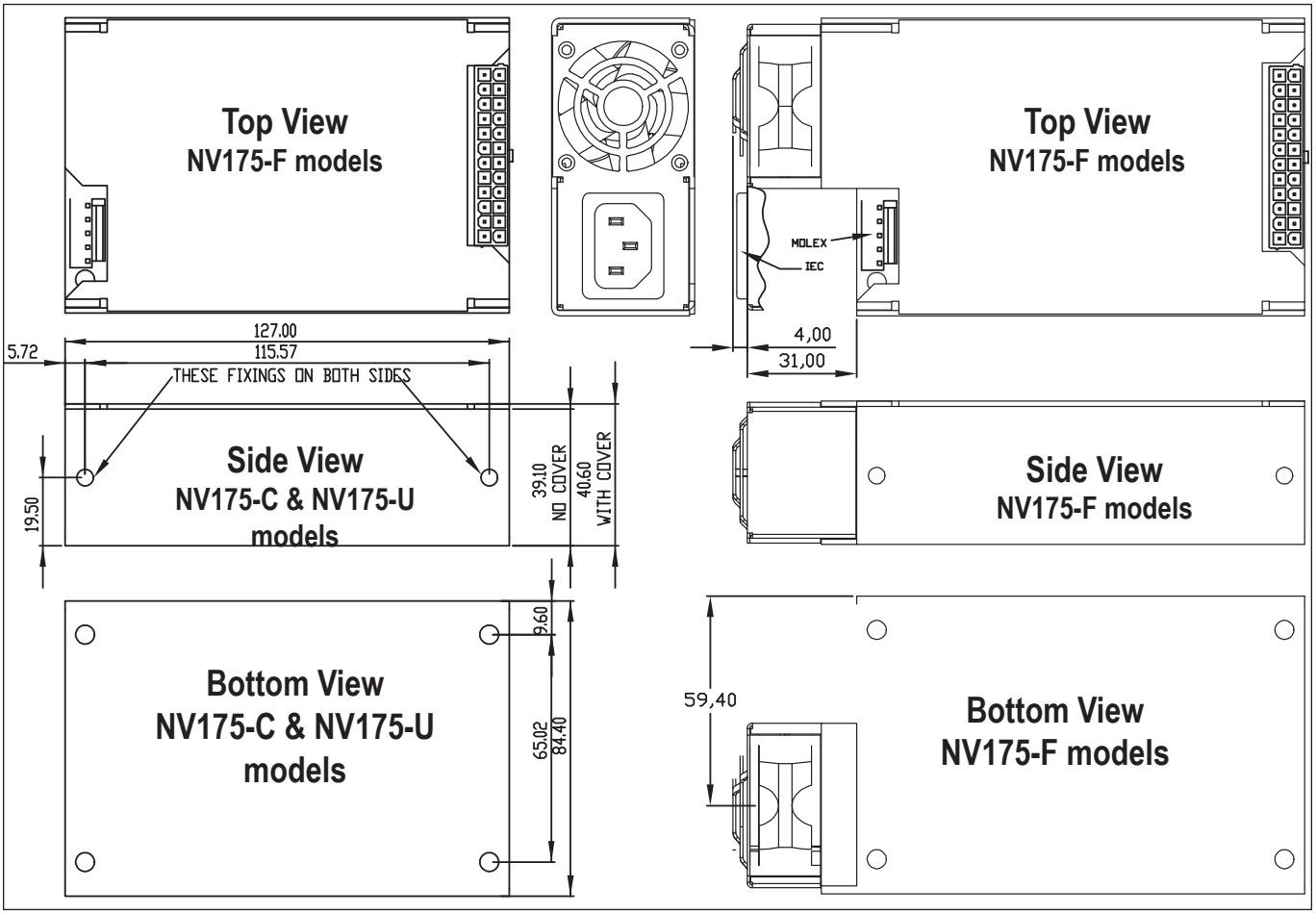
| PIN | FUNCTION | PIN | FUNCTION |
|---|---|---|---|
| 12 | STANDBY +Ve | 24 | Do not connect |
| 11 | Do not connect | 23 | Do not connect |
| 10 | CH1 OUTPUT | 22 | CH1 GOOD |
| 9 | CH1 OUTPUT | 21 | CH1 OUTPUT |
| 8 | CH1 OUTPUT | 20 | CH1 OUTPUT |
| 7 | +SENSE CH1 | 19 | -SENSE CH1 |
| 6 | 0V COMMON | 18 | 0V COMMON |
| 5 | 0V COMMON | 17 | 0V COMMON |
| 4 | Do not connect | 16 | 0V COMMON |
| 3 | Do not connect | 15 | Do not connect |
| 2 | Do not connect | 14 | Do not connect |
| 1 | CH3 OUTPUT | 13 | CH4 OUTPUT |

J2

| PIN | FUNCTION |
|---|---|
| 1 | EARTH |
| 2 | NOT CONNECTED |
| 3 | LIVE |
| 4 | NOT CONNECTED |
| 5 | NEUTRAL |

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

| Part No | Contents |
|---|---|
| 94910 | 1 off input connector and 3 crimps |
| 94668 | 1 off output connector and 20 crimps |




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