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Medical Industrial Test Broadcast Comms Renewable

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

| Features | Benefits |
|---|---|
| • High efficiency | Minimises heat in system |
| • Low profile | Fits 1U applications |
| • High power density | Reduces space requirement |
| • Temperature controlled fan option | Reduces system noise |
| • 3 year warranty | Low cost of ownership |




## Input

| | | | |
|---|---|---|---|
| Input Voltage | 90-264Vac<br>133-388Vdc also available, contact sales | Input Frequency | 45 - 63Hz<br>(440Hz with reduced PFC - consult sales office) |
| Input Harmonics | EN61000-3-2 compliant | | |
| Input Fuse | Timelag (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, 500µA Single Fault Condition) | | |

## Available Outputs

| Channel 1 | | Adjustment Range | Channel 2[1] | | Adjustment Range | Channel 3[3] | | Adjustment Range | Channel 4[4] | | Adjustment Range |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 5V / 25A[2] | 5 - 5.5V | 1<br>2<br>3<br>0 | 1.8V / 15A<br>2.7V / 15A<br>3.3V / 15A<br>Omit | 0.9 - 2.5V<br>2.5 - 3.3V<br>2.5 - 3.3V | T<br>F<br>G<br>0 | 12V / 5A<br>15V / 5A<br>24V / 2.5A<br>Omit | 12 - 15V<br>12 - 15V<br>18 - 24V | T<br>F<br>3H<br>5H<br>TH<br>FH<br>0H<br>0 | -12V / 1A<br>-15V / 1A<br>-3.3V / 2A[9]<br>-5V / 2A[9]<br>-12V / 2A[9]<br>-15V / 2A[9]<br>Fan supply only<br>Omit | Fixed<br>Fixed<br>Fixed<br>Fixed<br>Fixed<br>Fixed |
| T<br>F | 12V / 15A<br>15V / 12A | 12 - 15V[5]<br>12 - 15V[6] | 5<br>0 | 5V / 10A[10]<br>Omit | 3.3 - 5.5V | | | | | | |
| G | 24V / 7.5A | 24 - 28V[7] | 5<br>0 | 5V / 8A[8]<br>Omit | 3.3 - 5.5V | | | | | | |

1. 1.8V, 2.7V, 3.3V channel 2 only available with 5V Channel 1
   5V/10A channel 2 only available with 12V or 15V Channel 1
   5V/8A channel 2 only available with 24V Channel 1.
2. Maximum combined output current from Ch1 & Ch2 = 25A
   Models with 5V channel 1 are limited to 175W output power
3. Follow letters in red by 'Y' for negative output channel 3.
4. Follow letters in red by 'P' for positive output channel 4.
5. 12 - 12.5V if 24V channel 3 fitted.
6. 14.5 - 15V if 24V channel 3 fitted
7. 24 - 24.5V if 5V channel 2 fitted
   24 - 26V if 24V channel 3 fitted.
8. 7A max with '-F' or '-I' option.
9. 1.5A max with '-F' or '-I'option.
10. 9A max with '-F' or '-I'option.

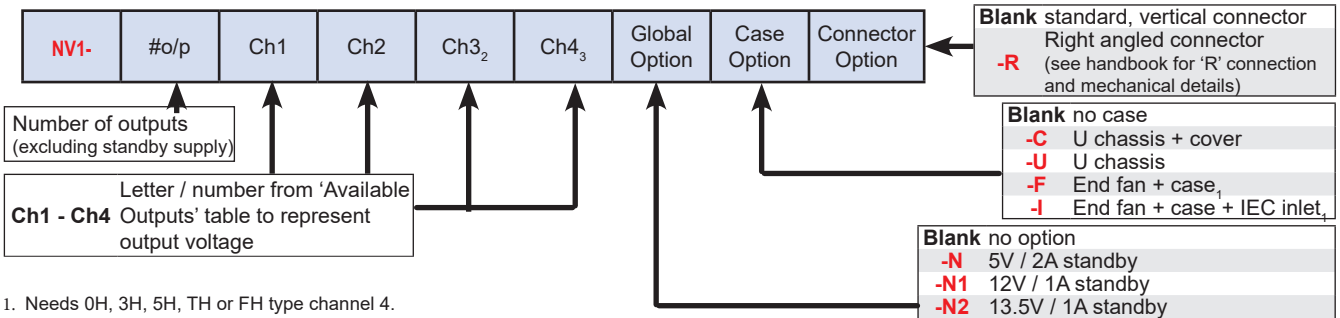
**Other output options are available, please contact sales office with your requirements**

## Isolation

| | | |
|---|---|---|
| Input to Output | 2 x MOOPs (3rd edition 60601)<br>4.3kVdc | Medical reinforced (2 x MOPPs) version available, contact sales office for details. |
| Input to Earth | 1 x MOOP (3rd edition 60601)<br>1.5kVac, 2.3kVdc | |
| Output to Earth | 200Vdc | |

## How To Create A Product Description

Confirm availability of created product with TDK-Lambda




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.

## 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 | Channels 1 & 2. 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 | |
| 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 |

## QUICK SELECTOR - example configurations

| Model | Ch1 | Ch2 | Ch3 | Ch4 | Ch5 | Global Option |
|---|---|---|---|---|---|---|
| NV1-1T000 | 12V / 15A | - | - | - | - | No |
| NV1-1G000 | 24V / 7.5A | - | - | - | - | No |
| NV1-453TT | 5V / 25A | 3.3V / 15A | 12V / 5A | -12V / 1A | - | No |
| NV1-453TT-N3 | 5V / 25A | 3.3V / 15A | 12V / 5A | -12V / 1A | 5V / 2A | ATX (-N3) |
| NV1-453FF | 5V / 25A | 3.3V / 15A | 15V / 5A | -15V / 1A | - | No |
| NV1-453FF-N3 | 5V / 25A | 3.3V / 15A | 15V / 5A | -15V / 1A | 5V / 2A | ATX (-N3) |
| NV1-4G5TT | 24V / 7.5A | 5V / 8A | 12V / 5A | -12V / 1A | - | No |
| NV1-4G5TT-N3 | 24V / 7.5A | 5V / 8A | 12V / 5A | -12V / 1A | 5V / 2A | ATX (-N3) |
| NV1-4G5FF | 24V / 7.5A | 5V / 8A | 15V / 5A | -15V / 1A | - | No |
| NV1-4G5FF-N3 | 24V / 7.5A | 5V / 8A | 15V / 5A | -15V / 1A | 5V / 2A | ATX (-N3) |

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<br>-N option = 5V / 2A (2.5A peak)<br>-N1 Option = 12V / 1A<br>-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<br>-N3 option = 5V / 2A<br>-N4 Option = 12V / 1A |

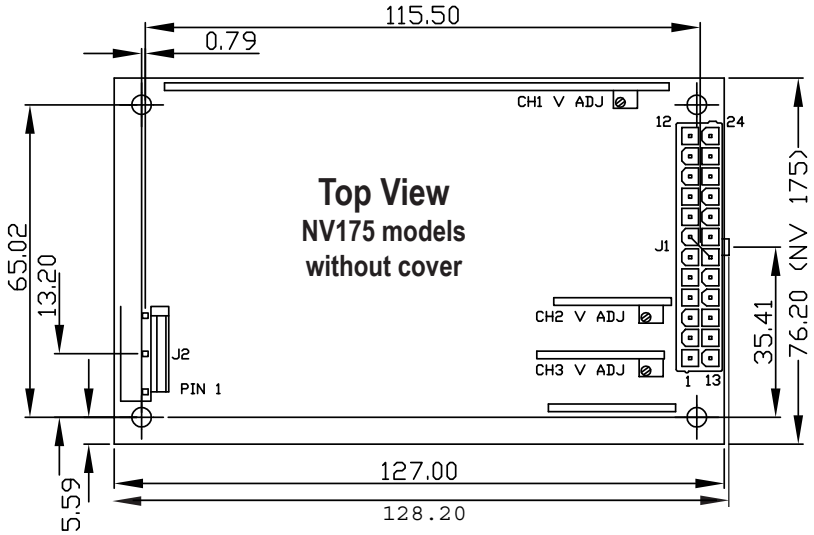
| Immunity EN61000-6-2:2005, EN60601-1-2:2007 | | | | Criteria |
|---|---|---|---|---|
| Electrostatic Discharge | EN61000-4-2 | Level 4 | Air discharge 15kV, Contact discharge 8kV. Not applicable to open frame units | A |
| Electromagnetic Field | EN61000-4-3 | Level 3 | 12V/m | A |
| Fast / Burst Transient | 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 and dips to 40% for 5 cycles below 154Vac nominal input | A |

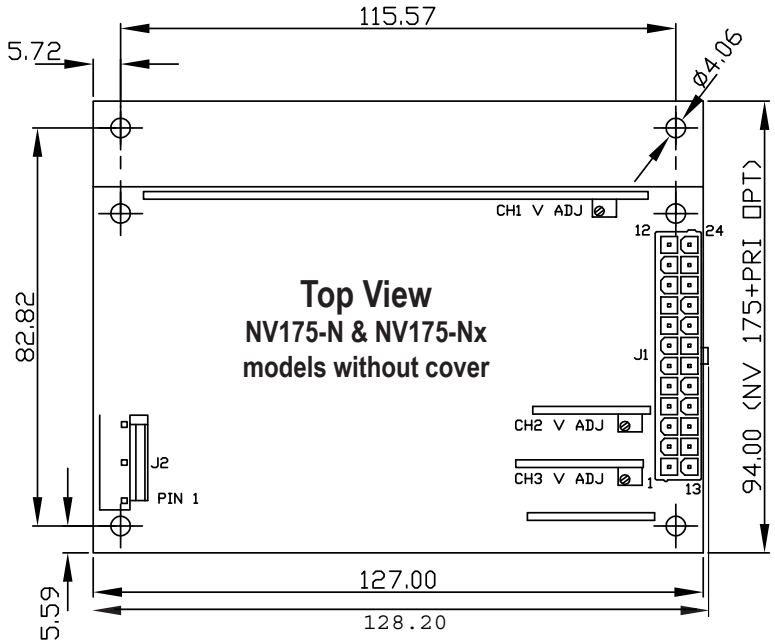
| Emissions EN61000-6-3:2007, EN60601-1-2:2007 | | |
|---|---|---|
| Radiated Electric Field | EN55011, EN55032 | (as per CISPR.11/22) Class B, FCC47 part 15 subpart B<br>see application note for details. Additional filtering is required for IEC inlet version |
| Conducted Emissions | EN55011, EN55032 | (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 |

| Environment | |
|---|---|
| Temperature | 0°C to 50°C operational, -40°C to 70°C storage.<br>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<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 |

| 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<br>CAN/CSA-C22.2 No 60601-1-08 | File E349607 |
| IEC/EN61010 | File E331788 |
| CE Mark (EN62368-1) | Low Voltage Directive (LVD), electromagnetic compatibility (EMC) and Restriction of Hazardous Substances (RoHS) |
| UKCA (EN62368-1) | Electrical Equipment (Safety) Regulations, 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




J2

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

J1

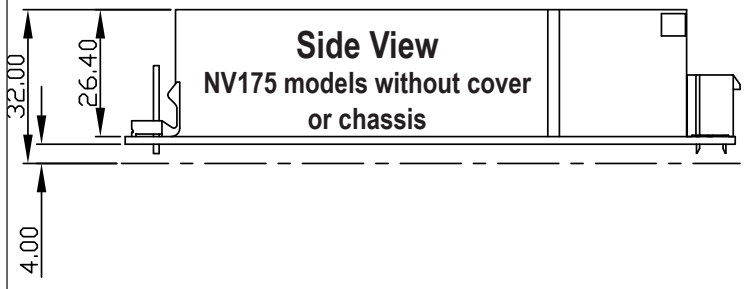
| PIN | FUNCTION | PIN | FUNCTION |
|---|---|---|---|
| 12 | STANDBY +Ve | 24 | STANDBY RETURN |
| 11 | POWER GOOD | 23 | REMOTE ON/OFF |
| 10 | CH1 OUTPUT | 22 | CH1 GOOD |
| 9 | CH1 OUTPUT | 21 | CH1 OUTPUT |
| 8 | CH1 OUTPUT | 20 | CH1 OUTPUT |
| 7 | +SENSE CH1 | 19 | -SENSE CH1 |
| 6 | 0V COMMON | 18 | 0V COMMON |
| 5 | 0V COMMON | 17 | 0V COMMON |
| 4 | CH2 OUTPUT | 16 | 0V COMMON |
| 3 | CH2 OUTPUT | 15 | CH2 OUTPUT |
| 2 | +SENSE CH2 | 14 | -SENSE CH2 |
| 1 | CH3 OUTPUT | 13 | CH4 OUTPUT |

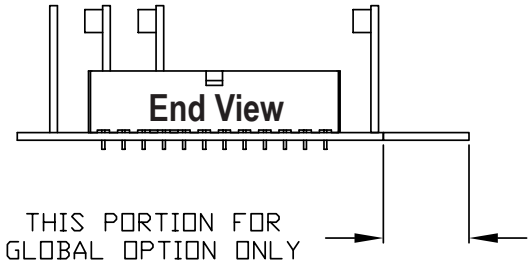
MATING PARTS (MOLEX OR EQUIVALENT)

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

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

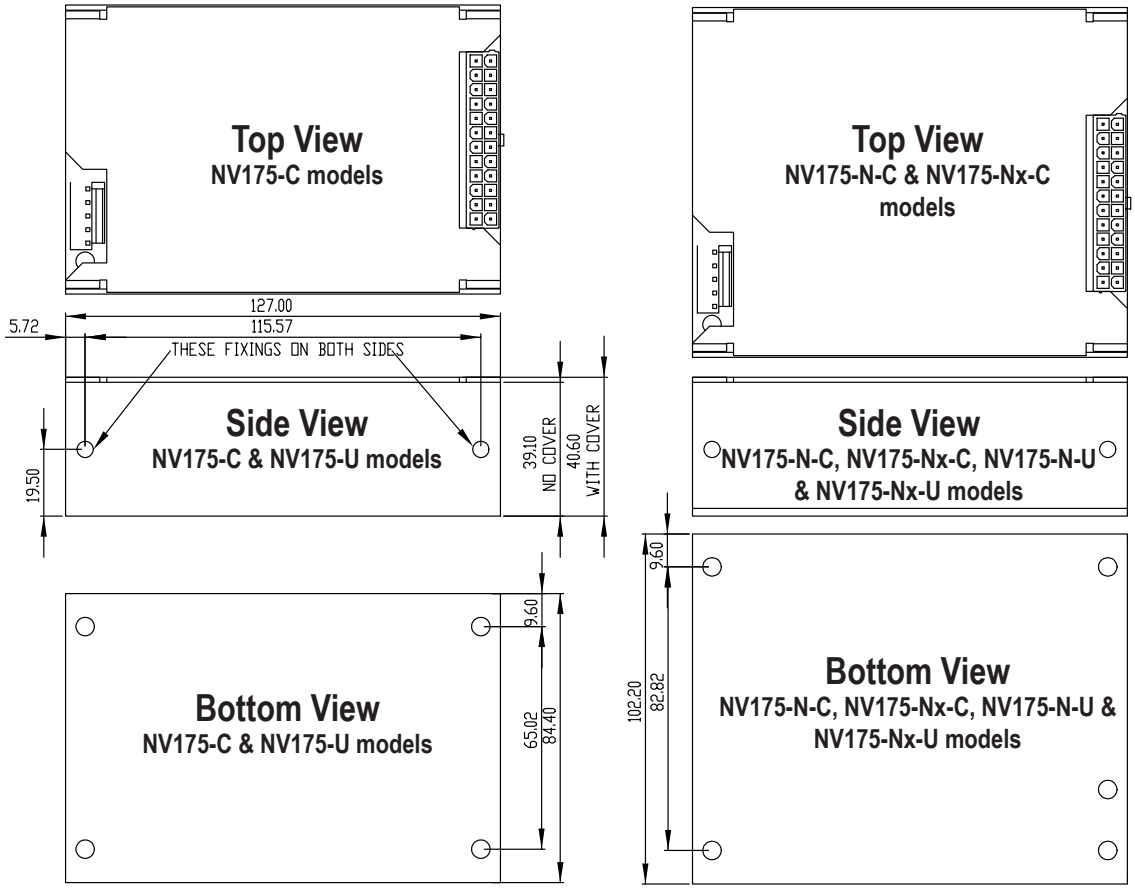
| Part Number | Contents |
|---|---|
| 94910 | 1 off input connector and 3 crimps |
| 94911 | 1 off output connector and 24 crimps |



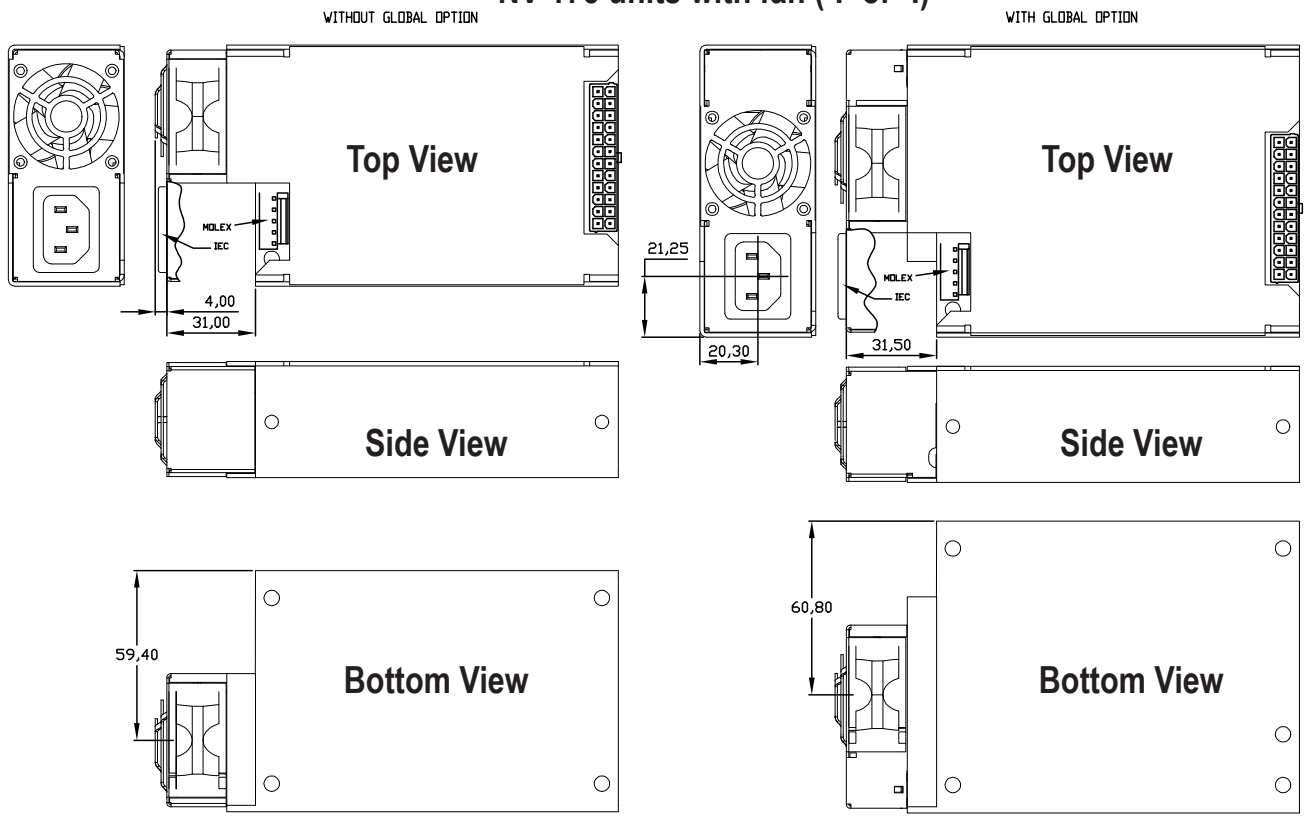




Notes: 1. All customer fixings M3 2. Maximum thread penetration 4.5mm 3. Maximum torque 0.9Nm 4. All tolerances +/-0.5mm

## Outline & Connection Drawings




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




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**



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