

# ORBIT 60 SERIES

## AC-DC Industrial Power Supply

### Datasheet

Bently Nevada Machinery Condition Monitoring

142M8947 Rev. C



## Description

This generation of DIN-rail power supplies combines the most efficient circuit topology with optimized cost/performance ratio for industrial environments and for electrical control cabinets. They have a very high efficiency of up to 95.0% which allows a very slim package design. The output voltage is adjustable from -2% to +17%. The case offers the potentially useful feature to fix the DIN-rail clip to the side wall for the mounting inside flat panels. Over a period of minimum 4 seconds they can operate with a boost power of 150%. The boost power facilitates the activation of stepper motors, solenoids or actuators. The units operate with a high power factor of up to 98% by active power factor correction which also keeps the input inrush current low.

- Slim profile for DIN-rail mounting
- Alternative side-mounting for flat panels
- High power factor by active power correction
- Very high efficiency up to 95%
- Back power immunity
- 150% peak current for 4 seconds
- Operating temperature range: -40°C to +70°C max.
- Adjustable output voltage
- Short circuit and overload protection
- 3-year product warranty

| Output Power max. | Output Voltage Nominal | Output Current max. | Output Current peak | Efficiency typical |
|-------------------|------------------------|---------------------|---------------------|--------------------|
| 240 Watt          | 24 VDC (23.5-28.0 VDC) | 10,000 mA           | 15,000 mA           | 95 %               |
| 480 Watt          | 24 VDC (23.5-28.0 VDC) | 20,000 mA           | 30,000 mA           | 95 %               |



## Specifications

### Inputs

| Description            | 240 Watt  | 480 Watt                                  |
|------------------------|---|---|
| Input Voltage          | 85-264 Vac<br>(full range)<br>100-250 Vdc                                   | 85-264 Vac<br>(full range)<br>100-250 Vdc |
| Input Frequency        | 45-65 Hz  | 45-65 Hz                                  |
| Power Consumption      | 2,300 mW<br>typical (at<br>no load)   | 4,900 mW<br>typical (at<br>no load)       |
| Input Inrush Current   | 30 A max.<br>(at 230 Vac)   | 30 A max.<br>(at 230 Vac)                 |
| Recommended Input Fuse | (The need of an external fuse has to be assessed in the final application.) |   |



"The Orbit 60 Series system was qualified with the power supplies listed in this datasheet. Use of a reduced wattage power supply may result in changed behavior under fault conditions."

### Outputs

| Specification                       | 240 Watt   | 480 Watt               |
|-------------------------------------|--|------------------------|
| Output Power maximum                | 240 Watts max  | 480 Watts max          |
| Output Voltage nominal (adjustable) | 24 Vdc (23.5-28.0 Vdc)<br>(by trim potentiometer)<br>Output power must not exceed rated power. | 24 Vdc (23.5-28.0 Vdc) |
| Output Current maximum              | 10,000 mA  | 20,000 mA              |

| Specification                             | 240 Watt   | 480 Watt  |
|---|--|-----------|
| Output Current peak                       | 15,000 mA  | 30,000 mA |
|   | 150% max. peak operation power<br>4 s max. peak operation time (auto switch off)<br>10 s typical off time<br><br>During peak operation, the unit continuously switches off the output voltage after 4 s and restarts after approximately 10 s. |           |
| Efficiency typical                        | 95%  | 95%       |
| Regulation                                | 0.1% max. input variation (Vmin-Vmax)<br>0.5% max. load variation (10-90%)   |           |
| Ripple and Noise                          | 100 mVp-p max. (20 MHz Bandwidth)  |           |
| Capacitive Load                           | Infinite   |           |
| Minimum Load                              | Not required   |           |
| Temperature Coefficient                   | ±0.02%/K max.  |           |
| Hold-up Time (full load)                  | 20 ms min.   |           |
| Hold-up Time (75% max load)               | 47 ms typical  |           |
| Hold-up Time (75% max load w/ redundancy) | 50 ms min.   |           |
| Start-up Time                             | 2,000 ms max.  |           |
| Short Circuit Protection                  | Continuous, automatic recovery   |           |

| Specification             | 240 Watt   | 480 Watt  |
|---------------------------|--|---|
| Overload Protection       | Constant current mode<br>Switch off after 4 s delay,<br>automatic restart  |   |
| Output Current Limitation | 155% min. of I <sub>out</sub> max.   |   |
| Overvoltage Protection    | 117–146% of V <sub>out</sub> nom.<br>32–35 VDC (24 VDC model)<br><br>(In case of an internal error a second voltage regulation loop keeps the output voltage at a safe level, the power supply turns off and tries to restart after 10 s.) |   |
| Transient Response        | 600 mV max. Peak Variation (10% to 90% Load Step)<br><br>2000 µs typical Response Time (10% to 90% Load Step)  | 600 mV max. Peak Variation (10% to 90% Load Step)<br><br>5000 µs typical Response Time (10% to 90% Load Step) |



All specifications valid at nominal voltage, full load and +25°C after warm-up time unless otherwise stated.

## LED Indications

### Power OK Indication

|                   |   |
|-------------------|---|
| Status Indicator  | Indicated by green LEDs: front and side |
| Trigger Threshold | OK: 22.5 VDC, Off: 21.5 VDC             |

### Power OK Relay

|          |                      |
|----------|----------------------|
| Power OK | Relay contact closed |
|----------|----------------------|

|                    |                    |
|--------------------|--------------------|
| Power Off          | Relay contact open |
| Pin Specifications | 30 VDC / 1 A max.  |

## Electrical

|                       |                       |
|-----------------------|-----------------------|
| Over Voltage Category | OVC II                |
| Switching Frequency   | 75–100 kHz (PWM)      |
| Insulation System     | Reinforced Insulation |

### Isolation Test Voltage

|                            |           |
|----------------------------|-----------|
| Input to Output, 60 s      | 3,000 VAC |
| Input to Case or PE, 60 s  | 1,500 VDC |
| Output to Case or PE, 60 s | 750 VDC   |

### Creepage

|                      |             |
|----------------------|-------------|
| Input to Output      | 8 mm min.   |
| Input to Case or PE  | 4 mm min.   |
| Output to Case or PE | 1.5 mm min. |

### Clearance

|                      |             |
|----------------------|-------------|
| Input to Output      | 8 mm min.   |
| Input to Case or PE  | 4 mm min.   |
| Output to Case or PE | 1.5 mm min. |

### Leakage Current

|                       |  |
|-----------------------|--|
| Earth Leakage Current | 3500 µA max.                                   |
| Touch Current         | 240 Watt: 310 µA max.<br>480 Watt: 880 µA max. |

## Physical

|                  |   |
|------------------|---|
| Housing Material | Aluminum (Chassis)<br>Stainless Steel (Cover) |
| Housing Type     | Screw Terminal                                |

|          |                                     |
|----------|-------------------------------------|
| Mounting | DIN-rails as per EN 50022-35×15/7.5 |
| Weight   | 240 Watt: 643 g<br>480 Watt: 1018 g |

## Environmental

|  |                                      |   |
|--|--------------------------------------|---|
| Relative Humidity                      | 95% max. (non condensing)            |   |
| Temperature Ranges                     | Operating Temperature                | -40°C to +70°C  |
| Power Derating                         | High Temperature                     | 2 %/K above 60°C (at standard operation)<br>3%/K above 60°C (at peak power mode)        |
|  | Low Input Voltage                    | 3%/V below 90 VAC (at standard operation)<br>1.5 %/V below 100 VAC (at peak power mode) |
| Over Temperature Protection Switch Off | Protection Mode                      | Latch Off   |
| Cooling System                         | Natural convection (20 LFM)          |   |
| Altitude During Operation              | 2,000 m max.                         |   |
| Protection Class                       | Class I (Prepared): Connection to PE |   |
| Pollution Degree                       | PD 2                                 |   |

|  |   |  |
|--|---|--|
| Environment<br>(Compliance to EN 61373 only with optional DIN-Rail Clip TIB-RMK01) | Vibration   | EN 61373<br>IEC 60068-2-6<br>2 g, 3 axis, sine sweep, 10-55 Hz, 11 oct/min |
|  | Mechanical Shock  | EN 61373<br>IEC 60068-2-27<br>25 g, 3 axis, half sine, 11 ms               |
| Thermal Impedance  | 240 Watt: 0.95 K/W<br>480 Watt: 0.6 K/W   |  |
| Power Back Immunity  | 35 V max.<br><br>(When external voltage is supplied above set output voltage and below OVP threshold, the power supply will function normally without switch off or destruction, even if external voltage is applied continuously.) |  |

## Compliance and Certifications

### FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

### EMC

European Community Directive:

EMC Directive 2014/30/EU

Standards:

EN 61000-6-2; Immunity for Industrial Environments

EN 61000-6-4; Emissions for Industrial Environments

### Electrical Safety

European Community Directive:

LV Directive 2014/35/EU

Standards:

EN 61010-1;

EN 61010-2-201;

### RoHS

European Community Directive:

RoHS Directive 2011/65/EU

### Functional Safety

This component is non-interfering with the safety system. The system SIL 2 certification does not require this component be SIL certified.

## Hazardous Area Approvals



For the detailed listing of country and product-specific approvals, refer to the [Approvals Quick Reference Guide \(108M1756\)](#).

For additional technical documentation, please log in to [bntechsupport.com](http://bntechsupport.com) and access the Bently Nevada Media Library.

### cNRTLus

Class I, Zone 2: AEx/Ex ec nC IIC T4 Gc;

Class I, Division 2, Groups A, B, C, D T4;

T4 @ Ta= -30°C to +70°C (-22°F to +158°F)



De-rating conditions must be considered. Refer to installation drawing for details.

### ATEX/IECEx



II 3 G  
Ex ec nC IIC T4 Gc

T4 @ Ta= -30°C to +70°C (-22°F to +158°F)



De-rating conditions must be considered. Refer to installation drawing for details.

## Ordering Information



For the detailed listing of country and product-specific approvals, refer to the [Approvals Quick Reference Guide \(108M1756\)](#).

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## AC/DC Industrial Power Supply

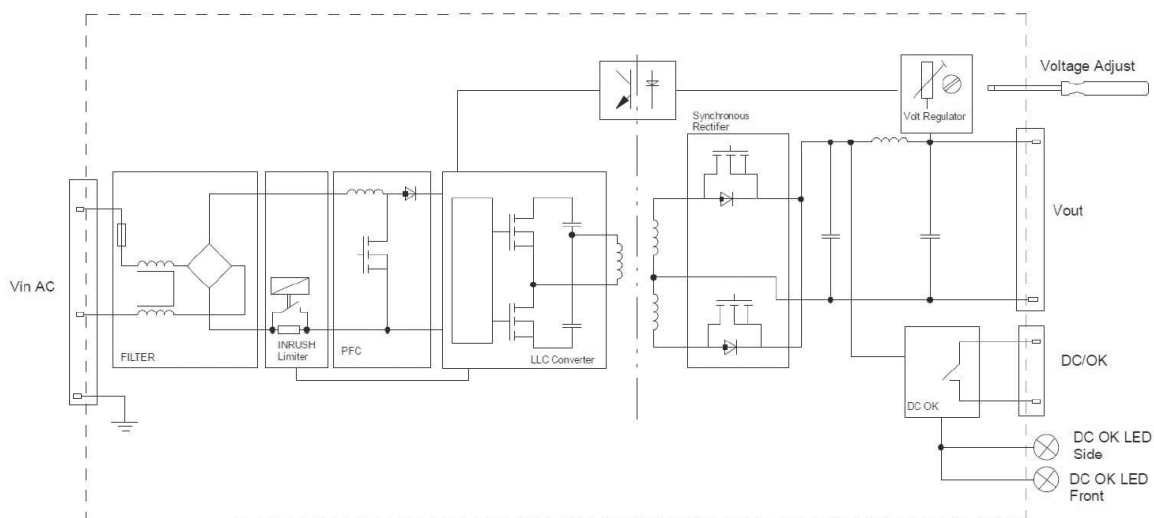


Specific Power Supplies are exclusively used with either the 3U (240 W) or 6U (480 W chassis).

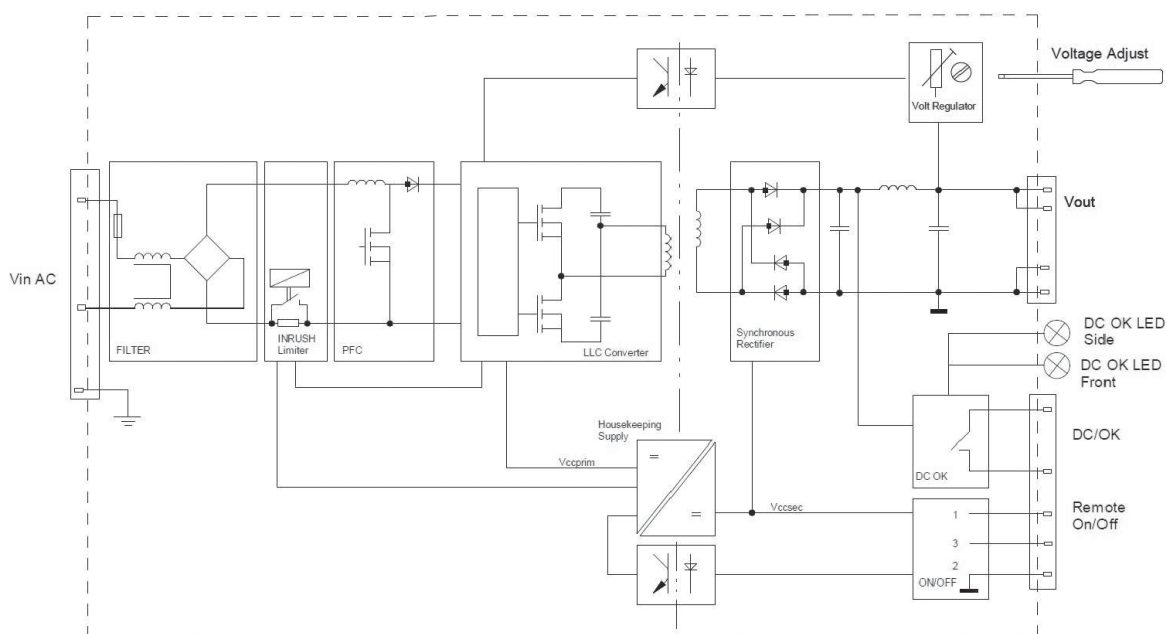
| Ordering Option  | Description                 |
|--|-----------------------------|
| <b>60X/XPS01-AAA • 240 Watt AC/DC (3U) Industrial Power Supply</b> |                             |
| AAA – Agency Approvals   |                             |
| 00   | No Hazardous Area           |
| 01   | CSA/NRTL/C (Class I, Div 2) |
| 02   | Multi (CSA, ATEX, IECEx)    |
| XXX  | Country Specific Approvals  |
| <b>60X/XPS02-AAA • 480 Watt AC/DC (6U) Industrial Power Supply</b> |                             |
| AAA – Agency Approvals   |                             |
| 00   | No Hazardous Area           |
| 01   | CSA/NRTL/C (Class I, Div 2) |
| 02   | Multi (CSA, ATEX, IECEx)    |
| XXX  | Country Specific Approvals  |



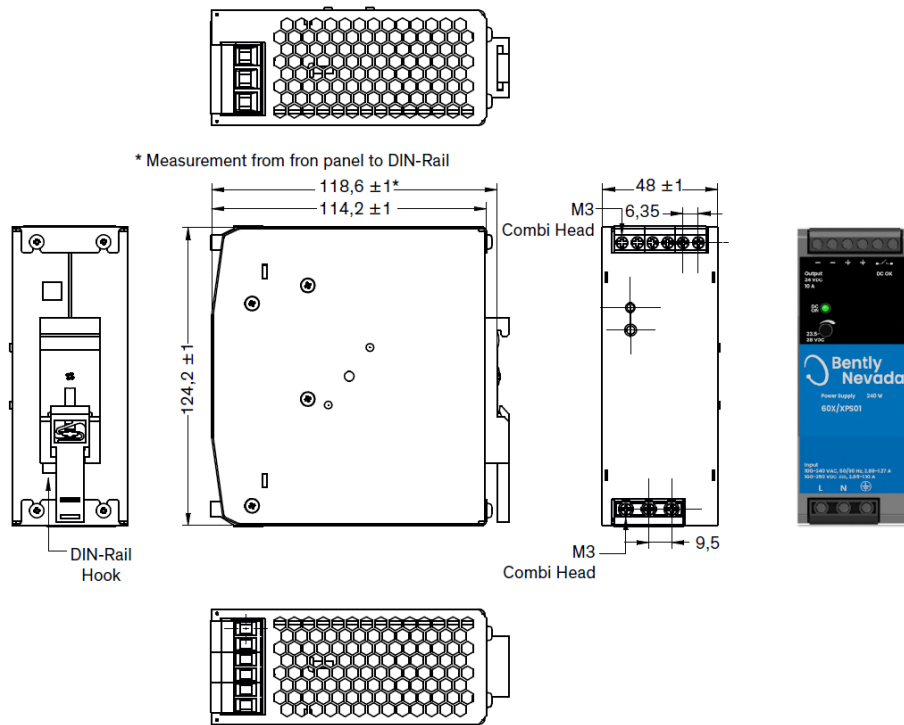
## Graphs and Figures



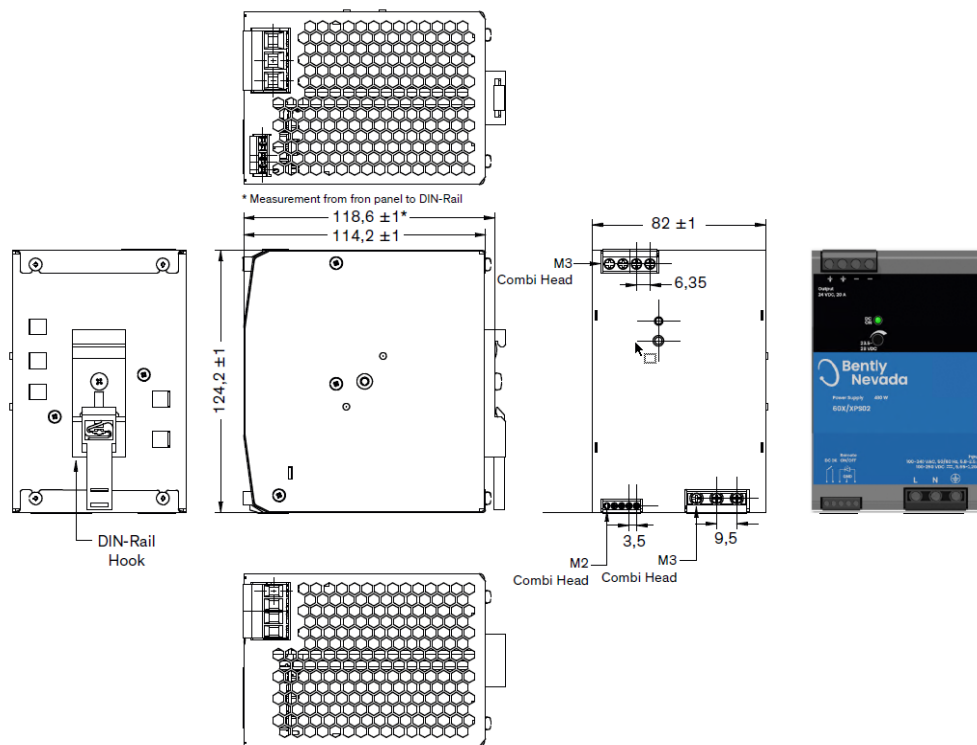
**Figure 1: 240 Watt Black Diagram**



**Figure 2: 480 Watt Black Diagram**

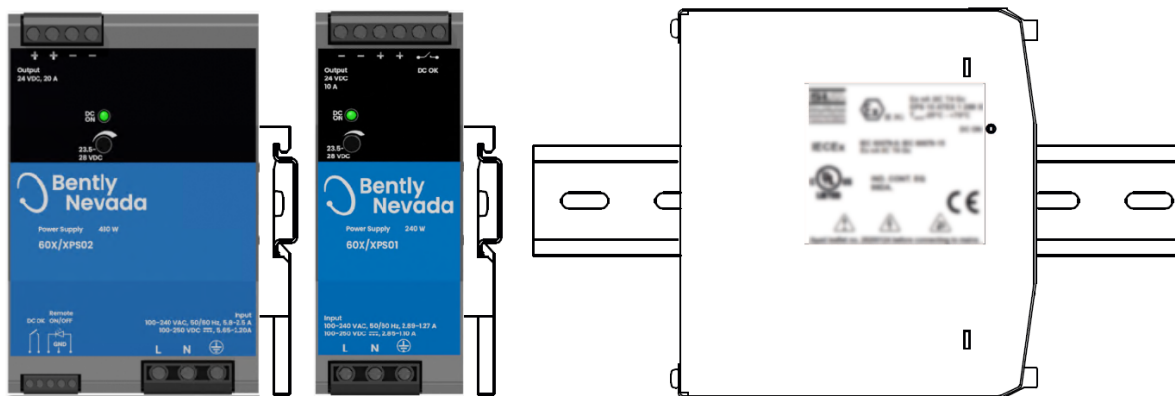


**Figure 3: 240 Watt Outline Dimensions**



**Figure 4: 480 Watt Outline Dimensions**





**Figure 5: Alternative Side Mounting**

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