5-60 Watts
DNR05-60 Series

Rugged Design for Industrial Applications
Up to 89% Efficiency
Wide Adjustment Range
DC OK 24 V Models
DC Standby Versions
Connector Options
Full Power to +60 °C

Specification

Input

- Input Voltage
  - 90-264 VAC, 120-370 VDC: DNR05/10/18
  - 85-264 VAC, 90-375 VDC: DNR30/60
- Input Frequency
  - 47-63 Hz
- Inrush Current
  - 5-18 W: 10/18 A at 115/230 VAC
  - 30 W: 20/40 A at 115/230 VAC
  - 60 W: 30/60 A at 115/230 VAC
- Power Factor
  - Meets EN61000-3-2 for class A equipment
- Earth Leakage Current
  - 0.8 mA max

Output

- Output Voltage
  - See tables
- Output Voltage Trim
  - See tables
- Initial Set Accuracy
  - ±1%
- Minimum Load
  - No minimum load required
- Start Up Delay
  - <1000 ms
- Start Up Rise Time
  - <150 ms
- Hold Up Time
  - 5 W: 30/130 ms at 115/230 VAC
  - 10 W: 25/100 ms at 115/230 VAC
  - 18 W: 20/75 ms at 115/230 VAC
  - 30 W: 20/30 ms at 115/230 VAC
  - 60 W: 20/30 ms at 115/230 VAC
- Line Regulation
  - 5-18 W: ±1.0% max
  - 30-60 W: ±0.5% max
- Load Regulation
  - 5-18 W: ±2.0% max
  - 30-60 W: ±0.5% max
- Transient Response
  - 300 μs for a 50% load change
- Ripple & Noise
  - 50 mV pk-pk, 20 MHz BW
- Overvoltage Protection
  - Output clamps at 120-145% Vnom
- Overload Protection
  - 105-145%
- Short Circuit Protection
  - 5-18 W: Trip and restart (Hiccup mode)
  - 30-60 W: Constant power
- Temperature Coefficient
  - ±0.03%/°C

General

- Efficiency
  - See tables
- Isolation
  - 3000 VAC Input to Output
  - 1500 VAC Input to Ground
  - 500 VAC Output to Ground
- Switching Frequency
  - 100 KHz typical
- Signals
  - DC ON indicator LED Green: All models
  - DC LOW indicator LED Red: 5-18 W models
  - DC OK: 24 V 30-60 W models
- MTBF
  - 200 kHrs typical per MIL-HDBK-217F
  - GF, +40 °C

Environmental

- Operating Temperature
  - -10 °C to +70 °C, derate linearly from +50 °C for 5 & 18 W models, +60 °C for all other models (See derating curves)
  - Convection-cooled
- Operating Humidity
  - 20-95% RH, non-condensing
- Storage Temperature
  - -25 °C to +85 °C
- Shock
  - 4 g, 22 ms, X, Y & Z axis
- Vibration
  - 1 g, 10 Hz to 500 kHz, along X, Y & Z axis

EMC & Safety

- Emissions
  - EN55022, level B conducted
- Harmonic Currents
  - EN61000-3-2, class A
- Voltage Flicker
  - EN61000-3-3 amendments 1 & 2
- ESD Immunity
  - EN61000-4-2, level 3 Perf Criteria A
- Radiated Immunity
  - EN61000-4-3, level 3 Perf Criteria A
- EFT/Burst
  - EN61000-4-4, level 3 Perf Criteria A
- Surge
  - EN61000-4-5, level 3 Perf Criteria A
- Dips & Interruptions
  - EN61000-4-11, 30% 10 ms, 60% 100 ms, 100% 5000 ms
  - Perf Criteria A, B, B
- Safety Approvals
  - EN60950-1:2001, UL508, UL1310 - see note 3 & ratings table, UL60950-1, cUL60950-1, CE Mark
## Models and Ratings

<table>
<thead>
<tr>
<th>Output Voltage</th>
<th>Output Voltage Trim</th>
<th>Current</th>
<th>Typical Efficiency</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 V</td>
<td>4.50-5.75 V</td>
<td>1.000 A</td>
<td>69%</td>
<td>DNR05US05&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>12 V</td>
<td>10.80-13.80 V</td>
<td>0.420 A</td>
<td>72%</td>
<td>DNR06US12&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>15 V</td>
<td>13.50-17.25 V</td>
<td>0.340 A</td>
<td>72%</td>
<td>DNR06US15&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>24 V</td>
<td>21.60-28.80 V</td>
<td>0.210 A</td>
<td>72%</td>
<td>DNR05US24&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>5 V</td>
<td>4.50-5.75 V</td>
<td>2.000 A</td>
<td>73%</td>
<td>DNR10US05&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>12 V</td>
<td>10.80-13.80 V</td>
<td>0.840 A</td>
<td>75%</td>
<td>DNR10US12&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>15 V</td>
<td>13.50-17.25 V</td>
<td>0.670 A</td>
<td>76%</td>
<td>DNR10US15&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>24 V</td>
<td>21.60-28.80 V</td>
<td>0.420 A</td>
<td>76%</td>
<td>DNR10US24&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>5 V</td>
<td>5.00-5.50 V</td>
<td>3.000 A</td>
<td>75%</td>
<td>DNR18US05&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>12 V</td>
<td>12.00-14.00 V</td>
<td>1.500 A</td>
<td>77%</td>
<td>DNR18US12&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>15 V</td>
<td>13.50-17.25 V</td>
<td>1.200 A</td>
<td>77%</td>
<td>DNR18US15&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>24 V</td>
<td>21.60-28.80 V</td>
<td>0.750 A</td>
<td>77%</td>
<td>DNR18US24&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>5 V</td>
<td>5.00-5.50 V</td>
<td>6.000 A</td>
<td>79%</td>
<td>DNR30US05&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>12 V</td>
<td>12.00-14.00 V</td>
<td>2.500 A</td>
<td>84%</td>
<td>DNR30US12&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>24 V</td>
<td>24.00-28.00 V</td>
<td>1.250 A</td>
<td>86%</td>
<td>DNR30US24&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>48 V</td>
<td>48.00-55.00 V</td>
<td>0.625 A</td>
<td>86%</td>
<td>DNR30US48&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>5 V</td>
<td>5.00-5.50 V</td>
<td>10.000 A</td>
<td>79%</td>
<td>DNR60US05&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>12 V</td>
<td>12.00-14.00 V</td>
<td>5.000 A</td>
<td>86%</td>
<td>DNR60US12&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>24 V</td>
<td>24.00-28.00 V</td>
<td>2.500 A</td>
<td>89%</td>
<td>DNR60US24&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>48 V</td>
<td>48.00-55.00 V</td>
<td>1.250 A</td>
<td>89%</td>
<td>DNR60US48&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

### Notes
1. Add suffix `-S` for spring clamp option.
2. 30-60 W models are suitable for battery-charging applications.
3. Approved to UL1310.

† Available from Farnell. See pages 204-206.

### Derating Curves

#### DNR5-18 Models

![Derating Curve for DNR5-18 Models](image1)

#### DNR30-60 Models

![Derating Curve for DNR30-60 Models](image2)
Mechanical Details

5/10/18 W Models

Notes
1. All dimensions in inches (mm).
2. Weight 0.33 lb (150 g) approx.

30/60 W Models

Notes
1. All dimensions in inches (mm).
2. Weight 0.6 lb (275 g) approx.

DNR05-60 Connections

<table>
<thead>
<tr>
<th>Conn</th>
<th>Pin</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>1</td>
<td>Ground</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Neutral</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Line</td>
</tr>
<tr>
<td>DC</td>
<td>1</td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Negative</td>
</tr>
</tbody>
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DNR30/60 Connections

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<td></td>
<td>2</td>
<td>Positive</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Negative</td>
</tr>
</tbody>
</table>

* 24 V & standby models only.
Standby Versions

DNR05-60

Output Set Voltages For Standby Versions

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Current</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNR30US12*</td>
<td>13.6 V</td>
<td>2.20 A</td>
<td>84%</td>
</tr>
<tr>
<td>DNR30US24*</td>
<td>27.2 V</td>
<td>1.10 A</td>
<td>86%</td>
</tr>
<tr>
<td>DNR30US48*</td>
<td>54.5 V</td>
<td>0.55 A</td>
<td>86%</td>
</tr>
<tr>
<td>DNR60US12*</td>
<td>13.6 V</td>
<td>4.40 A</td>
<td>86%</td>
</tr>
<tr>
<td>DNR60US24*</td>
<td>27.2 V</td>
<td>2.20 A</td>
<td>89%</td>
</tr>
<tr>
<td>DNR60US48*</td>
<td>54.5 V</td>
<td>1.10 A</td>
<td>89%</td>
</tr>
</tbody>
</table>

Notes
** at the end of the part number denotes DC standby system.

DC OK

30-60 W Models

Output good = 24 V
Output not good = 0 V

Example using external relay to create volt-free contact

Example using external components to create TTL signal

Standard on 24 V models, 30-60 W only.