# 5–60 Watts
# DNR Series





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

## Specification

### Input

| | |
|---|---|
| Input Voltage | • 90-264 VAC, 120-375 VDC (DNR05/10/18)<br>85-264 VAC, 90-375 VDC (DNR30/60) |
| Input Frequency | • 47-63 Hz |
| Input Current | • See tables |
| Inrush Current | • 5-18 W: 15/30 A at 115/230 VAC<br>30 W: 20/40 A at 115/230 VAC<br>60 W: 30/60 A at 115/230 VAC |
| Power Factor | • EN61000-3-2, class A |
| Earth Leakage Current | • 0.8 mA max |
| Input Protection | • Internal fuse T2A, 250 VAC fitted in line |

### Output

| | |
|---|---|
| Output Voltage | • See tables |
| Output Voltage Trim | • See tables |
| Initial Set Accuracy | • ±1% |
| Minimum Load | • No minimum load required |
| Start Up Delay | • <1 s (may increase at low temperature extremes) |
| Start Up Rise Time | • <150 ms |
| Hold Up Time | • 30/130 ms at 115/230 VAC (DNR05)<br>25/100 ms at 115/230 VAC (DNR10)<br>20/75 ms at 115/230 VAC (DNR18)<br>20/30 ms at 115/230 VAC (DNR30)<br>20/30 ms at 115/230 VAC DNR60) |
| Line Regulation | • 5-18 W: ±1.0% max<br>30-60 W: ±0.5% max |
| Load Regulation | • 5-18 W: ±2.0% max<br>30-60 W: ±0.5% max |
| Parallel Operation | • Redundancy module DPM10 available for load currents up to 10 A (not with standby system), contact sales |
| Transient Response | • 4% max deviation recovery to within 1% in 2 ms for a 50% load change |
| Ripple & Noise | • 50 mV pk-pk, 20 MHz bandwidth (may increase at low temperature extremes) |
| Overvoltage Protection | • Output clamps at 120-145% Vnom, auto recovery |
| Overload Protection | • 110-165% constant current (DNR05-18)<br>105-150% power limited (DNR30/60) |
| Short Circuit Protection | • Power limited, auto recovery |
| Temperature Coefficient | • ±0.03%/°C |

### Safety

| | |
|---|---|
| Safety Approvals | • CE & UKCA meets all applicable directives & legislation |

### General

| | |
|---|---|
| Efficiency | • See tables |
| Isolation | • 3000 VAC Input to Output, 1500 VAC Input to Ground, 500 VAC Output to Ground |
| Switching Frequency | • 132 KHz typical, 55-90 kHz (DNR60) |
| Signals | • DC ON indicator LED Green: All models<br>DC LOW indicator LED Red: 5-18 W models<br>DC OK: 24 V 30-60 W models<br>DC OK: All standby models |
| MTBF | • 800 kHrs typical Bellcore, Issue 6 at +40 °C, GB (DNR05/10/18), 530 kHrs typical Bellcore, Issue 6 at +40 °C, GB (DNR30/60) |
| DIN Rail | • Compatible with TS35/7.5 or TS35/15 |

### Environmental

| | |
|---|---|
| Operating Temperature | • -20 °C to +70 °C (DNR05/10/18)<br>-40 °C to +70 °C, start up at -35 °C (DNR30/60), all units derate linearly from 60 °C (see derating curves) |
| Cooling | • Convection-cooled with 25mm free space all sides |
| Operating Altitude | • 5000m |
| Operating Humidity | • 20-95% RH, non-condensing |
| Storage Temperature | • -25 °C to +85 °C (DNR05/10/18)<br>-40 °C to +85 °C (DNR30/60) |
| Shock | • 15 g, 11 ms, X, Y & Z axis, 3 shocks/axis in both directions |
| Vibration | • 2 g, 10 Hz to 500 Hz, along X, Y & Z axis, 60 mins/axis, mounted on rail |

### EMC & Safety

| | |
|---|---|
| Emissions | • EN55022, level B conducted & radiated |
| Harmonic Currents | • EN61000-3-2, class A |
| Voltage Flicker | • EN61000-3-3 |
| ESD Immunity | • EN61000-4-2, level 4, Perf Criteria A |
| Radiated Immunity | • EN61000-4-3, level 3, Perf Criteria A |
| EFT/Burst | • EN61000-4-4, level 4, Perf Criteria A |
| Surge | • EN61000-4-5, installation class 3, Perf Criteria A |
| Conducted Immunity | • EN61000-4-6, level 3, Perf Criteria A |
| Magnetic Field | • EN61000-4-8, level 4 Perf Criteria A |
| Dips & Interruptions | • EN61000-4-11, 30% 10 ms, 60% 100 ms, 100% 5000 ms Perf Criteria A, B, B |
| Safety Approvals | • EN62368-1, UL508 Pollution Degree 2, UL1310 class 2 power recognised. See note 3 & ratings table, UL62368-1, cUL62368-1 Overvoltage Category II, UL508 Overvoltage Category III, ANSI/ISA 12.12.01. Class 1, Division 2 Groups A,B,C and D<br>DNR30 & DNR60: SEMI F47 |

## Models and Ratings



| Output Voltage | Input Current (typ.) 115 VAC | Input Current (typ.) 230 VAC | Output Voltage Trim | Output Current | Efficiency (typ.) | Model Number |
|---|---|---|---|---|---|---|
| 5 V | 0.12 A | 0.08 A | 4.50-5.75 V | 1.000 A | 69% | DNR05US05 |
| 12 V | 0.12 A | 0.08 A | 10.80-13.80 V | 0.420 A | 72% | DNR05US12 |
| 15 V | 0.12 A | 0.08 A | 13.50-17.25 V | 0.340 A | 72% | DNR05US15 |
| 24 V | 0.12 A | 0.08 A | 21.60-28.80 V | 0.210 A | 72% | DNR05US24 |
| 5 V | 0.20 A | 0.13 A | 4.50-5.75 V | 2.000 A | 73% | DNR10US05 |
| 12 V | 0.20 A | 0.13 A | 10.80-13.80 V | 0.840 A | 75% | DNR10US12 |
| 15 V | 0.20 A | 0.13 A | 13.50-17.25 V | 0.670 A | 76% | DNR10US15 |
| 24 V | 0.20 A | 0.13 A | 21.60-28.80 V | 0.420 A | 76% | DNR10US24 |
| 5 V | 0.36 A | 0.21 A | 4.50-5.75 V | 3.000 A | 75% | DNR18US05 |
| 12 V | 0.36 A | 0.21 A | 10.80-13.80 V | 1.500 A | 77% | DNR18US12 |
| 15 V | 0.36 A | 0.21 A | 13.50-17.25 V | 1.200 A | 77% | DNR18US15 |
| 24 V | 0.36 A | 0.21 A | 21.60-28.80 V | 0.750 A | 77% | DNR18US24 |
| 5 V | 0.56 A | 0.33 A | 5.00-5.50 V | 6.000 A | 79% | DNR30US05[2,3] |
| 12 V | 0.56 A | 0.33 A | 12.00-14.00 V | 2.500 A | 84% | DNR30US12[2,3] |
| 24 V | 0.56 A | 0.33 A | 24.00-28.00 V | 1.250 A | 86% | DNR30US24[2,3] |
| 48 V | 0.56 A | 0.33 A | 48.00-55.00 V | 0.625 A | 86% | DNR30US48[2,3] |
| 5 V | 1.10 A | 0.59 A | 5.00-5.50 V | 10.000 A | 79% | DNR60US05[2,3] |
| 12 V | 1.10 A | 0.59 A | 12.00-14.00 V | 5.000 A | 86% | DNR60US12[2,3] |
| 24 V | 1.10 A | 0.59 A | 24.00-28.00 V | 2.500 A | 89% | DNR60US24[2,3] |
| 48 V | 1.10 A | 0.59 A | 48.00-55.00 V | 1.250 A | 89% | DNR60US48[2,3] |

### Notes

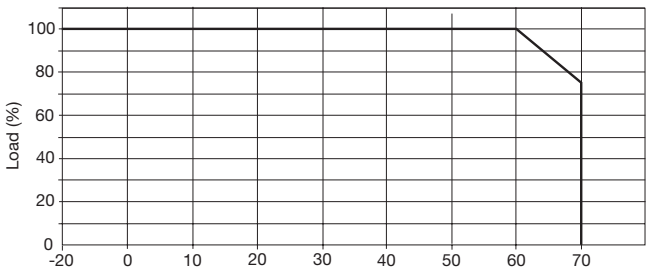
*1. 30-60 W models are suitable for battery-charging applications. Available for OEM quantities, contact sales.*

*2. Approved to UL1310, but 5 & 12 V not Class 2 Power recognised.*

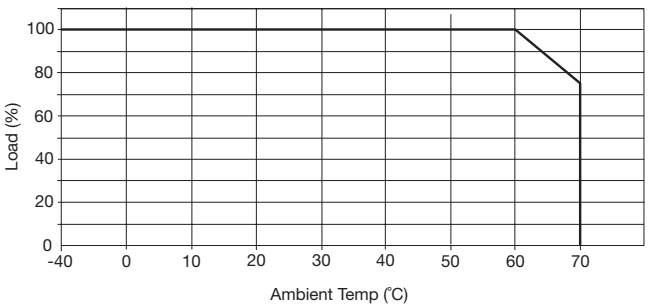
*3. SEMI F47 compliant.*

## Derating Curves

### DNR05-18 W Models



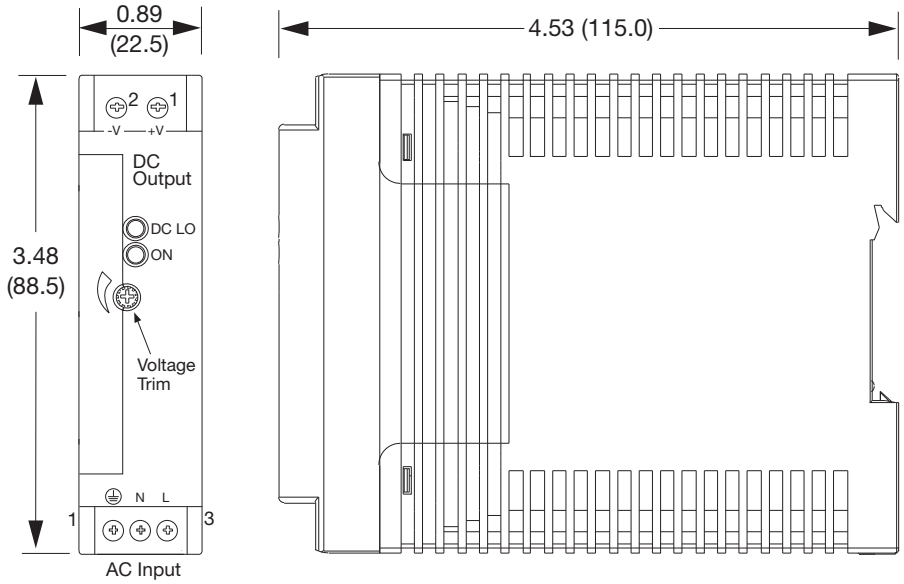

### DNR30-60 W Models



# Mechanical Details



## DNR05/10/18 W Models

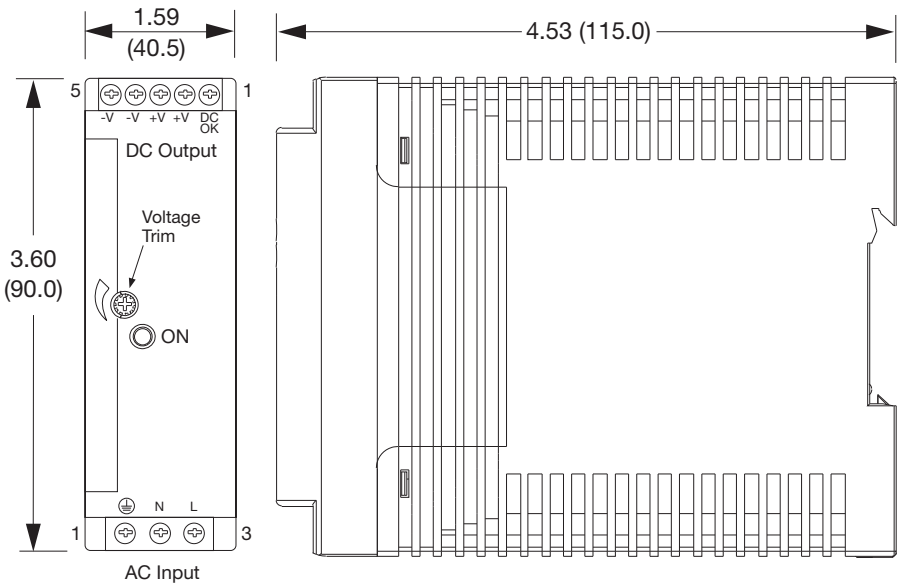



| DNR05, 10, 18 Connections | | |
|---|---|---|
| Conn | Pin | Designation |
| AC Input | 1 | Ground |
| | 2 | Neutral |
| | 3 | Line |
| DC Output | 1 | Positive |
| | 2 | Negative |

### Notes

1. All dimensions in inches (mm).
2. Weight 0.33 lb (150 g) approx.
3. Tolerance: ±0.02 (0.5) maximum.
4. Connection screw maximum torque:
   Input: 9 lbs-in (1.0 Nm), Output: 5.5 lbs-in (0.6 Nm)

## 30/60 W Models




| DNR30/60 Connections | | |
|---|---|---|
| Conn | Pin | Designation |
| AC Input | 1 | Ground |
| | 2 | Neutral |
| | 3 | Line |
| DC Output | 1 | DC OK* |
| | 2 | Positive |
| | 3 | Positive |
| | 4 | Negative |
| | 5 | Negative |

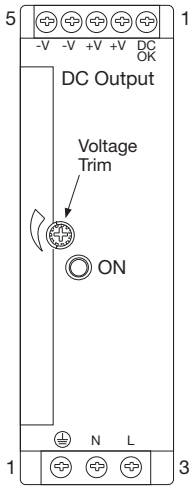
* 24 V and standby models only.

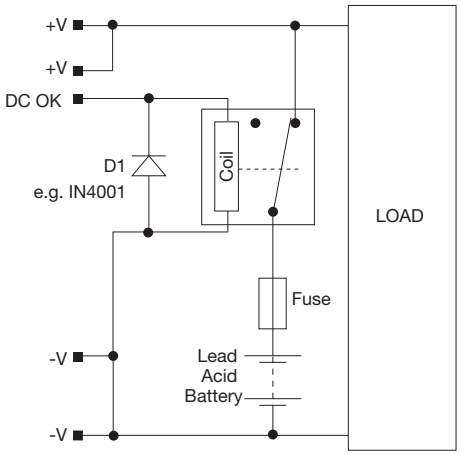
### Notes

1. All dimensions in inches (mm).
2. Weight 0.8 lb (350 g) approx.
3. Tolerance: ±0.02 (0.5) maximum.
4. Connection screw maximum torque:
   Input: 9 lbs-in (1.0 Nm), Output: 5.5 lbs-in (0.6 Nm)

## Standby Versions






DNR30/60 connection for DC standby system applications

Maximum current drain from battery by PSU when inactive 22 mA

| DNR30/60 Connections | | |
|---|---|---|
| Conn | Pin | Designation |
| AC Input | 1 | Ground |
| | 2 | Neutral |
| | 3 | Line |
| DC Output | 1 | DC OK |
| | 2 | Positive |
| | 3 | Positive |
| | 4 | Negative |
| | 5 | Negative |

### Notes

1. With AC in, unit provides power to the load and to charge the battery. The DC OK signal acts by sensing a voltage on +V and holds the relay closed.
2. With loss of AC in, battery voltage is present on +V. DC OK signal holds the relay closed. Battery supplies power to the load.
3. As the battery discharges, its voltage falls. When this falls below the level shown in the table below the DC OK signal switches off to allow the relay to open to disconnect and protect the battery.

| Output Set Voltages For Standby Versions | | | | |
|---|---|---|---|---|
| Model[1,3] | Voltage | Current | DC OK Signal Off | Efficiency |
| DNR30US12# | 13.6 V | 2.20 A | 10.30-11.30 V | 84% |
| DNR30US24# | 27.2 V | 1.10 A | 21.10-22.10 V | 86% |
| DNR30US48# | 54.5 V | 0.55 A | 42.70-43.70 V | 86% |
| DNR60US12#[2] | 13.6 V | 4.40 A | 10.30-11.30 V | 86% |
| DNR60US24# | 27.2 V | 2.20 A | 21.10-22.10 V | 89% |
| DNR60US48# | 54.5 V | 1.10 A | 42.70-43.70 V | 89% |

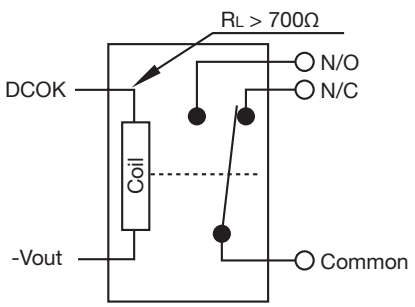
### Notes

1. Suffix # indicates standby version.
2. Not UL1310 approved.
3. *Available for OEM quantities, contact sales.*

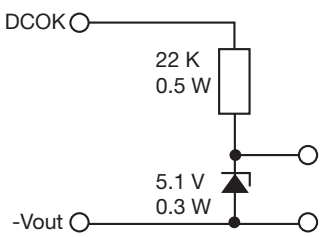
## DC OK

### 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.