

DNR05-60 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) 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 |
| Input Protection | • Internal fuse T2A, 250 VAC |

Output

| | |
|--------------------------|--|
| Output Voltage | • See tables |
| Output Voltage Trim | • See tables |
| Initial Set Accuracy | • $\pm 1\%$ |
| Minimum Load | • No minimum load required |
| Start Up Delay | • <1000 ms (may increase at low temperature extremes) |
| Start Up Rise Time | • <150 ms |
| Hold Up Time | • 30/130 ms at 115/230 VAC (DNR05) 25/100 ms at 115/230 VAC (DNR10) 20/75 ms at 115/230 VAC (DNR18) 20/30 ms at 115/230 VAC (DNR30) 20/30 ms at 115/230 VAC DNR60) |
| Line Regulation | • 5-18 W: $\pm 1.0\%$ max 30-60 W: $\pm 0.5\%$ max |
| Load Regulation | • 5-18 W: $\pm 2.0\%$ max 30-60 W: $\pm 0.5\%$ max |
| Parallel Operation | • Redundancy module DPM10 available for load currents up to 10 A, contact sales. |
| Transient Response | • 4% max deviation recovering to within 1% in 1 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 | • 105-145% Constant current, 105-145% Power limited (DNR30/60) |
| Short Circuit Protection | • Power limited, auto recovery |
| Temperature Coefficient | • $\pm 0.03\%/^{\circ}\text{C}$ |

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 | • 780 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) -40 °C to +70 °C, start up at -35 °C (DNR30/60), derate linearly from 60 °C (see derating curves) |
| Cooling | • Convection-cooled with 25mm free space all sides |
| Operating Humidity | • 20-95% RH, non-condensing |
| Storage Temperature | • -25 °C to +85 °C (DNR05/10/18) -40 °C to +85 °C (DNR30/60) |
| 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 & radiated |
| 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 |
| 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 | • EN60950-1 UL508 Pollution Degree 2, UL1310 Class 2 power recognised, See note 3 & ratings table, UL60950-1 Overvoltage Category II, UL508 Overvoltage Category III, DNR30 & DNR60: SEMI F47 ANSI/ISA 12.12.01. Class 1, Division 2 Groups A,B,C and D |

Models and Ratings

| Output Voltage | Output Voltage Trim | Current | Typical Efficiency | Model Number |
|----------------|---------------------|----------|--------------------|---------------------------------|
| 5 V | 4.50-5.75 V | 1.000 A | 69% | DNR05US05 ^(†) |
| 12 V | 10.80-13.80 V | 0.420 A | 72% | DNR05US12 ^(†) |
| 15 V | 13.50-17.25 V | 0.340 A | 72% | DNR05US15 ^(†) |
| 24 V | 21.60-28.80 V | 0.210 A | 72% | DNR05US24 ^(†) |
| 5 V | 4.50-5.75 V | 2.000 A | 73% | DNR10US05 ^{^†)} |
| 12 V | 10.80-13.80 V | 0.840 A | 75% | DNR10US12 ^{^†)} |
| 15 V | 13.50-17.25 V | 0.670 A | 76% | DNR10US15 ^{^†)} |
| 24 V | 21.60-28.80 V | 0.420 A | 76% | DNR10US24 ^{†^†)} |
| 5 V | 4.50-5.75 V | 3.000 A | 75% | DNR18US05 ^{†^†)} |
| 12 V | 10.80-13.80 V | 1.500 A | 77% | DNR18US12 ^{†^†)} |
| 15 V | 13.50-17.25 V | 1.200 A | 77% | DNR18US15 ^{†^†)} |
| 24 V | 21.60-28.80 V | 0.750 A | 77% | DNR18US24 ^{†^†)} |
| 5 V | 5.00-5.50 V | 6.000 A | 79% | DNR30US05 ^{†^†(1,3,4)} |
| 12 V | 12.00-14.00 V | 2.500 A | 84% | DNR30US12 ^{†^†(1,3,4)} |
| 24 V | 24.00-28.00 V | 1.250 A | 86% | DNR30US24 ^{†^†(1,3,4)} |
| 48 V | 48.00-55.00 V | 0.625 A | 86% | DNR30US48 ^{†^†(1,3,4)} |
| 5 V | 5.00-5.50 V | 10.000 A | 79% | DNR60US05 ^{†^†(1,3,4)} |
| 12 V | 12.00-14.00 V | 5.000 A | 86% | DNR60US12 ^{†^†(1,3,4)} |
| 24 V | 24.00-28.00 V | 2.500 A | 89% | DNR60US24 ^{†^†(1,3,4)} |
| 48 V | 48.00-55.00 V | 1.250 A | 89% | DNR60US48 ^{†^†(1,3,4)} |

Notes

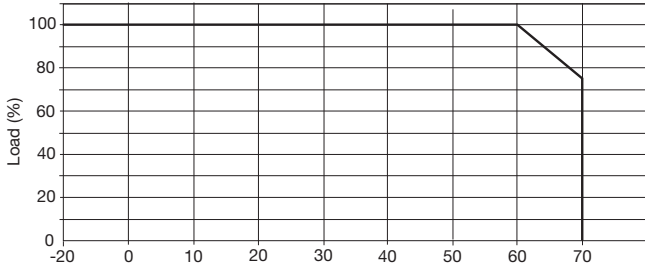
1. Add suffix '-S' for spring clamp connection option.
2. 30-60 W models are suitable for battery-charging applications.
3. Approved to UL1310, but not Class 2 Power recognised.
4. SEMI F47 compliant.

† Available from Farnell. See pages 266-269.

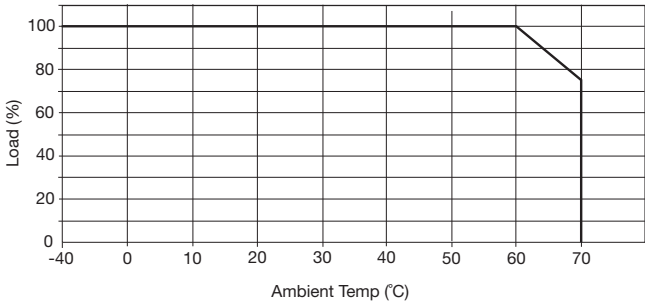
^ Available from Newark. See pages 270-272.

Derating Curves

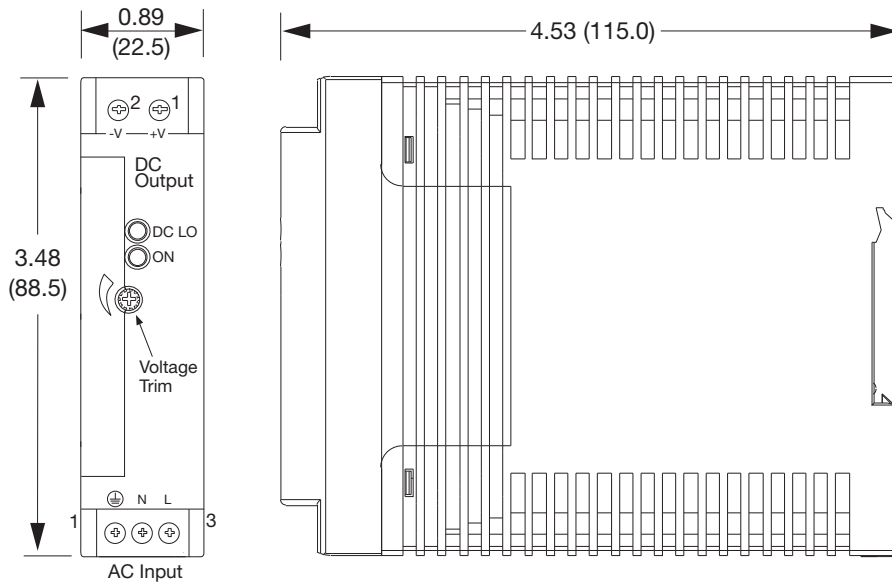
DNR5-18 Models



DNR30-60 Models



Mechanical Details
5/10/18 W Models

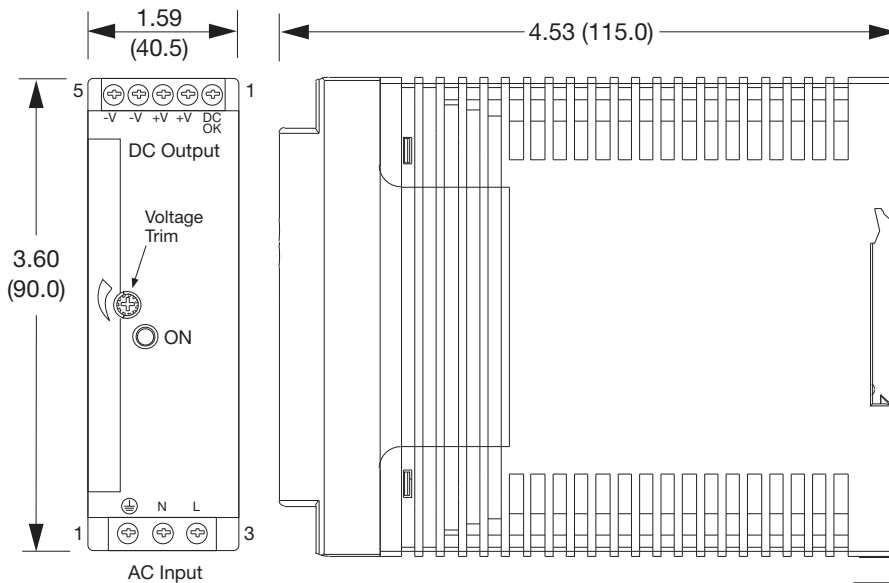


Notes

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

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

30/60 W Models

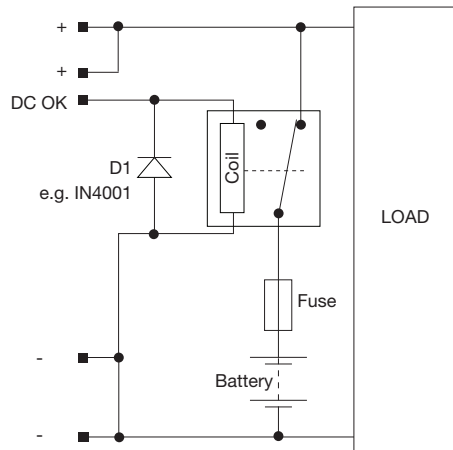
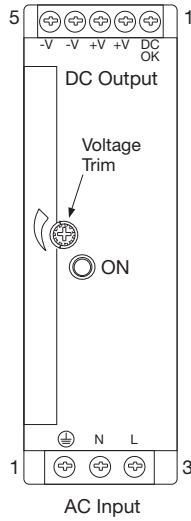


Notes

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

| 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 models only.



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 |

DNR30/60 connection for DC standby system applications

| Output Set Voltages For Standby Versions | | | |
|--|---------|---------|------------|
| Model ⁽¹⁾ | Voltage | Current | Efficiency |
| DNR30US12# | 13.6 V | 2.20 A | 84% |
| DNR30US24# | 27.2 V | 1.10 A | 86% |
| DNR30US48# | 54.5 V | 0.55 A | 86% |
| DNR60US12# ⁽²⁾ | 13.6 V | 4.40 A | 86% |
| DNR60US24# | 27.2 V | 2.20 A | 89% |
| DNR60US48# | 54.5 V | 1.10 A | 89% |

1. Suffix # indicates standby version.

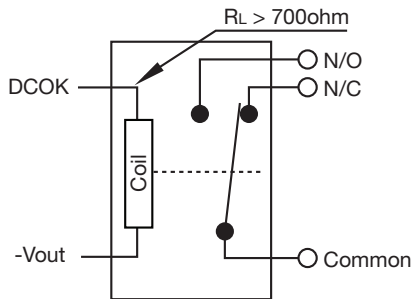
2. Not UL1310 approved.

DC OK

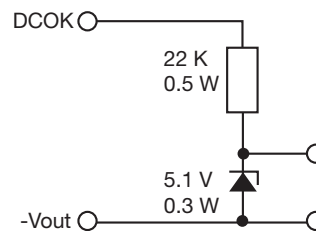
30-60 W Models

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.