

# DNR05-60 SERIES

AC/DC Single Output DIN Rail: 5 ~ 60 Watts



## Features

- 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
- 30-60W suitable for battery charging

## 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 (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

**DNR05-60 XP**

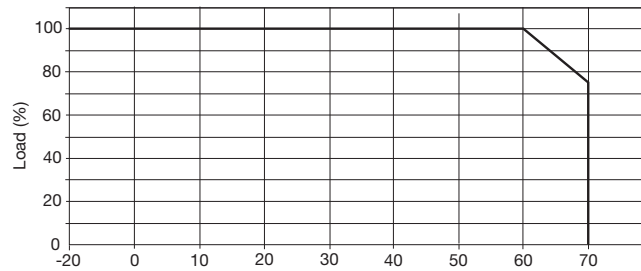
Output Voltage	Output Voltage Trim	Current	Typical Efficiency	Model Number
5 V	4.50-5.75 V	1.000 A	69%	DNR05US05 <sup>(1)</sup>
12 V	10.80-13.80 V	0.420 A	72%	DNR05US12 <sup>(1)</sup>
15 V	13.50-17.25 V	0.340 A	72%	DNR05US15 <sup>(1)</sup>
24 V	21.60-28.80 V	0.210 A	72%	DNR05US24 <sup>(1)</sup>
5 V	4.50-5.75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

### Notes

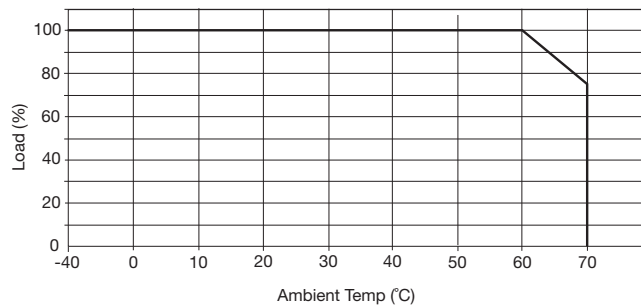
1. Add suffix '-S' for spring clamp connection option.
2. 30-60 W models are suitable for battery-charging applications.
3. Approved to UL1310, but not Class 2 Power recognised.
4. SEMI F47 compliant.

## Derating Curves

DNR5-18 Models

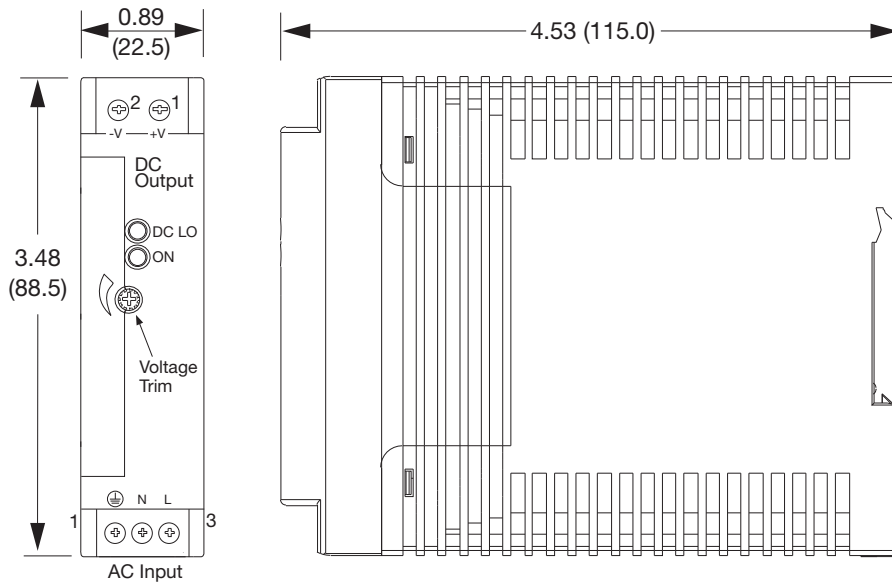


DNR30-60 Models



# Mechanical Details

## 5/10/18 W Models

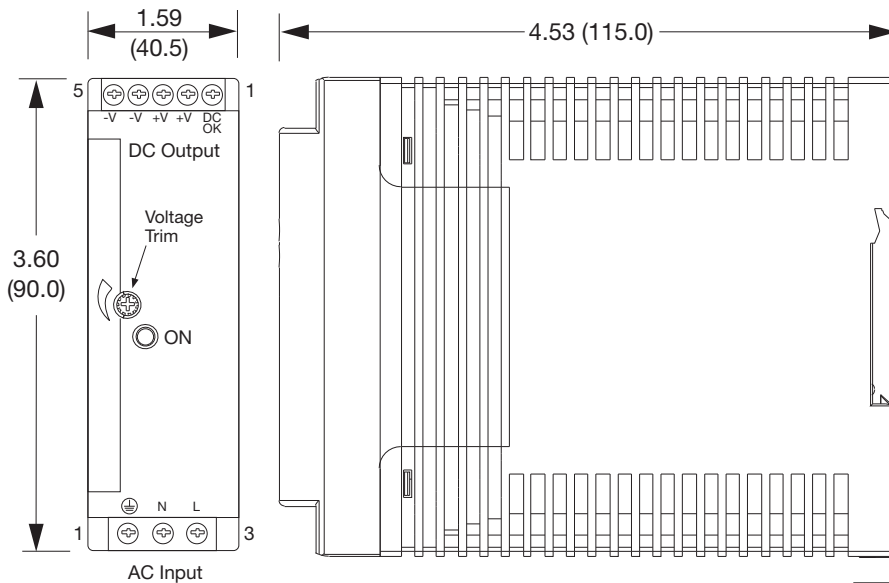


### Notes

1. All dimensions in inches (mm).
2. Tolerance:  $\pm 0.02$  (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

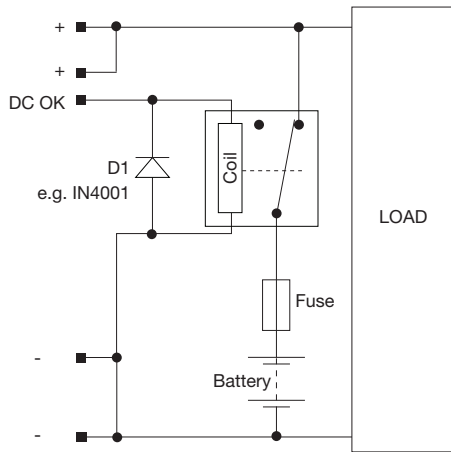
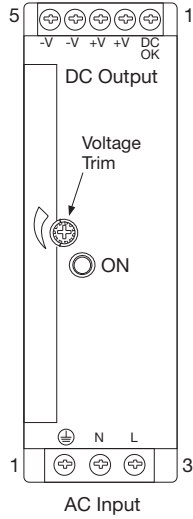


### Notes

1. All dimensions in inches (mm).
2. Tolerance:  $\pm 0.02$  (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 <sup>(1)</sup>	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# <sup>(2)</sup>	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.

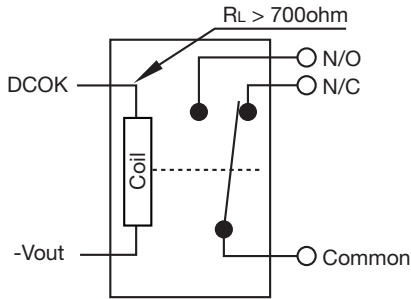
2. Not UL1310 approved.

DC OK

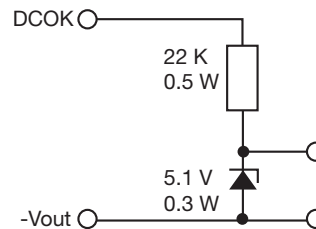
30-60 W Models

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.