

DNR120-960TS SERIES

AC/DC 3Phase DIN Rail Power Supplies: 120-960 Watts



Features

- Three Phase Input
- Up to 92% Efficiency
- Wide Adjustment Range
- Full Power -40 °C to +60 °C
- Rugged Design for Industrial Applications
- Single Phase Input Operation (340-575 VAC)
- Suitable for battery charging

Specification

Input

Input Voltage	• 340-575 VAC 3 phase (single phase operation with 75% of rated output), 480-820 VDC
Input Frequency	• 47-63 Hz
Input Current	• DNR120TS: 0.35 A at 500 VAC DNR240TS: 0.70 A at 500 VAC DNR480TS: 1.00 A at 500 VAC DNR960TS: 1.60 A at 500 VAC
Inrush Current	• 120 W 15 A typical at 500 VAC, cold start 240 W 20 A typical at 500 VAC, cold start 480 W 29 A typical at 500 VAC, cold start 960 W 30 A typical at 500 VAC, cold start
Power Factor	• 0.6 at 500 VAC input and nominal load
Earth Leakage Current	• 0.32 mA
Input Protection	• 3 internal fuses, 2 A, 600 VAC (DNR120TS) T3.15 A, 500 VAC (DNR240TS, DNR480 TS) 5 A, 600 VAC (DNR960TS)

Output

Output Voltage	• See table
Output Voltage Trim	• See table
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	• 20 ms min at 400 VAC
Line Regulation	• $\pm 1\%$
Load Regulation	• $\pm 1\%$ max ($\pm 5\%$ for units in parallel)
Transient Response	• 4% max deviation recovering to within 1% in 1 ms for 50% load change
Ripple & Noise	• 100 mV pk-pk 20 MHz bandwidth (may increase at low temperature extremes)
Overvoltage Protection	• 120-145%, recycle input to reset,
Overload Protection	• 110%-140%, constant current, auto recovery
Temperature Coefficient	• $\pm 0.02\%/^{\circ}\text{C}$
Short Circuit Protection	• Continuous trip and restart (Hiccup Mode) Power limited (DNR480TS)
Parallel Operation	• 2 units can be connected in parallel, DNR240TS, DNR480TS and DNR960TS only, total output derates by 10%, use Ishare connection for DNR960TS. Redundancy module DPM10 available for load currents up to 10 A, contact sales

General

Efficiency	• See table
Isolation	• 3000 VAC Input to Output 1500 VAC Input to Ground 500 VAC Output to Ground
Switching Frequency	• DNR120TS: 65 kHz typical DNR240TS/960TS: 25 kHz typical DNR480TS: 70 kHz typical
Signals	• DC ON indicator LED Green, DC LOW indicator LED Red DC OK: normally open relay on 24 V models
MTBF	• DNR120TS: 560 kHrs, 240TS: 485 kHrs 480TS: 400 kHrs, 960TS: 350 kHrs to Bellcore Issue 6, at +40 °C, GB
DIN Rail	• Compatible with TS35/7.5 or TS35/15

Environmental

Operating Temperature	• -40 °C to 70 °C (DNR480TS -30 °C), derate linearly from 60 °C at 2.5%/°C (3.5%/°C for DNR960TS) (see derating curves)
Cooling	• Convection-cooled with 25 mm free space all sides
Operating Humidity	• 20-95% RH, non-condensing
Storage Temperature	• -40 °C to +85 °C
Shock	• 4 g peak, 22 ms on X, Y and Z axis
Vibration	• 10 to 500 Hz, 1 g rms on X, Y and Z axis

EMC & Safety

Emissions	• EN55022, class 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, level 4 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% 500 ms, 60% 200 ms, >95% 5000 ms Perf Criteria A, A, A
Safety Approvals	• EN60950-1 UL508 UL60950-1 Pollution Degree 2, UL60950-1 Overvoltage Category II UL508 Overvoltage Category III, ANSI/ISA 12.12.01 Class 1, Division 2, Groups A,B,C and D

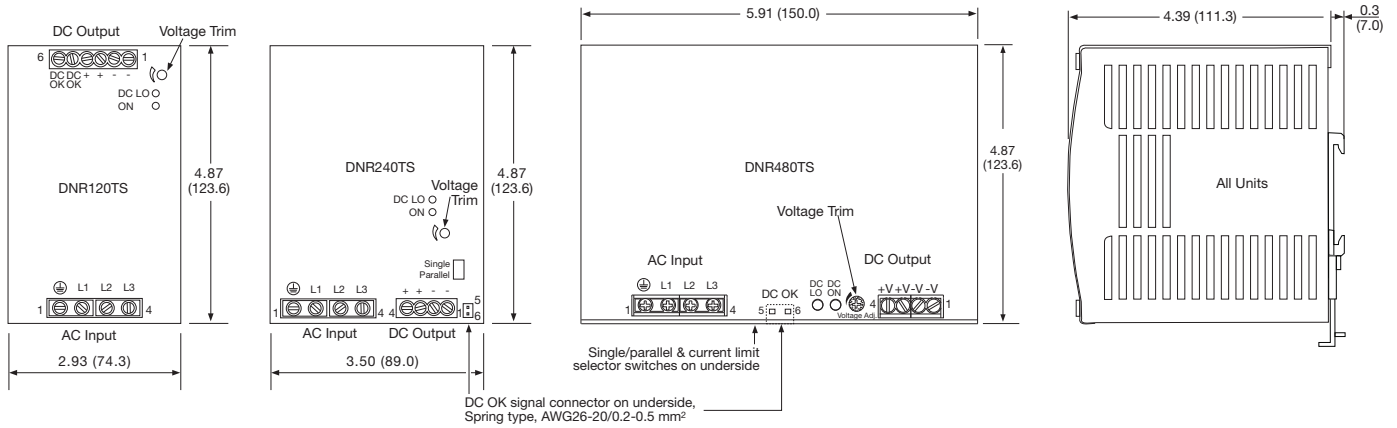
Models and Ratings

Output Voltage	Output Voltage Trim	Output Current ⁽¹⁾	Typical Efficiency	Model Number
12 V	11.4-14.5 V	10.0 A	87%	DNR120TS12†
24 V	22.5-28.5 V	5.0 A	88%	DNR120TS24†
24 V	22.5-28.5 V	10.0 A	87%	DNR240TS24-I†
48 V	47.0-56.0 V	5.0 A	88%	DNR240TS48-I†
24 V	22.5-28.5 V	20.0 A	88%	DNR480TS24-I†
48 V	47.0-56.0 V	10.0 A	89%	DNR480TS48-I†
24 V	22.5-28.5 V	40.0 A	92%	DNR960TS24-I†
48 V	47.0-56.0 V	20.0 A	91%	DNR960TS48-I†

Notes

1. Reduce by 25% for single phase input operation, (340-575 VAC).

Mechanical Details



Pin	Pin Connections - DC Output		
	DNR120 Designation	DNR240-480 Designation	DNR960TS Designation
1	-V	-V	DC OK*
2	-V	-V	DC OK*
3	+V	+V	+Ishare [®]
4	+V	+V	-Ishare [®]
5	DC OK*	DC OK*	+V
6	DC OK*	DC OK*	+V
7			+V
8			-V
9			-V
10			-V

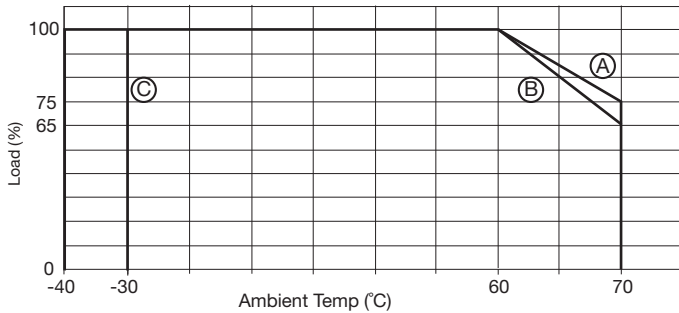
Pin Connections - AC Input	
Pin	Designation
1	Ground
2	L1
3	L2
4	L3

* Available on 24 V versions only

Notes

- All dimensions in inches (mm).
- Tolerance: ±0.02 (0.5) maximum.
- Weight - DNR120TS: 1.76 lb (800 g) approx.
DNR240TS: 2.43 lb (1100 g) approx.
DNR480TS: 4.23 lb (1920 g) approx.
DNR960TS: 7.05 lb (3200 g) approx.
- Screw terminal: 10-24 AWG cable size.
- DC OK Relay 60 VDC at 300 mA.
- Allow 0.98" (25 mm) clearance all round to ensure adequate ventilation.
- Connection screw maximum torque: Input: 9 lbs-in (1.0 Nm), Output: 5.5 lbs-in (0.6 Nm).
- Connecting +Ishare and -Ishare between two power supplies will force the current to share.

Derating Curves



- (A) DNR120-240TS
- (B) DNR960TS
- (C) DNR480TS