

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 |

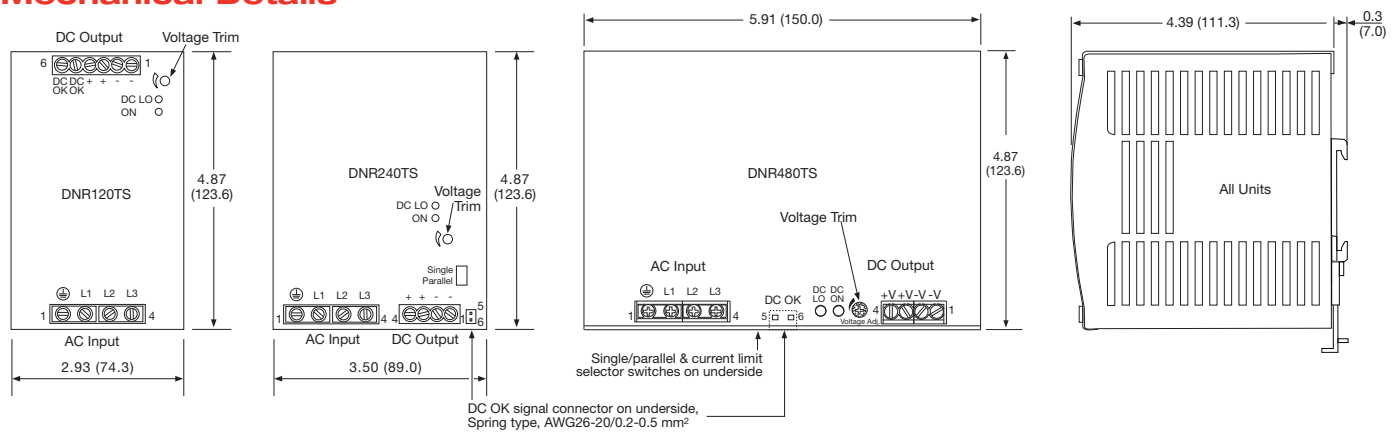
Models and Ratings

| 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 | 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 |

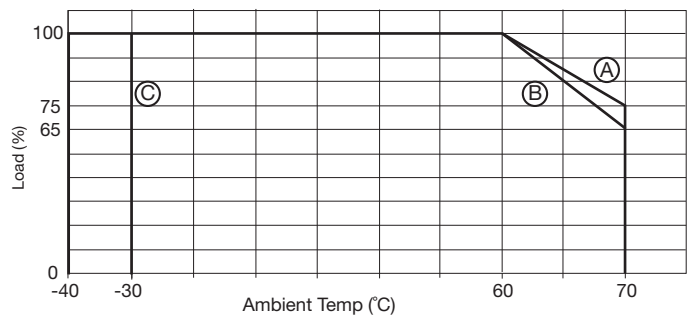
| Pin | Designation |
|-----|-------------|
| 1 | Ground |
| 2 | L1 |
| 3 | L2 |
| 4 | L3 |

* 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



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