

# 120-960 Watts

## DNR120-960TS Series



- Three Phase AC Input
- Up to 93% Efficiency
- Wide Adjustment Range
- Full Power -40 °C to +60 °C
- Rugged Design for Industrial Applications
- Single Phase Input Operation (340-575 VAC)
- 3 Year Warranty

### 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         | • See tables   |
| Inrush Current        | • DNR120: 10.0 A, DNR240: 20.0 A, DNR480: 20.0 A, DNR960: 30.0 A, typical at 480 VAC, cold start               |
| Power Factor          | • 0.6 typical at 480 VAC input and nominal load, DNR960TS: 0.8 typical at 480 VAC input and nominal load       |
| Earth Leakage Current | • 0.32 mA  |
| Input Protection      | • 3 internal fuses, DNR120TS, DNR240TS: T2.0 A, 600 VAC, DNR480TS: T3.15 A, 500 VAC, DNR960TS: T5.0 A, 500 VAC |

#### Output

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|----------------------------|---|
| Output Voltage             | • See table   |
| Output Voltage Trim        | • See table   |
| 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               | • 20 ms min at 480 VAC, DNR960TS: 15 ms min at 480 VAC  |
| Line Regulation            | • ±1%   |
| Load Regulation            | • ±1% max (±5% for units in parallel (not DNR120TS))  |
| Parallel Operation         | • 2 units can be connected in parallel (not DNR120TS), total power available is 90% of the rated current of each unit, minimum load per unit 10%, use Ishare connection for DNR960TS. Redundancy module DPM10 available for load currents up to 10 A, contact sales |
| Transient Response         | • 4% max deviation recovering to within 1% in 2 ms for 50% load change  |
| Ripple & Noise             | • 100 mV pk-pk 20 MHz bandwidth, DNR960TS: 80 mV pk-pk 20 MHz bandwidth, (may increase at low temperature extremes)   |
| Overvoltage Protection     | • 120-145%, auto recovery   |
| Overload Protection        | • 110%-140%, constant current, auto recovery  |
| Overtemperature Protection | • 100%-110%, on heatsink, auto recovery   |
| Temperature Coefficient    | • ±0.03%/°C   |
| Short Circuit Protection   | • Continuous trip and restart (hiccup mode) (DNR480TS switchable hiccup mode or power limited)  |

#### General

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|---------------------|--|
| Efficiency          | • See table  |
| Isolation           | • 3000 VAC Input to Output, 1500 VAC Input to Ground, 500 VAC Output to Ground                               |
| Switching Frequency | • DNR120TS: 70 kHz typical, DNR240TS: 25 kHz typical, DNR480TS: 80 kHz typical, DNR960TS: 52 kHz typical     |
| Signals             | • DC ON indicator LED Green, DC LOW indicator LED Red<br>DC OK: normally open relay on 24V models            |
| MTBF                | • DNR120TS: 550 kHrs, 240TS: 500 kHrs<br>480TS: 420 kHrs, 960TS: 380 kHrs to Bellcore Issue 6, at +40 °C, GB |
| DIN Rail            | • Compatible with TS35/7.5 or TS35/15  |

#### Environmental

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|-----------------------|--|
| Operating Temperature | • -40 °C- to 70 °C (DNR480TS -30 °C), derate linearly from 60 °C at 2.5%/°C (3.5%/°C for DNR960TS), start up at -35 °C (DNR480TS -20 °C) see derating curves |
| Cooling               | • Convection-cooled with 25 mm free space all sides  |
| Operating Altitude    | • DNR120TS & DNR480TS 5000m, DNR960TS 3049m  |
| Operating Humidity    | • 20-95% RH, non-condensing  |
| Storage Temperature   | • -40 °C to +85 °C   |
| Shock                 | • 15 g, 11 ms, 3 axis, 6 faces, 3 shocks/face  |
| Vibration             | • 2 g, 10 Hz to 500 Hz, along X, Y & Z axis, 60 min/axis, mounted on rail  |

#### EMC & Safety

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|----------------------|--|
| 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, installation class 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     | • EN62368-1, UL508, UL62368-1, cUL60950-1, 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) |

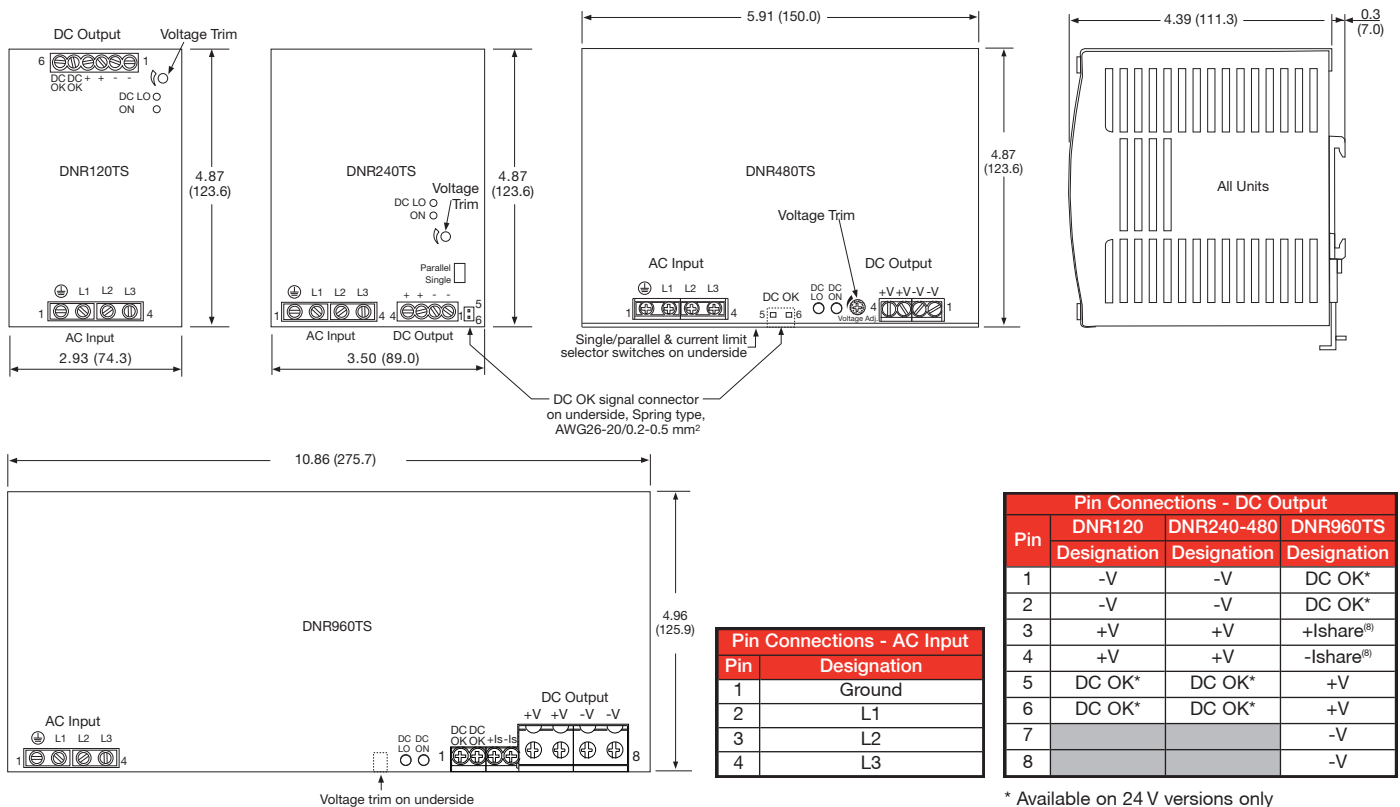
## Models and Ratings

Output Voltage	Input Current (typ.)		Output Voltage Trim	Output Current <sup>(1)</sup>	Efficiency (typ.)	Model Number
	400 VAC	500 VAC				
12 V	0.36 A	0.30 A	11.4-14.5 V	10.0 A	87%	DNR120TS12
24 V	0.36 A	0.30 A	22.5-28.5 V	5.0 A	89%	DNR120TS24
24 V	0.65 A	0.55 A	22.5-28.5 V	10.0 A	90%	DNR240TS24-I
48 V	0.65 A	0.55 A	47.0-56.0 V	5.0 A	91%	DNR240TS48-I
24 V	1.10 A	0.93 A	22.5-28.5 V	20.0 A	90%	DNR480TS24-I
48 V	1.10 A	0.93 A	47.0-56.0 V	10.0 A	91%	DNR480TS48-I
24 V	1.72 A	1.50 A	22.5-28.5 V	40.0 A	92%	DNR960TS24-I
48 V	1.72 A	1.50 A	47.0-56.0 V	20.0 A	93%	DNR960TS48-I

### Notes

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

## Mechanical Details



### Notes

1. All dimensions in inches (mm).
2. Tolerance:  $\pm 0.02$  (0.5) maximum.
3. Weight - DNR120TS: 1.76 lb (800 g) approx.  
DNR240TS: 2.43 lb (1100 g) approx.  
DNR480TS: 4.23 lb (1720 g) approx.  
DNR960TS: 7.05 lb (3200 g) approx.
4. Screw terminal: 10-24 AWG cable size.
5. DC OK Relay rated at 60 VDC at 300 mA.
6. Allow 0.98" (25 mm) clearance all round to ensure adequate ventilation.
7. Connection screw maximum torque: Input: 9 lbs-in (1.0 Nm), Output (and signals DNR960TS): 5.5 lbs-in (0.6 Nm), Output (DNR960TS): 15.6 lbs-in (1.7 Nm).
8. Connecting +Ishare and -Ishare between two power supplies will force the units to current share.

## Derating Curves

