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

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

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 DC OK: normally open relay on 24 V models
MTBF	• DNR120TS: 550 kHrs, 240TS: 500 kHrs 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

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

Emissions	• EN55032, 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) CE & UKCA meets all applicable directives & legislation

DNR120–960TS XP

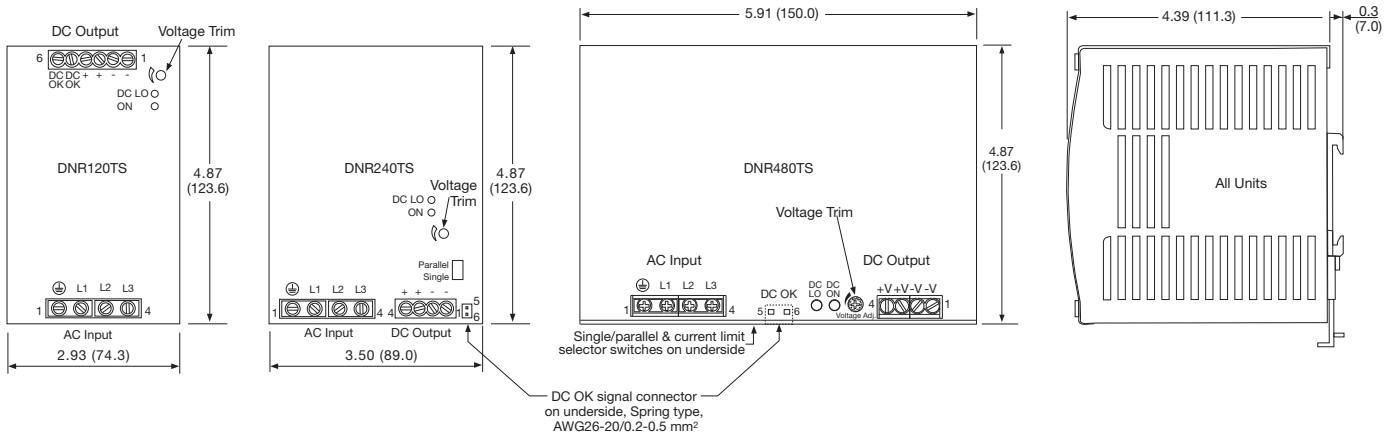
Models and Ratings

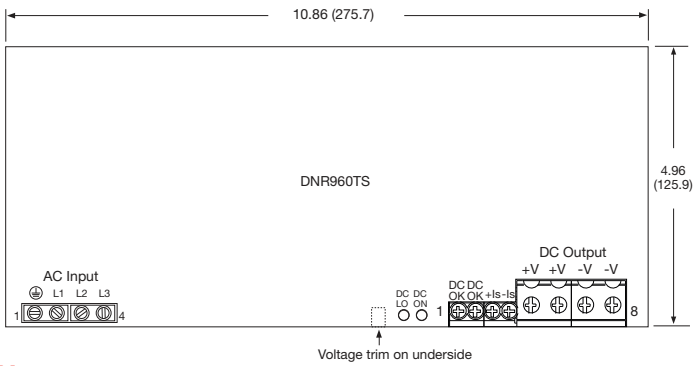
Output Voltage	Input Current (typ.)		Output Voltage Trim	Output Current[1]	Efficiency (typ.)	Model Number
	400 VAC	500 VAC				
12 V	0.36 A	0.30 A	11.4-14.5 V	10.0 A	87%	DNR120TS12
24 V	0.36 A	0.30 A	22.5-28.5 V	5.0 A	89%	DNR120TS24
24 V	0.65 A	0.55 A	22.5-28.5 V	10.0 A	90%	DNR240TS24-I
48 V	0.65 A	0.55 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





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

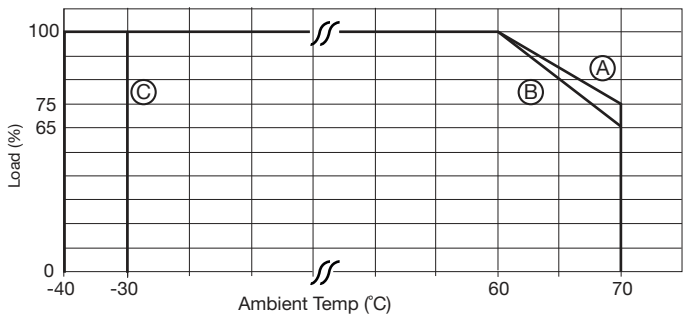
Pin Connections - DC Output			
Pin	DNR120 Designation	DNR240-480 Designation	DNR960TS Designation
1	-V	-V	DC OK*
2	-V	-V	DC OK*
3	+V	+V	+Ishare[8]
4	+V	+V	-Ishare[8]
5	DC OK*	DC OK*	+V
6	DC OK*	DC OK*	+V
7			-V
8			-V

* Available on 24 V versions only

Notes

1. All dimensions in inches (mm).
2. Tolerance: ±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



Ⓐ DNR120-240TS
Ⓑ DNR960TS
Ⓒ DNR480TS