



AMERICAN HIGH VOLTAGE
POWER SUPPLIES FOR THE WORLD

NTR Series Regulated High Voltage Power Supply For Neutron Generator Tubes

General Description

NTR-100 Series high voltage power supplies are designed to power D-T reaction neutron generating tubes used in down-hole environments. They are intended for use in rugged shock and vibration environments and can operate at ambient temperatures up to 175 degrees Celsius.

Using a state of the art parallel multiplier* configuration the NTR series offers efficiencies of up to 50% with low stored energy and are not easily damaged by arcing. The parallel multiplier configuration provides for greater dynamic load regulation than Cockroft-Walton designs while providing ripple typically less than 2% at full power and the voltage. The output voltage of the NT power supply is easily programmable via analog signals. Both current and voltage monitors are provided. Both current and voltage monitors are provided.

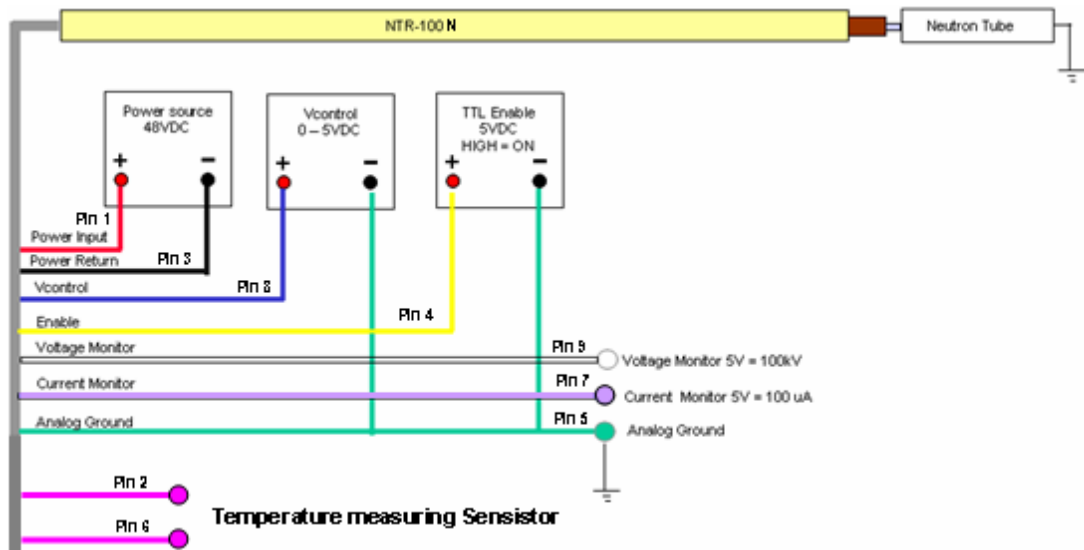
*patents: 8,085,561, 8,203,858, 8,976,552

Features

- Output regulated to +/- 1%
- Output voltage programmable
- Encapsulated
- Vin = 48V (other voltages available)
- 10 Watt power
- 175 °Celsius operation (185°C case)
- Internal Sensistor for temperature measurement.



Connection Diagram





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Electrical Characteristics (NTR-100N – 48Vin)

(at 25 degrees C unless otherwise specified)

Parameter	Conditions	Value			Units
		Min	Typical	Max	
Supply Voltage*:	(all models)	42 VDC	48VDC	55 VDC	VDC
Input Current:	No Load: (Not enabled)	3	8	9	mA
	No Load: 100kV 25°C:	170	180	230	mA
	Full Load (10W) 25°C:	380	310	350	mA
	Full Load (10W) 175°C:	460	425	475	mA
Output Ripple:	No Load (all models):	0.7%	1%	2%	Vpp
	Full Load (all models):	0.85%	1%	2%	Vpp
Load Regulation:	No Load to Full Load	1%	1%	1.1%	V _{NL} /V _{FL}
	Half Load to Full Load	0.5%	0.8%	0.9%	V _{1/2L} /V _{FL}
Output Linearity	No Load		1%		$\frac{\Delta V_{OUT}}{\Delta V_{OUT} (ideal)}$
Output Linearity	Full Load (all models):		1%		$\frac{\Delta V_{OUT}}{\Delta V_{OUT} (ideal)}$
Short Circuit Current:			200	300	μA
Power Efficiency:	Full Load 25°C:	60%	65%	65%	P _{OUT}
	Full Load 175°C:	40%	45%	50%	----- P _{IN}
Temperature Drift:	No Load			200	ppm/DegC
	Full Load			250	ppm/Deg C
Thermal Rise:	No Load (case)			2	° C
(must remove 12W heat)	Full Load (case)			10	° C
Stored Energy:	100kV output:			0.25	Joules
Arc Limiting Resistor:	Past feedback:			1	Megohm
Enable:	TTL High = ON		5		VDC
	open = OFF ground = OFF Impedance:		100K		Ohms
Vcontrol:	Program for 100kV		5		VDC
	Linearity:		1%		
	Impedance:		10K		Ohms
Voltage Monitor:	Output Voltage = 100kV		5		VDC
Current Monitor	Output Current = 100uA		5		VDC
Monitor Linearity:	At full output		1%		
Monitor Impedance:	At full output		1K		Ohms

* Other input voltages available: 100VDC and 200VDC



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Physical Characteristics

(at 25 degrees C unless otherwise specified)

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Parameter	Conditions	Value	Units
Dimensions	MKS	3.18 Diameter x 120 L	cm
	English	1.25 Diameter x 47.25 L	inches
Volume:	MKS	975	cm ³
	English	62	inch ³
Mass:	MKS	2.5	kilograms
	English	5.4	pounds
Packaging:	Polyimide encapsulant		
Finish	Brass outer housing		
Terminations:	Input:	9 pin micro-D female	DK: 1003-2445-ND
	Mating connector (w/Teflon wires)	9 pin micro-D male	DK: 1003-2432-ND
	Output:	10-32 threaded hole	

Environmental Characteristics

(at 25 degrees C unless otherwise specified)

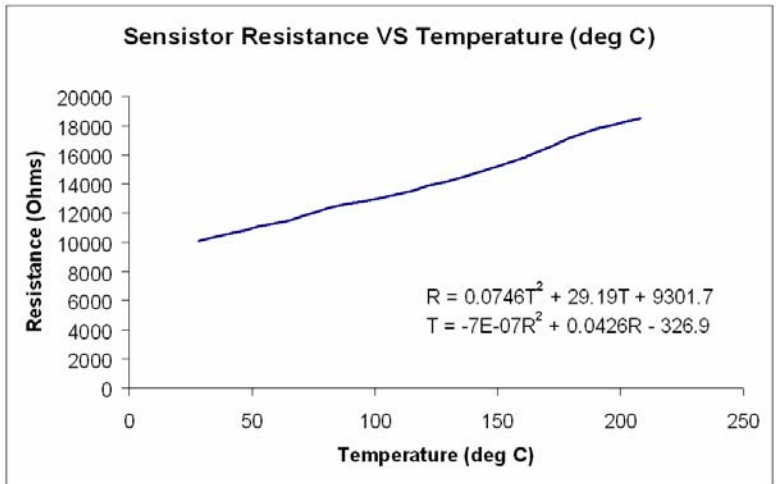
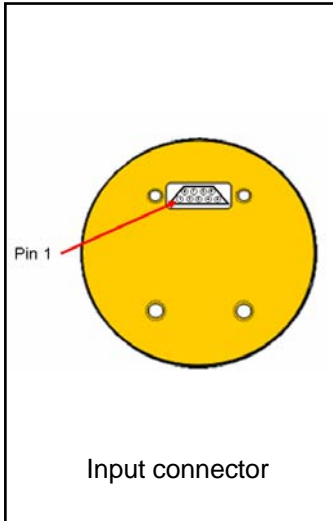
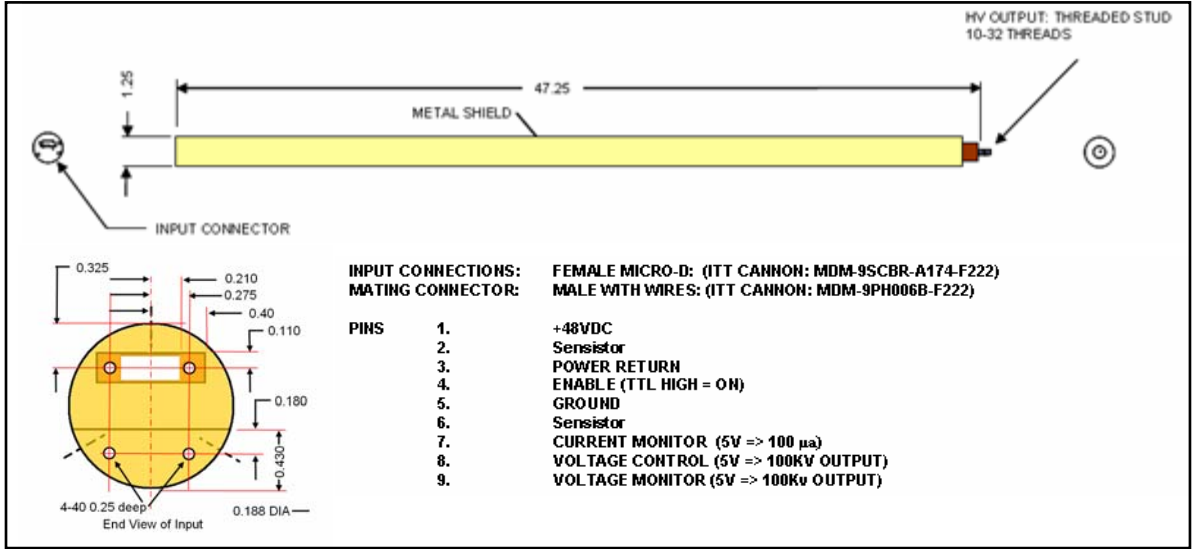
Parameter	Conditions	Value	Units
Temperature Range	case temperature (maximum)	-20 degrees to + 185 degrees	Celsius
	case temperature (maximum)	-5 degrees to + 365 degrees	Fahrenheit
Shock:	MIL-STD-810 Method 516	20 g's	Proc IV
Environment:	SF6:	100 required for corona	psi
	SF6:	7.5 x 10 ⁵	N/m ²
Vibrations:	MIL-STD-810 Method 514	20 g's	Curve E
Thermal Shock	MIL-STD-810 Method 504	-40 deg C to + 175 deg C	Class 2



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Outline Drawing: (inches)



Notes:

- Other input voltages available include: 100VDC and 200VDC
- Polarity option: Positive or Negative (common)
- Units with output proportional to input available in the NTP series
- User must follow operating procedures set forth in document: AHV 480681
- Even though the NTR series has very low stored energy, the 1 Megohm output arc limiting resistor in series with the output connection.
- There is an internal 10 Ohm resistor between Analog Ground (Pin 5) and Power Return (Pin 3)
- Chassis is connected directly to Analog Ground (Pin 5)