



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 tube arcing. The parallel multiplier configuration provides for greater dynamic load regulation than Cockroft-Walton designs maintaining ripple typically less than 2% at full power. The output voltage of the NT power supply is easily programmable via analog signals. Both current and voltage monitors are provided.

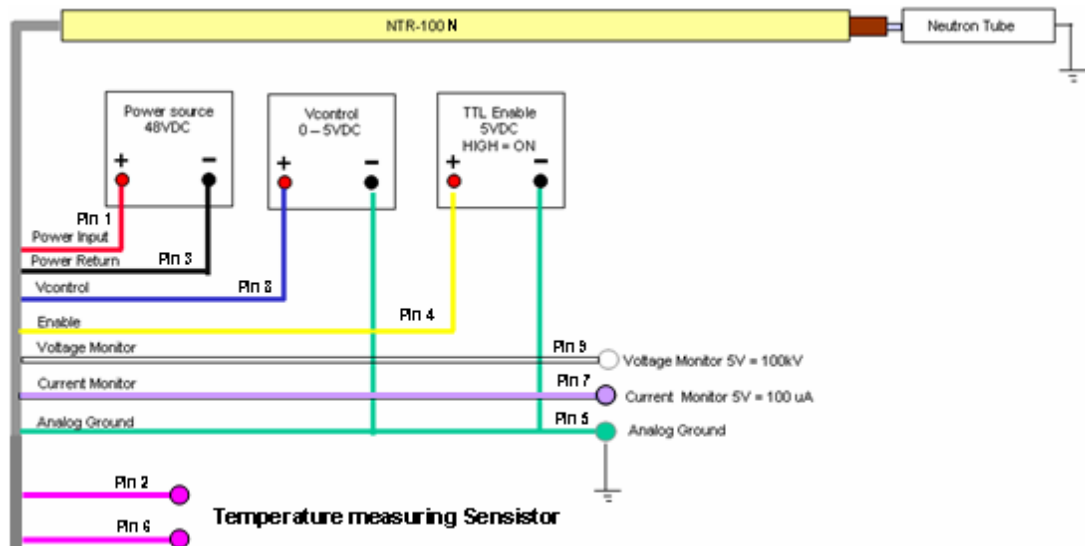
*patents: 8,085,561, 8,203,858, 8,976,552

Features

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



Connection Diagram





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Electrical Characteristics (NTR-100N – 48Vin)

(at 25 degrees C unless otherwise specified)

NTR Series Rev H

Parameter	Conditions	Value			Units
		Min	Typical	Max	
Supply Voltage*:	(all models)	43 VDC	48VDC	53 VDC	VDC
Input Current:	No Load: (Not enabled)	7	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	520	600	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 (10kHz Pulse)		5%	10%	V _{NL} /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:	Set Max		200	300	μA
Power Efficiency:	Full Load 25°C:	55%	60%	65%	P _{OUT}
	Full Load 175°C:	30%	35%	40%	----- P _{IN}
Temperature Drift:	No Load			200	ppm/DegC
	Full Load			250	ppm/Deg C
Thermal Rise: (must remove 18W heat)	No Load (case)			5	° C
	Full Load (case)			20	° 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:		10K		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
Temperature Sensor	Celsius = 0.02219R-196				

* Other input voltages available: 100VDC and 200VDC

** Current monitor returns average output current



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Physical Characteristics

(at 25 degrees C unless otherwise specified)

Parameter	Conditions	Value	Units
Dimensions	MKS	3.18 Diameter x 122 L	cm
	English	1.25 Diameter x 48.00 L	inches
Volume:	MKS	967	cm ³
	English	59	inch ³
Mass:	MKS	3.64	kilograms
	English	8.0	pounds
Packaging:	Polyimide encapsulant		
Finish	Brass outer housing		
Terminations:	Input:	Flying Leads	
	Output:	10-32 threaded hole	

NTR Series Rev H

Environmental Characteristics

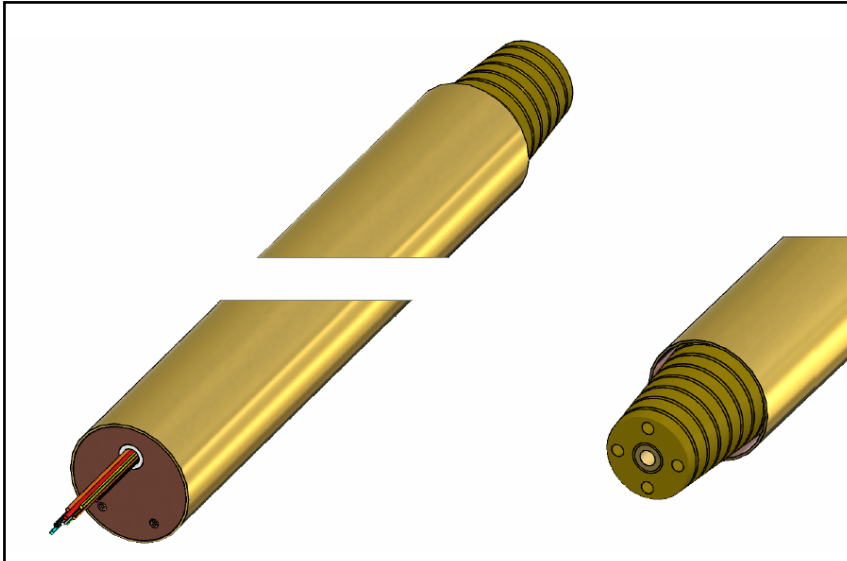
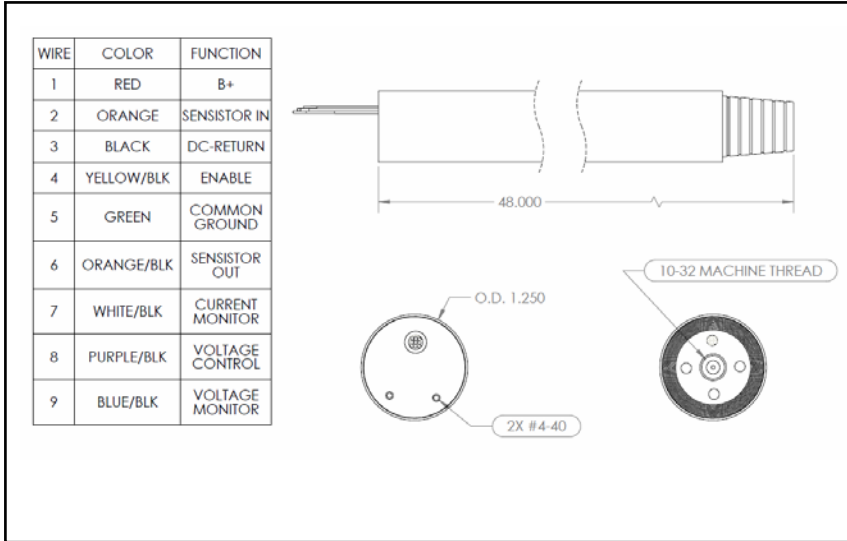
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Parameter	Conditions	Value	Units
Temperature Range	case temperature (absolute max)	-20 degrees to + 185 degrees	Celsius
	case temperature (absolute max)	-5 degrees to + 365 degrees	Fahrenheit
Shock:	MIL-STD-810 Method 516	20 g's	Proc IV
Environment:	SF6:	100 required for corona	psi
	SF6:	7.5 x 10 ⁵	N/m ²



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Outline Drawing: (inches)



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