



**AMERICAN HIGH VOLTAGE**  
POWER SUPPLIES FOR THE WORLD

**H-25B Series**

# H-25B Series 200 Deg C High Voltage Power Supply

## General Description

The H-25B Series high voltage power supplies are the ultimate in exotic power supplies. They are designed to operate at extreme temperatures and in harsh environments especially for the oil well logging industry. The H-25B units provide up to 3kV at 100 uA of regulated output, either positive or negative polarity. All models are adjustable over a 3:1 output voltage range by either voltage or resistance programming. Temperature drift is less than 20 ppm/deg C by using advanced internal reference and drift compensation techniques. All models are reverse input and output arc and short circuit protected.

## Features

- Output proportional to Input
- Encapsulated
- 50 VDC to 9,000 VDC available
- 1.5, 3, 5 and 10 Watt power
- Various input voltages available



## Connection Diagram

### CONTROL

Yellow (Control)

Green (Ground)

Red +

Black -

### INPUT

OUTPUT

### Available Models:

#### Positive output Models:

Name	Maximum Output Voltage	Input Voltage	1 <sup>st</sup> Year
H-25BLVP - 15	1,000 VDC @ 300 uA	15 VDC	1983
H-25BMVP - 15	2,000 VDC @ 150 uA	15 VDC	1985
H-25BHVP - 15	3,000 VDC @ 100 uA	15 VDC	1986
H-25BLVP - 24	1,000 VDC @ 300 uA	24 VDC	1988
H-25BMVP - 24	2,000 VDC @ 150 uA	24 VDC	1982
H-25BHVP - 24	3,000 VDC @ 100 uA	24 VDC	1984
H-25BLVP - 30	1,000 VDC @ 300 uA	30 VDC	1988
H-25BMVP - 30	2,000 VDC @ 150 uA	30 VDC	1982
H-25BHVP - 30	3,000 VDC @ 100 uA	30 VDC	1984

**Available Models:****Negative output Models:**

<b>Name</b>	<b>Maximum Output Voltage</b>	<b>Input Voltage</b>	<b>1<sup>st</sup> Year</b>
H-25BLVN - 15	1,000 VDC @ 300 uA (Negative)	15 VDC	1987
H-25BMVN - 15	2,000 VDC @ 150 uA (Negative)	15 VDC	1990
H-25BHVN - 15	3,000 VDC @ 100 uA (Negative)	15 VDC	1992
H-25BLVP - 24	1,000 VDC @ 300 uA (Negative)	24 VDC	1983
H-25BMVN -24	2,000 VDC @ 150 uA (Negative)	24 VDC	1981
H-25BHVN - 24	3,000 VDC @ 100 uA (Negative)	24 VDC	1988
H-25BLVN - 30	1,000 VDC @ 300 uA (Negative)	30 VDC	1990
H-25BMVN -30	2,000 VDC @ 150 uA (Negative)	30 VDC	1982
H-25BHVN - 30	3,000 VDC @ 100 uA (Negative)	30 VDC	1985



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## Electrical Characteristics

(at 25 degrees C unless otherwise specified)

Parameter	Conditions	Value			Units
		Min	Typical	Max	
Supply Voltage*:	H-25BXVY - 15	14 VDC	15VDC	16 VDC	VDC
	H-25BXVY - 24	22 VDC	24VDC	26 VDC	VDC
	H-25BXVY - 30	27 VDC	30VDC	33 VDC	VDC
Input Current:	No Load (- 15 model):	45	50	55	mA
	No Load (-24 model):	30	35	40	mA
	No Load (- 30 model):	30	35	40	mA
	Full Load (-15 model):	75	80	85	mA
	Full Load (-24 model):	36	40	44	mA
	Full Load (-30 model):	36	40	44	mA
Output Ripple:	No Load (all models):	0.015 %	0.02 %	.03 %	Vpp
	Full Load (all models):	0.02 %	0.03 %	0.035%	Vpp
Load Regulation:	No Load to Full Load	0.01 %	0.02 %	0.025 %	VNL/VL
	Half Load to Full Load	0.01 %	0.01 %	0.01 %	VNL/VL
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:	(maximum input current)		100	125	mA
Power Efficiency:	Full Load	20%	25%	30%	$\frac{P_{OUT}}{P_{IN}}$
Reverse Input Polarity	Protected to 50 VDC				
Temperature Drift:	No Load			25	ppm/DegC
	Full Load			25	ppm/Deg C
Thermal Rise:	No Load (case)			2	degrees C
	Full Load (case)			5	degrees C
Slew Rate (10% - 90%)	No Load			100	mS
	Full Load			120	mS
Slew Rate (90% - 10%)	No Load			200	mS
	Full Load			100	mS
Drain Out Time	No Load (5 TC)			150	mS



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## Physical Characteristics

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Parameter	Conditions	Value	Units
Dimensions	MKS	88.9 L x 22.35 diameter	mm
	English	3.5 L x 0.88 diameter	inches
Volume:	MKS	34.87	cm <sup>3</sup>
	English	2.12	inch <sup>3</sup>
Mass:	MKS	120	grams
	English	4.3	oz
Packaging:	Brass Tubing with solid epoxy encapsulation		
Finish	Flat black		
Terminations:	Input:	Flying Teflon leads #22 AWG	
	Output:	Teflon Terminals	

## Environmental Characteristics

(at 25 degrees C unless otherwise specified)

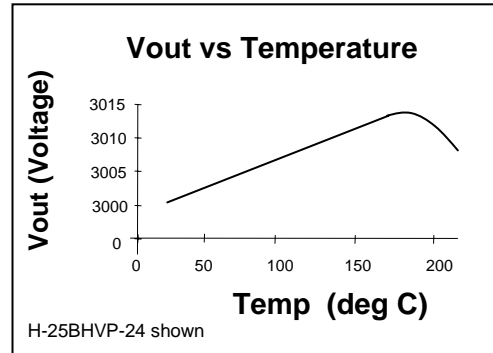
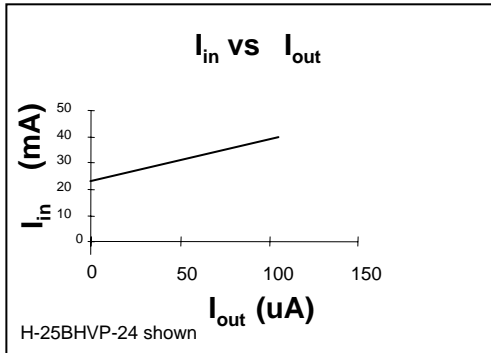
Parameter	Conditions	Value	Units
Temperature Range	case temperature	-40 degrees to + 200 degrees	Celsius
	case temperature	-40 degrees to + 392 degrees	Fahrenheit
Shock:	MIL-STD-810 Method 516	200 g's	Proc IV
Altitude:	pins sealed against corona	-350 to + 16,700	meters
	pins sealed against corona	-1,000 to +55,000	feet
Vibrations:	MIL-STD-810 Method 514	20 g's	Curve E
Thermal Shock	MIL-STD-810 Method 504	-40 deg C to +200 deg C	Class 2



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## H-25B Series Performance Charts

H-25B Series



## H-25B Series Application Notes

The H-25B Series high voltage power supplies are regulated against both line and load changes. The input current as a function of load and output voltage as a function temperature are shown in the above graphs. To set the output voltage to a fixed value lower than the maximum that the unit can provide is easily accomplished. In the resistance programming mode, a resistor is inserted between the Yellow control wire and the Green ground wire. For positive output units, a resistance value of zero Ohms yields the maximum output voltage. For negative output units, an open circuit yields the maximum. Figure 1 shows the connections for a positive output power supply. Figure 2 shows the output voltage as a function of control resistor.

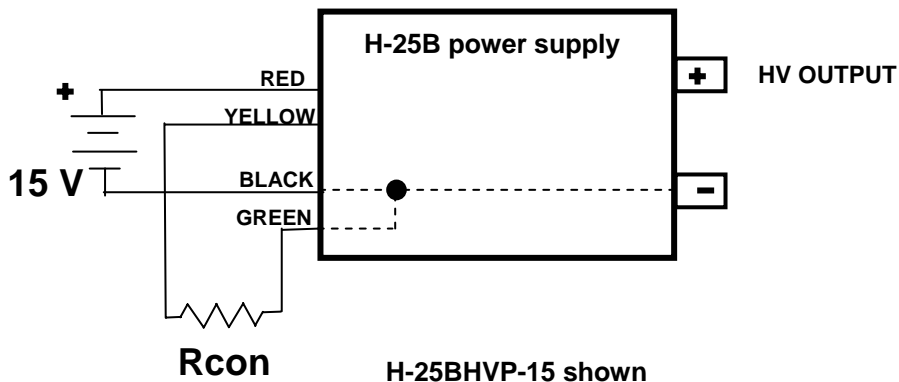


Figure 1: Resistance program of positive output of H-25B



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## H-25B Series Application Notes (continued)

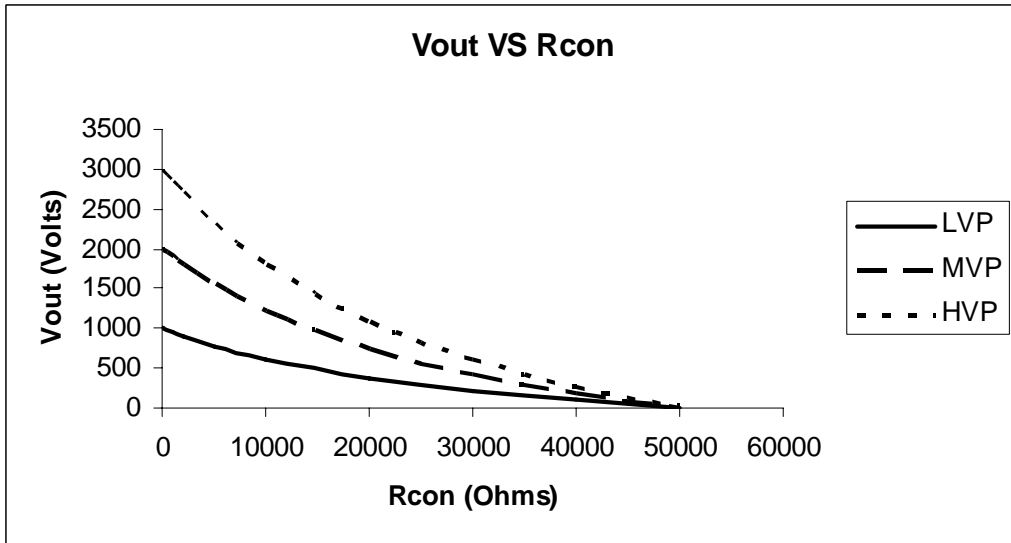


Figure 2: Positive Style H-25B Output Voltage as a function of control resistor

Some models of the H-25B Series high voltage power supplies can provide a negative output voltage. To set the output voltage to a fixed value lower than the maximum that the unit can provide is easily accomplished. In the resistance programming mode, a resistor is inserted between the Yellow control wire and the Green ground wire. For negative output units, an open circuit yields the maximum output voltage. Figure 3 shows the connections for a negative output power supply. Figure 4 shows the output voltage as a function of control resistor.

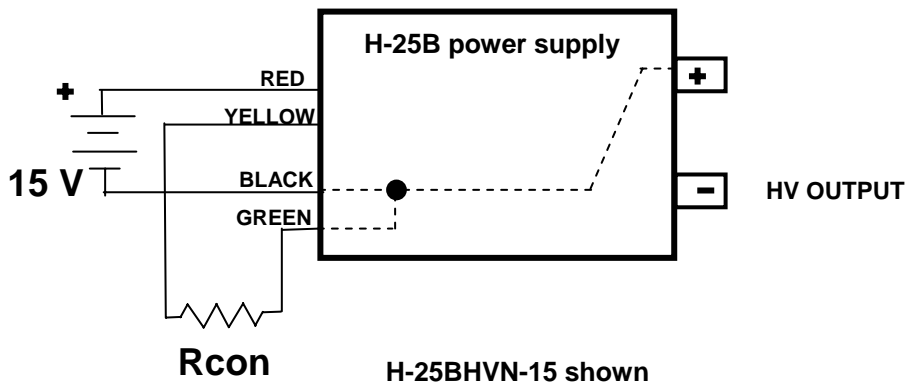


Figure 3: Resistance program of negative output of H-25B



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### H-25B Series Application Notes (continued)

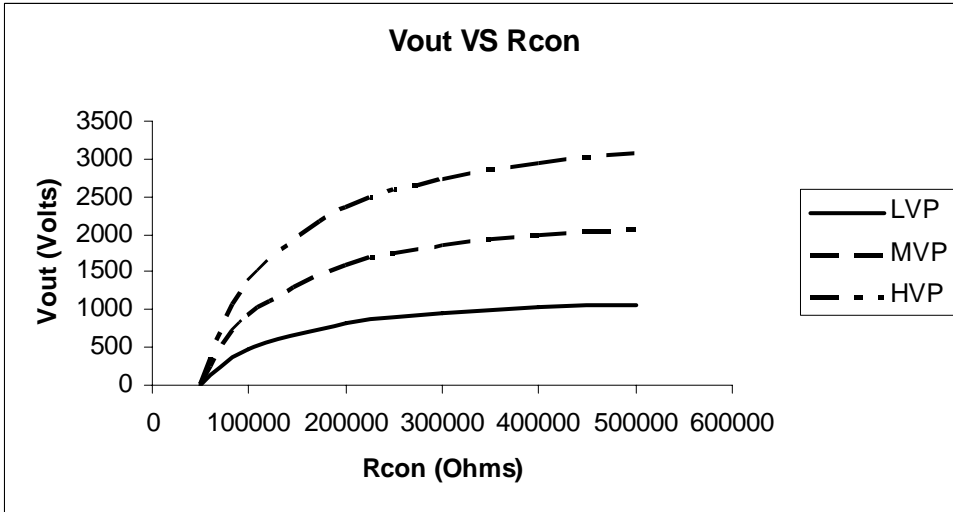


Figure 4: Negative Style H-25B Output Voltage as a function of control resistor

All H-25B power supplies can be controlled by an external reference voltage placed into the YELLOW lead. Figure 5 details this connection for positive style output units while Figure 6 shows the effect of this external voltage on the output voltage of the unit. The power supply will regulate at the set voltage and be stable against line and load variations as long as the external control voltage is fixed in magnitude.

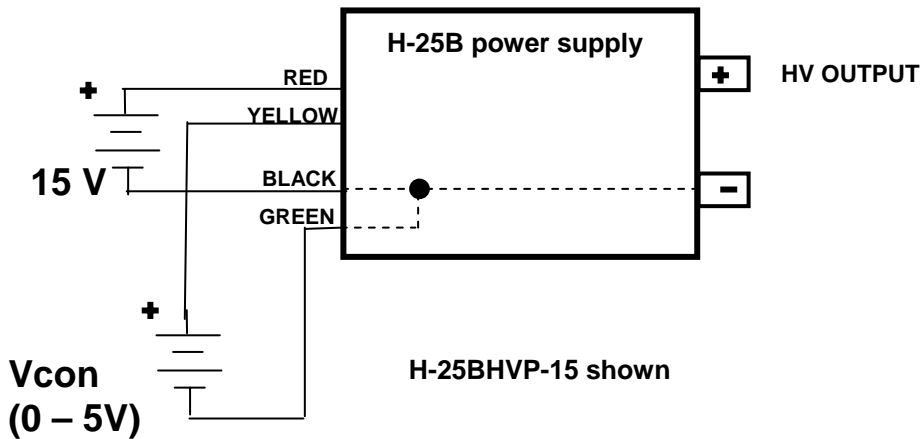


Figure 5: Voltage programming of positive output H-25B



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### H-25B Series Application Notes (continued)

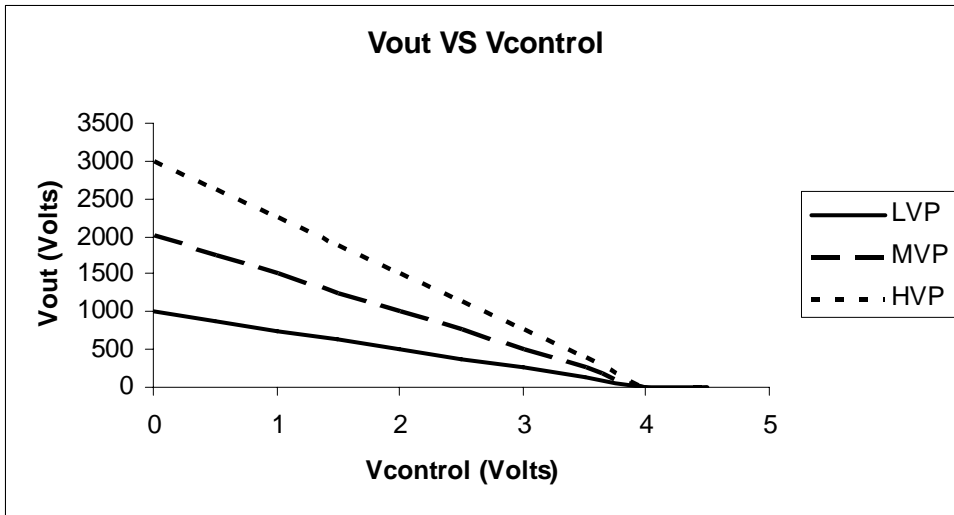


Figure 6: Positive Style H-25B Output Voltage as a function of program voltage

Negative output H-25B power supplies can also be controlled by an external reference voltage placed into the YELLOW lead. Figure 7 details this connection for negative style output units while Figure 8 shows the effect of this external voltage on the output voltage of the unit. The power supply will regulate at the set voltage and be stable against line and load variations as long as the external control voltage is fixed in magnitude.

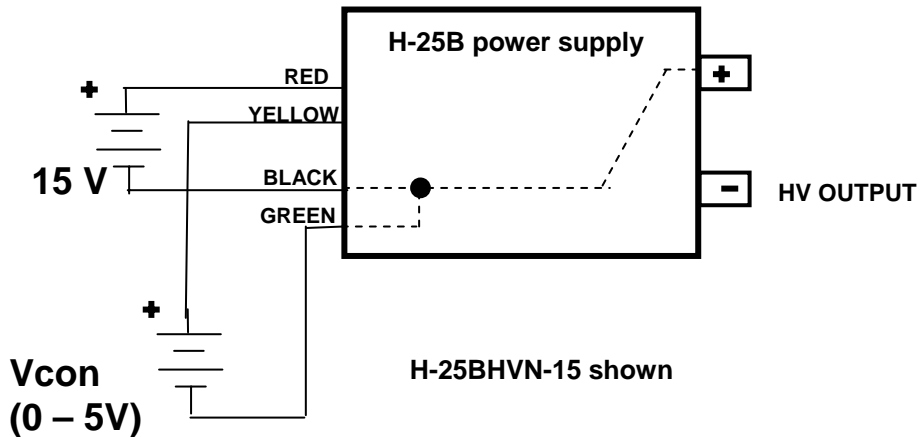


Figure 7: Voltage programming of negative output H-25B





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## H-25B Series Application Notes (continued)

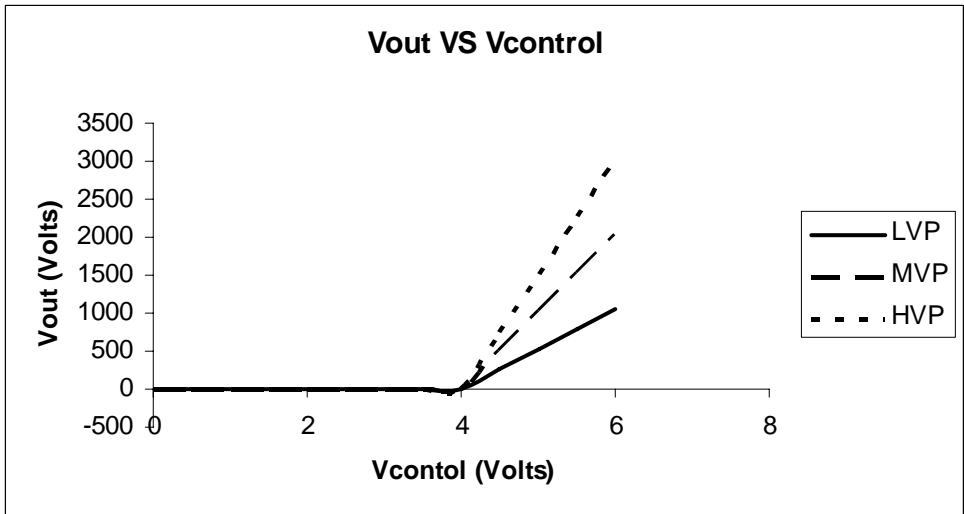


Figure 8: Positive Style H-25B Output Voltage as a function of program voltage

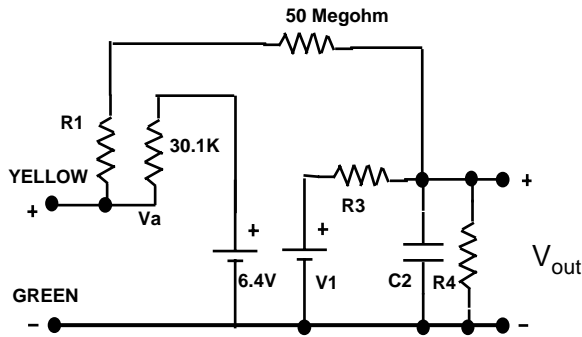
Negative output H-25B power supplies can also be controlled by an external reference voltage placed into the YELLOW lead. Figure 7 details this connection for negative style output units while Figure 8 shows the effect of this external voltage on the output voltage of the unit. The power supply will regulate at the set voltage and be stable against line and load variations as long as the external control voltage is fixed in magnitude.



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## Equivalent H-25B Circuit Model



H-25B HVPS Circuit Model

R1 = 201K Ohm (LVP), 100K Ohm (MVP), 67K Ohm (HVP)  
90K Ohm (LVN), 30K Ohm (MVN), 10K Ohm (HVN)

R3 = 1 K Ohms

R4 = 100 Megohms

C2 = (3 x 10<sup>-9</sup>) Farads

V1 = Positive output units:  $4.01 + (2 E8) / R1 - (50 E6)(Va)/R1$

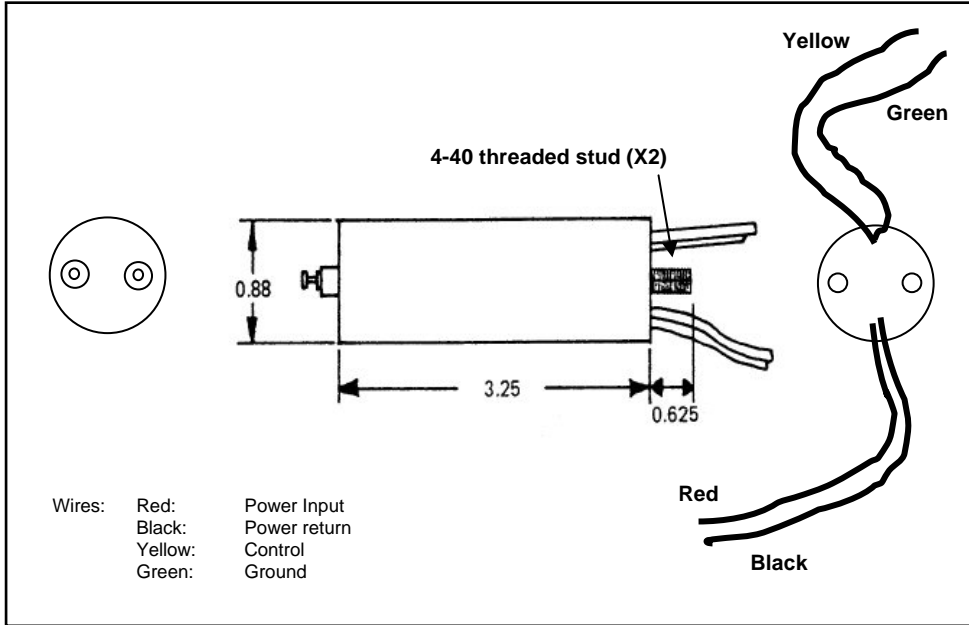
= Negative output units:  $(50 E6)(Va)/R1 - (2 E8)/R1 + 4.01$



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### Outline Drawing: (inches)



### Ordering Information:

**H-25BXVY - Z**

X = Output voltage range: L = 1KV, M = 2KV, H = 3KV  
Y = polarity P = positive, N = negative  
Z = Input voltage 15, 24, 30

**Example:**  
H-25BLVP-24: Maximum output = 1,000 V positive polarity 24 VDC input  
H-25BMVN-30: Maximum output = 3,000 V negative polarity 30 VDC input