RATED INPUT VOLTAGE REQUIREMENTS:		20 volts dc with suffix AAA = 200
		30 volts dc with suffix AAA = 300.
		48 volts dc with suffix AAA = 480.

ABSOLUTE MAXIMUM INPUT VOLTAGE:	Output voltage plus 40 with suffix CCC = 102 and suffix D = A.
	Output voltage plus 25 with suffix CCC = 102 and suffix D = F.
	Output voltage plus 20 with suffix CCC = 302 and suffix D = F.
	Under no circumstances shall the input voltage, including ripple, exceed 50 volts dc.

NOMINAL RATED OUTPUT VOLTAGE:		+ or – 5.0 volts dc with suffix BBB = 050
	+ or – 8.0 volts dc with suffix BBB = 080	+ or – 10.0 volts dc with suffix BBB = 100
	+ or – 12.0 volts dc with suffix BBB = 120	+ or – 12.5 volts dc with suffix BBB = 125
	+ or – 15.0 volts dc with suffix BBB = 150	+ or – 24.0 volts dc with suffix BBB = 240
The output voltage polarity will be the same as the input power supply polarity. The 8.0, 12.5 and 24 volt dc output configuration is available in the adjustable configuration, suffix D = A, only.		

OUTPUT VOLTAGE RANGE:	Positive outputs:	Plus 4.8 to 5.2 volts with suffix BBB = 050
		Plus 11.5 to 12.5 volts with suffix BBB = 120
		Plus 14.4 to 15.6 volts with suffix BBB = 150
	Negative outputs:	Minus 4.9 to 5.1 volts with suffix BBB = 050
		Minus 11.7 to 12.3 volts with suffix BBB = 120
		Minus 14.7 to 15.3 volts with suffix BBB = 150
The output ranges given above are for fixed output, 1000 ma. models, suffix CCC = 102 and suffix D = F		
Positive outputs with suffix CCC = 302		Plus 4.75 to 5.25 volts with suffix BBB = 050

RATED OUTPUT CURRENT:	+ or – 1000 ma. with suffix CCC = 102
	Plus 3000 ma. with suffix CCC = 302
The output current polarity will be the same as the input power supply polarity. The 3000 ma. output is only available in a 5 volt, suffix BBB = 050, fixed, suffix D = F, positive, suffix E = 0, configuration. The output current is thermally limited, refer to the application notes for details.	

LINE VOLTAGE REGULATION:	Adjustable models:	.05% per volt of output , all output voltages.
	Fixed models with suffix CCC = 102:	50 millivolts. with suffix BBB = 050
		120 millivolts with suffix BBB = 120
		150 millivolts with suffix BBB = 150
	Fixed models with suffix CCC = 302:	25 millivolts with suffix BBB = 050

LINE VOLTAGE RIPPLE REJECTION:	Adj. models:	Greater than 66 dB, all output voltages.
	Fixed models with suffix CCC = 102:	Greater than 54 dB, all output voltages.
	Fixed models with suffix CCC = 302:	Greater than 70 dB, with suffix BBB = 050

LOAD CURRENT REGULATION:	Adjustable models:	1% of output voltage, all output voltages.
	Fixed models with suffix CCC = 102:	50 millivolts. with suffix BBB = 050
		120 millivolts with suffix BBB = 120
		150 millivolts with suffix BBB = 150
	Fixed models with suffix CCC = 302:	100 millivolts with suffix BBB = 050

GENERAL DESCRIPTION:

This linear voltage regulator assembly is designed to convert the input DC power line to a stable, lower voltage, unipolar DC output. Models are available to provide a selection of output voltages from 5 to 24 volts DC to the connected load. Both positive or negative output voltage configurations are available. The positive 5 volt output model is capable of supplying a maximum of 3 amps to the connected load. Other voltage configurations will deliver up to 1 amp to the connected load. This device is typically used with an unregulated dc source to provide a stable power supply for transducers and other electronic devices that do not include internal voltage regulators.

This industrial grade module is built on a single circuit board and includes a capacitor input filter, a linear voltage regulator and a output status indicator. A fuse is supplied to protect the output from short circuits.

Both fixed and adjustable outputs are available. The adjustable output models include a control on the circuit board to adjust the output voltage up to plus or minus 10% from the nominal value. The linear voltage regulator features both thermal and overcurrent shutdown protection. Rated output current is available over the entire rated temperature range. The change in output voltage will not exceed 2% as the power line input voltage, output load current and ambient temperature are varied over the specified operating range.

The circuit board is solder masked and conformal coated. All external wiring connections are made to a single, plug-in terminal block. All external connections are clearly marked on the board.

PART NUMBERING SYSTEM:

Option identifier suffix groups

Model series identifier

B3163-AAA-BBB-CCC-DE

PART NUMBER SUFFIX GROUP EXPLANATION	
SUFFIX	**DESCRIPTION**
AAA	Rated input power supply voltage.
BBB	Regulated output voltage
CCC	Maximum rated output current
D	Output fixed or adjustable
E	Output voltage polarity

Parts shipped from the factory will have the correct alphanumeric option identifier in place of the suffix letters indicated in the table above.

ORDERING INFORMATION:

Refer to the B3163 model series selection sheet for a complete listing of the currently available models.

DATA SHEET FOR DATATRAN B3163 LINEAR DC VOLTAGE REGULATOR

(UNIPOLAR OUTPUT)

FOR TECHNICAL ASSISTANCE CONTACT
CONIC SYSTEMS INC.
11 REBEL LANE, PORT JERVIS, NY 12771
TEL: (845) 856-4313 FAX (845) 858-2824
www.conicsystems.com

SPECIFICATIONS, CONT:

MINIMUM OUTPUT CURRENT TO MAINTAIN SPECIFIED REGULATION:		15 ma. maximum
MINIMUM INPUT VOLTAGE TO MAINTAIN SPECIFIED REGULATION:		Maximum output voltage plus 2 volts.
OUTPUT RIPPLE AND NOISE:		15 millivolts, peak to peak, maximum at 100% of rated load current.
OUTPUT VOLTAGE ADJUST RANGE:		Plus and minus 10% of nominal, minimum, with suffix D = A.
INPUT FILTER CAPACITOR:	1000 ma. models, suffix CCC = 102	4700 uf at 50 volts dc.
	3000 ma. models, suffix CCC = 302	9400 uf at 50 volts dc.
OUTPUT CURRENT LIMIT:	1000 ma. models, suffix CCC = 102	1500 ma. minimum to 3700 ma. maximum
	3000 ma. models, suffix CCC = 302	3000 ma. minimum to 6000 ma. maximum
For the 3000 ma. models, suffix CCC = 302, the minimum current limit value will decrease from 3000 ma. to 2000 ma. as the input voltage increases from 12 volts to the maximum of 20 volts.		
OUTPUT FUSE SIZE:	1000 ma. models, suffix CCC = 102	1500 ma. Littlefuse number 313 01.5.
.100 amp with suffix CCC = 550	3000 ma. models, suffix CCC = 302	4000 ma. Littlefuse number 313 004.
The output fuses are type 3AG, slow blow. Replace with Littlefuse type 313, or equal.		
INPUT TO OUTPUT ISOLATION:	The linear dc voltage regulator does not provide any isolation between the input and the output. All devices connected to the device must operate at the same common potential (0 volt) as the input power supply.	
THERMAL RESISTANCE:	1000 ma. models, suffix CCC = 102	9.4 degree C / watt. Free air
		7.0 degree C / watt. 200 ft. / min.
		5.5 degree C / watt. 500 ft. / min.
	3000 ma. models, suffix CCC = 302	8.4 degree C / watt. Free air
		6.0 degree C / watt. 200 ft. / min.
		4.5 degree C / watt. 500 ft. / min.
OPERATING TEMPERATURE RANGE:		- 20 degrees C to + 75 degrees C.

APPLICATION INFORMATION:

The linear dc voltage regulators are available with rated output currents of either 1000 ma. or 3000 ma. (plus 5 volt output only). These are the absolute maximum values under ideal conditions. The available output current in a specific application will be limited by the thermal characteristics of the application. In other words, the maximum power that can be dissipated by the regulator must be limited to a value that will keep the internal junction temperature below 125 degrees C.

The power dissipated by the regulator is equal to the difference of the input and output voltages divided by the output current, as per the formula below:

Regulator power, watts (Pr) = [Input voltage (Vi) - Output voltage (Vo)] * Output current, amps (Io)

From the formula above, we can see that by increasing the input to output voltage differential or the output current we increase the regulator power. The maximum allowed power dissipation will vary with the ambient air temperature as well as the thermal resistance from the regulators junction to the air.. We can calculate the maximum power that the regulator can dissipate by using the formula below:

$$\text{Maximum power allowed, watts (Pd)} = \frac{\text{Junction temperature, degrees C. (Tj) - Air temperature, degrees C. (Ta)}}{\text{Thermal resistance, degrees C. per watt (Rt)}}$$

For maximum power use the maximum junction temperature of 125 degrees C. The thermal resistance is a function of the air flow over the regulator assembly. Thermal resistance values for free air (no cooling fan), 200 feet per minute and 500 feet

APPLICATION INFORMATION, CON'T:

per minute can be obtained from the specifications section of this data sheet. You may obtain thermal resistance values for other cooling flows from Datatran Labs Engineering Department if needed.

A word about cooling air flow. The thermal resistance values are based on linear flow. Most cooling fans are rated at cubic feet per minute. The cooling fan output, in cubic feet per minute, can be converted to linear feet per minute using the formula below:

$$\text{Air flow, feet per minute (Af)} = \frac{\text{Cooling fan flow, cubic feet per minute } (Af^3)}{\text{Cooling fan area, square feet } (Af^2)}$$

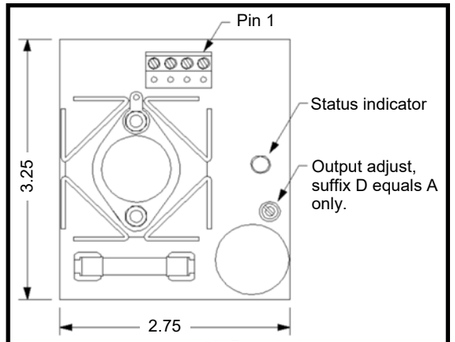
Most cooling fans are rated at their free air delivery and with zero back pressure. To obtain a realistic air flow, the value obtained above should be derated by 60% to 80% to adjust for the probable back pressure.

By substituting the Maximum power allowed (Pd) value for the Regulator power (Pr) value and rearranging the terms in equation number 1, we can determine the maximum output current at any combination of ambient temperature

$$\text{Maximum output current, amps (Io)} = \frac{\text{Maximum power allowed, watts (Pd)}}{\text{Input voltage (Vi) - Output voltage (Vo)}}$$

and input to output voltage differential. This is shown in the formula below:
The maximum output current shall not exceed the rated output current for the linear dc voltage regulator as defined

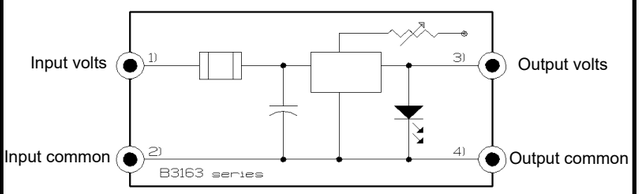
OUTLINE DIMENSIONS:



Mounts in model series Z1017 plastic track.

FUNCTIONAL DIAGRAM:

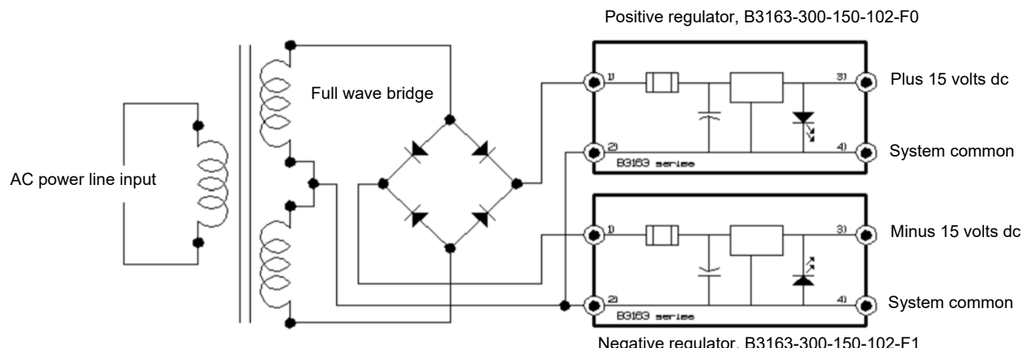
ADJUSTABLE, POSITIVE DC LINEAR REGULATOR SHOWN



The input and output commons (0 volt) are connected on the circuit board.
The linear dc voltage regulator DOES NOT provide isolation from input to output!

APPLICATION EXAMPLE:

LINE POWERED, REGULATED, BIPOLAR, 1 AMP, 15 VOLT DC POWER SUPPLY



Isolation and step down transformer. Line voltage primary. Approximately 36 volt, center tapped secondary, rated for 3.6 amps rms.

Refer to application notes for thermal current limit calculations.