

February 6, 2007

Baseline: Current SGA Performance Specifications

Load regulation: Specified at no load to full load, nominal AC input

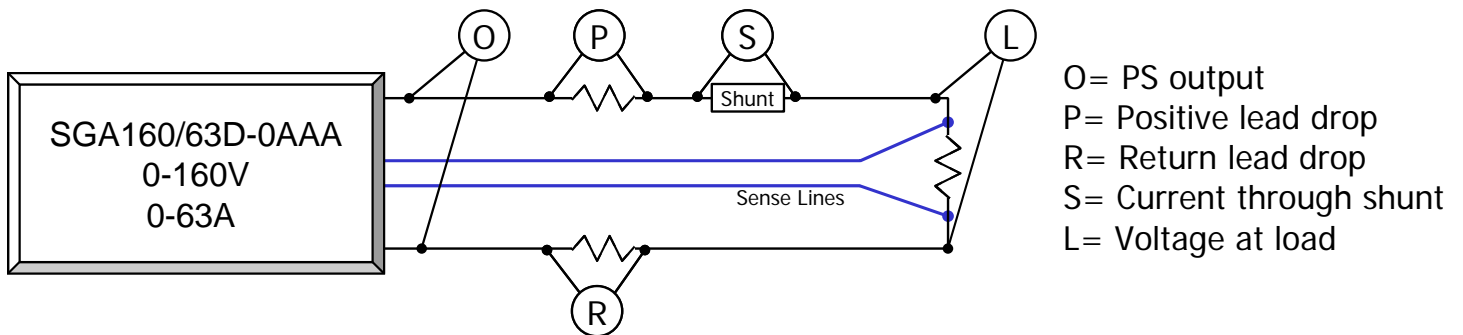
Voltage Mode: $\pm 0.02\%$ of full scale ($\pm 32\text{mv}$ at 160V full scale)

Current Mode: $\pm 0.1\%$ of full scale ($\pm 63\text{ma}$ at 63A full scale)

Remote Sense: The maximum load line drop is up to the full voltage rating of the supply. The drop in the load leads subtracts from the maximum voltage available for the load. Voltage regulation specifications apply for line drops of up to 10% of full-scale voltage on 40V to 100V models and up to 4% of full-scale voltage on 160V to 600V models

Unit Tested - SGA160/63D-0AAA S/N 0705A01847

Test set-up for line drop voltage regulation test



Set Power Supply output at 80V at no load, fix setting and then disable the unit. (Voltage setting was not changed for the remainder of the tests). Perform the three test series below to quantify the regulation response when high load line drop is experienced while utilizing remote sensing at the load.

Test Series 1

While maintaining constant load line resistance, vary the user load and measure the difference between the programmed voltage value and the actual voltage measured across the user load.

User Load Setting	Front Panel Voltage Display	Front Panel Current Display	Power Supply Output	Positive Lead V drop (1 ohm)	Negative Lead V drop (1 ohm)	Current through Shunt	Voltage across Load	Load Regulation (Volt across load) No Load minus loaded Condition
No load	80.1V	0.2A	80.06V	0.03mV	0.28mV	0.00	<u>80.068V</u>	No load reference
100 ohm	80.1V	1.0A	81.82V	0.87V	0.88V	1.0A	80.073V	5mV
10 ohm	80.1V	8.1A	97.81V	8.79V	8.95V	8.1A	80.069V	1mV
5 ohm	80.1V	15.9A	115.43V	17.52V	17.84V	15.9A	80.062V	- 6mV

Test Series 2

Same as Test 1, but set load at 5 ohm and test with unbalanced load line drop by placing load in just the negative and then just the positive lead with ~ 18V drop in each leg.

Load Setting	Front Panel Voltage Display	Front Panel Current Display	Power Supply Output	Positive Lead V drop (0 ohm) (1 ohm)	Negative Lead V drop (1 ohm) (0 ohm)	Current through Shunt	Voltage across Load	Load Regulation (Volt across load) No Load minus loaded Condition
5 ohm	80.1V	15.9A	97.98V	No drop	17.92V	15.9A	80.065V	-3mV
5 ohm	80.1V	15.9A	97.61V	17.53V	No drop	15.9A	80.074V	6mV

Test Series 3

Same as Test 2, but increase unbalanced load line drop to approximately ~ 36V drop in each leg.

Load Setting	Front Panel Voltage Display	Front Panel Current Display	Power supply output	Positive Lead V drop (2 ohm) (0 ohm)	Negative Lead V drop (0 ohm) (2 ohm)	Current through Shunt	Voltage across Load	Load Regulation (Volt across load) No Load minus loaded Condition
5 ohm	80.1V	15.9A	115.18V	35.11V	No drop	15.9A	80.076V	8mV
5 ohm	80.1V	15.9A	115.55V	No drop	35.48V	15.9A	80.066V	-2mV

Conclusion

The SGA power supply performed exceptionally well. Even when a load-line drop over 22% of the full-scale voltage (35.48V) was introduced, the power supply remained well within its regulation specification for both voltage and current. Specifically, the specification limit for the 160V SGA is $\pm 32\text{mv}$ and the maximum regulation disparity was only 8mv. This was the case whether the load line drop was balanced or not and equates to a load regulation of 0.005% of the rated output voltage.