

How to Choose Power Supplies

OVERVIEW

Which is better, Linear or Switcher Supplies?

Since servo motors are inductive they may run highly dynamic motion profiles. As a result, their current demand can vary widely. Surge currents from stand-still to maximum load may be extremely high, yet steady state current demand over time may be relatively mild. As a result, proper care should be taken when selecting power supplies.

Animatics offers two basic types of power supplies.

The chart to the right gives a brief comparison of the two types of supplies.

	Linear	Switcher
AC Input	Field selectable (120/240VAC)	Universal 90-240VAC
Power Factor Corrected	No	Yes
Relative Size	Big and bulky	Lightweight
Cooling	Ambient convection	Fan cooled
Surge Capacity	400%	5%
Voltage Regulation	15% Drop over range	0%, Fixed
Shunt Required ? ¹	Occasionally, but not typically	In most cases, highly recommended!

¹ See shunt section for more information!

MOTOR SPECIFICATIONS

LINEAR SYSTEMS

CONNECTIVITY

PERIPHERALS

IP 65 MODELS & CONNECTIVITY

POWER SUPPLIES & SHUNTS

GEAR HEADS

SOFTWARE

APPENDIX

As seen in the graph to the right, Linear (unregulated) supplies can handle large surge current loads. This is because Linear Supplies typically contain large output capacitors to handle those surges well.

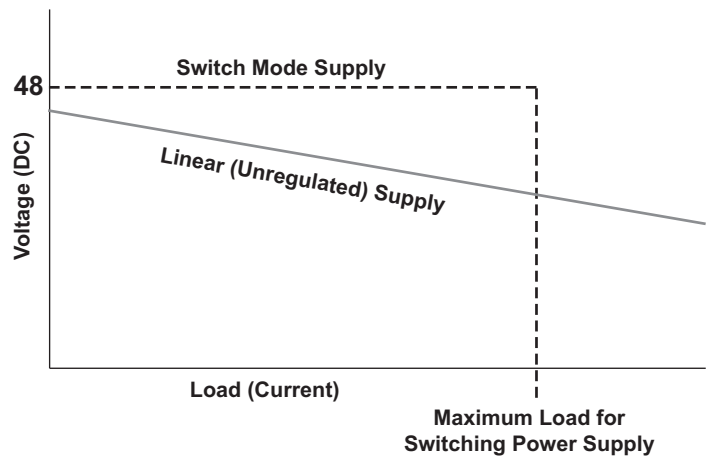
Voltage regulation: Switchers are highly regulated supplies. They will maintain fixed voltage until they reach maximum load and then will “crowbar” to zero volts to protect the output stages. Linear supplies will slowly drop in output voltage while supplying more and more current.

This is the most fundamental difference between switchers and unregulated supplies.

Even though a switcher cannot handle the higher current surges, if it can output as much current as you would expect for a given servo application, then they will actually help the servo accelerate much faster because system voltage will be maintained at maximum level.

However, if your servo application requires surge currents in excess of 50 Amps or more, the switchers may not be cost effective. Getting 50 amps from an Animatics 20 Amp supply is easy. Getting 50 Amps from Animatics switchers would require placing multiple units in parallel, so it may not be cost effective to do so.

Voltage Drop Comparison



Warning: Improper Power Supply Sizing may result in Motor Position Error Faults, Motor Resets, and Machine Faults