

Power Supplies in Industrial Control Panels

Switchers vs. Linear

Switching technology is the predominant method of AC-DC conversion for almost any type of electronic system sold today in the world, from PLC's to desktop PC's. The small size, lightweight and high efficiency of the switching products give them significant advantages over the linear technology products. Switching products provide well filtered and regulated DC of typically less than 1% deviation from the nominal output voltage.

Linears are about 50% efficient while their switching counterparts are typically over 80% efficient. With new technology, some now exceed 95% efficiency. Switchers are light enough to mount on a DIN Rail, while only the smallest linears are capable of being securely mounted to a DIN Rail. Linears are still popular today because they do provide very tight regulation (<.01% typically), almost perfectly clean DC, fast transient response and their low component count helps provide a lower material cost for its user.

Linears are typically open frame because of the excessive heat dissipation from their low efficiency. Most linears are recognized to UR 1950 and cannot meet the stricter temperature requirements of the UL 508 Listing, as most switching power supplies do.

If a control panel using a linear power supply is to be compatible with industry standards such as UL 508A, then it shall not be loaded more than 50 percent of its ampere rating. One exception to that is if the power supply complies with the temperature test in UL 508. Then it can be loaded for 100 percent of its ampere rating (i.e it must be UL 508 listed).