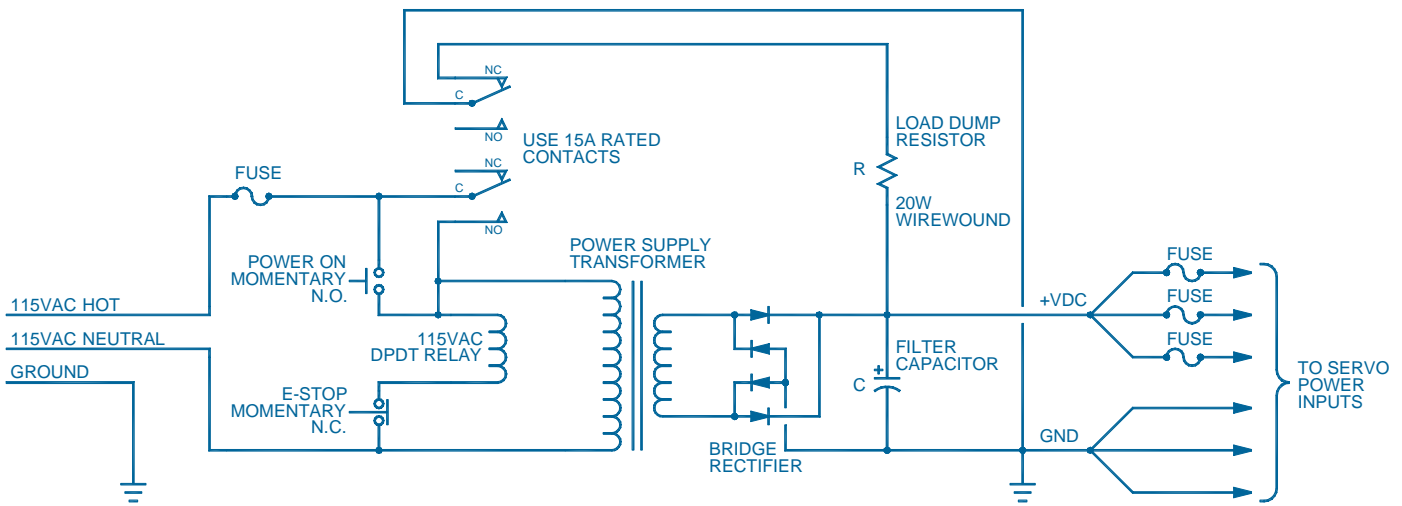


DC BRUSH TYPE SERVODRIVE E-STOP



This circuit will quickly bring a servomotor to a stop during an emergency without damaging the motor drives. Shown also is an unregulated power supply though any other type supply may be used as well.

This circuit uses two momentary switches; a momentary SPST normally open “POWER ON” switch and a momentary SPST normally closed “E-STOP” switch in conjunction with a 115VAC coil, DPDT 15A relay.

Pushing the “POWER ON” switch energizes the relay coil, which closes the NO contact and applies power to the power supply transformer. Those same relay contacts are in parallel with the “POWER ON” switch and the latch-on the relay coil. At that time the “POWER ON” switch may be released because the relay is latched.

The “E-STOP” switch is a SPST momentary NC switch. Pushing it interrupts the relay coil, causing it to drop out. When it drops out, its bottom SPDT contact opens and stops power to the power supply. The “E-STOP” switch can now be released since the relay is latched off.

The top relay DPDT contact goes to its NC position. The NC contacts crowbar the 20W wirewound resistor across the DC side of the power supply. This very rapidly discharges the filter capacitor “C” and dynamically breaks the servomotor to a stop. This occurs in about a half second at normal loads and speeds.

The size of this resistor “R” should be picked so it carries about 10A at the power supply voltage. For example, use a 6.8 ohm resistor for a 68VDC power supply voltage ($R=V/10$). It is very important to use a wirewound resistor. Only they are designed to sustain the momentary power overload that will result without damage. A 20W rated resistor will handle power supplies up to 1,500W

As a further refinement, a computer controlled SPST, NO contact can be placed in series with the “E-STOP” switch. This would prevent the power supply from running unless the computer said it was OK.

DPDT means “double pole, double throw”, SPST means “single pole, single throw”, NC means “normally closed”, NO means “normally open”.