



APPLICATION NOTE 700108D

EN1000 ISOLATION CIRCUITRY DESCRIPTION

EN1000 SERIES CONTROLS

The EN1000 Series Controls are microprocessor-based resistance welding controls that incorporate circuitry designed to prevent any output from the control due to spurious or unexpected or false conditions or failure of circuit components. The intent of this Application Note is to explain how the circuitry accomplishes this isolation.

The main isolation is provided by electro-mechanical control relay contacts that are in series with the solenoid valve voltage supply and the contactor firing circuitry. In a non-initiated state, the relay contacts are open and no output from these circuits are possible. When the control is initiated by the physical closure of a normally open set of external contacts (commonly a foot switch) across the initiation circuit, the relays are energized and their contacts close and complete the circuits to the solenoid valve and the contactor. The outputs are not actually energized, however, until the microprocessor reaches the point in the sequence at which the valve or contactor outputs are to be activated.

There is no way to guarantee that any control circuit will be immune to any component failure. It is always necessary to take personal safety precautions when operating any machinery. Through a Process Output system, the EN1000 Series Controls can be programmed so that if the 20 volt energizing voltage for the isolation relays appears in the absence of an initiation, or if the SCR contactor conducts current at any time other than when programmed, an output voltage will appear at the Valve 3 terminals. This voltage can be used to sound an alarm or operate a shunt trip breaker to remove line voltage from the machine and the control.

In addition to the relay contacts mentioned above, there are other levels of isolation. The initiation signals first pass through a circuit comprised of opto-isolators before being passed to the input circuitry of the microprocessor. The valve outputs are further isolated by the use of optically coupled triac (solid state) outputs and the weld pulses are isolated by a pulse transformer.

NOTICE

Valve 3 (SV5/SV6) will not be isolated if Jumper B is used on TS3. See diagram on back page.

