

Mercury Relay Installation

Quick Reference Guide

Required Tools and Equipment

- ▶ Antistatic wrist strap
- ▶ Small Phillips (#2) screwdriver
- ▶ Wire stripper and wire cutter
- ▶ Adjustable wrench
- ▶ Mounting hardware
- ▶ Voltmeter
- ▶ Crimpers
- ▶ Electrical tape
- ▶ 10 AWG wire - stranded or solid; insulated or bare
- ▶ Welding cables

100A Mercury Relay



Installing the Equipment

The following procedures are general steps for a typical installation. These procedures can be used for the following types of mercury relays: 100A, 60A, and 30A (part numbers 826762-000, 826761-000, and 826760-000, respectively).

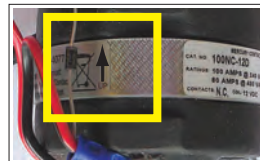
WARNING: To prevent electrostatic discharge (ESD) damage when handling electronic equipment, always wear an antistatic wrist strap attached to an unpainted, grounded metal object. Ensure the wrist strap has maximum contact with bare skin. **If wires are to be buried or covered, conduit must be used to protect the wires.**

WARNING: Always turn off power to rectifier and other devices before beginning installation.

WARNING: Please refer to the back of this guide for precautions when using mercury devices.

1 Mount Relay

- 1 Mount relay to suitable surface, such as to the rectifier, so that it is in close proximity to both rectifier and remote monitoring unit or MicroMax.



Relay

CAUTION: Relay must be mounted in a vertical position. Ensure that the arrow printed on the relay label is pointed up. If arrow is not shown on label, refer to text.

2 Connect Relay

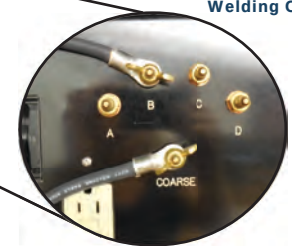
- 1 Connect welding cables to relay.
 - a Strip casing from welding cable ends.
 - b Loosen screws in relay's connections and insert cable wire in top and bottom.
 - c Tighten screw to secure cable wire.

Welding Cables on Relay



- 2 Connect welding cables to rectifier at either AC (shown, with link bar removed) or DC connections.

Welding Cables on AC



3 Connect Relay to Remote Monitoring Unit or MicroMax

- 1 Use red and black cable to connect relay to MicroMax or remote monitoring unit.
 - a For remote monitoring unit, use 10AWG wire with banana jacks to connect to SWITCH OUT input.



MicroMax Relay Inputs



Remote Monitoring Unit Relay Input

NOTE: These procedures are general steps for a typical installation. If your installation requires additional technical assistance, please call the Technical Services group at 1-800-229-3404.

Mercury Relay Advisory

This information is intended to notify American Innovations (AI) customers of the manufacturer's published limitations on mercury relays.

Customers primarily purchase mercury relays for use with current interrupters. Current interrupters provide great programming flexibility to enable customers to use a wide variety of interruption cycles.

AI supplies mercury relays from a variety of respected and reliable vendors including MDI and American Electronic Components (AEC). These manufacturers publish expected relay lives of 3 to 6 million cycles depending upon the type of relay selected. AEC, the manufacturer of Durakool relays, indicates that relay life will be significantly shortened at rates exceeding 1,500 cycles per hour. MDI recommends no more than 900 cycles per hour. Depending upon the interruption cycle chosen by the customer, it is possible to exceed the manufacturer's recommendation, which will result in a likely reduction of service life.

As an example, customers who elect to use mercury relays to interrupt at 1 cycle per second will generate 3600 cycles per hour. Customers should consult the manufacturer's documentation to select the appropriate relay for the application.

Durakool information can be found on the AEC web page at the following address:
<http://www.aecensors.com/html>

In the Durakool documentation, the following two situations are explained that may impact the current carrying capacity of the relay: 1) cycle rate and 2) voltage values. The sizing tables indicate a methodology for determining the maximum amperage that can be carried depending upon the cycle rate. An additional de-rating table for mercury relays is provided for those instances where voltage in excess of 48 V DC is being interrupted. When selecting relays, customers should be aware of both of these de-rating tables to choose the best relay for the application.

To avoid depolarization of the CP system, the mercury relays that AI sells are of the normally closed variety. It is possible that a normally closed relay will fail at the end of its life in the open position due to a malfunction of the spring mechanism that drives the plunger/contacts into a normally closed position. If this occurs, a depolarization situation would result. AI has the following two recommendations:

1. Customers using mercury relays should consider periodic replacement of these relays based upon engineering estimated life via a preventive maintenance program to reduce the likelihood of an open circuit failure.
2. If fast cycle operation is common, AI recommends a solid state relay for maximum life and reliability.

Although most interrupters are capable of being programmed for faster interruption cycles, AI recommends that customers not exceed 900 cycles per hour (or a cycle time of less than four seconds) and will not warranty devices that are utilized in this manner. AI adds a serial number to relays that is supplied to enable the tracking of the shipment date. The approximate age of the relay may be used to assist AI in return material response, failure analysis, and warranty claims. AI will also consult manufacturers to help determine failure cause and advise customers that warranties may not be honored if AI or the manufacturer deems that the mercury relay is used outside of recommended parameters.

If you have questions or need additional information, please contact Technical Support (800-299-3404). Office hours are Monday–Friday, 8:30 am – 5:00 pm Central Time.