

Loss of 120 VAC Alarm

Background

Loss of 120 voltage alternating current (VAC) to the rod control system power cabinet movable gripper (MG) multiplexing transformers can result in dropped rods when either manual or automatic rod motion is demanded. Voltage loss to the MG transformers can result from any of the following four failures:

1. Loss of main 120 VAC
2. Fuse FU53 or FU59 open
3. Fuse FU61 or FU62 open
4. Multiplexing relay MXR1 or MXR2 contacts fail to open

Failures 1 and 2 will actuate the non-urgent failure alarm and extinguish the group-selected lamps. Failures 3 and 4 will extinguish the group-selected lamps. Currently, there is no detection or indication for Failures 3 and 4 available in the control room. In addition, there is nothing to prevent rod motion and the resulting dropped rods if any of the failures occur.

Description

Westinghouse developed a kit that can be installed in each power cabinet in conjunction with a new alarm card to address the lack of alarm indication and potential for dropped rods. The kit consists of a small transformer assembly that is to be mounted on the sidewall of the power cabinet. The assembly includes a circuit card with four transformers to monitor each of the following signals:

- 120 VAC output of fuses FU61 and FU62
- 120 VAC output of multiplexing relays MXR1 and MXR2 to the Group A MG multiplexing transformer
- 120 VAC output of multiplexing relays MXR1 and MXR2 to the Group B MG multiplexing transformer
- 120 VAC output of multiplexing relays MXR1 and MXR2 to the Group C MG multiplexing transformer

The transformers step down the 120 VAC inputs to 16 VAC, which are then rectified on the transformer assembly to provide 20 voltage direct current (VDC) signals to a new monitoring circuit on a new alarm card.

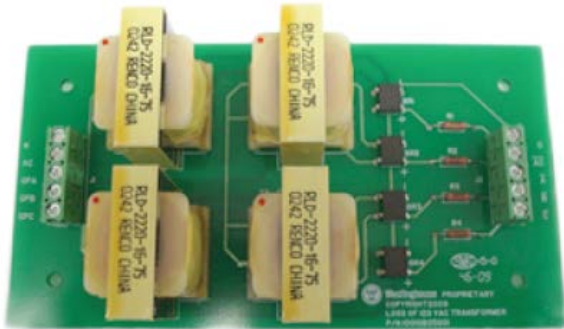
On the new alarm card, the new monitoring circuit also receives the two demand signals that activate the coils of relays MXR1 and MXR2. Loss of 120 VAC due to fuse FU61 or FU62 opening, or failure of MXR1 and MXR2 relay contacts to match demand signals to coils of the relays, will activate the urgent failure alarm and block rod motion, preventing dropped rods.



Loss of 120 VAC Modification Installed in Power Cabinet

Hardware

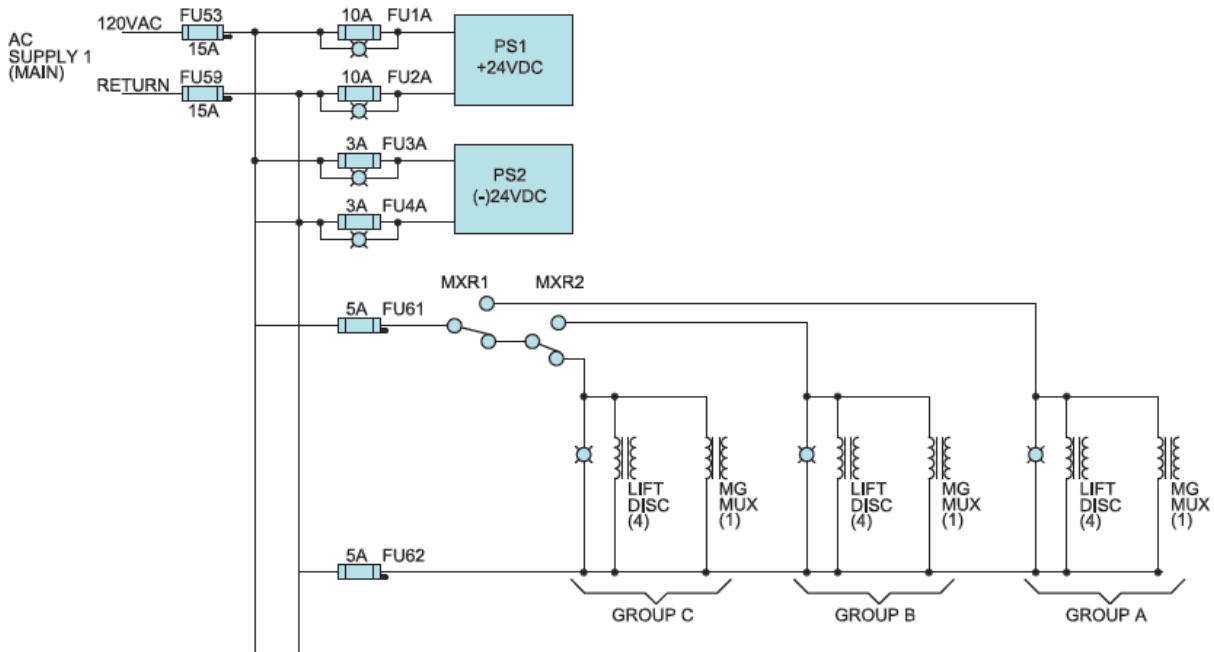
- Loss of 120 VAC transformer assembly kit 10015B25:
 - One kit is needed for each power cabinet. Each kit consists of a mounting plate with the transformer assembly circuit card attached and all necessary hardware and wire for installation.
- Alarm card 6D31106G01:
 - One alarm card is needed for each power cabinet.



Loss of 120 VAC Transformer Assembly – 10010B05G01

Benefits

- Avoids dropped rods from open 120 VAC fuses and multiplexing relay contact failures
- Provides for a match between the multiplexing relay contact outputs to MG multiplexing transformers and demand signals to coils of multiplexing relays
- Actuates urgent alarm locally and in the control room for loss of 120 VAC to MG multiplexing transformers



Power Cabinet: Simplified Main 120 VAC Power Circuit