Dings
magnetic group

TROUBLE SHOOTING GUIDE
RECTIFIERS AND ELECTRO MAGNETS

This bulletin contains a step-by-step troubleshooting procedure for both the rectifier and the electro magnetic separator.

Before starting, first follow this preliminary checklist:

1. Check all fuses.

2. Check all wiring for loose or broken connections.

3. Visually inspect all internal rectifier components.

4. If equipped with a starter, check all overloads (bi-metallic components) to see if any have tripped. Wait several minutes before resetting.

5. If equipped with a starter, check to see if correct heaters for selected voltage are installed and that load does not exceed nameplate rating.

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W A R N I N G

The following procedures should be performed by a qualified electrician. Extreme caution should be used as live electrical equipment will be tested. Before starting the testing procedure, turn off and lock-out any surrounding equipment that may pose a danger during testing. If the magnet is of the self-cleaning type, turn off and lock-out the power to the self-cleaning belt motor. The following instructions are for standard 230 VAC or 460 VAC, 3 phase, 60 Hz rectifiers. For special input voltages, consult factory.

STEP 1

Disconnect the DC cable leads to the magnet AT THE RECTIFIER TERMINAL BLOCK inside the rectifier cabinet.

Turn on the power to the rectifier.

Measure the AC input voltage to the rectifier at the terminal block.

1st Reading - Phase 1 to Phase 2_____Volts
2nd Reading - Phase 2 to Phase 3_____ Volts
3rd Reading - Phase 3 to Phase 1_____Volts

If all three voltage readings are within the following tolerances, the power supplying the rectifier is ok. Go to step 2.

230 VAC +/-5% for 230 VAC input rated rectifiers.
460 VAC +/-5% for 460 VAC input rated rectifiers.

If one or more of the voltage readings are out of tolerance, the power supplied to the rectifier is incorrect and must be corrected.

STEP 2

Turn off and lock-out the power to the rectifier. Disconnect the three leads from the transformer to the diode assembly inside the rectifier cabinet. Turn on the power to the rectifier. Measure the AC voltage at the output of the transformer inside the rectifier cabinet.

1st Reading - Phase 1 to Phase 2_____Volts
2nd Reading - Phase 2 to Phase 3_____Volts
3rd Reading - Phase 3 to Phase 1_____Volts

If all three voltage readings are 85 VAC +/-5% for 115 VDC output rated rectifiers or 170 VAC +/-5% for 230 VDC output rated rectifiers, the transformer is ok. Go to step 3. If one or more of the voltage readings are out of tolerance, replace the transformer or the entire rectifier.

STEP 3

Turn off and lock-out the power to the rectifier. Reconnect the three leads from the transformer to the diode assembly at the transformer output lugs inside the rectifier cabinet. Disconnect the two rectifier output leads to the magnet at the terminal block inside the rectifier cabinet marked "+" and "-". Turn on the power to the rectifier. Measure the DC output voltage of the rectifier at the terminal block inside the rectifier cabinet marked "+" and "-".

_____ VOLTS

If the reading is 115 VDC +/-5% for 115 VDC output rated rectifiers or 230 VDC +/-5% for 230 VDC output rated rectifiers, the rectifier is ok. Go to step 4. If the voltage reading is out of tolerance, replace the diode assembly.

STEP 4

Turn off and lock-out the power to the rectifier. Reconnect the two rectifier output leads to the magnet at the terminal block inside the rectifier cabinet. Turn on the power to the rectifier. Measure the DC voltage at the magnet feed through terminals on the magnet, not at the secondary terminal box on the magnet if so equipped.

_____ VOLTS

If the voltage reading is 115 VDC +/-5% for 115 VDC output rated rectifiers or 230 VDC +/-5% for 230 VDC output rated rectifiers, the leads and terminal blocks between the rectifier and the magnet feed through terminals are ok. Go to step 5. If the voltage reading is out of tolerance, replace or repair the leads between the rectifier and the magnet, as leads may be damaged, loose or undersized. Use caution not to rotate the studs in the feed through terminals on the magnet or the internal connections may be damaged.

STEP 5

Turn off and lock-out the power to the rectifier. Disconnect the two leads from the rectifier to the magnet at the magnet feed through terminals on the magnet, using caution not to rotate the studs in the feed through terminals as the internal connections may be damaged. The magnet must be cold for the following tests. Using the watts and the volts from the nameplate on the magnet, square the nameplate DC volts (115 VDC or 230 VDC) and divide by the nameplate watts to get the target ohm reading. Measure the ohms between the two magnet feed through terminals on the magnet.

_____ OHMS

NOTE: There is no polarity for the magnet terminal posts. Either lead can be connected to either terminal.

If the ohm reading is within +/-10% of the target ohm reading, go to step 6. If the ohm reading is out of tolerance or infinity, consult the factory, supplying all of the above readings that were taken.

STEP 6

Measure the ohm between one of the magnet feed through terminals and the magnet housing. (The preferred measuring instrument is a Megger).

_____ OHMS

If the reading is one megohm (1,000,000 ohms) or larger, the magnet is ok. If the meggar ohm reading is out of tolerance, consult the factory, supplying all of the above readings that were taken.

If it has been determined that the rectifier and magnetic separator are electrically sound and the performance of the separator is still in doubt, contact the factory for further assistance. There are many factors which can affect the ability of a separator to attract metal and a Dings Sales Engineer will be happy to discuss them with you to resolve the problem.

Significance of Electrical Readings:

Low DC Volts: Magnet will be weak

Low ohms (resistance): Possible shorted turns in coils

High ohms: Possible poor connection or open coil circuit

Low DC amps: Possible poor connection or open coil circuit

High DC amps: Possible shorted turns in coils

Meggar reading less than 1 megohm: One or more coils are grounded, poor insulation or transformer oil is contaminated with water

Remember: Ohms x Amps = Volts
IT'S OHM'S LAW!