Slip ring Troubleshooting and Cleaning

The slip rings are a friction device that bring a temperature signal from the thermocouple in the nip roll to the temperature controller. The signal from the thermocouple is very small and therefore if the signal rings get dirty, the signal will be erratic and may cause an overtemp alarm. An operator may notice that the actual temperature display is jumping around. This is an indication of a dirty signal ring on the slip ring. If the signal goes above 320 F the controller will disconnect the power to the heater. If the controller has sensed an over temp or a sensor failure, the controller will show –AL- flashing on the screen. The system will need to be checked to determine the source of the alarm and once cleared, the machine will need to be reset to regain power to the heater. If the signal rings are dirty please follow the steps below to clean the signal rings.

On the RH side of the top nip roll assembly, there is a slip ring mounted to the roll. This slip ring brings electricity to the heaters and picks up the roll temperature information for the temperature controllers. On the backside of the slip ring, there are two small rings and two sets of brushes that are used for the temperature. These brushes are connected to the temperature controller with a red and a white wire. The red and white wire plug into the back of the temperature controller.

Things to inspect:

1. Make sure that the thermocouple brushes are securely placed in their individual rings on the slip ring. Brush assembly #4 will go into the fourth ring and brush #5 will go into the fifth ring. Each brush is a pair and its arms must be in the same ring. The left brush pair are in #4 ring and the right brush pair are in the 5 ring. Failure to keep brushes in individual rings means the temperature is being measured at the ring and not the tip of the thermocouple in roll. This will lead to a uncontrolled nip roll and the roller will overheat (See figure 4)
2. Make sure that the wire connection on the brushes are securely connected to the wire connector on the red and white extension wires. If corrosion is seen, disconnect wires, use some emery cloth to remove corrosion, reconnect and add dielectric grease to prevent corrosion(see Figure 5)
3. Make sure connection between the thermocouple wires coming from the inside of the nip roll and connecting to the slip ring wires are good. If corrosion is seen, disconnect wires, use some emery cloth to remove corrosion, reconnect and add dielectric grease to prevent corrosion(see Figure 6)
4. Make sure that the red and white wires are securely connected in the back of the temperature controllers. (see Figure 7)

To clean the slip ring, use a spray contact cleaner that can be purchased at your local electronics store. Use the cleaner to clean each of the four brush contacts. To clean the rings, soak a pipe cleaner with the contact cleaner and press it down into the ring while rotating the nip roll. (see figure 8)

Caution, power to the heaters should be disconnected by turning off the circuit breakers to the heaters.

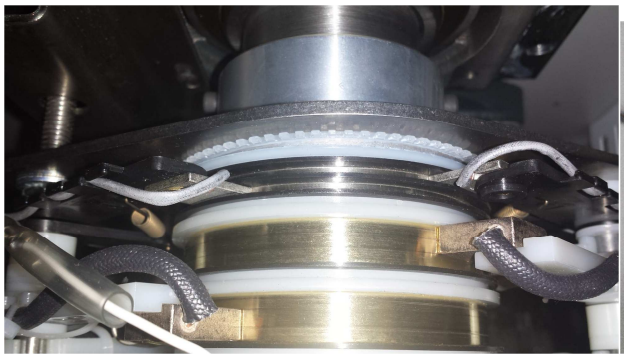

Figure 4. Signal Rings

Figure 5. Brush to wire connection

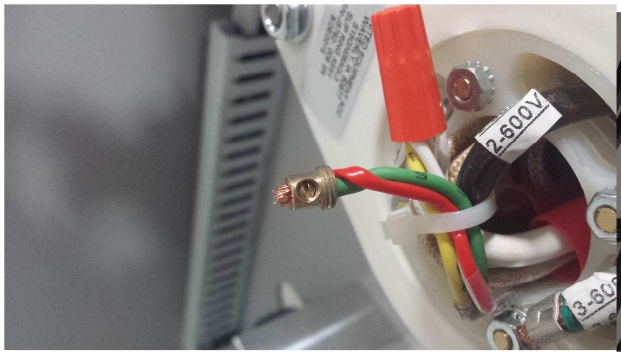

Figure 6. Thermocouple to Slip Ring connection

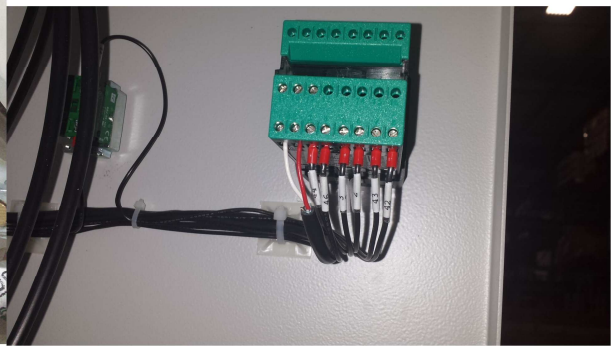

Figure 7. Wire to controller Connection

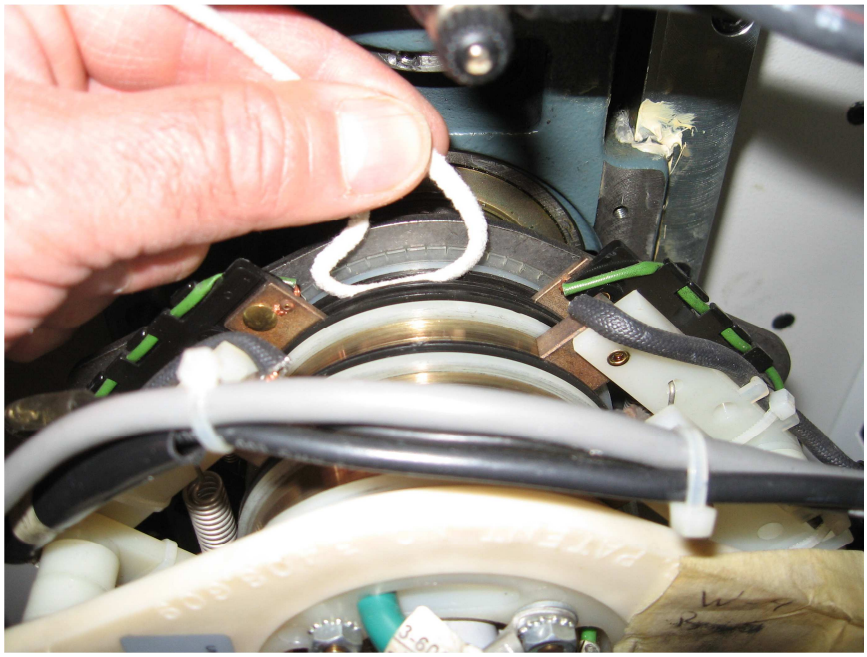

Figure 8. Cleaning the Slip ring