

Simple Fault Finding Techniques

Testing the output.

When you suspect that a controller is not working correctly there are a few simple steps that you can work through:

1. A visual check to check if the controller and contactor or SSR is switching correctly.
 2. Having done that we will test the first bit of the circuit, the controller to ensure that the output is working correctly.
 3. Lastly we will check the last bit, the SSR or contactor as see if they are working correctly.
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1. First check that the little LED on the front panel (C1) of the controller is turning on and off when the controller is calling for heat.
 - a. If it is, then check that in the case where you are using a contactor that you can hear it closing each time the light comes on, or in the case of an SSR check that the LED on the SSR is also switching on each time the controller light flashes.
 2. If the controller light is flashing but the contactor or SSR light is not switching, isolate the power and disconnect the wires leaving the controller, insulate them (tape) to avoid accidental contact and then power up the controller and test for the following.
 - a. In the case where you are using a contactor, make sure that there are NO WIRES connected to the output terminals of the controller including any bridges etc (on our VT9610 it would be T16 + T17 + T18), switch your meter to continuity and check across the common and normally open terminals, on our VT9610 it would be T16 + T17 and see that the relay is making contact (switching) each time the front light comes on. (You will measure continuity each time it flashes) If not it is possible that the output relay of the controller has been damaged. If it does, it means that the problem exists external to our controller and in these cases we recommend that you find a qualified electrician to check the balance of the circuit.
 - b. In the case where you are using a SSR, first check that the SSR you are using uses a 4 ~ 32 Vdc control signal or 90~280 Vac control signal, by reading on the SSR what the control input voltage should be.
 - i. If it is DC low voltage (4~32 Vdc) , simply turn the meter to Vdc and a measuring range larger than 24 VDC and then test on the 2 terminals on the controller (on our VT9610 it would be T16 +ve and T17 -ve) that each time the controller light comes on that you get 24 Vdc across the terminals.
 1. If you do, reconnect the two wires and perform the same test but measure for the 24 Vdc signal on the two signal terminals of the SSR (in our case T4 & T3) and make sure the 24 Vdc signal appears each time the LED on the controller front flashes. If you do see the voltage make sure that the led on the SSR also flashes each time you see the signal. If in fact you do see the signal and the SSR LED flashes but the heating elements are not getting hot, it is likely that the SSR is damaged and may need replacing.

- ii. If the SSR uses an AC signal (90~280 Vac or the like) it means that you will have a relay output controller that is simply switching a 240 Vac signal which is then used to supply the SSR control terminals. All that is happening is that a 240 vac supply (often via a bridge wire from a live point on the controller) is switched by the output relay which then feeds the SSR. THIS IS ONLY THE CASE WHERE THE SSR CONTROL SIGNAL IS 90~280 Vac and NOT IN THE CASE OF 4~32 Vdc SSR's.
 1. In this case proceed in much the same way as in 2a above, removing all the wires from the 3 output terminals and the testing for continuity as described. This will verify if the controller output relay is working fine or that the relay may be damaged.
 2. If the relay tests OK, reconnect the wires and then using a high voltage setting on your meter (greater than your line voltage say 240 vac) power up the controller and test across the two signal terminals of the SSR (in our case T4 & T3) and see that you are getting line voltage each time the controller light flashes (240 vac). If you are getting this voltage and the SSR LED does not flash, or the LED flashes and your heating elements are not heating, it is most likely that the SSR has been damaged.

These guidelines are merely that, simple guidelines. QIS maintain full indemnity against responsibility or prosecution for all or any mishap that may occur in using these guidelines, correctly or incorrectly. The onus is on the user to ensure that all health and safety regulations are adhered to and it is our advise, that in the event that you are not confident in the testing of or working with electrical circuits, you leave it alone and call a qualified electrician or engineer to assist. Should you not be sure, be sure to call and discuss your application with us before attempting any testing or repairs yourself.