Warning!

Line voltage exists on this unit, only qualified personnel should attempt to troubleshoot the controller.
Use extreme caution when taking measurements.

Additional ideas for troubleshooting.

1. Do you have a spare controller or firing circuit that you could swap? Or do you have multiple zones and could swap loads between controllers? If the problem stays with the load (i.e. does not follow the controller) then the problem is not the controller.
2. If your load can handle full line voltage, connect the two heavy wires from Line 1 and Load 1 together. This removes the controller and puts full line voltage to the load.

You are now ready to start the troubleshooting questions. Click on the correct answer for each question, you may use the BACK link to see the previous screen. Click HERE to start.

Remove all power from the system.
Visually inspect the firing circuit. Do you see any obvious damage?
NO YES BACK

Turn the power on and run the system.
Looking at the Command Indicator on the controller; is the LED on at least part of the time?
NO YES BACK

Is there voltage to the load?

NO YES BACK

Is the Over Current LED on?

NO YES BACK

Is the Shorted SCR LED on?

NO YES BACK

Is the Load Indicator LED on?

NOTE: In order for the Load Indicator LED to be on, you must be drawing at least 20% of the rated frame current. If your load is less than 20% of the rated frame current, answer YES.

NO YES BACK

With an AC Voltmeter, measure across the Line 1 and Line 2 terminals.
Is the reading equal to your line voltage (± 3Vac)?

No Yes Back

With an DC Voltmeter, measure across the COM(-) CCW and +5V CW pins of the black 18 pin connector.

Click here if the reading is less than 4Vdc

Click here if the reading is 4-6Vdc

Click here if the reading is greater than 6Vdc

BACK

With an Ohmmeter, measure between Common and Reset on the black 18 pin connector.
Is the resistance less than 10 ohms?

No Yes Back

Are you using a current command into the black 18 pin connector? (Like 4/20mA or 12/20mA).

No Yes Back

Turn the command to 100%, and then follow the steps for either a RUN or an IDLE command. NOTE: for the RUN command to be the active command, the RUN/IDLE position on the black 18 pin connector must be at the same potential as circuit common (tie COMMON to RUN/IDLE).

RUN command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and RUN(+) W being positive), should be about 6Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

IDLE command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and IDLE(+) W being positive), should be about 6Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

Are both of the above statements (in one of the paragraphs) OK?

NO YES BACK

Turn the command to 100%, and then follow the steps for either a RUN or an IDLE command. NOTE: for the RUN command to be the active command, the RUN/IDLE position on the black 18 pin connector must be at the same potential as circuit common (tie COMMON to RUN/IDLE).

RUN command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and RUN(+) W being positive), should be about 5Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

IDLE command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and IDLE(+) W being positive), should be about 5Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

Are both of the above statements (in one of the paragraphs) OK?

NO YES BACK

Remove power from the system.

For 50 Amp to 160 Amp controllers, locate the two transformer fuse holders, they are opposite of the black 18 pin connector. Make certain that the smaller end of the fuse is inserted into the holder first and that the non-tapered end of the fuse is inserted into the screw-off cap.

With an Ohmmeter, measure across each fuse.

Replace the fuses observing proper orientation.

Does each fuse measure less than 5 ohms?

NO YES BACK

For 200Amp to 425Amp controllers, remove the thumbscrew that holds the 18 pin connector in place and pull up evenly on the lid to get access to the transformer fuses.

For 500Amp and larger controllers, undo the two drawtight latches and pull up evenly on the lid to get access to the transformer fuses.

Locate the two transformer fuses (about the size of an AA battery) on the flat panel.

With an Ohmmeter, measure across each fuse.

Replace the fuses observing proper orientation.

Does each fuse measure less than 5 ohms?

NO YES BACK

On the firing circuit, opposite of the black 18 pin connector, locate the yellow and (2^{nd}) black wire near the middle of a 18 pin, high voltage connector (positions 7 and 12 on the connector).
If possible connect an AC voltmeter across the yellow and black wires, otherwise you will have to hold the voltmeter across the wires.
Make sure that the firing circuit is not touching anything metallic, turn power on and note the measurement.
Is the AC voltage between 20Vac and 36Vac?

NO YES BACK

With an AC Voltmeter, measure across the Load 1 and Line 2 terminals or place a clamp-on Ammeter around the wire that goes to Load 1.
Turn the LIMIT potentiometer one turn clockwise as you watch the meter.
Did the reading increase?
No Yes Back
(Turn the LIMIT potentiometer back to it's original location).

Is the Shorted SCR LED on?

NO YES BACK

Remove power from the system, and open the lid.
Make sure that the firing circuit is not touching anything metallic (you can disconnect the black 18 pin connector from the firing circuit if the wiring does not allow the lid to open).
On the firing circuit, opposite of the black 18 pin connector, locate a 18 pin, high voltage connector. Carefully, remove the 18 pin, high voltage connector from the firing circuit.
Turn power on; is there still voltage to the load?

NO YES BACK

Set the command to 100%.
Is the DC voltage between the Line 1 and Load 1 terminals less than 2 volts?
NO YES BACK

Does the LED intensity vary as you vary the command signal?

NO YES BACK

Are you using a current command into the black 18 pin connector? (Like 4/20mA or 12/20mA).

No Yes Back

Turn the command to 100%, and then follow the steps for either a RUN or an IDLE command. NOTE: for the RUN command to be the active command, the RUN/IDLE position on the black 18 pin connector must be at the same potential as circuit common (tie COMMON to RUN/IDLE).

RUN command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and RUN(+) W being positive), should be about 6Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

IDLE command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and IDLE(+) W being positive), should be about 6Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

Are both of the above statements (in one of the paragraphs) OK?

NO YES BACK

Turn the command to 100%, and then follow the steps for either a RUN or an IDLE command. NOTE: for the RUN command to be the active command, the RUN/IDLE position on the black 18 pin connector must be at the same potential as circuit common (tie COMMON to RUN/IDLE).

RUN command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and RUN(+) W being positive), should be about 5Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

IDLE command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and IDLE(+) W being positive), should be about 5Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

Are both of the above statements (in one of the paragraphs) OK?

NO YES BACK

Is there voltage to the load?

NO YES BACK

Set the command to 100%.
Is the DC voltage between the Line 1 and Load 1 terminals less than 2 volts?
NO YES BACK

Is the output what you expected?

NO YES BACK

Is the Load Indicator LED on?

NOTE: In order for the Load Indicator LED to be on, you must be drawing at least 20% of the rated frame current. If your load is less than 20% of the rated frame current, answer YES.

NO YES BACK

With an AC Voltmeter, measure across the Load 1 and Line 2 terminals or place a clamp-on Ammeter around the wire that goes to Load 1.
Turn the LIMIT potentiometer one turn clockwise as you watch the meter.
Did the reading increase?
No Yes Back
(Turn the LIMIT potentiometer back to it's original location).

Set the command to 100%.
Is the DC voltage between the Line 1 and Load 1 terminals less than 2 volts?
NO YES BACK

Remove power from the system, and open the lid.
Make sure that the firing circuit is not touching anything metallic (you can disconnect the black 18 pin connector from the firing circuit if the wiring does not allow the lid to open).
On the firing circuit, opposite of the black 18 pin connector, locate a 18 pin, high voltage connector. Carefully, remove the 18 pin high voltage connector from the firing circuit.
Turn the power back on and set the command to 100%.
Is the DC voltage between the Line 1 and Load 1 terminals less than 2 volts?

NO YES BACK

With the command at 0% (off), is the AC voltage between the Line 1 and Load 1 terminals equal to the line voltage (± 3Vac)?

NO YES BACK

Remove power from the system, and open the lid.
Make sure that the firing circuit is not touching anything metallic (you can disconnect the black 18 pin connector from the firing circuit if the wiring does not allow the lid to open).
On the firing circuit, opposite of the black 18 pin connector, locate a 18 pin, high voltage connector. Carefully, remove the 18 pin high voltage connector from the firing circuit.
Turn the power back on and set the command to 0%.
Is the AC voltage between the Line 1 and Load 1 terminals equal to the line voltage (± 3Vac)?

NO YES BACK

Are you using a current command into the black 18 pin connector? (Like 4/20mA or 12/20mA).

No YES BACK

Turn the command to 100%, and then follow the steps for either a RUN or an IDLE command. NOTE: for the RUN command to be the active command, the RUN/IDLE position on the black 18 pin connector must be at the same potential as circuit common (tie COMMON to RUN/IDLE).

RUN command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and RUN(+) W being positive), should be about 6Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

IDLE command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and IDLE(+) W being positive), should be about 6Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

Are both of the above statements (in one of the paragraphs) OK?

NO YES BACK

Turn the command to 100%, and then follow the steps for either a RUN or an IDLE command. NOTE: for the RUN command to be the active command, the RUN/IDLE position on the black 18 pin connector must be at the same potential as circuit common (tie COMMON to RUN/IDLE).

RUN command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and RUN(+) W being positive), should be about 5Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

IDLE command: the DC voltage on the black 18 pin connector (with COM(-) CCW being common and IDLE(+) W being positive), should be about 5Vdc (a positive reading). As you vary the command from 0% to 100%, the LED intensity should vary.

Are both of the above statements (in one of the paragraphs) OK?

NO YES BACK

With the command at 0% (off), the Command Indicator LED should be OFF and the load voltage should be 0Vac.
With the command at 100%, the Command Indicator LED should be ON and the load voltage should be equal to the line voltage (± 3Vac).
Are both of the above statements true?

NO YES BACK

1. With the command at 0% (off), turn the ZERO pot. CW until the LED just starts turning on, then turn the ZERO pot. CCW until the load voltage reads 0Vac.
2. With the command at 100%, turn the SPAN pot. CCW until the LED starts to dim, then turn the SPAN pot. CW until the load voltage equals the line voltage (± 3Vac).
3. There is some interaction between the ZERO and SPAN pots. so you must repeat the above steps until no further adjustment is needed.

BACK

With the command at 0% (off), the LED should be OFF and the load voltage should be 0Vac. With the command at 100%, the LED should be ON and the load voltage should be equal to the line voltage (± 3Vac).

Are both of the above statements true?

NO YES BACK

4. With the command at 0% (off), turn the ZERO pot. CW until the LED just starts turning on, then turn the ZERO pot. CCW until the load voltage reads 0Vac.
5. With the command at 100%, turn the SPAN pot. CCW until the LED starts to dim, then turn the SPAN pot. CW until the load voltage equals the line voltage (± 3Vac).
6. There is some interaction between the ZERO and SPAN pots. so you must repeat the above steps until no further adjustment is needed.

BACK

It appears that the transformer is not on the correct tap, has failed or that the protective thermostat has tripped.
First, remove power from the system.
Next, double-check that the transformer tap is on the correct voltage for your line.
Finally, check to see if the protective thermostat has tripped. On the firing circuit, opposite of the black 8 pin connector, locate the yellow and black wires near the middle of a 18 pin, high voltage connector (positions 7 and 12 on the connector). If possible, connect an Ohmmeter across the yellow and black wires, otherwise you will have to hold the voltmeter across the wires. If the resistance is less than 10 ohms, one of the other transformer windings must be open. If you get an infinite reading, either the transformer winding is open, or the protective thermostat has temporarily opened. The protective thermostat will reset itself after the heatsink temperature drops below 85° C. However, you need to find out why the controller gets so hot. Make certain that the fan (if equipped with a fan) runs when the controller is on and that the ambient temperature in the panel does not exceed 55° C.
If you need more help, please call Control Concepts, Inc. at 1-800-765-2799 for further troubleshooting help.

It appears that the SCR has failed. Please call 1-800-765-2799 for spare parts, warranty service or further troubleshooting help.

It appears that either the line or load is not wired correctly. Because of the many different loads that are possible, this troubleshooter can not help you any further. If you need more help after you verify that your load is correct, please call Control Concepts, Inc. at 1-800-765-2799 for further troubleshooting help.

It appears that the command is not wired correctly. Double-check the command source, command polarity and how it is connected to the controller. If you need more help after you verify that your command is correct, please call Control Concepts, Inc. at 1-800-765-2799 for further troubleshooting help.

It appears that the firing circuit has failed. Please call 1-800-765-2799 for spare parts, warranty service or further troubleshooting help.

It appears that power is not getting to the controller or not getting from the controller to the load. Check for open fuses or circuit breakers. Verify that the wiring is correct. If you need more help after you verify that your wiring, fusing and circuit breakers are correct, please call Control Concepts, Inc. at 1-800-765-2799 for further troubleshooting help.

We have not found the answer to your problem with this troubleshooter.
Please call 1-800-765-2799 and we will help you with further troubleshooting.

It appears that the current Limit is not set correctly for your load or that your load is not drawing the current that you expected. Verify that the load is wired properly and is the correct wattage. Once you are positive that the load is correct, you may wish to adjust the Limit potentiometer to a new value. The Limit Potentiometer is available through the lid.
The Limit potentiometer allows adjustment from 20% to 105% of the frame rated current. For example, if you are using a 120 Amp controller, the Limit potentiometer will allow adjustment from approximately 24 Amps to 126 Amps. Place a clamp-on Ammeter around the wire that goes into Load 1. While watching the Ammeter, adjust the load current to your required limit.
If you need more help after you verify that your wiring and load are correct, please call Control Concepts, Inc. at 1-800-765-2799 for further troubleshooting help.

It appears that your controller is being held in the Reset mode. You will not get any output until this is corrected. Look at the Reset input on the black 18 pin connector. You must determine why this input is being held to circuit common. You may have wired it incorrectly or have a set of contacts across the Reset and Common terminals. To prove that this is the problem, temporarily remove any wire(s) that go into the Reset terminal of the black 18 pin connector. If this does not correct the problem, please call 1-800-765-2799 and we will help you with further troubleshooting.

It appears that the Over Current Trip is not set correctly for your load or that your load is not drawing the current that you expected. Verify that the load is wired properly and is the correct wattage. Once you are positive that the load is correct, you may wish to adjust the OCT potentiometer to a new value.

The OCT potentiometer allows adjustment from 50% to 150% of the frame rated current. For example, if you are using a 120 Amp controller, the OCT potentiometer will allow adjustment from approximately 60 Amps to 180 Amps. Place a clamp-on Ammeter around the wire that goes into Load 1.

Remove power from the system, and open the lid.

On the firing circuit, locate the OCT potentiometer. It is to the left of the silk screening that says "Control Concepts, Inc."(upper-right corner). Turn the OCT potentiometer fully clockwise. Make sure that the firing circuit is not contacting anything metallic. Be certain that no part of your body is touching the firing circuit, as line voltage is present. Turn power back on and set the command to 100%. Adjust the OCT potentiometer counter-clockwise with a non-metallic adjustment tool until the OCT trips. Then turn the OCT potentiometer one turn clockwise.

If you need more help after you verify that your wiring and load are correct, please call Control Concepts, Inc. at 1-800-765-2799 for further troubleshooting help.