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.

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

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

No Yes Back

Is the Line OK LED on?

No Yes Back

With a DC Voltmeter, measure across the CCW and CW pins of the black 18 pin connector.

Click here if the reading is less than 5Vdc

Click here if the reading is 4-6Vdc

Click here if the reading is greater than 6Vdc

BACK

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

No Yes Back

With the command at 100%, the DC voltage on the black 18 pin connector (with CCW being common and 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 OK?

NO YES BACK

With the command at 100%, measure the DC voltage on the black 18 pin connector as follows:
Use CCW as common for all readings in this step.

Follow directions for command that you are using.
0/10V command - W being positive, should be about 10Vdc (a positive reading).
0/5V command - W being positive, should be about 5Vdc (a positive reading).
Potentiometer command - 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 OK?
NO YES BACK

Remove power from the system and follow the directions for the size controller that you are working with. With an Ohmmeter, measure across each fuse.

For 50 - 80 Amp controllers: Locate the three-pole transformer fuseblock. If the controller is mounted with the Line and Load connections up, the fuseblock is on the left-hand panel. If you need to remove the lid, simply give the lid a tug and it will pop off.

For 120 – 160 Amp controllers: Locate the three single-pole transformer screw-off fuseholders. If the controller is mounted with the fan down, the fuseholders are on the right-hand panel. 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. If you need to remove the lid, remove the thumbscrews that hold the 18 pin black connector in place and give the lid a tug .

For 200 Amp and larger controllers: Locate the three single-pole transformer fuseblocks on the flat panel under the lid. Undo the two drawtight latches and pull up evenly on the lid to get access to the transformer fuses.

Does each fuse measure less than 5 ohms?

NO YES BACK

With power still removed from the system and the lid still open; follow the directions for the size controller that you are working with.

Make certain that the firing circuit is not touching anything metallic.

Remember that the firing circuit has line voltage on it!

For 50 - 160 Amp controllers: On the firing circuit, opposite of the black 18 pin connector, locate the blue, white and black wires near the middle of a 14 pin, high voltage connector (P3 positions 8, 9 and 10). Apply power to the controller and carefully measure the AC voltage between the blue and white wires, the white and black wires and the black and blue wires.

For 200 - 750 Amp controllers: On the firing circuit, opposite of the black 18 pin connector, locate the blue, white and red wires near the middle of a 14 pin, high voltage connector (P3 positions 8, 9 and 10). Apply power to the controller and carefully measure the AC voltage between the blue and white wires, the white and red wires and the red and blue wires.

Are the AC voltages between 16Vac and 26Vac?

NO YES BACK

Does the Command 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

With the command at 100%, the DC voltage on the black 18 pin connector (with CCW being common and 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 OK?

NO YES BACK

With the command at 100%, measure the DC voltage on the black 18 pin connector as follows:
Use CCW as common for all readings in this step.

Follow directions for command that you are using.
0/10V command - W being positive, should be about 10Vdc (a positive reading).
0/5V command - W being positive, should be about 5Vdc (a positive reading).
Potentiometer command - 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 OK?
NO YES BACK

Remove power from the system, remove the two thumbscrews that hold the 18 pin black connector in place and open the lid.

On the firing circuit, opposite of the black 18 pin connector, locate a 14 pin, high voltage connector and a 28 pin, high voltage connector. Carefully remove both the 14 pin and the 28 pin connectors from the firing circuit.

Turn power on; is there still voltage to the load?

NO YES BACK

Set the command to 100%.
With a DC voltmeter, measure the voltage between the Line 1 and Load 1 terminals, between the Line 2 and Load 2 terminals and between the Line 3 and Load 3 terminals.
Are the readings all less than 2 volts?
NO YES BACK

Is there voltage to the load?

NO YES BACK

Set the command to 100%.
With a DC voltmeter, measure the voltage between the Line 1 and Load 1 terminals, between the Line 2 and Load 2 terminals and between the Line 3 and Load 3 terminals.
Are the readings all less than 2 volts?
NO YES BACK

Is the output what you expected?

NO YES BACK

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

NO YES BACK

With the command at 100%, the DC voltage on the black 18 pin connector (with CCW being common and 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 OK?

NO YES BACK

With the command at 100%, measure the DC voltage on the black 18 pin connector as follows:
Use CCW as common for all readings in this step.

Follow directions for command that you are using.
0/10V command - W being positive, should be about 10Vdc (a positive reading).
0/5V command - W being positive, should be about 5Vdc (a positive reading).
Potentiometer command - 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 OK?
NO YES BACK

Set the command to 100%.
With a DC voltmeter, measure the voltage between the Line 1 and Load 1 terminals, between the Line 2 and Load 2 terminals and between the Line 3 and Load 3 terminals.
Are the readings all less than 2 volts?
NO YES BACK

With the command at 0% (off), measure the AC voltage between the Line 1 and Load 1 terminals, between the Line 2 and Load 2 terminals and between the Line 3 and Load 3 terminals.

Are all of the readings equal to the line voltage (± 3Vac)?

NO YES BACK

With the command at 0%, the Command LED should be OFF and the load voltage should be 0Vac.
With the command at 100%, the Command 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), the Command Indicator LED should be OFF and the load voltage should be 0Vac.
2. With the command at 100%, the Command Indicator LED should be ON and the load voltage should be equal to 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

Remove power from the system, remove the two thumbscrews that hold the 18 pin black connector in place and open the lid.

On the firing circuit, opposite of the black 18 pin connector, locate a 14 pin, high voltage connector and a 28 pin, high voltage connector. Carefully remove both the 14 pin and the 28 pin connectors from the firing circuit.

Turn power on; are the DC voltages between the Line 1 and Load 1 terminals, between the Line 2 and Load 2 terminals and between the Line 3 and Load 3 terminals less than 2 volts?

NO YES BACK

Remove power from the system, remove the two thumbscrews that hold the 18 pin black connector in place and open the lid.

On the firing circuit, opposite of the black 18 pin connector, locate a 14 pin, high voltage connector and a 28 pin, high voltage connector. Carefully remove both the 14 pin and the 28 pin connectors from the firing circuit.

Turn power on; are the AC voltages between the Line 1 and Load 1 terminals, between the Line 2 and Load 2 terminals and between the Line 3 and Load 3 terminals equal to the line voltage (± 3Vac)?

NO YES BACK

Set the command to 100%.
With a DC voltmeter, measure the voltage between the Line 1 and Load 1 terminals, between the Line 2 and Load 2 terminals and between the Line 3 and Load 3 terminals.
Are the readings all less than 2 volts?
NO YES BACK

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

NO YES BACK

With the command at 0%, the Command LED should be OFF and the load voltage should be 0Vac.
With the command at 100%, the Command 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), the Command Indicator LED should be OFF and the load voltage should be 0Vac.
5. With the command at 100%, the Command Indicator LED should be ON and the load voltage should be equal to 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

Remove power from the system, remove the two thumbscrews that hold the 18 pin black connector in place and open the lid.

On the firing circuit, opposite of the black 18 pin connector, locate a 14 pin, high voltage connector and a 28 pin, high voltage connector. Carefully remove both the 14 pin and the 28 pin connectors from the firing circuit.

Turn power on; are the DC voltages between the Line 1 and Load 1 terminals, between the Line 2 and Load 2 terminals and between the Line 3 and Load 3 terminals less than 2 volts?

NO YES BACK

Remove power from the system, remove the two thumbscrews that hold the 18 pin black connector in place and open the lid.

On the firing circuit, opposite of the black 18 pin connector, locate a 14 pin, high voltage connector and a 28 pin, high voltage connector. Carefully remove both the 14 pin and the 28 pin connectors from the firing circuit.

Turn power on; are the AC voltages between the Line 1 and Load 1 terminals, between the Line 2 and Load 2 terminals and between the Line 3 and Load 3 terminals equal to the line voltage (± 3Vac)?

NO YES BACK

It appears that the transformer is not on the correct tap, has failed or that the protective thermostat(s) has tripped.

First, remove power from the system.

Next, double-check that all three of the transformer taps are on the correct voltage for your line.

Finally, check to see if the protective thermostat(s) has tripped. Follow the directions for the frame size that you are working with.

For 50 - 160 Amp controllers: On the firing circuit, opposite of the black 18 pin connector, locate the black, blue, white and black wires near the middle of a 14 pin, high voltage connector (P3 positions 7, 8, 9 and 10). With an Ohmmeter, measure between the black wires (P3 positions 7 and 10); the resistance should be less than 10 ohms. If you get an infinite reading, either the transformer winding is open, or the protective thermostat has temporarily opened.

For 200 - 750 Amp controllers: Open the lids and locate the three gray, 8 position terminal strips. Apply power to the controller and carefully measure the AC voltage between pins 3 and 6 on each terminal strip. Each measurement should be 0Vac, if you get a reading between 16 and 26 volts the thermostat has temporarily opened.

For all frames: 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 an 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.

It appears that the phase rotation is not correct. To fix this, remove any two Line connections and swap them. For example, remove the wires that go into Line1 and Line2, then place the wire that was in Line1 into Line2, place the wire that was in Line2 into Line1. Verify that the wiring is correct and reapply power, the Line OK LED should now be on. If you need more help after trying this phase rotation fix, 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.