

SS-400 SERIES

Induction Power Supply Troubleshooting Guide

- I) Power Up Problems (5,kW 7.5kW)
- a) Nothing happens when the control power switch is turned on. The wires from the top of this breaker should connect to the input of the control switch, the secondary side connects through an inline fuse to terminal block for control circuits. With all power to the unit disconnected, check that those wires are properly attached and that the fuse is not open.
 - b) When the main breaker is turned on, you can hear the fans start up, but nothing lights on the front panel. This could be that the 50-pin flat cable is unplugged, or that connector CN1 to the control board is unplugged.
 - c) The main circuit breaker will not stay up.
 - 1) The E-Stop button is depressed. Turn the E-Stop counter-clockwise to release.
 - 2) The 24VAC interlock loop has an open connection. This circuit runs from the TRAN 1077 transformer to the relay board (wire #23), from the relay board (wire #20) to pin 1 of the E-Stop switch, (white 14ga wire #20), from pin 2 of the E-Stop to the common shunt on the circuit breaker. The door switch could open or wires or connector (TB102) to the control board be disconnected, make sure all those lines have continuity.
 - 3) Check that external E-STOP is not engaged, press program button 2 secs, step through to external programs (EXT-S, DIS) if EXT-EN then press down arrow and enter.
 - 4) This could be a shorted inverter assy. Check the continuity between the positive and negative outputs of the diode bridge. If this shows a short, then do not try and set the breaker again.
 - 5) The Diode Bridge is shorted. Check continuity between the inputs of the Diode Bridge. If this shows a short, then one of the diode modules is blown.
- II) Fault Diagnosis
- a) Immediate Frequency Trip
 - 1) Connector CN2 is not plugged into the Control Board or wires on the connector have come loose.
 - 2) Heatsink assys not plugged into the buffer board.
 - 3) The load frequency is above the operating point of the unit. Increase the number of resonant capacitors
 - 4) The start frequency is adjusted too low a frequency. This may result in trying to run below resonance.
 - 5) A FET could be shorted. This can be checked by measuring the voltage across one of the dividing resistors (see below). You should see about 165VDC for a 240V unit, 330V for a 480V unit. If you measure 0V or the full voltage, then a FET is shorted. To do this, the power must be up, and the door switch interlock must be bypassed. Be very careful of High Voltage inside the cabinet.
(see picture below)
 - 6) The fuse above the inverter assy could be open.
 - 7) One of the 12V supplies is bad, measure 12.38V from black to red wires on the connectors.

Run-Time Problems

- a) Current Trip and Frequency Trip Simultaneously. This is a sign of a blown FET. Check the voltage across the voltage dividing resistors. With the breaker "on" you should see 165VDC for a 240V unit, 330V for a 480V unit. If you see 0V or full voltage then a FET is blown.
- b) Intermittent Frequency Trips
 - 1) Loose connections on capacitors (screws not tightened down), output blocks or output coils loose.
 - 2) Load shorting on output coil, or debris or water on capacitor rail.
 - 3) Windings on output coil shorting to each other.

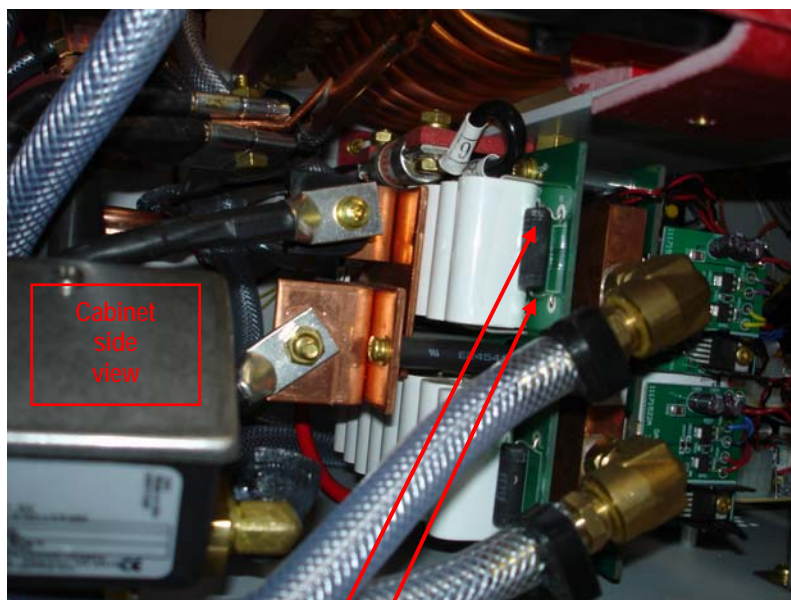
- 4) Overheated capacitors, loose transformer cables or loose connection on series inductor.
- 5) Loose plugs to control board or power supply.
- 6) One leg of the main circuit breaker is open
- 7) incorrect wiring on power plug or loose connections
- 8) electrical noise in power line getting back to the control circuits

c) Intermittent or immediate current Trips

- 1) Possible loose connection on three phase input power, check plug connections
- 2) Bad current CT on the inverter stand off.
- 2) If unit is running in current limit and a sudden change in line voltage occurs this can cause a current trip.
- 3) Turning unit on in high current condition (power knob full on)
Unit operating in high frequency and high current condition can cause switching noise which can cause intermittent current trips (move the tap bar up to decrease current) optimal operating current @50%.
- 4) Current trip will occur if start frequency is set at or below operating frequency. Common practice is to set start frequency at top limit, turn on the unit and note the idle frequency. Set the start frequency 5-10% above idle frequency.

d) Tips for dependable Operation

- 1) Make sure that the resonant load capacitors are securely tightened to the capacitor rails. loose capacitors can overheat and fail.
- 2) Whenever possible place the resonant capacitors in opposition on the capacitor rails. In other words, a capacitor directly below another.
- 3) Running unit with capacitors above the manufacturer's ratings will limit the life of the capacitors.
- 5) Running the unit near frequency limit results in lower currents, less heating of components, and more efficient operation. It will also prolong the life of the resonant capacitors. Running the unit at or near current limit can overheat the inverter modules or the resonate capacitors.



Divided voltage should be ~165VDC for a 240V unit and 330V for a 480V unit, if 0 or full voltage then a FET is shorted