Troubleshooting Inverters

Introduction

Whether you are using a Toshiba, Baldor, Yaskawa, Glentek, or AMC inverter, they are all "dumb devices". This means they only do what they are told by the card in slot #14; which is the spindle controller card.

Note: *The controller cards for the spindles are different than the cards for the axes other than the 1010-6 card, which can be configured as a spindle controller card. Thus, swapping cards and EEPROMS is not possible other than on a 1010-6 axis controller card.*

Symptom #1: The spindle either slows down very slowly or coasts to a stop.

This symptom is due to the regen circuit in your inverter or bad resistors. It controls the stopping of the spindle motor by sending the power from the spindle slowing down to your regen resistors on top of the machine. As a rule, if you have a 10HP machine, you will have a single resistor of 13 or 19 ohms and if you have a 15HP machine, you will have 7 ohms where you put two 13 ohm resistors in parallel. Your resistors could have opened up or failed. Remove one wire at a time from the inverter and test with an ohmmeter to see what resistance you have.

If the regen resistors are good, then you will need to replace the drive. You cannot repair the internal regen circuit. CNCPros carries all the inverters for Fadal machines, so we can get one out to you quickly.

Symptom #2: The spindle fluxuates at medium to high RPM's.

When your spindle encoder begins to fail, you will see this happen. Replace the spindle encoder with one of the two pictured below. Whichever one you have, we have them in stock. The installation is quite quick and simple.

ENC-0004

ENC-0007

Symptom #3: The spindle will turn one direction, but not the other.

You have EEPROMS which control the spindle on the spindle card. If you have rigid tapping, both the forward and reverse signals go active low and the spindle is controlled in forward and reverse by the incoming signal from the controller card going +-10VDC and both FWD and REV latches are low. These latches are controlled by solid state relays K7 (FWD) and K9 (REV). If one of these relays goes bad, you can experience this problem.

Symptom #4: The spindle will not turn at all.

Unfortunately, you either have a bad controller card in slot #14 of the card rack or your spindle drive is dead. If you have a keypad on the inverter, check the code or call us so we can explain the code and what is happening.

Because having a bad spindle motor is often unlikely, spend most of your time with the inverter. Check the incoming voltage and make sure it is between 190 and 230VAC. If it is outside of these parameters, your drive will either not work at all or short out internally.

One more thing to think about is the spindle orientation switch. If it is not reading properly, your spindle will bump and move a little then fault out.

While it seems obvious, if your belts are not engaged, then your spindle will not turn. Make sure your spindle drive belt is tight between the spindle and motor pulleys.

If the motor has not shorted out (check by using a Megger at the motor) and you have good power to the inverter, you can use a battery box (SVT-0288), which we sell on our website, to power the inverter.

If you don't have a battery box, you can power up your machine and use a 9 volt battery and connect it to pins 4 and 6 of the "A" plug on the inverter. Then go to the control, command an M3, and see if your spindle comes up. If so, your controller card is likely bad. If not, the inverter is likely the part that needs replacing.

Troubleshooting

If you become stuck or confused, don't panic. Simply contact us at 208.855.9426 and one of our friendly service technicians will be happy to assist you.

Instructions written by CNCPros.com. We put in hundreds of hours of hands-on experience in the field each year.