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Trouble Shooting a Jouan C/CR4.22 Centrifuge

[No Spin Condition](#)

[Erratic Speed Control](#)

[No Cooling](#)

[General Parts List](#)

[Wiring Diagram](#)

No Spin Condition (Removing the Front Panel)

- Using a 3mm Allen Wrench, remove screws at the base of the Front Panel
- Using a Flat blade screwdriver, insert the tip of the screwdriver between the top deck of the machine, and the front panel
- Using the screwdriver, pry the front panel pins out of the top deck to completely detach the front panel from the centrifuge.
- Carefully allow the panel to fold down, allowing the string to tighten and hold the panel in place.



No Spin Condition (Removing the Left Side Panel)

- Using a 3mm Allen Wrench, remove screws at the base of the Left Side Panel
- Using a Flat blade screwdriver, insert the tip of the screwdriver between the top deck of the machine, and the left side panel
- Using the screwdriver, pry the panel pins out of the top deck to completely detach the front panel from the centrifuge.



No Spin Condition – Error Codes

- The C/CR4.22 centrifuge will alarm if an alarm condition is met.

- The alarms that the unit will give are:
 - [Chamber Overtemperature](#)
 - [Motor Overtemperature](#)
 - [Imbalance](#)
 - [Lid Open](#)

- If the unit does not give any errors and does not spin:
 - [Click Here](#)



No Spin Condition – Chamber Overtemperature

- If a Chamber Overtemperature alarm occurs:
 - Verify the actual temperature in the chamber (at the sensor)
 - Verify the temperature reading on the display
 - To see the temperature read by the centrifuge, when in standby press the “F” key. The chamber temperature will flash on the display

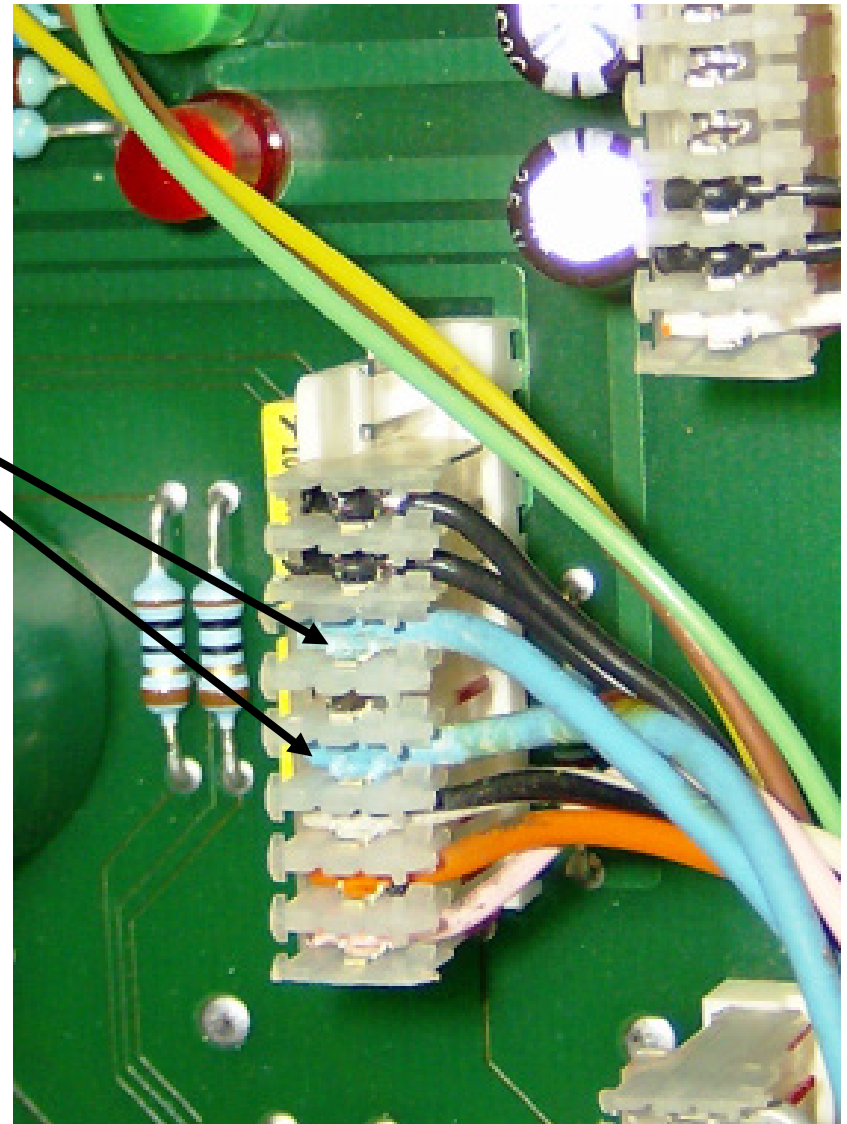
- If the Displayed temp. value matches the Actual:
 - [Fault in the Compressor Circuit](#)

- If the Displayed temp and Actual temperature do not match:
 - [Faulty Temperature Sensor](#)
 - [Faulty CPU assembly](#)



No Spin Condition – Motor Overtemperature

- If a Motor Overtemperature error occurs:
 - Locate connector J5 on the Main PCB
 - With connector still connected place a jumper across Pins 4 & 6 (Brown or Blue wires)
- If unit spins:
 - Check that the Overtemperature wires are not cut or disconnected from the connector on the PCB.
 - If the Overtemperature wires are OK, then replace the motor
- If unit fails to spin:
 - Replace CPU
- [Click Here for a General Parts List](#)



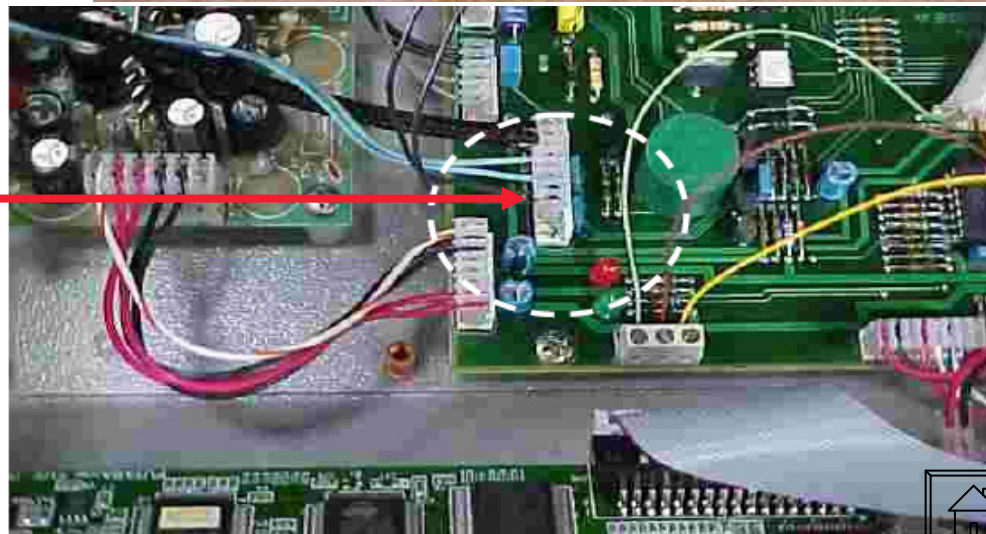
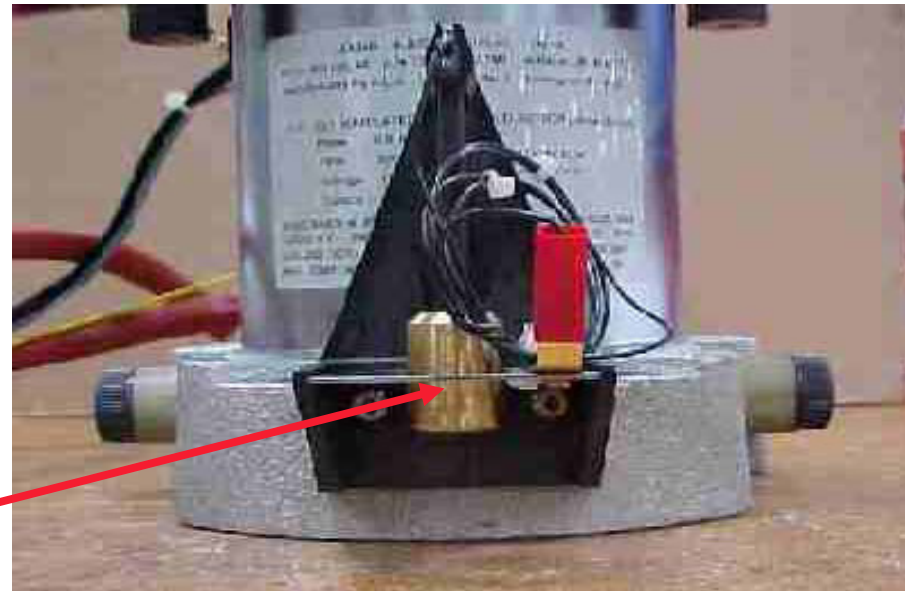
No Spin Condition – Imbalance

- The first thing to check on an imbalance alarm:
 - Unit is positioned on a sturdy countertop
 - Buckets are properly Loaded.
 - These units are capable of running with up to 20 grams of imbalance.
 - Check that the unit's trunnions are properly lubricated.
- If the above checks are OK, proceed to next slide



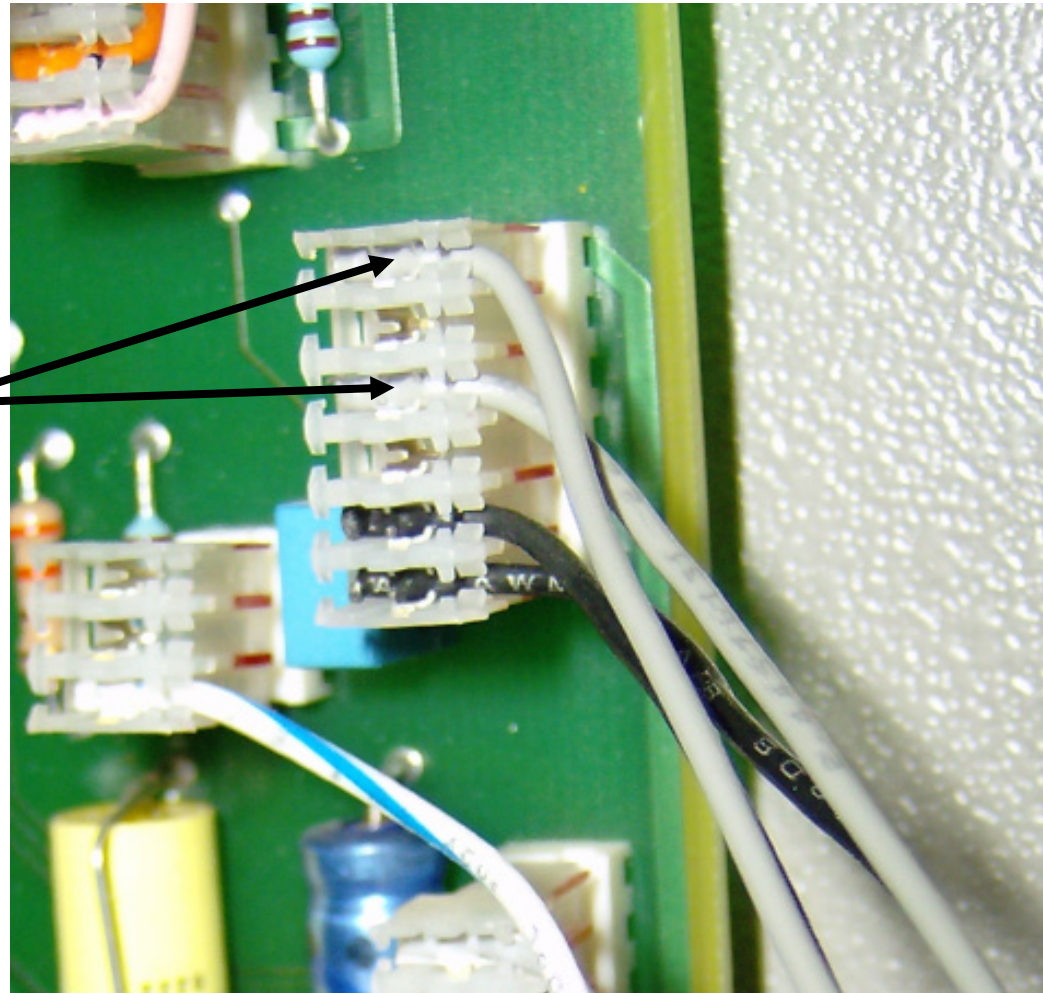
No Spin Condition – Imbalance (Continued)

- If an Imbalance Condition occurs:
- If an Imbalance occurs right after start is pressed:
 - Imbalance sensor is somehow shorted
 - Imbalance sensor is shorted during shipping to prevent damage to the Pendulum.
 - Check that sensor is not physically shorted
 - Unplug the imbalance sensor from Main CPU
 - Connector J5 Pins 7 & 8
 - If Imbalance still occurs right after start is pressed with sensor unplugged:
 - Replace CPU PCB
- [Click Here for a General Parts List](#)



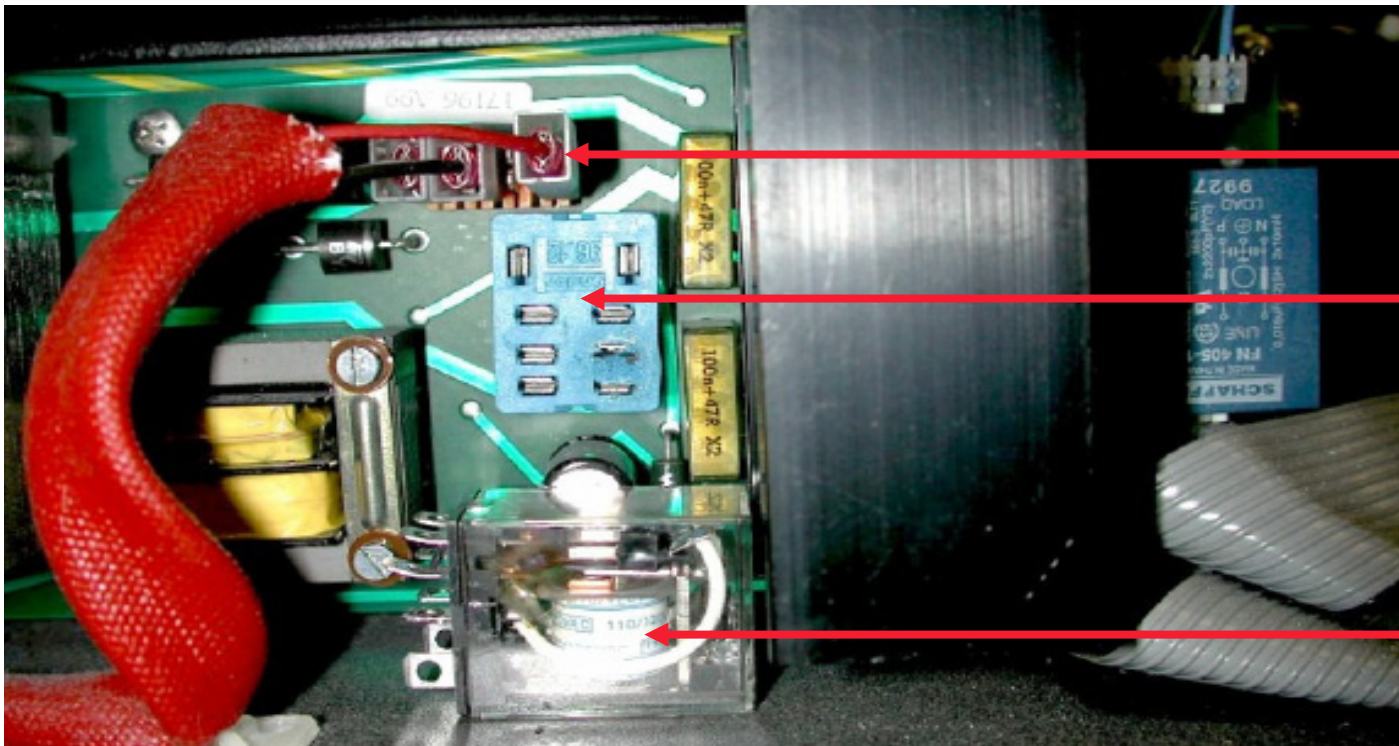
No Spin Condition – Lid Open

- If a Lid Open error Occurs:
- Faulty Lid Switches
 - When the Lid is closed you should see a short across the micro-Switches
 - To test the switches unplug connector J4 from the Main CPU.
 - The Lid switches connect to J4 Pins 5 & 6 (Gray Wires)
 - With the lid closed check that the switches are shorted.
 - Replace switches if they are open
- Faulty Main CPU
 - If the above check is OK Replace Main CPU.
- [Click Here for a General Parts List](#)



No Spin Condition – Checking Motor Voltage

- Locate the Power PCB on the Left Side of the unit.
- You will notice a four pin connector right above the Motor Relay.
- Check the DC Voltage when Start is pressed on the Red & Black wire.
- Voltage applied should be approximately 30vdc at start, and ramp up to as high as 110vdc at maximum speed.



Motor Leads

Relay
Receptacle

Motor Relay



No Spin Condition – Checking Motor Voltage (continued)

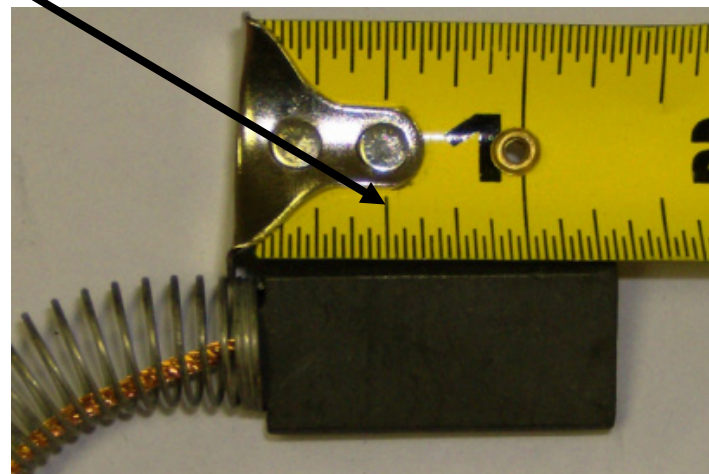
- If voltage is present:

- Brushes may be hung up
- Brushes may be too short
 - *Must be at least 0.50" Long*
- Faulty Motor



- If no Voltage is applied to the motor proceed to next slide

- [Click Here for a General Parts List](#)



No Spin Condition, No Motor Voltage - PCB Checks

- The two possible causes left on a No Spin Condition are:
 - Main CPU
 - Power PCB
- The best way to determine Which PCB is faulty is to run the integrated tests.
 - Specifically Test # 7.
- Continue to the next slide for instructions on how to run the test.



Running the Integrated Tests (View of Front Panel)



Running the Integrated Tests – Test # 7

- **Note: It is necessary to have a program with a DELTA TEMP = 0, before access to test procedure.*
- To call the test Procedure push the following keys in sequence:
 - “ENTER”, “STOP”, “7”
 - Press “ENTER”, then “ENTER” again.
- The following Message appears
 - FULL=0, ONE=1
 - Keying “0” will cause all the tests to run. Keying “1” requires the operator to select which test to run, by keying the test number.
 -
 - In this case, press “1” then “ENTER”
- The following Message appears
 - Test NO.? ____
 - Press “7”, then “ENTER”



Running the Integrated Tests – Test # 7 (Continued)

- The message on the display is now:
 - Test No. 7: Motor Test
 - Press “Enter”
- The displayed message now is:
 - Close the Lid
 - Even if the lid is closed, this message will appear
 - Close the lid and press “ENTER”
- The display now says:
 - Press Start
 - Press “START” to run the test



Running the Integrated Tests – Test # 7 (Continued)

- The display will show alternately:
 - 220v = 5.5A
 - 110v = 11A
 - If the unit spins, the RPM value will also be displayed
- If the unit spins, the display will show:
 - TEST NO 7 OK
- If the unit does not spin, the display will show:
 - TEST NO 7 BAD



Test # 7 Results

- If the unit fails Test # 7:
 - Failure of the SCR Bridge, or Relay on Power PCB is likely.
 - Replacement of the Power Control PCB is needed.
- If unit passes Test # 7:
 - Replacement of the Main CPU is needed.
 - It is possible to reset the processor on the MAIN CPU, and sometimes, temporarily fix the no spin condition.
 - Proceed to the next slide for details.
- [Click here for a General Parts List](#)

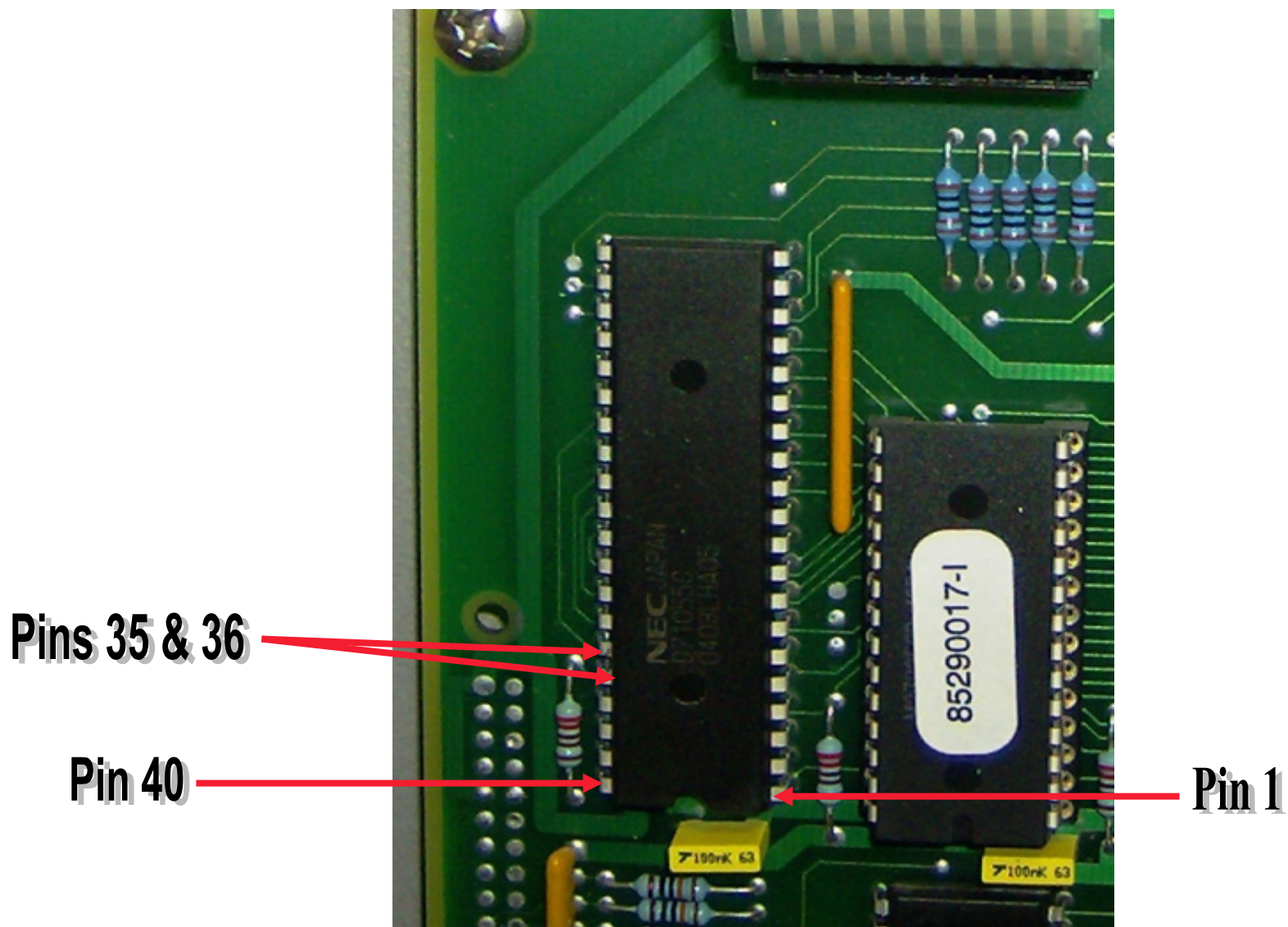


Resetting the Processor

- To reset the Processor:
- Short pins 35 & 36 together on the chip (see next slide) for 3 seconds.
- Unit will “beep”
- The display will come up in French
- It will be necessary to reprogram unit
- Unit may spin now, which can help your customer to continue their work, but PCB still needs to be replaced.
- See next slide for a view of CPU PCB and pins 35 & 36 of EPROM



View of CPU PCB.



Erratic Speed Control (Removing the Front Panel)

- Using a 3mm Allen Wrench, remove screws at the base of the Front Panel
- Using a Flat blade screwdriver, insert the tip of the screwdriver between the top deck of the machine, and the front panel
- Using the screwdriver, pry the front panel pins out of the top deck to completely detach the front panel from the centrifuge.
- Carefully allow the panel to fold down, allowing the string to tighten and hold the panel in place.



Erratic Speed Control (Removing the Left Side Panel)

- Using a 3mm Allen Wrench, remove screws at the base of the Left Side Panel
- Using a Flat blade screwdriver, insert the tip of the screwdriver between the top deck of the machine, and the left side panel
- Using the screwdriver, pry the panel pins out of the top deck to completely detach the front panel from the centrifuge.



Erratic Speed Control – Verifying Values

- Create a program with an Acceleration Rate of “9”, and a Set Speed of 4000 RPM.
- Allow centrifuge to either stabilize at set speed, or stabilize at the maximum speed it will make. Remove the Black viewport cap.
- Using a Photo-Tachometer, measure the actual speed of the unit through the view port in the center of the centrifuge lid.
- If the speed is accurate compared to the set point, try again at 2000RPM's.



Erratic Speed Control – Possible Failures

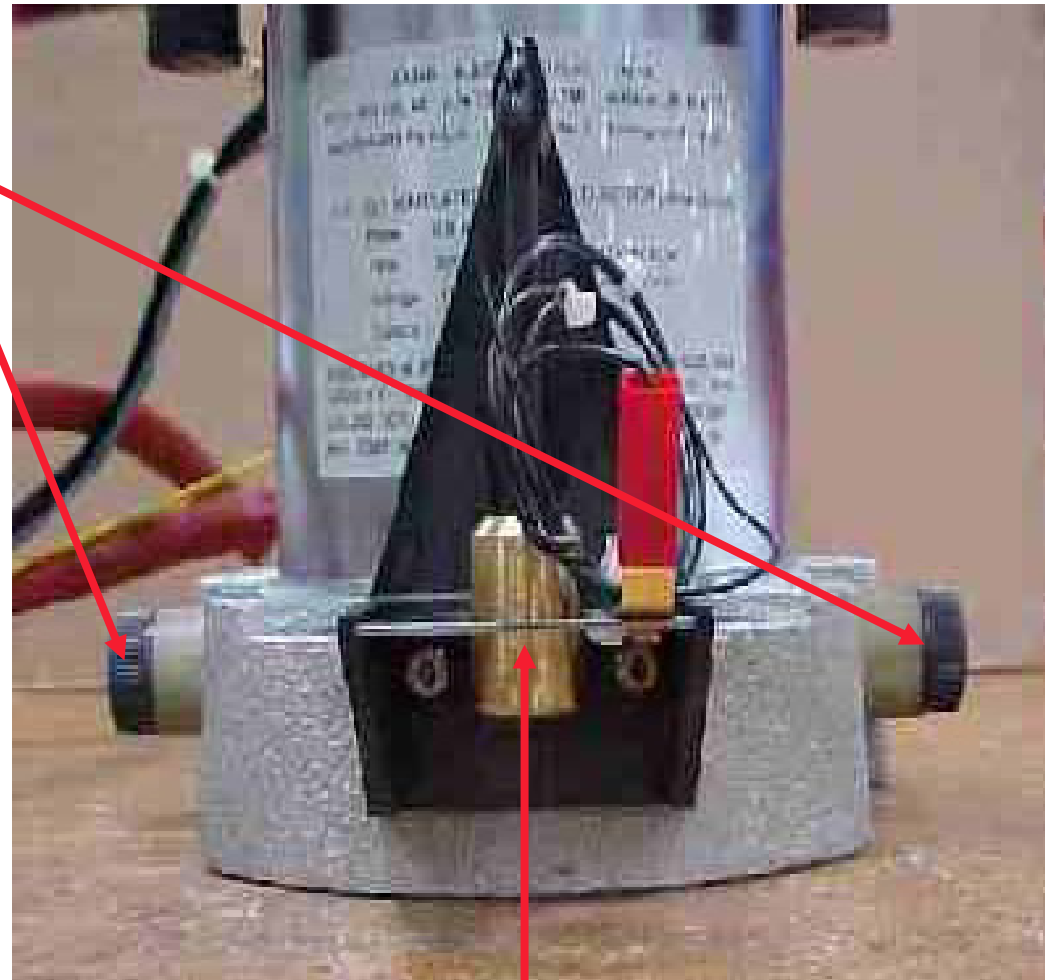
- If the speed display and the actual speed match:
 - [Check Brushes](#)

- If the speed display is different from the actual speed, check:
 - [Tachometer Sensor](#)
 - [Motor Magnets](#)
 - [Main CPU](#)



Erratic Speed Control – Checking Brushes

- You can check the brushes two different ways:
- Remove the back panel (refrigerated units only) and remove the brushes
- Turn the unit on it's back or side (if refrigerated, refrigeration side must go down) and the bottom of the motor is exposed.
- [Click Here for a General Parts List](#)

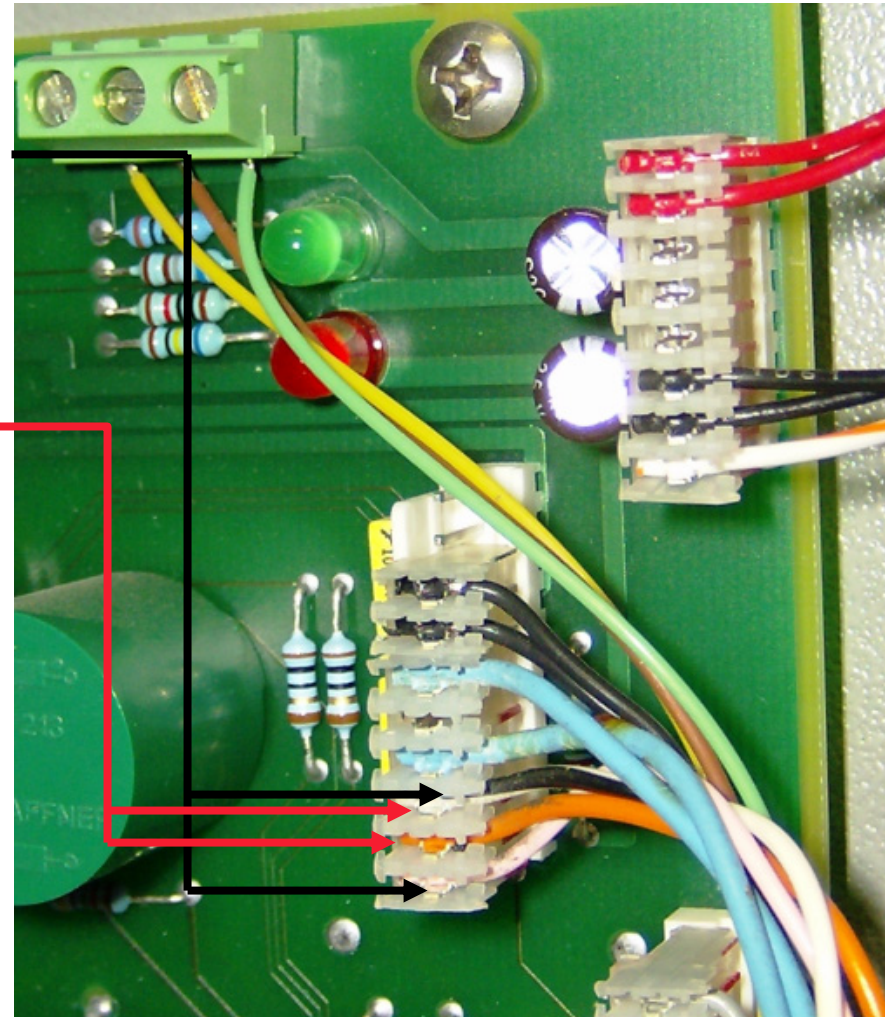


Imbalance
Sensor



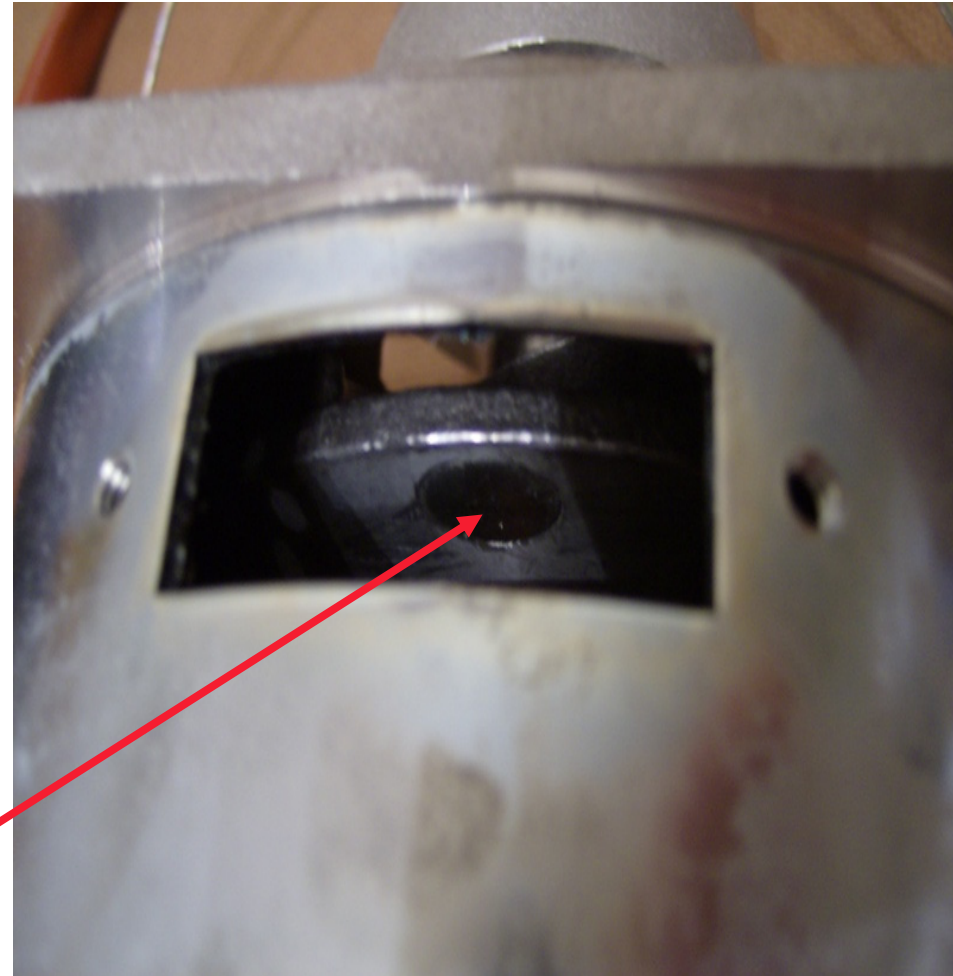
Erratic Speed Control – Tachometer Sensor Check

- Locate Connector J5 on Main CPU
- Verify that there is a 12vdc supply on J5 Pins 1 & 3 (Pink wire & White/Black wire)
 - If no 12vdc supply is present:
 - Replace Main CPU
- Check for 4 pulses per 1 revolution of the rotor on J5 Pins 2 & 3 (Orange Wire & White/Black wire).
- If one or more pulses are missing:
 - [Check the Motor Magnets](#)
- Check the frequency at Pins 2 & 3 while the motor is spinning. Multiply your reading by 15 to obtain the correct tach reading
- [Click Here for a General Parts List](#)



Erratic Speed Control Checking the Magnets in the Motor

- Remove rotor from the centrifuge.
- Disconnect Motor wires, Tachometer wires, and Imbalance wires.
- Turn centrifuge on it's side (refrigeration side down)
- Remove the three 10mm bolts from the motor mounts located under the chamber.
- Rotate the motor so that it can be pulled straight out.
- Once motor is pulled, remove tach sensor from motor by unscrewing the two Phillips head screws or 7mm bolts from Tach tray.
- Look inside the motor towards the top. You should see four circular magnets.
- If you are missing one or more of these, replace the motor.
- [Click Here for a General Parts List](#)



Erratic Speed Control – Checking the CPU

- Check the following:
 - [Brushes](#)
 - [Tachometer Sensor](#)
 - [Motor Magnets](#)

- If the above checks are OK:
 - Then the problem is with the CPU

- [Click Here for a General Parts List](#)

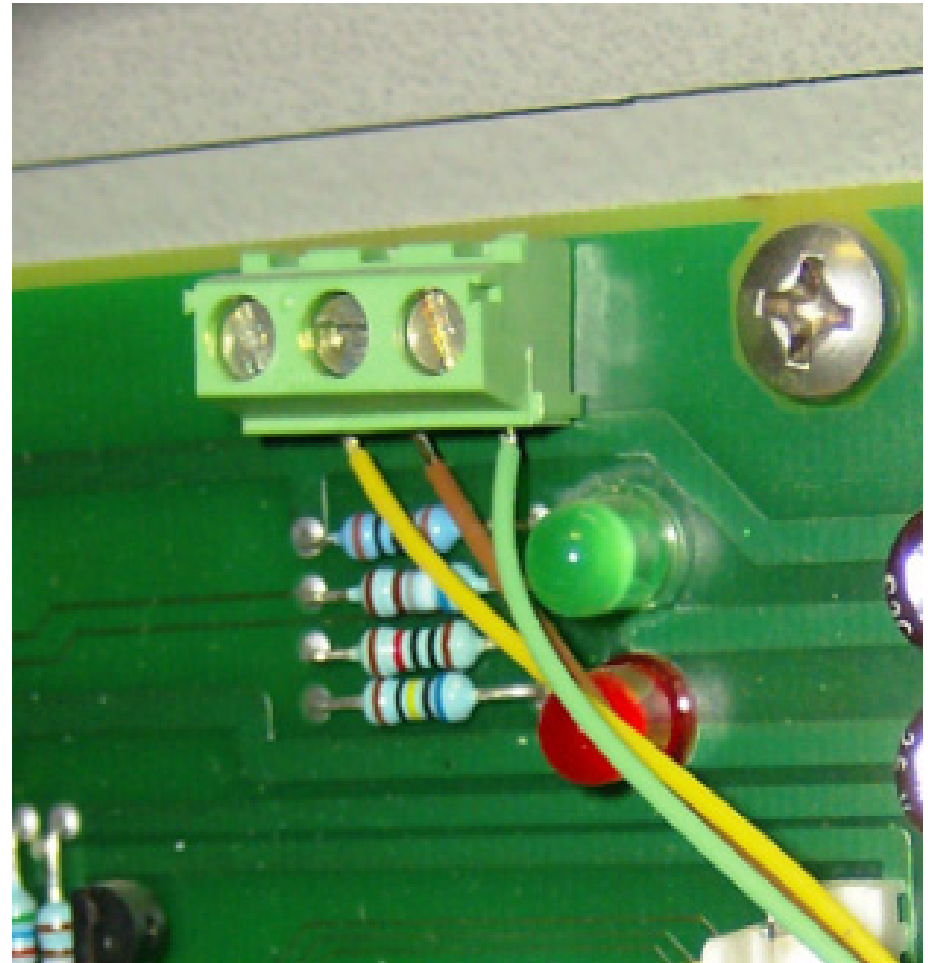


No Cooling

- In a “NO-COOL” situation there are several possibilities:
 - Temperature Sensor
 - CPU
 - Triac
 - Compressor

No Cooling – Checking Temperature Sensor

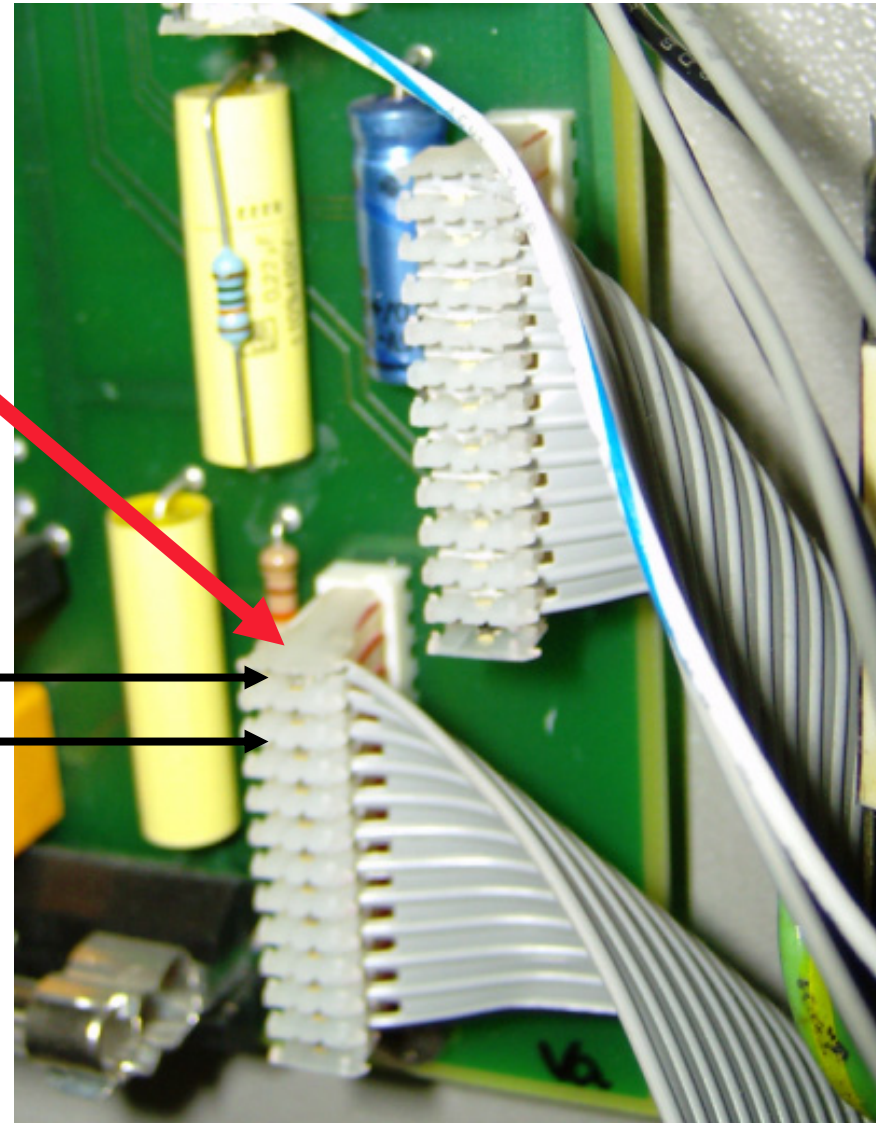
- Measure Temperature Sensor resistance:
 - $30\text{K}\Omega$ @ 25°C across Brown & Green Wires
 - $6\text{K}\Omega$ @ 25°C across Brown & Yellow Wires
- If sensor does not read correctly replace sensor
- [Click Here for General Parts List](#)



No Cooling – Checking CPU

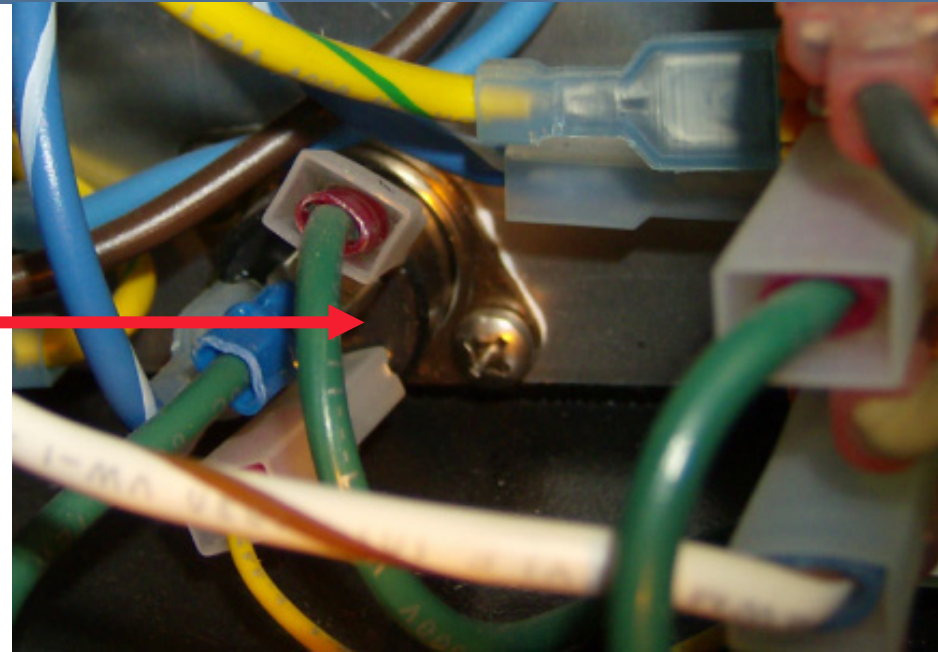
■ Checking the Gate Signal

- Locate connector J3
- Connect meter leads to pins 9 & 11
- When CPU commands the Compressor to be “OFF”, voltage should read line voltage.
- When CPU commands the compressor to be “ON”, voltage should drop to approximately 1-2VAC.
- If signal is not applied correctly, replace the CPU



No Cooling

- If sensor and PCB are correct:
 - Verify proper operation of cooling Triac
 - Verify proper operation of Compressor and starting components.
 - Check that start cap is not corroded
 - If CPU, Temperature Sensor, Triac and starting components are OK, then replace the compressor
 - [Click Here for General Parts List](#)

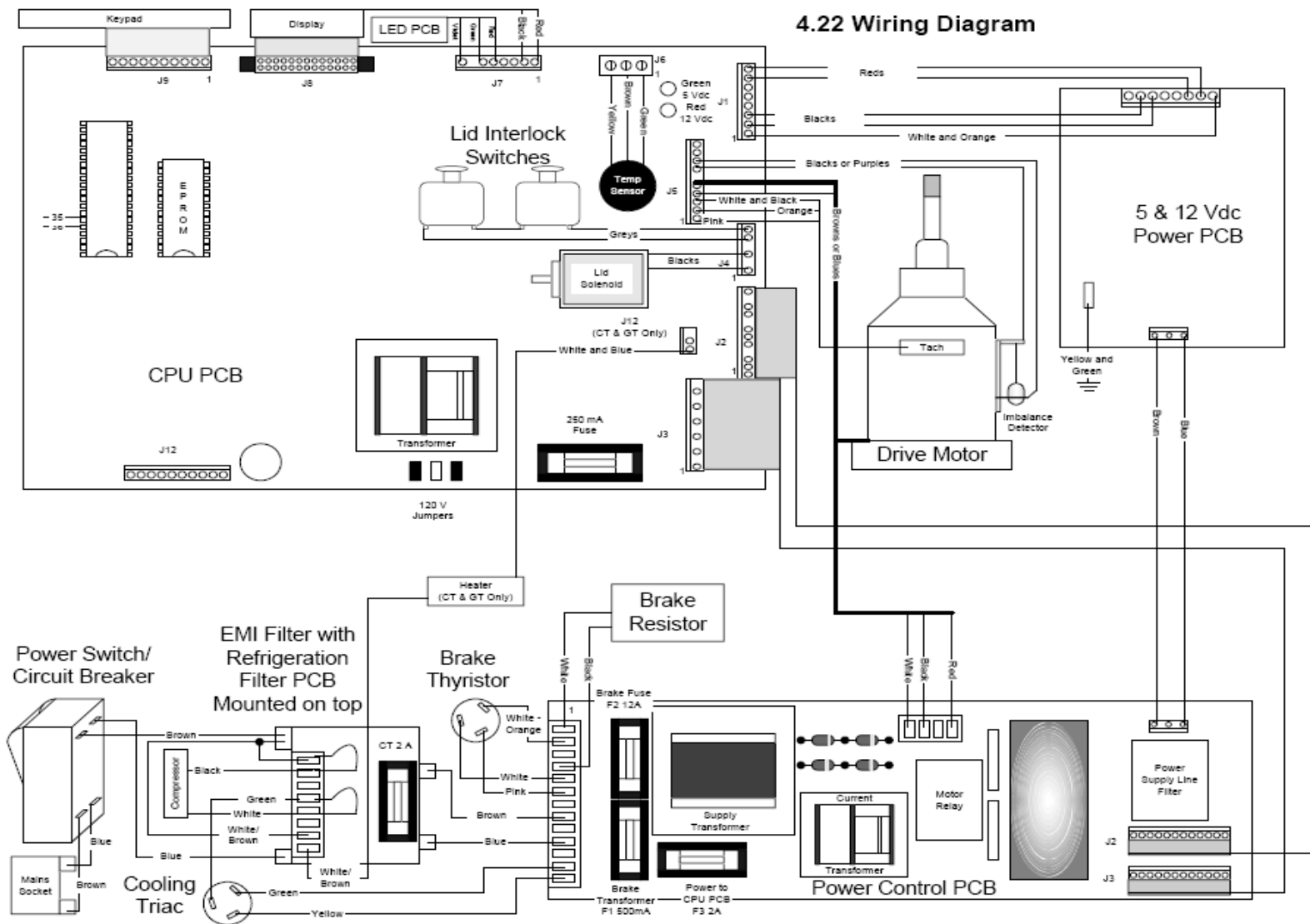


General Parts List

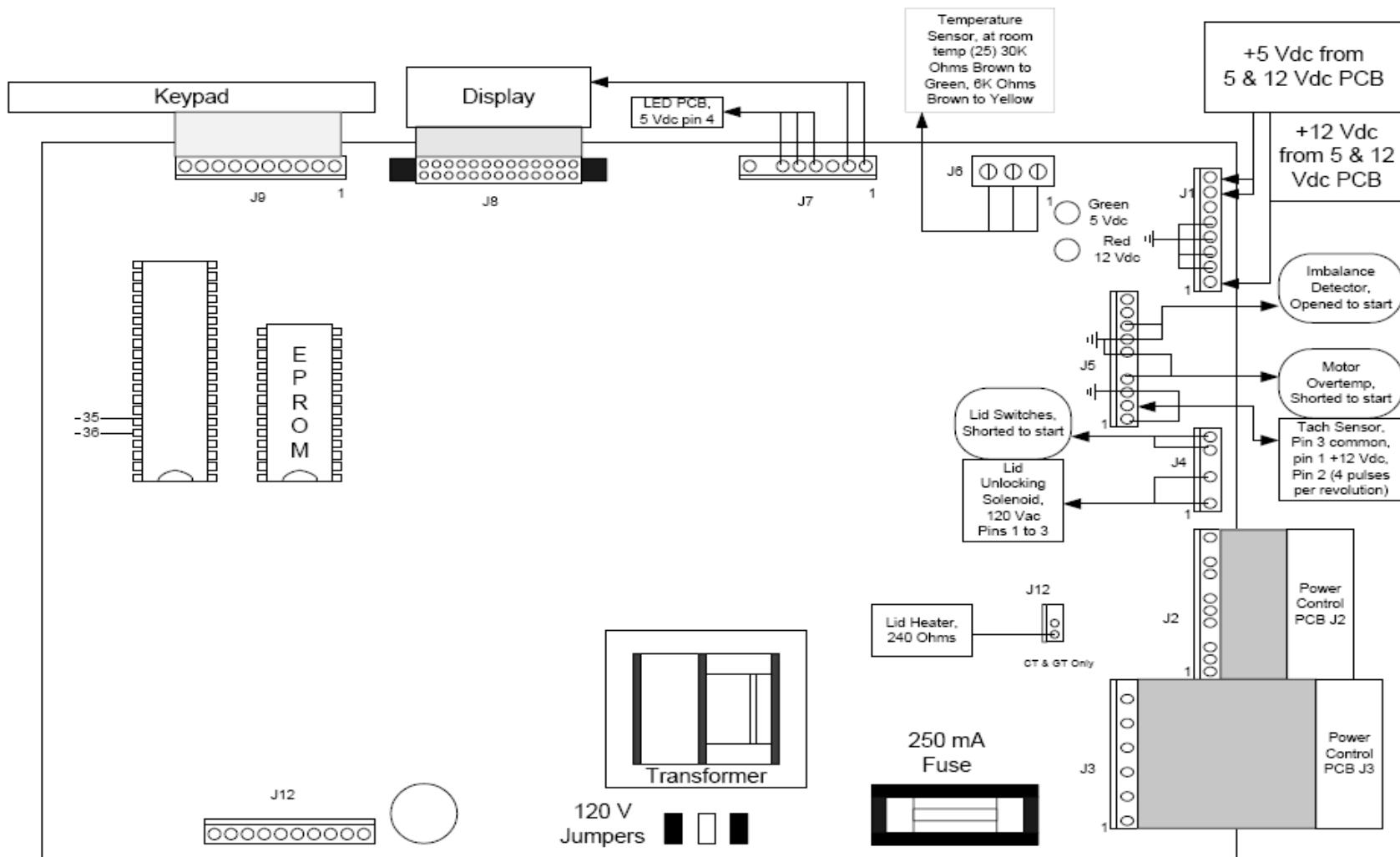
- Bushes (sold individually) –
 - ALC Motor – 89000214
 - Non ALC Motor – 89000056
- Condensing Unit (Embraco) – 51245458
- Keypad – 25176008
- Lid Switches
 - Old style (lever actuator) – 25445041
 - New Style (push button) – 86001406
- Locking Assy. – 89003307
- Motor – 25509559
- PCB's –
 - Main CPU-
 - C4.22 – 89000191
 - CR4.22 – 81000312
 - CT4.22 – 81000314
- PCB's –
 - Power – 25153152
 - Low Voltage Supply – 26005001
- Sensors –
 - Tachometer – 25153151
 - Imbalance – 85240244
 - Temperature - 86001274
- Starting Components (Embraco) –
 - Capacitor – 81001062
 - Relay – 81001063
- Triac (cooling) – 26897009



Wiring Diagram (1 of 3)



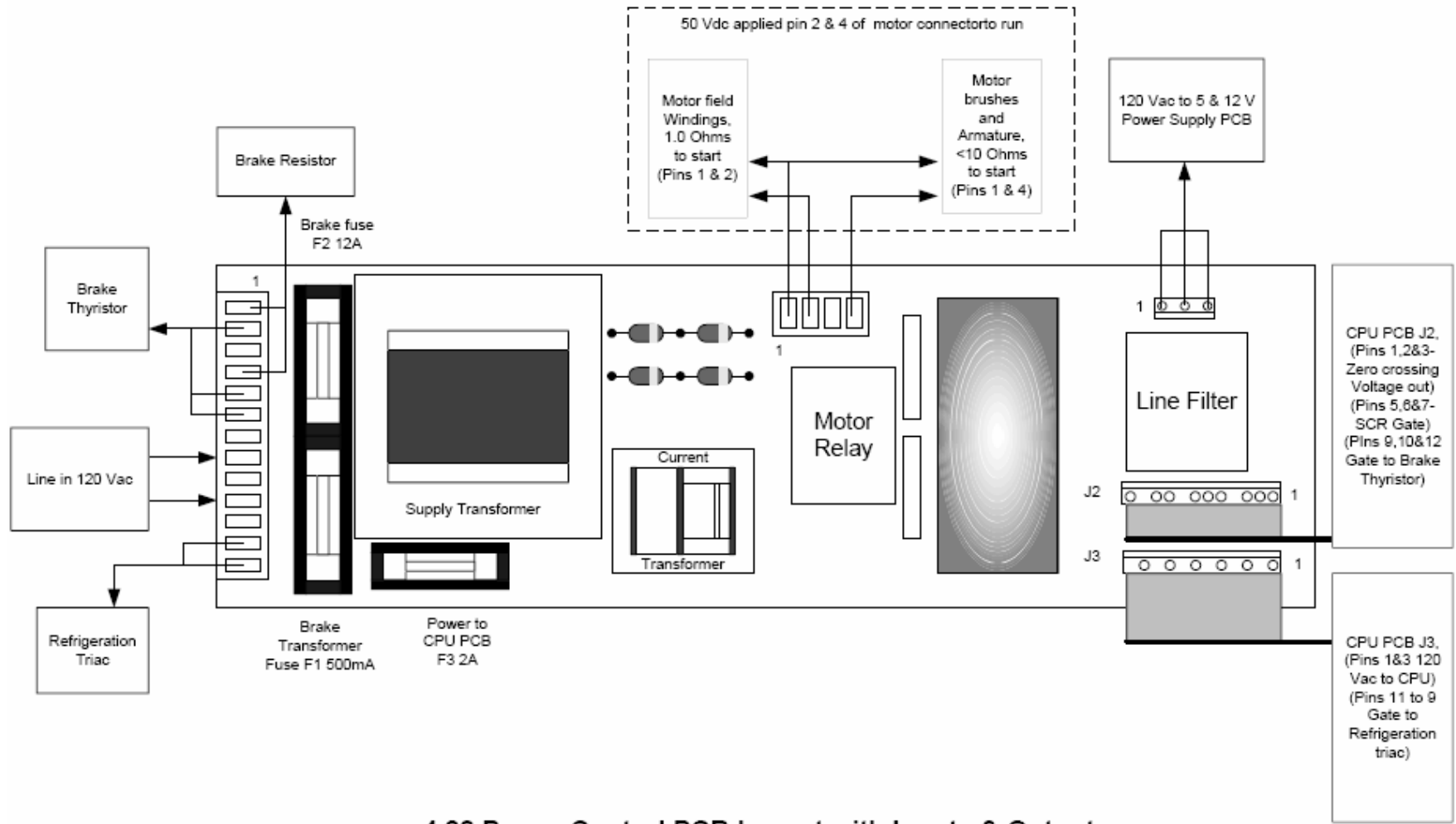
Wiring Diagram (2 of 3)



4.22 CPU PCB Layout with Inputs & Outputs



Wiring Diagram (3 of 3)



4.22 Power Control PCB Layout with Inputs & Outputs

