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TROUBLE SHOOTING GUIDE
VISIONS 3000 Hot Runner Mold Temperature Control Systems

For ITC's VISIONS 3000 Control System Only

WHERE IS THE PROBLEM

It is not unusual to suspect the control system when problems occur since that is where they are normally first detected. Experience indicates that that vast majority of hot runner control problems are generated in areas other than the controller. Other devices or wiring within the hot runner package are usually the root of the problem.

The VISIONS 3000 has a complete suite of junctions which allow a tool to be completely tested prior to placing it in production. This validation process can be done on a test bench, on the floor beside the machine, on in the event of a failure while in production, in the machine itself.

PROBLEM	PROBABLE CAUSE & REMEDY
Measured Temperatures on the display are not stable:	1 The zones may not have the correct PID setting selected. This would be the most likely cause if it is just the Cavity zones that were oscillating. Press the *"SETUP"* hotkey on the main screen to examine parameter #2 (Cavity PID) and #7 (Manifold PID). For the Cavity PID, the normal value is 3-Medium. If the Cavity's are oscillating, try setting this value to 4-Fast or 5-Very Fast. The Manifold PID should be set to 2-Slow in most cases. 2 If all the Cavity zones and/or all the Manifold zones are oscillating, it is possible that the Bandwidth (BW) and Time Constant (TC) values for the selected PID settings have been changed from the factory default. Check the settings using the table shown below:

Please note that access to change these values are protected by password.

Cavity Zone PID - Parameter #2

Settings	Name	Band Width	Parameter Number	Time Constant	Parameter Number
1	Very Slow	4	100	16	105
2	Slow	8	101	8	106
3	Medium	16	102	4	107
4	Fast	32	103	2	108
5	Very Fast	64	104	2	109

Manifold Zone PID - Parameter #3

Settings	Name	Band Width	Parameter Number	Time Constant	Parameter Number
1	Very Slow	2	110	32	115
2	Slow	4	111	16	116
3	Medium	8	112	8	117
4	Fast	16	113	4	118
5	Very Fast	32	114	2	119

	3 If all zones are oscillating, it is possible the VISIONS 3000 has a poor Ground or Neutral connection. Try a different socket or get a qualified electrician to test the power outlet. 4 If all zones are oscillating, it is possible the Ground and Neutral wires in in the socket have been swapped. Again try a different socket or get a qualified electrician to test the power outlet. 5 If all the zones are oscillating and it is not the power outlet socket, it is possible the PSU card has become faulty in the VISIONS 3000. Contact ITC for further information.
Output remains on all the time even though screen shows zero output power:	1 If this is a manifold zone (over 15 amps), it is probable that the associated power module has gone short circuit. All the power modules are labeled with their zone. Switch the system off and check the power module for proper operation. If faulty, replace the power module with a compatible unit.
The output from a given power module does not provide power:	1 It is probable that a fuse has blown on the module. Check the green LED on the card to see if it is on. Replace fuse with an identical type.

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Erratic Operation:	1 Check for loose connections between top and bottom boxes & input power, etc. 2 Check for frayed or broken wires. 3 Check fan filters & replace if dirty. 4 Check machine/mold for proper ground. 5 Heater may not be loose and not making solid contact with the mass.
Top Box does not power up:	1 Check that the controller is connected to 3-Phase power, then check that the VISIONS 3000 is turned on and that the (3) phase light's at the left of the top rack are lit. If one of the light's is out, the associated phase is not operational and the PSU for the top box is on that phase. Switch off the VISIONS 3000, rectify the power supply problem and try again. 2 If each of the (3) phase light's are on and the Bottom Box rack appears to be powered up correctly, check that the Top Box is correctly connected to the Top Box. If this is correct, it is possible the Top Box has failed. Please notify the factory.
Different results every time Tool Diagnosis is run. Particularly, thermocouple open and swapped errors:	1 The most likely cause of this problem is a faulty thermocouple card and it should be replaced. If the system has more than one thermocouple card, the faulty card can cause erratic readings on the other cards. Therefore, a systematic approach should be used to determine which card is at fault.
Why does the display show the error code "NO LOAD":	1 Current output is monitored for each active zone on the VISIONS 3000. If output power is requested and no current is measured then the "NO LOAD" error will be displayed. This error code is designed to show errors in the tool. However, the error code can also be the result of the following: A. If the "NO LOAD" error is shown on all the active zones, possible faults include: a The error could be caused by the tool connection conduits not being connected to the tool b It is possible that the VISIONS 3000 controller has not been fitted with a current sense module. Setup parameter 60, 61 & 62 should be set to "OFF". c It is possible that the fitted current sense module is faulty. To enable the VISIONS 3000 to continue to operate and control the load, Setup parameter 60, 61 & 62 should be set to "OFF" until the fault can be rectified. Current sense modules can be retro-fitted to systems. However, please contact ITC for further information. B. If the "NO LOAD" error appears on a single zone, possible faults include: a Fuse on the output card is faulty or missing. Check the green LED on the relevant output card to see if it is ON. If it is OFF, then replace the fuse with one of the same rating and operating characteristics of Ultra Rapid FF. b Check that there is continuity on the tool and that the heater has not failed. c Check that there is continuity on the tool connection cable.
What printers can be connected to the VISIONS 3000 to printout tool Diagnostics:	1 printer must have an RS232 interface. This is usually a male 25 or 9 pin "D" connector. 2 Epson LQ300
What setting should the printer be set to:	1 Baud Rate: 19200 bps Auto Line Feed: Off Parity: None Data Length: 8 bits ETX/ACK: Off

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Zone does not get to Set-Point:	1 Heater Failure: This would be shown on the screen as a "NO LOAD" error and could be the result of a failed heater, broken connection cable or faulty fuse. 2 Cable Wiring Fault/Fuse: This would be shown on the screen as a "NO LOAD" error and could be the result of a failed heater, broken connection cable or faulty fuse. 3 Output Fuse: This would be seen by the corresponding "GREEN LED" on the output card being "OFF". For manifold zones, it is also important to check the fuse. Always replace the fuse with a fuse of the same type, rating and speed. 4 Insufficient Wattage in Tool: It is possible the heater(s) are not of sufficient wattage to achieve the selected setpoint. If it is a cavity zone and the specifications of the heater is the same as the other zones which are reaching setpoint, then the fault is likely to be elsewhere. With manifold zones, it is common practice to combine a number of heaters to provide sufficient wattage. Check on the VISIONS 3000 display to ensure that the measured wattage corresponds to that specified on the tool drawing. If one or more heaters have failed, it will show up in this manner. 5 Incorrect Thermocouple Location: Particularly with manifold zones, if the thermocouple is located some distance away from the source of heat, then it is possible that the thermal losses in the tool will indicate that the thermocouple is reading a temperature considerably different than the temperature at the heater. 6 Output Power Limit Set Too Low: To improve the reliability of the heaters in the tool and save energy, the maximum power is limited to 100% on cavity zones and 90% on manifold zones. Particularly on the cavity zones, it is possible that the output limit is set too low and will need to be adjusted. In the setup, the cavity output power limit is parameter #3 and the manifold output limit is parameter #8 7 Water Temperature Set To Low: If the water temperature is set too low, then more heat is being drawn from the tool than can be provided by the heaters and the temperature will not rise enough to reach setpoint. 8 Injection Barrel Heat Too Low: If the temperature of the barrel zones are set too low, the increase in temperature required in the tool will be more than can be achieved with existing heaters.
Why does a selected zone not show data on the 3D Surface Graph:	1 Data from the zones are only shown on the surface graph when they are working in setpoint (AUTO) mode and using an operational thermocouple.
Why Does the Real Time Clock stay yellow when the zones are in-the-green:	1 The color of the Real Time Clock changes from yellow to green when the following conditions are met: ○ The VISIONS 3000 is fitted with software version 2.330 or later. ○ All active zones are within the Alarm Relay Tolerance (Setup Parameter #31). For example, for a setpoint temperature of 400° F and an Alarm Tolerance of 30° F, if the measured temperature of zone is between 370° & 420° F, the measured temperature will be displayed in green. ○ The Alarm Relay Holding Time (Setup Parameter #30) is greater than 0.
Heater Fails Prematurely or Operate Erratically:	1 Improper fit, heater may not be making good contact resulting in the lack of proper heat transfer. 2 Contamination by moisture, oils, dirt, etc. 3 Severe flexing of the heaters leads. 4 Operating temperature in excess of heaters rated capacity. 5 Corrosion prevents proper heater contact.

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Maintenance:
It is recommended that regular maintenance be carried out on the VISIONS 3000 controller to ensure that it operates without failure. In general we would recommend a 6 month check of all fasteners, connectors and filters to ensure the they are tight and undamaged and clean.

Calibration:
Due to it's design, the VISIONS 3000 has no adjustable components which can affect the calibration of the unit. Either the unit is in calibration, or due to a faulty component it is not.

Therefore, we recommend a 12 month check be made to determine that the unit is still within the specified calibration tolerance. If the unit is found to be outside of this tolerance, the unit is faulty and you should contact the factory for further information.

Fuses:
By far and away the most common fault found within the VISIONS 3000 is caused by the use of incorrect fuses, either in rating or failure characteristics. Please ensure that fuses are replaced with fuses of the same rating and blow characteristics - refer to the spare parts list in the manual for further information.
Caution: Never replace any fuses with out first determining the reason that the fuse had blown, for damage or injury may result.

Main Frame Breaker Switch =	Total System Heater Capacity
50	20,784 Watts or 86.6 Amps
70	29,080 Watts or 121.2 Amps
100	41,568 Watts or 173.2 Amps
125	51,960 Watts or 216.5 Amps
150	62,352 Watts or 259.8 Amps
175	72,744 Watts or 303.1 Amps
200	83,136 Watts or 346.4 Amps

a. Breaker size x 1.732 = the total system heater amperage capability
b. Total system amp draw x 240 = total system watts

Filters:
The VISIONS 3000 is fitted with fan filters to ensure that the introduction of dust to the inside of the VISIONS 3000 cabinet is kept to a minimum to ensure maximum reliability. Please ensure that the filters are regularly checked to ensure that they are in place, that they are clean and that they are of the correct type.
Please Note: Fan filters of the incorrect material or size can substantially reduce the effectiveness of the filter and can lead to overheating, and subsequent failure of the VISIONS 3000 cabinet.

Erratic Display:
It is possible that something has occurred electrically to upset the microprocessor in the system. It indicates that there may be more interference in the power line to the control system than filtering within the power supply can accommodate. A random occurrence is not a cause for concern. The solution usually is to connect the controller as close to the electrical service supply as possible and not to the molding machine, where motors, solenoids, etc., can cause interference.

ELECTRICAL HAZARD: *(ONLY Trained Electrical personnel should perform all service.)*
Never operate the system with the front door open or back panel removed. High voltage is present which can cause severe injury.

Proper Grounding:
Equipment (Machine, Mold, Etc.) which is not properly grounded, can cause erratic operation of the control or worse yet, severe damage to the control system, blown fuses, wires, thermocouples, etc.

Before Power Is Connected To The System:

1st Use an Ohm meter to check each heater power lead to ground. Resistance to ground should be greater than 20,000 Ohms

2nd Check resistance between each heater power leads: *(Heater Volts x Heater Volts ÷ Heater Watts = Measured Resistance {Ohms})*
Example: 240 v x 240 v ÷ 820 w = 70 Ohms

3rd Check connections of Red & White Thermocouple leads to insure proper connections at all terminals.

4th Use an Ohm meter to measure the resistance between Red & White T/C leads. Resistance reading should be low.

5th Measure resistance between Heater & Thermocouple leads. Resistance should be greater than 20,000 Ohms.

NOTE: ALWAYS DISCONNECT POWER BEFORE SERVICING ANY ELECTRICAL APPARATUS

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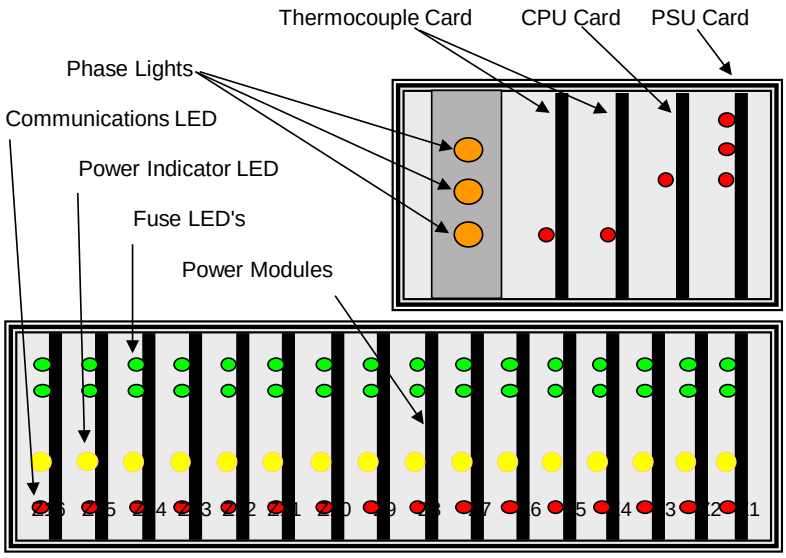
The diagrams below show the system LED's which are used for visual trouble shooting purposes. The Upper (Control) Rack contains Phase lights as well as those on the PSU, CPU & Thermocouple Cards. The Lower (Power) Rack show the LED's for the standard 15 amp Power modules. (16-Zones per rack)

When power is "ON" to the system, all three **Orange** LED's should be lit. If all three are off, check input power to the system. If any one of the **Orange** LED's is off, this would tend to indicate a failed phase and is more than likely a blown fuse or tripped circuit breaker on the building incoming power.

If all the **Orange** 3-Phase LED's are lit, then the three **Red** LED's on the PSU card should also be lit. These indicate from top to bottom (+12V, +5V, -12V). If all three LED's are off, check that Ground is properly connected. The PSU card fuse should also be checked and replaced if faulty. If only one of the **Red** LED's is lit, this would indicate a fault within the PSU card or a Power module is faulty. Turn "OFF" the VISIONS 3000 and then slide out of the racks, all of the cards except the PSU card. Turn the VISIONS 3000 back "ON" and determine if the three **Red** LED's on the PSU card are lit. If they are not lit,



there is a fault in the PSU card. If the three LED's on the PSU card are lit, switch the VISIONS 3000 "OFF" and slide the CPU card back into the rack, then turn the power back "ON". Check the three PSU LED's, If not lit, then it is the CPU card which is faulty. If the three **Red** PSU LED's do come on, turn "OFF" the VISIONS 3000 and slide the first thermocouple card back into the rack. Repeat this process until the thermocouple card which is pulling down the voltage is found.

If the PSU card is operating properly, the display (Top Box) should also be operational. If the display is blank, check that all communications and power leads are connected correctly between the Top & Bottom Boxes.

If the PSU card is operational, the CPU **Red** LED should also be lit. In "STOP" mode, the LED will be lit continuously. In "RUN" mode, the LED will blink as the CPU module communicates with the display. If the LED is lit and not blinking while the VISIONS 3000 is in "RUN" mode, this would indicate a faulty CPU card. This will also be indicated by the Top Box being unable to obtain any values and show "COMS ERROR" on each zone.

If the CPU card is operational and the front edge **Red** LED is blinking, a sequence will be seen as each of the Power modules **Red** LED's respond in turn. The sequence will illuminate only one communications LED on one module at a time. If two module communications LED's are lit at the same time, this would indicate that two modules are communicating on the same address on the VISIONS 3000 backplane, which is incorrect and will result in errors.

If the LED on the Thermocouple card does not operate, this indicates an error with the thermocouple module.