Magnus VLF Chiller Troubleshooting

Product

Magnus VLF with 2.7x thermal head

Background

The Magnus VLF with a 2.7x thermal head uses a chiller to keep the laser at the correct operating temperature. A pressure sensor monitors the coolant pressure and if the pressure drops too low then the firmware will shut down the thermal head. This procedure will help to isolate the cause of the problem.

Troubleshooting

What does the chiller's pressure regulator read?

The chiller's pressure regulator is factory set to 55 psi. maximum. The normal pressure reading on the chiller's pressure gauge, with all hoses connected to the head, is 40 - 45 psi (+/- 5 psi for gauge accuracy). The pressure gauge on the chiller will only show 55 psi if the coolant circuit is blocked.

Note: The pressure regulator should never need adjusting in the field.

Is the coolant circuit open?

The only true method to check system flow is to visually inspect the return flow into the chiller reservoir. The pressure sensor that is used to detect flow (the "low flow" warning sensor) is factory set to close at 34 psi rising and to open at 32 psi falling. If there is a blockage after the pressure sensor, the pressure sensor will detect high pressure and will not indicate a low flow situation.

To diagnose a low flow warning error:

- Check the head temperature. If the head is not overheating, then there is adequate flow.
- Check the chiller's pressure gauge—it should read 40 – 45 psi. If it reads 50 – 55 psi, then either a hose coupling is disconnected or a hose is kinked.
- Check the coolant return flow into chiller reservoir.
- Check that the pressure switch wiring harness is connected.

If the checks above are all OK, then the pressure sensor could be defective. Replace the sensor.

Is the TH2.7 temperature normal?

When the device is imaging, use the `>>LDD INFO` command repeatedly and monitor the diode temperature. If the chiller is operating correctly, the temperature should stay in the range of 15 -18 degrees by the end of the image.

Troubleshooting summary table

Symptom	Causes
Pressure gauge reads < 37 psi .	Low pressure. Faulty pump or no coolant. May also be accompanied by head over-temperature or low coolant flow errors.
Pressure gauge reads 37 psi – 50 psi. No errors reported.	The normal operating range for the chiller is 42-45 psi, but the gauge is only accurate to ± 5 psi.
Pressure gauge reads > 50 psi	A hose coupling is disconnected or a hose is kinked. The coolant is flowing through the chiller's internal bypass. The head will report an over-temperature error because it is not getting any coolant.
Pressure gauge reads 37 psi – 40 psi Coolant low flow errors reported.	If the gauge on the chiller is reading below 40 psi, then the problem may be either a faulty chiller or a faulty pressure switch. • If the head is reporting intermittent over-temperature errors, then the problem is definitely the chiller. • If the device is reporting low coolant flow errors, but the laser diode temperature is OK during imaging, then the pressure switch is faulty.

See also	Chiller page on TechPlanet (http://techplanet.creo.com/output/computer_to_plate/magnus_vlf/nav/chiller.htm).
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