

## P-97 & P-87 Air System Technical File

RAMP TEST is POSSIBLE

but

PULL is NOT POSSIBLE

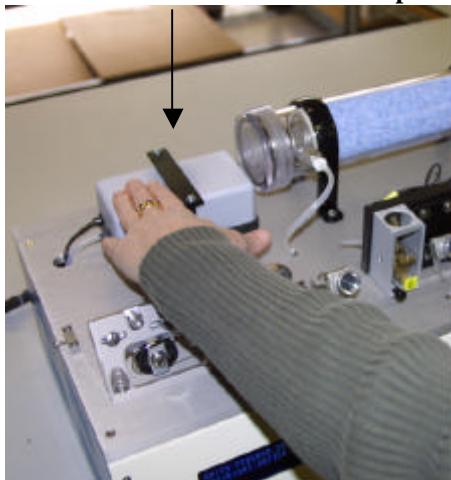
If your filament WILL heat up during a RAMP TEST, but WILL NOT heat up during a PULL, there is most likely a problem with the air (cooling) system where you have an air leak or the air is blocked. The air system is bypassed when running a ramp test, which is why the filament will heat up during the ramp test, but not when trying to pull a pipette.

Your puller needs to detect that there is a reserve of 2 psi of air pressure before it allows the filament to heat up. If the puller cannot detect 2 psi of air pressure, the puller will just sit there and do nothing after you press pull.

### To detect and locate an air leak:

Step 1) Place your hand on the pump (to the back left on the base plate and next to the Drierite canister) to feel if it is vibrating. Often you can also hear the pump running or air blowing if there are not too many other noises in your lab. If the pump is running constantly or sputtering on and off, you have an air leak and the puller can not achieve the default 2 psi of air pressure required to cool the glass when it is being pulled. Proceed to “Step 2.” If the pump is not vibrating/running, please proceed to “Step 4.”

**Check to See if Pump is Running or Sputtering.**



Step 2) If your pump is running, fold and pinch in half the tubing coming from the right port of the Drierite canister (the clear plastic tube with blue granules in it), and see if this makes the pump stop running (Image A). If the pump stops running, this indicates that your Norgren Reedex valve is stuck open and/or the wiring between the Norgren Reedex valve and the board is faulty causing an air leak.



Image A

**Pinching off tubing from Right Port of Drierite Canister**

The Norgren Reedex valve is the small rectangular black plastic on/off valve located behind the filament block assembly and has two small wires with yellow connectors (Image B). Contact Sutter and let us know you need a new Norgren Reedex valve and new wiring which connects the Norgren Reedex valve to the motherboard.

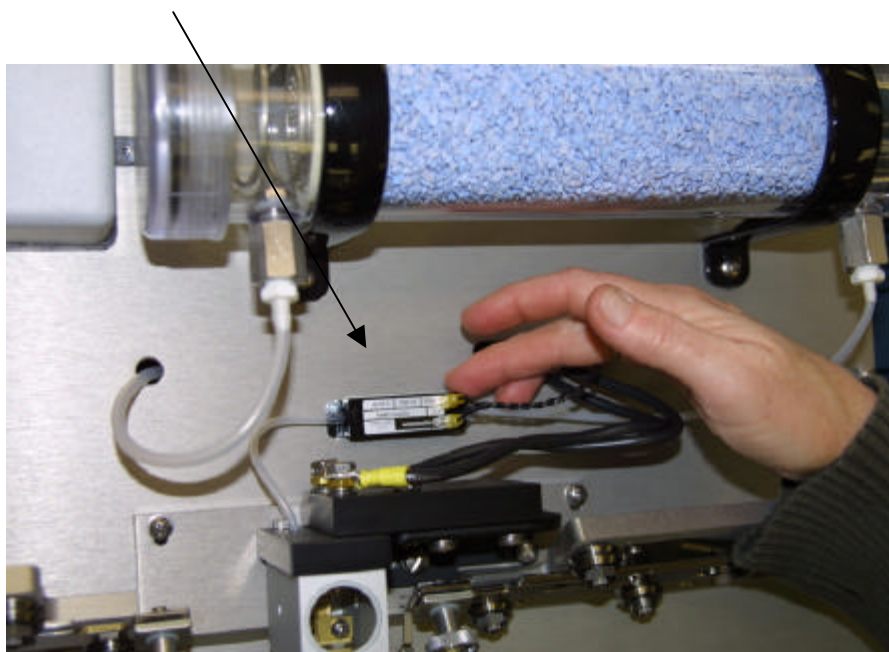


Image B

#### **Norgren Reedex Valve and Wiring, Part # V100097**

Step 3) If the pump does not stop, fold and pinch in half the tubing running from the left port of the Drierite canister (Image C) and see if this causes the pump to stop running. If this does cause the pump to stop running, you might have a hole in your tubing or the Drierite cap is loose. It is possible and quite common to develop an air leak after replacing the Drierite Granules since the cap to the Drierite canister can easily get cross threaded or placed on too loose. Please remove the canister, remove the cap, place a little vacuum grease on the black o-ring, and make sure the o-ring is in place and there are no particles or granules on the edge of the canister. Press down evenly on the cap to compress the spring, and tighten the cap. Reconnect the tubing and see if you have fixed the air leak.



Image C

#### **Pinching off tubing from Left Port of Drierite Canister**

**No Air leak detected, but filament will not heat up.**

Step 4) If you do not detect an air leak and the pump is quiet, it is best to first find out if the pump is working and capable of creating 2 psi of air pressure. Slip the tubing off the right port of the Drierite canister and see if the pump starts up. If the pump does activate, go to “Step 5”. If the pump does not start up, you will need to turn off and unplug the puller and open up the cabinet to inspect a fuse and a connector to the main board. Please contact Sutter for further instructions.

Step 5) If your pump activated when removing the tubing, then the pump is working, but the air flow is stuck closed and this is most likely due to a faulty Norgren Reedex valve. The Norgren Reedex valve is a small rectangular black plastic on/off valve located behind the filament block assembly and has two small wires with yellow connectors (Image B). To test to see if the Reedex is stuck closed, please proceed through the following steps:

- Load the glass, pull the puller bars all the way together, make sure you have an appropriate heat setting (Ramp to Ramp +10), and then press pull.
- If the filament does not heat up, and while nothing is happening, quickly pull the tubing from the right port of the Drierite canister and then quickly replace it. This event will create a drop and then an increase in the pressure (which is what would happen automatically if the reedex were functioning properly) and this will cause the puller to "see" the 2 psi of pressure and allow the filament to heat up.

If the filament does heat up after these steps, this indicates that your Norgren Reedex valve (Image B) is stuck closed. Please contact Sutter to order a new air valve (Part # V100097), the wire connectors to the main board, and the repair instructions.

