

2.4 Flow Rate Verification and Adjustment

Once the pressure verification is complete, the gas flow rate should be verified. Accurate gas flow through the nozzle is critical for achieving repeatable results. The DRS24C incorporates a Mass Flow Controller with closed loop control to monitor and regulate gas flow rates.

The two areas of flow verification include the Nozzle Flow Controller which controls actual flow rates and the Nozzle Flow Sensor which controls the Computer Digital Flow Display. Nozzle flow verification is required for initial installation, or any time the machine is disconnected and/or moved.

2.4.1 Nozzle Flow Controller Verification and Adjustment (100% only)

Materials required:

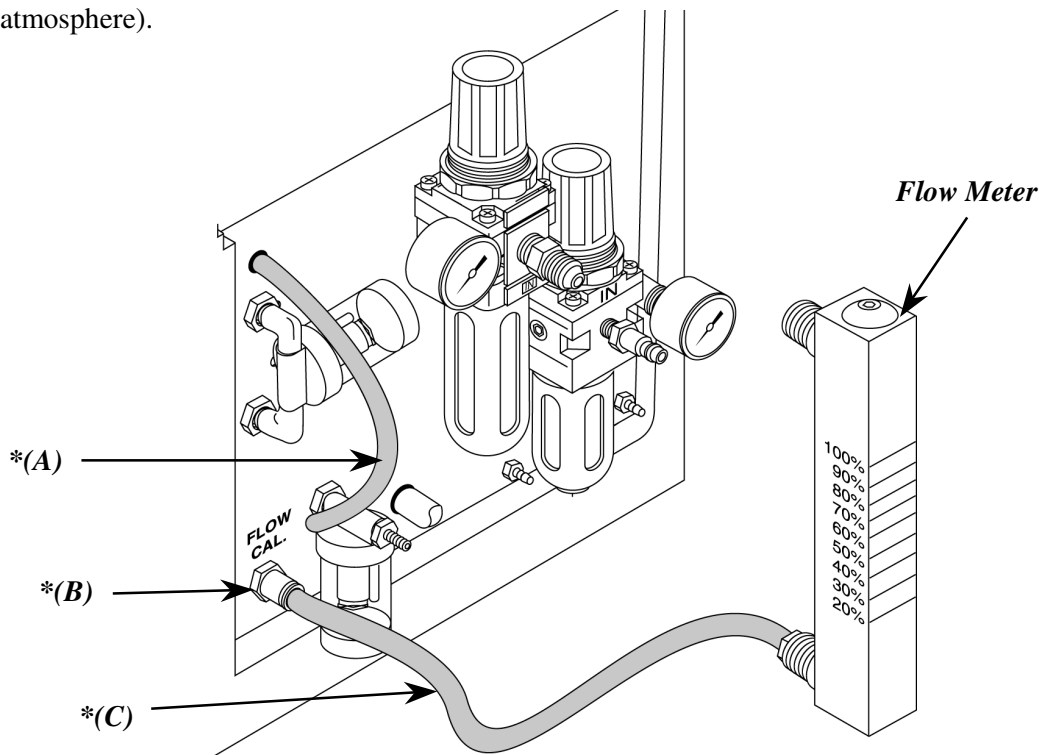
- Scribed reference flow meter supplied with the machine.

Initial conditions:

- Machine power must be turned on for a minimum of 30 minutes.
- Pressure to upper heater must be set precisely to 80 psi (+/- .5psi).

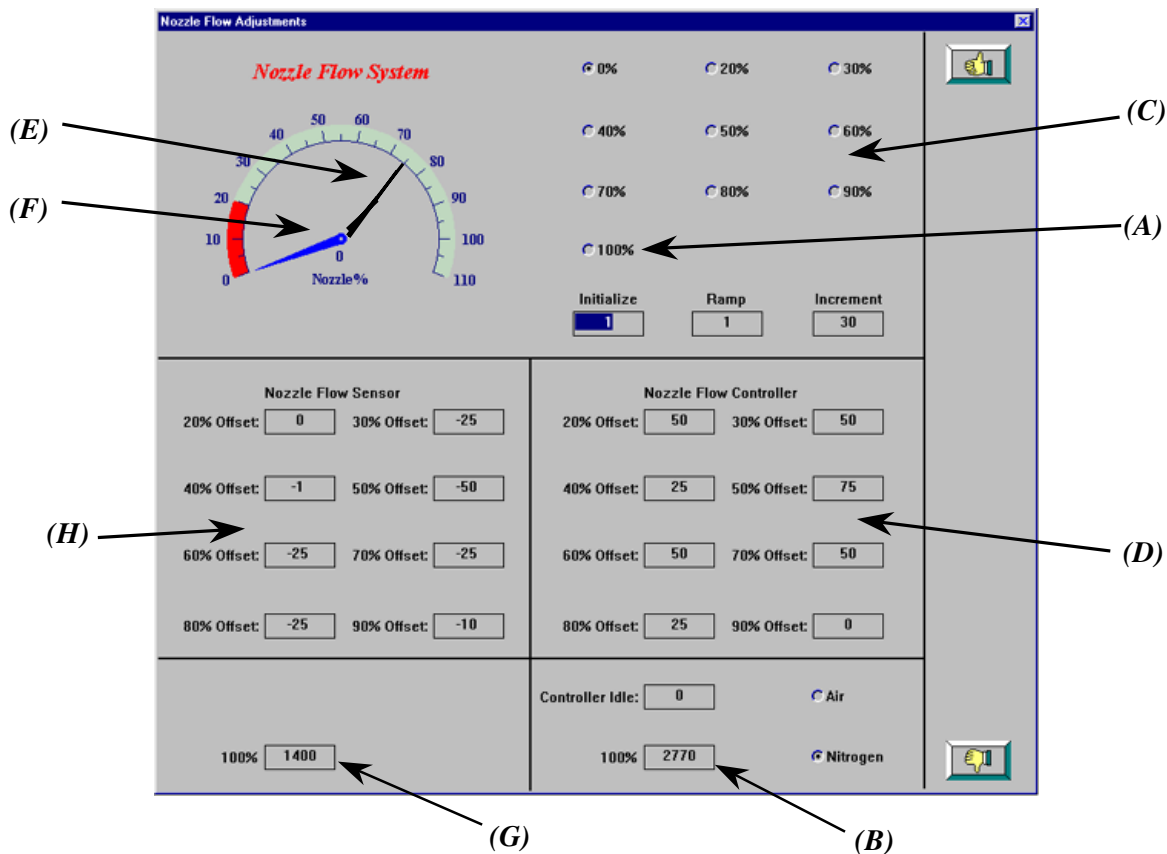
Set-Up:

- Disconnect the Blue Hose (A) from the Flow Cal Fitting (B).
- Connect the **Blue Hose (C)** from the Flow Meter into the **Flow Cal Fitting (B)**. (Meter exhausts to atmosphere).



***WARNING:** Be certain all hoses are inserted into fittings completely. A bad connection can result in a burned out heater or erroneous calibration readings.

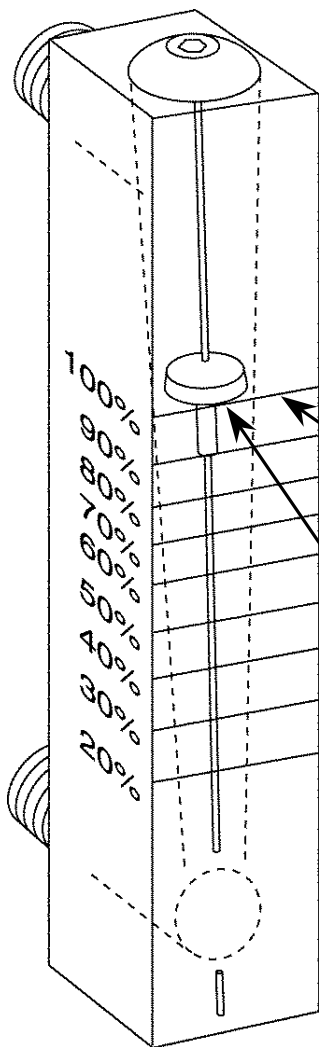
- Select *Setup* from the menu bar.
- Select *Nozzle Flow Meter*. The Nozzle Flow Adjustment screen will appear as shown below.



Making Flow Controller 100% Verifications and Adjustments:

- Click on the **100% radio button (A)**. The air flow will activate after 1-4 seconds.
- Wait 45 seconds before making any adjustments.
- Check the 100% scribe line on the flow meter. If the flow meter reads too high or too low, adjustments can be made immediately by entering a new value into the **100% Nozzle Flow Controller box (B)**. The air flow should not be interrupted. The adjustments will be automatically applied within 3-5 seconds.

Note: No adjustment is necessary if the flow is off by less than the thickness of the float +/-.

Flow Meter :**Flow Meter Value Chart 1:**

<u>Software Screen</u>	<u>Flow Meter Target Value</u>
20%	(20% scribe): .55 scfm
30%	(30% scribe): .82 scfm
40%	(40% scribe): 1.10 scfm
50%	(50% scribe): 1.37 scfm
60%	(60% scribe): 1.65 scfm
70%	(70% scribe): 1.92 scfm
80%	(80% scribe): 2.20 scfm
90%	(90% scribe): 2.47 scfm
100%	(100% scribe): 2.75 scfm

Read bottom of float head (largest diameter)

Meter should settle at 100%

*Reference:
100% is equivalent to 2.75 scfm.*

*Note: It is recommended that you use the tab key to enter into the adjustment box to change the setting.
Note: DO NOT HIT ENTER after the value has been set.*

- If the flow meter reads too high, decrease the value by increments of 5 in the **100% Nozzle Flow Controller box (B)**.
- If the flow meter reads too low, increase the value by increments of 5 in the **100% Nozzle Flow Controller box (B)**.

2.4.2 Nozzle Flow Controller Verification and Adjustment (20-90% only)

Making Flow Controller 20-90% Verifications and Adjustments:

- At this point, the **100% Flow Controller** value has been set.
- For each of the remaining **radio buttons (20-90%) (location C)**, the operator should run through the same verification and adjustment procedure that was just completed for the **100% Nozzle Flow Controller** value.
- If the flow meter reads too high, decrease the value by increments of 5 in the appropriate **20-90% Nozzle Flow Controller box (location D)**.
- If the flow meter reads too low, increase the value by increments of 5 in the appropriate **20-90% Nozzle Flow Controller box (location D)**.

2.4.3 Nozzle Flow Sensor Verification and Adjustment (100% only)

Making Flow Sensor 100% Verifications and Adjustments:

- Click on the **100% radio button (A)**. The air flow will activate after 1-4 seconds.
- Wait 45 seconds before making any adjustments.
- The software screen displays to the operator a **Yellow Needle (E)** (flow rate set point) and a **Blue Needle (F)** (actual flow rate sensor reading).
- Check the blue needle that is being displayed on the software screen. This needle represents the actual flow rate sensor output from the flow controller.
- The blue needle should bounce between 99-101%. If the blue needle is not within this range, adjustments can be made to the **100% Nozzle Flow Sensor** value.
- If the blue needle is too high, increase the value by increments of 5 in the **100% Nozzle Flow Sensor box (G)**.
- If the blue needle is too low, decrease the value by increments of 5 in the **100% Nozzle Flow Sensor box (G)**.

Note: This is **OPPOSITE** from all other flow controller and flow sensor adjustments.

2.4.4 Nozzle Flow Sensor Verification and Adjustment (20-90% only)

Making Flow Sensor 20-90% Verifications and Adjustments:

- At this point the **100% Flow Sensor** value has been set.
- For each of the remaining **radio buttons (20-90%)**, (**location C**), the operator should run through a similar verification and adjustment procedure that was just completed for the **100% Nozzle Flow Sensor** value.
- If the blue needle is too high, decrease the value by increments of 5 in the appropriate **20-90% Nozzle Flow Sensor box (location H)**.
- If the blue needle is too low, increase the value by increments of 5 in the appropriate **20-90% Nozzle Flow Sensor box (location H)**.

Note: After completing this calibration procedure, the operator should quickly run through all of the Flow Sensor ranges (20-90%). The purpose of this step is to assess the overall performance of the flow system.

- Select the **Thumbs Up** icon to save changes and exit the Flow Adjustment screen.

IMPORTANT!:: DISCONNECT THE BLUE FLOW METER HOSE FROM THE FLOW CALIBRATION FITTING AND RECONNECT THE BLUE UPPER HEATER HOSE. FAILURE TO RECONNECT THE UPPER HEATER HOSE PRIOR TO RUNNING THE TOP HEATER WILL CAUSE THE TOP HEATER ELEMENT TO FAIL.