

MARCH RIE CS-1701 SOP

Revised April 2020

START UP

1. Log into the tool in your FOM account.
2. Turn **ON** disconnect in the chase area to turn on the pump.
3. Switch **ON** the Main breaker on the back of the RFX-600.
4. Power **ON** the RFX-600 (Power button).
5. Power **ON** the MARCH CS-1701 (orange button).
6. Press **STOP** button on RIE (this resets the system), **MAN OP** button and then **BLEED** button. The **BLEED** LED will remain constantly illuminated while the RIE system is bleeding, and then turn off when the bleed is completed and the chamber should be at atmospheric pressure (the seal on the lid will crack open). If you cannot open the chamber at this point, press **STOP** and the **BLEED** once again.
7. Load your sample and close the lid.



The same basic format can be used to perform a different etch process with the desired gasses, pressures, etch times, etc.

NOTE: The RIE etching process can perform in the Manual and Auto mode, but it is recommended to use **Auto Mode** for process repeatability.

Parameters:

PRESS	Pressure (mTorr)	
PWR	Power (Watts)	
ENDPT	Disable endpoint detection	
TIME	Time (Seconds)	!!! Ignored in Manual mode!!!
TEMP	Disables DC bias	
AUX	Base pressure - typically 100 (mTorr)	
GAS 1-6	Gas flow rate (Sccm)	

Available gases:

GAS 1 = H ₂
GAS 2 = O ₂
GAS 3 = CHF ₃
GAS 4 = CF ₄

WRITING THE RECIPE

1. Toggle the **PROG** button on the RIE until the desired program number appears in the program number box.
2. Press the left **SET/READ** button to illuminate the left **SET/READ** LED. This allows all process parameters except gas flow rates to be set.
3. Initially, **PRESS** should be illuminated. Set this to desired pressure, using the left **INCR** or **DECR** button.
4. Press the **L DISP** button one time to illuminate **PWR**. Press the left **INCR** or **DECR** button to set the desired power.
5. Repeat the same procedure for all the parameters (TIME, AUX, etc.). Now that all the parameters except gas flow rates have been entered, press the left **SET/READ** button to extinguish the left **SET/READ** LED.
6. To set the gas flow rates, press the right **SET/READ** button to illuminate the right **SET/READ** LED.
7. Press the **R DISP** button until GAS 1 is illuminated. Set it to desired value by use of the right **INCR** or **DECR** buttons, as necessary.
8. Continue to toggle through the list of gasses, ensuring that the rest are all set to desired values or zero. After all gas flow rates are set, press the right **SET/READ** button to extinguish the right **SET/READ** LED. This saves the gas flow rate settings just entered.
9. The etching process is now saved in the selected program number.

RECIPE RUN IN AUTO MODE

1. Ensure that the RIE system is in the Auto mode (**MAN OP** LED is extinguished). If it is not, press the **MAN OP** button to extinguish the **MAN OP** LED.
2. Toggle the **PROG** button until the correct program number appears (just created program or already existed program). Ensure the **MAN OP** LED is extinguished, and press **START**. The entire process will be automatically performed by the RIE.
3. When program is finished press **STOP**, then press the **MAN OP** button to exit the Auto mode, and, finally, press **BLEED** button to vent the chamber and unload your sample.

RECIPE RUN IN MANUAL MODE

1. Make sure the RIE is in manual mode of operation (**MAN OP** LED lit). If not, Press the **MAN OP** button on the RIE.
2. Close lid and press **VAC ON**. Wait 1 minute for vacuum to establish. Then press the **PRESS** button on the RIE. This enables the pressure monitoring feature of the system.
3. Let the system pump down to 100 mTorr or lower.
4. Press the right **SET/READ** LED. Now, use the right **INCR** or **DECR** buttons to set the gas flow rates.
5. Press the **L DISP** button on the RIE until **PWR** is illuminated.
6. Press the left **SET/READ** button to illuminate the LED. Now, the power can be set - use the left **INCR** or **DECR** buttons. Don't exceed **400 Watts!!!** Then press left **SET/READ** button to extinguish LED.
7. Press the **GAS ON** (this enables the RIE system to introduce the gasses as determined by the gas settings) and wait for a desired pressure and press **RF ON** button. At this point, plasma should be visible inside the RIE chamber.
8. Use stop watch to count the time of the etching process.
9. Press the **BLEED** button on the RIE to stop the cleaning process. This should stop the gas flow, and bleed the system to atmospheric pressure. After the system pumps down to the base pressure, the RIE will begin to bleed, and return to atmospheric pressure. While the system is pumping down, the **BLEED** LED will blink. The **BLEED** LED will remain constantly illuminated while the RIE system is bleeding, and then turn off when the bleed is completed and the chamber should be at atmospheric pressure. If you cannot open the chamber at this point, press **STOP** and the **BLEED** once again.
10. Open the lid and unload your sample.

SHUTDOWN

1. After the process has completed and your sample is out, close the lid and press **MAN OP**, and then press **VAC ON**.
2. When pressure goes below 100 mTorr press **STOP** and **POWER** (orange button) to power **OFF** the MARCH CS-1701.
3. Power **OFF** the RFX-600 (Power button).
4. Switch **OFF** the Main breaker on the back of the RFX-600.
5. Turn **OFF** the disconnect in the chase area to turn off the pump.
6. Log out of the tool in your FOM account.

Plasma Descum Recipe (example)

PRESS 300
TIME 30
PWR 300
TEMP 0
ENDPT 0
AUX 100

GAS 1 = 0
GAS 2 = 20
GAS 3 = 0
GAS4 = 0