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Guide to Shut Down GC / GCMS Instruments (2020)

Technical Support, Thermo Scientific

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Summary of General Process

- Cool all heated zones to 35C and let them reach set point
- Switch off Main Power on all instruments
- Shut off all Gas Supplies



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FAQs

Common GC / GCMS Shut Down Questions

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Common Shut Down Questions

- **Should I remove my column from my Mass Spec?**
 - While it is recommended that you do remove your column from the Mass Spec, it's not absolutely necessary.
 - The reason we ask that you remove your column is because when you go to start your instrument back up, it's likely you'll want to re-condition your column. During column conditioning you are heating your GC oven to the maximum allowance of the column and pushing any contaminants out of the end of the column with the carrier gas. If your column is still installed in the Mass Spec, everything that is coming off your column will end up on your source / filament / prefilter / etc.
 - To protect your source and everything along the ion pathway in your Mass Spec, removing the column and blocking off your transfer line will prevent contaminants from being introduced. You'll restart you GC as usual and condition the column in the GC oven before re-installing in the Mass Spec and pumping down.
- **Should I remove my column from my GC Inlet / Detector?**
 - While is it recommended, it's also not necessary.
 - The reason we ask that you remove your column from the detectors, and as such the injectors, is two fold.
 - To maintain a column, it's always ideal to have it under gas. With your GC off, you no longer have gas going through the column. Although it's a fairly closed system when installed in the inlet / detector, it's not a perfectly sealed system. As such, atmosphere is still getting in your column and can slowly cause it to degrade.
 - Many detectors have components that are susceptible to degradation as a result of oxygen being introduced into the system. Again, while it's a fairly closed system with the column installed, it's not perfect. The best way to maintain your detectors is to remove the column and block them off so no atmosphere is being introduced.
- **Should I remove my source from my Mass Spec? (Only applicable for ISQ / TSQ Series)**
 - No matter what, when you re-start your system, you'll need to re-tune your Mass Spec. Because of this, we always suggest cleaning your source and starting from scratch like a brand new instrument. If you plan to take this route, it does not matter whether you remove your source now or later.
 - If you do not plan to clean your source before start-up, then you have two options.
 - If you have removed your column and blocked off the transfer line, you can leave your source in the instrument
 - If you did not remove your column, it's suggested that you remove your source and only install it after you have conditioned the column.



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Step 1: Cool Down the GC

Trace 1300 / Trace 1310 Series

Reference: Trace 1300 Series GC Hardware Manual - Section “Performing Routine Maintenance” and sub-section “Shutting Down the Trace 1300/Trace1310”

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Cool Down the GC – Trace 1300 / Trace 1310 Series

To begin the Shut Down, you will need to cool down all zones of your GC. The Trace 1300 Series has an Option to cool down all zones through the Maintenance functionality as described below. If you choose to do this manually, please keep in mind that carrier gas and makeup gas should stay on during this cool down process.

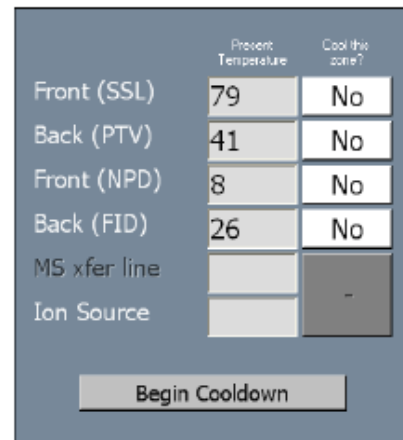
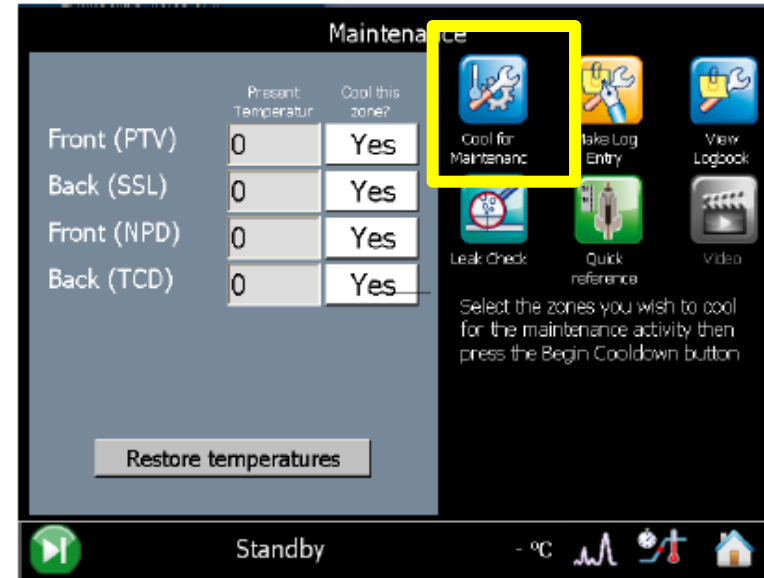
- Cool down the Inlets / Detectors to 35° C
 - [For Trace 1310 Touch Screens](#)
 - [For Chromeleon Software](#)
 - [For Xcalibur / TraceFinder](#)

Trace 1310 Touchscreen Cool Down

1: Select 'Maintenance' from the Main Screen on the Touch Panel



2: Select 'Cool for Maintenance'



3: Change all the 'Cool the zone?' options from No to Yes and then select 'Begin Cooldown'

Chromeleon Trace 1300 Cool Down

1: In the Chromeleon Console under the Instruments Category, go to the Thermo Scientific GCMS Home Tab and select Maintenance

The screenshot shows the Thermo Scientific GCMS Home console interface. The 'Maintenance' button is highlighted in a red box in the top right corner. A blue arrow points from this box to the 'Maintenance' dialog box. In the dialog box, the 'Cool?' checkboxes for 'Inlet #1', 'Inlet #2', 'Det. #1', and 'Det. #2' are highlighted in a red box. A blue arrow points from this box to the 'Start Cool-down' button.

Zone	Cool?	Current Temperature
Oven:		60.0
Inlet #1:	<input checked="" type="checkbox"/>	250
Inlet #2:	<input checked="" type="checkbox"/>	0
Det. #1:	<input checked="" type="checkbox"/>	250
Det. #2:	<input checked="" type="checkbox"/>	200

2: In the Maintenance screen, select all zones you'd like to cool by checking the box for 'Cool?' and then select 'Start Cool-down'.

Xcalibur / TraceFinder Trace 1300 Cool Down

The screenshot shows the Xcalibur software interface. The top panel is titled 'Status' and 'Acquisition Queue'. Under 'Run Manager', there is a list of runs. One run, 'TRACE 1300 Series GC', is highlighted with a yellow box. A blue arrow points from this box to the right. Below the Run Manager, there are several tabs: 'General', 'Detectors', 'Temperatures', 'Flows', and 'Pressures'. The 'General' tab is active, showing 'GC status: Ready' and 'Waiting for: Prep-run key'. Below this, there are 'Start' and 'Stop' buttons, and 'Diagnostics...' and 'Leak Check...' buttons. The 'Maintenance...' button is highlighted with a yellow box. A blue arrow points from this box to the right.

1: Open Xcalibur and select 'Trace 1300 Series GC' in the Status menu

The screenshot shows the 'TRACE 1300 Maintenance' dialog box. It has a 'Cooldown' section with a table of current temperatures for different zones. The 'Ready' button is highlighted with a blue arrow pointing upwards.

	Current
Front inlet:	<input checked="" type="checkbox"/> 55.0 °C
Back inlet:	<input checked="" type="checkbox"/> 55.0 °C
Front detector:	<input checked="" type="checkbox"/> 90.0 °C
Back detector:	<input checked="" type="checkbox"/> 45.0 °C

Ready

Start Cooldown

2: Select 'Maintenance'. If this is greyed out you must wait for your GC to be in a Ready status

3: Check all the zones to cool down and then select 'Start Cooldown'



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Step 1: Cool Down the GC

Trace GC Ultra Series

Reference: Trace GC Ultra Maintenance Manual – Multiple sections combined to provide a comprehensive view of appropriate shut down procedures

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Cool Down Oven / Injectors Manually through Keypad

1: Manually shut off the temperature of the oven and each Inlet

1. While in stand-by condition, press **OVEN** to access the oven control table.

OVEN		
Temp	50	50 <
Initial time		2
Ramp 1		10.0

2. Scroll to Temp and press **OFF**.

3. Press **LEFT INLET** or **RIGHT INLET** depending on which injector is operating. In the following example, a S/SL injector installed on the right channel is considered.

RIGHT INLET (S/SL)		
Temp	250	250 <
Pressure	100	100
Mode		split

4. Scroll to Temp and press **OFF**.

2: Check to make sure that the Carrier Gas for each Inlet is still on during this Cool Down process

press **LEFT CARRIER** or **RIGHT CARRIER** depending on which injector is operating.

RIGHT CARRIER (S/SL)		
Pressure	30.0	30.0
Col. flow	3.00	<
Lin. Veloc.		(60.9)

Cool Down Detectors Manually through Keypad

1: Manually shut off the temperature of each detector. Example below shows instructions / menu specific to FPD.

1. Press **LEFT DETECTOR** or **RIGHT DETECTOR**, depending on the location of the FPD detector, to access the FPD control table. In the following example, a FPD installed on the right channel is considered.
2. Scroll to **Flame** and press **OFF**.
3. Scroll subsequently to **Base temp, FPD temp, H2 and Air** and press **OFF**.

RIGHT DET (FPD)		
Flame		Off <
Base temp	300	Off
FPD temp	150	Off
Signal pA		(xx)
High voltage mode?		N
H2	90	Off
Air	115	Off
Mkup (N2)	0	0

1. Press **LEFT DETECTOR** or **RIGHT DETECTOR**, depending on the location of the ECD, to access the ECD control table. In the following example, an ECD installed on the right channel is considered.
2. Scroll subsequently to **Base temp and ECD temp** and press **OFF**.

RIGHT DETECTOR (ECD)		
Base temp	250	Off <
ECD temp	250	Off
Ref current nA		1.0
Freq kHz		(2.15)
Pulse amp V		25
Pulse width us		1.0
Mkup (N2)	40	Off

These are just examples of two Detectors. Please only shut off Temperatures and ignition gases. DO NOT turn off any Makeup Gases at this time.

Optional: Cool Down Aux Temperature Zones

If you have an older Mass Spec (DSQ Series), the Mass Spec Transfer Line is controlled through the GC. Use the following steps to begin cooling down the transfer line if you have a Mass Spec configured in your Setup.

1. Press AUX.

```
AUXILIARY
Signal      <
Detector
Temperature Zones
Pressure Channel
```

2. Select Temperature Zones

3: Select Transfer Line and turn Temp OFF or set to 35C



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Step 1: Cool Down the GC

Focus GC Series

Reference: Focus GC Instruction Manual – Multiple sections combined to provide a comprehensive view of appropriate shut down procedures

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Cool Down Focus GC Oven and Inlets

1: Manually shut off the temperature of the oven and each Inlet

In Main Menu move the cursor until **Oven** is selected. Press **ENTER** to open **OVEN** menu.

```
FOCUS GC
Oven
```

Scroll to **Temp**, **Initial time**,
Set temperature to appropriate value (35 or 0 which is OFF) then press **ENTER**.

```
OVEN
Temp      50.0  50.0
```

```
OVEN
Initial time  1.00
```

In Main Menu move the cursor until **Inlet** is selected. Press **ENTER** to display the **INLET** menu.

Scroll to **Temp** and set the appropriate value. (35 or 0 which is OFF)

2: Check to make sure that the Carrier Gas for each Inlet is still on during this Cool Down process

In Main Menu move the cursor until **CARRIER** is select. Press **ENTER** to open **CARRIER** menu

Depending on the mode (Constant Flow or Constant Pressure), make sure the Flow / Pressure is on and flowing

Cool Down Focus GC Detectors

1: Manually shut off the temperature of each detector. Below is an example of FID and TCD on a Focus GC

In Main Menu, move the cursor until **Detector** is selected. Press **ENTER** to display the **DETECTOR** menu.

DETECTOR (TCD)	
Filament power	Off
Fil status (not rdy)	
Block temp	200 200
Trans temp	200 200
Cost fill temp?	
Yes	
Fil temp (--)	350
Reference	On
Make-up	On

Constant Temperature

DETECTOR (TCD)	
Filament power	Off
Fil status (not rdy)	
Block temp	200 200
Trans temp	200 200
Cost fill temp?	No
Fil volts (--)	10
Fil temp limit	350
Reference	On
Make-up	On

Constant Voltage

For TCD, turn off FILAMENT POWER, BLOCK TEMP, TRANS TEMP, AND FILL TEMP. Ensure that 'Make-up' is still On.

DETECTOR (FID)	
Flame	Off
Temp	200 200
Signal pA	(10.0)
Ing. Thresh.	2.0
Flameout retry	Off
H2	On
Air	On
Make-up	Off

For FID, turn off FLAME, TEMP, H2, AND AIR. Ensure 'Make-up' is still On.



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Step 2: Cool Down and Vent Mass Spec

DSQ Series

Reference: DSQ II Hardware Manual – Section “Operating Instructions” sub-section “Shutting Down”

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Cool Down and Vent DSQ Mass Spec

2. Shut down the *DSQ II*.

- a. From the Instrument Setup window, click **Tune** to display the Tune window.
- b. Choose **Instrument | Shutdown** to start the automatic shutdown procedure:
 - *Xcalibur* Shut Down screen displays
 - Calibration Gas and CI Reagent Gas are turned off
 - Voltages are turned off to the Ion Source, Quadrupole, and Ion Detector Assembly
 - Ion Source heater turns off
 - Turbomolecular Pump turns off
 - *Xcalibur* counts down ten minutes for the pump to slow down
 - *Xcalibur* waits for the Ion Source to cool to < 175 °C to prevent oxidizing the hot parts when they are exposed to air
- c. Wait for the Transfer Line to cool to < 175 °C.



Typically controlled through GC when installed on a DSQ System

Cool Down and Vent DSQ Mass Spec Continued

3. Turn the *DSQ II* off.
 - a. Look for a screen to display that it is okay to turn off the main power to the *DSQ II*.
 - b. Click OK.

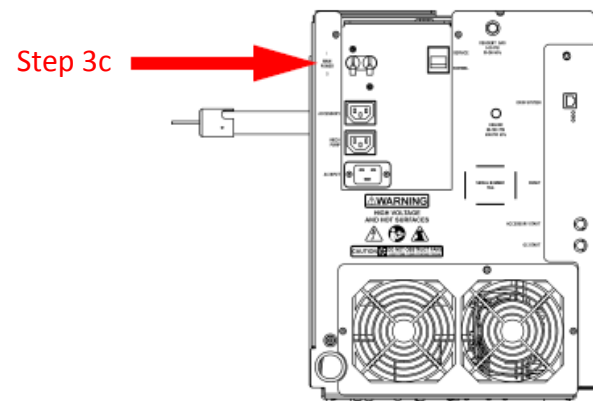


Figure 1-5. Main Circuit Breaker (Rear)

- c. Switch the Main Circuit Breaker to **OFF** (0). This turns off the Rotary-Vane Pump. Approximately three seconds later, the vent valve opens and the vacuum manifold vents to atmospheric pressure. This takes approximately three to four minutes.
 - d. Unplug the *DSQ II* power cord.
- 4: If present, turn Off any Auxiliary gas being delivered to the Mass Spec directly at the Tank or Gas Manifold

Optional

5: Remove Column from Transfer Line and block off with No-Hole Ferrule

Ferrule 1/16-in. No Hole Graphite/Vespel (76458-2009)



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Step 2: Cool Down and Vent Mass Spec

ISQ / TSQ Series

Reference: ISQ Series Hardware Manual – Section “Performing Routine Maintenance” sub-section “Powering off the ISQ Series Mass Spectrometer”

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ISQ Dashboard

Auto Tune
View Tune Report
Tune Types
Air & Water / Tune
Instrument Control
Shut Down

Status Analyzer Power Maintenance

Status: Idle

	Actual	Set-Point
MS transfer line temp.:	114 °C	150 °C
Ion source temp.:	114 °C	150 °C
Vacuum:	OK	
Foreline pressure:	126 mTorr	
Ion gauge pressure:	2.8×10 ⁻⁵ Torr	
Turbo-pump speed:	100 %	
CI reagent gas flow:	0.0 mL/min	0.0 mL/min

1: In the ISQ or TSQ Dashboard, select "Shut Down".

2: A window will pop up asking if you would like to cool the temperature zones before shutting down. Select "Yes".

TSQ Series

Shutting down the instrument will turn off all devices and cool down all temperature zones.

Is this what you want to do?

Yes No

3: The Status will change to "Shutting Down". At this point, the Turbo-pump speed will begin to slow.

Status Analyzer Power Maintenance

TSQ Duo

Status: Shutting down

	Actual	Set-Point
MS transfer line temp.:	156 °C	230 °C
Ion source temp.:	225 °C	310 °C
Vacuum:	Not Ready	
Foreline pressure:	2037 mTorr	
Ion gauge pressure:	Gauge not turned on	
Turbo-pump speed:	55 %	
Collision gas on:	No	
CI reagent gas flow:	0.0 mL/min	0.0 mL/min

Instrument Control Start Up

Cool Down and Vent ISQ / TSQ Mass Spec Continued

4: When the turbo-pump speed reaches 50%, the Status will change to "Shut Down"

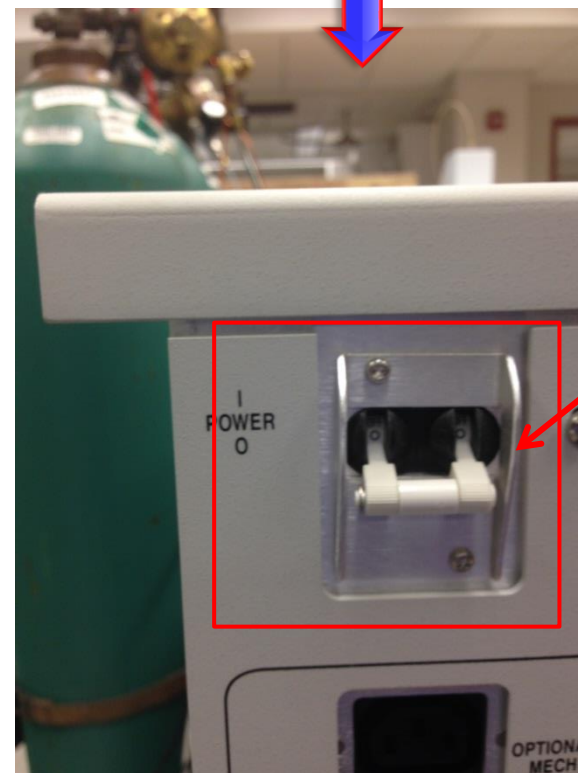


The screenshot shows the 'Status' tab of the 'TSQ Duo' software. The 'Status' field is highlighted with a red box and contains the text 'Shut down'. Below this, a table displays various instrument parameters:

	Actual	Set-Point
MS transfer line temp.:	152 °C	230 °C
Ion source temp.:	222 °C	310 °C
Vacuum:	Not Ready	
Foreline pressure:	2942 mTorr	
Ion gauge pressure:	Gauge not turned on	
Turbo-pump speed:	50 %	
Collision gas on:	No	
CI reagent gas flow:	0.0 mL/min	0.0 mL/min

At the bottom of the interface, there are two buttons: 'Instrument Control' and 'Start Up'.

5: At this point in time, you can flip the Power Break Switch on the back of the Mass Spec to the "Off" position. This will completely shut off the Mass Spec and the rough pump attached to it. Exit out of the ISQ or TSQ Dashboard.



In "Off" Position

Cool Down and Vent ISQ / TSQ Mass Spec Continued

6: Allow the Mass Spec to continue spinning down for approximately 5 minutes.

If you do not intend to remove your column from the transfer line, the best course of action is to leave the vent valve closed and let the vacuum dissipate naturally. Proceed to Step 10 at this point. **

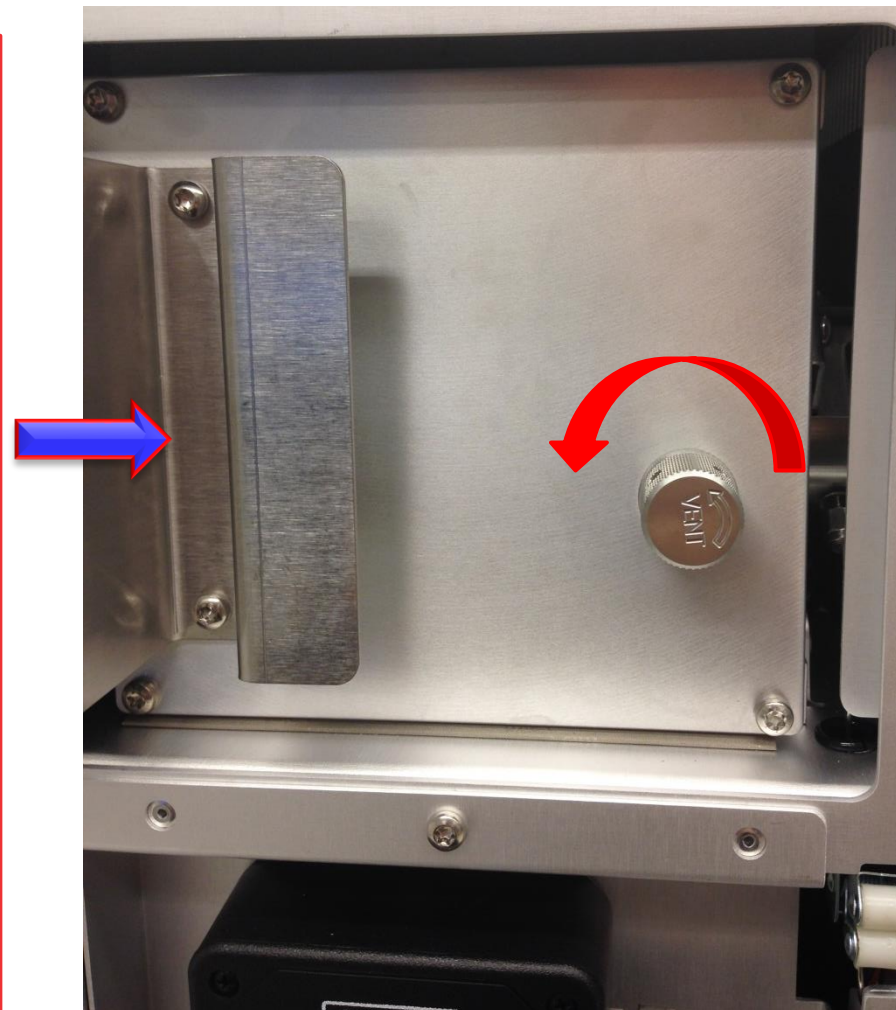
7: After 5 minutes, you can open the vent valve on the front of the Mass Spec (turn counter clockwise) and allow the vacuum to dissipate for another 5 minutes.

8: Once the system is completely vented, you can now remove the column from the transfer line and cap it with a No-Hole Ferrule (See next slide for Part Number).

9: Close the vent valve (turn clockwise).

10: Unplug the power cable to the ISQ / TSQ

11: Turn off any Auxiliary gas being delivered to the Mass Spec. This is done directly at the Tank / Gas manifold



**** Removing the column from the transfer line is optional during a shut down. While ideal, it's not absolutely necessary.**

Cool Down and Vent ISQ / TSQ Mass Spec Continued

No-hole ferrules are also known as Blind ferrules or Blank ferrules. They are solid all the way through and serve the purpose of blocking off the Mass Spec so no dust / atmosphere can get in while the system is shut down. These ferrules are installed on the transfer line with the same nut you would use if a column was present.

No-Hole Graphite Vespel Ferrule	Quantity: Pkg of 10
---------------------------------	---------------------



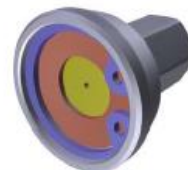
Thermo Scientific Part Number	1R76458-2009
-------------------------------	--------------

Nickel-Coated Nut for Graphite Vespel Ferrules	Quantity: Pkg of 5
--	--------------------



Thermo Scientific Part Number	1R76256-0060
-------------------------------	--------------

Spring-loaded Transfer Line Nut	Quantity: Each
---------------------------------	----------------



Thermo Scientific Part Number	1R120434-0010
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Step 2: Cool Down and Vent Mass Spec

Q Exactive GC

Reference: Q Exactive GC Operating Manual – Section “Operation” sub-section “Shutting Down the System”

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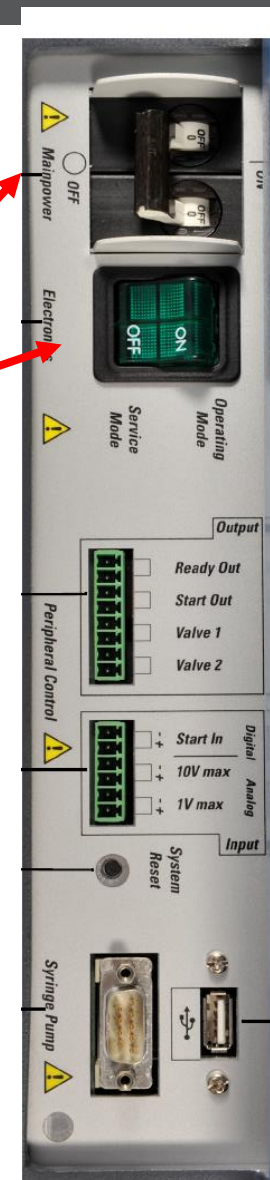
Cool Down and Vent QE GC Mass Spec

❖ To shut down the Q Exactive GC or Exactive GC system

1. Wait until data acquisition, if any, is complete.
2. Set heated zones to room temperature on the GC transfer line and the MS transfer line.
3. In the Tune software window, click the **On/Standby** button to put the instrument in Off condition. (See image in margin.) All high voltages are shut off, as is the C-Trap and HCD gas.
4. Place the electronics service switch, located on the power panel (See [Figure 3-5](#) on [page 3-9](#).), in the Service Mode position.
5. Put the main power circuit breaker switch of the mass spectrometer in the Off position.

▲ WARNING **High Voltage.** Hazardous electric voltage capable of causing an electric shock is used in the instrument. To ensure that the instrument is free from all electric current, always disconnect the power cords of *mass spectrometer and forepump*.

NOTICE An instrument that is shut down still consumes nitrogen because the vent valve is connected to the nitrogen supply of the laboratory. Keeping the nitrogen flow on prevents humidity from contaminating the vacuum system of the mass spectrometer. You may however switch off the nitrogen if your supply is limited. ▲





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Step 2: Cool Down and Vent Mass Spec

TSQ Quantum GC

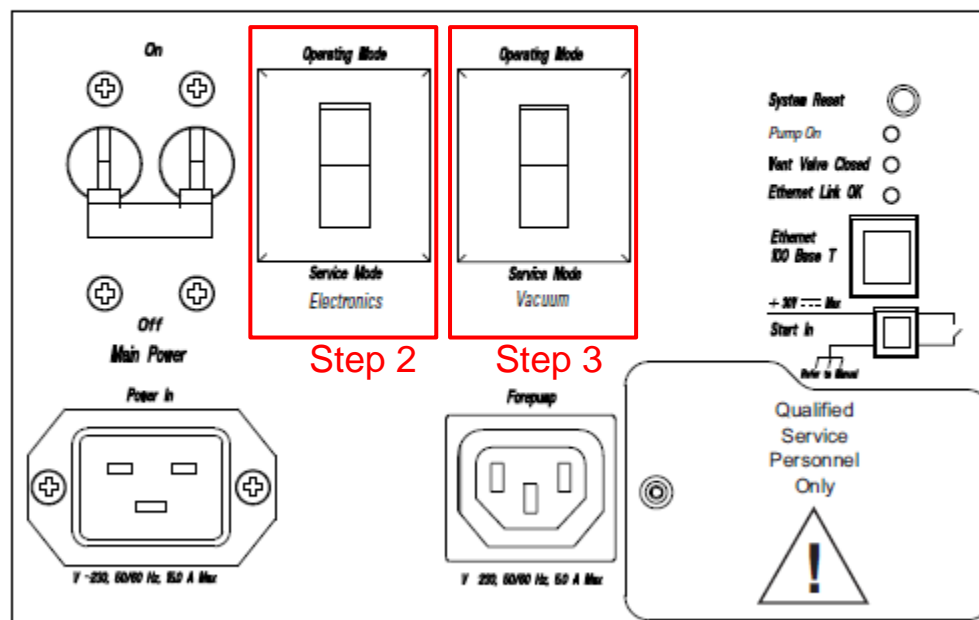
Reference: TSQ Quantum XLS Users Manual – Section “System Shutdown, Startup, and Reset” sub-section “Shutting Down the System Completely”

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Cool Down and Vent TSQ Quantum GC Mass Spec

- 1: From the TSQ EZ Tune window, choose **Control > Standby** (or click the **On/Standby** button) to put the mass spectrometer in standby.
- 2: Place the electronics service switch, located on the right-side power panel, in the Service Mode.

Figure 31. Right-side power panel of the mass spectrometer



- 3: Place the vacuum service switch, located on the right-side power panel, in the Service Mode position.

Cool Down and Vent TSQ Quantum GC Mass Spec Continued

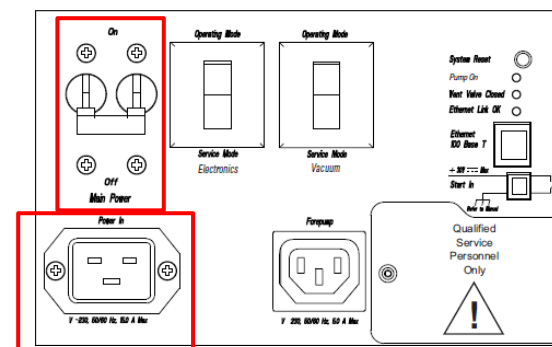
- 4: Place the mass spectrometer main power circuit breaker switch, located on the right-side power panel, in the Off position. When you place the main power circuit breaker switch in the Off position, the following occurs:
- All power to the mass spectrometer is turned off. (All LEDs on the front panel of the mass spectrometer are off.)
 - A capacitor on the Vent Delay PCB provides power to the vent valve for two to four minutes (to allow the turbomolecular pump to spin down). After the capacitor discharges, power to the vent valve solenoid shuts off. When power to the vent valve solenoid shuts off, the vent valve opens and the vacuum manifold vents with nitrogen, if you have a nitrogen cylinder connected, or else with filtered air.
 - After about two minutes, the pressure of the vacuum manifold reaches atmospheric pressure.
- 5: Unplug the power cord for the mass spectrometer.

CAUTION Allow heated components to cool before servicing them.

- 6: Press the System Power Off button (Figure 29) to remove all power from the TSQ Quantum XLS or TSQ Quantum GC system.
- 7: If you do not plan to use the system for an extended period, turn off the argon collision gas supply at the tank.

Step 4

Figure 31. Right-side power panel of the mass spectrometer



Step 5

Figure 29. System Power Off button on the front of the electronics module



Step 6

System Power Off button



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Step 3: Turn Off Autosampler

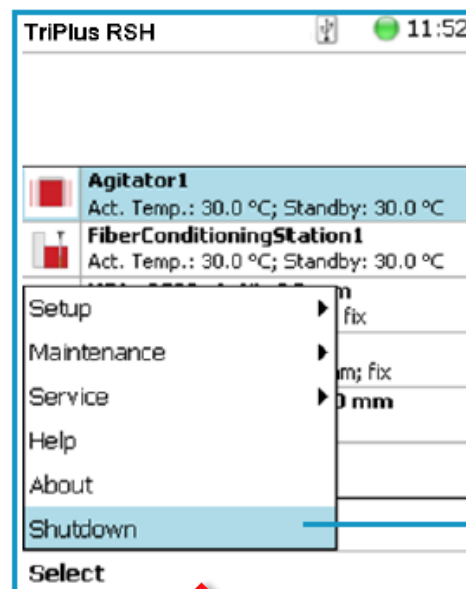
TriPlus RSH / TriPlus 100LS

Reference: TriPlus RSH User Guide – Section “TriPlus RSH Basic Information” sub-section “Shutdown Menu Item”

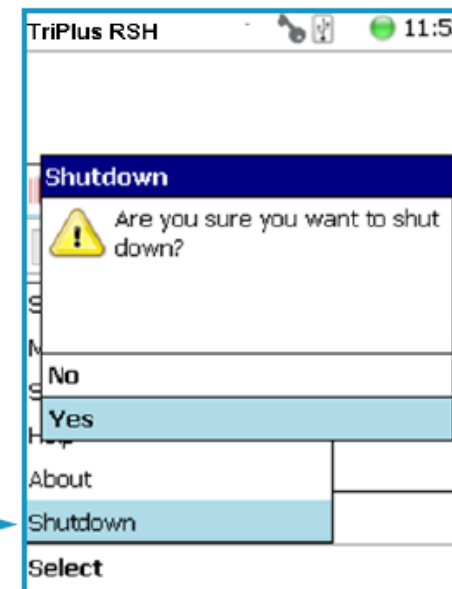
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Turn Off TriPlus RSH / 100LS - Automatically

- The following steps are automatically performed during a controlled Shutdown:
 - The Head moves to an empty position of the Automatic Tool Changing Station, engages and remains in this position.
 - If the Tool Release station is part of the TriPlus RSH configuration, the Head moves to the single slot.
 - The software shuts down, closes the application and disables the axes.



1: On your TriPlus RSH handheld or Virtual Terminal, choose 'Select' on the Main Menu. **



2: In the sub Menu that pops up, select 'Shutdown'. Another window will pop up asking if you are sure you want to shut down. Select 'Yes'

**** Chromeleon Virtual Terminal Access – In Chromeleon Console go to Instrument Category and select the TriPlus instrument tab. From there select 'More' and then 'Show Virtual Terminal'**

**** Xcalibur / TraceFinder Virtual Terminal Access – In Xcalibur Console go to Status tab and select the TriPlus. At the bottom of the Status pane the TriPlus options will be displayed. Select 'Virtual Terminal' from here.**

Turn Off TriPlus RSH / 100LS - Automatically Continued

Once the Tool is Parked (TriPlus RSH) you can now shut down the Autosampler

1. Switch Off the power module that supplies the instrument, then disconnect the power cable.
2. Disconnect the cable from the connector marked **Power** at the backside of the TriPlus RSH.

TriPlus 100LS Note

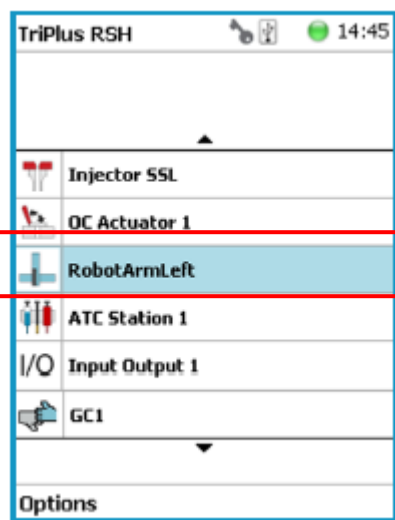
Please keep in mind that with a TriPlus 100LS, your Z head will still release the motors when powering off. It is suggested the stay near your instrument while this is happening so you can watch the Z head release and ensure that the syringe is gently resting in the bottom position

TriPlus RSH Headspace / SMPE Note

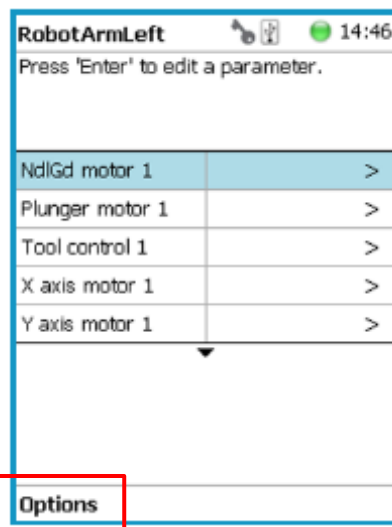
If you are running Headspace or SPME, you can shut off the Purge Gas being delivered to the autosampler at this time

Turn Off TriPlus RSH / 100LS - Manually

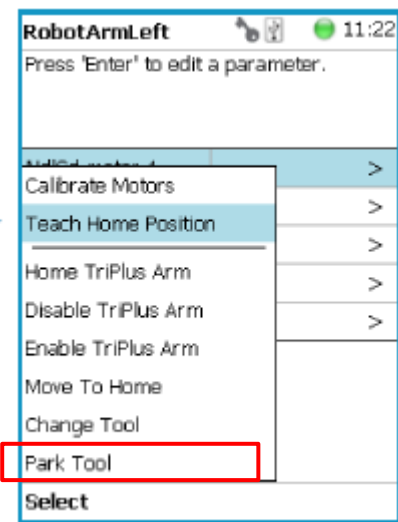
If you have a TriPlus RSH, it is suggested to Park your Tool before turning off the system. When you turn off the Power to your TriPlus RSH, the Z head will slowly start to lower it's arm as the motors are disengaged. If your Tool is still attached, there is a risk that the syringe will get bent if the Z head collides with an object while releasing the motors



1: On your TriPlus RSH handheld or Virtual Terminal, select RobotArmLeft



2: In the RobotArmLeft menu, select Options



3: In the Options menu select Park Tool

This Slide is not applicable for TriPlus 100LS System

Turn Off TriPlus RSH / 100LS - Manually Continued

Once the Tool is Parked (TriPlus RSH) you can now shut down the Autosampler

1. Switch Off the power module that supplies the instrument, then disconnect the power cable.
2. Disconnect the cable from the connector marked **Power** at the backside of the TriPlus RSH.

TriPlus 100LS Note

Please keep in mind that with a TriPlus 100LS, your Z head will still release the motors when powering off. It is suggested the stay near your instrument while this is happening so you can watch the Z head release and ensure that the syringe is gently resting in the bottom position

TriPlus RSH Headspace / SMPE Note

If you are running Headspace or SPME, you can shut off the Purge Gas being delivered to the autosampler at this time



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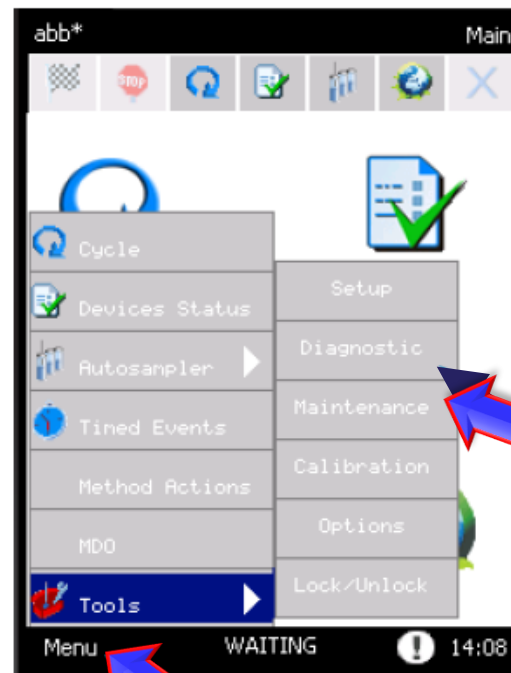
Step 3: Turn Off Autosampler

TriPlus 300HS

Reference: TriPlus 300 HS User Guide - Multiple sections combined to provide a comprehensive view of appropriate shut down procedures

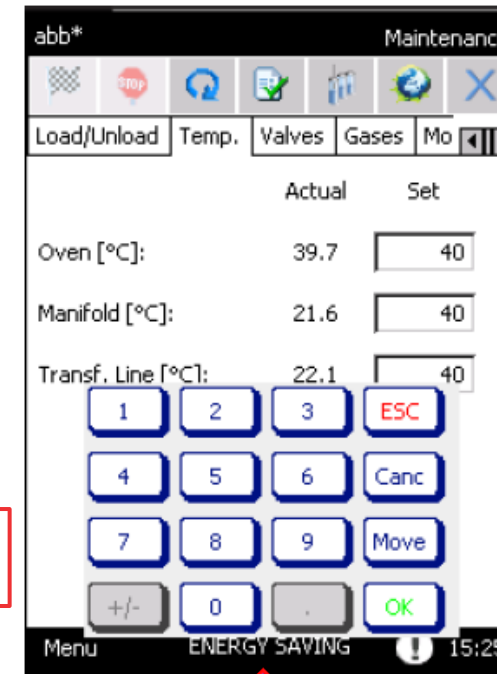
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Turn Off TriPlus 300HS



1: On your TriPlus 300HS User Interface, select 'Menu' and then 'Tools'

2: In the 'Tools' menu select 'Maintenance'

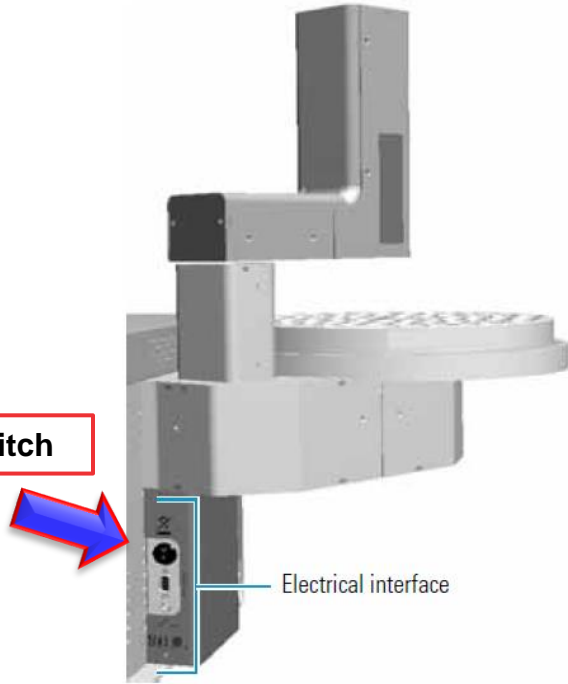


3: In the 'Temp' tab, set all the Temps to 35°C

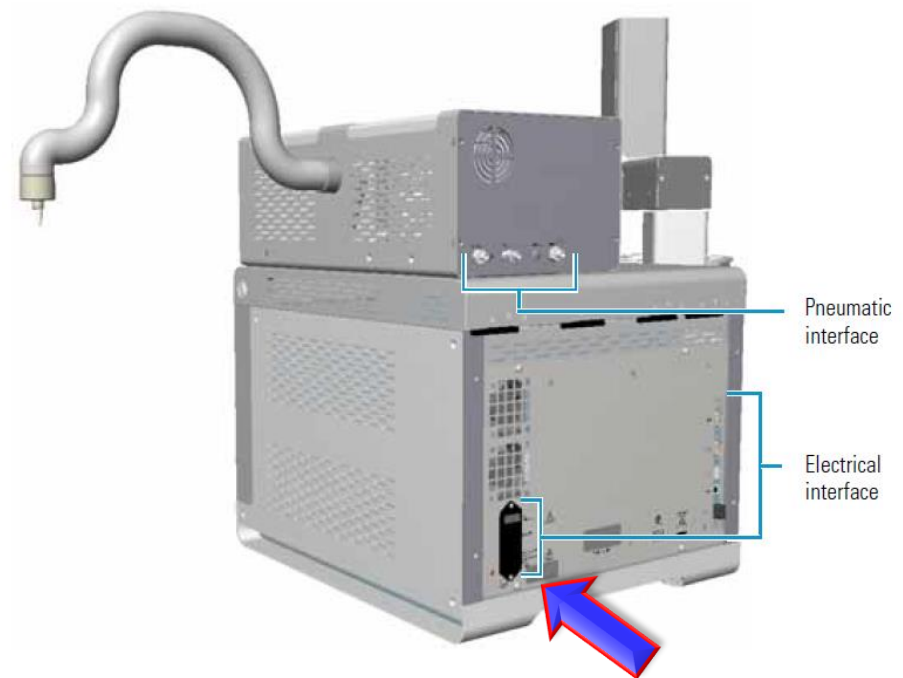
Turn Off TriPlus 300HS Continued

4: Once cooled you can switch the Autosampler Off and the Main Unit Off. Unplug Power Cable once powered Off.

Autosampler Arm Power Switch



Main Unit Power Switch





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Step 3: Turn Off Autosampler

TriPlus 500HS

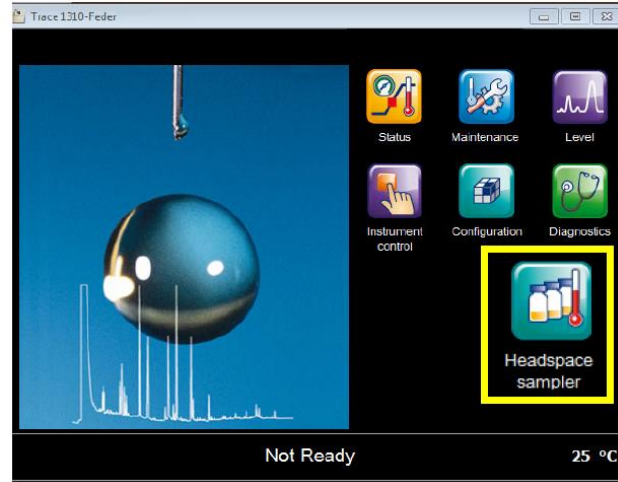
Reference: TriPlus 500 HS User Guide - Multiple sections combined to provide a comprehensive view of appropriate shut down procedures

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Turn Off TriPlus 500HS – Option 1 through Trace 1310 Touch Screen

Option 1: Cool down the 500HS Heated Zones through Trace 1310 Touch Screen. You can either set them to OFF or change their temperature to 35°C

1: Select Headspace Sampler from Main Menu



2: Select Instrument Control



	Actual	Setpoint
Vial Volume	20/22ml	
Incubator temp.	25	Off
Incubation time	15.0	
Shaking mode	Off	

	Actual	Setpoint
Press. mode		Pressure
Vial pressure (kPa)	100.0	
Vial pressurization time	1.00	
Vial pressurization rate	30.0	
Vial press. equil. time	0.20	
Loop pressure (kPa)	50.0	
Loop press. equil. time	1.0	
Loop/Valve temp.	25	Off

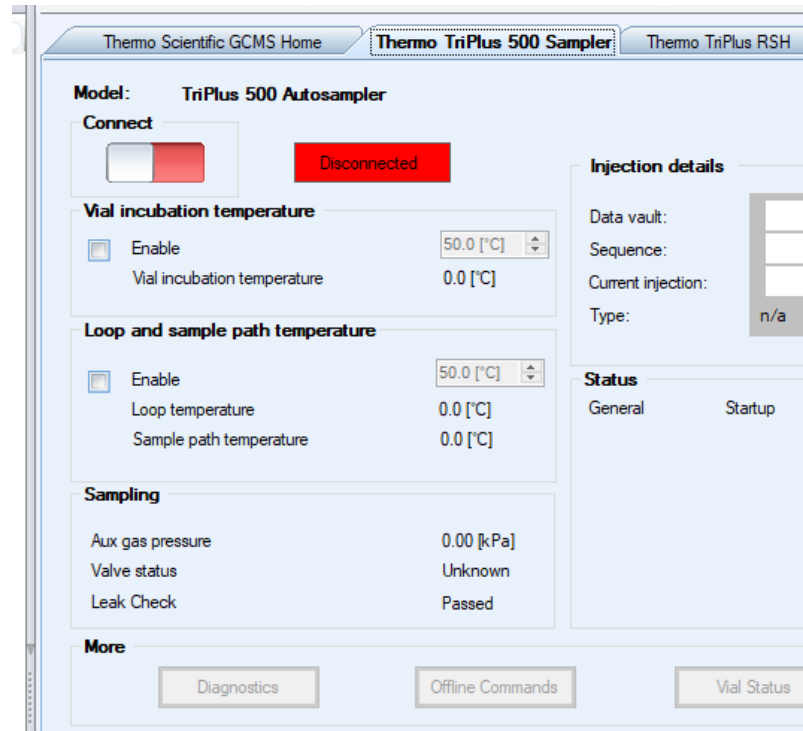
	Actual	Setpoint
Injection mode		Standard
Injection time	0.5	
Additional injections	1	
Enrichment time	10.0	
Vial venting enabled	On	
Needle purge level	2	
Needle purge time	1.0	
Constant purge	On	

3: Change Incubator and Loop/Valve temp to Off or 35C

Turn Off TriPlus 500HS – Option 2 through Chromeleon

Option 2: Cool down the 500HS Heated Zones through your Chromeleon software. You can either set them to OFF to change their temperature to 35°C

1: With your instrument 'Connected' you can Enable the Vial Incubation Temperature and Loop / Sample Path Temperature. Change these to 35°C or OFF



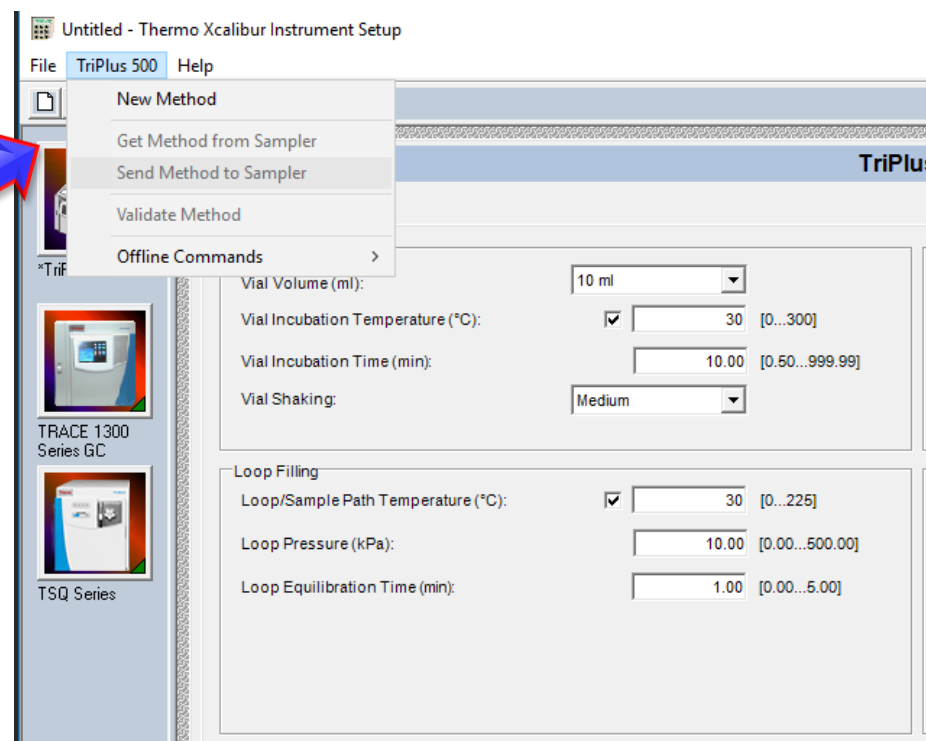
This image is just for software navigation purposes and does not reflect a connected system with temperatures turned on

Turn Off TriPlus 500HS – Option 3 through Xcalibur / TraceFinder

Option 3: Cool down the 500HS Heated Zones through Xcalibur / TraceFinder Instrument Setup. You can either set them to OFF to change their temperature to 35°C.

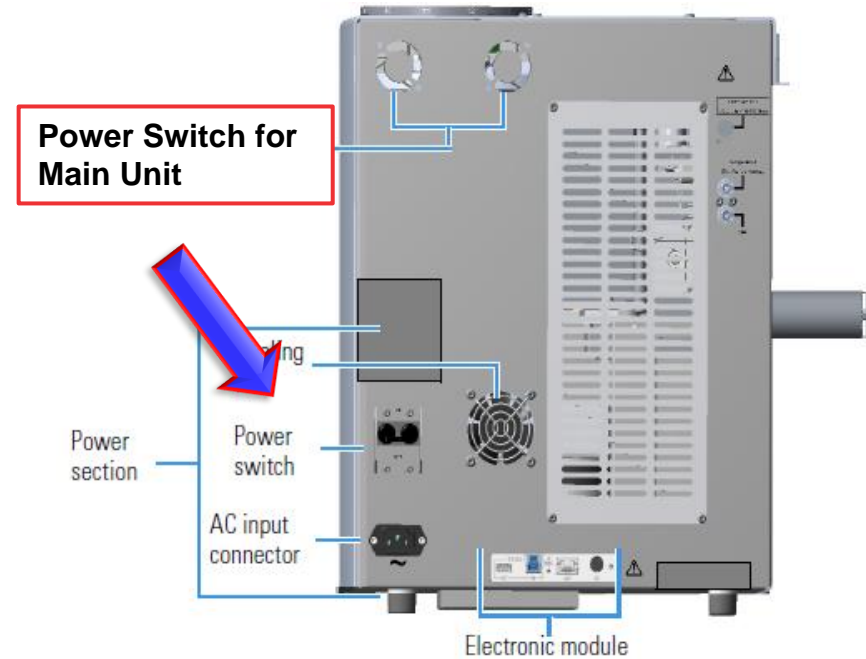
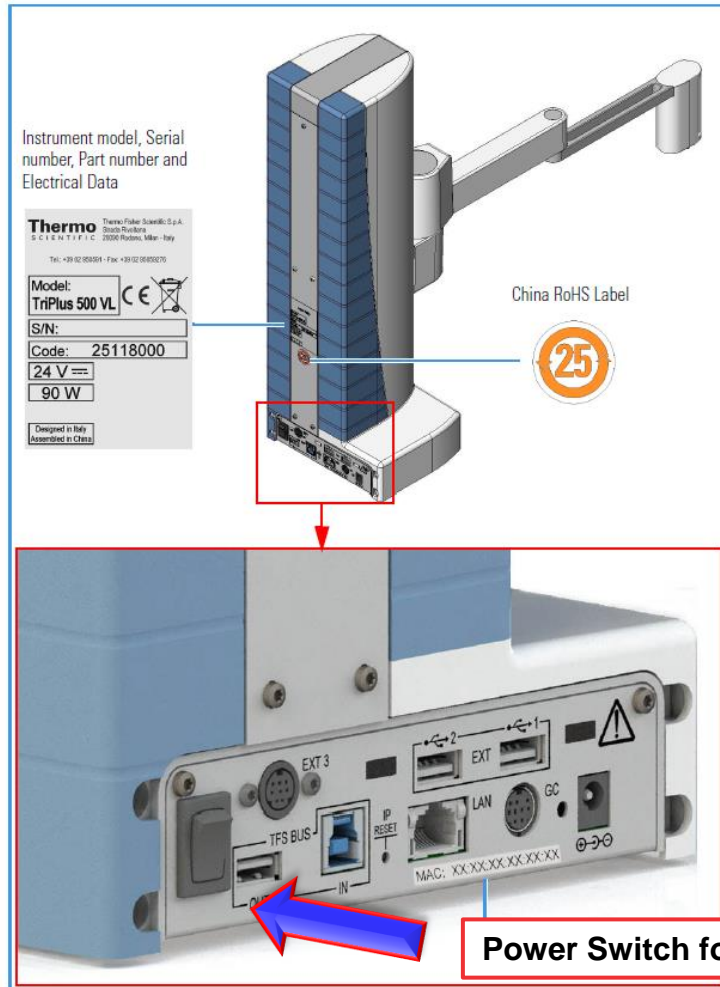
1: Open Xcalibur and select 'Instrument Setup'. Select TriPlus 500HS on the left navigation pane. Enable temperatures for Incubation and Loop / Sample Temp and either set to OFF or 35C

2: Once you have changed the temperatures, go to the Toolbar and select 'TriPlus 500' and then 'Send Method to Sampler'



Turn Off TriPlus 500HS Continued

Once cooled, turn off the Power to the Arm and the Main Unit. Unplug the Power Cables. Shut off Auxiliary Gas at Tank





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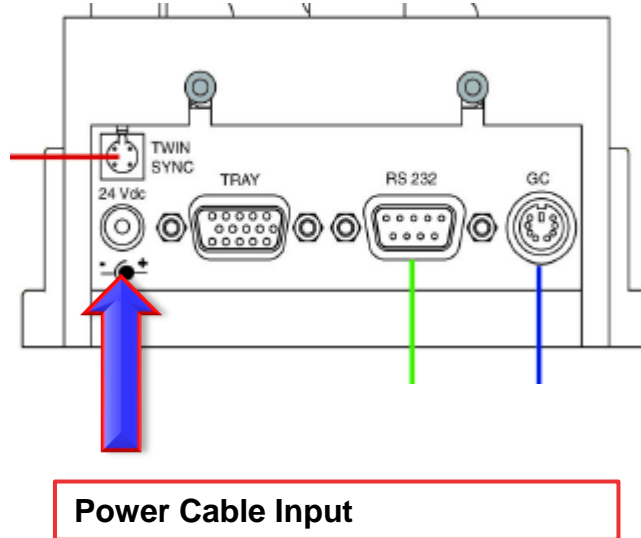
Step 3: Turn Off Autosampler

AI 1310

Reference: AI/AS 1310 User Manual

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1. Unplug the Vdc power cable of the external portable power supply from the jack marked **24 Vdc** located on the sampling unit back side.





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Step 3: Turn Off Autosampler

TriPlus Classic

Reference: TriPlus Operating Manual - Multiple sections combined to provide a comprehensive view of appropriate shut down procedures

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Turn Off TriPlus Classic

1. Switch Off the power module that supplies the instrument, then disconnect the power cable.
2. Disconnect the 25-pin cable form the connector marked POWER SUPPLY located on the rear panel of the power module.
- 3: Shut off any Purge Gas being delivered to the Autosampler at the tank

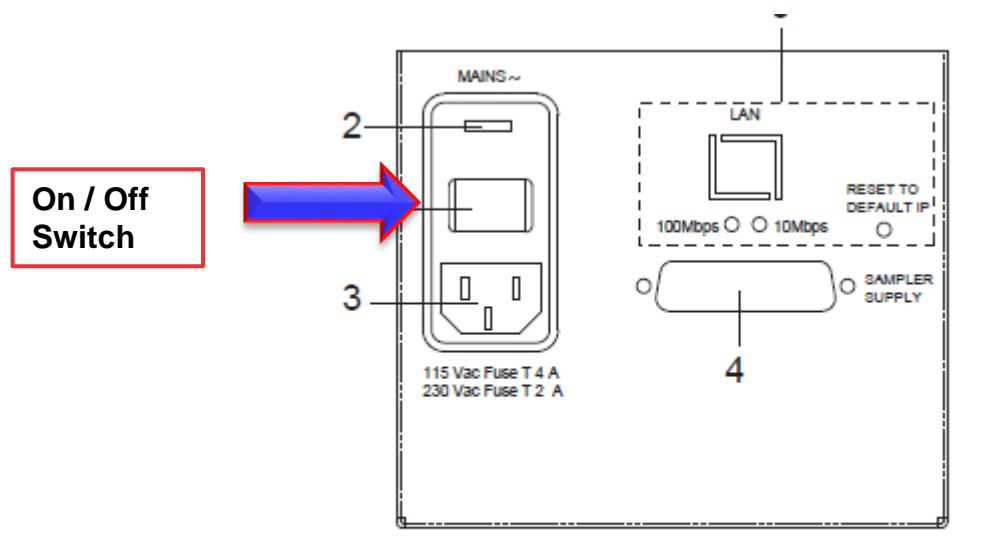


Figure 2-45. Power Module Rear Panel



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Step 4: Turn Off GC and Gases

Trace 1300 / Trace 1310 Series

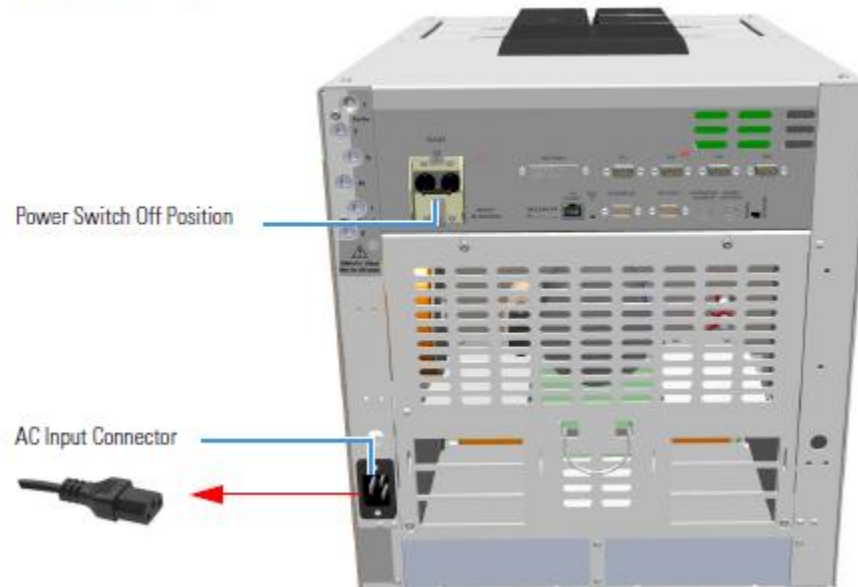
Reference: Trace 1300 Series GC Hardware Manual - Section “Performing Routine Maintenance” and sub-section “Shutting Down the Trace 1300/Trace1310”

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Turn Off Trace 1310 and Gas Supply

1: After you have confirmed that all inlets / detectors are cool and the Mass Spec is vented (if you have one present), you can Power Off the Trace 1310 by pushing down the power switch / breaker, located on the back of the instrument to the Off position (labeled O) . Unplug the Power Cable.




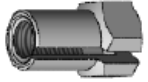
Figure 76. GC Power Off



**2: Turn off all Gas Supplies at the source (tank, manifold, etc).
3: If external modules are present, unplug the power cables.
4: If you have decided to remove the column from the Inlet / Detectors, remove them now and make sure you block off each detector with a No-Hole Ferrule (See next slide for Part Numbers)**

Trace 1310 Detector No-Hole Ferrules

No-hole ferrules are also known as Blind ferrules / Blanking disks. They are solid all the way through and serve the purpose of blocking off the detector / inlet so no dust / atmosphere can get in while the system is shut down. These ferrules are installed with the detector / inlet nut as you typically would if a column was present.

Blind Ferrule for SSL, SSLBKF, FID, ECD, NPD, TCD, and FPD		Each	29003421
Blind Ferrule for PTV, and PTVBKF		Each	29003419
Retaining Nut, Hexagonal, 1/4-in. (M6)		Pkg of 5	35050458
Split Retaining Nut (M4)		Pkg of 5	35053221



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Step 4: Turn Off GC and Gases

Trace GC Ultra Series

Reference: Trace GC Ultra Maintenance Manual – Multiple sections combined to provide a comprehensive view of appropriate shut down procedures

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Turn Off Trace GC Ultra and Gases

1: Once the Mass Spec is vented (if present) and all the GC inlets / detectors cooled, you can turn off the main Power to the GC and unplug the power cable.

- **If you chose to remove the column from the Mass Spec, please remove the column from the Inlets on the GC and cap the Inlet with a No-Hole ferrule.**
- **If you do not have a Mass Spec present and would still like to remove the column from your Detectors (FID, TCD, etc), remove the column now and block off each Inlet / Detector with a No-hole ferrule (also known as blind ferrule or blanking disk)**

2: Turn off the Gas being delivered to the GC / Mass Spec / Autosampler by closing the Gas Tanks

SSL, PTV, Most Detector Base
Bodies

Blanking disk for leak test	10	29032655
Fixing nut for column	5	35032423

Please refer to respective
Spare Parts Catalog for
compatible parts



Step 4: Turn Off GC and Gases

Focus GC Series

Reference: Focus GC Instruction Manual – Multiple sections combined to provide a comprehensive view of appropriate shut down procedures

Turn Off Focus GC and Gases

1: Once the Mass Spec is vented (if present) and all the GC inlets / detectors cooled, you can turn off the main Power to the GC and unplug the power cable.

- If you chose to remove the column from the Mass Spec, please remove the column from the Inlets on the GC and cap the Inlet with a No-Hole ferrule.
- If you do not have a Mass Spec present and would still like to remove the column from your Detectors (FID, TCD, etc), remove the column now and block off each Inlet / Detector with a No-hole ferrule (also known as blind ferrule or blanking disk)

2: Turn off the Gas being delivered to the GC / Mass Spec / Autosampler by closing the Gas Tanks



**On / Off
Switch**

SSL, PTV, Most Detector Base
Bodies

Blanking disk for leak test	10	29032655
Fixing nut for column	5	35032423

Please refer to respective
Spare Parts Catalog for
compatible parts

Additional Resources

- GC / GCMS Manuals
 - <https://gcgcms.freshdesk.com/support/solutions>
- Knowledge Base Articles
 - <https://kb.unitylabservices.com/>
- GC / GCMS Training Videos
 - <https://www.youtube.com/watch?v=At1Nv8vJpzY&list=PLhyY22T7hwebjNJboAG3fQE82ER9Xu2zB>
- Restek Comments on Column Storage
 - <https://blog.restek.com/how-should-i-store-my-gc-column/>

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supporting the global business of science



Questions?

**Please call Technical Support at 1-800-532-4752
Select Option 2 for Technical Support and then Option 1 for GC / GCMS**

Thank You!