Agilent 7667A

Mini Thermal Desorber

Installation and Operation

Agilent Technologies

Notices

© Agilent Technologies, Inc. 2012

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Agilent Technologies, Inc.as governed by the U.S. and international copyright laws.

Manual Part Number

G4370-90030

Edition

Second Revision, October 2013
Printed in China

Agilent Technologies (Shanghai) Co., Ltd., No. 412 Yinglun Road, Waigaoqiao Free Trade Zone, Pudong New Area, Shanghai
Tel: (800)820 3278

Warranty

The material contained in this document is provided "as is," and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein. Should Agilent and the user have singed a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement shall control.

Safety Notices

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Content

1. Getting Started
    - 7667A Mini Thermal Desorber Introduction 7
    - Be Familiar with the Mini Thermal Desorber 7
    - Working Principle of the Mini Thermal Desorber (Mini TD) 9
    - Work Flow of G4370A 10
    - Work Flow of G4370M 15
2. Installation and Operation
    - Preparation Before Installation 21
        - Parts Required for Installation 21
        - Tools Required for Installation 25
        - Site Preparation and Confirmation 25
        - Update of the Version of GC Firmware 25
    - Install the G4370A 26
        - Prepare the Instrument 26
        - Install theStainless Steel Tube Seamless in the Transfer Line 27
        - Connect the Transfer Lines to the 7820A GC Split/Splitless Inlets 30
        - Connect the Cables and Gas Lines 32
        - Restore the 7820A GC to the Operable Conditions 32
    - Install the G4370M 33
        - Prepare the Instrument 33
        - Install the G4370M on the 5975T LTM GC/MSD 33
        - Connect the Cables and Gas Lines 35
        - Restore the 5975T LTM GC/MSD System to the Operable Conditions 36
    - Replace the Desorption Tube 37
        - Install the Desorption Tube 37
        - Remove the Desorption Tube 39
    - Schematic Diagram of Connection with Other Agilent Gas-phase Products 39
    - 7667A Control Panel Operation 40
        - Power Switch and Status Indicators 41
        - Run Keys 41
        - Menu Key, Cancel Key and Dial 42

Status 43
To create a method 44
To Configure the Carrier Gas Type 47
To Load/save a method 48
Log 49
3. First Start
Materials Required 51
Conditioning Desorption Tube 51
Set the Checkout Method 51
Prepare the Checkout Samples 53
Run the Checkout Method 54
Compare the Checkout Results 54
4. Software Operation Guide
Preparation Before Start 56
ChemStation/Ezchrom Operation 56
Start Online Instrument 56
Gas Type Configuration 57
Parameter Settings 58
Create the Method 61
Save the Method 62
Run the Method 63
Create the Sequence 64
Save the Sequence 65
Run the Sequence 65
MassHunter Operation 66
Start Online Instrument 66
Gas Type Configuration 66
Parameter Settings 67
Create/Save the Method 67
Run the Method 67
Create the Sequence 68
Save the Sequence 69
Run the Sequence 69
Online Help Information 70

5. Routine Maintenance
Consumables List 72
Update the Mini TD Firmware 72
Replace the Injection Needle Ass 73
Remove the Injection Needle Ass 73
Install the Injection Needle Ass 75
Replace the O-ring and the Filter 76
Replace the Trap(for G4370M) 79
Remove the Stainless Steel Tube Seamless from the Transfer Line 82
6. Troubleshooting
Symptom 1: Start failure 84
Symptom 2: The carrier gas flow does not reach the set point or is zero 84
Symptom 3: The chromatogram is not shown 84
Symptom 4: The chromatogram indicates a lot of impurities 85
Symptom 5: Gas leak 85
Symptom 6: Overloading 85
Error Messages 86
Appendix 87

1

Getting Started

7667A Mini Thermal Desorber Introduction 7
Be Familiar with the Mini Thermal Desorber 7
Working Principle of the Mini Thermal Desorber (Mini TD) 9
Work Flow of G4370A 10
Work Flow of G4370M 15

This section will help the user to understand the basic use and working principle of the 7667A Mini Thermal Desorber as well as the use range of two different types of instruments.

Agilent Technologies

7667A Mini Thermal Desorber Introduction

The 7667A Mini Thermal Desorber (herein-after referred to as "**Mini TD**") is a One-Stage thermal desorber that is characterized by the small size and low power consumption.

The 7667A includes two versions: **The Entry version**(G4370A) and **the Enhanced version** (G4370M).
The entry version (G4370A) does not include the sampling pump and is suitable for offline sampling. It is mainly used in conjunction with the 7820A GC.
The Enhanced version (G4370M) comes with a sampling pump. It supports online automatic acquisition of gas samples and is mainly used in conjuction with the 5975T LTM GC/MSD.

The above versions can also be used in conjuction with other Agilent Gas-phase products through a remote control interface.

Be familiar with the Mini Thermal Desorber

Figure 1 Front View of the Entry version Mini Thermal Desorber (G4370A)

Figure 2 Front View of the Enhanced version Mini Thermal Desorber (G4370M)

Working Principle of the Mini Thermal Desorber (Mini TD)

The Mini TD has three operation modes: online sampling mode, desorption mode and conditioning mode.

Online Sampling Mode: Available on the G4370M only. It integrates all of processes from sampling to post run process after desorbing, which consists leak detection, online sampling, dry purging, desorbing, injection and cleaning process. In sampling process, the sampling pump included in the desorber extracts the sample gas into the internal tubing of the Mini TD (G4370M), and some components of the sample are absorbed on the desorption tube. For the entry version G4370A, the sampling is indicated status “offline”.

Desorption Mode: In the desorbing mode, the Desorber will only execute desorbing related process, which consists leak detection, dry purging, desorbing, injection and cleaning process. The online sampling process will not be included.

Conditioning Mode: Conditioning is not a part of the sample desorbing process. After a long time running or multiple runs, the performance of the sorbent tube might be degraded. The moisture and residual contaminants in the desorber and the desorption tube need to be removed by a long time baking, so that they restore to a better state.

Work Flow Chart of G4370A

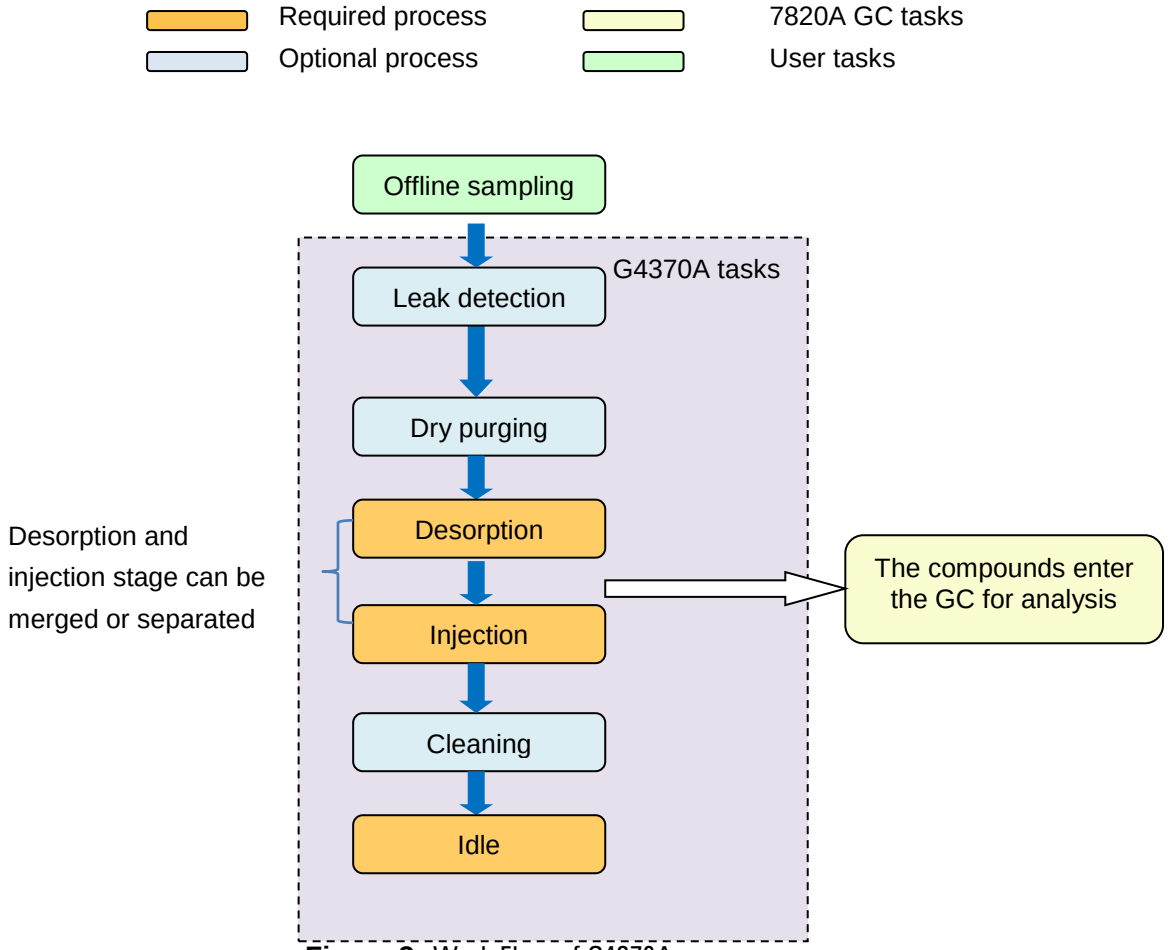


Figure 3 Work Flow of G4370A

Leak detection. For the entry version G4370A, it occurs before dry purging.

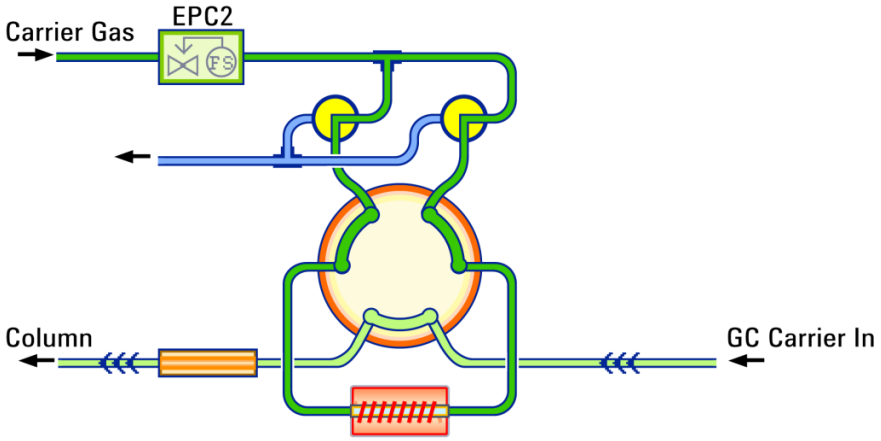


Figure 4 Schematic Diagram of Leak Detection, **G4370A**

Dry purging stage: The dry purging stage starts after the completion of leak detection (if the leak detection is turned on). In this process, the carrier gas will be purged into the tube, then the air and the moisture in the tube will be purged out, so that the desorption tube is in a relatively clean state before the desorption. Please specify the parameters as needed.

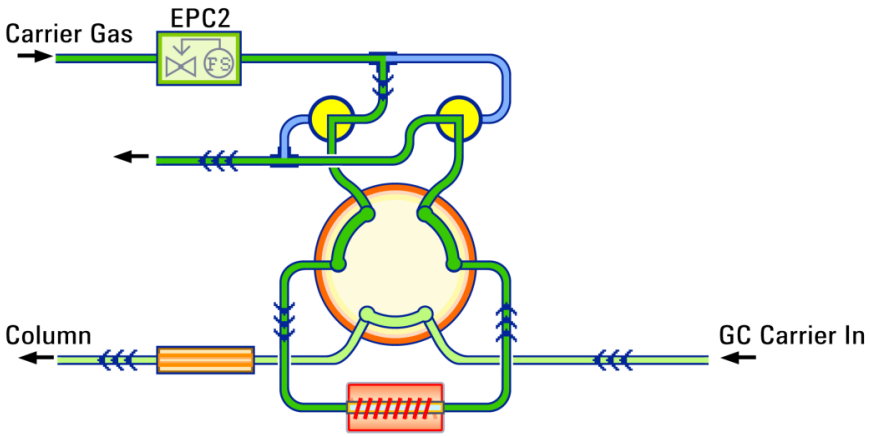


Figure 5 Schematic Diagram of Dry purging, **G4370A**

Desorbing & Injection stage; The user can select to separate or combine the desorbing process and injection process by enabling/disabling Start Injection Time through software interface or local control panel. When these two processes are separated: the Desorber will heat the desorption tube when the carrier flow is shut-off. Under this situation, the target components will be desorbed and sealed within the tube and wait for injection. In the following Injection process, the carrier flow from GC can take the desorbed components into the GC inlet more quickly and easily. As one of the important benefits, the peak width of components with lower boiling point will be dramatically decreased, that means the peak height & sensitivity will be increased. When these two processes are combined: the tube will start to be heated according to the predefined ramping rate, at the same time, the injection phase is started. The target components will be purged into GC inlet immediately as soon as they are desorbed. This desorbing method will have a positive influence on reducing carry-over for target components with higher boiling point.

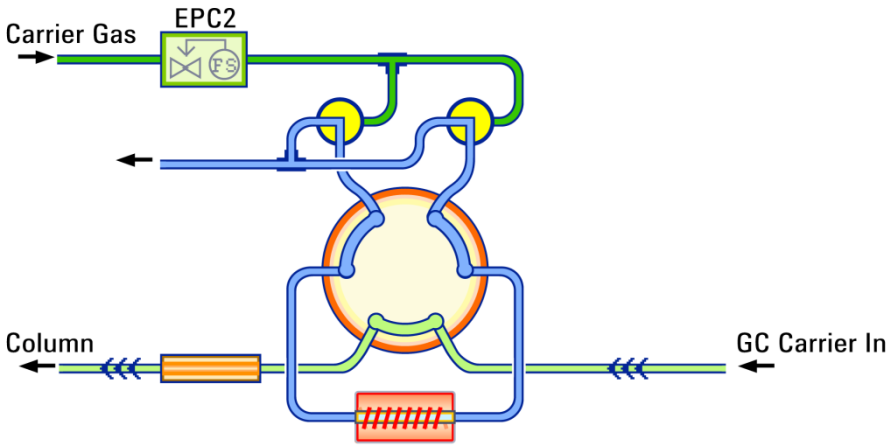


Figure 6 Schematic Diagram of Desorbing, **G4370A**

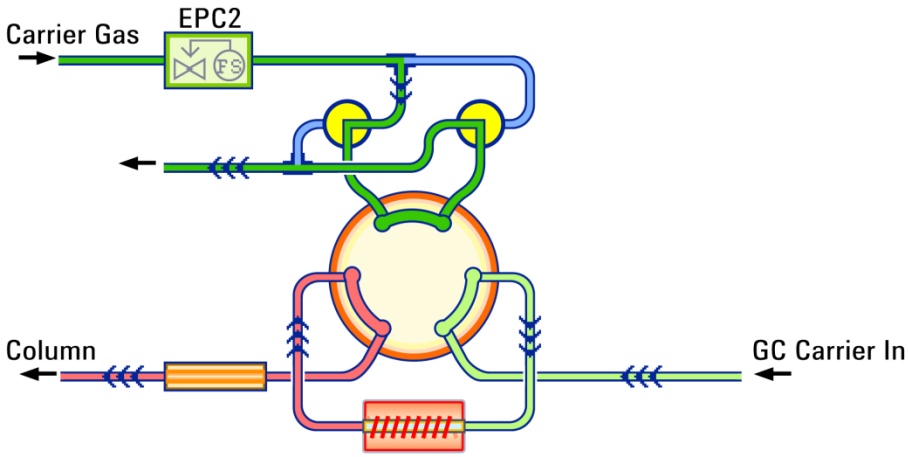


Figure 7 Schematic Diagram of Injection, **G4370A**

Cleaning stage: After the desorption stage, there may still be some residual sample remaining in the desorption tube. To ensure that the residue does not affect the subsequent desorption, the desorption tube needs to be cleaned with high temperature. Compared with the desorption stage, the cleaning stage should last longer (two to four minutes) and should be carried out with greater flow (150 to 200 mL/min) and at a very high temperature (320 °C or so, not exceeding the maximum temperature that can be used for the desorption tube. See the insturctions of the desorption tube for specific information).

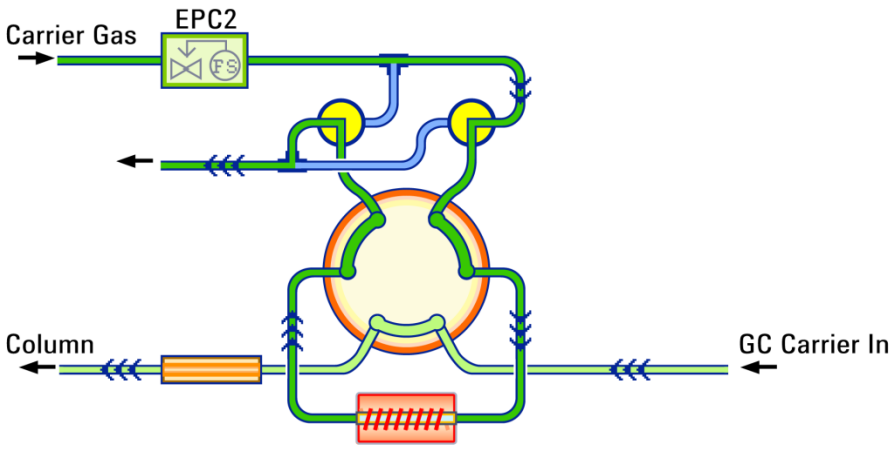


Figure 8 Schematic Diagram of Cleaning, **G4370A**

Idle Stage.

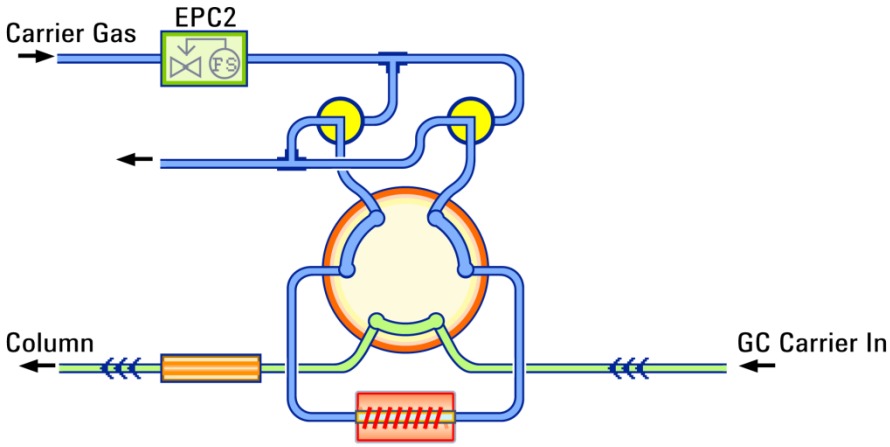


Figure 9 Schematic Diagram of Idle Stage, **G4370A**

Work Flow Chart of G4370M

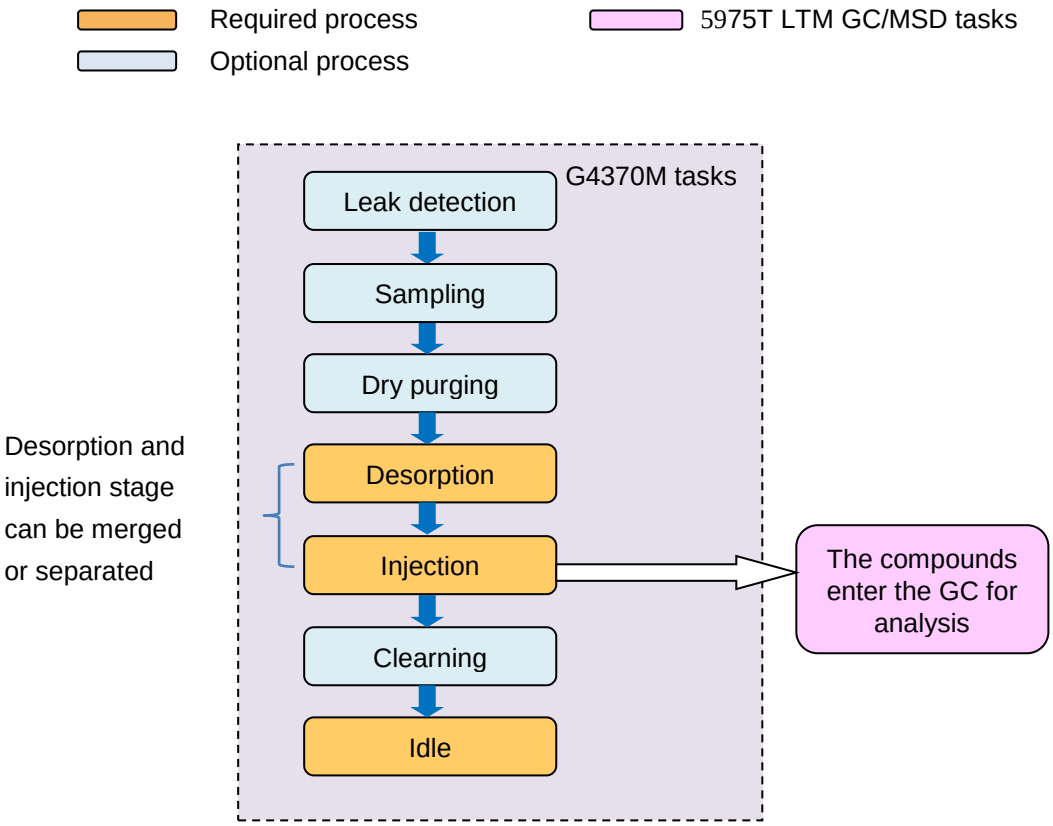


Figure 10 Work Flow of G4370M

Leak detection. For the Enhanced version G4370M, it occurs before sampling.

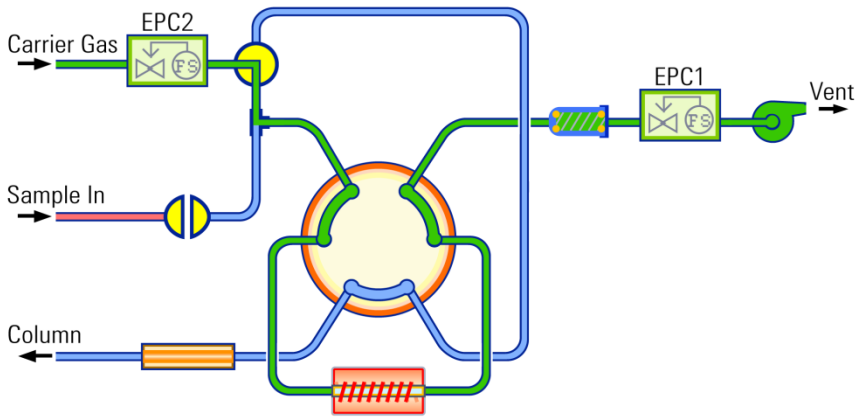


Figure 11 Schematic Diagram of Leak Detection, **G4370M**

Sampling stage: In sampling, the integrated pump will pump the gas sample into the tube and the target compounds will be absorbed by the tube. The sampling parameters are used to control the sampling duration and the speed of sampling. These parameters should be set based on the properties and quantity of the sample to be processed.

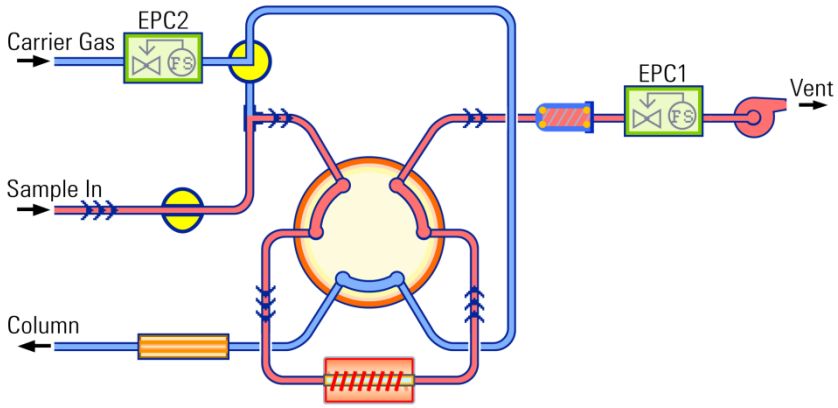


Figure 12 Schematic Diagram of Sampling Stage, **G4370M**

Dry purging stage: It starts after the completion of sampling and leak detection (if the leak detection is turned on). In this process, the carrier gas will be purged into the tube, then the air and the moisture in the tube will be purged out, so that the desorption tube is in a relatively clean state before the desorption. Please specify the parameters as needed.

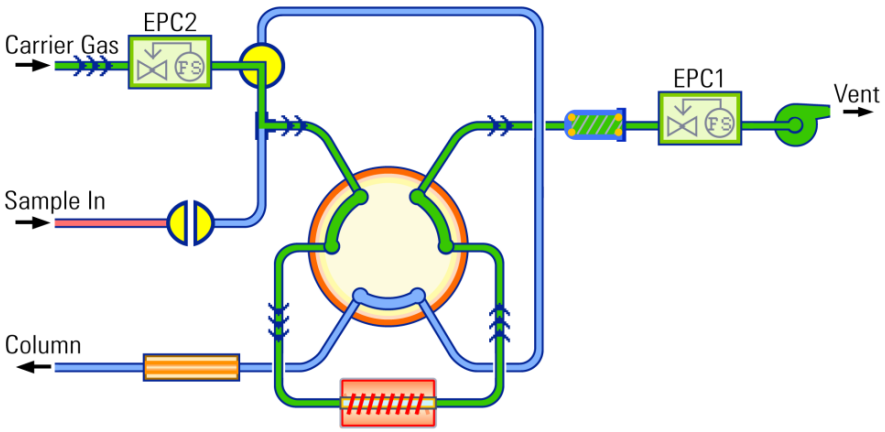


Figure 13 Schematic Diagram of Dry purging, **G4370M**

Desorbing & Injection stage: The user can select to separate or combine the desorbing process and injection process by enabling/disabling Start Injection Time through software interface or local control panel. When these two processes are separated: the Desorber will heat the desorption tube when the carrier flow is shut-off. Under this situation, the target components will be desorbed and sealed within the tube and wait for injection. In the following Injection process, the carrier flow from GC can take the desorbed components into the GC inlet more quickly and easily. As one of the important benefits, the peak width of components with lower boiling point will be dramatically decreased, that means the peak height & sensitivity will be increased. When these two processes are combined: the tube will start to be heated according to the predefined ramping rate, at the same time, the injection phase is started. The target components will be purged into GC inlet immediately as soon as they are desorbed. This desorbing method will have a positive influence on reducing carry-over for target components with higher boiling point.

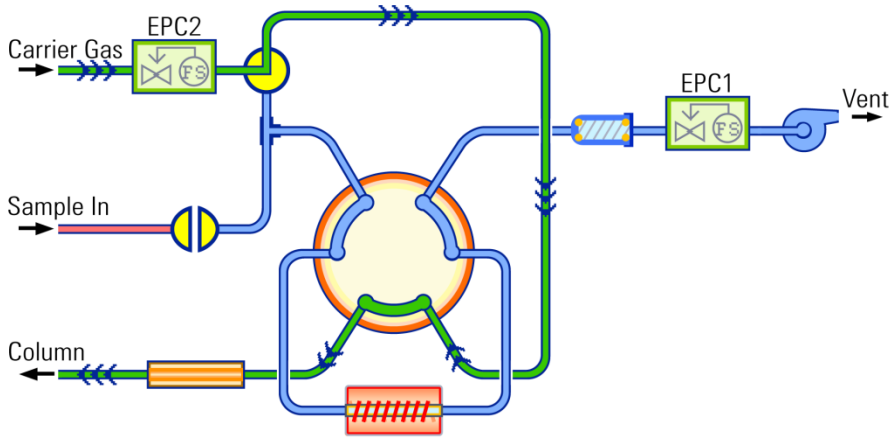


Figure 14 Schematic Diagram of desorbing, **G4370M**

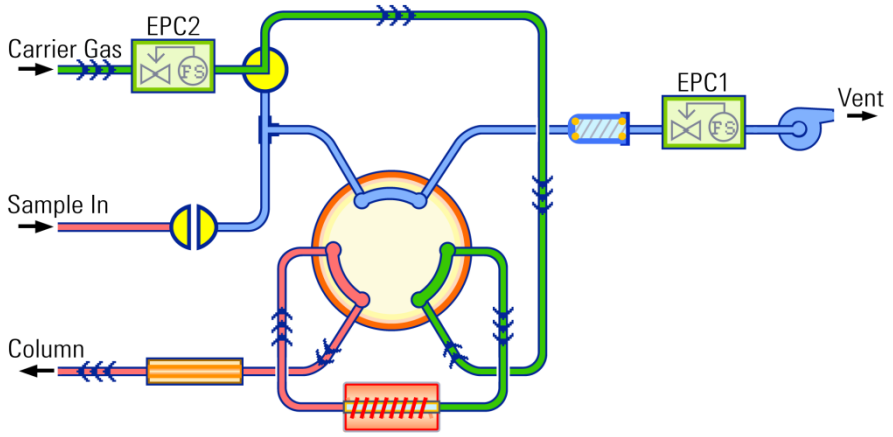


Figure 15 Schematic Diagram of Injection, **G4370M**

Cleaning stage: After the desorption stage, there may still be some residual sample remaining in the desorption tube. To ensure that the residue does not affect the subsequent desorption, the desorption tube needs to be cleaned with high temperature. Compared with the desorption stage, the cleaning stage should last longer (two to four minutes) and should be carried out with greater flow (150 to 200 mL/min) and at a very high temperature (320 °C or so, not exceeding the maximum temperature that can be used for the desorption tube. See the insturctions of the desorption tube for specific information)

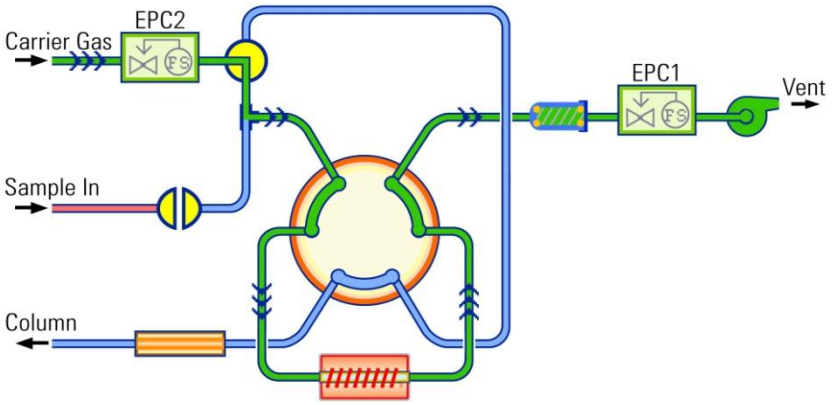


Figure 16 Schematic Diagram of Cleaning, **G4370M**

Idle Stage

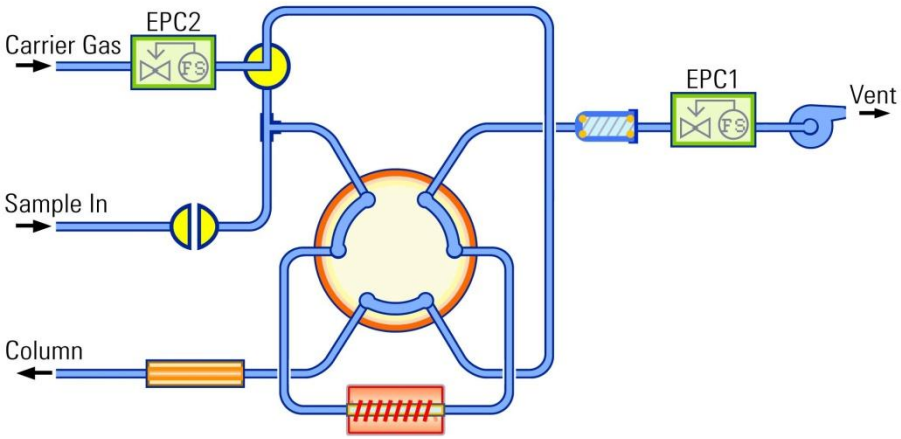


Figure 17 Schematic Diagram of Idle Stage, **G4370M**

Sample overlap mode: **The G4370M** supports **the sequence run.** Under normal circumstances, the sequence is executed in order, i.e. the next desorption does not start until the present run is completely finished and both the Mini TD and the GC have been restored to the ready and idle states. In the sample overlap mode, the Mini TD begins to prepare for the next sample desorption while the current GC analysisis still in progress. ***When the GC cycle time is longer than that of the Mini TD, the sample overlap mode can greatly improve the efficiency in the use of the desorber.***

2

Installation and Operation

Preparation Before Installation 21
- Parts Required for Installation 21
- Tools Required for Installation 25
- Site Preparation and Confirmation 25
- Update GC Firmware 25

Install the G4370A 26
- Prepare the Instrument 26
- Install thestainless Steel Tube Seamless in the Transfer Line 27
- Connect the Transfer Lines to the 7820A GC Split/Splitless Inlets 30
- Connect the Cables and Gas Lines 32
- Restore the 7820A GC to the Operable Conditions 32

Install the G4370M 33
- Prepare the Instrument 33
- Install the G4370M on the 5975T LTM GC/MSD 33
- Connect the Cables and Gas Lines 35
- Restore the 5975T LTM GC/MSD System to the Operable Conditions 36

Replace the Desorption Tube 37
- Install the Desorption Tube 37
- Remove the Desorption Tube 39

Connection with Other Agilent Gas-phase Products 40

7667A Control Panel Operation 41
Power Switch and Status Indicators 41
Run Keys 41
Menu Key, Cancel Key and Dial 42
Status 43
To create a method 44
To Configure the Carrier Gas Type 47
To Load/save a method 48
Log 49

The installation process of the 7667A depends on the purchased system components and the type of instrument used in conjunction with the Mini TD. Follow the steps related to the GC and the Mini TD in this section.

Preparation Before Installation

Parts Required for Installation

Table 1 Shipping Kit for G4370A

Description	Part Number	Quantity
Stainless Steel Tube Assembly	G4370-60000	1 EA
Xfer Line Support Assembly	G3504-60620	1 EA
O-Ring 0.364-in-ID	0905-1819	1 PK
PTFE Filter Disks 6.3mm Marks TD PK 10	MKI-U-DISK3	1 PK
Syringe 10uL FN bevel Tip	5190-1483	1 EA
Torx Screwdriver T10 Size	51820-3466	1 EA
Wrench-Double open-end 3/16*1/4 – in-Size	8710-2697	1 EA
Tubing Cutter	G4350-20120	1 EA
Union SS 1/16 inch Tubing	0100-0124	1 EA
Cap,1/16 inch Stainless Steel	0100-0050	1 EA
Cap Carrier Tube	G1544-20150	1 EA
Stainless Nut 1/16 inch	0100-0053	1 EA
1/16inch Ferrule set SST	0100-1490	1 EA
Tube fixer Tool	G4372-20048	1 EA
Catch Ferrule	G4372-20049	1 EA
O-Ring 0.239-in-ID	0905-1820	2 PK
Septum Retainer Nut for Transfer Line	G3452-60835	1 EA

Table 2 Shipping Kit for G4370M

Description	Part Number	Quantity
O-Ring 0.239-in-ID	0905-1820	2 PK
O-Ring 0.364-in-ID	0905-1819	1 PK
PTFE Filter Disks 6.3mm Marks TD PK 10	MKI-U-DISK3	1 PK
Syringe 10uL FN bevel Tip	5190-1483	1 EA
Torx Screwdriver T10 Size	51820-3466	1 EA
Wrench-Double open-end 3/16*1/4 – in-Size	8710-2697	1 EA
SCREW-MACHINE ASSEMBLY M4*12MM	0515-0382	2 EA
Injection Needle ASS	G4372-60015	1 EA

Table 2 Shipping Kit for G4370M（continued）

Description	Part Number	Quantity
Foot	G4370-20600	2 EA
Installation Pole	G4370-20456	1 EA
Installation Pole Assy	G4370-60020	1 EA
SACREW-MACH M4*10MM	0515-1269	4 EA
Tubing Cutter	G4350-20120	1 EA
Tube fixer Tool	G4372-20048	1 EA
Catch Ferrule	G4372-20049	1 EA

Table 3 Other supplied accessories

Description	Part Number	Quantity
1/8″ ODx250cm Cu Tubing Coil Assembly	**G1530-61100**	1 EA
FID Checkout sample	18710-60170	1 EA
7667 power Adaptor	0950-5534	1 EA
RS-232 Cable for ALS	G4370-61207	1 EA
APG Remote Cable	G4370-61208	1 EA
Utility DVD	G4600-64006	1 EA

7667A Power Adaptor (P/N 0950-5534)

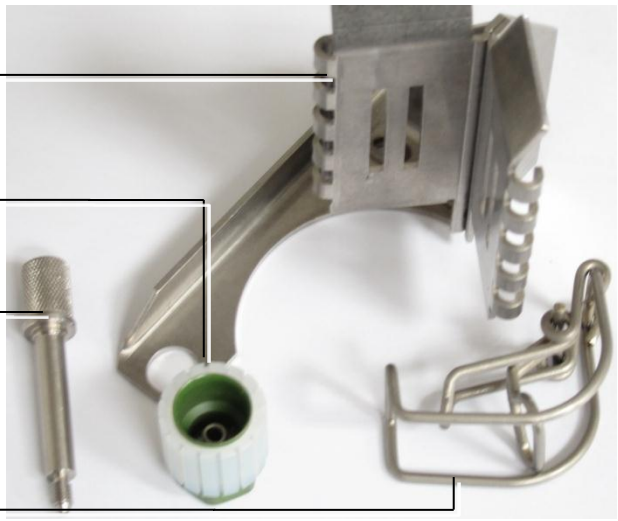
RS-232 Cable for ALS (P/N G4370-61207)

APG Remote Cable (P/N G4370-61208)

O-Ring 2-010 (in P/N 0905-1820 seal bag)
O-Ring 2-012 (in P/N 0905-1819 seal bag)

PTFE Filter Disks (MKI-U-DISK3)

Installation parts for G4370A

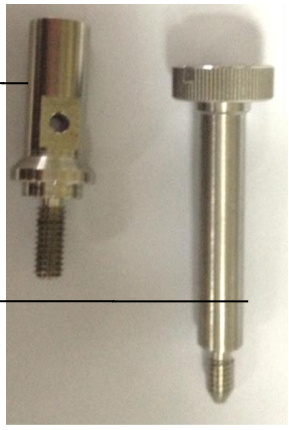


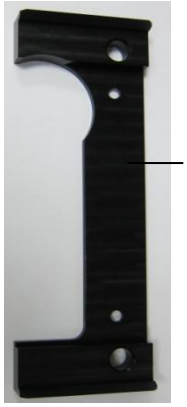
Xfer Line Support Assembly (P/N G3504-60620)

Installation parts for G4370M

Installation Pole
（P/N G4370-20456）

Installation Pole Assy
（P/N G4370-60020）





Foot
(P/N G4370-20600）

Injection Needle ASS（P/N G4372-60015）

Tools Required for Installation

- T-10 Screw driver (P/N 5182-3466)
- 1/4-3/16 Open-end wrench (P/N 8710-2679)
- Tubing Cutter (P/N G4350-20120)
- Precision tubing cutter (for the G4370A, P/N 5190-1442， prepared by CE)
- T-20 Screw driver (for the G4370M, P/N 5182-3465, prepared by customers or FSEs)
- Column cutting wafer（for G4370A, P/N 5181-7487, prepared by customers or FSEs）
- 7/16 wrench (Prepared by customers or FSEs）
- 5/16 (for G4370A, prepared by customers or FSEs）

Site Preparation and Confirmation

Verify and ensure that the installation site has been ready in accordance with the requirements of the Site Preparation manual. The appropriate benches, power supply and sockets, gas supply, traps and the necessary tools have been ready.

Update of the Version of GC Firmware

The Mini TD requires that the revision of the 7820A GC firmware is A.01.12.004 or later, and the revision of the 5975T LTM GC/MSD firmware is A.03.04.004 or later. If the firmware revision the user used is earlier than the above revisions, please update the firmware to the latest version (the user may download the latest firmware version from Agilent website **(www.agilent.com/chem)** or contact your local Agilent sale representitives).

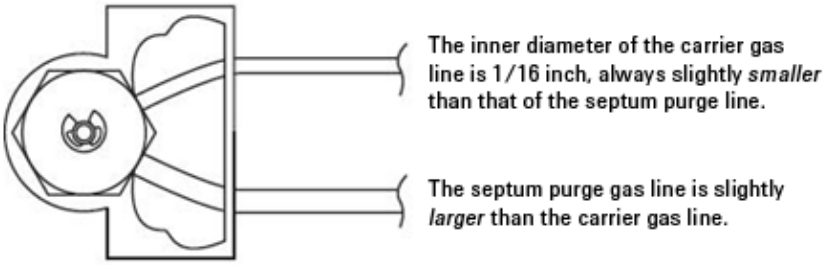
Install the G4370A

Prepare the Instrument

This procedure describes how to prepare the Agilent **7820A GC** for the installation of the G4370A.

WARNING **The 7820A GC inlet may be hot and cause burns. Cool the inlet to the ambient temperature before starting work.**

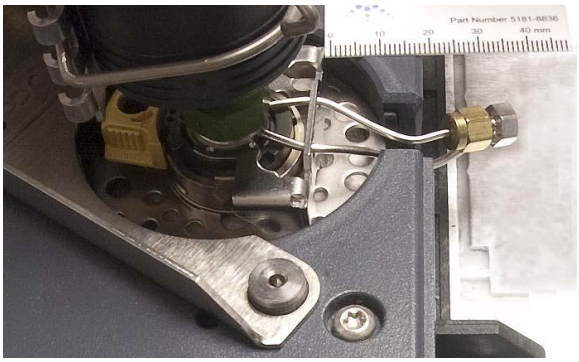
1. Set the temperature of the GC's Inlet, the Detector and the Oven to the **room temperature**.
2. Close all gas supplies.
3. Remove the front mounting post of the autosampler and injector.
4. Locate the inlet carrier gas line. The inlet carrier gas line is a 1/16-inch stainless steel tube that runs from the inlet EPC module to the inlet, usually beside the inlet carrier cover on the oven top. For split/splitless inlet, there is also a stainless steel septum purge vent line. The septum purge vent line is larger in diameter, and runs to the septum purge vent on the EPC module.



5. Using the precision tubing cutter (5190-1442), cut the carrier gas line leading into the inlet at approximately 3 to 5 cm from the septum head.

CAUTION **Cut the tubing as square as possible. Be careful to avoid kinks in the tubing. Avoid deforming the tubing. The cut should not be beveled or angled.**

6. Plug the inlet carrier line at the septum head using the cap assembly (P/N 0100-0050) provided in the ship kit.



7. Install the male half of a 1/16- inch union (P/N 0100-0124) onto the open end of the carrier gas tubing coming from the inlet EPC module.

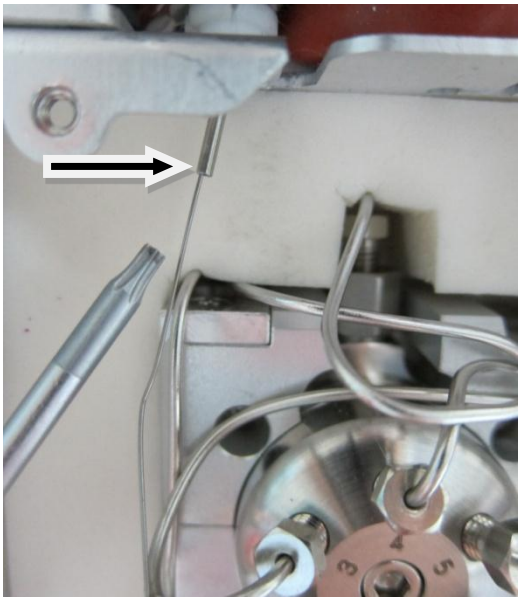
NOTE **When completed, you should be able to reassemble the original carrier flow path by removing the cap from the plug, then connecting the two ends of the tubing.**

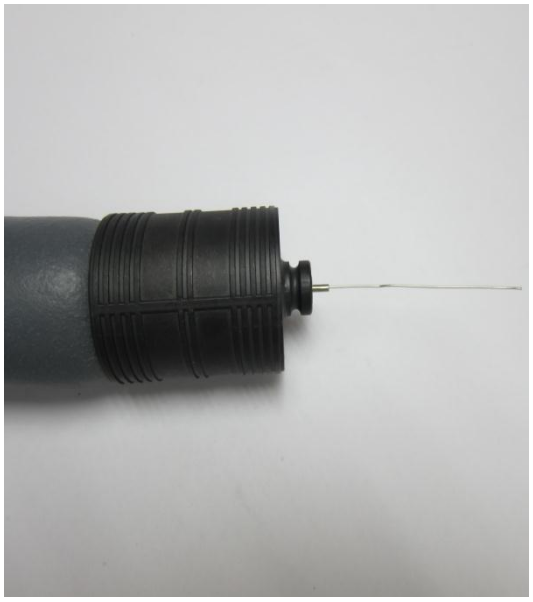
8. Use the other half of the 1/16- inch Swagelok union to connect the carrier gas tubing from the EPC module to the end of Cap Carrier Tube (G1544-20150).
9. Use the 1/16 inch Swagelok nut (P/N 0100-0053) and ferrule (P/N 0100-1490) to connect the other end of Cap Carrier Tube (G1544-20150) to the 1/16 inch carrier gas interface of the G4370A.
10. Check for leaks in the front inlet. Please refer to the «**7820A GC Troubleshooting** ».

Install the Stainless Steel Tube Seamless in the Transfer Line

1. Cool the G4370A heating zone to a room temperature. Remove three screws as shown in the figure and remove the valve box cover and insulation cotton.

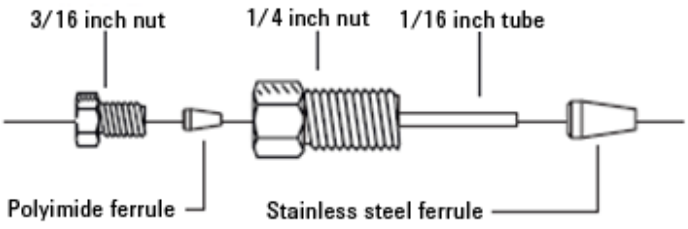
2. Unlock an approximately 1-meter long Stainless Steel Tube Seamless (G4370-20039). Gently pass the pipeline from the end close to the six-port valve through the transfer line till it comes out 6 cm or so from near the other end.



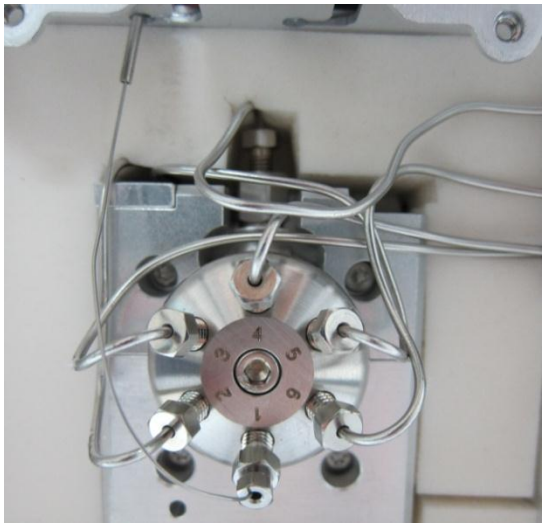


3. Use the 1/4 open-ended wrench to remove the Fitting-internal Reducer 1/16 to 1/32-in（0100-2594）on valve port 1 (see below picture), save it for future use.

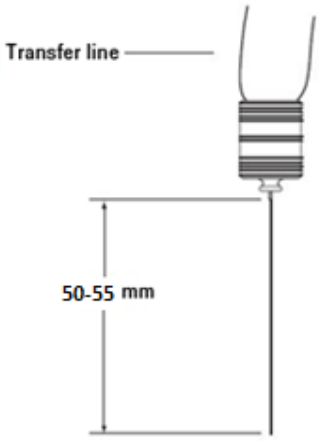
4. Assemble the Stainless Steel Tube Seamless according to the figure.



5. Install the Stainless Steel Tube Seamless to valve port 1. Tighten it with hand and then with the 1/4-3/16 open-ended wrench.



6. Pull out the Stainless Steel Tube Seamless from the inlet end of the transfer line and make the Stainless Steel Tube Seamless retain an appropriate length at the valve port end.
7. Use a column cutter (P/N 5181-7487) to trim the Stainless Steel Tube Seamless at GC inlet end, and make it 50-55 mm out the transfer line.



Connect the Transfer Line to the 7820A GC Split/Splitless Inlet

CAUTION **Wear clean lint-free gloves to prevent the parts from being stained by dust and skin secretions.**

1. Put the **G4370A** on the **left side** of the 7820A GC.
2. Replace Septum Retainer Nut for Transfer Line (G3452-60835).
3. Put the bracket in the transfer line assembly on the front inlet carrier gas cover. The two positioning holes in the bracket align to the mounting positions of the front injector and calibrating pin respectively. See the figure below.

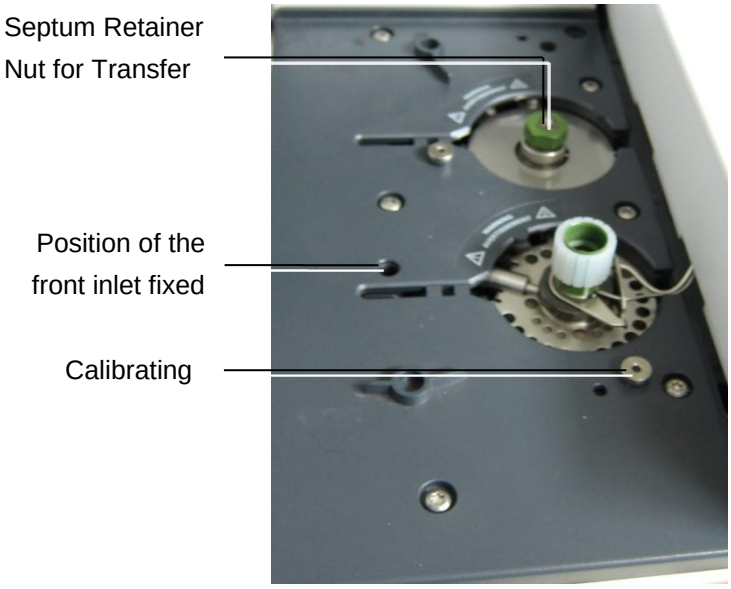


Figure 18 Installation position of the bracket. The figure shows the inlet carrier gas cover of the 7820A

4. Locate the knurled thumbscrews (in the transfer line support assembly) provided in the Mini TD's Shipping kit.
5. Insert the knurled thumbscrew into the mounting position of the the front injector and tighten with hand.
6. Insert the tip of the transfer line into the inlet.
7. The transfer line should be fixed after installed.

8. Install the Latch/clamp onto the bracket. Adjust the position of the clip so that it supports the transfer line at the highest possible position above the GC, as shown in Figure 19.

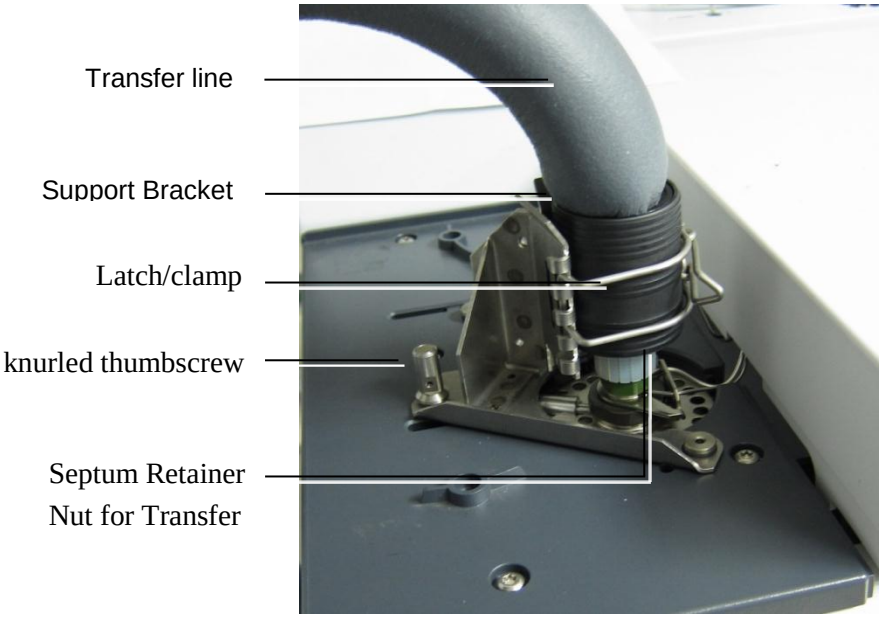


Figure 19 Transfer line installed onto the inlet of the 7820A

Connect the Cables and Gas Lines

1. Conncet 7667A power adapter cable (P/N 0950-5534) into the power socket of the **G4370A**.
2. Connect the RS-232 cable for ALS (G4370-61207) to the Serial Port of the **G4370A** and the ALS control module of the 7820A GC (Front port).
3. Connect the Gas Line according to Figure 20.

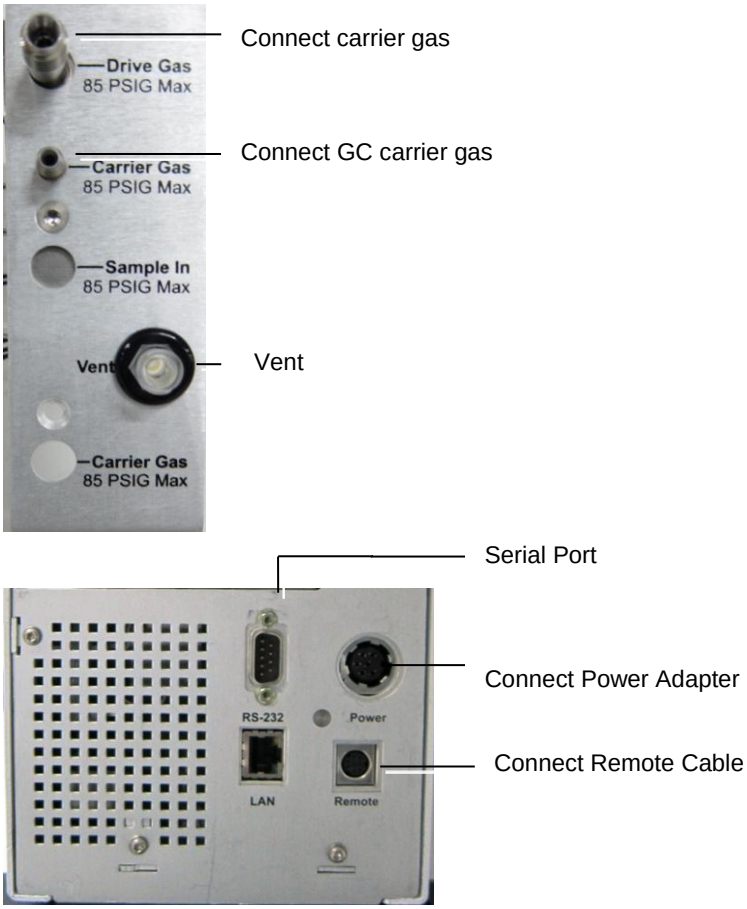


Figure 20 Cable and Gas Line interface of G4370A

WARNING **The carrier gas supply presure of the Mini TD must be larger than 60 psi, less than 85 psi.**

Restore the 7820A GC to the Operable Conditions

1. Turn on the gas supply.
2. Restore the inlet and the oven temperature to the operable conditions.

Install the G4370M

Prepare the Instrument

This procedure describes how to prepare the Agilent **5975T LTM GC/MSD** for the installation of the **G4370M**.

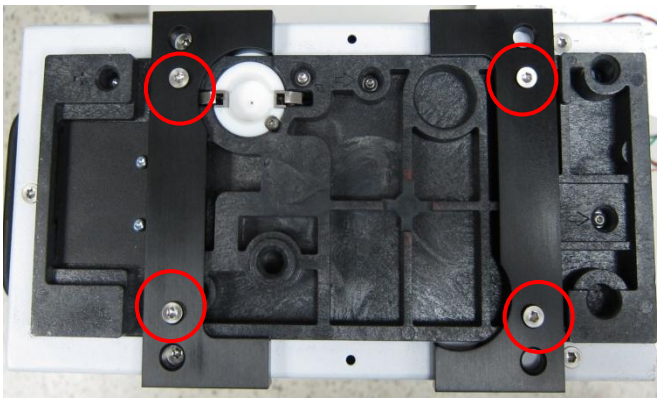
WARNING **The 5975T LTM GC/MSD inlet may be hot and cause burns. Cool the inlet to the ambient temperature before starting work.**

CAUTION **Do not install the G4370M on the mounting post of the autosampler, otherwise, the Mini TD will be damaged. Remove the mounting post of the autosampler.**

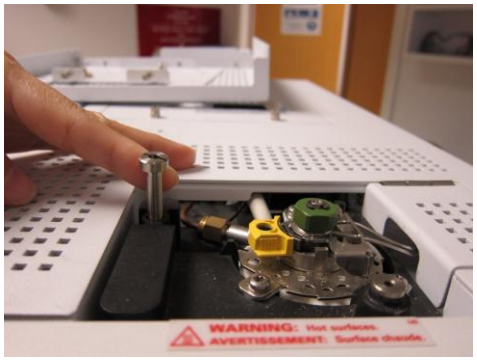
1. Cool the inlet and the oven to room temperature.
2. Close all gas supplies.
3. If the 5975T LTM GC/MSD is equipped with an autosampler, remove the autosampler and its mounting post.

Install the G4370M on the 5975T LTM GC/MSD

1. Put the Foot (P/N: G4370-20600) on the bottom of the G4370M , and fix 4 screws with red marked by using T20 screw driver.



2. Insert the Installation Pole Assy into the injector (ALS) miounting position and tighten it withhand.



3. Open the side cover, put the bottom bracket assembly (PN: G4370-60650) on the inlet of the 5975T, and follow the steps 1-2 as shown below.

2 Insert Installation Pole into the Installation Pole Assy position and tighten it with hands.

1 Fix the bracket assembly with M4*12*2 screws.

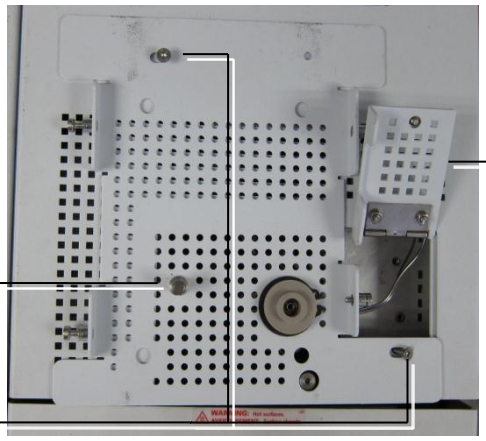


Figure 21 Positions of fixed screws This figure should be replaced by that with G4370M installed

4. Put the **G4370M** on the bracket and tighten the four fixing screws (P/N 0515-1269) on both sides with T20 screw driver.

Figure 22 Fixed screws on the Mini TD

Connect the Cables and Gas Lines

1. Connect the 7667A power adapter cable (P/N 0950-5534) into the power socket of the **G4370M**.
2. Connect the RS232 Auto Injector Cables to the RS 232 interface of the **G4370M** and the 5975T ALS control module respectively.
3. Connect the Gas Line according to Figure 23.

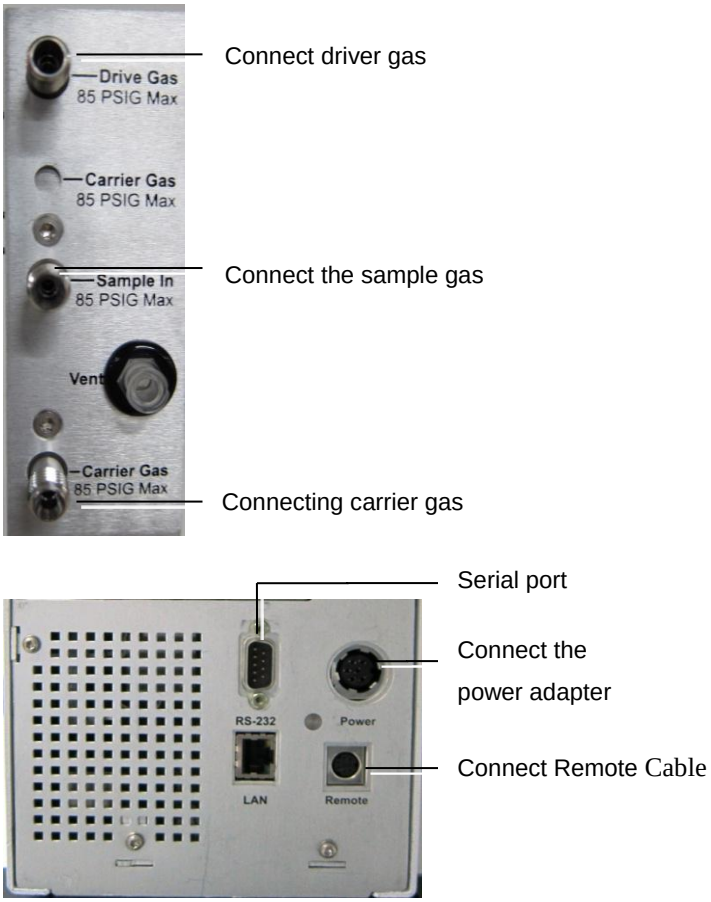


Figure 23 Cable and Gas Line interface of G4370M

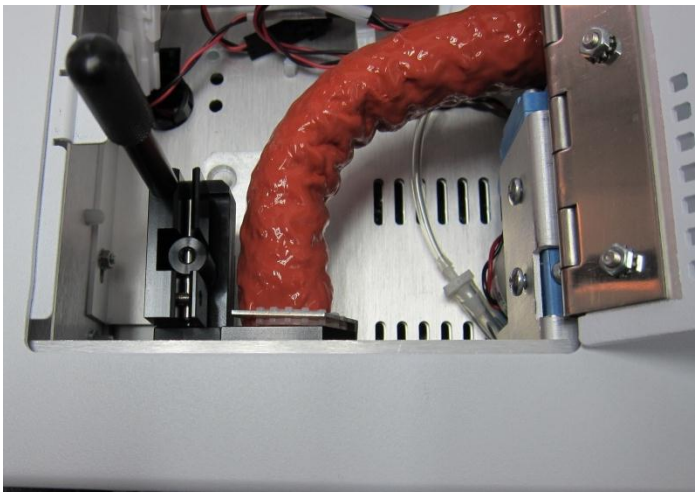
WARNING **The carrier gas supply presure of the Mini TD must be larger than 20 psi above Inlet pressure used in GC method. The dirver gas pressure is about 50 Psi.**

CAUTION **When connecting the Desorber with sample gas for sampling, the length and inner diameter of the sampling tubing will affect the maximal sampling flow rate. Agilent will recommend use tubing with 1/8" I.D. and length shorter than 10 meters. Otherwise, the sampling flow rate may not meet Agilent published specification.**

CAUTION **If the sample gas is pressurized, please make sure the sample gas is pressure regulated at a stable pressure. Otherwise, it will have negative influence on repeatability of sampling**

Restore the 5975T LTM GC/MSD System to the Operable Conditions

1. Open the right door of the **G4370M**.
2. Rotate the locking handle to the vertical position, unlock the injection slider, and push the injection slider to low injection position.

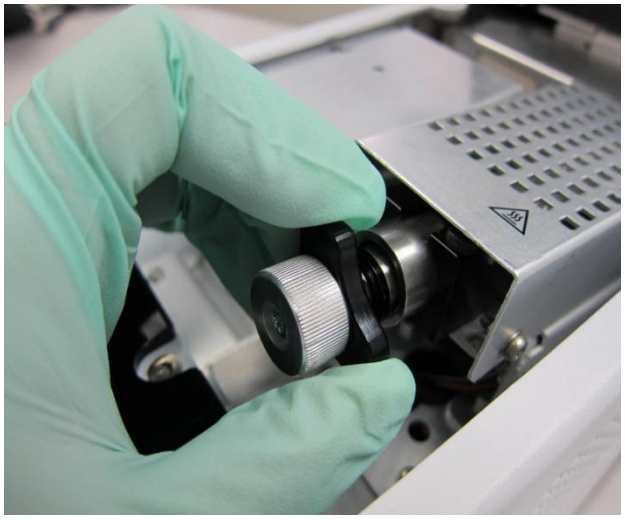


3. Rotate the locking handle back to the locked position.
4. Close the side door. The installation of the G4370M is completed.
5. Turn on the gas supply.
6. Restore the 5975T LTM GC/MSD inlet and the oven temperature to the operable conditions.

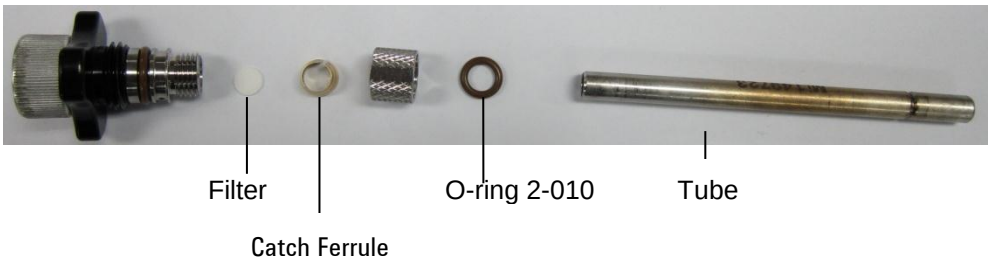
Replace the Desorption Tube

Install the Desorption Tube

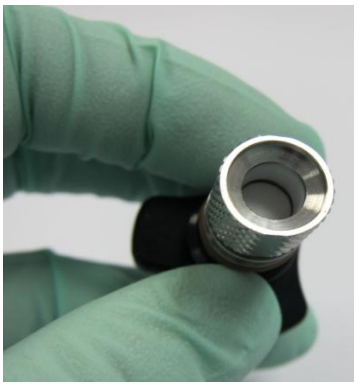
1. Open the top cover of the desorber, loosen the triangular nut counter-clockwise, and pull out the desorption tube assembly.



2. Loosen the desorption tube locking nut about 30 degree.
3. Take out the desorption tube sealing O-ring (0905-1014) and Filter (MKI-U-DISK3) from the shipping kit.



4. Install the desorption tube according to the order in the figure;
   - Check whether the Filter is already in tube handle and then rotate the desorption tube locking nut but not completely tighten it.
   - Set the sealing O-ring around the front end of the desorption tube.
   - Insert the front end of the desorption tube into the locking nut. Tighten the locking nut with hands or Tube fixer Tool (P/N G4372-20048).



1

2

3

4

5. Insert the desorption tube parts into the desorber and tighten the triangle nut with hand.

Remove the Desorption Tube

WARNING **Be careful! Tube temperature may be hot enough to cause burns. Please cool its temperature to room temperature, and then wear heat-resistant gloves during operating**.

1. Open the top cover of the desorber, rotate the triangular nut counter-clockwise to loosen, and pull the desorption tube assembly.
2. Loosen the desorption tube locking nut about 30 degree and pull out the desorption tube.

Connection with Other Agilent Gas-phase Products

7667A Back Panel

Agilent GC Back Panel

APG Remote Cable（P/N G4370-61208）

7667A Control Panel Operation

Power Switch and Status Indicators

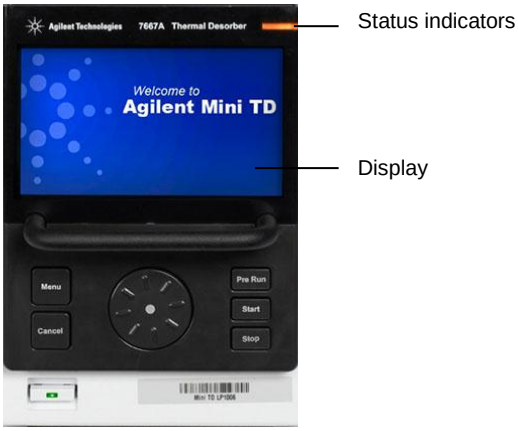


Figure 24 Schematic Diagram of the Control Panel

The current state of the Mini TD is indicated with the status indicators;

- Green indicates running.
- Yellow indicates that the Mini TD is in the Not Ready state (see the figure).
- Red indicates there are errors or potential dangers occurred in the Mini TD.
- Status indicators off indicates the ready state.

Run Key

This key is used for the pre-preparation before the sampling desorption, to run the method and stop running.

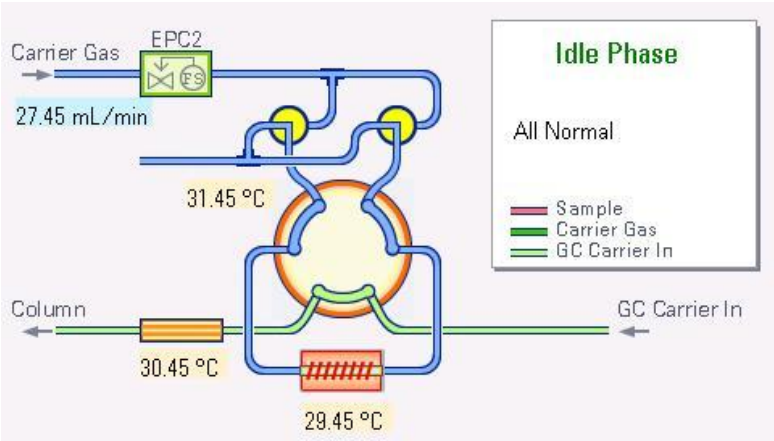
Prep Run	Press this key to start the ppreparation before Injection or Desorption/Injection .
Start	Press this key to start Injection or Desorption /Injection process.
Stop	Press this key to terminate the running method.

Menu Key, Cancel Key and Dial

Menu	Press to the Main Menu.
Cancel	Press to return to a previous menu, or cancel a function during a method.
Dial/Enter	Rotate Dial to select or change settings. Press Enter to confirm selections or settings.

Status

There are two different status pages on Control Panel: one is ‘flow diagram’; and another is ‘status table’.



Flow Diagram

Mini TD Status - Idle

Item	Actual	Status/Setpoint
Tube temp	0.0	0.0
Valve box	0.0	0.0
Transfer line	0.0	0.0
Sample flow	0.0	0.0
Carrier flow	0.0	0.0

Status Table

To creat a method

This section lists method parameters, along with a brief description of each one.

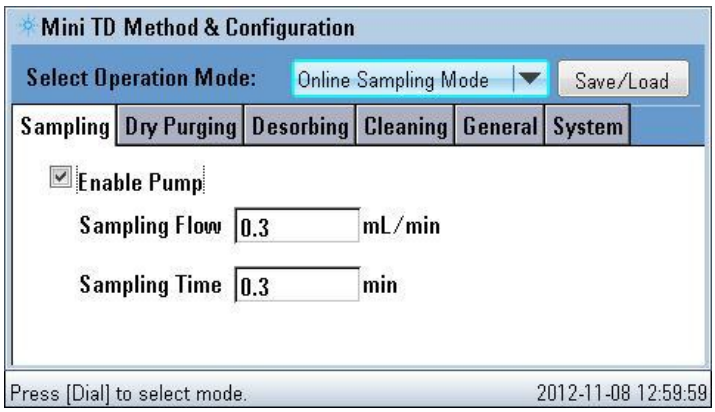
Table 4 List of Mini TD Setting parameters

Parameters	Range	Description
Select Operation Mode	Online sampling mode Desorbing mode Conditioning Mode	Select the operation mode as required
Sampling		
Enable Pump	☑/☐	Enable/disable Pump
Sampling Flow	5-150 mL/min*	Specify the gas flow in the sampling
Sampling Time	0-100 min	Specify the duration of the sampling operation
PreSampling Time	0-100 min	Specify the preparation time of the desorber before sampling
Dry Purging		
Enable Dry Purge	☑/☐	Enable/disable this function
Dry Purging Flow	0-200 mL/min	Specify the gas flow in the dry purging
Dry Purging Time	0-100 min	Specify the duration of the dry purging process
Desorbing		
Tube Temp	☑/☐ ≤325℃	On/Off Specify the initial temperature of the desorption tube
Carrier Flow	0-200 mL/min	Specify the carrier gas flow
Injection Start Time	☑/☐	Turn On/Off the injection function
	0-100 min	Specify the duration of injection (unit: minute)
Ramp	0-500℃/min	Spcify the rate of temperature Ramp of the first order
Cleaning		
Enable Clearning	☑/☐	Enable/disable this function
Clearning Flow	0-200 mL/min	Specify the flow in the cleaning of the Mini TD
Clearning Time	0-100 min	Specify the duration of the cleaning operation
Clearning Temp	≤325℃	Specify the temperature in the cleaning of the Mini TD
General		
Enable Leak Detection	☑/☐	Enable/disable this function
TransferLine Temp	≤200℃	Specify the transfer line temperature
ValveBox Temp	≤175℃	Specify the valve box temperature
Conditioning Parameters		
Condition Flow	0-200 mL/min	Specify the gas flow in the Conditioning
Condition Time	0-100 min	Specify the duration of the Conditioning process
Condition Temp	≤325℃	Specify the temperature in the Conditioning

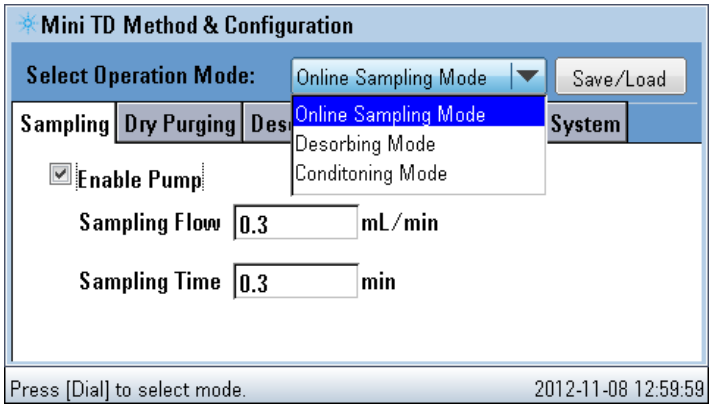
***** The sampling flow range will be affected by ambient pressure. The Maximal sampling flow rate will degrade in high altitude region.

To create a basic method, you will access to method parameters using [Menu]. For a list of method parameters, see Table 3.

1. Press [Menu].The display shows the current operation mode.



2. Rotate Dial to operation mode options, then press Enter.



3. Rotate Dial to select the desired Operation Mode, then press Enter.

4. Rotate Dial to switch between different tabs, then press Enter to enter the desireds tab.

5. Rotate Dial to switch between different parameters.

6. When checkbox is highlighted, press Enter to on/off it.

7. When textbox is highlighted,

    a. Press Enter to edit the value.

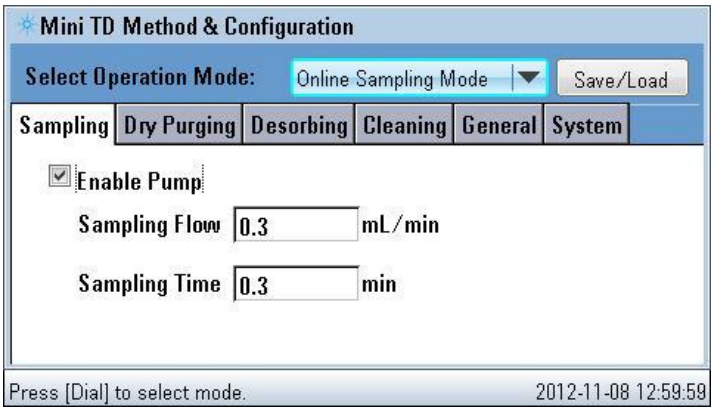
    b. Rotate Dial to change the settings.

    c. Press Enter to confirm the new settings.

8. Press [Cancel] to return to the selection;

9. Then press [Cancel] to return to Mode Selection and Load/Save button;

10. Setting up a basic method is complete. Save the method.(see ‘to Load/Save the method’)



To Configure the Carrier Gas Type

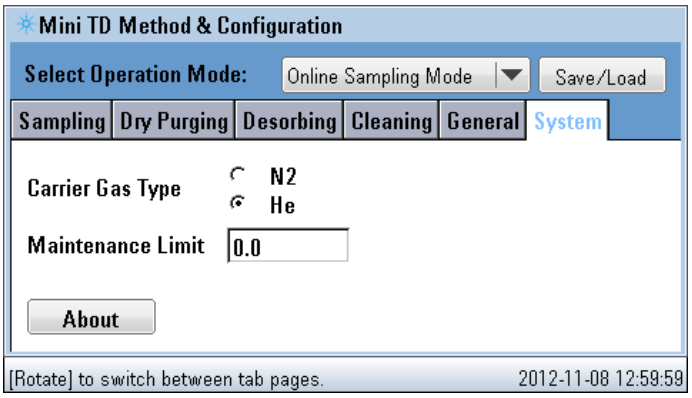
Wa **Mini TD Carrier Gas type must be consistence with the GC Carrier Gas type.**

1. 如

t

To configure the carrier gas type, you will access to the system page.

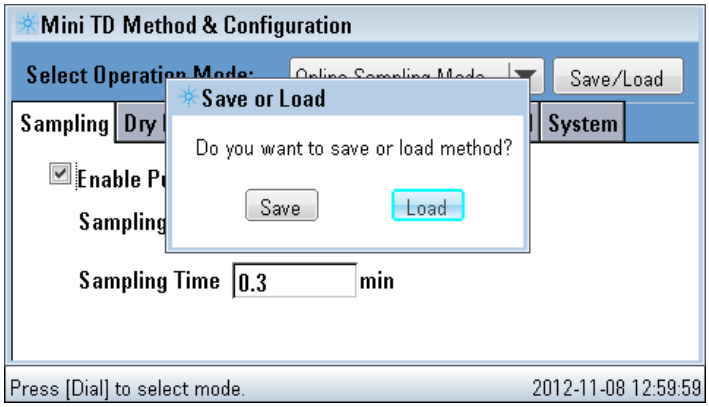
1. Press [Menu] twice.
2. Rotate Dial to select ‘System’ page.
3. Press Dial to enter Carrier Gas Type selection table.
4. Rotate Dial to select the desired Carrier Gas Type.
5. Press Dial to confirm the selection.

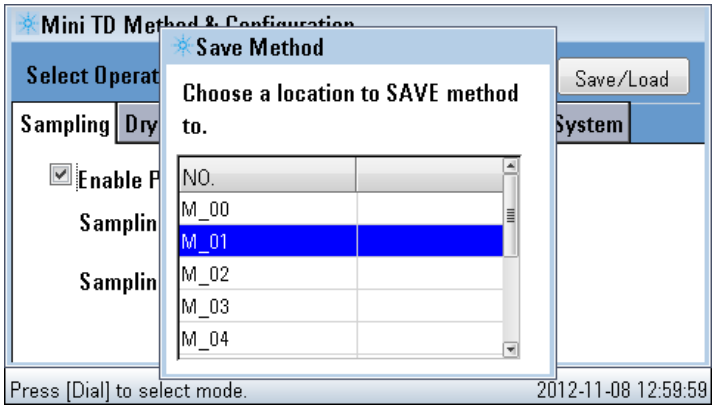


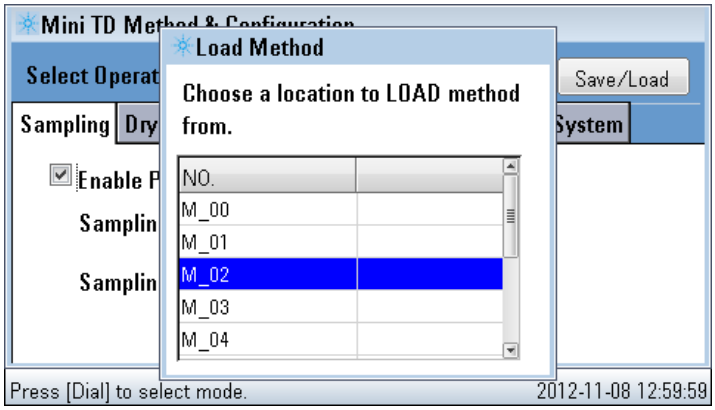
To Load/Save a Method

To Load/Save a method:

1. Press [Menu].
2. Rotate Dial to Load/Save button.
3. Press Enter. When prompted, rotate Dial to select Save or Load, and then press Enter to open the Load/Save list window.
4. Rotate Dial to select the slot number to which or from which you want to save or load method.
5. Press Enter to confirm your choice。

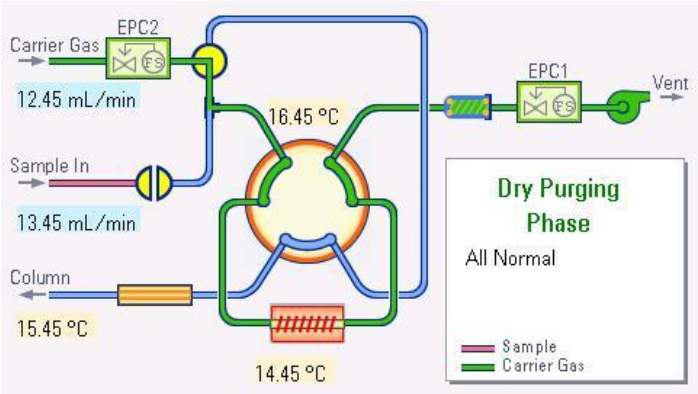




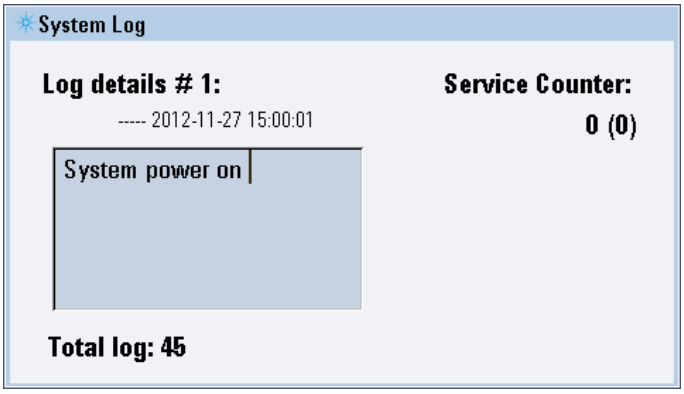


Log

1. To access log, press Enter twice on flow diagram page.



2. The display will indicate the number of entries the log contains.



3. Rotate Dial to select different log information.
4. Press Enter to return to flow diagram page.

3

First Start

Materials Needed 51
Condition the Desorption Tube 51
Set the Checkout Method 51
Prepare the Checkout Sample 53
Run the Checkout Method 54
Compare the Checkout Results 54

This section describes how to start the Agilent 7667A Mini Thermal Desorber for the first time and check out the performance of the **G4370A/G4370M** in the system.

Perform only the procrdure consistent with your instrument configuration.

Materials Needed

- 10 uL Syringes P/N 5190-1483
- Checkout sample F/N 18710-60170 (FID CHK sample)
- Desorption tube P/N C-TBP1TC (Details see Appendix)

Conditioning Desorption Tube

In order to ensure that the desorption tube works normally, the desorption tube need to be conditioned before the first run of the sample desorption.

1. Install the Desorption Tube. (Please refer to the **"Replace the Desorption Tube"** section in this manual).
2. Set the conditioning parameters on the panel (see List 5; for specific operation, refer to the "**7667A Control Panel Operation**" in this manual). Or load the Condition Method already saved in the system.
3. Press "**Start**" key on the control panel to start running the conditioning method.

Table 5 Recommended conditioning methods for the Mini TD

Parameters	G4370A	G4370M
Conditioning flow	50 ml/min	50 ml/min
Conditioning time	20 min	20 min
Conditioning temperature	320 °C	320 °C
Transfer line temperature	150 °C	150 °C
Valve box temperature	150 °C	150 °C
Type of carrier gas	Nitrogen	Nitrogen/Helium

Set the Checkout Method

Use the **Agilent data system (OpenLAB ChemStation/EZChrom, MassHunter)** to set the checkout method. The **ChemStation** is taken as an example below (refer to the **"Software Operation Guide"** in this manual for specific operation)

1. Run the OpenLAB ChemStation.
2. On the "Method and Run Control" interface, choose **Instrument > Edit Agilent 7820A parameters** to go to the "**Setting method**" interface.
3. Choose "**Configuration**" **module** to go to the gas type selection operation interface. Select the connected carrier gas type.
4. Edit the checkout method according to List 6 and List 7.
5. Apply the method to the instrument.
6. Save the method with a new name.

Table 6 Checkout method parameters of the Mini TD

Parameters	G4370A	G4370M
Sampling	Off	Off
Leak Detection	On	On
Enable Dry Purge	On	On
Dry Purging Flow	50 mL/min	50 mL/min
Dry Purging Time	0.5 min	0.5 min
Desorbing	Off	Off
Tube initial temp	40°C	40°C
Tube initial time	0	0
Tube ramp temp	500°C	500°C
Tube final temp	310 °C	310 °C
Tube final time	6 min	6 min
Cleaning	On	On
Cleaning Flow	200 mL/min	200 mL/min
Cleaning Time	8 min	8 min
Cleaning temp	320 °C	320 °C
Xferline Temp	180 °C	180 °C
ValveBox Temp	175 °C	175 °C
Carrier Flow	Off	30 mL/min

Table 7 The Method parameters of the 7820A GC/5975T LTM GC/MSD

Oven	
Equilibration Time	0.5 min
Initial temperature	50 °C
Initial time	0.5 min
Rate1	20 °C
Final temperature1	240 °C
Final time1	5 min
Inlet (split/splitless)	
Mode	Split
Heater	250 °C (On)
Pressure	4.0691 psi
Split ratio	40:1
Split flow	32 mL/min
Total flow	33.252 mL/min
Carrier gas saver	Off

Table 7 The Method parameters of the 7820A GC/5975T LTM GC/MSD (continued)

Column 1(19091J-413)	
Mode	Constant Flow mode
Flow	0.8 mL/min
Pressure	4.0691 psi
Average line speed	15.775 cm/s
Detector – FID	
Temperature	300 °C
Hydrogen flow	30 mL/min
Air flow	400 mL/min
Mode	Constant makeup flow
makeup flow	25 mL/min
MS or MSD	
Solvent delay	5 min
Running time	15 min
Scan range	35 to 550
Method used	Atune File
Inlet pressure	82.8 kPa (12 psi)
Column flow	1.1 mL/min

NOTE **The table lists the settings of the 7820A GC/5975T LTM GC/MSD. For other GC types, use the similar settings.**

Prepare the Checkout Sample

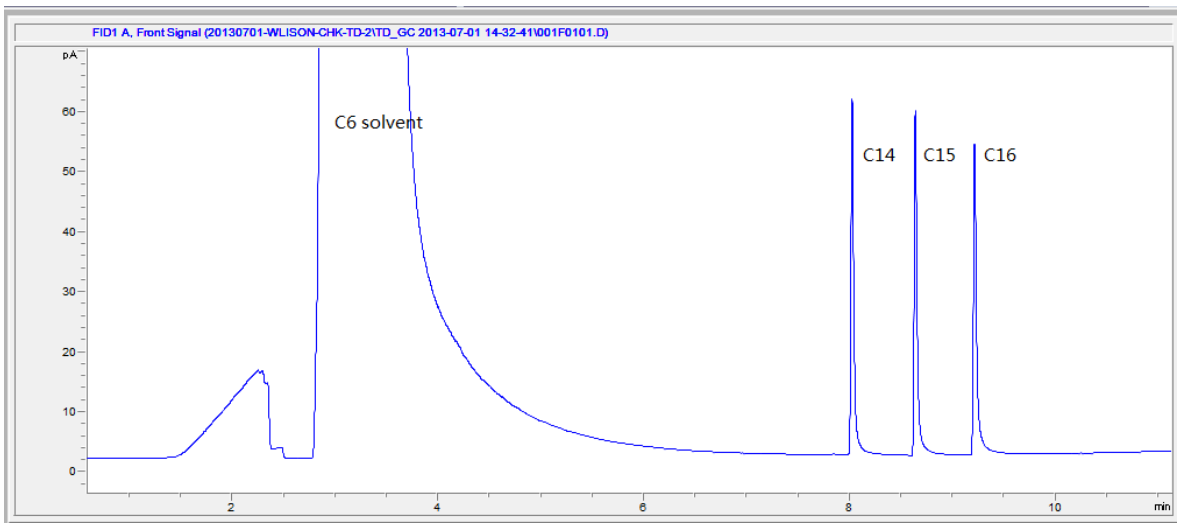
1. Take out the Syringe and checkout samples from the shipping kit.
2. Open the top cover of the desorber, loosen the triangular nut, and pull out the desorption tube assembly.
3. Disconnect the desorption tube from tube handle.
4. Use the Syringe to draw 1 ul checkout sample.
5. Inject the checkout sample into the desorption tube from the grooved end.
6. Insert the desorption tube into the desorber and tighten the triangle nut with your hands.
7. Close the top cover.

Run the Checkout Method

1. Select **Run Control > Sample Information** to go to the "**Sample Information**" interface.
2. Select the save path of the output signal, the output file name and the vial location (Vial 1 is the default injection location of the Mini TD, no need to change it).
3. Press the "**Run the Method**" button to start running the checkout method.
4. Or press "**Confirm**" button to close the "**Sample Information**" box, and then select **Run Control > Run the Method** to run the checkout method.

Compare the Checkout Results

When the run completes, compare the chromatogram against the example below. If correctly installed and operated properly, the output chromatogram should be similar to the example shown below.



Check out chromatogram

4

Software Operation Guide

Preparation Before Start 56
ChemStation/Ezchrom Operation 56
- Start Online Instrument 56
- Gas Type Configuration 57
- Parameter Settings 58
- Create the Method 61
- Save the Method 62
- Run the Method 63
- Create the Sequence 64
- Save the Sequence 65
- Run the Sequence 65

MassHunter Operation 66
- Start Online Instrument 66
- Gas Type Configuration 66
- Parameter Settings 67
- Create/Save the Method 67
- Run the Method 67
- Create the Sequence 68
- Save the Sequence 69
- Run the Sequence 69

Online Help Information 70

This guide describes how to use the Agilent data system to control the Mini TD.

Agilent Technologies

Preparation Before Start

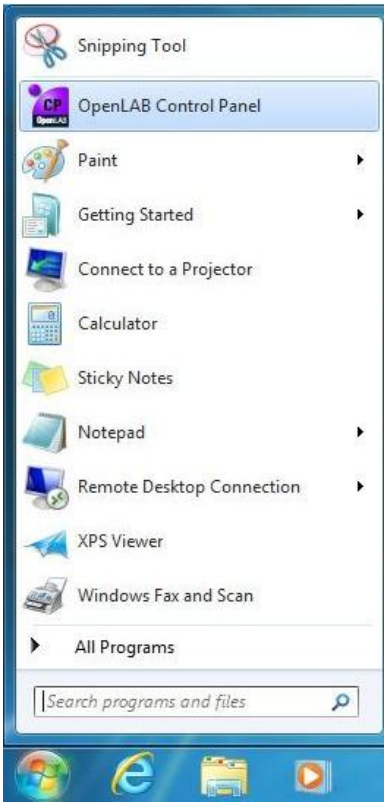
This guide assumes that:

- Agilent data system (**OpenLab ChemStation C.01.05/Mass Hunter B.07.00**) has been installed.
- The 7820A GC/5975T LTM GC/MSD is configured as online instrument.
- The 7820 GC/5975T LTM GC/MSD and the Mini TD are both ready.

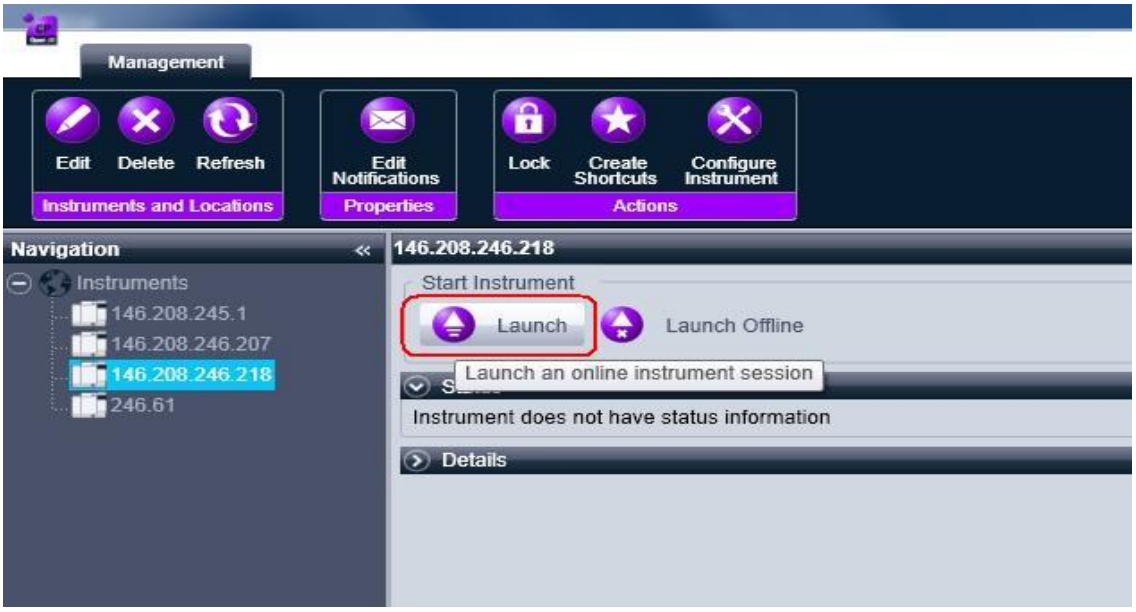
OpenLAB ChemStation C.01.05/Ezchrom Operation A.04.05

Start Online Instrument

1. In the "**Start**" menu, click the "**OpenLAB**" icon.

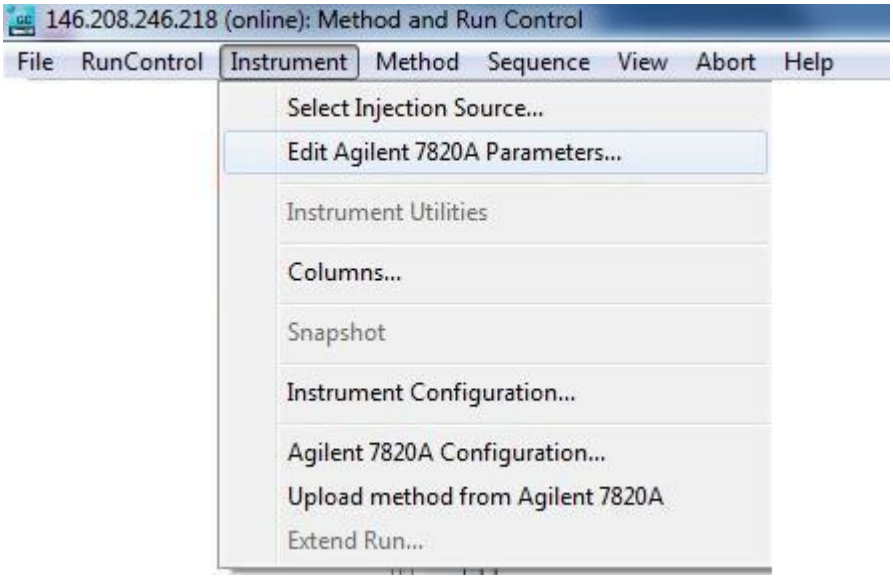


2. In the "**OpenLAB Control Panel**" box, press the "**Launch**" button to open the **ChemStation**.

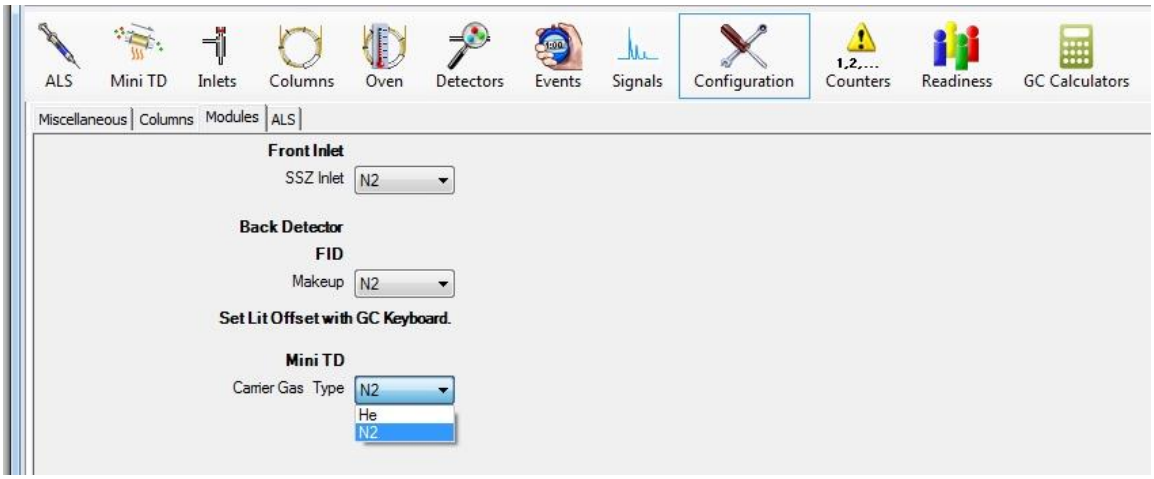


Gas Type Configuration

1. Select "**Instrument > Edit Agilent 7820 Parameters...**" to go to the "**Setting Method**" interface.



2. In the “**Setting Method**” interface, select “**Configuration” module** to go to the gas type selection interface. Nitrogen or helium is available.



WARNING **The carrier gas type of the Mini TD must be consistent with the that of the GC.**

Parameter Settings

1. Select “**Instrument > Edit Agilent 7820 Parameters...**” to go to the “**Setting Method**” interface.
2. Click the icon to go to the Mini TD parameter setting interface.
3. The 7667A Mini Thermal Desorber has three operation modes and the user may choose the proper operation mode based on their application.

Figure 25 Operation Mode drop-down menu

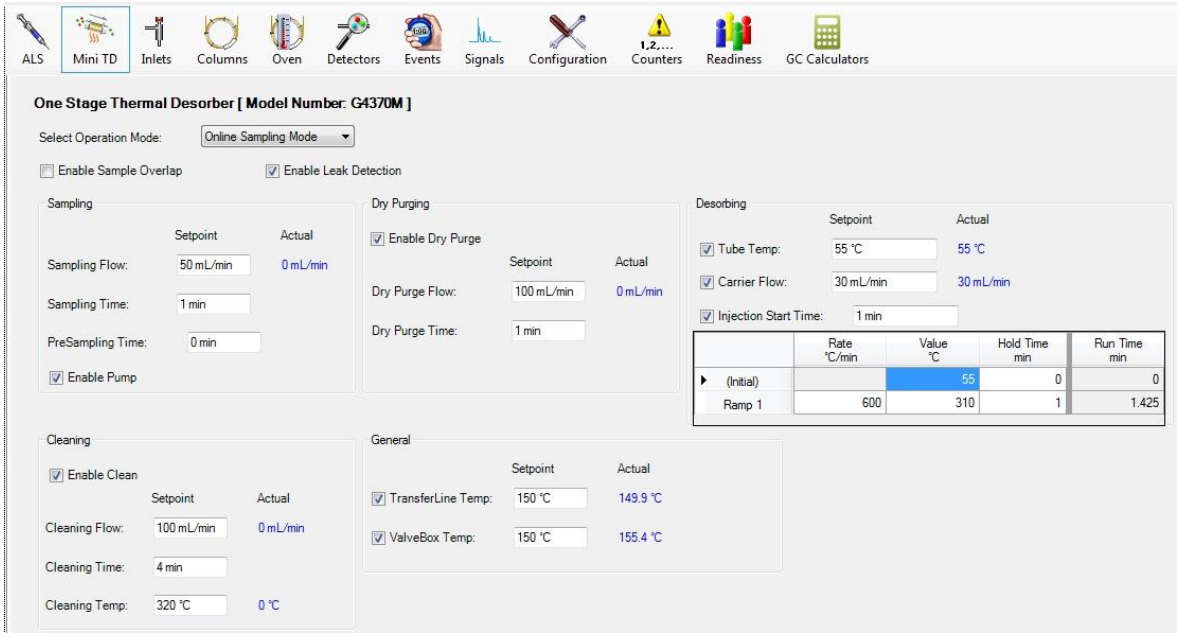


Figure 26 Online sampling mode interface

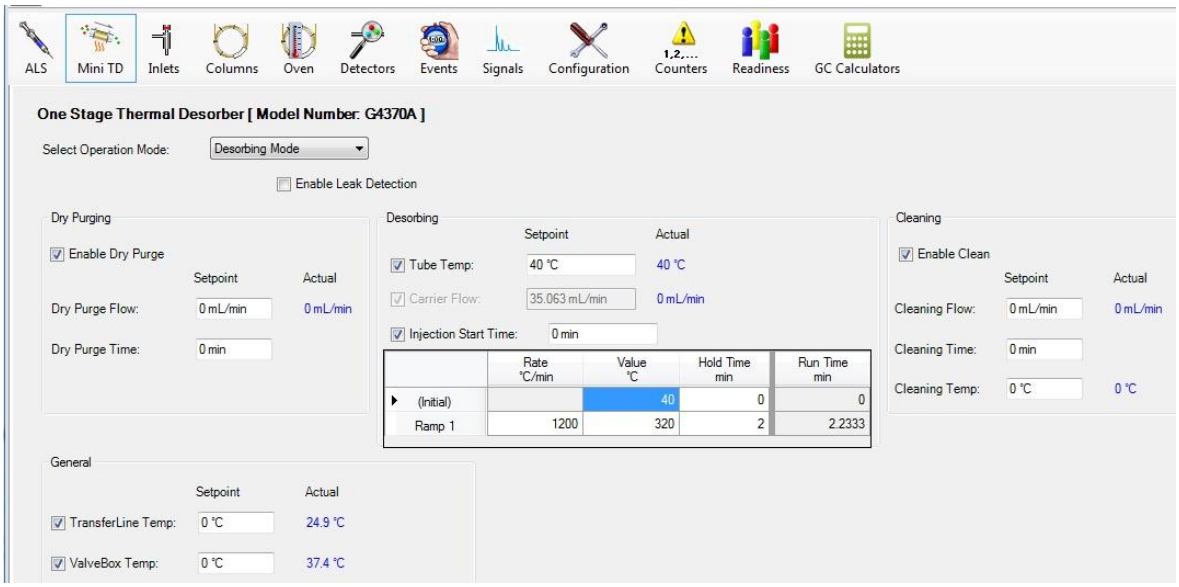


Figure 27 Desorption Mode interface

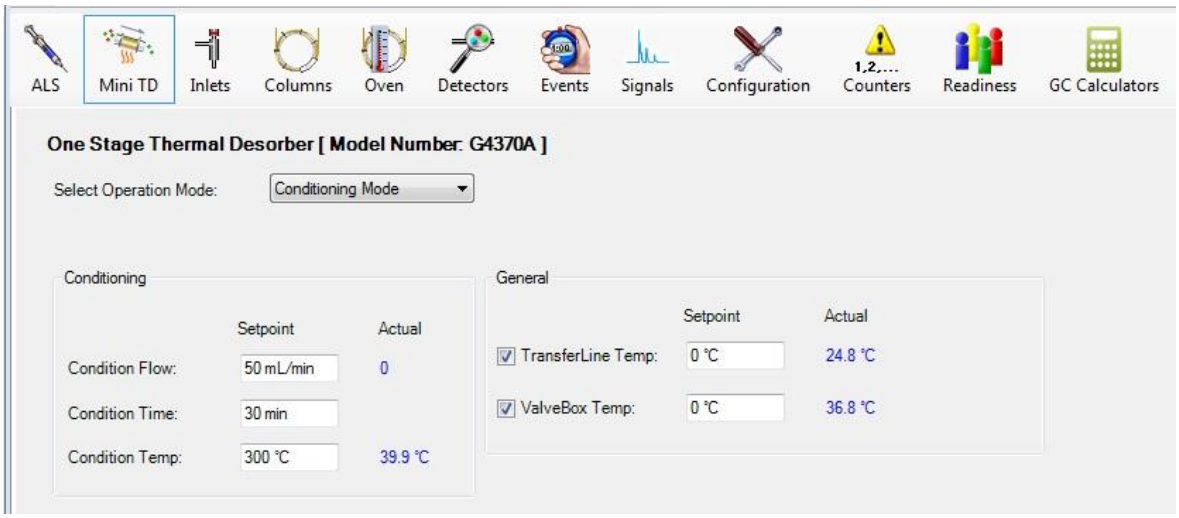


Figure 28 Conditioning Mode interface

4. Table 8 lists all of the editable parameters and the parameter range.

Table 8 List of Mini TD Setting parameters

Parameters	Range	Description
Select Operation Mode	Online sampling mode Desorption mode Conditioning Mode	Select the operation mode as required
Enable sample overlap	☑/☐	Enable/disable this function
After the previous injection is completed Prepare sample 0 min before end of GC run	⦿/○ ⦿/○ 0-100 min	1. Start the next sampling after the completion of the present injection (or after the completion of the cleaning if cleaning is needed). 2. Begin to prepare the sample # minutes before the completion of the GC running.
Enable Leak Detection	☑/☐	Enable/disable this function
Sampling		
Enable Pump	☑/☐	Enable/disable Pump
Sampling Flow	5-150 mL/min*	Specify the gas flow during sampling
Sampling Time	0-100 min	Specify the duration of the sampling
PreSampling Time	0-100 min	Specify the preparation time before sampling
Dry Purge		
Enable Dry Purge	☑/☐	Enable/disable this function
Dry Purging Flow	0-200 mL/min	Specify the gas flow during dry purging
Dry Purging Time	0-100 min	Specify the duration of the dry purging process

***** The sampling flow range will be affected by ambient pressure. The Maximal sampling flow rate will degrade in high altitude region.

Table 8 List of Mini TD Setting parameters (Continued)

Clearning		
Enable Clearning	☑/☐	Enable/disable this function
Clearning Flow	0-200 mL/min	Specify the flow in the cleaning of the Mini TD
Clearning Time	0-100 min	Specify the duration of the cleaning operation
Clearning Temp	≤325℃	Specify the temperature in the cleaning of the Mini TD
General		
Carrier Flow	0-200 mL/min	Specify the carrier gas flow
Xferline Temp	≤200℃	Specify the transfer line temperature
ValveBox Temp	≤175℃	Specify the valve box temperature
Desorbing		
Tube Temp	☑/☐ ≤325℃	On/Off Specify the initial temperature of the desorption tube
Injection Start Time	☑/☐ 0-100 min	Turn On/Off the injection function Specify the duration of injection (unit: minute)
Ramp	0-500 ℃/min	Spcify the rate of temperature Ramp of the first order
Conditioning Parameters		
Condition Flow	0-200 mL/min	Specify the gas flow in the Conditioning
Condition Time	0-100 min	Specify the duration of the Conditioning process
Condition Temp	≤ 325℃	Specify the temperature in the Conditioning

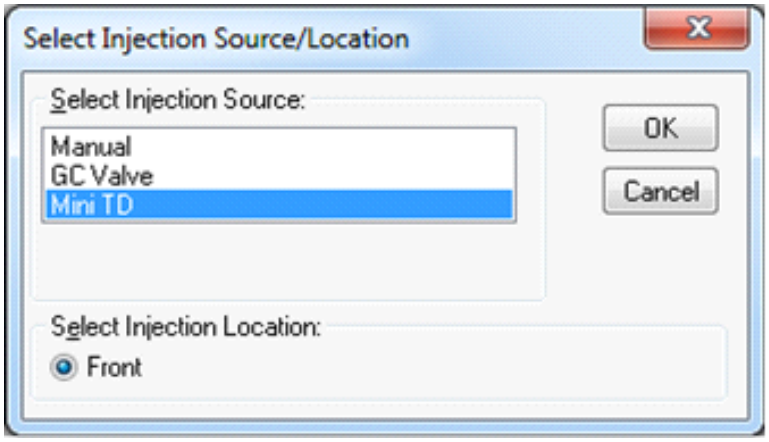
NOTE **The 7667A Mini Thermal Desorber only supports first-order ramp and the highest ramp rate is 500℃ /min.**

Create the Method

1. Select "**Instrument > Edit Agilent 7820 Parameters...**" to go to the "**Setting Method**" interface.
2. Click the

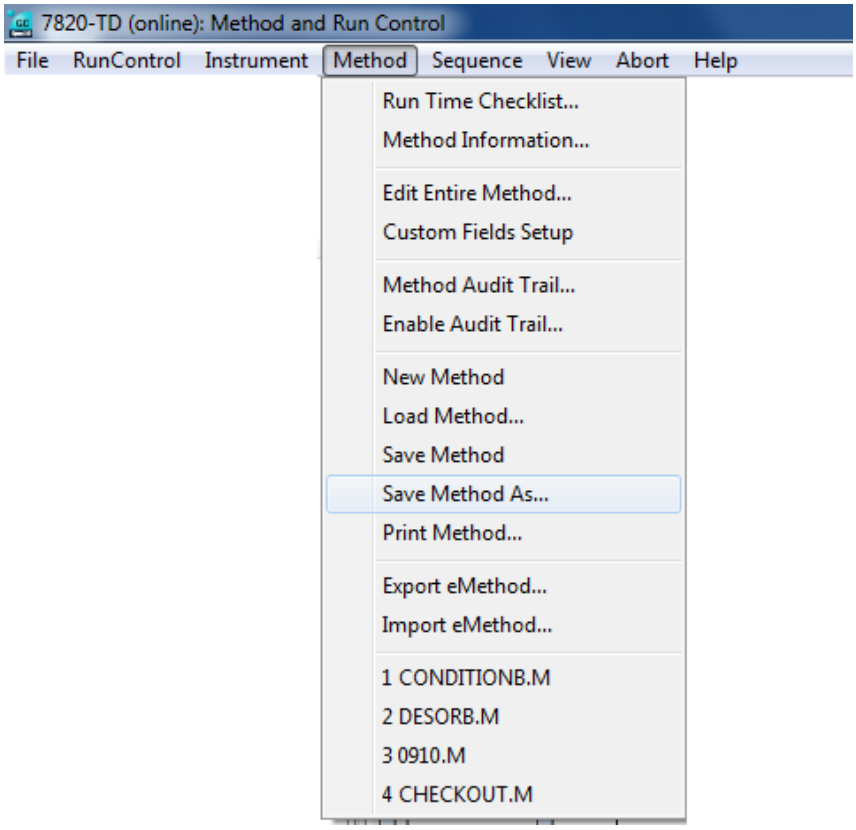
icon to go to the Mini TD parameter setting interface.
3. Select the operation mode as required.
4. Input/change other parameters as required. Refer to "Parameter Setting" in the above.
5. Press the "**Apply**" button to apply the method to the Mini TD.
6. Edit the 7820 GC parameters (refer to the 7820A GC Manual).

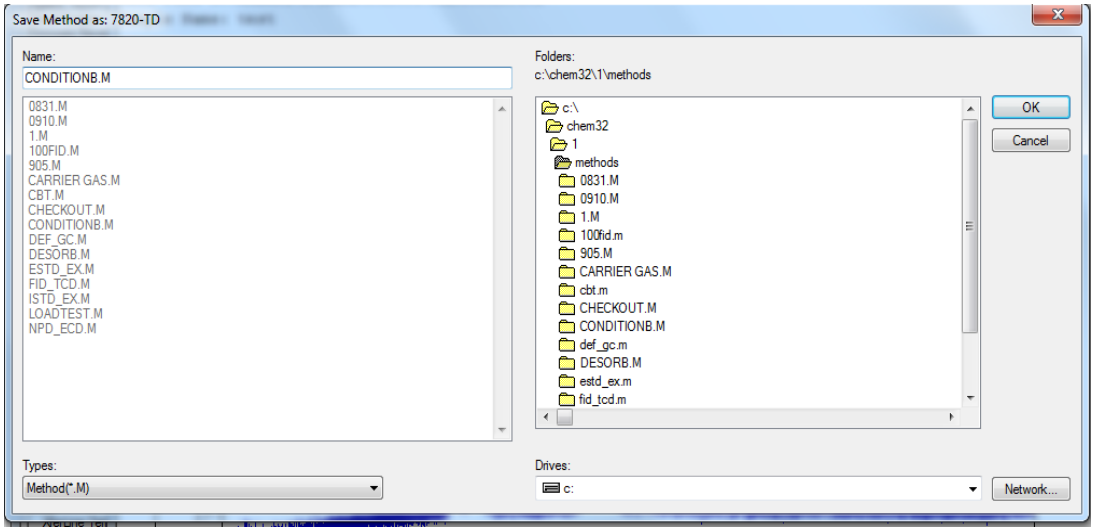
7. Select **Instrument** > **Select Injection Source** to open the "**Select Injection Source**" dialog box; select "Mini TD" as the injection source.



Save the Method

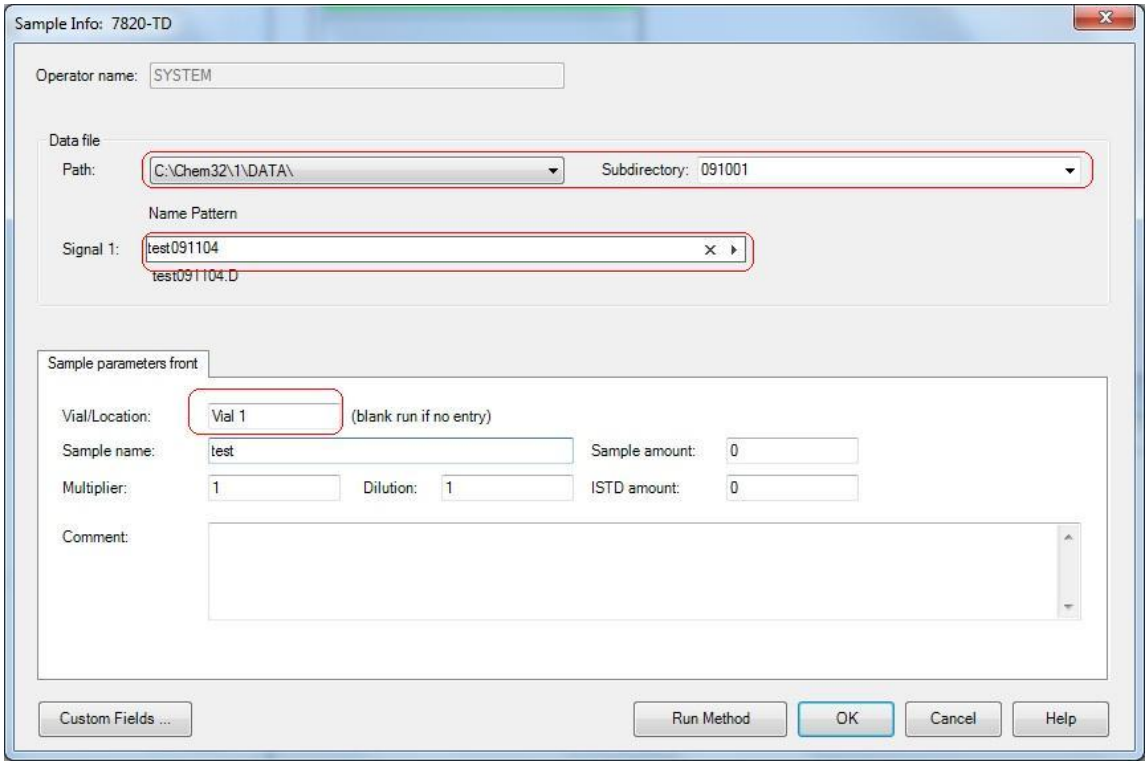
Select "**Method** > **Save Method As...**" to open the "**Save Method As**" diaglog box. Enter a new file name and press "**OK**" button to save the current method. Meanwhile, the method is applied to the GC-Mini TD system you have connected.





Run the Method

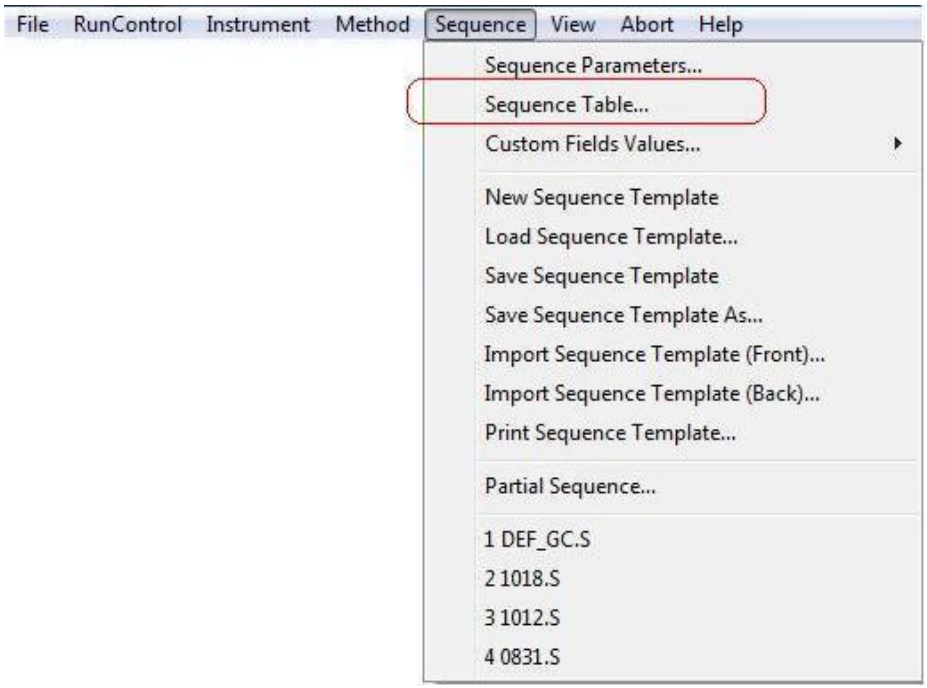
1. Select "**Run Control > Sample Information**" to open the "**Sample Information**" box. Then select the save path of the output signal, the output file name and the vial position (Vial1 is the default position of the Mini TD).



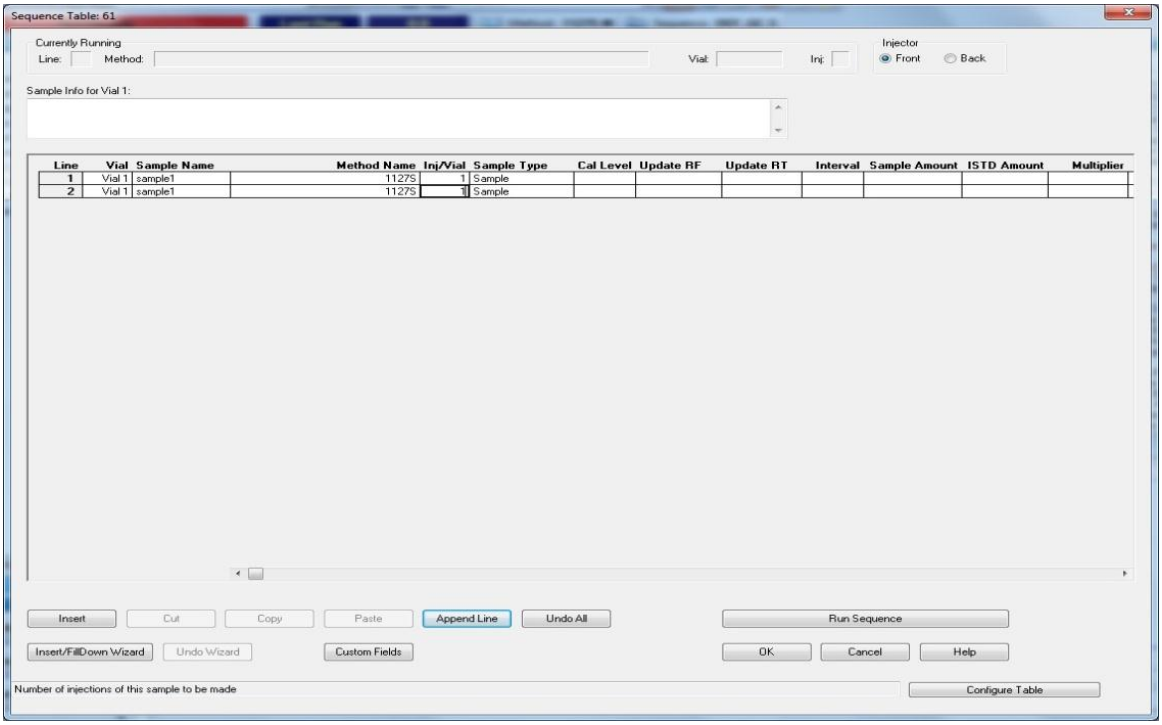
2. Press the “**Run Method**” button to start running the method, or press the “**OK**” button to close the “**Sample Information**” box. Then select “**Run Control > Run Method**” to start running the method.

Create the Sequence

1. Select “**Sequence > Sequence Table**” to open the sequence table.

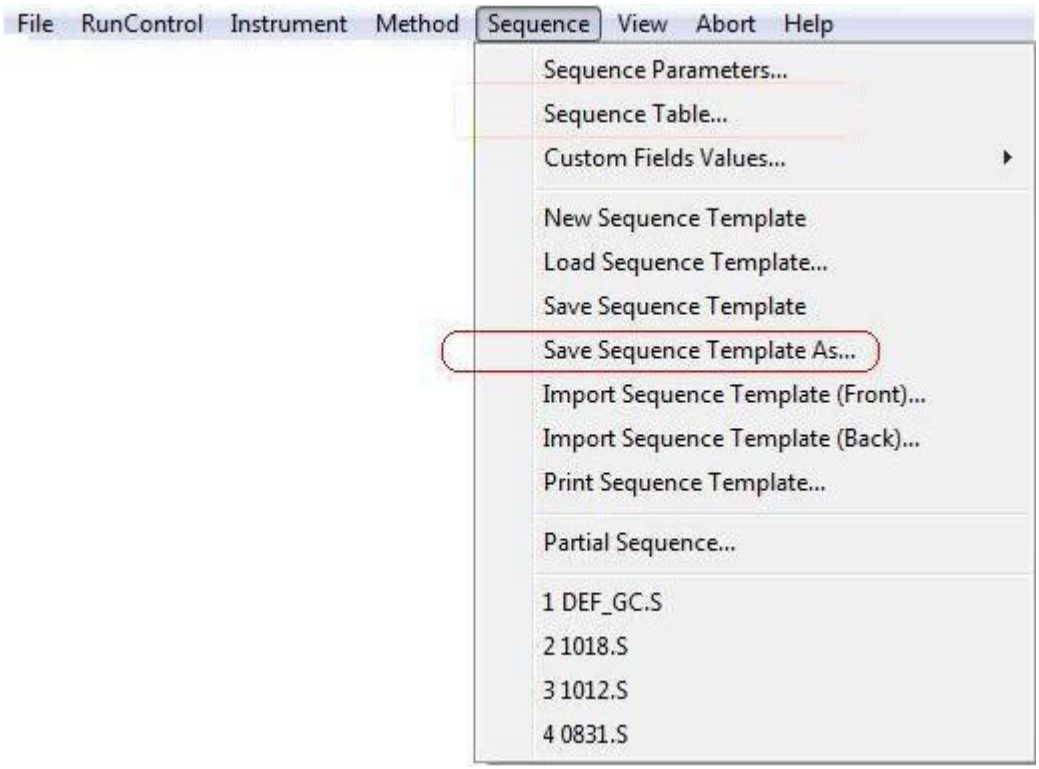


2. In the sequence table, enter the vial position (Vial1), the method name and the data file name.



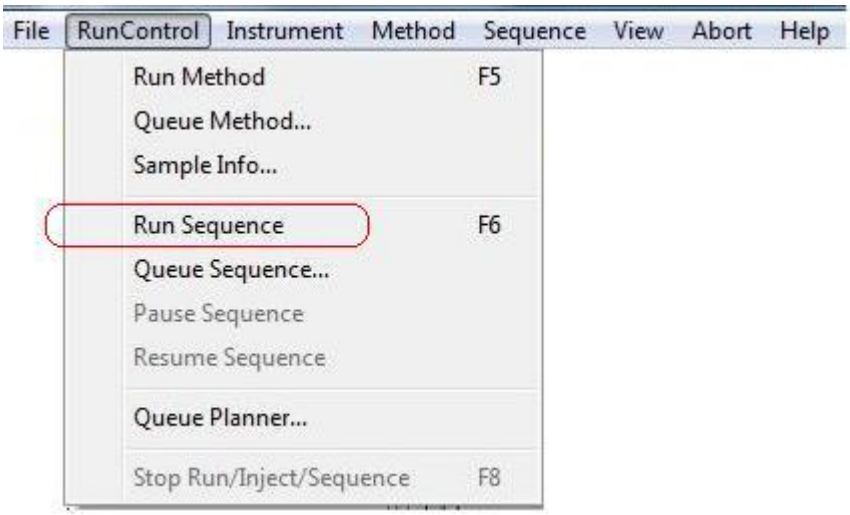
Save the Sequence

3. Select "**Sequence** > **Save Sequence Table As...**" to save the sequence.



Run the Sequence

4. Select "**Run Control** > **Run the Sequence**" to start running the current sequence.



MassHunter Operation

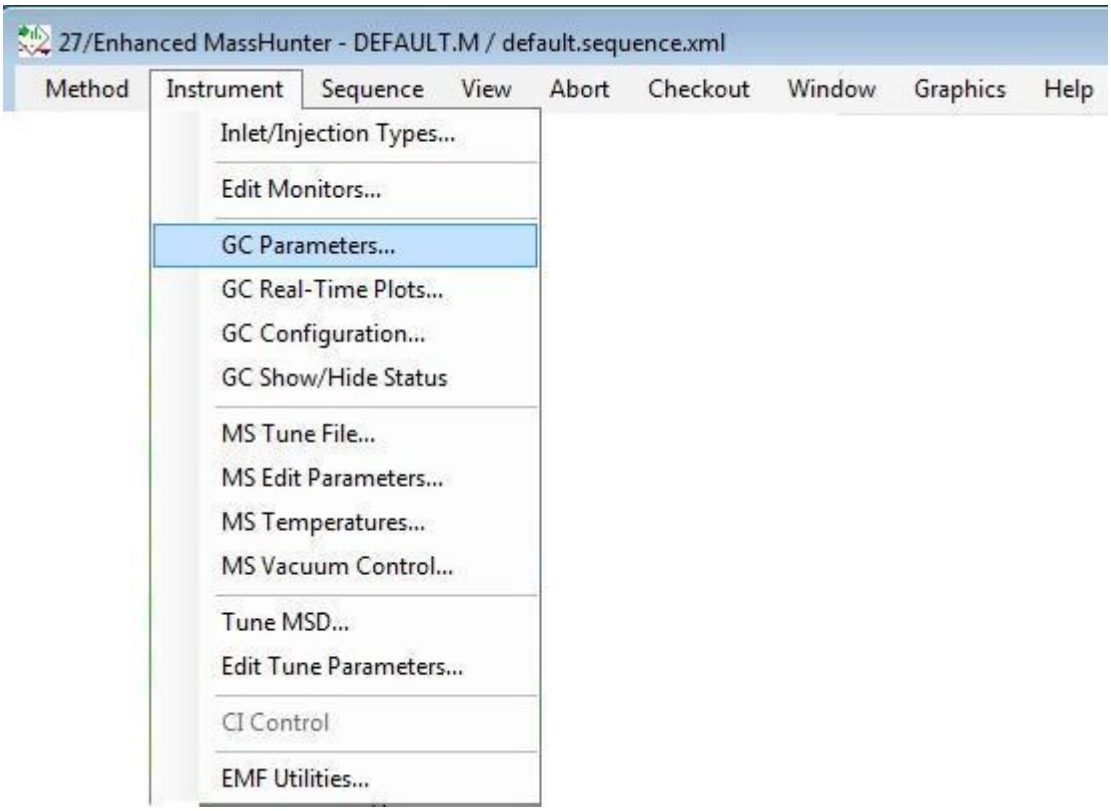
Start Online Instrument

1. On the “Desktop”, click the online instrument icon to enter the

“**MassHunter**” main interface.

Gas Type Configuration

1. Select “**Instrument > GC Parameters...**” to go to the “**Edit GC Parameters**” interface.



2. In the “**Edit GC Parameters**” interface, select “**Configuration**” **module** to go to the gas type selection interface.
3. OnlyHelium available.

Parameter Settings

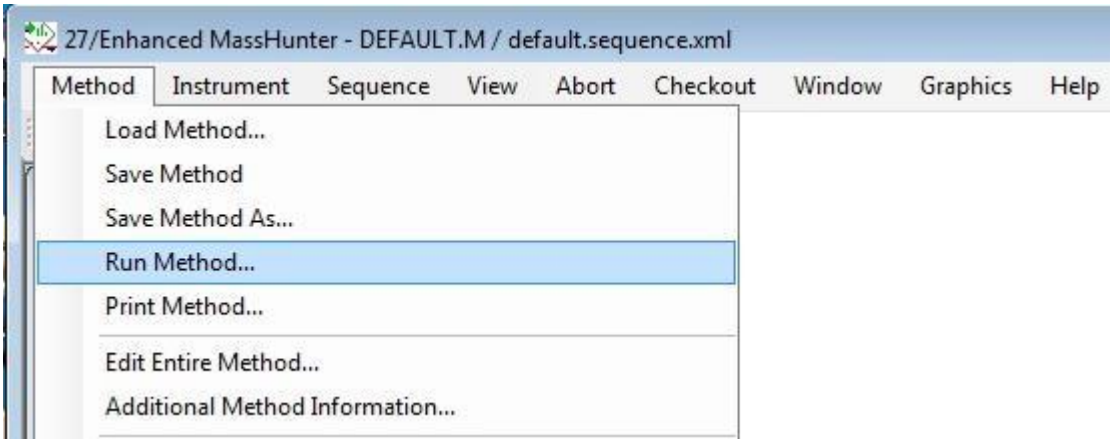
1. Select "**Instrument > GC Parameters**" to go to the "**Edit GC Parameters**" interface, and enter the GC parameters. (The specific operating steps are the same as those of "**ChemStation**").
2. Select "**Instrument > MS Parameters**" to go to the "**Edit MS Parameters**" interface, and enter the MS parameters.

Create/Save the Method

The operating steps of Create/Save Method is the same as those of "**ChemStation**".

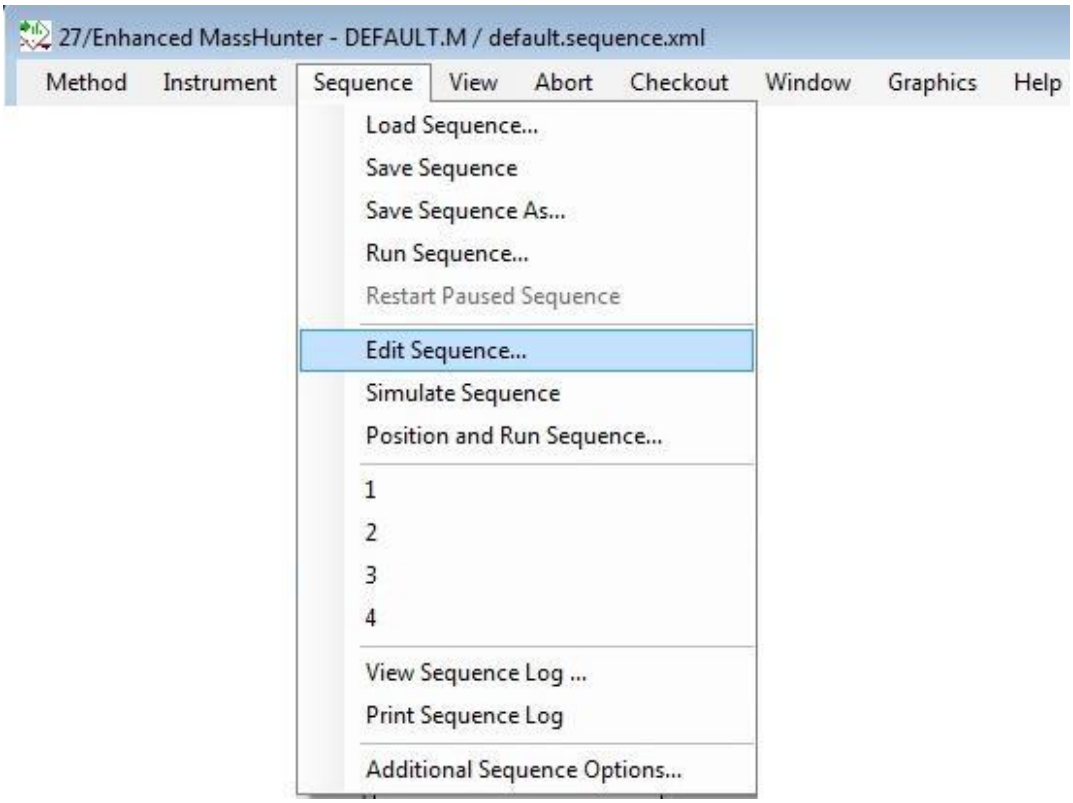
Run the Method

Select "**Method > Run the Method**" to start running the current method.

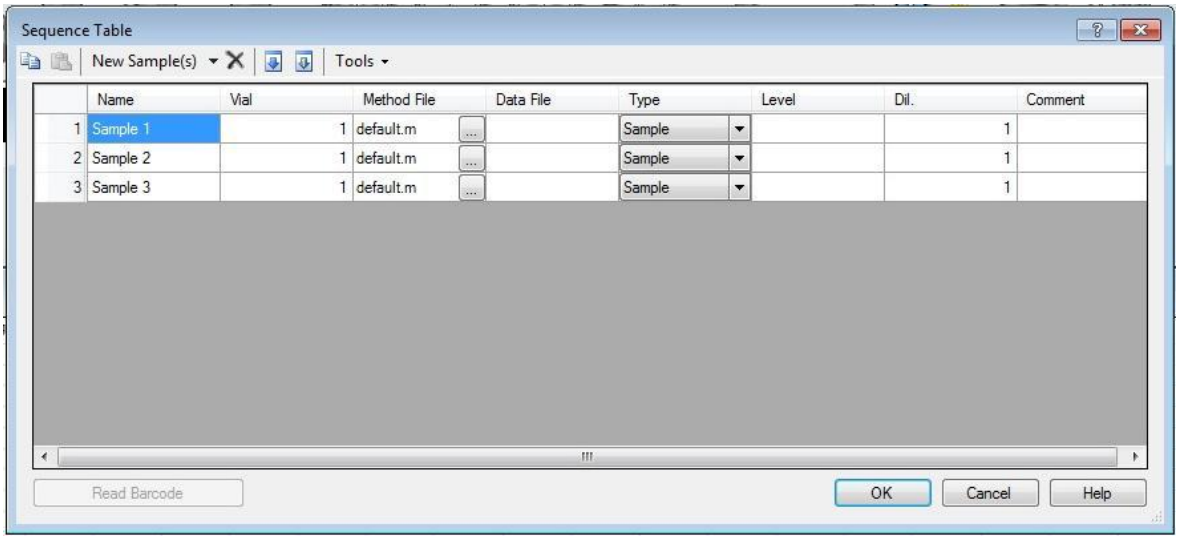


Create the Sequence

1. Select "**Sequence > Edit Sequence**" to open the "**Sequence Table**".

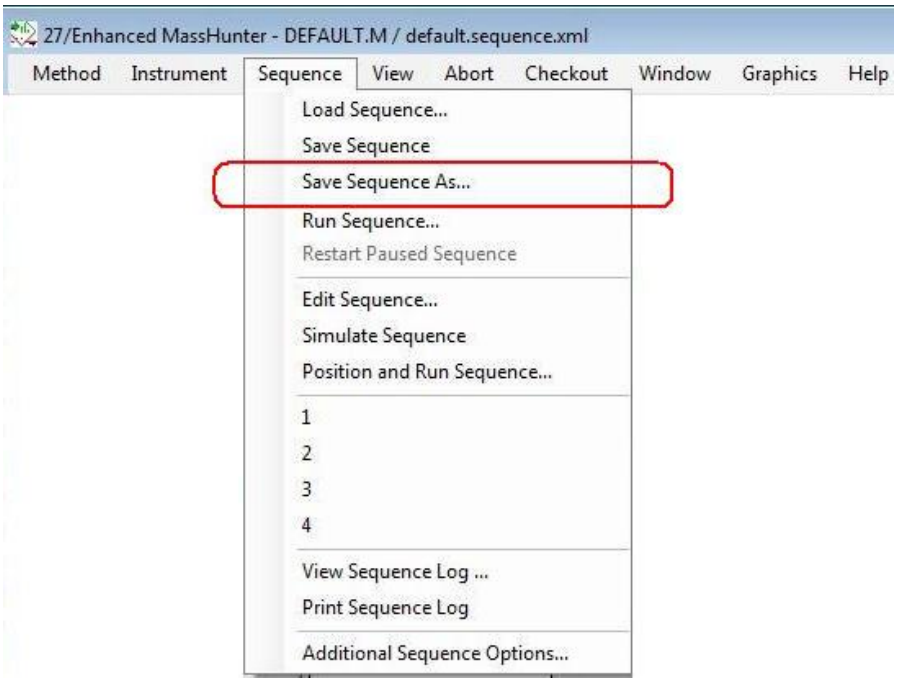


2. In "**sequence table**", enter the vial position (Vial1), the method name and the data file name.



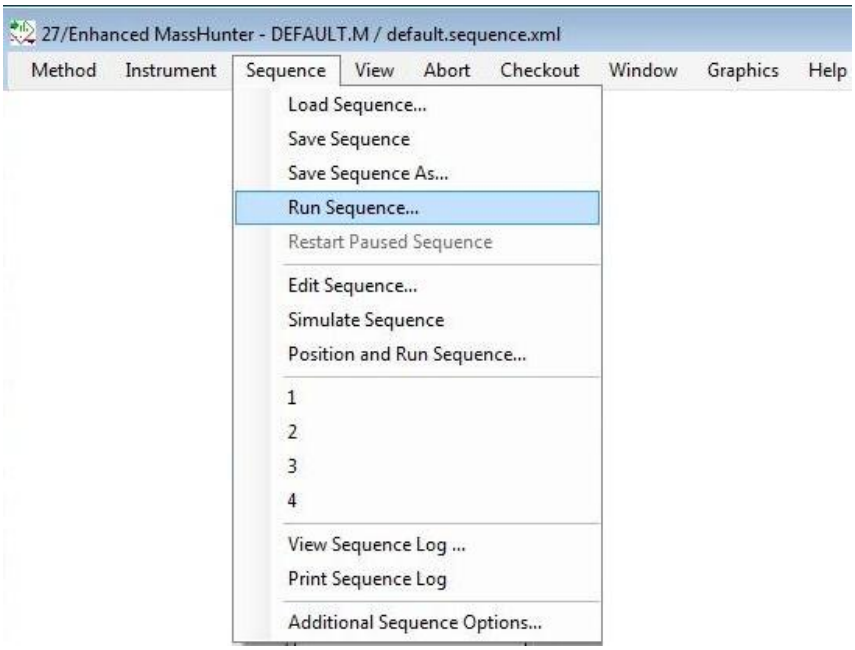
Save the Sequence

3. Select "**Sequence > Save Sequence Table As...**" to save the current sequence.



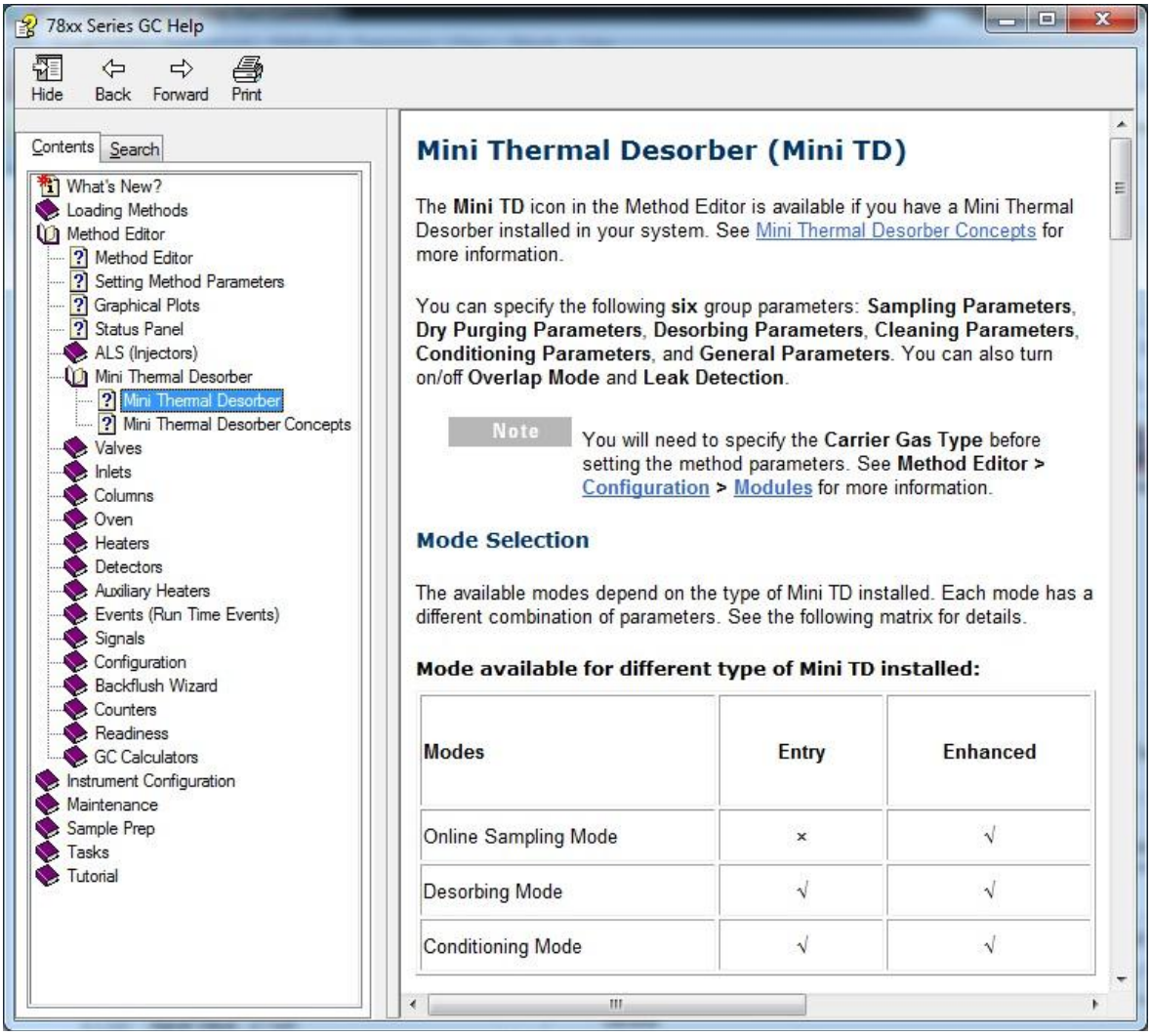
Run the Sequence

4. Select "**Sequence > Run the Sequence**" to run the current sequence.



Online Help Information

The Agilent Integrated Mini TD Software includes an extensive online help system with detailed information and common tasks on how to use the software.



5

Routine Maintenance

Consumables List 72
Update the Mini TD Firmware 72
Replace the Injection Needle Ass 73
Install the Injection Needle Ass 73
Remove the Injection Needle Ass 75
Replace the O-ring and the Filter 76
Replace the Trap(for G4370M) 79
Remove the Stainless Steel Tube Seamless from the Transfer Line 82

The information contained in this section will help you to successfully use the Mini TD and ensure that the 7667A Mini Thermal Desorber system can run with full performance.
The maintenance intervals of the **G4370A/G4370M** vary with the use frequency of the instrumen

Consumables List

Table 9 lists a number of consumables accompanying the 7667A. For the latest parts and consumables, visit Agilent's website: **www.agilent.com/chem**.

Table 9 Consumables

Consumables	**Agilent** Part Number
Desorption tube	C-TBP1TC
O-Ring 0.239-in-ID (O-ring)	0905-1820
O-Ring 0.364-in-ID (Large O-ring)	0905-1819
Injection Needle Ass	G4372-60015
Filter	MKI-U-DISK3
Trap	G1544-80500

Update the Mini TD Firmware

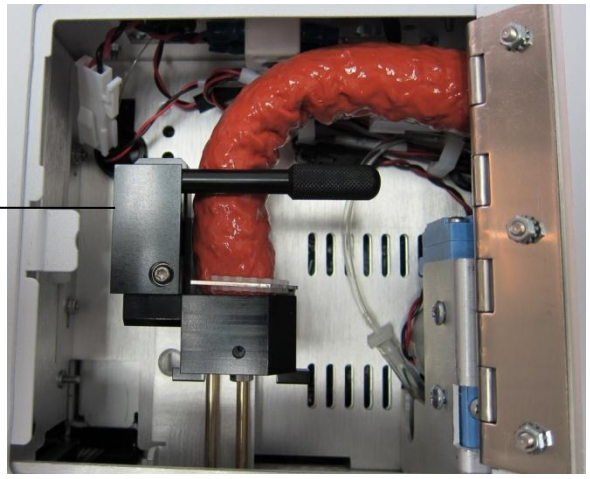
Please use **Agilent Instrument Update Utility** to update the Mini TD firmware. Users can download the latest revision of firmware from Agilent's website (**www.agilent.com/chem**) or contact your local Agilent's sale representitives.

Replace the Injection Needle Ass

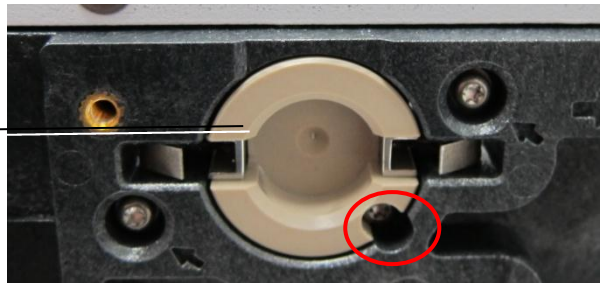
Install the Injection Needle Ass

1. Put the G4370M flat on the bench with side door facing up, and open the side door.

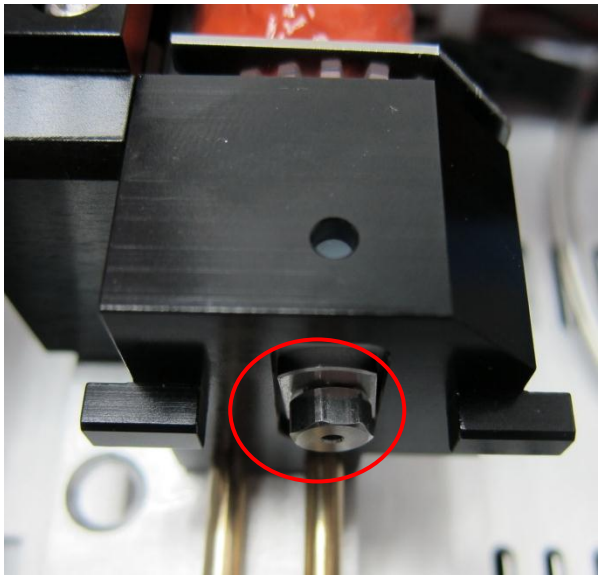
2. Confirm the injection slider in the locked high level.



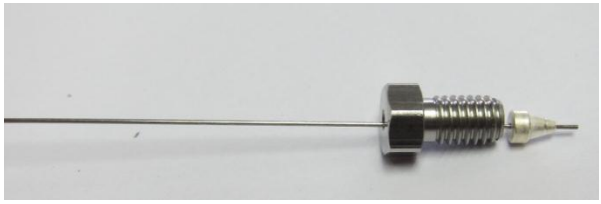
3. Use the T10 screwdriver to remove the screw as shown in the illustration.



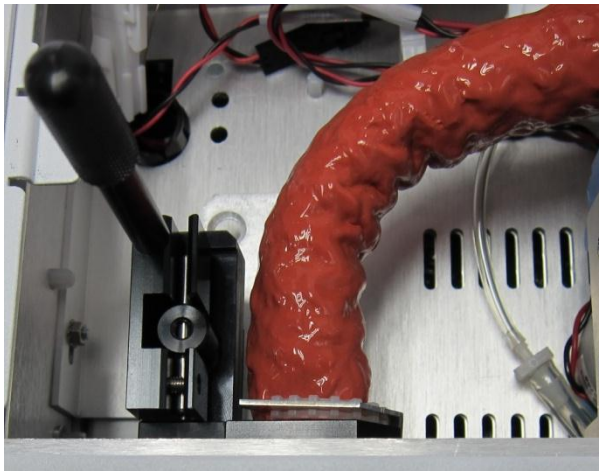
4. Push the inlet adapter out from the inside.
5. Use a 1/4 inch wrench to remove the lock nut.



6. Insert the Injection Needle Ass (P/N G4372-60015) into the lock nut and tighten it on the injection slider with your hands and then use the wrench to reinforce it.



7. Rotate the locking handle to the vertical position to unlock the injection slider. Push the injection slider to the injection low level.



8. Install the inlet adapter.

9. Push the injection slider to the locked high level, and then rotate the locking handle back to the locked position.

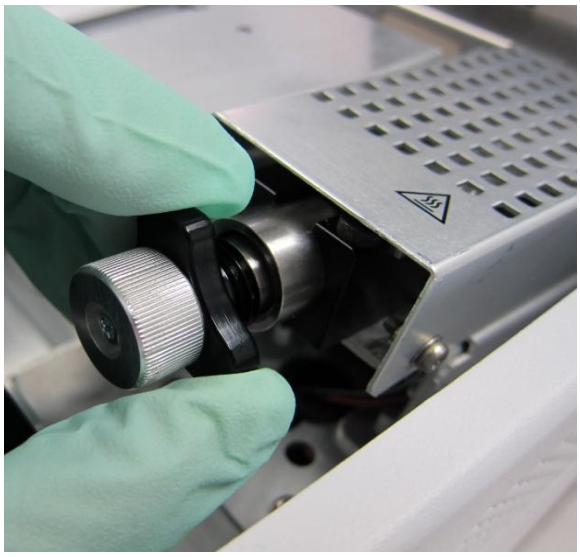
Remove the Injection Needle Ass

WARNING **Attention! The transfer line may be hot and cause burns. Cool it to room trmperature to avoid burns.**

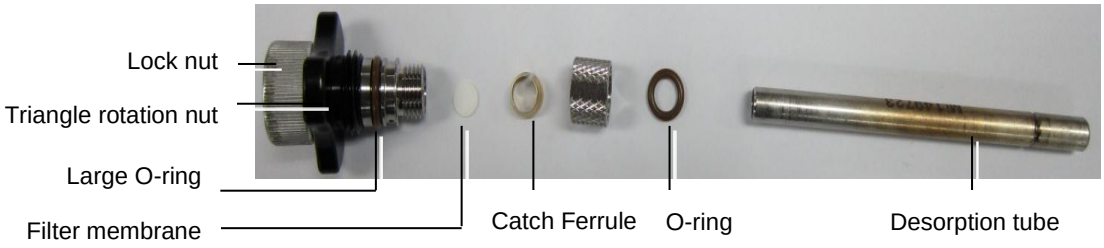
1. Cool the transfer line to room temperature.
2. Open the side door, and rotate the locking handle to the vertical position to unlock the injection slider.
3. Push the injection slider to the locked high position and rotate the locking handle to the locked position.
4. Close the side door.
5. Turn off the power and gas supply. Remove all the gas lines.
6. Remove the G4370M from the 5975T and put it flat on the bench.
7. Open the side door and remove the inlet adapter.
8. Loose the lock nut and pull out the Injection Needle Ass with hand.

Replace the O-ring and Filter

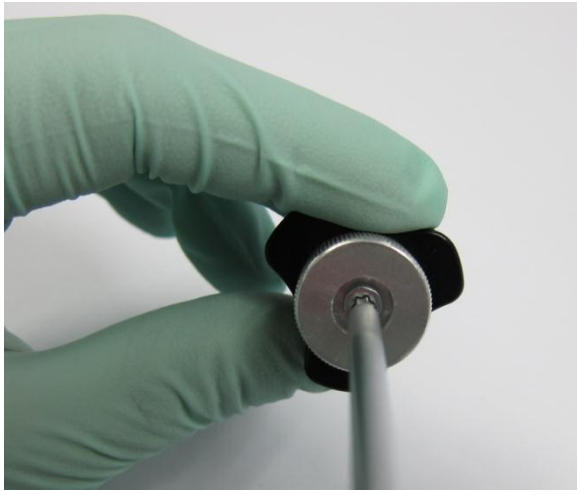
1. Open the top cover.
2. Unscrew the triangle rotation nut counterclockwise and take out the desorption tube assembly.



3. Remove the lock nut, pull out the desorption tube, and remove the O-ring and Filter.

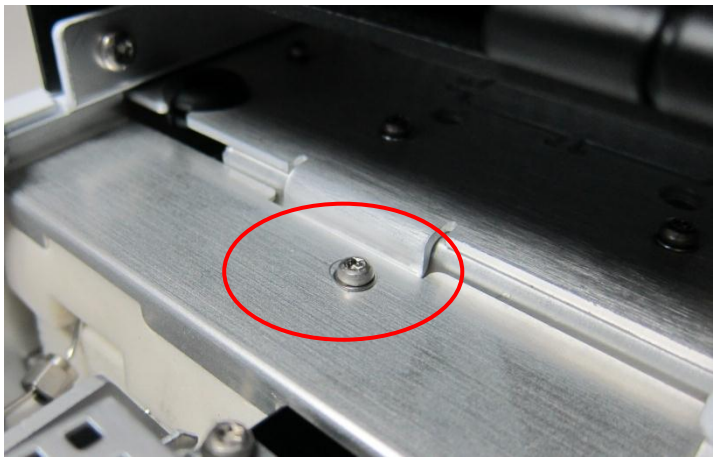


4. Replace the O-ring and Filter.
5. If a larger O-ring is not needed, ignore steps 6-9.
6. Use a T-10 screwdriver to remove the screw as shown in the illustration.

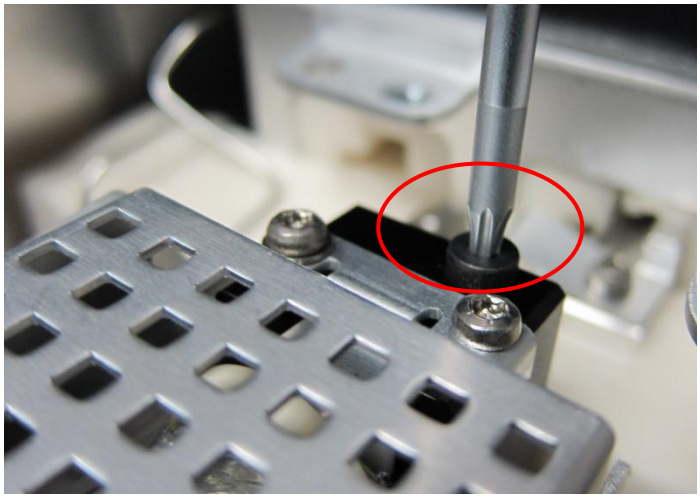


7. Remove the lock nut and triangle rotation nut.

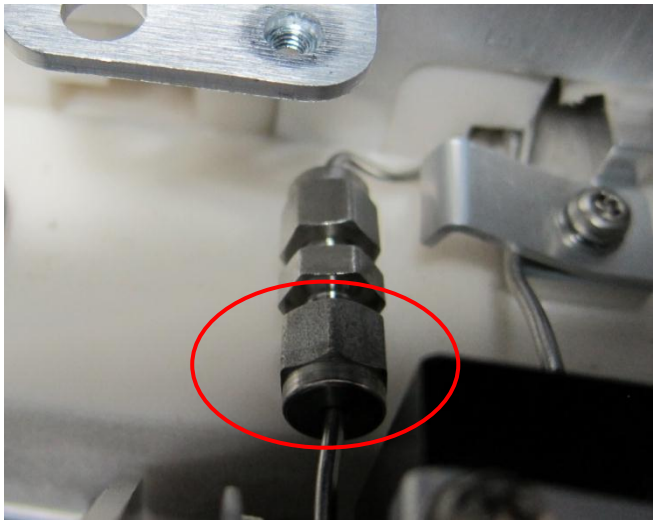
8. Replace with a larger O-ring.
9. Restore the desorption tube assembly.
10. If the sealing O-ring on the groove side of the desorption tube needs to be replaced, follow the steps below; or ignore the steps below.
11. Use a T-10 screwdriver to remove the nut as shown in the illustration and remove the cotton insulation cover and cotton insulation.



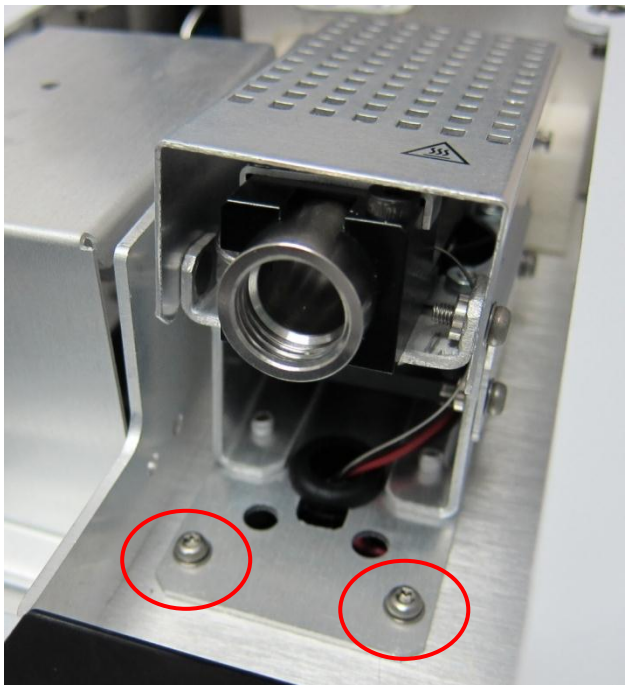
12. Loosen and pull out the screw as shown in the illustration.



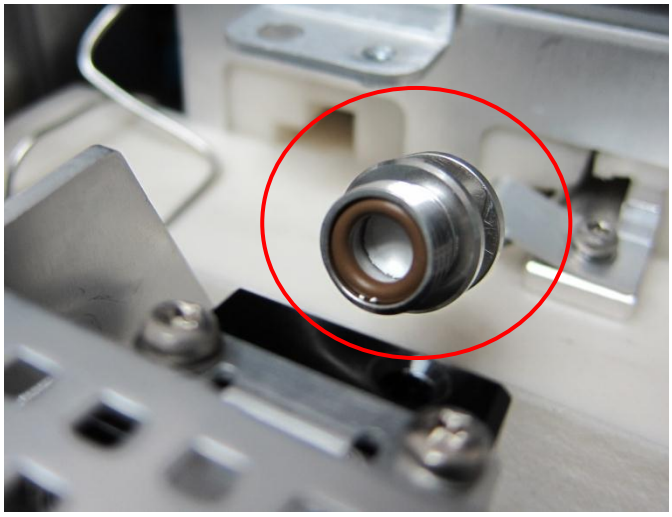
13. Use a 5/16 inch wrench to unscrew the nut as shown in the illustration.



14. Remove the screws as shown in the illustration.



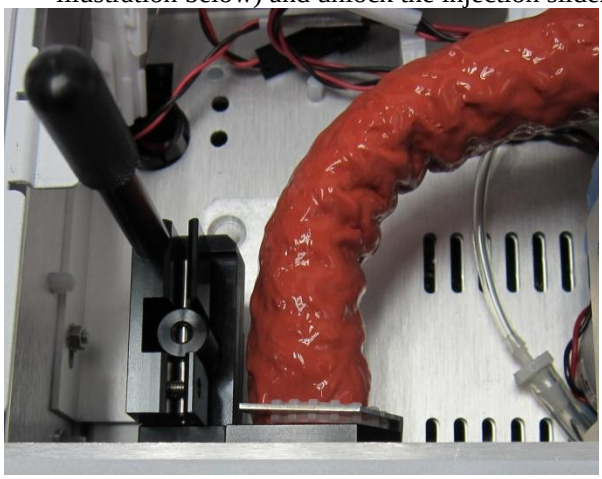
15. Push backward the heating tube assembly, and replace the O-ring and Filter as shown in the illustration.



16. Restore the desorption tube heater status.

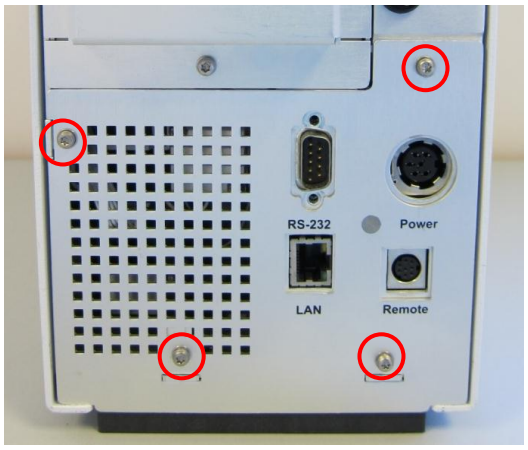
Replace the Trap(for G4370M)

1. Turn off all heating zone temperature.
2. Turn off the power and unplug it.
3. Turn off the gas supply and then remove the gas line on the instrument.
4. Open the side door.
5. Rotate the locking handle to the vertical position (see the illustration below) and unlock the injection slider.

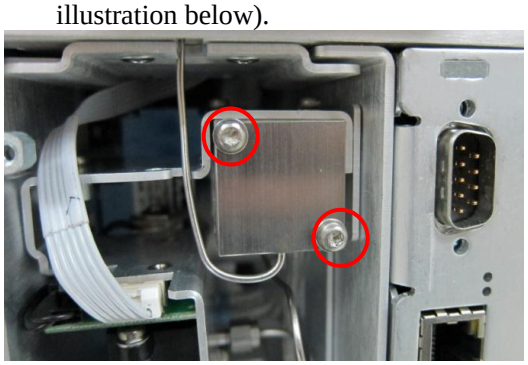


6. Push the injection slider to the locked high level, and then rotate the locking handle to the locked position.
7. Close the side door.
8. Remove the G4370M from the 5975T.

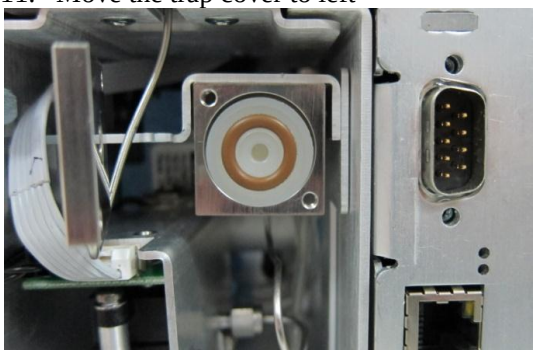
9. Put the instrument on the bench. See the illustration below.Remove the instrument rear cover.



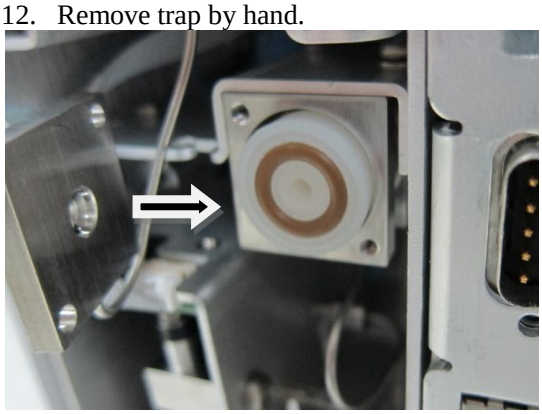
10. Remove the two screws as shown in the illustration (see the illustration below).



11. Move the trap cover to left



12. Remove trap by hand.



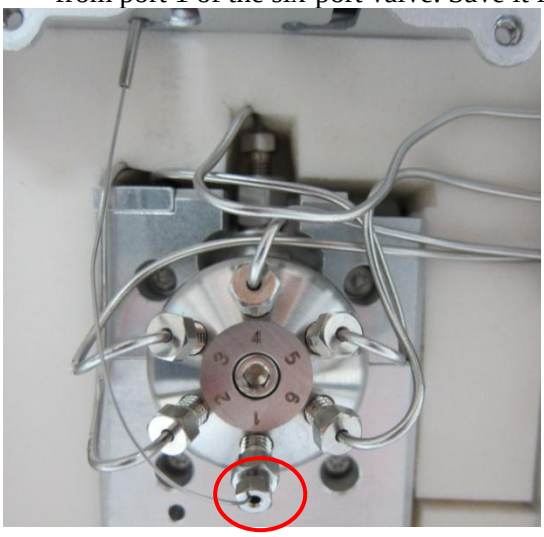
13. insert a new trap (G1544-80500).
14. Restore the instrument to the original state.

Remove the Stainless Steel Tube Seamless from the Transfer Line (for G4370A)

CAUTION **Disconnecting the transfer line may interrupt the GC carrier gas flow. Cool the GC Column Oven and inlet as needed to prevent damage to the column.**

WARNING **Attention! The column oven and inlet may be hot and cause burns. Please wear protective gloves to avoid burns.**

1. Cool the G4370A heating zone to a safe handling temperature.
2. Remove the valve box cover and take out the cotton insulation.
3. Remove the Fitting-internal Reducer 1/16 to 1/32-in. from port 1 of the six-port valve. Save it for future use.



.

4. Loosen the long transfer line Latch/Clamp on the GC.
5. Pull out the Stainless Steel Tube Seamless from the inlet.
6. Gently grasp the stainliss steel tube on an inlet end and pull the column from the transfer line.

6

Troubleshooting

Symptom 1: Start failure 84
Symptom 2: The carrier gas flow does not reach the set point 84
Symptom 3: The chromatogram is not shown 84
Symptom 4: The chromatograms indicate a lot of impurities 85
Symptom 5: Gas leak 85
Symptom 6: Overloading 85
Error Messages 86

This section only deals with the problems related to the Mini TD. However, many of the symptoms described here may also originate from other problems, especially GC's temperature and the stability of GC's gas supply.

If you are unable to correct the problem, please contact Agilent's support.

Symptom 1: Start failure

Switch on 7667A and it is not initialized properly.

Possible Cause	Operation
Power cord is not plugged	Check whether the power cord is plugged.
The power adapter plug is not plugged	Check if the power adapter 6-hole connector is plugged

Symptom 2: The carrier gas flow does not reach the set point

Possible Cause	Operation
The gas supply is not connected properly	Tighten the carrier gas interface. The carrier gas configuration should be consistent with that of the actual gas type.
Insufficient pressure leads to unregular carrier gas supply	Check the upstream carrier gas pressure that should be higher than 60 psi (or 0.4 Mpa)
Injection Needle Ass clogged	Replace the Injection Needle Ass

Symptom 3: The chromatogram is not shown

Possible Cause	Operation
Gas chromatography failure	Recommended to disconnect the thermal desorber, prepare standard checkout sample and observe if the sample will make a peak
The Mini TD's Injection Needle Ass is not inserted into the GC inlet	Insert the Injection Needle Ass completely into the gas chromatography inlet
The desorption tube is not properly configured in the thermal desorption instrument	Check if the desorption tube is installed properly. Check if the desorption tube is with the correct sorbent. Check if the driver gas is connected and pressurized.
Sampling fails; the carrier gas type is not configured properly	If you are using the G4370M version, ensure that the sample enters the inlet. Observe if the sample flow reaches the set piont; if it is very low or is zero, restart the instrument and re-configure the carrier gas type. If you are using the G4370A version, ensure that the sampling process is correct
The desorption tube leaks at the connection point The sampling flow is normal, but the flow in purging does not reach the set point or is zero	Confirm if the triangle nut in the desorption tube assembly is tightened; if it does not work, replace the O-ring
The carrier gas flow does not reach the set point	Check the upstream carrier gas pressure that should be higher than 60 psi (or 0.4 Mpa)

Symptom 4: The chromatograms indicate a lot of impurities

Possible Cause	Operation
There are some Residual impurities in the column and the desorption tube	Before testing the sample, it is recommended to condition the chromatographic column and the desorption tube and test with a blank run, which may be Nitrogen instead. If the blank sample still has a lot of mixed peaks, confirm if the gas chromatography inlet is contaminated.
The liner and septum are contaminated	Replace the liner and septum

Symptom 5: Gas leak

The flow does not reach the set point or is zero in the purging process.

Possible Cause	Operation
The desorption tube is not tightened properly into the thermal desorber, or the desorption tube's O-ring needs to be replaced	It is recommended to tighten the desorption tube or replace the O-ring.

Symptom 6: Overloading

Serious residue is found in the blank run after the injection(Carryover is larger than 1%.).

Possible Cause	Operation
The sample concentration is too high	It is recommended to extend the cleaning time to 10 min, heat the desorption tube to the maximum allowable temperature, and set the flow to 200 ml/min.
High-boiling-point sample enters the thermal desorber	Confirm if the sample contains high boiling point components. This thermal desorber does not support the component with boiling point higher than those of the n-alkanes C16. If any high-boiling-point component, whose melting or boiling point is higher than those of the n-alkanes C16, enters, which have an impact on the test, the first recommendation is to condtion the Mini TD system completely. If it doesn’t work, replace the valve box and tube weldments. Please contact Customer Service.

Error Messages

Table 10 lists the error messages that the Mini TD reports (in the Workstation Log and Control Panel). If a message received is not included in the table below, please note it down and report the error message to Agilent's support.

Table 10 Error messages

Error Code	Code Meaning	Possible Cause
0x0001	Transfer line heater shut down	Transfer line is burned
0x0002	Transfer line heater sensor open	Transfer line is burned or the sensor is damaged
0x0004	Valve box heater shut down	Valve box is burned
0x0008	Valve box heater sensor open	Valve box is burned or the sensor is damaged
0x0010	Tube heater shut down	Heating wire is damaged
0x0020	Tube heater sensor open	Heating wire is damaged or the sensor is damaged
0x0040	Sampling flow EPC shut down	Sampling channel is blogged
0x0080	Sampling flow EPC not functional	Sampling channel is blogged
0x0400	Carrier flow EPC shut down	Upstream carrier gas pressure is insufficient or there is no carrier gas; carrier gas configuration is not consistent with the actual gas type
0x0800	Carrier flow EPC not functional	Upstream carrier gas pressure is insufficient or there is no carrier gas; carrier gas configuration is not consistent with the actual gas type
0x1000	Lost communication	Sync cable is not connected
0x2000	Leak detected	Desorption tube is not tightened, or O-ring in the desorption tube is not sealed
0x3000	TD is disconnected form GC	RS232 Cable for ALS interface is not connected

Appendix

Tube parameters:

MARKES international

Markes International Ltd.
Gwaun Elai Medi Science Campus, Llantrisant
RCT, CF72 8XL, United Kingdom
Tel: +44 (0)1443 230935 Fax: +44 (0)1443 231531
www.markes.com enquiries@markes.com

How to condition your sorbent tubes

Your tubes are packed with: **Tenax TA**

They have a maximum desorption temperature of: **350°C**

Tubes should be conditioned using clean carrier gas Carrier gas (e.g. Oxygen Free Nitrogen or Helium at 5N grade and ideally with a hydrocarbon filter in the gas line), at a flow of between 50ml/min and 100ml/min.

We recommend the following conditioning method for these freshly packed sorbent tubes:

2 hours at 320°C followed by

30 mins at 335°C

Once cleaned tubes should be capped with ¼ inch brass storage caps fitted with ¼ inch combined PTFE ferrules. These caps should be tightened finger tight and a quarter turn.

Tubes should be stored in a CLEAN environment and the brass storage caps should not be removed until immediately prior to sampling or desorption.

For trace level (low ppb / ppt level) analyses it is advisable to run blank desorptions prior to sampling.

We recommend the following maximum desorption temperature to reduce artefacts and extend sorbent lifetime: **300 - 320°C**

For reconditioning tubes we recommend:

15 – 30 mins at 335°C

However if the tubes become severely contaminated or are left for a period of time (1week+) without being capped then it is recommended that the full procedure shown above be repeated.

These tubes have a lifetime of approximately: **100** cycles, which includes both desorption and conditioning cycles. We recommend that the tubes be repacked with fresh sorbent after this.

Further information about selection of sorbents and conditioning criteria can be found in Markes International's Thermal Desorption Technical Support Note TDTS05. Further information about minimising tube artefacts during storage and / or transportation can be found in Markes International's Thermal Desorption Technical Support Note TDTS19.

These and many other technical publications can be obtained by registering on the Markes web site www.markes.com/registration or by contacting Markes International on consumables@markes.com