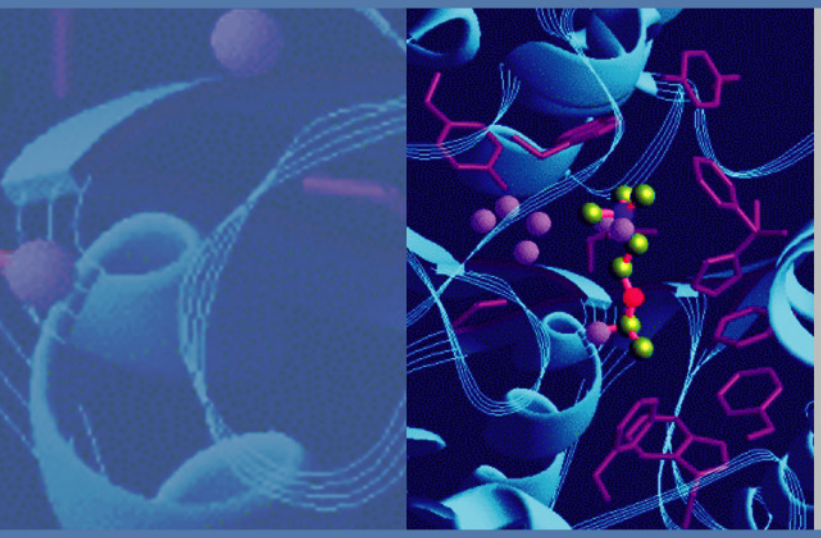


Thermo Xcalibur

TRACE 1300 1310 Gas Chromatograph Setup

User Guide

Revision D September 2014

Part of Thermo Fisher Scientific

Thermo SCIENTIFIC

Release history: The Xcalibur manuals support Xcalibur version 2.2 and above.

For Research Use Only. Not for use in diagnostic procedures.

Contents

Preface

This guide provides the instruction for the control of the TRACE 1300/1310 gas chromatograph TRACE 1300/1310 through Xcalibur.

The Thermo Xcalibur™ mass spectrometry data system uses a sequence to specify samples of various types and a processing method to automatically detect and analyze the sample. This manual describes how to create and work with processing methods and sequences.To provide us with comments about this document, please click the link below. Thank you in advance for your help.

Contents

Related Documentation

Thermo Fisher Scientific provides these documents for Xcalibur:

- *Xcalibur Getting Started (Quantitative Analysis)*
- *Acquisition and Processing User Guide*
- *Quantitative Analysis User Guide*
- •*Qualitative Analysis User Guide*
- *Creating and Searching Libraries User Guide*
- *XReport User Guide*
- *Xcalibur System and 21 CFR Part 11 Compliance Administrator Guide*

- •Help from within the software

❖ **To view product manuals**

Go to **Start > Programs > Xcalibur > Manuals > product-name.**

❖ **To open Help**

- From the product-name window, choose **Help > product-name Help**.
- If available for a specific window or dialog box, click **Help** or press **F1** for information about setting parameters.

For more information, including upcoming application notes, visit www.thermo.com.

System Requirements

product-name requires a license. In addition, your system must meet these minimum requirements.

System	Requirements
PC	• 4 GHz processor with 4GB RAM • CD-ROM drive • Video card and monitor capable of 1280x1024 resolution (XGA) • 250 GB or greater available on the C: drive • NTFS format
Software	• Microsoft® Windows® XP Professional with Service Pack 3 • Windows 7 Professional (32-bit) with Service Pack 1 • Xcalibur™ 2.1 or higher

Safety and Special Notices

Make sure you follow the precautionary statements presented in this guide. The safety and other special notices appear in boxes.

Safety and special notices include the following:

CAUTION Highlights hazards to humans, property, or the environment. Each CAUTION notice is accompanied by an appropriate CAUTION symbol.

IMPORTANT Highlights information necessary to prevent damage to software, loss of data, or invalid test results; or might contain information that is critical for optimal performance of the system.

Note Highlights information of general interest.

Tip Highlights helpful information that can make a task easier.

Contacting Us

Thermo Fisher Scientific provides comprehensive technical assistance worldwide and is dedicated to the quality of our customer relationships and services.

Use http://www.thermoscientific.com address for products information.

Use http://www.gc-gcms-customersupport.com/WebPage/Share/Default.aspx address to contact your local Thermo Fisher Scientific office or affiliate GC-GC/MS Customer Support.

TRACE 1300/1310 Configuration

This chapter contains the instruction to configure your TRACE 1300/1310.

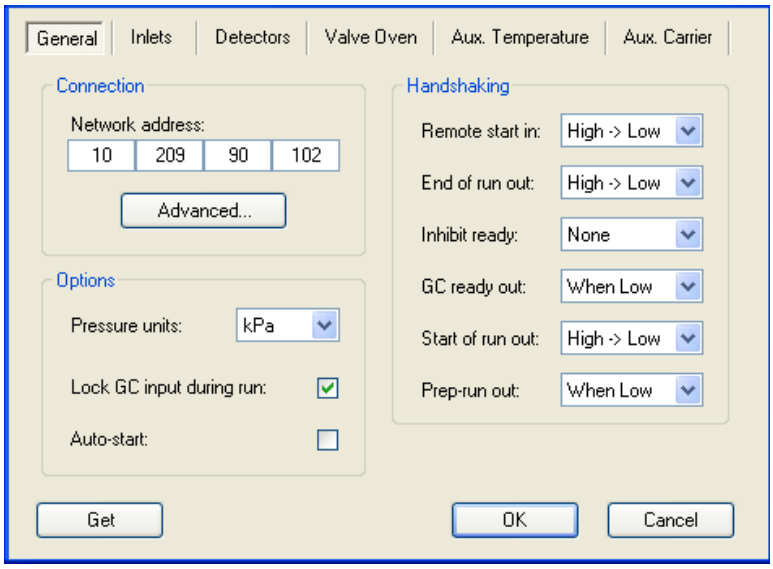
Contents

Introduction

This dialog box is available from the Instrument Configuration window.
To open this view choose Start | Programs | Thermo Foundation | Instrument Configuration.

Click the **TRACE 1300/1310** button located in the Available Devices column. Click **Add**, then **Configure** button. The TRACE 1300/1310 Configuration window is visualized.
See Figure 1.

Figure 1. TRACE 1300/1310 Configuration Window



Configuration windows is subdivided into the following tabs.

- Configuration General Tab
- Configuration Inlets Tab
- Configuration Detectors Tab
- Configuration Valve Oven Tab
- Configuration Auxiliary Temperature Tab
- Configuration Auxiliary Carrier Tab

Configuration windows includes the following common buttons:

Get — Use this button any time you want to automatically enter the configurations already entered into your GC.

Ok — Use this button to close the dialog box and confirm your selection.

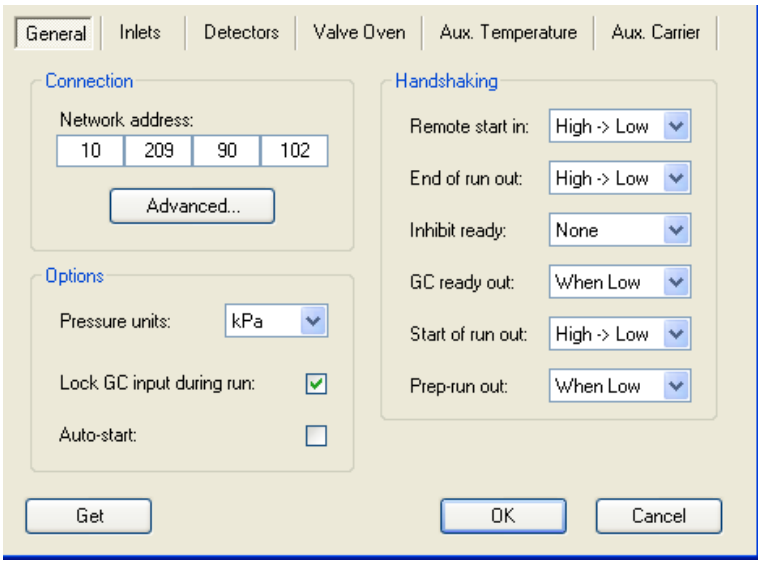
Cancel — Use this button to clears all modifications done.

Help — Use this button to open help instruction.

Configuration General Tab

This tab allows to configure the network address, the handshaking parameters, and the pressure unit. See Figure 2.

Figure 2. Configuration Window: General Tab



This tab includes the following fields:

- Connection
- Option
- Handshaking

Connection

In this field you set the LAN communication between the TRACE 1300/1310 and the data system. The parameters are described below

- **Network Address** — Enter the I.P. address to allow the LAN control of the GC through the Thermo data systems.

  The TRACE 1300/1310 is shipped with a default IP address, that may not match the needs of the LAN where the GC must be installed. To change the default values, contact your LAN administrator and ask the IP address to be assigned, the netmask, and eventually the port.

  – The IP address is a 3 digits x 4 fields given by the network administrator e.g. 192.168.127.10

  – The netmask is a 3 digits x 4 fields given by the network administrator e.g. 255.255.255.0

  - The port is a 4 digits number given by the network administrator e.g. 4001 (4001 is usually the CPU/LAN default).
  - The default IP address of the TRACE 1300/1310 CPU is **192.168.127.254**.
- **Advanced** — Click on this button to open the Advanced LAN Setting window where the advanced parameters for LAN communication may be set.
  - **Port No** — it specifies the port number
  - **Timeout (ms)** — it specifies the timeout value in milliseconds.Generally the two default values are 500 and 4001 respectively.

Option

This field includes the following options.

- **Pressure Unit** — From the drop-down list, choose one: **psi**, **kPa**, **bar**.
- **Lock GC input during run** box if GC input are not desired during the run.
- **Autostart** — Select this check box if you want the GC start automatically when ready.

Handshaking

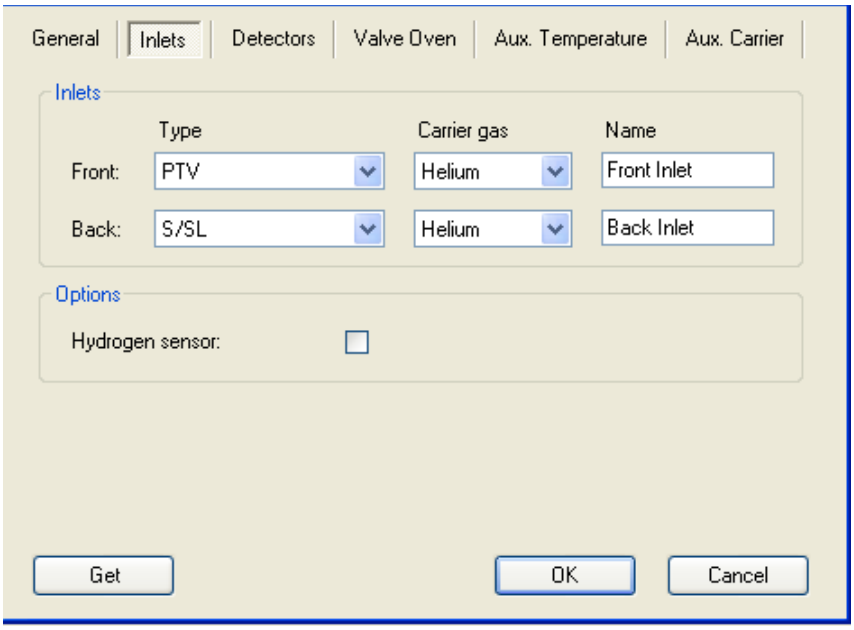
To configure the signals from external devices, such as an autosampler or mass spectrometer, during analysis. To allow other devices to run properly, you must indicate how the signal will change.

- **Remote Start In** — Allows another device to start the GC. The range is L to H (low to high), H to L (high to low). For the AI 3000/AS 3000 II autosampler, you must select H to L.
- **End of Run Out** — Signals another device that the run has ended. The range is L to H (low to high), H to L (high to low).
- **Inhibit Ready** — Delays readiness until the GC receives a signal from another device. The range is L (low), H (high) and Neither.
- **GC Ready Out** — Signals another device that the GC is ready. The range is L (low), H (High).
- **Start of Run Out** — Signals another device, that the run has started.The range is L to H (low to high), H to L (high to low).
- **Prep Run Out** — Signals another device that the GC is preparing for a run. The range is L (low), H (high).

Configuration Inlets Tab

Use this tab to select the inlets installed on your GC and the carrier gas used. See Figure 3.

Figure 3. Configuration Window: Inlets Tab



This tab includes the following fields:

- Inlets
- Options

Inlets

This field includes the following options:

- **Inlet Type** — Choose the front/back injector module installed on your GC.
  - **Front** — Choose one: None, S/SL, S/SL Backflush, Gas Sampling Valve, Helium Saver S/SL, PTV, or PTV Backflush.
  - **Back** — Choose one: None, S/SL, S/SL Backflush, Gas Sampling Valve, Helium Saver S/SL, PTV, or PTV Backflush.
- **Carrier Gas** — Choose the type of carrier gas used to supply the front/back injector module.
  - **Front** — Choose one: Helium, Hydrogen, Nitrogen, Argon, or Argon/Methane.
  - **Back** — Choose one: Helium, Hydrogen, Nitrogen, Argon, or Argon/Methane.
- **Name** — Enter the front/back position the injector module is installed.

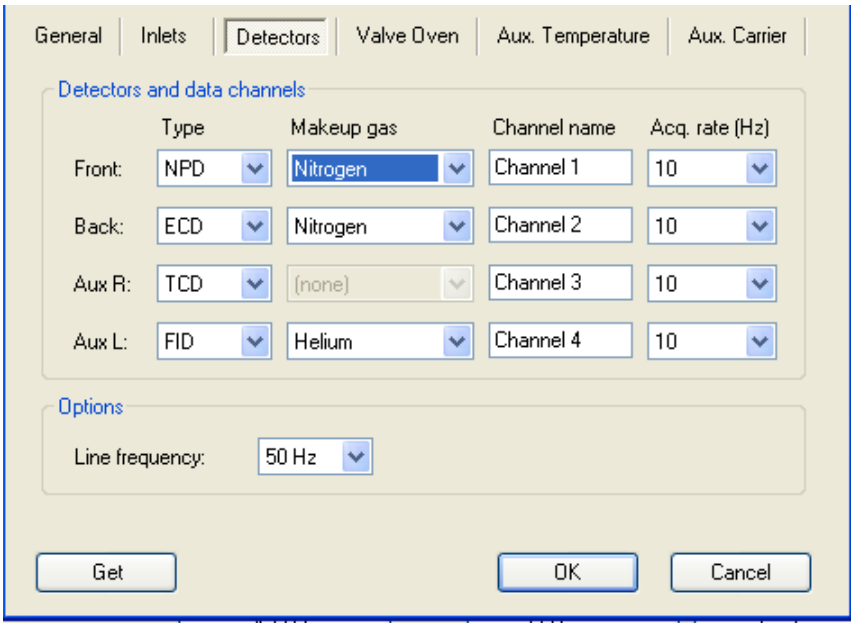
Options

Select **Hydrogen sensor** check box if the hydrogen sensor is installed into the GC.

Configuration Detectors Tab

Use this tab to configure the detectors you will use with your TRACE 1300/1310. See Figure 4.

Figure 4. Configuration Window: Detectors Tab



If you disconnect your detector from your GC, remember to reconfigure your TRACE 1300/1310 here. Detectors chosen here display instrument setup pages and list in the Detector Events located in the "Run Table Page" on page 112.

This tab includes the following fields:

- Detector and Data Channel
- Options

Detector and Data Channel

This field includes the following options:

- **Detector Type** — Choose the front/back/aux L/aux R detector module installed on your GC, TRACE 1310 Auxiliary Oven (Valve Oven), or both.

  - **Front** — Select the front detector module (None, FID, ECD, NPD, TCD, FPD, PDD, or GDI) installed on the GC.
  - **Back** — Select the back detector module (None, FID, ECD, NPD, TCD, FPD, PDD or GDI) installed on the GC.
  - **Aux L** — Select the auxiliary left detector module (None, FID, ECD, NPD, TCD, FPD, PDD, or GDI) installed on the TRACE 1310 Auxiliary Oven module.
  - **Aux R** — Select the auxiliary right detector module (None, FID, ECD, NPD, TCD, FPD, PDD, or GDI) installed on the TRACE 1310 Auxiliary Oven module.

    Note When GDI is selected, the button **Configure GDI...**is visualized for configuring the GDI detector. See Configuring a GDI Detector.

- **Makeup Gas** — Choose the type of makeup gas to use for the front/back/aux L/aux R detector modules.
  - **Front** — Choose one: None, Helium, Hydrogen, or Nitrogen.
  - **Back** — Choose one: None, Helium, Hydrogen, or Nitrogen.
  - **Aux L** — Choose one: None, Helium, Hydrogen, or Nitrogen.
  - **Aux R** — Choose one: None Helium, Hydrogen, or Nitrogen.

  Note The FPD detector does not have makeup gas so the makeup field is disabled.

- **Acquisition Rate (Hz)** — Select the number of data points to take per second during the acquisition. The maximum acquisition frequency is 10 Hz.
- **Channel Name** — Channels 1 through 4 are the data sources connected to the GC.

Options

This field includes the following option.

- **Line Frequency** — Select the AC power frequency (50 Hz or 60 Hz) that your GC is plugged into. The line frequency control indicates allowable scan rate values.

Configuring a GDI Detector

The GDI module factory set-up includes three flow restrictors providing a full scale of 50 mL/min of Nitrogen. All three channels are set to **Nitrogen**, and 50 mL/min **full scale** by default.

If a different gas is used, it must be configured, and the full scale also change accordingly. Use the following gas conversion factors to calculate the new full scale.

He = 1.10	H_2 = 2.20	Air = 0.96	Ar = 0.84	Ar/CH_4 = 0.86

To obtain the new full scale, multiply the N_2 full scale (50 mL/min) by the conversion factor.

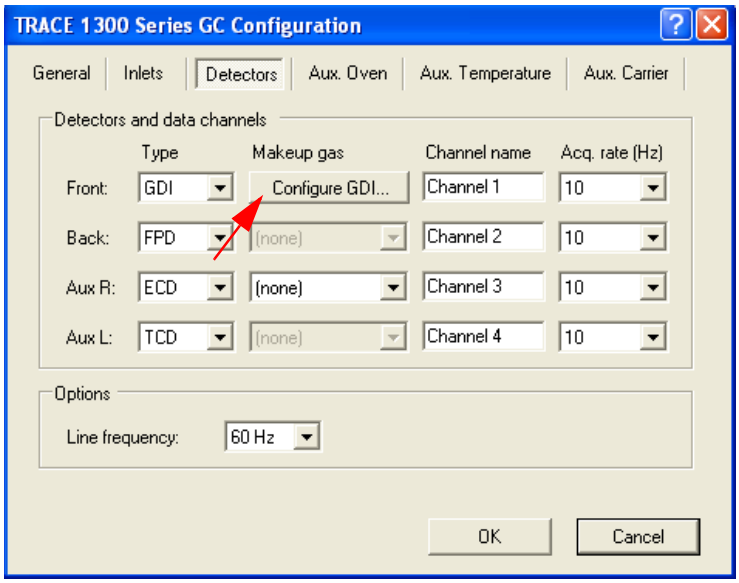
He = 55.0	H_2 = 110.0	Air = 48.0	Ar = 42.0	Ar/CH_4 = 43.0

If higher flow rates or very low flow rates are required, the flow restrictor must be replaced by custom one. When a custom flow restrictor is used, the new full scale must be determined. The module is designed to use 1/4-in. encapsulated porous metal flow restrictors.

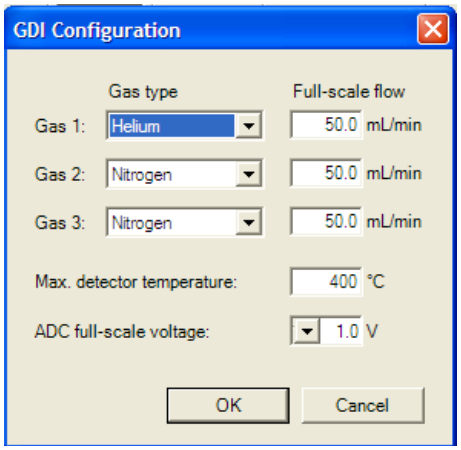
Note For replacing the encapsulated flow restrictor and determining the new full scale, refer to the sections **Adding a Generic Detector Interface | Replacing the Flow Restrictors** in Chapter 9 of the *TRACE 1300/TRACE 1310 Hardware Manual*.

❖ To configure a GDI Detector

1. In the **Configuration** window select the **Detectors** tab.
2. Select the **Detector Type**: choose **GDI**. The **Configure GDI...** button is visualized.



3. Click **Configure GDI...**; the GDI Configuration page is visualized.

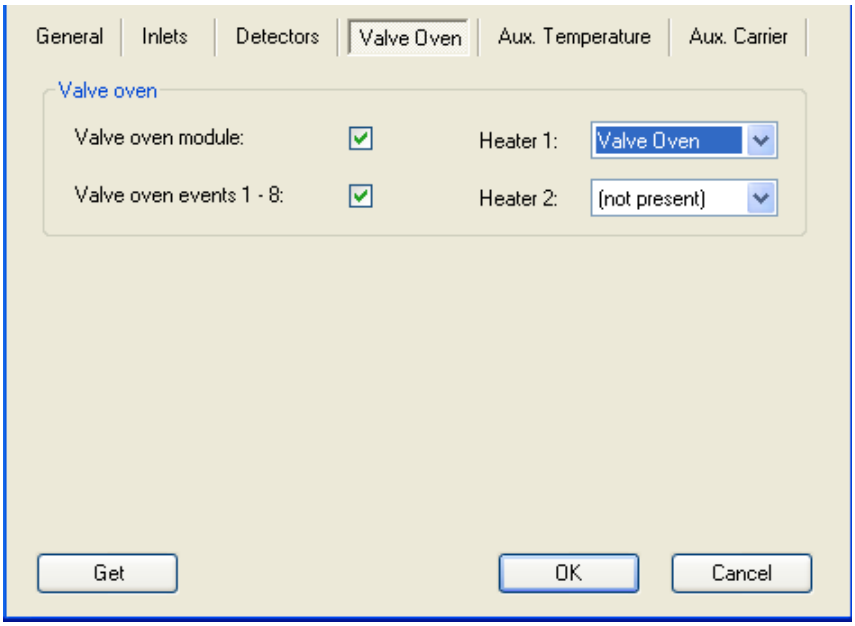


- **Gas Type:** — Select the type of gas used for the detector gases **Gas1**, **Gas2**, and **Gas3**. Choose one: Air, Hydrogen, Nitrogen, Helium, Argon, or Argon/Methane. Nitrogen is the default gas.
- **Full-scale flow** — Set the full scale value of the restriction installed for each detector gas. Set a value in the range 1-1000 mL/min. Default value is 50 mL/min.
- **Max. detector temperature:** — Select the maximum detector temperature in the range from 0 °C to 450 °C. The default temperature is 400 °C.
- **ADC full scale voltage:** — Select the Analog Digital Converter input full scale voltage. Choose one: 1 V, 5 V, or 10 V. The default value is 1V.

Configuration Valve Oven Tab

These controls allow you to configure and use a Valve Oven module coupled with your TRACE 1300/1310. See Figure 5.

Figure 5. Configuration Window: Valve Oven Tab



This tab includes the following fields:

- Valve Oven

Valve Oven

- **Valve Oven Module** — Select this check box to enable the setting for the Valve Oven module. See also "Auxiliary Temperature Page" on page 108.
- **Valve Oven Events 1- 8** — Select this check box to enable Valve Oven events. See also "Run Table Page" on page 112.
- **Heater 1**: — Select the components connected to the heater 1 among: **Not present**, **Valve Oven**, **H. T. Valve Oven**, and **Aux 3**. See also "Auxiliary Temperature Page" on page 108.
- **Heater 2**: — Select the components connected to the heater 2 among: **Not present**, **Aux Col. Oven**, **Aux 4**, and **Methanizer**.

The temperature limits must be consistent with the configuration as for the auxiliary temperatures. See Table 1.

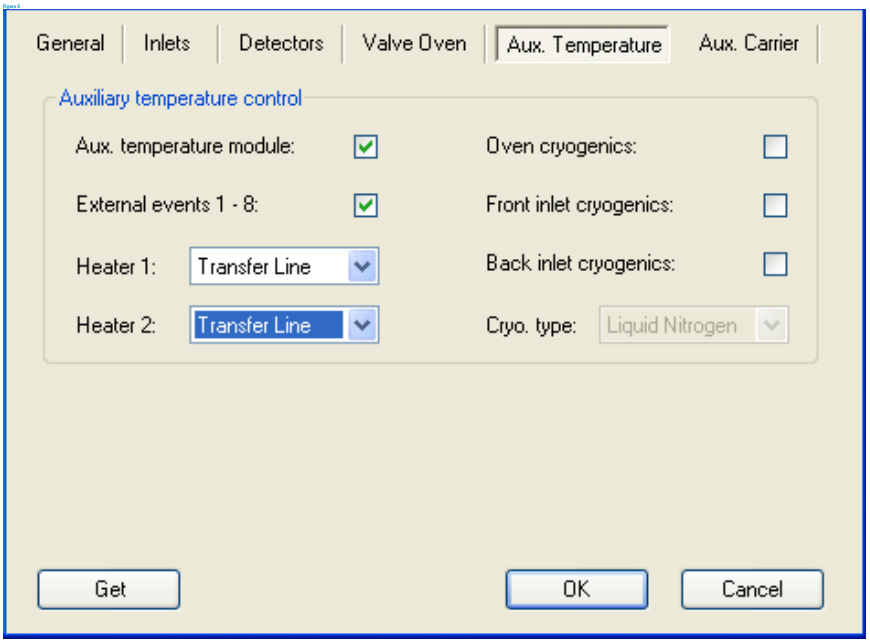
Table 1. Auxiliary Temperature Limits

Type	Max Temperature °C	Available on:	Notes
Transfer Line	400	Aux 1, Aux 2	Primary module, display as Transfer Line.
Valve Oven	200	Aux 3 only	Secondary module (Valve Oven)
High Temperature Valve Oven	300	Aux 3 only	Secondary module (Valve Oven)
Aux Column Oven	250	Aux 4 only	Secondary module (Valve Oven)
Methanizer	400	Aux 4 only	Secondary module (Valve Oven)
Aux Temperature (generic)	400	All Aux 1, 2, 3, and 4	Primary and secondary modules, display as Aux Temperature (#)

Configuration Auxiliary Temperature Tab

These controls allow you to configure and use an auxiliary temperature interface. See Figure 6

Figure 6. Configuration Window: Auxiliary Temperature Tab



This tab includes the following field:

- Auxiliary Temperature Control

Auxiliary Temperature Control

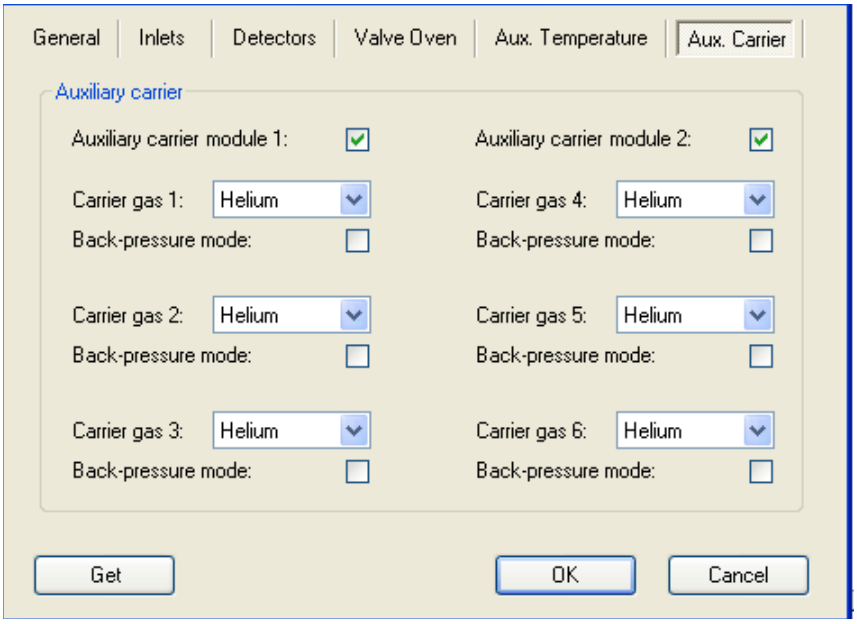
The available options are:

- **Auxiliary Control Module** — Select this check box to enable the setting for the auxiliary control modules and options installed on your GC. See also "Auxiliary Temperature Page" on page 108.
- **External Events 1- 8** — Select this check box to enable external events. See also "Run Table Page" on page 112.
- **Heater 1** — Select the component connected to the Heater 1 among: No present, Transfer Line 1, and Aux Heater. See also "Auxiliary Temperature Page" on page 108.
- **Heater 2**— Select the component connected to the Heater 2among: No present, Transfer Line 2, and Aux Heater. See also "Auxiliary Temperature Page" on page 108.
- **Oven Cryogenics** — Select this check box if the Oven Cryo option is installed in your GC. See also "Oven Page" on page 38.
- **Front/Back Inlet Cryogenics** — Select this check box if the front/back inlet cryogenic option is installed in your GC.
- **Cryo Type** — Select the coolant used by your cryogenic option. Choose one: Liquid Nitrogen or Carbon Dioxide.

Configuration Auxiliary Carrier Tab

These controls allow you to configure and use an Auxiliary Carrier interface. See Figure 7

Figure 7. Configuration Window: Auxiliary Carrier Tab



This menu includes both the Auxiliary Gas modules. One of them will be mounted inside the Valve Oven module, and the other into the GC. See also "Auxiliary Carrier Page" on page 109.

This tab includes the following field:

- Auxiliary Carrier Control

Auxiliary Carrier Control

The available options are:

- **Auxiliary Control Module 1** — Select this check box to enable the setting for the auxiliary control module and options installed on your GC or Valve Oven module.
  - **Carrier Gas 1** — Select the type of the carrier gas in use for the selected auxiliary carrier line 1. The choices are He, H_2, and N_2.
  - **Back-pressure mode** — Select the corresponding check box if the carrier line is used as vent.
  - **Carrier Gas 2** — Select the type of the carrier gas in use for the selected auxiliary carrier line 2. The choices are He, H_2, and N_2.
  - **Back-pressure mode** — Select the corresponding check box if you want operating in back-pressure mode.
  - **Carrier Gas 3** — Select the type of the carrier gas in use for the selected auxiliary carrier line 3. The choices are He, H_2, and N_2.
  - **Back-pressure mode** — Select the corresponding check box if you want operating in back-pressure mode.
- **Auxiliary Control Module 2**— Select this check box to enable the setting for the second auxiliary control module and options installed on your GC or Valve Oven module.
  - **Carrier Gas 4** — Select the type of the carrier gas in use for the selected auxiliary carrier line 4. The choices are He, H_2, and N_2.
  - **Back-pressure mode** — Select the corresponding check box if you want operating in back-pressure mode.
  - **Carrier Gas 5** — Select the type of the carrier gas in use for the selected auxiliary carrier line 5. The choices are He, H_2, and N_2.
  - **Back-pressure mode** — Select the corresponding check box if you want operating in back-pressure mode.
  - **Carrier Gas 6** — Select the type of the carrier gas in use for the selected auxiliary carrier line 6. The choices are He, H_2, and N_2.
  - **Back-pressure mode** — Select the corresponding check box if you want operating in back-pressure mode.

TRACE 1300/1310 Status

This chapter describes the current status of the TRACE 1300/1310.

Contents

Road Map Home Page Status Tabs

Status pages are located on Xcalibur Roadmap-Home page. Just highlight TRACE 1300/1310 from the Roadmap Status tab scroll list and see the following pages (status, temperatures, flows, and pressures) display the current GC status.

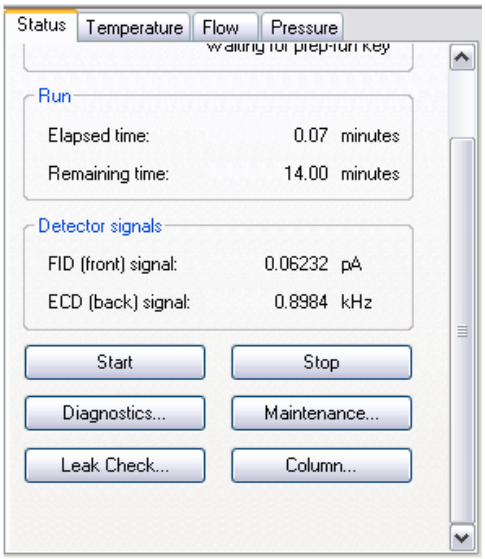
Status includes the following tabs:

- Status
- Temperatures
- Flows
- Pressure

Status

This tab displays the current status of the GC and allows to perform maintenance and diagnostics. See Figure 8.

Figure 8. Status Tabs



This tab includes the following fields and buttons:

- General
- Run
- Detector Signals
- Start
- Stop

- Diagnostics
- Maintenance
- Temperatures
- Leak Check
- Column
- Column Setup

Note The buttons Diagnostic, Maintenance, Leak Check, and Column are available only when the GC is in the Stand-by condition.

General

This field includes the following option.

- **Status** — Indicates if the instrument is communicating to Xcalibur.

Run

This field includes the following options.

- **Elapsed time** — The amount of time that has elapsed since the run started.
- **Remaining time** — The amount of time that remains before the run finishes.

Detector Signals

This field indicates the signal level of the detector modules installed in the GC system.

Start

Click on this button to start a run.

Stop

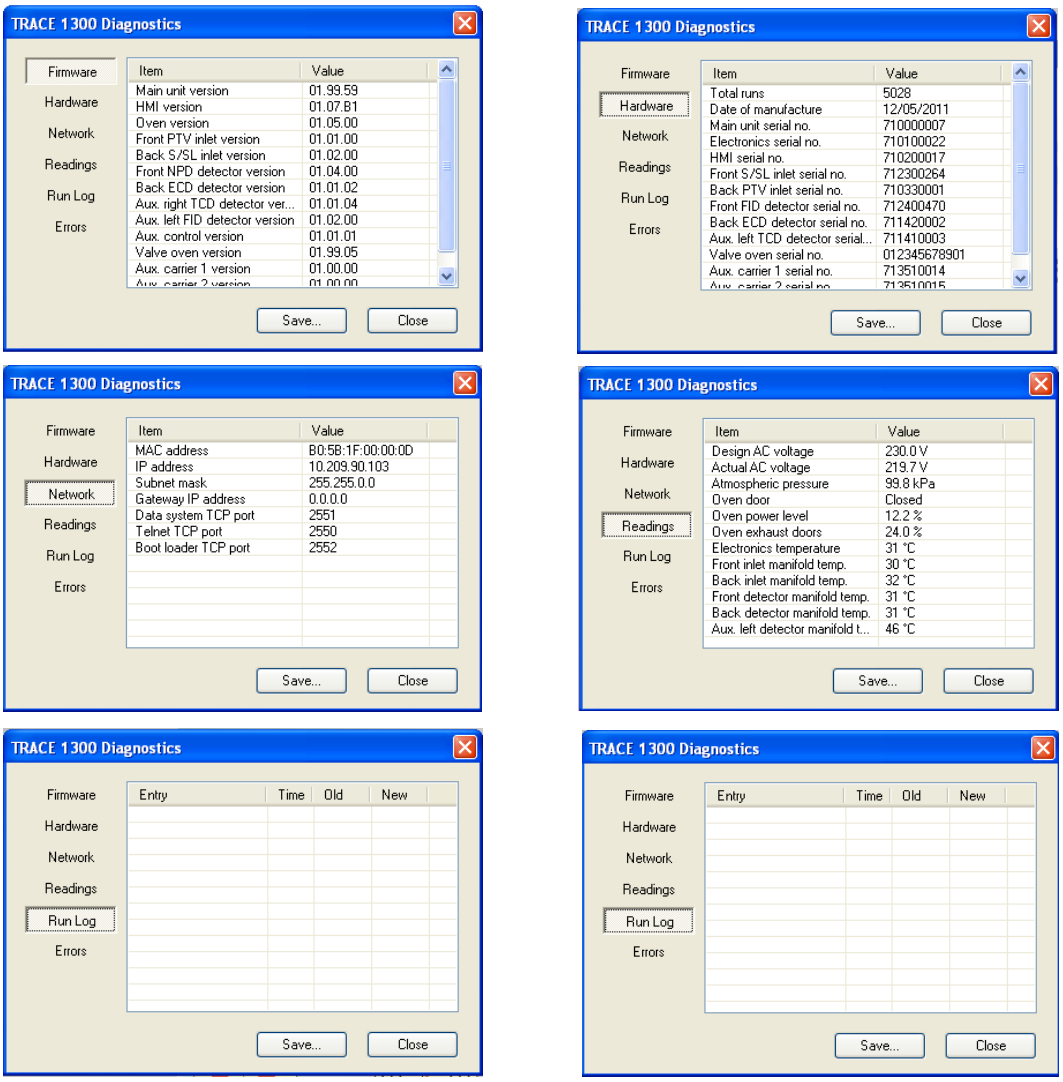
Click on this button to stop a run in progress.

Diagnostics

Click on this button to bring up diagnostic information including: firmware, hardware and network information; oven, injector and detector status; diagnostic of the possible error; and the run log which records errors that happens during the run time.

By clicking the relevant button the following diagnostics pages are visualized. See Figure 9.

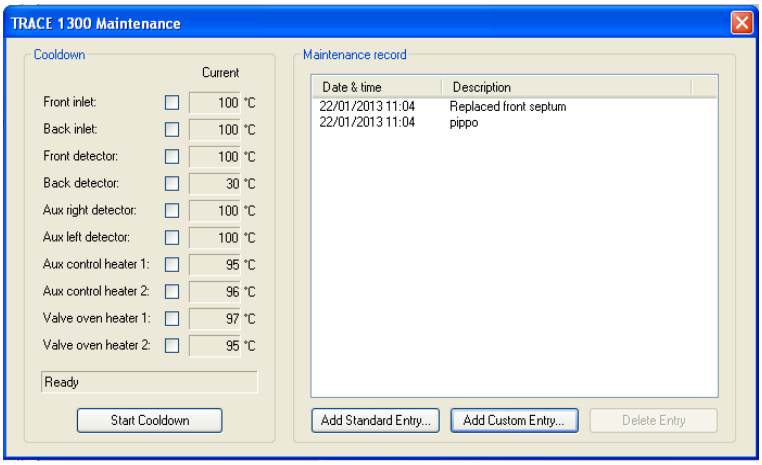
Figure 9. Diagnostic Pages



Maintenance

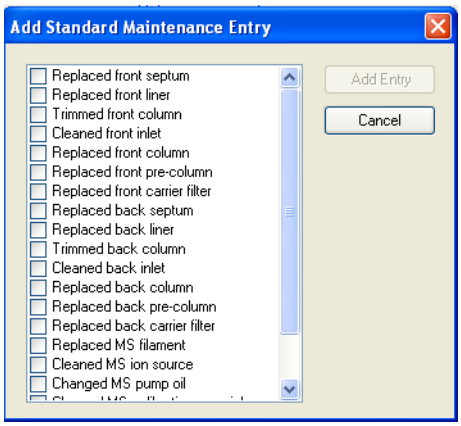
Click on this button to perform the maintenance of GC unit and modules when required. The Maintenance page is visualized. See Figure 10.

Figure 10. Maintenance Page

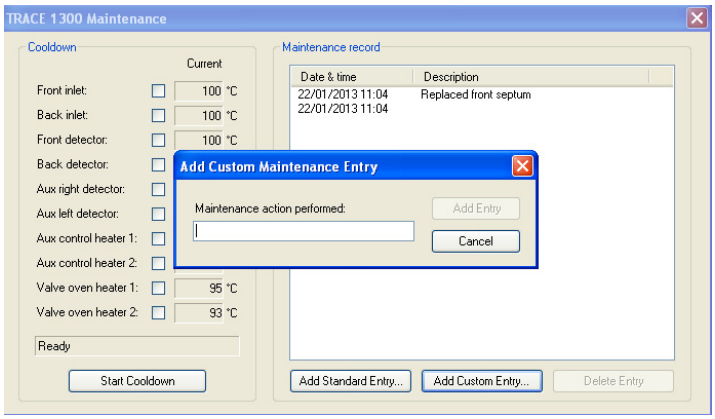


This page includes the following fields.

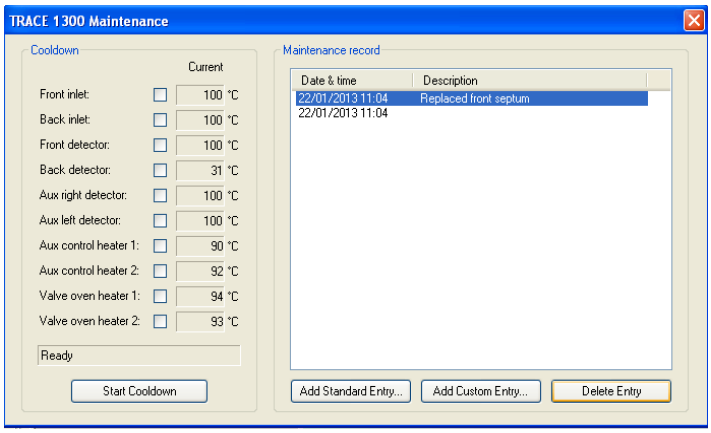
- **Cool-down Temperature** — To cool down the Oven, Front and Back Inlet, and Front and Back Detector temperatures. Select the check box of the component to cool-down, then set the target temperature. The default value is 50 °C. See also **Start Cool-Down** button.
- **Start Cool-Down** — Click on this button to start the cooling of the Oven, Front and Back Inlet, and Front and Back Detector as set in Cool-down temperature field.
- **Maintenance log entries record** — From the down list choose the maintenance to be done by selecting the corresponding check box.
  - Click **Add Standard Entry** to add standard maintenance entries. Select the item you want entry by checking the relevant check box.



  - Click **Add Custom Entry** to add a performed maintenance action into the Maintenance record list.



– Click **Delete Entry** to remove an item from the Maintenance record list.

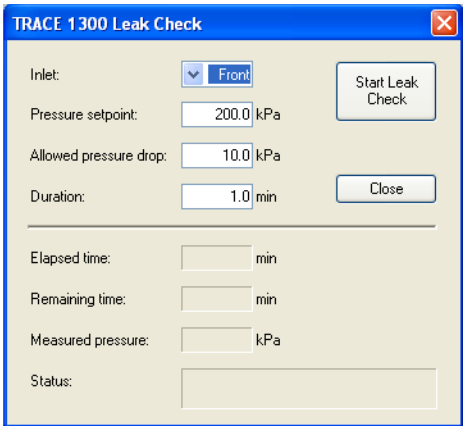


- **Close** — Click on this button to close and exit Maintenance page.

Leak Check

Press this button to perform a leak check at the desired pressure. See Figure 11.

Figure 11. Leak Check Page



When you perform an automatic leak check, the GC measures the column flow with a true mass flow sensor and compares it to a calculated flow value obtained from the original column constant to see if the numbers match. The instrument detects a gas leak if there is a significant difference between the two values.

This procedure requires the use of the column-flowmeter connector. Refer to the *TRACE 1300 and TRACE 1310 Hardware Manual* for details.

To start the leak check operate as follows:

1. Select the Front/Back inlet
2. To start leak check press **Start Check** button. You can visualize the actual values of Pressure and Column flow.

Note To exit leak check menu without performing leak check, press **Close** button. To abort leak check press **Stop Check** button.

3. The system is automatically pressurized with carrier gas and sealed to perform leak check.
4. At the end of the leak check, if the system is free of leaks the Leak Check Passed message will be visualized.
5. If leaks are found, an error message will be displayed. In this case, eliminate leaks and repeat the leak check procedure.
6. Note that only a previous Column Characterization, performed in a condition of true tightness, can ensure the validity of the subsequent Automatic Leak Check responses.

Column

Click on **Column** button to open the **Column Setup** dialog box to perform the evaluation of the column in use on the back/front position. See Column Setup.

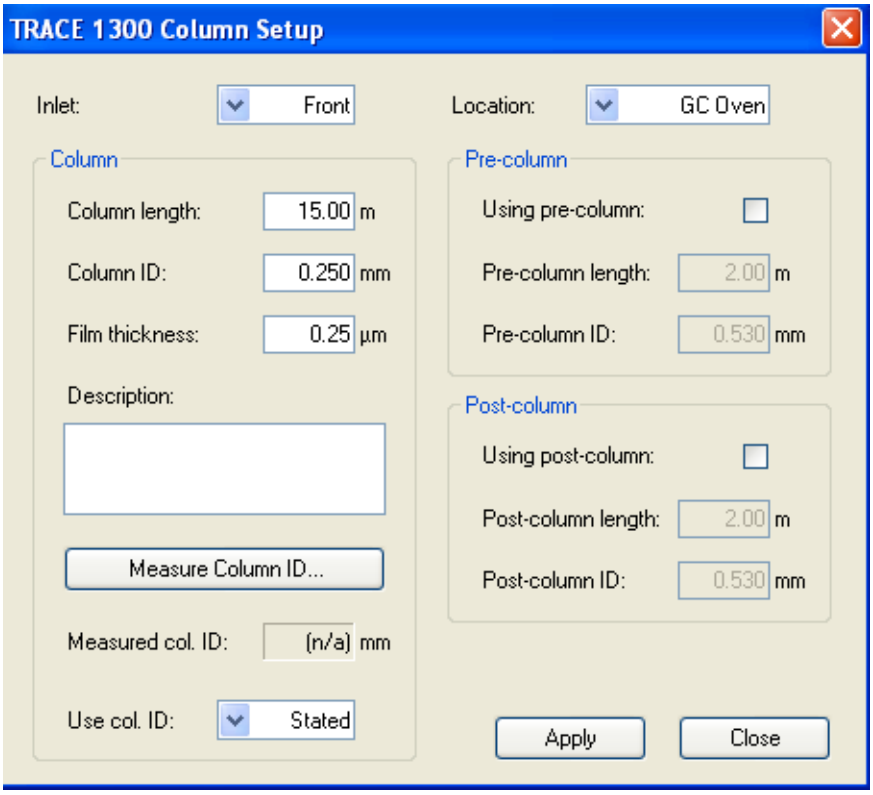
This function allows the calculation of the actual column ID according to the actual flow of the carrier gas measured at the outlet of the column.

The procedure requires the use of the column-flowmeter connector and of the digital flowmeter. Refer to the *TRACE 1300 and TRACE 1310 Hardware Manual* for details.

Column Setup

This Column Setup dialog window opens by clicking the **Column** button on the Status Page. See Figure 12.

Figure 12. Column Setup Dialog Window



Column Setup window contains the following fields:

- Inlet
- Location
- Column
- Pre-Column
- Post-Column
- Use Column ID

Inlet

Select the inlet of the column in use among Front, Back, Aux 1,…Aux 6.

Location

Select the location where the column is installed: **GC oven**, **Valve Oven**, or **Aux column oven**. The related temperature is used for the flow calculation.The default location is GC oven.

This parameter must be sent to the GC together with column parameters.

Column

The nominal dimension of the column in use are to be set in this field. The options are described in the following table.

Table 2. Column Nominal Dimension

Parameter	Description
Column length (m)	Enter the length of the column in the range from 0.01 to 200 m.
Column ID (mm)	Enter the internal diameter of the column in the range from 0.050 to 0.999 mm.
Measured Column ID	This field is not editable. It indicates an averaged calculated ID which reflect the current pneumatic resistance, permitting a more accurate calculation of the carrier gas line velocity.
Film thickness (mm)	Enter the film thickness of the column in the range from 0.01 to 20 µm.
Description	Enter a description of the column if desired.
Measure ID button	Click on this button to calculate the correct column ID. The calculated value is indicate in the Measure Column ID field.

Pre-Column

If a precolumn is present select **Using pre-column** check box. The menu requires to set the **Pre-column Length** and the nominal internal diameter **Pre-column ID** of in the same ranges valid for the column.

Post-Column

If a post-column is present select **Using post-column** check box. The menu requires to set the **Post-column Length** and the nominal internal diameter **Post-column ID** of in the same ranges valid for the column.

Use Column ID

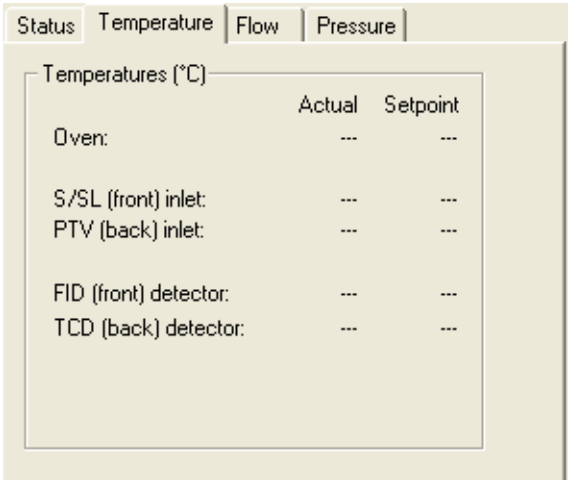
It is used to operate in flow mode. The deviation of the actual column ID from the nominal value is mostly affecting the column flow rate. To assure the utmost accuracy for the column carrier flow rate calculation, the Column Evaluation procedure is recommended.

Select **Stated** if the use of the column parameters are desired, or **Measured** if the use of the measured flow is desired.

Temperatures

These values show the actual and setpoint Temperature parameters. See Figure 13.

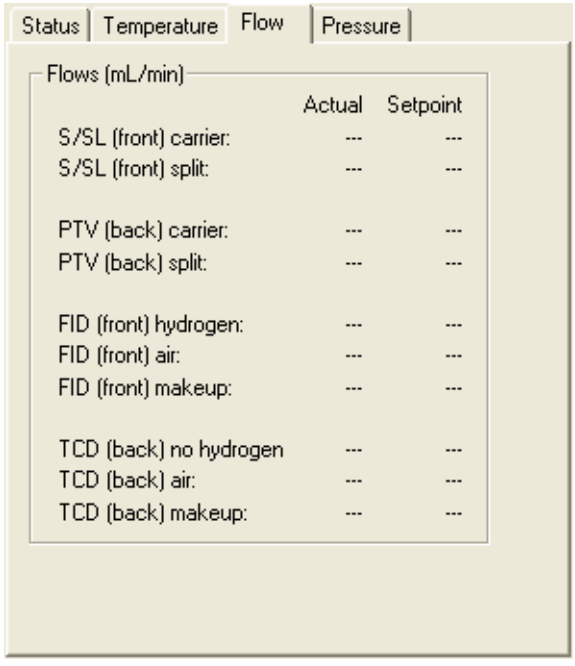
Figure 13. Temperature Tab



Flows

These values show the actual and setpoint Flow parameters. See Figure 14.

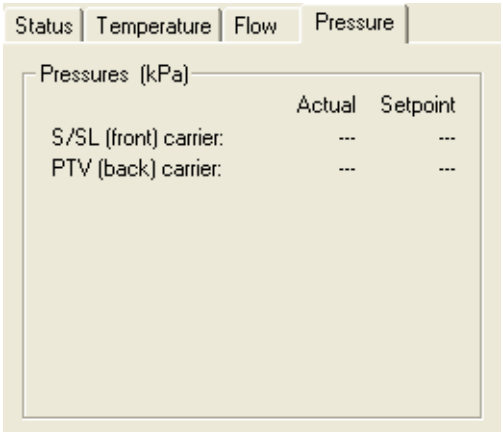
Figure 14. Flow Tab



Pressure

These values show the actual and setpoint Pressure parameters. See Figure 15.

Figure 15. Pressure Tab



TRACE 1300/1310 Menu

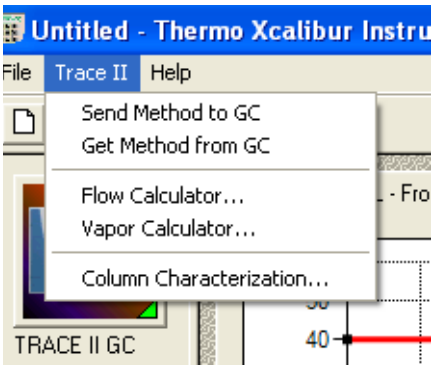
This chapter describes the Instrument Setup menu.

Contents

Menu Description

The TRACE menu is located on the Instrument Setup-menu bar. See Figure 16

Figure 16. TRACE 1300/1310 Menu



The pull-down menu contains the following options:

- Send Method to GC command
- Get Method from GC command
- Flow Calculator
- Vapor Calculator

Send Method to GC command

Downloads the GC portion of the current method from the Instrument Setup window to the gas chromatograph.

Get Method from GC command

Uploads the current method from the gas chromatograph to the Instrument Setup Window.

Flow Calculator

This facility can be used to calculate the flow rate through a capillary column when you are using non-DPFC pneumatics or manual pressure settings. The Column Flow Calculator dialog box is used to calculate the flow rate through the column based on the column dimensions, conditions and the type of carrier gas in use.

For more information, see: "Using Column Flow Calculator" on page 30.

Vapor Calculator

A liquid sample injected into a heated GC inlet rapidly vaporizes and expands. Vapor Volume Calculator rapidly calculates the expansion volume of several factors (solvent, injected liquid volume, temperature, and inlet pressure). Included with this calculation is the resulting vapor expansion volume relative to inlet liner's inner dimensions.

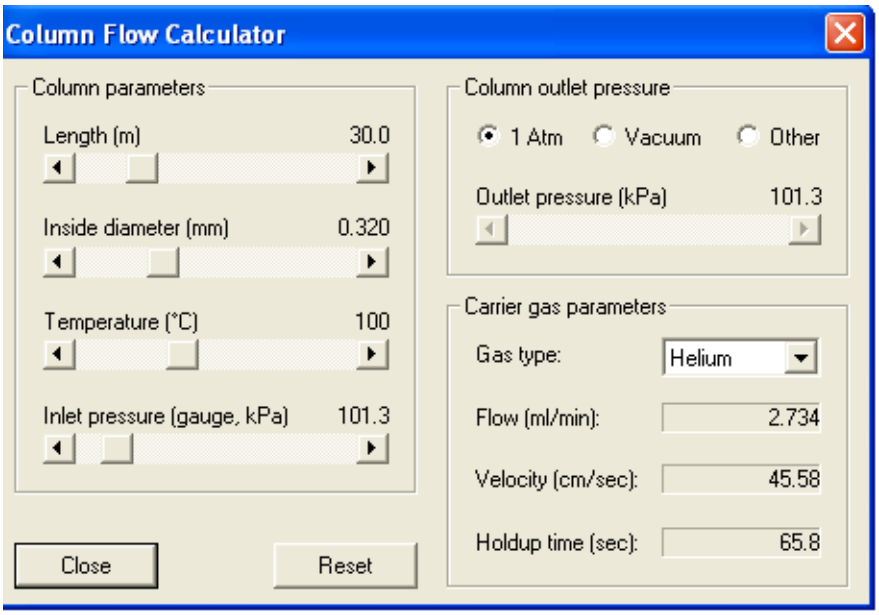
Ideally, the vapor volume of an injected aliquot should not exceed the liner volume. Excess vapor can expand into other parts of the inlet and contaminate gas lines or result in sample loss. This facility allows you to determine the volume of the vaporized aliquot under the conditions applied to the inlet.

For more information refer to: "Using Vapor Volume Calculator" on page 33.

Using Column Flow Calculator

In TRACE 1300/1310 drop-down menu select **Flow Calculator** to open the Column Flow Calculator dialog box. See Figure 17.

Figure 17. Column Flow Calculator Dialog Box



Note When you have completed the calculation, close the dialog box by clicking the **Done** button. These values are retained so that you can refer to them later. If you wish to reset all control parameters back to the factory settings click on **Reset** button. The only parameters for which default values can be changed and saved are pressure units (kPa, psi, or bar) and the controls listed in the Column Outlet Pressure group box (1 atm, vacuum, other, and outlet pressure).

When you have completed the calculation, close the dialog box by clicking the **Done** button. These values are retained so that you can refer to them later. If you wish to reset all control parameters back to the factory settings click on **Reset** button. The only parameters for which default values can be changed and saved are pressure units (kPa, psi, or bar) and the controls listed in the Column Outlet Pressure group box (1 atm, vacuum, other, and outlet pressure).

This window contains the following fields:

- Column Parameters
- Column Outlet Pressure
- Carrier Gas Parameters

Column Parameters

The setting are made via a series of slider bars. The value to be used is shown at the top right hand side of the bar. Choose the parameters to be changed and place the mouse pointer on the slider. Hold down the left mouse button. You can now move the slider along the bar. To fine tune the setting, click on one of the arrow buttons at the ends of the bar.

The parameters are described in Table 3.

Table 3. Column Parameters

Parameter	Function
Length	Set the column length in the range 0.1-150 m.
Inside Diameter	Set the diameter in the range 0.050-1.00 mm.
Temperature	Set the temperature in the range from -100 to 450 °C.
Inlet Pressure	Set the inlet pressure in the range 0.0-1000.0 kPa.

Column Outlet Pressure

Select one of the option radio buttons described in Table 4.

Table 4. Column Outlet Pressure Options

Option	Description
1 Atm	This option sets the pressure to 101.3 kPa on the scale below.
Vacuum	This option sets the pressure to 0.0 kPa on the scale below.
Other	When you choose this option, you can use the scale below to select a value in the range 0.0-300.0 kPa.

Carrier Gas Parameters

The carrier gas parameters are displayed in this field. See Table 5 for details.

Table 5. Carrier Gas Parameters (Sheet 1 of 2)

Parameter	Function
Gas Type	Choose a carrier gas from the drop-down list. The options are: Helium, Hydrogen and Nitrogen.
Flow	This is a read-only field. The value is calculated from the entries made.

Table 5. Carrier Gas Parameters (Sheet 2 of 2)

Parameter	Function
Velocity	This is a read-only field. The value is calculated from the entries made.
Holdup Time	This is a read-only field. The value is calculated from the entries made and is the time taken for a non retained component to elute from the column.

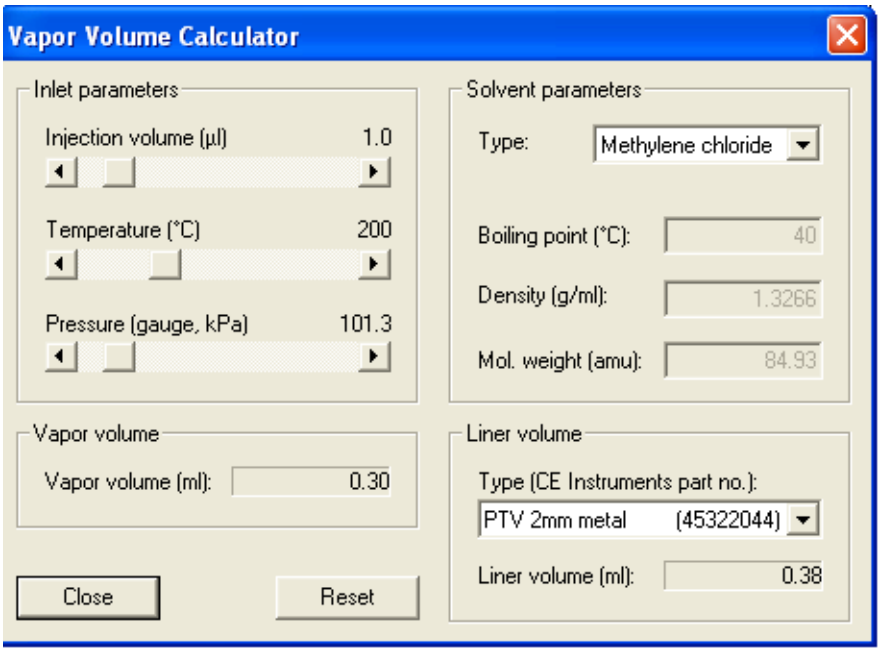
When you have completed the calculation, close the dialog box by clicking on the **Done** button. These values are retained so that you can refer to them later. If you wish to start again, click on the **Reset** button.

Using Vapor Volume Calculator

In TRACE 1300/1310 drop-down menu select **Vapor Calculator** to open the Vapor Volume Calculator dialog box. See Figure 18.

When you have completed the calculation, close the dialog box by clicking the **Done** button. These values are retained so that you can refer to them later. If you wish to start again, click on the **Reset** button.

Figure 18. Vapor Volume Calculator Dialog Window



This window includes the following fields:

- Inlet Parameters
- Solvent Parameters
- Vapor Volume
- Liner Volume

Inlet Parameters

The settings are made via a series of slider bars. The value to be used is shown at the top right hand side of the bar. Choose the parameter to be changed and place the mouse pointer on the slider. Hold down the left mouse button. You can now move the slider along the bar. To fine tune the setting, click on one of the arrow buttons at the ends of the bar.

One click corresponds to an increment, the size of which depends on the number of decimal places used for a particular value. For example, a pressure increment is 0.1 kPa.

The options are described in Table 6.

Table 6. Inlet parameters

Option	Function
Injection Volume	Move the slider until the injection volume to be used is shown. The range is 0-10 µL.
Temperature	Move the slider until the inlet temperature to be used is shown. The range is 0-450 °C.
Pressure	Move the slider until the inlet pressure to be used is shown. The range is 0-1000 kPa.

Solvent Parameters

These options listed in Table 7 describe the properties of the solvents.

Table 7. Solvent Parameters

Option	Function
Type	Select the solvent from the drop-down list. Selecting **Other**, boiling points, density and molecular weight field will be enabled and you can enter the values manually.
Boiling Point	The boiling point of the selected solvent is shown here.
Density	The density of the selected solvent is shown here.
Mol Weight	The molecular weight of the selected solvent is shown here.

Vapor Volume

The volume of vapor derived from the injected aliquot is displayed in the read-only Vapor Volume field.

Liner Volume

Comparing vapor expansion volumes with liner volumes gives an estimate of the sample volume that can be injected under different conditions. In practice, mixing and diluting sample vapor with carrier gas during rapid evaporation means that the actual volume occupied by vapor may be greater than the calculated volume, and it depends on the liner design and how rapidly carrier gas is moving through the inlet.

A good starting point in method development is to choose the liner, injection volume, temperature, and pressure so that the vapor volume does not exceed the liner volume. (For **splitless** injections, the liner volume should also be considered in choosing the purge hold time, so that the inlet will be swept at least once by carrier gas flowing onto the column.)

These parameters apply to the column liner volume. See Table 8 for details.

Table 8. Liner Volume Settings

Option	Function
Type	Choose the column liner in use.
Liner Volume	The liner volume is displayed in this read-only field.

Instrument Setup

This chapter contains the instructions to edit the TRACE 1300/1310 parameters according to the front/back injector and front/back detector modules, and optional devices installed.

Contents

Edit TRACE 1300/1310 Parameters

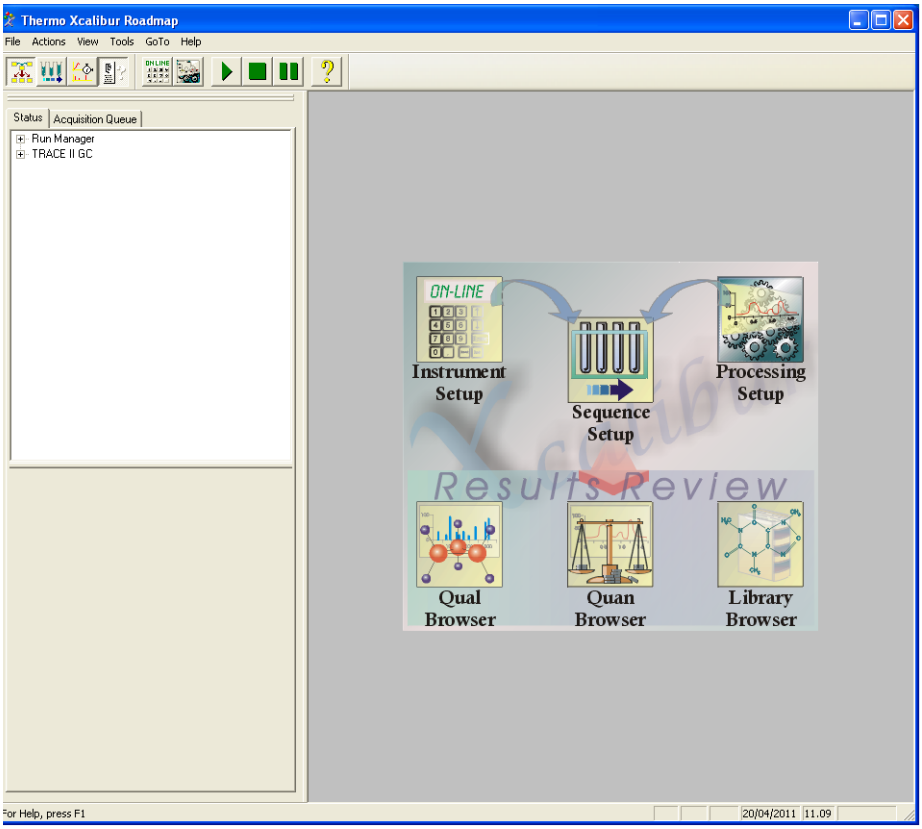
The parameters to set for the TRACE 1300/1310 (oven, injectors and detector) should be set according to GC configuration.

All parameters can be sent to or loaded from the instrument connected by using the functions available in "TRACE 1300/1310 Menu" on page 27.

To open this view:

1. Choose **Instrument Setup** from the Home Page window.
2. Click on the TRACE 1300/1310 panel button located in the **Instrument Setup** window.

Figure 19. Roadmap Home Page



Using the TRACE 1300/1310 Tabs:

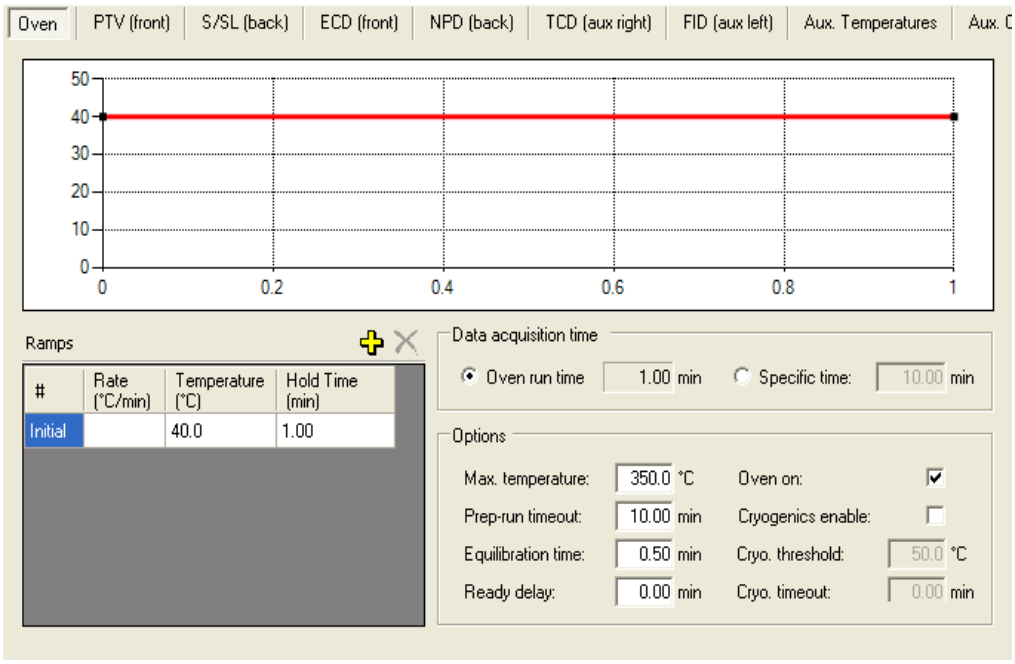
After you have configured the TRACE and options, you are ready to set the controls to run your method.

Oven Page

To display this page click on the **Oven** tab from the Instrument Setup view.

This page is the method editor for setting up parameters in the GC run. See Figure 20.

Figure 20. TRACE 1300/1310 Oven Page



This page includes the following fields:

- Oven Temperature Program Graph
- Ramps
- Acquisition Time
- Options

Oven Temperature Program Graph

Graphical representations of the oven temperature program including any post run events. The axes are temperature in degrees centigrade, and time in minutes. An isothermal run just gives a flat line

Ramps

The temperature program comprises an initial isothermal field followed by up to seven linear ramps. The initial row is displayed by default and cannot be hidden.

The parameters in the program timetable are described in Table 9.

Table 9. Oven Ramps Parameters and Buttons

Column	Function
Ramps Buttons 	Use these buttons to add or remove the number of ramps to use in the oven temperature program. This is the rate in degrees Centigrade per minute the GC oven is ramped up or down from the initial temperature, or the previous level's final ramp temperature. Clicking on the  button automatically adds a ramp level after the last one listed. Clicking on the  removes the highest level or the one being displayed on the bottom.
Rate	This field is not available for the initial field of the program. Enter a rate of temperature change in the range 0.1-125 °C/min.
Temp	Enter a temperature for the isothermal field of the ramp. • The range is 0-450 °C. • The range is –50 °C to Oven Maximum with carbon dioxide cryogenic installed. Otherwise the lower limit is 0 °C. • The range is –100 °C to Oven Maximum with liquid nitrogen cryogenic installed. Otherwise the lower limit is 0 °C.
Hold Time	Enter a time for which the temperature is to be held in the range 0.00-999.99 min.

Acquisition Time

Use this field to set the run time. The acquisition time parameters are described in Table 10.

Table 10. Acquisition Time Parameters

Parameter	Description
Oven Run Time	Select this option button if you want to use the time calculated for the oven program as the run time. The value is displayed in the adjacent read-only field.
Specific Time	Select this option button if you wish to enter a specific run time. The range is 0.01-999.99 min.

Options

Various oven parameters are set in this field. The oven parameters are described in Table 11.

Table 11. Options Field Parameters (Sheet 1 of 2)

Parameter	Description
Max Temp	Enter a value for the maximum oven temperature in the range 0-450 °C if you are not using cryogenics. With cryogenics enabled, the lower limit is –50 °C with carbon dioxide and –100 °C with liquid nitrogen. This entry controls the maximum temperature values in the temperature program field.
Prep-run Timeout	Enter a time during which the injection must occur. If this does not happen, the chromatograph returns to the Standby condition. The range is 0.00-999.99 min.
Equilibration Time	This is the time required for equilibrating the oven temperature after it has been set or modified. Enter a value in the range 0.00-999.99 min.
Ready Delay	Set the delay time before the GC enters the Ready to Inject condition. Enter a value in the range 0–99.9 min. This time must not exceed the **Prep-run Timeout** value.
Oven On	Select this check box to enable the oven control.
Cryogenics enable	This option is visualized if **Oven cryogenics** has been selected in Instrument Configuration. See "TRACE 1300/1310 Configuration" on page 1. Select/clear this check box to enable or disable the cryogenic system when it is installed and configured with CO_2 or LN_2 as a coolant.

Table 11. Options Field Parameters (Sheet 2 of 2)

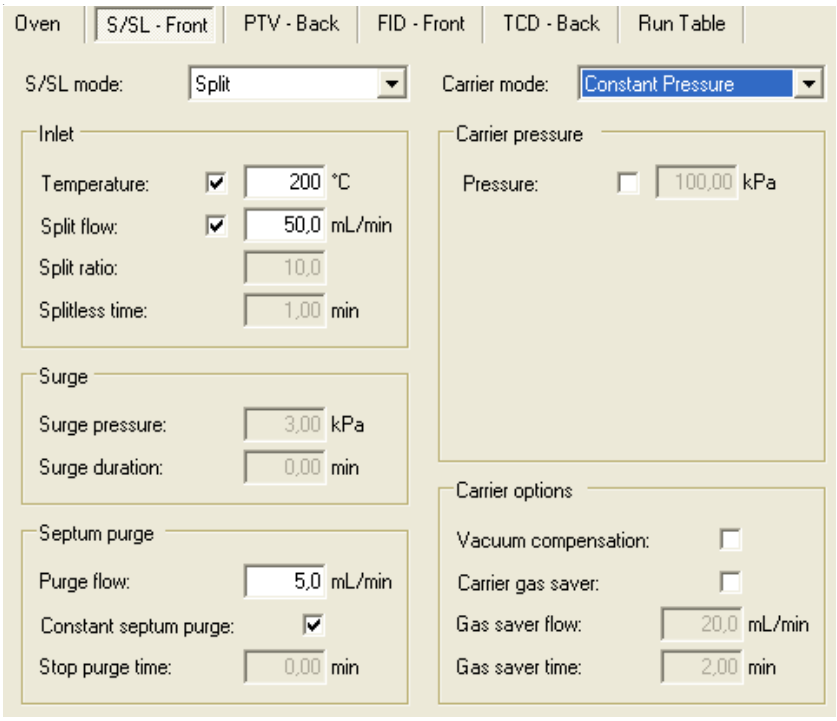
Parameter	Description
Cryo threshold	This option is visualized if **Oven cryogenics** has been selected in Instrument Configuration. See "TRACE 1300/1310 Configuration" on page 1. Specify the temperature at which the cryo system begins to supply the coolant. Enter a value in the range 40-200 °C.
Cryo timeout	This option is visualized if **Oven cryogenics** has been selected in Instrument Configuration. See TRACE 1300/1310 Configuration on page 1. Specify the time after which if the GC does not reach the ready condition, it stops the use of the cryo stops and remains in NOT ready condition. Re-send the method to restore the function. Enter a value from 0.00 to 999.9 min. The default value is 60.00 minutes.

S/SL Page

To display this page click on the S/SL Front/Back tab from the Instrument Setup view.

This page is the method editor for the front/back Split/Splitless injector module.
See Figure 21.

Figure 21. TRACE 1300/1310 S/SL Page



This page includes the following fields:

- S/SL Mode
- Inlet
- Surge
- Septum Purge
- Carrier Mode
- Carrier Flow
- Carrier Pressure
- Programmed Carrier Flow
- Programmed Carrier Pressure
- Carrier Options

S/SL Mode

This parameter enables the fields in this pane. The options are described in Table 12.

Table 12. S/SL Mode Options

Option	Function
Split	This option enables the Inlet field only. The carrier flow is split in the injection port with the bulk going out the split vent. Use this injection mode when analyzing high concentration or neat samples, or in instances where sensitivity is less important. The split vent remains open all the time. This method yields the sharpest peaks if the split gas is properly mixed.
Splitless	This option enables the Inlet and Purge fields. The split vent is closed during the injection to drive most of the sample into the column. The solvent effect is required to refocus the analytes, especially more volatile compounds. You can achieve the solvent effect by keeping the analytical column or guard column slightly below the solvent's boiling point. Splitless times of about 1 minute are typical.
Splitless w/Surge	This option enables all fields. Same as **Splitless** but can also program a surge during an injection. Surge starts at Prep Run and continues until the surge duration time is finished. Surge is further defined in the next group of controls.

Inlet

The inlet parameters are set in this field which is common to all modes. Inlet parameters are described in Table 13.

Table 13. S/SL Inlet Parameters

Parameter	Description
Temperature	Select the check box to enable the adjacent field. Enter a value for the inlet temperature in the range 0-400 °C.
Split Flow	Select the check box to enable the adjacent field. Enter a value in the range 5-1250 mL/min. The **Split Ratio** is adjusted automatically. In addition, this value is governed by the initial column flow rate entered on the associated **Carrier mode**. • If the flow rate is changed, the Split Flow value is adjusted so that the split ratio is maintained. However, • if the Split Flow value then falls outside its limits, a warning is generated and you then have to change the entry to a valid number.
Split Ratio	This field is enabled under the following conditions: • Mode is set to Split. • The Split Flow check box is selected. • On the associated Carrier mode, Flow Mode is set to either Constant Flow or Programmed Flow. This is the ratio between the split flow and the column flow. $\text{SplitRatio} = \frac{\text{SplitFlow}}{\text{ColumnFlow}}$ Enter a value in the range 1-12500. The Split Flow entry is adjusted automatically.
Splitless Time	This field is enabled when the **S/SL Mode** is set to either **Splitless** or **Splitless w/Surge**. Specify the length of time the split valve remains closed after a splitless injection. Enter a value in the range 0.00-999.99 min. The timer begins at the start of the run. During this time, most of the sample transfers from the injector to the column. The split vent reopens when the splitless time ends. This occurs in order to remove excess solvent vapor.

Surge

This field is enabled when the **S/SL Mode** is set to **Splitless** or **Splitless w/Surge**. Make the surge settings in this field. Surge parameters are described in Table 14.

Table 14. S/SL Surge Parameters

Parameters	Description
Surge Pressure	The pressure applied during the splitless time to produce a surge of flow in the injector to speed transfer of the sample. It may be used, depending upon the analysis, to sharpen peaks closer to the solvent's boiling point where cold trapping is ineffective and solvent effect is the main refocusing mechanism. Enter a value in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi).
Surge Duration	This is the time for which the surge pressure is maintained. Enter a value in the range 0.00-999.99 min. Typically, set to coincide with the **Splitless time**.

Septum Purge

This field controls the septum purge for the injector. Septum purge is used to sweep the bottom of the septum to reduce contamination from sample analytes. This prevents carryover from run to run. Septum purge also prevents contamination of the injector from septum bleed. Make the purge settings in this field.

Septum purge parameters are described in Table 15.

Table 15. S/SL Purge parameters

Parameter	Description
Purge Flow	This time indicates the flow at which the septum is continuously flushed.
Constant Septum Purge	Select the check box to continuously flush the septum with a purge flow.
Stop Purge Time	This field is enabled if the Constant Septum Purge check box is cleared. You can then enter a time at which the septum purge ceases. The range is 0.00-999.99 min.

Carrier Mode

In this field, you select the flow mode for the carrier gas.

The choice made here controls the parameters available in the Carrier Flow/ Carrier Pressure and Ramps field.

- **Constant Flow** — A single Flow field is available along with a check box to enable or disable it. The graph shows a horizontal line at the flow rate indicated. See "Carrier Flow" on page 46.
- **Constant Pressure** — A single Pressure field is available along with a check box to enable or disable it. The graph shows a horizontal line at the pressure indicated. See "Carrier Pressure" on page 46.
- **Programmed Flow** — Flow program fields are displayed. The graph represents the ramps in the program. See "Programmed Carrier Flow" on page 46.
- **Programmed Pressure** — Pressure program fields are displayed. The graph represents the ramps in the program. See"Programmed Carrier Pressure" on page 47.

Carrier Flow

Use this field to set up flow when **Constant flow** carrier mode has been selected.

Select the **Flow** check box to enable the Flow field. Enter a value in the range 0.001-100 mL/min. If you clear the check box, the field is disabled and the graph becomes a horizontal line at a flow rate of zero.

Carrier Pressure

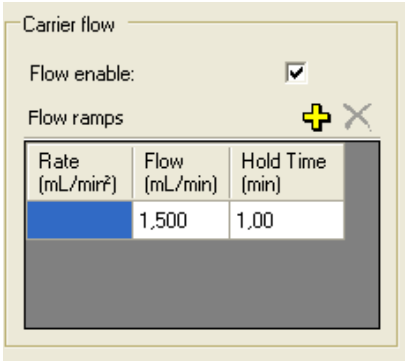
Use this field to set up pressure when **Constant pressure** carrier mode has been selected.

Select the **Pressure** check box to enable the Pressure field.
Enter a value in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi). If you clear the check box, the field is disabled and the graph becomes a horizontal line at zero pressure.

Programmed Carrier Flow

Use this field to set up flow program when **Programmed Flow** carrier mode has been selected. See Figure 22.

Figure 22. Programmed Carrier Flow



In this mode you can program an initial constant flow rate field followed by up to three ramps.

Select the **Flow enable** check box to enable the flow.

Enable the number of flow ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden.

If you wish to disable the ramps temporarily, clear the **Flow enable** check box. This disables the Flow column and the program is ignored as shown in the graph which becomes a horizontal line at zero flow rate. The values entered are preserved and may be reactivated by selecting the check box once more.

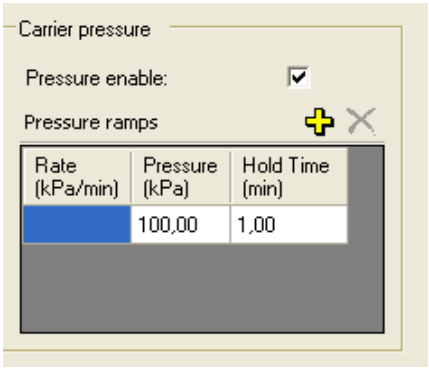
The parameters in the timetable are the follows:

- **Rate** — Enter a value for the rate of flow rate change in the range 0.001-100 mL/min^2. This field is not available for the initial field of the program.
- **Flow —** Enter a value for the constant flow rate field of the ramp in the range 0.001-100 mL/min.
- **Hold Time** — Enter a value for which the flow rate will be held. The range is 0.00-999.99 min.

Programmed Carrier Pressure

Use this field to set up pressure program when **Programmed Pressure** carrier mode has been selected. See Figure 23.

Figure 23. Programmed Carrier Pressure



In this mode you can program an initial constant pressure rate field followed by up to three ramps.

Select the **Pressure enable** check box to enable the flow.

Enable the number of pressure ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden. If you wish to disable the Pressure ramps temporarily, clear the **Pressure enable** check box. This disables the Pressure column and the program is ignored as shown in the graph which becomes a horizontal line at zero pressure. The values entered are preserved and may be reactivated by selecting the check box once more.

The parameters in the timetable re the follows.

- **Rate** — Enter a value for the rate of pressure change in the range 0.01-1000 kPa/min. This field is not available for the initial field of the program.
- **Pressure** — Enter a value for the constant pressure field of the ramp in the range 5-1000 kPa(0.05 to 10 bar; 0.725 to 145 psi).
- **Hold Time** — Enter a time for which the pressure will be held. The range is 0.00-999.99 min.

Carrier Options

This field includes the following parameters.

- **Vacuum Compensation** — Select the check box to enable the vacuum compensation feature. Use this only when the TRACE 1300/1310 is connected with a mass spectrometer. When the check box is not selected, calculations are made for a normal GC detector, which is usually at atmospheric pressure.

- **Carrier Gas Saver** — Select the check box to enable the function in this field. Gas saver controls reduce carrier gas consumption, especially when a large split flow is used. It is set to come on at some point well after the injection to conserve gas.

  Gas Saver parameters are described in Table 16.

Table 16. Gas Saver Parameters

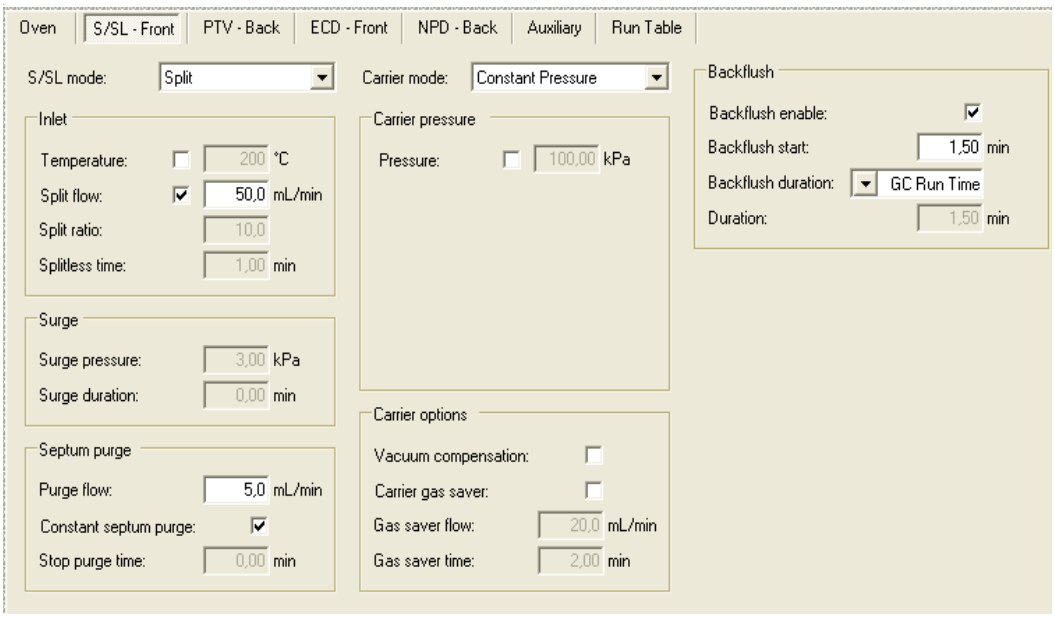
Parameter	Description
Gas Saver Flow	Enter a value for the gas saver flow rate in the range 5-500 mL/min.
Gas Saver Time	This is time into the run when the gas saver feature starts up. Enter a value in the range 0.00-999.99 min.

S/SL Backflush Page

To display this page click on the Front/Back S/SL Backflush tab from the Instrument Setup view.

This page is the method editor for the Front/Back Split/Splitless injector module for Backflush. See Figure 24.

Figure 24. TRACE 1300/1310 SSL Backflush Page



This page includes the following fields:

- S/SL Mode
- Inlet
- Surge
- Septum Purge
- Carrier Mode
- Carrier Flow
- Carrier Pressure
- Programmed Carrier Flow
- Programmed Carrier Pressure
- Carrier Options
- Backflush

S/SL Backflush Mode

This parameter enables the fields in this pane. The options are described in Table 17.

Table 17. S/SL Backflush Mode Options

Option	Function
Split	This option enables the Inlet field only. The carrier flow is split in the injection port with the bulk going out the split vent. Use this injection mode when analyzing high concentration or neat samples, or in instances where sensitivity is less important. The split vent remains open all the time. This method yields the sharpest peaks if the split gas is properly mixed.
Splitless	This option enables the Inlet and Purge fields. The split vent is closed during the injection to drive most of the sample into the column. The solvent effect is required to refocus the analytes, especially more volatile compounds. You can achieve the solvent effect by keeping the analytical column or guard column slightly below the solvent's boiling point. Splitless times of about 1 minute are typical.
Splitless w/Surge	This option enables all fields. Same as **Splitless** but can also program a surge during an injection. Surge starts at Prep Run and continues until the surge duration time is finished. Surge is further defined in the next group of controls.

Inlet

The inlet parameters are set in this field which is common to all modes. The S/SL inlet parameters are described in Table 18.

Table 18. S/SL Backflush Inlet Parameters (Sheet 1 of 2)

Parameter	Description
Temperature	Select the check box to enable the adjacent field. Enter a value for the inlet temperature in the range 0-400 °C.
Split Flow	Select the check box to enable the adjacent field. Enter a value in the range 5-1250 mL/min. The **Split Ratio** is adjusted automatically. In addition, this value is governed by the initial column flow rate entered on the associated **Carrier mode**. • If the flow rate is changed, the Split Flow value is adjusted so that the split ratio is maintained. However, • if the Split Flow value then falls outside its limits, a warning is generated and you then have to change the entry to a valid number.

Table 18. S/SL Backflush Inlet Parameters (Sheet 2 of 2)

Parameter	Description
Split Ratio	This field is enabled under the following conditions: • Mode is set to Split. • The Split Flow check box is selected. • On the associated Carrier mode, Flow Mode is set to either Constant Flow or Programmed Flow. This is the ratio between the split flow and the column flow. $\text{SplitRatio} = \frac{\text{SplitFlow}}{\text{ColumnFlow}}$ Enter a value in the range 1-12500. The Split Flow entry is adjusted automatically.
Splitless Time	This field is enabled when the **S/SL Mode** is set to either **Splitless** or **Splitless w/Surge**. Specify the length of time the split valve remains closed after a splitless injection. Enter a value in the range 0.00-999.99 min. The timer begins at the start of the run. During this time, most of the sample transfers from the injector to the column. The split vent reopens when the splitless time ends. This occurs in order to remove excess solvent vapor.

Surge

This field is enabled when the **S/SL Mode** is set to **Splitless** or **Splitless w/Surge**. Make the surge settings in this field. Surge parameters are described in Table 19.

Table 19. S/SL Backflush Surge Parameters

Parameters	Description
Surge Pressure	The pressure applied during the splitless time to produce a surge of flow in the injector to speed transfer of the sample. It may be used, depending upon the analysis, to sharpen peaks closer to the solvent's boiling point where cold trapping is ineffective and solvent effect is the main refocusing mechanism. Enter a value in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi).
Surge Duration	This is the time for which the surge pressure is maintained. Enter a value in the range 0.00-999.99 min. Typically, set to coincide with the **Splitless time**.

Septum Purge

This field controls the septum purge for the injector. Septum purge is used to sweep the bottom of the septum to reduce contamination from sample analytes. This prevents carryover from run to run. Septum purge also prevents contamination of the injector from septum bleed. Make the purge settings in this field.

Septum purge parameters are described in Table 20.

Table 20. S/SL Backflush Purge parameters

Parameter	Description
Purge Flow	This time indicates the flow at which the septum is continuously flushed.
Constant Septum Purge	Select the check box to continuously flush the septum with a purge flow.
Stop Purge Time	This field is enabled if the Constant Septum Purge check box is cleared. You can then enter a time at which the septum purge ceases. The range is 0.00-999.99 min.

Carrier Mode

In this field, you select the flow mode for the carrier gas.

The choice made here controls the parameters available in the Carrier Flow/ Carrier Pressure and Ramps field.

- **Constant Flow** — A single Flow field is available along with a check box to enable or disable it. The graph shows a horizontal line at the flow rate indicated. See "Carrier Flow" on page 53.
- **Constant Pressure** — A single Pressure field is available along with a check box to enable or disable it. The graph shows a horizontal line at the pressure indicated. See "Carrier Pressure" on page 54.
- **Programmed Flow** — Flow program fields are displayed. The graph represents the ramps in the program. See "Programmed Carrier Flow" on page 54.
- **Programmed Pressure** — Pressure program fields are displayed. The graph represents the ramps in the program. See "Programmed Carrier Pressure" on page 55.

Carrier Flow

Use this field to set up flow when **Constant flow** carrier mode has been selected.

Select the **Flow** check box to enable the Flow field.
Enter a value in the range 0.001-100 mL/min. If you clear the check box, the field is disabled and the graph becomes a horizontal line at a flow rate of zero.

Carrier Pressure

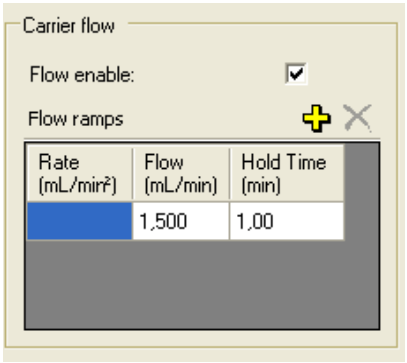
Use this field to set up pressure when **Constant pressure** carrier mode has been selected.

Select the **Pressure** check box to enable the Pressure field. Enter a value in the range 3-1000 kPa. If you clear the check box, the field is disabled and the graph becomes a horizontal line at zero pressure.

Programmed Carrier Flow

Use this field to set up flow program when **Programmed Flow** carrier mode has been selected. See Figure 25.

Figure 25. Programmed Carrier Flow



In this mode you can program an initial constant flow rate field followed by up to three ramps.

Select the **Flow enable** check box to enable the flow.

Enable the number of flow ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden.

If you wish to disable the ramps temporarily, clear the **Flow enable** check box. This disables the Flow column and the program is ignored as shown in the graph which becomes a horizontal line at zero flow rate. The values entered are preserved and may be reactivated by selecting the check box once more.

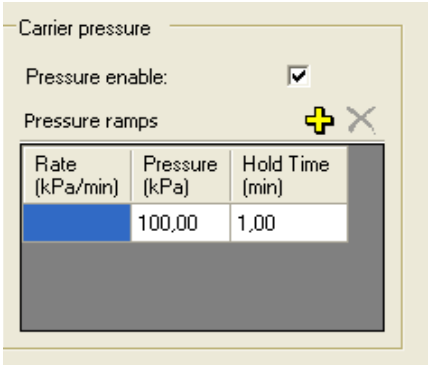
The parameters in the timetable are the follows:

- **Rate** — Enter a value for the rate of flow rate change in the range 0.001-100 mL/min^2. This field is not available for the initial field of the program.
- **Flow** — Enter a value for the constant flow rate field of the ramp in the range 0.001-100 mL/min.
- **Hold Time** — Enter a value for which the flow rate will be held. The range is 0.00-999.99 min.

Programmed Carrier Pressure

Use this field to set up pressure program when **Programmed Pressure** carrier mode has been selected. See Figure 23.

Figure 26. Programmed Carrier Pressure



In this mode you can program an initial constant pressure rate field followed by up to three ramps.

Select the **Pressure enable** check box to enable the flow.

Enable the number of pressure ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden. If you wish to disable the Pressure ramps temporarily, clear the **Pressure enable** check box. This disables the Pressure column and the program is ignored as shown in the graph which becomes a horizontal line at zero pressure. The values entered are preserved and may be reactivated by selecting the check box once more.

The parameters in the timetable re the follows.

- **Rate** — Enter a value for the rate of pressure change in the range 0.01-1000 kPa/min. This field is not available for the initial field of the program.
- **Pressure** — Enter a value for the constant pressure field of the ramp in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi).

- **Hold Time** — Enter a time for which the pressure will be held. The range is 0.00-999.99 min.

Carrier Options

This field includes the following parameters.

- **Vacuum Compensation** — Select the check box to enable the vacuum compensation feature. Use this only when the TRACE 1300/1310 is connected with a mass spectrometer detector. When the check box is not selected, calculations are made for a normal GC detector, which is usually at atmospheric pressure.
- **Carrier Gas Saver** — Select the check box to enable the function in this field. Gas saver controls reduce carrier gas consumption, especially when a large split flow is used. It is set to come on at some point well after the injection to conserve gas.

  The parameters are described in Table 21.

Table 21. Gas Saver Parameters

Parameter	Description
Gas Saver Flow	Enter a value for the gas saver flow rate in the range 5-500 mL/min.
Gas Saver Time	This is time into the run when the gas saver feature starts up. Enter a value in the range 0.00-999.99 min.

Backflush

Use this field to set up the Backflush parameters. They are described in Table 22.

Table 22. S/SL Backflush Parameters

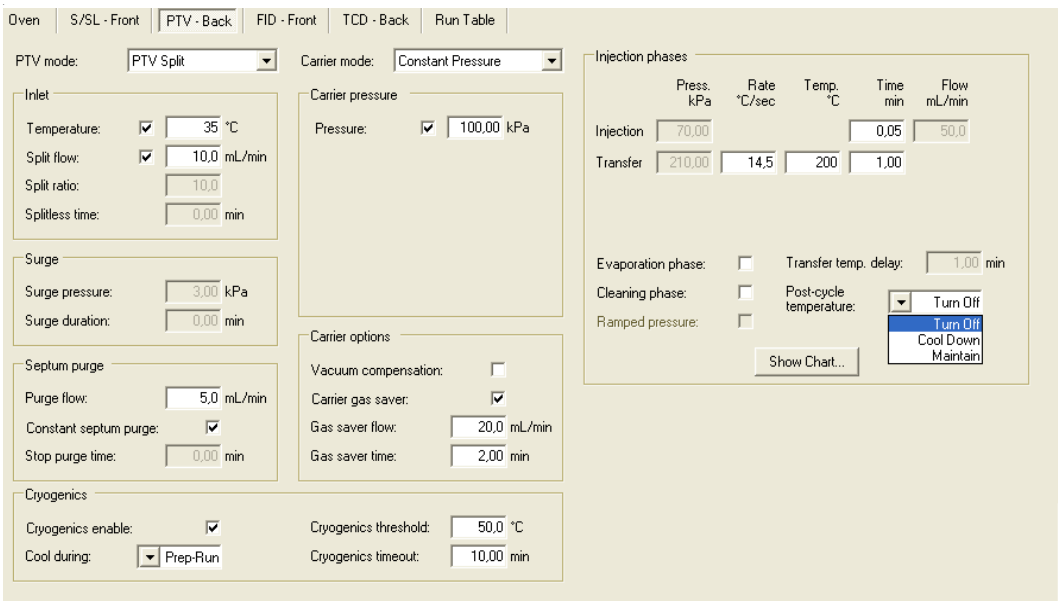
ParameteR	Description
Backflush Enable	Select this check box to enable the Backflush field.
Backflush Start	Set here the time at which the backflush starts.
Backflush Duration	Choose between GC Run Time and Specific Time. • **GC Run Time** — Select this option if you want to use the time calculated for the oven program as the run time. • **Specific Time** — Select this option button if you wish to enter a specific run time.
Duration	This parameter is enable when **Specific Time** has been selected. Set here the duration of the backflush in the range 0.00-999.99 min.

PTV Page

To display this page click on the Front/Back PTV tab from the Instrument Setup view.

This page is the method editor for the Front/Back Programmable Temperature Vaporizing injector module. See Figure 27.

Figure 27. TRACE 1300/1310 PTV Page



This page includes the following fields:

- PTV Mode
- Inlet
- Surge
- Septum Purge
- Carrier Mode
- Carrier Flow
- Carrier Pressure
- Programmed Carrier Flow
- Programmed Carrier Pressure
- Carrier Options
- Injection Phases
- Cryogenics

PTV Mode

The Mode setting controls the availability of the parameters in this pane. Select the appropriate entry for your injector.

- All **PTV** injection modes are **programmable ramped temperatures** you operate at varying temperatures with specified times and temperature increments. Selecting PTV modes activates various controls listed in the **Injections Phases** field.
- All **CT** injection modes are **constant temperature** (isothermal) modes you operate at set temperatures and time increments. Selecting CT modes disables all controls in the **Injections Phases** field.
- **On-Column** injection mode is selected to use the PTV similarly to an On-Column injector.

The options are described in the following table.

Table 23. PTV Modes

PTV Mode	Description
PTV Split	The carrier flow is split in the injection port with the bulk going out the split vent. The split vent remains open all the time.
PTV Splitless	To close the split vent during injection to drive all the sample into the column. Splitless times of about 1minute are typical.
PTV Large Volume	To eliminate the solvent before the sample enters the column.
CT Split	To perform traditional isothermal split operation. The carrier flow is split in the injection port with the bulk going out the split vent. The split vent remains open all the time.
CT Splitless	To perform traditional isothermal splitless operation. The split vent is closed during injection to drive all the sample into the column. Splitless times of about 1minute are typical.
CT Splitless w/surge	Same as **Splitless** but can also program a surge during an injection. Surge starts at Prep Run and continues until the surge duration time is finished. Surge is further defined in next group of controls.
On-Column	To use the PTV injector as an On-Column injector. The injector heats with an automatic temperature rate emulating the oven temperature. When using this technique, set the initial oven temperature below the solvent boiling point.

Inlet

The inlet parameters are set in this field and described in Table 24.

Table 24. PTV Inlet Parameters (Sheet 1 of 2)

Parameter	Description
Temperature	Select the check box to enable the adjacent field. If the cryogenic option is present, enter a value for the inlet temperature in the range from - 50 to 450 °C with carbon dioxide and -100 to 450 °C with liquid nitrogen. Otherwise the lower limit is 0 °C. For non-cryogenic use, this temperature is usually set near above the solvent boiling point. Optimum temperature for an analytical method varies with the method and sample requirements. The entry also has a check box for on/off values, so that the temperature setting may be turned off without affecting the setpoint (usually used for troubleshooting purposes.)
Split Flow	Select the check box to enable the adjacent field. Enter a value in the range 5-1250 mL/min. The **Split Ratio** is adjusted automatically. In addition, this value is governed by the initial column flow rate entered on the associated **Carrier mode**. • If the flow rate is changed, the Split Flow value is adjusted so that the split ratio is maintained. However, • if the Split Flow value then falls outside its limits, a warning is generated and you then have to change the entry to a valid number.
Split Ratio	This field is enabled under the following conditions: • Mode is set to PTV Split or CT Split. • The Split Flow check box is selected. • On the associated Carrier mode, Flow Mode is set to either Constant Flow or Programmed Flow. This is the ratio between the split flow and the column flow. $\text{SplitRatio} = \frac{\text{SplitFlow}}{\text{ColumnFlow}}$ Enter a value in the range 1-12500. The Split Flow entry is adjusted automatically.
Splitless Time	This field is enabled when the **Mode** is set to either **Splitless** or **Splitless w/Surge**. Specify the length of time the split valve remains closed after a splitless injection. The timer begins at the start of the run. During this time, most of the sample transfers from the injector to the column. The split vent reopens when the splitless time ends. This occurs in order to remove excess solvent vapor. Enter a value in the range 0.00-999.99 min.

Table 24. PTV Inlet Parameters (Sheet 2 of 2)

Parameter	Description
Splitless Time	This field is disabled when the Mode is set to either PTV Split or CT Split. It is the time for which the split valve is closed. Enter a value in the range 0.00-999.99 min.

Surge

This field is enabled when the Mode is set to CT Splitless w/Surge. The parameters are described in Table 25.

Table 25. PTV Surge Parameters

Parameters	Description
Surge Pressure	The CT Splitless w/Surge mode allows a higher inlet pressure to be applied during injection. This serves to reduce the volume of the vapor cloud created when injected sample is vaporized, and may improve separated analytes resolution. Enter a value in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi).
Surge Duration	This is the time necessary to ensure the injected sample transfers to the analytical column; so that the column flow is slightly affected. Enter a value in the range 0.00-999.99 min.

Septum Purge

This field controls the septum purge for the injector. Septum purge is used to sweep the bottom of the septum to reduce contamination from sample analytes. This prevents carryover from run to run. Septum purge also prevents contamination of the injector from septum bleed. Make the purge settings in this field.

Septum purge parameters are described in Table 20.

Table 26. PTV Purge parameters

Parameter	Description
Purge Flow	This time indicates the flow at which the septum is continuously flushed.
Constant Septum Purge	Select the check box to continuously flush the septum with a purge flow.
Stop Purge Time	This field is enabled if the Constant Septum Purge check box is cleared. You can then enter a time at which the septum purge ceases. The range is 0.00-999.99 min.

Carrier Mode

In this field, you select the flow mode for the carrier gas.

The choice made here controls the parameters available in the Carrier Flow/ Carrier Pressure and Ramps field.

- **Constant Flow** — A single Flow field is available along with a check box to enable or disable it. The graph shows a horizontal line at the flow rate indicated. See "Carrier Flow" on page 61.
- **Constant Pressure** — A single Pressure field is available along with a check box to enable or disable it. The graph shows a horizontal line at the pressure indicated. See "Carrier Pressure" on page 61.
- **Programmed Flow** — Flow program fields are displayed. The graph represents the ramps in the program. See "Programmed Carrier Flow" on page 61.
- **Programmed Pressure** — Pressure program fields are displayed. The graph represents the ramps in the program. See "Programmed Carrier Pressure" on page 62.

Carrier Flow

Use this field to set up flow when **Constant flow** carrier mode has been selected.

Select the **Flow** check box to enable the Flow field.
Enter a value in the range 0.001-100 mL/min. If you clear the check box, the field is disabled and the graph becomes a horizontal line at a flow rate of zero.

Carrier Pressure

Use this field to set up pressure when **Constant pressure** carrier mode has been selected.

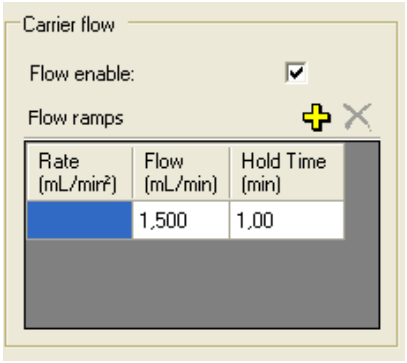
Select the **Pressure** check box to enable the Pressure field. Enter a value in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi).

If you clear the check box, the field is disabled and the graph becomes a horizontal line at zero pressure.

Programmed Carrier Flow

Use this field to set up flow program when **Programmed Flow** carrier mode has been selected. See Figure 28.

Figure 28. Programmed Carrier Flow



In this mode you can program an initial constant flow rate field followed by up to three ramps.

Select the **Flow enable** check box to enable the flow.

Enable the number of flow ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden.

If you wish to disable the ramps temporarily, clear the **Flow enable** check box. This disables the Flow column and the program is ignored as shown in the graph which becomes a horizontal line at zero flow rate. The values entered are preserved and may be reactivated by selecting the check box once more.

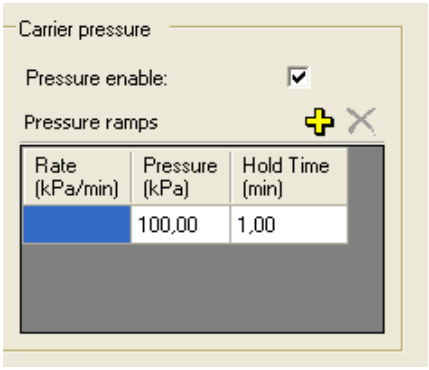
The parameters in the timetable are the follows:

- **Rate** — Enter a value for the rate of flow rate change in the range 0.001-100 mL/min^2. This field is not available for the initial field of the program.
- **Flow** — Enter a value for the constant flow rate field of the ramp in the range 0.001-100 mL/min.
- **Hold Time** — Enter a value for which the flow rate will be held. The range is 0.00-999.99 min.

Programmed Carrier Pressure

Use this field to set up pressure program when **Programmed Pressure** carrier mode has been selected. See Figure 29.

Figure 29. Programmed Carrier Pressure



In this mode you can program an initial constant pressure rate field followed by up to three ramps.

Select the **Pressure enable** check box to enable the flow.

Enable the number of pressure ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden. If you wish to disable the Pressure ramps temporarily, clear the **Pressure enable** check box. This disables the Pressure column and the program is ignored as shown in the graph which becomes a horizontal line at zero pressure. The values entered are preserved and may be reactivated by selecting the check box once more.

The parameters in the timetable are the follows.

- **Rate** — Enter a value for the rate of pressure change in the range 0.01-1000 kPa/min. This field is not available for the initial field of the program.
- **Pressure** — Enter a value for the constant pressure field of the ramp in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi).
- **Hold Time** — Enter a time for which the pressure will be held. The range is 0.00-999.99 min.

Carrier Options

This field includes the following parameters.

- **Vacuum Compensation** — Select the check box to enable the vacuum compensation feature. Use this only when the TRACE 1300/1310 is connected with a mass spectrometer detector. When the check box is not selected, calculations are made for a normal GC detector, which is usually at atmospheric pressure.

- **Carrier Gas Saver** — Select the check box to enable the function in this field. Gas saver controls reduce carrier gas consumption, especially when a large split flow is used. It is set to come on at some point well after the injection to conserve gas.

  The parameters are described in Table 27.

Table 27. Gas Saver Parameters

Parameter	Description
Gas Saver Flow	Enter a value for the gas saver flow rate in the range 5-500 mL/min.
Gas Saver Time	This is time into the run when the gas saver feature starts up. Enter a value in the range 0.00-999.99 min.

Injection Phases

This field is enabled for PTV mode options only. The fields are activated by selections made in the **Options** field. Further restrictions apply. These are described as necessary.

There are four phases: **Injection**, **Evaporation**, **Transfer** and **Cleaning**. These are arranged in a table.

For details refer to the following tables.

Table 28. PTV Injection Phases (1) (Sheet 1 of 2)

Phases	Description
Injection	Use this control for the injection's ramped pressure. Available only with PTV Splitless or PTV Large Volume mode.
Evaporation	It is enabled when **Evaporation phase** check box is selected. This group of controls allows you to specify solvent evaporation controls: pressure (PTV Splitless only), rate, temperature, and time in minutes. Set the solvent evaporation temperature; set the rate to reach the solvent evaporation temperature.
Transfer	This group of controls allows you to specify controls for the sample transfer into the column: Pressure (PTV Splitless only), rate, temperature, and time in minutes. Specify the pressure if available. Set the rate in °C/s to reach the sample transfer temperature. Set the temperature for sample transfer into the column. Set the time in minutes for the transfer temperature to be maintained.

Table 28. PTV Injection Phases (1) (Sheet 2 of 2)

Phases	Description
Cleaning	It is enabled when **Cleaning phase** check box is selected. Set the rate necessary to reach the cleaning temperature. Set the injector cleaning temperature. Set the time in minutes the cleaning temperature must be maintained.
Evaporation Phase	Select this check box to enable the Evaporation phase parameters in the Injection Phases field.
Cleaning Phase	Select this check box to enable the Cleaning phase parameters in the Injection Phases field.
Ramped Pressure	Select this check box to enable the Pressure parameters in the Injection Phases field. This is enabled only when Mode is set to PTV Splitless.
Transfer temp. delay	It is active only when Large Volume mode is set. It delays the temperature ramp start after evaporation phase. Enter a value in the range 0.00 to 999.99
Post-cycle temperature	Choose one among **Turn Off**, **Cool Down**, **Maintain** as required

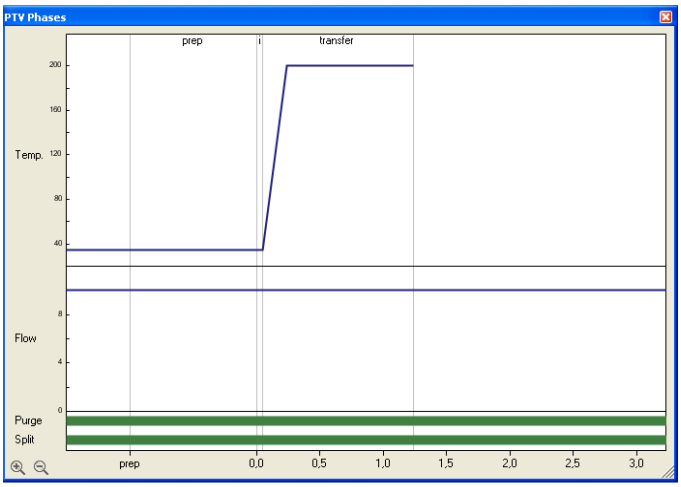
Table 29. PTV Injection Phases (2)

Column	Faction
Pressure	This column is enabled only when Mode is PTV Splitless and the Ramped Pressure check box is selected. Enter a value in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi). This parameter does not apply to the Cleaning phase.
Rate	This column is enabled only when the Evaporation Phase check box is selected. Enter a value in the range 0.1-14.5°C/min. This parameter does not apply to the Injection phase.
Temp	This is the temperature of the phase. Enter a value in the range 0-450°C (- 50 to 450 °C with carbon dioxide and -100 to 450 °C with liquid nitrogen).
Time	This is time for which the temperature of the phase is to be held. Enter a value in the range 0.00-999.99 min.
Flow	This parameter applies only to the Injection and Cleaning phases. For the Injection phase, Mode must be set to PTV Large Volume. For the Cleaning phase, the Cleaning Phase check box must be selected. Enter a value in the range 5-1250 mL/min.

Show Graph

To view the PTV phases dialog box, click on the **Show Graph** button.

Figure 30. Example Graph



This is a read-only, graphical display of changes in temperature, flow rate, and valve state with time. You can use the arrow buttons in the bottom left-hand corner to expand the time scale and view the early phases in more detail. The left-hand button expands the scale while the right hand one contracts it. The graph cannot be scrolled in expanded mode.

Cryogenics

This field is visualized if **Front/Back Inlet cryogenics** has been enabled in Instrument Configuration. See "TRACE 1300/1310 Configuration" on page 1.

The Cryogenics parameters are described in Table 30.

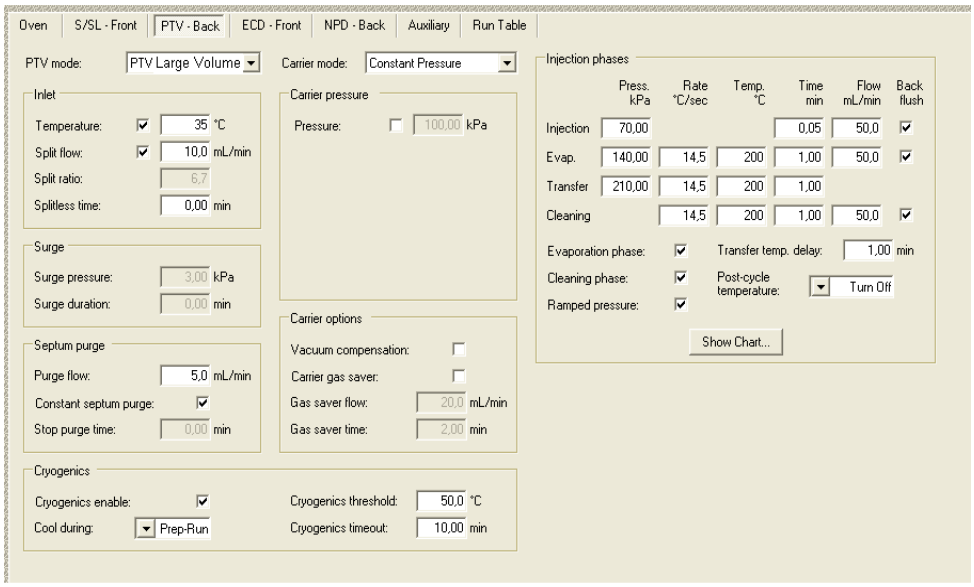
Table 30. Cryogenics Field Parameters

Parameter	Description
Cryogenics enable	Select this check box to enable the cryogenic system.
Cool during	Select when performing the cool. Choose between Prep-Run or Post -Run,
Cryo threshold	Specify the temperature at which the cryo system begins to supply the coolant. Enter a value in the range 40-200 °C.
Cryo timeout	Enter the time at which the cryo system will be disabled. Enter a value in the range 0–30 min.

PTV Backflush Page

To display this page click on the Front/Back PTV Backflush tab from the Instrument Setup view.
This page is the method editor for the Front/Back Programmable Temperature Vaporizing injector module for Backflush. See Figure 27.

Figure 31. TRACE 1300/1310 PTV Backflush Page



This page includes the following fields:

- PTV Mode
- Inlet
- Surge
- Septum Purge
- Carrier Mode
- Carrier Flow
- Carrier Pressure
- Programmed Carrier Flow
- Programmed Carrier Pressure
- Carrier Options
- Injection Phases
- Backflush
- Cryogenics

PTV Mode

The Mode setting controls the availability of the parameters in this pane. Select the appropriate entry for your injector.

- All **PTV** injection modes are **programmable ramped temperatures** you operate at varying temperatures with specified times and temperature increments. Selecting PTV modes activates various controls listed in the **Injections Phases** field.
- All **CT** injection modes are **constant temperature** (isothermal) modes you operate at set temperatures and time increments. Selecting CT modes disables all controls in the **Injections Phases** field.

The options are described in the following tables.

Table 31. PTV Modes

PTV Mode	Description
PTV Split	The carrier flow is split in the injection port with the bulk going out the split vent. The split vent remains open all the time.
PTV Splitless	To close the split vent during injection to drive all the sample into the column. Splitless times of about 1minute are typical.
PTV Large Volume	To eliminate the solvent before the sample enters the column.
CT Split	To perform traditional isothermal split operation. The carrier flow is split in the injection port with the bulk going out the split vent. The split vent remains open all the time.
CT Splitless	To perform traditional isothermal splitless operation. The split vent is closed during injection to drive all the sample into the column. Splitless times of about 1minute are typical.
CT Splitless w/surge	Same as **Splitless** but can also program a surge during an injection. Surge starts at Prep Run and continues until the surge duration time is finished. Surge is further defined in next group of controls.

Inlet

The inlet parameters are set in this field and described in Table 24.

Table 32. PTV Backflush Inlet Parameters (Sheet 1 of 2)

Parameter	Description
Temperature	Select the check box to enable the adjacent field. If the cryogenic option is present, enter a value for the inlet temperature in the range from - 50 to 450 °C with carbon dioxide and -100 to 450 °C with liquid nitrogen. Otherwise the lower limit is 0 °C. For non-cryogenic use, this temperature is usually set near above the solvent boiling point. Optimum temperature for an analytical method varies with the method and sample requirements. The entry also has a check box for on/off values, so that the temperature setting may be turned off without affecting the setpoint (usually used for troubleshooting purposes.)
Split Flow	Select the check box to enable the adjacent field. Enter a value in the range 5-1250 mL/min. The **Split Ratio** is adjusted automatically. In addition, this value is governed by the initial column flow rate entered on the associated **Carrier mode**. • If the flow rate is changed, the Split Flow value is adjusted so that the split ratio is maintained. However, • if the Split Flow value then falls outside its limits, a warning is generated and you then have to change the entry to a valid number.
Split Ratio	This field is enabled under the following conditions: • Mode is set to PTV Split or CT Split. • The Split Flow check box is selected. • On the associated Carrier mode, Flow Mode is set to either Constant Flow or Programmed Flow. This is the ratio between the split flow and the column flow. $\text{SplitRatio} = \frac{\text{SplitFlow}}{\text{ColumnFlow}}$ Enter a value in the range 1-12500. The Split Flow entry is adjusted automatically.
Splitless Time	This field is enabled when the **Mode** is set to either **Splitless** or **Splitless w/Surge**. Specify the length of time the split valve remains closed after a splitless injection. The timer begins at the start of the run. During this time, most of the sample transfers from the injector to the column. The split vent reopens when the splitless time ends. This occurs in order to remove excess solvent vapor. Enter a value in the range 0.00-999.99 min.

Table 32. PTV Backflush Inlet Parameters (Sheet 2 of 2)

Parameter	Description
Splitless Time	This field is disabled when the Mode is set to either PTV Split or CT Split. It is the time for which the split valve is closed. Enter a value in the range 0.00-999.99 min.

Surge

This field is enabled when the Mode is set to CT Splitless w/Surge. The parameters are described in Table 25.

Table 33. PTV Surge Parameters

Parameters	Description
Surge Pressure	The CT Splitless w/Surge mode allows a higher inlet pressure to be applied during injection. This serves to reduce the volume of the vapor cloud created when injected sample is vaporized, and may improve separated analytes resolution. Enter a value in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi).
Surge Duration	This is the time necessary to ensure the injected sample transfers to the analytical column; so that the column flow is slightly affected. Enter a value in the range 0.00-999.99 min.

Septum Purge

This field controls the septum purge for the injector. Septum purge is used to sweep the bottom of the septum to reduce contamination from sample analytes. This prevents carryover from run to run. Septum purge also prevents contamination of the injector from septum bleed. Make the purge settings in this field.

Septum purge parameters are described in Table 20.

Table 34. PTV Backflush Purge Parameters

Parameter	Description
Purge Flow	This time indicates the flow at which the septum is continuously flushed.
Constant Septum Purge	Select the check box to continuously flush the septum with a purge flow.
Stop Purge Time	This field is enabled if the Constant Septum Purge check box is cleared. You can then enter a time at which the septum purge ceases. The range is 0.00-999.99 min.

Carrier Mode

In this field, you select the flow mode for the carrier gas.

The choice made here controls the parameters available in the Carrier Flow/ Carrier Pressure and Ramps field.

- **Constant Flow** — A single Flow field is available along with a check box to enable or disable it. The graph shows a horizontal line at the flow rate indicated. See "Carrier Flow" on page 71.
- **Constant Pressure** — A single Pressure field is available along with a check box to enable or disable it. The graph shows a horizontal line at the pressure indicated. See "Carrier Pressure" on page 71.
- **Programmed Flow** — Flow program fields are displayed. The graph represents the ramps in the program. See "Programmed Carrier Flow" on page 71.
- **Programmed Pressure** — Pressure program fields are displayed. The graph represents the ramps in the program. See "Programmed Carrier Pressure" on page 72.

Carrier Flow

Use this field to set up flow when **Constant flow** carrier mode has been selected.

Select the **Flow** check box to enable the Flow field.
Enter a value in the range 0.001-100 mL/min. If you clear the check box, the field is disabled and the graph becomes a horizontal line at a flow rate of zero.

Carrier Pressure

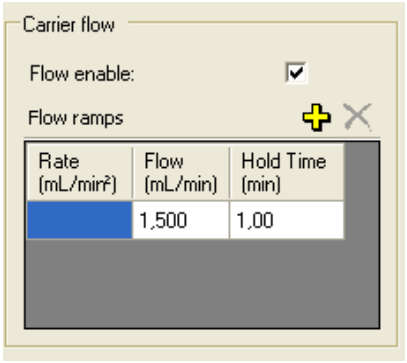
Use this field to set up pressure when **Constant pressure** carrier mode has been selected.

Select the **Pressure** check box to enable the Pressure field.
Enter a value in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi). If you clear the check box, the field is disabled and the graph becomes a horizontal line at zero pressure.

Programmed Carrier Flow

Use this field to set up flow program when **Programmed Flow** carrier mode has been selected. See Figure 28.

Figure 32. Programmed Carrier Flow



In this mode you can program an initial constant flow rate field followed by up to three ramps.

Select the **Flow enable** check box to enable the flow.

Enable the number of flow ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden.

If you wish to disable the ramps temporarily, clear the **Flow enable** check box. This disables the Flow column and the program is ignored as shown in the graph which becomes a horizontal line at zero flow rate. The values entered are preserved and may be reactivated by selecting the check box once more.

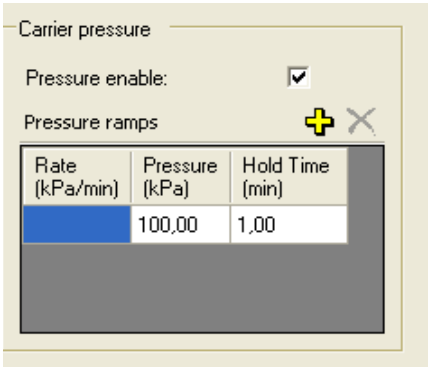
The parameters in the timetable are the follows:

- **Rate** — Enter a value for the rate of flow rate change in the range 0.001-100 mL/min^2. This field is not available for the initial field of the program.
- **Flow** — Enter a value for the constant flow rate field of the ramp in the range 0.001-100 mL/min.
- **Hold Time** — Enter a value for which the flow rate will be held. The range is 0.00-999.99 min.

Programmed Carrier Pressure

Use this field to set up pressure program when **Programmed Pressure** carrier mode has been selected. See Figure 29.

Figure 33. Programmed Carrier Pressure



In this mode you can program an initial constant pressure rate field followed by up to three ramps.

Select the **Pressure enable** check box to enable the flow.

Enable the number of pressure ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden. If you wish to disable the Pressure ramps temporarily, clear the **Pressure enable** check box. This disables the Pressure column and the program is ignored as shown in the graph which becomes a horizontal line at zero pressure. The values entered are preserved and may be reactivated by selecting the check box once more.

The parameters in the timetable are the follows.

- **Rate** — Enter a value for the rate of pressure change in the range 0.01-1000 kPa/min. This field is not available for the initial field of the program.
- **Pressure** — Enter a value for the constant pressure field of the ramp in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi).
- **Hold Time** — Enter a time for which the pressure will be held. The range is 0.00-999.99 min.

Carrier Options

This field includes the following parameters.

- **Vacuum Compensation** — Select the check box to enable the vacuum compensation feature. Use this only when the TRACE 1300/1310 is connected with a mass spectrometer detector. When the check box is not selected, calculations are made for a normal GC detector, which is usually at atmospheric pressure.

- **Carrier Gas Saver** — Select the check box to enable the function in this field. Gas saver controls reduce carrier gas consumption, especially when a large split flow is used. It is set to come on at some point well after the injection to conserve gas. The parameters are described in Table 27.

Table 35. Gas Saver Parameters

Parameter	Description
Gas Saver Flow	Enter a value for the gas saver flow rate in the range 5-500 mL/min.
Gas Saver Time	This is time into the run when the gas saver feature starts up. Enter a value in the range 0.00-999.99 min.

Injection Phases

This field is enabled for PTV mode options only. The fields are activated by selections made in the **Options** field. Further restrictions apply. These are described as necessary.

There are four phases: **Injection**, **Evaporation**, **Transfer** and **Cleaning**. These are arranged in a table.

For details refer to the following tables.

Table 36. PTV Backflush Injection Phases (1) (Sheet 1 of 2)

Phases	Description
Injection	Use this control for the injection's ramped pressure. Available only with PTV Splitless or PTV Large Volume mode.
Evaporation	It is enabled when **Evaporation phase** check box is selected. This group of controls allows you to specify solvent evaporation controls: pressure (PTV Splitless only), rate, temperature, and time in minutes. Set the solvent evaporation temperature; set the rate to reach the solvent evaporation temperature.
Transfer	This group of controls allows you to specify controls for the sample transfer into the column: Pressure (PTV Splitless only), rate, temperature, and time in minutes. Specify the pressure if available. Set the rate in °C/s to reach the sample transfer temperature. Set the temperature for sample transfer into the column. Set the time in minutes for the transfer temperature to be maintained.

Table 36. PTV Backflush Injection Phases (1) (Sheet 2 of 2)

Phases	Description
Cleaning	It is enabled when **Cleaning phase** check box is selected. Set the rate necessary to reach the cleaning temperature. Set the injector cleaning temperature. Set the time in minutes the cleaning temperature must be maintained.
Evaporation Phase	Select this check box to enable the Evaporation phase parameters in the Injection Phases field.
Cleaning Phase	Select this check box to enable the Cleaning phase parameters in the Injection Phases field.
Ramped Pressure	Select this check box to enable the Pressure parameters in the Injection Phases field. This is enabled only when Mode is set to PTV Splitless.
Transfer temp. delay	It is active only when Large Volume mode is set. It delays the temperature ramp start after evaporation phase. Enter a value in the range 0.00 to 999.99
Post-cycle temperature	Choose among **Turn Off**, **Cool Down**, **Maintain**

Table 37. PTV Backflush Injection Phases (2) (Sheet 1 of 2)

Column	Faction
Pressure	This column is enabled only when Mode is PTV Splitless, and the Ramped Pressure check box is selected. Enter a value in the range 5-1000 kPa. This parameter does not apply to the Cleaning phase.
Rate	This column is enabled only when the Evaporation Phase check box is selected. Enter a value in the range 0.1-14.5°C/min. This parameter does not apply to the Injection phase.
Temp	This is the temperature of the phase. Enter a value in the range 0-450°C (- 50 to 450 °C with carbon dioxide and -100 to 450 °C with liquid nitrogen).
Time	This is time for which the temperature of the phase is to be held. Enter a value in the range 0.00-999.99 min.

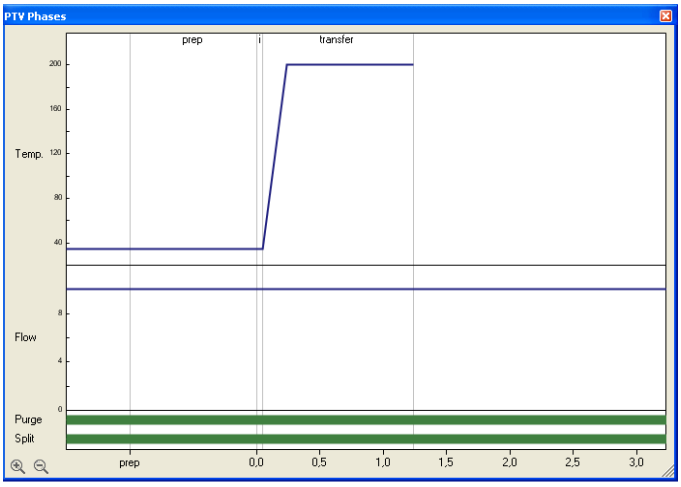
Table 37. PTV Backflush Injection Phases (2) (Sheet 2 of 2)

Column	Faction
Flow	This parameter applies only to the Injection and Cleaning phases. For the Injection phase, Mode must be set to PTV Large Volume. For the Cleaning phase, the Cleaning Phase check box must be selected. Enter a value in the range 5-1250 mL/min.
Backflush	Select the check box to enable the backflush during Injection, Evaporation (only in Large Volume mode), and/or Cleaning phases.

Show Graph

To view the PTV phases dialog box, click on the **Show Graph** button.

Figure 34. Example Graph

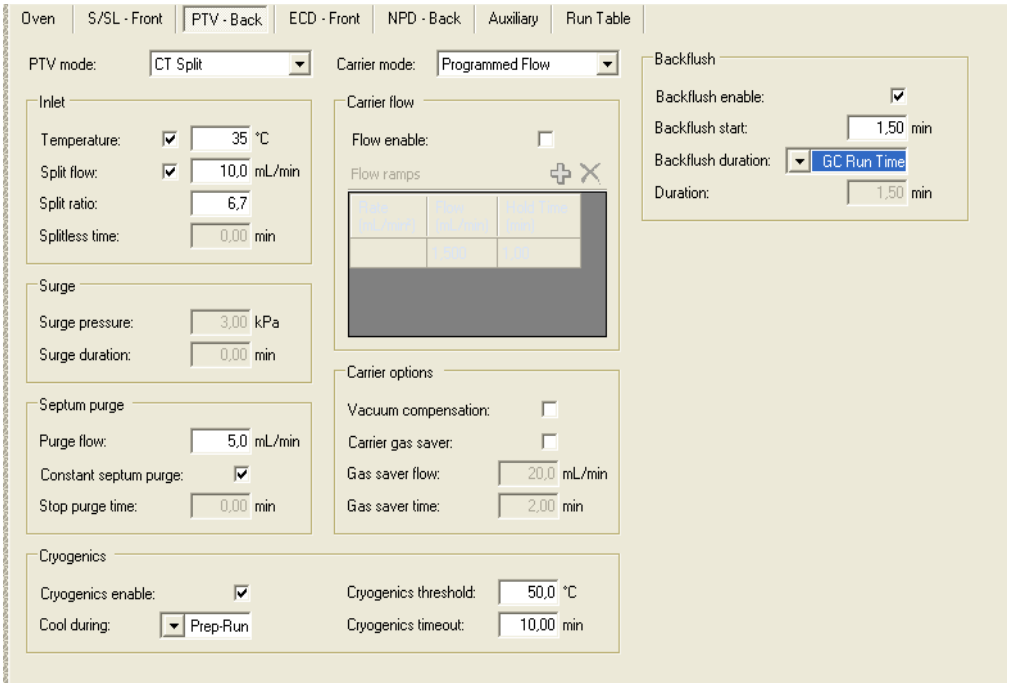


This is a read-only, graphical display of changes in temperature, flow rate, and valve state with time. You can use the arrow buttons in the bottom left-hand corner to expand the time scale and view the early phases in more detail. The left-hand button expands the scale while the right hand one contracts it. The graph cannot be scrolled in expanded mode.

Backflush

This field is visualized when CT Split, CT Splitless, or CT Splitless w Surge mode has been selected. In the PTV modes the backflush can be enabled during the injection, evaporation, and cleaning phases depending on the mode chosen. See Figure 35

Figure 35. PTV Backflush Field



Use this field to set up the Backflush parameters. They are described in Table 38.

Table 38. PTV Backflush Parameters

ParameteR	Description
Backflush Enable	Select this check box to enable the Backflush field.
Backflush Start	Set here the time at which the backflush starts.
Backflush Duration	Choose between GC Run Time and Specific Time. • **GC Run Time** — Select this option if you want to use the time calculated for the oven program as the run time. • **Specific Time**—Select this option button if you wish to enter a specific run time.
Duration	This parameter is enable when **Specific Time** has been selected. Set here the duration of the backflush in the range 0.00-999.99 min.

Cryogenics

This field is visualized if **Front/Back Inlet cryogenics** has been enabled in Instrument Configuration. See "TRACE 1300/1310 Configuration" on page 1.

The Cryogenics parameters are described in Table 30.

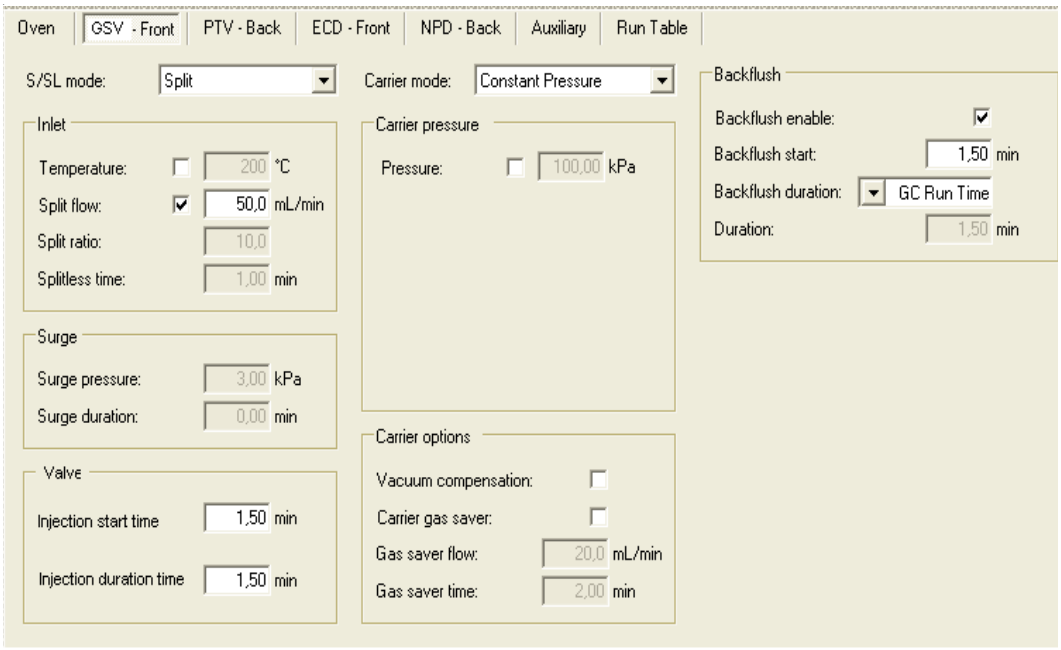
Table 39. Cryogenics Field Parameters

Parameter	Description
Cryogenics enable	Select this check box to enable the cryogenic system.
Cool during	Select when performing the cool. Choose between Prep-Run or Post -Run.
Cryo threshold	Specify the temperature at which the cryo system begins to supply the coolant. Enter a value in the range 40-200 °C.
Cryo timeout	Enter the time at which the cryo system will be disabled. Enter a value in the range 0–30 min.

Gas Sampling Valve Page

This page is the method editor for the Front/Back Gas Sampling Valve (GSV) module. See Figure 36.

Figure 36. TRACE 1300 - GSV Page



This page includes the following fields:

- S/SL Mode
- Inlet
- Surge
- Valve
- Carrier Mode
- Carrier Flow
- Carrier Pressure
- Programmed Carrier Flow
- Programmed Carrier Pressure
- Carrier Options
- Backflush

S/SL Mode

This parameter enables the fields in this pane. The options are described in Table 40.

Table 40. GSV - S/SL Mode Options

Option	Function
Split	This option enables the Inlet field only. The carrier flow is split in the injection port with the bulk going out the split vent. Use this injection mode when analyzing high concentration or neat samples, or in instances where sensitivity is less important. The split vent remains open all the time. This method yields the sharpest peaks if the split gas is properly mixed. **IMPORTANT** When **Split** mode is selected the Gas Sampling Valve parameters in the **Valve** field are enabled. See "Valve" on page 82.
Splitless	This option enables the Inlet and Purge fields. The split vent is closed during the injection to drive most of the sample into the column. The solvent effect is required to refocus the analytes, especially more volatile compounds. You can achieve the solvent effect by keeping the analytical column or guard column slightly below the solvent's boiling point. Splitless times of about 1 minute are typical. **IMPORTANT** When **Splitless** mode is selected the Gas Sampling Valve parameters in the **Valve** field are disabled. In this case the **Sampling time** coincides with the **Splitless Time**. See "Valve" on page 82.
Splitless w/Surge	This option enables all fields. Same as **Splitless** but can also program a surge during an injection. Surge starts at Prep Run and continues until the surge duration time is finished. Surge is further defined in the next group of controls. **IMPORTANT** When **Splitless w/Surge** mode is selected the Gas Sampling Valve parameters in the **Valve** field are disabled. In this case the **Sampling time** coincides with the **Splitless Time**. See "Valve" on page 82.

Inlet

The inlet parameters are set in this field which is common to all modes. The inlet parameters are described in Table 41.

Table 41. GSV - Inlet Parameters

Parameter	Description
Temperature	Select the check box to enable the adjacent field. Enter a value for the gas sampling valve temperature in the range 0-150 °C.
Split Flow	Select the check box to enable the adjacent field. Enter a value in the range of 5-1250 mL/min. The **Split Ratio** is adjusted automatically. In addition, this value is governed by the initial column flow rate entered on the associated **Carrier mode**. • If the flow rate is changed, the Split Flow value is adjusted so that the split ratio is maintained. However, if the Split Flow value then falls outside its limits, a warning is generated and you then have to change the entry to a valid number.
Split Ratio	This field is enabled under the following conditions: • Mode is set to Split. • The Split Flow check box is selected. • On the associated Carrier mode, the Flow Mode is set to either Constant Flow or Programmed Flow. This is the ratio between the split flow and the column flow. $\text{SplitRatio} = \frac{\text{SplitFlow}}{\text{ColumnFlow}}$ Enter a value in the range of 1-12500. The Split Flow entry is adjusted automatically.
Splitless Time	This field is enabled when the **S/SL Mode** is set to either **Splitless** or **Splitless w/Surge**. The splitless time coincides with the **injection duration** parameter of the gas sampling valve. Enter a value in the range of 0.00-999.99 min. The timer begins at the start of the run. During this time, most of the sample transfers from the sample loop to the column. The split vent reopens when the splitless time ends. This occurs in order to remove excess solvent vapor.

Surge

This field is enabled when the **S/SL Mode** is set to **Splitless** or **Splitless w/Surge**. Make the surge settings in this field. Surge parameters are described in Table 42.

Table 42. GSV - Surge Parameters

Parameter	Description
Surge Pressure	The pressure applied during the splitless time to produce a surge of flow in the injector to speed transfer of the sample. It may be used, depending upon the analysis, to sharpen peaks closer to the solvent's boiling point where cold trapping is ineffective and solvent effect is the main refocusing mechanism. Enter a value in the range of 5-1000 kPa (0.725-145 psi; 0.05-10 bar).
Surge Duration	This is the time for which the surge pressure is maintained. Enter a value in the range of 0.00-999.99 min. Typically, set to coincide with the **Splitless time**.

Valve

This field is enabled when the **S/SL Mode** is set to **Split** and allows the injection with the gas sampling valve. The field is disabled when **S/SL Mode** set to **Splitless** or **Splitless w/Surge**; in this case the sampling time coincides with the Splitless time. Valve parameters are described in Table 43.

Table 43. SSLGSV - Valve Parameters

Parameter	Description
Injection start time	Defines the time at which the injection must begin.
Injection duration	Defines the time the sampling valve must be maintained on injection position.

Carrier Mode

In this field, you select the flow mode for the carrier gas.

The choice made here controls the parameters available in the Carrier Flow/Carrier Pressure and Ramps field.

- **Constant Flow** — A single Flow field is available along with a check box to enable or disable it. The graph shows a horizontal line at the flow rate indicated. See Carrier Flow.
- **Constant Pressure** — A single Pressure field is available along with a check box to enable or disable it. The graph shows a horizontal line at the pressure indicated. See Carrier Pressure.
- **Programmed Flow** — The Flow program fields are displayed. The graph represents the ramps in the program. See "Programmed Carrier Flow" on page 83.

- **Programmed Pressure** — The Pressure program fields are displayed. The graph represents the ramps in the program. See "Programmed Carrier Pressure" on page 84.

Carrier Flow

Use this field to set up flow when the **Constant flow** carrier mode has been selected.

Select the **Flow** check box to enable the Flow field.
Enter a value in the range of 0.1-100 mL/min. If you clear the check box, the field is disabled and the graph becomes a horizontal line at a flow rate of zero.

Carrier Pressure

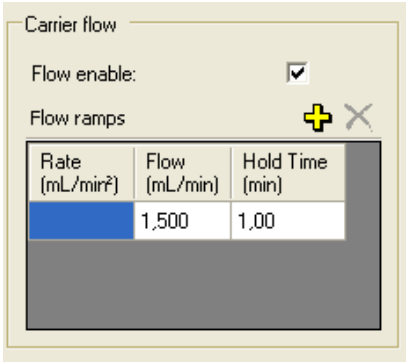
Use this field to set up pressure when **Constant pressure** carrier mode has been selected.

Select the **Pressure** check box to enable the Pressure field.
Enter a value in the range of 5-1000 kPa (0.725-145 psi; 0.05-10 bar). If you clear the check box, the field is disabled and the graph becomes a horizontal line at zero pressure.

Programmed Carrier Flow

Use this field to set up a flow program when the **Programmed Flow** carrier mode has been selected. See Figure 37.

Figure 37. Programmed Carrier Flow



In this mode you can program an initial constant flow rate field followed by up to three ramps.

Select the **Flow enable** check box to enable the flow.

Enable the number of flow ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden.

If you wish to disable the ramps temporarily, clear the **Flow enable** check box. This disables the Flow column and the program is ignored as shown in the graph, which becomes a horizontal line at zero flow rate. The values entered are preserved and may be reactivated by selecting the check box once more.

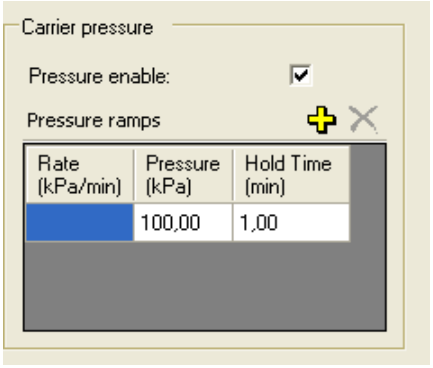
The parameters in the timetable are as follows:

- **Rate** — Enter a value for the rate of flow rate change in the range of 0.001-100 mL/min^2. This field is not available for the initial field of the program.
- **Flow** — Enter a value for the constant flow rate field of the ramp in the range of 0.001-100 mL/min.
- **Hold Time** — Enter a value for which the flow rate will be held. The range is 0.00-999.99 min.

Programmed Carrier Pressure

Use this field to set up a pressure program when **Programmed Pressure** carrier mode has been selected. See Figure 38.

Figure 38. Programmed Carrier Pressure



In this mode you can program an initial constant pressure rate field followed by up to three ramps.

Select the **Pressure enable** check box to enable the pressure.

Enable the number of pressure ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden. If you wish to disable the Pressure ramps temporarily, clear the **Pressure enable** check box. This disables the Pressure column, and the program is ignored as shown in the graph which, becomes a horizontal line at zero pressure. The values entered are preserved and may be reactivated by selecting the check box once more.

The parameters in the timetable are as follows.

- **Rate** — Enter a value for the rate of pressure change in the range 0.01-1000 kPa/min (0.001-145 psi; 0.0001-10 bar). This field is not available for the initial field of the program.
- **Pressure** — Enter a value for the constant pressure field of the ramp in the range 5-1000 kPa (0.725-145 psi; 0.05-10 bar).
- **Hold Time** — Enter a time for which the pressure will be held. The range is 0.00-999.99 min.

Carrier Options

This field includes the following parameters:

- **Vacuum Compensation** — Select the check box to enable the vacuum compensation feature. Use this only when the TRACE 1300 is connected to a mass spectrometer detector. When the check box is not selected, calculations are made for a normal GC detector, which is usually at atmospheric pressure.
- **Carrier Gas Saver** — Select the check box to enable the function in this field. Gas saver controls reduce carrier gas consumption, especially when a large split flow is used. It is set to come on at some point well after the injection to conserve gas.

  The parameters are described in Table 44.

Table 44. Gas Saver Parameters

Parameter	Description
Gas Saver Flow	Enter a value for the gas saver flow rate in the range 5-500 mL/min.
Gas Saver Time	This is time into the run when the gas saver feature starts up. Enter a value in the range of 0.00-999.99 min.

Backflush

Use this field to set up the Backflush parameters. They are described in Table 45.

Table 45. GSV - Backflush Parameters (Sheet 1 of 2)

Parameter	Description
Backflush Enable	Select this check box to enable the Backflush field.
Backflush Start	Set the time at which the backflush starts here.

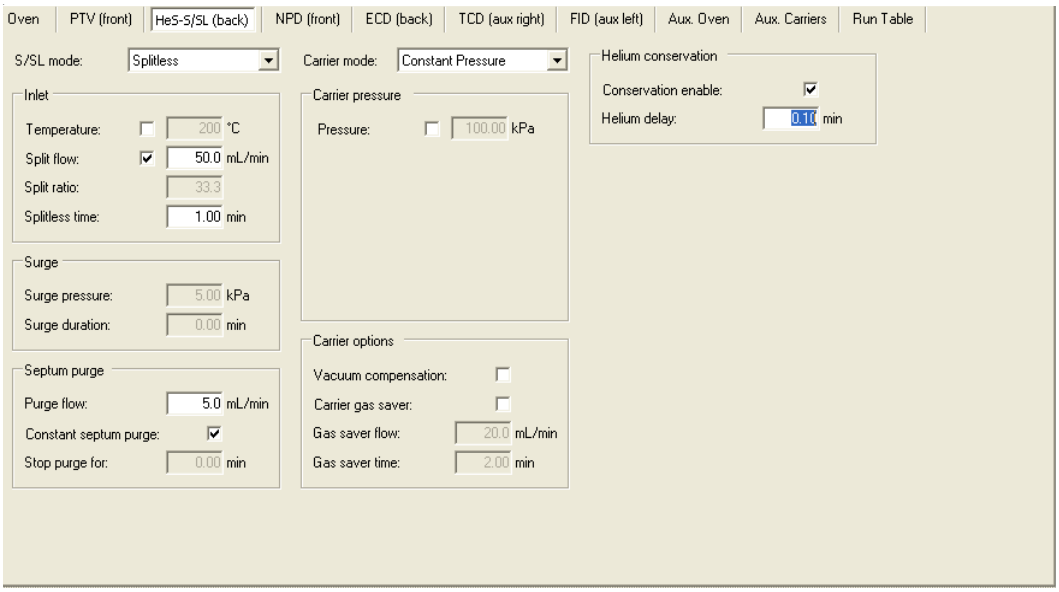
Table 45. GSV - Backflush Parameters (Sheet 2 of 2)

Parameter	Description
Backflush Duration	Choose between GC Run Time and Specific Time. • **GC Run Time** — Select this option if you want to use the time calculated for the oven program as the run time. • **Specific Time** — Select this option button if you want to enter a specific run time.
Duration	This parameter is enabled when **Specific Time** has been selected. Set the duration of the backflush here in the range of 0.00-999.99 min.

Helium Saver Page

This page is the method editor for the front/back Instant Connect Helium Saver Injector (HeS-S/SL) module.
See Figure 39.

Figure 39. TRACE 1300/1310 HeS-S/SL Page



This page includes the following fields:

- S/SL Mode
- Inlet
- Surge
- Septum Purge

- Carrier Mode
- Carrier Flow
- Carrier Pressure
- Programmed Carrier Flow
- Programmed Carrier Pressure
- Carrier Options
- Helium Conservation

Related Topic:

- Determining Helium Regulator Pressure

S/SL Mode

This parameter enables the fields in this pane. The options are described in Table 46.

Table 46. HeS-S/SL Mode Options

Option	Function
Split	This option enables the Inlet field only. The carrier flow is split in the injection port with the bulk going out the split vent. Use this injection mode when analyzing high concentration or neat samples, or in instances where sensitivity is less important. The split vent remains open all the time. This method yields the sharpest peaks if the split gas is properly mixed.
Splitless	This option enables the Inlet and Purge fields. The split vent is closed during the injection to drive most of the sample into the column. The solvent effect is required to refocus the analytes, especially more volatile compounds. You can achieve the solvent effect by keeping the analytical column or guard column slightly below the solvent's boiling point. Splitless times of about 1 minute are typical.
Splitless w/Surge	This option enables all fields. Same as **Splitless** but can also program a surge during an injection. Surge starts at Prep Run and continues until the surge duration time is finished. Surge is further defined in the next group of controls.

Inlet

The inlet parameters are set in this field which is common to all modes. Inlet parameters are described in Table 47.

Table 47. HeS-S/SL Inlet Parameters

Parameter	Description
Temperature	Select the check box to enable the adjacent field. Enter a value for the inlet temperature in the range 0-400 °C.
Split Flow	Select the check box to enable the adjacent field. Enter a value in the range 5-1250 mL/min. The **Split Ratio** is adjusted automatically. In addition, this value is governed by the initial column flow rate entered on the associated **Carrier mode**. • If the flow rate is changed, the Split Flow value is adjusted so that the split ratio is maintained. However, • if the Split Flow value then falls outside its limits, a warning is generated and you then have to change the entry to a valid number.
Split Ratio	This field is enabled under the following conditions: • Mode is set to Split. • The Split Flow check box is selected. • On the associated Carrier mode, Flow Mode is set to either Constant Flow or Programmed Flow. This is the ratio between the split flow and the column flow. $\text{SplitRatio} = \frac{\text{SplitFlow}}{\text{ColumnFlow}}$ Enter a value in the range 1-12500. The Split Flow entry is adjusted automatically.
Splitless Time	This field is enabled when the **S/SL Mode** is set to either **Splitless** or **Splitless w/Surge**. Specify the length of time the split valve remains closed after a splitless injection. Enter a value in the range 0.00-999.99 min. The timer begins at the start of the run. During this time, most of the sample transfers from the injector to the column. The split vent reopens when the splitless time ends. This occurs in order to remove excess solvent vapor.

Surge

This field is enabled when the **S/SL Mode** is set to **Splitless** or **Splitless w/Surge**. Make the surge settings in this field. Surge parameters are described in Table 48.

Table 48. HeS-S/SL Surge Parameters

Parameters	Description
Surge Pressure	The pressure applied during the splitless time to produce a surge of flow in the injector to speed transfer of the sample. It may be used, depending upon the analysis, to sharpen peaks closer to the solvent's boiling point where cold trapping is ineffective and solvent effect is the main refocusing mechanism. Enter a value in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi).
Surge Duration	This is the time for which the surge pressure is maintained. Enter a value in the range 0.00-999.99 min. Typically, set to coincide with the **Splitless time**.

Septum Purge

This field controls the septum purge for the injector. Septum purge is used to sweep the bottom of the septum to reduce contamination from sample analytes. This prevents carryover from run to run. Septum purge also prevents contamination of the injector from septum bleed. Make the purge settings in this field.

Septum purge parameters are described in Table 49.

Table 49. HeS-S/SL Purge parameters

Parameter	Description
Purge Flow	This time indicates the flow at which the septum is continuously flushed.
Constant Septum Purge	Select the check box to continuously flush the septum with a purge flow.
Stop Purge Time	This field is enabled if the Constant Septum Purge check box is cleared. You can then enter a time at which the septum purge ceases. The range is 0.00-999.99 min.

Carrier Mode

In this field, you select the flow mode for the carrier gas.

The choice made here controls the parameters available in the Carrier Flow/ Carrier Pressure and Ramps field.

- **Constant Flow** — A single Flow field is available along with a check box to enable or disable it. The graph shows a horizontal line at the flow rate indicated. See "Carrier Flow" on page 90.

- **Constant Pressure** — A single Pressure field is available along with a check box to enable or disable it. The graph shows a horizontal line at the pressure indicated. See "Carrier Pressure" on page 90.
- **Programmed Flow** — Flow program fields are displayed. The graph represents the ramps in the program. See "Programmed Carrier Flow" on page 90.
- **Programmed Pressure** — Pressure program fields are displayed. The graph represents the ramps in the program. See "Programmed Carrier Pressure" on page 91.

Carrier Flow

Use this field to set up flow when **Constant flow** carrier mode has been selected.

Select the **Flow** check box to enable the Flow field. Enter a value in the range 0.001-100 mL/min. If you clear the check box, the field is disabled and the graph becomes a horizontal line at a flow rate of zero.

Carrier Pressure

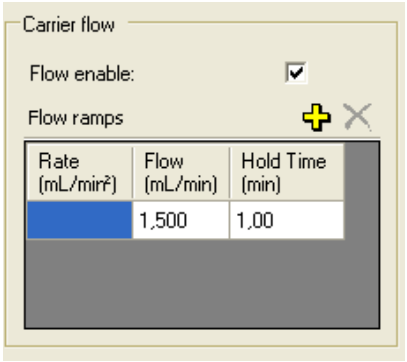
Use this field to set up pressure when **Constant pressure** carrier mode has been selected.

Select the **Pressure** check box to enable the Pressure field.
Enter a value in the range 5-1000 kPa (0.05 to 10 bar; 0.725 to 145 psi). If you clear the check box, the field is disabled and the graph becomes a horizontal line at zero pressure.

Programmed Carrier Flow

Use this field to set up flow program when **Programmed Flow** carrier mode has been selected. See Figure 40.

Figure 40. Programmed Carrier Flow



In this mode you can program an initial constant flow rate field followed by up to three ramps.

Select the **Flow enable** check box to enable the flow.

Enable the number of flow ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden.

If you wish to disable the ramps temporarily, clear the **Flow enable** check box. This disables the Flow column and the program is ignored as shown in the graph which becomes a horizontal line at zero flow rate. The values entered are preserved and may be reactivated by selecting the check box once more.

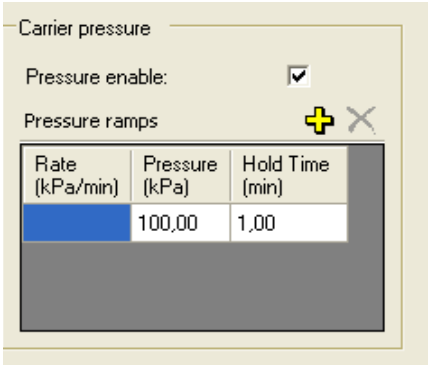
The parameters in the timetable are the follows:

- **Rate** — Enter a value for the rate of flow rate change in the range 0.001-100 mL/min^2. This field is not available for the initial field of the program.
- **Flow** — Enter a value for the constant flow rate field of the ramp in the range 0.001-100 mL/min.
- **Hold Time** — Enter a value for which the flow rate will be held. The range is 0.00-999.99 min.

Programmed Carrier Pressure

Use this field to set up pressure program when **Programmed Pressure** carrier mode has been selected. See Figure 41.

Figure 41. Programmed Carrier Pressure



In this mode you can program an initial constant pressure rate field followed by up to three ramps.

Select the **Pressure enable** check box to enable the flow.

Enable the number of pressure ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden. If you wish to disable the Pressure ramps temporarily, clear the **Pressure enable** check box. This disables the Pressure column and the program is ignored as shown in the graph which becomes a horizontal line at zero pressure. The values entered are preserved and may be reactivated by selecting the check box once more.

The parameters in the timetable re the follows.

- **Rate** — Enter a value for the rate of pressure change in the range 0.01-1000 kPa/min. This field is not available for the initial field of the program.
- **Pressure** — Enter a value for the constant pressure field of the ramp in the range 5-1000 kPa(0.05 to 10 bar; 0.725 to 145 psi).
- **Hold Time** — Enter a time for which the pressure will be held. The range is 0.00-999.99 min.

Carrier Options

This field includes the following parameters.

- **Vacuum Compensation** — Select the check box to enable the vacuum compensation feature. Use this only when the TRACE 1300/1310 is connected with a mass spectrometer. When the check box is not selected, calculations are made for a normal GC detector, which is usually at atmospheric pressure.
- **Carrier Gas Saver** — Select the check box to enable the function in this field. Gas saver controls reduce the consumption of nitrogen pressurized gas, especially when a large split flow is used. It is set to come on at some point well after the injection to conserve gas.

  Gas Saver parameters are described in Table 50.

Table 50. Gas Saver Parameters

Parameter	Description
Gas Saver Flow	Enter a value for the gas saver flow rate in the range 5-500 mL/min.
Gas Saver Time	This is time into the run when the gas saver feature starts up. Enter a value in the range 0.00-999.99 min.

Helium Conservation

This field includes the parameters for the helium conservation.

Helium conservation parameters are described in Table 51.

Table 51. HeS-S/SL Helium Conservation Parameters

Parameter	Description
Conservation enable	Select the check box to enable the helium conservation feature.
Helium Delay	Set the delay time before the helium conservation feature starts up. Enter a value in the range 0.00-999.99 min.

Determining Helium Regulator Pressure

Table 52 serves as a guide for setting the correct helium regulator pressure for column type.

Table 52. Determining Correct Helium Regulator Pressure for Column Type (Sheet 1 of 2)

Column Length	Column i.d.	Desired Flow *	Required helium regulator pressure psig (kPa; bar) **
5 m/10 m	0.10 mm	0.4 mL/min	110 psig (760 kPa; 7.6 bar)
		0.5 mL/min	120 psig (830 kPa; 8.3 bar)
		0.6 mL/min	130 psig (900 kPa; 9 bar)
10 m/20 m	0.18 mm	0.8 mL/min	100 psig (690 kPa; 6.9 bar)
		1.0 mL/min	110 psig (760 kPa; 7.6 bar)
		1.2 mL/min	120 psig (830 kPa; 8.3 bar)
		1.5 mL/min	130 psig (900 kPa; 9 bar)
		2.0 mL/min	140 psig (970 kPa; 9.7 bar)
15 m	0.25 mm	1.0 mL/min	100 psig (690 kPa; 6.9 bar)
		1.2 mL/min	110 psig (760 kPa; 7.6 bar)
		1.7 mL/min	120 psig (830 kPa; 8.3 bar)
		2.2 mL/min	130 psig (900 kPa; 9 bar)
		2.7 mL/min	140 psig (970 kPa; 9.7 bar)
30 m	0.25 mm	1.0 mL/min	100 psig (690 kPa; 6.9 bar)
		1.2 mL/min	110 psig (760 kPa; 7.6 bar)
		1.7 mL/min	120 psig (830 kPa; 8.3 bar)
		2.2 mL/min	130 psig (900 kPa; 9 bar)
		2.7 mL/min	140 psig (970 kPa; 9.7 bar)
		3.2 mL/min	150 psig (1030 kPa; 10.3 bar)
60 m	0.25 mm	1.0 mL/min	120 psig (830 kPa; 8.3 bar)
		1.2 mL/min	130 psig (900 kPa; 9 bar)
		1.7 mL/min	140 psig (970 kPa; 9.7 bar)
		2.2 mL/min	150 psig (1030 kPa; 10.3 bar)

Table 52. Determining Correct Helium Regulator Pressure for Column Type (Sheet 2 of 2)

Column Length	Column i.d.	Desired Flow *	Required helium regulator pressure psig (kPa; bar) **
100 m	0.25 mm	1.0 mL/min	130 psig (900 kPa; 9 bar)
		1.2 mL/min	140 psig (970 kPa; 9.7 bar)
		1.7 mL/min	150 psig (1030 kPa; 10.3 bar)
30 m	0.32 mm	1.5 mL/min	100 psig (690 kPa; 6.9 bar)
		2.0 mL/min	110 psig (760 kPa; 7.6 bar)
		2.5 mL/min	120 psig (830 kPa; 8.3 bar)
		3.0 mL/min	130 psig (900 kPa; 9 bar)
		3.5 mL/min	140 psig (970 kPa; 9.7 bar)
60 m	0.32 mm	1.5 mL/min	110 psig (760 kPa; 7.6 bar)
		2.0 mL/min	120 psig (830 kPa; 8.3 bar)
		2.5 mL/min	130 psig (900 kPa; 9 bar)
		3.0 mL/min	140 psig (970 kPa; 9.7 bar)
		3.5 mL/min	150 psig (1030 kPa; 10.3 bar)
100 m	0.32 mm	1.5 mL/min	130 psig (900 kPa; 9 bar)
		2.0 mL/min	140 psig (970 kPa; 9.7 bar)
		2.5 mL/min	150 psig (1030 kPa; 10.3 bar)

* For flow rates not specifically listed, round up in pressure to the next highest value. For example, if 1.5 mL/min is desired using a 0.25 mm ID column of 15 m length, use a helium regulator pressure of 110 psig (760 kPa; 7.6 bar).

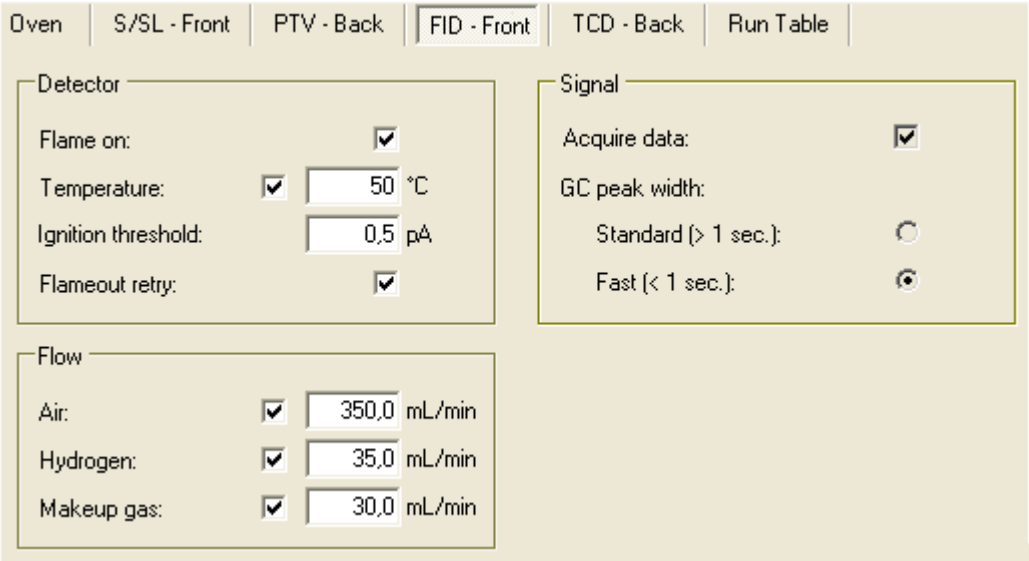
** Minimum pressure required to avoid nitrogen back diffusion into the helium carrier gas.Higher pressure will result in a slightly higher (than minimum) consumption of helium, but will not result in adverse analytical performance.

FID Page

To display this page click on the FID Front/Back/Aux L/Aux R tab from the Instrument Setup view.

FID Page is the method editor for the Front/Back /Aux L/Aux R Flame Ionization Detector module. See Figure 42.

Figure 42. Flame Ionization Detector (FID) Page



This page includes the following fields:

- Detector
- Flow
- Signal

Detector

Set the detector parameters in this field. See Table 53 for details.

Table 53. FID Detector Parameters

Parameter	Description
Flame On	Select the check box to ignite the flame. This can only happen if the Base Temperature is at least 150 °C and air and hydrogen flows are enabled in the Flow field. If you clear this check box, the Air and Hydrogen check boxes are cleared automatically.
Temperature	Select the check box to enable the adjacent field. This controls the temperature of the detector. In the field enter a temperature in the range 0-450 °C.

Table 53. FID Detector Parameters

Parameter	Description
Ignition Threshold	If Flameout Retry is enabled, the flame will re-ignite if the signal current drops below this value. Enter a value in the range 0-10 pA.
Flameout Retry	Select the check box to enable this feature.

Flow

These check boxes allow you to turn the flows on and off only. See Table 54 for details.

Table 54. FID Flow Parameters

Parameter	Description
Air	Select the check box to switch on the air flow and enable the adjacent flow rate field. Enter a value in the range 5-500 mL/min.
Hydrogen	Select the check box to switch on the hydrogen flow and enable the adjacent flow rate field. Enter a value in the range 1-100 mL/min.
Makeup gas	Select the check box to switch on the makeup flow and enable the adjacent flow rate field. Enter a value in the range 1-50 mL/min.

Signal

Check the **Acquire data** box to enable the acquisition of the data.

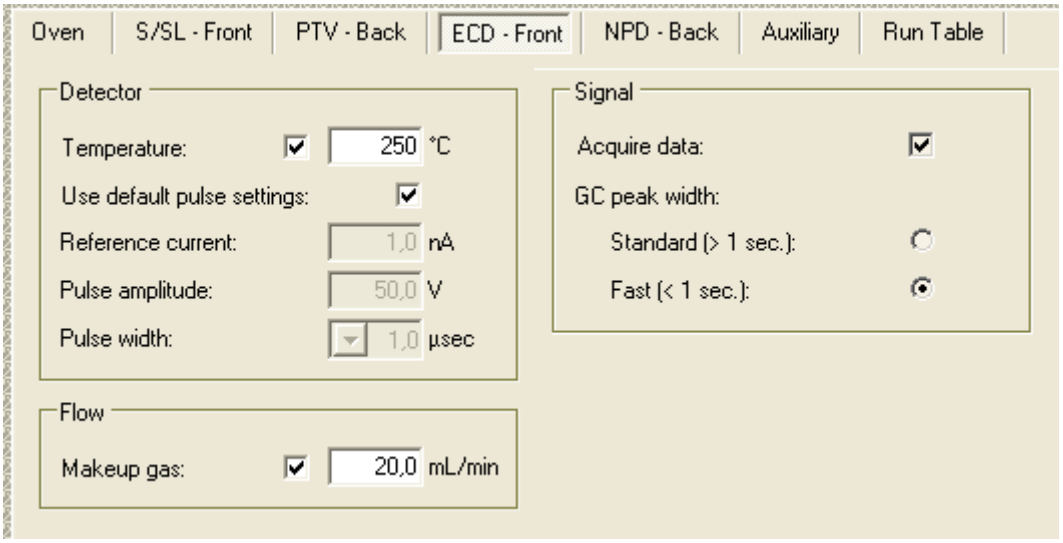
Select **Standard GC peaks (> 1 s)** or **Fast GC peaks (< 1 s)** radio option button as required.

ECD Page

To display this page click on the ECD Front/Back/Aux L/Aux R tab from the Instrument Setup view.

ECD Page is the method editor for the Front/Back/Aux L/Aux R Electron Capture Detector module. See Figure 43.

Figure 43. Electron Capture Detector (ECD) Page



This page includes the following fields:

- Detector
- Flow
- Signal

Detector

Set the detector parameters in this field. See Table 55 for details.

Table 55. ECD Detector Parameters (Sheet 1 of 2)

Parameter	Description
Temperature	Select the check box to enable the adjacent field. This controls the temperature of the detector. Enter a value in the range 0-400 °C.
Use Default Pulse Setting	Select the check box to enable this feature. Reference current, Pulse amplitude and Pulse width are set to optimum working values.When the check box is selected, the fields of these parameters are not enabled.

Table 55. ECD Detector Parameters (Sheet 2 of 2)

Parameter	Description
Reference Current	Enter a value for the cell reference current in the range 0.1-1.5 nA.
Pulse Amplitude	Select the voltage applied to the detector. Enter a value for the pulse amplitude in the range 5-50 V.
Pulse Width	Select a value for the pulse width from the drop-down list. The range is from 0.1 µs to 2.0 µs in steps of 0.1 µs. The value selected depends on the type of makeup gas being used with the ECD. • Use of Nitrogen requires a pulse width value typically of 1.0 µs. • Use of Argon/Methane requires a 0.1 µs pulse to produce the highest linear range.

WARNING In a very clean systems the cell base frequency may fall lower than 1 kHz, being the 1 kHz frequency the optimal cell frequency. When this happens, to recover the cell frequency back to 1 kHz, it is advisable to reduce the Pulse Width by 0.1 µs steps until the optimal frequency is reached.
We advise you to avoid working with ECD frequencies lower than 1 kHz.

Flow

The **Makeup** check box allows you to turn the flow on and off only. The parameters are described in Table 56.

Table 56. ECD Makeup Parameters

Parameter	Description
Makeup gas	Select the check box to enable the makeup gas flow and the adjacent field. The range for this entry depends on the gas being used. The range of the makeup gas flow rate is 5-500 mL/min for **Nitrogen** or **Argon/Methane**.

Signal

Check the **Acquire data** box to enable the acquisition of the data.

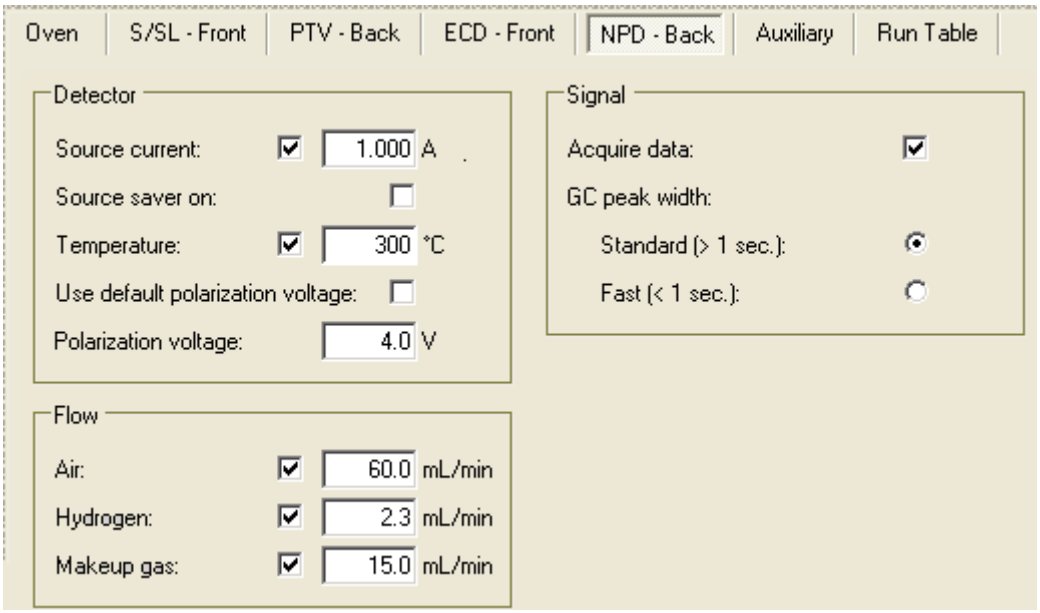
Select **Standard GC peaks (> 1 s)** or **Fast GC peaks (< 1 s)** radio option button as required.

NPD Page

To display this page click on the NPD Front/Back/Aux L/Aux R tab from the Instrument Setup view.

NPD Page is the method editor for the Front/Back/Aux L/Aux R Nitrogen Phosphorous Detector module. See Figure 44.

Figure 44. Nitrogen Phosphorus Detector Page



This page includes the following fields:

- Detector
- Flow
- Signal

Detector

Set the detector parameters in this field. See Table 57 for details.

Table 57. NPD Detector Parameters (Sheet 1 of 2)

Parameter	Description
Source Current	This is the current applied to heat the thermionic source. Enter a value in the range 1.000-5000 A.
Source Saver On	Check this box to enable the source saver function intended to reduce the consumption of the NPD source.

Table 57. NPD Detector Parameters (Sheet 2 of 2)

Parameter	Description
Temperature	Select the check box to enable the adjacent field. This controls the temperature of the detector. Enter a value in the range 0-450 °C.
Use Default Polarization Voltage	Select the check box to enable this feature. When selected, the Polarization voltage field is not enabled.
Polarization Voltage	Enter a value in the range 1-100 V.

Flow

These check boxes allow you to turn the gas flows on and off only. The parameters are described in Table 58.

Table 58. NPD Flow Parameters

Parameter	Description
Air	Select the check box to switch on the air flow and enable the adjacent flow rate field. Enter a value in the range 5-500 mL/min.
Hydrogen	Select the check box to switch on the hydrogen flow and enable the adjacent flow rate field. Enter a value in the range 0.1-10 mL/min.
Makeup gas	Select the check box to switch on the makeup flow and enable the adjacent flow rate field. Enter a value in the range 1.0-50.0 mL/min.

Signal

Check the **Acquire data** box to enable the acquisition of the data.

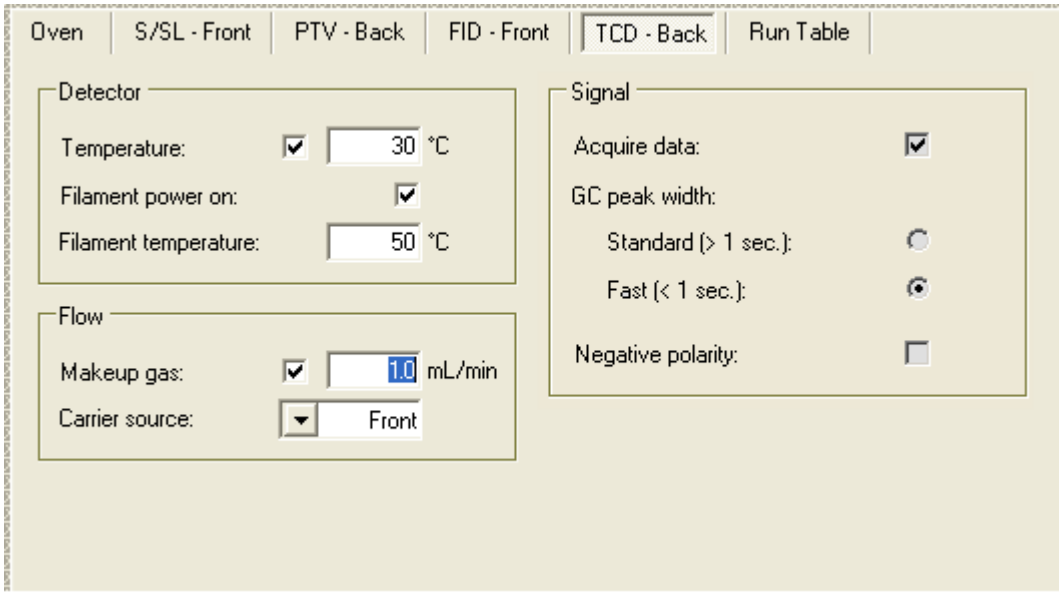
Select **Standard GC peaks (> 1 s)** or **Fast GC peaks (< 1 s)** radio option button as required.

TCD Page

To display this page click on the TCD Front/Back/Aux L/Aux R tab from the Instrument Setup view.

TCD Page is the method editor for the Front/Back/Aux L/Aux R Thermal Conductivity Detector module. See Figure 45.

Figure 45. Thermal Conductivity Detector Page



This page includes the following fields:

- Detector
- Flow
- Signal

Detector

Set the detector parameters in this field. See Table 59 for details.

Table 59. TCD Detector Parameters (Sheet 1 of 2)

Parameter	Description
Temperature	Select the check box to enable the adjacent field. This controls the temperature of the detector. Enter a value in the range 0-400 °C. Typical temperature is 200 °C depending on the application used. Set the temperature to a higher value than the maximum temperature reached by the GC column oven during the analysis.

Table 59. TCD Detector Parameters (Sheet 2 of 2)

Parameter	Description
Filament Power	Select the check box to switch on the power to the filament.
Filament Temperature	Enter a value for the constant filament temperature in the range 50-450 °C. Filament temperatures should be kept 50-100 °C higher than the block temperature. The greater the difference the better the sensitivity. However, the usable difference between the block temperature and the filament temperature depends on the carrier gas used. The suggested ΔT is: • from 50 °C to 100 °C if the carrier gas is helium. • 100 °C if the carrier gas is nitrogen.

Flow

The TCD Flow parameters are described in Table 60.

Table 60. TCD Flow Parameters

Parameter	Description
Makeup Gas	Select the check box to enable the makeup gas flow and the adjacent field. Enter a value for the makeup gas flow rate in the range 0.5-5.0 mL/min.
Carrier Source	When two injectors are present, this parameter tells the chromatograph which inlet is connected to the TCD. It is used to protect the filaments on DGFC systems when the carrier gas supply is inadvertently shut off, for example following septum replacement. From the drop-down list, select Front or Back.

Signal

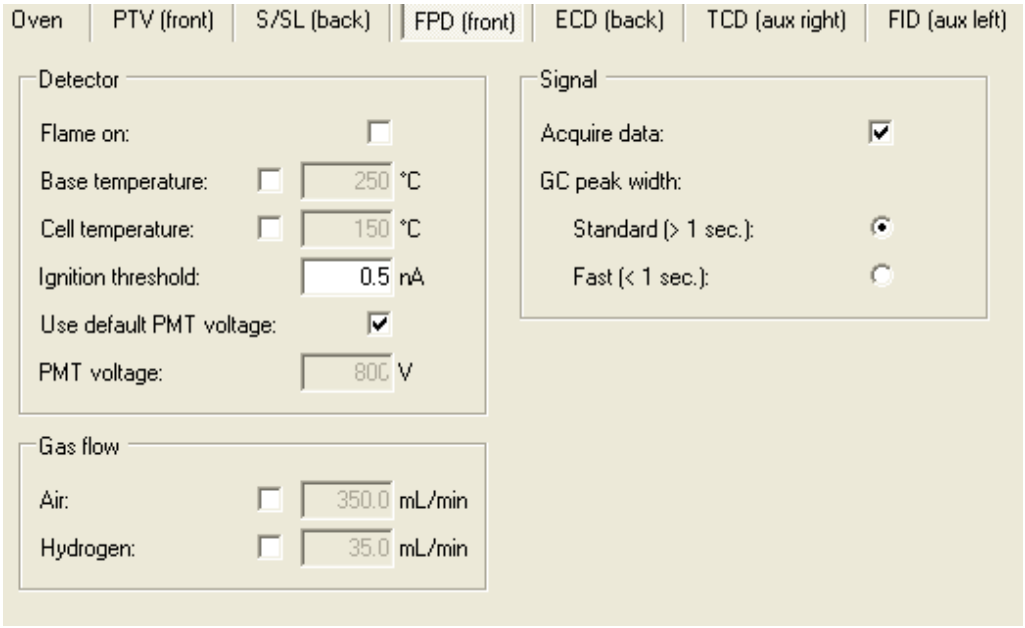
Check the **Acquire data** box to enable the acquisition of the data.

Select **Standard GC peaks (> 1 s)** or **Fast GC peaks (< 1 s)** radio option button as required.

FPD Page

To display this page click on the FPD Front/Back/Aux L/Aux R tab from the Instrument Setup view.
FPD Page is the method editor for the Front/Back/Aux L/Aux R Flame Photometric Detector module. See Figure 46.

Figure 46. Flame Photometric Detector (FPD) Page



This page includes the following fields:

- Detector
- Gas Flow
- Signal

Detector

Set the detector parameters in this field. See Table 61 for details.

Table 61. FPD Detector Parameters (Sheet 1 of 2)

Parameter	Description
Flame On	Select the check box to ignite the flame. This can only happen if the Base Temperature and Cell Temperature are at least 150 °C, and air and hydrogen flows are enabled in the Flow field. If you clear this check box, the Air and Hydrogen check boxes are cleared automatically.
Base Temperature	Select the check box to enable the adjacent field. This controls the temperature of the detector base. In the field enter a temperature in the range 0-450 °C.

Table 61. FPD Detector Parameters (Sheet 2 of 2)

Parameter	Description
Cell Temperature	Select the check box to enable the adjacent field. This controls the temperature of the detector. In the field enter a temperature in the range 0-200 °C. **WARNING** The default Cell Temperature for the FPD is 150 °C. This is enough to prevent water generated by the flame to condensate inside the FPD body. Higher temperatures can be used but they may have adverse effects on PMT sensitivity.
Ignition Threshold	Ignition threshold is the point at which the FPD attempts to re-ignite. Set a value in the range 0.0-10.0 nA. The default value is 0.0 nA. **Note** To select a good value for the **Ignition Threshold** parameter, the intensity of the baseline signal at flame ON must be determined. Note the value of the baseline intensity at flame OFF, then note the value of the baseline intensity at flame ON, and choose an Ignition Threshold between these two levels.
Use default PMT voltage	Select the check box if you want selecting the default PMT voltage of - 800 V. The PMT Voltage field is disabled.
PMT Voltage	This box is enabled if the Use default PMT voltage check box is clear. Set a value in the range from -800 V to -1200 V. This field is disabled when the Use default PMT voltage check box is selected.

Gas Flow

These check boxes allow you to turn the flows on and off only. See Table 62 for details.

Table 62. FPD Flow Parameters

Parameter	Description
Air	Select the check box to switch on the air flow and enable the adjacent flow rate field. Enter a value in the range of 5-500 mL/min.
Hydrogen	Select the check box to switch on the hydrogen flow and enable the adjacent flow rate field. Enter a value in the range of 1-100 mL/min.

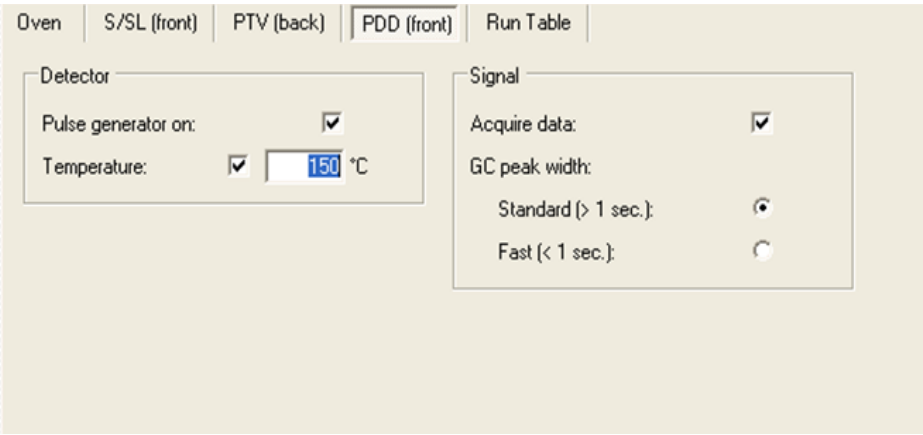
Signal

Check the **Acquire data** box to enable the acquisition of the data. Select either the **Standard GC peaks (> 1 s)** or the **Fast GC peaks (< 1 s)** radio button option as required.

PDD Page

To display this page click on the PDD Front/Back/Aux L/Aux R tab from the Instrument Setup view.
PDD Page is the method editor for the Front/Back/Aux L/Aux R Pulsed Discharge Detector module. See Figure 47.

Figure 47. Pulsed Discharge Detector (PDD) Page



This page includes the following fields:

- Detector
- Signal

Detector

Set the detector parameters in this field. See Table 63 for details.

Table 63. PDD Detector Parameters

Parameter	Description
Pulse generator on	Select the check box to turn on the pulse generator. This ignites the plasma discharge, which is done after stabilization and bakeout.
Temperature	Select the check box to enable the adjacent field. This controls the temperature of the detector. In the field enter a temperature in the range 0-450 °C.

Signal

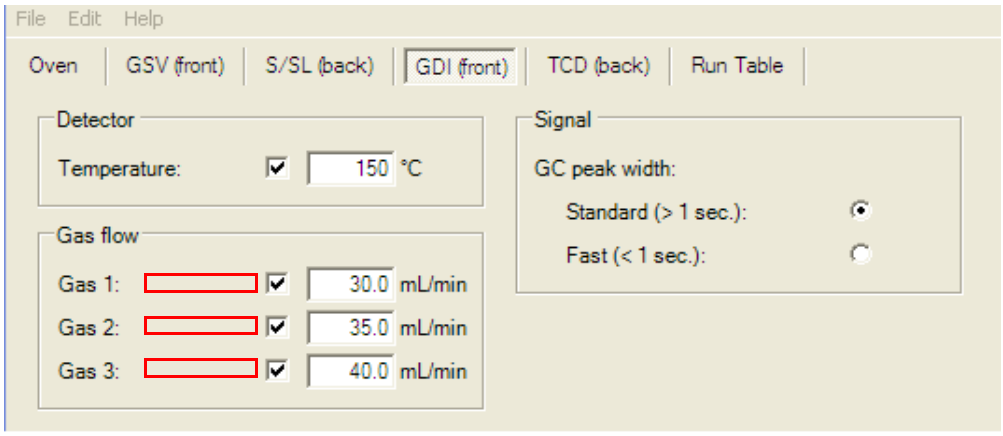
Check the **Acquire data** box to enable the acquisition of the data.

Select either the **Standard GC peaks (> 1 s)** or the **Fast GC peaks (< 1 s)** radio button option as required.

GDI Page

GDI Page is the method editor for the Front/Back/Aux L/Aux R Generic Detector Interface for third-party detector. See Figure 48

Figure 48. Generic Detector Interface (GDI) Page



Note On the right of Gas 1, Gas 2, and Gas 3, the type of gas (Air, Hydrogen, Nitrogen, Helium, Argon, or Argon/Methane) selected in the configuration page is indicated.

This page includes the following fields:

- Detector
- Gas Flow
- Signal

Detector

Set the detector parameter in this field. See Table 64 for details.

Table 64. GDI Detector Parameter

Parameter	Description
Temperature	Select the check box to enable the adjacent field. This controls the temperature of the detector. In the field enter a temperature in the range 0-450 °C.

Gas Flow

These check boxes allow you to turn the flows on and off only. See Table 65 for details.

Table 65. GDI Flow Parameters

Parameter	Description
Gas 1:	Select the check box to switch on the flow of the detector gas connected to **Gas 1** line, and enable the adjacent flow rate field. Set the value of the gas flow in mL/min according to the **Full Scale** value of the Gas 1 encapsulated flow restrictor.
Gas 2:	Select the check box to switch on the flow of the detector gas connected to **Gas 2**line, and enable the adjacent flow rate field. Set the value of the gas flow in mL/min according to the **Full Scale** value of the Gas 2 encapsulated flow restrictor.
Gas 3:	Select the check box to switch on the flow of the detector gas connected to **Gas 3**line, and enable the adjacent flow rate field. Set the value of the gas flow in mL/min according to the **Full Scale** value of the Gas 3encapsulated flow restrictor.

Signal

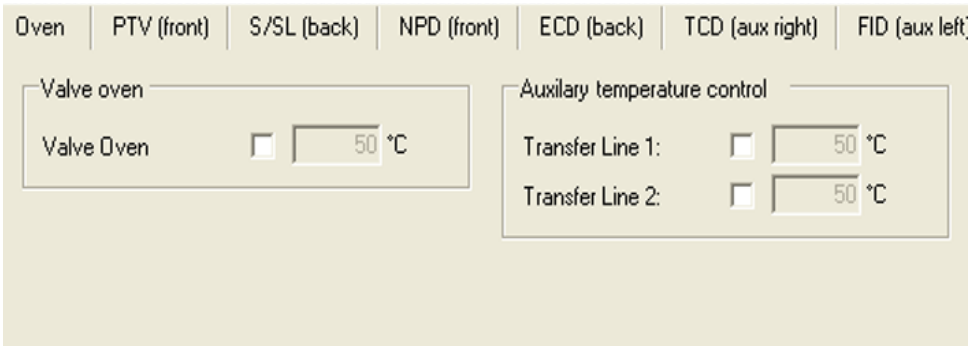
Check the **Acquire data** box to enable the acquisition of the data.

Select either the **Standard GC peaks (> 1 s)** or the **Fast GC peaks (< 1 s)** radio button option as required.

Auxiliary Temperature Page

Defines the temperature parameters of the external auxiliary temperature modules selected in the Instrument Configuration. See the example Figure 49.

Figure 49. Auxiliary Temperature Page



This page includes the following fields:

- Valve Oven Options
- Auxiliary Temperature Options

Valve Oven Options

Options of **Valve Oven** are: Valve Oven, HT Valve Oven, Aux Column Oven, Aux Heater 3, Aux Heater 4, and Methanizer.

- **Valve Oven** — Controls the temperature of the main oven for working at low temperature. Enter a value up to 200°C.
- **HT Valve Oven** — Controls the temperature of the main oven for working at high temperature. Enter a value up to 300°C.
- **Aux Column Oven** — Controls the temperature of the secondary oven. Enter a value up to 250°C.
- **Aux Heater 3** — Controls the temperature of the generic auxiliary heater 3. Enter a value up to 400°C.
- **Aux Heater 4** — Controls the temperature of the generic auxiliary heater 4. Enter a value up to 400°C.
- **Methanizer** — Controls the temperature of the generic auxiliary heater 4. Enter a value up to 400°C.

Auxiliary Temperature Options

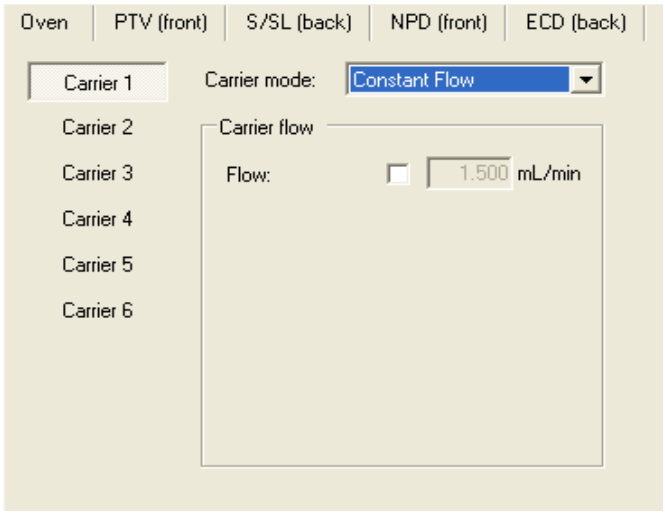
Options of **Auxiliary Temperature Control** are: Transfer Line 1, Transfer Line 2, Aux Heater 1, and Aux Heater 2.

- **Transfer Line 1** — Controls the temperature of the MS transfer line. Enter a value up to 400°C.
- **Transfer Line 2** — Controls the temperature of a second MS transfer line. Enter a value up to 400°C.
- **Aux Heater 1** — Controls the temperature of the generic auxiliary heater 1. Enter a value up to 400°C.
- **Aux Heater 2** — Controls the temperature of the generic auxiliary heater 2. Enter a value up to 400°C.

Auxiliary Carrier Page

Defines the carrier gas parameters of the auxiliary Carrier Gas modules. Up to six auxiliary carrier lines from **Carrier 1** to **Carrier 6** can be selected. See Figure 50.

Figure 50. Auxiliary Carrier Page



Each carrier gas line includes the following field.

- Carrier Mode

Carrier Mode

Defines the auxiliary carrier gas control mode to use: Constant Flow, Constant Pressure, Programmed Flow, and Programmed Pressure. Each mode activates or deactivates the dedicated parameters.

- **Constant Flow —** Use this field to set up flow when the **Constant flow** carrier mode has been selected.

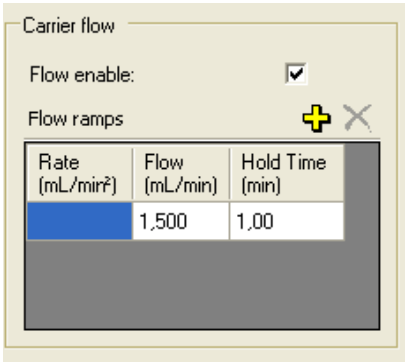
Select the **Flow** check box to enable the Flow field.
Enter a value in the range of 0.1-100 mL/min. If you clear the check box, the field is disabled and the graph becomes a horizontal line at a flow rate of zero.

- **Constant Pressure —** Use this field to set up pressure when the **Constant pressure** carrier mode has been selected.

  Select the **Pressure** check box to enable the Pressure field.
  Enter a value in the range of 5-1000 kPa (0.725-145 psi; 0.05-10 bar). If you clear the check box, the field is disabled and the graph becomes a horizontal line at zero pressure.

- **Programmed Flow** — Use this field to set up a flow program when **Programmed Flow** carrier mode has been selected. See Figure 51.

Figure 51. Programmed Carrier Flow



Select the **Flow enable** check box to enable the flow.

Enable the number of flow ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden.

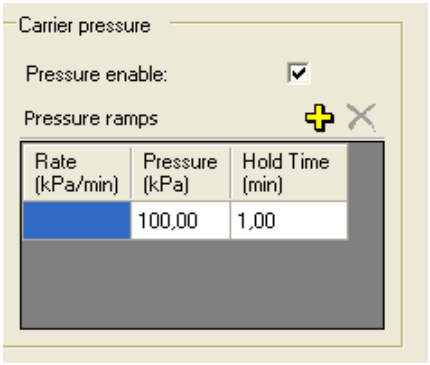
If you wish to disable the ramps temporarily, clear the **Flow enable** check box. This disables the Flow column and the program is ignored as shown in the graph, which becomes a horizontal line at zero flow rate. The values entered are preserved and may be reactivated by selecting the check box once more.

The parameters in the timetable are as follows:

- **Rate** — Enter a value for the rate of flow rate change in the range of 0.001-100 mL/min^2. This field is not available for the initial field of the program.
- **Flow —** Enter a value for the constant flow rate field of the ramp in the range of 0.001-100 mL/min.
- **Hold Time** — Enter a value for which the flow rate will be held. The range is 0.00-999.99 min.

- **Programmed Pressure** — Use this field to set up a flow program when **Programmed Pressure carrier** mode has been selected. See Figure 52.

Figure 52. Programmed Pressure



In this mode you can program an initial constant pressure rate field followed by up to three ramps.

Select the **Pressure enable** check box to enable the pressure.

Enable the number of pressure ramps required by clicking on the button.

Conversely, to reduce the number of rows on display, click on the button as necessary.

The initial row is displayed by default and cannot be hidden. If you wish to disable the Pressure ramps temporarily, clear the **Pressure enable** check box. This disables the Pressure column, and the program is ignored as shown in the graph, which becomes a horizontal line at zero pressure. The values entered are preserved and may be reactivated by selecting the check box once more.

The parameters in the timetable are as follows.

– **Rate** — Enter a value for the rate of pressure change in the range of 0.01-1000 kPa/min (0.001-145 psi; 0.0001-10 bar). This field is not available for the initial field of the program.

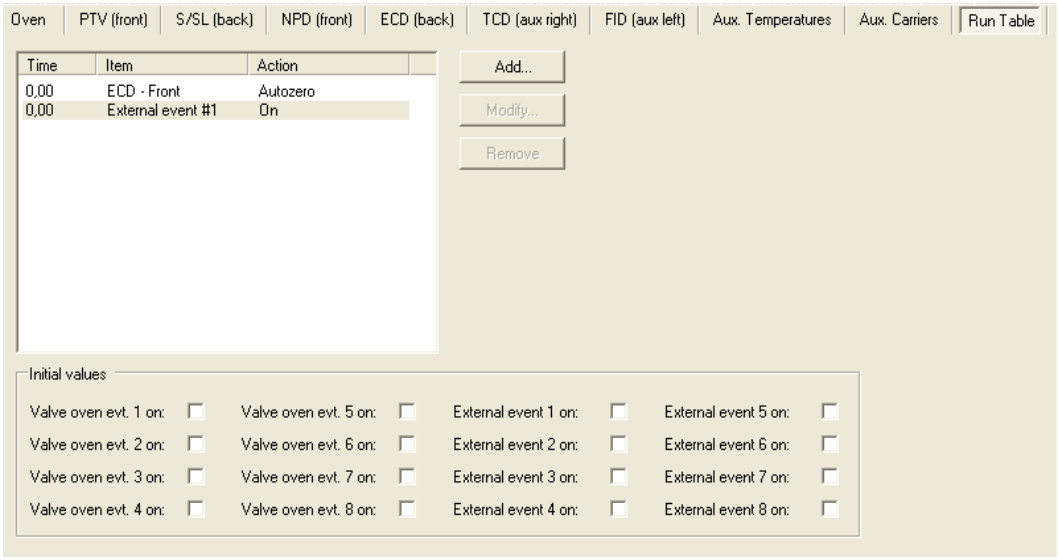
– **Pressure** — Enter a value for the constant pressure field of the ramp in the range of 5-1000 kPa (0.725-145 psi; 0.05-10 bar).

– **Hold Time** — Enter a time for which the pressure will be held. The range is 0.00-999.99 min.

Run Table Page

You can use this page to set up detector, valve, and external events to occur at the Prep-run or during a run. Events displayed on the Run Table page are from selections made in the Run-Time Event screen on page 114. The page of Figure 53 is displayed.

Figure 53. Run Table Page



This page includes the following fields:

- Initial Values
- Event Program Timetable
- Adding Events
- Modifying Events
- Removing Events
- Run-Time Event

Initial Values

In this field you can activate the externally controlled devices set in External Event field. See also "Run-Time Event" on page 114 for details.

Select the option button to activate the associated fields.

Event Program Timetable

Events are sorted into time order automatically. The table has three columns: Time, Item and Setting. See Table 66 for details.

Table 66. Event Program Timetable

Column	Description
Time	This shows the time in the run at which the event will take place.
Item	The Item column shows the event type and identifies the external event or valve number.
Action	This column indicates Action associated with the event, for example switching a lamp on or off.

Adding Events

Click the **Add** button to view the "Run-Time Event" on page 114 dialog window. Run items you select from this dialog are added to the Event Program Timetable.

Modifying Events

Click the **Modify** button to edit a selected run item listed in the Event Program Timetable.

Removing Events

Select an item in the Event Program Timetable. Click the **Remove** button to remove the selected run item from the run table.

Run-Time Event

The Run-Time Event window is displayed when the **Add** button is selected.

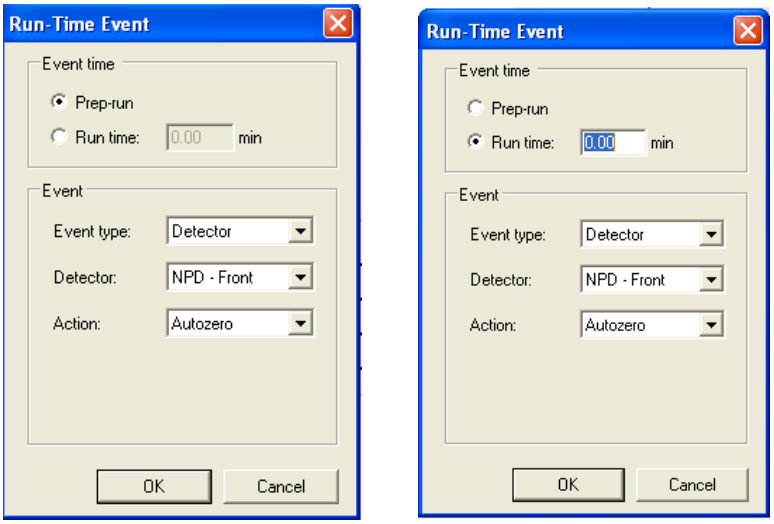
There are four types of events: detector, valve oven, external, and aux carrier.

Event Time

Select either the **Prep Run** or **Run Time** option button. When you select the Prep Run option button, the time field is disabled.

Select the Run Time option button to enable the adjacent field. Enter the time at which the event is to occur in the range of 0.00-999.99 min.

Figure 54. Run-Time Event Window.



Event

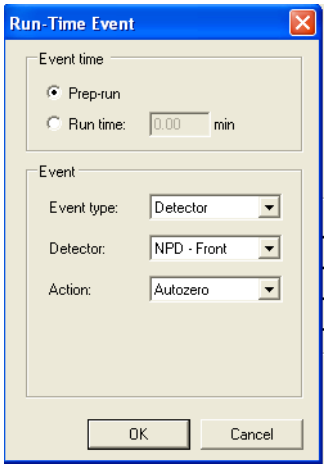
Select the event type among Detector, Valve Oven, External, and Aux Carrier.

Refer to:

- Detector Event
- Valve Oven Event
- External Event
- Aux Carrier Event

Detector Event

Select **Detector** to activate the associated fields. In the Detector field, choose the detector to which the event is to be applied. This selection enables the action appropriate to the type of detector.



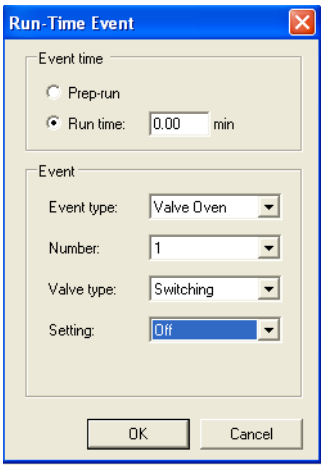
The actions are summarized in Table 67.

Table 67. Detector Event Options

Option	Details	Settings
Autozero	Applies to all detector types.	Select this option to zero the detector output at the given time.
Neg. Polarity	Applies to TCD only. The entry will invert the polarity at the given time.	On or Off
Source Current	Applies to NPD only. The entry will change the source current at the given time.	On or Off

Valve Oven Event

Select **Valve Oven** to activate the associated fields. In the Valve Oven field, set the condition of the desired valve controlled into the Valve Oven module.



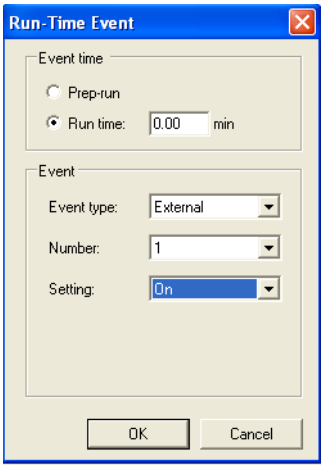
The option are summarized in Table 68.

Table 68. Valve Oven Event Options

Option	Details
Number	Select the number of the valve in the range of 1-8.
Valve type	Select Sampling or Switching according to the valve type.
Setting	Set the event to On or Off.

External Event

Select **External** to activate the associated fields. In the External field, set the default condition for up to eight externally controlled devices.



The options are summarized in Table 69.

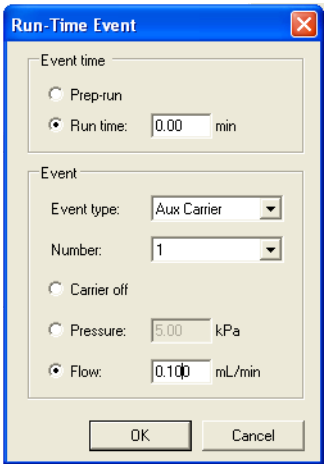
Table 69. External Event Options

Option	Details
Number	Select the number of the external event in the range of 1-8.
Setting	Set the event to On or Off.

Note When the chromatograph is in Standby mode, each device will return to the default condition set here. The option selected is visualized and enabled in Initial Values field.

Aux Carrier Event

Select **Aux Carrier** to activate the associated fields. In the Aux Carrier field, set the default condition for up to six auxiliary carrier lines.



The options are summarized in Table 70.

Table 70. Aux Carrier Event Options

Option	Details
Number	Select the number of the auxiliary carrier line in the range of 1-6.
Carrier off	Check this radio button to turn off the auxiliary carrier of the selected line.
Pressure	Check this radio button to set the desired pressure for the auxiliary carrier of the selected line.
Flow	Check this radio button to set the desired flow for the auxiliary carrier of the selected line.