

Agilent IM-QTOF LC/MS

Automatic Pressure Regulation and Alternate Drift Gas

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The Agilent 6560 Ion Mobility Quadrupole Time-of-Flight (IM-QTOF) LC/MS with factory-installed Automatic Pressure Regulation and Alternate Drift Gas module:

- Allows use of drift gases other than Ultra-Pure Nitrogen
- Automatically regulates the pressure of the drift gas

This guide shows you how to configure the IM-QTOF instrument for the selected drift gas.

NOTE

If your IM-QTOF is equipped with the G2582A Drift Gas Upgrade Kit, use the *G2582A Drift Gas Upgrade Kit Quick Start Guide* instead.



Gas Plumbing Overview

The plumbing configuration for the Agilent IM-QTOF LC/MS is shown in **Figure 1**.

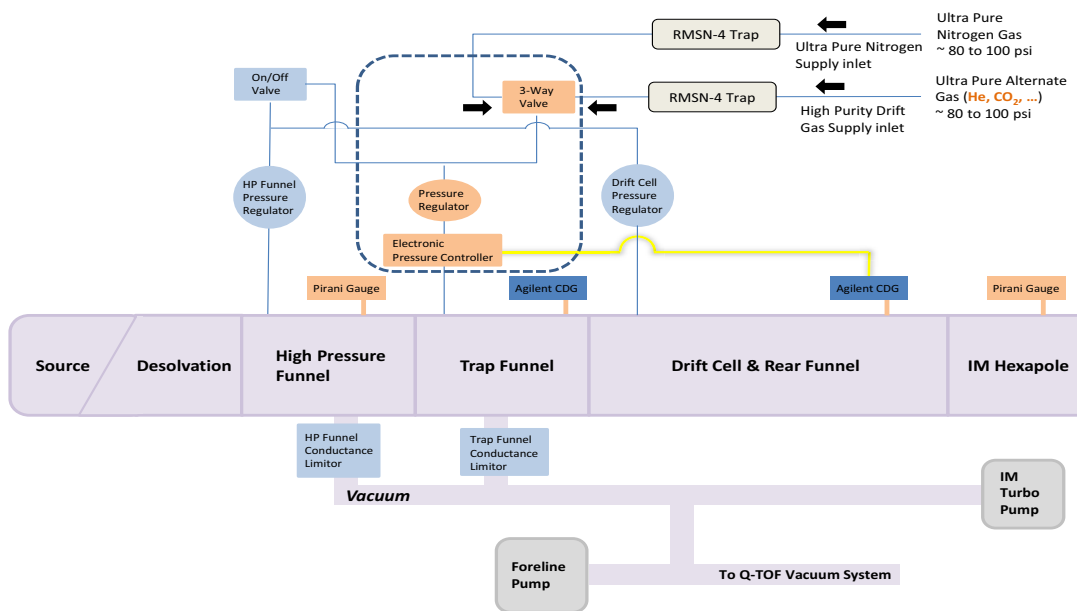


Figure 1. Gas plumbing for IM-QTOF instrument (IM section)

WARNING

Do not use corrosive or flammable drift gases. Use of such gases can result in an explosion.



Gas Plumbing Overview

Alternate drift gases are supported by

- the Capacitance Diaphragm Gauges, which can read true pressure accurately regardless of the drift gas that is used
- enhanced electronics that control drift gas pressure in real-time to maintain static drift gas pressure regardless of changing system conditions

Air must be excluded in the drying gas.

Nitrogen Drift Gas supply must meet minimum pressure and purity (>99.998%) requirements.

The expected gas consumption by the IM section of the IM-QTOF instrument is approximately 1 liter/minute.

To configure the IM-QTOF system for Ultra-Pure Nitrogen drift gas

To configure the IM-QTOF system for Ultra-Pure Nitrogen drift gas

Before you begin, make sure that the Nitrogen gas is Ultra Pure (>99.998%).

- 1 Turn the 3-way valve to the **Ultra Pure Nitrogen** position. See **Figure 2**.
- 2 Adjust the **Drift Cell** pressure regulator. See **“To adjust vacuum pressure”** on page 7.
- 3 *Optional.* Use a 1/4-inch Swagelok plug to cover the **High Purity Drift Gas Supply inlet**.

This gas plumbing configuration introduces Ultra Pure Nitrogen into the High Pressure Funnel, Trap Funnel and the Drift Cell.

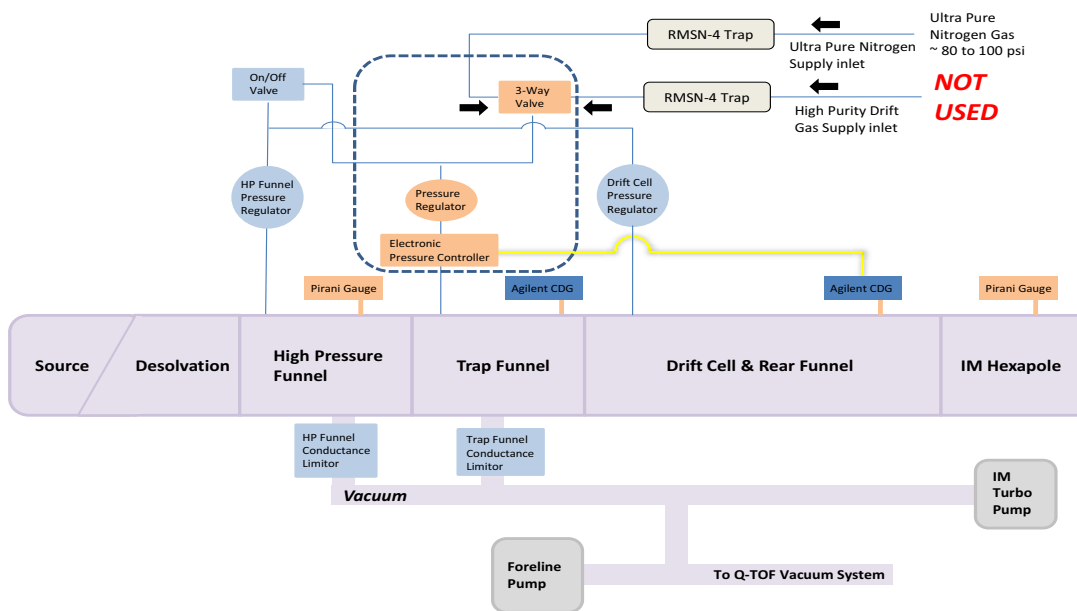


Figure 2. Gas plumbing for the IM section of the IM-QTOF instrument for use with Ultra Pure Nitrogen drift gas

To configure the IM-QTOF system for Ultra-Pure Alternate drift gases

Before you begin, make sure to use Ultra-Pure Drift Gas (>99.998%).

NOTE

The MassHunter Data Acquisition program supports these alternate drift gases: Ar, CH₄, CO₂, He, N₂O, and SF₆. To use a drift gas other than those listed, select **Other** as the **Gas Type**.

- 1 Connect the Ultra Pure Drift Gas to the RMSN-4 trap for the **High Purity Drift Gas Supply** inlet.
- 2 Turn the 3-way valve to the **High Purity Gas** position. See **Figure 3**.
- 3 Adjust the **Drift Cell** pressure regulator. Adjust the **HP Funnel** pressure regulator if needed. See **“To adjust vacuum pressure”** on page 7.

This gas plumbing configuration introduces Drift Gas other than Nitrogen into the High Pressure Funnel, Trap Funnel, and Drift Cell.

To configure the IM-QTOF system for Ultra-Pure Alternate drift gases

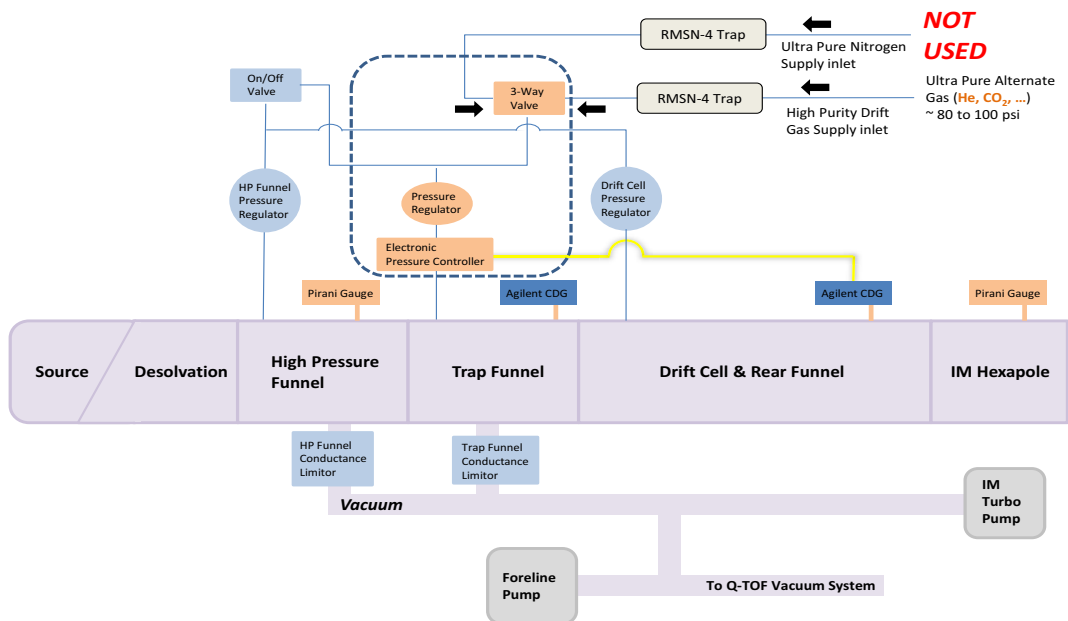
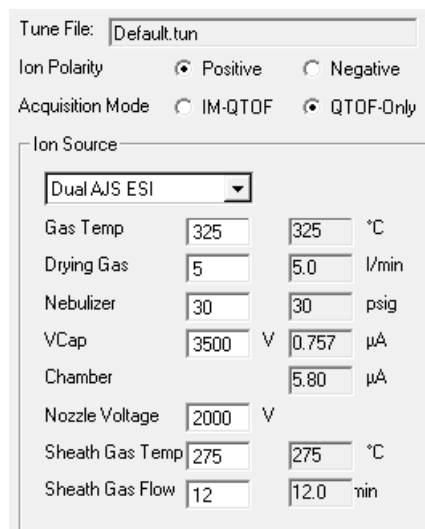


Figure 3. Gas plumbing for the IM section of the IM-QTOF instrument to use High Purity drift gas

To adjust vacuum pressure

To adjust vacuum pressure

- 1 Make sure that the IM-QTOF system is equilibrated in **QTOF-Only Tune Mode** with the operating source conditions as shown in **Figure 4**.



The screenshot shows a configuration window for the instrument's tune file. The 'Tune File' is set to 'Default.tun'. The 'Ion Polarity' is set to 'Positive'. The 'Acquisition Mode' is set to 'QTOF-Only'. The 'Ion Source' is set to 'Dual AJS ESI'. The following parameters are displayed:

Parameter	Value	Unit
Gas Temp	325	°C
Drying Gas	5	l/min
Nebulizer	30	psig
VCap	3500	V
Chamber	0.757	µA
Nozzle Voltage	5.80	µA
Sheath Gas Temp	2000	V
Sheath Gas Flow	275	°C
	12	min

Figure 4. Operating conditions

- 2 Adjust vacuum levels:
 - a Change the **Context** to **Tune**.
 - b Click **Manual Tune > IM > Pressure & Actuals**.
 - c Make sure that the source temperature is stable at the temperature indicated in the method.

To adjust vacuum pressure

d Set **Drift Tube Pressure** to **3.95** Torr. See **Figure 5**.

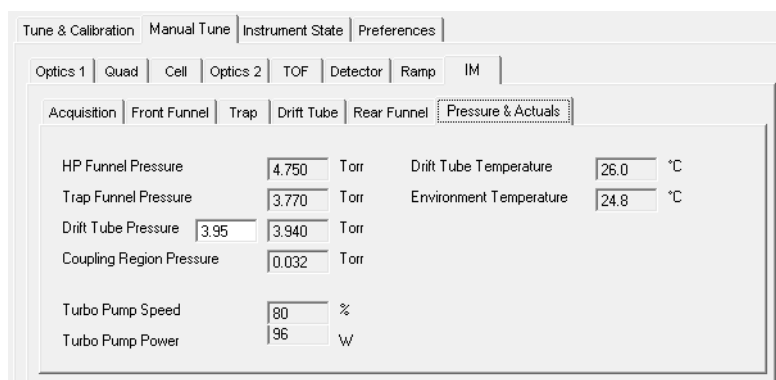


Figure 5. Pressure & Actuals tab

e Locate the pressure regulator valves on the front of the instrument, next to the ion source. See **Figure 6**.



Figure 6. Adjusting the Drift Cell pressure regulator (left) and High Pressure Funnel pressure regulator (right)

To adjust vacuum pressure

- f For nitrogen drift gas, turn the **Drift Cell** pressure regulator knob to adjust the pressure difference between the **Trap Funnel Pressure** and **Drift Tube Pressure**. To increase the pressure difference, turn the **Drift Cell** pressure regulator knob clockwise. Adjust the **Drift Cell** pressure regulator until **Trap Funnel Pressure** shows a reading below **Drift Tube Pressure** by a difference indicated in **Table 1**.
- g For alternate drift gases, turn the **Drift Cell** pressure regulator knob to adjust the pressure difference between the **Trap Funnel Pressure** and **Drift Tube Pressure**. If needed, also adjust the **HP Funnel** pressure regulator until **Trap Funnel Pressure** shows a reading below **Drift Tube Pressure** by a difference indicated in **Table 1**, while **Drift Tube Pressure** remains at **3.95** Torr.

Table 1 Required pressure differential between Trap Funnel Pressure and Drift Tube Pressure

For this drift gas option	Adjust this pressure regulator	Until Trap Funnel Pressure is less than Drift Tube Pressure by this amount*
Nitrogen only	Drift Cell	0.15 to 0.20 Torr
Helium	Drift Cell and HP Funnel	0.25 to 0.30 Torr
Other Alternate Drift Gas	Drift Cell (If needed, also HP Funnel)	0.20 to 0.25 Torr

* **Drift Tube Pressure** must be greater than **Trap Funnel Pressure**.

In This Book

This guide contains information to set up the IM-QTOF LC/MS to use and monitor different drift gases.

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