SOFTWARE

CHROMATEC ANALYTIC

BUILD 4.0

USER MANUAL

214.00045-51I

MS TUNE

Revision 02.07.2024

Table of contents

1 Starting the program 4
2 Main menu 5
3 Check 6
3.1 Diagnostics 6
3.2 Scanning 7
4 Autotune 9
5 Storage 11
5.1 Settings 11
5.2 Reports 12
6 Right panel 14
6.1 Temperature 14
6.2 Vacuum board 14
6.3 Ionization/Gas 15
6.4 Main board 15
6.5 Pump 15
6.6 State 15

1 STARTING THE PROGRAM

The "MS Tune" application is designed to diagnose and tune a mass spectrometric detector (MSD).

The application is launched from the "Control Panel":


Go to the "Status" page of the main window.


Open the MSD menu using the appropriate button and select "Open Tuner".

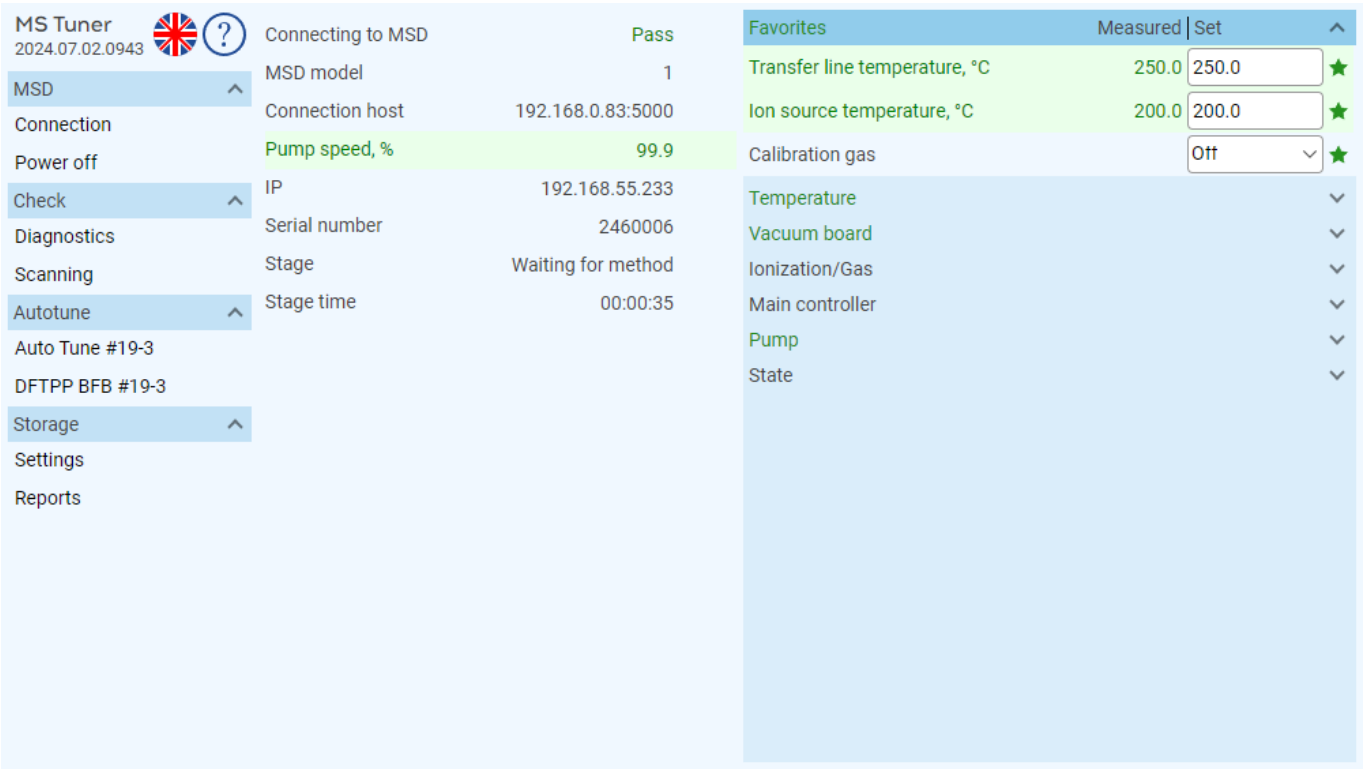


Fig 1.1 – MS Tune с выбранной страницей "Отчёты"

The program window is divided into three areas:

- The main menu is located on the left panel.
- The central area is occupied by content corresponding to the selected menu item.
- In the right pane, you can set and monitor MSD parameters.

The right panel can be hidden and shown using the keyboard shortcut CTRL+SHIFT+~

2 MAIN MENU

Table 2.1 –"MS Tune" main menu

Menu item	Command	Action
MSD	Connection	Information about connecting to the MSD.
	Power off	Preparing the MSD to turn off.
Check	Diagnostics	Performing diagnostics of MSD components.
	Scanning	View spectra of residual gases and calibration gas in real time.
Autotune	Auto Tune	Carrying out standard or quick setup with the ability to manually select customizable parameters.
	DFTPP BFB	
Storage	Settings	Manage settings.
	Reports	Opens the report storage for viewing.

3 CHECK

3.1 Diagnostics

Perform diagnostics on the MSD daily before starting operation:

- In the left pane, select the "Diagnostics" menu item.
- Check the boxes next to the tests you want to run (all are checked by default). Each test can be performed either separately by double-clicking the left mouse button on the test name, or several tests in a row by ticking the tests of interest
- You can perform multiple scan cycles by checking the “Run continuously” checkbox.
- The test will stop if any test fails. You can complete all tests by checking the "Ignore errors" checkbox.

Click on the "Run" button.

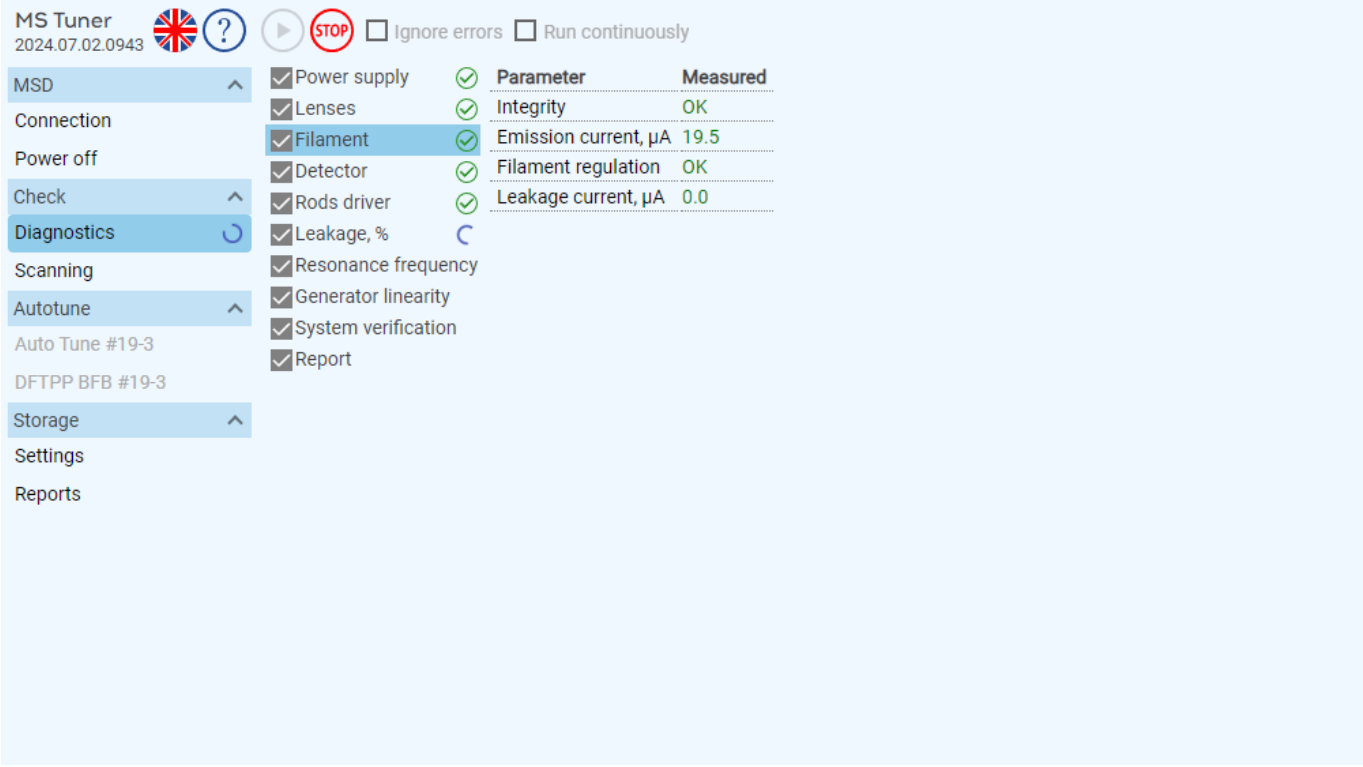


Fig 3.1 – Diagnostics

Below is a list of tests you can perform:

Power supply. Checking supply voltages.

Lenses. Checking the voltages on the lenses and prefilter, checking the electron energy.

Filament. Checking the performance of the filament.

Detector. Checking the voltage and noise of the detecting system.

Rod driver. Checking the constant voltages on the mass filter rods.

Leakage. Checking air leakage into the vacuum chamber.

Resonant frequency. Checking the resonant frequency of the RF generator.

Generator linearity. Checking the linearity of the RF generator.

Upon completion of the diagnosis, a report is generated.

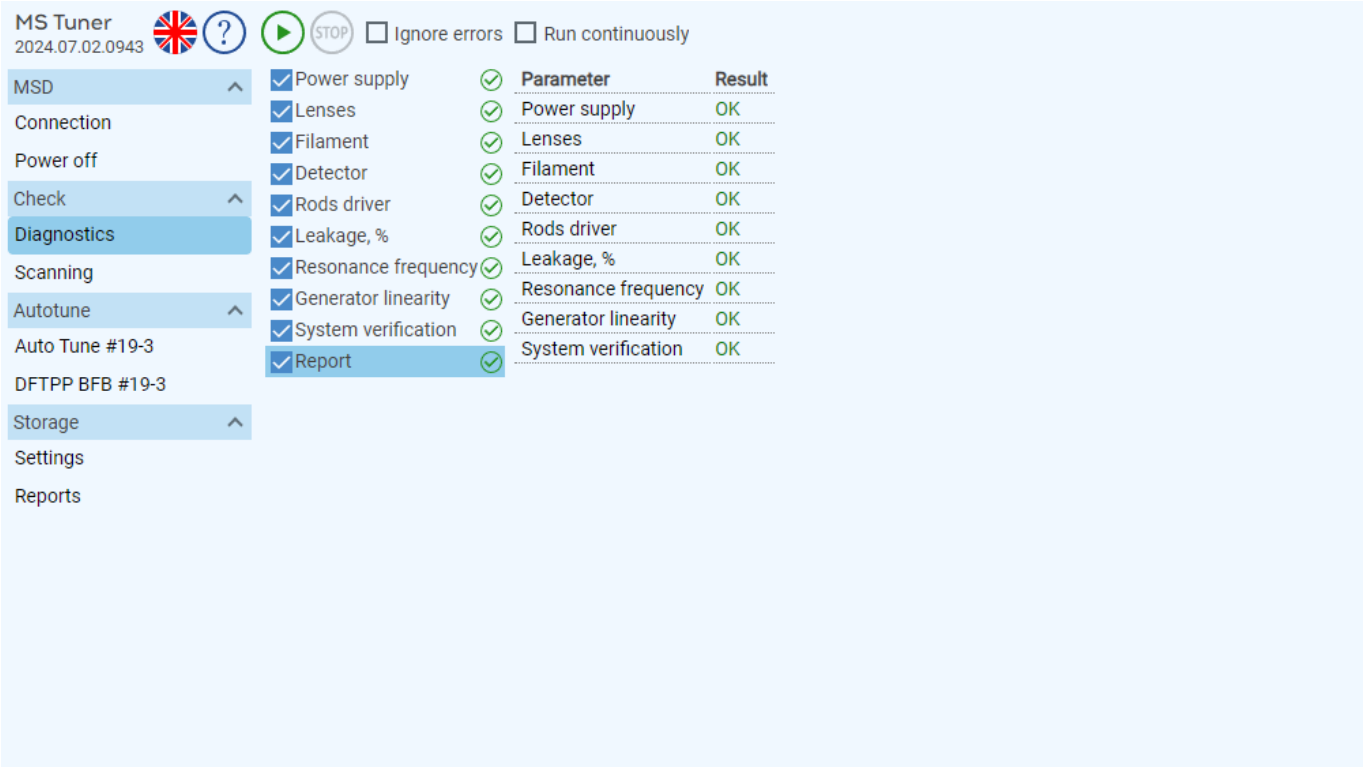


Fig 3.2 – Diagnostics complete

3.2 Scanning

In the left pane, select the "Scanning" menu item.

To start scanning, click the "Run" button.

To stop scanning, click the "Abort" button.

To set the scanning range, specify the initial and final m/z values in the "Mass" field or click on the "Mass" link and select one of three preset ranges:

- 10-100 (water/air),
- 50-650 (calibration gas),
- 60-700 (CI calibration gas).

To enable low or high flow calibration gas, use the Calibration Gas drop-down list.

To disable the Filament, Dynode, and Multiplier, uncheck the corresponding boxes.

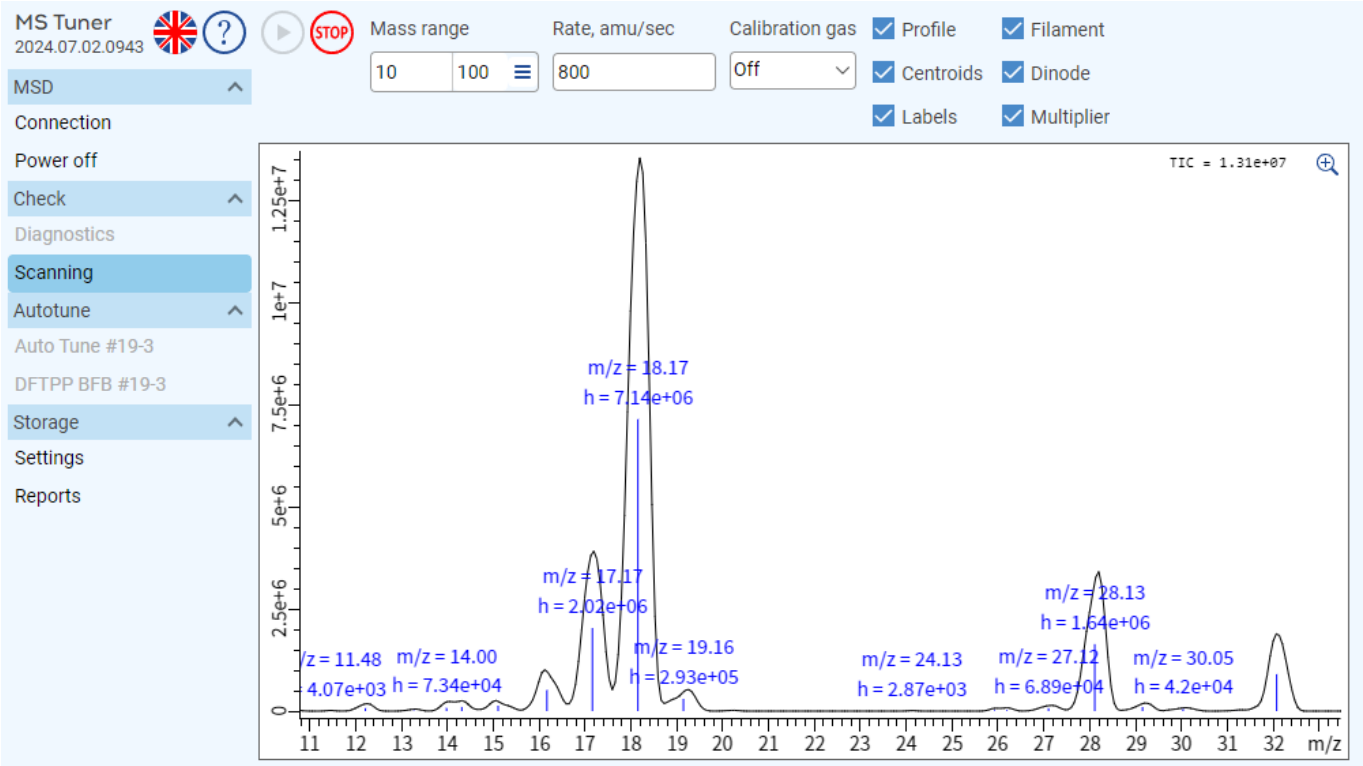


Fig 3.3 – Scanning

4 AUTOTUNE

Automatic configuration should be carried out no earlier than 6 hours after turning on the complex and setting the operating mode.

The standard "Auto Tune" setting allows you to tune the MSD for maximum sensitivity.

The "DFTPP/BFB" setting allows you to configure the MSD to operate according to EPA standards by adjusting the specific PFTBA ion ratio.

- In the left panel, select the "Auto Tune" menu item.
- In the main window, select the settings you want to make (all are selected by default). Each setting item can be performed separately by double-clicking the left mouse button on the item name.
- You can perform multiple setup cycles by checking the “Run continuously” checkbox.
- The configuration queue will stop if any item is completed in error. You can complete all the steps to the end by checking the “Ignore errors” checkbox.
- Check the "Report" checkbox if you want to create a report on the MSD setup. Keep printed versions of the reports so that if your computer malfunctions, you can restore information about previous settings. Viewing and printing of previously generated reports is done by clicking "Archive" → "Reports"

Click on the "Run" button.

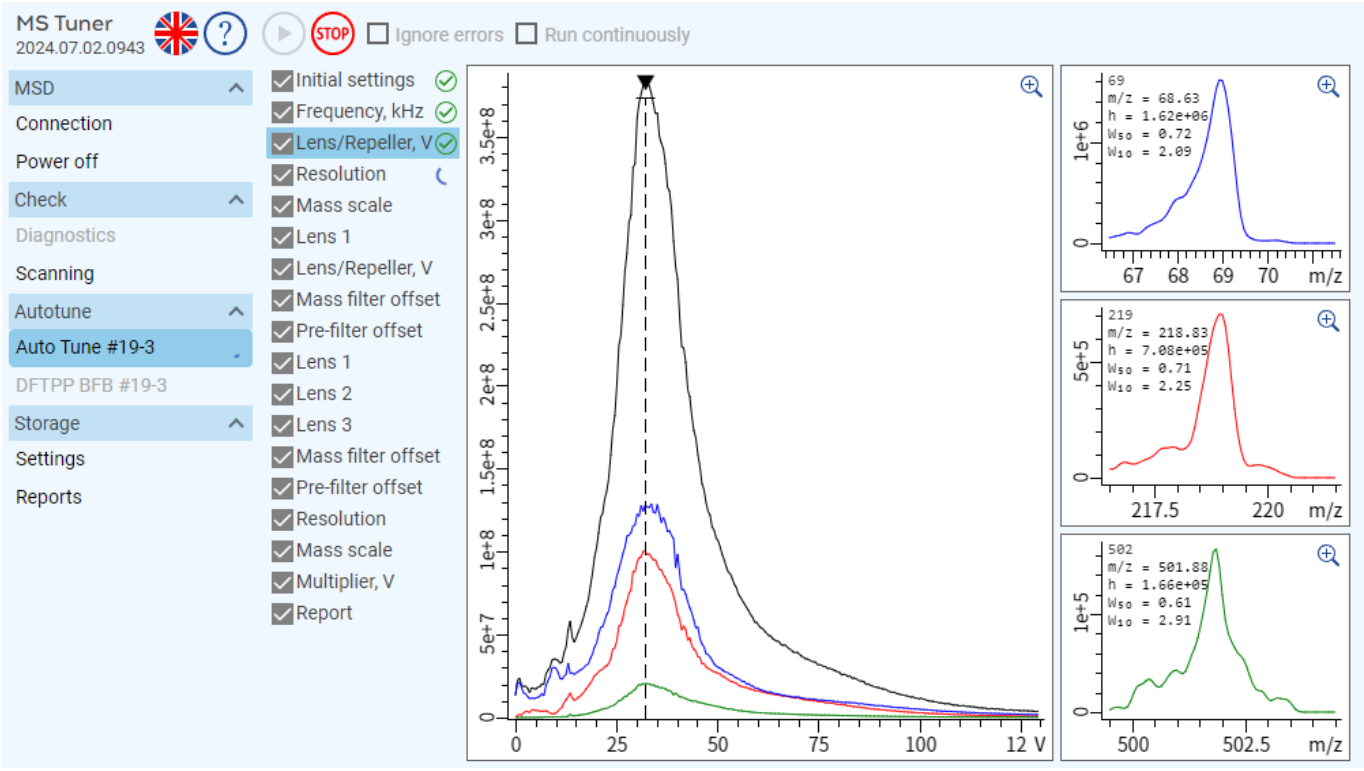


Fig 4.1 – Autotune

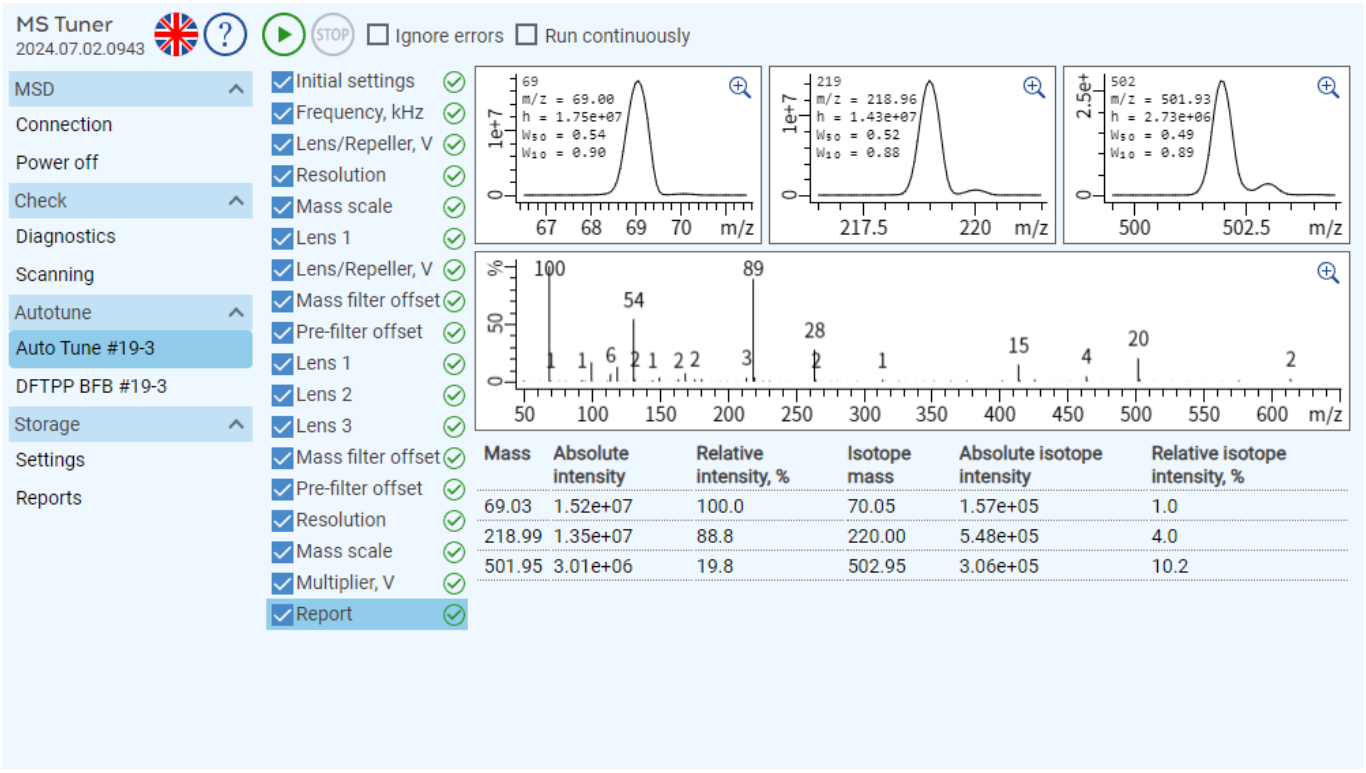


Fig 4.2 – Autotune complete

5 STORAGE

5.1 Settings

The Settings page displays the MSD tunes. Parameters that have changed compared to the current tune are highlighted in red.

To save your current tune, click "Save". The tune will be saved to the MSD. The file name contains the type of ionization (E – electronic, C – chemical), the polarity of the ions for which the tune is made (+ or -), as well as the current date and time.

To load a tune into the MSD, select it from the list of tunes and click the "Make selected tune current" button.

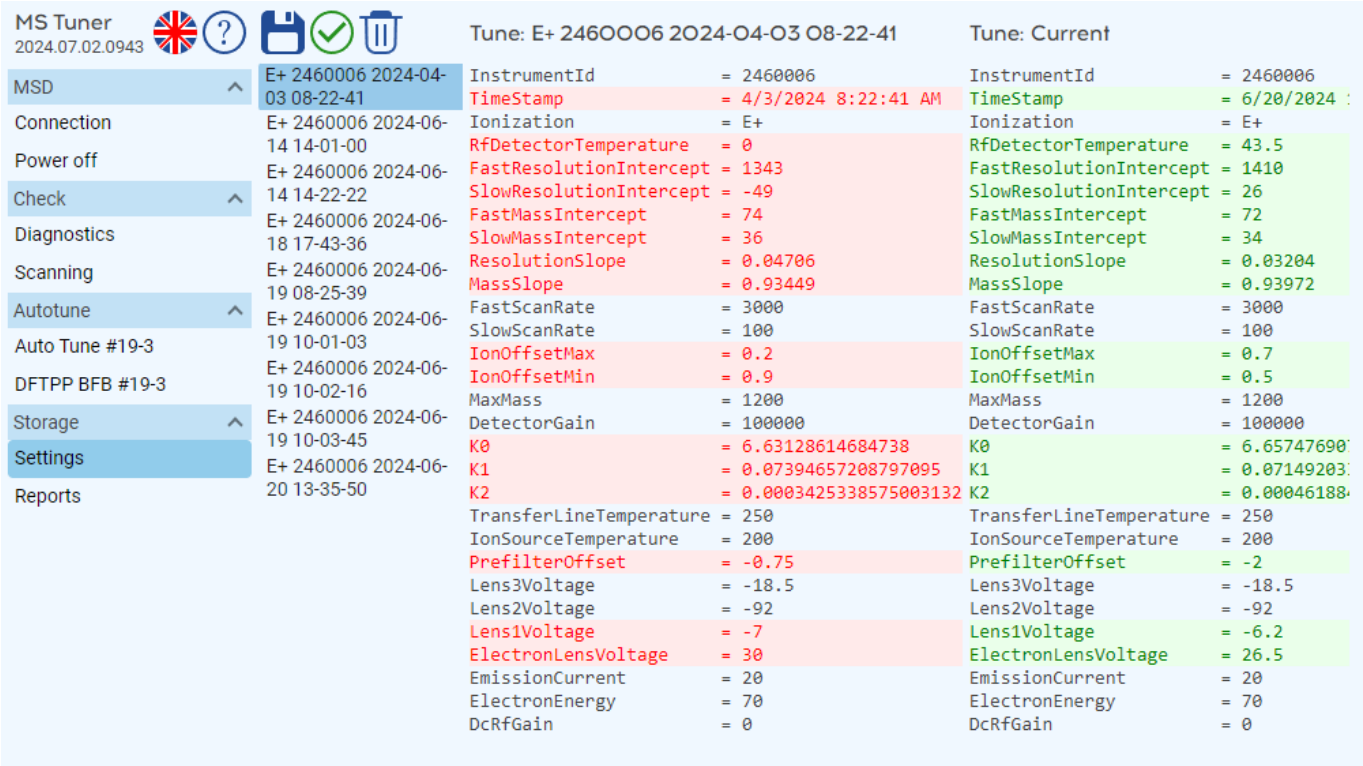


Fig 5.1 – Tunes archive. Comparison of selected and current (MSD model 1)

To compare any two tunes, select them while holding down the **CTRL** key.

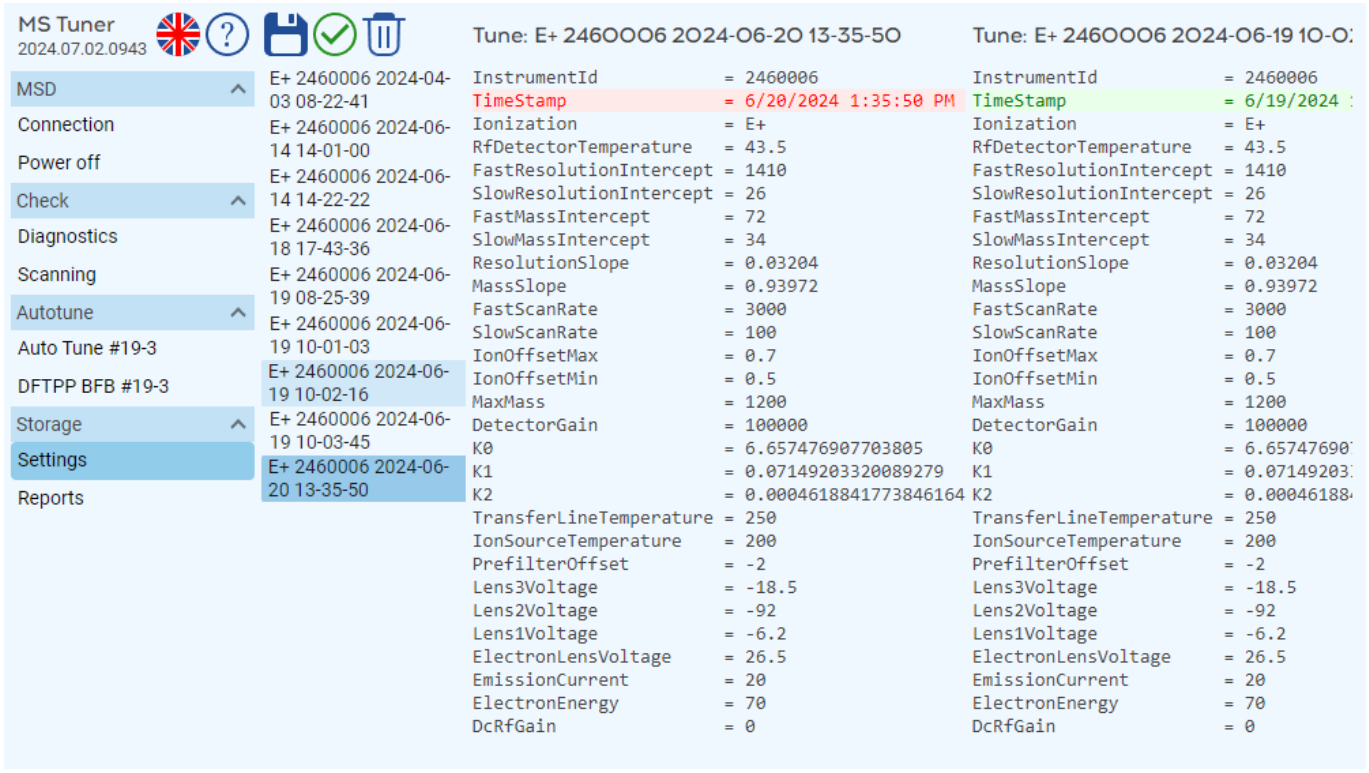


Fig 5.2 – Tunes archive. Comparison of two selected tunes (MSD model 1)

5.2 Reports

Reports in PDF format are available in the Chromatec Navigator report repository. There you can view reports for each of your MSDs. The corresponding MS Tune page only displays reports for the MSD you are currently connected to.



Fig 5.3 – Reports

 You can re-query the list of saved reports using the "Update" button.

When there are a lot of reports, you can find the one you need using the filter line.

6 RIGHT PANEL

The right pane contains MSD commands and parameters. To expand or collapse the list of parameters, double-click in any free area of the right panel.

If the parameter values are within the normal range, the color of their indicator will be green; if any of the parameters is outside the norm, then the color of its indicator will turn red.

Any parameters can be added to the "Favorites" section.

6.1 Temperature

Control of set and measured temperatures.

6.2 Vacuum board

Table 6.1 – Vacuum board parameters

Parameter	**Destination**
Forevacuum, mTorr	Vacuum sensor readings
Deep vacuum meter	Turning on the deep vacuum meter
Deep vacuum, µTorr	Deep vacuum sensor readings. The parameter is displayed if the deep vacuum meter is enabled.
Vacuuming the Direct Probe	The command is executed before opening the vacuum sluice with the direct input probe installed on it. The command opens the airlock valve for 20 s, during which air is pumped out of the airlock by a forevacuum pump.

6.3 Ionization/Gas

Switching the type of ionization ("Electronic" / "Chemical"), control of reagent gas and calibration gas.

Table 6.2 – Ionization/gas parameters

Parameter	Destination
Ionization type	Electronic, Chemical
Reagent gas	Off, Methane, Isobutane, Carbon dioxide. The parameter is available for chemical ionization.
CI reagent gas flow, ml/min	Not available if reagent gas is turned off.
	The range of values depends on the selected type of reagent gas:
	Methane: 0.3…4.7
	Isobutane: 0.3…3
	Carbon dioxide: 0.3…3
Reagent gas inlet	A, B (corresponds to inputs on the back of the MSD)
Galibration gas	Off, Big flow, small flow

6.4 Main board

This section displays information about MSD firmware.

6.5 Pump

This section displays information about the status of the pump, its model and firmware.

6.6 State

This section displays the name of the current stage of MSD operation and its time.