Biotage® Selekt

User Manual

Biotage®

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System Overview

Biotage® Selekt is an automated flash purification system with a built-in QR reader for Biotage® Sfär columns, RFID reader for Selekt collection racks, UV detector, pump, fraction collector, and touch screen.

Optional accessories from Biotage that can be used with the system are Biotage® Solvent Detector, an instrument tray, a secondary solvent containment, and a safety valve. It is also possible to connect an external detector with analog output signal, and connect the system to a network to enable e-mail functionality such as notifications and auto send of reports.

Columns

The system has two column channels. Columns can be placed both on the right side of the system and on the front (up to 50g); see Figure 1.

Figure 1. Biotage® Selekt with two columns.

QR Reader

All Biotage® Sfär columns have a QR code that can be read by the QR reader underneath the touch screen; see Figure 2. When scanning a column using the QR reader, the system will be able to trace all runs performed on the system using that specific column based on its ID.

Figure 2. Scanning a Biotage® Sfär column.

Racks and Vessels

The system collects fractions into a variety of collection racks and vessels. The following Selekt racks are available:

- 48 positions for 13 x 100 mm tubes with a vessel volume of 9 mL.
- 35 positions for 16 x 100 mm tubes with a vessel volume of 14 mL.
- 35 positions for 16 x 150 mm tubes with a vessel volume of 22 mL.
- 28 positions for 18 x 150 mm tubes with a vessel volume of 27 mL.
- 15 positions for 25 x 150 mm tubes with a vessel volume of 45 mL.
- 6 positions for 120 mL flasks.
- 10 positions for 240 mL flasks.
- 8 positions for 480 mL flasks.

The predefined vessel volumes can be lowered if desired.

The collection bed can either hold a collection tray with up to three of the racks with vessel volumes up to 120 mL (Figure 3), or one of the 240 or 480 mL flask racks.

One collection tray is standard, but by extending the fraction collector, it is possible to use two collection trays at the same time. The maximum collection volume with no rack change is 3840 mL for standard bed and 7680 mL for extended bed.

RFID Tags

All Selekt collection racks have an RFID (radio-frequency identification) tag that is automatically identified by the system when placed on the collection bed. The tag contains information on the rack type and the run(s) that is/are currently in the rack, if performed on the same system, or which system it was last used on.

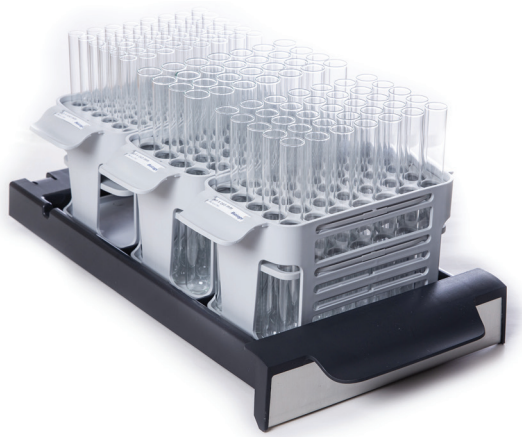


Figure 3. Collection tray with three racks.

Solvent Supply

The system is equipped with four solvent inlets found on the right side of the system (S1-S4).

Secondary Solvent Containment with Biotage® Solvent Detector*

A maximum of four 5-L reservoirs can be placed on the optional secondary solvent containment; see Figure 4. Larger reservoirs than 5 L must be placed elsewhere.

Note: To be compliant with the US secondary containment regulations, do not use reservoirs larger than 4 L.

Figure 4. The optional secondary solvent containment.

Solvent and Waste Monitoring

The system can maintain a running calculation of the fluid levels in the reservoirs based on information entered by the user. With solvent and waste monitoring enabled, the system will:

- Inform the user when there is not enough solvent or waste capacity for a run.
- Issue an on-screen notification when a solvent level is below 20% of the set capacity.
- Issue an on-screen notification when the waste level is above 85% of the set capacity.
- Pause the system when it is time to refill a solvent reservoir (when 10% is left) or empty the waste reservoir (when 95% full).

Instrument Tray with Biotage® Solvent Detector*

An optional instrument tray with a solvent detector is available for safe unattended operation. When solvent is detected, the system is paused and all pump functionality disabled until the solvent detector is dry again.

Figure 5. The optional instrument tray with a solvent detector.

* It is only possible to connect one Biotage Solvent Detector to the system.

Internal UV Detector

The system includes either a 200 to 400 nm UV detector or a 198 to 810 nm UV-VIS detector.

External Detector

It is possible to connect an external detector with analog output signal. For more information, see the Biotage® Selekt Installation and Safety document (P/N 416182).

Collection and Fractionation Methods

Available detection signals are:

- **λ-All:** The system uses average absorbance within a user-defined wavelength range for collection and fractionation. Only available on systems with a Spektra software license.
- **UV1 and UV2:** The system uses one or two wavelength signal(s) for collection and fractionation.
- **EXT:** The system uses the signal from an external detector for collection and fractionation. Optional.

Possible collection and fractionation parameters are Collect All, Threshold, and Valley Fractionation. The system always fractionates on volume, which is when a test tube or bottle reaches the specified vessel volume or a user-defined maximum fraction volume for the run. At any time, you can manually switch to a new collection vessel by pressing ▯+ in the chromatogram.

Any signal combination can be used for collection and fractionation. Signals that are not used for collection can be used for monitoring.

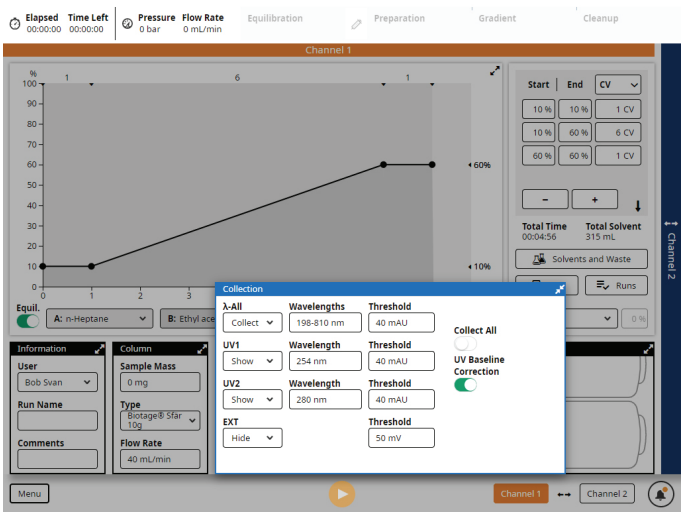


Figure 6. The Collection panel expanded on a system with a Spektra software license and an external detector connected.

E-mail Functionality

With the system connected to an e-mail server, it is possible for the users to:

- **Receive e-mail notifications** when user interaction is required for their runs, e.g. when a rack has to be replaced, a solvent needs to be replenished, a waste reservoir needs to be emptied, and a leak is detected by Biotage® Solvent Detector.
- **Automatically receive the report by e-mail** when their purification run has been completed.
- **Send reports and logs from the system by e-mail.**

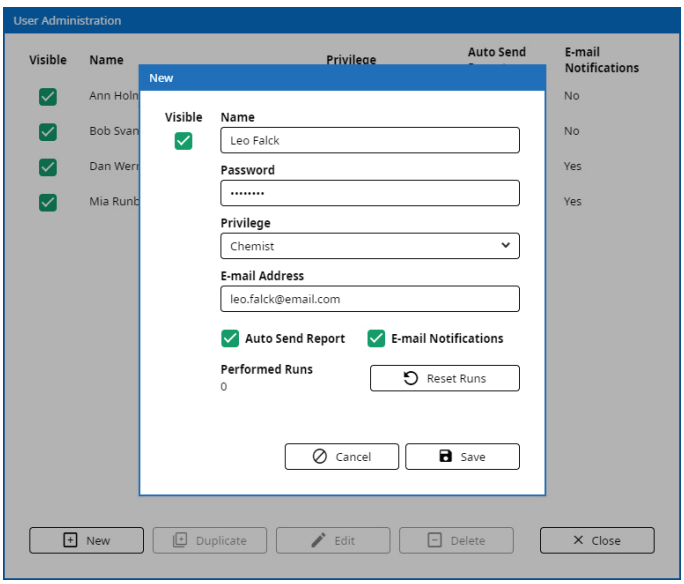


Figure 7. E-mail notifications and auto send of reports are enabled and disabled individually in each user account.

Audible Alarm

When the audible alarm is enabled in the system settings, a warning will sound if an error has occurred.

Lighting

To provide better visibility and status information for the user, there is a light strip underneath the touch screen and a mirror behind the collection racks.

When the light strip is enabled in the system settings, the color indicates the status of the system:

- **White:** System idle or processing.
- **Orange:** User interaction required for the run on channel 1.
- **Blue:** User interaction required for the run on channel 2.
- **Green:** Run completed.
- **Red:** System error. The system needs to be restarted.

Biotage® Safety Valve

The optional safety valve (P/N 417115SP) enables you to use columns or combinations (e.g. column and dry load vessel) with a combined column volume larger than 0.8 L and up to a maximum of 3.1 L.

The safety valve is designed to open at 8 bar and discharge fluid until the pressure drops below 8 bar.

Figure 8. The safety valve connected to a SNAP XL column mounted on the system.

Spektra Software License (Optional)

The following features are included in the Spektra software license that is sold separately:

- **λ-All detection.** The system uses average absorbance within a user-defined wavelength range for collection and fractionation.
- **UV Baseline Correction.** When the UV baseline correction option is turned on, the gradient run is preceded by a light absorbance detection phase. During this phase, the light absorbance of the used solvents (A, B, and modifier) is measured for the whole detector range using either the initial gradient mix to the end mix A/B or the initial gradient mix to 100% solvent B. The measurement results in a baseline that is subtracted from the detector signal during the gradient run.
- **Absorbance spectrum.** The absorbance spectrum for the whole detector range is displayed during the run.
- **Tool for spectrum analysis.** The analysis view shows the chromatogram and the absorbance spectrum for the whole detector range for a selected point in the chromatogram.

Prepare the System

Mount Column Holders

The system is shipped with column holders for Sfär columns of different sizes. Ensure that they are mounted in the desired positions on the system.

Figure 9 shows how to mount a column holder on the right side of the system. There are also two positions for column holders on the front of the system that can be used for Biotage columns up to 50g; see Figure 10.

Figure 9. Slide the column holder screw into the desired position on the right side of the system and then place the holder over the screw and fasten.

Figure 10. Biotage columns up to 50g can be placed on the front of the system.

Install Biotage® Safety Valve (Optional)

Warning

- Always use Biotage Safety Valve (P/N 417115SP) when processing columns or combinations (e.g. column and dry load vessel) with a total CV larger than 0.8 L.
- Never use columns or combinations with a total CV larger than 3.1 L.
- Do not over-tighten the fittings or the tubing may become damaged.

The optional safety valve (P/N 417115SP) enables you to use columns or combinations (e.g. column and dry load vessel) with a combined column volume larger than 0.8 L and up to a maximum of 3.1 L.

The safety valve is designed to open at 8 bar and discharge fluid until the pressure drops below 8 bar.

Required tools:

- Torx T6 screwdriver.
- Open-end wrench, 14 mm.
- Open-end wrench, 17 mm.

To install the safety valve:

1. Fit the supplied drain tube to the outlet of the safety valve (see A in Figure 11) using the two open-end wrenches.
2. Mount the safety valve to the right side of the system:
   a. Slide the valve into one of the rails on the right side of the system; see Figure 11.
   b. When the safety valve is in the desired position, tighten the fastening screw (see B in Figure 11) using the Torx T6 screwdriver.
3. Connect the tubing leading from the **C1** or **C2** port on the right side of the system (see Figure 15 on page 6), depending on which channel you want to use, to the connection at the bottom of the safety valve (see C in Figure 11).
4. Connect the extra tube supplied with the safety valve to the connection at the top of the valve (see D in Figure 11).

   Note: This tube is to be connected to the Luer fitting at the top of the column. For instructions on how to mount a SNAP XL column onto the system, see “Mount a Biotage® SNAP XL Column (Optional)” on page 5.
5. Insert the drain tube into the system’s waste reservoir.

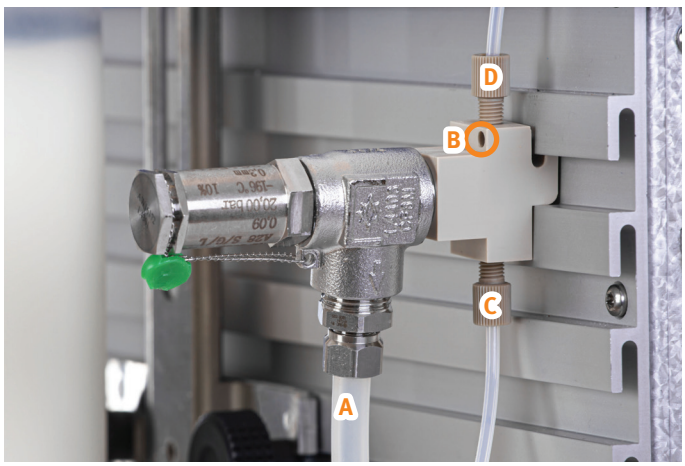


Figure 11. The safety valve. A: Drain tube. B: Screw for fastening the valve to the system. C: Tube from the C1 or C2 port on the right side of the system. D: Tube going to the top of the column.

Mount a Biotage® SNAP XL Column (Optional)

Warning

- Always use Biotage Safety Valve (P/N 417115SP) when processing columns or combinations (e.g. column and dry load vessel) with a total CV larger than 0.8 L.
- Never use columns or combinations with a total CV larger than 3.1 L.
- Do not over-tighten the fittings or the tubing may become damaged.

Note: When using SNAP XL columns, it is not possible to have the optional secondary solvent containment placed on top of the system.

Mount the Biotage® SNAP XL Column Holder

The Biotage® SNAP XL column holder must be ordered separately (P/N 412422).

1. Slide one screw (see A in Figure 12) into one of the two lower rails on the right side of the system.
2. Slide the column holder into position with the fastening bracket (see B in Figure 12) in the same rail as the screw.
3. Slide the other screw into the same rail.
4. Lock the column holder in the desired position using the two screws; see the column holder to the right in Figure 12.

Note: The top screw is used for adjusting the column holder to the length of the used column.

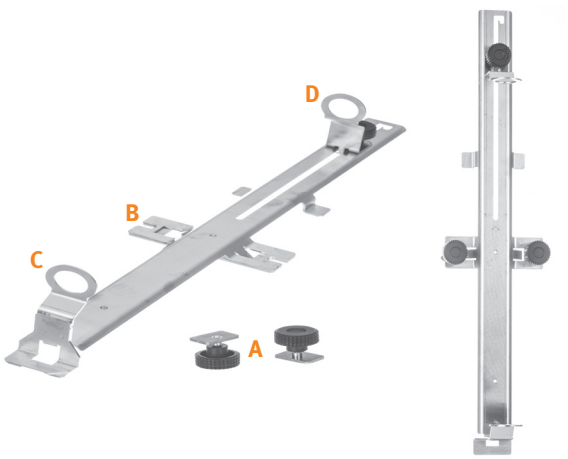


Figure 12. SNAP XL column holder. A: Holder screws. B: Fastening bracket. C: Bottom column loop. D: Top column loop.

Mount the Biotage® SNAP XL Column

Two SNAP XL fittings with Luer connections are required and must be ordered separately; see Figure 14 on page 6.

1. Remove the stoppers from the top and bottom of the column.
2. Place the column in the bottom loop on the column holder (see C in Figure 12) and then unfasten and lower the top loop (see D in Figure 12) until it is in contact with the column (see Figure 13). Tighten the screw.

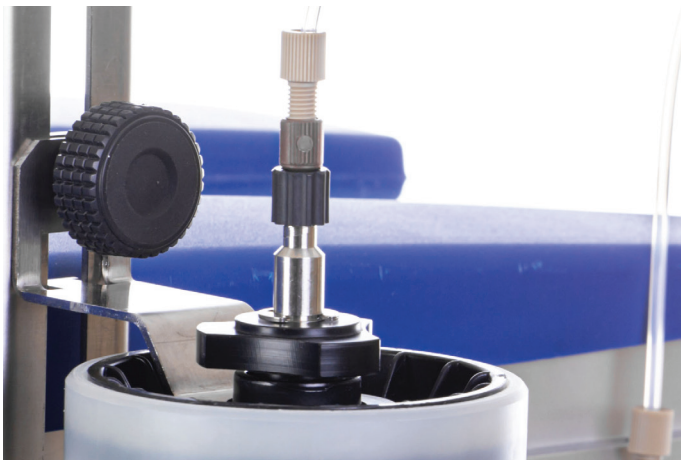


Figure 13. The top screw is used for adjusting the column holder to the length of the used column.

3. Fasten the SNAP XL fittings to the top and bottom of the column; see Figure 14 on page 6.
4. Connect the tubing leading from the **C1** or **C2** port on the right side of the system (see Figure 15 on page 6), depending on which channel you want to use, to the connection at the bottom of the safety valve (see C in Figure 11).
5. Connect the tube leading from the connection at the top of the safety valve (see D in Figure 11) to the Luer fitting at the top of the column.
6. Connect the tubing leading to the **R1** or **R2** port on the right side of the system (see Figure 15 on page 6), depending on which channel you want to use, to the Luer fitting at the bottom of the column.
7. Insert the drain tube (see A in Figure 11) into the waste reservoir.

Figure 14. SNAP XL column with SNAP XL fittings with Luer connections.

Figure 15. The C1, C2, R1, and R2 ports on the right side of the system.

Inspect the Tubing

Warning

» Shut down the system before replacing any tubing. Use only tubing designed for the Selekt system and supplied by Biotage.

Inspect all tubes before each run to ensure that they do not show signs of wear or damage and that they are properly connected and tightened. Use caution when finger tightening fittings to prevent stripped threads or crushed ferrules.

All external tubing on the system except for the tubing on the collection arm can be replaced by the user.

Note: All tube types, dimensions, and lengths are essential for the performance of the system. Only replace tubes with the equivalent tubes designed for the Selekt system and supplied by Biotage.

Start Up the System

Turn on the system using the power switch located on the left side of the system; see Figure 16.

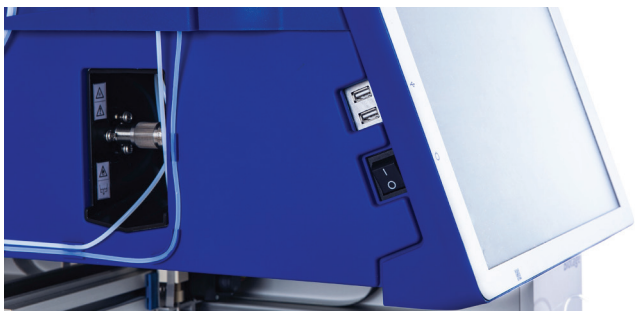


Figure 16. The power switch is located on the left side of the system.

Setup of Automatic Conversion Between Normal and Reversed Phase

Selekt automatically converts system solvents from normal to reversed phase when the following criteria are met:

- Previous run was performed on the other channel.
- Previous run was performed using a column intended for the other chemistry type (reversed/normal phase) than the one used for the current run.
- None of the runs use more than two solvents, i.e. no modifier, solvent C, or solvent D.
- The strong solvent of the previous run is still connected to the system.

Automatic conversion is performed between the runs as follows:

1. The system pumps 100% of the strong solvent of the previous run via bypass.
2. The system pumps 100% of the strong solvent of the current run via bypass.

Assign Solvents and Set Reservoir Volumes

When a purification is run, the software determines which solvent inlets are connected to the solvents used in the run.

Note: For reversed-phase purification with methanol and water, it is strongly recommended to premix the water with 5% of methanol and degass either through vacuum or sonication. Degassing of protic solvent blends decreases out-gassing of entrapped air during gradient elution, which will impact gradient performance and flow rates.

Note: With solvent and waste monitoring enabled (see page 27), the capacity and current fluid level must be entered each time you empty a waste reservoir or refill a solvent.

Note: All four solvent inlets must be primed with solvent to achieve the specified pump performance.

1. In the software, press **Menu** and then **Solvent Setup**.
2. Assign a solvent to each solvent inlet using the solvent drop-down lists (see Figure 17).

   To add solvents to the list, press **Solvent Administration**. For more information, see page 25.
3. If solvent monitoring is enabled, enter the capacity and the current solvent level of each solvent reservoir.
4. If waste monitoring is enabled, enter the capacity and the current waste level of the waste reservoir.
5. Prime the solvent inlets that have been assigned a new solvent; see below.

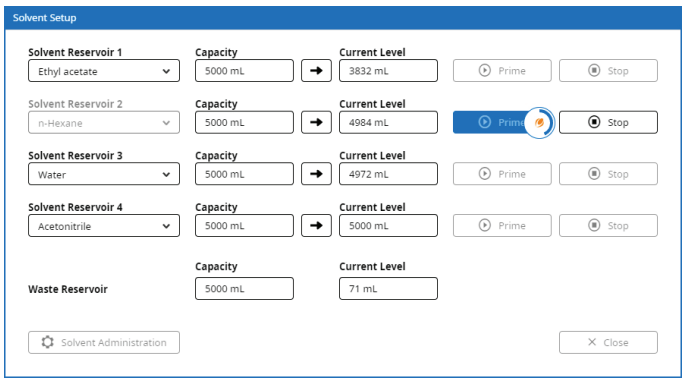


Figure 17. The Solvent Setup window with solvent and waste monitoring enabled.

Prime the Solvent Inlets

Before you start a purification on your system, you might need to prime the solvent inlets to:

- Remove any air bubbles from the pump and the solvent inlets by flushing them with solvents.
- Empty the solvent inlets of solvents used in the previous purification and fill them with new solvents.

Note: All four solvent inlets must be primed with solvent to achieve the specified pump performance.

Note: We recommend to have all solvent reservoirs on the same physical height to improve accuracy in the solvent mixing.

1. In the software, press **Menu** and then **Solvent Setup**.
2. Prime the solvent inlets by pressing the corresponding **Prime** buttons (see Figure 17). Note that 27 mL of the assigned solvent is used for each prime.

Flush the System

If the automatic line flush is disabled on your system (see page 27), ensure to flush the column flow path before each run (see page 18).

Set Up a Purification

Warning

- Never exceed the maximum pressure or flow rate for the used column.
- Always use Biotage Safety Valve (P/N 417115SP) when processing columns or combinations (e.g. column and dry load vessel) with a total CV larger than 0.8 L.
- Never use columns or combinations with a total CV larger than 3.1 L.
- Never use the system without a column mounted or the column inlet and outlet tubing coupled together, on both channels.

Note: For instructions on how to mount a SNAP XL column onto the system, see page 5.

1. In the software, select the column channel to be used by pressing **Channel 1** or **Channel 2** in the lower right corner, or by swiping left or right on the channel tab along the edge.
2. To base the purification on a previous run, press **Runs** and then see “Base a New Run on a Previous Run” on page 22.
3. Either scan your column using the QR reader underneath the touch screen (see Figure 18) or select the column type from the **Type** drop-down list in the **Column** panel (see Figure 19).

   Note: If using a column or a combination of a column and e.g. dry load vessel with a total CV larger than 0.8 L, a safety valve supplied by Biotage (P/N 417115SP) must be used. For more information, see page 4.

Figure 18. The QR reader is located underneath the touch screen.

4. Place the column in a column holder on the right side of the system or on the front (up to 50g).
5. Connect the correct inlet and outlet tubing to the column. The tubes for channel 1 are labeled **C1** with orange tags and the tubes for channel 2 are labeled **C2** with blue tags.
6. Ensure that the inlet and outlet tubing on the other (unused) channel are coupled together.
7. Place the collection rack(s) that you want to use on the collection bed. Racks with vessel volumes up to 120 mL require the collection tray. Selekt racks are automatically identified by the system when placed on the collection bed. If automatic rack detection has been disabled (see page 27), select the collection rack manually (see “Specify the Rack Parameters” on page 11).
8. Set up the run parameters as described in the following sections.

Note: If the button is available in the bottom right corner, one or more run parameters are either missing or incorrect. Press for more information.

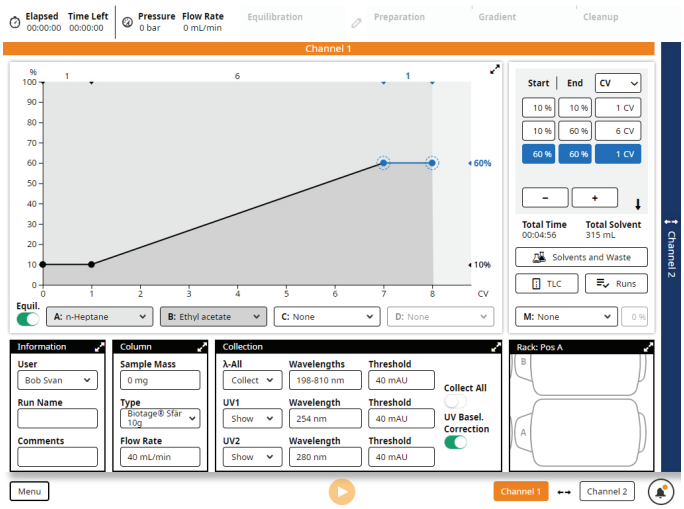


Figure 19. The run setup view.

Specify the Gradient

The gradient can be set up using the gradient graph or the gradient table. It is also possible to calculate a gradient from R_f values obtained from TLC analysis (see page 9).

Gradient Graph and Table

Expand the gradient graph by pressing and the gradient table by pressing .

Change the length unit by selecting **CV**, **mm:ss**, or **mL** from the unit drop-down menu in the gradient table or the expanded gradient graph.

To add a gradient segment, press the **+** button in the gradient table or the expanded gradient graph. The new segment will be added after the selected segment or node or at the end of the gradient if nothing is selected.

To delete a node or segment, select it and press the **–** button in the gradient table or the expanded gradient graph.

To increase or decrease the length of a gradient segment or change the solvent mix, either 1) drag the segment or node to the desired position in the gradient graph, or 2) change the value in the gradient table.

Note that it is possible to zoom in and out of the gradient using the pinch-to-zoom feature. To reset the zoom, press .

Gradient Parameters

- **Unit or CV/mL/mm:ss:** The gradient length unit. CV (column volumes), milliliters, or minutes and seconds; see Figure 20.
- **Start:** The percentage of the strong solvent at the beginning of the gradient segment.
- **End:** The percentage of the strong solvent at the end of the gradient segment.
- **A-D:** The solvents to be used.
- **M/Modifier:** If you want to use a fixed percentage of modifier during the purification, select the solvent to be used and its percentage in the solvent mix.
- **Equil./Equilibration:** The column is equilibrated before the run, unless this options is turned off. The equilibration volume and flow rate are set automatically based on the selected column type. To see the settings, expand the **Column** panel (see Figure 24 on page 10). We strongly recommend that the equilibration is not turned off.

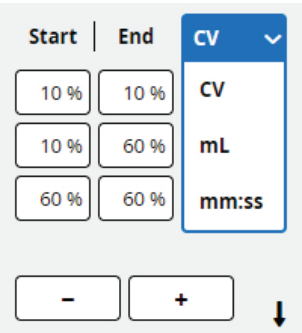


Figure 20. The gradient length unit can be selected in the gradient table (as shown above) and in the expanded gradient graph (see Figure 21).

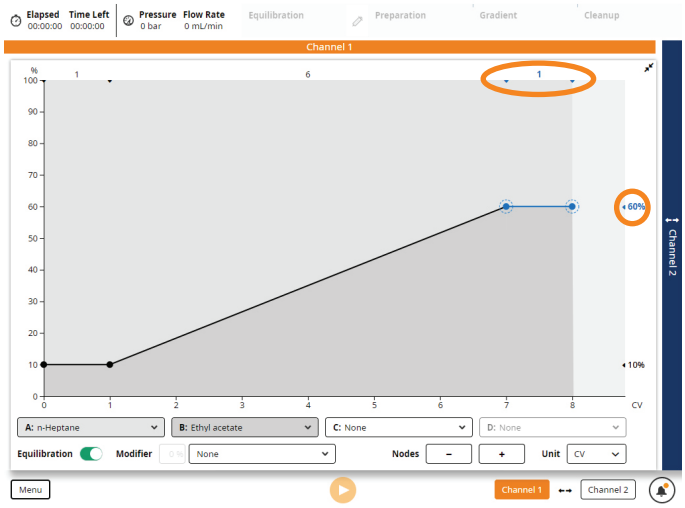


Figure 21. The expanded gradient graph. Gradient markers along the top and right show the length and solvent percentage for the segments.

Calculate a Gradient from TLC Data

Note the following when using the **TLC to Gradient** editor:

- Accuracy of prediction can be reduced if using alcohols, such as methanol and ethanol, very volatile modifiers such as diethyl ether, or modifiers that permanently alter the properties of the silica.
- Reversed-phase TLC is not supported.
- Slight variations in migration rates may occur if samples are applied too close to the edge of the TLC plate. Apply samples at least 10 mm from the edge to avoid the edge effect.

To calculate a purification gradient from the R_f values obtained from TLC analysis:

1. Open the **TLC to Gradient** editor (see Figure 22 on page 10) by pressing **TLC**.
2. Select the **Strong Solvent** text box and enter the percentage of the strongest (most polar) solvent in the TLC analysis.
3. Mark the solvent front of the TLC plate by sliding the **Front** line to the correct position.
4. Enter the R_f value of the product of interest in the **R_f Product** text box or by sliding the **Product** line to the correct position on the TLC plate.
5. Enter the R_f value of the impurity closest below and above the product in the **R_f Impurity 1** and **R_f Impurity 2** text boxes or by sliding the corresponding lines to the correct positions on the TLC plate. A value for **R_f Impurity 1** is required.

6. If you have two plates, press **Add Plate** and repeat steps 2 through 5 for the second plate. One plate gives a linear gradient and two plates give a step gradient.
7. To calculate a purification gradient, press **Create**.

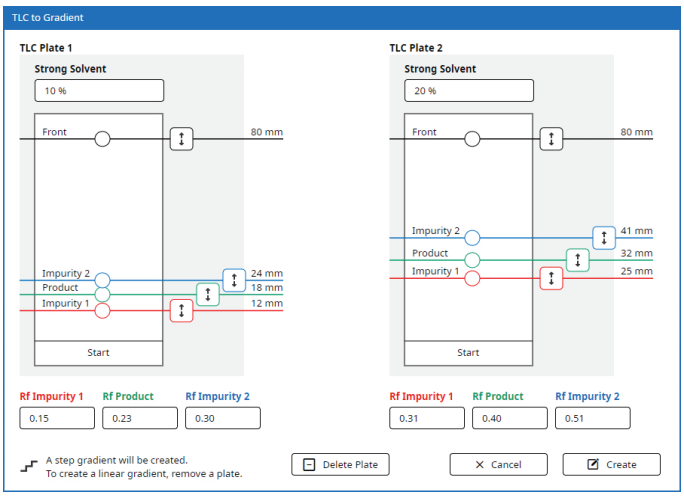


Figure 22. The TLC to Gradient editor.

Specify the Information Parameters

- **User:** The name of the user. If you have not been assigned a user name, please contact your system supervisor.
- **Run Name:** The name of the run. If left blank, the name will be auto-generated based on date and time when the purification is performed.
- **Comments:** Comments on the purification run. (Optional.)

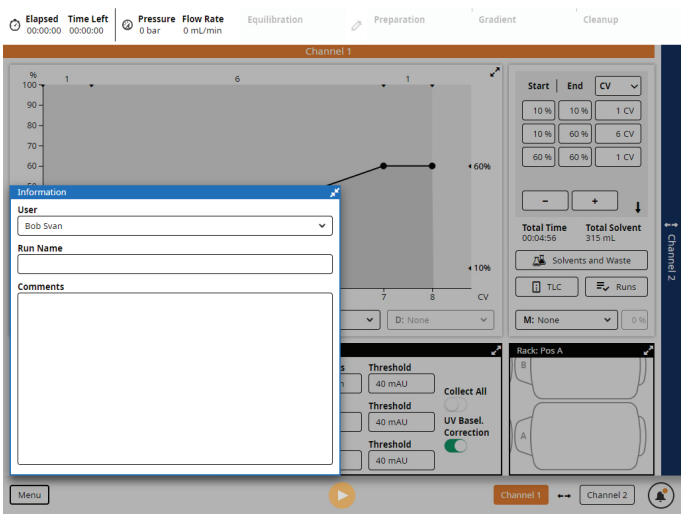


Figure 23. The Information panel expanded.

Specify the Column Parameters

- **Sample Mass:** The crude sample mass.
- **Type:** The column type. Either scan the column using the QR reader underneath the touch screen or select a column type from the drop-down list. If a column is scanned, the icon is shown in the **Column** panel. If the column name is orange or red, its load capacity is smaller than the entered sample mass.

  Note: If using a column or a combination of a column and e.g. dry load vessel with a total CV larger than 0.8 L, a safety valve supplied by Biotage (P/N 417115SP) must be used. For more information, see page 4.

- **Flow Rate:** The default (recommended) flow rate for the selected column type is preselected. If you want to change it, consider that the maximum flow rate applied depends on the following:
  - The maximum pressure or flow rate setting for the column and any other accessories used in the setup.
  - The maximum aspiration rate(s) defined for the used solvent(s).

Note: If you expand the **Column** panel, all of the settings for the selected column type are displayed (see Figure 24). If the column has been scanned, the column's ID and the number of times it has been used is also displayed. For more information, see "Administrate Column Types" on page 25.

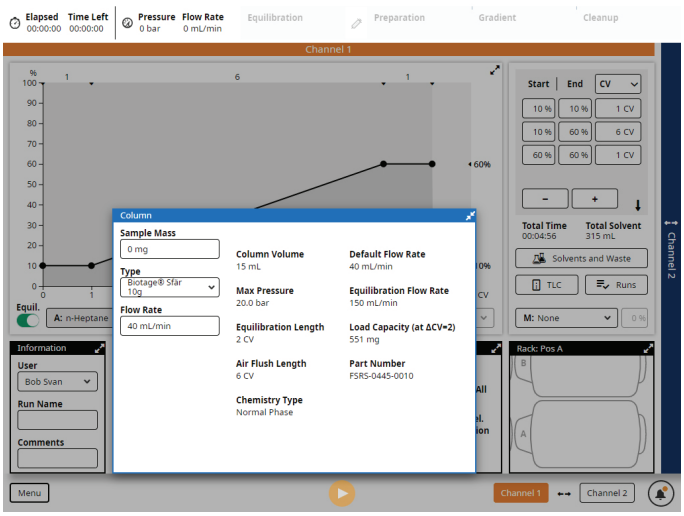


Figure 24. The Column panel expanded.

Specify the Collection Parameters

- **λ-All*:** Select whether the average absorbance within a user-defined wavelength range should be used for collection and fractionation (**Collect**), used for monitoring (**Show**), or not be shown during the run (**Hide**).
- **UV1 and UV2:** Select whether the wavelength signals should be used for collection and fractionation (**Collect**), used for monitoring (**Show**), or not be shown during the run (**Hide**).
- **EXT:** Select whether a signal from an external detector (optional) should be used for collection and fractionation (**Collect**), used for monitoring (**Show**), or not be shown during the run (**Hide**).
- **Wavelengths*:** The shortest and longest wavelength to be included in the λ-All signal. The range is 200 to 400 nm (UV detector) or 198 to 810 nm (UV-VIS detector).
- **Wavelength:** The wavelength to be used for UV1 and UV2. The range is 200 to 400 nm (UV detector) or 198 to 810 nm (UV-VIS detector).
- **Threshold:** Used to collect samples when the signal level exceeds the set threshold.
- **Collect All:** Used to collect the entire run.
- **UV Baseline Correction*:** When this option is turned on, the gradient run is preceded by a light absorbance detection phase. During this phase, the light absorbance of the used solvents (A, B, and modifier) is measured for the whole detector range using either the initial gradient mix to the end mix A/B or the initial gradient mix to 100% solvent B (see “System Settings” on page 27). The measurement results in a baseline containing the maximum absorbance of the solvents. During the gradient run, the baseline is subtracted from the detector signal affecting UV1, UV2, λ-All, and the absorbance spectrum.

* Only available on systems with a Spektra software license.

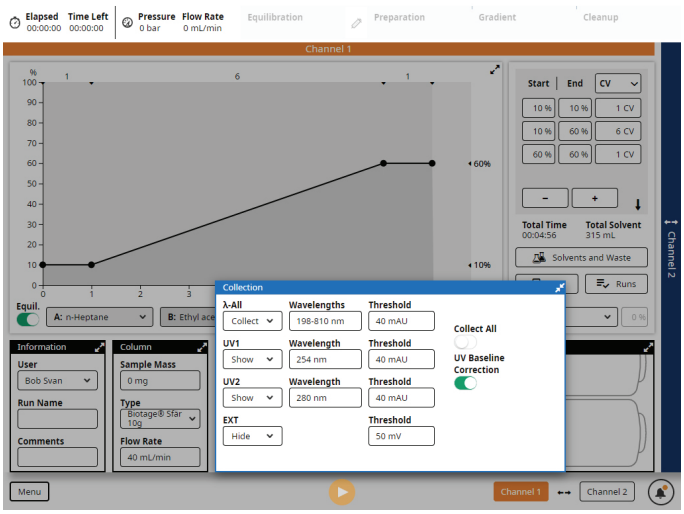


Figure 25. The Collection panel expanded on a system with a Spektra software license and an external detector connected.

Specify the Rack Parameters

Load Racks

The Selekt racks have RFID tags that are automatically identified by the system when placed on the collection bed. RFID racks have the))) icon in the expanded **Rack** panel (see Figure 26).

If the RFID reader is disabled in the system settings (see page 27), it is possible to select the collection rack type manually by expanding the **Rack** panel (see Figure 26).

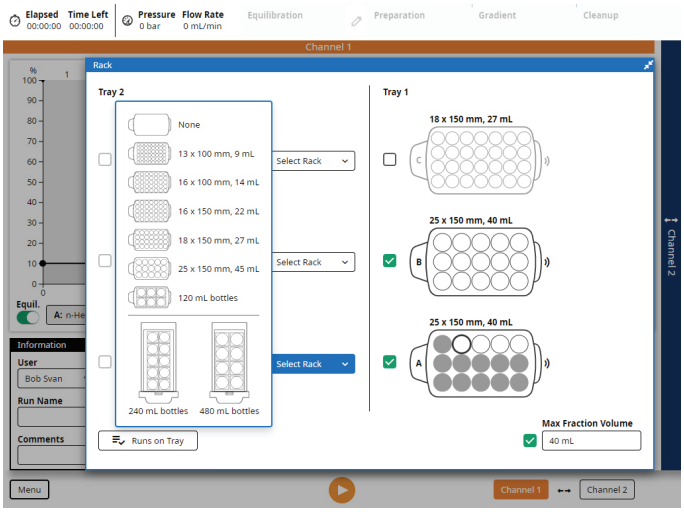


Figure 26. The Rack panel expanded on a system with extended collection bed and rack sharing enabled in the system settings (Start Collection is set to First Empty Vessel). Rack A was used in the previous run but still has empty vessels that can be used by the next run. Rack C is disabled and will not be used for collection. Note that it is also possible to select the rack type from the drop-down list, if e.g. the RFID reader is disabled in the system settings.

Assign Racks to the Run

To assign or remove a rack from the run, expand the **Rack** panel (see Figure 26) and set/clear the check box in front of the rack. The following racks will automatically be assigned to your run:

- A rack that you place on the collection bed.
- A rack that was assigned to but not used by the previous run.
- The last rack used in the previous run, if it still has one or more empty vessels or rows that are allowed to be used in the next run according to the system settings (see “Rack Sharing” on page 12).

Note: If you do not want to share the last rack used in the previous run, either remove it from the system or clear the check box in front of the rack.

Rack Sharing

The system offers the possibility to have the first fraction(s) of a run collected in the last rack used by the previous run if the following applies:

- The **Start Collection** parameter in the system settings is set to **First Empty Row** or **First Empty Vessel**.
- The last rack used in the previous run:
  - Contains at least one row of empty vessels or one empty vessel, depending on the **Start Collection** setting (see previous bullet).
  - Has not already been shared by five runs.
  - Is enabled in the **Rack** panel when the run is started.

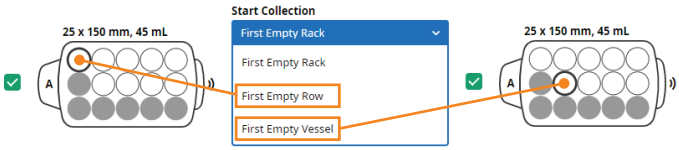


Figure 27. There are two Start Collection options in the system settings that allow two consecutive runs to share a rack, First Empty Row and First Empty Vessel. The first collection vessel to be used is highlighted with a thicker border.

Collection Order

The system uses the assigned racks in alphabetical order in regard to their positions on the tray. The dispensing order is left to right starting with the front vessel row. The first vessel that will be used for the run is highlighted with a thicker border; see Figure 27.

Note: If the run is sharing a rack with the previous run, collection will start in the shared rack independent of the positions of other racks assigned to the run. For more information see “Rack Sharing” above.

Max Fraction Volume

If you want to use a lower fraction volume than the one defined for the selected rack(s), expand the **Rack** panel, enable the **Max Fraction Volume** option (see Figure 26 on page 11), and enter the desired volume. Note that this setting will only be applied on racks with a higher vessel volume.

Start, Monitor, and Control a Purification

Warning

- Read and follow the safety precautions against static electricity in the Biotage® Selekt Installation and Safety document (P/N 416182) that is supplied with the system.
- Always ensure that the settings for the column selected in the software are correct for the column to be used before starting a run. Never exceed the maximum pressure or flow rate for the used column.
- Never use the system without a column mounted or the column inlet and outlet tubing coupled together, on both channels.
- Keep hands away from the collection arm area until the arm has returned to its home position (in the inner right corner) and the system is paused or in standby.
- The system may be pressurized when paused.
- Monitor the waste reservoir to prevent overflow during operation.

Start a Purification

1. Ensure that a sufficient quantity of the correct solvent is present in each solvent reservoir and that the waste reservoir has sufficient capacity for the run. To view the estimated solvent consumption for the run, press **Solvents and Waste**.
2. Start the purification by pressing ▶. If the button is disabled, press 🔔 in the bottom right corner for more information.

   If solvent and waste monitoring is enabled, you will be notified if there is not enough solvent or waste capacity for the run when you press ▶.
3. When the **Sample Load** dialog opens, load your sample.
4. Start the gradient run by pressing the appropriate button in the **Sample Load** dialog. We recommend that a gradient run is not started until the UV lamp is sufficiently warmed up.

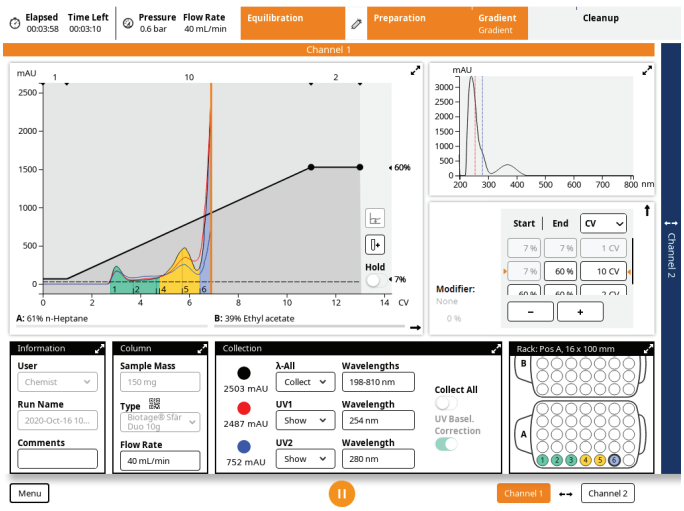


Figure 28. The default run view with the Spektra software license installed.

Monitor the Purification in Progress

While a purification is running, a dynamic chromatogram and the programmed gradient are displayed in the run view (see Figure 28). The gradient mix in the graph and the table are presented without any modifier. If a Spektra software license has been installed on your system, an absorbance spectrum for the whole detector range is also displayed.

You can expand the chromatogram by pressing ➞ (full width) or ⤢ (full size), the spectrum (if available) by pressing ⤢ and the gradient table by pressing ⬇. Change the length unit by selecting **CV**, **mm:ss**, or **mL** from the drop-down menu in the gradient table (see Figure 28) or in the fully expanded chromatogram (see Figure 29).

Figure 29. The chromatogram can be expanded to full width or full size.

Fractions

Fractions that are already collected can be located by matching their colors and numbers in the chromatogram with the vessel colors and numbers in the **Rack** panel (see Figure 28). Fractions from the same peak have the same color. Fractions only collected due to the **Collect All** option are colored gray.

Chromatogram

The signals and the thresholds are displayed in the chromatogram using the following colors:

● = Light absorption measured by the internal detector for the whole λ-All range and the threshold in mAU. (Requires a Spektra software license.)

● = Light absorption measured by the internal detector at wavelength UV1 and the threshold in mAU.

● = Light absorption measured by the internal detector at wavelength UV2 and the threshold in mAU.

● = Signal from the external detector (when connected) and the threshold in mV.

The defined wavelengths and real-time measurements of the absorption are displayed in the **Collection** panel.

Zoom in on the Chromatogram

It is always possible to zoom in and out of the gradient and chromatogram using the pinch-to-zoom feature (see Figure 30). It is possible to zoom in one direction (X or Y) or both directions (X and Y). To reset the zoom, press 🔍.

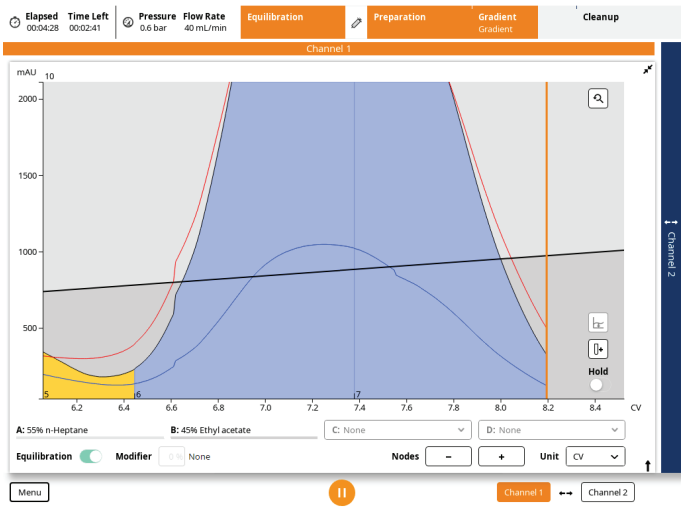


Figure 30. Zoomed-in chromatogram.

Current Solvent Mix

The percentage of pumped solvents (excluding the modifier, if used) are displayed underneath the chromatogram during the whole run (see Figure 28 and Figure 29 on page 13).

Status in the Top Pane

- **Conversion:** When reversed phase is run on one channel and normal phase on the other, a solvent flush is performed between runs that are using different channels. Note that conversions are not performed when one of the runs uses more than two solvents. For more information; see page 7.
- **Equilibration Flush:** The system empties the solvent inlets of solvents used in the previous purification and fills them with new solvents.
- **Equilibration:** The system is running a column equilibration.
- **Purge:** The system releases the column pressure.
- **Sample Load:** Sample can be loaded onto the column.
- **UV Warm-Up:** The UV lamp is being warmed up.
- **UV Zero:** The system is setting the UV zero level using the solvent mix used at the start of the gradient.
- **Baseline Detection:** The system is measuring the light absorbance of the used solvents (A, B, and modifier) for the whole detector range. During the gradient run, the baseline is subtracted from the signal.
- **Baseline Flush:** After baseline detection, the system is flushed with the solvent mix used at the start of the gradient.
- **Gradient:** The system is running a purification.
- **Line Flush, Purge, and Detector Flush:** At the end of a run, i.e. after the gradient purification stage is completed or ended by the user, the system performs the flushes that are enabled in the system settings (see page 27) and a system decompression (purge).
- **Finished:** The purification run was completed or ended/aborted by the user.
- **Failed:** The purification run failed.

Manual UV Zero

During the gradient run, it is possible to manually set the current UV absorbance level to zero AU by pressing in the chromatogram (see Figure 30). This feature can be enabled/disabled in the system settings; see page 27.

Note: The button is only enabled when **UV Baseline Correction** is turned off in the run setup.

Start and End an Isocratic Segment

At any time during the gradient run, you can start an isocratic segment by enabling the **Hold** option in the chromatogram (see Figure 30). End the segment by disabling the option.

Add, Empty, and Replace Racks During the Run

Note: To add/remove racks during a run, the run must be paused.

If more fractions are to be collected than can fit in the available rack(s), the system automatically pauses, the collection arm returns to the home position (the inner right corner), and you are prompted to load and/or assign more racks to the run.

To assign a rack to the run, expand the **Rack** panel and set the check box in front of the rack.

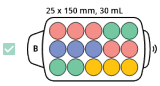
Note: Rack sharing with another run is only possible at the start of a run; see “Rack Sharing” on page 12.

Empty a Rack

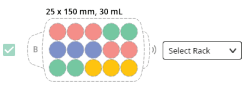
When a Selekt rack that has been used in previous run(s) is removed from the system and then reinserted, it is automatically cleared and enabled for the run in progress.

When a Selekt rack that has been used for the run in progress is removed from the system and then reinserted, it is not cleared automatically. To clear the rack, press **Empty** in the **Rack** panel.

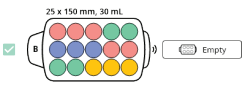
Note: If the RFID reader is disabled in the system settings, all racks have to be manually cleared in the **Rack** panel.



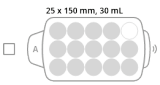
Rack has been used by the run in progress.



Rack has been removed.

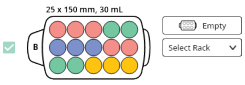


Rack has been reinserted. If all vessels are empty, press **Empty**.

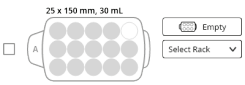


Rack was used in a previous run or runs. When removed and then reinserted, it is automatically emptied in the software.

Table 1. Unload and empty a rack when the RFID reader is enabled, system paused.



Rack B has been used by the run in progress and Rack A was used in a previous run or runs.

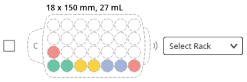


When replacing all vessels with empty ones, press **Empty**.

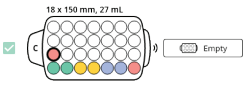
When replacing the rack with another type of rack, select the correct type from the **Select Rack** drop-down list.

When removing the rack and leaving the rack position empty, select **None** from the **Select Rack** drop-down list.

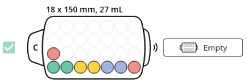
Table 2. Unload and empty a rack when the RFID reader is disabled, system paused.



Rack has been removed.



Rack reinserted before the run is resumed. Collection will be resumed in the vessel with thicker border. If all vessels are empty, press **Empty**.



Rack reinserted after the run was resumed. Empty vessels cannot be used. If all vessels are empty, press **Empty**. The rack can then be reused.

Table 3. Unload the rack in use when the RFID reader is enabled, system paused.

Resume the Run

Before you resume the run, ensure that the setup in the **Rack** panel corresponds to what is loaded onto the collection bed.

The system uses the assigned racks in alphabetical order in regard to their positions on the tray. Collection will be resumed in the vessel that is highlighted with a thicker border in the **Rack** panel; see Figure 31.

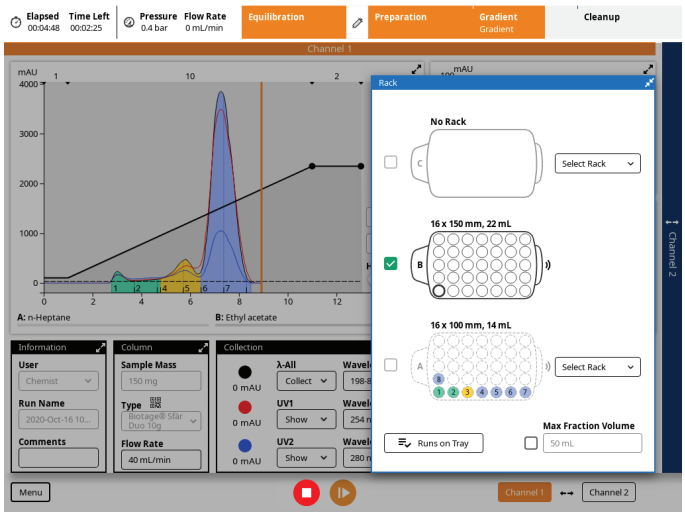


Figure 31. The Rack panel. Rack A is used in the current run but has been removed, and rack B is assigned to the run but has not yet been used. If the run is resumed without rack A being in position, the collection will be resumed in rack B.

Manually Fractionate

At any time during the gradient run, you can switch to a new collection vessel by pressing in the chromatogram.

Line Flush, Decompression, and Detector Flush

At the end of a run, i.e. after the gradient purification stage is completed, the system performs a line flush (if enabled), system decompression (purge), and a detector flush (if enabled). To enable or disable flushes and specify whether enabled flushes are collected or not, see page 27.

Auto Extend

If the collection criteria are still met (any signal is above threshold level) when the system reaches the end of a purification, the system extends the gradient purification stage of the run with 25% of the total gradient length using the final conditions of the run.

Pause, End, or Abort a Purification

Note: Pausing a purification may cause gradient inconsistency due to heat, solvent and sample diffusion, etc.

Pause and Resume a Purification Run

1. To pause the purification in progress, press .
   The collection arm returns to its home position (in the inner right corner) and the system is paused.
2. To resume the run from the point at which it was paused, press .

End the Equilibration Step or End or Abort the Purification Run

1. Press . The collection arm returns to its home position (in the inner right corner) and the system is paused.
2. Press .
3. When the **System Paused** dialog opens, select one of the available options:
   - **Skip Equilibration:** End the equilibration step and move on to the gradient.
   - **Abort:** End the purification run without performing any flushes.
   - **Cleanup:** End the purification run and perform the flushes that are enabled in the system settings and a system decompression (purge).

Edit a Purification

Edit on the Fly

The following run parameters can be changed without pausing the purification run:

- The run comment in the **Information** panel.
- The flow rate in the **Column** panel.
- All collection parameters in the **Collection** panel except for the UV baseline correction; see “Specify the Collection Parameters” on page 11.
- The gradient except for adding new solvent combinations.
- The modifier percentage.

All changes except for changes to the gradient are instant. When editing the gradient, the modified gradient is purple and the ongoing gradient is black (see Figure 32). The modified/purple gradient is applied when you press .

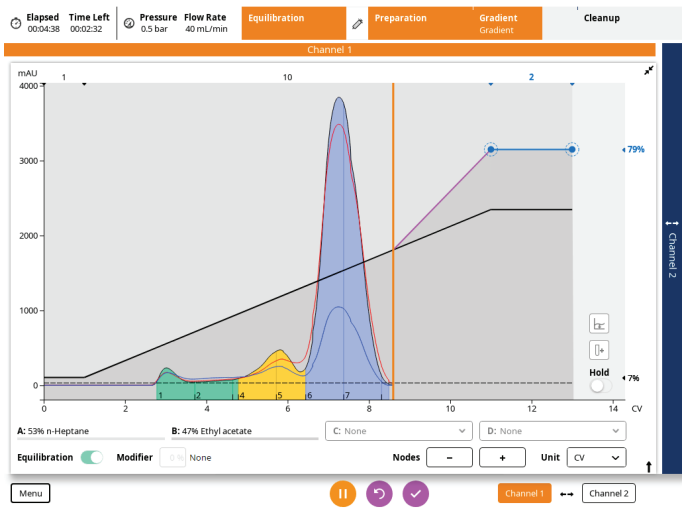


Figure 32. When editing the gradient while the system is processing, the modified gradient is purple and the ongoing gradient is black. The modified/purple gradient is applied when you press .

Pause to Edit a Purification in Progress

With the system paused, it is not only possible to change all the run parameters that can be changed without pausing (see “Edit on the Fly” above), but it is also possible to add new solvent combinations to the gradient and change the **Max Fraction Volume** setting in the **Rack** panel.

1. Press . The collection arm returns to its home position (in the inner right corner) and the system is paused.
2. Edit the run settings; see “Set Up a Purification” on page 8. To undo all changes, press .

   Note: To add a solvent combination to the gradient, expand the chromatogram to full size by pressing .
3. To apply the changes and resume the run, press .

Confirm Cleanup

If the **Confirm Cleanup** option is enabled on the system, the **Gradient Run Completed** dialog appears before cleanup is performed, giving the user the option to manually extend the run (see Figure 33). To extend, press **Extend Run**, edit the run settings, and then resume the run. By default the gradient is extended with 25% of the total gradient length using the final conditions of the run.

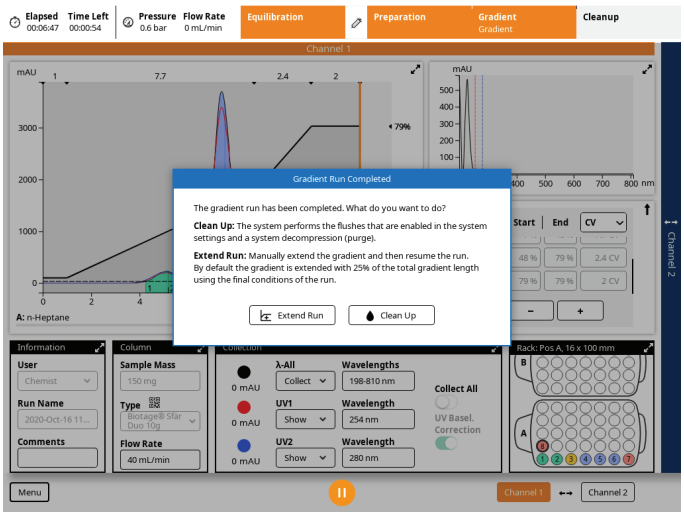


Figure 33. If the Confirm Cleanup option is enabled on the system, the Gradient Run Completed dialog appears before cleanup is performed, giving the user the possibility to extend the run.

Unload a Purification

Warning

» Never flush or purge the system without a column mounted or the column inlet and outlet tubing coupled together, on both channels.

Flush the Column with Air

Empty the column of remaining solvents using the air flush feature; see page 24.

Purge the Column

Any remaining pressure after a purification can be released using the purge feature; see page 24.

Unload the Run

When the purification is finished, unload the column and rack(s). To avoid leakage, plug the column inlet and outlet fittings and couple the column inlet and outlet tubes together (see Figure 34).

Remove Racks in the Software

When the RFID reader is not enabled in the system settings (see page 27), racks that are unloaded have to be removed manually in the software by selecting **None** in the corresponding **Select Rack** drop-down list.

Figure 34. When a run is finished, couple the column inlet and outlet tubes together.

Flush the System

If the last purification of the day is performed with a halogenated solvent (e.g. DCM), we recommend that you assign methanol or a similar solvent to the inlet line used with the halogenated solvent (see page 7) and flush with at least 30 mL (see page 23).

Shut Down the System

Warning

» Failure to perform an orderly system shutdown may result in user data corruption and/or remaining pressure.

An orderly system shutdown helps prevent data corruption. For critical applications, the use of a suitable Uninterruptable Power Supply (UPS) may help avoid data loss during a power outage.

1. When the system is not processing, press **Menu, Shut Down**, and then **Yes** to confirm.
2. When the message saying it is safe to turn off the system appears on the touch screen, turn off the system. The power switch is located on the left side of the system; see Figure 35.
3. If desired, unplug the power cord from the power outlet.

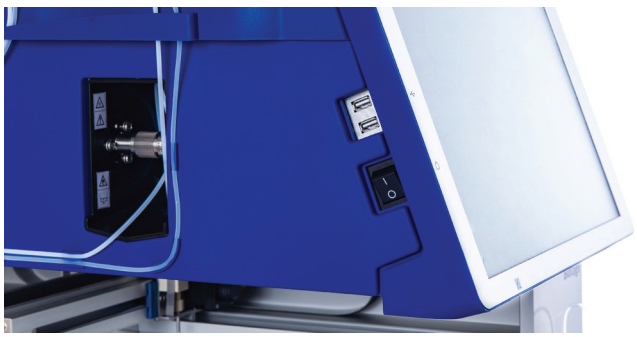


Figure 35. The power switch is located on the left side of the system.

Results

The reports for the purifications that have been processed on the system can be accessed by pressing **Menu** and then **Results**.

The full Selekt report contains the chromatogram, the gradient (in the chromatogram and a table), TLC data (if entered), run parameters, rack information, system information, and the run log. It is also possible to add analysis pictures and a report note after the run has been completed.

If desired, you can create a customized report where you can disable some of the report content. Whether the full Selekt report or the customized version will be displayed in the **Results** view, depends on the setting for the **Apply Report Setup** option.

The result can be analyzed by selecting the report and pressing **Analysis**. The default view shows the chromatogram and rack(s) and can be used for finding fractions. A second view, which requires a Spektra software license, shows the chromatogram and the absorbance spectrum for the whole detector range for a selected point in the chromatogram. This optional view can be used for spectrum analysis.

Search the Results

Search Criteria

The reports can be filtered on user name, chemistry type (normal or reversed phase), and run date; see Figure 36. To clear all filters, press ✕. The reports are listed in chronological order with favorites at the top. Add a report to your favorites by pressing the star to the left (★ = favorite).

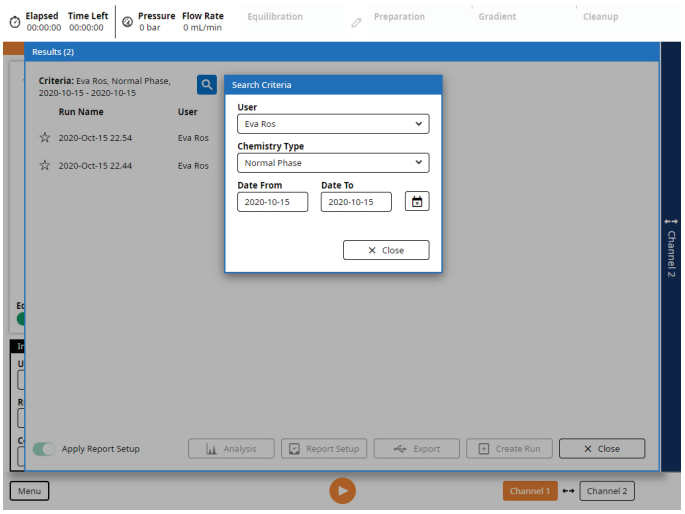


Figure 36. It is possible to search for runs performed by a specific user at a specific date or range of dates. The reports can also be filtered on chemistry type, normal or reversed phase.

Results Based on Column ID

If you scan the Biotage columns using the QR reader, the system will be able to trace all runs performed using a specific column based on its ID.

To see all runs that have been performed using a column:

1. Scan the column.
2. Expand the **Column** panel and press **Previous Runs**. The **Results** view opens showing all runs performed using the scanned column.

Results Based on Rack ID

Reports for runs that are available on the collection bed can quickly be accessed by doing the following.

1. Press ▭ in the **Results** view. The rack filter is opened in the lower left corner; see Figure 37 on page 20.

   Note: The rack filter can also be opened by expanding the **Rack** panel and pressing **Runs on Tray**.

2. In the rack filter, the following information and options are available:
   - **Show Report(s):** The rack contains fractions from a run (or up to five runs if rack sharing is allowed) that has/have been completed. Press the button to view the report(s). If several racks were used in a run, the selected rack will be highlighted in the displayed report (see Figure 37 on page 20).
   - **In progress:** The rack is being used by the run in progress, i.e. the report is not yet available.
   - **Empty:** The rack is empty, i.e. there is no report available.
   - **Show Info:** The rack was last used on another system i.e. there is no report available. Press the button to view the system's ID. The system ID can be found in the **About** view.

When a Selekt rack is unloaded after a run has been completed, it is automatically cleared in the software (in the **Rack** panel) when returned to the system. Still, as long as the rack is not used for a new run (or it has been cleared by the user pressing **Empty** in the **Rack** panel) and the RFID reader is enabled, the system keeps the information on which run(s) that the rack was last used for. This information can be accessed by using the rack filter as described above.

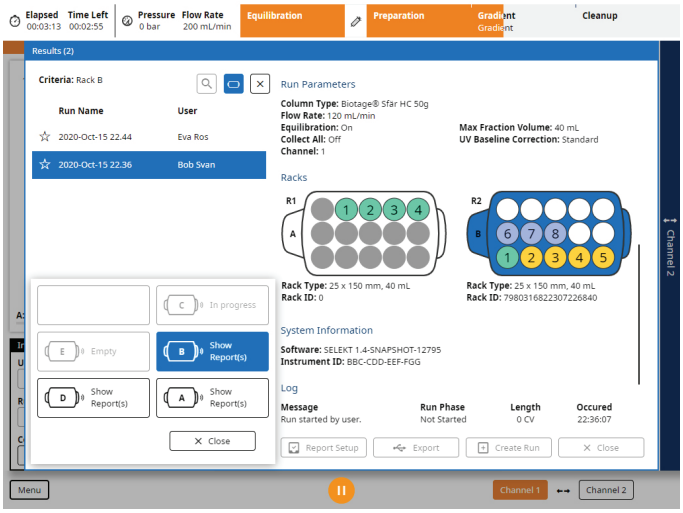


Figure 37. The rack filter in the Results view. The selected rack (in position B) has fractions from two different runs, i.e. two reports are listed. As two racks were used in the selected run, the selected rack is highlighted in the report. (The example shows a system with an extended collection bed and rack sharing enabled.)

Analysis of the Result

Analyze the result by selecting the report in the **Results** view and pressing **Analysis**.

Find Fractions

In the default **Analysis** view, the chromatogram and rack(s) are shown (see Figure 38). The chromatogram can be zoomed using the pinch-to-zoom feature, and the signals and UV baseline correction (if used) can be disabled and enabled individually by pressing **Options**. Use this view to find your fractions.

Fractions can be located by matching their colors and numbers in the chromatogram with the vessel colors and numbers in the rack(s). Fractions from the same peak have the same color. Fractions only collected due to the **Collect All** option are gray.

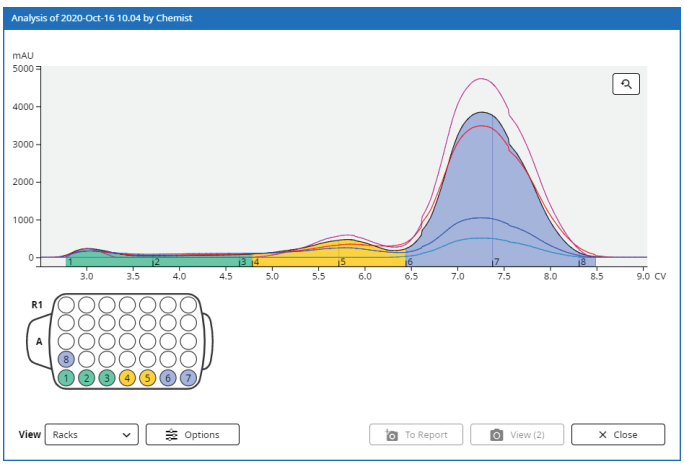


Figure 38. The Analysis view showing the chromatogram and the rack(s).

Analyze the Spectrum

If a Spektra software license is installed, it is possible to switch from viewing the rack(s) to viewing an absorbance spectrum by selecting **Spectrum** from the **View** drop-down list (see Figure 39). In this view, you can:

- Drag the line in the chromatogram to the position/time for which you want see the absorbance spectrum.
- Drag the λ1 and λ2 lines to the desired wavelengths in the spectrum. The curves for the extra wavelengths will be added to the chromatogram.
- Zoom the chromatogram using the pinch-to-zoom feature. It is possible to zoom in one direction (X or Y) or both directions (X and Y). To reset the zoom, press 🔍.
- Enable and disable signals and the UV baseline correction (if used) individually by pressing **Options**; see Figure 40.

  Note: Toggling the **UV Baseline Correction** option only affects the spectrum and the λ1 and λ2 signals.

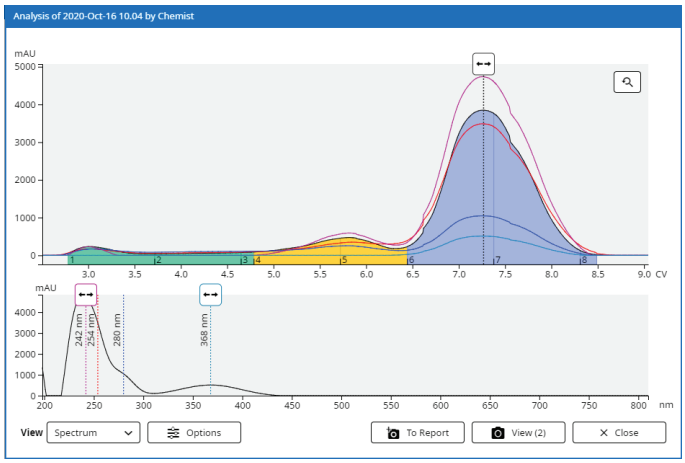


Figure 39. The Analysis view showing the chromatogram and the absorbance spectrum. Requires a Spektra software license.

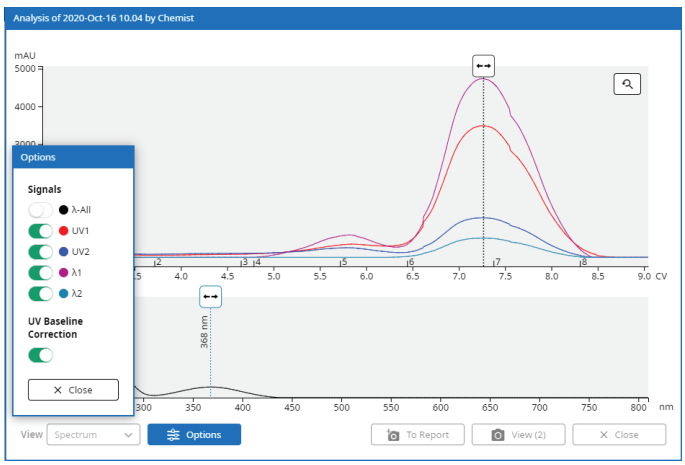


Figure 40. The Options dialog.

Add Analysis Pictures to the Report

It is possible to add one or more pictures of the chromatogram with a changed zoom factor and/or enabled/disabled signals and UV baseline correction to the report. If a Spektra software license is installed, the spectrum is also included in the pictures.

To add a picture, press **To Report** in the racks or spectrum view (see Figure 38 and Figure 41). To view the pictures that have been taken, press **View**. To delete a picture, select it in the **Pictures in Report** dialog and press **Delete** (Figure 41).

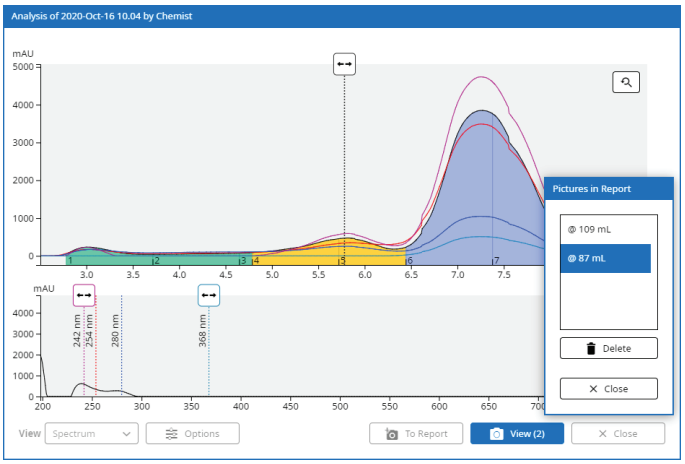


Figure 41. The Pictures in Report dialog.

Customize the Report

Customize a report by selecting it in the **Results** view and pressing **Report Setup.** In the **Report Setup** view (see Figure 42), the following content can be enabled or disabled in the report. The changes are shown in real time.

- **λ-All:** The lambda all signal in the chromatogram.
- **UV1:** The UV1 signal in the chromatogram.
- **UV2:** The UV2 signal in the chromatogram.
- **EXT:** The external detector signal in the chromatogram.
- **Gradient:** The gradient in the chromatogram.
- **Analysis:** Pictures taken in the analysis view; see "Add Analysis Pictures to the Report" above.
- **Gradient Table:** The gradient table.
- **TLC Data:** The TLC data.
- **Racks:** Rack illustrations with the fractions.
- **Channel:** The channel that was used for the run (1 or 2).
- **Comments:** The comments entered before the run was started and during the run.
- **Report Note:** The report note that can been entered in the **Report Note** field in the **Report Setup** view.
- **Log:** The run log.
- **Unit:** The length unit.

Note that the full Selekt report is not overwritten and can always be accessed by turning off the **Apply Report Setup** option.

Add a Report Note

Add a report note by selecting the report and pressing **Report Setup.** In the **Report Setup** view, enter the run note in the **Report Note** field and press **Save** (see Figure 42).

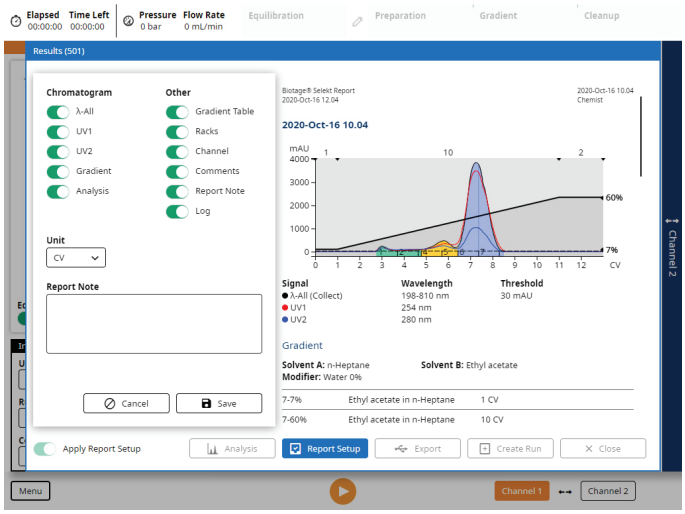


Figure 42. The Report Setup view.

Export the Report

With your system connected to an e-mail server, the report can either be sent from the system in an e-mail or exported to a USB memory device. If auto send of reports is enabled in your user account, the system will automatically send the report when your run is completed.

Note: When exporting a report, you also get two result files, one XML file with all raw run data and one SPECTRUM file with the raw 3D UV spectrum.

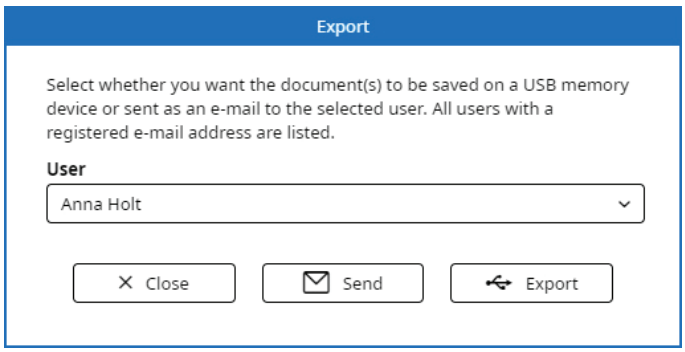


Figure 43. When the system is connected to an e-mail server, you can choose whether you want to send the report in an e-mail or export it to a USB memory device.

Export the Report to a USB Memory Device

1. Connect the USB memory device to a USB port on the left side of the system.
2. Select the desired report in the **Results** view.
3. Select whether to export the full Selekt report or a customized version by turning the **Apply Report Setup** option off or on. To customize the report, see page 21.
4. Press **Export**.
5. If the **Export** dialog opens, press **Export** again. The report is saved as a PDF file at \biotage\selekt*user name*. The result files are saved at \biotage\selekt\results.
6. When the export has been completed (), remove the USB memory device.

Send the Report in an E-mail

Note: This option is only available when the system is connected to an e-mail server.

1. Select the desired report in the **Results** view.
2. Select whether to export the full Selekt report or a customized version by turning the **Apply Report Setup** option off or on. To customize the report, see page 21.
3. Press **Export**.
4. In the **Export** dialog, select your user name in the **User** drop-down list and press **Send**.

   Note: Only users with a registered e-mail address are listed in the **User** drop-down list.
5. When the e-mail has been sent (), press **Close**.

Base a New Run on a Previous Run

To create a new run with the same purification parameters as in a previous run:

1. Select the run to base the next run on.
2. Press **Create Run** and then select **Channel 1** or **Channel 2** in the appearing dialog.

Flushes and Purge

Warning

- Never flush the system without a column mounted or the column inlet and outlet tubing coupled together, on both channels.
- Always use the purge feature to release any remaining pressure in a column after a flush operation.
- To prevent leakage, visually check all tubes and fittings before flushing the system.

Enter the **Flushes and Purge** view (see Figure 44) by pressing **Menu** and then **Flushes and Purge**.

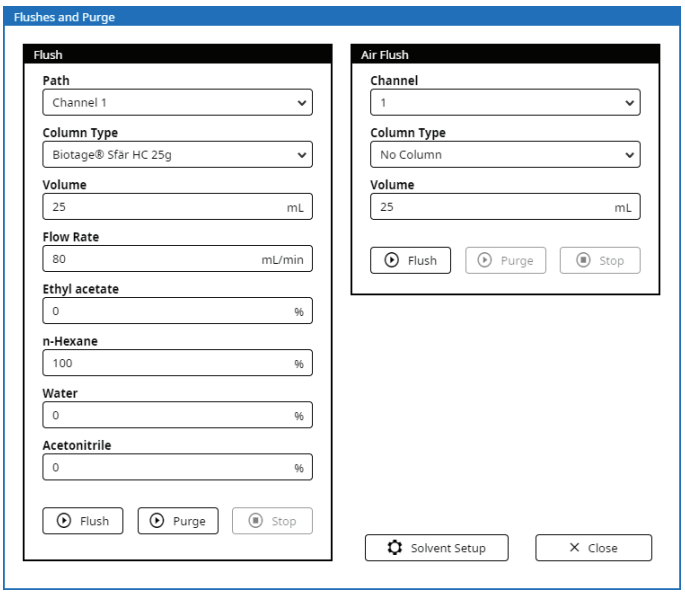


Figure 44. The Flushes and Purge view.

Flush

Use the flush feature to for example:

- Clean the flow path. If the last purification of the day is performed with a halogenated solvent (e.g. DCM), we recommend that you assign methanol or a similar solvent to the inlet line used with the halogenated solvent (see page 7) and flush with at least 30 mL.
- Check for leaks in the tubing and fittings.

To flush the system:

1. Select the path to be flushed from the **Path** drop-down menu. To flush the flow path except column channel, select the bypass option. To flush a column channel, select a channel option. See a schematic of the flow paths in Figure 45.
2. If a channel option was selected, select the column mounted from the **Column Type** drop-down menu. If selecting “No Column”, ensure that the column inlet and outlet tubing are coupled together.
3. Ensure that the inlet and outlet tubing on the other (unused) channel are coupled together.
4. Enter the flush volume in the **Volume** text box.
5. Enter the flow rate in the **Flow Rate** text box. Note that maximum flow rate applied depends on the maximum pressure setting of the column type (if used) and the maximum aspiration rate(s) for the used solvent(s).
6. Enter the percentage to be used of each solvent connected to the system. If several solvents are listed and you only want to use one solvent, enter “100” for that solvent and “0” for the other ones.
7. Ensure that a sufficient quantity of each selected solvent is present in the solvent reservoirs.
8. Ensure that the waste reservoir has sufficient capacity for the flush.
9. Press **Flush**.
10. If a column was used, press **Purge** to release any remaining pressure.

Flow Paths

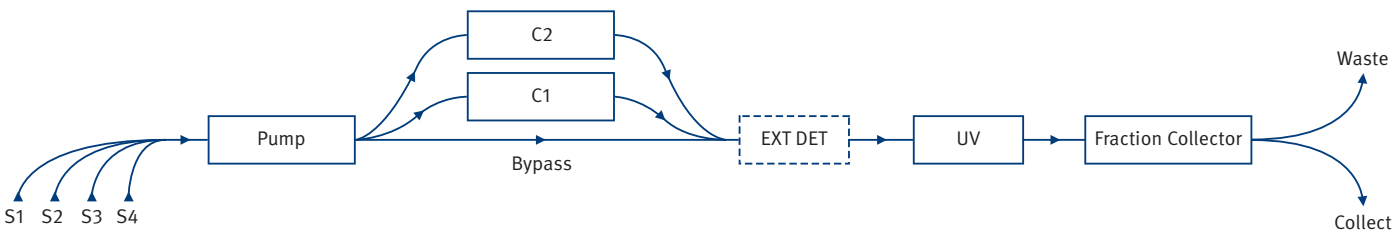


Figure 45. The flow paths in the system.

Air Flush

Use the air flush feature to e.g. empty a column of remaining solvents after a purification run.

1. Select the channel to be flushed from the **Channel** drop-down menu.
2. Select the column mounted on the selected channel from the **Column Type** drop-down menu. If selecting "No Column", ensure that the column inlet and outlet tubing are coupled together.
3. Ensure that the inlet and outlet tubing on the other (unused) channel are coupled together.
4. Enter the air flush volume in the **Volume** text box. The default volume is the recommended volume for the selected column, if selected.
5. Press **Flush**.
6. If a column was used, press **Purge** to release any remaining pressure.

Purge

Use the purge feature to manually release any pressure in the column.

1. Select the channel to be purged from the **Channel** drop-down menu.
2. Select the column mounted on the selected channel from the **Column Type** drop-down menu.
3. Ensure that the inlet and outlet tubing on the other (unused) channel are coupled together.
4. Press **Purge**. Note that the current pressure is displayed in the top left corner of the software.

Data Administration

Note: Only users with system owner privilege can administrate column types, solvents, rack types, and user accounts.

Administrate Column Types

The software comes with a preconfigured list of column types and their settings. To add, edit, and delete user-defined column types, press **Menu**, **Data Administration** and then **Column Administration** (see Figure 46).

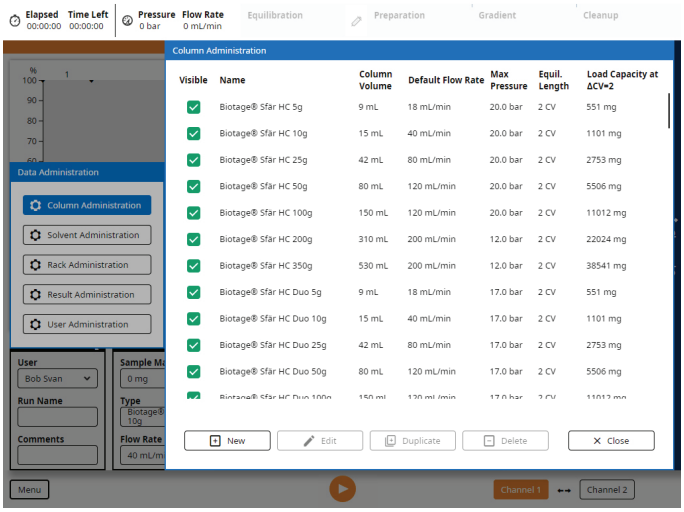


Figure 46. The Column Administration view.

Column Parameters

Warning

- Always use Biotage Safety Valve (P/N 417115SP) when processing columns or combinations (e.g. column and dry load vessel) with a total CV larger than 0.8 L.
- Never use columns or combinations with a total CV larger than 3.1 L.
- Never exceed the maximum pressure or flow rate for the column.

Note: The preconfigured Biotage column types cannot be edited or deleted. We recommend that you disable **Visible** for any column that will not be used.

- **Visible:** If enabled, the column type is available for use.
- **Name:** The name of the column type.
- **Column Volume:** The column volume (CV) in mL.
- **Default Flow Rate:** The default flow rate in mL/min.
- **Max Pressure:** The safety pressure in bar or psi (see page 27). If reached, the flow rate will be reduced to keep the pressure at this level.
- **Equilibration Pressure:** The maximum pressure during the equilibration, in bar or psi (see page 27). If reached, the flow rate will be reduced to keep the pressure at this level.
- **Equil./Equilibration Length:** The equilibration length in CV.
- **Equilibration Flow Rate:** The equilibration flow rate in mL/min.
- **Air Flush Length:** The air flush length in CV. This value will be used as the default volume for the air flush feature (see page 24).
- **Load Capacity at ΔCV=2:** The approximate load capacity when delta CV is 2.
- **Chemistry Type:** The type of chromatography the column is used for, normal or reversed phase.
- **Part Number:** The manufacturer's part number.

Administrate Solvents

The software comes with a preconfigured list of solvents and their settings. To add, edit, and delete user-defined solvents, press **Menu**, **Data Administration** and then **Solvent Administration** (see Figure 47).

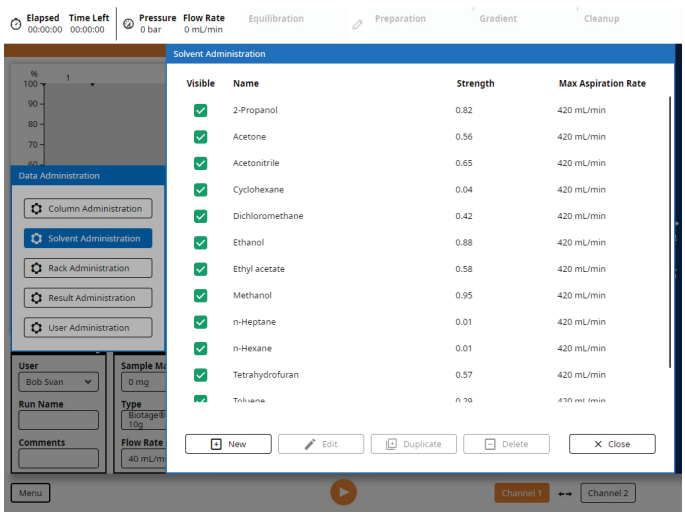


Figure 47. The Solvent Administration view.

Solvent Parameters

Note: The preconfigured Biotage solvents cannot be edited or deleted. We recommend that you disable **Visible** for any solvent that will not be used.

- **Visible:** If enabled, the solvent is available for use.
- **Name:** The solvent name.

- **Strength:** The solvent strength value, a value between 0 and 1.[1,2]
- **Max Aspiration Rate:** The maximum rate at which the solvent can be drawn into the pump during the fill stroke, in mL/min. To achieve the system's maximum flow rate (300 mL/min), use 420 mL/min. If necessary, reduce the flow rate to avoid cavitation.

[1] Neue U. D. HPLC Columns Theory, Technology, and Practice, Wiley-VCH (1997).

[2] Dean J. A. Lange's Handbook of Chemistry, 15th edition, McGraw-Hill (1999).

Administrate Racks

The software comes with a preconfigured list of Biotage racks and their settings. If desired, it is possible to lower the vessel volume for these racks. To change, press **Menu**, **Data Administration** and then **Rack Administration.**

Rack Parameters

Note that only the vessel volume can be changed.

- **Name:** The name of the rack type.
- **Columns:** The number of vessel columns in the rack.
- **Rows:** The number of vessel rows in the rack.
- **Vessel Volume:** The vessel/fractionation volume in mL. To reset to the predefined volume, press **Reset** in the **Edit** dialog.

Administrate Results

Note: Deleted results cannot be recovered.

One, several, or all results can be selected and deleted in the **Result Administration** view. To access the view, press **Menu, Data Administration** and then **Result Administration.** For help finding the results to be deleted, see "Search the Results" on page 19.

Administrate User Accounts

To add, edit, and delete user accounts, press **Menu**, **Data Administration** and then **User Administration** (see Figure 48).

Note: The first time you log into the Data Administration view, log in using the user account "System Owner" and the password "1234". Before you log out, it is strongly recommended that this password is changed.

User Parameters

- **Visible:** If enabled, the user account is available for use.
- **Name:** The user name, which will be used in the user name selection boxes as well as in the purification reports. If you change the user name, all reports associated with the user will be updated. If deleting a user, their reports will still be accessible but they will not state the user name.
- **Password:** It is possible to password-protect a user account with System Owner privilege. The password will be used when entering the Data Administration, System Settings, and Maintenance views.
- **Privilege:** A user can have chemist or system owner privilege:
  - **Chemist:** The user can set up and run purifications, and view results.
  - **System Owner:** The user has both the chemist privilege (see above) and access to the Data Administration view (see page 25), System Settings view (see page 27) and Maintenance view (see page 30).
- **E-mail Address:** The user's e-mail address. If the system is connected to an e-mail server, this address can be used for e-mail notifications, auto-send of reports, and export of reports and current system log.
- **Auto Send Report:** If enabled and the system is connected to an e-mail server, the user will automatically receive the reports for runs performed by the user when completed.
- **E-mail Notifications:** If enabled and the system is connected to an e-mail server, e-mail notifications will be sent when user interaction is required for runs performed by the user, e.g. when a rack has to be replaced, a solvent needs to be replenished (if monitoring is enabled), a waste reservoir needs to be emptied (if monitoring is enabled), and a leak is detected by the optional Biotage Solvent Detector.

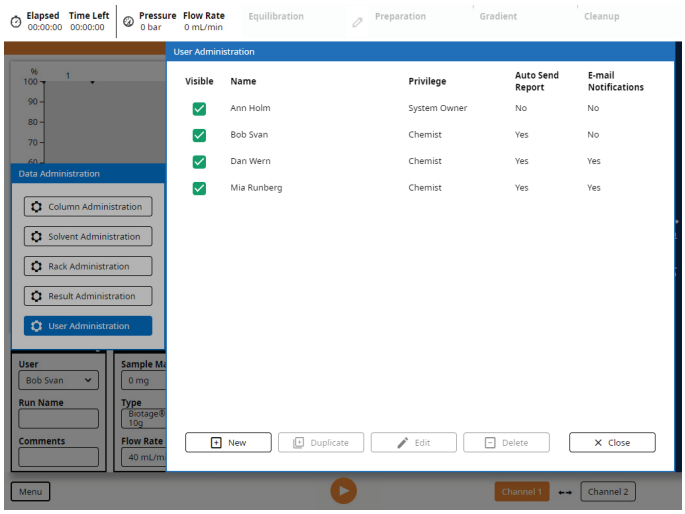


Figure 48. The User Administration view.

System Settings

Note: Only users with system owner privilege can change the system settings.

Enter the software's settings view (see Figure 49) by pressing **Menu** and then **System Settings**. The following system settings are available.

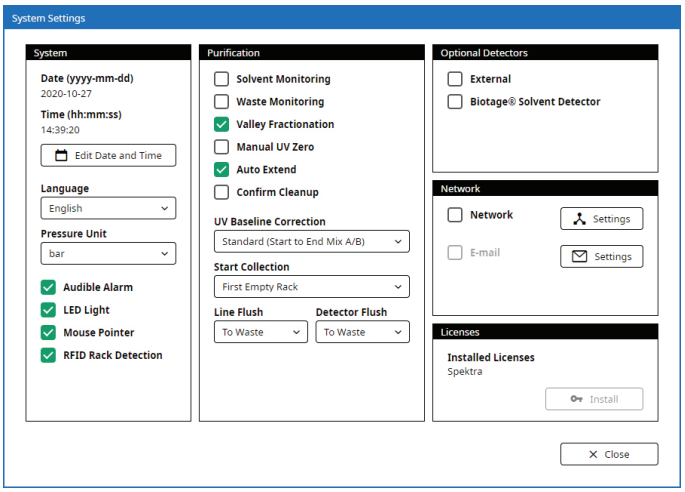


Figure 49. The System Settings view.

System

- **Date (yyyy:mm:dd):** Setting the date correctly ensures an accurate date stamp for your purification reports.*
- **Time (hh:mm:ss):** Setting the time correctly ensures an accurate time stamp for your purification reports.*
- **Language:** The language to be used in the software's purification mode. English is always used in the Data Administration, System Settings, and Maintenance views, and in the reports.
- **Pressure Unit:** The unit to be used by the system, bar or psi.
- **Audible Alarm:** If enabled, a warning will sound when an error has occurred.
- **LED Light:** If enabled, the light strip underneath the touch screen is lit when the system is on. The color indicates the status of the system; see "Lighting" on page 3.
- **Mouse Pointer:** When connecting a mouse to one of the USB ports, you need to enable the mouse pointer.
- **RFID Rack Detection:** If enabled, Selekt racks are automatically identified by the system when placed on the collection bed.

* The system has to be restarted for the new configuration to take effect.

Purification

Note: Collected flushes are added to the gradient in the report.

- **Solvent Monitoring:** If enabled, the system will notify the user when a solvent level is below 20% of the set capacity (see Figure 50). When 10% is left, the system will be paused and the user will be prompted to refill the solvent.
- **Waste Monitoring:** If enabled, the system will notify the user when the waste level is above 85% of the set capacity (see Figure 50). When the waste level is at 95% of the set capacity, the system will be paused and the user will be prompted to empty the waste reservoir.

Figure 50. Level notification for waste and solvent.

- **Valley Fractionation:** If enabled, fractionation will occur when a valley is detected between two peaks in one of the signals in the chromatogram.
- **Manual UV Zero:** If enabled, it is possible to manually set the current UV absorbance level to zero AU during the gradient run.

  Note: The system automatically performs a UV Zero using the initial gradient mix before the run is started.
- **Auto Extend:** If enabled and the collection criteria are still met (any signal is above threshold level) when the system reaches the end of a purification, the system extends the gradient purification stage of the run with 25% of the total gradient length using the final conditions of the run.
- **Confirm Cleanup:** If enabled, the user will get the option (through a popup dialog) to manually extend the run before the system performs the flushes that are enabled in the system settings and a system decompression (purge).
- **UV Baseline Correction:** Whether the baseline correction is performed using the initial gradient mix to the end mix A/B (**Standard**) or using the initial gradient mix to 100% solvent B (**Full**).
- **Start Collection:** Whether collection is to be started in the **First Empty Vessel**, **First Empty Row**, or **First Empty Rack**. The first two options enable rack sharing between runs. For more information, see "Rack Sharing" on page 12.
- **Line Flush:** If enabled, the system flushes the column inlet line at the end of the run using the run's weakest solvent. Select whether to **Collect** the flush (using the same collection criteria as during the gradient run) or send it **To Waste**.

  Note: If the automatic line flush is disabled (**Off**), ensure to flush the column flow path manually before each run.

» **Detector Flush:** If enabled, the system flushes the internal detector and any external detector connected to the system at the end of the run using the run's strongest solvent. Select whether to **Collect** the flush (using the same collection criteria as during the gradient run) or send it **To Waste**.

Note: We recommend that the detector flush is enabled. A contaminated detector flow cell has decreased transmissivity, which causes increased noise levels, decreased response, and difficulties performing UV Zero.

Optional Detectors

» **External:** Enable this option when an external detector is connected to the system. The following parameters are available for the external detector:

  » **Tube Volume:** Enter the volume of the additional tubing and/or flow cell of the external detector in the **Tube Volume** text box. This amount of solvent will be added to the automatic flushes.

  » **Max Flow Rate:** Enter the maximum flow rate that can be used with the external detector. This will depend on the back pressure generated in the detector and its tubing, and the technical specification of the detector.

» **Biotage® Solvent Detector:** Enable this option when the optional solvent detector from Biotage is connected to the system.

Network

Configure a Network Connection

1. Connect a shielded category 5 TP cable between the **ETH** port at the rear of the system and your network.

   Note: Do not connect the network cable to the **AUX** port.

2. Enable the **Network** option in the **Network** field.
3. Press the corresponding **Settings** button and enter the required network settings. Please contact your IT department for help with entering the correct settings for your network.

   Note: The **Host Name** will be used to identify the system on your network.

4. When done, press **Save.**
5. In the **Restart Required** dialog, press **Shut Down**.

   Note: The system has to be restarted for the new network settings to take effect.

6. When the message saying that it is safe to turn off the system appears on the screen, turn off the system. The power switch is located on the left side of the system.
7. Turn on the system.

Configure E-mail Server Connection

1. Configure a network connection; see above.
2. Log into the system settings view by pressing **Menu** and then **System Settings**.
3. Enable the **E-mail** option in the **Network** field.
4. Press the corresponding **Settings** button and enter the required e-mail settings. Please contact your IT department for help with entering the correct settings for your e-mail server.

   Note: The **Sender E-mail Address** is the address that is shown as the sender when receiving e-mails from the system.

5. Test the connection to the e-mail server:
   a. Press **Test E-mail**.
   b. In the **Test E-mail** dialog, select your user account from the **User** drop-down list.
   c. If you do not receive a test e-mail, check the network and e-mail settings and the address in the user account.
6. When you have received a test e-mail, press **Save.**

Note: If you disable the **Network** and **E-mail** options, the latest settings are saved until enabled again.

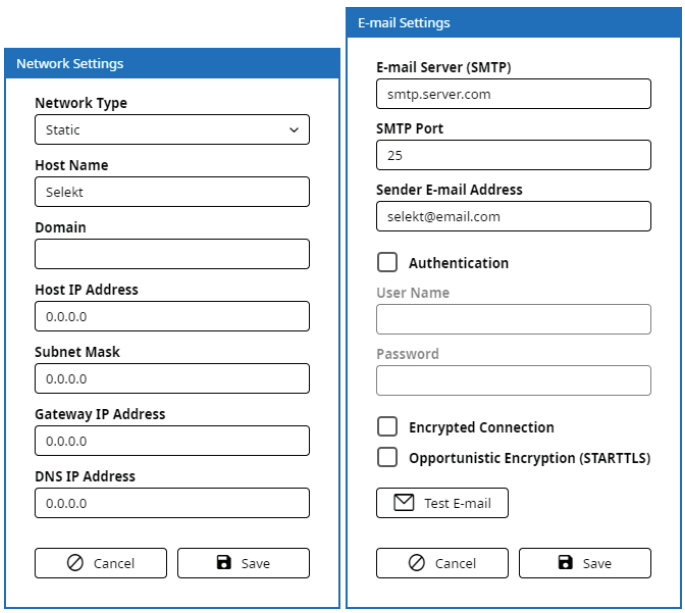


Figure 51. The Network Settings and E-mail Settings dialogs.

Licenses

To enable λ-all detection mode and baseline correction, you need a Spektra software license. To purchase a Spektra software license, please contact your local representative.

To install a license:

1. Create a directory called \biotage\selekt\ on a USB memory device and save the license file to this location.
2. Connect the memory device to a USB port on the left side of the system.
3. Press **Install** in the **Licenses** field.
4. When a message saying that the license was successfully installed appears, remove the USB memory device.

Maintenance

Warning

- There are potentially lethal voltages inside the system. Do not remove the cover panels; there are no user serviceable parts inside.
- If the system has been damaged or does not function properly, shut it down immediately and contact Biotage® 1-Point Support™ (www.biotage.com).

Back Up and Restore the System's Database

The system database contains all results and registered solvents, column types, and user accounts.

Note: Restart is required after both backup and restore.

Note: Do not remove the USB memory device until the backup/restore has been completed.

To back up the database:

1. Press **Menu** and then **Maintenance**.
2. Connect an empty memory device to a USB port on the left side of the system.
3. Press **Back Up Database...**. The **Confirm Backup** dialog opens.
4. To confirm backup, press **Yes**.
5. When a message saying that the backup has been completed appears, remove the memory device and press **Shut Down**. The backup file is saved at \biotage\selekt\backup\.

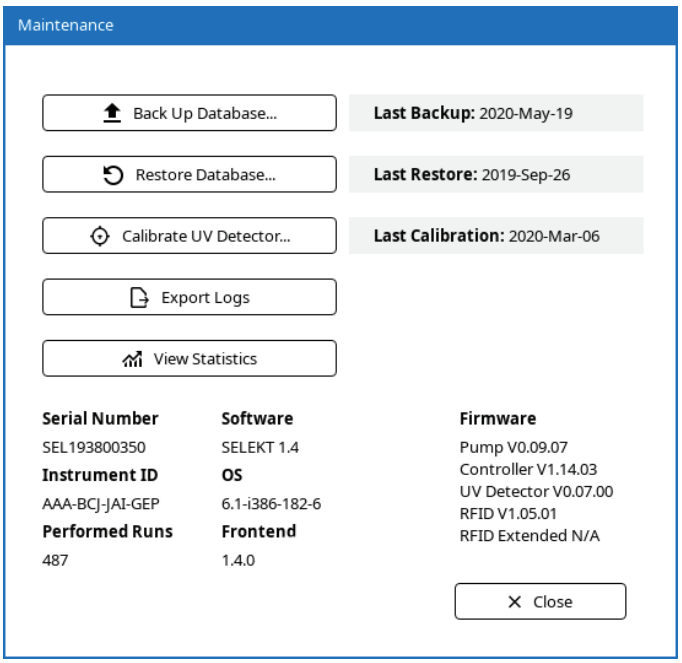


Figure 52. The Maintenance view.

To restore the database:

1. Press **Menu** and then **Maintenance**.
2. Connect the memory device that contains the backup to a USB port on the left side of the system.
3. Press **Restore Database...**.
4. In the **Select Backup File** dialog, select the backup file and press **Restore**. The **Confirm Restore** dialog opens.
5. To confirm restore, press **Yes**.
6. When a message saying that the restore has been completed appears, remove the memory device and press **Shut Down**.

Export System Logs

If your system is connected to an e-mail server, you can either send the system log(s) in an e-mail or export them to a USB memory device. Note that only the current system log is sent with the e-mail while all system logs are exported to the USB memory device.

Export to a USB Memory Device

1. Connect the USB memory device to a USB port on the left side of the system.
2. Press **Menu**, **Maintenance**, and then **Export Logs**.
3. If the **Export** dialog opens, press **Export** again. The documents are saved in a zip file at \biotage\selekt\logs.
4. When the export has been completed (✓), press **Close** and remove the USB memory device.

Send in E-mail

1. Press **Menu**, **Maintenance**, and then **Export Logs**.
2. In the **Export** dialog, select your user name in the **User** drop-down list and press **Send**.

   Note: Only users with a registered e-mail address are listed in the **User** drop-down list.
3. When the e-mail has been sent (✓), press **Close**.

Calibrate the Internal UV Detector

If the internal detector needs to be recalibrated (e.g. when a new flow cell has been installed), use the following procedure.

1. Press **Menu** and then **Maintenance**.
2. Press **Calibrate UV Detector...**. Read and follow the instructions that appear on the screen.

Clean the Exterior of the System

Regular cleaning of the touch screen, if performed properly, extends the touch screen life and reduces wear.

Warning

» When cleaning the touch screen, use only non ammonia-based window cleaner and do not apply the liquid directly to the screen as this could damage electronic components.

Note: Avoid harsh cleaners and chemicals, and moisture getting into the system.

1. Shut down the system as described on page 18.
2. Disconnect the power cord from the power outlet.
3. Clean the touch screen using a clean, non-abrasive, dry cloth. If this does not clean the screen properly, the cloth can be lightly dampened with a non ammonia-based window cleaner. After cleaning, wipe dry with a clean, non-abrasive cloth.
4. Clean the exterior surfaces of the system using a clean, lint-free cloth lightly dampened with water. If required, a small amount of mild soap may also be used. After cleaning, wipe dry with a clean, lint-free cloth.

Clean the Flow Cell of the Internal UV Detector

Warning

» Ultraviolet (UV) light can injure your eyes. Always turn off the system before removing the flow cell. Never have the system turned on when the flow cell is removed or when the retaining nut is loosened.

Note: Always handle the flow cell using gloves and never touch the fiber optics; see Figure 53.

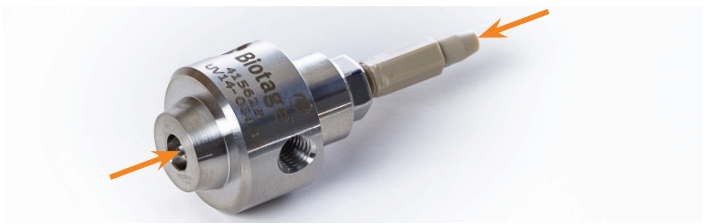


Figure 53. The fiber optics on the flow cell. Do not touch.

Keep the detector flow cell clean and protect it from dust and chemical spills. Particular attention should be paid to prevent the flow cell from leaking.

A contaminated flow cell has decreased transmissivity, which causes increased noise levels, decreased response, and difficulties performing UV Zero.

To clean the detector flow cell:

1. Shut down the system as described on page 18.
2. Remove the flow cell by holding the flow cell with one hand while loosening the retaining nut.
3. Disconnect the inlet and outlet tubing from the flow cell and visually inspect the cell for contamination.

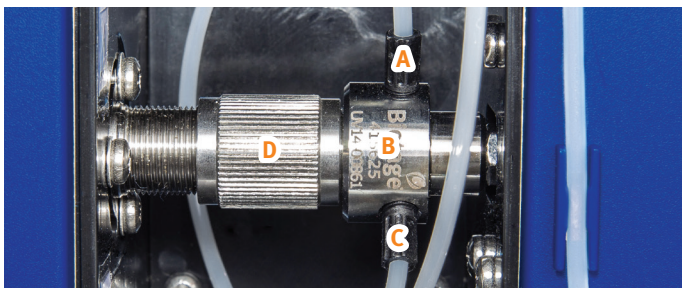


Figure 54. The flow cell of the internal detector. A = flow cell outlet tube, B = flow cell, C = flow cell inlet tube, and D = retaining nut.

4. Flush the flow cell with a series of miscible solvents using the injection maintenance kit supplied with the system. Select the solvents based on the contamination. It is possible to use both organic and inorganic solvents and diluted solutions of acids (e.g. H_2SO_4 or HNO_3 diluted with distilled water in a ratio of 1:20 to 1:10), unless they react with stainless steel, PTFE, or fused silica windows.
5. Visually re-examine cell windows for visible contamination. If contamination is still present, repeat step 4. If you are not able to remove the contamination, we recommend that you replace the flow cell (P/N 415625SP) and recalibrate the UV detector (see page 30).
6. Carefully insert the flow cell and close the retaining nut:
   a. Insert the flow cell cone straight into its housing inside the UV detector; see the highlighted section in Figure 55.
   b. Close the retaining nut. **Tip!** At the last couple of turns, hold the flow cell flat against the retaining nut while closing the nut completely.

   Note: The retaining nut should close with little effort. If it is difficult to close, the flow cell is probably misaligned.
7. Reconnect the tubing to the flow cell.

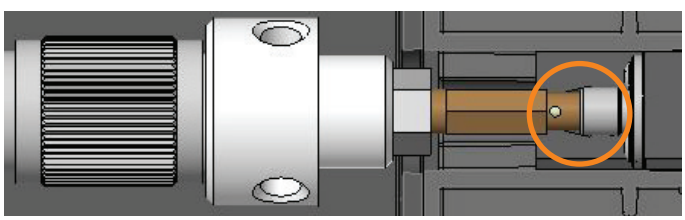


Figure 55. Cross section of the flow cell properly inserted into the UV detector.

Clean or Release Check Valves

Clean the Pump Check Valves

If the last purification of the day is performed with a halogenated solvent (e.g. DCM), we recommend that you assign methanol or a similar solvent to the inlet line used with the halogenated solvent (see page 7) and flush the system with at least 30 mL (see page 23) to rinse the halogenated solvent from the check valves.

Release Stuck Check Valves

Low or inconsistent flow delivery volume and/or superimposed periodic UV or UV-VIS signals can be signs of stuck check valves.

Warning

» When releasing a stuck check valve, there is a risk of a small amount of solvent splashing out.

1. Release the pressure by slowly unscrewing the check valve cap from one of the **CV OUT** valves using the Torx 50 screwdriver supplied with the system; see Figure 56.

Figure 56. Removing the check valve cap from one of the CV OUT valves.

2. Remove the check valve by pushing an unused pipette tip or similar into the check valve and then pulling it out; see Figure 57A.
3. Push on the ball inside the check valve using an unused pipette tip or similar; see Figure 57B. Ensure that the ball moves freely. Otherwise, replace the check valve (P/N 415115SP).
4. Repeat the procedure for the other three check valves.

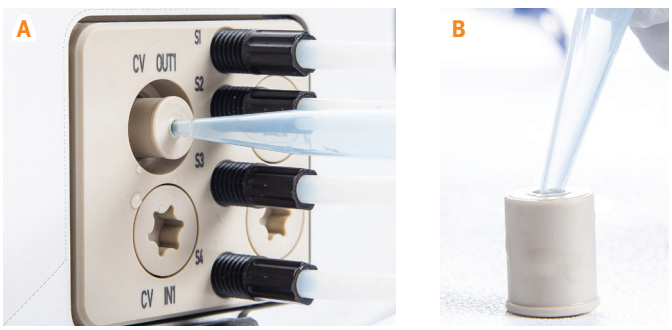


Figure 57. Release stuck check valves.

Manually Change Between Normal and Reversed Phase

To avoid issues during a solvent change, it is necessary to perform the change throughout the entire chromatographic system (i.e. in the reservoir, pump, tubing, and detector).

The procedure is to flush the system (see page 23), with a series of mutually miscible solvents until a gradual change to the new solvent is accomplished. If this procedure is not followed, precipitation may occur not only in the flow cell of the internal detector but also in other parts of the system. For example, to change from organic solvents to aqueous solutions, it is necessary to flush the whole system with acetone or an alcohol.

Leaks

Warning

» Always handle leakage immediately.

» Follow all generally-accepted lab safety procedures and applicable laws and regulations.

» Always follow local and national safety regulations and the solvent manufacturer's safety, handling, storage, and disposal recommendations; refer to the safety data sheets (SDS).

» Electrical equipment can introduce ignition hazards. Ensure that all solvent manufacturers' recommendations are followed with respect to handling, ventilation, and operating environment.

» Personnel working with or near the system must wear protective clothing, safety gear, and eye protection in accordance with applicable local and national safety regulations.

» Shut down the system before replacing any tubing. Use only tubing designed for the Selekt system and supplied by Biotage.

Shut Down the System at Leakage

If a leakage is observed, shut down the system as follows:

1. If a purification is in progress, press ■ and then **Abort**.
2. If a prime or flush is in progress (started by the user), press **Stop**.
3. Press **Menu**, **Shut Down**, and then **Yes** to confirm.
4. When the message saying it is safe to turn off the system appears on the touch screen, turn off the system. The power switch is located on the left side of the system.

External Leakage

External leakage may occur due to e.g. loose fittings or damaged tubing. Any leakage in the flow cell of the internal detector is drained via the drip sheet; see Figure 58.

Figure 58. Drainage of leakage from the flow cell of the internal detector.

All external tubing on the system except for the tubing on the collection arm can be replaced by the user; a list of spare parts is available at www.biotage.com.

Note: All tube types, dimensions, and lengths are essential for the performance of the system. Only replace tubes with the equivalent tubes designed for the Selekt system and supplied by Biotage.

If an external leakage is observed:

1. Shut down the system as described above.
2. Disconnect the power cord from the power outlet.
3. Remove the spillage using the appropriate safety precautions. In the event of leakage from a column, allow all solvent vapor to dissipate before removing the column. Do not wipe away any excess solvent from the column surface as this can generate additional static charge.
4. If using the optional instrument tray, ensure that the tray and the solvent detector (including the space underneath the detector) are cleaned and wiped dry. To remove the solvent detector, unsnap the detector cable from the two tube clips, open the hatch holding the solvent detector in position, and pull the detector sideways (see Figure 59).

Figure 59. Instrument tray with a solvent detector. A = tube clips holding the detector cable and B = the solvent detector hatch open.

5. If using the optional secondary solvent containment:
   a. Ensure that the secondary solvent containment and solvent detector (including the space underneath the detector) are cleaned and wiped dry. To remove the solvent detector, remove the cable locking plate, open the hatch holding the solvent detector in position, and pull the detector sideways (see Figure 60). If you are using the solvent containment on the top of the system and need to remove it to clean it, unscrew (Torx 20) and remove (slide out) the two brackets at the rear of the system (see Figure 61). Reassemble by reversing the procedure.

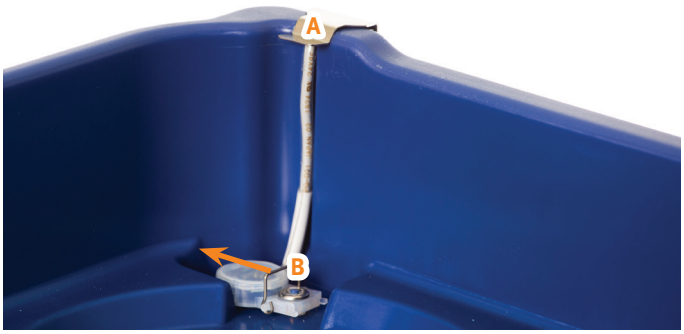


Figure 60. Secondary solvent containment with a solvent detector. A = cable locking plate and B = the solvent detector hatch open.

   b. If using the secondary solvent containment on the top of the system, ensure that the drain tube is not damaged and is properly connected to the drain port at the rear; see A in Figure 61. The other end shall be inserted into a waste reservoir.

Figure 61. The two screws holding the brackets for the optional secondary solvent containment (circled) and the drain port (A).

6. Check all external tubes and connections for leaks. Use caution when finger tightening fittings to prevent stripped threads or crushed ferrules. Replace damaged tubing.
7. Once you have located and resolved the leakage, reconnect the system to power and turn on the system.
8. Check all tubes and connections for leaks using the flush function; see page 23. Flush with water or another suitable solvent.
9. If the problem persists:
   a. End the flush by pressing **Stop**.
   b. Shut down the system and disconnect the power cord from the power outlet.
   c. Contact Biotage 1-Point Support.

Internal Leakage

Internal leakage, due to e.g. worn pump seals or tube fittings, is drained through drain ports underneath the system.

If an internal leakage is observed:

1. Shut down the system as described in “Shut Down the System at Leakage” on page 32.
2. Disconnect the power cord from the power outlet.
3. Ensure that the leakage is not external; see “External Leakage” on page 32.
4. Contact Biotage 1-Point Support.

Replace the Fuses

Warning

» Use only exact replacement fuses specified by Biotage (P/N 411916SP). Incorrect fuses create a potential fire hazard.

1. Shut down the system as described on page 18.
2. Disconnect the power cord from the power outlet.
3. Unplug the power cord from the rear of the system.
4. Loosen the fuse holder by carefully prying under the notch at the bottom of the holder with a small standard (flat blade) screwdriver; see Figure 62.
5. Grab the fuse holder with your fingers and remove it from the system.
6. Replace the two fuses with new fuses of the same type and rating specified by Biotage (P/N 411916SP).
7. Put the fuse holder back in place.

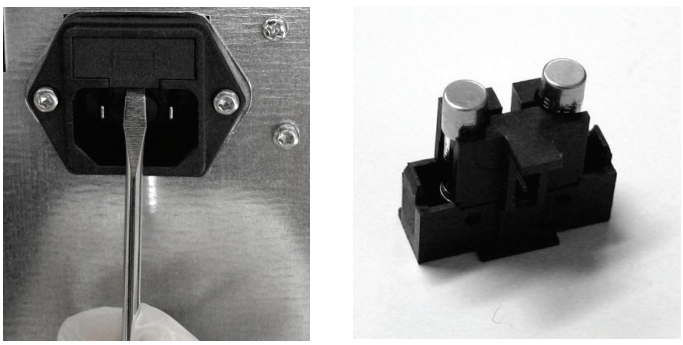


Figure 62. Loosening the fuse holder.

Replace the Needle

1. Shut down the system as described on page 18.
2. Remove the needle.
3. Assemble the new needle, ferrule, and peek nut (P/N 413245SP). Ensure that the needle is flush with the end of the ferrule; see A in Figure 63.
4. Mount the needle on the collection arm. Ensure that the needle is touching the needle guide; see B in Figure 63.

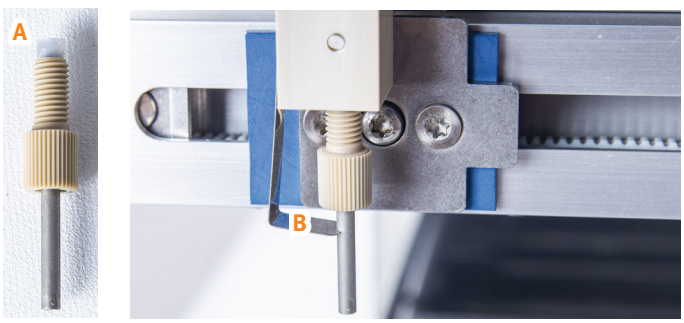


Figure 63. Assemble the needle, ferrule (A), and nut, and assemble it on the collection arm. Ensure that the needle is touching the needle guide (B).

Sonicate Solvent Inlet Filters

A solvent inlet filter is installed on the end of each solvent inlet line. The solvent inlet filters protect the pump and columns from damage due to particulate contamination. These filters should be cleaned (sonicated) or replaced every 1000 hours of operation or every 12 months, whichever comes first. If replacing, we recommend that you replace both the inlet lines and the filters (P/N 413008SP includes four inlet lines and four filters).

Troubleshooting

Fraction Collector-Related Problems

- **The collection arm does not position correctly over each collection vessel:**
  - Ensure that the racks and tray(s) are aligned correctly.
  - Ensure that the correct rack type has been selected in the **Rack** panel for the rack in use (see page 11).
  - Ensure that there is nothing obstructing or restricting the arm movement.

  If this does not solve the problem, the collection arm may need to be recalibrated. Contact Biotage 1-Point Support.
- **Dripping needle and/or inconsistent dispensing volumes** can be signs of a dirty collect valve. Please contact Biotage 1-Point Support.

Gradient Problems

Low composition gradient is not correct

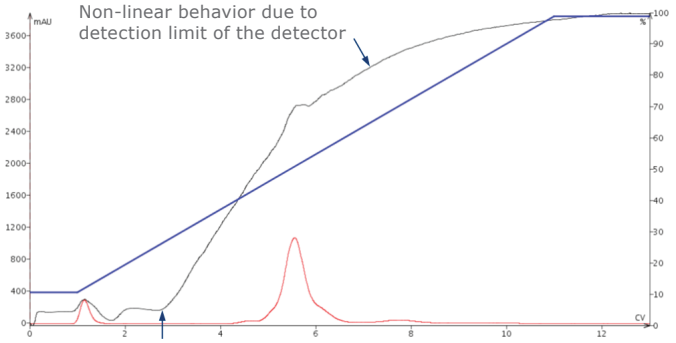
To improve gradient accuracy at very low percentages, premix solvents using the desired final % strong solvent in the weak solvent and use this as solvent B. Program the gradient from 0 to 100% B using the pre-mixed solvent B.

The baseline drift is different from the programmed gradient

Two factors contribute to altering the gradient as observed by the internal detector:

1. As it takes at least 1 CV for the solvent to pass through the column and reach the internal detector, the initial front of the gradient will always be delayed by at least 1 CV compared to the programmed gradient. A longer gradient delay may be due to interactions with the silica, where strong solvent is being selectively retained on the column.
2. The gradient as observed by the internal detector will at times decline and plateau before the programmed gradient does. This is due to the detection limit of the internal detector. Any increase in the concentration of strong solvent will not be registered as no light is reaching the detector at those particular wavelengths.

If using a system with a Spektra software license, try performing the run with the **UV Baseline Correction** option turned on.



Longer delay than expected (approx. 2 CV instead of 1 CV) due to interactions with the silica, where strong solvent is being selectively retained on the column

Internal UV Detector-Related Problems

- **No signal.** Check that the UV flow cell is correctly mounted, see step 6 in "Clean the Flow Cell of the Internal UV Detector" on page 31.
- **Noise** may be due to a contaminated flow cell. Clean the flow cell; see page 31.
- **Drifting baseline** may be due to:
  - Contaminated flow cell. Clean the flow cell; see page 31.
  - Used solvent is absorbing light at the selected wavelength(s). Change the collection and fractionation wavelength(s) or turn on the **UV Baseline Correction** option (only on systems with a Spektra software license).
  - Defective UV lamp. Contact Biotage 1-Point Support.
- **UV baseline correction is not eliminating drifting baseline:**
  - B/C or C/D solvents are used. The UV baseline correction is only adjusting for absorbance of the A/B solvents.
  - The gradient is modified by the user during the run. If the gradient is changed outside of its original boundaries, this is not covered by the standard UV baseline correction (start to end mix A/B). Change to full UV baseline correction (start mix to 100% B) in the system settings (see page 27).
  - The modifier percentage is changed by the user during the run. The UV baseline correction is based on the original percentage.
- **Missing peaks when using UV baseline correction.** If expected peaks do not show when you have the **UV Baseline Correction** option turned on and you are using solvents that are high-absorbing over a wide range of wavelengths (e.g. acetone or toluene), try performing the run without UV baseline correction.

» **UV detector error during UV Zero.**
The problem may be due to:
  » Contaminated flow cell. Clean the flow cell; see page 31.
  » Highly absorbing solvent(s). Choose less absorbing solvent(s).
  » Sample in the flow cell. Flush the system (see page 23) and retry performing the run.
  » The UV detector needs to be recalibrated; see page 30.

Leak Detected

See “Leaks” on page 32.

Overpressure Detected

Blockage due to precipitate or kinked tubing

Warning

» Shut down the system before replacing any tubing. Use only tubing designed for the Selekt system and supplied by Biotage.

1. Once the pressure has decreased to ambient pressure (the current pressure is displayed in the top left corner of the software), shut down the system (see page 18).

   Note: If the pressure does not reach ambient within a few minutes, release the contained pressure as described in “Restart after power failure or shutdown with overpressure” below.
2. If applicable, straighten or replace kinked tubing. Only replace tubes with the equivalent tubes designed for the Selekt system and supplied by Biotage.
3. Visually inspect all tubing for precipitation. If found, remove and clean the tubing.
4. Visually inspect the flow cell for precipitation. If found, clean the flow cell (see page 31).
5. Turn on the system.

The flow rate is too high for a purification or flush

1. If the overpressure occurred during a flush, press **Purge** in the **Flushes and Purge** view. Once the pressure has decreased to ambient pressure (the current pressure is displayed in the top left corner of the software), start a new flush at a lower flow rate.
2. If the overpressure occurred during a run, lower the flow rate and resume the run. The system will wait until the pressure has decreased to an acceptable level before proceeding with the run using the lower flow rate.

Restart after power failure or shutdown with overpressure

Warning

» When releasing a stuck check valve, there is a risk of a small amount of solvent splashing out.

1. Release the pressure by slowly unscrewing the check valve cap from one of the **CV OUT** valves using the Torx 50 screwdriver supplied with the system; see Figure 64.
2. Once the pressure has been reduced to ambient pressure (the current pressure is displayed in the top left corner of the software), fasten the check valve cap.

Figure 64. Removing the check valve cap from one of the CV OUT valves.

Pump-Related Problems

Note: If using highly volatile (i.e. high vapor pressure) solvents such as DCM, reservoir elevation is strongly recommended. Have all solvents on the same physical height to improve accuracy in the solvent mixing. It is also highly advisable to reduce the max aspiration rate (see “Administrate Solvents” on page 25) and, if possible, lower the ambient temperature. See “Solvent Specifications” on page 38 for the vapor pressure of different solvents.

» **Air bubbles moving through the column inlet tubing in a steady stream during solvent delivery** may be due to:
  » Little or no solvent in the lines. Refill the solvent reservoir(s) and ensure that all used solvent inlet lines are submerged in solvent (see “Prime the Solvent Inlets” on page 7).
  » One or more solvent inlet lines are loose. Check fittings and tighten if necessary.
  » One or more solvent inlet filters are clogged. Sonicate or replace the solvent inlet filters; see page 34. Note that particulate-free solvent is required and that re-circulating of the solvent is not recommended.
  » Solvent cavitation or degassing during aspiration stroke. Possible solutions are: 1. Elevate the solvent reservoirs. 2. Lower the ambient temperature. 3. Sonicate or replace the solvent inlet filters; see page 34. 4. Reduce the max aspiration rate for the used solvents; see “Administrate Solvents” on page 25.

- **Low or inconsistent flow delivery volume and/or superimposed periodic detector signals** may be due to:
  - Not all four solvent inlets have been primed. To achieve the specified pump performance, ensure that all solvent inlets have been primed (see page 7).
  - One or more pump check valves are not functioning properly. Flush with methanol or a similar solvent (see page 23) and check for leaks in the tubing or fittings (see “Leaks” on page 32). If this does not solve the problem, release the check valves as described on page 32.
  - Solvent cavitation or degassing during aspiration stroke. Possible solutions are: 1. Elevate the solvent reservoirs. 2. Lower the ambient temperature. 3. Sonicate or replace the solvent inlet filters; see page 34. 4. Reduce the max aspiration rate for the used solvents; see “Administrate Solvents” on page 25.
- **The pump does not deliver solvent.**
  The problem may be due to:
  - No or insufficient solvent in the reservoir(s). Refill the solvent reservoir(s) and ensure that all used solvent inlet lines are submerged in solvent (see “Prime the Solvent Inlets” on page 7).
  - Stuck pump check valve(s). Flush with methanol or a similar solvent; see page 23. If this does not solve the problem, release the check valves as described on page 32.
  - Blockage in solvent line(s). Sonicate or replace the solvent inlet filters; see page 34. Straighten or replace kinked tubing. If this does not solve the problem, flush the entire system with methanol or isopropanol at a low flow rate (see page 23).
  - Leakage. Check for leaks in the tubing or fittings; see “Leaks” on page 32.

QR Reader Problems

If the QR reader underneath the touch screen is not lit, please contact Biotage 1-Point Support.

Contact Biotage® 1-Point Support™

For assistance at any time during troubleshooting or if your problem persists, contact Biotage 1-Point Support. See contact information on the back of this document or visit our website www.biotage.com.

Solvent Specifications

Warning

» Many solvents are considered hazardous to humans and the environment, so take appropriate safety precautions when using them. Comply with Safety Data Sheets (SDS) and any other applicable regulations for the safe use, handling, transporting, storage, and disposal of these solvents.

Solvent	CAS No.	Strength[1,2]	Selectivity Class[3]	UV Cutoff (nm)	Vapor Pressure at 20°C (psi)	Vapor Pressure at 20°C (mbar)
Acetone	67-64-1	0.56	6 (VIa)	330	3.6	247.4
Acetonitrile	75-05-8	0.65	6 (VIb)	190	1.4	93.6
Cyclohexane	110-82-7	0.04	0	210	1.5	103.4
Dichloromethane (DCM)	75-09-2	0.42	5 (V)	235	6.9	475.3
Ethanol	64-17-5	0.88	2 (II)	210	1.3	90.0
Ethyl acetate	141-78-6	0.58	6 (VIa)	255	1.4	98.3
n-Heptane	142-82-5	0.01	0	210	0.7	47.4
n-Hexane	110-54-3	0.01	0	210	2.3	161.6
Methanol	67-56-1	0.95	2 (II)	210	1.9	129.7
2-Propanol (IPA, isopropanol)	67-63-0	0.82	2 (II)	210	0.6	44.0
Tetrahydrofuran	109-99-9	0.57	3 (III)	220	2.5	172.4
Toluene	108-88-3	0.29	7 (VII)	286	0.4	29.1
Water	7732-18-5	1.00*	0	190	0.3	23.4

Table 4. Solvent specifications.

[1] Neue U. D. HPLC Columns Theory, Technology, and Practice, Wiley-VCH (1997).

[2] Dean J. A. Lange's Handbook of Chemistry, 15th edition, McGraw-Hill (1999).

[3] Snyder L. R. and Kirkland J. J. Introduction to Modern Liquid Chromatography, Wiley (1979).

* When water is used in reversed phase chromatography, the strength value is 0.

General Information

Consumables and Accessories

Only genuine Biotage consumables and accessories must be used in the system. To order consumables and accessories, see contact information on the back of this document or visit our website www.biotage.com.

Accessories that may be necessary for the “Maintenance” section are listed below.

Part No.	Description	Qty
415115SP	Inlet Check Valve,	4
415625SP	Flow Cell	1
413245SP	Fraction Collector Needle	1
411916SP	Fuse 4.0 TA/250 VAC, 5 x 20 mm	5
413008SP	Four solvent inlet lines and filters (S1-S4)	1
411851SP	Waste outlet tube	1

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Please contact your local Biotage representative. See contact information on the back of this document or visit our website www.biotage.com.

Notes

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