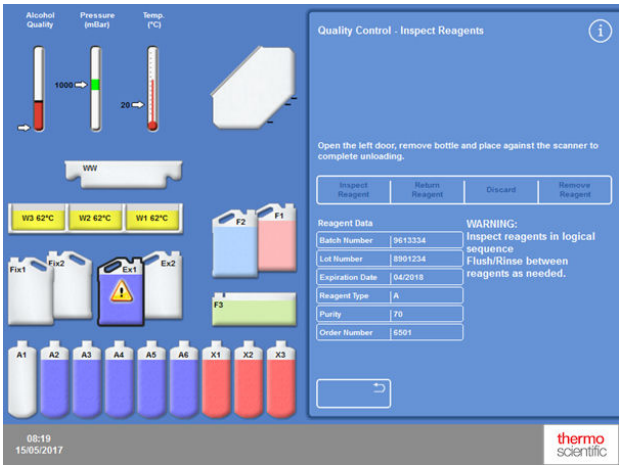
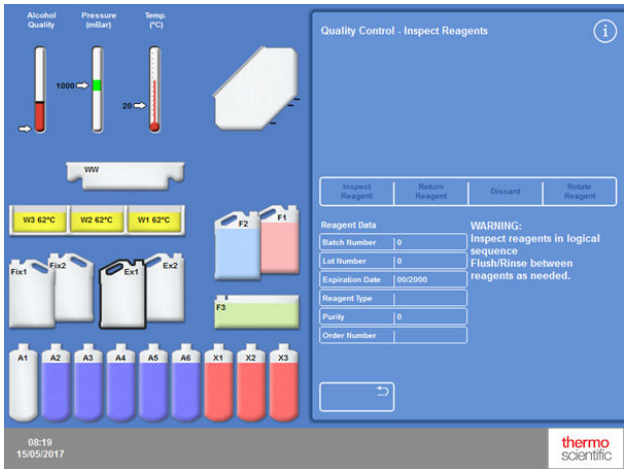
- The prompt is then shown to request the bottle is scanned out by removing and placing against the left door. To complete the process follow the instructions and wait for the system to write to the tag to indicate that it is waste.
- If a 'BONG' noise is generated the user will need to either move the bottle to get it into the correct position or adjust the door to be closer to the bottle.
- If a 'Bing' noise is generated this will confirm the scan has been successful.



- Once the process is complete the appropriate Ex bottle will become empty and the Reagent Data will be blanked.



Loading a Reagent or Wax after a Discard

Reagents or wax can be loaded after a discard, if required.

To load a reagent:

- Highlight the bottle to be loaded by pressing the graphic on the screen.
- Press Load Reagent.
- Ensure that the new reagent is loaded in position Ex1 or Ex2.
- Press Confirm Loaded to draw the reagent into the Reaction Chamber and then into the highlighted concealed bottle.

Note

Do not leave the Inspect Reagents screen during reagent transfer.

To load wax:

- Load wax pellets into the required wax bath.
- Highlight the wax bath that has been loaded by pressing the graphic on the screen.
- Press Waxbath Heater ON to start heating.

Rotating a Reagent or Wax after a Discard

Reagents or wax can be rotated manually after a discard, if required.

Note

This option is only available if the bottle position to the left of the reagent being inspected is also empty.

To rotate a reagent:

- Inspect the reagent in the Reaction Chamber.
- Press Rotate Reagent to drain the reaction chamber and to shift the reagent down into the next concealed reagent bottle.
- Inspect the next reagent and follow the same sequence to manually rotate all reagents.

To rotate a wax:

- Inspect the wax in the Reaction Chamber.

Note

Ensure you leave the wax in the reaction chamber for a minimum of 10 minutes if this is the first wax in the reaction chamber.

- Press Rotate Reagent to drain the Reaction Chamber and to shift the wax down to the next wax bath.
- Inspect the next wax bath and follow the same sequence to manually rotate all waxes.

Running and Viewing Reports

Various reports are available to help you assess instrument performance and reagent usage.

Reports comprise a range of different event logs that are presented together in order to provide information on specific system events, for example, temperature readings. Reports can be generated according to the time at which events occurred and the event log types.

You can generate a report by selecting a time period and then choosing a report type. Reports can be viewed on screen or saved onto a USB memory stick for viewing on a computer.

Note

Some reports can be large and may be truncated before they are displayed on screen. To see the full report, save the report to USB and view it on a computer.

The following time periods can be specified:

- Last Run: Retrieves the event logs for a chosen report that were generated from the time the last process run was started through to the present time.
- Last 24 Hours: Retrieves all of the event logs for the chosen report that were generated over the previous 24 hours and up to the present time.
- Last 7 Days: Retrieves all of the event logs for the chosen report that were generated over the previous seven days and up to the present time.
- All Data Retrieves all of the event logs for a chosen report that were generated from the last instrument reset up to the present time.

The following reports are available to view:

- Program Printouts:* A list of all programs and their parameters that are currently installed on the instrument.
- Full Event Log: A log of every event generated from the last instrument reset to the present time.

  Note

  This report will be very large.
- Concise Event Log: A reduced version of the full event log containing only process log events.
- Quality Control Status:* A single page report showing information about the usage of the reagent bottles and wax baths.
- Quality Control History: Rotation and reagent management event logs, for example, specific gravity readings.
- Temperature Status:* This captures immediate temperature data for the wax and reaction chamber and current fluid levels.
- Temperature History: Shows a range of temperature readings for process and flush cycles.
- Instrument Setup:* Shows the complete set of configuration settings, in text form, that are currently being used on the instrument.

* These reports are independent of the specified time period.

To view reports:

- Select **Quality Control** > **Reports** to display the Quality Control - Reports screen.
- Choose the time period for the report.
- To display a single report on the screen, press **View** next to the report that you require.

  The report is displayed on the screen.
- Use your fingertip on the Touchscreen to scroll down through the report.
- Press **OK** to exit.

Quality Control – Reports screen

Saving reports:

Note

Before saving reports, ensure that a USB memory stick is in place in the instrument.

- Select an individual report or multiple reports.

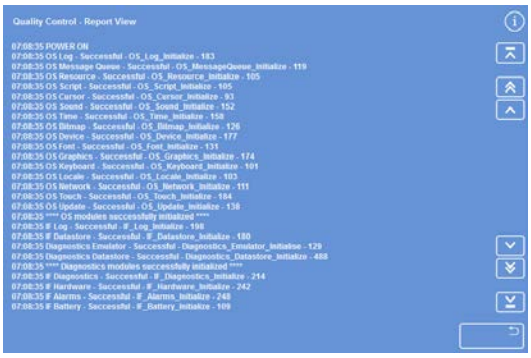
  After selection, reports are highlighted in yellow.
- Press **OK** to save and exit from the screen.

  The light on the USB memory stick flashes while saving is in progress.
- Press **OK** to return to the Main Screen.

Note

OK will appear shaded if a USB memory stick is not inserted.

- The Quality Control – Report View screen shows all the relevant information logs for the report selected.
- The buttons on the right hand side of the screen allow the user to scroll up and down the report by single lines, sections or straight to the top and bottom of the report.



Reagent Rotation

Revos uses an in-process system for maintaining dehydrants, clearants and infiltrants. Manually defined triggers are used to inform an operator, via the Quality Control screen, that a defined reagent has reached its usage limit and should be rotated. For more information, refer to Triggers for Reagent Rotation.

When a reagent is rotated, Revos completes the process in the following way:

- The used reagent is discarded from the appropriate containers (used for the first steps in these processing groups, for example, A1, X1 and/or W1).
- The rest of the reagents are rotated by moving each reagent down by one position.
- On the next processing run, fresh reagents are drawn up from the appropriate Exchange bottles, used during the process and then drained into the last concealed bottle position within the groups.

Note

Be careful to ensure that discarded waste is not accidently reloaded back into the instrument.

Rotation is automatic and simply requires the operator to acknowledge system prompts, place Exchange bottles into the appropriate positions and waste wax tray and to load new reagents when prompted to do so. The usage of fixatives, flush reagents and filters is also tracked and system alerts are displayed when these need to be changed.

The rotation process and renewal of other reagents and filters occurs as part of routine processing but can be requested at any time. Refer to Quality Control, Filter and Reagent Renewal Limits.

Triggers for Reagent Rotation

Note

All such prompts can either be acknowledged or postponed, but for quality reasons, we suggest acknowledging the prompts when they are received

Triggers for reagent rotation can be based on days of the week, usage counts or alcohol quality:

- Days of the week: Prompts to rotate reagents or discard wax are issued on the chosen day(s). Multiple days can be highlighted.
- Usage counts: Prompts are issued to rotate reagents or discard wax when the defined usage limit for a reagent or wax is reached.
- Alcohol quality: The specific gravity of alcohol in reagent bottle A1 is monitored. When this falls below a set level and into the red zone on the Alcohol Quality gauge, prompts are issued to rotate reagents or discard wax.

Setting Triggers for Reagent Rotation

The triggers for reagent rotation are set from the Rotation Management screen. All three reagent groups can be set to rotate based upon the same trigger or a combination of different triggers.

Note

For optimum reagent utilisation and processing, it is recommended that concealed reagent and wax rotations are based on A1 alcohol quality.

To set rotation triggers:

- Select **Options** > **Instrument Setup** > **Rotation Management**.

  The Instrument Setup - Rotation Management screen is displayed.

  The current rotation triggers are highlighted in yellow. The default trigger is A1 Quality.

Note

It is only possible to have one type of rotation trigger set for each reagent group. The selected trigger will automatically override any triggers that were set previously.

The Instrument Setup - Rotation Management screen

- To base rotation on days of the week, press the button(s) corresponding to the day(s) on which you want to rotate the reagents or wax.

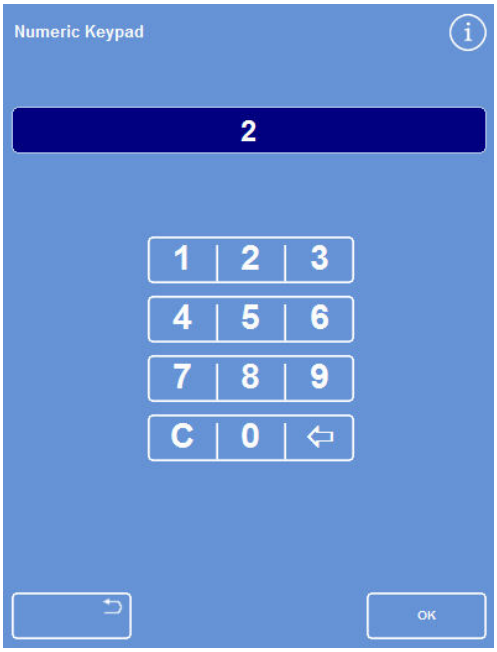
  The chosen day(s) will be highlighted in yellow.

- Press OK to save.

Rotating based on day of the week (wax on Friday)

- To base rotation on usage counts, press Use Limit and set the use limit using the number pad. To turn the limit off, enter zero (0).
- Press OK when you have set the required limit.

  The Use Limit button will indicate the new limit in yellow, or will read 'Off' if zero has been entered.



Rotation based on use limits

Note

If a use limit of zero is entered, a Quality Control rotation trigger will not have been set for that particular group.

- To base reagent rotation on alcohol quality, press A1 Quality for each of the reagent groups.

A1 Quality button (for Xylene)

Note

The factory default value for the A1 Quality Threshold is approximately 45%. Be careful if you adjust this value as, over a period of time, any increases or decreases can result in either higher or lower than optimal alcohol concentrations and can adversely affect tissue quality.

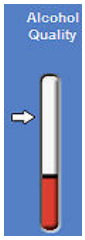
- Use the up and down arrow buttons to adjust the A1 Quality Threshold for earlier or later reagent rotations.

  The threshold is represented by the red zone on the Alcohol Quality gauge (left side of screen).

  Each arrow button press expands or contracts the zone by approximately 1.25% from the black line. When the red zone exactly meets the black line, the A1 Quality Threshold is at the factory default setting of 45%.

- Press OK to save.
- To return to the Main Screen, press OK repeatedly.

A1 Quality Threshold up and down buttons



Alcohol Quality Gauge

Requesting Reagent Rotation

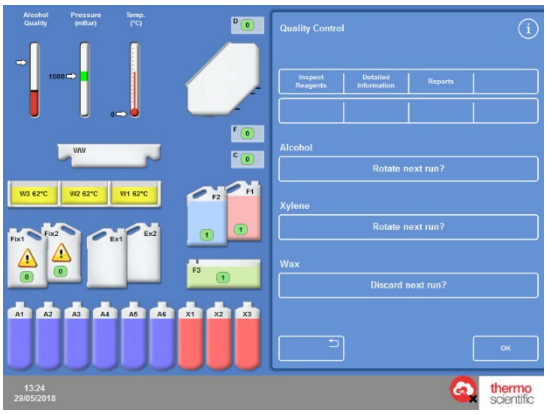
Rotation schedules are automatically controlled by alcohol quality, use counts or days of the week; however, it is also possible to add in additional manual rotations as required.

Note

The Quality Control screen is displayed automatically at the beginning of a process run if any of the reagents or filters are due for renewal.

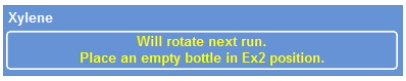
To request rotation of a reagent:

- From the Main Screen, press **Quality Control**.
- On the Quality Control screen, press **Rotate next run?** to select a group of reagent bottles.



Requesting reagent rotation for X1–X3

- The text will change to 'Will rotate next run'.



Reagents will rotate next run

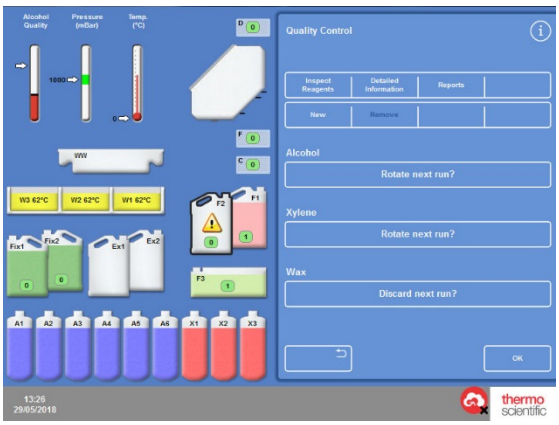
- Press same key to return to '**Will rotate next run**'.
- To return to the Main Screen, press **OK**.

Cancelling the request

To request wax discard:

- From the Main Screen, select **Quality Control**.
- On the Quality Control screen, press **Will discard next run** to select the wax baths.

  Notice that the wax baths are highlighted in black.
- From the Quality Control menu, press **Request Discard**.



Requesting a wax discard

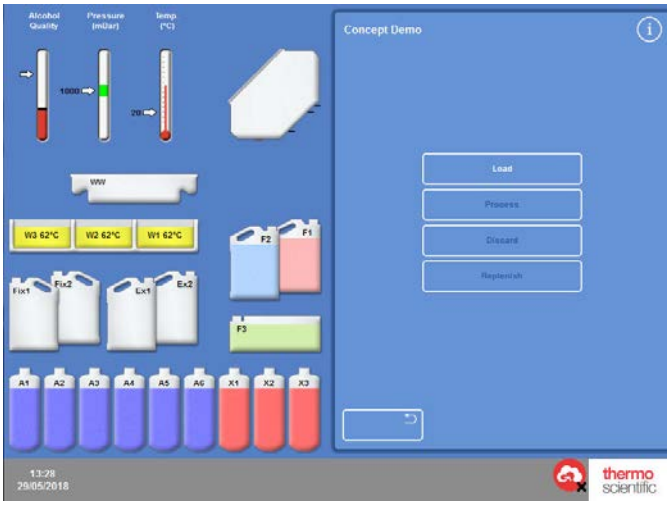
- Press same key to return to '**Will rotate next run**'.
- To return to the Main Screen, press **OK**.

Wax will discard next run

Concept Demonstration

The concept demonstration shows you how reagents are transferred during processing. The demonstration comprises four sections and runs in the following sequence:

1. Loading reagents
2. Processing
3. Discarding reagents
4. Replenishing reagents



Concept Demonstration

Notes

The demonstration is not available when the instrument is running a process, flush or inspection.

The screen lock function will not operate during a demonstration run.

Any alarms that are generated while the demonstration is running will not be displayed on the screen, however audible alarms will sound, providing that they have been configured to do so, refer to Audio and Remote Alarms.

The demonstration will only run in sequence, starting with Load and ending with Replenish.

To run the demonstration:

- Select Options > Instrument Setup > Concept Demo.

  The Concept Demo screen appears and the DEMO icon appears on the Information Bar.
- Press Load.

  The demonstration starts. The Load section and the remaining sections in the sequence are greyed out.
- To exit and return to the Options - Instrument Setup screen, press the button.
- To pause or restart the demonstration, press the Pause/Restart button.
- Once the load demonstration has completed, the process, discard and replenish demonstrations can be run in order.

Customisation and Workflow

Revos has default settings that will enable your laboratory to process specimens through typical daily processing cycles. In addition, it is possible to change some of the available settings to utilise reagents more efficiently, to change the days of the week that the instrument is available for automatic delay purposes, or to change the programs which are offered by default at various times of the day. These changes are made using the Customisation option which is accessed from the Instrument Setup menu.

Customising Your Instrument

You can customise Revos, adding your own text to appear at the bottom of the screen, next to the Thermo Scientific logo. You can also specify how the Reaction Chamber is filled, how long a program can be left on hold before an alarm sounds and define when the instrument goes into power-save (dimmed) mode.

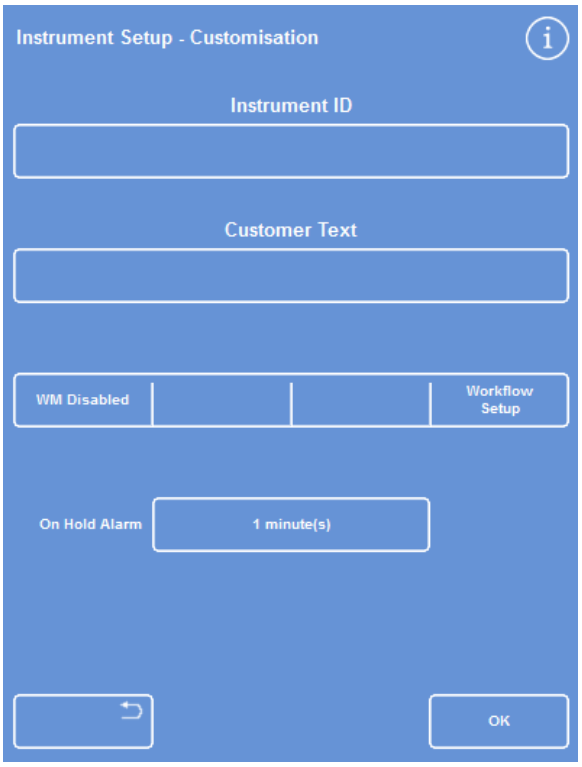
To customise your instrument:

- Select Options > Instrument Setup > Customisation.

  The Instrument Setup - Customisation screen appears.
- To record information about the instrument or your location, press the Instrument ID field or the Customer Text field.

  The on-screen keyboard appears.
- Enter the text that you want to display and press OK.
- Select the required filling options, alarm setting and shift pattern. See below for details.
- Press OK to save the settings.

  Any changes to the Instrument ID and Customer Text will now be shown in the information bar at the bottom of the screen.
- To return to the Main Screen, press OK repeatedly.



The Instrument Setup - Customisation screen

Customisation Options Explained

The following table summarises the Revos customisation options:

Option	Description
Instrument ID	A text field which can be used to record information about the instrument. A maximum of 30 characters can be entered. The text is displayed at the bottom of the Main Screen, next to the Thermo Scientific logo. The text is also added to reports to help with identification, refer to File Operations for more information.
Customer Text	A text field which can be used to record customer-specific information. A maximum of 30 characters can be entered. The text is displayed at the bottom of the Main Screen, next to the Thermo Scientific logo and under the Instrument ID text.
Workflow Setup	Opens the Customisation - Workflow Setup screen. Refer to Setting the Workflow Processing Options for details.
On Hold Alarm	This setting specifies how long a program can be left on hold before an alarm sounds. Press the button to set the required time (1–5 minutes).
Shift Start	This setting defines the start of the working day; this is when the instrument comes out of power-save (dimmed) mode. Press the button to specify the shift start time.
Shift End	This setting defines the end of the working day; this is when the instrument goes into power-save (dimmed) mode. Press the button to specify the shift end time.

Setting the Workflow Processing Options

Revos can be setup to operate in one of three different processing modes:

Single Program:	This option allows you to define a single default program which will be available to operators at all times of the day.
Daytime Overnight:	If specimens are processed overnight and also during the day, this option allows you to specify the programs that will be available at specific times of the day.
No Default:	If there are different groups of operators using the instrument, the default program option can be removed to allow operators to select the program that they want to use when the Reaction Chamber lid is opened.

Note

If required, operators can still choose a different program from the displayed default when processing specimens.

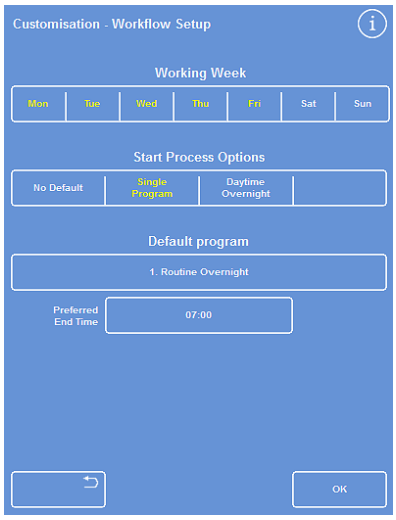
To set workflow processing options:

- Select Options > Instrument Setup > Customisation.
- From the Instrument Setup - Customisation screen, press Workflow Setup.

  The Customisation - Workflow Setup screen appears:
- Select the required options. Additional fields may appear depending on the options that you choose (refer to Workflow Setup Options Explained).

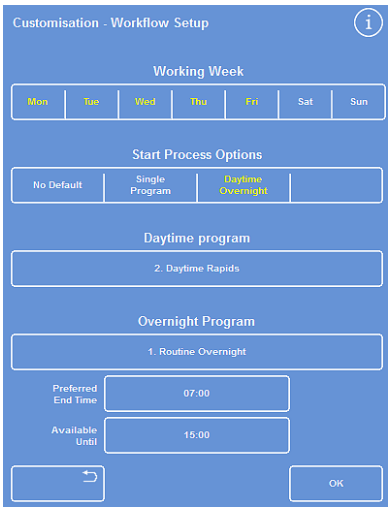
  If you select Single Program, the instrument will assume you wish to process specimens overnight and offer the default overnight program.

  If you select Daytime Overnight you will be required to specify the program offered during the day (up until the time that you select in Available Until) and the overnight program.



The Customisation - Workflow Setup screen

- To change any one of the default programs, press the appropriate program button and choose the required program from the Select a Program screen.
- Press OK to save the selected workflow options.
- To return to the Main Screen, press OK repeatedly.



Daytime Overnight processing option selected

Workflow Setup Options Explained

The options and settings on the Customisation - Workflow Setup screen are as follows:

Option	Description
Working Week	Sets the days of the week that the instrument will be in use. Selected days are shown in yellow.
Start Process Options	Sets the process type which is selected when you initiate a processing run. You can choose from: **Single Program:** One program (the default program) is offered by default at all times of the day. Choose this option if you only run one type of process. **Daytime Overnight:** Different programs can be set for daytime and overnight processing. Choose this option if you routinely process specimens during the day and overnight. **No Default:** No program is offered by default and the operator must manually select the required program. Choose this option if you are using Revos to run a variety of process types.
Default Program	If Single Program is selected, the program that is offered at all times of the day is set here. Press the button to choose the required default program from the Select a Program screen.
Daytime Program	If Daytime Overnight is selected, the program that is offered for daytime processing is set here. Press the button to choose the required daytime program from the Select a Program screen.
Overnight Program	If Daytime Overnight is selected, the program that is offered for overnight processing is set here. Press the button to choose the required overnight program from the Select a Program screen.
Preferred End Time	Sets the end time for the chosen delayed start program (does not apply to an immediate start program).
Available Until	The latest time Revos will offer the daytime program. After this time, the overnight program will be offered. Press the button to set the time.

Programs and Flushes

Revos uses programs and flushes to process specimens or flush the system prior to another processing run. Programs and flushes are built up from a series of user-defined steps or instructions. Each individual step comprises a number of parameters which can be set individually or applied to a group of steps using the same reagent type. Steps can also be disabled if, for example, you want to use only one fixative step or are using xylene-free processing.

The following step parameters can be changed:

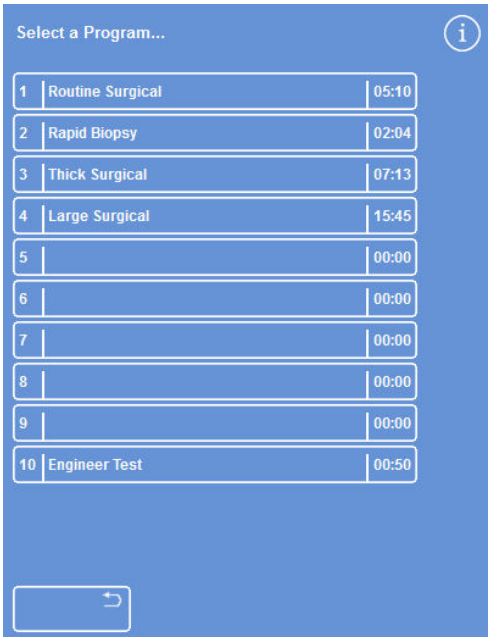
- The temperature of the reagent used in a particular step.
- The time for the processing step.
- The vacuum/pressure conditions under which the processing step takes place.
- The time that specimens are allowed to drain between processing steps.

Viewing Program or Flush Details

You can view details of all of the programs and flushes that have been defined on your instrument. The individual program or flush steps can be changed, as required. Refer to Editing a Program or Flush for more information on changing programs and flushes.

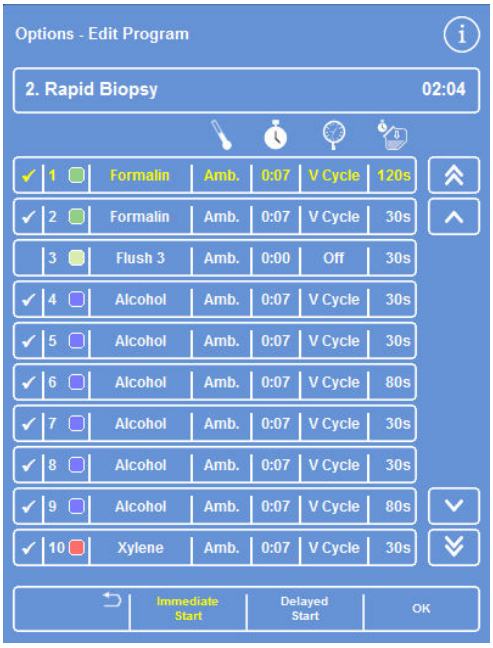
To view program details:

- From the Main Screen, select **Options > Edit Programs** to display the Select a Program screen.
- Choose the program that you want to view.



Selecting a program

The Options - Edit Program screen displays details of the fixative and dehydrant steps in the selected program.

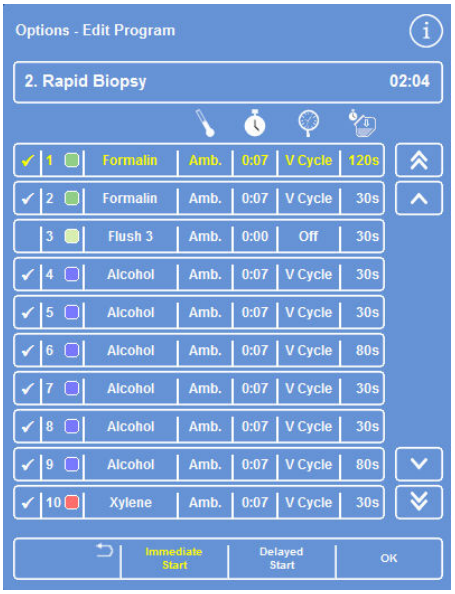


Fixative and dehydrant step details

Note

To display steps for clearants and infiltrants, press the button.

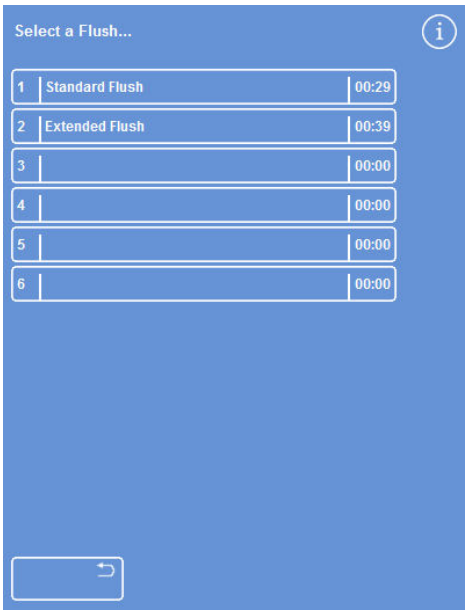
- To return to the Select a Program screen, press .
- To return to the Main Screen from the Select a Program screen, press and then OK.



Clearant and infiltrant step details

To view flush details:

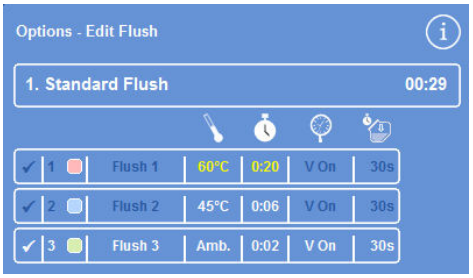
- From the Main Screen, select Options > Edit Flushes.
- Choose the required flush program from the screen:



Selecting a flush

The Options - Edit Flushes screen displays details of the selected flush:

- Press to return to the Select a Flush screen.
- To return to the Main Screen from the Select a Flush screen, press and then OK.



Flush details

Program and Flush Parameter Fields Explained

Each step in a program or flush comprises a set of parameters which can be adjusted independently. These parameters are explained in the following table:

Parameter	Description
Step Number	Shows the step number in the program or flush. Each program can have up to 15 steps. Flushes have three steps.
Selection box	Press this box to include or exclude a fixative step or dehydrant / infiltrant / clearant group from the program or flush. If a step is disabled, it is shown as shaded on the Monitoring screen during a program or flush run. **Note** *The selection box is not available for mandatory flush steps.*
Reagent Name / Reagent Group Name	Shows the name of the reagent or reagent group. For more information on reagent names and storage temperatures, refer to Defining Reagent Names and Setting Reagent Storage Temperatures.
Temperature	Shows the usage temperature for the program or flush step. This can be different from the storage temperature. Press the button to specify the required step temperature up to 55°. **Note** *Reagents cannot be cooled.*
Time	Shows the time (hours and minutes) for each processing step - the maximum is 99:59. Press the button to specify the required step time. **Note** *The time to transfer reagents is included in this time. Steps should be at least three minutes long. If a shorter step is entered, and fluid transfers take longer than three minutes, then the program will overrun its expected end time.* The first wax step in any program should be at least 10 minutes long in order to minimise wax carry-over on the Reaction Chamber walls, and to allow the level sensors to warm up to the wax temperature.

Parameter	Description
Vacuum	Controls the vacuum conditions in the Reaction Chamber during each step. Three settings are available, press the button to select the required setting: Off: Specimens are held at atmospheric pressure. On: Specimens are held at approximately 650 mbar absolute (350 mbar below atmospheric pressure). V Cycle: Specimens are held in a 15 minute, vacuum to atmospheric cycle that ranges from approximately 600 mbar absolute (vacuum conditions) through to atmospheric pressure. P Cycle: Specimens are held in a 10 minute, vacuum to pressure cycle that ranges from approximately 600 mbar absolute (vacuum conditions) through to 1200 mbar absolute (pressure conditions).
Drain Time	Shows the time (seconds) allowed for the specimens to drain before moving to the next processing step. Press the button to specify the required drain time (minimum of 30 - 180 seconds).
Immediate Start	When selected, the program will default to an immediate start.
Delayed Start	When selected, the program will default to a delayed start.

Creating a New Program or Flush

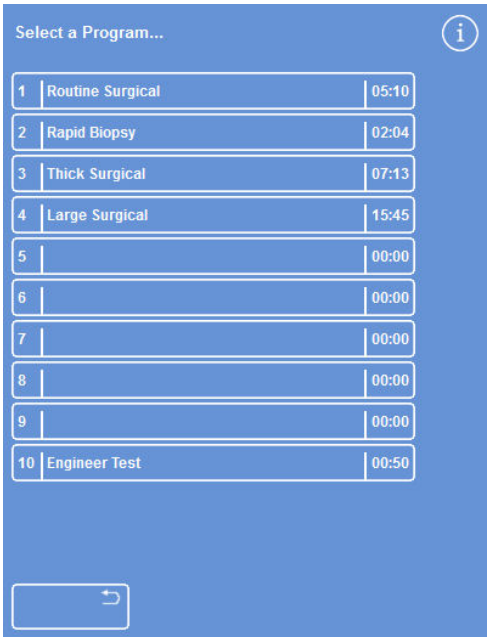
New programs and flushes can be defined as required. To make this easier, default step details are loaded when you select an empty program or flush 'slot'. These can then be amended to create the program or flush that you require.

Note

Try to make the name of any program or flush that you create as descriptive as possible, but limit the description to 17 characters. Up to ten programs and four flushes can be defined.

To create a new program:

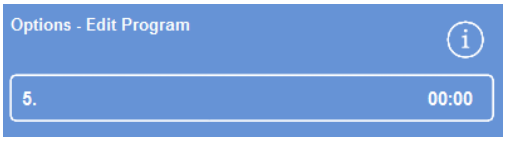
- From the Main Screen, select Options > Edit Programs.
- Press an empty button on the Select a Program screen. Programs with a name and time already have defined program steps:



Empty buttons: 3 to 9

The Options - Edit Program screen is displayed:

Adjust the displayed values as required



Press to define the program name

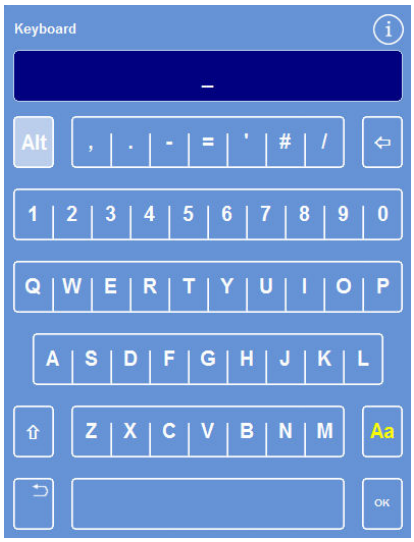
- Enter a name for the new program.

  To do this, press the empty program name button and use the on-screen keyboard to enter the name.

Note

A maximum of 30 characters can be used for program and flush names.

- Press OK to confirm the name.



Using the on-screen keyboard

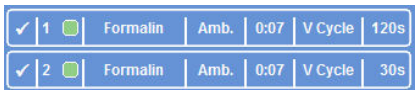
- The steps are disabled by default; to enable one or more of these, press the selection box to the right of the step number.

  A tick (check mark) will appear in the box and the corresponding reagent container or containers will become highlighted.

- Define the program step details, adding in the individual step and drain times.

Note

The default step time is 10 minutes, and the default drain time is 30 seconds.



Steps 1 and 2 enabled (tick in box)

The total time is shown to the right of the program name.

- Press OK to save the new program.
- Press to return to the Options screen and then OK to return to the Main Screen.

For more information on changing parameters, refer to Changing the Program or Flush Name.

Note

If program or flush step parameters are edited, the Step / Group is automatically enabled.

To create a new flush:

- From the Main Screen, select Options > Edit Flushes.
- Press an 'empty' button on the Select a Flush screen. Flushes with a name and time already have defined flush steps.

  The Options - Edit Flush screen is displayed:
- Enter a name for the new flush. To do this press the name button and use the on-screen keyboard to enter the name.
- Press OK to confirm the name.
- Define the flush step details. Refer to Changing Program or Flush Step Parameters for details.

  The total time is shown to the right of the flush name.
- Press OK to save the new flush.
- Press to return to the Options screen and then OK to return to the Main Screen.

Creating a new flush

Editing a Program or Flush

You can make changes to an existing program or flush so that the steps or conditions match your requirements.

Note

It is recommended that you do not change the default programs and flushes that are provided with Revos. Instead, create a new program or flush and change that, as required. Refer to Creating a New Program or Flush for details.

Flush 1 and Flush 2 cannot be omitted from default flush programs.

To edit a program:

- From the Main Screen, select Options > Edit Programs.
- Select the program that you want to change.
- On the Options - Edit Program screen, make the required changes to the program or step details. See below for details.
- Press OK to save the changes.

To edit a flush:

- From the Main Screen, select Options > Edit Flushes.
- Select the flush that you want to change.
- On the Options - Edit Flush screen, make the required changes to the flush or step details. See below for details.
- Press OK to save the changes.

Note

If you have made any changes to a program or flush and press on the Options - Edit Program screen or Options - Edit Flush screen, you will be asked to confirm that you want to discard unsaved changes. To confirm, press OK.

If you want to save the changes that you have made or continue working on a program or flush, press to return to the Options - Edit Program screen or to the Options - Edit Flush screen. To save any changes, press OK.

Changing the Program or Flush Name

You can change the name of a program or flush, as required. Try to make names as descriptive as possible, but limit the description to a maximum of 17 characters.

To change the name of the program or flush:

- From the Main Screen, select either **Options > Edit Programs** or **Options** > **Edit Flushes**.
- Select the program or flush that you want to change.

  The Options – Edit Program for the chosen program or flush appears.
- Press the existing name button to display the on-screen keyboard.
- Enter the new name and press **OK.**

Changing Program or Flush Step Parameters

Each step in a program or flush comprises several parameters, each of which can be changed. If you change a parameter for a reagent within a group, it is also possible to copy that change to the other reagents in the group.

Usage Temperature

You can set the usage temperature on an individual basis; 1-65°C for each reagent, 45-65° for wax and a maximum of 65° for Flush 1.

The temperature cannot be set lower than the reagent storage temperature. Storage temperatures are set using the Reagent Storage Temperature option. Refer to Configuring Reagents for details.

The current usage temperatures for each reagent within a program group are displayed on the Edit Program or Edit Flush screen under the thermometer icon:

Amb.	To use the reagent at ambient temperature (for use with fixatives, dehydrants and clearants).
Stor.	To use the reagent at storage temperature (for use with dehydrants, clearants and waxes).
35°C	To use the reagent at a specific temperature (for use with all reagents).

To set the usage temperature for a program or flush step:

- From the Main Screen, select either **Options** > **Edit Programs or Options > Edit Flushes.**
- Select the program or flush that you want to change.
- In the column labelled with the icon, press the current usage temperature for the required reagent.

Note

To access the settings for the program clearant and infiltration groups, press the button.

  The current temperature selection is shown at the top of the screen.

- Use the number pad to set the usage temperature.

Options - Edit Program screen (step temperature highlighted)

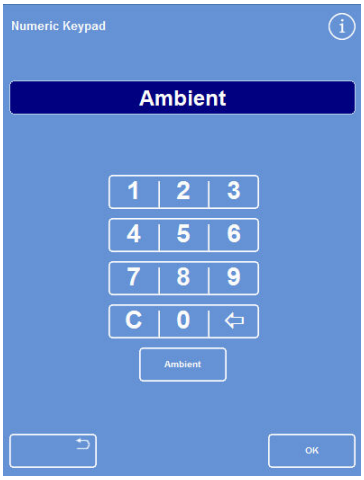
Alternatively, press Amb. to use the reagent at ambient temperature or Storage Temp. to use the reagent at its storage temperature.

- To copy the setting to other members of the reagent group, select Copy To Group.

Note

Ambient is not available for infiltrants and storage temperature is not available for fixatives. Copy To Group is not available for a fixative (steps 1 and 2) or flush steps.

- Press OK to save your setting and return to the Options – Edit Program screen.



The Edit Program - Step Temperature screen (alcohol and xylene)

Step Time

You can set the time for each step in a program or flush. The time to transfer reagents is included in the setting that you choose.

Steps should be at least three minutes long to ensure that all fluid transfers complete on-time.

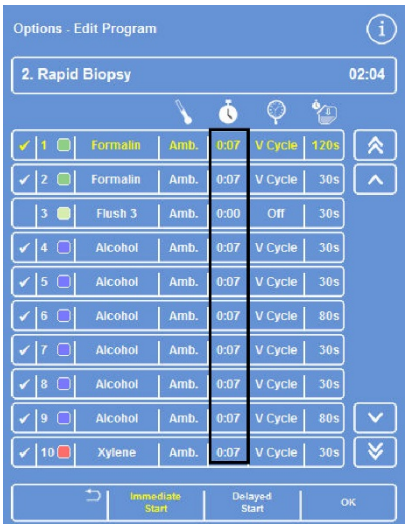
The first wax step in any program should be at least 10 minutes long in order to minimise wax carry-over on the Reaction Chamber walls, and to allow the level sensors to warm up to the wax temperature.

To set the time for a program or flush step:

- From the Main Screen, select **Options** > **Edit Program**.
- Select the program or flush that you want to change.
- In the column labelled with the icon, press the step time for the reagent.

Note

To access the settings for the program clearant and infiltration groups, press the button.



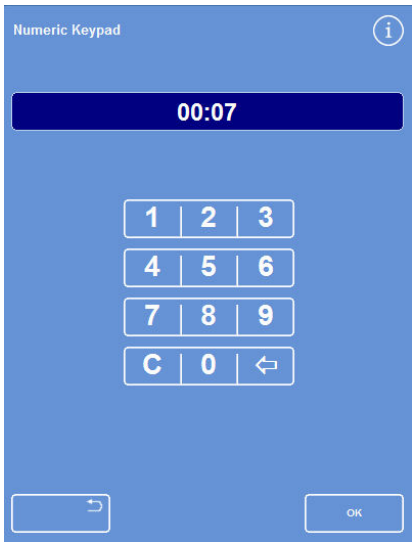
Edit Program screen (step time highlighted)

The Edit Program - Step Time screen is displayed:

- Use the number pad to set the required step time.
- Select **Copy To Group** to copy the setting to other members of the group, if applicable.
- Press **OK** to save your setting and return to the Options – Edit Program screen.

Note

The only way to skip a step is to change the step time to 0:00, although the reagent will still be drawn into the chamber. This is not possible on W1.



The Edit Program - Step Time screen

Vacuum Setting

Each step in a program or flush can take place at atmospheric pressure or under constant or cycled vacuum conditions.

To set the vacuum for a program or flush step:

- From the Main Screen, select **Options** > **Edit Program**.
- Select the program or flush that you want to change.
- In the column labelled with the icon, press the vacuum button for the reagent.

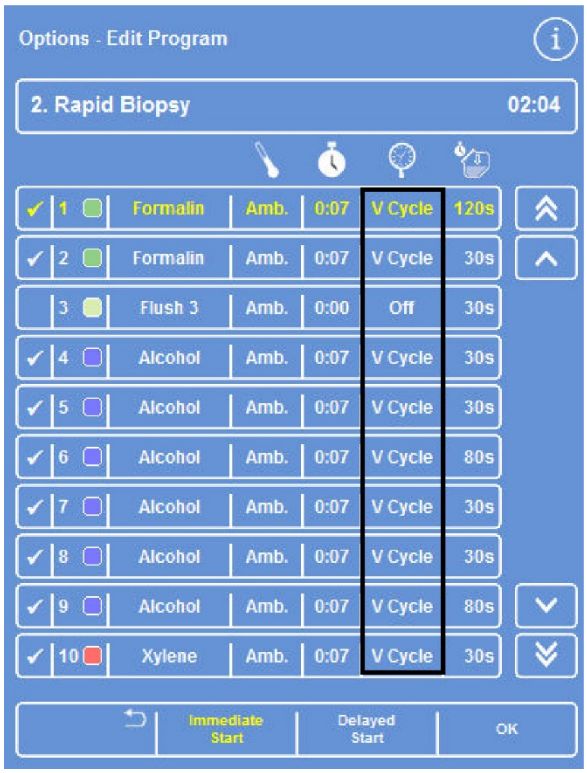
Note

To access the settings for the program clearant and infiltration groups, press the button.

- Select the required condition:

Off	• Specimens are held at atmospheric pressure.
On	• Specimens are held at approximately 600 mbar absolute (400 mbar below atmospheric pressure).
V Cycle	Specimens are held in a 15 minute, vacuum to atmospheric cycle that ranges from approximately 600 mbar absolute (vacuum conditions) through to atmospheric pressure.
P Cycle	Specimens are held in a 10 minute, vacuum to pressure cycle that ranges from approximately 600 mbar absolute (vacuum conditions) through to 1200 mbar absolute (pressure conditions)

- Press **OK** to save your setting and return to the Options – Edit Program screen.



Edit Program screen (step vacuum settings highlighted)

Drain Time

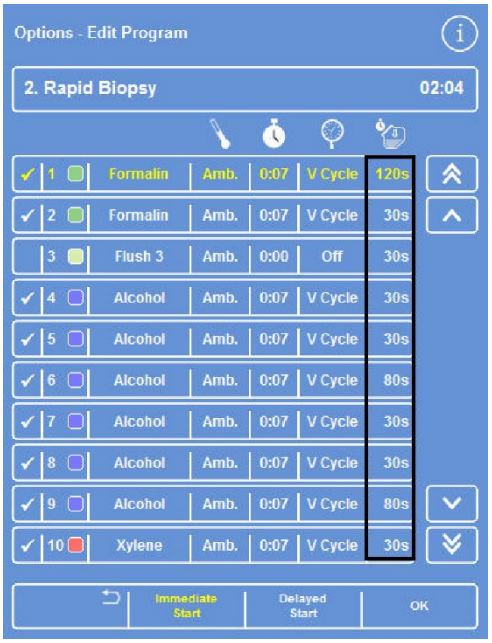
For each step in your program or flush, you can set how long specimens are allowed to drain before moving to the next step.

To set the drain time for a program or flush step:

- From the Main Screen, select **Options** > **Edit Program**.
- Select the program or flush that you want to change.
- In the column labelled with the icon, press the drain time for the reagent.

Note

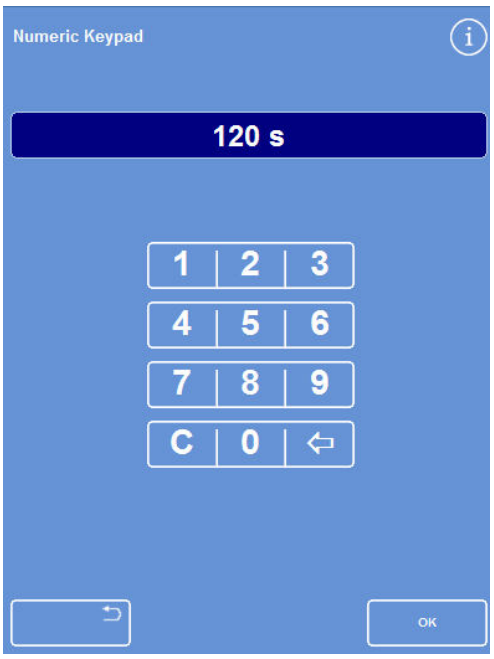
To access the settings for the program clearant and infiltration groups, press the button.



Edit Program screen (step drain time settings highlighted)

The Edit Program - Step Drain Time screen is displayed:

- Use the number pad to set the required drain time (30-180 seconds).
- Select **Copy To Group** to copy the setting to other members of the group, if applicable.
- Press **OK** to save your setting and return to the Options – Edit Program screen.



The Edit Program - Step Drain Time screen

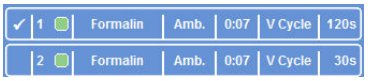
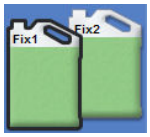
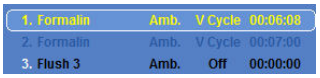
Enabling and Disabling Individual Steps

To adapt programs and flushes to your needs, you can enable or disable steps from any of the following program sections:

- Individual fixative steps
- Dehydrant group steps
- Clearant group steps
- Infiltration group steps
- Individual flush steps (F3 only)

Note

Not individual steps within the groups.

Example program	Display
Step 1 is enabled and step 2 is disabled:	 *Enabling and disabling program steps*
If you disable a step or group, it is also shown not selected on the Main Screen when you are editing the program:	 *Fix2 is disabled and not selected on the display*
When the program is run, Step 2 is shown greyed out and will be skipped:	 *Step 2 is skipped after Step 1 completes*

To enable or disable a program step or group:

- To disable a step or group, press the step selection box to clear the selection marker (tick).
- To enable a step or group, press the step selection box to display a selection marker (tick).
- Press OK to save your changes and return to the Select a Program... screen.
- To return to the Main Screen, press and then OK.

Start Type

You can specify whether you want the program to start immediately or after a delay. Yellow indicates the current setting:

- Immediate Start – The program will start immediately and run through the chosen steps to completion.
- Delayed Start – The start time of the program will be delayed so that the program can run overnight and complete at the Preferred End Time, refer to Workflow Setup Options Explained.

Access Code Protection

Access code protection enables the main administrator of the instrument to protect certain system functions. This helps to restrict the level of access that individual or groups of operators have across all menus and options.

To use access codes, a four-digit Admin Code must first be set by the instrument administrator. Once this is set, users can be added and their four-digit access code and level of access defined.

When access code protection has been enabled, the following types of padlock icon are displayed:

- On the Information Bar (bottom of screen):

This indicates that the interface is unlocked for the main administrator (ADMIN). This level of access is protected by the Admin Code.

This indicates that access to the interface is restricted according to the level of access given to a particular user. Their user name is displayed under the padlock.

- On function buttons:

This indicates that access to the function has been restricted. To gain access, the operator must enter a four-digit access code.

Note

The Options – Customer Services – Production Services and Reset Options buttons are permanently restricted. Production Services provides options to assist with fault finding and recovery.

Contact your service representative for assistance with these functions.

Access code protection is available for the following functions:

- Options — Access to the Options Menu from the Main Screen.
- Instrument setup — Access to the Instrument Setup menu.
- Edit program — Access to the Edit Program option.
- Modify start — Ability to modify start program parameters on the Reaction Chamber Available screen.
- Inspect reagent — Access to the Inspect Reagent option from the Quality Control menu.
- QC override — Ability to override QC warnings and postpone rotation.

Enabling Access Code Protection

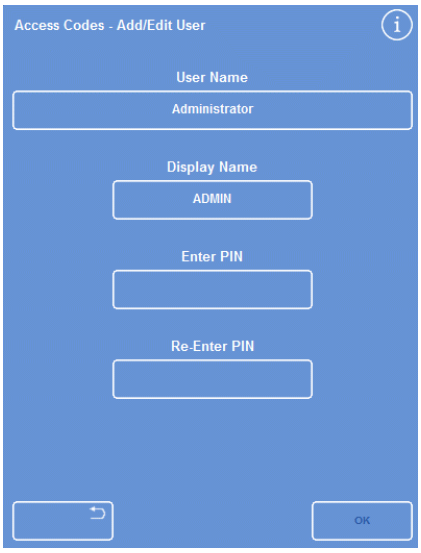
The instrument is shipped without any access codes set. To use Access Codes, you must first set an Admin Code.

To set an Admin Code:

- From the Main Screen, select **Options** > **Instrument Setup** > **Access Codes**.

  The Instrument Setup – Set Access Codes screen appears.
- Press **Set Admin Code**.

  The Set Admin Code screen is displayed.
- Use the number pad to enter a four-digit Admin access code.
- Press **OK**.
- Re-enter the access code and press **OK**.



Instrument Setup – Set Access Codes screen

Note

If you re-enter the code incorrectly, you will be prompted to re-enter the code twice.

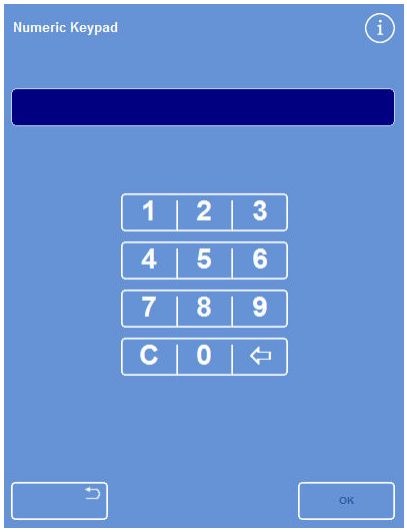
- The Instrument Setup – Set Access Codes screen reappears.

The unlocked ADMIN padlock icon is shown on the Information Bar:

- To log out of the access level that you are using, touch the padlock icon.

Note

Always return to the home screen after touching the padlock icon to prevent unauthorised access to any unprotected functions.



Set Admin Code screen

To clear an Admin Code:

Note

Clearing the Admin Code will permanently delete all users.

- Press the Clear Admin Code button.

  Press OK to confirm that you want to clear the Admin Code and delete all users.

Adding a New System User

Note

Before adding users to the system, an Admin Code must be set and you will need to have Admin access.
An unlocked ADMIN padlock icon, shown on the Information Bar, indicates this. Refer to Enabling Access Code Protection for details.

To add a new system user:

- From the Main Screen, select **Options** > **Instrument Setup** > **Access Codes**.

  The Instrument Setup – Set Access Codes screen appears.

  Enter the Admin access code.

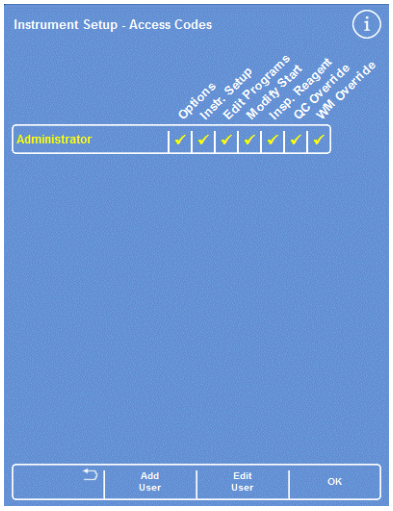
- Press Add User.

  The Add / Edit User screen appears.

- Press **Name** and use the on-screen keyboard to enter the new user's login name.

Note

A maximum of 5 characters can be used for user names.



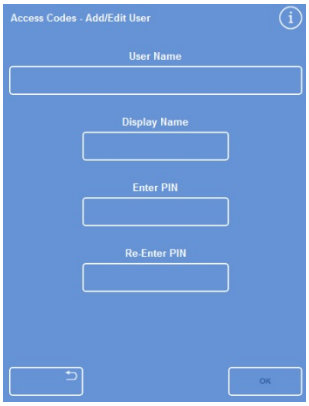
Instrument Setup – Set Access Codes screen

- Press **OK**.

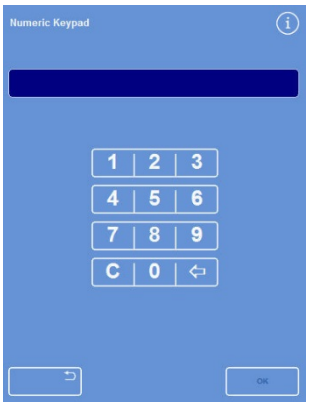
  The Add / Edit User screen reappears, showing the new user name on the Name button.

- To change the name, press the **Name** button and enter a new name.
- Press **Set Code** and use the number pad to define the user's four-digit access code. Press **OK**.
- Re-enter the access code and press **OK**.

  If the code is accepted, the Add / Edit User screen reappears. If the code is not accepted, enter a different code.



Add / Edit User screen with user name



Setting the user code

- Press **OK** to return to the Set Access Codes screen.

  The new user is listed under the Administrator.

- To return to the Main Screen, press **OK** repeatedly.

Username row with 3 users added

Granting Access to a Function

Note

Before granting access to functions, an Admin Code must be set and you will need to have Admin access.
An unlocked ADMIN padlock icon, shown on the Information Bar, indicates this. Refer to Enabling Access Code Protection for details.

To grant access to a function:

- Select Options > Instrument Setup > Access Codes.

  The Instrument Setup – Set Access Codes screen appears.
- Press the appropriate buttons on the username / function table to select (tick) functions that you want particular users to have access to.
- Press OK.

Note

Options must be selected in order for a user to be able to access Instrument Setup and Edit Program.

Adding access to different functions for users

Removing Access to a Function

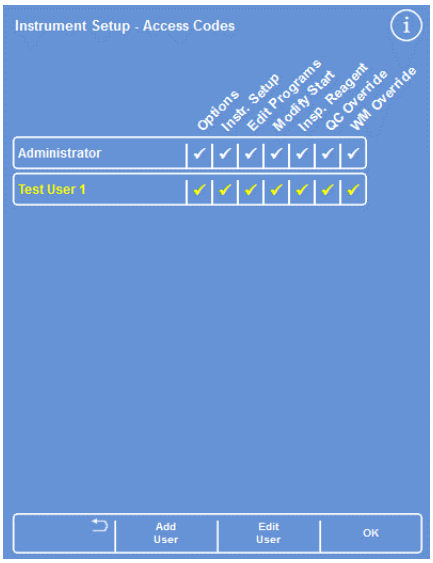
Note

Before removing access to functions, an Admin Code must be set and you will need to have Admin access.
An unlocked ADMIN padlock icon, shown on the Information Bar, indicates this. Refer to Enabling Access Code Protection for details.

To remove access to a function:

- Select Options > Instrument Setup > Access Codes.

  The Instrument Setup – Set Access Codes screen appears.
- Press the appropriate buttons on the username / function table to clear the tick from any functions that you do not want a user to have access to.
- Press OK.



Removing access to QC Override for user Test User 1

Deleting a System User

Note

Before deleting system users, an Admin Code must be set and you will need to have Admin access.
An unlocked ADMIN padlock icon, shown on the Information Bar, indicates this. Refer to Enabling Access Code Protection for details.

To delete a system user:

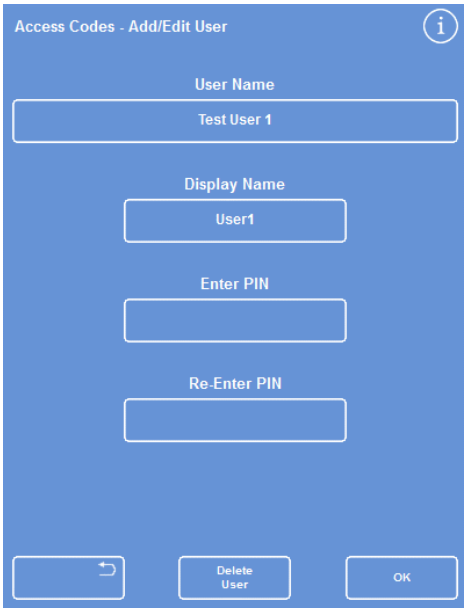
- Select Options > Instrument Setup > Access Codes.

  The Instrument Setup – Set Access Codes screen appears.
- Press the user that you want to delete.

  The Add / Edit User screen appears.
- Press Delete User.

  The Delete User - Confirm screen is displayed.
- To delete the user, press OK.

  The Instrument Setup – Set Access Code screen reappears.
- To return to the Main Screen, press OK repeatedly.



Deleting the user Test User 1

Deleting Admin

- Delete all users
- Final 'Delete' removes Admin and Pin.

Audio and Remote Alarms

Revos monitors various system events which can be used to trigger audio and remote alarms. For example, audio alarms can be set to alert operators that the instrument is on hold (the lid has been opened when processing has started) or a program has ended.

Remote alarms can be used to alert on-call managers that an instrument has a fault or mains power has failed. For more information about connecting remote alarms and autodialers, refer to Connecting a Remote Alarm.

External circuits should only be connected to the Remote Alarm socket by a technically competent person.

The external circuit should comply with the requirements of either IEC 61010-1 or IEC 60950, or both.

Using Audio and Remote Alarms

The Instrument Setup - Audio Remote Alarms screen displays a list of system events that can be monitored.

From here you can configure the system to play a sound and / or trigger a remote alarm should any of the listed events occur.

- To access the screen, select Options > Instrument Setup > Audio / Remote Alarms.

The Instrument Setup - Audio Remote Alarms screen

Changing the alarm settings

You can change alarm sounds, the number of repeats and enable or disable instrument alarms for events.

Up to two remote alarms can be defined for each event and operated for any combination of events.

Note

The careful setting of alarms helps to ensure that processing quality is maintained and that any faults are identified promptly.

Alarm sound:

- To listen to the current sound, press the ▶ symbol next to the event description.
- To change the current sound, press the sound button for an event until the required sound is shown. The selected sound will play on each press of the sound button. Volume is 0 to 100.

Remote alarm (RA) 1 and 2:

- Press the RA1 / RA2 buttons until the required condition is shown:

On	The RA is enabled and will remain active until it is turned off.
Off	The RA is disabled and will ignore any event that occurs.
Tune	The RA is enabled and will remain on for the duration of the alarm sound repeats.

- To save the settings and return to the Instrument Setup screen, press OK.

Remote Alarm Notification Icons

When a remote alarm is triggered an icon displays in the grey bar at the bottom of the interface.

The following icons can be shown:

1	Remote Alarm 1 has been triggered.
2	Remote Alarm 2 has been triggered.
1 2	Both Remote Alarm 1and Remote Alarm 2 have been triggered.

File Operations

Revos can save programs, flushes and setup information to a USB memory stick for backup or transfer to another instrument. You will find the options to save and load information on the **File Operations** menu.

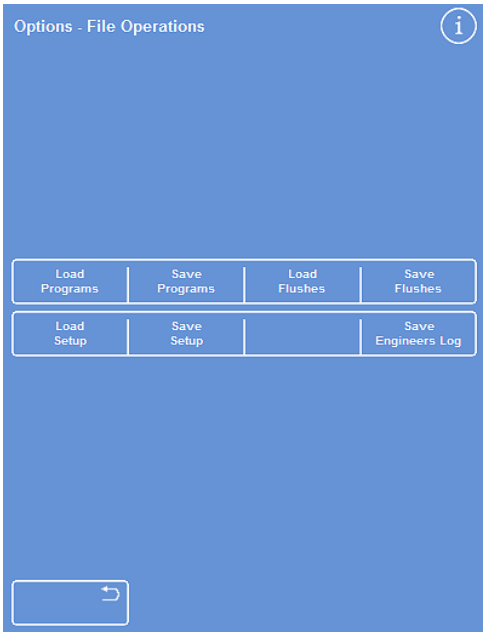
Note

It is important to save programs and the setup of your instrument to a USB memory stick.

You can use this information to restore your instrument should there be a problem, or transfer the setup, programs or flushes to another Revos instrument in your laboratory.

Folder Naming

The name of the USB root folder is taken from the instrument's serial number. The report subfolders are named by date and the identification text on the reports is taken from the Instrument ID and Customer Text.



The Options - File Operations menu

Using a USB memory stick with the instrument:

The USB port is for memory sticks only.

Do not connect any other type of USB device to the Revos.

- Insert a USB memory stick into the USB port. For the location of the USB port, refer to Identification of Parts.

  Inserting a USB memory stick will prompt the icon to appear at the bottom of the Main Screen, to the right of the date and time.

- Press the icon to capture an image of the screen.

  Images are saved to the root directory of the USB memory stick in a folder called ScreenDumps.

Saving Programs and Flushes

Programs and flushes can be saved onto a USB memory stick to provide a backup or for transfer to another Revos instrument. This can be done with individual programs and flushes, or all programs and flushes.

Note

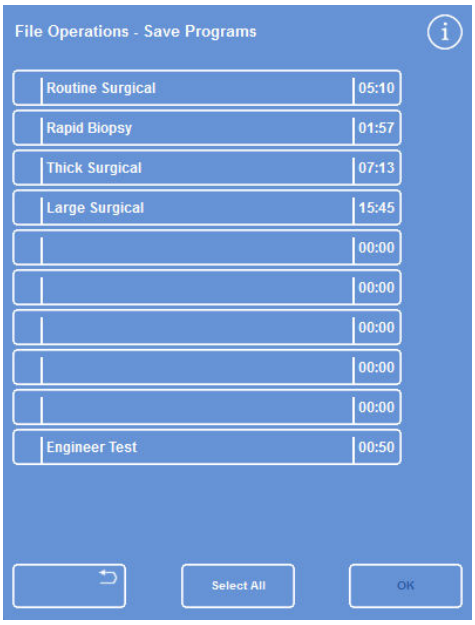
Before saving or loading programs and flushes, ensure that a USB memory stick is in place in the instrument. If a USB memory stick is not in place, the options will appear shaded.

To save a selected program:

- From the Main Screen, select Options > File Operations > Save Programs.
- Select the program(s) that you want to save from the Select a Program screen.
- Press OK to save and return to the Options – File Operations screen.

To save all programs:

- From the Main Screen, select Options > File Operations > Save Programs.
- Press Select All to select all programs on the list.
- Press OK to save and return to the Options – File Operations screen.



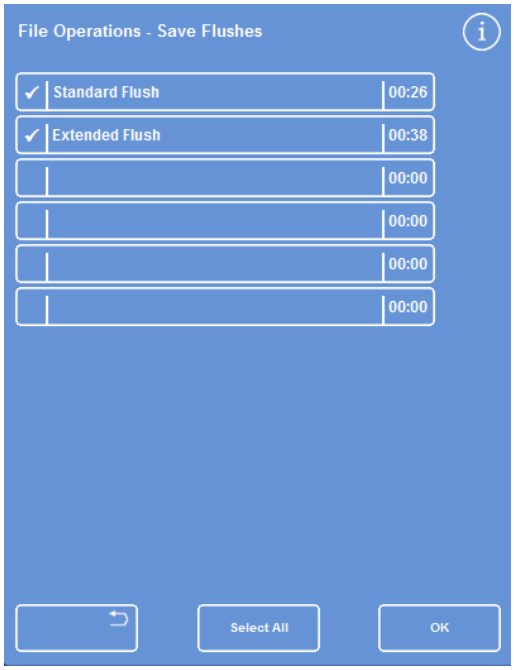
Select a Program screen

To save a selected flush:

- From the Main Screen, select Options > File Operations > Save Flushes.
- Press Flushes.
- Select the flush that you want to save from the Select a Flush screen by clicking in the space next to relevant flush.
- Press OK to save and return to the Options – File Operations screen.

To save all flushes:

- From the Main Screen, select Options > File Operations > Save Flushes.
- Press Flushes.
- Press Select All to select all flushes on the list.
- Press OK to save and return to the Options – File Operations screen.



Select a Flush screen

Loading Programs and Flushes

The following types of program and flush can be loaded on to the instrument:

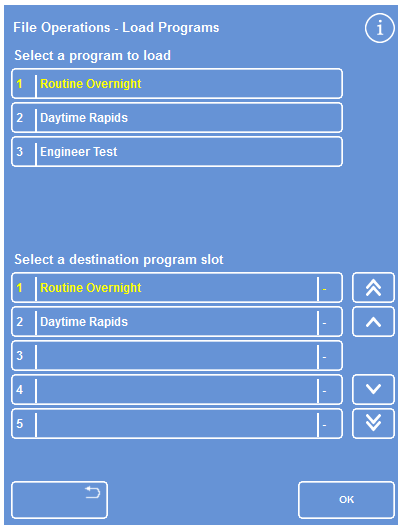
- Individual programs or flushes that have been developed and saved from another instrument.
- All programs or flushes from another instrument.

Notes

When all of the programs or flushes from another instrument are loaded on to the instrument, all of the programs or flushes on the current instrument will be overwritten, after confirmation.

Before saving or loading programs and flushes, ensure that a USB memory stick is in place in the instrument. If a USB memory stick is not in place, the options will appear shaded.

Programs and flushes are loaded from the Load Programs and Load Flushes screens. Both screens have the following options:



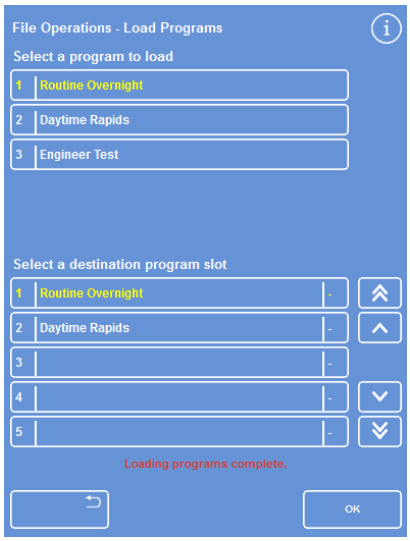
Load Programs screen

Select a source folder	From here, you can select a folder that contains the required program or flush. Source folders are labelled with the instrument serial number.

Note

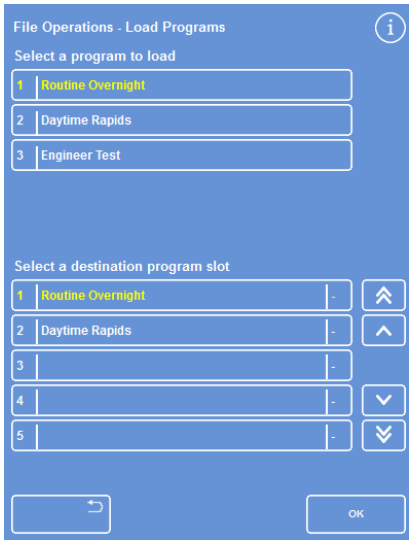
Any other folders present on the USB memory stick will also appear on the Select Source Folder screen.

Select a program to load	From here, you can select a program or flush from the selected source folder.
Select a destination program slot	From here, you can select a program slot that will be overwritten with the chosen program or flush. The default is the next empty program slot.
Load All	This enables you to load all programs or flushes from the selected source folder.
Flushes / Programs	This enables you to switch between the Load Program and Load Flushes screens.



Load Flushes screen

To load an individual program:



Load Programs screen

- From the Main Screen, select Options > File Operations > Load Programs.

  The File Operations - Load Programs screen appears.

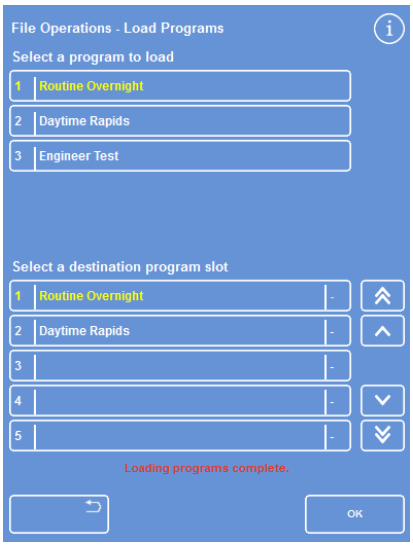
- To change the source folder, press the **Select a source folder** button and select the required folder from the list.

  The Load Programs screen reappears.

- To select the program that you want to load, press the **Select a program to load** button and choose the program.
- Press **OK**.

  The File Operations - Load Programs screen reappears and the destination will default to the next empty program slot. This is indicated on the Select a destination program slot button.

- To change the destination, press **Select a destination program slot**, select the required slot and press **OK**. You can overwrite an existing program, if required.
- Press **OK** to load the selected program.
- Press the button to return to the Options screen and then **OK** to return to the Main Screen.



Load Flushes screen

To load all programs:

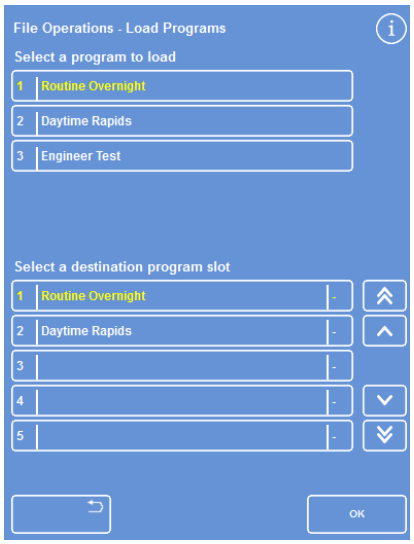
- From the Main Screen, select Options > File Operations > Load Programs.

  The Load Programs screen appears.

- To change the source folder, press the **Select a source folder** button and select the required folder from the list.

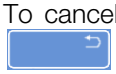
  The Load Programs screen reappears.

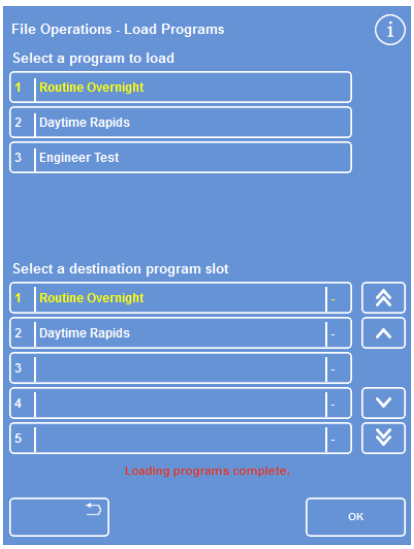
- Press Load All.



Loading all programs from USB

You will be prompted to confirm that you want to overwrite all of the programs on your instrument.

- To cancel and return to the Load Programs screen, press  .
- Click **OK** to load all programs.
- To return to the Main Screen, press **OK** repeatedly.



Press OK to confirm

To load an individual flush:

- From the Main Screen, select Options > File Operations > Load Programs.

  The Load Programs screen appears.

- Press **Flushes**.

  The File Operations – Load Flushes Screen appears.

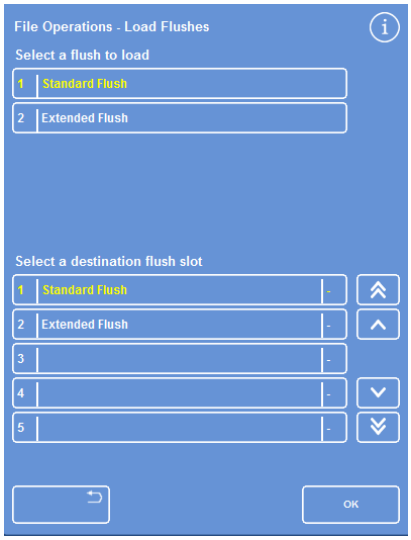
- To change the source folder, press the **Select a source folder** button and select the required folder from the list.

  The Load Flushes screen reappears.

- To select the flush that you want to load, press the **Select a flush to load** button and choose a flush.
- Press **OK**.

  The Load Flushes screen reappears and the destination will default to the next empty flush slot. This is indicated on the 'Select a destination flush slot' button.

- To change the destination, press **Select a destination flush slot**, select the required slot and press **OK**. You can overwrite an existing flush, if required.
- To return to the Main Screen, press **OK** repeatedly.



Loading flushes from USB

To load all flushes:

- Select Options > File Operations > Load Programs.

  The Load Programs screen appears.

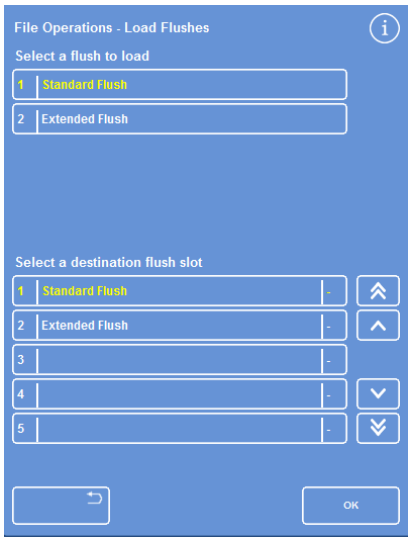
- Press **Flushes**.

  The File Operations – Load Flushes Screen appears.

- To change the source folder, press the **relevant destination slot** button. Then press **OK**.

  The Load Program screen reappears.

- Press Load All.

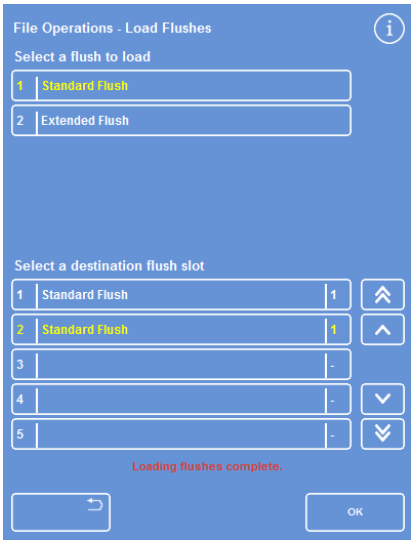


Loading all flushes from USB

You will be prompted to confirm that you want to overwrite all of the programs on your instrument.

- Click OK to load all flush programs.

  To cancel and return to the Load Programs screen, press .



Press OK to confirm

Loading and Saving Setup

Instrument setup information can be saved to a USB memory stick and then loaded from the stick to other instruments. The following setup information will be saved:

- Reagent names
- Storage temperatures
- Rotation management settings
- Reagent use limits
- Access code settings

Setup data is saved to the instrument's source folder on the USB stick. Source folders are labelled with the instrument serial number.

Note

Before saving or loading instrument setup, ensure that a USB memory stick is in place in the instrument. If a USB memory stick is not in place, the options will appear shaded.

To save instrument setup:

- Select Options > File Operations > Save Setup.

  The setup data is saved to the instrument's source folder on the USB memory stick.

Note

Any existing setup data in the source folder will be overwritten. To save more than one set of setup data, use a separate USB memory stick.

To load instrument setup:

- Select Options > File Operations > Load Setup.

  The File Operations – Load Setup Screen appears. The current source folder is displayed within the Select a source folder button.

- To change the source folder, press the Select a source folder button and select the required folder from the list and press OK.

  The Options – File Operations screen reappears.

- To return to the Main Screen, press OK twice.

Setting Laboratory Information Management System (LIMS) Messages

Revos can be programmed to send user-defined LIMS messages including program start, underfill, alcohol at limit, filter changed and instrument fault. A maximum of 25 characters can be used for LIMS messages.

Note

The message length is also limited to the maximum number of visible characters that the on-screen keyboard can display.

For the location of the Revos LIMS interface, refer to Connecting a Laboratory Information Management System (LIMS).

To set LIMS messages:

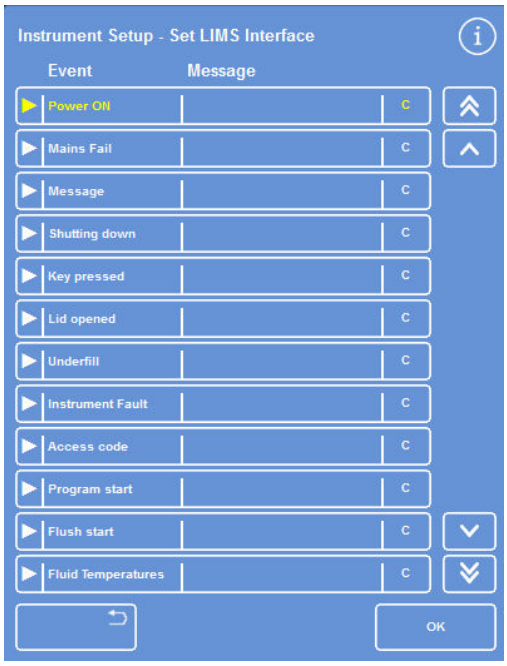
- Select Options > Instrument Setup > Set LIMS Interface.

  The Set LIMS screen appears.
- Press C to clear any message that has been defined for an event.
- Press within the **Message** box to define an outgoing message using the on-screen keyboard.

Note

A maximum of 25 characters can be used for LIMS messages.

- Press ▶ to send the defined message via the LIMS interface.
- Press **OK** to save any changes and return to the Instrument Setup menu. Press ⮌ to return without saving.
- To return to the Main Screen, press **OK** repeatedly.



Set LIMS screen

Syntri Service

For details on the Syntri Service facility within Revos, please refer to the Syntri Service Operator Guide A84110200.

Language

Changing the Display Language

The display language is set when the instrument is setup, but it can be changed, if required.

To change the display language:

- Select Options > Instrument Setup > Language Select.

  The currently selected language is shown in yellow text.
- Press the button for the required display language and press OK.
- To return to the Main Screen, press OK repeatedly.

The Instrument Setup - Language Select screen

Customer Services

This menu provides access to a range of options and settings that are used as an aid to fault finding and recovery.

Note

The functions on this screen should be used with caution. Contact your service representative for assistance with these functions.

To access the Customer Services menu:

- Select Options > Customer Services.

  The Customer Services screen appears.

The Customer Services Menu

The following options and functions can be accessed from the Customer Services menu:

Production Services	Production Services provides options to assist with fault finding and recovery. Note *This button is permanently restricted.*
Production Tests	Not available to customers
Services	Not available to customers
Service Tests	Not available to customers
Reset Options	From here, you can perform a reset to return the instrument to the factory installed settings and set the instrument to display a full load of reagents for testing purposes. Note *These options are permanently restricted.*
Disable Pipes	From this screen you can disable pipes, connecting the reagent containers with the Reaction Chamber, in order to isolate components. Note *This facility can be used to remove one reagent in a group from within a program. It should only be used in the event of a fault until a service representative can attend.*
Software Update	Software update is under instrument setup (and is available to customers)

Chapter 5 - Cleaning and Maintenance

This chapter describes how to clean and maintain your Revos instrument and covers the following subjects:

- Cleaning safety
- Clearing spillages
- Daily and weekly cleaning tasks
- Cleaning reagent bottle dip tubes and the flush water bottle
- Discarding used wax
- Cleaning the Touchscreen display
- Changing filters
- Checking the instrument on a regular basis
- Taking the instrument out of operation

Cleaning Safety and Tasks

Cleaning Safety

Normal standards of laboratory hygiene and routine maintenance procedures are all that is necessary to keep the Revos in good and serviceable condition.

Before using any cleaning or decontamination method, except those recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the equipment.

Inspect the instrument for obvious damage or wear whenever you clean or use it.

Always wipe up any spills immediately.

In the event of a major spillage, disconnect the instrument from the mains supply immediately and do not reconnect and switch on until the instrument has been thoroughly dried out and checked by a Service Engineer.

If biohazardous material is spilt on, or inside, the instrument you must carry out the appropriate decontamination.

Do not use abrasive compounds or metal components to clean Revos or its components and accessories.

Always take the necessary safety precautions when you clean or decontaminate Revos to protect yourself against the effects of chemicals.

As with all scientific equipment, due care and Good Laboratory Practice must be employed when dealing with chemicals, and consideration must be given to the potential for hazard when dealing with particular chemicals.

Unless otherwise stated, only use reagents that appear on the approved list to clean Revos (refer to Appendix D – Approved Reagents).

Clearing Spillages

Note

Follow your own laboratory practice spillage procedures or do the following.

Any reagent spills within the instrument will be contained. Small spills, such as drips from the reagent tubes when the reagents are changed, will evaporate and be extracted.

Some chemicals which may be used during operation are flammable – do not use sources of ignition in the vicinity of the instrument when it is loaded with reagents.

Harmful chemical vapours such as xylene and toluene may be emitted during the normal operation of some instruments, and the operator should be aware of suitable precautions and safety measures.

To clean large spills:

- Remove all the reagent bottles from the Reagent Storage Area.
- To access the spillage containment area, lift and remove the metal shelf in the base of the Reagent Storage Area.
- Clean and dispose of any liquid from this area in accordance with any local procedures or regulations.
- Replace the metal shelf and the reagent bottles.

Note

Ensure that the metal shelf is the correct way up; the folded edge must be on the top.

Daily and Weekly Cleaning Tasks

The following cleaning tasks must be performed on a daily and weekly basis.

Daily

Check the following on a daily basis:

- General instrument cleanliness.
- Reagent bottle contents (front bottles).
- Level sensors; clean as required.

Weekly

Check the following on a weekly basis:

- Spillage containment area.
- Wax bath contents.
- Level sensors; clean with the provided Level Sensor cleaning pad.

Wax and Wax Baths

Ensure that you wipe out Wax Bath 3 after the wax is rotated and discarded into the waste wax tray.

Discarding Used Wax

When the oldest wax is discarded from the W1 position during a rotation (refer to Renewing Dehydrants, Clearants and Infiltrants Using Rotation), it is discarded directly into the consumable waste wax tray.

Note

For information on how to discard wax after an inspection, refer to Discarding a Reagent after Inspection.

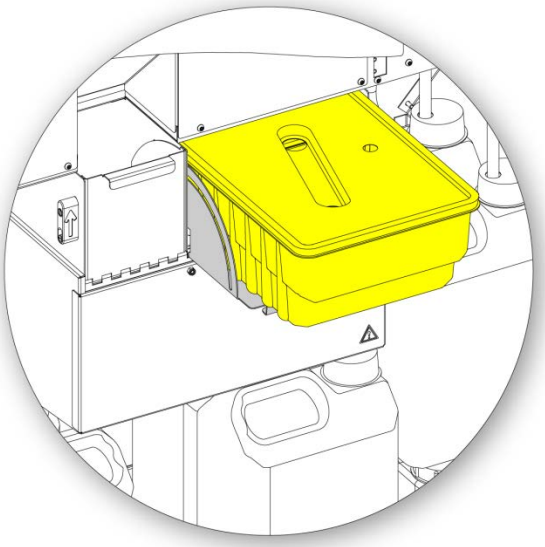
To discard used wax:

- Open the wax door and carefully slide the consumable waste wax tray from the instrument.

The waste wax tray contains hot molten wax.

- Place the tray in a cool, well-ventilated area away from the instrument and allow the wax to set.
- When the waste wax has set, discard the entire waste wax tray and solid wax in accordance with local procedures and regulations.
- Fit a new consumable waste wax tray into the instrument above the wax baths and close the access doors.

Ensure that there is always an empty waste wax tray in the instrument.



Waste wax tray fitted above W1 and W2

Cleaning the Wax Bath

After a wax rotation has completed, Wax Bath 3 is empty.

To clean the wax bath:

- Open the wax access door on the left.
- Use absorbent paper to wipe out any remaining wax from the wax bath.

  Make sure that no paper is left in the wax bath.

The bases of the wax baths are hot.

Always wear protective gloves.

Reagent and Flush Bottles

Ensure that you clean the reagent dip tubes when reagents are replaced.

Note

The Flush 3 bottle should be cleaned and refilled when flush reagents are renewed.

Cleaning the Reagent Supply Bottle Dip Tubes

The dip tubes supplying the following bottles must be cleaned each time the reagents are changed or discarded:

- Fixative 1 (Fix1)
- Fixative 2 (Fix2)
- Exchange 1 (Ex1)
- Exchange 2 (Ex2)
- Flush 1 (F1)
- Flush 2 (F2)
- Flush 3 (F3)

To clean reagent supply bottle dip tubes during reagent change:

- Carefully remove the dip tubes from the reagent bottles.
- Clean any contamination from the surface of the tubes with a lint-free cloth.
- Remove the bottles from the instrument and replace their caps.
- Dispose of the used reagents in accordance with your local regulations and procedures.
- Replace reagents according to the Quality Control and Reagent Renewal procedures. Refer to Quality Control, Filter and Reagent Renewal Limits.

Cleaning the Flush 3 Water Bottle

The Flush 3 (F3) bottle is located in the cabinet, below the F1 and F2 bottles.

To remove the F3 water bottle:

- Remove the F1 and F2 bottles.
- Remove the green reagent tube from the rear of the F3 bottle and carefully lift and slide the bottle out of the Reagent Storage Area.
- Remove the cap and dispose of the water in accordance with any local procedures and regulations.

Keep the F3 bottle level to avoid any spillage. The F3 bottle must be cleaned before it is refilled with water.

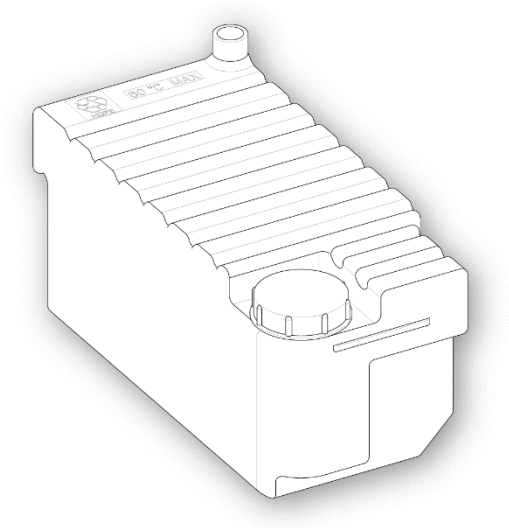
To clean the F3 water bottle:

- Rinse the bottle with clean water and mild detergent.
- Use a bottle brush if required.

Do not use temperatures higher than 60°C.

To refill and refit the F3 water bottle:

- Refill the F3 bottle with water up to the underside of the fill-line (approximately 5 litres).
- Replace the cap.
- Place the water bottle in the Reagent Storage Area with the cap towards the front of the instrument.
- Fit the green tube into the open pipe at the rear of the F3 water bottle.
- Make sure that the tube is fully inserted into the water bottle (so it sits on the bottom of the bottle) and that there are no kinks in the flexible section of tube.
- Replace the F1 and F2 bottles.



F3 Water bottle with the fill-line visible

General Cleaning and Maintenance

Cleaning the Display

The Touchscreen display should be cleaned on a regular basis. Ensure that the screen is locked before it is cleaned.

To clean the display:

- Lock the screen. To do this, press and hold the Thermo Scientific logo in the bottom right of the screen until the 'locked screen' icon appears.
- Gently wipe the Touchscreen with a soft damp cloth.
- Unlock the Touchscreen. To do this, press and hold the Thermo Scientific logo in the bottom right of the screen until the 'locked screen' icon disappears.

Do not use solvents to clean the Touchscreen.

Changing Filters

Change the filters every 13 weeks. To replace the filters, refer to Fitting the Filters.

Regular Maintenance Checks

The following table describes items that should be checked on a regular basis:

Area	Item	Frequency	What to do
Wax baths	Level	Weekly	Check wax levels in all wax baths.
Lid/ Reaction Chamber	Seal	After each processing run	Clean the Reaction Chamber and keep the lid and seal clear of solid wax deposits.
	Level Sensors	After each flush cycle	Carefully wipe with gauze or paper towels.
		Weekly	Clean with tissue or the provided Level Sensor cleaning pad.
	Latch	Whenever the lid is opened	Check that the lid latch operates correctly. The downdraft system should operate and the display should show the lid open.
Reagent Storage Area	Reagent Pipes	When loading or unloading reagents	Check that the flexible parts of the reagent tubes in the front of the cabinet are not damaged or collapsed.
	Reaction Chamber Heater Trip	Monthly	Press the Push-to-Test switch next to the Heater Reset Switch in the Reagent Storage Area. The Heater Reset Switch should operate and the Reaction Chamber Heater trip icon will be displayed on the screen. Press the Heater Reset Switch in fully to reactivate the Reaction Chamber heaters. The Reaction Chamber Heater Fault icon will disappear from the screen.
	Battery Isolation Switch	Monthly	Check the operation of the Battery Isolation Switch during a flush cycle. When the O side is pressed (OFF), the Battery Fault icon should be displayed. When the I side of the switch is pressed (ON), the icon should disappear.

Instrument Shutdown Procedure

For continuous and consistent processing, Revos should be switched on at all times. However, if the instrument is to be moved, left unattended for extended periods of time, or decommissioned, carry out the following steps.

When you return or move the instrument you must remove any excess tissue left in the instrument and carry out a flush before shutting down the instrument.

- Ensure that any processing programs have finished.
- Carry out a flush procedure. Refer to Flushing the Instrument for details.
- Unload wax and reagents from the instrument. Refer to Unloading Reagents for details.
- Press the O (OFF) side of the mains switch to switch off Revos.
- When the red screen goes appears, press OK.
- Press the O (OFF) side of the Battery Isolation Switch to isolate the battery.

Note

If you want to repack the instrument, refer to Appendix C – Repacking Instructions.

Unloading Reagents

If required, all of the wax and reagents can be unloaded from Revos. This should be done in the following situations:

- If you are changing to a different set of reagents.
- If the instrument is to be moved or left unattended for a long period of time.

Unloading removes all reagents via the Reaction Chamber into the waste wax tray and exchange bottles at positions Ex1 and Ex2.

Note

*The **Unload Reagents** option is only available when reagents have already been loaded into Revos. Refer to Loading Reagents for information on loading reagents into the instrument.*

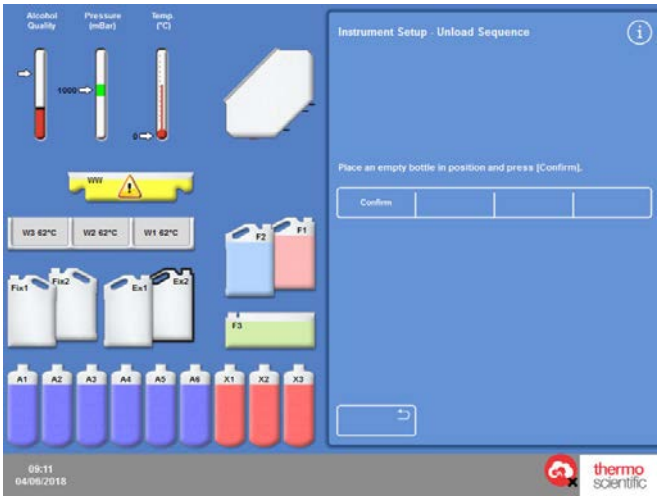
Initiating Reagent Unloading

- Select Options > Instrument Setup > Unload Reagents.

  The Unload Sequence screen appears.
- To unload the reagents from the instrument, follow the on-screen instructions and then press Unload.

RFID Unloading

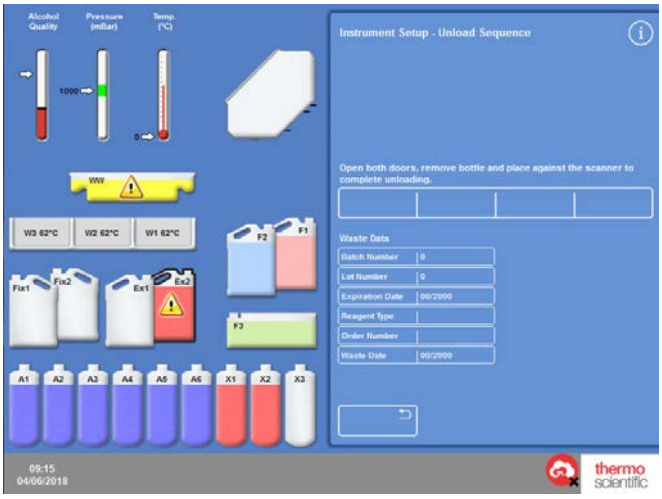
- When unloading a reagent the system will ask the user to place the bottle in the highlighted position:



Note

Once the user confirms the system goes through the unload process of moving the reagent into the chamber and then the appropriate Ex bottle.

- Once the unloading has completed the display will show the waste data that will be programmed into the bottle tag to indicate that the product is 'waste':

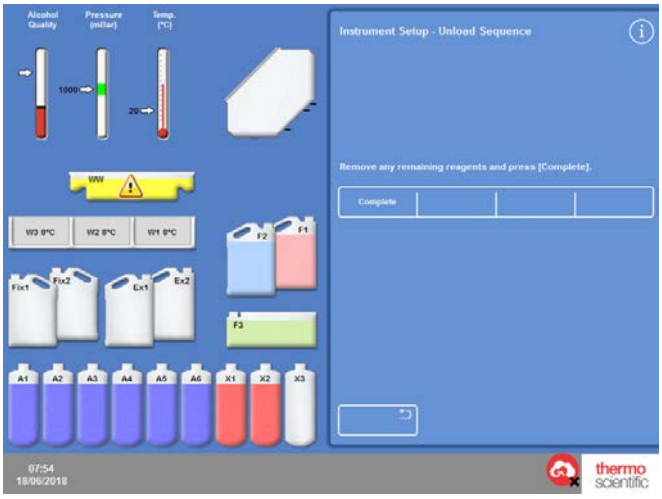


- Remove the bottle and place against the scanner to allow the system to move onto the next step.

Note

Once system has written to the tag there is an audible indicator to indicate success or failure of the write.

- The system is then ready to move onto the next reagent.



Note

This cycle will complete until the system is unloaded.

Unloading Wax

Note

Wear gloves during this procedure due to the high temperature of the wax.

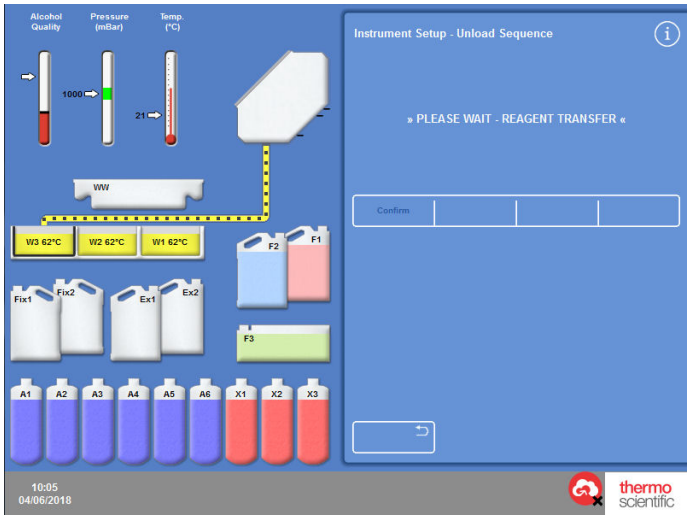
- Ensure the consumable waste wax tray is correctly fitted above wax baths, W1 and W2.
- Press **Unload** to pump the wax from the selected wax bath into the Reaction Chamber and then discard it into the waste wax tray.

Note

At this point, you may need to wait for the wax to reach temperature before the transfer.

- Repeat this process for the other wax baths.

  When the last wax bath has been unloaded, the screen instructions will prompt you to start a hot rinse using F1.
- Press **Start** to flush and remove any remaining wax from the Reaction Chamber.



Unloading wax

Unloading Clearants

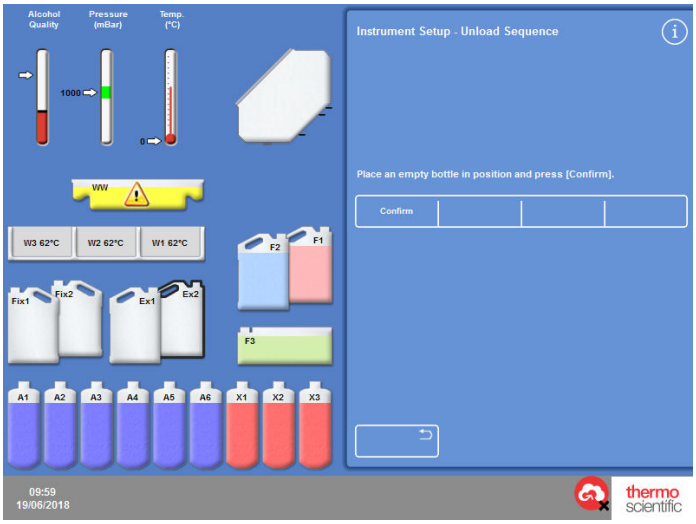
The unload procedure continues; the Ex2 bottle is highlighted with a black outline.

- Confirm that bottle Ex2 is empty and then press **Unload** to continue removing the reagents.

  The contents of X3 is drawn into the Reaction Chamber and then pumped into Ex2.

  The Ex2 bottle image changes to full, with a flashing black outline and warning triangle displayed within it.

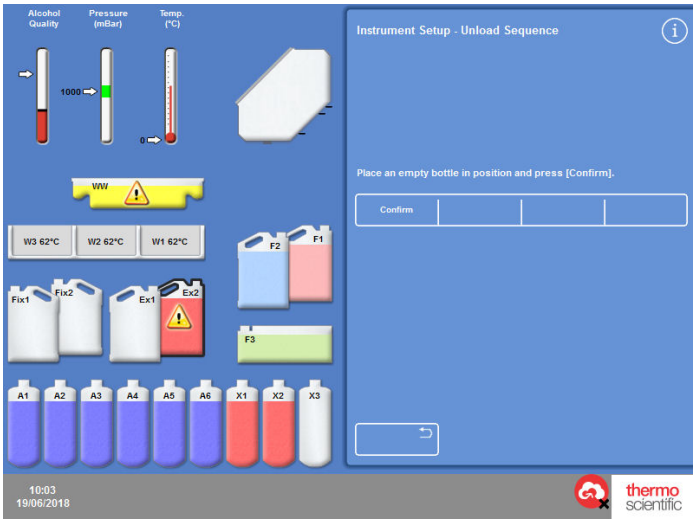
- Remove bottle Ex2 and dispose of its contents in accordance with local procedures and regulations.
- Place another empty bottle in the Ex2 position and press **Unload**.
- Follow the screen instructions to continue removing the remaining clearant reagents.



Unloading clearants – Ex2 outlined

When all clearants are unloaded you will be prompted to start a flush to remove any remaining clearant from the Reaction Chamber.

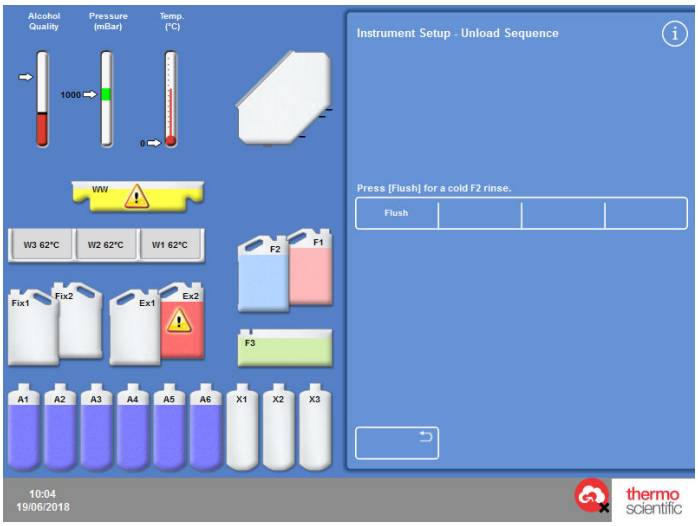
- Press **Start** for a hot F2 rinse.
- Press **Start** for a cold F3 rinse.



Unloading clearants – Ex2 full

Unloading Flush Reagents

- Remove the F1, F2 and F3 bottles from the cabinet and press **Unload**.
- Dispose of waste reagents in accordance with local procedures and regulations.
- Replace F3 back into the cabinet after emptying.

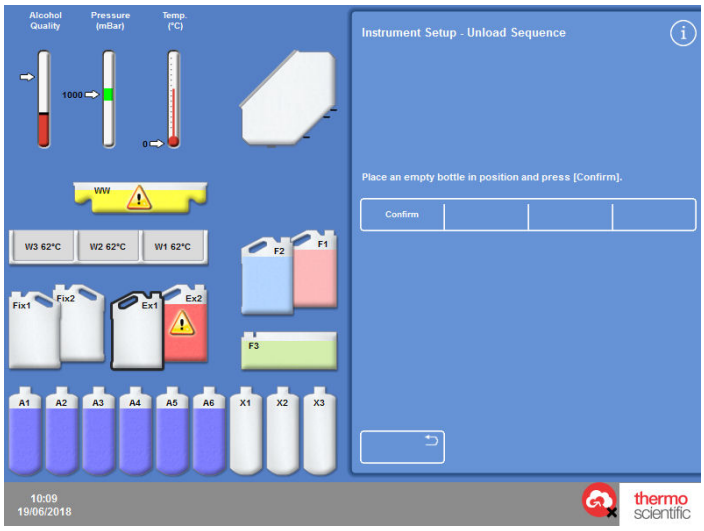


Unloading Flush Reagents, F1 highlighted

Unloading Dehydrants

The unload procedure continues; the first dehydrant bottle (A1) and the Ex1 bottle are highlighted.

- Follow the screen instructions to confirm that the bottle Ex1 is empty. Press **Unload** to continue to remove the reagents.
- Remove the Ex1 bottle and dispose of its contents in accordance with local procedures and regulations.
- Place another empty bottle in the Ex1 position and follow the screen instructions to remove the remaining dehydrants.



A6 dehydrant bottle and the Ex1 position highlighted

Removing Fixatives

- Remove the Fix1 and Fix2 bottles from the cabinet and press **Unload**.

  The Instrument Setup menu is re-displayed.
- Dispose of waste reagents in accordance with local procedures and regulations.
- Press **OK** to return to the Options menu and then **OK** again to return to the Main Screen.

Chapter 6 -Troubleshooting

This chapter describes how to troubleshoot problems that may occur when using Revos and covers the following subjects:

- Recognising alert icons and use the Fault Status screen to identify and resolve problems.
- Dealing with instrument malfunctions, should they occur.
- Solving tissue processing problems.
- A list of frequently asked questions with answers.

Faults

Alert Icons

Revos places the highest priority on specimen integrity and processing quality. The instrument continually monitors its status, giving clear visual and audible warnings in the event of a problem, and provides specimen safety measures.

- Alert icons appear at the bottom of the screen, to the left of the Thermo Scientific logo.
- The Quality Control and Fault Status screens enable quick diagnosis; these are automatically displayed if you start a program when there are problems with the instrument or reagents. Issues must be resolved before the program will start. For more information, refer to Quality Control Checks and Using the Fault Status Screen.
- The rechargeable battery provides backup power if there is a mains power failure.
- A sounding alarm with remote facility can send warnings outside of working hours.

Icon	Description
	Reaction Chamber Heater Trip Processing cannot start. Open the right cabinet door and press the Reset switch. This icon is normally displayed when power is restored after an interruption. Refer to Instrument Start-up Procedure.
	Reaction Chamber Heater Trip Due to Error An error has caused the heater to trip. Processing cannot start. Open the right cabinet door and press the **Reset** switch.
	Access Code The access code has been entered. The name of the user who entered the code is displayed below the icon. Refer to Access Code Protection.
	Main Cabinet Doors Open This condition displays the Quality Control Screen. Close and lock the cabinet doors then press **OK** to leave the Quality Control Screen.
	Battery Isolation Switch The battery isolation switch is not on. Open the right cabinet door and turn the rocker switch **ON** to restore battery backup and ensure power to the instrument. Refer to Instrument Start-up Procedure.
	Mains Power Failure The instrument is running on battery backup power. The available power is displayed as a percentage. Inspect mains power connections, power cable and mains supply. Some heating functions are limited when running on battery backup.
	Quality Control Alert Open the Quality Control screen for details.

Icon	Description
	Remote Alarm A remote alarm has sounded. The icon indicates whether it is Alarm 1 or Alarm 2. Press the icon to silence the alarm.
	Syntri Service Session in Progress Syntri Service is being connected and the instrument is being checked.
	USB Flash Drive Connected A USB memory stick has been connected via the USB port on the front of the instrument. Press the icon to capture an image of the screen. Images are saved to the root directory of the USB memory stick in a folder called Screen Dumps.
	Screen Locked The screen is currently locked. To lock or unlock the screen, press and hold the Thermo Scientific Logo at the bottom right of the interface for five seconds. Refer to Cleaning the Display.
	Hardware Issue There is a problem with the instrument which has not been acknowledged. Processing cannot start. Press **Options** > **Faults** to display the Fault Status screen. Pressing the icon will also open the Fault Status screen. Refer to Using the Fault Status Screen.

Using the Fault Status Screen

If the wrench (spanner) icon is displayed, this indicates that there is a hardware issue that needs to be addressed before processing can start. You will need to check the Fault Status Screen to find out more information about the issue.

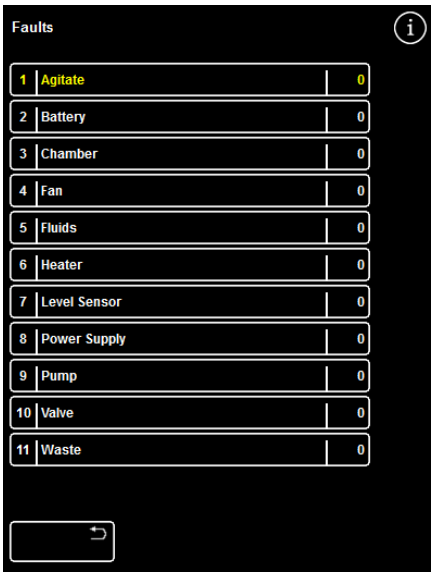
- To display the screen either select **Options** > **Faults** or press the wrench (spanner) icon.

The Fault Status Screen lists all current warnings and faults and their status:

- A warning (WARN) indicates the presence of an issue that can be acknowledged or resolved by the operator.
- A fault (FAULT) indicates the presence of an issue that may require service intervention.
- To display any warnings or faults that are not listed on the first page, press **Page Down**.
- To view all active and inactive warnings and faults, press **Show All**.

The following information is displayed for each warning and fault:

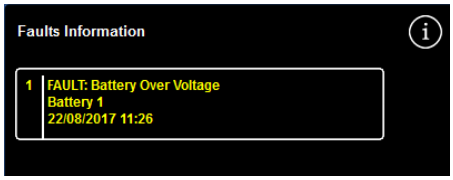
- Number: Each warning and fault has a predefined number and is listed in numerical order.
- Status: Reported as OK, WARN or FAULT.
- Name: For example, Specific gravity or Reaction Chamber (RC) trip out.
- Last: The date and time of the last trigger.
- Count: The number of times that the warning or fault has occurred.



Fault Status Screen

Note

Some warnings, that can be resolved by the operator, have a solution displayed at the top of the screen:

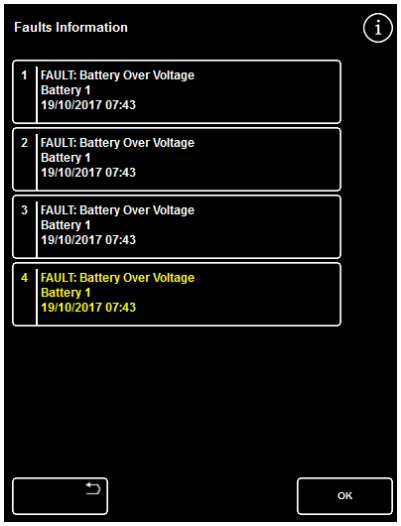


Fault Solution

Acknowledge and Retry

- To Acknowledge the Warning or Fault, select it and press the OK button. If it can be cleared it will be removed from the screen.

These selections clear the alert icon, and you can try to continue processing. If the problem persists, contact Thermo Fisher Scientific.

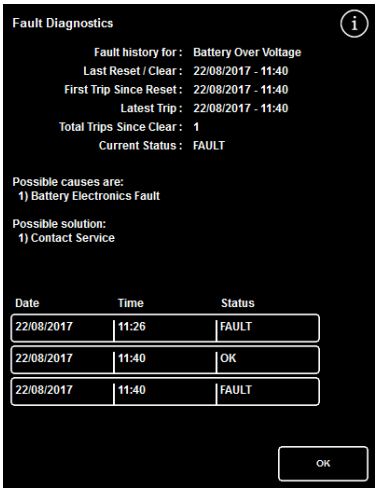


Acknowledge button

More Info

For historical information about a fault, select the fault to display the Fault Info screen.

This screen provides details of previous occurrences of the fault condition and its current status.



Fault Info screen

Underfills and Recovery

Reaction Chamber underfill and overfill events are also displayed on the fault status screen.

Processing Problems - Soft, Spongy Tissue

Refer to the table below if processing results in soft, spongy tissue.

Note

Revos cannot be used for reprocessing.

Problems	Possible Causes	Solutions
Difficult to section. Section breaks up on the water bath. Poor staining.	Inadequate fixation	Increase time in fixative. Use microwave-enhanced technique. Bisect if encapsulated specimen or produce a thinner block. **Note** *Improper fixation cannot be remedied.*
Clearing impossible. Discoloured cloudy areas within specimen. Section breaks up on water bath.	Inadequate dehydration	Increase time in alcohol. Make sure concentration of alcohol is correct. Adjust solution rotation schedule. Rule out contamination from lipids. Bisect if encapsulated specimen or produce a thinner block. Re-infiltrate in wax. If inadequate, reverse process to absolute alcohol and reprocess.
Wax cannot infiltrate. Discoloured cloudy areas within specimen. Section breaks up on the water bath.	Inadequate clearing	Make sure the specimen is completely dehydrated. Adjust rotation schedule. Increase time in clearant. Use vacuum. Bisect if encapsulated specimen or produce a thinner block. Re-infiltrate in wax. If inadequate, reverse process to absolute alcohol and reprocess.
Can feel or smell clearing solution. No support when sectioned. Section breaks up on the water bath.	Inadequate wax infiltration	Extend exposure time. Use vacuum. Bisect if encapsulated specimen or produce thinner block. Re-infiltrate. Use vacuum to promote infiltration.

Hard, Brittle Tissue

Refer to the table below if processing results in hard, brittle tissue.

Problems	Possible Causes	Solutions
Obvious drying of all or part of the specimen.	Drying during transport	Use the volume of 20:1 in an appropriately sized container of fixative. Reconstitute the specimen.
Brittle sections that fall out of block. Microchatter.	Excessive dehydration	Decrease time and/or steps. Check graduated strengths of alcohol. Segregate small, delicate specimens. Do not use heat and/or vacuum. Soak for short time in chilled water and then section slowly. Do not trim away the hydrated area.
	Excessive clearing	Decrease time and/or steps. Evaluate xylene substitutes. Segregate small, delicate specimens. Do not use heat and/or vacuum. Soak for short time in chilled water and then section slowly. Do not trim away the hydrated area.
	Excessive heat	Reduce processing temperature during reagent steps. Decrease time and/or steps. Check temperature reading with thermometer. Segregate small, delicate specimens. Soak for short time in chilled water and then section slowly. Do not trim away the hydrated area.

Frequently Asked Questions

The following frequently asked questions are answered in this section:

- How do I run a process with only one fixative step?
- What is the recommended way to open the lid during a process run?
- Why is the minimum time in the first wax 10 minutes?
- How can a step in a program be deleted in a program?
- How do I change the alcohol quality rotation setting?
- How can I abort a processing run?
- How do I power off the Revos correctly?
- What do I do if the instrument software screen is not responding?
- How do I check an underfill?
- How can I start a processing run on a step other than step 1?
- How can I discard a concealed reagent or wax?
- How can I load a new reagent into one of the back (concealed) reagent positions?
- How can I manually rotate the concealed reagents and wax baths?
- Does the Revos automatically update for Daylight Savings Time (DST)?
- What is an alcohol hydrometer and how do I use it to check alcohol percentages?
- Can I use the flush cycle to clean my embedding base moulds?
- Why is my quality control usage limit count red instead of green?
- Why can I not enter values other than zero on my filters in the QC screen?
- How can I determine when my last reagent rotation occurred?
- How can I verify that all reagent / wax positons were used during the last processing run?
- How do I retrieve my tissues if an instrument malfunction occurs while the instrument is under vacuum or pressure?
- I exited the Inspect Reagents screen while loading reagent into a concealed bottle. How can I finish loading the bottle?

How do I run a process with only one fixative step?

- From the Main Screen, press **Options** > **Edit Program**.

  The Select a Program screen appears.
- Select the required program.

  The Options – Edit Program screen appears.
- Disable the Fixative 2 step by removing the checkmark (tick) from its box.

  For details, refer to Editing a Program or Flush.

What is the recommended way to open the lid during a process run?

- Open the **Lid**.
- Wait until the status message says 'Lid released' and then open the lid.

  For details, refer to Stopping a Process.

Note

*Opening the lid without first pressing **Lid Release** will result in a Lid Open Alarm fault.*

Why is the minimum time in the first wax 10 minutes?

This is to allow sufficient time to heat the surface of the level sensors.

If the surface of the level sensors are not allowed to heat up sufficiently, a covering of wax can be left on them when the Reaction Chamber is drained. This will cause the instrument to register the presence of wax up to the affected level and continue to attempt to drain an already empty chamber.

It takes ten minutes to ensure that the level sensors are all up to temperature.

How can a step be deleted in a program?

Other than for the fixatives, individual steps cannot be removed from a program.

To remove an entire group of reagents (for example, Dehydrant, Clearant or Infiltration):

- Remove the checkmark (tick) from the applicable box.

  For details, refer to Editing a Program or Flush.

Note

Entering a zero time (00:00) for a step will NOT delete the step. The appropriate reagent will still be drawn into the chamber and then immediately drained.

How do I change the alcohol quality rotation setting?

- From the Main screen, press Options > Instrument Setup > Rotation Management.

  The Instrument Setup – Rotation Management screen appears.

  Use the **A1 Quality Threshold** arrow keys to adjust the rotation threshold up or down in 1.25% intervals.

  For details, refer to Reagent Rotation.

How can I abort a processing run?

- From the Process Monitoring screen, press **Stop** > **Abort**.

  The Status line will say 'Aborting Process' while the Reaction Chamber drains.

  Once the chamber is empty, the baskets can be removed and another process started, if required.

Note

It is not recommended to abort a rotation run beyond the fixative step(s). All reagents and waxes should be used in a program when rotations are to take place – otherwise, a scheduled discard or replenishment might not occur.

How do I power off Revos correctly?

- Ensure that the instrument is not running a process. If it is, wait until the process has completed and then run a flush before powering off.
- Switch off the main power switch, located at the back of the unit, and wait while the instrument powers down.
- When the red screen goes off, press OK.

  It is now safe to turn off the battery switch located in the front cabinet.

What do I do if the instrument software screen is not responding?

- Power down the instrument.
- Wait 10 seconds then apply power to the instrument.

Note

If this is unsuccessful, please contact your local Thermo Fisher Scientific representative.

How do I check an underfill?

- From the Main screen, press Quality Control > Inspect Reagents.

  The Quality Control – Inspect Reagents screen appears.

- Select the bottle that you want to inspect from the display on the left of the screen and press **Inspect Reagent**.

  The reagent is drawn into the Reaction Chamber. Once this is complete, the reagent can be topped-up by pouring additional reagent directly into the chamber.

- When finished, close the chamber lid and press **Return Reagent**.
- For the precautions that need to be observed before attempting this procedure, refer to Inspecting reagents and waxes.

The chamber should be empty when inspecting a reagent.

Ensure that the alcohol positions are topped-up with an appropriate percentage (i.e. a percentage that is close to that recorded during inspection).

The use of an alcohol hydrometer is recommended for accuracy when attempting to determine percentages.

The use of an inappropriate alcohol percentage has the potential to adversely affect processing results.

How can I start a processing run on a step other than step 1?

- From the Reaction Chamber Available screen, press the **Start Step** button until the desired step is reached and then press **Immediate Start**.

  The selected reagent will be drawn into the Reaction Chamber and the remainder of the process will run as programmed.

Note

A delayed start function is not available when 'step-starting' a process run.

How can I discard a concealed reagent or wax?

- From the Main screen, press Quality Control > Inspect Reagents.

  The Quality Control – Inspect Reagents screen appears.

- Select the bottle or wax bath that you want to discard from the display on the left of the screen and press **Inspect Reagent**.

  The reagent or wax is drawn into the Reaction Chamber.

- Once the reagent or wax has been drawn into the Reaction Chamber, press **Discard** to discard it.

Note

If you are inspecting wax, it needs to remain in the chamber for a minimum of 10 minutes prior to pressing Discard so that the chamber has sufficient time to heat.

- Check that an empty reagent bottle or waste wax tray is in place and press **Confirm Loaded**.

  The contents of the chamber drain into the appropriate container.

  For details, refer to Inspecting reagents and waxes and Discarding a Reagent after Inspection.

How can I load new reagent into one of the back (concealed) reagent positions?

- From the Main screen, press **Quality Control** > **Inspect Reagents**.

  The Quality Control – Inspect Reagents screen appears.

- Select the empty bottle that you want to load from the display on the left of the screen and press **Load Reagent**.

Note

*The **Load Reagent** button is only available if the selected bottle is empty. If the selected bottle is full, its contents will need to be inspected and discarded before loading with new reagent.*

- Place the new reagent into the appropriate Exchange position (Ex1 or Ex2) and press **Confirm Loaded**.

  The contents of the Exchange bottle will be drawn into the Reaction Chamber and then automatically drained into the applicable concealed reagent position.

How can I manually rotate the concealed reagents and wax baths?

- From the Main screen, press **Quality Control** > **Inspect Reagents**.

  The Quality Control – Inspect Reagents screen appears.

- Select the reagent or wax container that you want to discard from the display on the left of the screen and

  Press Inspect Reagent.

  The reagent or wax is drawn into the Reaction Chamber.

- Once the reagent or wax has been drawn into the Reaction Chamber, press **Discard** to discard it.

Note

If you are inspecting wax, it needs to remain in the chamber for a minimum of 10 minutes prior to pressing Discard so that the chamber has sufficient time to heat.

- Check that an empty reagent bottle or waste wax tray is in place and press **Confirm Loaded**.

  The contents of the chamber drain into the appropriate container.

  For details, refer to Inspecting reagents and waxes and Discarding a Reagent after Inspection.

- To rotate the next reagent or wax in the sequence down to the empty position, select that reagent's image from the display on the left of the screen and press **Inspect Reagent**.

  The reagent is drawn into the Reaction Chamber.

- Once the reagent or wax has been drawn into the Reaction Chamber, press **Rotate Reagent**.

  The contents of the chamber will drain one position down the reagent or wax line instead of being returned to its original container.

- Continue this process until all reagents or waxes have been rotated appropriately.

Does Revos automatically update for Daylight Savings Time (DST)?

No, it does not. If located in an area where DST is observed, the time needs to be manually changed.

To change the time:

- From the Main Screen press **Options** > **Set Time**.

  The Options – Set Time screen appears.

- To change the hour, press **Hour**.

  The Hour button becomes highlighted in yellow.

- Use the single arrow keys (up or down) to change the time in one-hour increments
- Press **OK** to save the changes.

What is an alcohol hydrometer and how do I use it to check alcohol percentages?

A hydrometer is used to measure the specific gravity of liquids. An alcohol hydrometer measures the specific gravity of alcohol and correlates it to a scale marked on the hydrometer that measures percentage or proof, or both.

To check the alcohol percentage of a concealed dehydrant position:

- From the Main screen, press Quality Control > Inspect Reagents.

  The Quality Control – Inspect Reagents screen appears.
- Select the bottle that you want to inspect from the display on the left of the screen and press Inspect Reagent.

  The reagent is drawn into the Reaction Chamber. Once the reagent has been drawn into the Reaction Chamber, a sample can be removed for testing purposes.
- For details, refer to Inspecting reagents and waxes.
- Pour the sample into a tall (preferably clear) container such as a graduated cylinder.
- Gently lower the hydrometer into the cylinder – allowing it to come to rest.

Note

It is important that the hydrometer floats freely in the sample and does not touch the bottom or sides of the container. Choose a container of suitable size and fill it with an appropriate amount of sample reagent so that the hydrometer floats within it.

- To read the value of the sample, look for the point at which the top of the sample touches the hydrometer and the corresponding point on the hydrometer's percentage / proof scale.

Note:

The majority of under-fill problems on Revos can be eliminated by using 5 litre reagent bottles.

Can I use the flush cycle to clean my embedding base moulds?

No. It is recommended that the flush cycle be used solely to clean the Reaction Chamber and basket(s). Cleaning base moulds during a flush cycle increases the amount of paraffin in the flush reagents.

Flush reagents can only be used a maximum of five times.

Why is my quality control usage limit count red instead of green?

Red usage limit count:	This indicates that the quality control limit has been reached (or exceeded) for that particular reagent or filter. A yellow QC triangle will also be shown in this scenario.
Yellow usage limit count:	This indicates that there is one use remaining (or in the case of a filter, one week remaining) until the limit has been reached.
Green usage limit count:	This indicates that the count is within the defined use limit period.

To view or edit use limit settings:

- From the Main screen, press Options > Instrument Setup > Reagent Use Limits.

  The Instrument Setup – Reagent Use Limits screen appears. From here you can view and define the use limits for fixatives, filters and flush reagents.

Why can I not enter values other than zero on my filters in the QC screen?

Counts can only be cleared on filters and flush reagents within the Quality Control screen.

To view or edit use limit settings:

- From the Main screen, press Options > Instrument Setup > Reagent Use Limits.

  The Instrument Setup – Reagent Use Limits screen appears.

Note

For the flush reagents, use limit settings cannot be increased beyond the default value of five.

If required, fixative counts can be adjusted. For example, if a process run was started and aborted in the first fixative step, you may wish to adjust the Fix1 count in order to more accurately reflect actual usage.

To adjust a fixative count:

- From the Main screen, press Quality Control > Detailed Information.

  The Quality Control – Detailed Information screen appears.
- Select the required fixative from the display on the left of the screen.

  An Adjust Count button appears within the Detailed Information screen.
- Press Adjust Count.

  The Adjust Count – Fixative Use Count screen appears.
- Enter the required fixative count value and press OK to save.

How can I determine when my last reagent rotation occurred?

- From the Main screen, press Quality Control > Detailed Information.

  The Quality Control – Detailed Information screen appears.

  This screen lists all of the concealed reagents and wax baths and for each one shows the loading date, the last rotation date and the number of times that it has been used.

How can I verify that all reagent / wax positions were used during the last processing run?

- From the Main screen, press Quality Control > Reports > Concise Event Log – View.

  An on-screen report appears that shows a listing of the reagent / wax positions used during a particular processing run, their order of use and the times that each one was drawn into the Reaction Chamber.

Note

The following time periods can be specified for reports:

- *The last run*
- *The last 24 hours*
- *The last 7 days*
- *All data*

Why are my processing results very poor immediately following a reagent rotation?

Check the quality of your new A6 reagent to ensure that the previously discarded A1 waste has not been accidently reloaded into the instrument:

- From the Main screen, press **Quality Control > Inspect Reagents**.
- Select the A6 bottle by pressing on its image and then press **Inspect Reagent**.

  Once the reagent has been drawn into the Reaction Chamber, it can be visually inspected. For more details, refer to Inspecting reagents and waxes.

Note

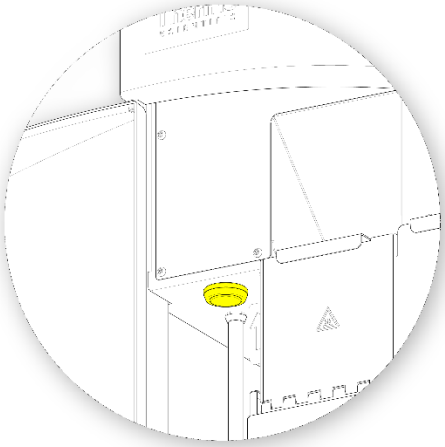
If waste has been accidentally reloaded, it should be readily apparent once the reagent is visually inspected. If in doubt, a hydrometer can be used to determine the alcohol percentage. The A6 position should always contain 100% alcohol.

- If it is determined that former A1 waste has been accidentally reloaded, each position from A6 through W3 should be discarded and loaded with fresh reagent / wax. For more details, refer to Discarding a Reagent after Inspection and Loading a Reagent or Wax After a Discard.
- In the event of a xylene rotation only (that is, alcohol did not rotate along with xylene), start by inspecting X3. If it is determined that former X1 waste has been accidentally reloaded, each position from X3 through W3 should be discarded and loaded with fresh reagent / wax.

How do I retrieve my tissues if an instrument malfunction occurs while the instrument is under vacuum or pressure?

- Open the lid gently or Stop / Abort options, if available.

- If these options are not available, open the left hand door, and press the red release button on the front of the left hand side of the compartment.



- Remove all specimens from the Reaction Chamber.
- Rotate the central cone to access baskets easier.

I exited the Inspect Reagents screen while loading reagent into a concealed bottle. How can I finish loading the bottle?

- The reagent will be in the Reaction Chamber. To return to the Inspect Reagents screen, from the Main Screen, press Quality Control > Inspect Reagents.
- Press Rotate to complete loading the reagent to the concealed bottle.

Appendices

The appendices provide additional information about your Revos instrument.

The following subjects are covered:

- Spares and accessories.
- Fitting optional vent adapters.
- Repacking your instrument after it has been decommissioned.
- Approved reagents.
- Program examples.
- Screen maps showing how the instrument's software menus and options are organised.

Appendix A - Accessories

Accessories Baskets

Item	Quantity	Part Number
Organised basket (Set of 6)	1	A84110031
Mega basket (Set of 6)	1	A84110032
Level Sensor cleaning pad	1	A78410095

Extraction Adaptor Kits

Item	Quantity	Part Number
Downdraft Extraction Duct Adapter Kit	1	A84110045
Main Air System Duct Adapter Kit	1	A78410024

Filters

Item	Quantity	Part Number
Vapour filter (carbon)	1	9990610
Carbon	6	7411258
Formaldehyde Filter	1	9990612
Formaldehyde Filter	6	B9990612CS

Reagent Bottles and Wax Kits

Item	Quantity	Part Number
5 litre Reagent Bottle (empty)	6	AP14721
Wax Waste Tray	5	A82310032

Note

A range of tissue processing reagents and wax exchange kits are available from your Thermo Fisher Scientific representative.

General

Item	Quantity	Part Number
Operator Guide	1	A84110100
Spatula	1	P09046
2GB USB Flash Drive	1	AP17385

Appendix B - Fitting the Optional Vent Adapters

The optional vent adapters allow fumes to be extracted from Revos into a fume cupboard or hood, or vented to the outside atmosphere.

Do not use the vent adapters to extract the fumes through the building's Heating, Ventilating, and Air Conditioning (HVAC) system or a common site extraction system.

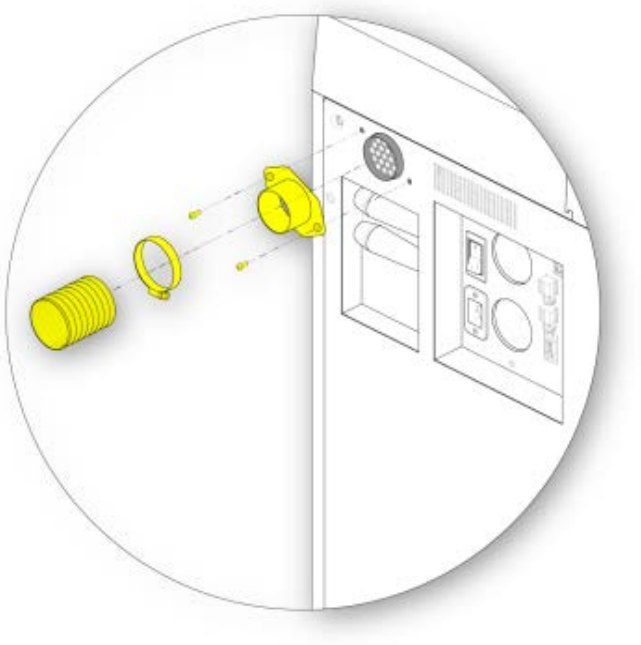
Extraction Vent Adapter

The main air system duct adapter attaches to the vent outlet on the back of the instrument and vents reagent and wax fumes away from the instrument through flexible ducting.

Do not remove the main extraction filters when the extraction vent adapter has been fitted to the instrument.

To fit the extraction vent adapter:

- Fit the extraction vent adapter to the vent outlet on the rear of the instrument with the fixings supplied.
- Attach flexible ducting to the vent adapter and secure with the clip.
- Route the ducting to a vented area.



Fitting the extraction vent adapter

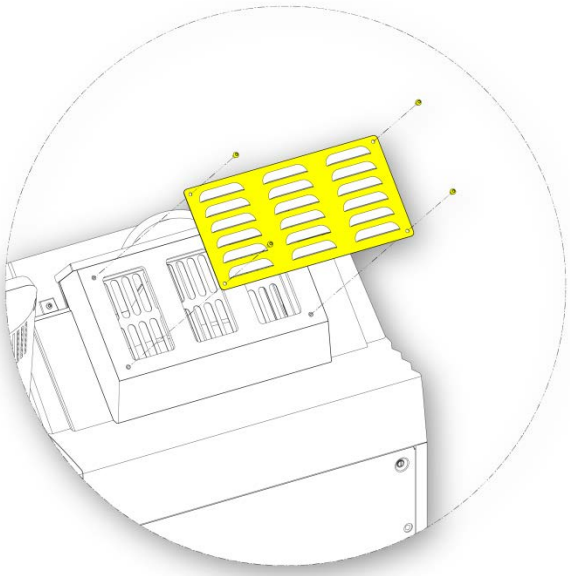
Downdraft Extraction Vent Adapter

The downdraft extraction duct adapter kit attaches to the back of the downdraft filter compartment and vents the downdraft airflow away from the instrument through flexible ducting.

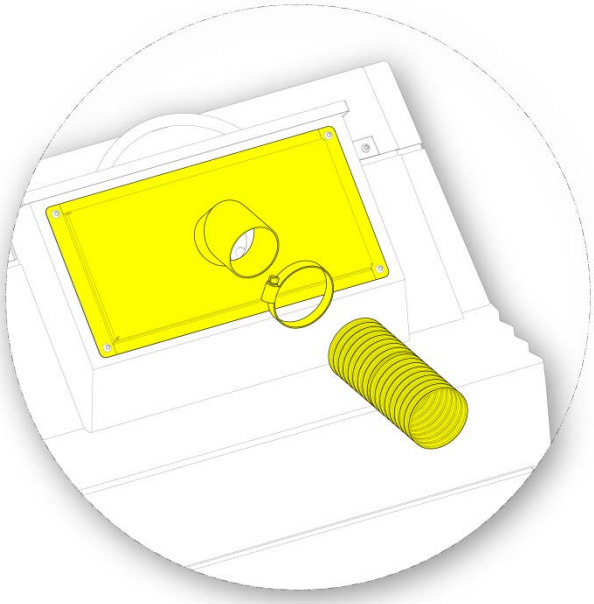
Do not remove the main extraction filters when the extraction vent adapter has been fitted to the instrument.

To fit the downdraft extraction vent adapter:

- Remove the cover from the back of the instrument.



- Open the downdraft filter cover and remove the downdraft filter. The filter should be replaced after the adapter has been fitted.
- Fit the downdraft extraction vent adapter to the back of the instrument using the screws and gasket provided.
- Attach flexible ducting to the vent adapter, secure with the clip and route the ducting to a vented area.



Fitting the Downdraft Extraction Vent Adapter

Appendix C – Repacking Instructions

If the instrument is to be transported, follow these packaging instructions, after unloading ALL reagents and wax and switching the instrument off. For more information, refer to Instrument Shutdown Procedure and Unloading Reagents.

When you return or move the instrument you must remove any excess tissue left in the instrument and carry out a flush before packing the instrument in the packing container.

When moving Revos, use safe lifting practices. Revos weighs approximately 165 kg (364 lb) when empty.

At least two people are needed to safely move the instrument.

Note

Use ALL original packaging and keep the instrument upright at ALL times.

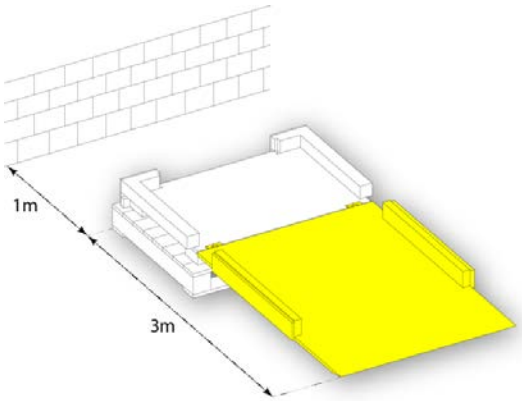
- Place the base of the packaging in a clear area.

  3.5 metres is required in front of the packaging for the ramp and approximately one metre is required behind the packaging.

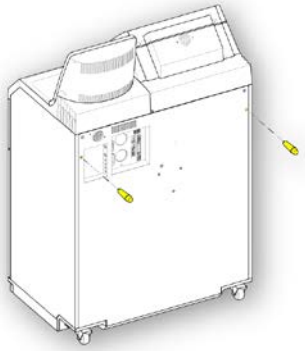
Note

The wooden piece slots under the plinth.

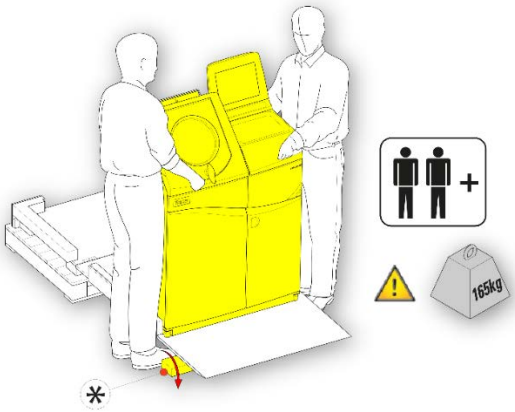
- Lower the packaging ramp:



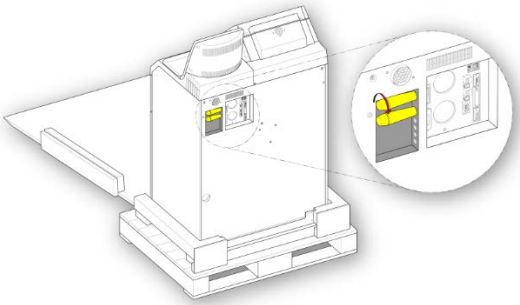
- Fit the handles to the back of the instrument:



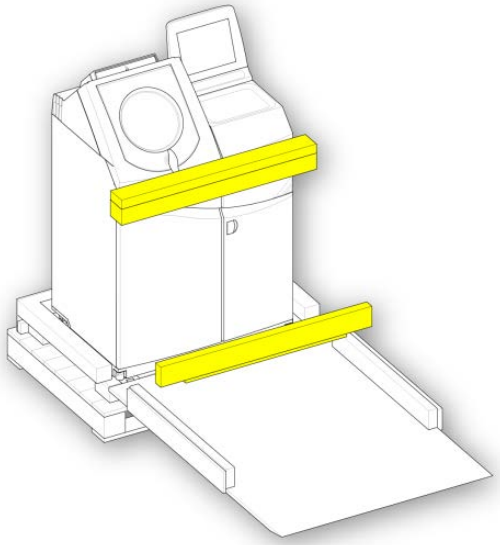
- Carefully wheel the instrument up the ramp until it sits securely in the base:



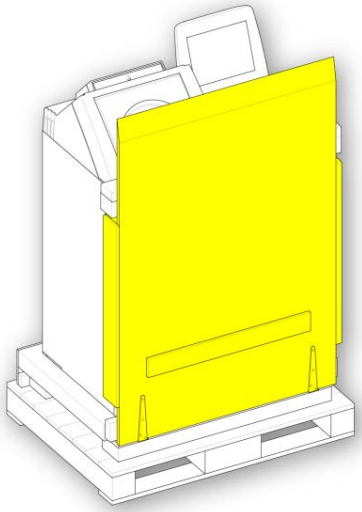
- Remove the handles and secure them at the back of the instrument:



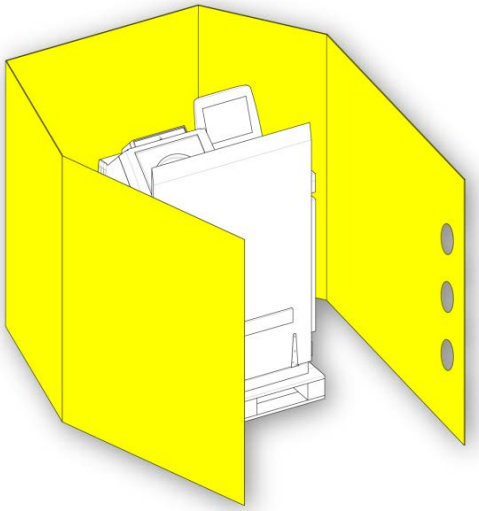
- Put the foam pieces in place:



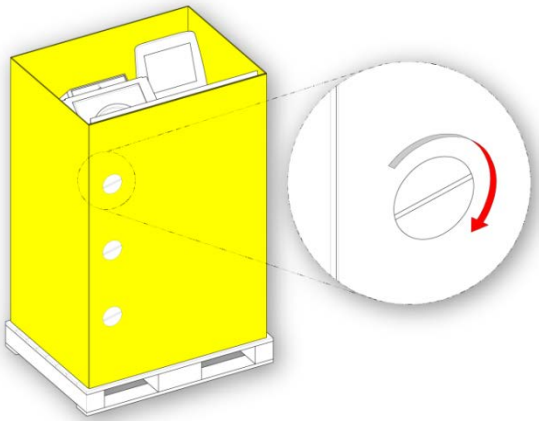
- Raise the ramp:



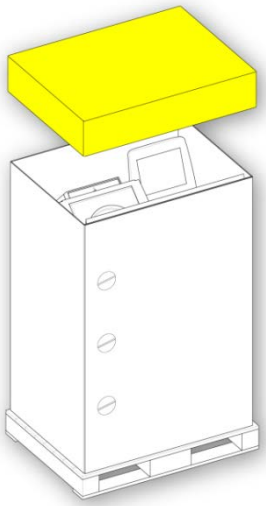
- Fit the outer cover:



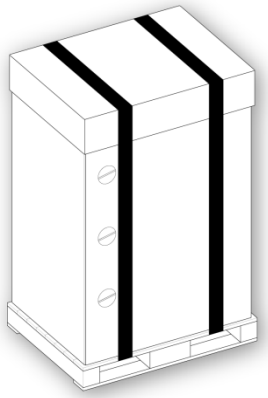
- Turn the three fasteners to secure the outer cover
  in place:



- Fit the lid over the outer cover:



- Secure the packaging using two bands through the palette and over the lid:



After packaging, ensure that the instrument is kept upright at all times while it is being transported.

Appendix D - Approved Reagents

All the reagents specified by Thermo Fisher Scientific for use with the Thermo Scientific Revos tissue processor are listed below.

Do not use Bouin's fixative, acetone, formal saline, or any reagents containing calcium chloride.

Waxes containing DMSO may damage painted surfaces – in particular if the painted surface is scratched.

Refer to the Safety Data Sheets (SDS) when handling the reagents.

Type	Approved Reagents
Fixatives	• 10% neutral buffered formalin (phosphate buffers) • Richard-Allan Scientific Pen-Fix
Dehydrants	• Ethanol • Reagent grade alcohol (RGA) / industrial methylated spirit (IMS) – up to 5% methanol in ethanol • Isopropyl alcohol • Richard-Allan Scientific Flex 100 (up to 40% methanol in isopropyl alcohol)
Clearants	• Xylene • Toluene • Shandon Xylene Substitute • Richard-Allan Scientific Clear-Rite 3
Infiltrants	• Shandon Histoplast • Shandon Precision Cut • Richard-Allan Scientific Histoplast PE • Richard-Allan Scientific Histoplast LP • RA Lamb VA5 • Richard-Allan Scientific Type 1, Type 3, Type 6, Type 9, Type L and Type H
Flush	• Any of the named clearants (max 65° C) • Any of the named dehydrants • Water
Surface Cleaning	• Sodium hypochlorite (10% in water used at ambient temperature)

Appendix E - Program Examples

The tables in this appendix show the default process and flush programs installed on Revos. They have all been validated.

Routine Overnight

Step	Reagent		Temp (°C)	Time (hh:mm)	Vac	Drain time (sec)
1	10% Formalin		Amb.	0:30	Off	30
2	10% Formalin		Amb.	0:30	Off	60
3	Dehydrant Group (Alcohol)	75%	30	1:00	On	30
4		90%	30	1:00	On	30
5		95%	30	1:00	On	30
6		100%	30	1:00	On	30
7		100%	30	1:00	On	30
8		100%	30	1:00	On	60
9	Clearant Group (Xylene)		30	1:00	On	30
10			30	1:00	On	30
11			30	1:00	On	120
12	Infiltration Group (Wax)		62	1:20	On	120
13			62	1:20	On	120
14			62	1:20	On	120

Daytime Rapids

Step	Reagent		Temp (°C)	Time (hh:mm)	Vac	Drain time (sec)
1	10% Formalin		Amb.	0:10	Off	30
2	10% Formalin		Amb.	0:10	Off	60
3	Dehydrant Group (Alcohol)	75%	30	0:10	On	30
4		90%	30	0:10	On	30
5		95%	30	0:10	On	30
6		100%	30	0:10	On	30
7		100%	30	0:10	On	30
8		100%	30	0:10	On	60
9	Clearant Group (Xylene)		30	0:10	On	30
10			30	0:10	On	30
11			30	0:10	On	120
12	Infiltration Group (Wax)		62	0:10	On	120
13			62	0:10	On	120
14			62	0:10	On	120

Standard Flush Program

Step	Reagent	Temp (°C)	Time (hh:mm)	Vac	Drain time (sec)
1	Flush 1	60	0:20	On	30
2	Flush 2	45	0:03	On	30
3	Flush 3	Amb.	0:02	On	30

Extended Flush Program

Step	Reagent	Temp (°C)	Time (hh:mm)	Vac	Drain time (sec)
1	Flush 1	60	0:30	On	30
2	Flush 2	45	0:05	On	30
3	Flush 3	Amb.	0:02	On	30

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