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K SERIES | 3K, 5K and 10K AUTOMATION PROGRAM (V 4.2) for 3000, 5000 and 10000 SERIES REVERSE OSMOSIS (R. O.)

Illustrated 5000 SERIES R. O. 5K AUTOMATION PROGRAM

USER MANUAL

March 2024 | Version 03

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A leader in equipment and products for the maple syrup industry, LAPIERRE EQUIPMENT distinguishes itself by its ability to innovate and develop high-performance solutions. This is what enables it to make significant changes in production techniques and processes in order to increase crop yield of high quality syrup.

LAPIERRE EQUIPMENT has a wealth of experience accumulated over three generations of maple syrup producers. These are also people driven by passion and a deep desire to help the industry evolve with the utmost respect for nature.

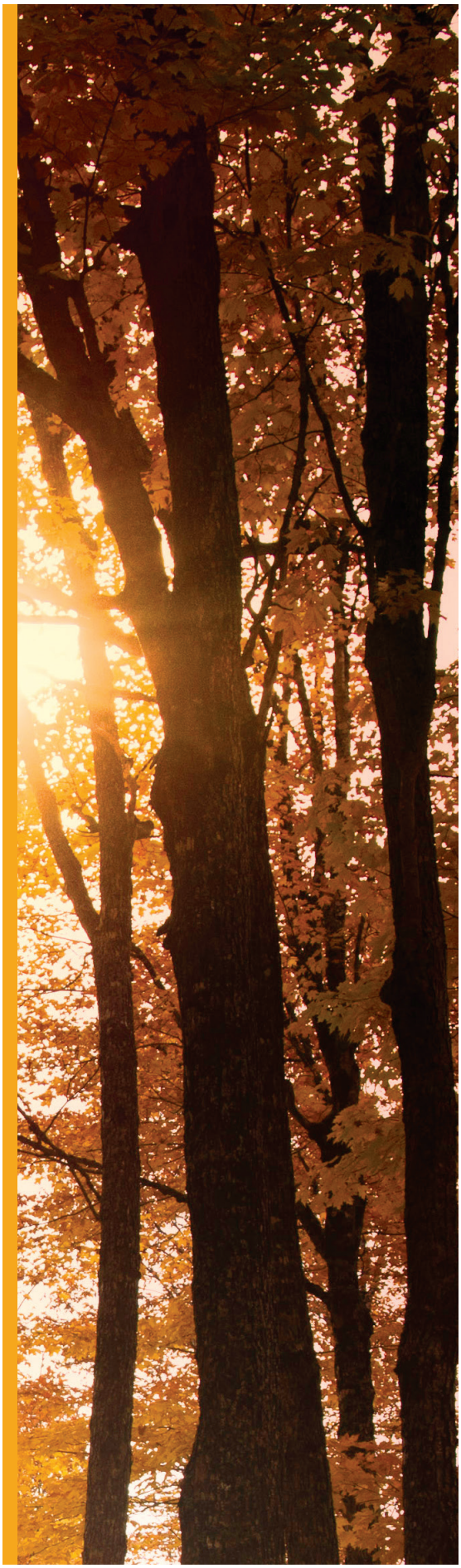
Honoured to serve your customers

LAPIERRE EQUIPMENT is honoured to actively assist maple syrup producers during the sugar season.

Today you have made a wise choice for at least two good reasons: the superior quality of our products and the exceptional quality of all our expert advisers in the region.

We sincerely appreciate your trust. And we will be happy to serve you again in your future equipment purchases, regardless of the size of your sugar bush.

Thank you!



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Please note the information required below when dealing with customer service professionals. You can easily find this information on **your invoice**.

The model shown may differ from your model.

IMPORTANT INFORMATION ABOUT YOUR K SERIES R. O. AUTOMATION PROGRAM

Customer Service: 819 548.5454 | 1 833 548.5454 | info@elapierre.com

Version number: _____

Purchase date: _____

Invoice number: _____

We will be pleased to answer any of your questions, please do not hesitate to contact us.

LE CHOIX DE LA LANGUE de votre programme d'automatisation a été préalablement fait par le technicien des ÉQUIPEMENTS LAPIERRE avant la livraison de votre équipement. Si vous souhaitez MODIFIER LA LANGUE, il est nécessaire de CONTACTER NOTRE SERVICE À LA CLIENTÈLE au 819 548.5454 ou au 1 833 548.5454. Pour effectuer facilement cette modification à distance, votre programme d'automatisation doit être connecté à Internet (voir *Section 2.1*). Bien que cette procédure soit brève, elle nécessite l'intervention d'un technicien.

Merci.

FRANÇAIS | ENGLISH

THE CHOICE OF LANGUAGE for your automation program was made by the LAPIERRE EQUIPMENT technician before your equipment was delivered. If you wish to CHANGE THE LANGUAGE, it is necessary to CONTACT OUR CUSTOMER SERVICE at 819 548.5454 or at 1 833 548.5454. To easily make this change remotely, your automation program must be connected to the Internet (see *Section 2.1*). Although this procedure is brief, it requires the intervention of a technician.

Thank you.

K SERIES | 3K, 5K and 10K AUTOMATION PROGRAM (V 4.2) for 3000, 5000 and 10000 SERIES REVERSE OSMOSIS (R. O.)

- This USER MANUAL can be used as a reference for the 3K, 5K and 10K Automation Programs of version 4.2.
- **LATEST VERSION OF THIS USER'S MANUAL:** Please refer to our website for the latest version of this user's manual.

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TABLE OF CONTENTS

TABLE OF ILLUSTRATIONS

Note: Here you can check off the illustrations in which you have a particular interest.

TABLE OF APPENDICES

TABLE OF WARNINGS

- It is important to read, understand and follow the instructions and warnings contained in this user manual.
- This manual must be stored in a known place and accessible at all times by staff.
- All product operators must be familiar with the contents of this manual.
- Always disconnect the power supply before performing any maintenance or repairs.

2.1 INTERNET CONNECTION

Location of the router for Internet connection

To perform remote consultation, the automation program must be connected to the Internet. To do this, connect your Ethernet cable to the router located in the electrical box of your concentrator.

ILLUSTRATION 1 | USB Internet connection to the router

2.2 USB KEY

Location of the USB port

The results of your PEP cycles are automatically stored in the automation program. The USB key permanently plugged into the USB port of the concentrator program computer stores your data here as it is collected.

At the end of the season, simply retrieve the USB key and export your results to your personal computer.

To connect a USB key, use the port located behind the computer screen of your concentrator.

ILLUSTRATION 2 | USB port behind the computer screen

Below are some practical notions that will help you when consulting this USER MANUAL.

2.3 SCREENS AND WINDOWS

Operation screen

An operation screen displays information and has one or more tactile keys for:

- activating the checkbox of a parameter or setting; or
- configuring a value for a parameter or setting.

Consultation screen

A consultation screen allows you to read information only.

Pop-up window

A pop-up window is partially superimposed on the operation screen that is currently in use. It can be used to configure parameters and settings or view information.

2.4 PICTOGRAMS

[ ] This pictogram indicates that the part of the screen **described in the text** is a tactile key.

[ ] The combination of these two pictograms indicates that the part of the screen **described in the text** is a tactile key in the form of a checkbox.

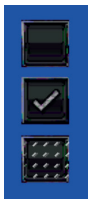
[ ] This symbol indicates that this area of the operation screen is a tactile key.

2.5 CHECKBOXES

Several operation screens have checkboxes.
An empty checkbox (1) indicates that the parameter or setting is not activated.
Therefore, a checkmark (2) in the checkbox indicates that the parameter or setting is enabled.
A checkbox marked with a watermark (3) indicates that this box cannot be checked.

ILLUSTRATION 3 | Checkboxes properties

1
2
3



2.6 PARAMETERS AND SETTINGS

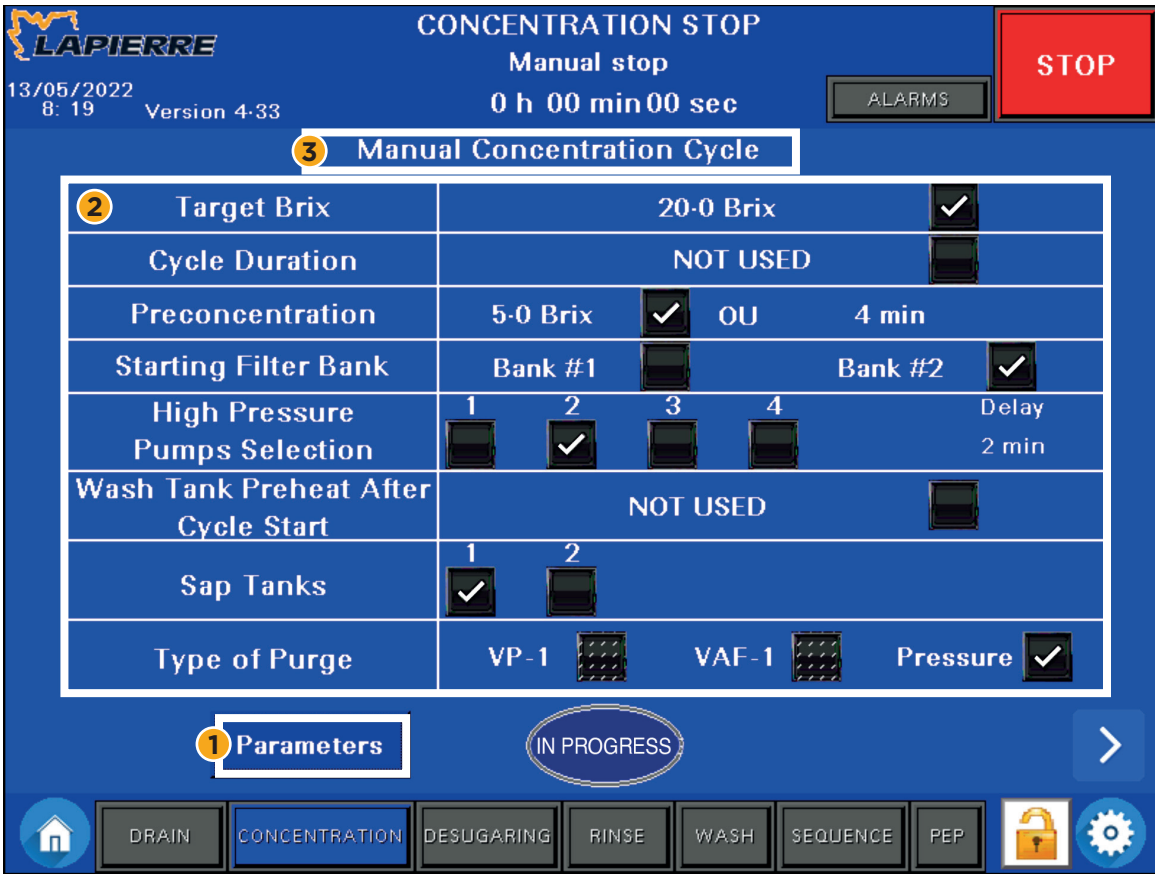
The PARAMETERS are linked to the **functionality of the R. O.**
The SETTINGS are linked to the **operating cycles of the automation program.**

The PARAMETERS are linked to the **functionality of the R. O.** These parameters have an influence on the operating cycles, whether they are SINGLE CYCLES or MULTIPLE CYCLES IN SEQUENCE (see *Section 5.2*). To access the parameters of the active operation screen, simply press the tactile key [PARAMETERS] 1, which appears on some of the program screens.

The SETTINGS 2 are linked to the **operating cycles of the automation program**. They influence only one cycle, the one on which they are made. In our example, we are in the CONCENTRATION CYCLE 3. The settings made on this operation screen therefore only influence this operating cycle and do not affect the other cycles of the program, whether they are SINGLE or MULTIPLE IN SEQUENCE.

It should be noted that the program has about 100 PARAMETERS, all numbered. When the tactile key [PARAMETERS] is pressed in an operation screen, only the parameters related to that screen are displayed in the new operation screen. Thus, in our example, by pressing [PARAMETERS] only the parameters related to the CONCENTRATION cycle 3 are displayed.

ILLUSTRATION 4 | Identification of parameters, settings and cycle in a screen



Configuring the speed of the R. O. pumps

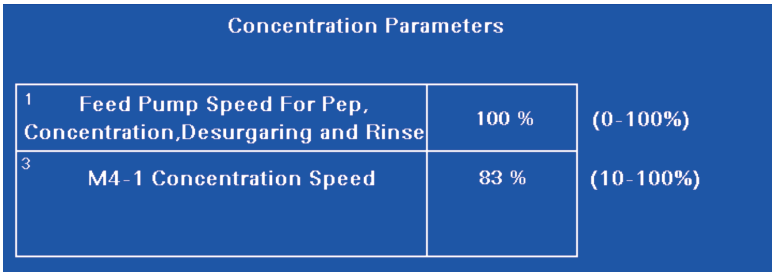
Here is an important concept related to the configuration R. O. pump speeds.

The operation screen below allows you to configure the parameters for the CONCENTRATION cycle, as indicated in the screen title.

The superscript numbers on the left side of the screen, 1 and 3 in our example below, are the parameter numbers.

- Note that the value of parameter No. 1, set by the operator, is 100% in our example. Although 100% is the value set for the CONCENTRATION cycle, this parameter also has an influence on three other cycles, namely the PEP, DESUGARING and RINSE cycles. In fact, the description of parameter No. 1 indicates the following: Feed pump speed for PEP, CONCENTRATION, DESUGARING and RINSE. This parameter implies that the feed pump speed is 100% in these four cycles, whether they are SINGLE or MULTIPLE CYCLES IN SEQUENCE. This value can be modified by the operator.
- As for the speed of the M4-1 pump, parameter No. 3, it is 83% in our example below. This parameter only influences the CONCENTRATION cycle. And this value can be modified by the operator.

ILLUSTRATION 5 | Cycles affected by the speed parameter of a pump



- Note that the speed is fixed for the M-2 high pressure pump group of the 5K series. Therefore, no parameters influence the speed of these pumps.

This important safety measure reduces or eliminates an imminent or existing hazard that could affect the safety of people as well as the integrity of the R. O. or the work in progress.

Activating the emergency stop | The mushroom button is located on the control panel of your R. O. It is clearly visible with its red button on a yellow background marked “ARRET” (STOP).

Simply press the red button to perform an emergency stop, which allows you to stop the R. O. quickly and safely. It cancels the operation in progress, but the touchscreen remains in operation.

Restarting the R. O. | To disengage the emergency stop function, simply pull the red button out to its initial position. This action does not restart the R. O. In fact, when an emergency stop is disengaged, the R. O. must be reset and restarted.

NOTE | Engaging the emergency stop function activates one or more alarms. It is necessary to resolve the current alarm(s) before restarting the equipment (see *Section 5.3.1.1*).

ILLUSTRATION 6 | Emergency stop button

SECTION 4 **LOCKING AND UNLOCKING THE AUTOMATION PROGRAM**

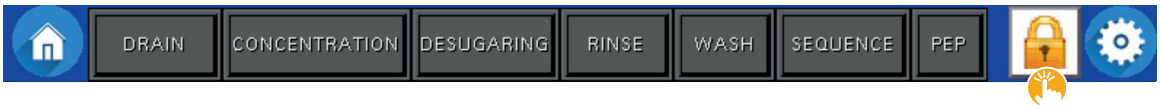
The locking of the automation program helps secure the general operation of the R. O. For example, it can prevent accidental start-up or even unwanted changes to parameters and settings by visitors.

The program is automatically locked upon start-up.

When the program is locked:

- The yellow padlock that appears on the right side of the bottom banner is locked,
  - the following illustration shows that the program is locked.
- It is possible to navigate through the program and view all the screens.
- However, it is not possible to configure any settings or parameters.

ILLUSTRATION 7 | Bottom banner: padlock locked

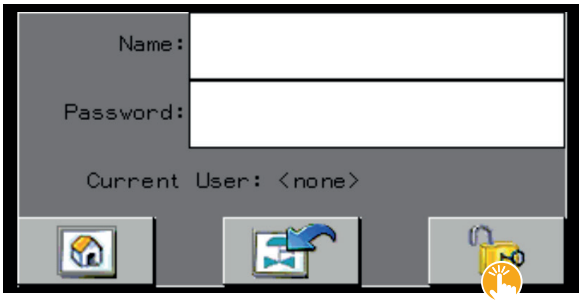


To unlock the program, follow these instructions:

NOTE | The padlock displayed is then locked in the bottom banner.

1. Press the tactile key [ ] on the padlock in the banner.
2. A pop-up window appears (see the following illustration):
   - enter your username,
   - enter your password,
     - o username and password are configured when the R. O. is switched on.
3. Press the padlock tactile key [ ] in the pop-up window.
   - This padlock is always displayed open, regardless of whether the program is locked or unlocked.

ILLUSTRATION 8 | Unlocking: enter your username and password



4. The result of the text area CURRENT USER will change from NONE to EQL (Lapierre Equipment) (see the following illustration).

ILLUSTRATION 9 | Unlocked, current user: EQL

5. Then press the tactile key:
   - [ ] to return to the homepage; or
   - the backspace key [ ] to return to the last page viewed.

To lock the program, follow the instructions below:

NOTE | The padlock displayed is then unlocked in the bottom banner.

• Press the tactile key [ ] of the padlock in the banner.
   - The padlock then changes to locked and the program is locked.

This K SERIES automation program was designed and developed by LAPIERRE EQUIPMENT. It simplifies the management of the 3000, 5000 and 10000 series R. O.s, corresponding to 3K, 5K and 10K depending on the series of R. O. it is integrated to.

This program is operated from a touchscreen.

To use the K SERIES automation program, the MODE switch on the control panel must be set to AUTO (see *Illustration 10*). The word STOP will be displayed in a red tactile key on the right side of the top banner.

When in the MANUAL position, MANUAL MODE appears in a yellow rectangle in the same location on the right side of the top banner (see *Illustration 11*).

ILLUSTRATION 10 | Manual - automation switch

ILLUSTRATION 11 | Identification of a screen in manual mode

This program is useful to the operator for:

- operating the R. O. onsite from the touchscreen located on the R. O. control panel,
- operating the R. O. remotely from the application installed on their smartphone or tablet,
- consulting the current status of the R. O. and its operating cycle onsite or remotely, and
- programming and saving single or multiple cycles in sequence for immediate or later use onsite or remotely.

5.1 OPERATING CYCLES

This program has several OPERATING CYCLES. You can easily operate your R. O. using SINGLE CYCLES or MULTIPLE CYCLES IN SEQUENCE (see next *Section 5.2*).

The following is a list of the OPERATING CYCLES of the automation program as they appear in the bottom banner at the bottom of the touchscreen.

ILLUSTRATION 12 | Bottom banner: operating cycles

- There are eight OPERATING CYCLES for your R. O. :
  - DRAIN
  - CONCENTRATION
  - DESUGARING
  - RINSE
  - WASH
  - SEQUENCE
    - o WAIT (see *Section 8.6.1, Phase 3*)
  - PEP (Pure Water Permeability) test

5.2 SINGLE AND MULTIPLE CYCLES IN SEQUENCE

A SINGLE CYCLE refers to the programming of a single cycle for immediate or later use. A SINGLE CYCLE is programmed or used by pressing its tactile key located in the bottom banner of the display.

- The last settings of a SINGLE CYCLE are always saved by the program. Therefore, the next time the cycle is used, the last settings are used, unless they are changed.

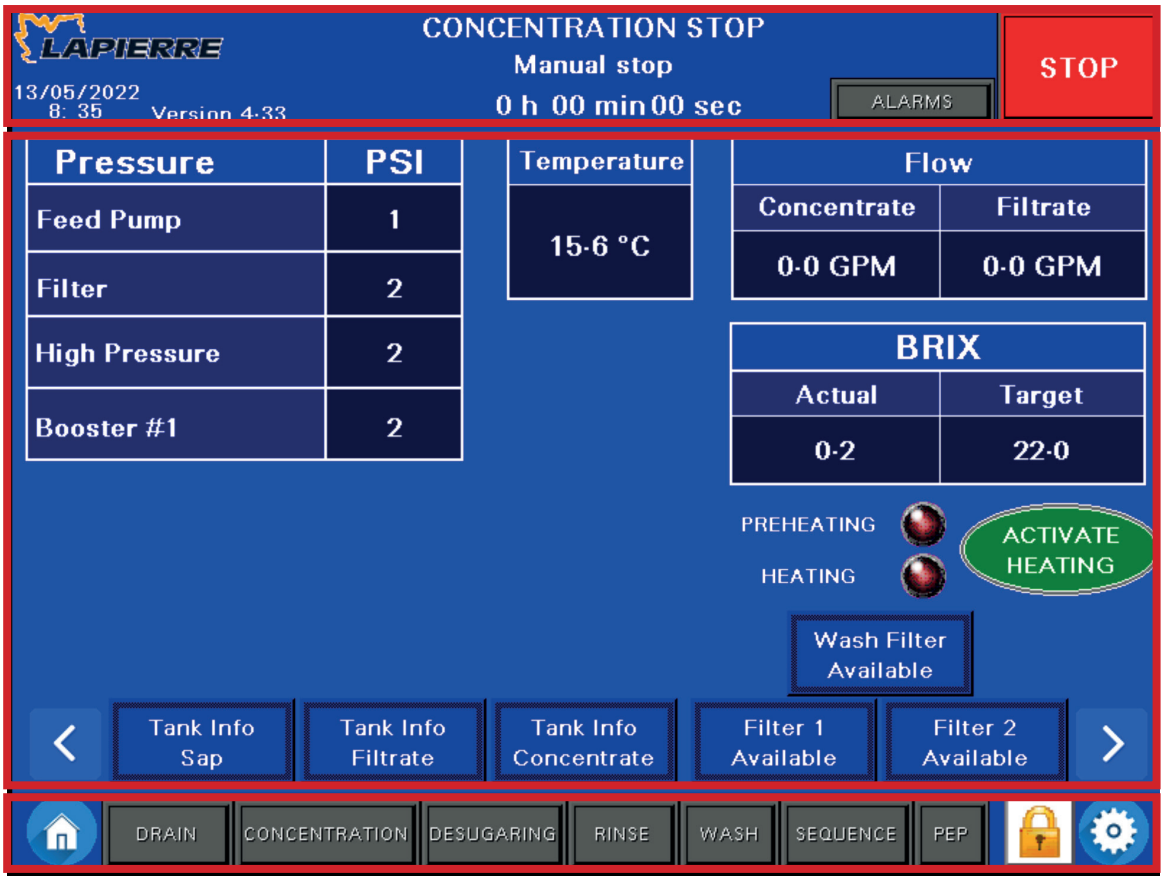
MULTIPLE CYCLES IN SEQUENCE refer to the programming of several cycles that are executed successively and without interruption for immediate or later use. MULTIPLE CYCLES IN SEQUENCE are programmed or used by pressing the tactile key SEQUENCE located in the bottom banner of the screen. For example, in a typical job that you do often, you could program the following cycles in order: CONCENTRATION - DESUGARING - RINSE - WASH - RINSE (see *Section 8.6*).

5.3 PRESENTATION OF A TYPICAL OPERATION SCREEN

The operation screen shown below is the MAIN HOME SCREEN. All operation and consultation screens are divided into three distinct parts:

- The TOP BANNER
- The SCREEN BODY
- The BOTTOM BANNER

ILLUSTRATION 13 | Operation screen: banners and body



TOP BANNER

SCREEN BODY

BOTTOM BANNER

5.3.1 Top banner

The TOP BANNER is the same for all operation and consultation screens of the automation program.

The top banner provides information about **the current cycle or status of the R. O.** Although you can use the BODY and BOTTOM BANNER of the touchscreen for other purposes, **the information in the TOP BANNER always shows information about the current cycle or status of the R. O.**

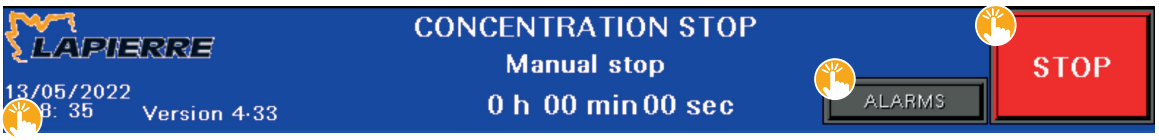
This last instruction indicates that you could, for example, proceed with the programming of a sequence of cycles while the R. O. is performing a rinse cycle. Thus, the screen body displays a window that allows you to program your sequence, while the top banner displays **information on the current rinse cycle being performed by the R. O.**

Presentation of the contents of the top banner.

The following top banner shows us this information:

- the date and time,
- the current version of the program,
- the operating cycle and the current status of the R. O.,
- the elapsed time of the current operating cycle, if applicable.

ILLUSTRATION 14 | Contents of the top banner



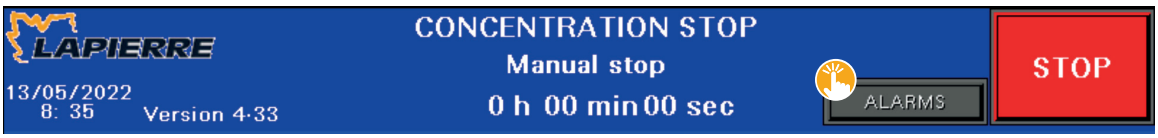
Here is the list of choices you can make from the tactile keys on the top banner:

- [13/05/2022 8:35] DATE AND TIME: Tactile key to set the date and time
- [ALARMS]: Tactile key and indicator light that turns red when an alarm is active
  - Press this key to access the information page for the active alarm (see *Section 5.3.1.1*).
- [STOP]: Tactile key to stop the current operating cycle
  - The current operating cycle is the one displayed in the centre of the top banner.
  - It is also the one represented in the bottom banner with the flashing blue tactile key.
    - o This key also stops the current cycle of a cycle sequence.

5.3.1.1 Active alarms operation screen

From the top banner, access the ALARMS operation screen by pressing the tactile key [ALARMS] at the top right of the screen.

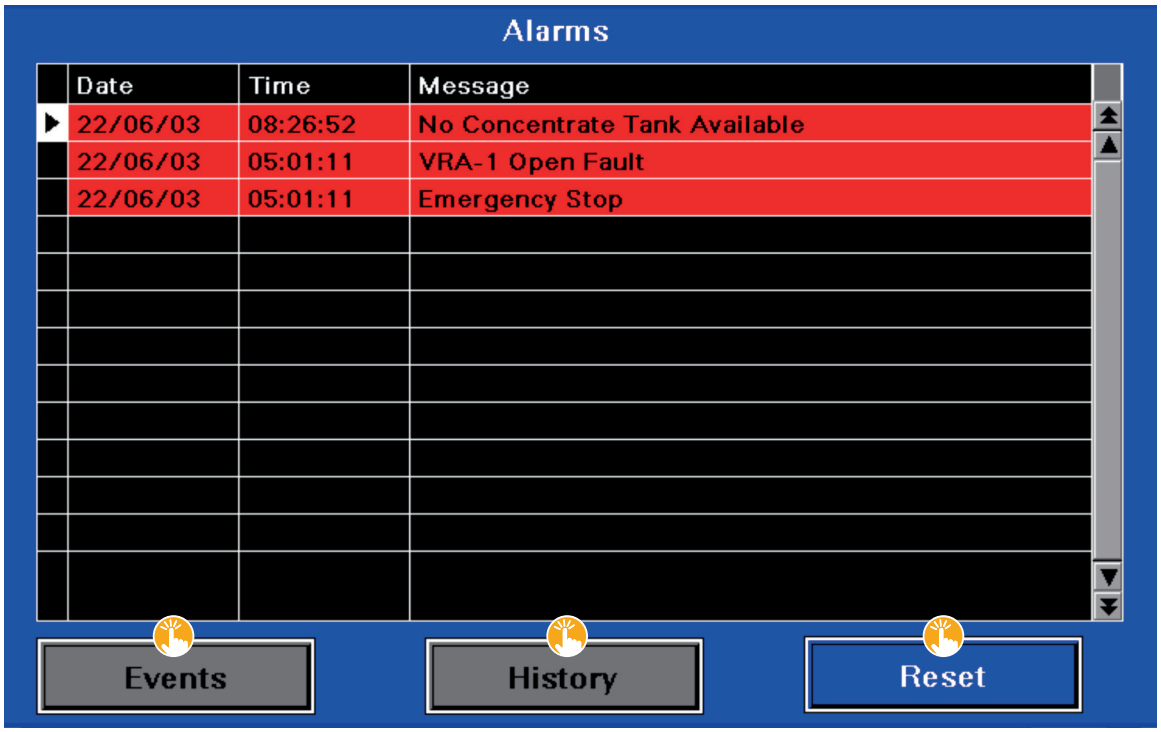
ILLUSTRATION 15 | Top banner: tactile key Alarm



The following operation screen shows us this information:

- The date, time and a message about the alarm(s) that are currently active in the automation program.
  - It is possible that several active alarms are displayed simultaneously.
- The list shows the most recent alarm first and the oldest last.
  - The following example illustrates three alarms, two of which activated at the same time.

ILLUSTRATION 16 | Operation screen for Active alarms



Here is a list of choices you can make from the tactile keys on this operation screen:

- [EVENTS]: Tactile key to access the consultation screen showing all the operating cycles that have been carried out so far (see *Section 5.3.1.1.1* below)
- [HISTORY]: Tactile key to access the consultation screen showing the history of all the alarms that have been recorded up to now (see *Section 5.3.1.1.2* below)
- [RESET]: Tactile key to delete the displayed alarm(s)

  IMPORTANT | The current alarm(s) must be resolved before resetting.

  - If the current alarm(s) are not resolved, it is impossible to operate the R. O. in AUTOMATION mode (see *Illustration 10*).

    NOTE | Some alarms do not prevent all operations. For example, the “BRIX NOT REACHED” alarm does not stop the R. O.

  - If an alarm cannot be reset, look for the source of the alarm. For example, for the «VRA-1 Open fault» alarm (see *Illustration 16* above), the valve may be blocked or damaged. If damaged, you will need to contact the customer service.

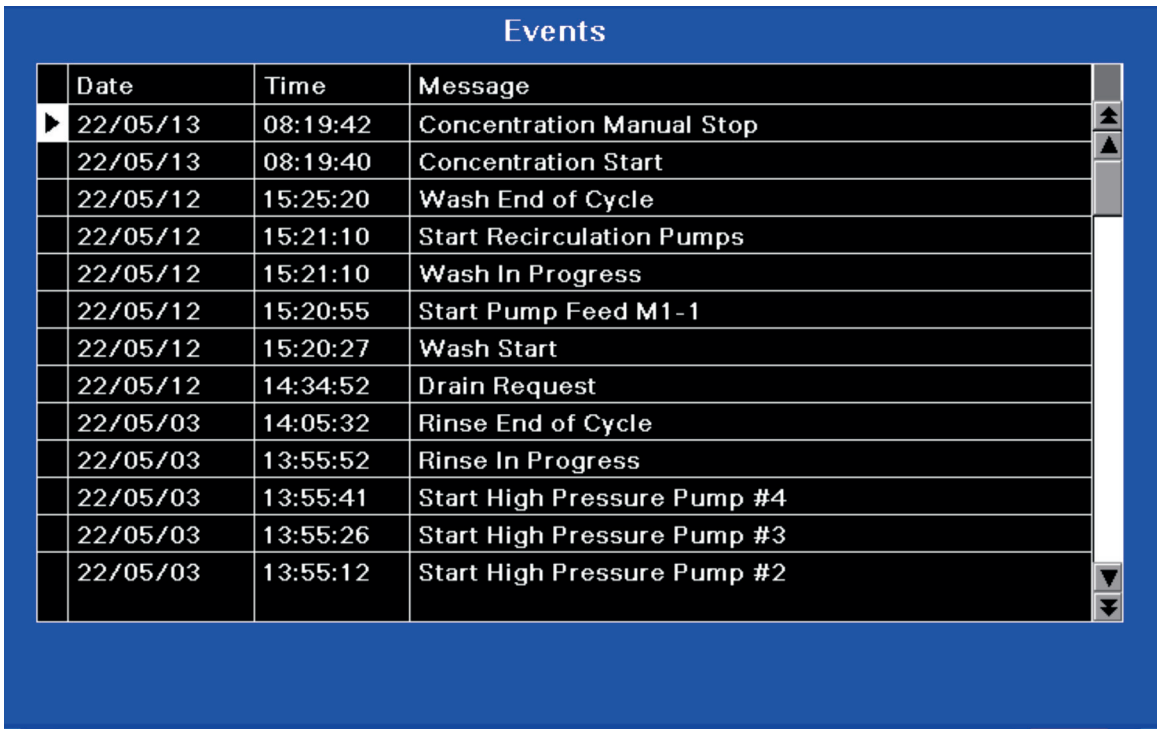
5.3.1.1.1 Active alarms/Events

Consultation subscreen of the ACTIVE ALARMS screen.

The following consultation subscreen shows us this information:

- the date, time and a message about the events that have been recorded so far in the program,
- the list shows the most recent event first and the oldest last,
- this list may be useful to the current operator or their replacement for reference.

ILLUSTRATION 17 | Consultation subscreen for Active alarms/Events



No tactile key selections can be made from this screen.

5.3.1.1.2 Active alarms/History

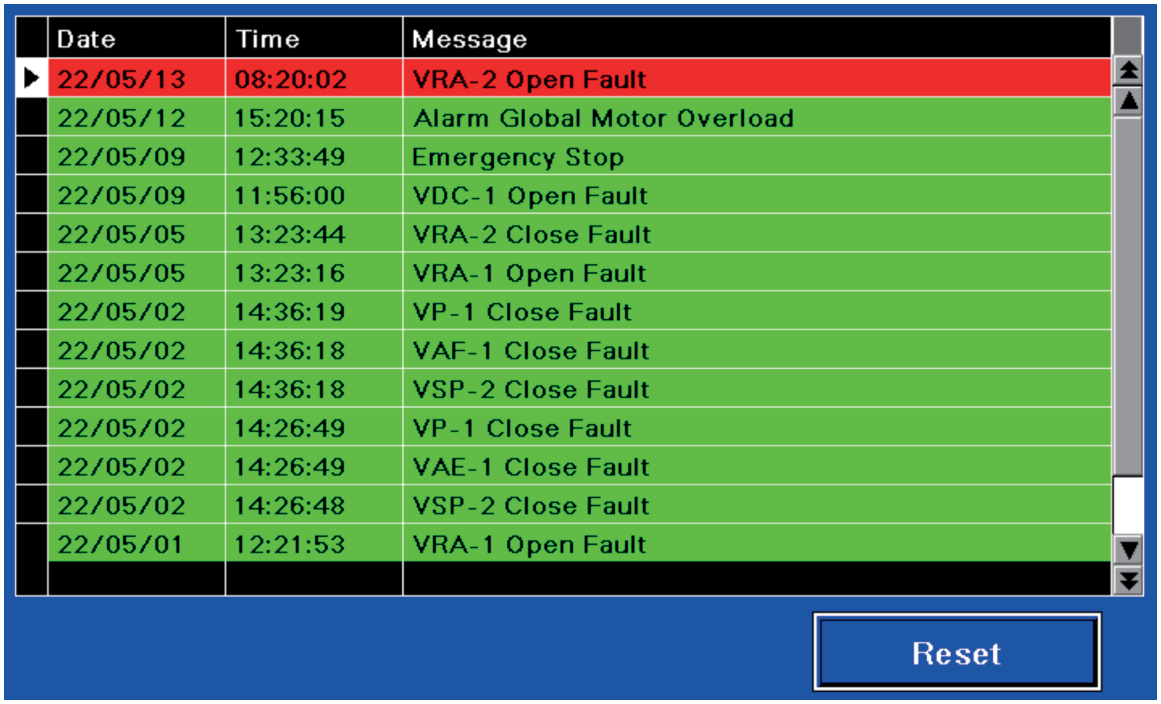
Consultation subscreen of the ACTIVE ALARMS screen.

The following consultation subscreen shows us this information:

- the chronological list of past alarms that have been recorded so far in the program,
- the list shows the most recent alarm first and the oldest last,
- this list may be useful to the current operator or their replacement for reference,
- an alarm in green represents a resolved alarm,
- an alarm in red represents an active alarm.

IMPORTANT | In the event of a power failure, the data in this list will be deleted and cannot be recovered. **A BACK-UP BATTERY is therefore recommended to ensure that your data is backed up**. These batteries are available from your LAPIERRE EQUIPMENT distributor.

ILLUSTRATION 18 | Consultation subscreen for Active alarms/History

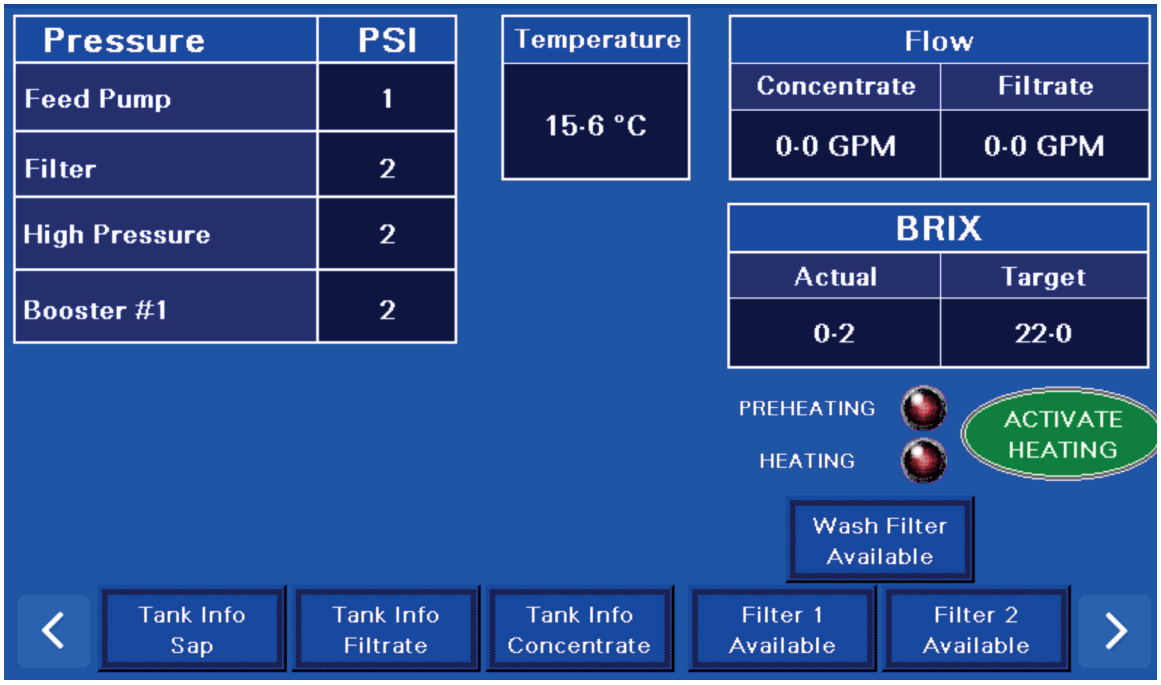


No tactile key selections can be made from this subscreen. The RESET key is not active in this screen.

5.3.2 Screen body

The SCREEN BODY refers to the part between the top and bottom banners of the touchscreen. Its contents are different from one operation screen to another. The screen shown below is the program's MAIN HOME SCREEN, which can be accessed any time by pressing the icon [ ] found to the left of the bottom banner (see Illustration 20).

ILLUSTRATION 19 | Screen body



5.3.3 Bottom banner

The BOTTOM BANNER is the same for all operation screens of the automation program.

Tactile key colours and flashing modes:

- When a cycle is in progress, its corresponding tactile key is displayed in flashing blue.
- When you use the SCREEN BODY in connection with a specific cycle, the tactile key for the corresponding cycle is displayed in solid blue. For example, if you are performing a search or adjusting parameters in the concentration cycle, the CONCENTRATION tactile key will be displayed in solid blue.
- If the R. O. is in operation and you adjust parameters and settings in a cycle (B) other than the current one (A):
  - The tactile key of the current cycle (A) is displayed in flashing blue.
  - The tactile key for the other cycle (B) is displayed in solid blue.
  - All other cycles are in grey.

Presentation of the contents of the bottom banner:

ILLUSTRATION 20 | Contents of the bottom banner

- [ ]: Tactile key to access the main home screen
  - See *Section 6.1*
- [DRAIN]: Tactile key to access the DRAIN operation screen
  - See *Section 8.1*
- [CONCENTRATION]: Tactile key to access the CONCENTRATION operation screen
  - See *Section 8.2*
- [DESUGARING]: Tactile key to access the DESUGARING operation screen
  - See *Section 8.3*
- [RINSE]: Tactile key to access the RINSE operation screen
  - See *Section 8.4*
- [WASH]: Tactile key to access the WASH operation screen
  - See *Section 8.5*
- [SEQUENCE]: Tactile key to access the SEQUENCE operation screen
  - See *Section 8.6*
- [PEP]: Tactile key to access the PEP operation screen
  - See *Section 8.7*
- [ ]: Tactile key to lock or unlock the possibility to modify parameters and settings
  - See *Section 4*
- [ ]: Tactile key to access the different settings

Note that since the bottom banner is permanently displayed in the program, navigation between screens is possible any time.

Section 6 provides information related to the four central operation screens of the automation program.

On each side and at the bottom of the screen body are two permanent screen navigation arrows. You can navigate forward or backward (left and right) using these arrows any time.

ILLUSTRATION 21 | Navigation between the home screen and its three subscreens

These arrows give access to the four central operation screens of the program, which are, in order:

1. MAIN HOME SCREEN
2. VALVES operation subscreen
3. PUMPS operation subscreen
4. HYDRAULIC DIAGRAM operation subscreen

ILLUSTRATION 22 | The main home screen and its three subscreens

6.1 MAIN HOME SCREEN (1 of 4)

The main home screen is the operation screen that appears when the program is opened.

You can access this screen any time by pressing the tactile key [ ] found in the bottom banner.

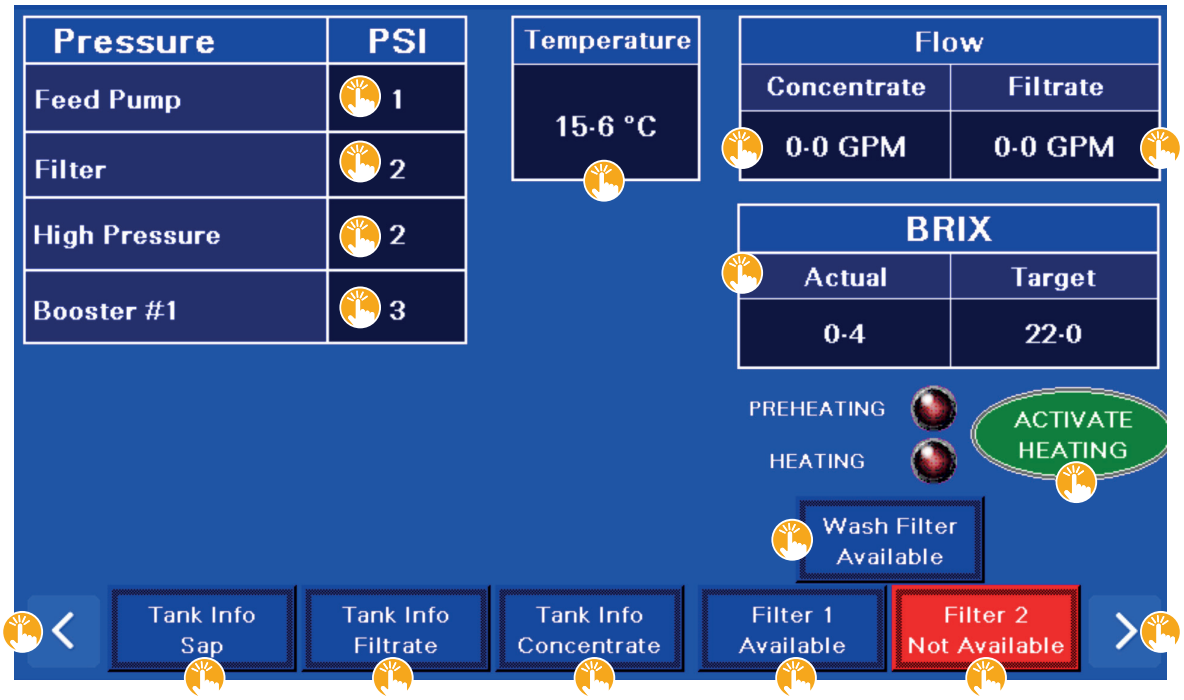
The following operation screen shows us this information:

- Pressure readings:
  - At the outlet of the FEED PUMP
  - At the outlet of the FILTERS
  - At the outlet of the R. O. (HIGH PRESSURE)
  - At the inlet of BOOSTER pump No. 1

  NOTE | Our example shows only one booster pump. There could be as many as three.
- The TEMPERATURE of the maple sap at the inlet of the R. O. (degrees in Fahrenheit are also available in the program).

- CONCENTRATE and FILTRATE FLOW rates when the R. O. is in operation.
- The ACTUAL BRIX level of the maple sap and the set BRIX level (TARGET) set by the operator.
- If PREHEATING or HEATING is active.
  - The status is active when the corresponding indicator is lit.
- The status of FILTERS No. 1 and No. 2 and the WASH FILTER.
  - A tactile key displayed in red indicates that the filters are not available.

ILLUSTRATION 23 | Main home screen



Here is the list of choices you can make from the tactile keys on this operation screen:

- [1] FEED PUMP
- [2] FILTERS
- [2] HIGH PRESSURE
- [3] BOOSTER No. 1
- [15-6 °C] TEMPERATURE
- [0-0 GPM] CONCENTRATE FLOW
- [0-0 GPM] FILTRATE FLOW
- [Actuel] BRIX

These eight tactile keys give you access to similar pop-up windows (see *Section 6.1.1, Illustration 25*).

- [ACTIVATE HEATING]: Tactile key to activate or deactivate the HEATING of the water in the wash tank
  - Heating is activated when the HEATING indicator is lit.
- [TANK INFO SAP]: Tactile key to see the status and level of the maple sap tank(s)
- [TANK INFO FILTRATE]: Tactile key to see the status and level of the filtrate tank(s)
- [TANK INFO CONCENTRATE]: Tactile key to see the status and level of the concentrate tank(s)
- [FILTER 1]: Tactile key to change the status of filter group No. 1
  - The status can be available or not available.
  - The status may also indicate “clogged.”
    - Note that this status cannot be selected with the tactile key.
- [FILTER 2]: Tactile key to change the status of filter group No. 2
  - The status can be available or not available.
  - The status may also indicate “clogged.”
    - Note that this status cannot be selected with the tactile key.
- [WASH FILTER]: Tactile key to change the status of the WASH FILTER
  - The status can be available or not available.
  - The status may also indicate “clogged.”
    - Note that this status cannot be selected with the tactile key.

Refer to *Section 7* for details on the screens related to the previous six tactile keys.

- [<] [>]: Tactile keys that allow you to access the main home screen and its three operation subscreens in turn.

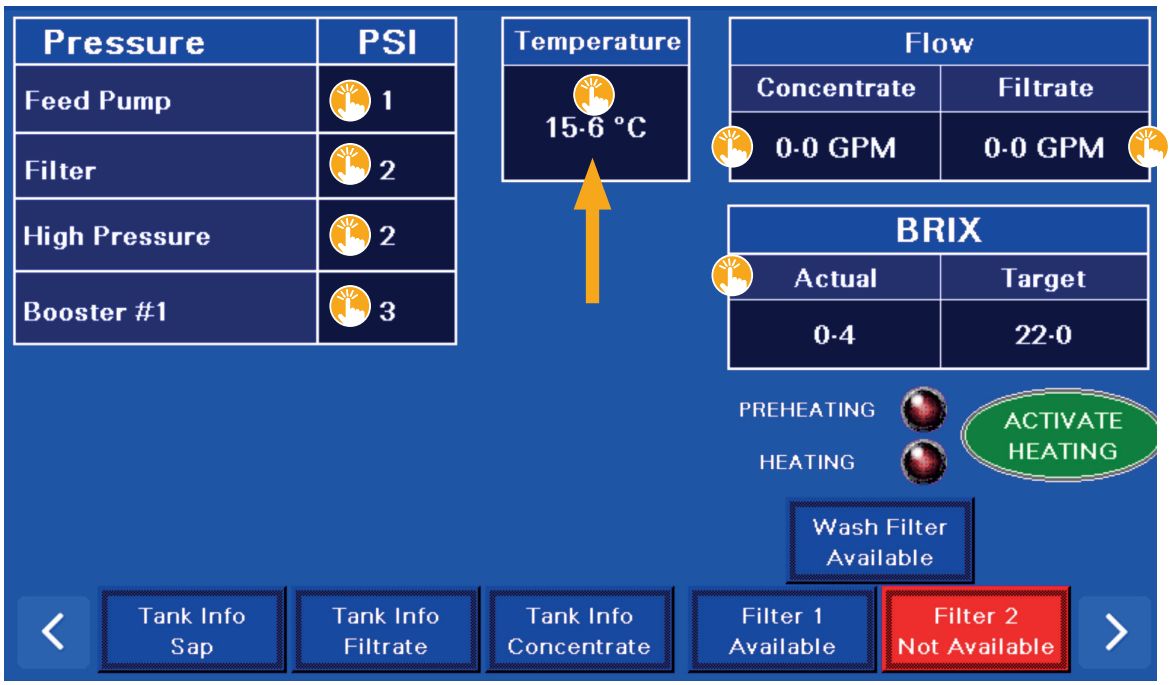
6.1.1 Typical pop-up window

From the main home screen shown below, you can access eight pop-up windows, all with similar configurations and navigation principles.

These eight links are listed just below the main home screen in the previous section (*Illustration 23*).

For example, to access the pop-up window related to TEMPERATURE trends, simply press the TEMPERATURE tactile key at the top centre of the screen.

ILLUSTRATION 24 | Main home screen to Temperature



A pop-up window appears, shown in the following illustration.

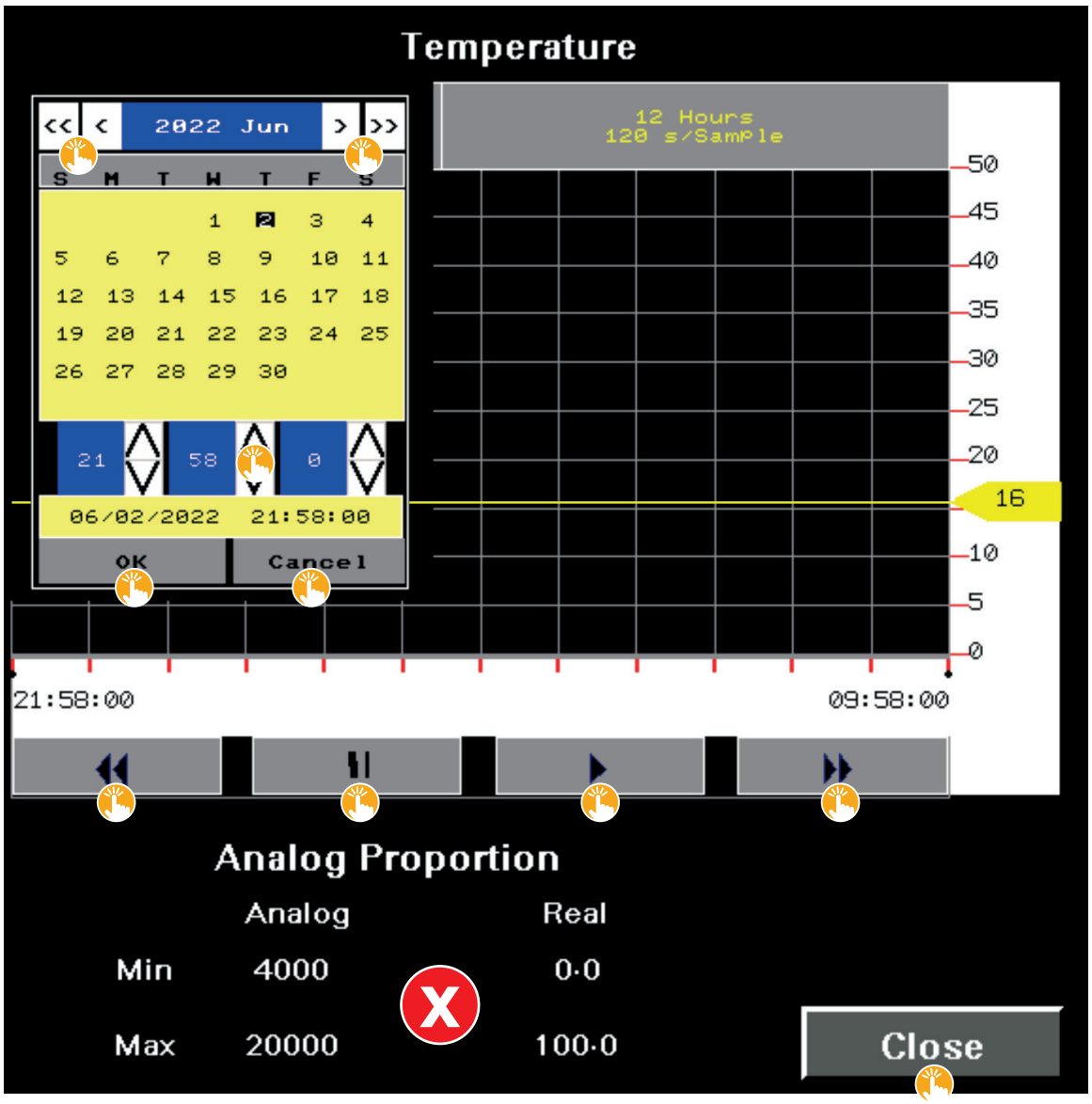
This screen is presented as an example and shows the TEMPERATURE trends for:

- the current period shown in the table; or
- periods that have been previously recorded in the program database.
  - The database is convenient for reference or consultation.

The example shown below indicates that on June 2 and 3, 2022, between 09:58 p.m. (21:58:00) and 09:58:00 a.m., the temperature trend was 60,8 °F (16 °C).

- The top part tells us:
  - The title of the screen and the table (temperature).
- The calendar tells us:
  - The current date or record you are viewing, as applicable (June 2, 2022).
    - The period you are currently viewing in the table (09:58:00 p.m. - 09:58:00 a.m.).
- The right-hand column shows us:
  - Degrees, in Celsius (degrees in Fahrenheit are also available in the program).
  - The line and the yellow pointer indicate the temperature at the date and time indicated.
- The bottom part displays the ANALOG PROPORTION data:
  - These adjustment parameters are pre-set at the factory.
  - These parameters should not be changed.

ILLUSTRATION 25 | Pop-up window for Temperature



Here is the list of choices you can make from the tactile keys in this pop-up window.

NOTE | To view the yellow calendar as seen from this pop-up window, you must first press its thumbnail, which you will find in the same place.

- [<<, <, > and >>]: Tactile keys for navigating between the months and days of the data recorded in the program
- [^ and v]: Tactile keys for navigating between the hours, minutes and seconds of the data recorded in the program
- [OK]: Tactile key to confirm your choices in the calendar
- [CANCEL]: Tactile key to cancel your choices in the calendar

The four tactile keys for navigation in the current playback sequence are used as follows.

NOTE | The *current playback sequence* represents what is currently displayed on the screen. It could be the reading of a data file recorded a few days ago in the program, or it could be the reading of the operation that is currently taking place on your R. O.

- [<<]: Go back 30 seconds in the *current playback sequence*
- [||]: Pause the *current playback sequence*
- [>]: Return in real time
- [>>]: Advance 30 seconds in the current playback sequence
  - Up to the current time if you are reading the current operation on your R. O.
- [Close]: Tactile key to close the temperature trends pop-up window

6.2 R. O. VALVE OPERATION SCREEN (2 OF 4)

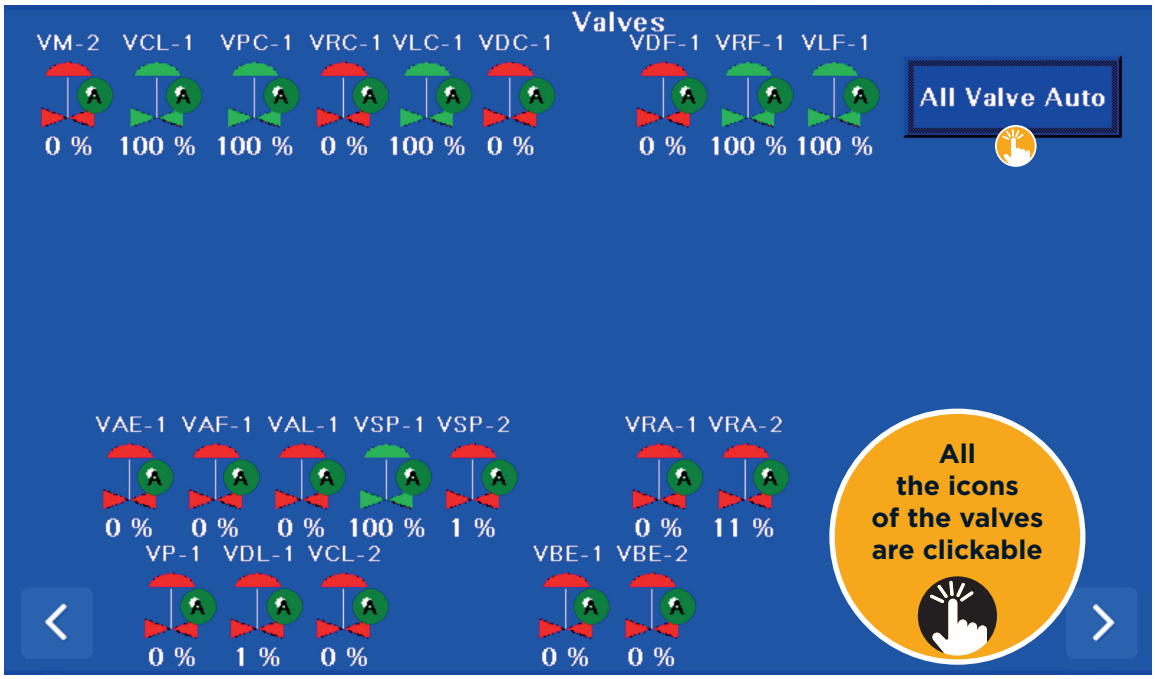
Illustration 26 | The main home screen and its three subscreens

The VALVE operation screen of the R. O. is the first of the three central subscreens of the program. To access it, simply press the left [<] or right arrow [>] located on either side of the bottom of the screen body until you reach it. If you are in the main home screen, press the right arrow [>] once to get there.

The following operation screen shows us this information:

- All the VALVES of the R. O., each with its own icon.
- Each icon is presented by the valve identifier indicated on the R. O. (VM-2, VBE-2, etc.).
- The current status of the valve according to the colour of its icon:
  - a red icon indicates that the valve is closed,
  - a green icon indicates that the valve is open.
- The choice of the valve's operating setting, according to the colour and the letter of the lettered dot:
  - a green dot with the letter A indicates that the valve is operating AUTOMATICALLY,
  - a yellow dot with the letter M indicates that the valve is operating MANUALLY,
  - to operate the R. O. AUTOMATICALLY, all the dots must be green with the letter A.
- The percentage quantifies the valve opening coefficient, which can be between 0 and 100%.
  - In our example, valves VSP-2, VRA-2 and VDL-1 are in an opening or closing process.

ILLUSTRATION 27 | Operation screen of the R. O. valves



Here is the list of choices you can make from the tactile keys on this operation screen:

- [ALL VALVES AUTO]: Tactile key to set all valves to AUTOMATION simultaneously
- [VALVE ICONS]: Tactile keys to access the pop-up window of a valve (see next section)

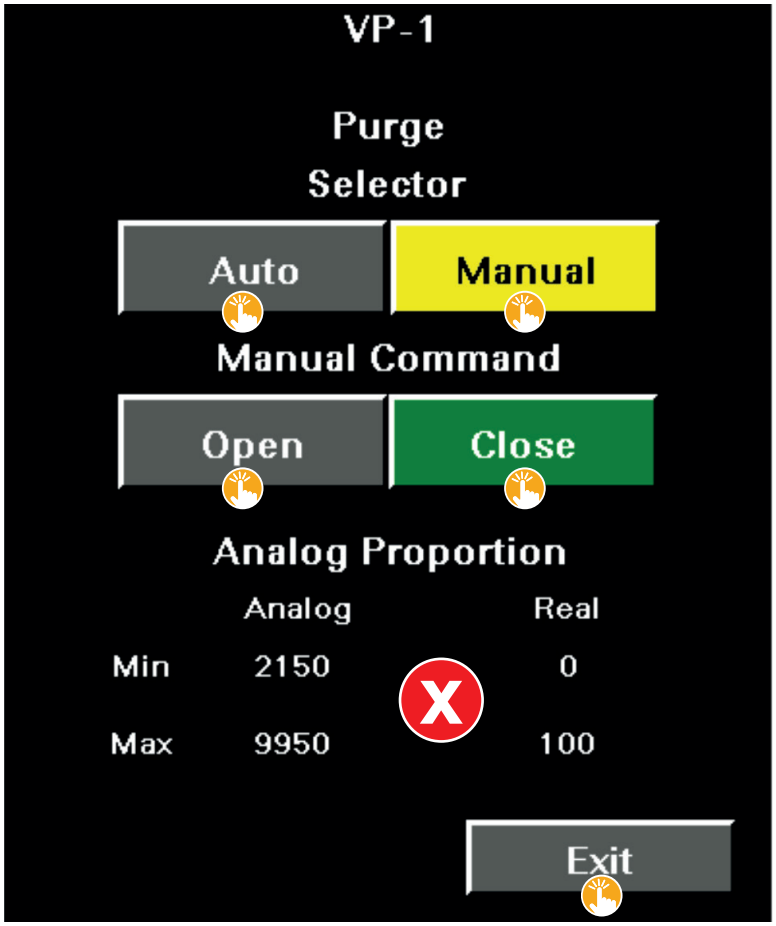
6.2.1 Valve pop-up window

To access the pop-up window for one of the R. O.'s valves, press the desired valve icon from the previous operation screen in *Section 6.2*.

The following pop-up window shows us this information:

- The identifier of the selected valve:
  - VP-1 shown below.
- The AUTOMATION or MANUAL valve operation SELECTOR:
  - a button with a colour other than grey indicates the current selection,
  - the valve is therefore set to be operated MANUALLY in our example.
- MANUAL COMMAND:
  - Since the valve is operated MANUALLY, the tactile keys [OPEN] and [CLOSE] are displayed in the pop-up window.
    - o They are not when the selection is set to AUTOMATION.
  - A button with a colour other than grey indicates the current selection.
    - o The valve is therefore set to be CLOSED in our example.
- ANALOG PROPORTION data:
  - These adjustment parameters are pre-set at the factory.
  - These parameters must not be changed as this will affect the opening and closing of the valve.

ILLUSTRATION 28 | Pop-up window of an R. O. valve



Here is the list of choices you can make from the tactile keys in this pop-up window:

- [AUTO] SELECTOR: Tactile key to operate the valve AUTOMATICALLY
- [MANUEL] SELECTOR: Tactile key to operate the valve MANUALLY
- [OPEN] MANUAL CONTROL: Tactile key to open the valve manually
- [CLOSE] MANUAL CONTROL: Tactile key to close the valve manually
- [EXIT]: Tactile key to save the settings and close the valve pop-up window

6.3 R. O. PUMP OPERATION SCREEN (3 of 4)

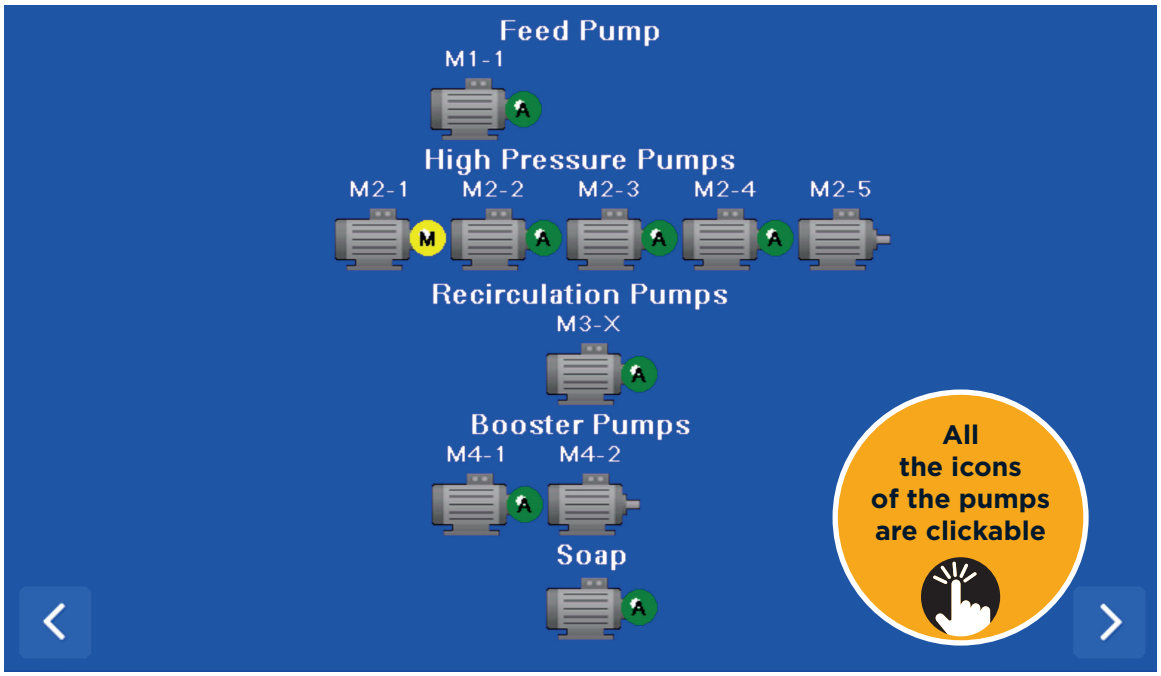
Illustration 29 | The main home screen and its three subscreens

The R. O.'s PUMPS operation screen is the second of the program's three central subscreens. To access it, simply press the left [<] or right arrow [>] located on either side of the bottom of the screen body until you reach it. If you are in the main home screen, press the right arrow [>] twice to get there.

The following operation screen shows us this information:

- All the pumps in the R. O., each with its own icon.
  - Except for the M3-X icon, which represents a group of pumps.
- The role of the pump or group of pumps (feed pump, soap, etc.).
  - The pump identified as SOAP is used for the injection of liquid soap.
- Identification of contactors M1, M2, M3 and M4 in the electrical panel:
  - M1 = FEED PUMP
  - M2 = HIGH-PRESSURE PUMPS
  - M3 = RECIRCULATION PUMP GROUP
  - M4 = BOOSTER PUMPS
- The identifier of each pump shown in this screen is the same as the one indicated on the R. O. (M2-1, soap, etc.).
- The choice of the pump's operating setting, according to the colour and letter of the lettered dot:
  - A green dot with the letter A indicates that the pump is operating AUTOMATICALLY.
  - A yellow dot with the letter M indicates that the pump is operating MANUALLY.
    - In the example shown below, the M2-1 pump is operated MANUALLY.
  - To operate the R. O. AUTOMATICALLY, all the dots must be green with the letter A.

ILLUSTRATION 30 | R. O. pump operation screen



Here is the list of choices you can make from the tactile keys on this operation screen:

• [PUMP ICONS]: Tactile keys to access a pump's pop-up window (see next section)

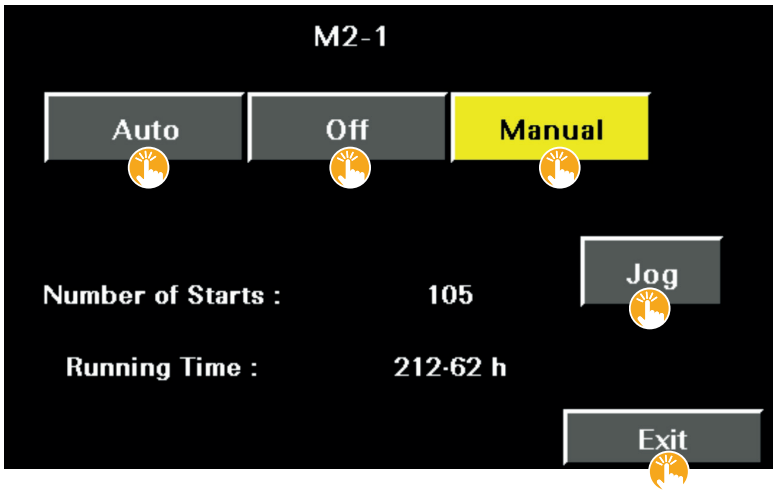
6.3.1 Pump pop-up window

To access the pop-up window for one of the pumps in your R. O., press the desired pump icon from the previous touchscreen in *Section 6.3*.

The following pop-up window shows us this information:

• The identifier of the selected pump:
  - M2-1 shown below.
• If the pump is operated AUTOMATICALLY or MANUALLY, or if it is out of service:
  - A button with a colour other than grey indicates the current selection.
  - The pump is therefore set to be operated MANUALLY in our example.
• NUMBER OF STARTS:
  - The total number of starts or pump starts.
  - The example illustrates 105 starts.
• RUNNING TIME:
  - The pump's operating time in hours and minutes.
  - Note that the minutes are displayed as a percentage of an hour, so 212.62 h.

ILLUSTRATION 31 | Pop-up window of a pump in the R. O.



Here is the list of choices you can make from the tactile keys in this pop-up window:

• [AUTO]: Tactile key to operate the pump AUTOMATICALLY
• [OFF]: Tactile key to turn the pump OFF
  - In the event of a pump failure, breakage or other problem, this key will not automatically activate. The operator must manually turn the pump OFF by pressing this tactile key.

  IMPORTANT | The pump can no longer be used in the program. To use it again, return to this pop-up window and reactivate the pump by pressing the AUTO tactile key.

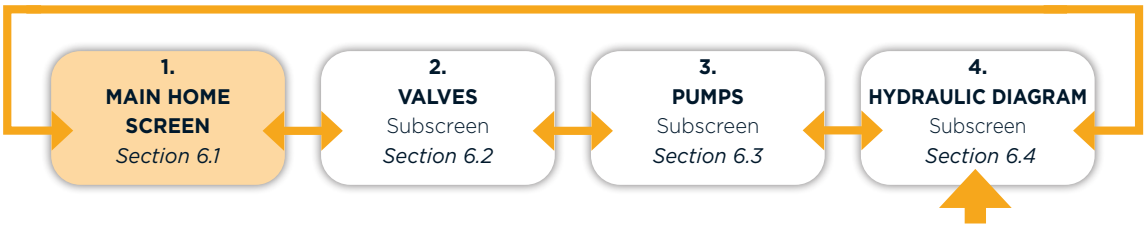
- [MANUAL]: Tactile key to operate the pump MANUALLY
- [JOG]: Tactile key to manually check the operation and status of the pump
  - This key is only visible and accessible when the selector is in MANUAL (see previous point).
  - This tactile key allows you to operate the pump continuously as long as you keep your finger pressed on the tactile key.

USE CAUTION BEFORE ACTIVATING THE JOG KEY. Manual operation of the pump with this key involves some risk. For example, make sure that no one is near the pump to avoid accidents and injuries, and make sure that the pump has sufficient water supply during the entire test period.

- [EXIT]: Tactile key to save settings and close the pump pop-up window.

6.4 R. O. HYDRAULIC DIAGRAM CONSULTATION SCREEN (4 of 4)

Illustration 32 | The main home screen and its three subscreens



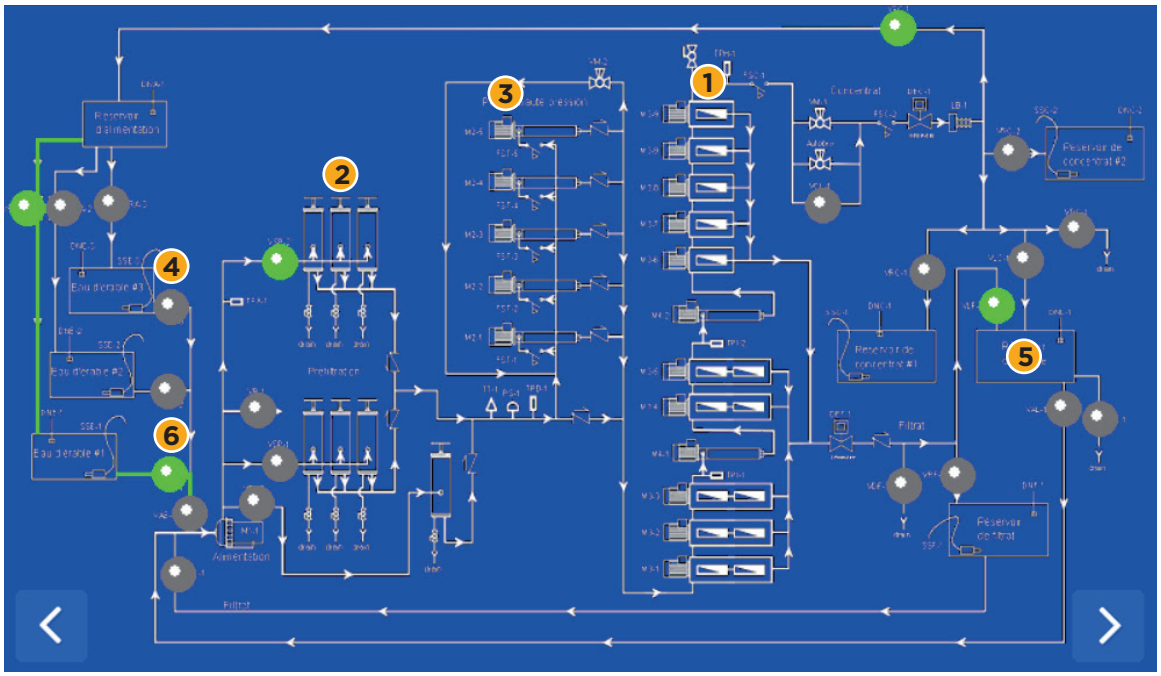
The consultation screen showing the HYDRAULIC DIAGRAM of the R. O. is the third of the three central subscreens of the program. To access it, simply press the left [<] or right arrow [>] located on either side of the bottom of the screen until you reach it. If you are in the main home screen, press the right arrow [>] three times to get there.

If you click the right arrow [>] again, you will return to the home screen. You can also return to previous screens by clicking on the left arrow [<].

The following operation screen shows us this information:

- An overview of the R. O. :
  - Pressure vessels 1
  - Filters 2
  - Pumps 3
  - Valves 4
  - Tanks 5 and other components
- The colour of the dots indicates whether the valves are open or closed:
  - A grey dot indicates that the valve is closed 4
  - A green dot indicates that the valve is open 6

ILLUSTRATION 33 | Consultation screen of the Hydraulic diagram of the R. O.



No tactile key selections can be made from this consultation screen.

Section 7 provides information related to the following six tactile keys. These keys can be found in the lower part of the screen body, depending on which screen you are on in the program.

ILLUSTRATION 34 | Tactile keys on tanks and filters

- [TANK INFO SAP]: Tactile key to consult the status and level of the maple sap tank(s)
- [TANK INFO FILTRATE]: Tactile key to consult the status and level of the filtrate tank(s)
- [TANK INFO CONCENTRATE]: Tactile key to consult the status and level of the concentrate tank(s)
- [FILTERS 1 AVAILABLE]: Tactile keys for changing the status of filter group No. 1
- [FILTERS 2 NOT AVAILABLE]: Tactile keys for changing the status of filter group No. 2
- [WASH FILTER AVAILABLE]: Tactile keys to change the status of the wash filter

7.1 TACTILE KEY TANK INFO SAP

This tactile key allows you to view the status and level of the maple sap tank(s).

ILLUSTRATION 35 | Tactile key of the maple Sap tanks

An R. O. can host one or more tanks, depending on the configuration. Each of the tanks are illustrated in the following operation screen and has its own identification number, i.e. 1, 2 and 3 in our example.

- A standard R. O. has a tank for the maple sap, a tank for the filtrate and a tank for the concentrate. It is possible to have more than one tank per liquid. It is then necessary to ask the multi-tank option when ordering.

The following operation screen shows us this information for tank No. 1:

- It is the active tank since it has a green outline.
  - If the configuration contains only one tank, there is no green outline.

- Its identification number is 1.
  - The red dot, to the right of DNE-1, lights up if the tank level reaches the DNE-1 high-level alarm. A system is then activated to ensure normal operation. It is recommended to Install the float slightly above the maximum level of 100% assigned to the level sensor and below the tank overflow, if it has one.
- Its current filling level is 73%.
  - The percentage increases as the filling process continues.
- The SET POINT recorded by the operator is 100%.
- It is the second (2) tank to be filled in ORDER.
  - Multi-tank is a configuration option. You will be able to set the filling order only if you have more than one tank.
  - It is possible to fill two or more tanks simultaneously:
    - o to fill several tanks simultaneously, simply assign them the same number (ORDER),
    - o for example, if you assign number 1 to tanks 1 and 2 and number 2 to tank 3, the first two tanks will fill up simultaneously first, and tank 3 will fill up second.
- The WAITING time before it is available for concentration is 5 minutes.
  - This waiting time allows the water to settle before the concentration cycle starts.
- It is AVAILABLE for FILLING.

ILLUSTRATION 36 | Operation screen for Sap tanks

Here is the list of choices you can make from the tactile keys on this operation screen:

- [73 %] ("TANK TACTILE KEY"): Tank tactile key No. 1 to access a pop-up window about the liquid level in the tank and the analog proportions (see *Section 7.3.1, Illustration 42*)
- [100 %] SET POINT: Tactile key to set the tank set point, or the desired filling level (percentage)
  - When pressed, a touchpad allows you to enter a level between 0 and 100%.
- [2] ORDER: Tactile key to set the order in which the tank is filled
  - When pressed, a touchpad allows you to enter a number between 1 and the number of tanks in the configuration.
- [0 h 5 min] WAITING: Tactile key to set a pause before the sap is available for concentration
  - When pressed, a touchpad allows you to enter a pause time between 0 minutes and 9 hours.
- [AVAILABLE FILLING] (optional): If applicable, a tactile key to make the tank available for filling

- Four choices are offered, in order, to determine the status of the tank:
  - o AVAILABLE FOR FILLING: This choice makes the tank available for filling.
  - o WAITING: This choice is flashing and indicates that the tank is on hold for concentration.
  - o AVAILABLE CONCENTRATION: This choice makes the tank available for concentration.
  - o NOT AVAILABLE: This choice makes the tank unavailable, a practical status for cleaning.

It is important to **SET THE TANK STATUS TO "NOT AVAILABLE" WHEN CLEANING, SERVICING OR PERFORMING ANY HUMAN INTERVENTION** in the tank. This will make the area safe by making it inactive to prevent accidents and injuries.

IF ALL THE TANKS ARE "UNAVAILABLE", AN OPERATING CYCLE USING THIS OR THESE TANK(S) WILL NOT BE ABLE TO START.

7.2 TACTILE KEY TANK INFO FILTRATE

This tactile key allows you to view the status and level of the filtrate tank(s).

ILLUSTRATION 37 | Tactile key of the Tank info filtrate

An R. O. can host one or more tanks, depending on the configuration. A single tank is shown in the following operation screen and its identification number is 1 in our example, since it is the only one.

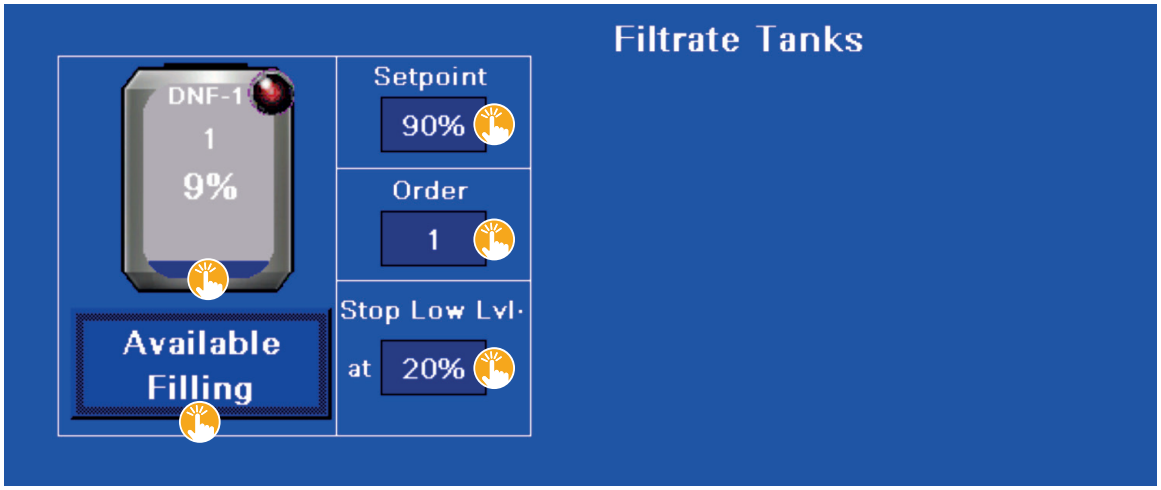
- A standard R. O. has a tank for the maple sap, a tank for the filtrate and a tank for the concentrate. It is possible to have more than one tank per liquid. It is then necessary to ask the multi-tank option when ordering.

The following operation screen shows us this information for tank No. 1:

- There is only one tank in the configuration.
- Its identification number is 1.
  - The red dot, to the right of DNF-1, lights up if the tank level reaches the DNF-1 high-level alarm. At this point a system that manages the opening and closing of the VDF-1 valve is activated to ensure the normal monitoring of the operation. It is recommended to Install the float slightly above the maximum level of 100% assigned to the level sensor and below the tank overflow, if it has one.

- Its current filling level is 9%.
  - The percentage increases as the filling process continues.
- The filling level recorded by the operator is 90% (SET POINT).
  - This indicates that the tank is considered full when it reaches this level.
- It is the first tank (1) to be filled in ORDER.
  - In fact, this function is inactive in our example since it has only one tank.
  - Multi-tank is a configuration option. You will be able to set the filling order only if you have more than one tank.
  - It is possible to fill two or more tanks simultaneously:
    - o to fill several tanks simultaneously, simply assign them the same number (ORDER),
    - o for example, if you assign number 1 to tanks 1 and 2 and number 2 to tank 3, the first two tanks will fill up simultaneously first, and tank 3 will fill up second.
- The STOP in LOW LEVEL is 20%.
  - The low-level stop represents the minimum safety threshold of filtrate to be kept in the tank, e.g. for washing.
- The tank is AVAILABLE FOR FILLING.

ILLUSTRATION 38 | Operation screen for the Filtrate tanks



Here is the list of choices you can make from the tactile keys on this operation screen:

- [9 %] ("TANK TACTILE KEY"): Tactile key to access a pop-up window on the liquid level in the tank as well as the analog proportions (see *Section 7.3.1, Illustration 42*)
- [90 %] SET POINT: Tactile key to set the tank set point, or the desired filling level (percentage)
  - When pressed, a touchpad allows you to enter a level between 0 and 100%.
- [1] ORDER: Tactile key to set the order in which the tanks are filled
  - When pressed, a touchpad allows you to enter a number between 1 and the number of tanks in the configuration.

- [20 %] LOW-LEVEL STOP: Tactile key to set the minimum safety level of filtrate to be kept in the tank to avoid running out of water
  - When pressed, a touchpad allows you to enter a level between 0 and 100%.
- [AVAILABLE FILLING]: Tactile key to make the tank available for filling
  - Two choices are offered, in order, to determine the status of the tank:
    - o AVAILABLE FOR FILLING: This choice makes the tank available for filling.
    - o NOT AVAILABLE: This choice makes the tank not available, a practical status for cleaning as an example.

It is important to **SET THE TANK STATUS TO "NOT AVAILABLE" WHEN CLEANING, SERVICING OR PERFORMING ANY HUMAN INTERVENTION** in the tank. This will make the area safe by making it inactive to prevent any accidents or injuries.

IF ALL THE TANKS ARE "UNAVAILABLE", AN OPERATING CYCLE USING THIS OR THESE TANK(S) WILL NOT BE ABLE TO START.

7.3 TACTILE KEY TANK INFO CONCENTRATE

This tactile key allows you to view the status and level of the concentrate tank(s).

ILLUSTRATION 39 | Tactile key of the Concentrate tanks

An R. O. can host one or more tanks, depending on the configuration. Each of the tanks are illustrated in the following operation screen and has its own identification number, i.e. 1, 2 and 3 in our example.

- A standard R. O. has a tank for the maple sap, a tank for the filtrate and a tank for the concentrate. It is possible to have more than one tank per liquid. It is then necessary to ask the multi-tank option when ordering.

In relation to tank No. 1, the following operation screen shows us this information:

- Its identification number is 1.
  - The red dot, to the right of DNC-1, will light up if the tank level reaches the DNC-1 high-level alarm float. It is recommended to Install the float slightly above the maximum level of 100% assigned to the level sensor and below the tank overflow, if it has one.
- Its current filling level is at full capacity, i.e. 100%.
- The SET POINT recorded by the operator is 100%.
- It is the first tank (1) to be filled in ORDER:
  - multi-tank is a configuration option. You will be able to set the filling order only if you have more than one tank,
  - it is possible to fill two or more tanks simultaneously:

o to fill several tanks simultaneously, simply assign them the same number (ORDER),

o for example, if you assign number 1 to tanks 1 and 2 and number 2 to tank 3, the first two tanks will fill up simultaneously first, and tank 3 will fill up second.

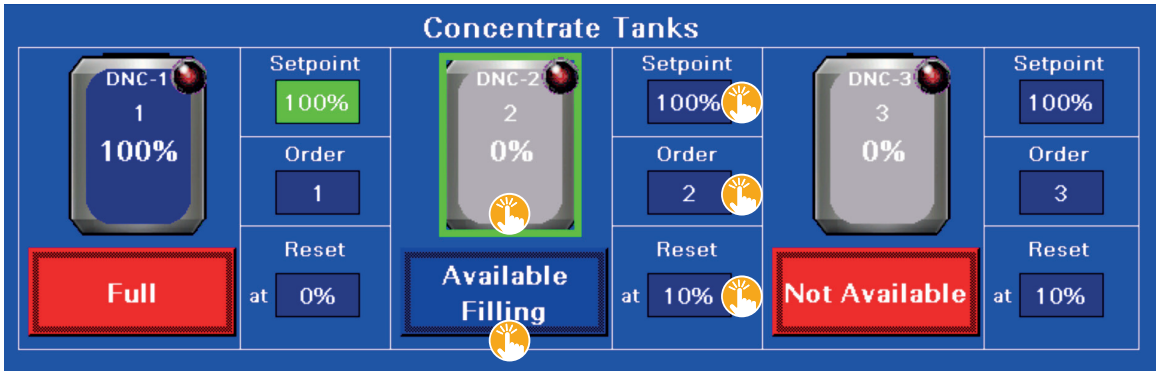
- The RESET set by the operator is at 0%.
  - Reset means that the tank is available for the next filling as soon as its liquid level has decreased to 0%.
- Its status is FULL.
  - Its status is full since the set point recorded filling level is reached, i.e. 100% in our example.

For tank No. 2, the operation screen shows us this information, among others:

- it is the active tank since it has a green outline,
  - the tank is filling, and the percentage increases as it fills.

NOTE | Single tank filling is possible by activating the checkbox [UNIQUE FILLING] (see *Section 7.3.1, Illustration 42*). This box is found in the pop-up window that appears when you click on [0 %] (tank tactile key) in the operation screen below. This setting can be useful if you want to wash the tank between fills, for example.

ILLUSTRATION 40 | Operation screen for Concentrate tanks



Here is the list of choices you can make from the tactile keys on this operation screen:

Tank No. 2:

- [0 %] ("TANK TACTILE KEY"): Tactile key to access a pop-up window on the liquid level in the tank as well as the analog proportions (see *Section 7.3.1, Illustration 42*)
  - This window also allows you to activate the unique filling checkbox.
- [100 %] SET POINT: Tactile key to set the tank set point, or the desired filling level (percentage)
  - When pressed, a touchpad allows you to enter a level between 0 and 100%.
- [2] ORDER: Tactile key to set the order in which the tanks are filled
  - When pressed, a touchpad allows you to enter a number between 1 and the number of tanks in your configuration.
- [10 %] RESET: Tactile key to set the level at which the tank becomes available for the next filling
  - When pressed, a touchpad allows you to enter a level between 0 and 100%.

- [AVAILABLE FILLING]: Tactile key to make the tank available for filling
  - Two choices are offered, in order, to determine the status of the tank:
    - o AVAILABLE FOR FILLING: This choice makes the tank available for filling.
    - o NOT AVAILABLE: This choice makes the tank unavailable, a practical status for cleaning as an example.

It is important to **SET THE TANK STATUS TO "NOT AVAILABLE" WHEN CLEANING, SERVICING OR PERFORMING ANY HUMAN INTERVENTION** in the tank. This will make the area safe by making it inactive to prevent any accidents or injuries.

IF ALL THE TANKS ARE "UNAVAILABLE", AN OPERATING CYCLE USING THIS OR THESE TANK(S) WILL NOT BE ABLE TO START.

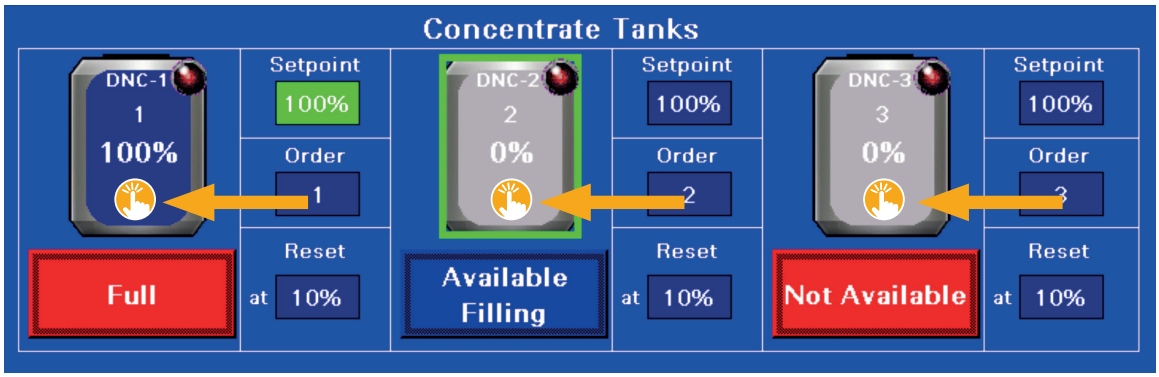
7.3.1 Typical liquid level and unique filling pop-up window

This pop-up window shows the current concentrate level in the tank. You will find this same type of window for each of the tanks in the configuration: maple sap tank, filtrate tank and concentrate tank.

The UNIQUE FILLING checkbox is also enabled or disabled from this screen. This setting can be useful if you want to wash the tank between fills, for example.

To access this screen, simply press the desired tank tactile key in an operation screen.

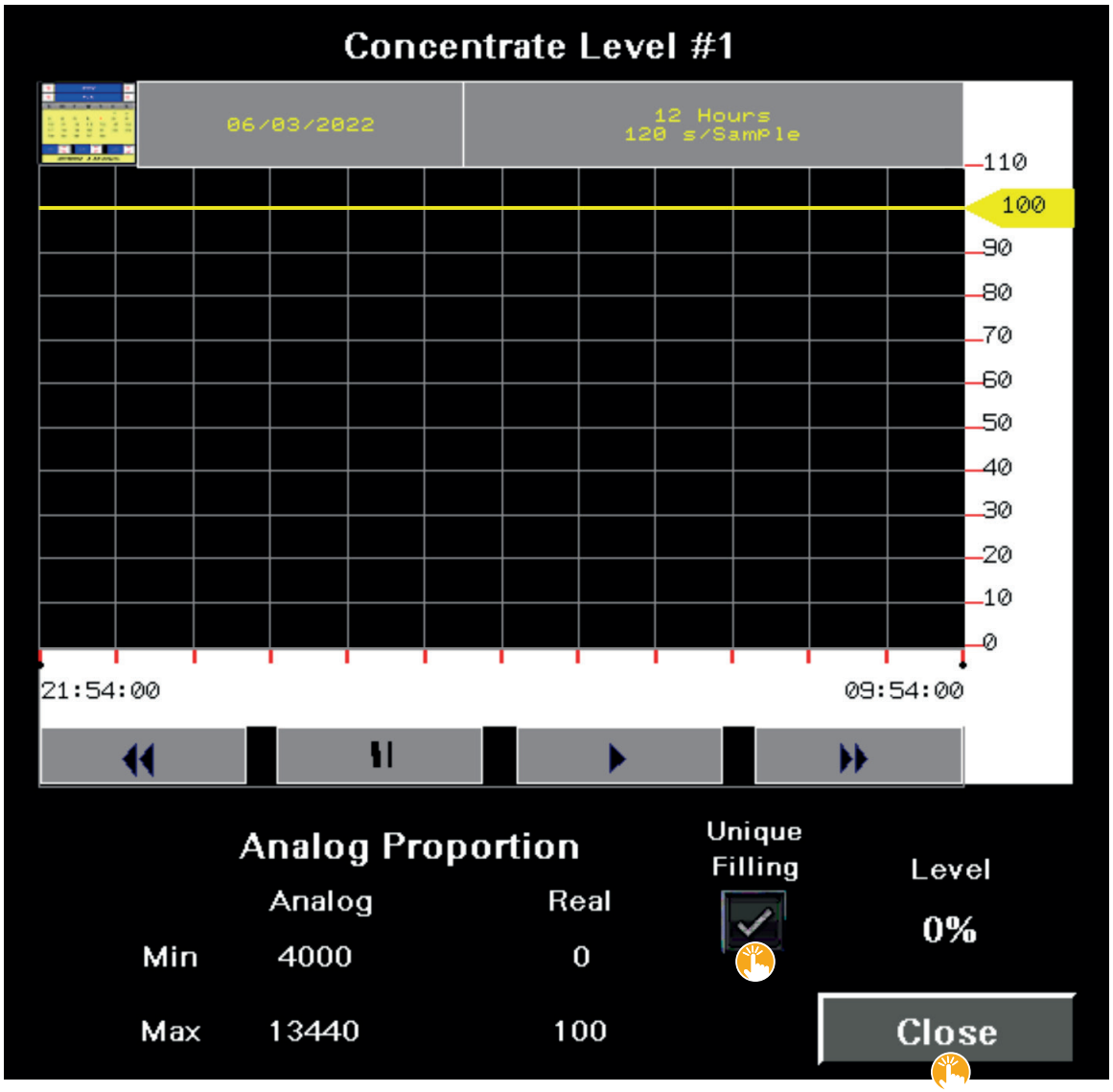
ILLUSTRATION 41 | Tactile keys on the tanks



The following pop-up window shows us this information:

- The percentage concentrate level of tank No. 1 on June 3 and 4, 2022 between 09:54 p.m. (21:54:00) and 9:54:00 a.m. was 100%.
- UNIQUE FILLING is activated.
  - Unique filling applies to the concentrate tank(s) only. When the concentrate level reaches the percentage set by the operator, the tank becomes unavailable for filling.

ILLUSTRATION 42 | Pop-up window for liquid level in a tank



Here is the list of choices you can make from the tactile keys on this operation screen:

- [UNIQUE FILLING]: Tactile key to activate the unique filling option of the tank
- [CLOSE]: Tactile key to save the setting and close the pop-up window

7.4 TACTILE KEYS FILTERS 1, FILTERS 2 AND WASH FILTER

These tactile keys are linked to filter groups 1 and 2 and the wash filer. They do not direct to other operation screens.

ILLUSTRATION 43 | Tactile key for filter groups 1 and 2 and the Wash filter

The following is a list of choices you can make from the tactile keys on this operation screen. The same instructions apply to all three tactile keys.

- [FILTERS 1, 2 and WASH]: Tactile keys to set the desired status of the two filter groups and the wash filter
  - Two choices are offered:
    - o AVAILABLE: This choice makes this filter group available for various operations such as concentration, for example.
    - o NOT AVAILABLE: This choice makes this filter group unavailable.
      - ■ This status must be activated for filter replacement.

> It is essential to **SET THE CONDITION OF THE FILTER(S) TO "NOT AVAILABLE" WHEN REPLACING, CLEANING, SERVICING OR PERFORMING ANY HUMAN INTERVENTION** on the filter(s). This will make the area safe by making it inactive to prevent any accidents or injuries.

  - An additional status, set by the program, can be displayed:
    - o CLOGGED: If applicable, this status indicates that the filter(s) are clogged and need to be changed.
      - ■ Select the NOT AVAILABLE status, replace the filter(s) and then return to the AVAILABLE status.

      NOTE | If the clogged filters are not replaced, both sets of filters 1 and 2 will be used simultaneously.

> When **THE "CLOGGED" STATUS IS DISPLAYED**, it is important to **MAKE THE FILTERS' STATUS "NOT AVAILABLE"** to avoid splashing and injury during maintenance.

Section 8 provides information related to the following seven tactile keys. These keys are permanently located in the bottom banner of the screen.

ILLUSTRATION 44 | Tactile keys for operating cycles in the bottom banner

- [DRAIN]: Tactile key to access the DRAIN operation screen
- [CONCENTRATION]: Tactile key to access the CONCENTRATION operation screen
- [DESUGARING]: Tactile key to access the DESUGARING operation screen
- [RINSE]: Tactile key to access the RINSE operation screen
- [WASH]: Tactile key to access the WASH operation screen
- [SEQUENCE]: Tactile key to access the SEQUENCE operation screen
- [PEP]: Tactile key to access the PEP operation screen

8.1 TACTILE KEY DRAIN

ILLUSTRATION 45 | Tactile key for Drain cycle

This tactile key takes you to the DRAIN operation screen (see *Illustration 46*).

This screen allows you to activate the valves that will open for a certain time during this cycle.

- Activated valves are opened during the cycle.
- At the end of the cycle, the valves return to their initial opening (before the cycle started).

The following operation screen shows us this information:

- Each icon is presented by its valve identifier as shown on the R. O. (VM-2, VBE-2, etc.).
- VAL-1 and VDL-1 valves are fully open (100%).
- The colour of the icon indicates the current status of the valve:
  - A red icon indicates that the valve is closed.
  - A green icon indicates that the valve is open.
- The percentage indicates the status of the valve:
  - At 0%, the valve is completely closed.
  - At 100%, the valve is fully open.
  - 1 to 99% indicates the valve opening as a percentage:
    - In the process of opening, 78% indicates that the valve is 78% open.
    - In the process of closing, 78% indicates that there is still 78% to go before the valve is completely closed.
- The CYCLE TIME of the drainage set by the operator, i.e. 4 MINUTES in our example.

- To stop the drainage manually, simply press the tactile key [STOP], located on the right side of the top banner of the display panel.

• The FILLING WASH TANK is not activated since its checkbox is empty:

- If it is activated, the end of the valve opening cycle is determined by the first of the following two events attained:

  o when the tank level reaches the DNL-1 high-level alarm float; or

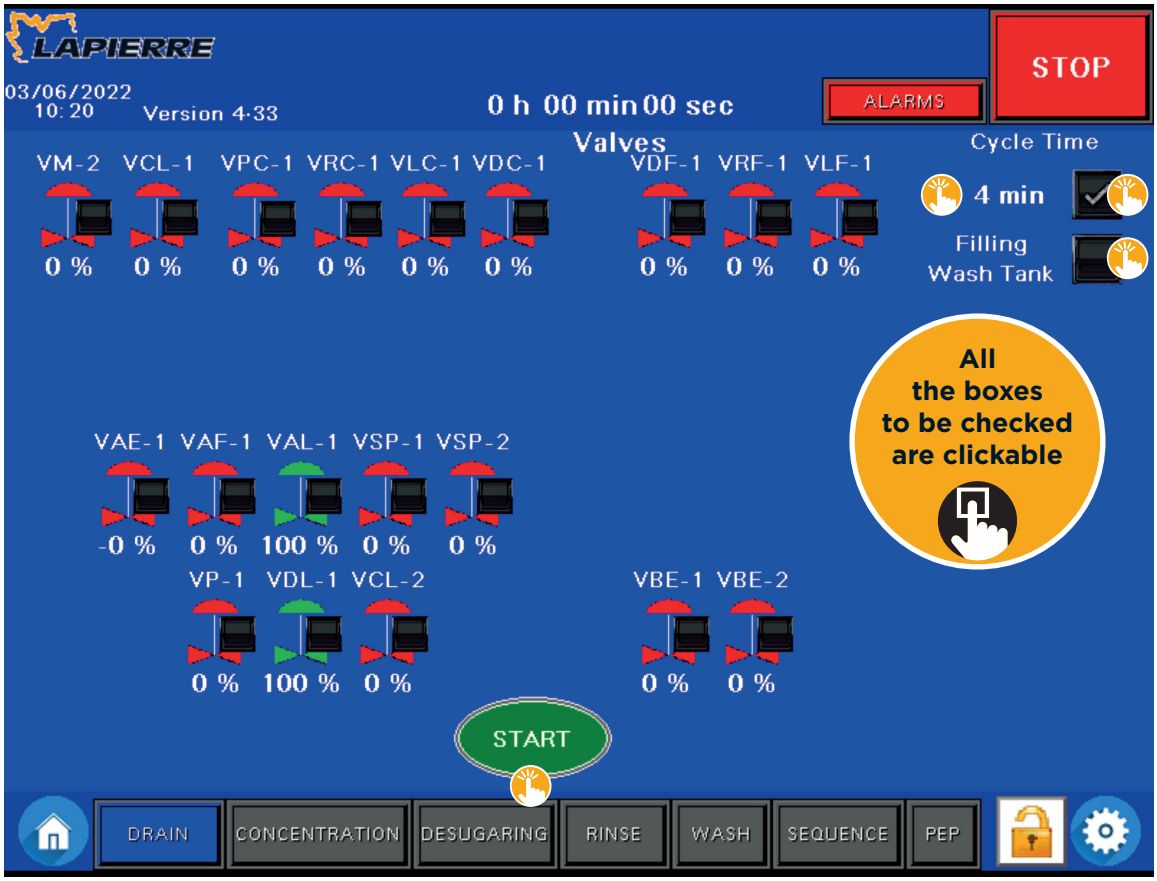
  o the maximum filling time of the wash tank, i.e. parameter No. 42 (see *Section 8.5.1, Illustration 64*).

- To stop the filling manually, simply press the tactile key [STOP] located on the right side of the top banner of the display panel.

NOTE | Under CYCLE TIME, one of the two previous checkboxes must be checked.

• In the bottom banner of the screen, the blue display colour of the DRAIN tactile key indicates that you are currently in the drain operation screen.

ILLUSTRATION 46 | Drain cycle operation screen



Here is the list of choices you can make from the tactile keys on this operation screen:

- [VALVES]: Tactile keys to set the valve(s) to be opened
- [4 MIN] CYCLE TIME: Tactile key to activate setting and set the duration of the cycle time
  - When [4 min] is pressed, a touchpad appears in a pop-up window to set the duration of the cycle time (0 to 99 minutes).
- [WASH TANK FILLING] CYCLE TIME: Tactile key to activate the wash tank filling option
- [START]: Tactile key to start the drain cycle
  - The drain cycle starts immediately after the key is pressed.
  - The cycle will not stop until the CYCLE TIME has elapsed.

8.1.1 Operation screen Drain/VALVE ORIENTATION

When you press the [START] tactile key in the previous section (see *Illustration 46*), the program starts the drain cycle, and this tactile key becomes IN PROGRESS (see *Illustration 47*).

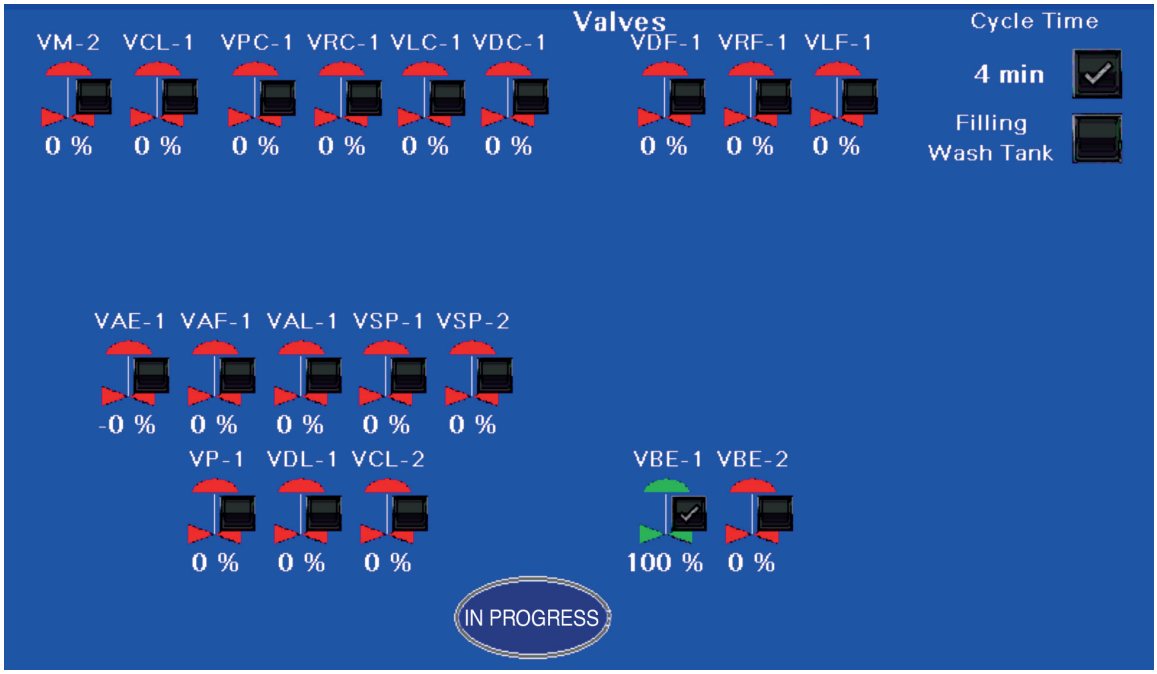
Here is the list of operations in order:

1. Valves activated for opening are oriented to open.
2. Valves that are not activated for opening are oriented to close.
3. The cycle starts and stops according to the parameters set by the operator.

The following operation screen shows us this information:

- Only one valve is activated for opening (the VBE-1 valve).
- The VBE-1 valve is at 100% of its full opening:
  - a green icon indicates that the valve is open,
  - the process of opening the valves completely takes only a few seconds.
- The drain CYCLE TIME is activated and set at 4 MINUTES by the operator.
  - Drainage starts when all selected valves are 100% open.
- The tactile key at the bottom of the operation screen indicates that the operation is IN PROGRESS.

ILLUSTRATION 47 | Operation screen of Drain cycle/Valve orientation



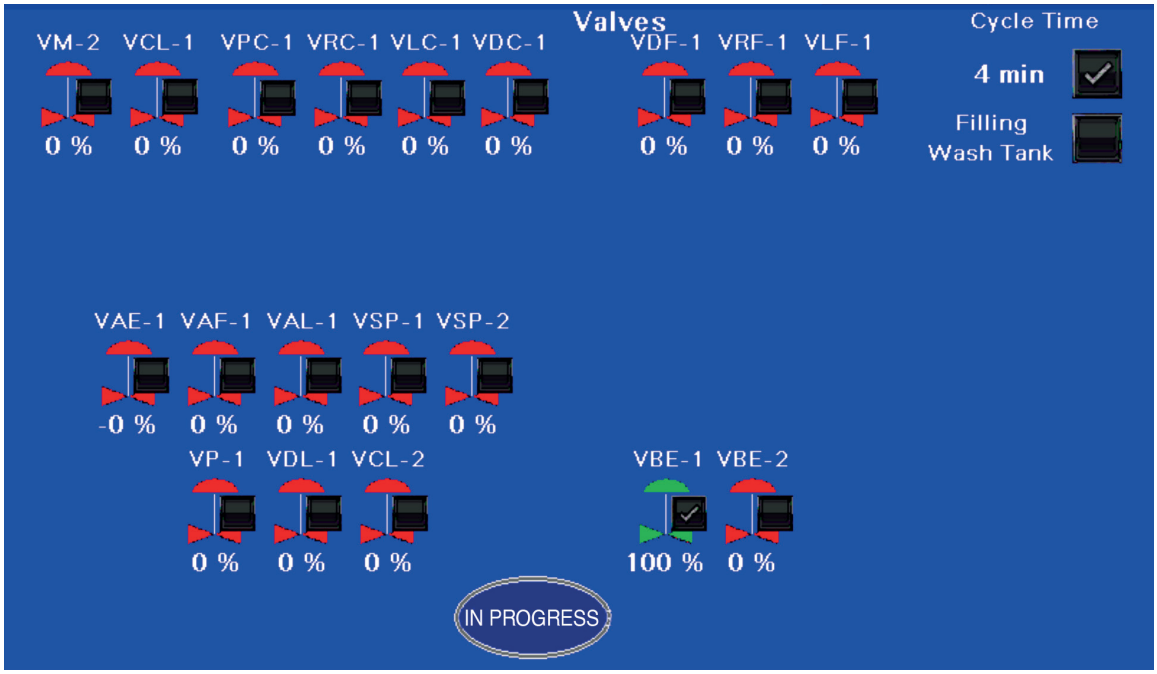
No tactile key selections can be made from this IN PROGRESS screen.

8.1.2 Operation screen Drain/IN PROGRESS

Following the opening of the valves in the previous section, the top banner now reads DRAIN/IN PROGRESS, which means that the activated valves are fully open, and that the drain cycle is now in progress.

The VBE-1 valve icon turns green, indicating that it is now fully open (100%).

ILLUSTRATION 48 | Operation screen of the Drain cycle/In progress



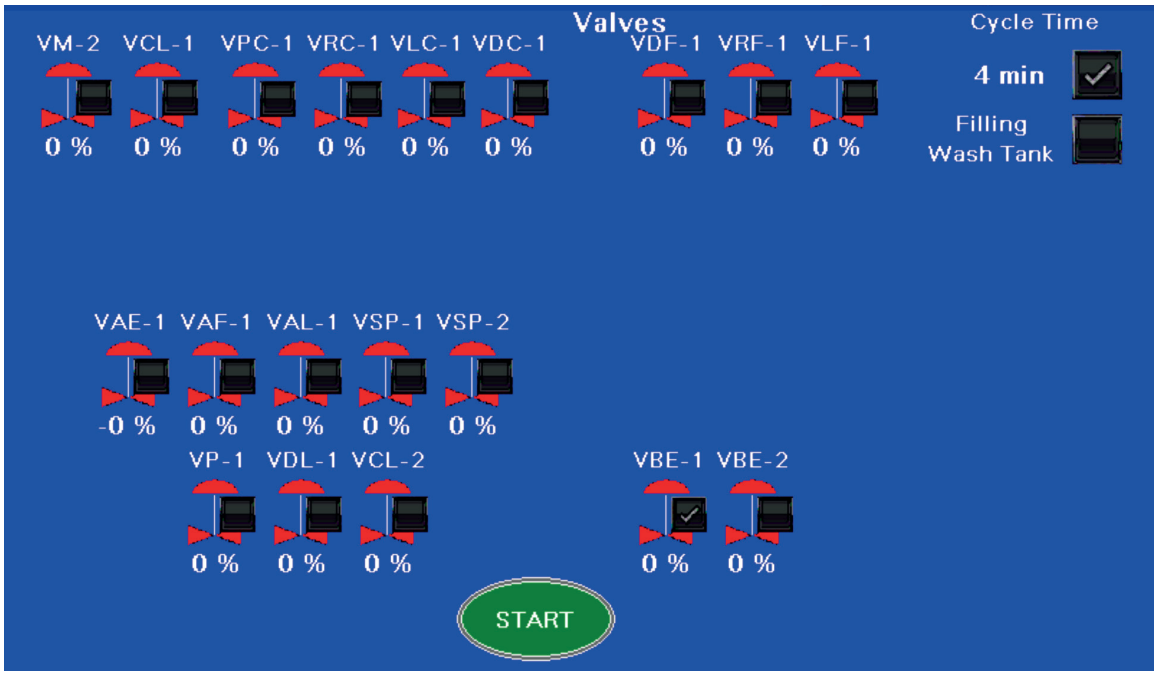
No tactile key selections can be made from this IN PROGRESS screen.

8.1.3 Operation screen Drain/END OF CYCLE

At the end of the drain cycle, the top banner reads DRAIN STOP/END OF CYCLE, which means that the drain cycle is now complete.

Notice that the VBE-1 valve icon has turned red, indicating that it is now closed (0%).

ILLUSTRATION 49 | Drain stop/End of cycle operation screen



No tactile key selections can be made from this START screen.

8.2 TACTILE KEY CONCENTRATION

This tactile key takes you to the CONCENTRATION operation screen (see *Illustration 51*).

ILLUSTRATION 50 | Tactile key for the Concentration cycle

The following operation screen shows us this information:

- The TARGET BRIX degree setting is activated and has been set at 20 by the operator.
  - If the setting is not activated, the text box will read NOT USED.
- The concentration CYCLE DURATION is not activated, so the text box indicates NOT USED.
  - If the concentration CYCLE DURATION is not activated, the cycle stops at the first of the following events attained:
    - o a feed pressure below 20 psi,
      - ■ usually caused by an empty maple water tank or clogged filters,
    - o a pressure that exceeds the maximum allowed, generating a high-pressure alarm,
    - o the unavailability of another tank to receive the concentrate.
- PRECONCENTRATION is set at 15 DEGREES BRIX or 4 MINUTES by the operator.
  - By activating the BRIX degree box, a touchpad appears in a pop-up window to set the degree.

- If the box is not activated, the program takes into account the duration of the preconcentration chosen by the operator.
- In our example, since the BRIX degree is activated, the transfer of water to the tank is determined by the first of the following two events attained:
  - o the selected Brix degree; or
  - o the time set by the operator.

• The STARTING FILTER BANK is performed by the FILTERS No. 1 group.
- Our example shows that the system configuration has two filter groups.

• The HIGH-PRESSURE PUMP SELECTION used is No. 2 and the start-up delay is 0 minutes.
- Our example shows that the system configuration has four pumps.
- In the pump group installed on the R. O., pump No. 1 is the one at the bottom, No. 2 is the one above, and so on.
- It is possible to set the start-up TIME between each of the pumps.
  - o The activated pumps will then start in ascending order according to the delay set by the operator.
  - o If the delay is set to 0 minutes, as in our example, the pump starts immediately.
    - ■ If more than one pump is used, the first pump starts immediately, while the others start one after the other with a 10 second delay between each.

NOTE | The delay between each pump allows the feed pressure to stabilise. Therefore, if the feed pressure drops when the pumps start and causes the R. O. to shut down, it is advisable to increase the delay to more than 10 seconds.

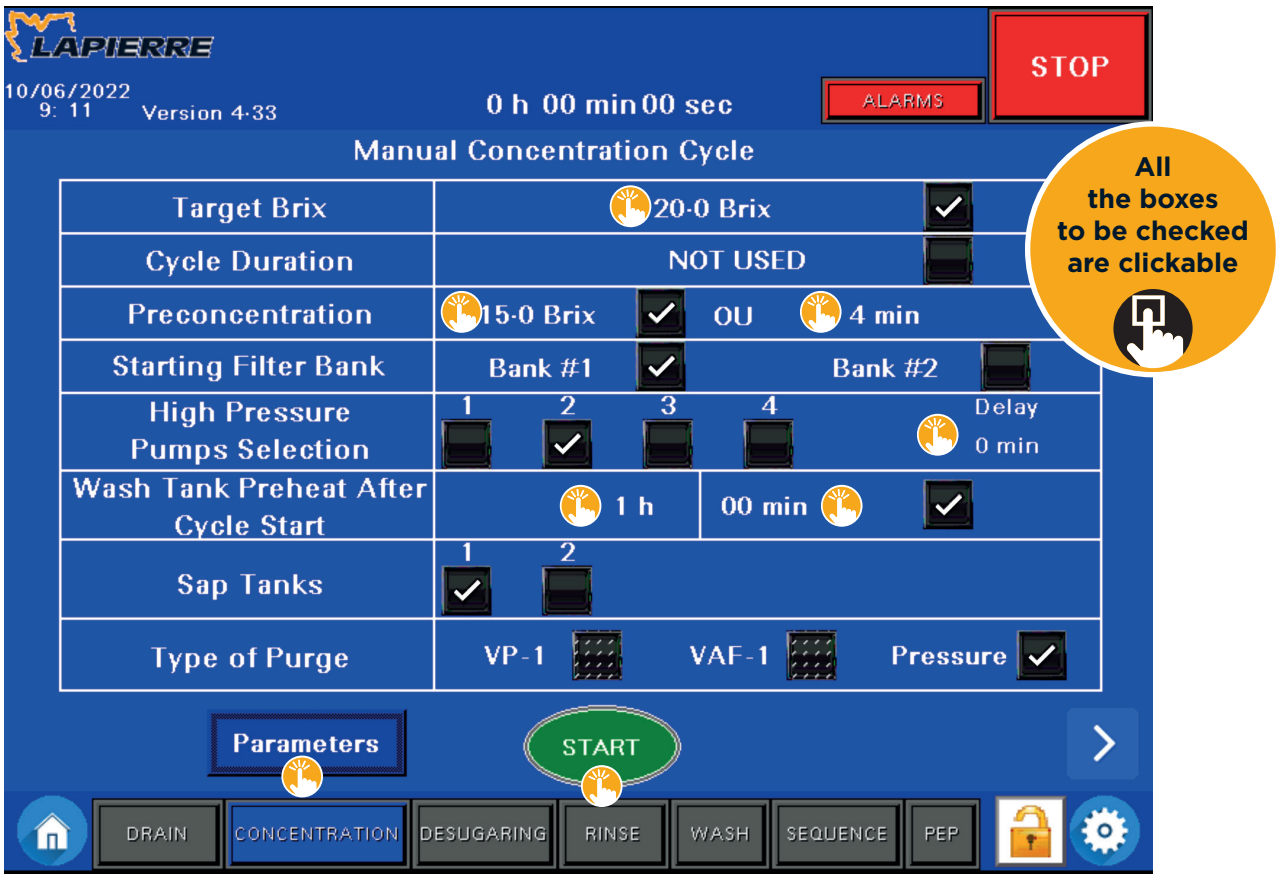
• The PREHEATING OF THE ELEMENTS AFTER THE CYCLE START is activated and set at 1 H 00 MIN by the operator.
- When you press the checkbox, a checkmark is displayed.
  - o It is then necessary to set how much time elapses after the START of the concentration cycle before the preheating of the elements begins.
- If the setting is not activated, the text box will read NOT USED.

• The MAPLE SAP TANK used is No. 1.
- Our example shows that the plant configuration has two tanks.
  - o Multi-tank is a configuration option.

• The TYPE OF PURGE used is in PRESSURE.
- The types of purges shown here have been configured by the programmer at LAPIERRE EQUIPMENT in the system settings. This configuration is done following a discussion with the customer and before the equipment is delivered.
- Three choices are available:
  - o VP-1: If the feed pump fails to start, the VP-1 valve will open to vent the pump or lines to allow priming. The VP-1 valve must be directed to the drain.
  - o VAF-1: When the feed pump fails to start, the VAF-1 valve opens and causes a surge of filtrate from a higher level. This surge allows the air to be evacuated from the pump or lines and allows it to be primed.
  - o Pressure: In the event of a feed pump priming failure, the VP-1 valve opens while the feed pump is running, allowing air to be vented from the pump or lines and ensuring priming. Note that the VP-1 valve must be directed to the maple sap tank and that the PRESSURE purge can only be performed when the feed pump is supplied with maple sap or filtrate.
    - ■ This type of purge is not available for the wash cycle.

If **NO PURGE TYPE IS SELECTED** by the operator **AND THE R. O. MUST PERFORM AN AIR PURGE** to start, the cycle may fail to start.

ILLUSTRATION 51 | Concentration cycle operation screen



Here is the list of choices you can make from the tactile keys on this operation screen:

- [TARGET BRIX]: Tactile key to activate the setting and set the BRIX TARGET degree value
  - [20-0 Brix]: Tactile key to set the Brix degree.
    - o When pressed, a touchpad appears in a pop-up window to set the concentration value of the maple sap.
- [CYCLE DURATION]: Tactile key to activate the setting and set the maximum time of the concentration cycle
  - When pressed, a checkmark appears to activate the setting.
  - When you press the hours space, a touchpad appears in a pop-up window to set the duration of the cycle in hours.
  - When you press the minutes space, a touchpad appears in a pop-up window to set and complete the cycle time in minutes.

- [15-0 BRIX] PRECONCENTRATION: Tactile key to activate the setting and set the desired Brix level for the preconcentration cycle
  - When [15-0 BRIX] is pressed, a touchpad appears in a pop-up window to set the degree.
  - If the setting is not activated, the text box will read NOT USED.
- [4 MIN] PRECONCENTRATION: Tactile key to set the maximum desired duration for the preconcentration cycle
  - When pressed, a touchpad appears in a pop-up window to set the cycle time in minutes.
  - A duration must necessarily be set, and it must be at least one minute.
- [GROUP Nos. 1 | 2] STARTING FILTER BANK: Tactile keys to activate a group of filters for prefiltration
  - You can only activate one of the two filter groups for pre-filtration.
- [Nos. 1 | 2 | 3 | 4] HIGH-PRESSURE PUMP SELECTION: Tactile keys to select the high-pressure pump(s) to be used
  - It is possible to select one or more pumps simultaneously for concentration.
- [DELAY 0 MIN] HIGH-PRESSURE PUMP SELECTION: Tactile key to set the start-up delay between each pump
  - When pressed, a touchpad appears in a pop-up window to set the delay in minutes.
- [PREHEATING OF THE ELEMENTS AFTER THE CYCLE START]: Tactile key to activate the setting and set how much time after the concentration cycle has started to preheat the elements
  - By pressing the space [1 h], a touchpad appears in a pop-up window to set the number of hours.
  - By pressing the space [00 min], a touchpad appears in a pop-up window to set and complete the duration in minutes.
- [Nos. 1 | 2] MAPLE SAP TANKS: Tactile keys to set which maple sap tank(s) to use
  - It is possible to select one or more tanks simultaneously for concentration.
- [VP-1 | VAF-1 | PRESSURE] PURGE TYPE: Tactile keys to set the type of purge to use
- [PARAMETERS]: Tactile key to access the PARAMETERS of the CONCENTRATION cycle

  TIP | It is best to set the PARAMETERS before you START the cycle.
- [START]: Tactile key to activate the cycle start

8.2.1 Tactile key Concentration/PARAMETERS

These two operation subscreens appear when you press the tactile key [PARAMETERS] of the CONCENTRATION operation screen in the previous *Section 8.2*.

Screen 1 of 2 | The following operation screen shows us this information:

NOTE | The superscript numbers (26, 27, 28, 20, 29, 30 and 70) indicate the parameter numbers to which each statement refers.

NOTE | The data in brackets (1-60 min) indicates the possible selection range of the statement value.

- 26. The MINIMUM TIME FOR CONCENTRATION set by the operator is 60 minutes.
  - If the cycle is interrupted before the set minimum time has elapsed, a notification appears.
  - The notification reads: "Minimum concentration cycle time not reached."
  - In MULTIPLE CYCLES IN SEQUENCE, this is the minimum time that the concentration cycle must last to proceed to the next cycle.
    - o The cycle can be interrupted by air bubbles, a clogged filter or a lack of sap, for example.
- 27. The high-pressure pumps stop when the level of the maple sap tank, as set by the operator, is 4%.
  - This parameter prevents air from being drawn into the R. O. by the pumps.
- 28. Following the shutdown of the pumps, as set by the previous parameter, only one pump starts up again and is assigned to empty the rest of the maple sap tank.

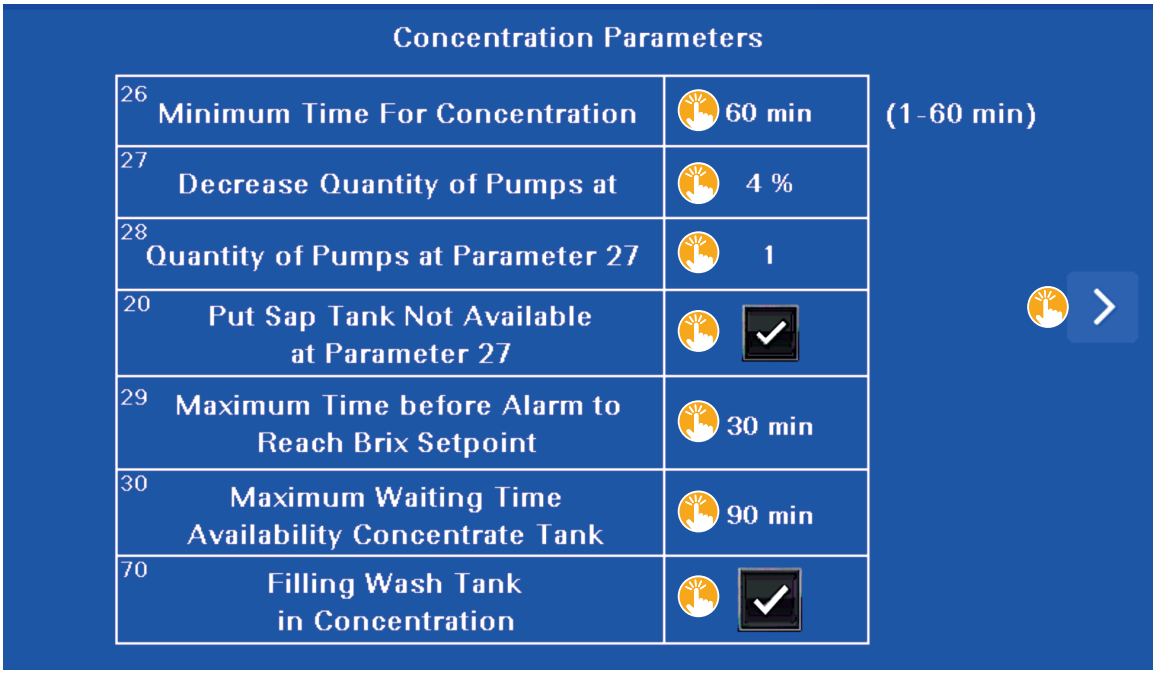
  TIP | Using only one pump is recommended, although more than one can be selected.

  NOTE | Using fewer pumps to complete the concentration operation allows the tank to be emptied completely and more efficiently.
- 20. When the percentage level of parameter No. 27 is reached, the concentration cycle stops and the maple sap tank becomes unavailable for filling.
  - A checkmark in the checkbox tells the program that there will be only one fill in this tank.

  NOTE | This condition allows for the washing of the tank between fills.
  - To allow the tank to refill, you will need to make the tank available in the TANK INFO SAP page (see *Section 7.1, Illustration 36*).
- 29. The MAXIMUM TIME set by the operator to receive a notification that the Brix level has not been reached after the start of the concentration cycle is 30 minutes.
  - The notification reads: "Brix not reached."
- 30. The MAXIMUM WAITING TIME BEFORE THE AVAILABILITY OF THE CONCENTRATE TANK set by the operator to receive a notification is 90 minutes.
  - The notification reads: "Concentrate tank waiting too long."

  NOTE | During MULTIPLE CYCLES IN SEQUENCE, if the tank is full after activating the concentration start, it is normal that the cycle cannot continue. In this condition and if the tank is still full after 90 minutes, a notification will appear: "No concentrate tank available."
- 70. The FILLING OF THE WASH TANK at the start of the concentration cycle is activated.
  - The filtrate produced during the concentration cycle is directed to the wash tank until its level reaches the high-level alarm.
  - When the wash tank is full, the filtrate is then directed to the filtrate tank.

ILLUSTRATION 52 | Concentration cycle parameters (screen 1 of 2)



Here is the list of choices you can make from the tactile keys on this operation screen:

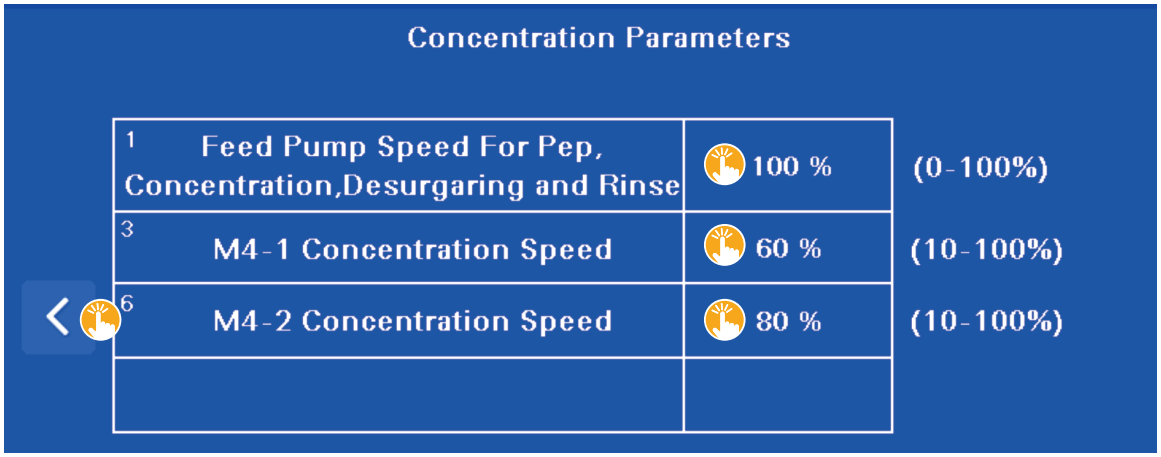
- [60 min] MINIMUM TIME, Parameter No. 26: Tactile key to set the minimum time for concentration
  - When pressed, a touchpad appears in a pop-up window to set the duration (1 to 60 minutes).
- [4 %] DECREASE QUANTITY PUMPS, Parameter No. 27: Tactile key to set the level (percentage) of the maple sap tank at which the high-pressure pumps stop working
  - When pressed, a touchpad appears in a pop-up window to set a percentage (0 to 100%).
- [1] QUANTITY OF PUMPS, Parameter No. 28: Tactile key to set the number of pumps that start up again and that are assigned to the complete emptying of the maple sap tank following the pump stop requested in parameter No. 27
  - When pressed, a touchpad appears in a pop-up window to set the number from 1 to X depending on your R. O. configuration.
- [MAKE SAP TANK NOT AVAILABLE] Parameter No. 20: Tactile key to make the maple sap tank unavailable for filling depending on the value of parameter No. 27
- [30 min] MAXIMUM ALARM TIME, Parameter No. 29: Tactile key to set the maximum time after the start of the concentration cycle to activate the alarm and receive a notification that the Brix degree has not been reached
  - When pressed, a touchpad appears in a pop-up window to set the duration (1 to 60 minutes).

- [90 min] MAXIMUM WAITING TIME, Parameter No. 30: Tactile key to set the maximum wait time before the concentrate tank is available for filling
  - When pressed, a touchpad appears in a pop-up window to set the duration (1 to 99 minutes).
- [WASH TANK FILLING] Parameter No. 70: Tactile key to activate the filling of the wash tank at the start of the concentration cycle
- [>]: Tactile key to access screen 2 of 2

Screen 2 of 2 | The following operation screen shows us this information:

- 1. The operator-set percentage speed for the feed pump during the PEP, concentration, desugaring and rinse cycles is 100%.
- 3. The operator-set percentage speed for the M4-1 booster pump during the concentration cycle is 60%.
- 6. The operator-set percentage speed for the M4-2 booster pump during the concentration cycle is 80%.

ILLUSTRATION 53 | Concentration cycle parameters (screen 2 of 2)



Here is the list of choices you can make from the tactile keys on this operation screen:

- [100 %] FEED PUMP SPEED Parameter No. 1: Tactile key to set the speed (percentage) of the feed pump in the PEP, concentration, desugaring and rinse cycles
  - When pressed, a touchpad appears in a pop-up window to set a percentage (0 to 100%).
- [60 %] M4-1 SPEED Parameter No. 3: Tactile key to set the speed (percentage) of booster pump M4-1
  - When pressed, a touchpad appears in a pop-up window to set the percentage (10 to 100%).
- [80 %] M4-2 SPEED Parameter No. 6: Tactile key to set the speed (percentage) of booster pump M4-2
  - When pressed, a touchpad appears in a pop-up window to set the percentage (10 to 100%).
- [<]: Tactile key to return to screen 1 of 2

8.2.2 Tactile key Concentration/START

When you press the tactile key [START] on the CONCENTRATION operation screen (see *Section 8.2, Illustration 51*), the program starts the concentration cycle, and this tactile key becomes IN PROGRESS (see *Illustration* below).

The top banner then reads CONCENTRATION/ORIENTATION OF VALVES.

When the START button is pressed, the following list of operations is displayed:
1. The valves open or close according to what is pre-set by the automation program.

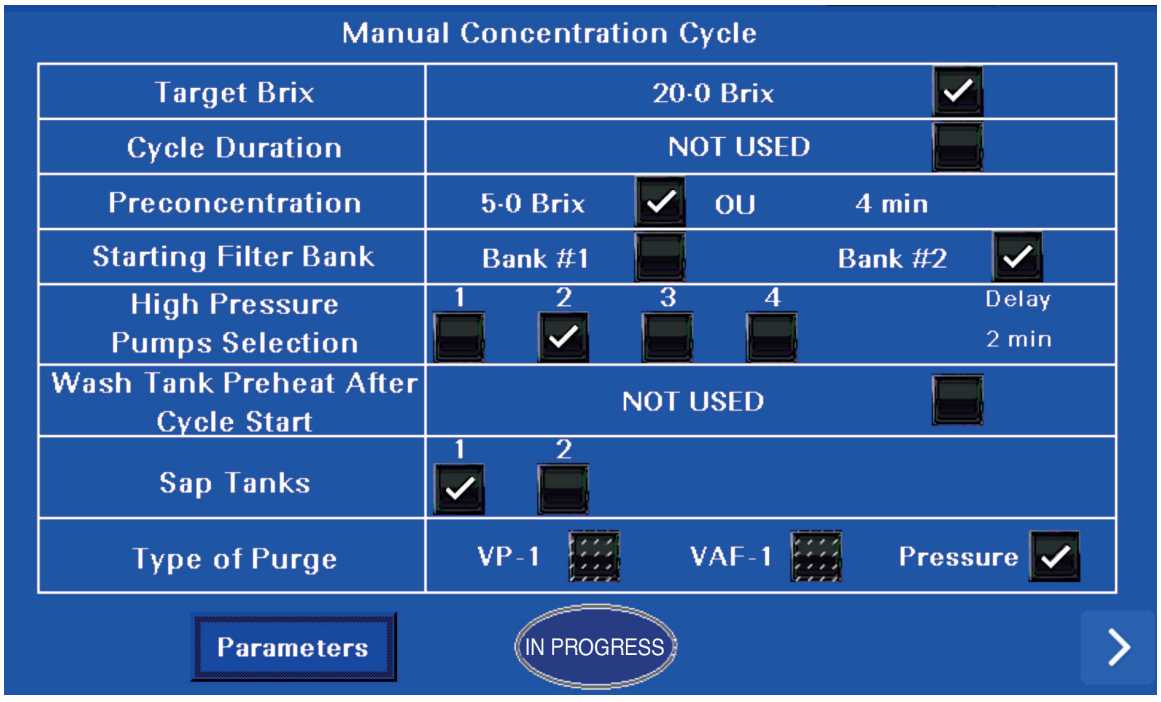
NOTE | It is normal for there to be some movement in the orientation of the valves as the cycle progresses.

2. The feed pump starts.

NOTE | It is possible that the pump does not prime properly. If this happens, the program will take over, perform a purge and then continue the cycle that was running. No action is required on your part.

3. The recirculation pumps start.
4. The priming cycle of the high-pressure pumps begins:
   - 4.1 Pump No. 1 runs for 10 seconds, then stops.
   - 4.2 All other pumps, depending on your configuration, run in turn for 10 seconds, then stop.
5. Each of the selected high-pressure pumps starts in turn according to the delay set by the operator.
6. The preconcentration cycle starts.
7. The concentration cycle starts.

ILLUSTRATION 54 | Operation screen of the Concentration cycle/In progress



No tactile key selections can be made from this IN PROGRESS screen.

8.3 TACTILE KEY DESUGARING

This tactile key takes you to the DESUGARING operation screen.

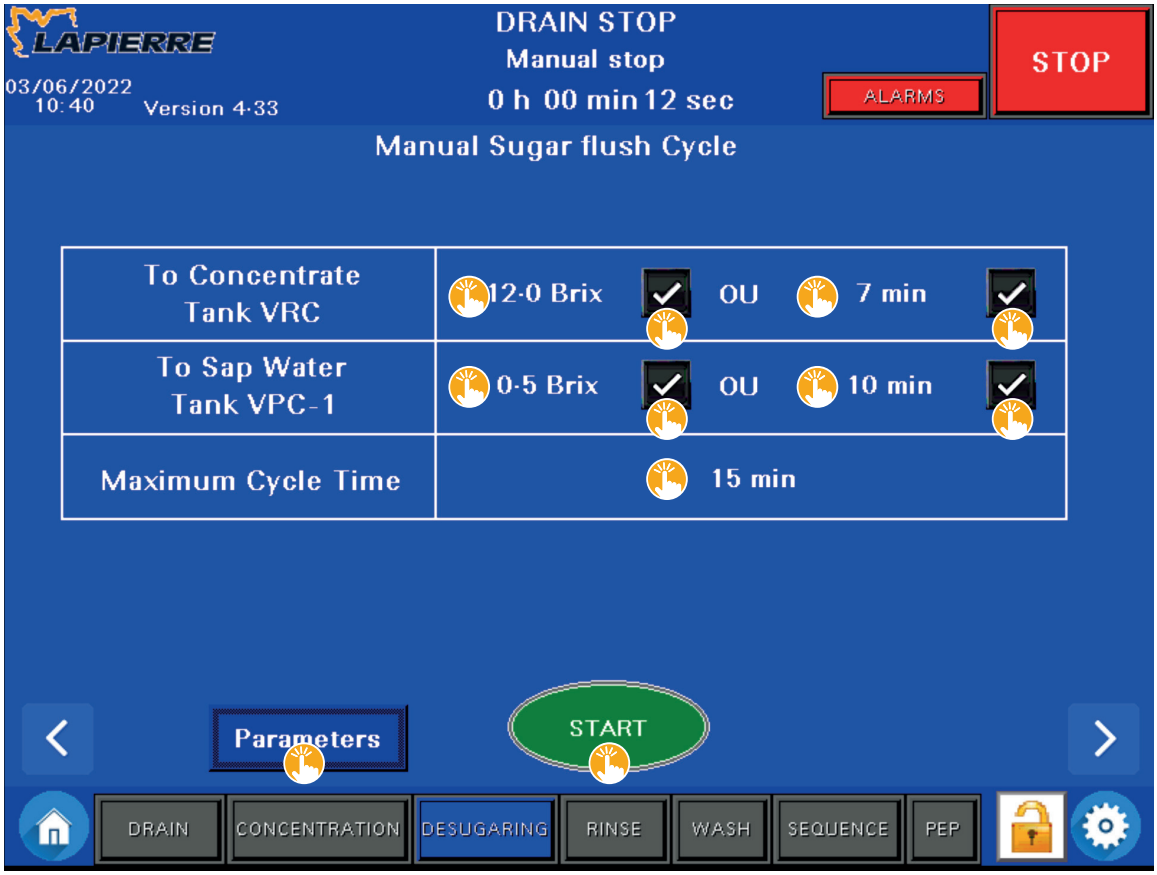
This operating cycle is used to perform desugarization following a concentration cycle. It removes the sugar that has accumulated in the system.

ILLUSTRATION 55 | Tactile key for Desugaring cycle

The following operation screen shows us this information:

- The desugaring of the VRC CONCENTRATE TANK is done according to the following two settings:
  - when the concentrate reaches 12 °Brix; or
  - after 7 minutes of desugaring.
    - o One of the two previous settings must be activated: either the BRIX degree or TIMING (duration).
    - o If both settings are activated, the cycle ends when the first of the two events is attained.
- The desugaring process is continued with the VPC-1 MAPLE SAP TANK according to the following two settings:
  - when the concentrate reaches 0.5 °Brix; or
  - after 10 minutes of desugaring.
    - o One of the two previous settings must be activated: either the BRIX degree or TIMING (duration).
    - o If both settings are activated, the cycle ends when the first of the two events is attained, unless the total operation reaches 15 minutes (see next setting).
- In fact, the execution MAXIMUM TIME set by the operator to perform the above two steps is 15 minutes.
  - If the cycle reaches this maximum time limit without having fulfilled the previous values, it is stopped even if it has not been completed.

ILLUSTRATION 56 | Operation screen of the Desugaring cycle



Here is the list of choices you can make from the tactile keys on this operation screen:

- [12-0 Brix] TO CONCENTRATE TANK VRC: Tactile key to activate setting and set the Brix degree value
  - When [12-0 Brix] is pressed, a touchpad appears in a pop-up window to set the desired Brix degree value.
  - If the setting is not activated, the text box will read NOT USED.
- [7 min] TO CONCENTRATE TANK VRC: Tactile key to activate setting and set the maximum time of the cycle step
  - When [7 min] is pressed, a touchpad appears in a pop-up window to set the maximum duration of the cycle step.
  - If the setting is not activated, the text box will read NOT USED.
- [0-5 Brix] TO MAPLE SAP TANK VPC-1: Tactile key to activate setting and set the Brix degree
  - When [0-5 Brix] is pressed, a touchpad appears in a pop-up window to set the desired Brix degree value.
  - If the setting is not activated, the text box will read NOT USED.
- [10 min] TO MAPLE SAP TANK VPC-1: Tactile key to activate setting and set the maximum time of the operation
  - When [10 min] is pressed, a touchpad appears in a pop-up window to set the maximum duration of the cycle step.
  - If the setting is not activated, the text box will read NOT USED.

- [15 min] MAXIMUM TIME: Tactile key to set the maximum time of the desugaring cycle
  - When pressed, a touchpad appears in a pop-up window to set the maximum duration of the cycle step.
- [PARAMETERS]: Tactile key for accessing the PARAMETERS of the DESUGARING cycle (see the following section)

  TIP | It is best to set the PARAMETERS before you START the cycle.
- [START]: Tactile key to start the DESUGARING cycle

8.3.1 Tactile key Desugaring/PARAMETERS

This operation subscreen appears when you press the tactile key [PARAMETERS] of the DESUGARING operation screen of the previous *Section 8.3*.

NOTE | The superscript numbers (1, 4, 7, 47) indicate the parameter numbers to which each statement refers.

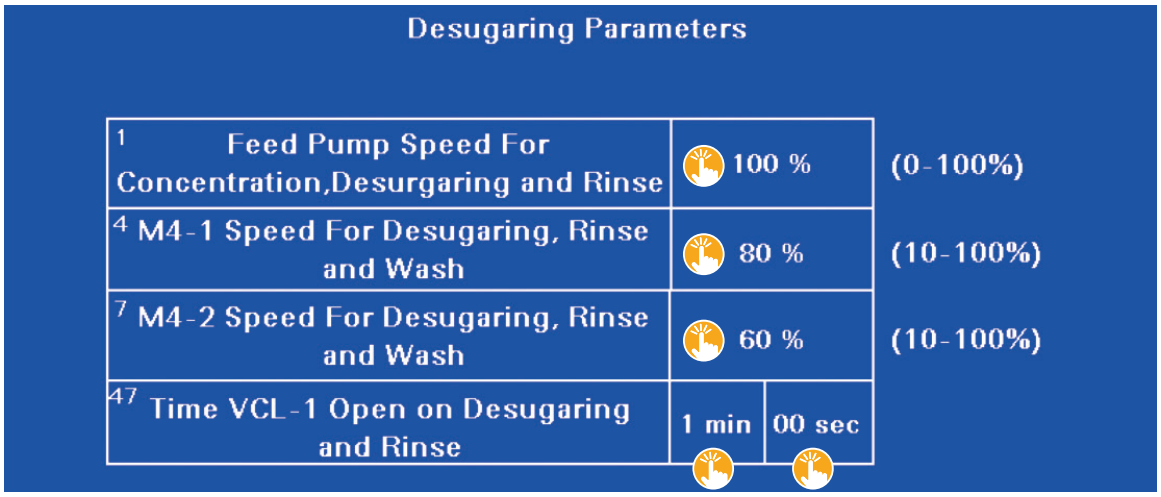
NOTE | The number in brackets (0/10-100%) indicates the possible range of selection of the statement value.

The following operation screen shows us this information:

- 1. The operator-set percentage speed of the feed pump during the concentration, desugaring and rinse cycles is 100%.
- 4. The operator-set percentage speed for the M4-1 booster pump during the desugaring, rinse and wash cycles is 80%.
- 7. The operator-set percentage speed for the M4-2 booster pump during the desugaring, rinse and wash cycles is 60%.
- 47. The VCL-1 valve remains open for one additional minute after the two steps in the previous section (see *Section 8.3*) are completed.

  NOTE | This time allows for the desugaring of a portion of the system's piping.

ILLUSTRATION 57 | Desugaring cycle parameters



Here is the list of choices you can make from the tactile keys on this operation screen:

- [100 %] FEED PUMP SPEED Parameter No. 1: Tactile key to set the speed (percentage) of the feed pump
  - When pressed, a touchpad appears in a pop-up window to set the percentage (0 to 100%).
- [80 %] M4-1 SPEED Parameter No. 4: Tactile key to set the speed (percentage) of pump M4-1
  - When pressed, a touchpad appears in a pop-up window to set the percentage (10 to 100%).
- [60 %] M4-2 SPEED Parameter No. 7: Tactile key to set the speed (percentage) of pump M4-2
  - When pressed, a touchpad appears in a pop-up window to set the percentage (10 to 100%).
- [1 min / 00 sec] TIME VCL-1 Parameter No. 47: Tactile keys to set the opening time of the VCL-1 valve
  - When you press the space [1 min], a touchpad appears in a pop-up window to set the duration in minutes.
  - When you press the space [00 sec], a touchpad appears in a pop-up window to set and complete the duration of the valve opening time in seconds.

8.3.2 Tactile key Desugaring/START

When you press the tactile key [START] on the DESUGARING operation screen (see *Section 8.3, Illustration 56*), the program will start the DESUGARING cycle, and this tactile key will become IN PROGRESS (see *Illustration* below).

The top banner then reads DESUGARING/VALVE ORIENTATION.

When the START button is pressed, the following list of operations will be performed:

1. The valves open or close according to what is pre-set by the automation program.

   NOTE | It is normal for there to be some movement in the orientation of the valves as the cycle progresses.

2. The feed pump starts.

   NOTE | It is possible that the pump does not prime properly. If this happens, the program will take over, perform a purge and then continue the cycle that was running. No action is required on your part.

3. The recirculation pumps start.

4. The priming cycle of the high-pressure pumps begins, ensuring the desugaring and evacuation of the residual sugars remaining in the pumps:

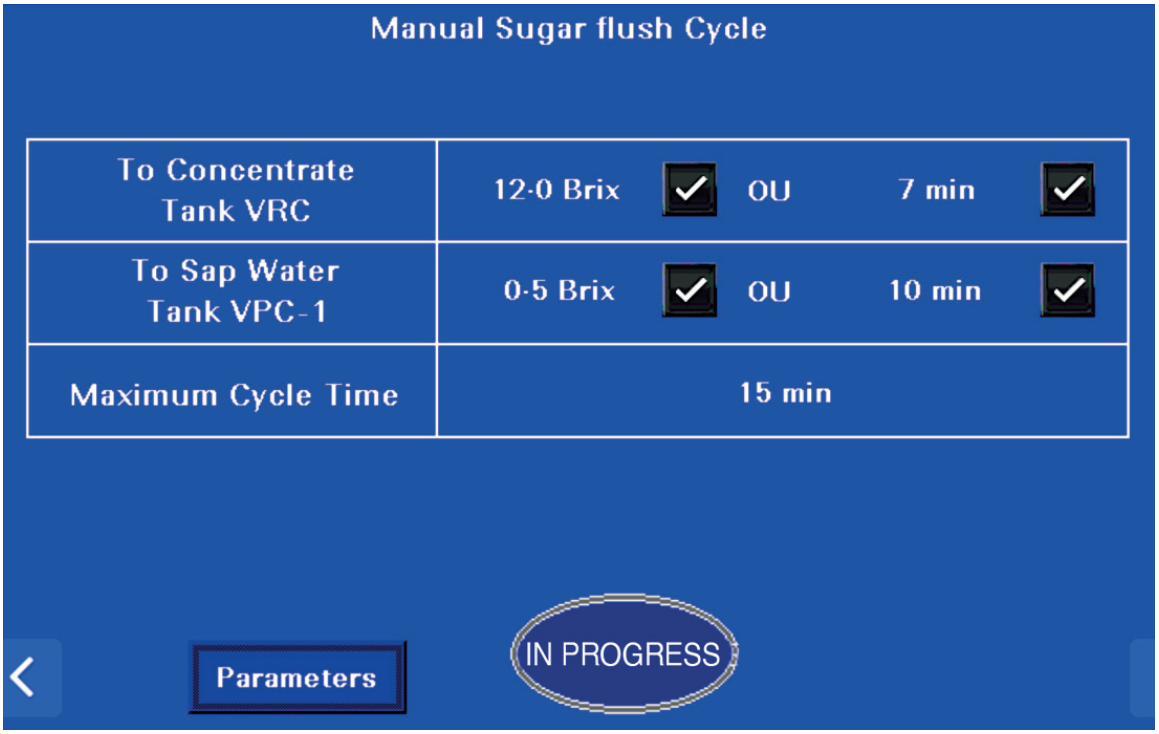
   4.1 Pump No. 1 runs for 10 seconds, then stops.

   4.2 All other pumps, depending on your configuration, run in turn for 10 seconds, then stop.

5. The desugaring of the waterline to the concentrate tank is done according to parameter No. 47 set by the operator (see previous *Section 8.3.1, Illustration 57, parameter No. 47*).

NOTE | It is normal for there to be some movement in the orientation of the valves as the cycle progresses.

ILLUSTRATION 58 | Operation screen of the Desugaring cycle/In progress



No tactile key selections can be made from this IN PROGRESS screen.

8.4 TACTILE KEY RINSE

This tactile key takes you to the RINSE operation screen.

This operating cycle is used to perform a rinsing operation of the R. O. It dislodges particles inside the membranes and removes residual chemicals.

ILLUSTRATION 59 | Tactile key for Rinse cycle

The following operation screen shows us this information:

- The MAXIMUM RINSE CYCLE TIME has not been activated because the checkbox is empty.
- The RINSE VOLUME is activated, the total number of gallons for the rinse cycle set by the operator is 200 gallons and the total number of gallons used so far in the rinse cycle is 0.

  NOTE | The gallon totalizer gives an approximate live measurement.

  - If the value in number of gallons of parameter No. 80 (see *Section 8.4.1, Illustration 61*) set by the operator is not reached during MULTIPLE CYCLES IN SEQUENCE, the cycle in progress will stop and an alarm will be triggered. This alarm then generates a notification that reads: “Rinse volume not reached after washing.” In our example, the value assigned to parameter No. 80 by the operator is 100 gallons.

  NOTE | The RINSE VOLUME value must be higher than the one set by the operator in parameter No. 80. If not, the sequence will be interrupted when the - lower - RINSE VOLUME value is reached.

  TIP | When setting the RINSE VOLUME value for the first time or changing it later, it is recommended that you first look at the value of parameter No. 80.

NOTE | One of the two previous settings must be activated: either MAXIMUM RINSE CYCLE TIME or RINSE VOLUME. Only one of the two settings can be activated at a time.

- The AFTER WASH setting is enabled since there is a checkmark in the checkbox.

  NOTE | The AFTER WASH setting ensures that a minimum volume of filtrate is used during the rinse cycle. This minimum volume is set by the operator at parameter No. 80 (see *Section 8.4.1, Illustration 61*).

  - Parameter 80 is only taken into account by the program if the AFTER WASH checkbox is activated.
  - This setting is only useful when programming MULTIPLE CYCLES IN SEQUENCE of the R. O.
  - This setting is directly related to the RINSE VOLUME parameter located just above.
    - o If activated, it automatically selects the RINSE VOLUME setting. As a result, the cycle is necessarily based on RINSE VOLUME, not RINSE TIME.
- FILTRATION for the rinse cycle cleans the WASH filter only since it is the only one activated.
  - This cycle will rinse the entire equipment, excluding the two non-activated options.

  NOTE | One of the three boxes must be activated. Only one of the three boxes can be activated at a time.

ILLUSTRATION 60 | Rinse cycle operation screen

Here is the list of choices you can make from the tactile keys on this operation screen:

- [MAXIMUM RINSE CYCLE TIME]: Checkbox to activate this setting and set a maximum duration for the rinse time
  - When you press the [60 min], space, a touchpad appears in a pop-up window to set the duration of the rinse cycle.
- [RINSE VOLUME]: Checkbox to activate this setting and set the number of gallons of filtrate used for the rinse cycle
  - When you press the space [200 gal], a touchpad appears in a pop-up window to set the number of gallons used for the cycle.
- [AFTER WASH]: Checkbox to activate this setting
- [No. 1] FILTRATION: Checkbox to activate filter group No. 1 for rinsing
- [No. 2] FILTRATION: Checkbox to activate filter group No. 2 for rinsing
- [WASHING] FILTRATION: Checkbox to activate the WASH filter for rinsing
- [PARAMETERS]: Tactile key to access the RINSE cycle PARAMETERS (see next section)
- [START]: Tactile key to start the rinse cycle

8.4.1 Tactile key Rinse/PARAMETERS

This operation subscreen appears when you press the tactile key [PARAMETERS] of the RINSE operation screen in *Section 8.4.*

NOTE | The superscript numbers (1, 4, 7, 60, 47, 71 and 80) indicate the parameter numbers to which each statement refers.

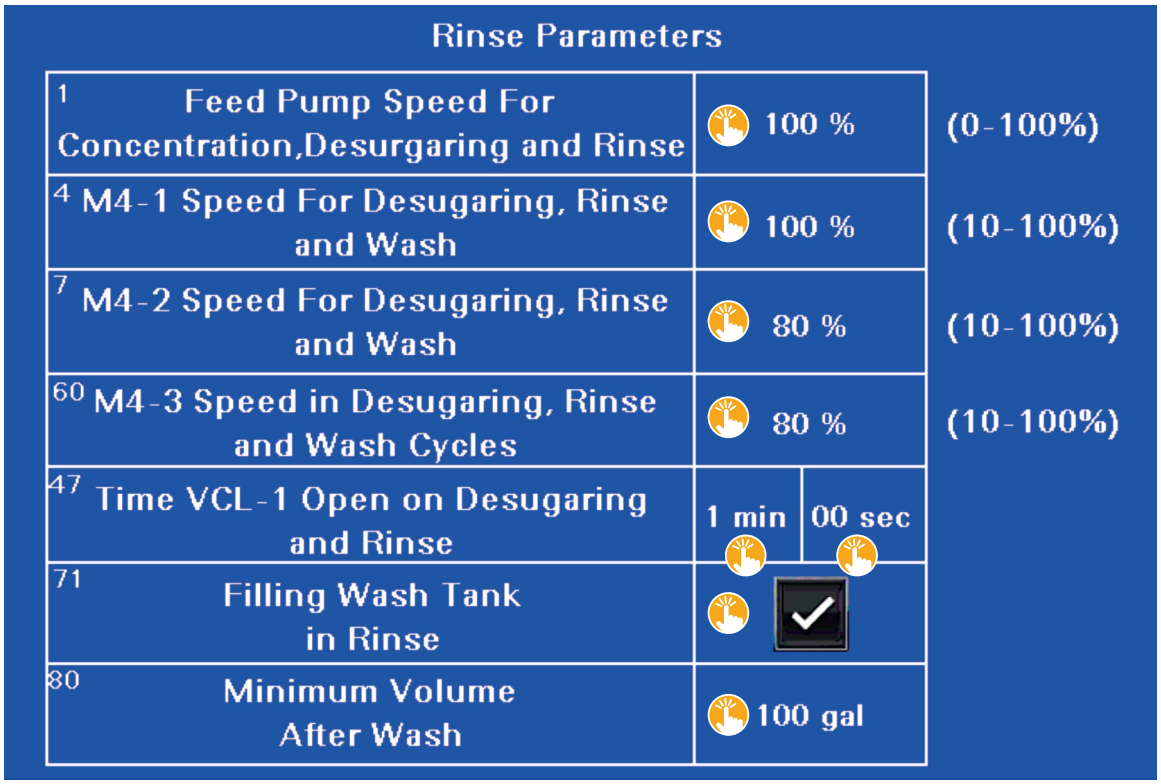
NOTE | The number in brackets (0-100%) indicates the possible range of selection of the statement value.

The following operation screen shows us this information:

- 1. The operator-set percentage speed of the feed pump during the concentration, desugaring and rinse cycles is 100%.
- 4. The operator-set percentage speed for the M4-1 booster pump during desugaring, rinse and wash cycles is 100%.
- 7. The operator-set percentage speed for the M4-2 booster pump during desugaring, rinse and wash cycles is 80%.
- 60. The operator-set percentage speed for the M4-3 booster pump during desugaring, rinse and wash cycles is 80%.
- 47. The VCL-1 valve remains open one additional minute when the MAXIMUM RINSE CYCLE TIME or RINSE VOLUME cycle is complete, depending on what you set for the first two settings in the operation screen in *Section 8.4*.

  NOTE | This time allows for the flushing of a portion of the system's piping.
- 71. The FILLING OF THE WASH TANK at the start of the RINSE cycle is activated.
  - The filtrate is directed to the wash tank until its level reaches the high-level alarm float or parameter No. 42 of WASH PARAMETERS: Maximum time for filling the wash tank (see *Section 8.5.1, Illustration 64*). Filling ends when the first of these two events is attained.
  - When the wash tank is full, the filtrate is then directed to the drain.
- 80. The minimum number of gallons of filtrate to be used for the rinse cycle is 100 gallons.
  - This value set by the operator is used to set the minimum number of gallons desired to effectively flush the system.
  - This parameter is directly related to the third setting, AFTER WASH, in the previous operation screen in *Section 8.4.*
    - o As a result, if you have not enabled the AFTER WASH setting, the program will ignore the number of gallons you have set in parameter No. 80.
  - This parameter is only useful when programming MULTIPLE CYCLES IN SEQUENCE of the R. O.

ILLUSTRATION 61 | Rinse cycle parameters



Here is the list of choices you can make from the tactile keys on this operation screen:

- [100 %] FEED PUMP SPEED Parameter No. 1: Tactile key to set the speed (percentage) of the feed pump
  - When pressed, a touchpad appears in a pop-up window to set the percentage (0 to 100%).
- [100 %] M4-1 SPEED Parameter No. 4: Tactile key to set the speed (percentage) of pump M4-1
  - When pressed, a touchpad appears in a pop-up window to set the percentage (10 to 100%).
- [80 %] M4-2 SPEED Parameter No. 7: Tactile key to set the speed (percentage) of pump M4-2
  - When pressed, a touchpad appears in a pop-up window to set the percentage (10 to 100%).
- [80 %] M4-3 SPEED Parameter No. 60: Tactile key to set the speed (percentage) of pump M4-3
  - When pressed, a touchpad appears in a pop-up window to set the percentage (10 to 100%).
- [1 min / 00 sec] TIME VCL-1 Parameter No. 47: Tactile keys to set the opening time of the VCL-1 valve
  - When you press the space [1 min], a touchpad appears in a pop-up window to set the duration in minutes.
  - When you press the space [00 sec], a touchpad appears in a pop-up window to set and complete the duration of the valve opening time in seconds.

- [FILLING WASH TANK] Parameter No. 71: Tactile key to activate the wash tank filling parameter at the start of the rinse cycle
- [100 GAL] MINIMUM VOLUME Parameter No. 80: Tactile key to set the minimum number of gallons of filtrate to be used for the rinse cycle
  - When pressed, a touchpad appears in a pop-up window to set the number of gallons to use.

8.4.2 Tactile key Rinse/START

When you press the [START] tactile key on the RINSE operation screen (see *Section 8.4, Illustration 60*), the program starts the rinse cycle, and this tactile key becomes IN PROGRESS.

The top banner now reads RINSE/VALVE ORIENTATION.

When the START button is pressed, the following list of operations is displayed:

1. The valves open or close according to what is pre-set by the automation program.

   NOTE | It is normal for there to be some movement in the orientation of the valves as the cycle progresses.

2. The feed pump starts.

   NOTE | It is possible that the pump does not prime properly. If this happens, the program will take over, perform a purge and then continue the cycle that was running. No action is required on your part.

3. The recirculation pumps start.

4. The priming cycle of the high-pressure pumps begins. This rinses and evacuates residual soap and other particles that have remained in the pumps.

   4.1 Pump No. 1 runs for 10 seconds, then stops.

   4.2 All other pumps, depending on your configuration, run in turn for 10 seconds, then stop.

5. The operation ends when the event you selected is attained: either the MAXIMUM RINSE CYCLE TIME or the RINSE VOLUME. These are the first two settings in *Illustration 60 in Section 8.4*.

8.5 TACTILE KEY WASH

This tactile key takes you to the WASH operation screen.

This operating cycle is used to perform a membrane washing operation.

ILLUSTRATION 62 | Tactile key for Wash cycle

The following operation screen shows us this information:

- SOAP INJECTION for the wash cycle is activated and the injection starts when the wash water temperature reaches 86 °F (30 °C).
  - If the setting is not activated, the text box will read NOT USED.
    - o In this case, there is no soap injection. This setting can be useful if you want to add soap manually or wash without using soap.
- WASH CYCLE TIME is activated, and the time set by the operator is 45 minutes.
  - If the setting is not activated, the text box will read NOT USED.
    - o In this case, the cycle stops when the high temperature level of parameter No. 45 set by the operator is reached (see *Section 8.5.1, Illustration 64*). In our example, this is 113 °F (45 °C).

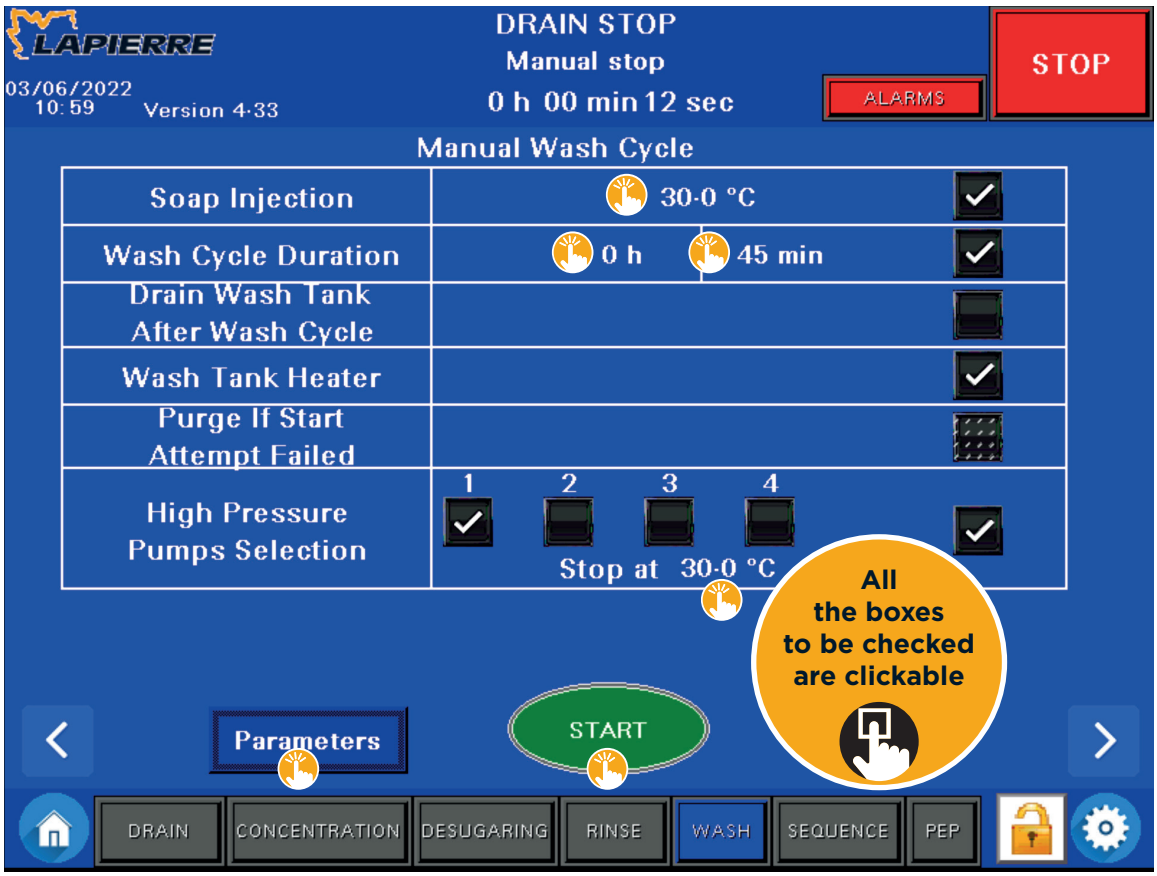
As specified by the membrane manufacturer, **THE HIGH TEMPERATURE LEVEL MUST BE SET AT A MAXIMUM OF 113 °F (45 °C).**

- WASH TANK DRAINAGE AFTER WASH CYCLE is not activated.
- WASH TANK HEATER is activated.
  - If your configuration includes two elements, they heat simultaneously.
- PURGE ON FAILURE TO START cannot be activated.
  - A checkbox marked with a watermark indicates that this box cannot be checked.
  - If you are purging in PRESSURE type (see *Section 8.2.2, Illustration 54*), this setting cannot be activated. However, it can be activated if you are purging in VAF or VP.
- HIGH-PRESSURE PUMP SELECTION is activated.
  - Pump No. 1 has been set by the operator.

NOTE | Running more than one high-pressure pump raises the temperature more quickly. The pump(s) then runs until the water reaches the operator's set temperature of 86 °F (30 °C).

TIP | Do not run too many high-pressure pumps during the wash cycle. The high pressure reading should not be above 100 psi during this cycle.

ILLUSTRATION 63 | Wash cycle operation screen



Here is the list of choices you can make from the tactile keys on this operation screen:

- [SOAP INJECTION]: Tactile key to activate the soap use setting during the WASH
  - When you press the space [30-0 °C] a touchpad appears in a pop-up window to set the wash water temperature at which the soap is injected.
- [WASH CYCLE TIME]: Tactile key to activate the wash cycle time and set the duration
  - When you press the space [0 h], a touchpad appears in a pop-up window to set the duration in hours.
  - When you press the space [45 min], a touchpad appears in a pop-up window to set and complete the duration of the cycle in minutes.
- [WASH TANK DRAINAGE AFTER WASH CYCLE]: Tactile key to activate this setting
- [WASH TANK HEATER]: Tactile key to activate this setting
- [PURGE ON FAILURE TO START]: Tactile key to activate this setting, if applicable

- [HIGH-PRESSURE PUMP SELECTION]: Tactile key to activate this setting
  - [1]: Tactile key to activate pump No. 1
  - [2]: Tactile key to activate pump No. 2
  - [3]: Tactile key to activate pump No. 3
  - [4]: Tactile key to activate pump No. 4
  - When you press the space [30-0 °C], a touchpad appears in a pop-up window to set the temperature.
- [PARAMETERS]: Tactile key to access the PARAMETERS of the WASH cycle (see *Section 8.5.1, Illustrations 64-65*)

  NOTE | It is best to set the PARAMETERS before starting the cycle.
- [START]: Tactile key to start the WASH cycle

8.5.1 Tactile key Wash/PARAMETERS

This operation subscreen appears when you press the tactile key [PARAMETERS] of the WASH operation screen in *Section 8.5*.

NOTE | The superscript numbers (41, 42, 43, 44, 45, 46, 48 and 72) indicate the parameter numbers to which each statement refers.

NOTE | The data in brackets (1-30 min) indicates the possible selection range of the statement value.

Screen 1 of 2 | The following operation screen shows us this information:

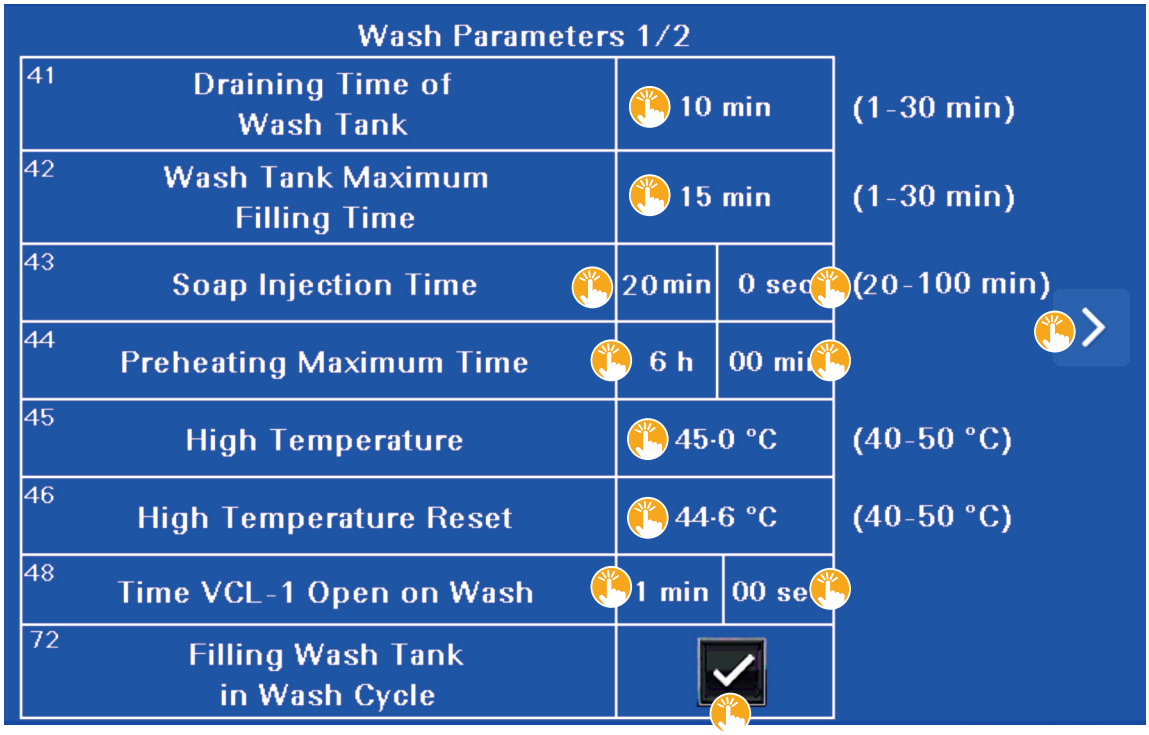
- 41. The DRAIN TIME OF THE WASH TANK set by the operator is 10 minutes.
  - This is the opening time of the drain valve located at the outlet of the wash tank.
  - Parameter related to the third setting in *Section 8.5: The drainage of the wash tank after the wash cycle.*
- 42. The MAXIMUM FILLING TIME OF THE WASH TANK set by the operator is 15 minutes.
  - The tank filling step ends when the first of the following two events is attained:
    - o when the tank level reaches the DNL-1 high-level alarm float; or
    - o parameter Nº 42: Maximum filling time of the wash tank.
- 43. The minimum SOAP INJECTION TIME is 20 minutes.
  - This timing is the maximum valve opening time. The valve closes when the first of the following two events is attained:
    - o when the time has elapsed,
    - o or at the end of the wash cycle.
  - Soap is injected when the water temperature reaches 86 °F (30 °C), the first setting in *Section 8.5.*
- 44. The PREHEATING MAXIMUM TIME for the elements set by the operator is 6 hours.
  - After the start of the cycle, the duration of the heating elements is 6 hours.
- 45. The maximum TEMPERATURE of the water used for washing is 113 °F (45 °C).
  - When the water reaches this temperature, the R. O. stops.

As specified by the membrane manufacturer, **THE HIGH TEMPERATURE LEVEL MUST BE SET AT A MAXIMUM OF 113 °F (45 °C).**

- 46. The HIGH TEMPERATURE RESET set by the operator is 112.3 °F (44.6 °C).
  - In connection with parameter No. 45, parameter No. 46 is the temperature set by the operator at which the R. O. can start up again.
  - During SINGLE CYCLES, you can restart the R. O. when the temperature has dropped to 112.3 °F (44.6 °C).
  - During MULTIPLE CYCLES IN SEQUENCE, the sequence stops and continues when the temperature has dropped to 112.3 °F (44.6 °C).
- 48. The VCL-1 VALVE OPENS for one minute at the end of the cycle, as set by the operator.

  NOTE | This time allows for the flushing of a portion of the system's piping.
- 72. The WASH TANK FILLING IN WASHING CYCLE is activated.

ILLUSTRATION 64 | Wash cycle parameters (screen 1 of 2)



Here is the list of choices you can make from the tactile keys on this operation screen:

- [10 min] DRAIN TIME OF THE WASH TANK, Parameter No. 41: Tactile key to set the drain time of the wash tank
  - When pressed, a touchpad appears in a pop-up window to set the duration (1 to 30 minutes).
- [15 min] MAXIMUM FILLING TIME OF THE WASH TANK, Parameter No. 42: Tactile key to set the maximum filling time of the wash tank
  - When pressed, a touchpad appears in a pop-up window to set the duration (1 to 30 minutes).
- [20 min / 0 sec] SOAP INJECTION TIME, Parameter No. 43: Tactile keys to set the time during which soap is injected for washing
  - When you press the space [20 min], a touchpad appears in a pop-up window to set the duration in minutes (20 to 100 minutes).
  - When you press the space [0 sec], a touchpad appears in a pop-up window to set and complete the duration in seconds.
- [6 h / 00 min] PREHEATING MAXIMUM TIME, Parameter No. 44: Tactile keys to set the maximum time for preheating the elements
  - When you press the space [6 h], a touchpad appears in a pop-up window to set the duration in hours.
  - When you press the space [00 min], a touchpad appears in a pop-up window to set and complete the duration in minutes.
- [45-0 °C] HIGH TEMPERATURE, Parameter No. 45: Tactile key to set the maximum temperature degree of the water
  - When pressed, a touchpad appears in a pop-up window to set the temperature 104 to 122 °F (40 to 50°C).

As specified by the membrane manufacturer, **THE HIGH TEMPERATURE LEVEL MUST BE SET AT A MAXIMUM OF 113 °F (45 °C).**

- [44,6 °C] HIGH TEMPERATURE RESET, Parameter No. 46: Tactile key to set the water high temperature degree for the R. O. reset
  - When pressed, a touchpad appears in a pop-up window to set the temperature 104 to 122 °F (40 to 50°C).
- [1 min / 00 sec] VCL-1 TIME OPEN ON WASH, Parameter No. 48: Tactile keys to set the opening time of the VCL-1 valve at the end of the wash
  - When you press the space [1 min], a touchpad appears in a pop-up window to set the duration in minutes.
  - When you press the space [00 sec], a touchpad appears in a pop-up window to set and complete the duration in seconds.
- [WASH TANK FILLING IN WASH CYCLE] Parameter No. 72: Tactile key to activate the wash tank filling parameter during the wash cycle

• [>]: Tactile key to access screen 2 of 2

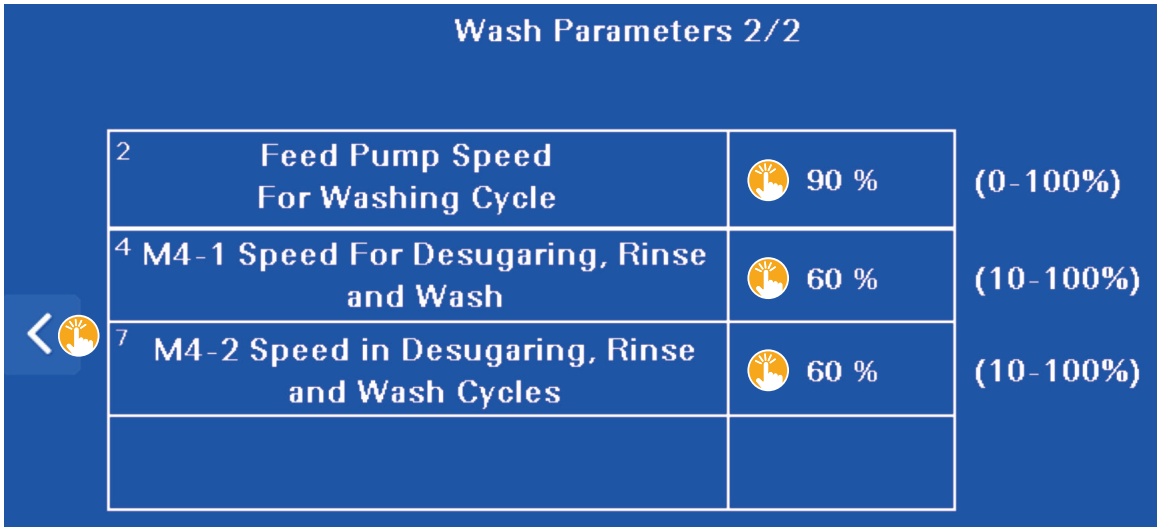
Screen 2 of 2 | The following operation screen shows us this information:

• 2. The operator-set percentage speed for the feed pump during the wash cycle is 90%.

• 4. The operator-set percentage speed for the M4-1 booster pump during desugaring, rinse and wash cycles is 60%.

• 7. The operator-set percentage speed for the M4-2 booster pump during desugaring, rinse and wash cycles is 60%.

ILLUSTRATION 65 | Wash cycle parameters (screen 2 of 2)



Here is the list of choices you can make from the tactile keys on this operation screen:

• [90 %] FEED PUMP SPEED, Parameter No. 2: Tactile key for setting the speed (percentage) of the feed pump
- When pressed, a touchpad appears in a pop-up window to set the speed (0 to 100%).

• [60 %] M4-1 SPEED, Parameter No. 4: Tactile key to set the speed (percentage) of the M4-1 pump
- When pressed, a touchpad appears in a pop-up window to set the speed (10 to 100%).

• [60 %] M4-2 SPEED, Parameter No. 7: Tactile key to set the speed (percentage) of the M4-2 pump
- When pressed, a touchpad appears in a pop-up window to set the speed (10 to 100%).

• [<]: Tactile key to access screen 1 of 2

8.5.2 Tactile key Wash/START

When the tactile key [START] on the WASH operation screen is pressed (see *Section 8.5, Illustration 63*), the program starts the wash cycle, and this tactile key becomes IN PROGRESS (see illustration below).

The top banner then reads WASHING/VALVE ORIENTATION.

When the START button is pressed, the following list of operations is displayed:

1. The valves open or close according to what is pre-set by the automation program.

   NOTE | It is normal for there to be some movement in the orientation of the valves as the cycle progresses.

2. The feed pump starts.

   NOTE | It is possible that the pump does not prime properly. If this happens, the program will take over, perform a purge and then continue the cycle that was running. No action is required on your part.

   - The PRESSURE purge type is not available for the wash cycle.

3. The recirculation pumps start.

4. The priming cycle of the high-pressure pumps begins.

   - Pump No. 1 runs for 10 seconds, then stops.
   - All other pumps, depending on your configuration, run in turn for 10 seconds, then stop.

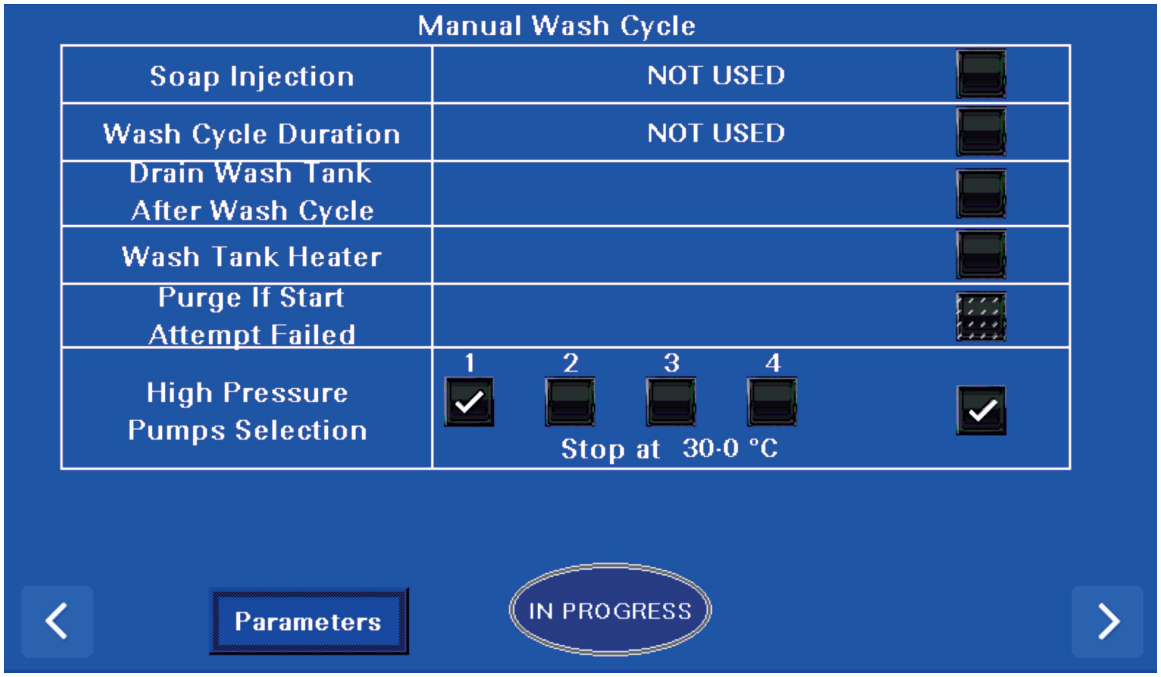
5. The operation ends when the first of the following two events is attained: either WASH CYCLE TIME, 45 minutes in our example (see *Section 8.5, Illustration 63*), or HIGH TEMPERATURE, 113 °F (45°C) in our example (see *Section 8.5.1, Illustration 64, parameter No. 45*).

   - This condition of the two events applies if you have activated the WASH CYCLE TIME. Otherwise, the value set for HIGH TEMPERATURE ends the operation.

6. The VCL-1 valve opens during the last minute of the wash cycle, as set by the operator.

   NOTE | This time allows for the washing of a portion of the system's piping.

ILLUSTRATION 66 | Operation screen of the Wash cycle/In progress



No tactile key selections can be made from this IN PROGRESS screen.

8.6 TACTILE KEY SEQUENCE

This tactile key takes you to the SEQUENCE operation screen.

This screen allows you to program and save MULTIPLE CYCLES IN SEQUENCE for immediate or future use on-site or remotely.

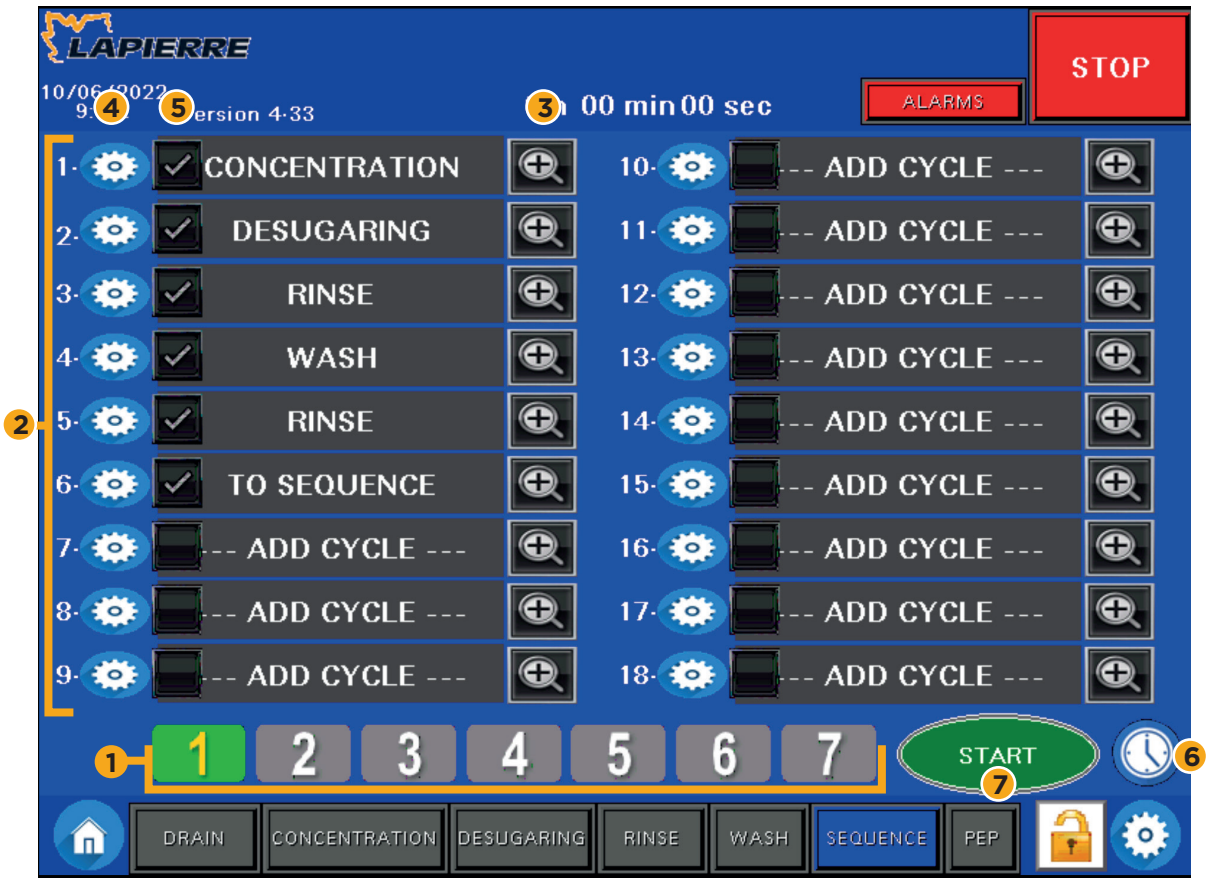
ILLUSTRATION 67 | Tactile key for Multiple cycles in sequence

Below the following illustration, you'll find a description of each of the functionalities of this operation screen, followed by the steps for creating a cycle sequence.

The following operation screen shows us this information:

- The active S I N cycle sequence is number 1 since its tactile key at the bottom left of the screen is green.
  - A "**S I N**" is a **S**EQUENCE **I**DENTIFICATION **N**UMBER.
- This sequence is composed of six cycles, from CONCENTRATION (1) to TO SEQUENCE (6).
  - In fact, checkboxes 1 to 6 are checked.

ILLUSTRATION 68 | Operation screen for Multiple cycles in sequence



1. **S I N**: [ ] **S**equence **I**dentification **N**umber, up to seven possible **S I N** cycle sequences
2. **1 to 18**: Steps of cycles in the sequence (up to 18 possible successive steps or cycles)
3. : [ ] To set the choice of the desired cycle (9 selections are possible)

   NOTE | The selection ADD CYCLE represents an *ABSENCE OF CYCLE* for the corresponding step.
4. : [ ] To make the settings for the corresponding cycle
5. : [ ] Checkboxes to activate or deactivate the corresponding cycle
6. : [ ] To program a start time during the day for the selected **S I N**
7. **Start**: [ ] To start the selected **S I N** immediately

8.6.1 Creating a new S I N cycle sequence

The creation of a new sequence is done in three phases.

PHASE 1: SELECT A **S I N** 1 : a **S**EQUENCE **I**DENTIFICATION **N**UMBER

First select a S I N [1 to 7] that has not already been programmed.

- Each S I N represents a customized cycle sequence to be programmed.
- Up to seven different cycle sequences can be programmed.

Each of these seven S I N tactile keys allows you to:

- create and save a new sequence of cycles in the first instance; or
- access an already programmed cycle sequence later on.
  - The created cycle sequence is stored in the automation program and can be accessed until it is deleted (see *Section 8.6.1.4*).
  - The cycle sequences remain programmed in case of power failure or emergency stop.

When a new cycle sequence is required and all the S I N are used, then one of the seven sequences already programmed must be deleted to create a new one. Refer to *Section 8.6.1.4* to learn how to delete a cycle sequence.

Here is an important concept related to S I N:

- Each of the seven S I N is independent of the six others:
  - The settings selected when a new S I N is created have no influence on those set in another S I N already created, and vice versa (see *Section 8.6.1.1*).
  - The same instruction applies to any changes made to the settings of a S I N.

PHASE 2: PROGRAMMING THE CYCLE SEQUENCE 2

The sequence of each cycle must then be programmed.

The integration of each of your cycles in the sequence must respect the order proposed by the program (1 to 18). Thus, start with step 1 and continue to a maximum of 18 steps.

It is important to follow these instructions:

- Step 1 must necessarily include a cycle.
- A step between two cycles must always include a cycle.
  - It is not possible to leave or include ADD CYCLE (i.e. Absence of cycle) between two steps. In this case, the sequence is stopped.
  - Each step, from step 1 to the active end of the sequence, must therefore include a cycle.
    - o Our example in *Section 8.6, Illustration 68*, has six active steps, 1 through 6. The rest of the sequence, 7 through 18, shows ADD CYCLE (i.e. Absence of cycle).

To add the desired cycle 1 to the sequence, first press the corresponding tactile key [3]. A pop-up window appears, listing all the cycles in the program. Press on the desired cycle in the list, which then appears in the sequence text box. Repeat the instruction for cycle No. 2, and so on for each cycle to be included in the sequence.

This pop-up window lists the following cycles and additional options*:

NOTE | ADD CYCLE, i.e. Absence of cycle, is the default entry in the sequence text area until another cycle is selected.

- Add cycle | (COMPLEMENTARY OPTION) i.e. absence of cycles
- Concentration | Cycle
- Desugaring | Cycle
- Rinse | Cycle
- Wash | Cycle
- PEP | Cycle
- Wait | Cycle
- Drain | Cycle
- To sequence | (COMPLEMENTARY OPTION) Continue to another S I N
- Delete step | (COMPLEMENTARY OPTION) Replaces step cycle with **ADD CYCLE**, i.e. Absence of cycle

*To lighten the text, we say sequence of **cycles** even though the nine proposed selections include seven program *cycles* as well as two other *complementary options.*

Then proceed to PHASE 3 below. Moving to this third phase automatically selects all the cycles displayed.

Here is an important concept related to S I N:

It is impossible to include a CONCENTRATION cycle after a WASH cycle. In fact, it is not possible to concentrate after washing. As a result, after a WASH cycle, the CONCENTRATION selection is not proposed in the list of cycles and complementary options.

PHASE 3: MAKE THE CYCLE SETTINGS 4

After including each of the desired cycles in the sequence, the settings must be chosen.

To do this, press the icon [ ] 4 ccorresponding to the cycle. A pop-up window will appear in which the cycle settings can be selected.

The settings for each cycle follow the same logic seen in the previous sections of this manual, so you may wish to consult the relevant sections when selecting cycle settings.

- ADD CYCLE

With this choice, the R. O. receives no instructions except to be inactive. ADD CYCLE cannot be used as the first step or between two steps. If your sequence contains fewer than 18 steps, this choice closes the active sequence and all subsequent unused steps up to 18 (see *Section 8.6, Illustration 68, steps 7 to 18*).

- CONCENTRATION
  - See *Section 8.2*
- DESUGARING
  - See *Section 8.3*
- RINSE
  - See *Section 8.4*
- WASH
  - See *Section 8.5*
- PEP
  - Refer to *Section 8.7*
- WAIT

This cycle makes it possible to set a waiting time in the sequence before continuing to the next step.

- This could be to allow, for example, an extended soap soak time before moving to the rinse cycle.

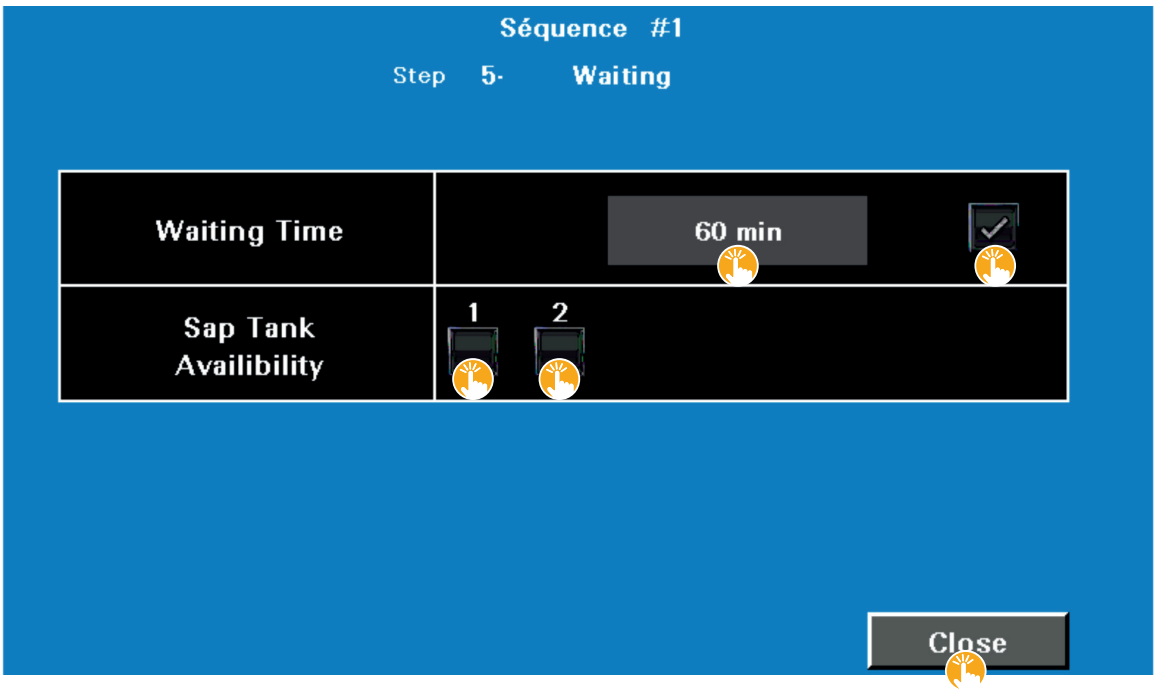
By pressing the tactile key [ ] 4 corresponding to this cycle, the following operation screen appears in a pop-up window.

This pop-up window shows us this information:

- The S I N of the cycle sequence is number 1.
- This step is number 5.
- The name of the cycle is WAIT.
- The WAITING TIME setting is activated and set to 60 minutes by the operator.
- The MAPLE SAP TANK AVAILABILITY setting is not activated.
  - o Our example shows that the configuration has two tanks.
  - o It is possible to select one or both tanks.
    - ■ The waiting time ends when the activated tank(s) is/are available.

NOTE | One of the two previous settings must be activated: WAITING TIME or WATER SAP TANK AVAILABILITY. If both are enabled, the WAIT cycle will end when the first of the two events is attained.

ILLUSTRATION 69 | Pop-up window for the Waiting cycle



Here is the list of choices you can make from the tactile keys in this pop-up window:

- [WAITING TIME]: Tactile key to activate the setting and set the number of minutes of wait time
  - o When you press the space [60 min], a touchpad appears in a pop-up window to set the duration.
- [No. 1] WATER SAP TANK AVAILABILITY: Tactile key to activate the setting and select tank No. 1
- [No. 2] WATER SAP TANK AVAILABILITY: Tactile key to activate the setting and select tank No. 2
- [CLOSE]: Tactile key to save the settings and close the pop-up window

• DRAIN

- See *Section 8.1*

• TO SEQUENCE

This choice makes it possible to carry out, in the sequence of the cycles:

- a move to the beginning of another S I N; or
- a return to the beginning of the S I N you are currently in.
  - o Used at the end of a cycle sequence.
  - o This choice automatically directs the program to the first step of the selected S I N.

This selection can be useful for the following reasons:

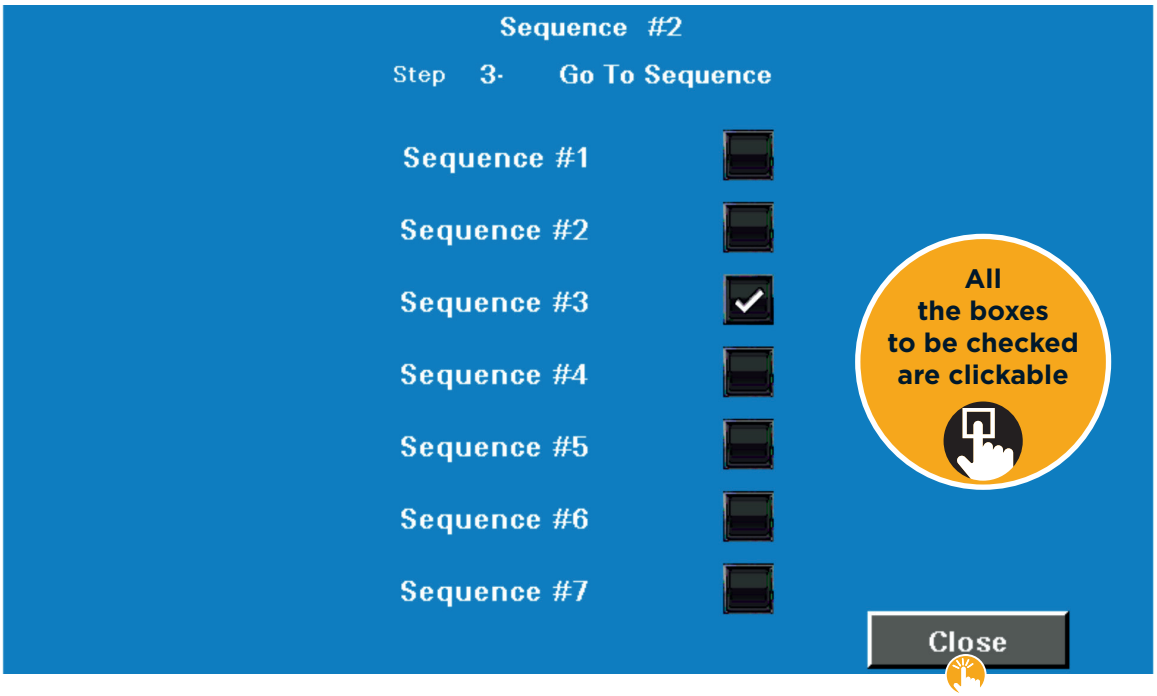
- If a cycle sequence has more than 18 steps.
- To make a continuous loop between two different S I N, a manual stop is therefore necessary.
- To make a continuous loop of the same S I N, a manual stop is therefore necessary.
  - o For example, a water concentration and cleaning loop in the same sequence of cycles.

The following operation screen shows us this information:

- The S I N of the cycle sequence is number 2.
- This step is number 3.
- The name of the cycle is TO SEQUENCE.
- The move is made to the S I N 3 sequence of cycles.

NOTE | Only one of the checkboxes can be enabled.

ILLUSTRATION 70 | Pop-up window from selection (cycle) to sequence



Here is the list of choices you can make from the tactile keys in this pop-up window:

• [SEQUENCE No. 1]: Tactile key for activating the move to the S I N 1 sequence of cycles
  - This instruction is the same for sequences Nos. 2 to 7.

• [CLOSE]: Tactile key to save the setting and close the window

After completing phases 1, 2 and 3 in Section 8.6.1, the S I N cycle sequence is complete and ready for use.

8.6.1.1 Important notes on the setting of SINGLE CYCLES versus MULTIPLE CYCLES IN SEQUENCE

The settings for a SINGLE CYCLE are made by the operator and saved in the program. The settings from the last session are automatically used unless they are changed by the operator in the next session.

Operating the R. O. with SINGLE CYCLES is one choice. The second choice is to use it with MULTIPLE CYCLES IN SEQUENCE that are programmed, as presented in the previous section.

Here are a few things you should know about setting up SINGLE CYCLES and MULTIPLE CYCLES IN SEQUENCE:

- The configuration of the settings for SINGLE and MULTIPLE CYCLES IN SEQUENCE is exactly the same.
  - Although the visual appearance of the pop-up windows is somewhat different, the content remains the same.
- The **settings** selected in SINGLE cycles have no influence on those selected in MULTIPLE CYCLES IN SEQUENCE, and vice versa.
- The **parameters** set in one S I N have an influence on those set in the other six S I N, and vice versa.

8.6.1.2 Modifying a S I N cycle sequence temporarily

A S I N cycle sequence can be temporarily modified without altering its initial settings.

Taking the screenshot in *Section 8.6, Illustration 68*, as an example, it is possible to suspend step 6 (TO SEQUENCE) for the day's operation. Simply deactivate its checkbox. By pressing the tactile key [START], the sequence of cycles is started and cycle 6 is not performed.

One or more steps in the sequence can be temporarily suspended. The activated steps are performed in ascending order, even if one or more steps are deactivated.

To return to the initial settings, simply reactivate the checkbox(es).

IMPORTANT | The checkbox(es) is/are not automatically reactivated the next time the S I N is opened. Therefore, in our example, the next time you use S I N 1, you must activate cycle 6 (TO SEQUENCE) so that it is again integrated into the sequence of cycles.

8.6.1.3 Modifying a S I N cycle sequence permanently

A S I N cycle sequence can be permanently changed.

Taking the screenshot in *Section 8.6, Illustration 68*, as an example, it is possible to modify cycle 6 (TO SEQUENCE). You can modify this cycle by pressing the corresponding tactile key [3] and replacing it with another cycle or with ADD CYCLE (i.e. Absence of cycle).

However, if the cycle to be modified is not the last one in the active list, then the last cycles of the sequence must be rebuilt. In fact, although a cycle can be temporarily suspended in a sequence, the program does not allow the absence of a cycle between two cycles or at step 1 of the sequence.

Therefore, in our example, if you decide to eliminate cycle 4 WASH and keep the last two, then the RINSE and SEQUENCE cycles must be rebuilt in positions 4 and 5, respectively.

Permanent changes in each of the cycles are also possible. In this case, you can make the changes by accessing the settings of the desired cycle by pressing the corresponding tactile key [4].

8.6.1.4 Deleting a S I N cycle sequence permanently

A complete S I N cycle sequence cannot be deleted from a block in a single action.

To do this, each of the active steps in the sequence must be changed so that it shows ADD CYCLE (i.e. Absence of cycle). Proceed by pressing the tactile key [] 3 on each active step and select ADD CYCLE. All the steps in the sequence must display this selection.

It is VERY IMPORTANT to **START WITH THE LAST ACTIVE STEP** in the sequence, and then continue the cycle change BACK TO STEP 1. In our example (*Section 8.6, Illustration 68*), we must start with step 6 and CONTINUE IN DESCENDING ORDER (5, 4, 3, 2 and 1). Not following this rule, by starting with step 3 in our example, results in the inability to change the selection of subsequent steps (4, 5 and 6). To get around this problem in our example, simply select a cycle other than ADD CYCLE at step 3.

It is then possible to use this S I N again to create a new sequence of cycles.

Here are a few things you should know about S I N:

- Although they are ordered from 1 to 7, deleting the complete content of a S I N does not reorder all the other S I N.
  - If you delete the complete content of S I N 3, you will recreate new content for S I N 3.

8.6.2 Using a S I N cycle sequence

First, here are a few things you should know about S I N:

- When a step in the sequence is in progress, a green highlighted rectangle appears in the space identifying the cycle.
- When a step in the sequence is completed, the checkmark in its corresponding 5 box disappears.
  - This continues until all active steps are completed.

  IMPORTANT | If the cycle sequence ends normally, the checkboxes are automatically reactivated by the program.
- It is possible to skip a step that is in progress and move on to the next one immediately.
  - To do so, you must uncheck its corresponding 5 box.
- It is also possible to suspend a step before its execution in the sequence.
  - To do so, you must uncheck its corresponding 5 box.

Programmed S I N cycle sequences can be used either immediately, or at a time scheduled by the operator for the current day, or when a tank is available for concentration as set by the operator. Details are given in the next three sections.

8.6.2.1 Activate the immediate start of the S I N cycle sequence 7 (see *Section 8.6, Illustration 68*)

To use a S I N immediately, proceed as follows:

1. [SEQUENCE]: Press this tactile key located in the bottom banner.

2. In the SEQUENCE operation screen that appears, press the tactile key of the desired S I N 1 , which then turns green.

3. [START]: Press the tactile key START 7.

The selected S I N cycle sequence is then started immediately.

8.6.2.2 Plan the start of the S I N cycle sequence 6 (see *Section 8.6, Illustration 68*)

To schedule the start of the S I N sequence at a specific time during the day, proceed as follows:

1. Press the tactile key [SEQUENCE] located in the bottom banner.

2. In the SEQUENCE operation screen that appears, press the desired S I N 1 which then turns green.

3. Press the tactile key [ ] 6 to set the S I N start time in the pop-up window that appears.

4. Activate the checkbox (see next illustration) for a SCHEDULED START.

5. Set the time and minutes for the planned start of the S I N sequence.

   - For example, if you want the start time to be 2:15 p.m., set the hour to 14 and the minutes to 15.

> The **SCHEDULED START TIME IS CONSISTENT WITH THE TIME DISPLAYED ON THE AUTOMATION PROGRAM SCREEN**. It is therefore important to make sure that the time displayed is the right one. If it is not, it is recommended that you adjust the time of the automation program.

6. Press the tactile key [CLOSE] to save the setting and close the pop-up window.

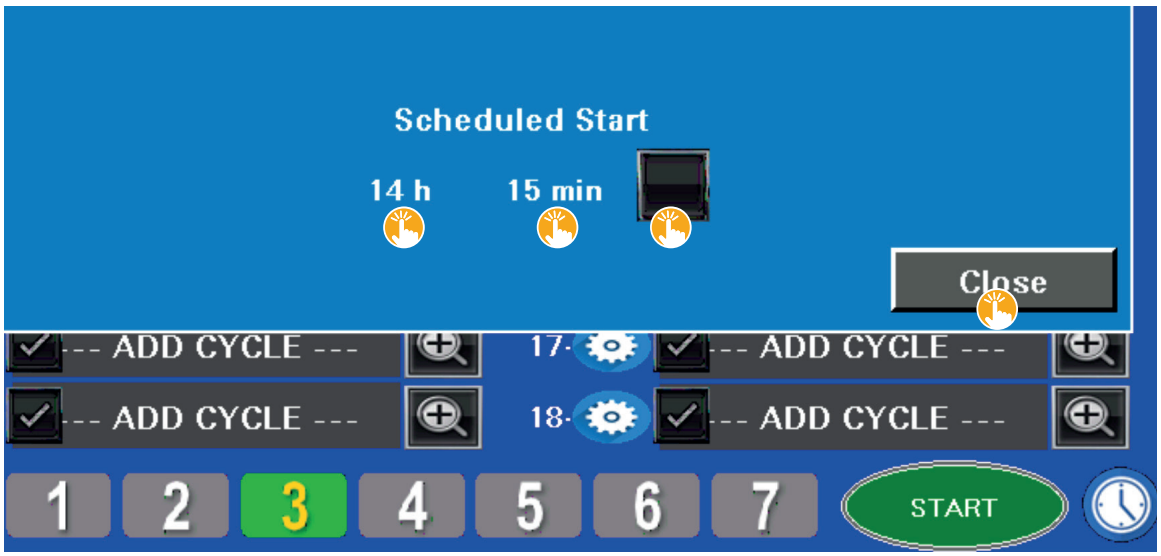
   - The text SCHEDULED START appears and flashes in the top banner.

NOTE | Do not press the tactile key START on the operation screen as the S I N cycle will then start immediately instead of using the scheduled start setting.

The following operation screen shows us this information:

- The scheduled start time is 2:15 p.m. (14 h 15 min).
- Since there is no checkmark in the checkbox, the setting is not yet activated.

ILLUSTRATION 71 | Pop-up window for the planned start of a S I N



Here is the list of choices you can make from the tactile keys in this pop-up window:

- [ ]: Tactile key to activate the S I N cycle start time setting
- [2 (14) h / 15 min]: Tactile keys to set the start time of the S I N
  - By pressing the space [2 (14) h], a touchpad appears in a pop-up window to set the start time.
  - By pressing the space [15 min], a touchpad appears in a pop-up window to set and complete the time in minutes.
- [CLOSE]: Tactile key to save the setting and close the window

The cycle sequence then starts at the time planned by the operator.

8.6.2.3 Plan the start of the S I N cycle sequence when a sap tank becomes available for concentration

To schedule the start of the S I N sequence when a sap tank becomes available for concentration, proceed as follows:

Simply activate the desired SAP TANK checkbox on the operation screen in *Illustration 72*, in *Section 8.6.3*, as well as the START WAITING FOR CONCENTRATION AVAILABILITY checkbox at the bottom of the same screen.

Finally, press the START tactile key on the Operation screen for multiple cycles in sequence (see *Section 8.6, Illustration 68*).

8.6.2.4 Interruption during a S I N cycle sequence

The interruption of a S I N cycle sequence can occur as a result of a command given by the automation program or a voluntary command requested by the operator.

• Interruption by the program during the cycle sequence
A sequence of cycles can be interrupted in response to a pre-programmed setting or one that is programmed by the operator. An example of this is an alarm, such as for the detection of clogged or unavailable filters. A notification for this alarm will appear on the screen.

The situation must then be corrected and the same S I N cycle sequence restarted manually by pressing the [START] key. The sequence will then restart at the beginning of the step in which the interruption occurred.

• Manual interruption during the cycle sequence
The manual interruption controlled by the operator is done by pressing the red tactile key STOP located in the top banner of the operation screen.

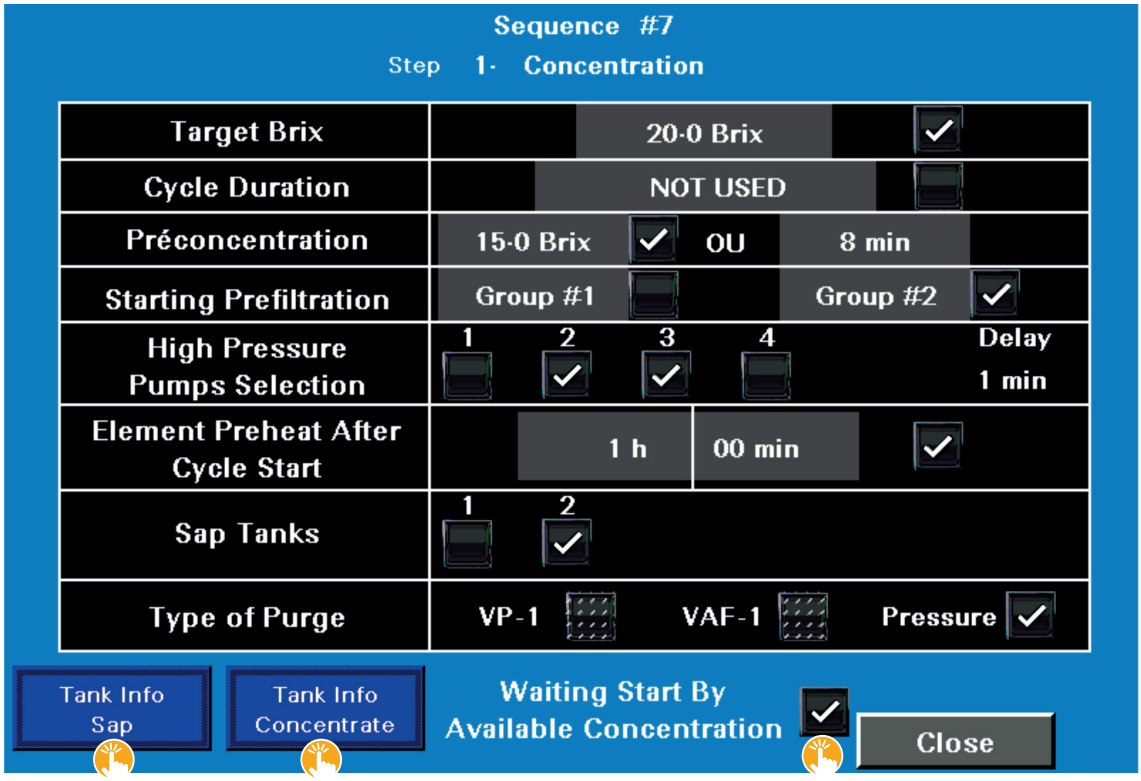
It can be useful, for example, to modify the settings of the current step or solve a problem identified by the operator.

Press the START key to manually restart the R. O. The sequence will restart at the beginning of the step in which the interruption occurred.

8.6.3 Typical operation screen

Here is a typical pop-up window for selecting the settings of a cycle in the context of MULTIPLE CYCLES IN SEQUENCE.

ILLUSTRATION 72 | Operation screen for cycle settings in the context of Multiple cycles in sequence



Below is the same operating screen, but for the SINGLE CYCLE. Although the visual appearance of the screens is somewhat different, the contents of the SINGLE CYCLE and the MULTIPLE CYCLES IN SEQUENCE are the same.

Here is the list of choices you can make from the tactile keys at the bottom of the window above:

• [TANK INFO SAP]: This tactile key allows you to see the status and level of the maple sap tank(s)
- See *Section 7.1.*

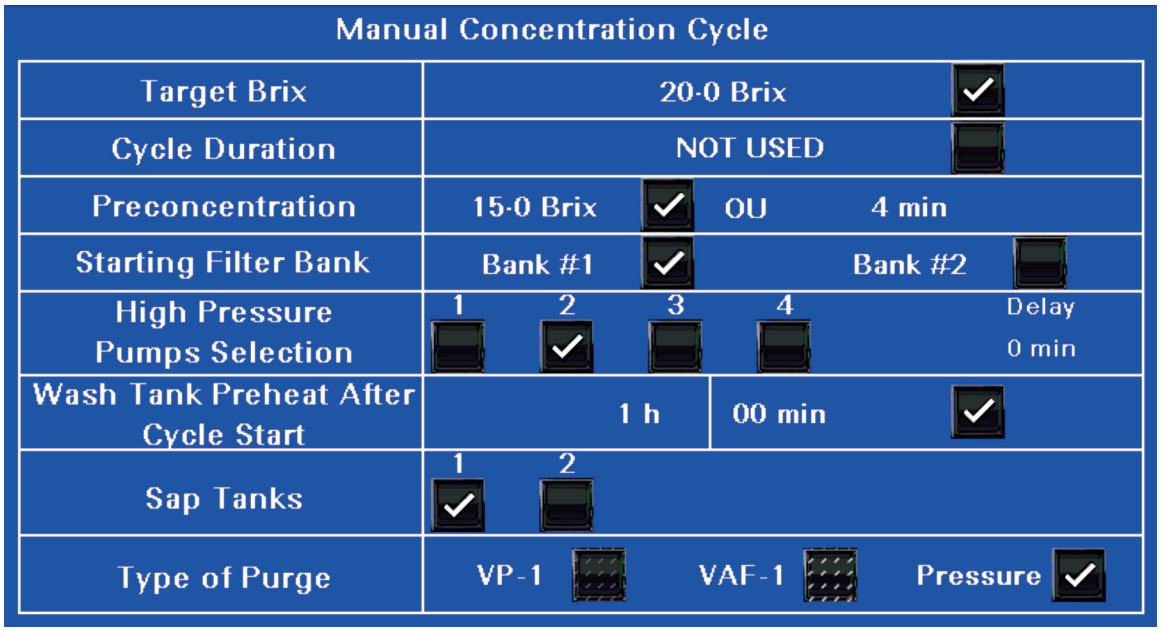
- [TANK INFO CONCENTRATE]: This tactile key allows you to see the status and level of the concentrate tank(s)

  - See *Section 7.3.*

- [START WAITING FOR CONCENTRATION AVAILABILITY]: Tactile key to activate the setting that tells the program to wait for the tanks to become available before concentration cycle

  - Previous illustration indicates that SAP TANK No. 2 is selected. You must also press the tactile key START on the operation screen for multiple cycles in sequence (see *Section 8.6, Illustration 68*).

ILLUSTRATION 73 | Operating screen for settings of a Single cycle



8.7 TACTILE KEY PEP (PURE WATER PERMEABILITY)

This tactile key takes you to the following PEP (Pure Water Permeability) operation screen.

This operating cycle indicates the performance status of your membranes in gallons per minute (GPM).

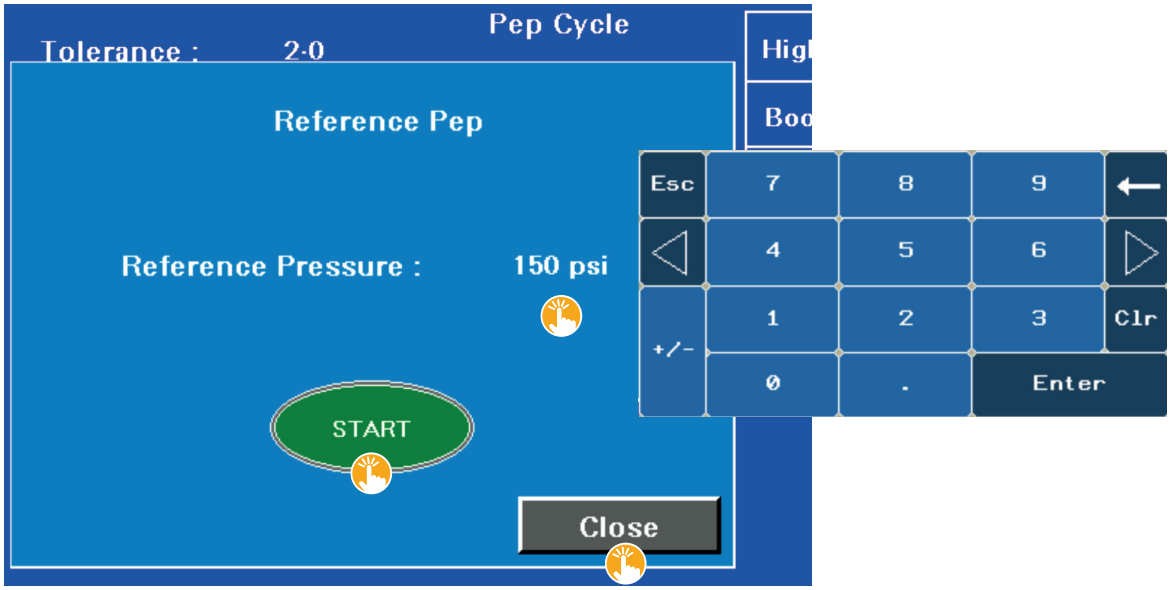
ILLUSTRATION 74 | Tactile key for the PEP cycle

The following operation screen shows us this information:

- A TOLERANCE of ±2-0 psi, set by the operator, is allowed from the reference pressure of 250 psi
- HIGH PRESSURE reads 421 psi
- BOOSTER pump No. 1 reads 383 psi
- BOOSTER pump No. 2 reads 409 psi
  - These last *three results* are the same as those found on the main home screen.
- The CURRENT REFERENCE for PEP is 33 GPM at 250 psi

ILLUSTRATION 75 | Operation screen of the PEP cycle

ILLUSTRATION 76 | Pop-up window to determine the initial PEP test result



The following is a list of the choices you can make from the tactile keys on the previous operation screen (*Illustration 75*):

- [2-0] TOLERANCE: Tactile key to set the tolerance (psi) to the reference pressure
  - When pressed, a touchpad appears in a pop-up window to set the psi.

  NOTE | A maximum deviation of 5 psi is recommended.
- [PARAMETERS]: Tactile key to access the PARAMETERS of the PEP cycle
- [REFERENCE]: Tactile key to access the pop-up window to determine the initial PEP test result
  - When pressed, a pop-up window appears (see *Illustration 76* above).
    - o When you press the space [150 PSI] a touchpad appears in a pop-up window to set the reference pressure.
    - o The following two tactile keys are also displayed in the pop-up window:
      - ■ [START]: Tactile key to start the reference PEP cycle that will determine the initial PEP test result.
        - ❖ The result of the initial PEP test then becomes the reference for subsequent comparative PEP test results.
        - ❖ The tactile key START will then become IN PROGRESS.
      - ■ [CLOSE]: Tactile key to close the window.
- [RESULTS]: Tactile key to access the results of the various PEP tests
  - When the tactile key is pressed, an operation screen appears (see *Section 8.7.2, Illustration 78* below).
- [EXTRACT DATA]: Tactile key to extract all PEP test results from the automation program to download on a USB key (included)

- [421] HIGH PRESSURE: Tactile key to go to the HIGH PRESSURE consultation screen (see *Section 6.1.1*)
- [383] BOOSTER No. 1: Tactile key to go to the Booster Pump consultation screen 1 (see *Section 6.1.1*)
- [409] BOOSTER No. 2: Tactile key to go to the Booster Pump consultation screen 2 (see *Section 6.1.1*)
- [EFFICIENCY (BEFORE WASHING)]: Tactile key to run the PEP test cycle before the wash cycle
  - The PEP test cycle starts immediately when the tactile key is pressed.
- [AFTER HOT WATER]: Tactile key to run the PEP test cycle after a hot water rinse
  - The PEP test cycle starts immediately when the tactile key is pressed.
- [AFTER SOAP]: Tactile key to run the PEP test cycle after a soap wash
  - The PEP test cycle starts immediately when the tactile key is pressed.

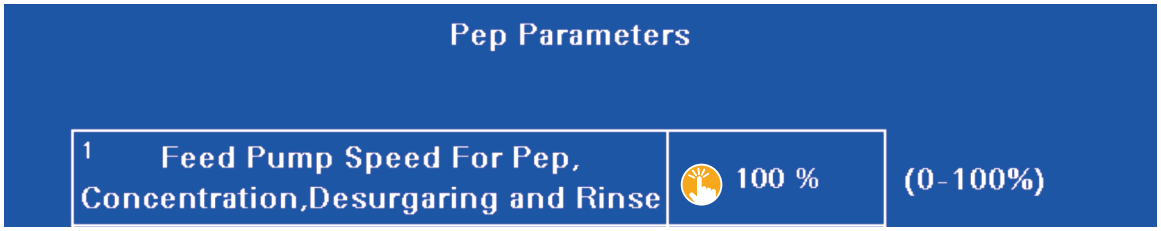
8.7.1 Tactile key PEP/PARAMETERS

This operation subscreen appears when you press the tactile key [PARAMETERS] on the PEP operation screen in *Section 8.7, Illustration 75*.

The following operation screen shows us this information:

- 1. The FEED PUMP SPEED FOR THE PEP, CONCENTRATION, DESUGARING AND RINSE cycles set by the operator is 100%.

ILLUSTRATION 77 | PEP cycle parameters



Here is the choice you can make from the tactile key on this operation screen.

- [100 %] FEED PUMP SPEED, Parameter No. 1: Tactile key to set the feeding pump speed for the PEP, concentration, desugaring and rinse cycles
  - When pressed, a touchpad appears in a pop-up window to set the speed (0 to 100%).

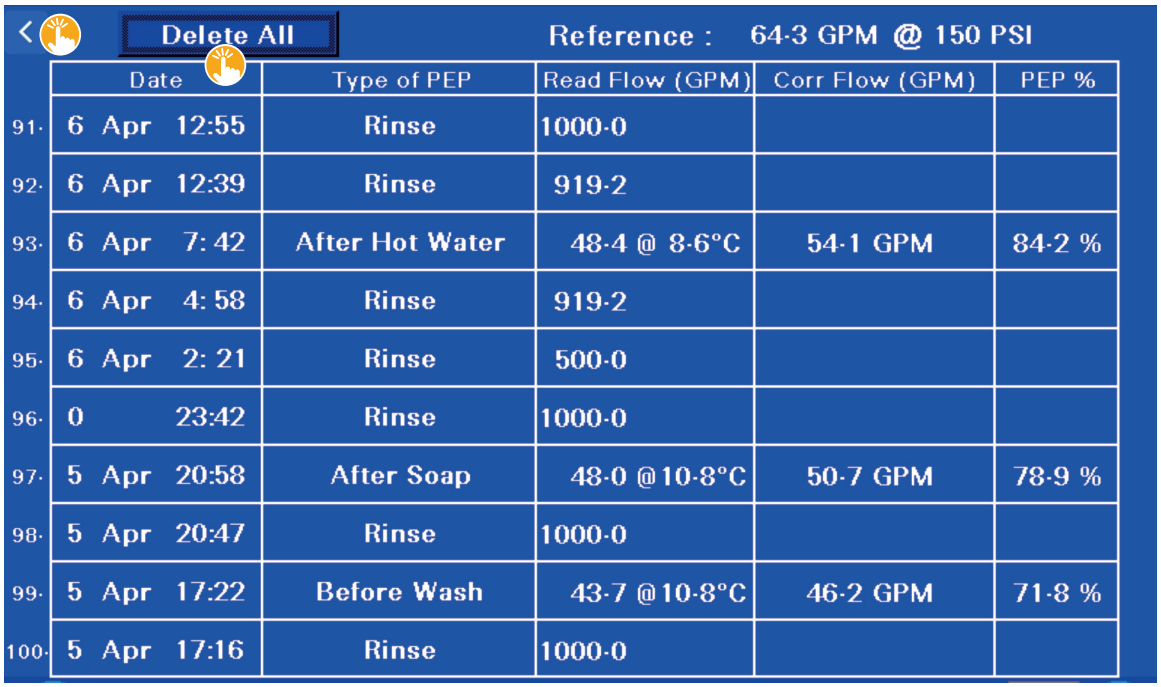
8.7.2 Tactile key PEP/RESULTS

The following operation screen shows us this information:

- The CURRENT REFERENCE is 64.3 GPM at 150 psi.
  - These are the current INITIAL PEP baseline values, which allow the program to set the comparative PEP percentages.

- Results data, by line, for numbers 91 to 100.
  - Each result line is numbered on the far left of the screen (1 to 100).
  - Up to 100 results can be saved and displayed in the list.
  - This results page shows the last page of results in the list (91 to 100).
  - Result 1 is the most recent and 100 the oldest.
  - The most recent result is always displayed first in the list.
  - Beyond 100 results, each new record deletes the oldest one from the list.

ILLUSTRATION 78 | Table of results of all PEP tests performed



	Date	Type of PEP	Read Flow (GPM)	Corr Flow (GPM)	PEP %
91.	6 Apr 12:55	Rinse	1000-0		
92.	6 Apr 12:39	Rinse	919-2		
93.	6 Apr 7: 42	After Hot Water	48-4 @ 8-6°C	54-1 GPM	84-2 %
94.	6 Apr 4: 58	Rinse	919-2		
95.	6 Apr 2: 21	Rinse	500-0		
96.	0 23:42	Rinse	1000-0		
97.	5 Apr 20:58	After Soap	48-0 @10-8°C	50-7 GPM	78-9 %
98.	5 Apr 20:47	Rinse	1000-0		
99.	5 Apr 17:22	Before Wash	43-7 @10-8°C	46-2 GPM	71-8 %
100.	5 Apr 17:16	Rinse	1000-0		

NOTE | The RINSE operations carried out by the automation program are recorded in the table as evidence of the execution of these cycles over time.

Here is the list of choices you can make from the tactile keys on this operation screen:

- [<]: Tactile keys to access the previous results screen up to results screen 1 to 10
- [DELETE ALL]: Tactile key to access a pop-up window to confirm the deletion of all the results
  - Deleted results cannot be recovered.

  TIP | Delete the previous year's results at the beginning of the season.
- [>]: Tactile keys to access the next results screen, up to the last saved results or results 91 to 100
  - Since the page shown is the last one in the results group (91 to 100), this tactile key does not appear in this operation screen.

APPENDIX A PROCEDURE FOR THE CONFIGURATION AND REMOTE CONNECTION TO THE AUTOMATION PROGRAM

It is possible to easily operate the Automation Program of your Reverse Osmosis R. O. from your cellular device or tablet.

First, make sure the router is connected to the Internet. Refer to *Section 2* under *INTERNET CONNECTION* for more information.

FIVE STEPS

There are five quick and easy steps to operate your remote automation:

- eCATCHER | OPEN A SESSION on the eCATCHER APPLICATION
- eCATCHER | CONNECT to your VPN
- eCATCHER | CONNECT to your R. O. PROGRAM

- Vijeo Design'Air | LOG IN to the Vijeo Design'Air APPLICATION / Access your device
- Vijeo Design'Air | Agree to consent to remote equipment liability

Below is the procedure for configuring your device or connecting to the program remotely.

WHAT YOU NEED TO HAVE ON HAND TO CONFIGURE eCATCHER AND/OR LOG IN

- The account information (3 items) for the eCATCHER application provided to you by LAPIERRE EQUIPMENT.
- Your 4-digit Personal Identification Number (PIN), which you will determine below in point No. 2.

Please note these three pieces of information and your PIN in the table found in the inside cover at the very end of the manual: ACCOUNT INFORMATION FOR THE eCATCHER APPLICATION.

WHAT YOU NEED TO HAVE ON HAND TO CONFIGURE VIJEO DESIGN'AIR AND/OR LOG IN

- The name of your equipment, which you will determine later in point No. 1.
- IP address (Host) **192.168.10.200**.

Please note these two pieces of information in the table found in the inside cover at the very end of the manual: ACCOUNT INFORMATION FOR THE VIJEO DESIGN'AIR APPLICATION.

DOWNLOAD THE FOLLOWING TWO APPLICATIONS

- First, " eCatcher ".

eCATCHER allows you to access your VPN (Virtual Private Network) and then connect to your R. O. PROGRAM.

1. eCATCHER (Password) → 2. VPN (PIN) → 3. PROGRAM R. O. (CONNECT Button)

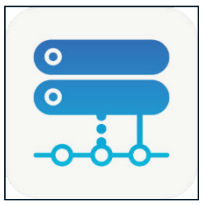
- Then " Vijeo Design'Air ".

Vijeo Design'Air allows you to connect to your R. O. device (computer screen) and remotely operate its program via the touch screen of your mobile device.

These applications are available in the Apple Store and Google Play. Here is an overview of the icons of these applications in these virtual stores (2024).

Note that Vijeo Design'Air is a paid application. You only have to pay $39.99 CAD (2024) at the time of purchase. This is an ongoing service and not an annual subscription. You only pay this amount once.

eCATCHER **Vijeo Design'Air**



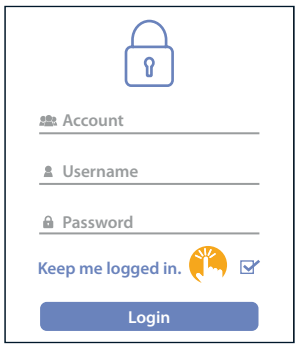
CONFIGURATION/CONNECT TO eCATCHER

eCATCHER CONFIGURATION

1. OPEN A SESSION ON THE eCATCHER APPLICATION

First, press on the icon of your application.

• Enter the three pieces of information provided to you by LAPIERRE EQUIPMENT in the account window.



- Account
- Username
- Password

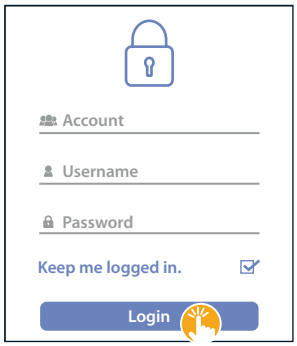
  o Be sure to use upper and lower case letters when entering the password.

  NOTE | Your PASSWORD allows you to LOG IN to eCATCHER.

TIP | KEEP ME LOGGED IN

It is best to enable the [KEEP ME LOGGED IN] checkbox at this point. See *3.b IMPORTANT TIP* below for more information.

• Then press [LOGIN].



Your session is now open and you will be directed to the next screen.

2. CONNECT TO YOUR VPN

• First determine a 4-digit PIN.

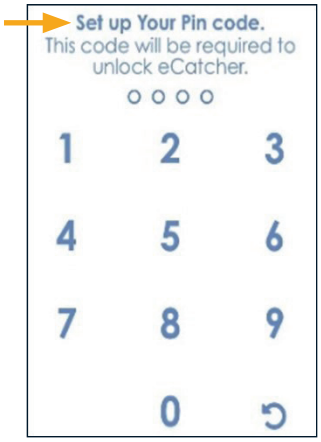
• Record your PIN in the table found in the inside cover at the very end of the manual.

• Enter your PIN on the screen.

• Confirm your PIN by re-entering it on the screen.

NOTE | Notice the title of the next screen: **SET UP** YOUR PIN CODE.

NOTE | Your PIN allows you to connect to your VPN.



You now have access to your VPN and are directed to the next screen.

NOTE | Your PIN is required every time you want to connect to your VPN. See *3.b IMPORTANT TIP* below for more information.

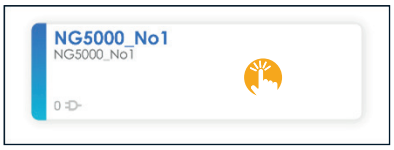
3. CONNECT TO YOUR R. O. PROGRAM

After entering your PIN twice, your program will appear on the screen.

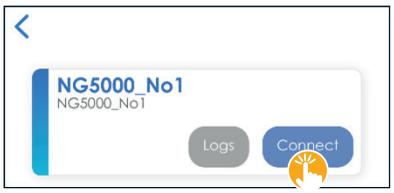
The name of your program has been registered by the LAPIERRE EQUIPMENT technician before your equipment is delivered. This name is the name of your account or a diminutive of it since only a certain number of characters is possible.

In the screen shown below, the fictitious name *" NG5000_No1 "* is used.

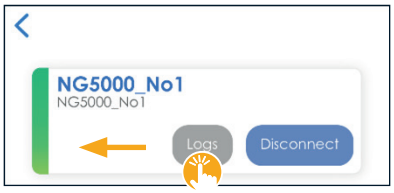
• Press the icon of your program that appears on the screen.



• Then press the [CONNECT] button that appears in the program icon.

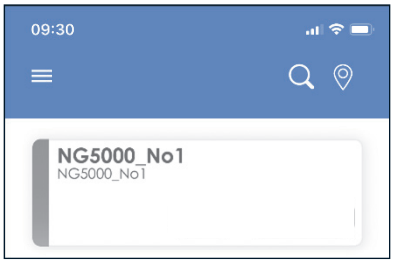


The left border of the icon will change from blue to green, indicating that you are connected to your R. O. program.



The [LOG] button allows you to view, among other things, the activity log between the automation program and the server.

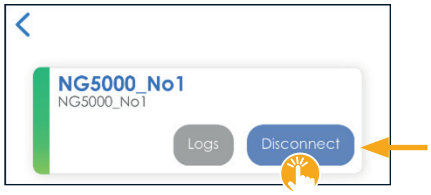
IMPORTANT | The unshaded screenshot **above** shows an active application window, indicating that you are connected to the Internet and logged into the program. A grayed out window, like the one **below**, indicates that your Internet connection is inactive and you are not connected to the program. Correct the situation before continuing with the configuration or connection procedure.



3.a Disconnecting from your R. O. program

To disconnect from your R. O. program, you can close your eCATCHER application or press the [DISCONNECT] button on the next screen.

Pressing the [DISCONNECT] button will disconnect you from the R. O. NG5000_No1 program only. You still have access to your VPN, and your session on the eCATCHER application is still open.



3.b IMPORTANT TIP about logging out of eCATCHER and your PIN

In order to use the same PIN (*Point 2*), following your next login to your eCATCHER application (*Point 1*), you must follow these instructions:

- Activate the [KEEP ME LOGGED IN] checkbox (*Point 1*).
- Exit the eCATCHER application **without pressing [LOGOUT]**.
  - That is, simply close the window of your mobile application **without pressing the Logout button [LOGOUT]**.

This way, the next time you connect to your VPN (*point 2*), you can use the same PIN again.

If you fail to follow these two instructions, you will have to initialize a new PIN to connect to your VPN (*point 2*).

CONNECTING TO eCATCHER

On subsequent CONNECTIONS:

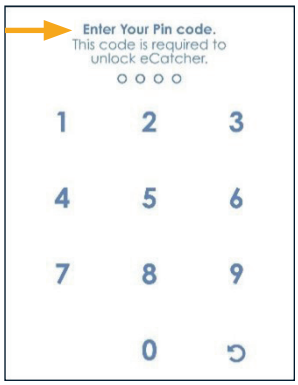
YOU HAVE LOGGED OUT DURING YOUR LAST VISIT OR ACCIDENTALLY CLOSED YOUR SESSION

You need to log in to the eCATCHER application (*Point 1*) and initialize a new PIN to connect to your VPN (*Point 2*).

YOU DID NOT LOG OUT DURING YOUR LAST VISIT

First log in to the eCATCHER application. Since you did not [LOGOUT] on your last visit and had checked the [KEEP ME LOGGED IN] box, you will be directed to the following screen upon opening the eCATCHER application. All you have to do is enter your PIN.

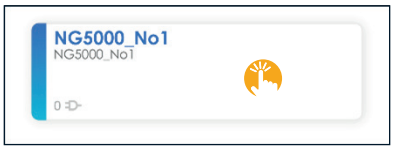
NOTE | Notice the title of the next screen: **ENTER** YOUR PIN CODE instead of **SET UP** YOUR PIN CODE which you will find in *point 2*.



By entering your PIN, you will have access to your VPN and will be able to connect to your R. O. program.

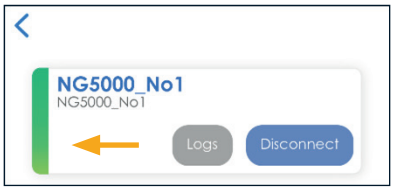
You will then be directed to the next screen.

• Press the icon of your program that appears on the screen.



• Then press the [CONNECT] button that appears in the program icon.

The left border of the icon will change from blue to green, indicating that you are connected to your R. O. program.



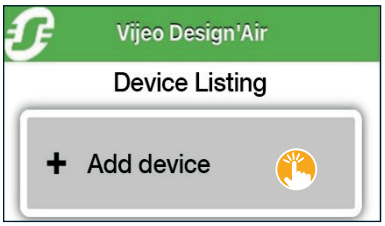
CONFIGURE/CONNECT TO Vijeo Design'Air

Vijeo Design'Air CONFIGURATION

1. OPEN A SESSION AND ADD A DEVICE ON THE Vijeo Design'Air APPLICATION

First, press your application icon.

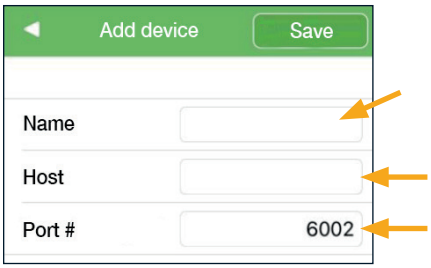
• Press [ADD DEVICE].



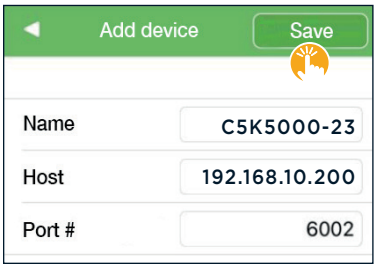
• Then enter the following information in the window:

- [NAME] = the name of your equipment, at your choice (C5K5000-23 in our example)
  - o Please note the name of your equipment in the table in the inside cover at the very end of the manual.
- [HOST] = **192.168.10.200**

The [PORT NUMBER], 6002, is entered by default when the screen is opened.



• Press [SAVE].



2. ACCESS YOUR DEVICE

Once your device has been added, it will appear and now be accessible.

• Press its icon to access it.

3. CONSENT TO LIABILITY FOR REMOTE USE OF THE EQUIPMENT

You are required to read the warning message.

You must accept responsibility for the use of the remote control function of the equipment.

• To do this, after reading the warning message, press the check box [I UNDERSTAND].
• Then confirm by pressing [OK].

• [Display only]: Touch screen only for consulting the program without being able to intervene.
• [Cancel]: Touch screen to cancel your consent.

4. ACCESS TO YOUR R. O. DEVICE (COMPUTER SCREEN)

You are now connected to your R. O. screen, or device. You can now view your R. O.'s operation screen on your device and have access to all of its functions.

Log out of the application and your automation program

By simply closing the application, you will be automatically logged out after a certain amount of inactivity.

CONNECTING TO Vijeo Design'Air

On subsequent CONNECTIONS.

When you open the Vijeo Design'Air application, you will be taken to the following screen (same screen as in *point 2*).

• Then press the icon of your device.

- Consent to be responsible for the remote use of the equipment

  This consent is required every time you use this application.
  If necessary, refer to *point 3* for further explanation.

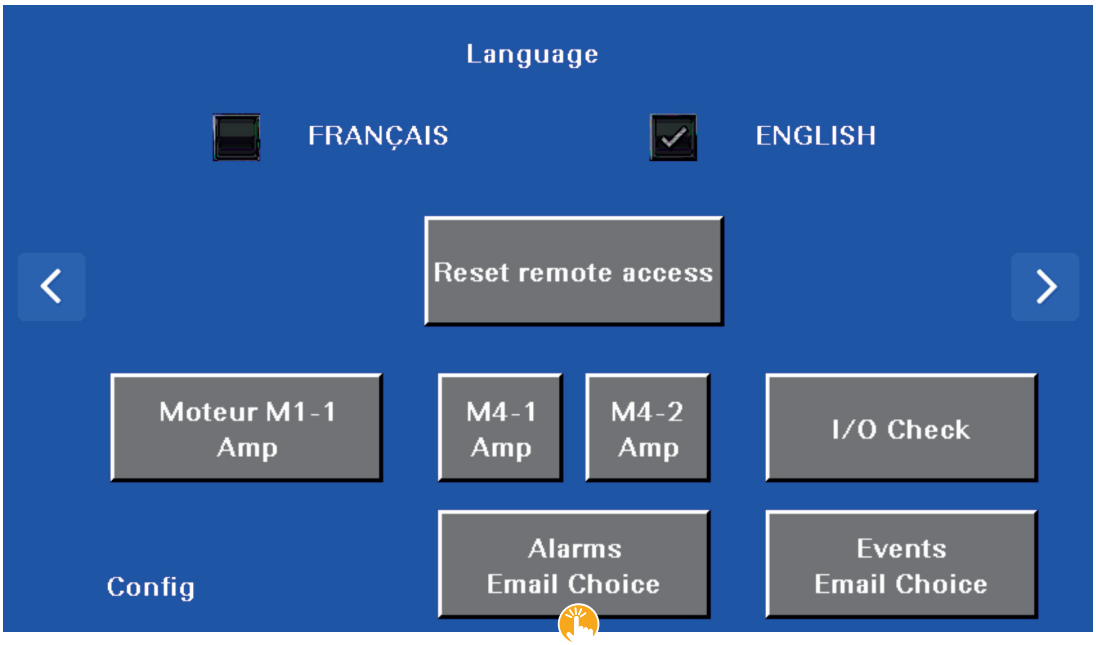
- You are now connected to your R. O. automation program (same screen as in *point 4*).

  You now have remote access to all program and equipment functions.

APPENDIX B **ALARMS TO BE RECEIVED BY TEXT MESSAGES**

See below for a list of alarms you can choose to receive via text message when your R. O. is on.

To access this list, first press the settings icon [⚙] located on the right of the bottom banner. You are then directed to the operation screen below. Then press [E-MAIL ALARMS CHOICE].

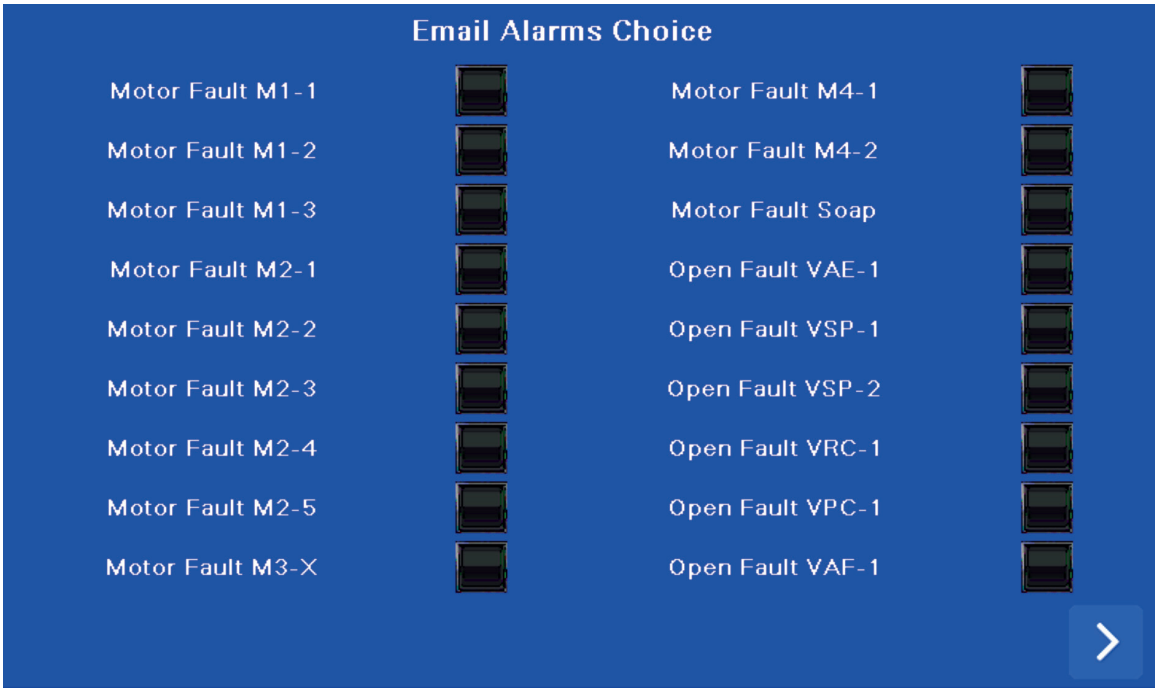


The following four operation screens appear in the order shown below. Simply press the left or right arrows at the bottom of the screen to access the previous or next operation screen.

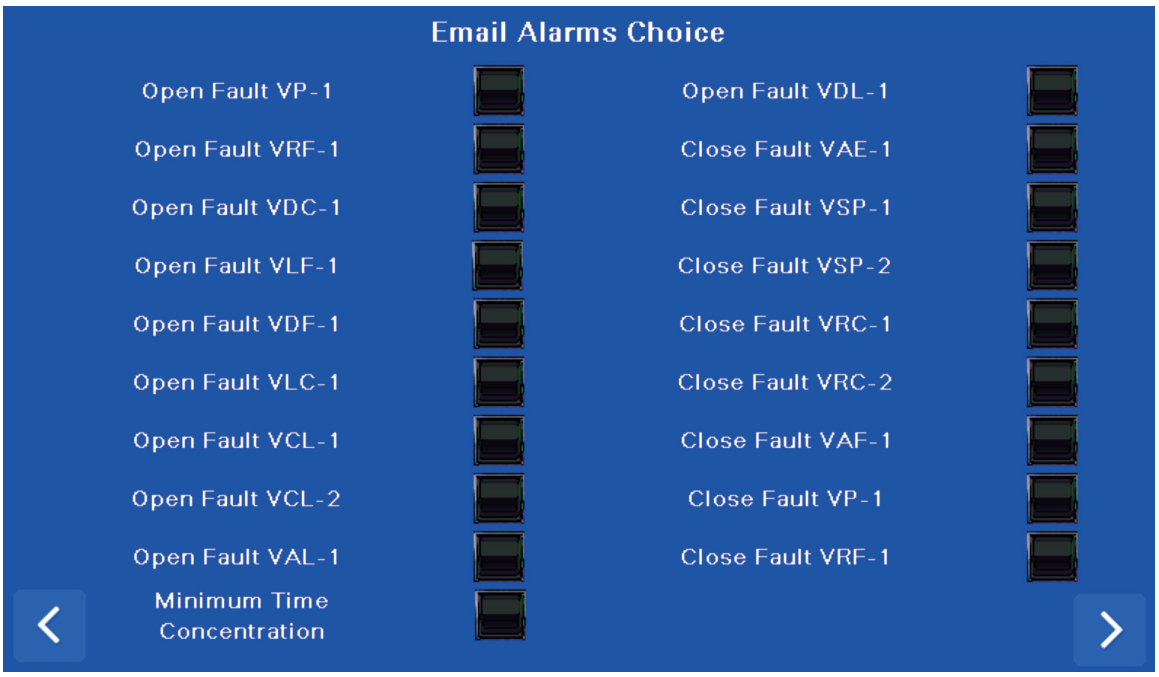
You then only need to activate the corresponding checkbox(es) to receive the desired alarms on your mobile device.

Note that *Section 5.3.1.1.1 Active alarms operation screen* shows you all the alarms issued by the automation program. Here you can choose which alarms are sent to your mobile device.

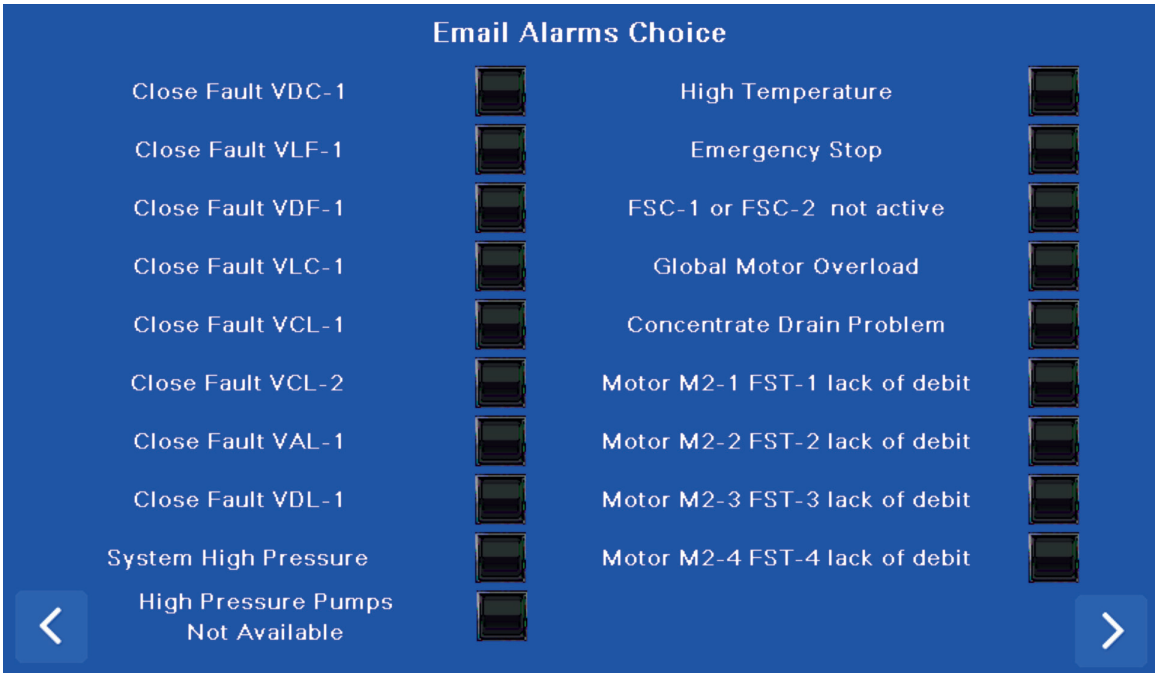
Screen 1 of 4



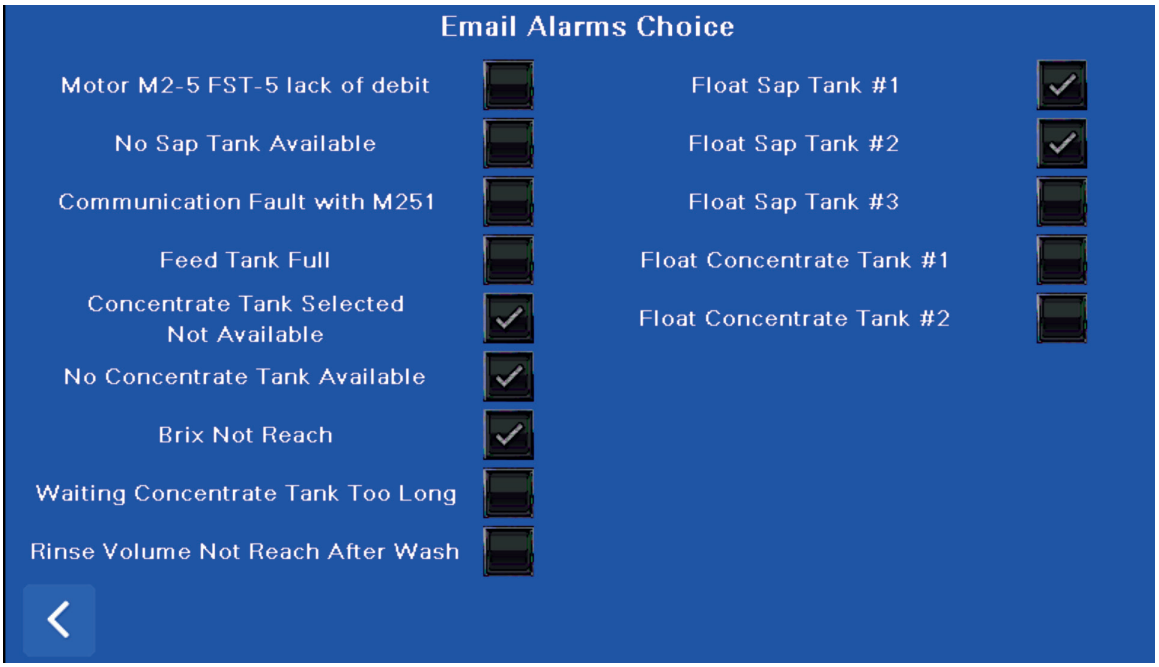
Screen 2 of 4



Screen 3 of 4



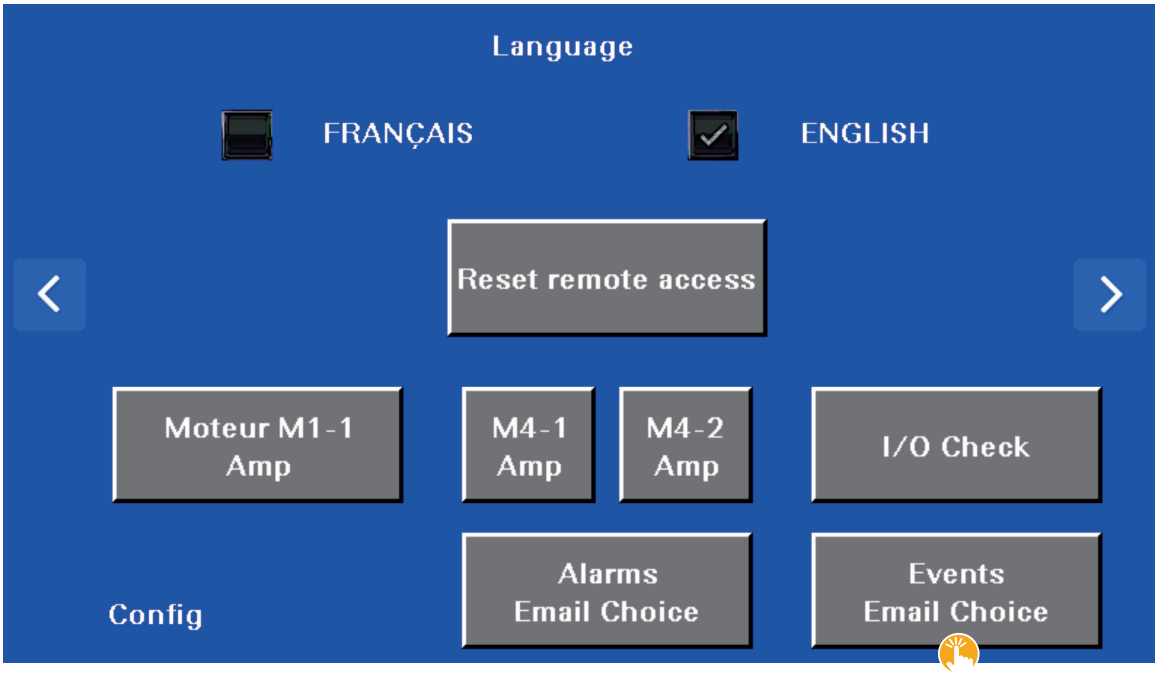
Screen 4 of 4



APPENDIX C **EVENTS TO BE RECEIVED BY TEXT MESSAGES**

See below for a list of events you can choose to receive by text message when your R. O. is on.

To access this list, first press the settings icon [⚙] located on the right of the bottom banner. You are then directed to the operation screen below. Then press [E-MAIL CHOICE EVENTS].

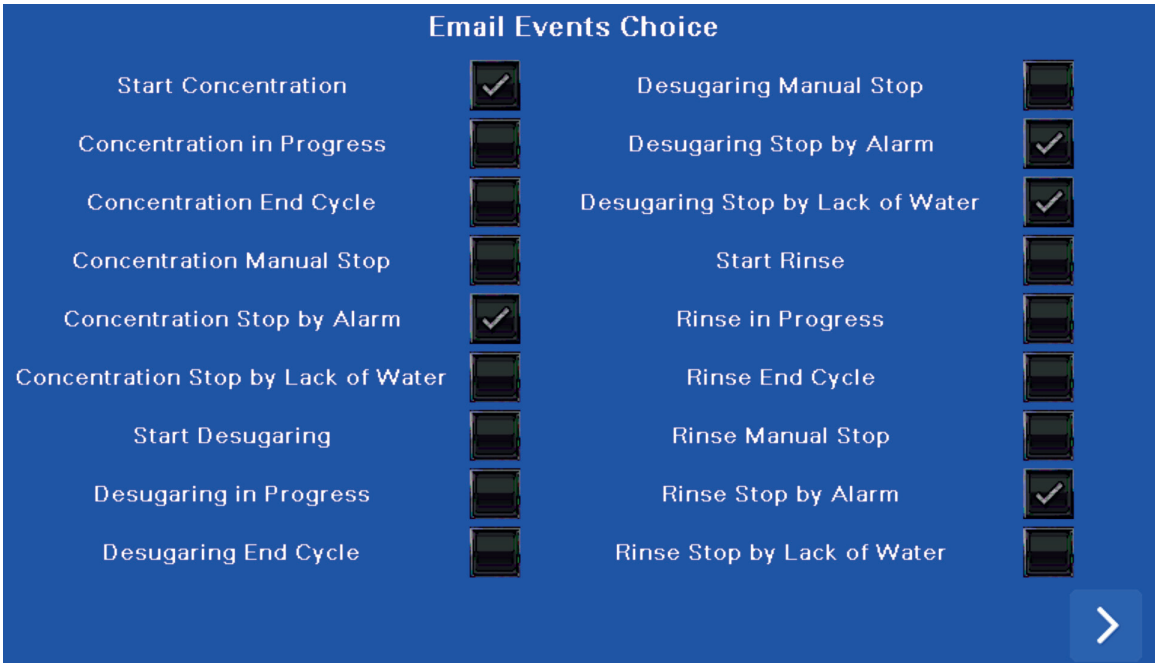


The following six operation screens appear in the order shown below. Simply press the left or right arrows at the bottom of the screen to access the previous or next operation screen.

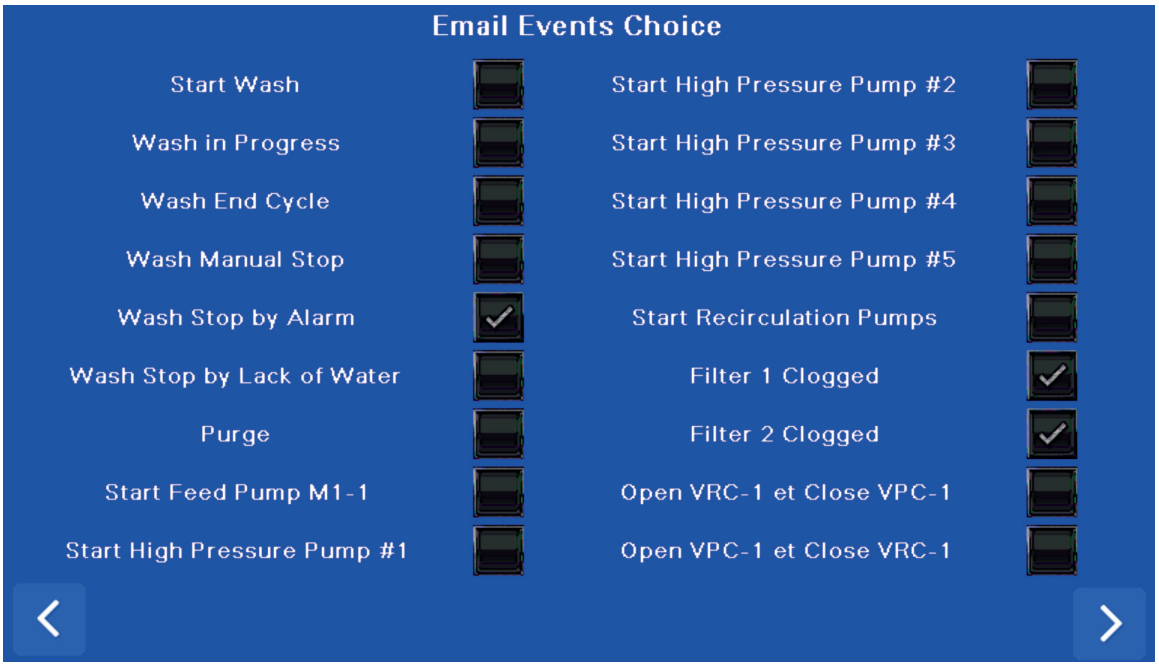
You then only need to activate the corresponding checkbox(es) to receive the desired events on your mobile device.

Note that *Section 5.3.1.1.1 Active alarms*/**Events** shows you all the events issued by the automation program. Here you can choose which events are sent to your mobile device.

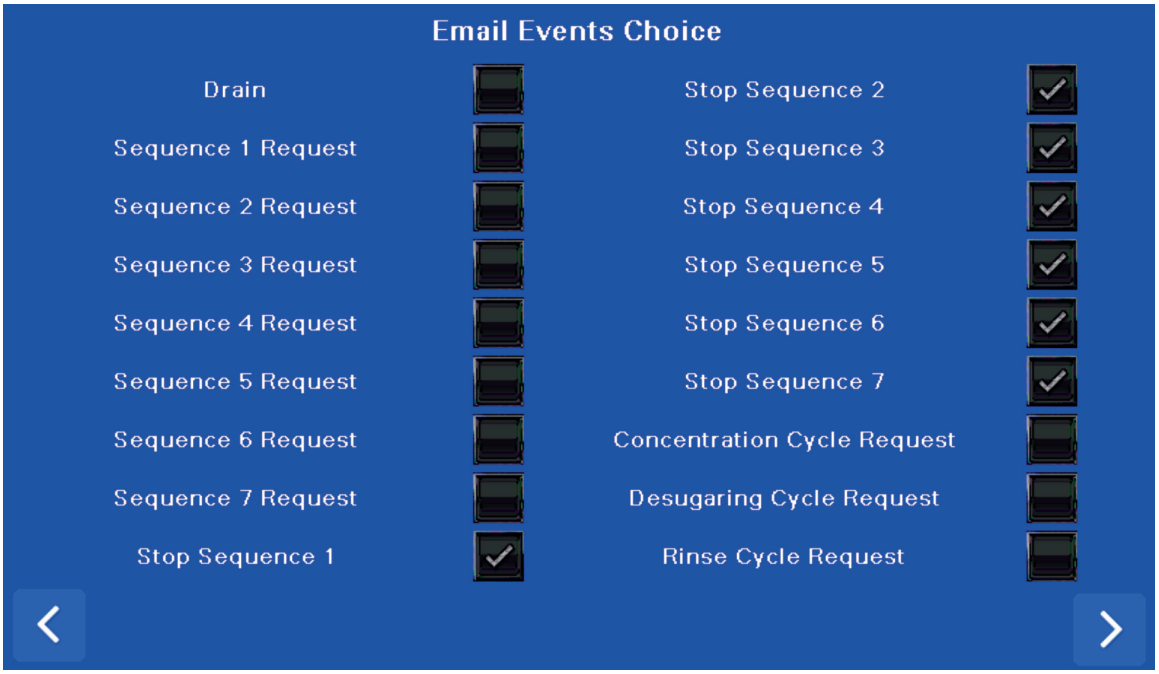
Screen 1 of 6



Screen 2 of 6

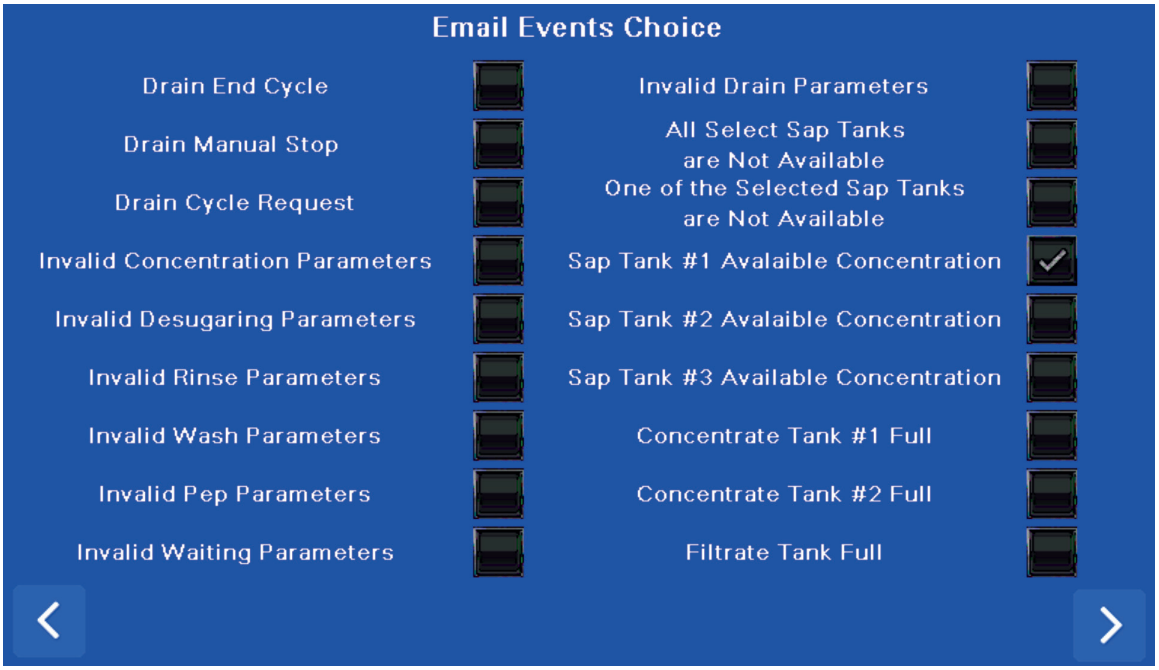


Screen 3 of 6

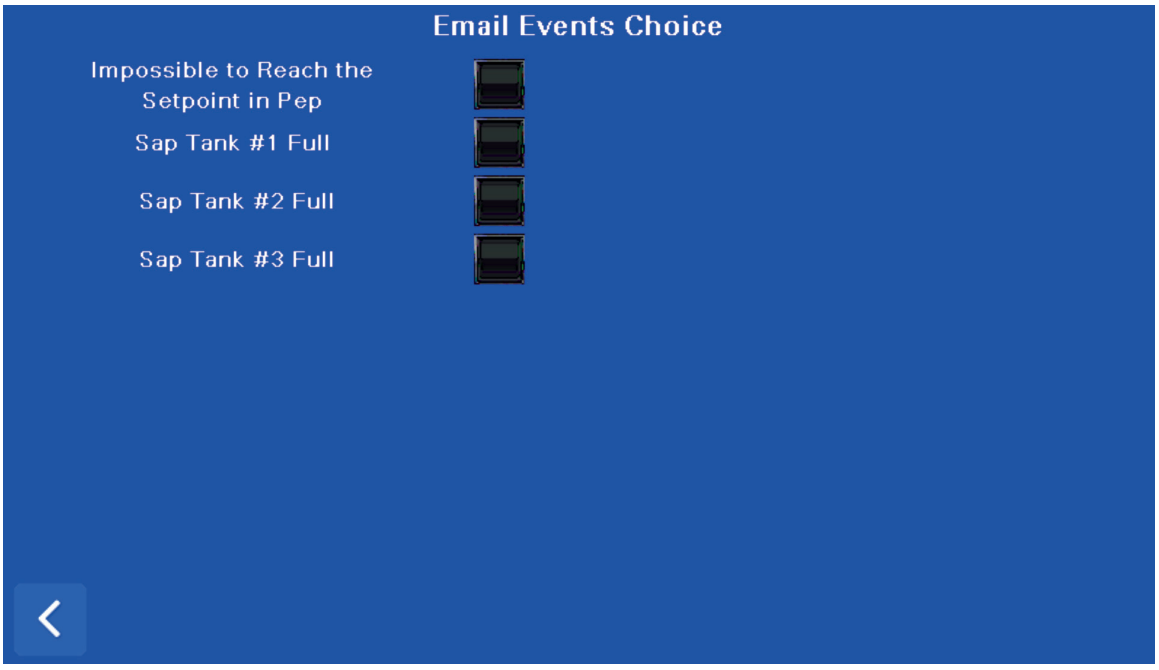


Screen 4 of 6

Screen 5 of 6



Screen 6 of 6



Your R. O. is equipped with several valves. Below is a list of the identifier, name and function of each one.

Note that the valve identifiers are acronyms of their names. Therefore, **VAE** is the acronym for " ***Valve Alimentation Érable*** " (**Sap Intake Valve**). As for the number, such as VAE- " **1** " , it represents the number of the valve. In fact, several valves can have the same function, like the VBE and VRA valves where you can count up to 6 optional valves.

The identifiers of each valve are indicated on the R. O. (e.g. VAE-1, VSP-1, etc.).

VALVE IDENTIFIERS, NAMES AND FUNCTIONS

IDENTIFIER	VALVE NAME	VALVE FUNCTION
VAE-1	Sap intake valve	Inlet valve of the sap feed pump
VAF-1	Filtrate intake valve	Inlet valve of the filtrate feed pump
VAL-1	Wash intake valve	Inlet valve of the wash water feed pump
[1] VBE-1 to 6	Sap tank valve	Sap tank selection valve
VCL-1	Wash concentration valve	V3 selection valve for concentration/wash mode
VCL-2	Wash concentration valve	Selection valve for wash filter
VDC-1	Concentrate drain valve	Valve that directs concentrate to drain
VDF-1	Filtrate drain valve	Valve that directs filtrate to drain
VDL-1	Wash drain valve	Wash tank drain valve
VLC-1	Concentrate wash valve	Valve that directs concentrate to wash tank
VLF-1	Filtrate wash valve	Valve that directs filtrate to wash tank
VP-1	Purge valve	Priming valve for feed pump
VPC-1	Preconcentration valve	Valve that returns water to the sap tank during preconcentration
[1] VRA-1 to 6	Intake tank valve	Valve that supplies sap to the sap tanks
VRC-1	Concentrate tank valve	Valve that directs concentrate water to concentrate tank
[1] VRC-2 to 6	Concentrate tank valve	Valve that directs concentrate water to concentrate tank
VRF-1	Filtrate tank valve	Valve that directs filtrate to filtrate tank
[1] VRF-2 to 6	Filtrate tank valve	Valve that directs filtrate to filtrate tank
VSP-1	Prefiltration selection valve	Prefiltration bank selection valve
[1] VSP-2	Prefiltration selection valve	Prefiltration bank selection valve

[1] These valves are optional.

APPENDIX E VALVES: VALVE POSITIONS ACCORDING TO THE OPERATING CYCLES

Below you will find the position of each of the valves according to the following operating cycles:

- Concentration
- Desugaring
- Rinse
- Rinse (after soap)
- Wash

These tables are useful when operating your R. O. in manual mode (see *Section 5, Figures 10 and 11*).

NOTE | It should be noted that there may be movement in the orientation of the valves as the steps in each of the R. O. cycles are performed. Thus, although each valve is identified as closed or open in the following tables, one of them may potentially open or close momentarily during certain operations. For example, during the Concentration cycle, the VPC-1 valve could open and remain open until the set point is reached if you have activated this option. Conversely, during the Desugaring cycle, the VCL-1 valve will close at the end of the cycle to desugar a portion of the system piping, as set by the automation program.

POSITION OF THE VALVES DURING THE CONCENTRATION CYCLE

CONCENTRATION		
VALVE	**Opened**	**Closed**
VAE-1	x	
VAF-1		x
VAL-1		x
[1] VBE-1 to 6	x[2]	
VCL-1		x
VCL-2		x
VDC-1		x
VDF-1		x
VDL-1		x
VLC-1		x
VLF-1		x
VP-1		x
VPC-1		x
VRC-1	x[3]	
[1] VRC-2 to 6	x[3]	
VRF-1	x[4]	
[1] VRF-2 to 6	x[4]	
VSP-1	x[5]	
[1] VSP-2	x[5]	

POSITION OF THE VALVES DURING THE DESUGARING CYCLE

DESUGARING		
VALVE	**Opened**	**Closed**
VAE-1		x
VAF-1	x	
VAL-1		x
[1] VBE-1 to 6		x
VCL-1	x	
VCL-2		x
VDC-1		x
VDF-1		x
VDL-1		x
VLC-1		x
VLF-1		x
VP-1		x
VPC-1		x
VRC-1	x[3]	
[1] VRC-2 to 6	x[3]	
VRF-1	x[4]	
[1] VRF-2 to 6	x[4]	
VSP-1	x[5]	
[1] VSP-2	x[5]	

POSITION OF THE VALVES DURING THE RINSE CYCLE

RINSE		
VALVE	**Opened**	**Closed**
VAE-1		x
VAF-1	x	
VAL-1		x
[1] VBE-1 to 6		x
VCL-1	x	
VCL-2	x	
VDC-1	x	
VDF-1		x
VDL-1		x
VLC-1		x
VLF-1		x
VP-1		x
VPC-1		x
VRC-1		x
[1] VRC-2 to 6		x
VRF-1	x[4]	
[1] VRF-2 to 6	x[4]	
VSP-1		x
[1] VSP-2		x

[1] These valves are optional.

[2] At least one of the VBE valves must be open. The decision to open one or more valves is the choice of the operator.

[3] Only one of the VRC valves must be open.

[4] Only one of the VRF valves must be open.

[5] Only one of the VSP valves must be open.

POSITION OF THE VALVES DURING THE RINSE CYCLE (AFTER SOAP)

RINSE (AFTER SOAP)		
VALVE	**Opened**	**Closed**
VAE-1		x
VAF-1	x	
VAL-1		x
[1] VBE-1 to 6		x
VCL-1	x	
VCL-2	x	
VDC-1	x	
VDF-1	x	
VDL-1		x
VLC-1		x
VLF-1		x
VP-1		x
VPC-1		x
VRC-1		x
[1] VRC-2 to 6		x
VRF-1		x
[1] VRF-2 to 6		x
VSP-1		x
[1] VSP-2		x

POSITION OF THE VALVES DURING THE WASH CYCLE

WASH		
VALVE	**Opened**	**Closed**
VAE-1		x
VAF-1		x
VAL-1	x	
[1] VBE-1 to 6		x
VCL-1	x	
VCL-2	x	
VDC-1		x
VDF-1		x
VDL-1		x
VLC-1	x	
VLF-1	x	
VP-1		x
VPC-1		x
VRC-1		x
[1] VRC-2 to 6		x
VRF-1		x
[1] VRF-2 to 6		x
VSP-1		x
[1] VSP-2		x

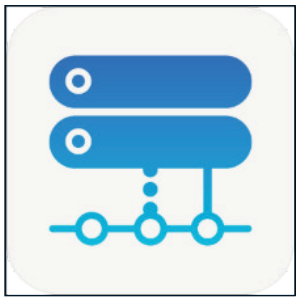
[1] These valves are optional.

NOTES

NOTES

ACCOUNT INFORMATION

FOR THE eCATCHER APPLICATION



Information provided by LAPIERRE EQUIPMENT

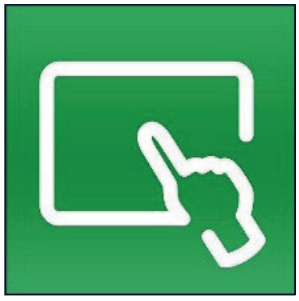
- Account _____
- Username _____
- Password _____

Your 4-digit PIN - to be chosen by you

- Your PIN _____ _____ _____ _____

ACCOUNT INFORMATION

FOR THE Vijeo Design'Air APPLICATION



Your equipment name – to be chosen by you

- Name of your equipment _____
- IP address (Host): **192.168.10.200**.

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We sincerely appreciate your trust.

Thank you!

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