274 chemin des Agriès 31860 Labarthe-sur-Lèze - France
Tél : +33 (0)5 34 480 480 - E-mail : sndc@sndc.fr
www.sndc.net - www.ecoclim.net

RF452 USER MANUAL

RF Product Line

R452A Refrigerant Charging and Recovery Unit

Reference : 480A72

Tutorials on using the unit.

Read this user and maintenance manual carefully and thoroughly before use.
Keep this manual in a safe and convenient place for later consultation.

Date	Revision	Auteur	Description
2023-07-05	1	EB	Document created
2020-10-07	2	EB	P53 value correction
2024-11-13	3	SA	Update EU Declaration New panel added Photos update Internal cleaning added New error messages added Updating of operating cycles and graphic charter DESP certification Addition of plant inspection period

274 chemin des Agriès 31860 Labarthe-sur-Lèze - France
Tél : +33 (0)5 34 480 480 - E-mail : sndc@sndc.fr
www.sndc.net - www.ecoclim.net

CE MARKING

Please affix the supplied identification label here

CONTENTS

Foreword

Thank you for choosing the **RF452** Refrigerant Charging and Recovery Unit. Right from the start, our principal aim has been to respond to all your needs for precision, reliability, durability and capability whilst guaranteeing maximum safety for the operator.

The **RF452** is designed for use on refrigeration units using **R452A** refrigerant, and is intended for the following :

- The recovery and recycling of R452A refrigerant,
- Vacuum of the system,
- Replacing refrigerant oil,
- Recharging with **R452A** refrigerant

It is equipped with electronic scales for weighing the refrigerant, injected oil and recuperated oil. The phrases of intervention are managed automatically by the bias of a microprocessor. The operator will be able to, according to his needs, programme them in an automated way or parameter them manually.

The RF452 should only be used by operators with the appropriate professional skills and knowledge of the fundamental principles refrigeration systems, refrigerants and the risks posed by pressurised systems.

Warranty

Any modifications to the **SNDC RF452** will invalidate the warranty.

Warranty Terms and Conditions :

The **RF452** is covered by a warranty for **12 months**, starting from the date of delivery.
36-month warranty: When ordering the **RF452**, there is the option to sign up for a **3-year Ecoclim** maintenance contract, which will extend the warranty for an additional **24 months**.

The warranty covers component parts and their replacement by **SNDC**-authorised repair technicians.

The warranty does not cover any of the following :

- The costs of periodic maintenance recommended by **SNDC Ecoclim**.
- Replacement of consumables, such as fast connectors, charging hoses, refrigerant oil, filters, vacuum pump oil, etc.
- Repair or replacement of components due to normal wear and tear.
- Damage resulting from:
  - Use or handling not in accordance with the instructions provided by **SNDC Ecoclim.**
  - A lack of maintenance in accordance with the instructions provided by **SNDC Ecoclim**.
  - Exceeding the recommended maintenance intervals:
    - **100 hours** of vacuum use (Alert message after 95 hours),
    - **500 kg** of recovered refrigerant (Alert message after 400 kg).
  - Use with accessories or products that do not conform with the specifications provided by **SNDC Ecoclim**.
  - Any modification or repairs carried out by technicians not duly authorised by **SNDC Ecoclim**.
  - Negligence, accidents, fire or the use of liquids, chemicals or other substances not recommended by **SNDC Ecoclim**.
  - Use of a refrigerant fluid other than that for which the unit is intended (**R452A**).
  - Flooding, vibrations, prolonged exposure to excessive heat and inadequate ventilation.
  - Electrical supply faults, power surges, undervoltage, radiation, electrostatic discharges or lightning strikes.

Symbols used

Electrical hazard: Presence of high-voltage parts with a risk of electric shock.
Ensure that you have the necessary electrical qualifications in accordance with current legislation.

R452A Type of refrigerant that the unit is designed for.

Hazard: Pay close attention to conditions or problems that could pose a risk to people's personal safety.

Warning: This symbol identifies conditions or problems that do not pose a risk to people's personal safety.

Read the user manual carefully before using the device.

Wear protective gloves.

Wear protective goggles

Wear appropriate protective clothing.

Glossary

External Bottle	Bottle containing new **R452A** refrigerant used to refill the internal tank of the unit
LP	Low pression
Refrigerant Charging	Introduction of a determined quantity of refrigerant in the system
Leak Testing	Test to maintain the vacuum level after depressurising a system
Cycle	Automated set of functions: Recovery / Vacuum / Oil Replacement / Refrigerant Charging
Charging Hose	Hose connecting the unit to the system
Group/system	Refrigeration circuit
HP	High Pressure – Haute Pression
Non-condensables	Gases that will not condense into a liquid state within the operating temperatures of the system, such as air
Oil Injection	Introduction of a determined quantity of new oil in the system
HP	High Pressure
Operator	Person trained and skilled in the handling of refrigerant fluids and use of the charging and recovery unit
Phase	Execution of a function
Recovery	Removal of refrigerant from a system and its storage in the unit's internal tank
Recycling	Reduction of contaminants in the refrigerant through the separation of oil, extraction of non-condensable gases and use of devices such as filter dryers to reduce humidity, acidity and suspended particles
Refrigerant	Refrigerant fluid
Tank	Bottle situated inside the unit and used to store refrigerant
Vacuum	Depressurisation of a system with the aid of a vacuum pump in order to remove humidity and non-condensable gases

Safety Guidelines

1. General Rules

We advise you to carefully read this manual in its entirety and familiarise yourself with the operation of the **RF452** before use. It is essential for both the operator's safety and the integrity of the equipment to respect and follow the procedures and instructions contained in this document.

- For any maintenance, repairs or replacement of parts, please contact **SNDC Ecoclim**. Any modifications or repairs attempted by non-expert personnel could render the equipment unsafe to use and pose a serious risk to the operator.
- Never lean on the **RF452**; it is not a work surface or a mode of transport.
- When connecting the unit to the system, position the hoses in such a way that they do not become an obstacle or risk causing damage or harm.
- Ensure that you follow all current regulations regarding hygiene and safety at work. Do not leave the **RF452** Unit unattended, even when it is working in automatic mode.

2. Working Environment

- Use of the **RF452** is strictly reserved for those technicians who have been appropriately trained and possess the necessary qualifications in accordance with current legislation. Under no circumstances should the unit be used by children.
- Ensure that the **RF452** is kept well clear of any flame or live heat source. Refrigerant vapour decomposes at high temperatures, releasing toxic substances that are hazardous for both the operator and the environment. The **RF452** must not be used in any location where there is a risk of fire or explosion.
- Do not smoke in the area where work is carried out. Always ensure that the working environment is sufficiently ventilated. Ensure that you do not inhale refrigerant vapour fumes.
- We recommend using the **RF452** in a well-lit environment.
- The **RF452** should always be used and stored in a dry place protected from the weather. You should not attempt to use or store the **RF452** in bad weather.
- If the RF404 control unit is installed in a recognised seismic zone, the installer must take the necessary steps to eliminate this risk. The device is not designed to withstand this risk.
- If climatic events (snow, wind, bad weather, frost, sea spray, etc.) are foreseeable, the installer must take all necessary steps to protect the control unit.

3. When in Use

R452A **The RF452 is designed to be used only with R452A refrigerant. It should not be used with a different type of refrigerant.**

When working with the RF452, ensure that you wear appropriate protective accessories, such as goggles with side protection, heatproof gloves and protective clothing.

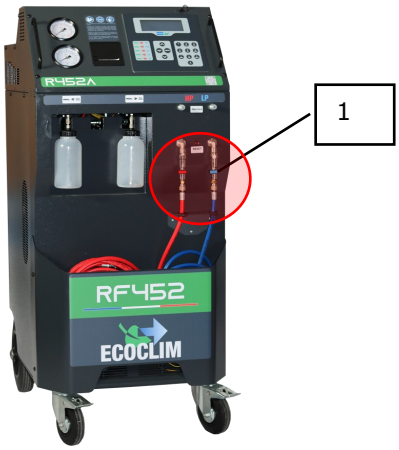
Be particularly vigilant of potential spills or sprays of refrigerant. Given its very low boiling temperature:

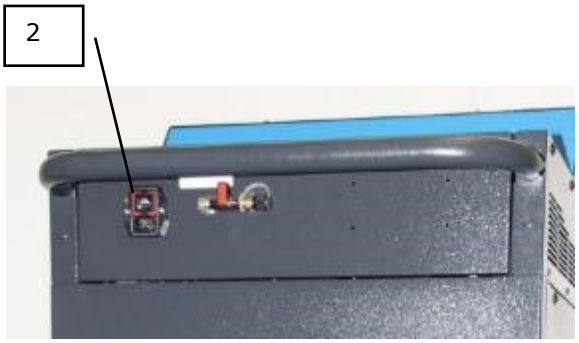
- Contact with the eyes can cause serious damage to eyesight.
- Contact with the skin can lead to serious burns.

Should refrigerant spray in the direction of the eyes or skin, rinse the affected area thoroughly and contact a doctor immediately.

The images below show the main areas of risk when using the **RF452** Unit :

1. Risk of a release of refrigerant.
2. Presence of high-voltage parts.





- Use only refrigerant oil compatible with **R452A** refrigerant.
- Always use the **RF452** with the in-operation protections. Never make any modifications whatsoever to the **RF452**.
- The **RF452** is designed to be used by a single operator. It is advised that other people keep their distance when the unit is in use.
- Always use the couplers attached to the ends of the **HP** and **LP** hoses to connect the unit to the system. Never use these fittings for any other purpose.
- Never remove the refrigerant tank. Never fill the tank with liquid refrigerant over **80%** of its maximum capacity.
- When in operation, visually monitor the level in the recovered oil bottle to prevent it from overflowing.
- Never disconnect the **HP** or **LP** hoses with excessive speed or force. Do not disconnect the hoses when the unit is in operation. Always disconnect the hoses with the greatest of care as they are likely to still contain pressurised refrigerant.
- Never leave the **RF452** stored inside an unventilated vehicle. Certain temperatures and high-pressure conditions will cause the safety valve to open and refrigerant to be released.

4. Power Supply

- Ensure that the power source used includes all the required electrical safety measures, such as connection to ground, circuit breaker, etc.
- If using an electrical extension cable, always ensure that the cable has been fully unwound and that it is not positioned in such a way that may lead to a risk of damage or harm. Always avoid lying cables across passageways or in humid areas.
- Never open the chassis of the **RF452** Unit whilst in operation or connected to a power source.
- Always check the condition of the power cable before connecting the unit to a power source.
- Should a power cut occur whilst the unit is in operation, the operation in progress will not be saved. You will need to start again from the beginning.

Description

1. Technical Specifications

DESCRIPTION		VALUE
Net Weight		145 kg
Dimensions (H x W x D)		1224 x 563 x 810 mm
Vacuum Pump Flow Rate		180 l/min
Vacuum Level		0.01 mbar
Refrigerant Tank Capacity		30 kg
Supply Voltage		230 V
Power Supply Frequency		50 Hz
Max. Power		1000 W
Max. Current		4 A
Min. Working Temperature		5°C
Max. Working Temperature		50°C
Storage Temperature		-30°C à +60°C
Max. Pressure		28 bars
According to French Standard NF E35-421	Recovery speed, vapour phase	14 kg/h
	Recovery speed, liquid phase	49 kg/h
	Recovery efficiency	99,77%
	Pressure once recovery complete	-0.04 bar

The noise level of the unit has been measured to be below **70dB(A)**. Therefore, there is no requirement for the operator to use hearing protection when the unit is in continuous use (see **ISO 3746**). However, it remains the user's responsibility to assess the operator's exposure to noise in conformance with current hygiene and safety regulations.

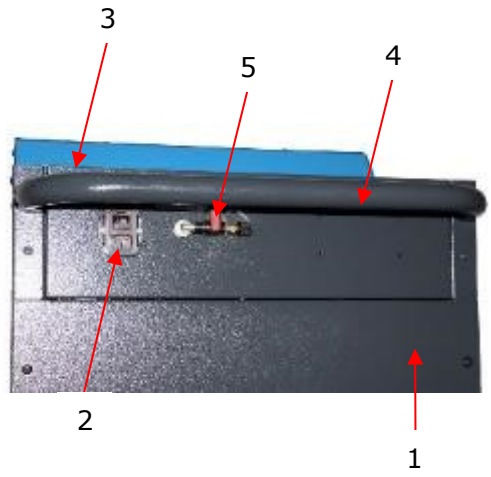
The identification plate on the back of the unit contains the following information:

- The manufacturer's name and address
- The name, model and reference of the unit, its year of manufacture and serial number
- The refrigerant for which it is designed, and the refrigerant group,
- The weight of the unit
- The supply voltage and frequency
- The rated power
- The operating temperature range.
- The operating pressure range.
- PED compliance information.

The **RF452** Unit is equipped with the following main components :

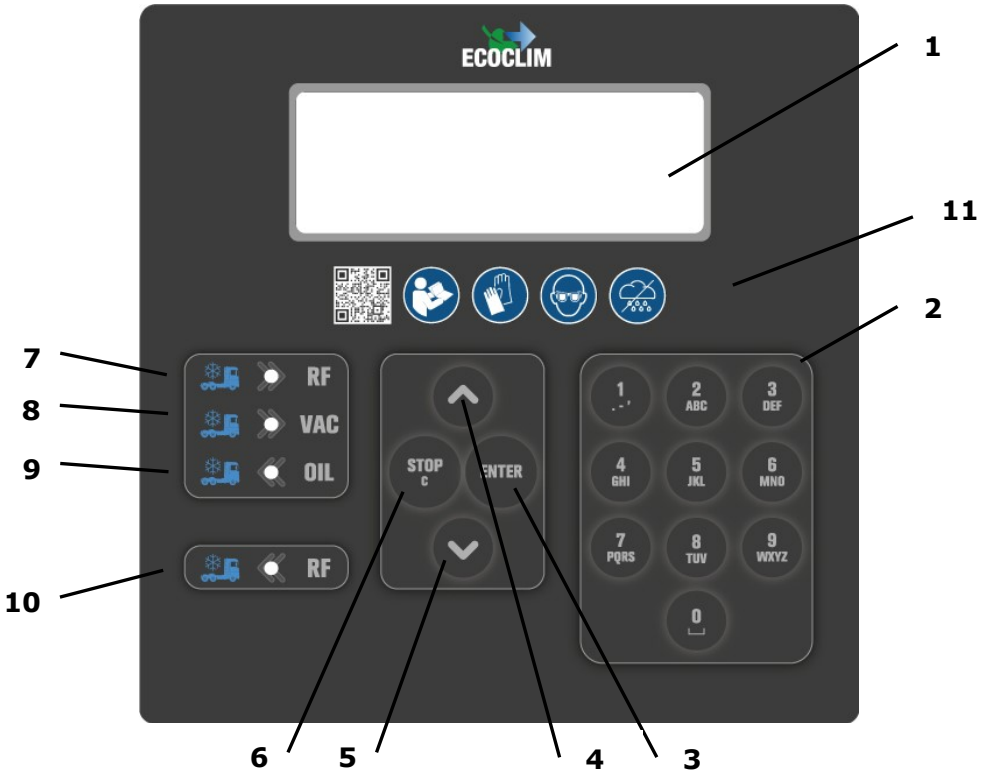
- Digital Control Panel: This controls the various processes using a microprocessor.
- Pressure Gauges **(∅ 80 mm**)
- **HP** and **LP** Charging Hoses: Standard length of **7 metres** and fitted with isolation valves.
- Refrigerant Tank: Maximum useful capacity of **35 kg**. This stores the recycled refrigerant before reuse. It is fitted with an electronically controlled heating element, a safety valve and an electrical purge valve for non-condensables.
- Electronic Refrigerant Scales: This can weigh up to 35 kg of refrigerant with a resolution of 1 g. Precision: ± 0.5%
- Electronic Oil Scales: Resolution 1 g; Precision: ± 1 g.
- Vacuum Pump: This removes air and humidity present in the system.
- Compressor: This recovers the refrigerant from the system to store it in the unit's internal bottle.
- Filter Dryer: This retains the impurities and humidity present in the refrigerant.
- Separator: This separates the recovered oil from the recovered refrigerant.
- 500-ml bottles with measurement markings for new and recovered oil.

2. Equipment Diagram



No.	IDENTIFICATION
1	Rear panel
2	Electrical socket and start/stop switch
3	Storage tray
4	Rear handle
5	Nitrogen port
6	USB port
7	Control panel
8	Front handle
9	HP Valve
10	LP Valve
11	Filter
12	LP Hose
13	HP Hose
14	Front tray
15	Front wheel with brake
16	Lifting bar
17	Recovered oil bottle
18	New oil bottle
19	Inflatable rear wheel
20	Thermal printer
21	LP Pressure Gauge
22	HP Pressure Gauge

3. Control Panel



No.	IDENTIFICATION	FUNCTION
1	Screen	Display menus and functions
2	Numerical Buttons	Edit values
3	**ENTER** Button	Confirm menu selection, functions or values
4	⮝ Button	Scroll up
5	⮟ Button	Scroll down
6	**STOP / C** Button	Stop a function, make corrections and return when programming Holding for 3 seconds interrupts the current process and returns to the start-up screen
7	**RF** LED	Recovery/recycling phase
8	**VAC** LED	Vacuum phase
9	**OIL** LED	New oil injection phase
10	**RF** LED	Refrigerant charging phase
11	Logos instructions	Instructions for use

A flashing LED indicates that the phase in question is in progress.
A continuously lit LED indicates that the phase concerned has been programmed.
An unlit LED indicates that the phase in question has not been programmed or has already finished.

Installation and Prior Checks

1. Component Checks

Once the unit has been removed from its packaging, check that the **RF452** and its accessories are intact and free from damage. If this is not the case, contact **SNDC** immediately.

Make sure that the following accessories are present :

- User Manual
- Laminated factsheet
- Electrical power cable
- Blue **LP** charging hose and **R452A** valve
- Red **HP** charging hose and **R452A** valve
- PED compliance documentation.

Remove the unit from its packaging platform by lifting it using the rear handle and the front lifting bar.
Do not attempt to lift the unit on your own!

⚠ **Handle the unit with care and avoid knocks.**
Never lift the unit using the front handles!

2. Transportation and Handling

When transporting the unit in a vehicle, ensure that the vehicle is suitable for the transportation of such a unit.

⚠ Whilst the heaviest components are in the lower section of the unit to lower its centre of gravity, there is still a possibility that the unit could tip over.

The unit is fitted with four wheels.
To move the unit, simply push it by hand.

⚠ **Always keep the unit in an upright position.**

Transportation in a vehicule :

Weight : 145 kg!

When loading or unloading the unit, take all necessary steps to avoid any risks and hazards and use a suitable ramp.

Do not attempt to lift the unit by yourself!
The unit should always be moved by a minimum of two people and a ramp should always be used

When transporting the unit in a vehicle:

- Lock the brakes on the front wheels,
- Secure the unit using straps.

The image shows an example of how the unit can be stowed in a vehicle. Configurations may vary depending on the vehicle.

Never secure the unit by the front handles !

3. Starting the RF452

Once you have checked that the unit is in good condition, connect the power cable to the socket on the rear of the unit **(1).**

Ensure that the power supply meets the requirements stated on the identification plate.

Start the unit by pressing the start/stop switch.

The control panel will light up after about 10 seconds.

The display will show the start-up screen:

```
Refrigerant -x.xxxkg
New Oil           0 g

Tank          -0.3 bar
```

The screen will show:

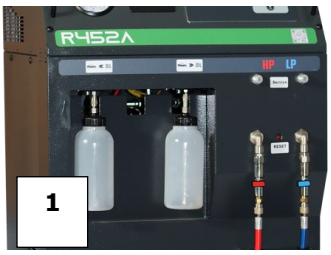
- The amount of refrigerant and new oil available,
- The pressure in the refrigerant tank.

When the tank is empty, the RF452 will display a negative quantity. The **RF452** is designed to be used with a reserve of 2 to 3 kg of refrigerant. Therefore, once the tank has been filled to this level, the value shown (which is the usable weight) will become positive

4. Using the RF452 for the First Time

When the unit is delivered, the tank will be empty. To fill the tank, you will need to perform the «**Transfer of Refrigerant**» process as described in Section ***Transfer of Refrigerant.***

The new oil will be loaded into the injection bottle **(1)**.



⚠ The refrigerant oil for **R452A** refrigerant is highly hygroscopic. To prevent it from deteriorating, avoid leaving it exposed to the open air for long periods of time.

⚠ **Only use oil compatible with R452A refrigerant.**

Note : Upon delivery, the internal components, such as the compressor and the vacuum pump, will already contain the necessary lubrification oil. Only the vacuum pump will require regular maintenance.

Usage Instructions

1. Safety Reminders

- Always ensure that all the necessary operating conditions are met before using the unit.
- Always use the unit in a well-ventilated area. If you are using the unit inside a vehicle, ensure that there is good ventilation and air circulation.
- Always check that the unit and the hoses are in good condition before use.
- For complete safety, always wear the necessary protective equipment when using the unit.
- Always keep an appropriate fire extinguisher near the places where the unit is used and stored.
- Ensure that the unit is connected to a grounded power supply that conforms with current electrical supply regulations.
- Ensure that the unit is sitting on a flat, stable surface to prevent it from tipping over.

2. Connecting the Unit to the Refrigeration System

(1) Connect:

- The unit's **HP** hose to the liquid reservoir of the refrigeration system or the **HP** port.
- The unit's **LP** hose to the **LP** charging port on the refrigeration system.

(2) Open the valve on each charging hose.

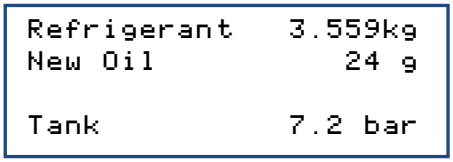
The **HP** and **LP** pressure gauges will show the pressure in the refrigeration system.

Note :

- The **RF452** allows the operator to take into consideration the configuration of the refrigeration circuit by choosing either a single connection (**HP** or **LP**) or a double connection (**HP** and **LP**).
- **If possible, set the refrigeration system in « service » mode to open all valves and facilitate recovery.**

3. Introduction to the RF452's Automatic Cycles

Upon starting the unit, the display will light up and the unit will perform an internal cleaning every 3 start-ups (see ***Internal cleaning*** section) and show the start-up screen:

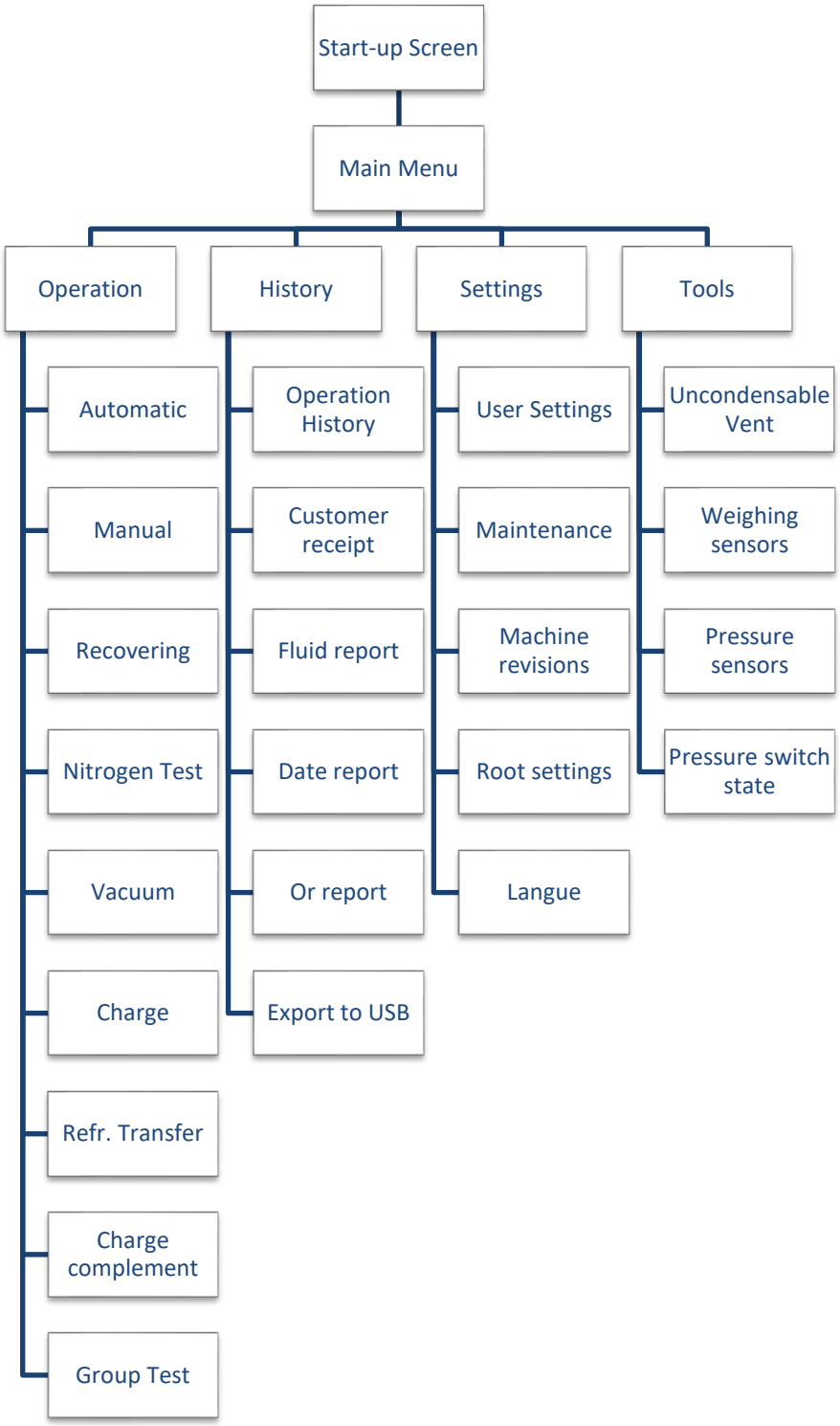


This screen shows:

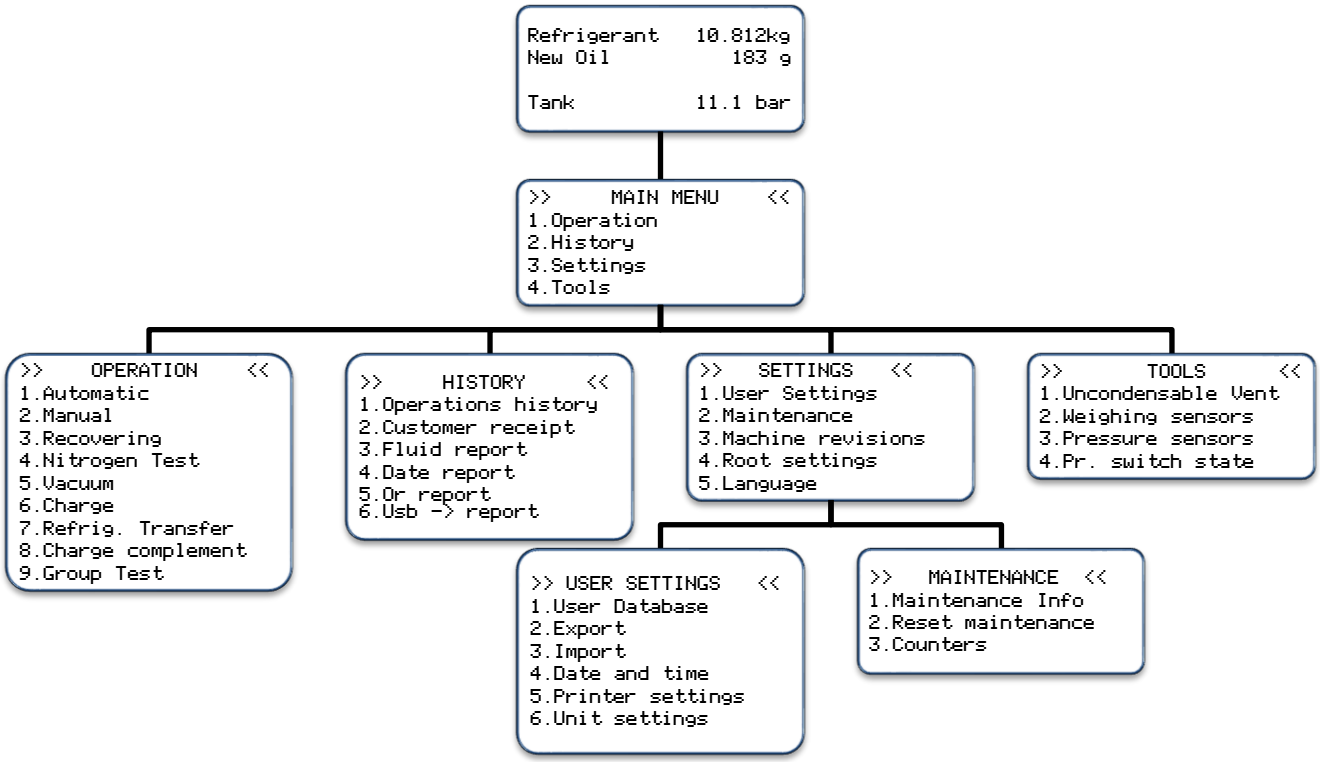
- The amount of refrigerant and new oil available.
- The pressure in the refrigerant tank.

➢ From this screen, press **ENTER** to access the menu.
➢ Any alerts or information messages will be shown before displaying the main menu

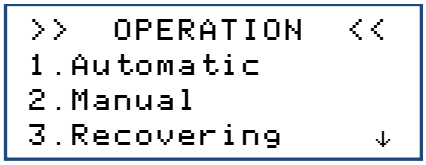
General Introduction to the Menus:



Detailed Diagram of the Menus:



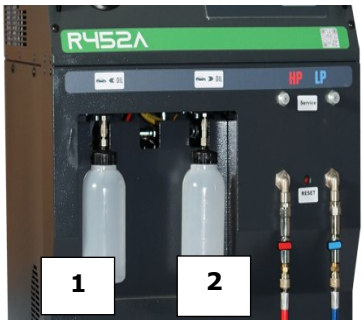
⚠ The presence of a down arrow (↓) in the bottom right of the screen indicates that other menus are available. Press the ▼ button on the keypad to show the rest of the list.



⚠ To select a function, press the corresponding button on the keypad.
Example: Press **1** to access the **« Automatic »** sub-menu.

4. Messages and Fault Codes

Refrigerant level too low ENTER: Continue STOP: Abort	There is not enough refrigerant in the tank to perform the chosen operation. Press **STOP** to exit the operation. See Section ***Transfer of refrigerant*** explaining how to transfer refrigerant to refill the tank.
Refrigerant level too high ENTER: Continue STOP: Abort	This message indicates that the refrigerant tank will soon be full. The unit will not be able to recover a large amount of refrigerant as a result.
Recovering High tank level ENTER: Continue STOP: Abort	The message indicates that the refrigerant tank will soon be full.
Oil level too low ENTER: Continue STOP: Abort	There is not enough new oil available. Add oil to the new oil bottle **(1)** and press **ENTER**.
Waste oil level too high ENTER: Continue STOP: Abort	This message indicates that the recovered oil bottle is almost full. To perform recovery or cleaning operations, you will first need to empty the bottle **(2)**, then press **ENTER** to resume.
RECOVERY TIME OUT ENTER : >>	The timeout for recovery has been reached. Press **ENTER** to stop the operation in progress. Perform a new recovery operation. See section ***Programming a Cycle Manually.***
CHARGE TIME OUT ENTER : >>	The timeout for recovery has been reached. Press **ENTER** to stop the operation in progress. Perform a new recovery operation. See section ***Programming a Cycle Manually***
Waste oil bottle incorrectly inserted Check the bottle ENTER : >>	The waste oil bottle is incorrectly connected or blocked. Check the bottle connection. Press **ENTER** to continue with the current operation.
Please check Maintenance menu	This message will be shown when one (or many) maintenance operations are required: • Filter dryer replacement • Vacuum pump oil replacement • Annual service Press **ENTER** to continue to the start-up screen. Refer to Chapter ***Maintenance*.**



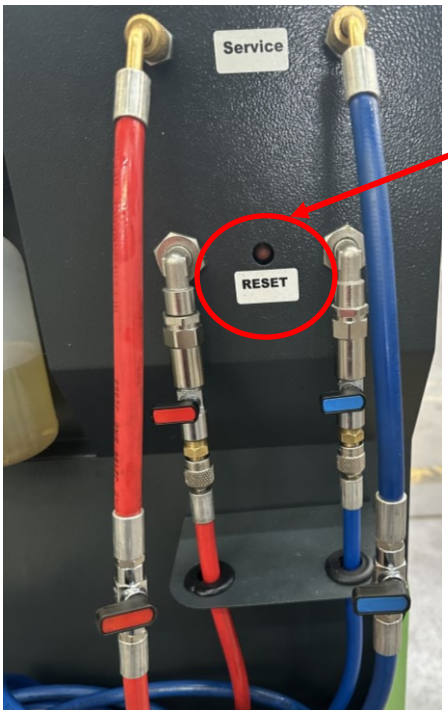
Fault Codes :

CODE	COMPOSANT	DETAIL	POSSIBLE CAUSE
131	**HP** Pressure Switch	Excess pressure: **P>28 bar** Compressor discharge	Tank closed. Refrigerant level too high. Excess non-condensables in the tank. Pressure switch reset activated.

```
    ERREUR 131 :
    OVERPRESSURE
Tank          28 bar
   ENTER: Tank purge
```

Press **ENTER** to degas and drop the tank pressure until it is equal to the pressure in the table below:

TEMP (°C)	THEORETICAL CYLINDER PRESSURE (BAR) R452A
10	7,2
15	7,6
20	9,8
25	11,4
30	13,2
35	15
40	17,1



RESET of pressure switch

Then press the RESET button on the pressure switch to reset it.

Programming Operations

1. Operations Menu

To access the Operations menu, you will need two pieces of information that will be recorded with the chosen operation:

- **Operator ID**: Identifying the operator performing the operation **(4 characters minimum)**
- **Repair Order Number**: Repair order number associated with the chosen operation(s) **(6 characters minimum)**

From the start-up screen, press **ENTER** to access the main menu.

```
>>    MAIN MENU    <<
1.Operation
2.History
3.Settings          ↓
```

Select **1**.

```
Enter technician ID :


1234
```

Enter the Operator ID (**4 characters minimum**).
Press **ENTER.**

```
    Enter number
    Fixing order

OR1234567
```

Enter the Repair Order number (**6 characters minimum**).
Press **ENTER.**

2. Programming an Automatic Cycle

The **RF452** can be programmed to automatically perform a cycle consisting of the following phases:

- Recovery of refrigerant and emptying of used oil.
- Vacuum: the **RF452** will automatically determine the vacuum time.
- Injection of new oil: The **RF452** will inject the same amount of new oil as the amount recovered.
- Refrigerant charging.

From the start-up screen, press **ENTER** to access the main menu.

```
>>   OPERATION    <<
1.Automatic
2.Manual
3.Recovering      ↓
```

Select **1**.

```
>> AUTO OPERATION <<
1.Groups database
2.User database
3.Manual ref qty
```

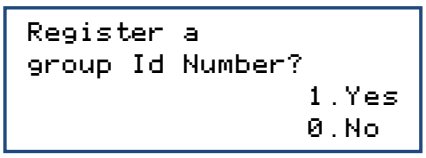
The operator can select:

- A vehicle from the built-in vehicle database (**1**);
- A vehicle from the database created by the user (**2**);
- To input the system capacity manually (**3**).

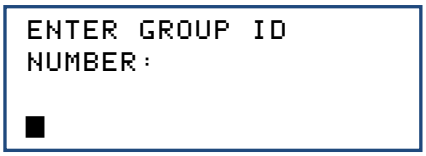
a. Automatic Cycle Using the Built-in Database

```
>> AUTO OPERATION <<
1.Groups database
2.User database
3.Manual ref qty
```

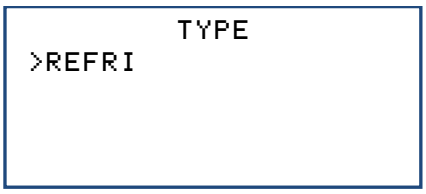
In the **>> AUTO OPERATION <<** menu, select **1**.



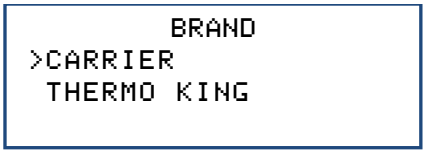
To enter the group registration number, select **1**.
Otherwise, press **0**.



If you have chosen to do so, you can now enter the group registration number.
To enter letters, hold the corresponding number button until the desired letter appears.
Example: **6-M-N-O**
Press the **(C)** button to correct any mistakes.

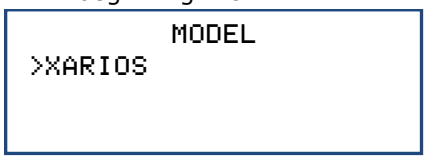


With the down arrow (⮟), select the type of system and confirm by pressing **ENTER**.

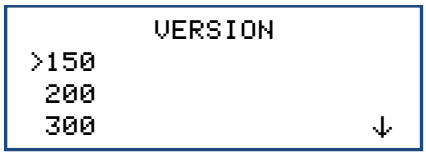


With the down arrow (⮟), select the system brand and confirm by pressing **ENTER**.
Note: Hold the down arrow (⮟) to scroll rapidly down the list.

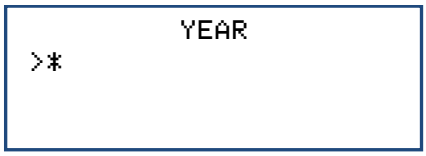
It is possible to scroll quicker using the number pad.
Example: Pressing the number **6** corresponding with letters **MNO** will jump straight to brands beginning with **M**.



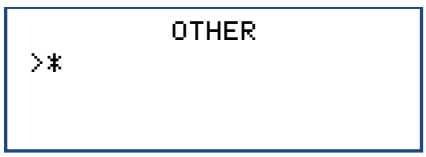
With the down arrow ⮟, select the system model and confirm by pressing **ENTER**.



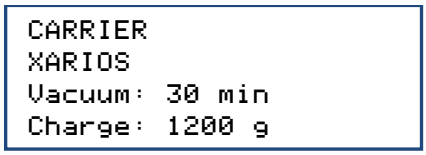
With the down arrow ⮟, select the system version and confirm by pressing **ENTER**.



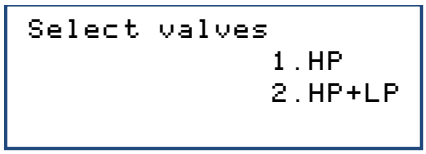
With the down arrow ⮟, select the system desired and confirm by pressing **ENTER**.



With the down arrow ⮟, select the system desired and confirm by pressing **ENTER**.



The screen will show the brand and model of the system selected, the vacuum time and the amount of refrigerant to charge for this group.
Press **ENTER** to confirm.



Select the configuration for the refrigeration circuit (the hoses and system ports used).

Start process ENTER: Yes STOP: No	Press **ENTER** to confirm. Note: You can cancel programming by pressing **STOP**. The screen will then return to the **>> AUTO OPERATION <<** screen.

Operation Sequence: Refer to Section ***Cycle Operation Sequence.***

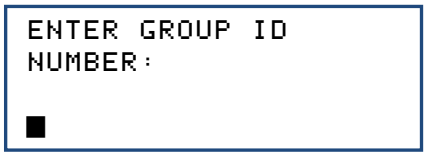
b. Automatic Cycle Using the User Database

>> AUTO OPERATION << 1.Groups database 2.User database 3.Manual ref qty	In the **>> AUTO OPERATION <<** menu, select **2**.
Register a group Id Number? 1.Yes 0.No	To enter the group registration number, select **1**. Otherwise, press **0**.
ENTER GROUP ID NUMBER: ■	If you have chosen to do so, you can now enter the group registration number. To enter letters, hold the corresponding number button until the desired letter appears. *Example:* ***6-M-N-O*** Press the **(C)** button to correct any mistakes.
SELECT GROUP MODEL >GROUP 1 GROUP 2	With the down arrow (▼), select the system and confirm by pressing **ENTER**.
GROUP 1 Vacuum: 20 mn Tightness: 4 mn Charge : 700 g	The screen will show the settings for the chosen system. Press **ENTER** to continue.
Select valves 1. HP 2. HP+LP	Select the configuration for the refrigeration circuit (the hoses and system ports used).
Start process ENTER : Yes STOP : No	Press **ENTER** to confirm.

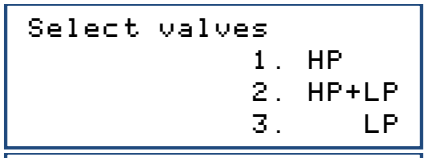
Operation Sequence: Refer to Section ***Cycle Operation Sequence***

c. Automatic Cycle, Manually Entering Amount of Refrigerant

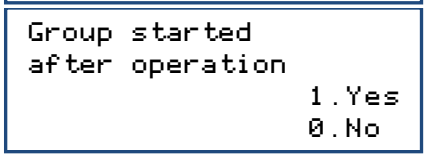
>> AUTO OPERATION << 1.Groups database 2.User database 3.Manual ref qty	In the **>> AUTO OPERATION <<** menu, select **3**.
Register a group Id Number? 1.Yes 0.No	To enter the group registration number, select **1**. Otherwise, press **0**.



If you have chosen to do so, you can now enter the group registration number.
To enter letters, hold the corresponding number button until the desired letter appears.
Example: ***6-M-N-O***
Press the **(C)** button to correct any mistakes.

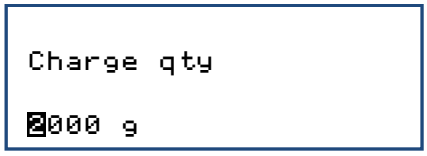


Select the configuration for the refrigeration circuit (the hoses and system ports used).



This window will only appear if (2) HP+LP has been chosen!
Choose whether the system will be started at the end of the cycle for performance tests.

Note : Depending on the user response, the automatic programme will manage the compensation for the refrigerant remaining in the charging hoses and instruct the operator on how to empty and disconnect the hoses at the end of the cycle.



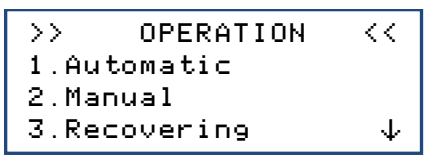
By default, the screen shows the amount of refrigerant to be 2000 g.
To charge a different amount, enter a value and press **ENTER**.

Press **ENTER** to confirm.

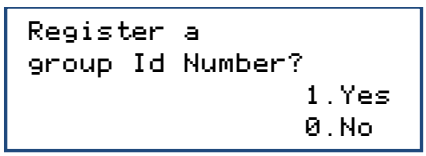
Operation Sequence: Refer to Section ***Cycle Operation Sequence***

3. Programming a Cycle Manually

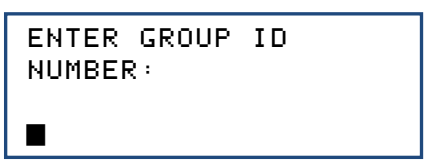
In manual mode, the operator chooses the operations to be performed. For example, the operator could programme a recovery phase before opening a circuit to replace a component.



In the **>>OPERATION<<** menu, select **2**.



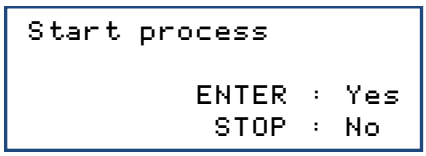
To enter the group registration number, select **1**.
Otherwise, press **0**.



If you have chosen to do so, you can now enter the group registration number.
To enter letters, hold the corresponding number button until the desired letter appears.
Example: **6-M-N-O**
Press the **(C)** button to correct any mistakes.

Select valves 1. HP 2. HP+LP 3. LP	Select the configuration for the refrigeration circuit (the hoses and system ports used).
Recovering 1. Yes 0. No	To programme a recovery phase, select **1**. To continue programming a cycle without a recovery phase, select **0**.
Recovering Pressure control 2 min	By default, the pressure analysis time is set to 2 minutes. To change this, enter the value and confirm by pressing **ENTER**. Note: *This screen will only appear if a recovery phase has been chosen previously*.
Vacuum 1. Yes 0. No	To programme a vacuum phase, select **1**. Otherwise, press **0**.
Vacuum duration 20 min	Enter the desired vacuum time. Note: *This screen will only appear if a vacuum phase has been chosen previously*
Tightness check 4 min	Enter the desired leak test time. *Note: This screen will only appear if a leak test phase has been chosen previously.*
Automatic oil Complement 1. Yes 0. No	The automatic reinjection of oil injects an amount of new oil equal to the amount of oil recovered. To automatically add oil, select **1**. *Note: This screen will not appear unless recovery and* vacuum *have been chosen previously.*
Qty oil to add 0 g	If the automatic reinjection of oil is not selected, the amount of oil to be added to the system will be shown.
Refrigerant charge 1. Yes 0. No	To programme refrigerant charging, select **1**. Otherwise, select **0**. *Note: If the automatic reinjection of oil was programmed previously, this screen will not appear; the refrigerant to be charged will be programmed automatically.*
Charge qty 2000 g	By default, the amount of refrigerant to be charged is set to 2000 grams. To change this, enter a value and confirm by pressing **ENTER**.
Group started after operation 1.Yes 0.No	Choose whether the system will be started at the end of the cycle for performance tests. *Note: This window will only appear if a charge has been programmed and the coupler configuration of **(2) HP+LP** has been chosen.*

Note : Depending on the user response, the automatic programme will manage the compensation for the refrigerant remaining in the charging hoses and instruct the operator on how to empty and disconnect the hoses at the end of the cycle.



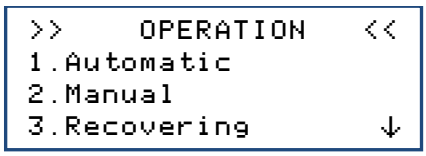
Press **ENTER** to start the programmed cycle.

Operation Sequence: Refer to Section ***Cycle Operation Sequence***

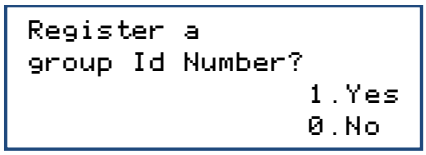
a. Refrigerant Recovery

By choosing this function, the operator can empty the refrigerant from the system before opening the circuit to carry out repairs.

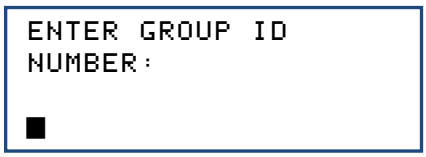
The unit must be connected to the refrigeration system using the **HP** and **LP** hoses**.**



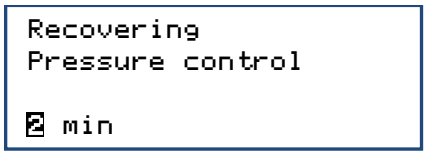
In the **>>OPERATION<<** menu, select **3**.



To enter the group registration number, select **1**.
Otherwise, press **0**.



If you have chosen to do so, you can now enter the group registration number.
To enter letters, hold the corresponding number button until the desired letter appears.
Example: ***6-M-N-O***
Press the **(C)** button to correct any mistakes.



By default, the pressure analysis time is set to 2 minutes.
To change this, enter a value and confirm by pressing **ENTER**.

Press **ENTER** to start the cycle.

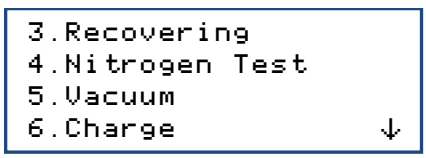
Operation Sequence: Refer to Section ***Cycle Operation Sequence***

b. Charging a System after Repairs

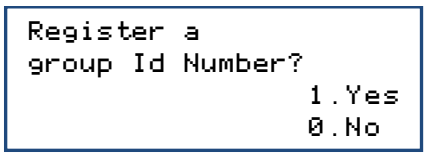
If repairs are carried out that require the refrigeration circuit to be opened, once repairs are complete, the operator will be able to:

- Inject oil into the system;
- Charge the system with refrigerant.

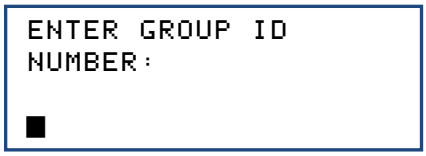
The unit must be connected to the refrigeration system using the **HP** and **LP** hoses. Once the charging process is complete, the unit will ask the operator to start the system to finish the charge and test performance.



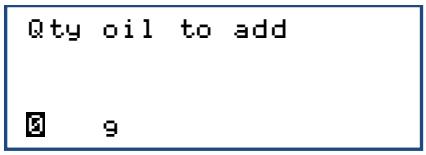
In the **>>OPERATION<<** menu, press **6**.



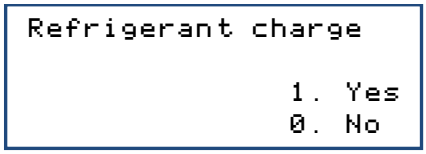
To enter the group registration number, select **1**.
Otherwise, press **0**.



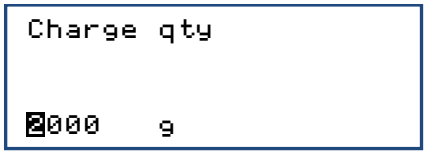
If you have chosen to do so, you can now enter the group registration number.
To enter letters, hold the corresponding number button until the desired letter appears.
Example: ***6-M-N-O***
Press the **(C)** button to correct any mistakes.



By default, the amount of oil to be added is set to 0 g.
To change this, enter a value and press **ENTER**.



To programme the charging of refrigerant, select **1**.
Note: If an injection of oil has been programmed previously, this screen will not appear; the amount to be charged will be programmed automatically.



By default, the amount of refrigerant to charge is set to 2000 grams.
To change this, enter a value then press **ENTER**.

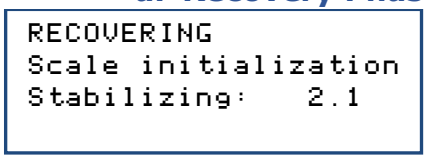
Press **ENTER** to start the programmed cycle.

Note : It is essential to perform a vacuum to inject oil.

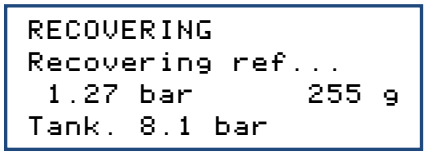
Operation Sequence: Refer to Section ***Cycle Operation Sequence***

4. Cycle Operation Sequence

a. Recovery Phase

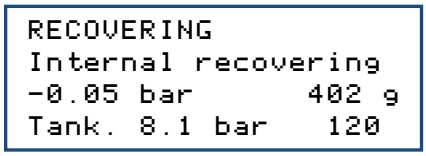


Before starting the recovery phase, the unit will initialise the scales and check that the measurement is stable. If the **RF452** is subject to movement, this stabilisation could take some time due to the movement of liquid in the tank.



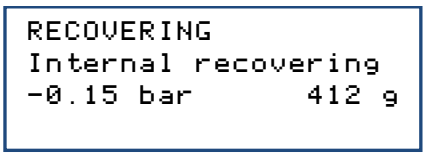
During the recovery phase, the screen will show:

- The system pressure;
- The amount of refrigerant recovered;
- The tank pressure

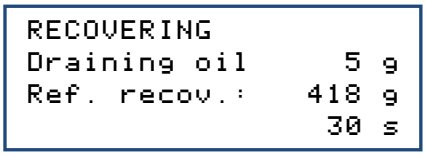


When the system pressure drops below **-0.05 bar**, the unit will analyse the pressures for the programmed time.

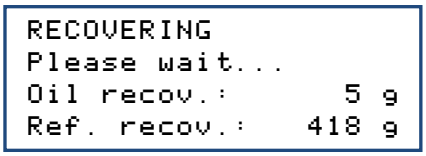
Note : During this analysis phase, if the pressure exceeds **0.2 bar** once again, the **RF452** unit will automatically restart the recovery phase.



The unit will extract the refrigerant from the internal separator.

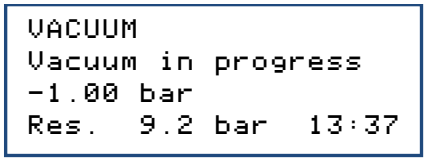


The unit will empty the recovered oil into the corresponding bottle.



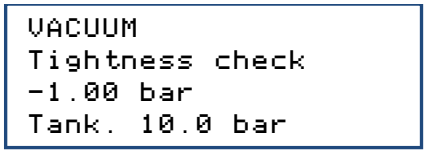
The display shows the amounts of refrigerant, and oil recovered.

b. Vacuum Phase



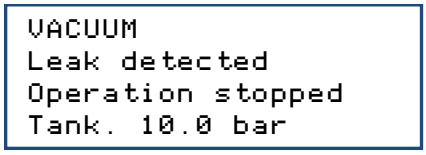
During the vacuum phase, the screen will show:

- The system pressure;
- The pressure in the refrigerant tank;
- The remaining vacuum time.



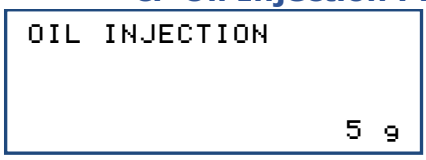
After vacuum, the unit will carry out a leak test for the programmed time. The screen will show:

- The system pressure;
- The pressure in the refrigerant tank;
- The remaining test time.



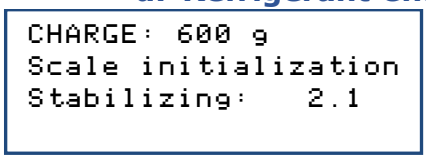
During the leak test, if the pressure exceeds **-0.8 bar**, the cycle will stop, and the unit will display a warning message.

c. Oil Injection Phase

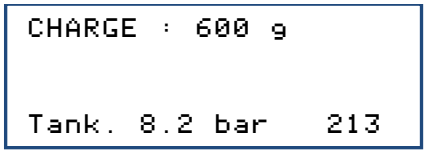


The unit will inject the programmed amount of oil.

d. Refrigerant Charging Phase



Before beginning the charging phase, the unit will initialise the scales and check that the measure is stable. If the unit is subject to movement, this stabilisation could take some time due to the movement of liquid in the tank.



The screen will show the tank pressure, and the amount of refrigerant charged into the system over the course of the charging phase.

e. System Test and Hose Emptying Phase

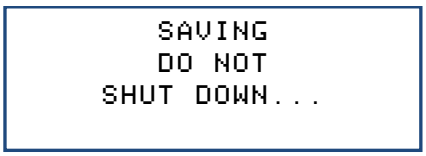
The operator can test the system performance and measure the **HP** and **LP** pressures when in operation.

CHARGE: 600 g > Start group ENTER: >>	Start the refrigeration system and proceed to monitor performance. Once the check has been completed, press **ENTER**.
CHARGE: 600 g Hoses recovering Close HP valve ENTER: >>	After checking the pressures; With the system in operation, close the valve on the **HP** hose, then press **ENTER**.
CHARGE: 600 g Hoses recovering 6.30 bar 30	The **RF452** uses pulses to open the electro-valves connecting the HP and LP hoses. The refrigeration system draws the refrigerant whilst in operation. The number of pulses remaining will be displayed in the bottom left of the screen.
CHARGE: 600 g Hoses recovering Close LP valve ENTER: >>	Close the valve on the **LP** hose, then press **ENTER**.
CHARGE: 600 g Hoses recovering 0.20 bar	The hoses are now isolated from the refrigeration system. The **RF452** will now empty the remaining refrigerant from the two hoses.
SAVING DO NOT SHUT DOWN...	The unit records the intervention data. Wait a few seconds.
Operation finished ENTER: >>	The process is complete. The **RF452** will print out a ticket summarising the operations carried out and the display will return to the **>>OPERATION<<** menu.

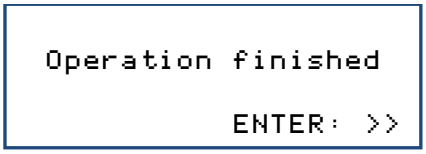
End of operation
Stop the group.
The hoses are empty. The operator can disconnect them from the group in complete safety.

f. Emptying the Hoses without a System Test

CHARGE: 600 g Charge complete ENTER: >>	Once the system is charged with refrigerant, the unit will emit a sound and show an information message. Press **ENTER**.
CHARGE: 600 g Hoses recovering Close valves ENTER: >>	Close the valves on the **HP** and **LP** hoses to isolate them from the refrigeration system. Then, press **ENTER**.
CHARGE: 600 g Hoses recovering 2.78 bar	The unit will empty the refrigerant remaining in the two hoses.



The unit records the intervention data.
Wait a few seconds.



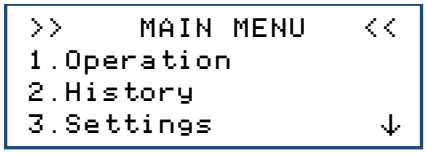
The process is complete. The **RF452** will print out a ticket summarising the operations carried out and the display will return to the **>>OPERATION<<** menu.

The hoses are now empty, and the operator can safely disconnect them and replace the caps on the system charging ports.

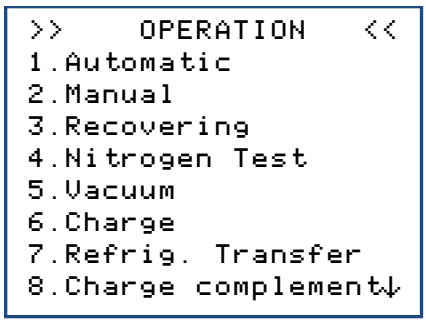
5. Charge Complement

This operation adds R452A refrigerant to the unit. It is done by low pressure in the circuit and takes place with the unit's motor running.

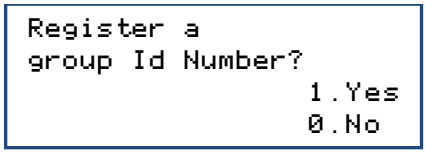
From the start-up screen, press **ENTER** to access the main menu.



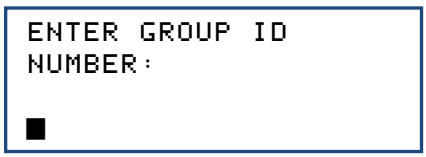
Select **1**.



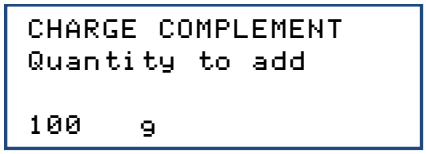
Select **8**.



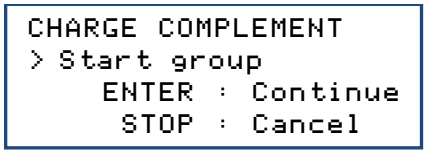
To enter the group registration number, select **1**.
Otherwise, press **0**.



If you have chosen to do so, you can now enter the group registration number.
To enter letters, hold the corresponding number button until the desired letter appears.
Example: ***6-M-N-O***
Press the **(C)** button to correct any mistakes.



Enter the quantity of refrigerant to be added.
Then press **ENTER**.



Start the group.
Then press **ENTER**.

CHARGE COMPL.: 100g Scale initialization Stabilisation : 2.1	Before beginning the charging phase, the unit will initialise the scales and check that the measure is stable. If the unit is subject to movement, this stabilisation could take some time due to the movement of liquid in the tank.
CHARGE COMPL.: 100g 30 g	The screen will show the amount of refrigerant charged into the system over the course of the charging phase.

Note : Once the additional charge has been made, allow the group to stabilise and check its **HP** and **LP** pressures on the pressure gauges.

COMPLEMENT FINISHED 1: Hoses recovery 0: New charge compl.	To fill up with additional refrigerant, select **0**. To complete the operation, select **1**.
COMPLEMENT FINISHED Close HP valve ENTER : Continue	With the group running, close the **HP** hose valve, then press **ENTER**.
COMPLEMENT FINISHED 6.30 bar 30	The **RF452** uses pulses to open the electro-valves connecting the HP and LP hoses. The refrigeration system draws the refrigerant whilst in operation. The number of pulses remaining will be displayed in the bottom left of the screen.
COMPLEMENT FINISHED Close LP valve ENTER : Continuer	Close the **LP** hose valve, then press **ENTER**.
COMPLEMENT FINISHED 0.20 bar	The hoses are now isolated from the refrigeration system. The **RF452** will empty the remaining refrigerant from the two hoses.
SAVING DO NOT SHUT DOWN...	The unit records the intervention data. Wait a few seconds.
Operation finished ENTER: >>	The process is complete. The **RF452** will print out a ticket summarising the operations carried out and the display will return to the **>>OPERATION<<** menu.

End of operation

Stop the group.

The hoses are empty. The operator can disconnect them from the group in complete safety.

6. Transfer of Refrigerant

This function fills the tank in the **RF452** using a bottle of virgin refrigerant.

From the start-up screen, press **ENTER** to access the main menu.

```
>>    MAIN MENU   <<
1.Operation
2.History
3.Settings          ↓
```

Select **1**.

```
>>    OPERATION   <<
1.Automatic
2.Manual
3.Recovering
4.Nitrogen Test
5.Vacuum
6.Charge
7.Refrig. Transfer ↓
```

Select **7.**

```
REFRIGERANT TRANSFER
Qty to transfer
Maximum :
1200  g
```

The screen shows the maximum amount that can be added to the tank.
Enter the amount of refrigerant to transfer and press **ENTER**.

```
REFRIGERANT TRANSFER
Prep in progress
Hoses vacuum
Please wait...  009s
```

The **RF452** performs a vacuum drawing of the hoses to eliminate non-condensables.

```
REFRIGERANT TRANSFER
> Connect HP Hose
>Open cylinder valve
1200  g         ENTER
```

(1) Connect the **HP** hose to the bottle of **R452A** refrigerant.
(2) Open the valve on the **HP** hose.
(3) Open the tap on the bottle.
Press **ENTER**.

```
REFRIGERANT TRANSFER
Scale initialization
Stabilizing
1200  g         ENTER
```

The unit will proceed to initiate and stabilise the scales before beginning the transfer.

```
REFRIGERANT TRANSFER
 Please wait...
 4.8 bar        648 g
Tank. 10.2 bar
```

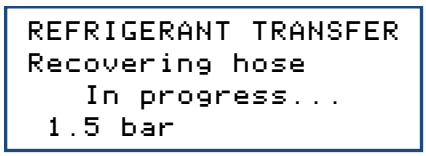
The screen will show the amount transferred in real time.

```
REFRIGERANT TRANSFER
Cylinder empty
-0.28 bar       942 g
Tank. 11.3 bar
```

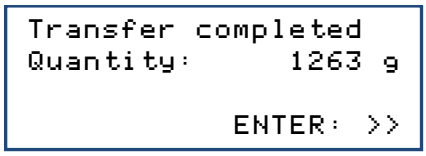
If the bottle becomes empty before the desired amount of refrigerant has been transferred, the screen will display this message.

```
REFRIGERANT TRANSFER
Recovering hose
> Close cylinder
Tank. 11.2 bar
```

This message will be shown when the programmed amount has been transferred or if the bottle is empty.
Close the tap on the bottle and press **ENTER**.



The **RF452** will recover the refrigerant contained in the **HP** hose.



The screen will show the total amount charged in the tank. This includes the amount programmed by the operator, as well as the amount recovered from the HP hose and the circuit in the **RF452** itself.

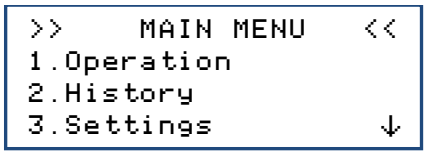
Operation Complete

- The unit will print out a ticket.
- Close the valve on the HP hose and disconnect it from the refrigerant bottle.
- Press **ENTER** to return to the **>>OPERATION<<** menu.

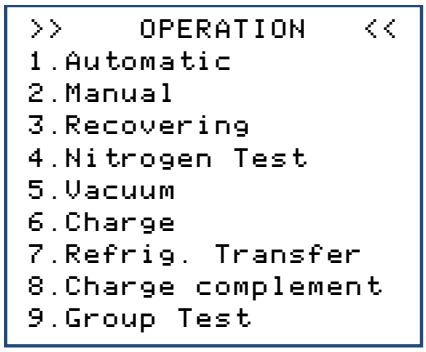
7. Group Test

The operator can test the system performance and measure the **HP** and **LP** pressures whilst the system is in operation.

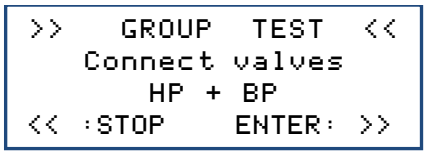
From the start-up screen, press **ENTER** to access the main menu.



Select **1**.

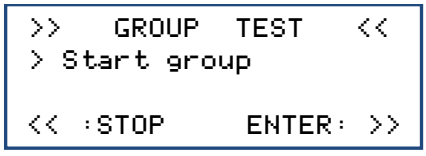


Select **9**.

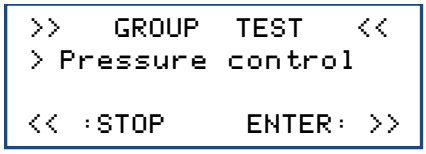


Connect the **HP** and **LP** hoses to the **HP** and **LP** ports on the refrigeration system and open the valves.
Press **ENTER**.

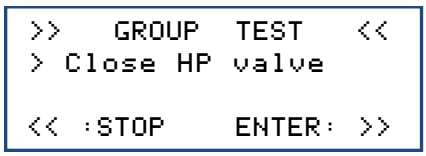
Note : The **HP** and **LP** pressure gauges show the system pressure.



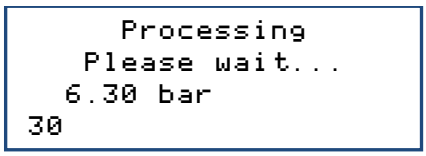
Start the system and press **ENTER**.



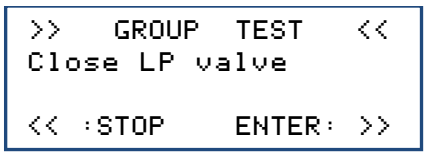
Check performance of the system
Once the test is complete, press **ENTER**.



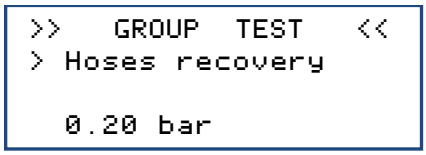
Close the valve on the **HP** hose, then press **ENTER**.



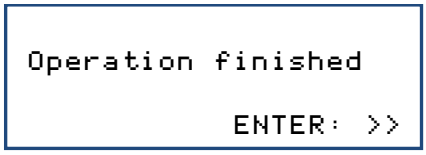
The **RF452** uses pulses to open the electro-valves connecting the HP and LP hoses. The refrigeration system draws the refrigerant whilst in operation.
The number of pulses remaining will be displayed in the bottom left of the screen.



Close the valve on the **LP** hose, then press **ENTER**.



The hoses are now isolated from the refrigeration system.
The **RF452** will empty the remaining refrigerant from the two hoses.



The operation is complete.
Press **ENTER** to return to the **>>INTERVENTION<<** menu.

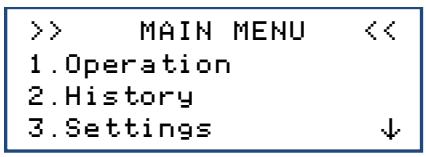
End of operation
Stop the unit.
The hoses are empty. The operator can safely disconnect them from the unit and replace the plugs in the unit's charging ports.

8. Nitrogen Test

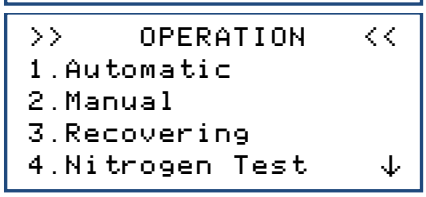
The nitrogen port on the back of the unit should only be used with pure nitrogen (N2) or hydrogenated nitrogen (NIDRON 5).

The pressure applied to the nitrogen port must not exceed 15 bar.

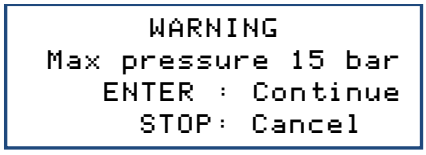
The Nitrogen Test menu provides the function to test for leaks with the system under pressure.



Select **1**.



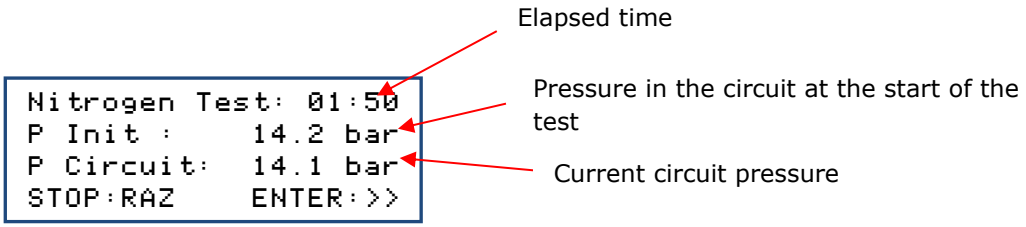
Select **4**.



The pressure applied to the nitrogen port must not exceed 15 bar.
Press **ENTER**.

Connect valves HP + LP ENTER : Continue STOP : Cancel	Connect the **HP** and **LP** hoses to the refrigeration system charging ports **(1)** and tighten the wheels on the couplers **(2)**. Press **ENTER**.
Connect nitrogen ENTER: >>	Connect the bottle of nitrogen to the nitrogen port on the back of the unit. Press **ENTER**.
Open slowly Nitro. valve:15b max Manifold P: 1.50 bar ENTER: Continue	Slowly open the tap on the bottle of nitrogen and the nitrogen valve on the back of the **RF452** to pressurise the unit, taking care to not exceed the maximum pressure of 15 bar. Press **ENTER.**
Close Nitrogen valve ENTER: Start test	Press **ENTER** to start the Nitrogen test.

Pressure test in progress.



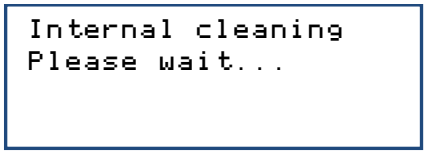
If you wish to discount the time taken for the circuit pressure to stabilise, it is possible to reset the clock and the initial circuit pressure by pressing the **STOP** button.

Once the test is finished, press **ENTER.**

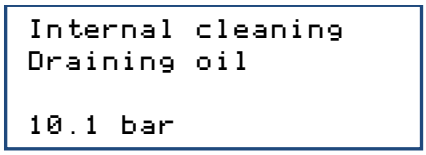
Close Nitrogen tank ENTER: >>	Close the bottle of nitrogen. Press **ENTER**.
Disconnect Nitro. ENTER: >>	Disconnect the bottle from the nitrogen port on the back of the **RF452**. Press **ENTER**.
Open slowly Nitro. Valve 11.3 bar ENTER: >>	Slowly open the nitrogen valve on the back of the unit to empty the circuit. Monitor the circuit pressure on the screen. Press **ENTER**.
Close Nitro. Valve ENTER: >>	Close the nitrogen valve on the back of the **RF452**. The operation is finished. Press **ENTER** to return to **>>INTERVENTION<<** menu.

9. Internal cleaning

When the unit is started up, it performs an internal cleaning every 3 start-ups.



Wait during the entire internal cleaning operation.



At the end of the cleaning operation, the unit drains the waste oil. The waste oil is propelled by a very low proportion of gaseous refrigerant **R452A**.

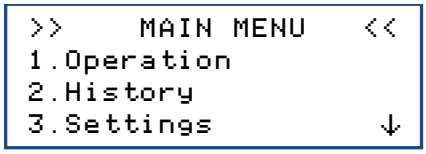
At the end of the draining process, the screen will display to the home page.

History

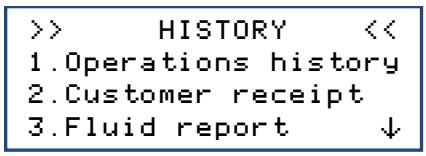
1. Operation History

The Operation History lists all the previous operations carried out using the **RF452**. From this menu, it is possible to reprint the ticket corresponding to a past operation.

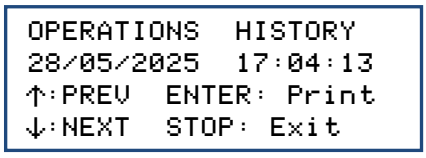
From the start-up screen, press **ENTER** to access the main menu.



Select **2**.



Select **1**.

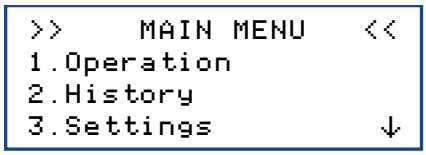


Use the up and down arrows (▲ and ▼) to scroll up and down the saved operations.
When you find the desired operation, press **ENTER** to print the corresponding ticket.
Press **STOP** to return to the menu.

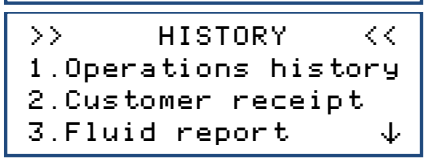
2. Customer Receipt

This function allows you to print a ticket for the customer which does not show the amounts of oil and refrigerant recovered.

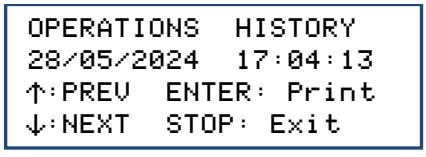
From the start-up screen, press **ENTER** to access the main menu.



Select **2**.



Select **2**.

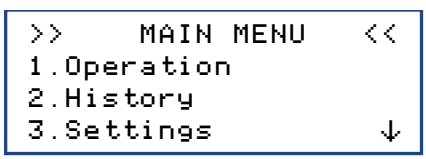


Use the up and down arrows (▲ and ▼) to scroll up and down the saved operations.
When you find the desired operation, press **ENTER** to print the corresponding ticket.
Press **STOP** to return to the menu.

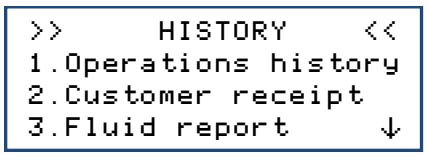
3. Fluid Report

This screen shows the total amount of refrigerant recovered, charged or transferred for the previous twelve months.

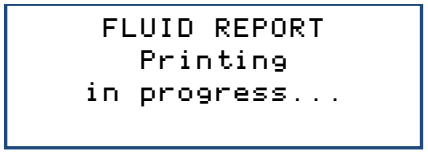
From the start-up screen, press **ENTER** to access the main menu.



Select **2**.



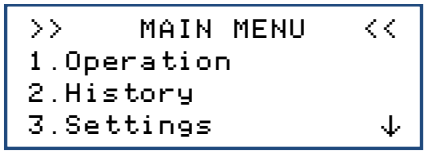
Select **3**.



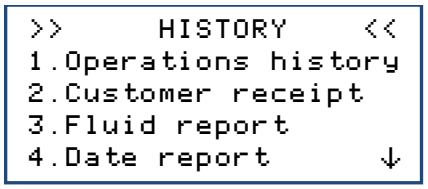
The unit prints the fluid balance for the last 12 months, then returns to the **>> HISTORY <<** menu.

4. Operations by Date

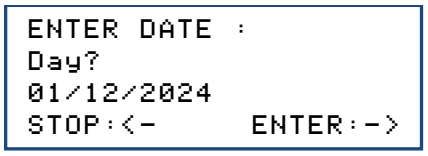
This function prints all operations for a given date chosen by the operator.
From the start-up screen, press **ENTER** to access the main menu.



Select **2**.



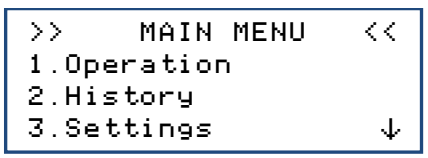
Select **4**.



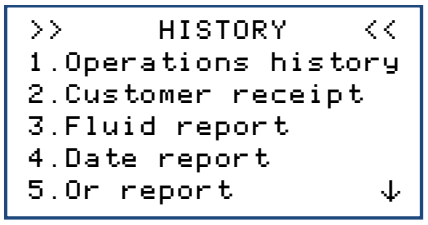
Enter the date and confirm by pressing **ENTER.** The **RF452** will then print all the operations carried out on that date.

5. Operations by Repair Order Number

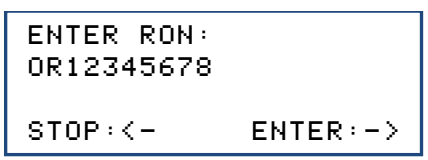
This function prints all operations for a given Repair Order Number entered by the operator.
From the start-up screen, press **ENTER** to access the main menu.



Select **2**.



Select **5**.

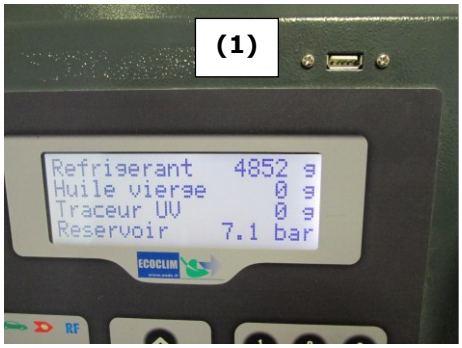


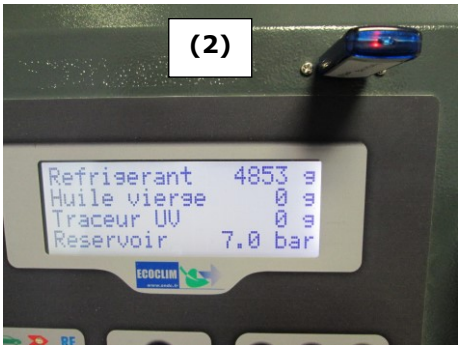
Enter a Repair Order Number (RON) between 6 characters minimum and confirm by pressing **ENTER.** The unit will print all the operations corresponding to that RON.

6. Export => USB

With this function, it is possible to export an Excel file of previous operations to a USB stick.

(1) Remove the cap from the USB port above the control panel.
(2) Connect a USB stick.





From the start-up screen, press **ENTER** to access the main menu.

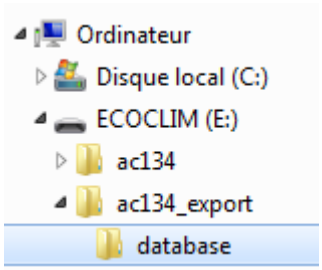
>> MAIN MENU << 1.Operation 2.History 3.Settings ↓	Select **2**.
>> HISTORIQUE << 1.Hist Interventions 2.Tickets clients 3.Bilan fluide 4.Bilan date 5.Bilan OR 6.Export -> USB	Select **6**.
EXPORT IN PROGRESS	The unit will export the data.
15 operations exported	Once the export is complete, the display will show this message and then return to the **>> HISTORY <<** screen.

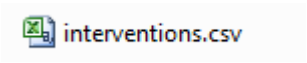
Note : If a USB stick is not connected when attempting the export data, the following message will be displayed :

ERROR: USB drive missing	Connect a USB stick and restart the export. If the error persists, restart the **RF452** unit.

Using the Data:

- Remove the USB stick from the **RF452** and plug it into a computer.
- Navigate to the USB drive and then to the folder entitled **RF452_export/database.**
- Open the Excel file entitled « interventions.csv ».





Each line corresponds to a past operation and will contain information such as the date, time, amounts of refrigerant recovered, charged or transferred and vacuum time.
Pressures are measured in millibars and the refrigerant quantities are measured in grams.

Settings

1. User Settings

a. User Database

The operator can create their own group database.

From the start-up screen, press **ENTER** to access the main menu.

```
>>    MAIN MENU   <<
1.Operation
2.History
3.Settings          ↓
```

Select **3**.

```
>>    SETTINGS    <<
1.User Settings
2.Maintenance
3.Unit revisions    ↓
```

Select **1**.

```
>> USER SETTINGS  <<
1.User database
2.Export
3.Import            ↓
```

Select **1**.

```
>>  USER DATABASE <<
1.New group
2.Edit group
3.Delete group
```

To create a new group, select **1**.

```
  CREATE NEW GROUP
Enter group name:

■
```

Enter the name of the vehicle using the number keys.
Example: To enter the letter A, hold the (2) button until the letter appears **(2-A-B-C-2-A...)**
Once the name of the vehicle has been entered, press **ENTER**.

```
  CREATE NEW GROUP
Vacuum
Vacuum duration
▣0  min
```

Setting the vacuum duration
By default, the vacuum time is set to 20 minutes. To change this, enter the new duration and press **ENTER**.

```
  CREATE NEW GROUP
Vacuum
Tightness check
4  min
```

Setting the leak test time
By default, the leak test time is set to 4 minutes. To change this, enter the new duration and press **ENTER**.

```
  CREATE NEW GROUP
Oil Qty:

▣  g
```

Setting the oil injection quantity
By default, the charge quantity is set to 0 gram. To change this, enter the quantity of oil to be injected and press **ENTER**.

```
  CREATE NEW GROUP
Qty charge:

▣000  g
```

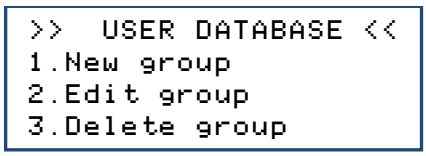
Setting the charge
By default, the charge quantity is set to 2000 grams. To change this, enter the new charge quantity and press **ENTER**.

```
GROUP 1
Vacuum: 30min + 4min
Oil: 5 g
Charge: 2000 g
```

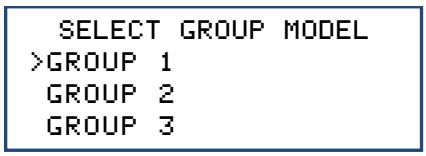
The screen now displays the configured settings.
To go back to a setting and change it, press **STOP**.
To continue, press **ENTER**.

To confirm the settings, press **ENTER**.
The group has now been added to the user database.

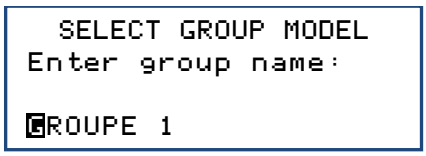
Editing an Existing Vehicle



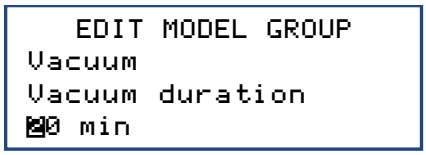
From the **>>USER DATABASE<<** menu, select **2**.



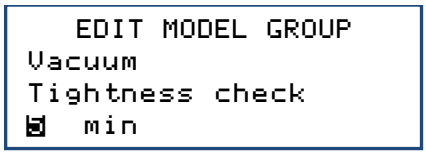
With the down arrow (▼), select the vehicle to edit and press **ENTER**.



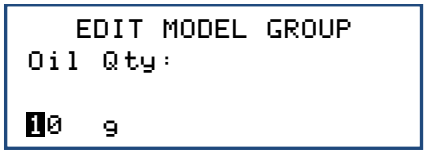
If required, enter the new name of the vehicle and press **ENTER**.



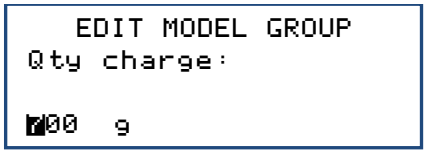
Entire the desired vacuum duration and press **ENTER**.



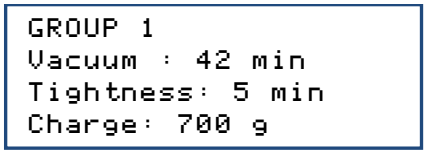
Entire the desired leak test time and press **ENTER**.



Enter the desired oil quantity and press **ENTER.**



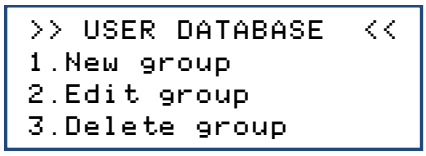
Enter the desired refrigerant charge quantity and press **ENTER**.



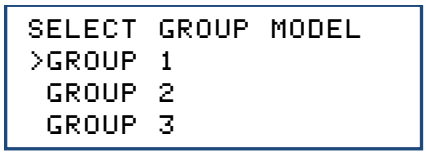
The screen will now show the chosen settings.
To go back and change a setting, press **STOP**.
To continue, press **ENTER**.

To confirm the settings, press **ENTER**.
The group has now been successfully edited.

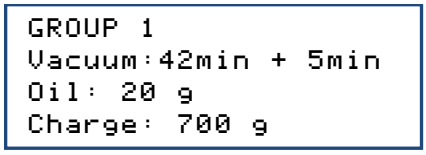
Deleting a Vehicle



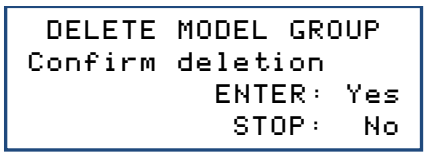
From the **>>USER DATABASE<<** menu, select **3**.



Using the down arrow (▼), select the group to delete and press **ENTER**.



The screen will now show the settings of the chosen group.
Press **ENTER** to continue.
To return to the group selection screen, press **STOP**.



To confirm deletion of the group, press **ENTER**. The group has now been deleted.
To cancel, press **STOP**.

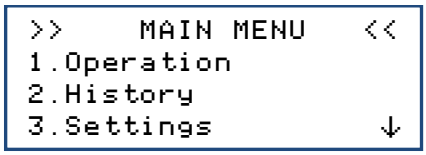
b. Exporting Settings

From this menu, it is possible to export the **RF452** settings to a USB stick. The settings that can be exported are:

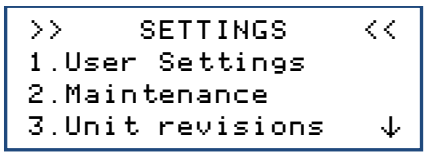
- The personalised group database
- The printing settings (ticket header)

To use this function, connect a USB stick to the unit.

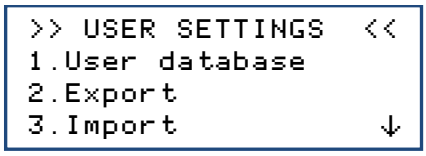
From the start-up screen, press **ENTER** to access the main menu.



Select **3**.

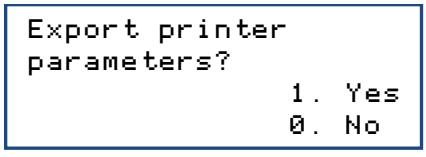


Select **1**.



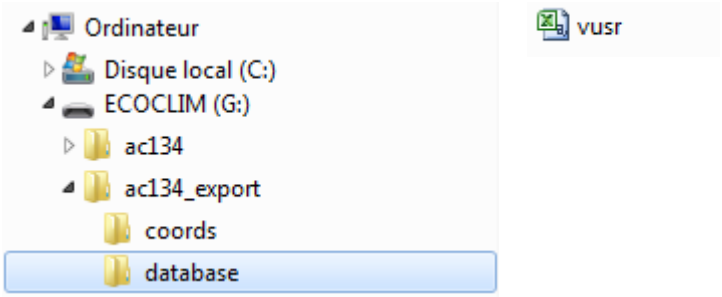
Select **2**.

To export the personalised group database, press **1**.

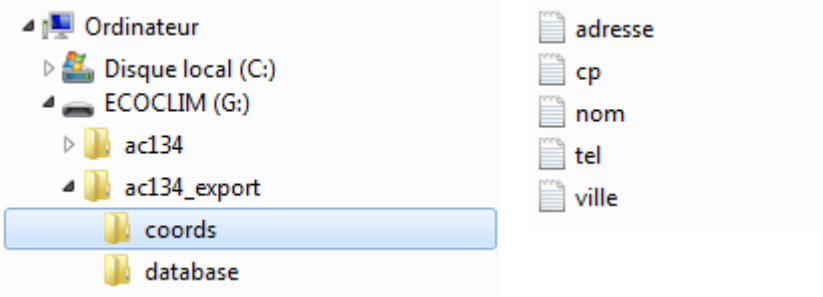


To export the printer settings (ticket header), press **1**.

- Remove the USB stick from the **RF452** and connect it to a computer.
- Navigate to the USB stick and then to the folder entitled **ac134_export/database.**
- Open the Excel file « vusr.csv ». This table lists the vehicles created by the user, with their respective settings.



The printer settings are exported in the form of text files, which can be seen in the folder entitled **ac134_export/coords.**



Note : If the USB stick already contains files with the same name as those shown above, these will be overwritten automatically when exporting data from the **RF452**.

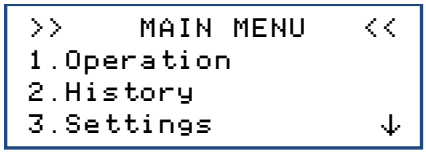
c. Importing Settings

From this menu, it is possible to import unit settings using a USB stick. The settings that can be imported are:

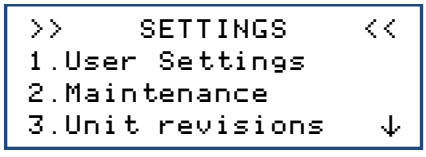
- The personalised vehicle database
- The printing settings (ticket header)

To use this function, ensure that the settings that you wish to import have been correctly loaded onto a USB stick. Then, connect the USB stick to the USB port on the **RF452**.

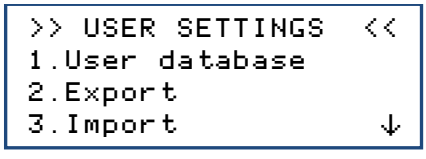
From the start-up screen, press **ENTER** to access the main menu.



Select **3**.



Select **1**.



Select **3**.

Enter serial number To import: ■	Enter the serial number of the unit that the data has been exported from. Press **ENTER** to confirm.
Import User groups database? 1. Yes 0. No	To import the personalised vehicle database, press **1**.
Import printer settings? 1. Yes 0. No	To import the printer settings (ticket header), press **1**.

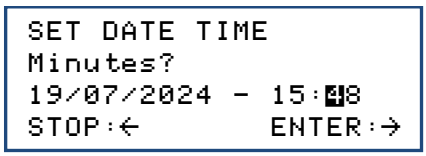
Note : Importing any settings will automatically overwrite any pre-existing settings on the **RF452** unit.

d. Date and Time Settings

This menu allows you to set the date and time on the **RF452**.

From the start-up screen, press **ENTER** to access the main menu

>> MAIN MENU << 1.Operation 2.History 3.Settings ↓	Select **3**.
>> SETTINGS << 1.User settings 2.Maintenance 3.Unit versions ↓	Select **1**.
>> USER SETTINGS << 1.User database 2.Export 3.Import 4.Date and time ↓	Select **4**.
SET DATE TIME Day? 19/02/2015 - 15:48 STOP:← ENTER:→	Enter the number of the day and press **ENTER**.
SET DATE TIME Month ? 19/07/2024 - 15:48 STOP:← ENTER:→	Enter the number of the month and press **ENTER**.
SET DATE TIME Year ? 19/07/2024 - 15:48 STOP:← ENTER:→	Enter the year and press **ENTER**.
SET DATE TIME Hour ? 19/07/2024- 15:48 STOP:← ENTER:→	Enter the hour and press **ENTER**.

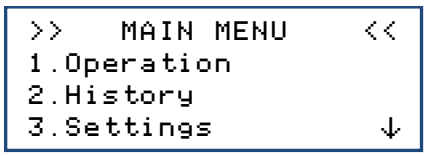


Enter the minutes and press **ENTER**. The settings have now been saved.

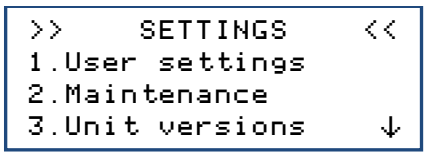
e. Printer Settings

The operator can personalise the ticket header with the name of the company, address, etc.

From the start-up screen, press **ENTER** to access the main menu.

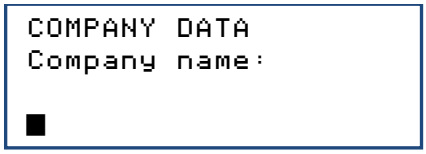


Select **3**.

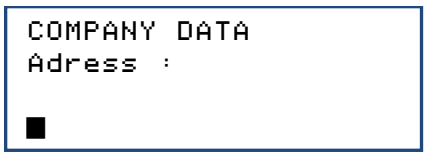


Select **1**.

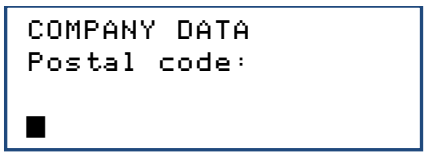
Select **5**.



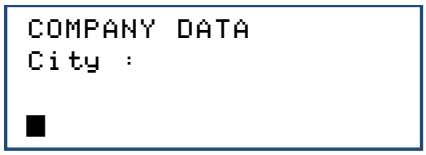
Enter the name of the company by using the number keys.
Example: To type the letter A, hold the (2) key until the letter appears.
Use the **STOP** button to correct any mistakes.
Once the company name has been entered, press **ENTER**.



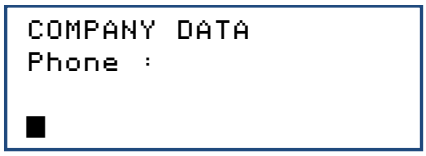
Enter the address and press **ENTER**.



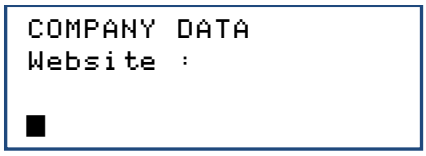
Enter the postcode and press **ENTER**.



Enter the town or city and press **ENTER**.



Enter the telephone number and press **ENTER**.



Enter the company website, if desired, and press **ENTER**.
The screen will then return to the **>> USER SETTINGS <<** menu.

f. Unit Settings

This menu allows the operator to:

- Customise the default settings
- Calibrate the sensors
- De-gas the tank.

From the start-up screen, press **ENTER** to access the main menu.

```
>>    MAIN MENU    <<
1.Operation
2.History
3.Settings          ↓
```

Select **3**.

```
>>    SETTINGS     <<
1.User settings
2.Maintenance
3.Unit versions     ↓
```

Select **1**.

```
>USER SETTINGS<
1.User database
2.Export
3.Import
4.Date and time
5.Printer settings
6.Unit settings
```

Select **6**.

```
      Password ?
        _____
```

Consult the table below to find out the access code required to modify a setting or carry out a maintenance operation.
Enter the access code and confirm by pressing **ENTER.** Then, change the setting or carry out the maintenance operation.

SETTING/OPERATION	DEFAULT VALUE	ACCESS CODE
Default vacuum time	20 minutes	1045
Default leak test time	4 minutes	1048
Default refrigerant charge quantity	2000 g	1001
Tare tank scales to zero		9220
Calibrate tank scales		3220
Calibrate weight of new oil		3460
Calibrate weight of recovered oil		3480
Calibrate pressure outlet sensor		2276
Calibrate tank pressure sensor		2272
Update software		6257
Update groups database		2387
Hose length	700 cm	1004
Default amount of refrigerant for additional charge	100 g	1065
Tank degassing		3429
Enter operator code: 0=deactivated, value=number of characters	4	1106
Enter RON: 0=deactivated, value=number of characters	6	1107

2. Maintenance Menu

Maintenance should be carried out by trained and skilled personnel. It is forbidden for anyone else to carry out work on any part of the unit that is not indicated in this section. Please contact **SNDC** in case of any incident or breakdown.

The **RF452** unit is subject to the Pressure Equipment Directive.
The customer must check the obligations for monitoring pressure equipment in service, applicable according to the country of operation, and draw up an appropriate inspection plan.

OPERATIONS	FREQUENCE	OPERATEURS
Draining the vacuum pump	100 hours of vacuum	User / Dealer Ecoclim
Replacement of filter drier	500 Kg of refrigerant recovered	User / Dealer Ecoclim
Cleaning hose filters	Annual	User / Dealer Ecoclim
Replacement of hose seal	Annual	User / Dealer Ecoclim
Check the accuracy of operations	Annual	Ecoclim dealer only
Calibration of load cells	Annual (if required)	Ecoclim dealer only
Calibration of pressure sensors	Annual (if required)	Ecoclim dealer only
Updating the software	Annual	Ecoclim dealer only
Replacement of the electronic battery	3 years	Ecoclim dealer only

a. Maintenance Info

This menu displays the maintenance interval counters.

From the start-up screen, press **ENTER** to access the main menu.

```
>>    MAIN MENU   <<
1.Operation
2.History
3.Settings          ↓
```

Select **3**.

```
>>    SETTINGS    <<
1.User settings
2.Maintenance
3.Unit versions     ↓
```

Select **2**.

```
>>   MAINTENANCE  <<
1.Maintenance info
2.Reset maintenance
3.Counters
```

Select **1**.

```
MAINTENANCE INFO
35284 g ref recycled
   824 min vacuum
   158 days
```

This screen will show:

- The total amount of refrigerant recovered in grams.
- The total vacuum time carried out in minutes.
- The number of days since the last service.

Explanation of Counters

COUNTER	WARNING LEVEL	MAXIMUM LEVEL	ACTION
Amount of refrigerant recycled « **g ref recycled** »	**400 kg**	**500 kg**	Replace the dryer filter
Total vacuum time « **min vacuum** »	**90 h**	**100 h**	Replace the vacuum pump oil
Number of days since the last maintenance or commissioning « **days** »	**347 days**	**365 days**	Carry out annual service

When the warning level is reached, the message **« Please check Maintenance menu »** will appear to warn the operator when the **RF452** is started.

If one of the maximum levels is reached, the operator will not be able to access the « OPERATION » menu until the required maintenance has been carried out.

b. Reset maintenance

This menu allows the relevant counters to be set to zero after maintenance. Access to his menu is reserved for personnel carrying out maintenance tasks and requires a password.

c. Counters

Access to the **RF452** general counter is reserved for the manufacturer and requires a password.

3. Unit Versions

You may be asked for the version of your unit when repairs, maintenance or assistance is required.

From the start-up screen, press **ENTER** to access the main menu.

```
>>    MAIN MENU    <<
1.Operation
2.History
3.Settings          ↓
```

Select **3**.

```
>>    SETTINGS     <<
1.User settings
2.Maintenance
3.Unit versions     ↓
```

Select **3**.

```
    UNIT REVISION
SW rev:          6006
HW rev:             C
SN:50031       RF452
```

The screen will show:

- The software version: SW
- The version of the unit control panel: HW
- The unit serial number: SN
- The name of the unit : **RF452**

Press **STOP** to exit the menu.

4. Manufacturer Settings

Access to this menu is reserved for the manufacturer and requires a password.

Servicing Menu

1. Degassing of non-condensables

This menu allows you to perform a de-gassing and purge any non-condensable gases contained in the internal tank. Take all necessary precautions before performing this operation:

- Wear appropriate protective equipment. Do not stay near the unit.
- Ensure that the ventilation grills are free of obstruction. Ensure that the working environment is well ventilated.

From the start-up screen, press **ENTER** to access the main menu

```
>>    MAIN MENU   <<
1.Operation
2.History
3.Settings
4.Tools
```

From the main menu, select **4**.

```
>>     TOOLS      <<
1.Uncondensable out
2.Weighing sensors
3.Pressure sensors ↓
```

Select **1**.

```
TANK AIR PURGE
Tank          11.1 bar
           ENTER: Yes
            STOP:  No
```

The screen will show the tank pressure.
To perform a de-gassing, press **ENTER.** The unit will open the degassing solenoid valve for 2 seconds.
To exit the menu, press **STOP**.

2. Weight Sensors

This menu shows the values of the unit's weight sensors.

From the start-up screen, press **ENTER** to access the main menu.

```
>>    MAIN MENU   <<
1.Operation
2.History
3.Settings
4.Tools
```

Select **4**.

```
>>     TOOLS      <<
1.Uncondensable out
2.Weighing sensors
3.Pressure sensors ↓
```

Select **2**.

```
Tank           8483 g
New oil         167 g
Waste oil        14 g
```

The screen will show the following quantities measured by their respective scales:

- Refrigerant (internal Tank)
- New oil
- Used oil

Press **STOP** to exit this screen.

3. Pressure Sensors

This menu shows the values measured by the pressure sensors and whether the heat belt is on or off.

From the start-up screen, press **ENTER** to access the main menu.

```
>>    MAIN MENU   <<
1.Operation
2.History
3.Settings
4.Tools
```

Select **4**.

```
>>     TOOLS      <<
1.Uncondensable out
2.Weighing sensors
3.Pressure sensors ↓
```

Select **3**.

```
Manifold P: 0.00 bar
P Tank:    11.15 bar
Heating belt:  OFF
Psetpoint: 13.00 bar
```

This screen will show:

- The pressure measured in the manifold.
- The pressure of the unit's internal tank.
- Whether the tank heat belt is on or off.
- Target pressure for the heating belt (**Psetpoint**)

Maintenance

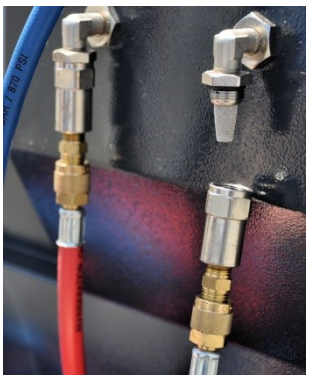
1. Cleaning of Hose Filters

The hose filters serve to protect the internal components of the **RF452** from particles and solid impurities contained in the recovered refrigerant**.**

They should be cleaned as often as possible and should be cleaned:

- **After every recovery of refrigerant from a contaminated system**
- **Before charging the refrigeration system.**

⚠ **Check that the hoses do not contain any refrigerant before disconnecting. Perform a recovery operation if required.**



Procedure:

- Unscrew the lower part of the filter.
- Clean with compressed air.
- Refit the lower part of the filter.

Filter reference: 470D25

2. Replacement of Filter Dryer

To guarantee the best performance, the filter dryer must be replaced once the unit has recovered a total of **500 kg** of refrigerant. The warning level for replacing the filter dryer is reached, the display will show the following message on start-up:

Please check Maintenance menu

Press **ENTER** to continue to the start-up screen.
Refer to section **0*Maintenance Info.***

⚠ Any maintenance operations that require the **RF452** to be opened must only be carried out by trained personnel. Please contact your **ECOCLIM** service centre

3. Replacement of the Vacuum Pump Oil

To guarantee the best performance, the vacuum pump oil should be replaced every **100 hours** of use. When the warning level for replacing the vacuum pump oil is reached, the display will show the following message on start-up:

Consulter le menu maintenance

Press **ENTER** to continue to the start-up screen.
Refer to section **0*Maintenance Info.***

⚠ Any maintenance operations that require the **RF452** to be opened must only be carried out by trained personnel. Please contact your **ECOCLIM** service centre.

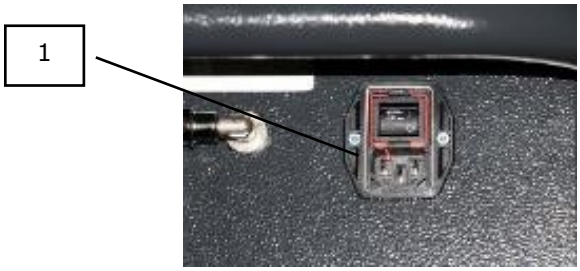
4. Annual Maintenance

In accordance with current regulations, an overall service of the unit must be carried out once a year. When the warning level for an annual service is reached, the display will show the following message on start-up **« Please check Maintenance menu »**. Refer to section **0*Maintenance Info***.

Shutdown

1. Shutting Down the RF452

To shut down the **RF452**, press the start/stop switch **(1)** on the back of the unit.



⚠ It is imperative (unless in case of an emergency) that the unit is not switched off while it is performing an operation. This could cause a loss of data and render the unit unusable.

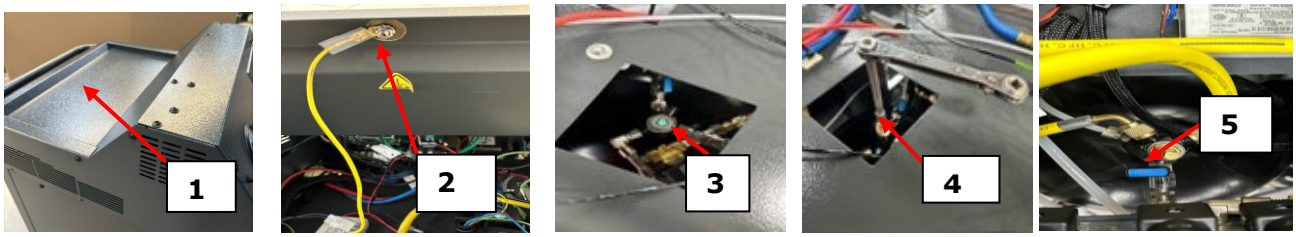
2. Long-term Shutdown

If the **RF452** is not going to be used for a long period of time:

- The unit should be disconnected from the electrical supply and stored upright in a dry, mild and well-ventilated place.
- The refrigerant tank must be closed.
- The unit should be protected with a cover.

<u>Procedure to close the refrigerant tank :</u>

- Disconnect the **RF452** from the electrical supply.
- Remove the storage tray **(1)**.
- Disconnect the ground connection from the storage tray **(2)**
- Remove the black cap from the tank **(3)**.
- Screw down the tank valve to close **(4)**.
- Close the hibernation valve **(5)**.
- Replace the cap on the tank, reconnect the ground connection and replace the storage



⚠ **When using the RF452 once again after it has been unused for a long time, ensure that the tank valve is open again before starting the unit.**

Notes

Your air conditioning partner since 1986

FIND ALL THE TUTORIALS FOR USING ECOCLIM STATIONS AND CONTROL UNITS, AS WELL AS ALL THE INFORMATION ON VEHICLE AIR CONDITIONING, BY SCANNING THE FOLLOWING QR CODES :

THE TUTORIALS ECOCLIM

THE NEWS BY ECOCLIM

SNDC ECOCLIM
274 CHEMIN DES AGRIÈS
31860 LABARTHE-SUR-LÈZE
05 34 480 480
SNDC@SNDC.FR