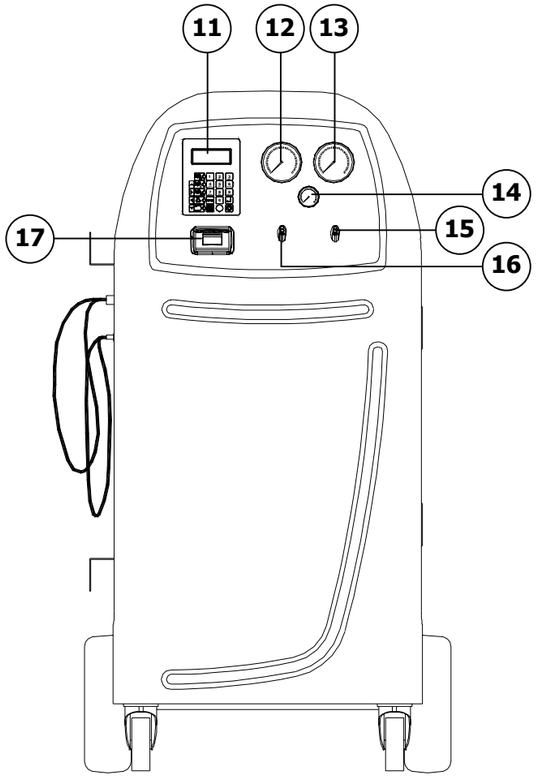
AC590PRO

OPERATORS MANUAL

9006351

AUSTRALIAN VERSION

ED2.2007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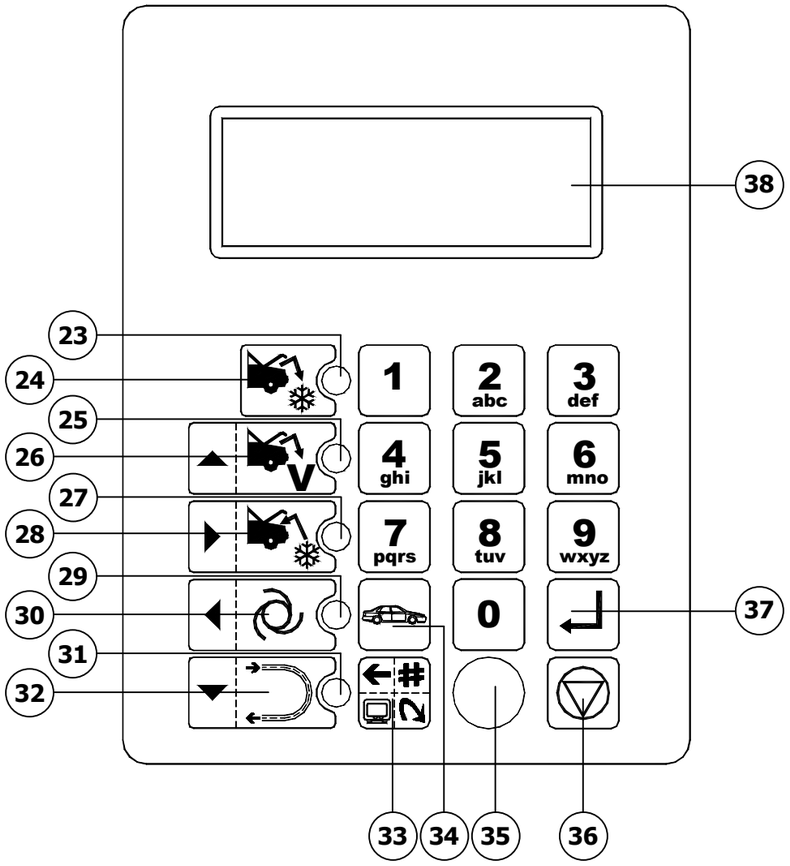
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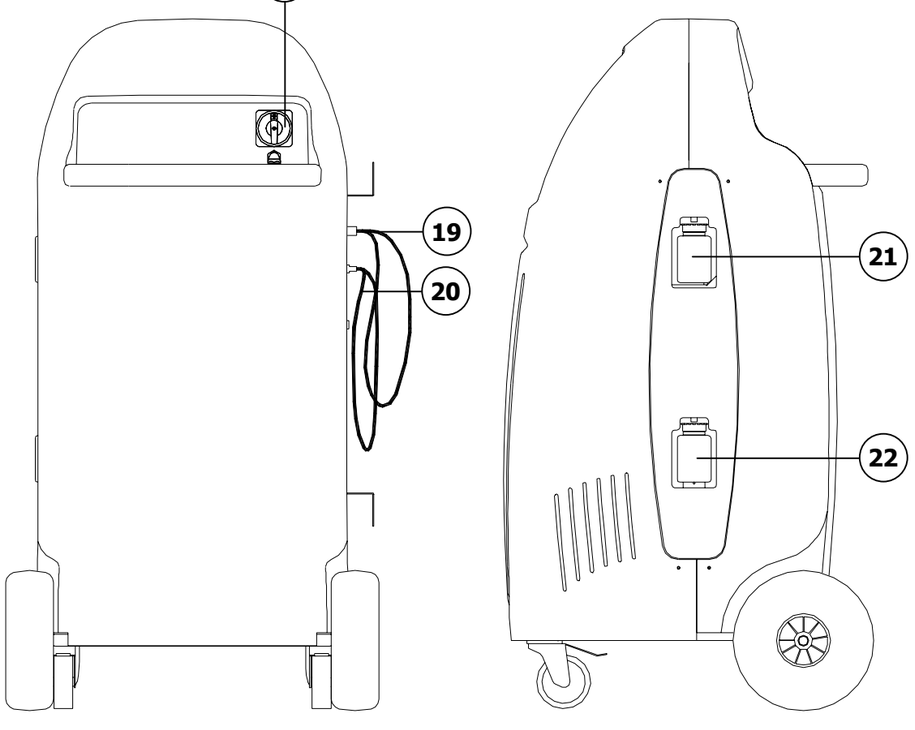
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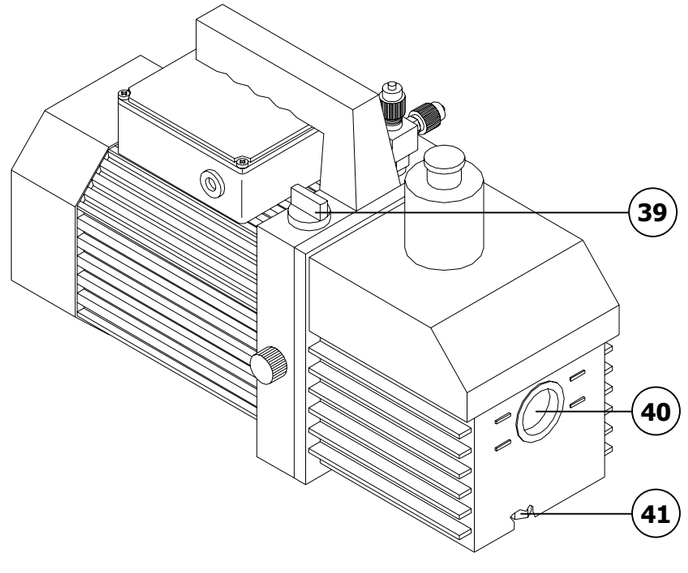
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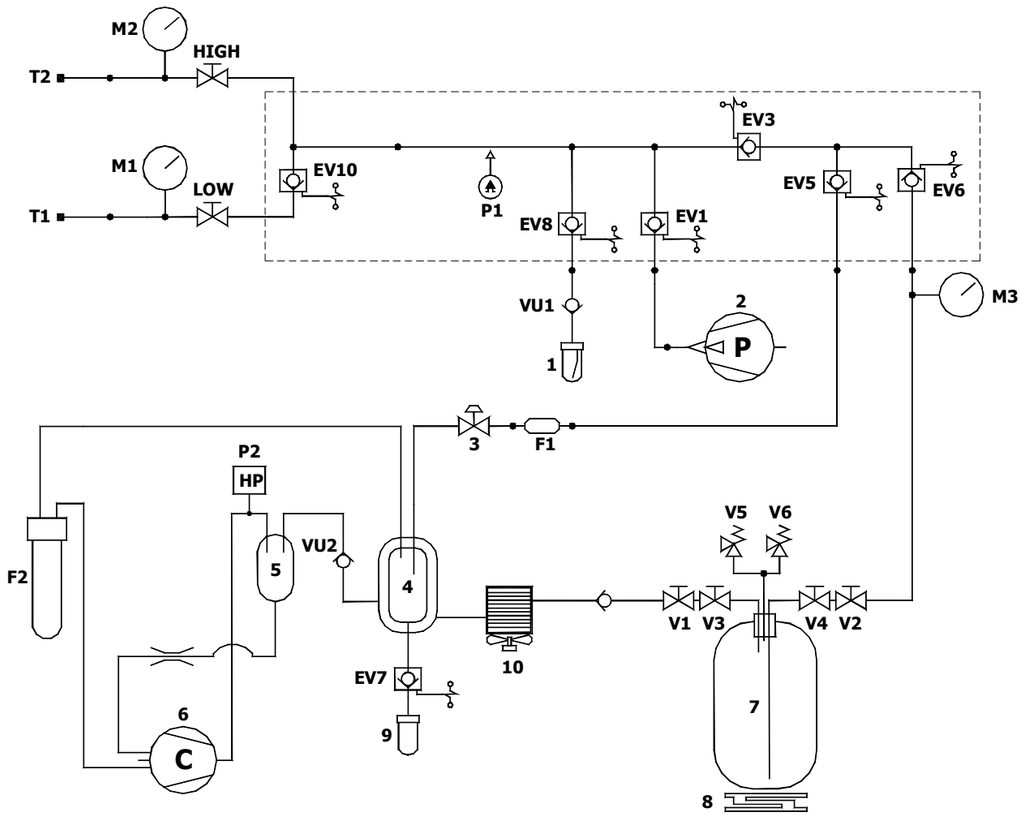
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The AC590PRO Operators Manual

Thank you for choosing a Robinair AC590PRO for your workshop. We are certain that it will give the utmost satisfaction and many years of service.

Please become fully familiar with the instructions in this user's manual.

The AC590PRO is an electronic unit for recovery, recycle, vacuum and charging of A/C systems using R134a refrigerant.

A simple but reliable connection system guarantees a safe working environment during all operations: refrigerant recovery and recycle; vacuum and leak test; additive and lubricant injection; circuit recharge and working pressure test.

The refrigerant flow is controlled and managed by an electronic scale to prevent any tank over pressurizing or over charging.

The quantity to be charged in the A/C system is set by the operator through the keyboard or by consulting the internal database.
A patented separator allows the separation of the refrigerant from the lubricant.

INDEX

CAPTIONS

M1	Low pressure gauge
M2	High pressure gauge
M3	Inside tank pressure meter
T1	Low pressure service hose
T2	High pressure service hose
LOW	Manifold set low pressure valve
HIGH	Manifold set high pressure valve
V1	Tank vapour side hose valve
V2	Tank liquid side hose valve
V3	Tank vapour side valve
V4	Tank liquid side valve
V5	Safety valve
V6	Non condensable drain valve
VU1	Oil protection unidirectional valve
VU2	Separator-still check valve
F1	Recovery line mechanic filter
F2	Dehydrating filter
EV1	Vacuum line solenoid valve
EV3	Circuit separation solenoid valve
EV5	Recovery/Recycle solenoid valve
EV6	Charge solenoid valve
EV7	Oil purge solenoid valve
EV8	Oil addition solenoid valve
EV10	High/low pressure separation solenoid valve
1	Oil replenishing bottle
2	Vacuum pump
3	Pressure adjuster
4	Separator-still for recovered oil
5	Separator-still for compressor oil
6	Compressor
7	Storage tank
8	Electronic scale
9	Oil purge bottle
10	Heat exchanger
P1	Pressure transducer
P2	High pressure switch

1.0 - SAFETY WITH THE AC590PRO

The advanced technology adopted in the design and production of the AC590PRO makes this equipment extremely simple and reliable. The user is not exposed to any risk if the general safety rules stated below are followed with proper use along with maintenance of the equipment.

NOTE:
This unit should be exclusively used by professionally trained operators who know the principles of refrigeration, refrigeratED systems, gases and the possible damages which might be caused by pressurized equipment.
Every user must read this manual carefully for correct and safe use of the equipment.

1.1 - Safe Operation

- It is necessary to wear suitable protection such as goggles and gloves. Contact with the refrigerant can cause blindness as well as other injuries to the operator. Please make reference to the symbols below:

Carefully read the instructions.

Do not use open air in case of rain or high humidity.

Use gloves.

Use protection goggles.

- Avoid contact with the skin, the low boiling temperature (about -30 °C) may provoke freezing.
- Do not inhale refrigerated gas fumes.
- Before connecting the AC590PRO to an A/C system or to an external tank, make sure all the valves are closed.

- Ensure that the process has been completed and that all valves are closed before disconnecting the AC590PRO. This will prevent release of the refrigerant into the atmosphere.

- Do not change the safety valve or control system settings.

- Do not use external tanks or other storage tanks that have not been type-approved or lack safety valves.

- Never leave the unit live if an immediate use is not scheduled. Disconnect the electrical supply before a long period of inactivity or prior to internal maintenance.

- Be careful while servicing the unit as connecting hoses may contain pressurized refrigerant.

- Do not use the unit in explosive environments.

Extraordinary maintenance interventions have to be performed by authorized staff only.

- Pressure leaks of the HCF-134a service equipment or the air conditioning system of the vehicle must not be tested using compressed air. Some air/HCF-134a mixtures can burn at high pressures. These mixtures can be dangerous and may cause fires or explosions with subsequent injury or damage.

Further information on the operators' health and safety can be obtained from the refrigerant producers.

1.2 - Safety devices

The AC590PRO is equipped with the following safety devices:

- **Overpressure valves**.

- Besides the overpressure valve a **maximum pressure switch** has been fitted which stops the compressor in case of excessive pressure.

ATTENTION:
Any type of tampering with the safety devices mentioned above is prohibited and will void warranty.

1.3 - The work environment

- The unit has to work in a sufficiently ventilated environment.

ATTENTION:
Work well away from free flames and hot surfaces; at high temperatures the refrigerant decomposes freeing toxic and aggressive substances which are noxious for the user and the environment.

- To function correctly the unit has to be opperated on an even surface. Do not shake the unit while handling.

- Do not subject the AC590PRO unit to vibration.

ATTENTION:
While operating do not disperse the refrigerant in the environment. **Such a precaution**, **besides being required by the international rules for the environment protection**, **is necessary to prevent the possible presence of refrigerant in the working environment from making it difficult to detect possible leaks**.

- Work in environments with sufficient lighting.

- Avoid inhalation of the refrigerants and oils in the A/C systems. Exposure may cause irritation to eyes and the respiratory tract. To remove R134a from the A/C system, use only the special recycling-units for R134a. If the refrigerant is accidentally released into the atmosphere, ventilate the work area before resuming service.

- Do not use the unit under direct sunrays; sun exposure can cause excessive temperatures and malfunctioning. Working temperatures indicated refer to the unit being not directly exposed to the sun.

2.0 - INTRODUCTION TO THE UNIT

The AC590PRO fits all the air-conditioners functioning with R134a refrigerant used on cars, trucks and industrial vehicles.

The AC590PRO microprocessor allows you to manage all functions by means of an electronic scale, an LCD (weight or minute values and help messages) and a control board with alphanumeric keyboard.

By connecting the AC590PRO to an A/C system the refrigerating gas can be recovered and recycled to enter the system again after a correct vacuum.

The amount of lubricant taken from the A/C system during the recovery can be measured and, afterwards, reintegrated into the system.
The unit is equipped with a two-stage pump for high vacuum and a manifold set to continuously monitor the operations.
Tightness test on the A/C system is carried out through the gauges the AC590PRO is equipped with.

The unit is equipped with special connectors to avoid cross-mixing with systems using R12.

ATTENTION:
Do not try to adapt this unit for air conditioning systems using R12.

3.0 - DESCRIPTION OF THE UNIT

11. Keyboard.

12. Low pression gauge.

13. High pression gauge.

14. Inside tank pressure meter.

15. High pression valve.

16. Low pression valve.

17. Printer (optional).

18. Main power switch.

19. High side connection hose.

20. Low side connection hose.

21. Oil injector glass.

22. Oil drain glass.

3.1 - The Keyboard

23. RECOVERY function LED.

24. RECOVERY function key.

25. VACUUM function LED.

26. VACUUM function key and cursor shifting upwards.

27. CHARGE function LED.

28. CHARGE function key and cursor shifting to the right.

29. AUTOMATIC function LED.

30. AUTOMATIC function key and cursor shifting to the left.

31. FLUSHING function LED.

32. FLUSHING function key and cursor shifting downwards.

33. MULTIFUNCTION key (menu, cancellation, by-pass and pause).

34. VEHICLE DATA and DATABASE function key.

35. Port for software updates.

36. STOP key.

37. ENTER key.

38. Display.

4.0 - INSTALLATION OF THE UNIT

Please find below operations to prepare the unit.

4.1 - Unpacking and checking components

- Remove the machine packaging.
- Check to ensure that all of the accessory components are present:
  - ✓ Operating instructions.
  - ✓ 1 Graduated beaker.
  - ✓ 2 cylinder connectors.
  - ✓ Bottle safety valve conformity certificate.

4.2 - Machine handling and storage

Remove the unit from the base pallet of the packaging.
The unit is moved on the four wheels. The two front wheels have brakes.
On rough terrain, the AC590PRO can be moved by tilting it and balancing the weight on the two rear wheels.
In spite of the fact that the heaviest components have been assembled on the base in order to lower the centre of gravity, it has not been possible to eliminate the **risk of overturning** completely.

4.3 - Preparation for use

Before starting to use the AC590PRO, it is possible to personalize it.
These settings are not compulsory on the standard models.
To personalize the A/C unit follow the procedures below;

- Turn on the unit and wait until the STAND-BY page is displayed (date and time).
- Simultaneously press the **3** and **FLUSHING** keys (**32**) for some seconds.
- The display shows **0000**.
- Enter the code **2222**.
- A menu is displayed containing the operations that may be carried out.
- Press the cursor shifting key upwards (**26**) or downwards (**32**) to scroll the menu.
- Select the required function and press **ENTER**.
- Press **STOP** to go back to the STAND-BY page.

LANGUAGE CHANGE

- Select the **LANGUAGE CHANGE** function and press **ENTER**.
- The list of languages available in memory is displayed.
- Press the cursor shifting key upwards (**26**) or downwards (**32**) to scroll the menu and press **ENTER** (**37**) to set the selected language.
- Then the main menu is displayed again.

UNITS OF MEASURE

- Select the **UNITS OF MEASURE** function and press **ENTER**.
- The list of units of measure available are displayed.
- Press either the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to scroll the menu and press **ENTER** (**37**) to set the selected unit of measure.
- Then the main menu is displayed again.

DATE AND TIME

- Select the **DATE AND TIME** function and press **ENTER**.
- The current date and time are displayed and the cursor positions on the date.
- Enter the date and press **ENTER** to confirm.
- The cursor positions on the time.
- Enter the time and press **ENTER** to confirm.
- Then the main menu is displayed again.

PIPES LENGTH

It is possible to supply, on demand, longer service pipes (optional); if this is the case it is necessary to set the machine so that during the charge it counterbalances the variation of refridgerant remaining in the pipes. The standard pipes that are supplied are 2,5 m long.

- Select the **PIPES LENGTH** function and press **ENTER**.
- The standard length of optional pipes are displayed.
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to scroll the menu and press **ENTER** to set the selected length.
- Then the main menu is displayed again.

GARAGE DATA

It is possible to enter the details of your own business, this is particularly useful for units that have installed the printer (optional).
To enter the workshop data there are 8 lines of 20 characters each.
The data entry is carried out through the keyboard, in a way similar to that used for mobile phones:

- Select the **GARAGE DATA** function and press **ENTER**.
- Press the numerical keys to select the letters and the characters.
- Press the cursor shifting keys to shift among the lines.
- Press the **MULTIFUNCTION** key (**33**) to erase the character that precedes the cursor.
- Press **ENTER** to memorize the garage data entry.
- Then the main menu is displayed again.

CONTRAST

- Select the **CONTRAST** function and press **ENTER**.
- A numerical index of the contrast degree is displayed.
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to modify the contrast and press **ENTER** to confirm.
- Then the main menu is displayed again.

FLUSHING

It is possible to install on the A/C unit the optional kit for flushing of components. If the unit is equipped with this kit, it is necessary to insert it in the internal parameters so that it enables this function.

- Select the **FLUSHING** function and press **ENTER**.
- The display displays the messages **ENABLED** and **DISABLED**.
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to select either **ENABLED** or **DISABLED** and press **ENTER** to confirm.
- Then the main menu is displayed again.

OIL SCALES

Not active on this version.

UV DYE

This menu is used to display the request of dye injection before the charge.

- Select the **UV DYE** function and press **ENTER**
- The display displays the messages **ENABLED** and **DISABLED**.
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to select either **ENABLED** or **DISABLED** and press **ENTER** to confirm.
- Then the main menu is displayed again.

ATTENTION:
To avoid any problems due to chemical incompatibilities with the internal components of the service station, use only UV dyes selected and supplied by Robinair under the following part numbers: RA16356, RA16357 or RA16286B. Problems resulting from the use of any different types of dyes, will cancel the unit warranty.

DATABASE UPDATE

This menu is used to update the car manufacturers' database.

- Insert the update key into the board front side.
- Select the **DB UPDATE** function and press **ENTER**.
- At the end of the operation the board resets automatically.
- Extract the key.

NOTE:
Do not switch off the A/C unit during the updating.

ENTRY OF THE SERIAL NUMBER

- Select the **SERIAL NUMBER** function and press **ENTER**.
- Enter the station serial number (engraved on the technical data plate applied to the station rear panel) by the numerical keys and then press **ENTER**.
- Then the main menu is displayed again.

NOTE:
Only the last 5 digits of the number have to be entered since the first one is entered automatically by the program.

4.4 - Bottle filling

Before being able to use the unit, after personalizing it, it is necessary to inject some refridgerant in the inner bottle. Comply with the following procedure:

- Connect the service hoses to an external cylinder full of refridgerant (use the supplied fittings).

NOTE:
There are two types of source tanks: one **with a liquid outlet** and one **without**.
Tanks **with liquid outlets** must remain in an upright position in order to transfer the liquid refrigerant. Use the **LIQUID** valve connection for this type of tank.
Tanks **without liquid outlets** are usually equipped with only one valve and have to be overturned to transfer the liquid refrigerant.

- Open the valve on the external bottle and on the service pipe.
- Open the high and low pressure valves on the unit.
- Press the **MULTIFUNCTION** key (**33**) from the STAND-BY page.
- The functions menu is displayed.
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to select the **BOTTLE FILLING** and press **ENTER** to confirm.
- The display shows the tank available capacity.
- Set the amount of refridgerant that you wish to inject (it is advisable to inject at least 4-5 Kg).
- Press **ENTER** to start the operation.
- Some massages prompt the operator for the pipes connection, then the function starts.
- The unit automatically stops once it reaches the set value.
- Close the valve on the source tank.
- Press **ENTER** to complete the operation and empty the pipes and the still separator.

NOTE:
Usually the final amount of recovered refridgerant exceeds the set value by about 500-700 g, as the still separator is also emptied.

- The function stops automatically when pressure is exceeded in the system.
- The STAND-BY page is displayed.
- Close the valves on the unit.

4.5 - Tank display

From the STAND-BY page it is possible to display the weight of the refridgerant in the tank.

- Press **ENTER** to display the weight.
- Press **STOP** to go back to the STAND-BY page.

5.0 - USE OF THE UNIT

Below is the description of the unit functions.

5.1 - Vehicle data entry

This function enables the units that are equipped with a printer, to display the vehicle data on the final printout.

- Press the **VEHICLE DATA** key (**34**).
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to select either **VEHICLE DATA** and press **ENTER** (**37**) to confirm.
- Enter the vehicle data with the alphanumeric keyboard.
- Press the **MULTIFUNCTION** key (**33**) to erase the character that precedes the cursor.
- Press **ENTER** to confirm the entered data and shift to the next line.
- Repeat the data entry and confirm all the items; in the end the main menu will be displayed again.

5.2 - Database

Charge data can be taken directly from the internal database. The database also contains further pieces of information that may be displayed or printed (for the units equipped with printer).

- Press the **DATABASE** key (**34**).
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to select either **DATABASE** and press **ENTER** to confirm.
- By the alphanumerical keys select the first letter of the car's **make**. Use the cursor keys to select the **make** of the tested car and press **ENTER** to confirm.
- By the alphanumerical keys select the first letter of the car's **model**. Use the cursor keys to select the **model** of the tested car and press **ENTER** to confirm.
- After scrolling all data the display shows two selection options:
  - ✓ Digit **1** to store data and use them during the next service. Then the program displays the STAND-BY page again.
  - ✓ Digit **2** to display data. Use the cursor shifting keys to scroll the data concerning the vehicle.
  - ✓ Press the **ENTER** key to print.
  - ✓ Press **STOP** (**36**) to go back to the DATABASE menu.

ATTENTION:
Always check the manufacturers service manual to confirm the refridgerant specifications.

DIAGNOSIS (optional)

It is important to note that the vehicle to be tested should be in a place that is not in direct sunlight and away from any adverse wind/drafty conditions. The most insignificant air currents can falsify the performance values drastically.

To evaluate the air conditioning system it is important to follow the procedure below:

- LOWER Bonnet.
- START engine (engine to be at normal operating temperature).
- Stabilise engine rpm at approximately 1500-2000 rpm.
- Air conditioning system ON.
- Centre face vent OPEN.
- Heating setting to maximum COLD.
- Interior fan set to HIGH.
- Recirculation OFF.
- Doors and windows OPEN.

It is recommended to confirm the compressor clutch is engaged before carrying out any performance tests.

Before recording or inputting any data it is important to note the position of the HVAC controls, engine temperature / rpm and adequate time has been given to allow the a/c system to Stabilise (no less than 3 minutes).

Ambient Temperature - To record the ambient temperature, it is important to take the temperature of the ambient air at approximately 1metre in front of the car. Inputting the temperature of the air around the engine compartment may lead to incorrect diagnosis.

High Side Pressure – With the compressor clutch engaged record the highest high pressure gauge reading. It is important to note a cycling clutch system will cause the compressor to cut in and out, thus, the high side pressure will rise and fall. It is the highest pressure reading that should be recorded.

Low Side Pressure - With the compressor clutch engaged record the lowest low pressure gauge reading. It is important to note a cycling clutch system will cause the compressor to cut in and out, thus, the low side pressure will rise and fall. It is the lowest pressure reading that should be recorded.

Centre Vent Temperature – When taking the centre face vent temperature input a mean value.

ATTENTION:

Air conditioning diagnostic software is designed to assist and guide professional and competent technicians diagnose air conditioning/climate control faults. The diagnosis and rectification offered is to be used for guidance purposes only and in no way should result in the replacing of components without first being inspected by the technician and established to be faulty.

- Press the **MULTIFUNCTION** key from the STAND-BY page.
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to select either **DIAGNOSIS** and press **ENTER** to confirm.

NOTE:

Diagnostics function only work if a vehicle from the database is selected. Otherwise the program enters directly the database enabling the selection and memorization of a vehicle before moving to the diagnostics.

- Entered the ambient temperature measured value and press **ENTER**.
- Entered the high pressure measured value and press **ENTER**.
- Entered the low pressure measured value and press **ENTER**.
- Entered the flap air temperature measured value and press **ENTER**.
- The display shows two selection options:
  - ✓ Digit **1** to select the result and display entered data with their status: OK, high, low.
  - ✓ Press the **ENTER** key to print.
  - ✓ Digit **2** to select hints and display the list of possible causes of the defect and the operation to carry out to solve the problem.
  - ✓ Press the **ENTER** key to print.
- Press **STOP** to go back to the STAND-BY page. When quitting, the program asks whether to cancel the vehicle data set in memory or not.

5.3 - Personalized Database

It is possible to create a personalized database where you can enter the data of vehicles that are not present in the standard database.

- Press the **DATABASE** key (**34**).
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to select either **PERSONALIZED DATABASE** and press **ENTER** to confirm.
- Enter the required data through the alphanumeric keyboard.

NOTE:
Four lines of 20 characters each are available for the description of the car. We suggest entering Make, Model, etc. since descriptions are entered in alphabetical order. The following lines are available: one 20 character line for the refridgerant amount, one 20 character line for the type of oil and one 20 character line for the amount of oil.

- Press the **MULTIFUNCTION** key to erase the character that precedes the cursor.
- Press the cursor shifting keys to shift the cursor on the display.
- Press **ENTER** to confirm the entered data and shift to the next line.

NOTE:
If necessary, it is possible to avoid entering all of the required data; if this is the case, press **ENTER** to shift to the next line and the field relating to that specific data will not be filled in.

- Repeat the data entry and confirm all the items; in the end the main menu will be displayed again.

ATTENTION:
Always check the manufacturers service manual to confirm the refridgerant specifications.

5.4 - Refrigerant recovery

ATTENTION:
Always wear protective goggles and gloves when working with refrigerant. **Read and comply with warnings at the beginning of this manual before using the unit**.

NOTE:
Run the A/C system for some minutes before starting recovery. Tests prove that a bigger amount of refrigerant is sucked if this operation is performed. Turn off the A/C system before servicing.

In order to recover the refridgerant present in the A/C system, carry out the following procedure:

- Some messages prompt the operator for the hoses to be connected. Press **ENTER** to go to the next message.
- Connect the **T1** low pressure and **T2** high pressure hoses of the A/C system.
- Open the valves on the hose quick couplers **T1** and **T2**.
- Open the high and low pressure valves on the unit.
- Press the **RECOVERY** key (**24**), and the self-cleaning function is started.
- The function will not start with a lack of pressure in the system; in this case a message is displayed to inform the operator.

NOTE:
This function is useful to ensure the correct weight of the recovered refridgerant. The self-cleaning function can be passed by pressing the **MULTIFUNCTION** key.

- When the self-cleaning is over, the refrigerant recovery starts.

NOTE:
The function stops automatically when the pressure inside the system drops below 0 bar.

- At the end of recovery the oil is automatically drained and the pressure values are checked.
- When the waiting time is over:
  - ✓ The function restarts automatically, if pressure has increased.
  - ✓ The display shows the amount of recovered refrigerant, if the pressure value has not changed.
- Close the valves on the unit.
- Press **STOP** to go back to the STAND-BY page. When quitting, the program asks whether to cancel the vehicle data set in memory or not.

- Some messages prompt the operator to disconnect the hoses.
- Select the desired option.

NOTE:
For the units equipped with printer (optional), after the display of data, comply with the following procedure:

- ✓ Enter the recovered oil value through the numerical keys and use the **MULTIFUNCTION** key to erase the entered value.
- ✓ Press **ENTER** to confirm the oil value.
- ✓ Press the **ENTER** key to print.
- ✓ Press the **STOP** key to exit.

5.5 - Evacuating the A/C system

NOTE:
If the vacuum pump has run for more than 10 hours the message **CHANGE OIL** appears. Carry out the maintenance according to the procedures described in the relevant section.

- Some messages prompt the operator for the hoses to be connected. Press **ENTER** to go to the next message.
- Open the high and low pressure valves on the unit.
- Press the **VACUUM** key (**26**).
- The function will not start if there is pressure presence in the system; in this case a message is displayed to inform the operator.
- Enter the desired vacuum time.
- Press **ENTER** to confirm and start the function.
- When the vacuum time is over the pressure values check time starts. At the end of this time the check result is displayed showing whether leaks have been detected in the system.
- Close the valves on the unit.
- Press **STOP** to go back to the STAND-BY page. When quitting, the program asks whether to cancel the vehicle data set in memory or not.
- Some messages prompt the operator to disconnect the hoses.
- Select the desired option.

NOTE:
For the units equipped with a printer (optional), after displaying the result of the test it is possible to carry out the following procedure:

- ✓ Press the **ENTER** key to print.
- ✓ Press the **STOP** key to exit.

5.6 - Oil injection and A/C system charge

ATTENTION:
This function must be performed only on A/C systems under vacuum (following a system evacuation function). At the end of the oil injection function, follow with a filling function.
Charge the oil from the high side only. In case of systems equipped with low side fitting only (LOW), wait at least 10 minutes before starting the A/C system after the charge.

- Some messages prompt the operator for the hoses to be connected. Press **ENTER** to go to the next message.
- Check that the service pipes are connected and that their valves are open.
- Press the **CHARGE** key (**28**).
- The display requires whether to carry out the oil charge.
  - ✓ Select **YES** to charge oil before charging.
  - ✓ Select **NO** to start the charge phase directly.
- Enter the amount of refridgerant to be charged and press **ENTER** to confirm.
  - ✓ If oil charge has been selected hold down the **MULTIFUNCTION** key to open the oil injection solenoid valve, release the key to close it.
  - ✓ Press the **ENTER** key to continue.
- The unit carries out the refridgerant charge and at the end displays the value of the charged refridgerant.
- To verify if the circuit is efficient, you need to check the functioning pressures.
- Close the valves on the unit.

ATTENTION:
Failure to close the valves may cause errors, malfunction or damage of the internal components.

- Switch On the car and the A/C system.
- Check pressure values.
- Switch Off the A/C system and the car.
- Close the valves on the service pipes.
- Press **STOP** to go back to the STAND-BY page. When quitting, the program asks whether to cancel the vehicle data set in memory or not.
- Some messages prompt the operator to disconnect the hoses.
- Select the desired option.

NOTE:
For units equipped with a printer (optional), after the display of the charged refridgerant carry out the following procedure:

- ✓ Enter the value of the injected oil through the numerical keys and use The **MULTIFUNCTION** key to erase the entered value.
- ✓ Press **ENTER** to confirm the oil value.
- ✓ Press the **ENTER** key to print.
- ✓ Press the **STOP** key to exit.

5.7 - Automatic function

This function allows carrying out recovery, vacuum, and charge functions in automatic function.

ATTENTION:
For cars equipped with a single service fitting the charge function should be carried out manually by following the procedure suggested by the manufacturer.

To carry out the automatic function:

- Some messages prompt the operator for the hoses to be connected. Press **ENTER** to go to the next message.
- Connect the **T1** low pressure and **T2** high pressure hoses of the A/C system.
- Open the valves on the hose quick couplers **T1** and **T2**.
- Open the high and low pressure valves on the unit.
- Press the **AUTOMATIC** function key (**30**).
- The display requires the entry of the vacuum time.
- Enter the value and press **ENTER** to confirm.
- The display requires whether to carry out the oil charge.
  - ✓ Select **YES** to charge oil (the station stops) before charging.
  - ✓ Select **NO** to start the charge phase directly.
- The display requires the entry of the amount of refrigerant to be charged.
- Enter the value and press **ENTER** to confirm.
- The function starts and continues automatically till the ends.

NOTE:
In case of errors, the station stops and displays the relevant error message.

- To verify if the circuit is efficient, you need to check the functioning pressures.
- Close the valves on the unit.

ATTENTION:
Failure to close the valves may cause errors, malfunction or damage of the internal components.

- Switch On the car and the A/C system.
- Check pressure values.
- Switch Off the A/C system and the car.
- Close the valves on the unit.
- Press **STOP** to go back to the STAND-BY page. When quitting, the program asks whether to cancel the vehicle data set in memory or not.
- Some messages prompt the operator to disconnect the hoses.
- Select the desired option.

NOTE:
For the units equipped with printer (optional), after the display of data, comply with the following procedure:

- ✓ Enter the recovered oil value through the numerical keys and use the **MULTIFUNCTION** key to erase the entered value.
- ✓ Press **ENTER** to confirm.
- ✓ Press the **STOP** key to exit.
- ✓ Enter the charged oil value through the numerical keys and use the **MULTIFUNCTION** key to erase the entered value.
- ✓ Press **ENTER** to confirm the oil value.
- ✓ Press the **ENTER** key to print.
- ✓ Press the **STOP** key to exit.

5.8 - Recycling function

- Press the **MULTIFUNCTION** key from the STAND-BY page.
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to select either **RECYCLING** and press **ENTER** to confirm.
- The function is self-limited to 60 minutes.
- Press **STOP** to cease this function.
- The function stops automatically after the complete draining of the internal circuit.

5.9 - Incomplete charge

- Close the high side quick coupler valve on the **T2** service hose on the A/C system.
- Start the vehicle system.
- Open the high and low pressure valves on the unit.
- Press **ENTER** to complete the charge.
- Let the residual refrigerant be sucked until manifold gauges show a pressure of about 1-2 bar.
- Close the low side quick coupler valve on the **T1** service hose on the A/C system.
- Turn off the vehicle and disconnect the unit from the vehicle.
- Close the valves on the unit.

ATTENTION:
Disconnect the flexible hoses with extreme caution. All of the flexible hoses can contain liquid refrigerant under pressure. Before using the equipment read and follow carefully the instructions at the beginning of this manual.

5.10 - Flushing (optional)

NOTA BENE:
Carefully read the flushing kit instructions for the correct connection and use of accessories.

To use the flushing kit follow instructions below:

- Connect the flushing kit and the part to be flushed following instructions of the flushing kit manual.
- Open the low side valve and press **ENTER** to continue.
- Select the vacuum time and press **ENTER** to drain the component.
- After the vacuum phase a test is carried out to be sure of the absence of leaks.
- If the leak test is positive, open the **flushing** valve.
- Wait until the flushing time is over or, if the cleaning is correct, press the **MULTIFUNCTION** key.
- Close the **flushing** valve and press **ENTER** to drain the circuit.
- Press **STOP** to terminate.

NOTE:
For the stations equipped with printer (optional) follow instructions below:

- ✓ Enter the amount of discharged oil and press **ENTER** to confirm.
- ✓ Press the **ENTER** key to print.
- ✓ Press the **STOP** key to exit.

6.0 - DISPLAYED MESSAGES

6.1 - Service messages

CHANGE OIL
Vacuum pump oil change (see chapter 7.1).

CHANGE FILTER
Change filter dryer (see chapter 7.3).

6.2 - Error messages

HIGH PRESSURE
Outfeed pressure from compressor is excessively high. Switch off the unit and wait for about 30 minutes. If the problem persists, contact the supplier.

SOFTWARE ERROR
Error in the software, contact the supplier.

FULL BOTTLE
refridgerant level in the bottle reached the maximum capacity level, carry out some charges to reduce the amount of refridgerant inside.

SCALE RECALIBRATION
Error in scale calibration, reset it. If the error persists, contact the supplier.

HIGH RECOVERY TIME
The recovery time exceeds the set safety limit. Make sure there are no leaks in the A/C system. If no leaks are detected, contact the supplier.

EMPTY SYSTEM
There is no refrigerant in the A/C system.

FULL SYSTEM
The A/C system is charged with refrigerant.

INCOMPLETE CHARGE
Excessive charge time; this proves that the pressure inside the bottle is equal to the pressure inside the A/C system (see chapter 5.9).

7.0 - MAINTENANCE

The AC590PRO is a highly reliable unit built with top-quality components with the use of today's most advanced production techniques.

For these reasons, maintenance is reduced to a minimum and marked by a very low frequency of intervention. In addition, owing to the electronic control system, all periodic maintenance procedures are signalled at the prescribed time.

CHANGE OIL Change vacuum pump oil (10 hours).

CHANGE FILTER Change filter dryer (150 Kg of fluid).

7.1 - Vacuum pump oil change

The oil of the vacuum pump must be changed frequently in order to assure higher performances of the unit.
When the oil has to be changed, the display shows **CHANGE OIL**.
To change the oil, follow carefully these instructions:

- Disconnect the unit from the power supply.
- Put a beaker under the cap (**41**), open the cap and discharge the oil contained in the vacuum pump.
- When the pump is empty, screw on the cap (**41**) and open the upper cap (**39**).
- Fill the pump with the oil through the upper hole. Check the oil level in the pump through the inspection glass (**40**); level has to reach the sight glass middle line.
- When the pump is filled, close the upper cap.

7.2 - Reset oil counter vacuum pump

After having changed the oil of the vacuum pump, reset the counter.
To reset the counter follow carefully these instructions:

- Simultaneously press the **3** and **FLUSHING** keys for some seconds.
- The display shows the message **0000**.
- Digit **5555** on the keypad and press **ENTER**.
- The functions menu is displayed.
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to select either **OIL CHANGE** and press **ENTER** to confirm.

The display shows a value which corresponds to the working hours of the vacuum pump.

- Press the **MULTIFUNCTION** key and keep it pressed.
- When the display shows **0000** release the **MULTIFUNCTION** key.
- The display displays the functions menu again.
- Press **STOP** to go back to the STAND-BY page.

7.3 - Filter dryer change

The filter dryer of this unit has been designed in order to eliminate all acid residues and the high water content of the refrigerant R134a.

The filter has to be changed when the display shows the message **CHANGE FILTER**. To change correctly the filter dryer, follow carefully these instructions.

- Connect the unit to the electrical power supplied and press the **RECOVERY** key.
- Open the high and low pressure valves on the unit.
- Wait for the end of self-cleaning.
- Let the compressor operate until the pressure indicated on the manometers has not decreased under the 0 (zero) bar value.
- Press the **STOP** key to stop the compressor. Now all the refrigerant has been drained from the filter and no pressure should be present.
- Close the valves on the unit.
- Disconnect the unit from the electrical power supply and remove the lower front panel.

ATTENTION:
During the following phase it will be necessary to open the refrigerant circuit of the unit. Wear goggles and gloves.

- Disconnect the filter with caution and replace it with a new one.

ATTENTION:
Check that the sealing rings are in the right position.

- Set up the plastic protection again.

7.4 - Reset counter filter dryer

After the change of the filter dryer, reset the counter.
To reset the counter follow carefully these instructions:

- Simultaneously press the **3** and **FLUSHING** keys for some seconds.
- The display shows the message **0000**.
- Digit **5555** on the keypad and press **ENTER**.
- The functions menu is displayed.
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to select either **FILTER CHANGE** and press **ENTER** to confirm.

The display shows a value, either in Kg or in Pounds, corresponding to the amount of refridgerant that has been filtered.

- Press the **MULTIFUNCTION** key and keep it pressed.
- When the display shows **0000** release the **MULTIFUNCTION** key.
- The display shows the functions menu again.
- Press **STOP** to go back to the STAND-BY page.

7.5 - Refrigerant scale calibration

Required equipment:

- ✓ 2 Sample weights.

After removing the rear cover, remove the container to the scale plate.

NOTE:
The hoses from the internal container do not have to be disconnected. If you wish to disconnect them, close the valves on the pipes and on the bottle.

- Simultaneously press the **3** and **FLUSHING** keys for some seconds.
- The displays shows **0000**.
- Set the value **1111**.
- Press the **ENTER** key.
- The functions menu is displayed.
- Press the upwards cursor shifting key (**26**) or the downwards cursor shifting key (**32**) to select either **BOTTLE CALIBRATION** and press **ENTER** to confirm.
- The displays shows **ZERO WEIGHT**.
- With the scale pan being completely empty, insert the numerical value **00.00** and press the **ENTER** key.
- The displays shows **SAMPLE WEIGHT**.
- Position the sample weight on the scale plate (the suggested weight ranges between 10 and 15 Kg).
- Enter the sample weight value and press the **ENTER** key.
- The display displays the functions menu again.
- Press **STOP** to go back to the STAND-BY page.

8.0 - STOPPAGE FOR LONG PERIODS

- The unit must be kept in a safe place
- Ensure that the valves on the internal tank are closed.
- To resume use, follow the activation process only after reopening the internal tank valves.

9.0 - DEMOLITION/DISPOSAL

9.1 - Disposal of the equipment

At the end of the equipment's lifetime, the following procedures must be performed:

- Detach and vent the gas from the unit circuit: be sure the refrigerant tank too is completely discharged, in compliance with the rules in force.
- Deliver the unit to a disposal centre.

9.2 - Disposal of the recycled materials

- The refrigerants recovered from A/C systems and which cannot be reused, must be delivered to gas suppliers for disposal as required.
- The lubricants extracted from systems must be disposed of as required by law.

10.0 - TECHNICAL SPECIFICATIONS

Refrigerant:

R134

Accuracy of the refrigerant electronic scale:

± 5 g

M1 M2 gauges:

Kl. 1.0

M3 gauge:

Kl. 2.5

Container capacity:

27 l

Maximum weight that can be stored:

20 Kg

Filtering station:

1 spin-on filter dryer

Supply voltage:

230 V/50 Hz

Power:

800 W

Working temperature:

0°C ÷ + 50°C

Humidity: 20 ÷ 75%

Transport and storage temperature:

- 25°C ÷ + 60°C

Dimensions:

1270 × 690 × 660

Weight:

110 Kg approx with empty tank

Noise:

<70 dB (A)

11.0 - SPARE PARTS

Components indicated below are those necessary for routine maintenance.

Dehydrating filter	**5117399**
N°1 Vacuum pump oil bottle	**13003RA**
Thermal paper roller (for units with printers)	**5607069**

12.0 - GLOSSARY OF TERMS

- **Refrigerant**: A refrigerant solely of the type for which the unit has been created (ex. R134a).
- **A/C system**: Air-conditioning system in the motor vehicle.
- **Unit or Station**: AC590PRO equipment for the recovery, recycling, evacuation and filling of the A/C system.
- **External tank**: Non-refillable fresh refrigerant (ex. R134a) cylinder, used to fill the refrigerant tank.
- **Refrigerant tank**: The tank specifically designed for the unit.
- **Function**: Execution of an individual function.
- **Recovery/Recycling**: Function in which the refrigerant is recovered by an A/C system and stored in the internal container.
- **Evacuation**: Function in which incondensables and moisture are evacuated from an A/C system solely by means of a vacuum pump.
- **Oil injection**: Introduction of oil inside an A/C system for the purpose of maintaining the amount of oil specified by the manufacturer.
- **Filling**: Function during which refrigerant is introduced into an A/C system in the amount specified by the manufacturer.