

# USE AND INSTRUCTION MANUAL

## ProSet 134



Code no. ProSet134 Manual Ver. 1.0 - FW Ver. 4.x.x

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### **1.0 Introduction**



The CPS ProSet Series Refrigerant Management System is designed with ease of use for the technician in mind. It has an icon-based display, a comprehensive vehicle data base. The oil replacement is easy and mounted externally at the front of the machine.

CPS is pleased to bring to the automotive technician the many innovations Automotive technicians have enjoyed for years. We hope you will enjoy using your new CPS ProSet Series Refrigerant Management System.

The present recycling and recharging unit for A/C systems is meant for commercial purposes and is thought to be used by trained personnel only being aware of the principles of refrigeration, conscious of the hazards which may derive from equipment working under pressure with substances at very low boiling temperature.

We advise to read these operations manual carefully and to <u>strictly comply</u> with the given information, paying particular attention to the safety regulations. We shall decline any responsibility

resulting from the improper use of the equipment, use for purposes other than those described in the present operating manual, incorrect operation, damages resulting from external influences.

Always keep the unit in <u>vertical position</u> to avoid oil leaks and the compressor to be damaged.

### 1.1 Compliance and scrapping instructions

COMPLIANCES

The unit described in the present manual has been designed, manufactured, and distributed meeting in full the essential requirements specified by the following EuropeanDirectives concerning safety of machinery, safety of low voltage electrical apparatus and electro-magnetic compatibility: MACHINERY DIRECTIVE (2006/42/CE); EN12100

LOW VOLTAGE DIRECTIVE (2006/95/CE). ELECTROMAGNETIC COMPATIBILITY DIRECTIVE (2004/108/CE)

The conformity is declared with reference to the following harmonized standards:EN 61010-1:2010; EN 62233 :2008 EN 61000-6-1:2007; EN 61000-6-3:2007. EN 61326-1:2020 ; EN 61326-1:2021 EN 61000-3-2 :2006/A1:2009/A2:2009; EN 61000-3-3:2008

The machines are built according to RoHS European Directive requirements (2002/95/CE).

### SCRAPPING

- Do not treat the unit as mixed solid waste for scrapping but take it into pieces (Waste separation).

- Refer to the specific collection points for waste of electric and electronic devices (AEE), according to the relevant CEE RAEE 2002/95/EC, 2002/96/EC2003/108/EC regulation.

- The vacuum pump and the containers of new and used oil contain mineral and synthetic oil. Therefore, specific regulations for scrapping must be followed. The same procedure must be followed for refrigerant gas residuals in the storage bottle. Also, the exhaust oildrained from the pump is a specific waste and must be collected according to the relevant regulations in force.

- Always check with Local Authorities



### 1.1.1 Safety Notes





### SAFETY ICONS

The meaning of the icons used in the present manual and on the unit is explained hereafter:

- A) Wear goggles when handling refrigerants
- B) Wear gloves when handling refrigerants
- C) Protect the unit against humidity
- D) Read the operations manual carefully
- E) Caution!
- F) Electrical shock hazard! De-energize the power source before servicing

### PRELIMINARY INSTRUCTIONS

The present recycling and recharging unit for A/C systems is meant for commercial purposes and is to be used by trained personnel only being aware of the principles of refrigeration, conscious of the hazards which may derive from equipment working under pressure with substances at very low boiling temperature (at 1,013 bar,the R134a boiling point is-26,1 C.

We advise to read the present operations manual carefully and to strictly comply with the given information, paying particular attention to the safety regulations. We shall decline any responsibility resulting from the improper use of the equipment, use for purposes other than those described in the present operating manual, incorrect operations, damages resulting from external influences. Always keep the unit in vertical position to avoid oil leaks and the compressor tobe damaged

### SAFETY DEVICES

The unit is equipped with following safety devices:

A) Pressure relief value on internal gas tank: releases pressure if 18 Bar are exceeded in the gas tank. The purpose of the value is to ensure that the max pressure inside the tank does not exceed the max operating pressure for which the tank has been designed. It is forbidden to intervene on this value, always contact specialized and authorized personnelin case of malfunctioning.

B) Safety fan: ventilates the unit continuously when in use. The software displays a warning in case of fan failure. This device applies to R1234YF refrigerant models only

C) Front wheels with brakes

### 1.1.2 Safety Advice





Please follow the below safety advice to limit possible risks:

- Read the instructions for use carefully before starting to operate with this Aircon service unit.
- Follow the information and the instructions of the refrigerant manufacturer.
- Observe any instructions on servicing vehicle A/C systems which apply to your company.
- Use with refrigerant indicated on the data plate only (HFO-1234YF or R134a).
- Do not make modifications to the service unit.
- Only employ original spare parts and accessories.
- Use authorized additives or consumables only (ask for advice from an authorised reseller).
- Before starting the machine first check each time whether the charging hoses and the quick
- couplers are undamaged and are not leaking.
- Recover refrigerant from the hoses before releasing the quick connections.

• Do not leave the unit unattended when switched on. Use the main switch to switch off the unit after its use.

- Always wear personal safety equipment, in particular gloves and protective goggles apart from
- following the general safety rules which apply to your company.
- Avoid inhaling the refrigerating gas.
- Avoid the contact with the skin by refrigerating gas, danger of freezing.
- Never exhaust the refrigerating gas into the environment.
- Do not use the unit in potentially explosive environments (for instance: battery charging rooms).
- Do not smoke whilst using the recharging unit.
- During the operations, locate the unit on a flat and leveled surface.
- Do not use the unit near flames or sources of heat; at high temperatures the
- refrigerating gas can generate poisonous substances for inhalation.
- Do not use the unit in very humid and wet environments or in the rain.
- Use the unit in open air environments.
- During maintenance operations disconnect the unit from the electrical power.

• Avoid removing the connecting hoses if not necessary; in case always make a vacuum in the hoses before using again.

• Maintenance operations must be carried out by specialized and authorised personnel.

• Do not violate for any reason at all the safety devices the unit is equipped with, like the high-pressure valve of the internal tank.

• Do not fill compressed air in the lines of the service unit or in the vehicle aircon system(a mixture of air and refrigerant can be flammable or explosive).

Please be aware that whatsoever damages due to a wrong or improper use of the recharging station will not be covered by our warranty. Consumables like packing and seals for hoses and quick couplings, fuses and damages occurred during transport are not part of the warranty.



### 1.2.1 Unpacking





Check the integrity of the packaging to exclude damages occurred during transport. If present on your packages, check the integrity of the "TILTWATCH" indicator (If the indicator has turned red, follow the relevant instructions).

Check the entirety of the equipment and of the relevant accessories.

Not conformities, if any, must be pointed out immediately and written on the transport documents. Keep the package with care and re-use it for future transportations.



### **1.2.2 Preliminary Checks**



TRANSPORT LOCKING CALIBRATION HOOK REMOVAL

Before using the unit for the first time, remove the hook screwed to the tank scale which is for transportation protection. Keep hook in safe place for if ever required for scale calibration. 1) Hook in transport lock position 2) Hook in calibration position

VACUUM PUMP OIL CHECK

Check the level of hydraulic oil in the vacuum pump and, if necessary, fill up to the level(about half of the spyglass)

Legend: 1) Oil inlet 2) Sight glass (set at half of the scale) 3) Oil drain



### 1.2.3 Hoses connection





Make sure the charging hoses are connected to the unit (high pressure = RED, low pressure = BLUE). Make sure that the quick couplings are in CLOSED position (turn counterclockwise toclose the coupling, see picture)

Carry out a vacuum cycle of one/two minutes followed by a leak test under vacuum. The above procedure avoids any air residuals left in the hoses and checks for eventual leaks (see the relevant instructions). The vacuum and the following leak test should be repeated whenever the charging hoses could have been contaminated with air.

Check if the setting relevant to the length of the hoses is correct (select SETTINGS, then HOSE LENGTH and modify if needed, by means of the buttons UP and DOWN.

If the hose length is set to 0 (zero), at the end of the working cycle, the unit will not calculate the gas remaining in the hoses at the end of the working cycle and will lead the user to suction the gas residuals in the A/C system of the vehicle, instead.

(In case of a pressure test, which is not preceded by a standard working cycle, the unit recovers the gas residuals in the vehicle by default, regardless to the above setting)





### 1.2.4 Internal bottle refill





The unit is delivered with the empty internal gas bottle for safety reasons. It is therefore necessary to fill the bottle with a refrigerant quantity not lower than 2 Kg and not higher than eighty percent of the maximum nominal capacity of the tank (this percentage may change according to local safety rules). To fill the internal tank please follow the relevant instructions of the present manual. To connect to the bottle, use the HP hose with the Supplied adaptor.

For filling of Bottle Ref Page 32 Section 7.1



Adaptor for R134A Bottles Code AD41



### 1.3 Unit description



### Legend:

- Top gauges panel
  Accessories storage
- 3) Main Switch

- 4) Ventilation grid
  5) Tank access door
  6) Vacuum Pump ventilation grid
- 7) Wheels with brake

- 10) New oil bottle
- 11) Oil drain bottle
- 12) Main LP and HP taps



### 1.3.1 User panel



The picture above shows the user panel that allows to control the functions of the unit.

Legend:

- 1) Bluetooth antenna (optional)
- 2) Thermal printer housing (optional) 3) LCD Display
- 4) USB mini port
- 5) Control buttons
- 6) High pressure gauge
- 7) Low pressure gauge8) Button DOWN
- 9) Button UP
- 10) Button ENTER
- 11) **Button EXIT**



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### 2.1 Startup initialization

When the machine is switched on, the type, the SW version and the last five digits of the serial number of the machine are shown on the display.

The unit further performs a series of tests to check its functionality and the absence of leaks in the internal circuits: an internal cleaning is performed including an exhaust OIL DRAIN and an INTERNAL VACUUM phase.

### 2.2 Main screen



The main system panel appears just after the start up procedure.

Several bits of information are displayed, like the refrigerant quantity contained in the internal tank as well as the refrigerant temperature.

This in turn gives the calculated tank pressure also displayed.

If the actual tank pressure is well lower than the calculated tank pressure, then a quantity of noncondensable gas is present inside the tank. In the case, provide to purge the tank.

A notifications panel including the count down to the system regular services, is available on this screen. Depending on the unit model press ESC to activate the notification panel. Press UP and DOWN to scroll the active notification list and ENTER to open the main menu.





### 2.3 Main Menu



The main menu provides the access to all functions as well as the setting of the A/C service unit.

The currently selected function is displayed in the title area while the corresponding icon is highlighted. While it makes sense for a particular function, the most significant input data value is displayed below the icon.

Three dots on the left or right side of the screen means the menu includes more functions by scrolling toward that side.

Press the UP and DOWN buttons to change the selection through the functions and press ENTER to enter the function menu.



### 3.1 Database





The database function allows the user to configure the service unit to perform the standard recoveryrecharge service suited for a specified vehicle.

A multilevel selection is provided to get the information related to the A/C system of the vehicle. The first level selects from the currently installed databases.





### 3.2 Model selection





### BRANDS

The brand list included in the selected database can be scrolled with this function to look for the required one.

Press UP and DOWN to scroll the list and ENTER to open the models list related to the currently selected brand.

### MODELS

This level browses to the vehicles model list related to the selected brand of the loaded database. Press UP and DOWN to scroll the list and ENTER to open the list of all the A/C systems provided for the currently selected vehicle model.









This is the deeper level of selection within a database. Several A/C system types may have been installed on a vehicle depending on the vehicle setting up or the production period.

Whenever it is significant, the name of the A/C system as well as the production period are displayed. This information will help you to select the right A/C setting data.

Other information may be displayed like the A/C compressor oil recommended from the vehicle manufacturer, the type of vehicle engine (Standard or Hybrid that include the pure electric vehicles) and the positions of the connection for the service unit quick couplers.

Finally, the quantity of refrigerant suited for the selected A/C system is displayed.

Press UP and DOWN to scroll the A/C systems list provided for the selected vehicle and ENTER to configure the service unit and move directly to the A/C service function.



### 4.1 A/C Service





The standard sequence of the A/C system service includes:

- 1) Refrigerant recovery
- 2) Exhaust oil drain
- 3) Stress test under nitrogen (Not Available on Proset 134)
- 4) Vacuum
- 5) Vacuum test
- 6) Oil refill
- 7) Dye refill (Not Available on Proset 134)
- 8) Charge trial (provided only in the HFO1234yf service units)
- 9) Refrigerant charge
- 10) AC Pressure test

The number of functions may change depending on the unit model or on the installed options.







Some service procedures require input data to be changed. A zero value for the inputs data means that the correspondent procedure will be not executed.

In the shown examples, the VACUUM service requires the user to change the vacuum time while the CHARGE service requires the quantity of refrigerant to be charged.

Press UP and DOWN to change the input value, ESC to confirm the value and move back to the A/C Service menu. Press RETURN to confirm the value and begin this single service.









Regardless of the A/C service type, before starting any procedure, the system shows the user a resume screen.

The screen shows the service type, the current vehicle brand and model and the technology of vehicle engine: standard or hybrid/electric.

Press ENTER to confirm the current vehicle or press UP and DOWN to change to a "not specified vehicle" with a standard or hybrid/electric engine.

In case of a service on a hybrid/electric vehicle and if it not yet done, the system will prompt for an oil decontamination procedure. See section 7.3 PG 34









The system asks the user to connect the charging hoses to the vehicle/the external bottle/the AC component to be serviced (depending on the current procedure) and "open" the relevant quick couplers. To "open" the couplers, turn the knob clockwise, to

"close" them turn it counterclockwise and open the main taps (see 1.3 "Unit description" no. 12, put in vertical position to open)

In case of connection to a vehicle and if this data is available, the position of the couplings in the engine compartment will be displayed on the right of the display. The title bar displays the currently selected procedure.

Whenever it makes sense, by pushing the UP and DOWN buttons, the user may set the unit to use both of the two lines (HP and LP) or one of them only.

As the couplers and the main taps are open, the pressure gauges will display the pressures of the connected vehicle/bottle.









### AUTOMATIC SERVICE

This function starts the fully automatic A/C services sequence to be performed automatically An input data set to zero means that the related step will be skipped. If the system detects a condition which prevents the operation, it displays an error message. The sequence will be interrupted, and the final hoses recovery procedure will be proposed.

Whenever it makes sense, the input value is displayed under the icon of the related service. An input data value set to zero means that the related service will be skipped.

SINGLE SERVICE STEP

Press UP and DOWN to select a service function and ENTER to start the relevant procedure.

The single functions may be performed individually or in a fully automatic service sequence. Select the left most function to start the fully automatic A/C services sequence or any of the other functions to perform only the relevant procedure.

Press ESC to break the working procedure without any regard of the progress.

If the system detects a condition that hinder it to proceed, the sequence will be interrupted, and the final hoses recovery procedure will be proposed.







During this phase, the system recovers the refrigerant from the A/C system and stores it in the internal tank.

As the pressure in the internal lines and in the vehicle decreases and reaches the lower limit, the compressor stops. The unit checks if the pressure increases (meaning that refrigerant residuals have still to be recovered from the vehicle) and, in case, performs a new recovery cycle. The procedure ends definitively when the pressure stabilizes on the lower values.





4.4 Oil Drain



If at least 50 g of refrigerant have been recovered, the Drain procedure starts automatically just after the Refrigerant Recovery procedure.

The unit displays the recovered refrigerant quantity.

(If your model is provided with oil scale) the screen displays the drained oil quantity and the recovered refrigerant quantity. The procedure is skipped for low quantities of recovered refrigerant.







The VACUUM procedure allows you to remove air and humidity traces from the A/C system. It is strongly recommended to have a convenient long VACUUM specially whenever the A/C system has been opened for example to change a component.

If the procedure cannot reach a good vacuum pressure, then it will stop, indicating a potential leakage in the A/C system.

As the programmed vacuum time expires, the VACUUM TEST procedure will start automatically if the related parameter is not set to zero.

### 4.6 Vacuum Test



The VACUUM TEST procedure starts automatically after the VACUUM procedure.

This procedure tests for the vacuum pressure will persist on the A/C system for a defined test time. If the A/C system pressure increases, the system will advise about a potential leakage in the A/C system. The test time is set through the menu SETUP -> WORKING SETUP -> VACUUM TEST. It the vacuum test time is set to zero the test will be skipped.



### 4.7 Oil Injection





The OIL REFILL cycle restores an oil back into the A/C circuit that could happen because of a refrigerant recovery.

The oil quantity to be refilled may be set at the beginning of the fully automatic service as well as just before the refill cycle is performed. This SEMI-AUTOMATIC MODE allows you to check the quantity of oil drained after the previous refrigerant recovery cycle and set a correspondent value to be refilled. Set the value to X to get this mode.

Example:

- X means the unit will stop after the vacuum cycle and wait for the setting of the user
- 0 g means the unit will charge no oil
- 5 g means the unit will charge 5 g in the A/C system.

The oil refill is possible only if the A/C system is vacuumed and shall be followed by a refrigerant charge.



4.9 Refilling Test (R1234yf models only)





This procedure performs a pre-charge test with a reduced refrigerant quantity (15% of the total quantity) to exclude possible leaks. Once the refrigerant has been charged, the unit checks for the defined period and control the pressure stability.

As the test period expires, the refrigerant is recovered to the internal tank to avoid error on the accuracy of the next refrigerant charge procedure.

In case it's possible to perform a test under pressure with nitrogen (stress test), the pre-charge cycle will be not necessary.



### 4.10 Refrigerant Charging

This procedure provides the charge to desired refrigerant quantity in the A/C system. Any previous injection of oil will carry inside the A/C system by the fluid refrigerant during this phase. The quantity which remains in the hoses after the charge cycle is automatically calculated and recovered in the tank. Only if the hose length setting has been set to "0"the unit will guide the user to switch on the A/C system to suction these residuals into the A/C system of the vehicle



# 5.0 Accessories

This menu collects several accessory phases that are provided to operate both on the A/C system and the single parts. The set includes a FLUSHING procedure and the so-called EASY FLUSH cycle.

### 5.1 Easyflush (Asia only)



The EASYFLUSH cycle automatically fills and recovers liquid refrigerant into the A/Csystem (or into parts of it).

To check if the refrigerant (the oil mixed with the refrigerant) is contaminated or not, use the accessory set **CPSEFLUSH** (not included in the standard outfit)

- Connect the vehicle's A/C system (or part of it) to the unit by means EASYFLUSH accessory kit, as described in the relevant instructions.

- Select EASYFLUSH and set the desired refrigerant quantity (depending on the volume of the part to be flushed)

- Open the main taps

- press ENTER

Before the flushing, the unit will automatically perform a vacuum cycle to test for any leakage. The vacuum cycle is mandatory to avoid any gas leakage into the environment.



### 6.0 Reports





The reports menu provides the functions to display and print the report relevant to the service performed with the service unit. A short cut is provided to the last service while amenu allows to seek through the complete services list.

A special report is deputed to display, print, and reset several counters including allthe ones required by the Gas rules.

### 6.1 Last A/C Service



The unit displays the data relevant to the last A/C service performed by the unit.

It is possible to print it (if a printer is present in your unit) by choosing ENTER or return to the previous page by choosing EXIT.



### 6.2 A/C Services



This function allows to navigate the internal services REGISTRY. The REGISTRY lists all the services ever performed on this unit, sorted by month. A single service may be visualized, and the receipt may be printed.

### 6.3 Reset Counters



The function displays the counters relevant to the refrigerant recovered by the unit, the refrigerant and the oil used to fill the vehicles.

Press ENTER to print a receipt. As the printing process is end, the system prompt for a counter reset. Press ENTER to confirm the counter reset and ESC to quit without reset.



### 7.0 Unit Management



This menu collects several features that allow the user to a regular self-maintenance like:

- the internal refrigerant tank refilling the self-cleaning cycles
- the decontamination cycles
- the scale test function





Use this cycle to load or refill the internal tank.

Press Blue enter button, scroll up arrow to Unit Management. Press Blue key.

Bottle refill will show, Press Blue enter key and follow prompts.

An input data is asked that is the quantity of refrigerant to be loaded. Please consider that depending on the hose length, a higher refrigerant quantity will be loaded. For a length of 3m the final refill will be higher of about 300/400 grams with respect of the set value.

See the instruction in Chapter 1 for more details about this cycle.







This cycle performs an internal refrigerant flushing with the purpose of cleaning the internal circuit by removing oil and dirty contaminants.

After the flushing, the cycle provides for the oil drain and internal vacuum.

A regular use of the **SELF-CLEANING cycle** may improve the unit efficiency and life.





### 7.3 Decontamination





The DECONTAMINATION cycle is a special self-cleaning cycle that allows to prepare the unit to work with a different oil.

With respect the SELF-CLEANING cycle, this one also involves the charge hoses.

After the above preliminary operations, the system performs three consecutive refrigerant LOAD AND RECOVERY cycles.

Note: the cycle is performed automatically when a service is performed on a hybrid vehicle after the station has been working on a non-hybrid vehicle.





### 7.4 Weight Test



All the unit models are provided with an internal scale for an accurate measurement of the recovered and refilled refrigerant. Depending on the model a further scale is provided to get the value of the drained and refilled oil.

Two procedures are provided to allows to test the scales by checking with a sample weight.

To test the refrigerant scale, put a sample of at least 100 g hung to the opposite supplied hook.

To test the oil scale, put the sample weight inside an empty oil bottle.

The measured difference is shown on the display.







The Set up menu allows the configuration of the service unit. The internal time and the language can be set through this function, as well as several parameters that allows the user to trim the operative phases.

### 8.1 Date Time



To set current Date and Time, use the buttons UP and DOWN to increase/decrease and press ENTER to confirm and skip to the next setting









Choose the language to be used by the unit and press ENTER to confirm and exit the setting,







Choose the desired LCD brightness/contrast values with the use of the buttons UP and DOWN and press ENTER to confirm and exit the setting



8.4 Working Setup



This menu collects several setting parameters that allows the user to trim the A/Cservice cycle depending on his own needs.

This parameter affects both the duration and the accuracy of the service.

It is strongly recommended to carefully read the following paragraphs before changing these values.







The parameter defines the length of the CHECK period during the RECOVERY cycle. The RECOVERY cycle alternates periods of actual refrigerant recovery during which the internal compressor is switched on, with check periods when the compressor is switchedoff and the system checks for an eventual pressure rise.

By setting this parameter to a shorter time could result to a shorter RECOVERY cycle but a higher quantity of refrigerant will be leaked during the VACUUM cycle.

The recommended value for this parameter is 3 minutes. The minimum value is 1 minute.









After a VACUUM cycle a VACUUM TEST cycle could automatically be performed. The test checks for the VACUUM pressure will be stable well close to -1000 mbar. The cycle stops in case a significant pressure increase is detected.

The parameter defines the duration of the test while a value of zero means the test will be skipped.









Configure the length of the currently used charging hoses (default length is 3000 cm, which can vary complying to your unit model).

NOTE: if the hose length is set to the correct length of the hoses, the unit will automatically calculate the refrigerant quantity which remains in the charging hoses after the service. These refrigerant residuals will be then automatically recovered in the internal tank.

If, on the opposite, the hoses length has been set to "0" the unit will guide the user to recover any gas residuals left in the hoses to the A/C system instead of recovering it into the unit again.









The parameter configures if the refrigerant quantity recovered from the vehicle's A/Csystem must be printed (YES/NO).

Press ENTER to confirm your choice.





8.7 Info



The menu provides a series of information about your unit:

- Model
- Serial number
- FW version
- Name (of the unit to identify the station)

and, on the following page (press INCREASE button to change page):

- Bottle capacity

- Refrigerant in use

Info

Serv.: 23/03/19 13:41 Charges: 4/4 Filter: 1/80 kg Pump: 0/60 h



### 9 Ordinary Maintenance



The maintenance must be carried out by an authorized Centre to make sure that the warranty of the product is not interrupted. The unit registers service operations to monitor the working hours of the filters and the vacuum pump oil. These counters must be reset by the service personnel.

### DEHYDRATING FILTER REPLACEMENT

Replace the filter once a year or when the unit warns you that a change is required.Recover the gas residuals left in the charging hoses and in the filter. Replace with original filters only. ATTENTION! The filters must be mounted according to the flow direction indicated by the arrow signed on the filters itself (see drawing)

### VACUUM PUMP OIL REPLACEMENT:

Open screw ref.1 and 3 to drain the oil from the pump. Allow the pump to turn for few seconds to drain completely. Fill with oil up to the middle of the sight glass ref. 2

. Turn the pump for few seconds, check if level has changed. Eventually add missing oil.

