

Advance R1234yf



Notes:

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1 PREFACE

The machine has been designed and built to ensure long lasting, high-level operating reliability with maximum safety for user.

This operating manual is part of the machine.

Read carefully before use.

- The user is responsible for the proper use of the machine in accordance with the instructions found in this operating manual.
- The manufacturer cannot be held responsible for damage to persons, animals and/or objects due to improper use different to that illustrated in this instruction manual.
- The manufacturer reserves the right to make technical and aesthetic alterations to the machine without prior notification.

The purpose of this operating manual is:

- To supply the user with all the information needed to use the machine starting from purchase on through to the disposal of this same machine.
- To ensure maximum support for the personnel assigned to the use and the maintenance of the machine.

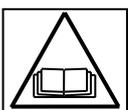
For any special needs or requests for technical assistance or spare parts, please contact the manufacturer.

This document may contain printing mistakes.

2 SYMBOLS



this safety alert symbol indicates that this message involves personal safety. Works danger, warning and caution indicate degree of hazard. Death, personal injury and/or property damage may occur unless instructions are followed carefully.



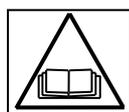
You are not ready to operate this machine if you have not read and understood the following safety items. Read this entire OPERATING MANUAL.

3 FORESEEN USE

The machine is designed solely for use in automobile air-conditioning system maintenance. This Service station may only be used with the refrigerant R1234yf and Silco UV Dye

It's forbidden to use the machine for disposal process!

4 SAFETY



The user is obliged to follow the “General safety rules”, to use the machine in according to the “intended use” and the instructions of this operating manual.

Therefore, the user is not exposed to any risk if the general safety rules reported below are followed with proper use and maintenance of the machine.

4.1 Glossary of Terms

- Machine: The machine relative to this operating manual.
- Refrigerant : Fluid reported on the identification label.
- A/C system: Air-conditioning system in the vehicle.
- External tank: New Refrigerant used to fill the internal vessel.
- Internal vessel: Refrigerant storage tank inside the station.
- Process: Execution of an individual function (e.g. Recovery).
- Cycle: Execution of more processes.

- **Recovery**: The recovery of refrigerant in any condition and its storage in a container outside the A/C system, without necessarily undergoing analysis or treatment of any kind.
- **Recycling**: A reduction of the contaminating substances in used refrigerants through oil separation, the recovery of incondensable and their single or multiple passage through elements that enable a reduction in humidity, acidity and particles.
- **Evacuation**: Phase in which incondensable and moisture are evacuated from an A/C system solely by means of a vacuum pump.
- **Oil charge**: Introduction of oil inside an A/C system for the purpose of maintaining the amount of oil specified by the manufacturer.
- **UV dye charge**: Introduction of UV dye inside an A/C system in order to detect possible leaks by means of a UV lamp.
- **Refrigerant charge**: Phase during which refrigerant is introduced into an A/C system in the amount specified by the manufacturer.

4.2 General safety rules

- This machine is intended for use by **QUALIFIED PERSONNEL** only. Such users must have a knowledge of the basics of refrigeration, refrigeration system, refrigerants and the potential hazards that machine under high pressure can cause.
- DO NOT modify the safety devices
- DO NOT use external tanks or other storage tanks that have not been type-approved or that lack safety valves.
- DO NOT use the machine near open flames and hot surfaces. At high temperatures, the refrigerant decomposes, releasing toxic and chemical substances that are hazardous for users and the environment.
- It's obliged to supervise the machine at all times.
- It's obliged to use only the refrigerant indicated on the identification label. Mixtures with other types of refrigerant will seriously damage the cooling and refrigeration system, as well as the machine.
- It's obliged to use goggles and gloves - contact with the refrigerant can cause blindness and other physical injury to the user.
- Avoid inhalation of vapours from the refrigerants and contact of the refrigerant with skin.
- Avoid to leave power supplied to the machine unless the machine is going to be used immediately. Cut off the electrical power supply prior to long intervals in which the machine will not be used.
- Attention: Ensure that all valves are closed before making connections between the machine and an A/C system or an external tank.
- Attention: Ensure that the process has been completed and that all valves are closed before disconnecting the machine.
- Attention: All of the flexible hoses may contain refrigerant under high pressure.
- Attention: The machine and A/C system in vehicles containing refrigerant should not be tested with compressed air. Some mixtures of air and refrigerant have proven to be combustible at high pressure levels. These mixtures are potentially hazardous and there is a risk of fire and explosions that can cause damage to property and personal injury. Additional medical and safety information can be obtained from the manufacturers of the oils and refrigerants.

4.3 Guidelines for handling refrigerants

4.3.1 Precautions for Refrigerant Storage

The refrigerant to be removed from a system must be handled carefully in order to prevent or minimize the possibilities of different refrigerants mixing. The tank used for storing refrigerants must be assigned to specific refrigerants to avoid different refrigerants mixing.

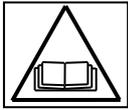
4.3.2 Recycling Capacity

The recycling machine's filter system should be replaced regularly in order to maintain the efficiency of the recycling machine.

4.3.3 General notifications

Before re-introducing refrigerant into the system, the system itself must be evacuated and cleaned. In order to be sure that the system is free of contaminating agents before introducing the refrigerant, all the procedures described in this instruction manual must be followed.

Clean and maintain the machine regularly, especially when highly contaminated refrigerant is used: it is extremely important that contamination from the previous operation is not transferred to subsequent operations.



The machine is designed exclusively for **1234yf**
The design meets all the guidelines of the European standard
EN 378:2010

Safety Classification and information about refrigerant:

The refrigerant is classified in **Table E.1** (Refrigerants designation) of **Annex E** (Normative) of the European standard **EN 378-1:2008 + A1: 2010 (E) (EN 378-1:2011)**

PROPANE series: 1234yf (2,3,3,3-tetrafluoro-1-propene $\text{CF}_3\text{CF}=\text{CH}_2$)

Safety group: **A2**

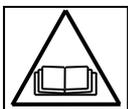
PED fluid group: **1**

The refrigerant (R) 1234yf is classified FLAMMABLE

The refrigerant can assume different names depending on the manufacturer!



For more information relating to the refrigerant refer to the
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006 (MSDS)



The **SAFETY DATA SHEET (MSDS)**
must be delivered to the operator (s) employee (s) using the machine!

HAZARDS IDENTIFICATION

Classification

REGULATION (EC) No 1272/2008

Flammable gases 1

H220 Extremely flammable gas.

Gases under pressure Liquefied gas

H280 Contains gas under pressure; may explode if heated.

DIRECTIVES 67/548/EEC or 1999/45/EC

F+ Extremely flammable

R12 Extremely flammable.

Tank label elements

REGULATION (CE) N. 1272/2008

Hazard pictograms:



Signal word : Danger

Hazard statements :

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

Precautionary statements :

P281 Use personal protective equipment as required.

P210 Keep away from heat/sparks/open flames/hot surfaces.
No smoking.

P260 Do not breathe dust/ fume/ gas/ mist/vapours/ spray.

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

P410 + P403 Protect from sunlight. Store in a well ventilated place.

DIRECTIVES 67/548/EEC o 1999/45/EC

Symbol(s) :



R-phrase(s):

S-phrase(s):

R12 Extremely flammable.

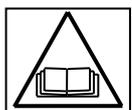
S 9 Keep container in a well-ventilated place.

S16 Keep away from sources of ignition – No smoking.

SYMBOLS



These safety alert symbols indicate that this message involves personal safety. Works danger, warning and caution indicate degree of hazard. Death, personal injury and/or property damage may occur unless instructions are followed carefully.



Do not operate this machine if you have not read and understood the following safety items. Read this entire OPERATING MANUAL.

4.4 Safety devices

The machine is equipped with the safety devices required from the European Directives:

- **Electric safety switch.**
- **Safety valve**



DO NOT MODIFY THE SAFETY DEVICES!

4.5 Not condensable gases discharge

A not condensable gas discharge valve is installed to consent the evacuation of the not condensable-gasses in the internal vessel.

The not condensable gas discharge valve could generate noises.



Never approach the not condensable gas discharge valves! Danger of pressurized gas discharge

4.6 The working environment

- The machine must be used in open environment or in places equipped with good ventilation (at least 4 changes of air per hour).
- The machine has been designed for use at a maximum altitude of 1000 m above sea level, within a temperature range of +5 and +40°C and with a maximum humidity of 50% at +40°C.
- Operate in sufficiently light conditions.

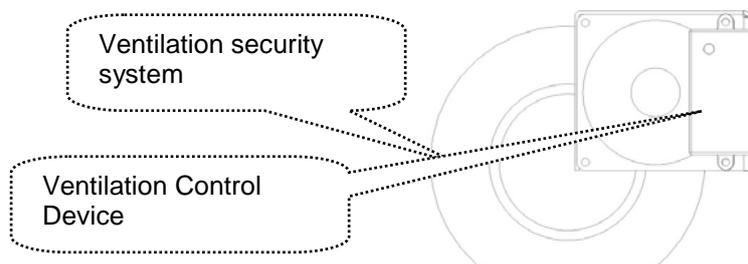
4.7 Ventilation Control Device VCD

The machine is designed for the refrigerant **1234yf** classified as flammable.

For this reason, the machine is equipped with a ventilation security system which has the task, in case of leakage of the circuit, to avoid the formation of pockets of refrigerant.

The Ventilation Control Device (VCD) monitors the efficiency of the ventilation security system and in case of anomaly of the same it prevents the use of the machine or activates the procedure for putting in safety.

In addition, the internal vessel is equipped with a normally closed electric valve which is activated only when the ventilation security system works correctly.



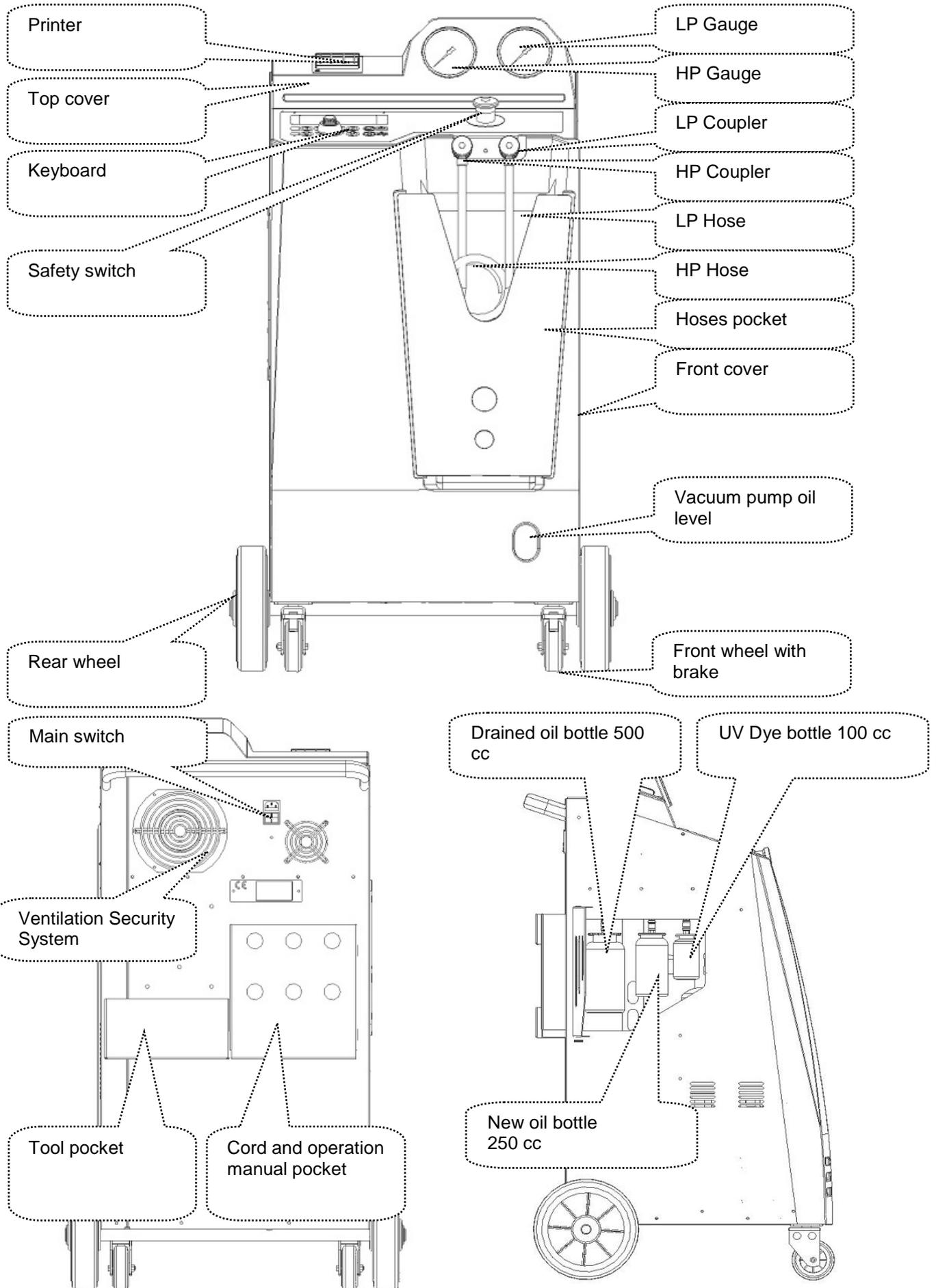
5 USE OF THE SERVICE STATION

5.1 Unpacking and checking of components

Remove the machine packaging and ensure that the following parts are present:

- **This operating manual.**
- EC/PED documentation

5.2 Service station description



Technical features	Service Station Advance/Advance+
Power supply	230V+/-10% 50Hz
Operating temperature range	10/49°C
Refrigerant	R1234yf
Internal vessel capacity (kg)	11
Maximum pressure (PS)	18 bar
Compressor	1/3 HP
Recovery rate (liquid)	390 g/min'
Not condensable gas discharge	Automatic
Main drier filter	Type 300/660 cc
Fan	172 mm + 80mm
Oil discharge	Automatic
Bottle capacity	500 cc
Weight scale	60 kg
Accuracy (+/-)	2 g
Vacuum pump	100 lt/min
Final pressure (mb abs)	0,08
Electronic vacuum meter	YES
Oil charge	Automatic
Bottle capacity	250 cc
UV tracer charge	Automatic
Bottle capacity	100 cc
Refrigerant charge	Automatic
Service hoses compensation	Automatic
Flushing program	YES

Configuration	Service Station Advance/Advance+
Display	4 x 20 crt
Keyboard / Encoder	YES
Car Data base (32 Mb)	YES
Printer	Build on
Gauges (pulse free)	D 80 mm
Service couplings	Parker SAE
Service hoses	2,5 m GY
Pocket tools	YES

5.3 Machine handling

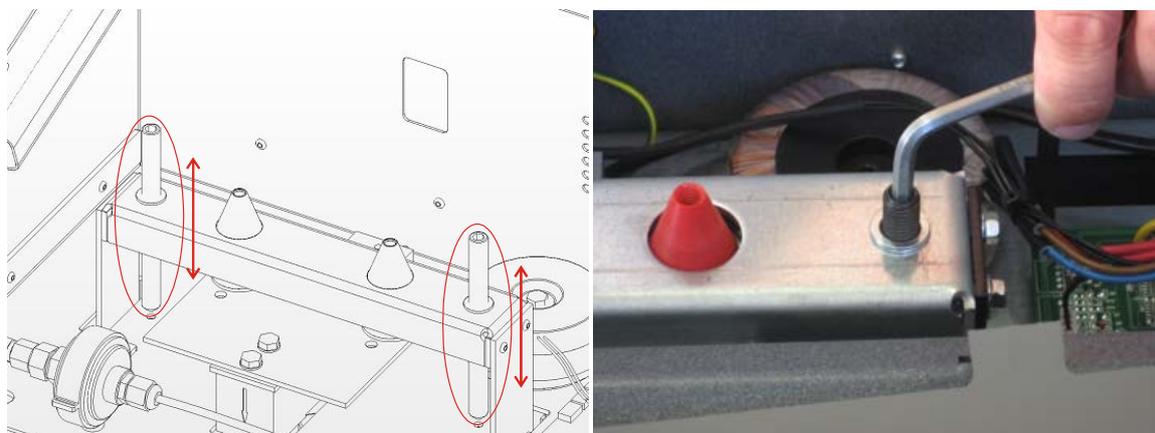
In spite of the fact that the heaviest components have been assembled on the base in order to lower the centre of gravity, it has not been possible to eliminate the risk of overturning completely.

The machine is moved on the four wheels.

On roughly ground, the machine **must be moved by tilting it and balancing the weight on the two rear wheels.**

5.4 Preparation for use

At the purpose to protect the weighting system the scale is blocked by two screws.



In order to activate the machine, please refer to Chap. 9.

5.5 Turning on and switching off

Turning on: Move the main switch to the ON position (I)

Switching off: Move the main switch to the OFF position (O)

DO NOT shut down the station by disconnecting the power cord!

5.6 Stillstand for longer periods

The machine should be positioned in a safe area, disconnected from the power supply and protected from excessive temperatures and humidity.

5.7 Disposal

At the end of the machine's lifetime deliver it to a disposal centre.

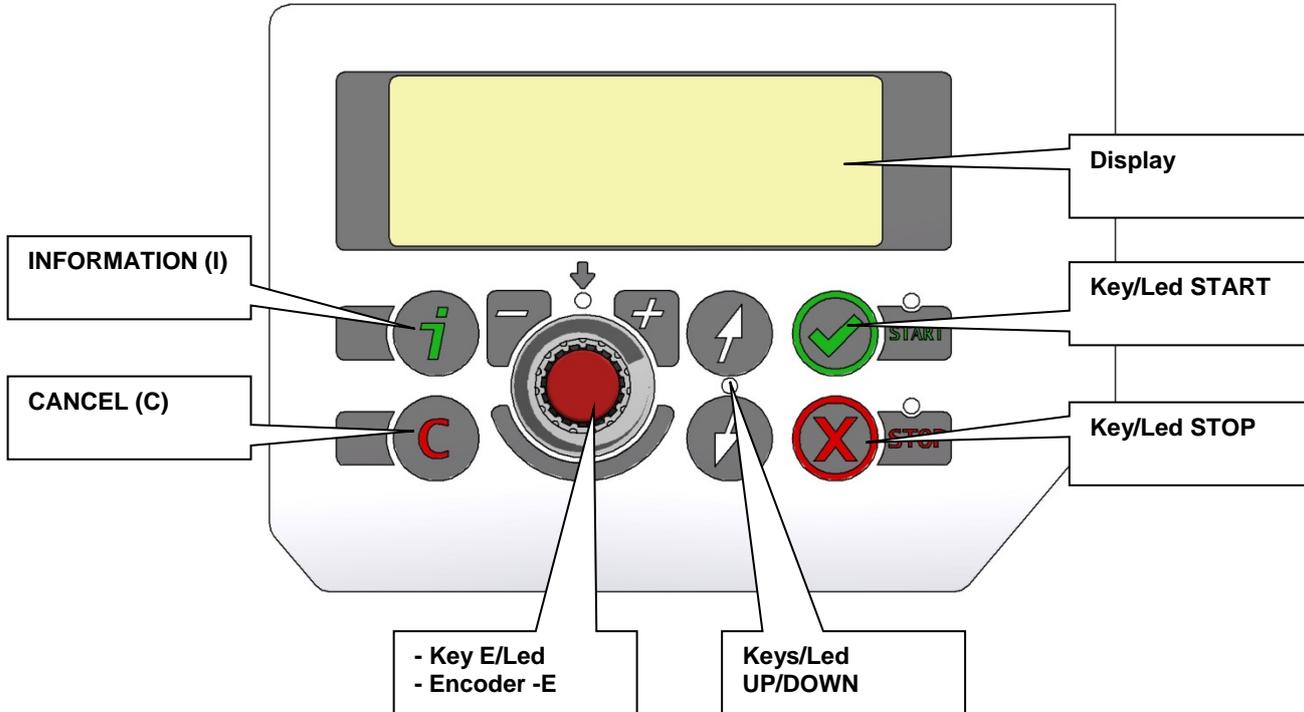
5.8 Recycled material disposal

The lubricants extracted from A/C system must be delivered to used oil collection centre!

6 START-UP

6.1 Keyboard description

Refer to the following drawing:



Press the Power Switch (I) to turn on the equipment.

Press the Power Switch (I) to turn on the equipment.

The ventilation security system starts and the display shows:

Ventilation system
check!
PLS wait.

After 30 sec. the ventilation security system is checked by the VCD.

If the ventilation security system is faulty or the inlet grid is obstructed , the display shows:

Ventilation
system fault!
Contact
SERVICE CENTER

Possible causes:

The inlet grid is obstructed: PLS remove the obstruction.

The main fan is faulty.

The main fan is blocked.

The VCD is faulty.

PLS contact exclusively the SERVICE CENTER!

If the ventilation security system works, the display shows:

Display (Stand-by)

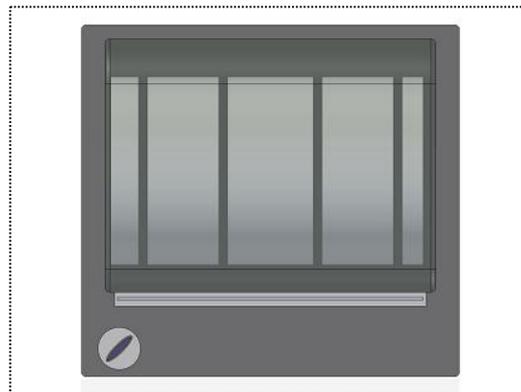
Silco d.o.o.
Braslovce

01-02-2008 10:20:30

Change the lines by the menu “**Company name**” (See Chap. 6.2.2)

6.1.1 Printer

Paper: L 58 mm
Diameter: D 40 mm



Paper feed ---

A) Before a process:

Max 20 characters (Plate nr., Chassis nr., etc..)

CAR DATA:

v
234567890 ABCDEFGHI

B) At the end of a process

Press “START” key for printing.

Press “STOP” key to end.

Service report
printing by “START”

6.2 SETTINGS

6.2.1 Date – Time

Turn "ENCODER" to select Date-Time Press "E" key to confirm

Turn "ENCODER" to modify the blinking value
Press "E" key to confirm
The next value blinking.
When the data are right, press "START" key to confirm.

Time:	10:20:30
Date:	01/02/08

6.2.2 Company name

Turn "ENCODER" to select Company name
Press "E" key to confirm

Silco d.o.o.
v
234567890 ABCDEFGHI

5 lines are available:

The following setting is an example:

Company name (Workshop)
Address (Road, etc..)
City
Phone
Fax

NOTE: All five lines are reported on the ticket, otherwise the line 1 and 3 on the display (in Stand-by).

Turn "ENCODER" to select the character. Press "E" key to confirm.
The character is reported on the first line (left).
If required, press "C" key to delete.
It is possible to move in the line by UP/DOWN
Turn "ENCODER" to select the next character. Press "E" key to confirm.
The character is reported on the first line.
Press "START" key to confirm the setting.
The display shown the following line.
Press "STOP" when the 5 lines are set.

6.2.3 Personal settings

The procedure allows to pre-set some basic settings for automatic programmes.

Turn "ENCODER" to select Personal setting Press "E" key to confirm

1 - Recovered refrigerant quantity and oil are reported on the print-out

0 - The data are not reported.

Print recovery data
1

Turn "ENCODER" to select 1 or 0. Then press "E" key to confirm

The default value is applied in:

Full service database Full service Smart service

Turn "ENCODER" to set. Press "E" key to confirm

Refrigerant residual
check
min. 2

The default value is applied in:

Full service database Full service Smart service

Turn "ENCODER" to set. Press "E" key to confirm.

Leak test
min. 2

The default value is applied in:

Full service database Full service Smart service

Turn "ENCODER" to set. Press "E" key to confirm.

PAG Oil cc. 8

The default value is applied in:

Full service database Full service Smart service

Turn "ENCODER" to set. Press "E" key to confirm.

NOTE: Set "0" to by-pass the process!

UV Dye min cc. 5

MIN. Qt. = 5 cc!!!



1 Printer build on

0 Printer off line or not installed.

Turn "ENCODER" to select 1 or 0. Press "E" key to confirm.

OPTIONAL
PRINTER
1

Turn "ENCODER" to select language.

Press "E" key to confirm

English

SN:Serial number, 361363: Production index (ex).

Press "STOP" key to exit.

SN000000 361363

6.2.4 Service hose length

Turn "ENCODER" to select Service hose length.

Press "E" key to confirm.



MAX. LENGHT= 500cm!!!

Set the HP hose
length (red hose)
cm. 250

The value set is the hose installed in the factory.

In event replacing the hoses with the new one's (longer)
new length must be set in order to compensate the refrigerant
in hoses.

Turn "ENCODER" to set. Press "E" to confirm

6.3 Anomaly messages

Scale blocked (See Chap.. 9) or faulty

Anomaly!
Scale

A1

Recovery process anomaly or compressor faulty.

Anomaly!
Recovery

C1

High pressure switch in function. Wait 20/30 min.
If the message appears again, please contact our
Service” department.

Anomaly!

Overpressure in
recovery process!

Maximum refrigerant quantity allowed!
Reduce the refrigerant quantity in the internal vessel.

Vessel brimming!

Please wait!

After few minutes the minimum value is not match.
Possible causes: defective A/C system, etc...

Insufficient vacuum
value!

Continue?

mb. ///

The vacuum value is not enough to guarantee the process.
Possible causes: leakage in A/C system, air in the bottles ...
Press “START” to bypass and continue with refrigerant
charging process.

Insufficient vacuum
For oil/UV charge!

START to bypass

The refrigerant quantity is lower then minimum
quantity required.
Perform “Internal vessel charge”.

Insufficient
refrigerant.

Charge the vessel.

Maintenance will expire soon.
Order the parts required (See Chap. 8)

Order filter drier
for next service.

Part. Nr.: 07.500

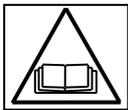
Order vac. pump oil
for next service.

Part. Nr.: 8020

6.4 First time use and vessel charge

The equipment contain not enough refrigerant to run.
The available quantity could be negative (i.e.: -500 g.)
It be necessary to put new refrigerant into the internal vessel before the use.

Turn "ENCODER" to select Vessel charge. Press "E" key to confirm.



Display (2 sec)

WARNING!
Verify Oil and UV
quantity in the bottles.

NOTE: The message is always shown before processes.
It does not mean something is wrong, it is only a
reminder to check the quantity of Oil and UV Dye
in bottles.



Connect the RED hose to a new tank of refrigerant.
If available, open the liquid tank valve (RED).
If no, turn the tank up-side-down.

Connect HP hose to
the external tank.
Open the valve
liquid side.

Turn "ENCODER" to set the value.
Minimum: 800 g.
Maximum: the value shown by the display.
Press "E" key to confirm.

Set the quantity.

g.////

Press "START" key to confirm

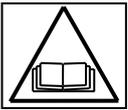
Confirm by "START"

Start in process

Process start.

Vessel charge in process.
Pressure mb.
Refrigerant g. ////

MESSAGE: If the equipment senses a pressure lower than the minimum value for the process.



Verify:
-Ext. Tank empty?
-Tank valve closed?

- Replace the external tank, then press "START" key to confirm
- Press "STOP" key to complete the process.

Process completed.

Close the tank valve and disconnect the red hose from the tank.
Press "START" key to confirm.

Vessel charge end.
Close the external tank valve.

Refrigerant recovery
from the
service hoses.

Press "STOP" key to end.

Equipment with printer: See Chap. 6.1.1

Vessel charge end.

g. ////

Follow the instructions.

Disconnect the HP/LP
service hoses from
the A/C system!

Press "START" key to confirm.

Refrigerant recovery
from the
service hoses.

At the end all the process values are
reported on the display.

Recovery

Refrigerant g. ///
Oil cc. ///

Vacuum

mb. ///

Press "STOP" key to end.
Press "START" key to print.
Then press "STOP" key to end.

A/C system charge

Quantity g. ///

7.3 Smart service

Press "E" key to select.



The program is similar to "Full service".

If the service station recognizes there was no significant leakage (therefore no moisture) in a system some processes will be by-passed and some sped up. This way valuable time, energy and egeral costs will be saved. For an average passanger car the complete service will be done in less than 10 minutes.

A/C system charge

A) In case of evacuation selected.

Turn "ENCODER" to set the oil value.
NOTE: The value is added to the quantity drained.
Minimum: 0 g.
Maximum: 150 g.
Press "E" key to confirm.

PAG Oil	cc. 8
UV Tracer	cc. _
Refrigerant	g. _____

Turn "ENCODER" to set the UV tracer value.
Minimum: 0 g. (process excluded)
Maximum: 50 g.
Press "E" key to confirm.
Turn "ENCODER" to set the refrigerant amount.
Minimum: 50 g.
Press "E" key to confirm.

B) In case of vacuum not selected.

Refrigerant	g. _____
-------------	----------

C) In case of A/C system charge

Turn "ENCODER" to set (normally HP)
Press "E" key to confirm.

Charge A/C system by HP PORT

Press "START" key to confirm

Confirm by "START"

The equipment performs all the process selected.

Start in process

Press the "Stop" key to finish and return to the Main menu.

Internal flushing

End!

7.6 A/C PRESSURE TEST

In order to check the A/C system pressures, perform the following instructions:

Press "E" key to confirm.

A/C pressure test

Check the A/C system pressure.
At the end press "X" key.

Verify the A/C
system pressure.

Disconnect the service hose with the A/C system OFF!

Disconnect the HP
Service hose (red)
from the A/C system

Press "START" key to confirm.

Refrigerant recovery
from the
service hoses

Wait the end.

8 MAINTENANCE

Press "E" key to select.

Possible selections:

Historical counters

Maintenance state

Counter reset

Press "E" key to confirm.

Select:

Historical counters

8.1 Historical counters

By this menu is possible to check the historical data of the machine.
The data are not resettable!

Select counter.
R1234yf recovered
Total
Kg. ///.

Turn "ENCODER" to select the following counters:

Refrigerant recovered from A/C system
Refrigerant recovered from external tank
Refrigerant charged to A/C system
Vacuum working time

8.2 Maintenance state

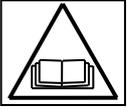
By this menu is possible to check the next service required

Filter replacement
within ///. Kg.
of R1234yf recovered
Part. Nr.: 07.500

Turn "ENCODER":

Oil pump replacement
within /// min.
pump working time.
Part. Nr.: 8020

8.3 Counter reset



Change the filter and/or the vacuum pump oil BEFORE reset!

Use only genuine spare parts or their equivalent!

The use of replacement parts which are not of equivalent quality may damage the machine!

Select counter.

R1234yf recovered

By this menu is possible to reset the counter relative to the filter.

Select counter.

Vacuum time

By this menu is possible to reset the counter relative to the vacuum pump oil.

Press "E" key to confirm.

Counter reset.
Confirm by "C"

min. ///

Press "C" key to confirm.

Counter reset.
Confirm again!

Press "C" key to confirm.

8.3.1 Filter replacement



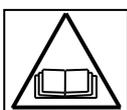
It's obliged to use goggles and gloves!
Contact with the refrigerant can cause blindness and other physical injury to the user!

At the purpose to reduce the internal pressure, before dismount the filter, start a recovery process!



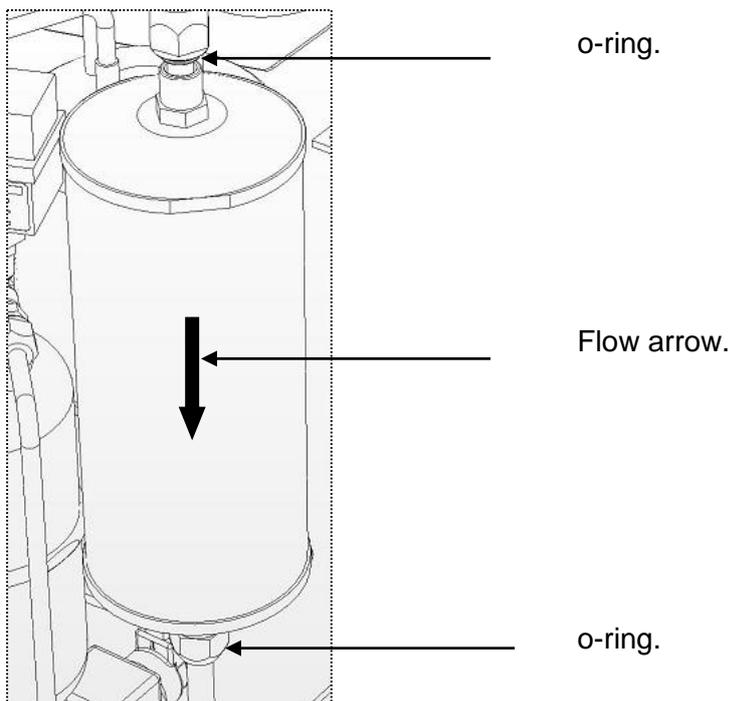
Disconnect the plug from the supply!

Dismount the front cover.
By two wrenches unscrew the filter's nuts.
Avoid torques on copper pipes!



Disposal in according to local directives!

Dismount the two o-rings from the copper pipes.
Lubricating and positioning correctly the new o-rings
Assembly the new filter. The flow arrow must be on the bottom direction!

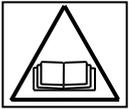


Screw the filter's nuts.
Assembly again the front cover.

8.3.2 Vacuum pump oil replacement



Disconnect the plug from the supply!
It's obliged to use gloves!



The oil extracted must be delivered to used oil collection centre!

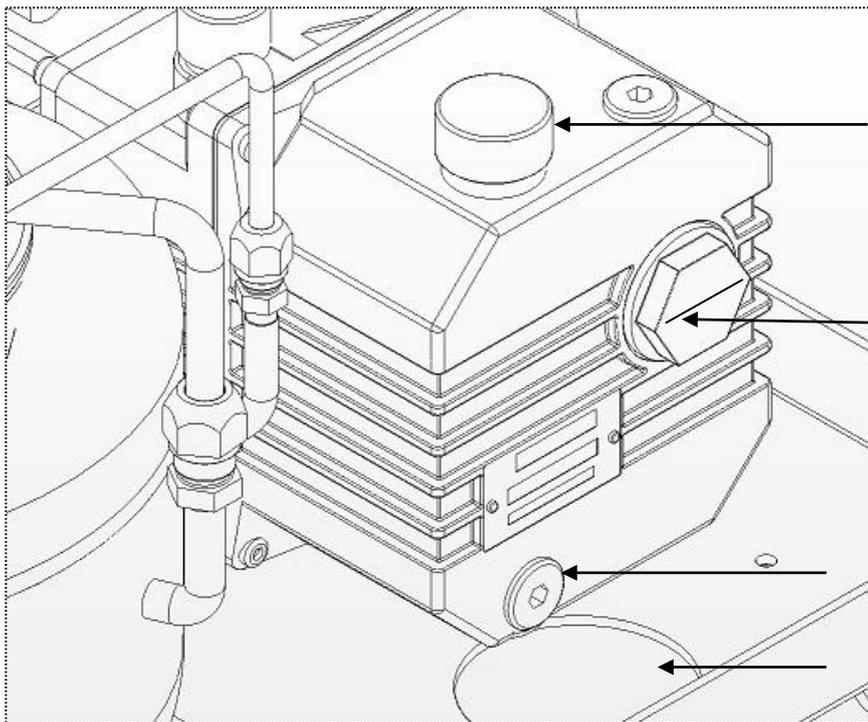
Dismount the front cover.

Unscrew the oil discharge cap and wait for the total oil exit.

Screw oil discharge cap and unscrew the muffler.

Fill the new oil. The correct pump's oil level is around half level-spy.

Screw the muffler.



Muffler

Level

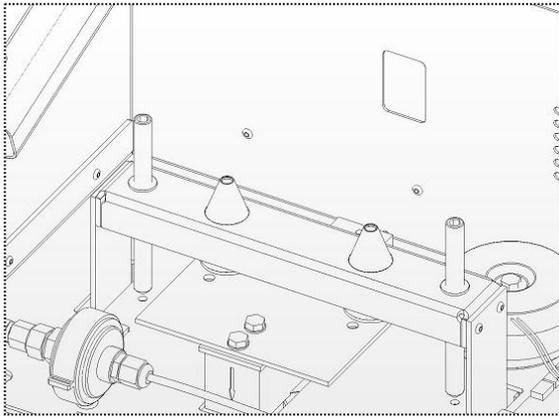
Discharge cap

Discharge hole

Assembly again the front cover.

Follow the instruction right and perform again the procedure!

At the end, unscrew the pins to the “working position”



“Working position”

The working position is match when is impossible to unscrew the pins. Assembly again the parts.

