

Automobile Air-Con Service Solution

AC1000 Operation Manual



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1 About this operation manual

This manual is for those who have the required professional ability of providing the maintenance service on vehicle air conditioning system.


This manual contains all the instructions necessary for safe and effective operating of the air Conditioning service Station. Read this operation manual carefully before putting the device into using for the first time.

Also note the following:

- the operator should comply with the laws about the service of vehicle air-conditioning by local government.
- the operator should be familiar with basic technical information of vehicle air- conditioning
- Instructions from the refrigerant manufacturer
- Instructions from the car manufacturer
- Any special instructions on servicing vehicle air conditioning systems which applied at your company

Keep this operation manual in the tool box of Air-Con Service Station, so that any information needed is always at your hand.

1.2 For illustrating the symbols in this operation manual

Format	Meaning	Example
KEY	Symbols used on the device	Press 
„BOLD”	Display messages	„LANGUAGE”
■ Text ■ Text	List in any order	■Pressure monitor ■Pressure relief valves
1. Text 2. Text 3. Text	Actions to be carried out in the order shown	1. Connect the device. 2. Switch on the device. 3. Press the selection button.
Text (1)	Part number	Use the keypad (7) to enter the data.
Text (A)	Part designations which refer to the diagrams shown in the section describing the work	Remove the filter cartridge (E) on the left side.



Risk of damage to the machine or other material damage



Special information for using the device effectively

2 Scope of delivery

The Air-Con Service Station and its accessories are carefully checked before shipping.

After delivery, please check all the parts listed below are present and undamaged.

If any part is missing or damaged, notify the company responsible for transport immediately

AC1000
Air-Con Service Station
Blue hose with coupling for LP connection and red hose with HP connection
Container for air conditioning compressor oil (PAG oil)
Container for used oil
Inner tank refill connector
Power cord
operation manual

3 Safety

3.1 General safety instructions



Read this operation manual carefully before starting up the Air-Con Service Station for the first time

Please note the following:

- the operator should comply with the laws about the service of vehicle air-conditioning by the local government.
- the operator should be familiar with technical information of vehicle air-conditioning
- Information from the refrigerant manufacturer
- Any special instructions on servicing vehicle air conditioning systems which applied at your company

And also please pay attention to these messages:

→ Only use the device for its intended purpose.

→ Only use genuine R134a refrigerant .If other refrigerants are mixed in, it can damage the Air-Con Service Station and the vehicle air condition system.

→ Only use the performance of POLYOL ester type refrigerator oil (PAG oil) used with the R134a.If other oil are mixed in, it can damage the vehicle air condition system.

→ Wear personal safety equipment (goggles and gloves) and avoid touching refrigerant, as this can cause chilblains to your body.

→ Do not inhale refrigerant gas . Although the gas is non-toxic, it displaces the oxygen you needed.

→ Do not make modifications to the Air-Con Service Station.

→ Each time before you start up the device or add gas to the Air-Con Service Station, first check whether the device is undamaged and components are not lost.

→ Do not start up the Air-Con Service Station if it is damaged.

→ Only used approved refrigerant bottles with safety valves to refill the Air-Con Service Station.

→ Drain the service hoses before you release connections.

→ Do not operate the Air-Con Service Station in areas where there is a risk of explosions (for example battery charging rooms or spraying booths).

→ Always use the main switch of the Air-Con Service Station for switching it on and off. Do not leave the device unattended when it is switch on.

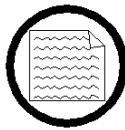
→ Before you shut down the Air-Con Service Station, make sure that the selected program has ended. Otherwise refrigerant can leak.

→ Do not pump compressed air into the refrigerant lines of Air-Con Service Station or into the vehicle air-conditioning system. A mixture of compressed air and refrigerant can be flammable or explosive.

3.2 Warnings on the Air-Con Service Station



Be careful



Observe the operation manual.



Protect the device against rain



Wear gloves when handling refrigerants.



Wear goggles when handling refrigerants.



Horizontal holding the station



Caution for fire

3.3 Safety devices

- Pressure monitor: switch the compressor off if the normal operation pressure is exceeded.
- Tank with pressure relief function: additional safety mechanism releaser to protect lines or vessels from bursting if the pressure continues to rise despite the action of the pressure monitor.

4 Proper use

The Air-Con Service Station is intended for performing maintenance on vehicle air-conditioning systems. The device is designed for commercial use.

The Air-Con Service Station may be operated by persons who have the required professional ability for servicing air-conditioning systems.

This Air-Con Service Station may only be used to service vehicle air-conditioning systems in which R134a refrigerant is used.



International assumes no liability for damage resulting from the following:

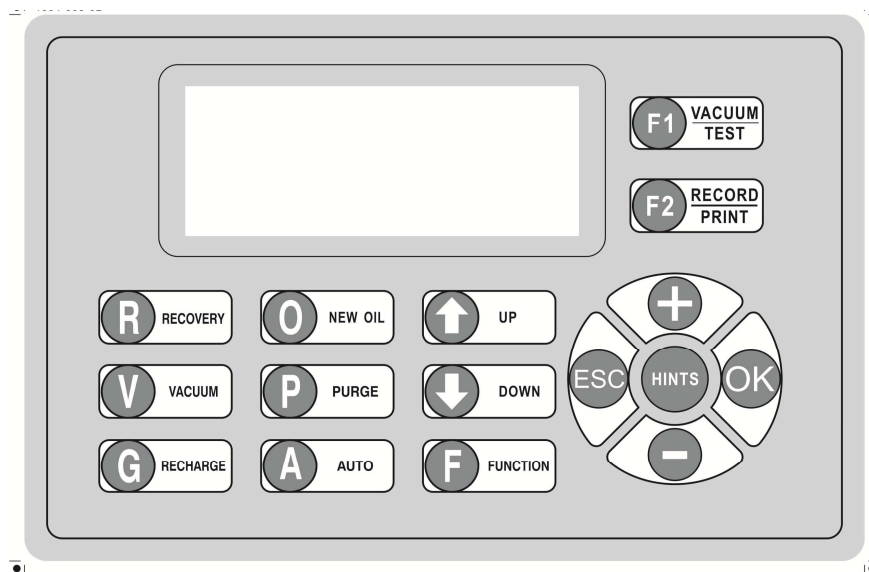
- Use for purposes more than those described in this operation manual.
 - Modification to the Air-Con Service Station without the permission of Zell
 - Damage to the device resulting from external influences.
 - Incorrect operation
-

5 Overview of the Air-Con Service Station



- | | |
|--|-------------------------------------|
| (1) used oil bottle | (2) new oil bottle |
| (3) power switch(double fuses embedded) | (4) pressure gauge for HIGH and LOW |
| (5) keypad | (6) HP and LP hoses |
| (7) pressure gauge for working tank | (8) working tank |
| (9) heating belt (optional item) | (10) printer(optional item) |
| (11) window for oil sight glass of vacuum pump | |

USER COMMUNICATION INTERFACE:



Recovery key : to recover the A/C refrigerant into the working tank



Vacuum key : to extract gases from A/C system



Purge key : to release non-condensable gases from working tank



Recharge key : to refill refrigerant into A/C system.



New oil key : to inject new oil into A/C system.



Function key : it allows to start the other service operation.



Auto key: one press operation for all steps automatically



Pressure up key: to add gas to A/C system.



Pressure down key: to remove gas from A/C system



Vacuum test key: Vacuum test for detecting leakage



Record print key: Record the previous 3 operations and to print receipt (printer is an option item)



Select keys: to shift the service items or edit the number inputted.



Start key : it allows to start the operation step.



Stop key : it allows to cancel the operation step.



Hint key : Help information for operations

6 First start-up

6.1 Setting up and switching on



220V or 110v Power supply must be firmly grounded

1. Drive the Air-Con Service Station to the workplace and lock the front wheels.



Before operation the device must be on a level, flat surface so that measurement can be made correctly.


2. Plug in the Air-Con Service Station to the power mains.
3. Switch it on, the Air-Con Service Station comes to standby mode:

AIRCON SERVICE STATION
Refrigerant **. ** KG




“Refrigerant **. ** KG” describes the quantity of refrigerant hold in working tank.

Note 1: The highlight "H" on the lower right LCD corner is the prompt that means you can

long press  key to get the help information about the current operation.

Note 2: if the LCD show bellow:

ERROR! CODE:E00
ELECTRONIC SCALE FAULT
* * . * *
ZERO BALANCE PLEASE!

This means the weighting system is out of work, need to be calibrated.press  and come to ZERO BALANCE item.More detail

information,please refer to 8.3

6.2 Putting in the bottle for new oil

Unscrew the PAG oil bottle, put about 150 ml new oil in and screw it back to the device.

6.3 Filling up the working tank

When the Air-Con Service Station is started for the first time, the internal refrigerant container must be filled with at least 6 kg from an external refrigerant cylinder.

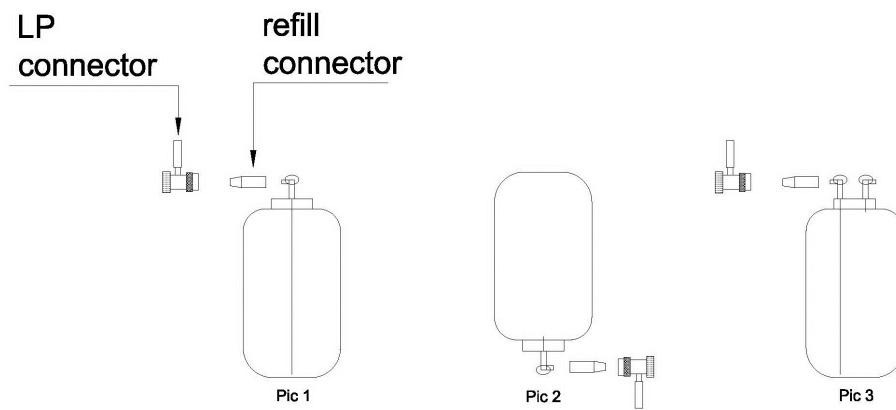


Also note the instructions on the refrigerant bottle.

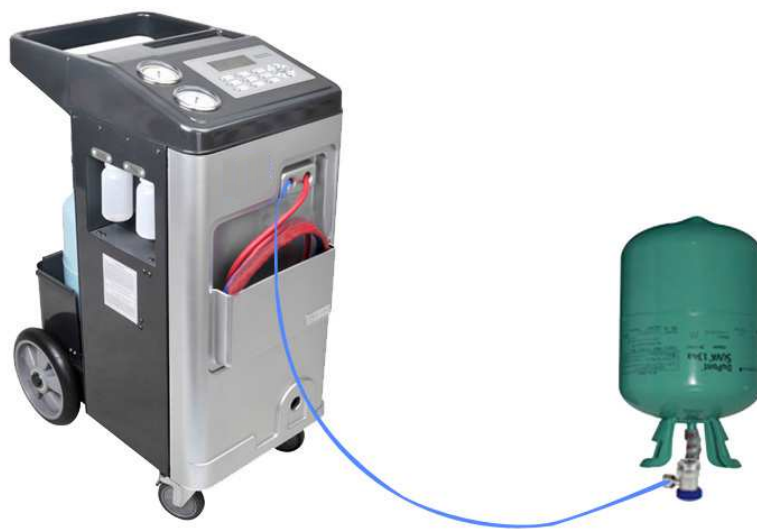
The current refrigerant quantity is shown in the standby mode.

There are three different types of external refrigerant bottle available:

- Refrigerant bottles without a rising pipe: These refrigerant bottles have one connection. When filling the Air-Con Service Station, the connection port must be at the bottom (turn the bottle upside down). As Pic 1
- Refrigerant bottles with rising pipe: These refrigerant bottles have one connection. When filling the Air-Con Service Station, the connection port must be on the top (place the bottle upright). As Pic 2
- Refrigerant bottles with rising pipe: These refrigerant bottles have two connections. To refill the Air-Con Service Station, use the connection marked with L (= liquid). When filling the Air-Con Service Station, the connection must be on the top (place the bottle upright). As Pic 3





1. On standby mode, put the refill connector to the refrigerant bottle and fix it, then join the LP adapter with the low pressure hose(blue) to the connector, as Pic 4

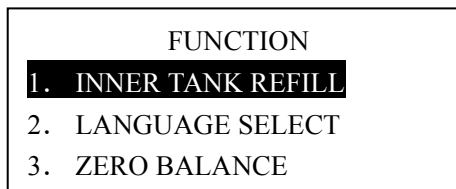



Pic 4

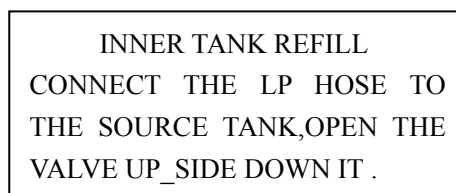
open the adapter, open the bottle valve and up side down it.press




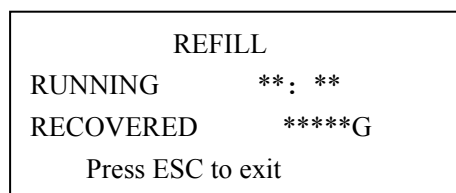
key, use the  or  key to select the item you want (highlight field is activated), select "INTERNAL TANK REFILL"



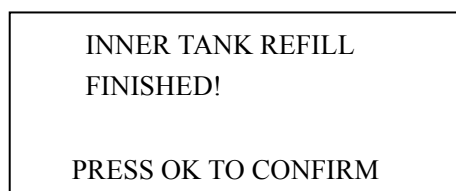
2. Press  to confirm. Follow the instructions on the display.





3. Press  to confirm. The quantity of refrigerant in the inner tank is shown.



4. The filling will stop automatically when the quantity of refrigerant is 9 KG



5. Close the refrigerant bottle valve, press  to confirm. Press  key to start recovery operation!

Note: you should recover the refrigerant. If you do not recycle the refrigerant inside the hose, it will cause refrigerant leakage when you release connections, as this can cause frosty.

6. Disconnect the LP adapter from the external refrigerant bottle. The device now is ready for operation.

7 Operation



When the automobile air-conditioning is serviced, the engine and the air-conditioning must be switched off.

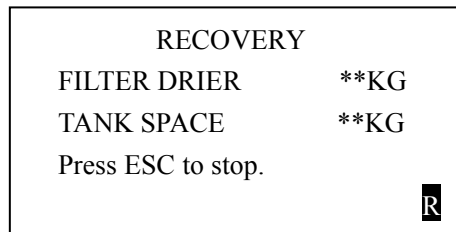
7.1 Recovery

Recovery operation is the process that the Air-Con Service Station sucks the refrigerant from the vehicle A/C system, purify it and storage the gas into the working tank. The equipment could automatically detect the gas is enough or not for the operation.


1. Unscrew the caps of the service port on vehicle and put on the LP/HP adapters of the Air-Con Service Station and open them.

2. Check the high and low pressure gauges. If the pointer is zero or about, it means that no refrigerant is in the air-conditioning system, you can

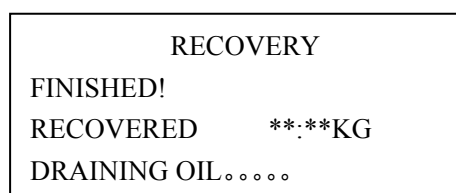
select other functions directly. If there exist pressure inside, press key, the device will start the recovery and recycling process.



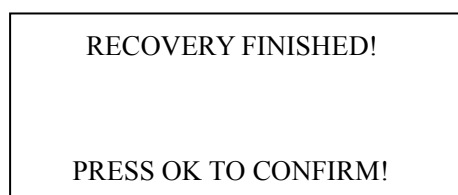
Note: The highlight "R" on the lower right corner is the prompt that means you can


specially long press  key for recovery. The recovery is only through the low side service port, and the operation will stop if the long pressed key is released. And the gas quantity can not be measured in the process.

3. When the recovery process is over, it will discharge used PAG oil automatically.



4. After about 5 seconds , The oil draining process would be finished.



5. Press  key to stop the alarm buzzer, then the recovery process finished!

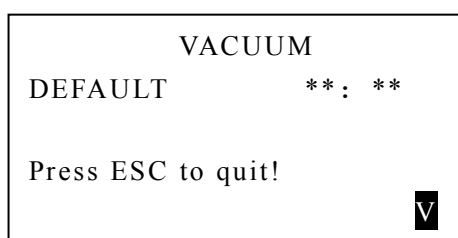
Note: After first phase of recovery, you need to spend some minutes, just waiting for more refrigerant evaporate into gas, if the pressure inside the A/C raised, the equipment will go on the recovery process, or it will go to next step.

7.2 Vacuum


Vacuum operation is the process that the Air-Con Service Station evacuate the vehicle A/C system into a vacuum state. The small quantity gases are exhausted outside. In the process, the pressure inside the A/C changes from the relative zero to absolute zero.




The equipment could automatically detect the pressure is suitable or not for operation.

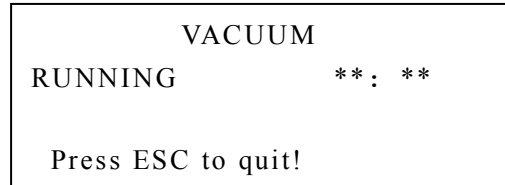
1. Press  key, the device comes to vacuum mode.




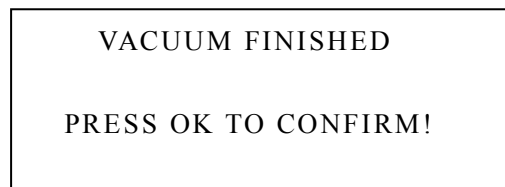
Note: at the lower right LCD corner there is a highlight "V", this also is a prompt that

means you can long press  key for a manual vacuum. If you do so, whatever the pressure is, the gas would be exhausted outside. Be careful for this operation, the introduced pressure is less than 0.5 bar, or when the gases rush out, the vacuum pump oil would spray.

2. Use  or  to set the vacuum time (suggest at least 10 minutes).
3. Press , the device will start vacuum operation.



4. The device will be finished automatically after expiry of the vacuum time, press  return to the standby mode.



5. wait about five minutes and check the state changing from the LP gauge indicator, if the pressure is raising, you need to confirm the air-conditioning's leakage. If leakage happens, you should repair it. If not, continue the next process.

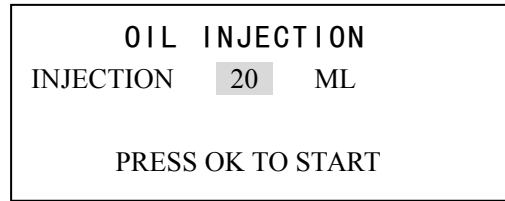
Note: if the A/C system is not opened to air, the suggested vacuum time is 5-10 minutes. If it is, the minutes should be 20-30.





If there is an heating belt for the equipment, the suggested minutes is at least 10 minutes. The heating belt only work during the vacuum process.

7.3 Oil injection

This operation is to make up of new PAG oil into vehicle A/C system though the Air-Con Service Station. it must be a vacuum state that the new oil could be added into the A/C system.

1. Check the new oil bottle, make sure that the PAG oil is more than 50ml inside.




2. Use  or  to adjust the oil quantity, then press OK, it will finish automatically. Or long press  key, the new PAG oil would be sucked into the A/C system. Watch the scale of the PAG bottle, when the oil is added with the desired quantity, stopped the operation.
3. Press  key back to the standby mode, continue the next process.



7.4 Recharge

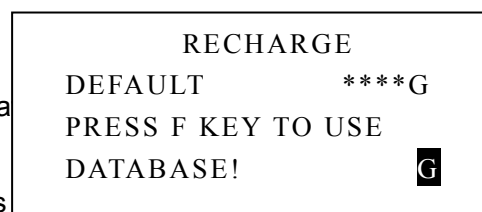
This operation is to fill with the refrigerant into the vehicle A/C system though the Air-Con Service Station. the quantity is measured by load cell and it must be a vacuum state that the gas could be added into the A/C system.



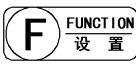
For this operation, the work tank should have at least 3 kg gas inside.

Usually, if the tank pressure is over than 6 bar, the recharge will be done quickly, or it need some special solution to resolve it.

1. Press  key to come to recharge process.

Note: The highlight "G" a  that means you could specially recharge the gas  charge only from the low side port. And the gas quantity can not be measured.




2. Press  or  key to adjust the refrigerant filling quantity. You could check the amount on the vehicle, or press  key to use the database embedded.

3. When all are ready, press  to start, it will recharge the air-conditioning with the refrigerant.

RECHARGE

RUNNING **:**

THERE *****g LEFT!

4. The process will be stopped automatically when the set quantity of refrigerant is completely filled into the A/C system .Press  to back to the standby mode.

RECHARGE FINISHED!

PRESS OK TO CONFIRM!

5. Take off the quick couples from the A/C system and screw back the valve caps to the service port. And empty the service hoses by recovery operation. The device is then ready for further use.

Note: some time the recharge maybe not finished in time, and the bellow information displayed:

charging time exceed!

RUNNING... **:**

THERE g LEFT

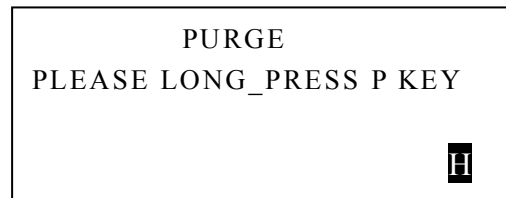
H

This is because tank pressure is not enough for the operation. Please go on the operation by starting the automobile engine and A/C, let the Low side to suck the gas into A/C system, it will automatically stop if the set gas quantity is finished.


7.5 Purge


The purge is designed to discharge the mixed non-condensable gases in the inner tank. It is harmful for the A/C station when the tank pressure is exceeded. It must release some pressure till to normal level. You no need to do this operation every time when you service a car, but need to check the tank pressure through the gauge in the morning before using it. Or the tank pressure is too high in some cases, you must stop all other to purge operation.

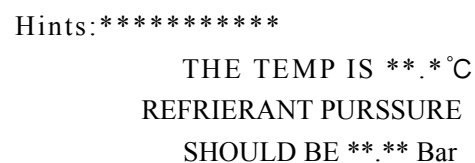
1. In stand by mode, press  key to purge mode




Note: The highlight "H" on the lower right corner is the prompt that you can long press

-  key to get help information about the current operate.

2. Press  key, the display will show the ambient temperature and the calculated relative pressure of refrigerant in theory.



Hints:*****
THE TEMP IS *.*°C
REFRIERANT PURSSURE
SHOULD BE *.* Bar


3. Check the tank pressure. If the gauge pointed pressure is no higher than displayed value, it means that no mixed gases in the tank, you can stop the operation and select the other ones. If the gauge pointed pressure is higher than displayed value, long-press  key, the device will start to release the gases, till the pointed pressure come near to the relative valve on the display.

7.6 AUTO

The automatic operation is including recovery, oil drain, vacuum, oil injection, and recharging, all steps are in one press. Before operation, you must confirm that the new PAG oil is enough, or it has risk that the air would be sucked into the vehicle A/C system.

1. In stand by mode, press  key to come to auto mode

IMPORTANT
PLEASE CONFIRM THE PAG
OIL IS MORE THAN 150 ml
PRESS OK TO NEXT

2. Check the PAG oil bottle to confirm it holds more than 150 ml oil in it, press the  key to continue.




PLEASE INPUT
REFRIGERANT **500** g
PRESS F TO USE DATABAS
PRESS OK TO START

PLEASE INPUT
VACUUM TIME **10** MIN

PRESS OK TO NEXT

PLEASE INPUT
OIL QUANTITY **20** ML

PRESS OK TO NEXT

3. Use the  and  key to adjust all the parameters for the operation.
then press the  key to start, the device will automatically run the recovery, oil drain, vacuum, oil injection, recharging phases.

7.7 PRESSURE UP

When the A/C system pressure is lower than desired, only due to shortage of refrigerant inside the A/C system, In this case, you no need redo all recovery/recycling/recharging process, by this function you could add some gas into the system and let the pressure rise to normal. The operation is only from the LP service port. and the filled gas can not be measured.

1. When the HP and LP pressure gauges indication is lower than normal, please press  key to add some gas into the A/C


system:

PRESSURE INCREASE
PLEASE LONG PRESS UP KEY
RELEASE IT WHEN
PRESSURE IS DESIRED

2. Long press  key, until the pressure is OK.

7.8 PRESSURE DOWN

When the A/C system pressure is higher than desired, only due to too much refrigerant inside the A/C system, In this case, you no need redo all recovery/recycling/recharging process, by this function you could remove some gas from the system to inner tank and let the pressure drop to normal. The operation is only from the LP service port. and the removed gas can not be measured.

1. When the HP and LP pressure gauge indicates scale is higher than normal, please press  key to reduce pressure from the A/C system:


PRESSURE DOWN
PLEASE LONG PRESS DOWN
KEY, RELEASE IT WHEN
PRESSURE IS DESIRED



2. Long press  key, until the pressure is OK.


7.9 VACUUM TEST

After a vacuum operation, if the A/C system can hold the vacuum state, that means the system is OK, if it lost some vacuum, there should be existing the leakage in somewhere. the operation is divided into two steps, first is vacuum, second is vacuum test.



1. Press  key ,the LCD show

VACUUM TEST
VACUUM TIME 10:00
Press OK to next 

Use the  and  to adjust the vacuum time then NEXT

2. Press  key ,then the LCD show

VACUUM TEST
TEST TIME 10:00
Press OK to start

Use the  and  to set the test time then NEXT

3. Press  key , vacuum start , and the LCD show

VACUUM
RUNNING **: **
Press ESC to EXIT

When vacuum is over ,the syetem begin to test ,and the LCD show


VACUUM TEST
VACUUM FINISHED 10:00
TESTING... 00:00
Press ESC to EXIT

When test finished , if OK,the LCD show



VACUUM TEST
VACUUM FINISHED 10:00
TEST OK
Press OK to CONFIRM

If not OK,

VACUUM TEST
VACUUM FINISHED 10:00
TEST FAILED
Press OK to CONFIRM

4. Press  key, to exit the program.

7.10 RECORD PRINT




It can show 3 records in all for the previous operation. Use  and  to select page 1/3,2/3 or 3/3. The content of the record are:

RECY. The recovery and the recycle gas amount
VACU. The vacuum minutes
NEW OIL. The new oil injection amount
RECG. The recharge gas amount

If there is a printer on the equipment, this data can be printed out as a receipt for customer.

1. Press  key,the LCD show

HISTORY 1/3
RECY. 500g VACU. 10min
NEW OIL 20ml RECG. 500g
PRESS OK TO PRINT

You can press  or  key to select history and press  key to print .

8 Service tasks

Other service are included this items as:

“1.INNER TANK REFILL

2.LANGUAGE SELECT

3.ZERO BALANCE

4.VACUUM PUMP OIL

5.FILTER DRIVER

6.HOSE COMPENSATION

7.PRESSURE RISE WAIT

8.OTHER SERVICE.”

If you want come to these items , please press  key and use

 or  to select and enter it.

8.1 Inner tank refill

Refer to 6.3

8.2 Language select

You can select Chinese or English according to custom.

8.3 Zero balance

HINT

提示


In order to make sure the refrigerant quantities correctly, the zero point of the scales must be checked regularly and reset if necessary.

Resetting is necessary:

- If the quantity deviates by more than 10g from the target value
 - If the Air-Con Service Station has been shaken, for example during transport on bumpy roads
 - Every four to six weeks
-

1. In standby mode, press  key ,to use the  or  key to select “**ZERO BALANCE**” item

ZERO BALANCE
PRESS OK WHEN PREPARED!

2. Remove the fix screw and lift the tank off from the scale plate. Make sure that there is **NOTHING** on, press  key .
After finishing it, the LCD will come to the standby mode automatically:

ZELL
AIRCON SERVICE STATION
Refrigerant -9.00 KG



IMPORTANT: It should show -9kg, that means the work is properly done.

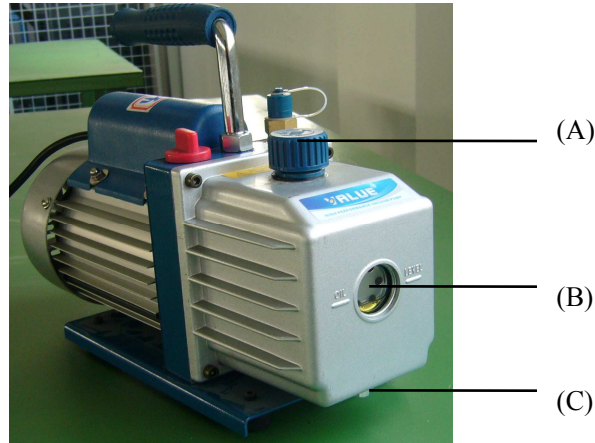
3. place back the tank on the scale plate and fix the screw back. Please make sure that the tank is placed vertically without touching any wall.




8.4 vacuum pump oil



Switch off the Air-Con Service Station and unplug it from the power supply before opening the house.

Before changing the oil, let the vacuum pump run for about 10 minutes (manually using the menu).



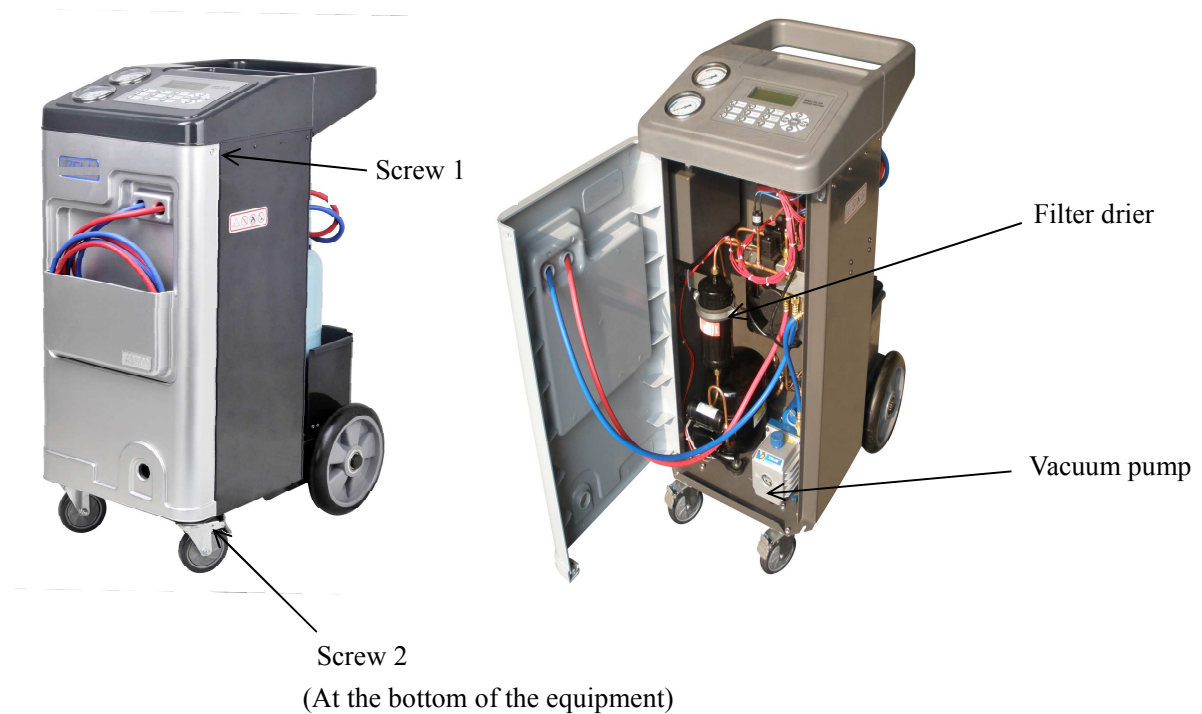
1. Open the front cover by unfix the screw 1 and 2 . Place a vessel with capacity of at least 1/2 litre under the Air-Con Service Station. The used oil in the vacuum pump would flow through the outlet in the base of the device.
2. Unscrew the outlet plug (A).
3. To drain the oil, unscrew the oil drain plug (C).
4. Once the oil has been completely drained from the pump housing, screw the oil drain plug (C) back in.
5. Feed up new oil into the vacuum pump, until the oil level is at the middle of the sight glass (B) and screw the outlet plug (A) back.
6. Put back the front cover,fix the screw 1 and 2,then reconnect the plug to power.
7. In function mode, to use the  or  key to select “**VACUUM PUMP OIL**” , Press  to reset the count

8.5 Replace the filter drier



Switch off the device before opening it and pull out the mains plug.

1. Take off the front panel, Remove the filter cartridge on the left side and replace it with a new one. When inserting a new filter cartridge, observe the flow direction (FLOW arrow must point downwards).
2. conform that the new filter drier is well fixed.
3. Put the front panel back on and reconnect the power plug.
4. In function mode, to use the \oplus or \ominus key to select “**FILTER DRIER**”
press OK key to reset the count



8.6 Hose compensation

You can service yourself by inputting a new quantity of refrigerant as a compensation when the recharging occurs.

note: we strongly claim to use the default setting of compensation

8.7 Pressure rise wait

Setting the waiting time that the refrigerant evaporate in the A/C system , during the recovery operation phase.the more minutes you set,the more percent of gas could be recovered.

8.8 Other service

This operations are need the password , if you want to use this you can call the hotline to ask for the password.

Note: for the electronic scale calibration,the pass word is 5814. Use the + and - to input the number

8.9 Cleaning and maintenance

- Clean the exterior of the device with a damp cloth as required. If necessary, use a little washing-up liquid. Do not use solvents or scouring agents.
- Regularly check the service hoses and adapters for damage. Do not start up the Air-Con Service Station if it is damaged.

9. Disposal

9.1 Disposing of used fluids



Used oil is hazardous waste. Do not mix used oil with other fluids. Keep used oil in suitable containers prior to disposal.


9.2 Disposing of packaging material

- The cardboard packaging material should be disposed of with other waste paper.
- Plastic packaging material should be added to other recyclable waste.

9.3 Scrapping the old unit

- If you wish to scrap the Air-Con Service Station, first completely drain it of all liquids and dispose of them in an environmentally responsible manner.
- Take the old device to your nearest recycling centre

10 Trouble shooting

Fault	Cause	Remedy
The display shows „ WARNING! CODE :W16 NOT ENOUGH PRESSURE TO RECOVERY!. ”	This message is normal, during the recovery process.	Press  to continue other operations. If you make sure that there is no refrigerant in A/C system .
The display shows „ WARNING! CODE:02 INNER TANK FILLED. ”	The inner tank is full of refrigerant .	Drain the internal refrigerant container in the proper manner.
The display shows „ WARNING! CODE:W01 TANK PRESSURE IS TOO HIGHT ”	This message is normal during the recovery process.	Stop and wait for the tank cooling down. And release some gases if necessary.
The display shows „ WARNING! CODE:W08 REFRIGERANT IS NOT ENOUGH. ”	Message during the recharge. The quantity of refrigerant is less than 2KG	Refill the refrigerant into the internal tank.
The display shows „ WARNING! CODE:W03 PRESSURE IN SYSTEM RECOVERY START. ”	Message during the vacuum. It means that there has refrigerant in the A/C system.	Recovery the refrigerant first.

11 Technical data

Dimensions (width x height x depth)	600 mm x 1150 mm x 700 mm
Weight	80 kg
Power supply	220 V- 50 Hz
Refrigerant	R134a
Vacuum pump	1L / min
Compressor	3/8 P
Filling cylinder accumulator capacity	80 kg
LCD back-lit display	192*64
Manometers	80mm
Tank manometers	40mm
Scale resolution	1g
Service hose	2.5m

12 Spare part list

NO.	Parts	Specification
1	Vacuum pump	VE115
2	Vacuum pump oil	330mL
3	Filter drier	302
4	Service hose for high pressure side(red)	2.5m
5	Service hose for low pressure side(blue)	2.5m
6	Oil bottle	250mL
7	Hermetic compressor	QD-10
8	High pressure gauge	80mm
9	Low pressure gauge	80mm
10	Tank pressure gauge	40mm
11	Service coupling for low pressure	QC-ML
12	Service coupling for high pressure	QC-MH
13	Solenoid valve	Sv3, SV1.6B
14	Liquid hose(red)	0.3m
15	Vapor hose (blue)	0.3m