INVENTO S110

AC Station

Manual

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1. Symbols use

1.1. Warning notices

Warning notices warn of dangers to the user or people in the vicinity. Warning notices also indicate the consequences of the hazard as well as preventive action. Warning notices have the following structure:

Warning symbol	**KEYWORD - Nature and source of hazard!** **Consequences of hazard in the event of failure to observe action and information given.** **▶Hazard prevention action information.**

The key word indicates the likelihood of occurrence and the severity of the hazard in the event of non-observance:

Keyword	Probability of occurrence	Severity of danger if instructions not observed
DANGER	Immediate impending danger	Death or server injury
WARNING	Possible impending danger	Death or server injury
CAUTION	Possible dangerous situation	Minor injury

1.2. Symbols in this documentation

Symbol	Designation	Explanation
	**Attention**	Warns about possible property damage
	**Information**	Practical hints and other useful information.
1. 2.	**Multi-step operation**	Instruction consisting of several steps.
	**One-step operation**	Instruction consisting of one step.
	**Intermediate result**	An instruction produces a visible intermediate result
	**Final result**	There is a visible final result on completion of the instruction.

1.3.On the product

 Observe all warning notices on products and ensure they remain legible.	 Wear protective goggles.	 Wear protective gloves.

2. Important notes

Before start up, connecting and operating the products. It is absolutely essential that the Original instructions / owner's manual and in particular, the manual are studied carefully. By doing so you can eliminate any uncertainties in handling the products and thus associated safety risks upfront; something which is in the interests of your own safety and will ultimately help avoid damage to the device. When a product is handed over to another person, not only the Original instructions but also the safety instructions and information on its designated use must be handed over to the person.

2.1. User group

The product may be used by skilled and instructed personnel only. Personnel scheduled to be trained, familiarized, and instructed or to take part in a general training course may only work with the product under the supervision of an experienced person. All work conducted on pressurized equipment may be performed by persons with sufficient knowledge and experience in the field of refrigeration, cooling systems and coolants and, also be aware of the risks involved in the use of pressurized devices.

2.2. Agreement

By using the product you agree to the following regulations:

| Copyright

Software and data are the property of S110 or its suppliers and protected against copying by copyright laws, international agreements and other national legal regulations. Copying or selling of data and software or any part there of is impermissible and punishable; in the event of any infringements S110 reserves the right to proceed with criminal prosecution and to claim for damages.

| Warranty

Any use of non-approved hardware and software will result in a modification to our product and thus to exclusion of any liability and warranty, even if the hardware or software has in the meantime been removed or deleted.

No changes may be made to our products. Our products may only be used in combination with original accessories and original service parts. Failing to do so, will render null and void all warranty claims.

This product may only be operated using approved operating systems. If the product is operated using an operating system other than the approved one, then our warranty obligation pursuant to our supply conditions will be rendered null and void. Furthermore, we will not be held liable for damage and consequential damage incurred through the use of a non-approved operating system.

2.3. Obligation of contractor

The contractor is obliged to ensure that all measures geared towards the prevention of accidents, industrial diseases, labor- related health risks are taken and measures towards making the workplace fit for people to work in are carried out.

| Basic rules

The contractor is bound to ensure that all electrical equipment and operating material is set up, modified and maintained by skilled electricians only or under the guidance and supervision of a skilled electrician in accordance with electrical engineering principles.

Furthermore, the contractor must ensure that all electrical equipment and operating material is operated in keeping with electrical engineering principles.

If a piece of electrical equipment or operating material is found to be defective, i.e. It does not or no longer complies with electrical engineering principles, the contractor must ensure that the fault is rectified immediately and, in the event that imminent danger exists, also ensure that the electrical equipment or the electrical operating material is not used.

2.4. Safety regulations

Always carefully study and follow all the safety regulations before using the product.

Avoid all skin contact with the refrigerant. The low boiling point of the refrigerant (approx. -30° C) can lead to frostbite. Should refrigerant come into contact with the skin, remove any moistened clothing immediately and rinse the area of skin affected with generous amounts of water.

- Avoid all skin contact with the UV dye. Should UV dye come into contact with the skin, remove moistened clothing immediately and rinse the area affected with generous amounts of water.
- R134a is colorless, with weak characteristic smell and heavier than air. It may flow into repair pits. Should refrigerant escape, Provide for sufficient ventilation (particularly in repair pits) and leave the workshop.

Never inhale refrigerant, dye and oil vapors. The vapors can irritate the eyes, nose and respiratory system. If liquid refrigerant or UV dye comes into contact with the eyes, rinse them thoroughly with water for 15 minutes. Then obtain medical attention even if no pain is felt.

- Never swallow UV dye. Should it be swallowed inadvertently, never attempt to induce vomiting. Drink generous amounts of water and obtain medical attention.
- Before connecting the S110 to a vehicle air conditioning system or an external refrigerant bottle, make sure the quick- release couplings are not leaking. Only ever use external refrigerant bottles provided with safety valves and certified in line with applicable standards.
- Before switching off the S110 , make sure all charging and drainage operations have been completed. This prevents damage to the unit and reduces the risk of refrigerant escaping into the environment.

Never use compressed air with R134a. Certain mixtures of air and R134a are highly flammable. Such mixtures are a potential hazard and may lead to fire or explosions and thus cause damage or injury.

- Refrigerant extracted from a vehicle air conditioning system maybe contaminated with moisture,lubricant, dirt and traces of other gases.
- If the refrigerant has been contaminated by being mixed with other gases, remove the contaminated refrigerant and add fresh R134a before using the S110 for A/C service.
- R134a is not to be used in areas in which there is a danger of explosion. Fire, open flames and smoking are prohibited.
- The S110 unit should not be exposed to excess moisture or be operated in wet areas. R134a is not to be mixed with other refrigerants. The mixing of refrigerants could damage the vehicle air conditioning system.
- De-energizing is only to be performed by a qualified electrician, a qualified electrician for specific tasks (hybrid) or a power systems engineer.

If high-voltage components or high-voltage wires are handled incorrectly, there is a risk of fatal injury from high voltage and the possible transmission of current through the body.

- Work on vehicles with high-voltage components is only ever to be performed in a safe de-energized condition by persons with the minimum qualification “Trained to perform electrical work”
- Even after deactivating a high-voltage vehicle electrical system, the high-voltage battery may still be live.
- Operating condition cannot be established from any running noise, as the electric machine is silent when stationary.
- Never open or damage high-voltage batteries.
- The S110 must be constantly monitored when in operation. Never leave the S110 unattended when in operation.
- Position the S110 on all four wheels on a flat, vibration-proof surface so that proper operation of the scales is guaranteed.
- The S110 can be secured in position by locking the caster brake.
- The S110 must always be transported in its operating position. Never lay down the S110 , as oil could then escape from the vacuum pump or the built in compressor could be damaged. There are no additional safety systems for protecting the S110 against damage resulting from natural catastrophes.
- The S110 must be subjected to regular maintenance to ensure the safety of the unit.
- Disconnect power before performing any maintenance or service to unit.
- Never perform any maintenance work which is not expressly recommended in this manual. Contact customer service if components have to be replaced other than in the course of maintenance work.
- If there is damage to the S110 , terminate usage immediately and contact customer service.
- The service hoses and service quick-release couplings must be regularly checked for wear and replaced if damaged.
- Never remove any components from inside the S110 except for maintenance or repair purposes.
- Be sure that the high and low manual valve is closed before connecting the device to the air conditioner. Don’t put the hose near rotation or heating automobile parts such as electronic fan or radiator.
- Check the vacuum pump oil level before use.
- Keep away from children and people of insufficient mental development when running.
- There must be more than 1Kg refrigerant inside the cylinder, otherwise machine doesn’t work.
- Close the high and low manual valve after each time of using this device.

2.5. Technical Data

Description	Specification
R134a Tank Capacity	18KGS
Service pressure	18 Bar
Method to Weigh Gas Content	Load Cell
Recovered Oil Container	300ml
Vacuum Pump	120L/min
Compressor Capacity	3/8 HP
Dryer Filter Ability	80KGS
Display	3.2 inch LCD
Software updating	USB
All Functions	Manual
Packing Dimension (H x W x D)	1300*700*610mm
Net weight	75 KGS
Gross weight	90 KGS
Power supply frequency	220V/50HZ
Voltage	220VAC
Recovery efficiency	>80%
Charging Accuracy	±10g
Lifetime of pump oil	600min

| Recovery phase

The refrigerant is extracted from the vehicle air conditioning system, cleaned and routed into the internal bottle of the S110. The refrigerant oil collected in the process is drained into the used oil bottle at the S110.

| Vacuum phase

A vacuum is generated in the vehicle air conditioning system. Measurement of the drop in pressure begins as soon as the vacuum has been generated.

| Charging phase

A certain quantity of refrigerant is added to the vehicle air conditioning system.

3. Product description

3.1. Application

S110 is suitable for vehicles with a conventional engine vehicles. S110 features the basic functions required for vehicle A/C service. The following functions can be implemented:

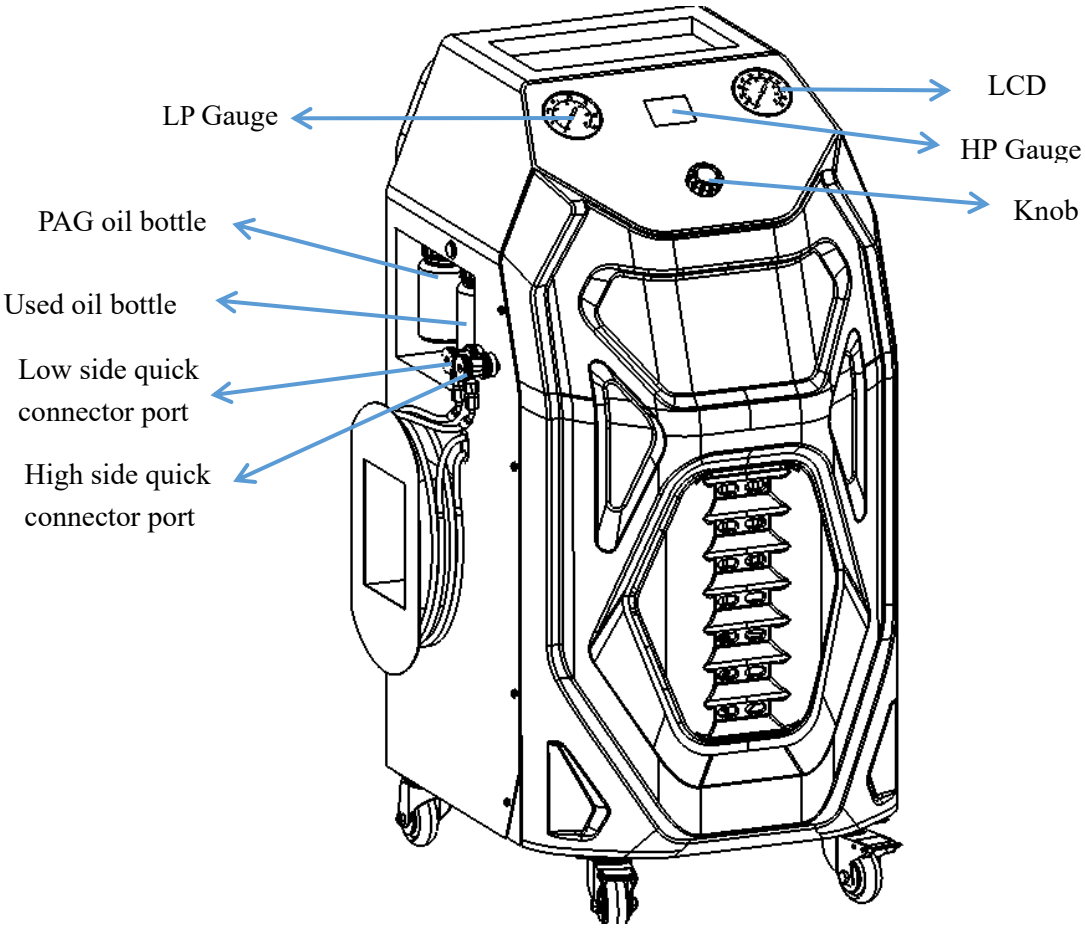
- Refrigerant recovery and recharging.
- Vacuum generation.

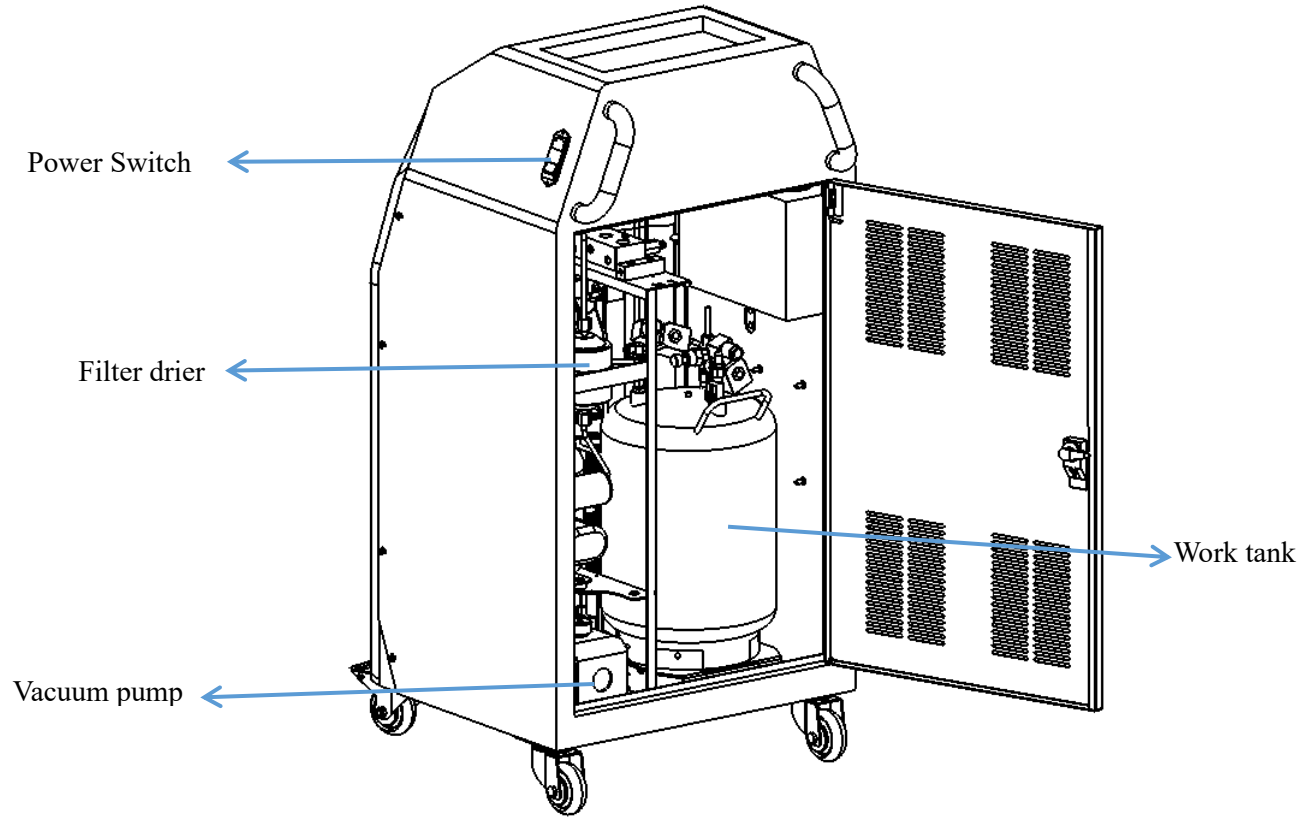
The S110 can only be operated with R134a.The S110 is not to be used for service work on vehicles with air conditioning systems employing refrigerants other than R134a, as this will cause damage. Prior to A/C service check the type of refrigerant used in the vehicle air conditioning system.

3.2. Scope of delivery

Description
Service hose (high pressure)
Service hose (low pressure)
Quick-release coupling (high pressure)
Quick-release coupling (low pressure)
Oil bottles

4. Description of unit





5. Input Selection

5.1.Display screen

The main interface is as below.

Main Menu

An Operation can be selected by touching the word on the upper right side of the screen or by touching the screen and selecting which type of process is desired.

- To select a function in the menu, touch finger to option.
- Do not use a sharp, pointed object on the touch screen. Damage may occur!
- Although the LCD touch screen is glass, do not use harsh chemicals to clean the surface. Standard glass cleaner is recommended

5.2.Main Menu Options

User can select the following functions:

- Recovery
- Vacuum
- Charge
- Maintenance

Each of the menu options will be described in detail later in the manual.

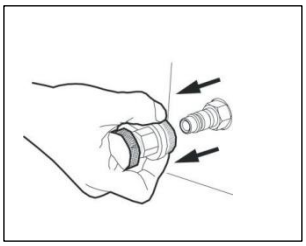
5.3.Quick couplers

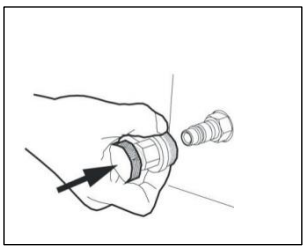
Quick coupler is the intelligent coupler that with the suitable procedure in the software enables to:

- Reduce the amount of non-condensing gases formed inside the cylinder;
- Avoid the refrigerant (loss) dispersion in the air during the disconnection of the couplers (Puff-effect);
- Check possible valve leaks before disconnection;

Quick Couplers

To connect the coupling, position the coupling on the parking coupler, pull back the knurled section of the coupling element and press carefully onto the connection.





The service quick-release couplings are connected to the service connections of the vehicle air conditioning system during A/C service. When not in use, the service quick-release couplings can be connected to the machine.

To remove the service quick-release couplings from the park coupler, press the coupling slightly towards the connection and carefully pull the knurled section back to unfasten it from the coupler.

5.4.Locking caster brakes

Rolling of the S110 can be prevented by locking the caster brakes at the front wheels.

5.5.Power supply cable and switch

The power supply cable is connected to the main power input. When not in operation, the power supply cable can be disconnected and hung on the handle. The S110 is switched on by toggling the rocker switch to the on position.

5.6.Functional description

The refrigerant recovered from the air conditioning system pass through the combo filter to remove suspended particles and moisture.

The purpose of the vacuum pump is to generate a vacuum in the air conditioning system which removes excess moisture and to detect possible leaks in the vehicle air conditioning system.

Used oil is separated from the recovered vehicle refrigerant and drained into the used oil bottle.

The vehicle air conditioning system is partly filled with UV
dye to facilitate the detection of leaks in the event of damage to the vehicle air conditioning system.

The refrigerant in the internal refrigerant bottle is used for filling the vehicle air conditioning system .

The purging unit for the non-condensing gases, consisting of a temperature sensor, pressure sensor, coil and orifice always takes effect when the internal refrigerant bottle pressure is higher than the saturation pressure.

6.Unpacking

Warning – Risk of personal injury!
Incorrect handling could cause equipment to overturn.

The manufacturer disclaims all responsibility for damage to objects and/or persons resulting from the equipment being wrongly removed from the pallet, or if the operation is performed by unsuitable personnel, with improper means protections and without complying with the existing laws on manual handling of loads and with the operations described in this manual.

- Remove staples and remove the carton.

- Cut straps securing unit to pallet.
- With 2 people, lift both front wheels by levering with the handle so unit is setting on the rear wheels.
- Slowly lower the unit from pallet by means of the rear wheels.

Keep the pallet, carton, and scratch protection film for use in case of a need to return unit.

7.Commissioning

All the operations described in Section 7 must be performed prior to first A/C service

7.1.Connections and positioning

- The S110 is designed for 220V, 50/60Hz.
- Follow the information on the S110 rating plate.

① Set the S110 on a flat, vibration proof surface.
② Actuate the caster brake to stop the S110 from rolling.
③ Connect the power supply cable to the power supply.
④ Switch on the main switch.

- The unit must be positioned on a stable, horizontal surface to ensure correct operation. Unit must be in an area with proper ventilation and at least 10cm from any potential obstacle to its internal ventilation.
- Keep unit out of rain and excessive humidity as moisture could cause irreparable damage.
- Prevent exposure to direct sunlight and excessive dust.
- Unit must be properly grounded with the power plug ground pin. Failure to ground unit can cause damage and constitutes a risk of fatal injury or shock to the operator.
- Do not unplug any internal electrical connections and only have internal components opened and repaired by trained customer service personnel.
- Contact customer service in the event of any transportation damage (e.g. oil leakage).
- Leave quick couplings closed when unit is not in use and at end of vehicle service operations.

the work tank

Risk of frostbite from escaping refrigerant

Refrigerant causes frostbite on the skin

- ➢ Check the service hoses for damage.
- ➢ Firmly connect the service quick- release couplings to the service hoses.
- ➢ Wear protective goggles.
- ➢ Wear protective gloves.

- Before the S110 can be used, the internal refrigerant cylinder must be filled with liquid refrigerant. Use only R134a refrigerant. To ensure a reliable procedure, it is advisable to use the optimum quantity of refrigerant. The optimum quantity of refrigerant for the S110 is 4kg – 10.0kg.

An inadequate quantity of refrigerant may make effectiveness of filling the vehicle air conditioning system impossible. Also, if there is an insufficient quantity, the S110 may not be able to operate efficiently. In the event of an excessive quantity, there may not be space for the refrigerant recovered from the vehicle air conditioning system. Execute the following actions in sequential order by following the procedure as shown on the display:

1. Set the internal cylinder fill to desired quantity (min. 3kg).
2. Connect the red hose to the source tank, ensure the valve of the source tank had been closed.

3. Vacuuming the hose...

4. Open the source tank valve, place the source tank up side down.

5. Tank Refilling reaches the preset amount. Please close the source tank valve, press Enter to recover the refrigerant in the hose.

8.A/C system service

8.1.Recovery process

1. From the main menu, select MANUAL, and then select RECOVERY.

2. Choose "Start" to begin Recoverying. Choose "Exit" to return the Main interface.

3. Recovery is in progress. The recovered weight will be displayed after the recovery process is completed.

4. Recovery Completed.

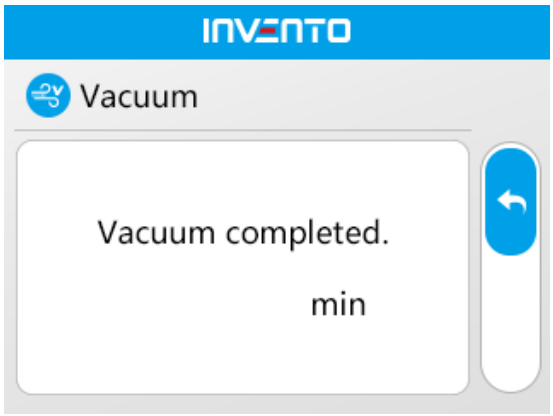
There is potential for unit to display an error because of the high internal pressure.

8.2.Vacuum process

1. From the main menu, select MANUAL, and then select VACUUM.

2. Set the Vacuum time, and press “Start” to begin vacuum process.

3. Vacuum completed. Press “Exit” to return the Main interface.

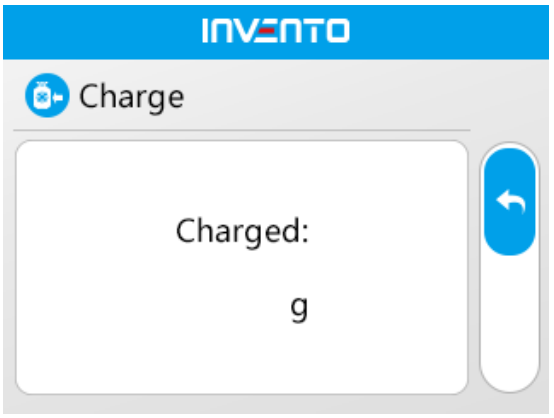


8.3.Charge process

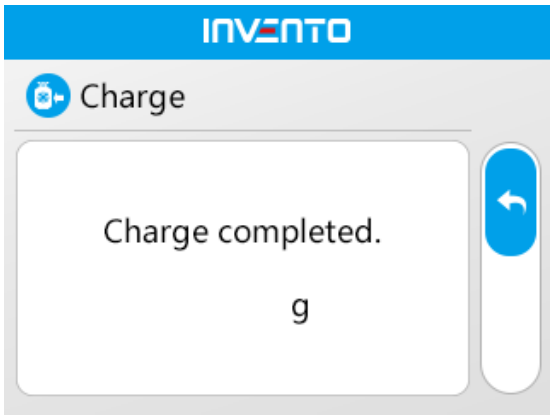
1. From the main menu, select MANUAL, and then select CHARGE.

2. Set the Charge amount, and press “Start” to begin charge process.

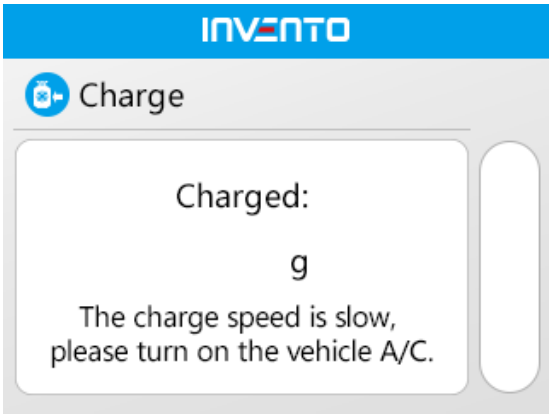
3. Charge is in progress. The charged weight will be displayed after the charge process is completed.



4. Charge Completed.



There is potential for unit to display an error of the slow charging. Please close the high side valve and turn on A/C.



9.Maintenance

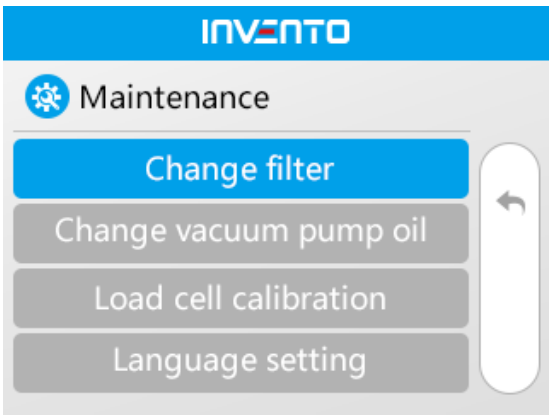
Please contact an authorized technical service center for purchasing factory replacement parts.

Make sure the machine is disconnected from power before removing plastic housing.

Never perform any maintenance work which is not expressly recommended in this Section.

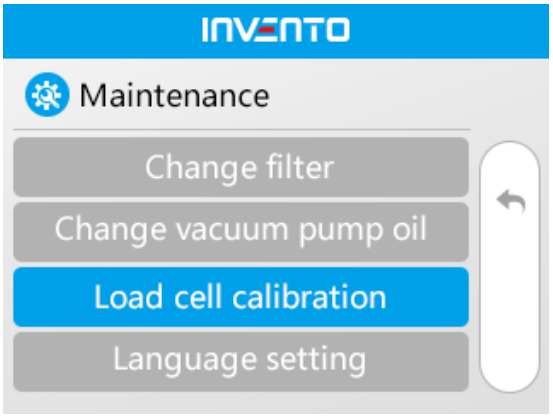
Contact customer service if components have to be replaced other than in the course of maintenance work.

To access MAINTENANCE from the MAIN MENU, press “Enter” to the next.

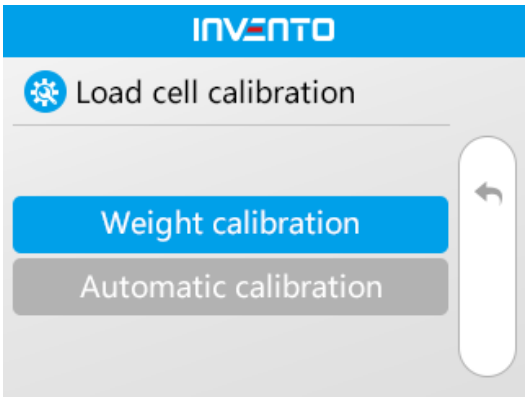


9.1.Load Cell Calibrate

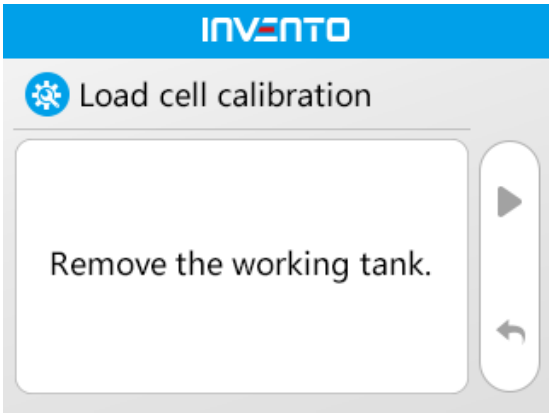
1. Remove the tank. Press “OK” to the next step.

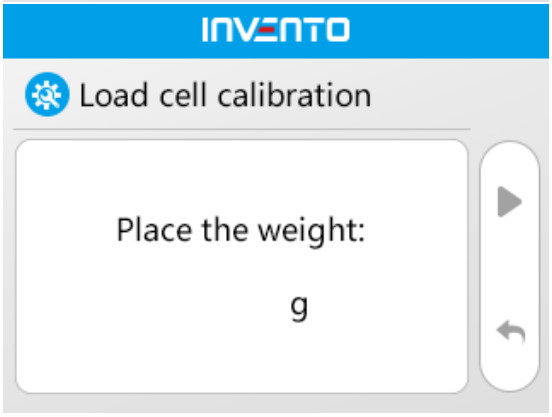


2.Choose the calibrate method, here we choose weight calibration.

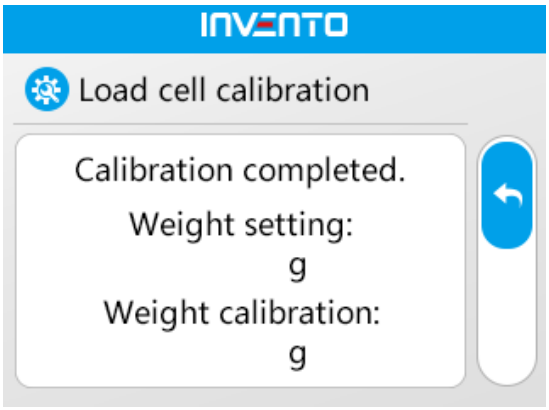


3. remove the work tank and put a known weight on it.

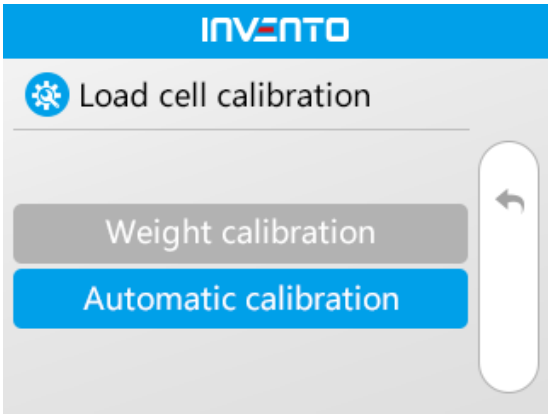




5. Calibrate complete. Press “Exit” to return the Main Interface.



6.choose the automatic calibration



9.2.Insufficient refrigerant in work tank

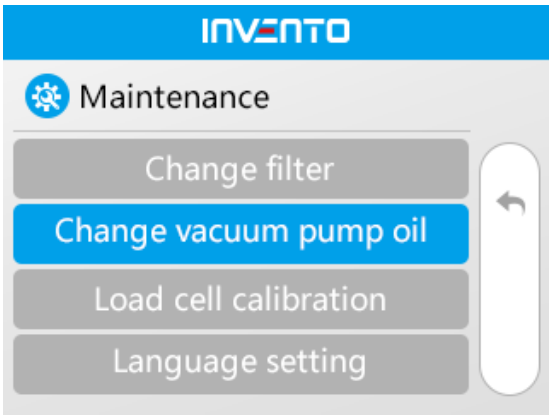
To ensure a reliable procedure, it is advisable to use the optimum quantity of refrigerant. The optimum quantity of refrigerant for the S110 is 4kg – 10.0kg.

An inadequate quantity of refrigerant may make effectiveness of filling the vehicle air conditioning system impossible. If there is insufficient refrigerant in work tank, please Refer to 7.2 Refill the work tank.

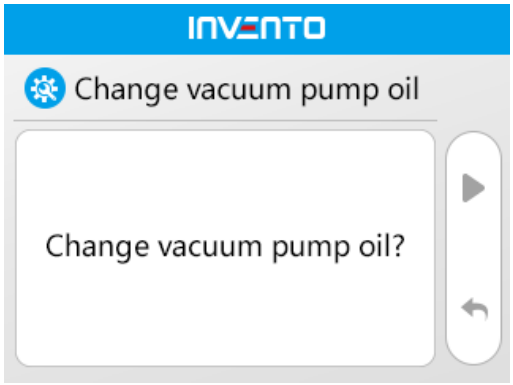
9.3.Vacuum pump oil change

When the oil level is reach the minimum position, pump oil should be added. System could accumulate the vacuum time. When the value reach to 600 hours, system would prompt changing the pump oil.

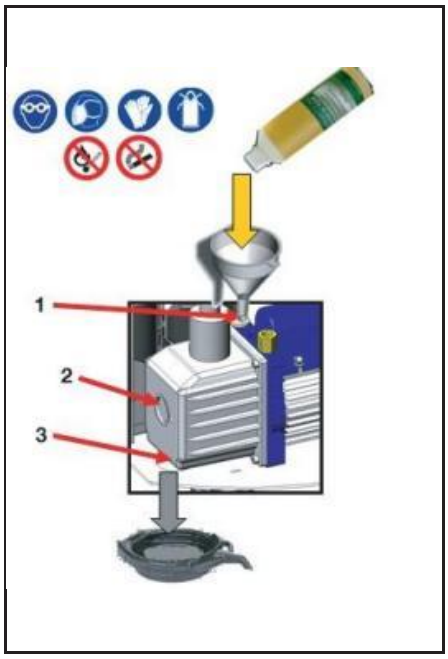
1. To begin the vacuum pump oil replacement process, from the MAINTENANCE menu, choose Replace Vacuum pump oil.



2. Before changing, run the vacuum process for 1 minute to be sure that the pump is in hot condition.

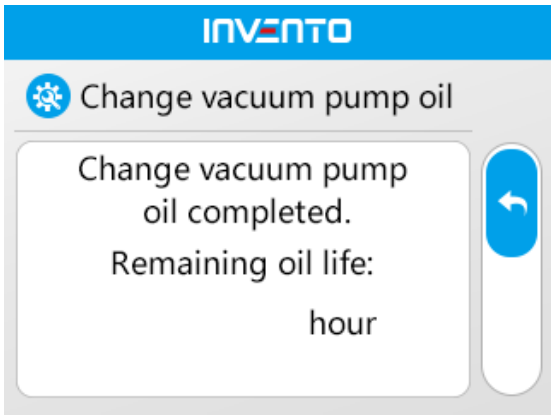


Using a flat head screwdriver, rotate the front locking screw and lift the front housing. Place a bowl under the vacuum pump oil drain hole. Remove the upper filling plug and the lower drain plug to allow the oil to drain from unit. Once the pump has been emptied, reinstall the lower drain plug. Fill the pump with new oil through the upper fill port using a funnel if needed.



Changing vacuum pump oil
1 Oil filling plug
2 Oil inspection window
3 Lower drain plug

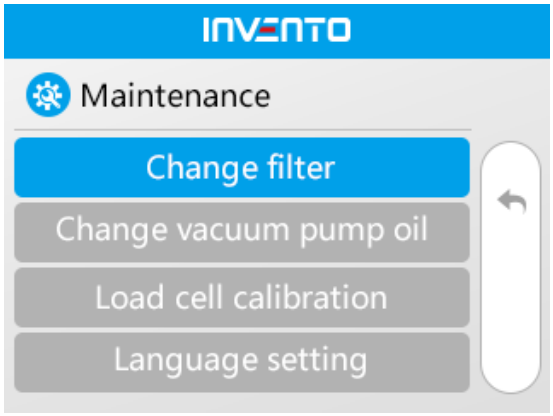
3.Replace Vacuum Pump Oil Complete. The machine will automatically update the vacuum oil capacity.



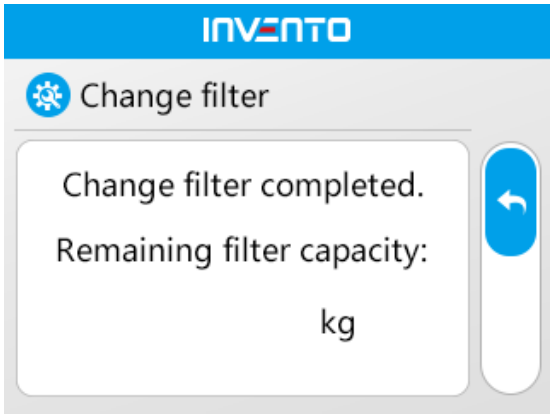
9.4.Replace filter dryer

System could accumulate the recovering refrigerant weight. When the value reach to 200Kg, system would prompt changing the dryer and filter. The “over” would be displayed when the power is on and system would not start recovering process.

1. To begin the filter replacement process, from the MAINTENANCE menu, choose Replace Filter.

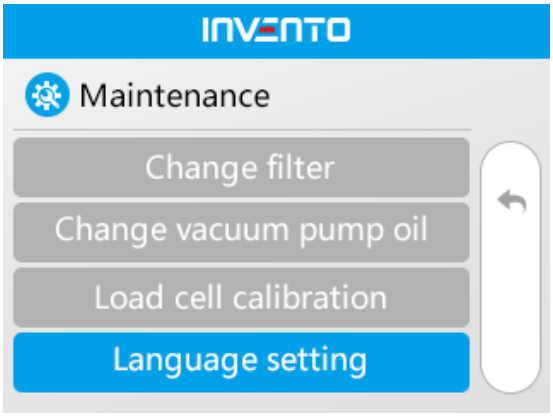


2. Replace the filter and the machine would reset the filter automatically. Replace Filter complete.



9.5.Language selection

1.select the language.



2.choose the language that you need.