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INTRODUCTION

This manual was drafted in accordance with the EEC Guidelines contained in Directive no. 392/89 as amended. This manual contains important information pertinent to operator safety. Read this manual through at least once before operating the machine. The manufacturer reserves the right to modify this manual and the machine itself with no prior notice. We therefore recommend checking any updates. This manual must accompany the machine in case of sale or other transfer.

CARE OF THE MANUAL

This manual must be kept in a cool, dry place and must be kept for the entire life of the machine. Take care not to damage this manual in whole or in part during consultation. Do not remove pages from this manual. Do not write on the pages; space for notes is provided at the end of each chapter.

WARRANTY

This product is warranted against any defect in materials and/or construction for a period of 1 (one) year from the date of delivery. The warranty consists of free-of-charge replacement or repair of defective component parts or parts considered defective by the Manufacturer. Reference to the machine serial number must be included in any requests for spare parts. Parts not covered by the manufacturer warranty are: pressure gauges.

This warranty does not cover defects arising from normal wear, incorrect or improper installation, or phenomena not inherent to normal use and operation of the product. Manufacturer guarantees the perfect suitability of the materials used for packing, in terms both of composition and mechanical strength/resistance. The guarantee does not cover breakdowns attributable to damage suffered during shipping or warehousing or caused by the use of accessories not meeting manufacturer's specifications, or to tampering with or repair of the product by unauthorized personnel. It is of utmost importance that the crates containing the machine be carefully inspected, upon delivery, in the presence of the shipping agent. We recommend performing inspection with extreme care, since damages to the crates due to shocks or dropping are not always immediately visible thanks to the shock-absorbing capacity of today's composite packing materials. The apparent integrity of the packing materials does not exclude possible damage to the goods, despite the due care taken by the manufacturer in packing them.

NOTE: Regarding the above, the Manufacturer reminds the Customer

that according to international and national laws and regulations in force the goods are shipped at the sole risk of the latter and, unless otherwise specified in the confirmation of order phase, the goods are shipped uninsured.

The Manufacturer therefore declines any and all responsibility in merit of REQUESTS for damages due to shipping, loading and unloading, and unpacking. The product for which repair under guarantee is requested must be shipped to the manufacturer under the customer's exclusive responsibility and at the customer's exclusive expense and risk. In order to avoid damage during shipping for repairs, the Manufacturer's original packing must always be used. The manufacturer declines any and all responsibility for damage to vehicles on which recovery/recycling and recharging are performed if said damage is the result of unskillful handling by the operator or of failure to observe the basic safety rules set forth in the instruction manual. This warranty replaces and excludes any other warranty or guarantee that the seller is required to provide under law or contract and defines all the customer's rights in regard of faults and defects and/or scarce quality in the products as purchased. Failure to observe the aforementioned conditions shall invalidate all forms of warranty on the MACHINE.

GENERAL INFORMATION

Machine identification information is printed on the data plate on the rear of the machine (Fig.1). Overall machine dimensions:

Height:	1060 mm	Width:	500 mm
Depth:	520 mm	Weight:	80 Kg

Like any equipment with moving parts, the machine inevitably produces noise. The construction system, paneling, and special provisions adopted by the Manufacturer are such that during work the average noise level of the machine is not in excess of 70 dB (A).

END-OF-LIFE

The symbol on the right indicates that in accordance with Directive 2002/96/EC the machine may not be disposed of as ordinary municipal waste but must be delivered to a specialized center for separation and disposal of WEEE (Waste Electrical and Electronic Equipment) or be returned to the dealer in case of purchase of a new machine. Current legislation provides severe sanctions in the case of disposal of WEEE into the environment. If improperly used or disposed of into the environment, electrical and electronic equipment can release substances dangerous for the environment and for human health.



SAFETY RULES

The machine designed for use in recovering the R134a refrigerant fluid used in the air-conditioning (A/C) systems of motor vehicles. The machine is designed to be used by qualified personnel only; moreover, correct use of the machine will depend on the operator's knowledge of the information contained in this manual, including the basic safety rules set forth below: Wear protective gloves and goggles. Do not expose the machine to direct sunlight or rain. Use only in well-ventilated work areas. Before performing any operation, check the vehicle use and maintenance manual for the type of refrigerant fluid used by the A/C system. Do not smoke in proximity to the machine while it is in operation. Do not use the machine in proximity to sources of heat, open flames, or sparks.

Check whenever the engine is turned off that the ignition key is turned to the full OFF position. Always close all the valves on the machine before connecting it to the A/C system of the vehicle. Connect only the machine hose supplied with the RED quick-connect coupling to the high-pressure branch of the A/C system. Connect only the machine hose supplied with the BLUE quick-connect coupling to the low-pressure branch of the A/C system. Keep the connection hoses away from moving parts and rotating elements such as cooling fans, alternators, etc. Keep the connection hoses away from hot objects and elements such as engine exhaust pipes, radiators, etc. Fill the A/C system with the quantity of refrigerant recommended by the manufacturer. Never exceed said quantity. Check the oil levels at the beginning of each operation. Always top up with the correct quantity of oil. Before connecting the MACHINE, check that voltage and frequency of main electrical supply match the value shown into the data plate.

Never fill the bottle to more than 80% of maximum capacity in order to leave an expansion chamber for absorbing any pressure increases.

Never touch the valves on the refrigerant bottle installed on-board the MACHINE. Dispose of the oil extracted from the A/C system and from the vacuum pump in suitable containers for used oils. Replace the filters punctually at the prescribed replacement times. Use only filters recommended by the manufacturer. Use only the oils recommended by the manufacturer. Take care never to use the vacuum pump oil in the A/C system, or vice-versa. Failure to observe any of the above safety precautions will invalidate all forms of guarantee on the MACHINE.

PRECAUTIONS FOR HANDLING AND USE OF REFRIGERANT FLUIDS

Refrigerant fluids expand to the gaseous state in standard environmental conditions. In order that they may be shipped and used they must be compressed into suitable bottles. We therefore recommend observing all the general precautions applicable to handling of pressurized containers. In the case of R134a in particular, we suggest the following special precautions: Avoid inhaling highly concentrated vapors even for short periods of time, since such vapors can cause loss of consciousness or death. R134a is not flammable, but if the vapor is exposed to open flames or incandescent surfaces it may undergo thermal decomposition and form acid substances. The acrid and pungent odor of these products of decomposition is sufficient to signal their presence. We therefore recommend avoiding use of R134a near open flames and incandescent elements. There exists no evidence of risks deriving from transdermal absorption of R134a. Nevertheless, due to the low boiling point of the liquid, it is advisable to wear protective garments such as to ensure that no jets of liquid or gas can come into contact with the skin. The use of goggles to avoid contact with the eyes is especially recommended, since the refrigerant liquid or gas can cause freezing of the ocular fluids. Moreover, we strongly advise users to avoid dispersing the R134a refrigerant fluid utilized in the machine since it is a substance that contributes to raising the temperature of the planet, with a global warming potential(GWP) of 1300.

PRINCIPLES OF OPERATION

In a single series of operations, the machine permits recovering and recycling refrigerant fluids with no risk of releasing the fluids into the environment, and also permits purging the A/C system of humidity and

deposits contained in the oil. The machine is equipped with a built-in evaporator/separator that removes oil and other impurities from the refrigerant fluid recovered from the A/C system and collects them in a container for that purpose. The fluid is then filtered and returned perfectly recycled to the bottle installed on the MACHINE.. The machine also permits running certain operational and seal tests on the A/C system.

SETUP

The machine is supplied fully assembled and tested. Referring to Figure 2, mount the hose with the BLUE quick-connect coupling on the male threaded connector indicated by the BLUE LOW PRESSURE symbol and the hose with the RED quick-connect coupling on the male threaded connector indicated by the RED HIGH PRESSURE symbol. Referring to Figure 3, remove the protection under the refrigerant scale as follows:

- Loosen the nut [2].
- Completely loosen the screw [1].
- Keep the screw [1], the nut [2], and the knurled washer [4] for possible future use.

NOTE: in the event that the equipment has to be transported, the refrigerant bottle scale should be locked in place as follows:

- Procure two size 10 wrenches.
- Tighten the nut [2] almost completely onto the screw [1].
- Insert the knurled washer [4] onto the screw [1].
- Turn the screw [1] just a few times on the threaded bush [6].
- Switch the machine on.
- Tighten the screw [1] until the display signals ZERO availability.
- Tighten the nut [2] forcefully (using the second wrench to block the screw [1]).
- Check that the screw [1] is actually locked, if necessary repeat the locking operation from the beginning.

THE MACHINE

BASIC COMPONENTS

Refer to fig 4,5,6,7:

- | | |
|-------------------------|--|
| a) Control console | b) Taps |
| c) Handle | d) High/Low Pressure threaded connectors |
| e) Top-up oil container | f) Bottle |
| g) Drying filters | h) Electronic scale |
| i) Heating resistance | j) Main switch |

- | | |
|--------------------------------------|----------------|
| k) Socket for electrical supply plug | l) Fuse |
| m) Used oil container | n) Serial port |
| o) Humidity gauge | p) Vacuum pump |
| q) Wheels | |

CONTROLS AND CONTROL SYSTEM

Refer to fig 8:

- (A1) High pressure gauge for A/C system
- (A2) Low pressure gauge for A/C system
- (A3) Printer (optional)
- (A4) Pressure gauge for bottle refrigerant pressure
- (A6) Emergency/alarms panel
- (A7) Display
- (A8) Pushbuttons for modifying and starting/stopping operations
- (A9) Operations selector panel

FUNCTION SELECTOR KEYBOARD

Refer to fig 9:

- (T1) Availability LED indicator: when lit, the display reports the quantity of refrigerant fluid contained in the bottle.
- (T2) Charging LED indicator (flashes during the CHARGING phase).
- (T3) Recovery LED indicator (flashes during the RECOVERY phase).
- (T4) Vacuum LED indicator (flashes during the VACUUM phase).
- (T5) Oil Discharge indicator (flashes during the OIL DISCHARGE phase).
- (T6) SEL key: Selects the operation to be performed. Every time this key is pressed one of the LEDs from T1 through T4 will light in sequence; the LED alongside each operation indicates that the operation may be started or that it is being performed (flashing LED).
- (T7) + key: Each time this key is pressed during the operations relative to setting the time and the quantity, the value of the flashing digit on the display will be increased by one unit.
- (T8) ARROW key: Each time this key is pressed while a display value is flashing during the operations relative to setting the time and the quantity, a different digit will be selected for modification (selected digit will flash).
- (T9) ENTER key: Pressing this key when a LED corresponding to an operation is lit but not flashing will permit modifying the times and the fluid quantities. Upon completion of modification, press the key again to confirm the datum
- (T10) START key: Pressing this key will start the operation indicated by

the lighted LED

(T11) STOP key: Pressing this key will stop the operation indicated by the flashing LED.

(T12) TEMPERATURE key: Pressing this key the display will show the bottle temperature in Celsius degree and Fahrenheit degree.

(T13) Display: According to the operation selected, displays the time or refrigerant quantity values.

STATUS AND ALARM PANEL

See fig 10:

(C1) HEATER ON: Lights to indicate that the electrical resistance of the machine is heating the bottle to maintain fluid pressure between 5.5 and 8,5 bar. The resistance does not operate during the RECOVERY phase of operation

(C2) HIGH PRESSURE: Lights and emits an acoustic signal when the pressure of the fluid in the circuit catch up 17.5 bar. The RECOVERY operation is automatically interrupted.

(C3) FULL BOTTLE: Lights and emits an acoustic signal when the bottle is full to more than 80% capacity (that is, 10 kg). The Recovery operation is automatically interrupted.

(C4) EMPTY BOTTLE: Lights and emits an acoustic signal when the quantity of refrigerant fluid contained in the bottle is low (2 kg). in order to avoid the emission of non-condensable gases. Fill the bottle according to the procedure described in the ROUTINE MAINTENANCE section.

PRELIMINARY OPERATIONS

Check that switch (j) is set to position 0. Check that all the machine taps are closed. Connect the machine to the electrical supply and switch on. Check that the vacuum pump oil level indicator shows at least one-half full. If the level is lower, add oil as explained in the MAINTENANCE section. Check that in the top-up oil container (e) there are at least 100 cc of the oil recommended by the manufacturer of the vehicle A/C system. Check the level of the oil in container (m) (< 200 cc). Check on the machine display that there are at least 3 kg of refrigerant in the bottle. Should this not be the case, fill the machine bottle from an external bottle of appropriate refrigerant following the procedure described in the ROUTINE MAINTENANCE section.

PURGE NON CONDENSABLE GAS

Before every service, check if there is air into the bottle; press the temperature bottle key (ref .T12 fig.9) and read the temperature of the bottle. Compare the bottle pressure with the one into the table; if the

bottle pressure if higher of the pressure read on the table, pull the ring of the security valve and bring back the bottle pressure to the table values. Example: Bottle temperature = 20 °C, the bottle pressure must bring back at 5,2 bar.

T (°C)	P (bar)	T (°C)	P (bar)	T (°C)	P (bar)	T (°C)	P (bar)	T (°C)	P (bar)	T (°C)	P (bar)
10	3.6	17.5	4.8	25	6.1	32.5	7.7	40	9.6	47.5	11.8
10.5	3.7	18	4.9	25.5	6.2	33	7.8	40.5	9.7	48	12
11	3.8	18.5	4.9	26	6.3	33.5	8	41	9.9	48.5	12.1
11.5	3.8	19	5	26.5	6.4	34	8.1	41.5	10	49	12.3
12	3.9	19.5	5.1	27	6.5	34.5	8.2	42	10.2	49.5	12.4
12.5	4	20	5.2	27.5	6.6	35	8.3	42.5	10.3	50	12.6
13	4.1	20.5	5.3	28	6.7	35.5	8.4	43	10.4	50.5	12.8
13.5	4.1	21	5.4	28.5	6.8	36	8.6	43.5	10.6	51	12.9
14	4.2	21.5	5.5	29	6.9	36.5	8.7	44	10.7	51.5	13.1
14.5	4.3	22	5.6	29.5	7.1	37	8.8	44.5	10.9	52	13.3
15	4.4	22.5	5.6	30	7.2	37.5	8.9	45	11	52.5	13.4
15.5	4.4	23	5.7	30.5	7.3	38	9.1	45.5	11.2	53	13.6
16	4.5	23.5	5.8	31	7.4	38.5	9.2	46	11.3	53.5	13.8
16.5	4.6	24	5.9	31.5	7.5	39	9.3	46.5	11.5	54	14
17	4.7	24.5	6	32	7.6	39.5	9.5	47	11.6	54.5	14.2

RECOVERY/RECYCLING PHASE

- 1) Connect the hoses to the A/C system with the quick-connect couplings, bearing in mind that BLUE must be connected to the low-pressure side and RED to high pressure. If the A/C system is equipped with a single quick-connect coupling for high or low pressure, connect only the relative hose.
- 2) Start the vehicle engine and switch on the air conditioner. Allow both to run for about 10 minutes with the passenger compartment fan at full speed.
- 3) Switch off the engine; if possible, keep the air conditioner fan running at maximum speed for the entire recovery phase
- 4) Open the high- and low-pressure taps (or, in the case of a single coupling, only the relative tap).
- 5) Press and hold the SEL key until the LED corresponding to "Recovery" lights; then press START. At this point the RECOVERY/RECYCLING phase will begin; the "Recovery" LED will flash. During this phase the amount of refrigerant recovered from the system will be displayed, in kilograms. Upon completion of the recovery phase the machine will stop and automatically discharge the used oil recovered from the A/C system during recovery. The oil discharge operation lasts 4 minutes. If during this time residual refrigeration fluid in the A/C system should increase the pressure, the machine will automatically recommence

- recovering the refrigerant.
- 6) Switch off the air conditioner fan and if necessary turn the vehicle ignition key to the full OFF position.
 - 7) At this point, all of the refrigerant contained in the A/C system will have been recovered and recycled; there remains to extract the air and the residual humidity from the A/C system by creating a vacuum.

VACUUM PHASE

- 1) Upon completion of the RECOVERY phase the machine will automatically proceed to the vacuum phase. It is nevertheless possible to start the vacuum phase directly by opening the high- and low-pressure taps, pressing the SEL key until the LED corresponding to "Vacuum" lights, and then pressing START. The preset vacuum time is 25 minutes (recommended for the majority of A/C systems), but may be modified as explained below. Press SEL until the "Vacuum" LED lights, then press ENTER; at this point the first digit on the left of the display will begin to flash. Press the + key until the desired digit appears. Likewise, press the ARROW and + keys to change the other digits. When setting is complete, press the ENTER key to confirm the vacuum time value.
- 2) During the vacuum phase, the display will clock its duration. Leave the machine running until the display reads 0000 and the pump stops automatically.
- 3) Close all the taps and read the vacuum value on pressure gauges (A1) and (A2). Wait for about 2 minutes, then check that the pressure has not increased during the interval. An increase in pressure signals leaks in the A/C system. Locate and eliminate the leaks; repeat the vacuum phase.

NEW OIL REINTEGRATION

- 1) Measure the quantity of oil extracted from the A/C system and check that the new oil container (e) contains at least 20 cc more than this quantity.
- 2) Open the high- and low-pressure taps (or in the case of a single coupling, only the relative tap).
- 3) Open the tap of the new oil container and keep it open until the quantity of oil extracted during the recovery phase has been replaced.
- 4) When the correct quantity has been reintegrated, close the new oil tap.

ATTENTION: the level of the oil in the container will fall, and

consequently the quantity must be calculated by subtraction. Upon termination of the oil reintegration operation you may go on to the refrigerant fluid charging/reintegration phase.

CHARGING/REINTEGRATION PHASE

During this phase, the refrigerant fluid is returned to the A/C system circuit.

- 1) Press the SEL key until the "Charging" LED lights.
- 2) Proceed as described below to set the quantity of refrigerant fluid to be charged.
 - a. Press the ENTER key. The first digit on the left of the display will begin to flash. Press the + key until the desired value appears. Likewise, press the ARROW and + keys to change the values of the other digits. Press ENTER when setting is completed to confirm the values. The quantity of fluid required for filling the system is usually reported on a data plate in the engine compartment of the vehicle. If the quantity is not known, consult the relevant system operating and maintenance manuals.
 - b. The database can be used, if installed:
Press the ARROW key. The first number on the left will begin to flash on the display. Find the relevant vehicle code on the special "table". Use the ARROW and + keys to enter the code. When finished, press ENTER to confirm. The display will again show the quantity of refrigerant available and the machine will be able to insert the correct amount of refrigerant.
NOTE: if the database has not been installed, "nodb" will appear on the display for a couple of seconds, then the quantity of refrigerant available will reappear. Please contact your retailer if you wish to install the database.
- 3) Open the high- and low-pressure taps (if previously closed) and press the START key. ATTENTION: if the pressure in the bottle is higher than 8 bar, open the low pressure tap only halfway (ca. 45° rotations) in order to avoid possible negative effects on the A/C system.
- 4) The machine will stop automatically when the preset quantity has been charged.
- 5) Close the high- and low-pressure taps.
- 6) Start the vehicle motor and switch on the A/C system. And allow both to run for at least 3 minutes. At this point the system will be at steady state and it will be possible to check the high and low pressure values on the relative pressure gauges.
- 7) Disconnect ONLY the high-pressure quick-connect coupling (if

necessary, switch the engine off). Then, with the A/C system still running, open the high- and low-pressure taps to force the A/C system to draw up the refrigerant contained in the hoses.

- 8) After about 1 (one) minute, disconnect the low-pressure couplings the machine from the vehicle A/C system and switch off the engine. Turn the main switch (i) to the 0 position.

ATTENTION: Should the pressure in the bottle be insufficient to charge the A/C system, it will be necessary to force the system to take up the fluid by suction. With the quick-connect couplings attached, CLOSE the high-pressure tap and run the A/C system with the low-pressure tap open. In the case of a single high-pressure coupling, charge about 100g in excess of the required quantity, since this amount will remain in the high-pressure hose at the end of the operation.

ROUTINE MAINTENANCE

FILLING THE MACHINE BOTTLE

This operation must be performed whenever the available refrigerant in the bottle is less than 3 kg and must in any case be performed when the "empty bottle" indicator lights on the control console.

IMPORTANT: Never tamper with the taps on the machine bottle. Procure a bottle of R134a gas; connect it to the high-pressure hose of the MACHINE. Open the tap of the external bottle and the high-pressure tap of the MACHINE. If the external bottle is not supplied with a suction device, turn it upside down to obtain a higher delivery rate. Switch the machine on, then hold down the SEL key until the LED corresponding to "Recovery" lights. Press the START key to start the MACHINE. The display will indicate the quantity of refrigerant transferred to the bottle on board the machine. Close the tap of the external bottle when the quantity transferred is 0.50 kg less than the final quantity desired. Allow the machine to recover the fluid remaining in the hose. The "oil discharge" LED will light when the machine will have recovered all the fluid from the hose. The machine will stop automatically. Close the high-pressure tap on the MACHINE, press the STOP key, and disconnect the external bottle.

VACUUM PUMP

Perform the operations listed below on a routine basis in order to ensure good operation of the vacuum pump:

M1) Oil top-up.

M2) Oil change.

When topping-up or replacing the pump oil, use only the oil

recommended by the manufacturer. Contact your retailer for information concerning the correct type of oil.

M.1) Oil top-up

This operation must be performed when the level of the oil falls to less than half on the indicator (4) (refer to Figure 11). NOTE: in order to correctly check the oil level, run the pump for at least 1 minute (running a vacuum procedure in the hose for 1 minute) so that the oil fluidifies. Check the oil level when the pump stops. To refill the oil, perform the steps listed below in the order given. Disconnect the MACHINE from the mains supply. Locate the oil cap (2) and screw it completely off. The oil must be added through the hole in which the oil cap was lodged (2). Add oil a little at a time, waiting for the level to rise before each successive addition, until the oil level is about ½ cm above the mark on the indicator (4). Replace the oil cap (2) and tighten down.

M.2) Oil change

The vacuum pump oil must be replaced every 150 working hours and in any case every time the refrigerant filters are replaced. The oil must also be replaced whenever it changes color due to absorption of humidity. Before beginning the oil change procedure, procure a container of at least 300 cc capacity in which to collect the used oil. The pump contains about 280 cc of oil. Use only the oils recommended by the manufacturer (consult your retailer).

- 1) Disconnect the machine from the mains supply.
- 2) Unscrew the filling cap 2 (refer to Fig. 11).
- 3) Unscrew the drain cap 3.
- 4) Allow all the oil to run out into a disposal container (with height < 10 cm).
- 5) Close the drain cap 3.
- 6) Pour in new oil through the filling hole, opened previously, until the level rises to the midpoint on the indicator 4.
- 7) Replace the oil cap 2 and tighten.

REPLACING THE DRYER FILTERS

Replace the filters whenever the machine gives the service alarm [SERV] during the first ten seconds of operation or whenever the humidity gauge signals the presence of humidity in the circuit (inner circle yellow). Before performing any operation, check that the replacement filters are the same types as those installed on the MACHINE. Then proceed as

described below (ref. fig.12):

- 1) Disconnect the machine from mains supply.
- 2) Wear gloves and safety goggles.
- 3) Remove the rear cover and right plate.
- 4) Close the taps of the on-board bottle, and close High/Low pressure taps.
- 5) Close both valves of the internal bottle and the valve [1,fig.12] of the filter [4,fig.12] .
- 6) Connect the L.P. quick coupler to the fitting [2,fig.12] of the filter [4,fig.12]. Connect the L.P. quick coupler to Low pressure tap with the blue hose. And open the L.P. quick coupler.
- 7) Connect the machine to the power supply.
- 8) Open the Low pressure tap, make a recovery phase.
- 9) Once the reading of the pressure is ZERO, close immediately the valve [3,fig.12] of the filter [5,fig.12] and press Stop or Reset.
- 10) Disconnect the machine from the power supply.
- 11) Disconnect the L.P. quick coupler from the fitting [2,fig.12] of the filter [4,fig.12].
- 12) Replace the old filters with the new ones, paying attention at the direction of the arrows.

CAUTION: Replace the old filter with the new one as quickly as possible in order to avoid possible contamination with the humidity in the ambient air.

- 13) Open the valve [1,fig.12] under the filter [4,fig.12] and the valve [3,fig.12] of the filter [5,fig.12]
- 14) Open both valves of the refrigerant bottle.
- 15) Mount the rear cover and right plate.
- 16) Connect the machine to the power supply, and turn on the machine
- 17) During the first 10 seconds (when the service alarm [SERV] is displayed),press the SEL key.
- 18) Type in the filter code to cancel the alarm (use the + and ARROW keys).
- 19) Recover about 500g of gas to charge the machine circuit.
- 20) Switch off the MACHINE
- 21) Disconnect the machine from mains supply.

FILLING THE NEW OIL TANK

It is good practice to fill the oil tank whenever the oil level falls below 100 cc in order to guarantee that there will be sufficient oil for topping up during successive operations. Types of oil: use only synthetic oils.

Always refer to the information provided by the system manufacturer. Procedure: Remove the tank, complete with cap, after disconnecting the quick-connect coupling on the upper part. Unscrew the cap and fill the tank with the correct quantity of suitable type and grade oil for compressors. Screw the cap back on, replace the tank, and reconnect the quick-connect coupling.

EMPTYING THE USED OIL TANK

This operation must be performed whenever the oil level exceeds 200 cc. Procedure: remove the tank from its lodging and unscrew the container (holding fixed the cap); empty the tank into a container for used oils, Screw the container (holding fixed the cap) and replace the container in its lodging.

SPECIAL MAINTENANCE OPERATIONS

CALIBRATING THE ELECTRONIC SCALE

This operation should be performed when the scale values displayed are out of line with known values. The operations listed below must be performed with the maximum attention and care. Always observe the precautions outlined in this section. Always place the weights carefully on the scale plate, one at a time. Always place the weights the center of the scale plate. Proceed as explained below to calibrate the scale (see fig.3). Disconnect the machine from mains supply. Procure a known reference weight (16 to 18 kg). Remove the cover on the rear of the machine to access the machine bottle. Close the blue and red taps on the bottle. Unscrew the bottle lock nut (3). Separate the heating coil (i,fig7) from the bottle (do not touch or disconnect the wires of the resistance coil).

Remove the bottle (5) from its seat, leaving the resistance around the scale plate. Rest the bottle on a stand at least 40 cm in height. Switch on the MACHINE. Be careful not to touch any electrical wires. Wait at least 10 seconds. Press the + and ARROW keys simultaneously and hold down for about 5 seconds. The value displayed at this point will correspond to the scale zero value. Press down lightly on the scale plate; the value should increase. If it does not, replace the charge cell. Press the ENTER key to memorize the value. (In this phase, take care that nothing touches the scale plate). Place the reference weight (16 to 18 kg) carefully at the center of the scale plate and check that the displayed value increases accordingly. Press the SEL key and use the + e ARROW keys to type in the 4 figures of the reference weight. Press ENTER. The display reading should be the reference weight minus the weight of the empty bottle (ca. 6.1 kg).

Remove the reference weight. Switch off the machine and disconnect from mains supply. Replace the bottle in its seat on the scale plate. Switch on the MACHINE, taking care not to touch any electrical wires. Check calibration: place a known 0.5 kg or 1 kg reference weight on the bottle and check that the displayed availability value increases by the value of the known reference weight $\pm 2\%$. Remove the reference weight. Switch off the machine and disconnect from mains supply. Screw down the bottle lock nut (3). Open the red and blue bottle taps. Replace the rear cover.

ADDITIONAL SETTINGS

CHANGING THE UNITS OF MEASURE (kg→lbs or lbs→kg)

Press the SEL, START, and ENTER keys simultaneously. Switch on the machine. The machine will change from one system of units of measurement to the other.

PRINTER (OPTIONAL)

If the printer is installed, the machine prints a summary slip at the end of each operation.

LEGEND

Availability:



Recovery:



Vacuum:



Charging:



REPLACING THE PRINTER PAPER

Use only heat-sensitive paper of the type described below.

Paper width: 58 mm

Maximum paper roll diameter: 32mm

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介绍

该手册依照 EEC 392/89 指令起草。手册中包含了关于操作者安全的重要信息，请在操作机器前至少阅读本手册一次。制造商保留对本手册以及此机器随时进行修改的权利，恕不另行通知。建议您定期检查更新信息。在机器销售或转让时，必须随同附带此手册。

保存该手册

请将本手册存放于阴凉干燥处，并务必妥善保存至此机器报废。请不要撕毁页面及在页面上涂写，倘若需要笔记，请写于每章节后的空白处。

保修条例

自交货之日起，对于任何由于材料不良或（和）装配不良导致的质量问题，本产品享受一年保修。保修内容包括：对于有缺陷的零部件，或者制造商认可的有缺陷的零部件，给予免费更换或维修。对于任何零配件索求，必需提供完整的产品序列号。不属于保修范围的是：压力表。

由于产品正常磨损、错误或不适当的安装方式、或未按正确的方式使用和操作等引起的故障不属于本保修范围。制造商保证会完全依据材质的特性结合力学强度/阻力等因素，采用最合适的材料用于包装。制造商不承担由于运输、中转入库、擅自使用不符合制造商规格的零配件、或者未经授权的人员对机器进行擅自更改与维修等而导致的设备损坏的保修。非常重要的一点是，您必须在收到货物时，当着运输公司人员的面，仔细检查包装箱及货物。我们建议采取非常仔细的检查，由于现在的包装箱采用的合成材料具有良好的抗震性与承受力，使受到撞击或坠落后产生的损害不一定能直观的显露出来。尽管制造商采取了严密的包装，但完好的包装箱外观不能排除内部货物破损的可能。

注意：综上所述，制造商提醒顾客，根据国际及国内关于货物运输的风险责任的相关法律法规，货物在运输时是未被保险的，除非在订单上特别注明。

因此，制造商拒绝承担任何因运输、装载、卸载和拆包过程导致的设备损坏的责任。产品被发回制造商进行保修的条件是顾客承担全部运输责任、除维修以外的费用以及其它可能的风险。为避免设备返厂维修时在运输过程中引起的损坏，请务必保留并使用制造商的原始包装。制造商拒绝承担由于设备使用者在对车辆进行回收/循环、加注过程中的不熟练操作或者不按照本手册规定的基本安全条款操作所造成的车辆损害的任何责任。本条款替代并排除了其他任何保修条款以及在法律或合同规定下要求销售商提供的其它任何担保，并且定义了关于客户购买到有故障问题和（或）劣质产品时的所有权利。如不遵守上述条例将使本产品的所有保修条款无效。

基本信息

产品的鉴定信息印刷在机身背面的铭牌上（图 1）。产品外型尺寸：

高	1060mm	宽	500mm
长	520mm	重	80KG

和任何采用可拆装零部件的设备一样，产品在工作时不可避免的会产生噪音。在工作时，制造商所采用的构架系统、镶板和特殊装置所产生的平均噪音值不会超过 70 分贝。

产品报废

右边的标志表示，根据 2002/96/EC 指令的要求，该机器不能作为普通市政垃圾处理，而是必须发运到指定的特别处理中心进行分离和报废电子电气设备处理，或者如果重新购买一台新设备的话就返还给经销商。针对在非指定环境中进行处置报废电子电气设备，现行法律规定了严厉的制裁措施。不恰当使用或处置，电子电器设备会释放出污染环境的有害物质，并影响人类的健康。



安全条例

本产品适用于汽车空调系统中 R134a 制冷剂的回收净化。本产品限于有从业资格的人员使用；此外，正确地使用本机器，还依赖于操作者对本手册所包含的信息的熟悉和掌握，包括规定的以下基本安全条例：穿戴好防护手套和防护眼镜；设备应避免阳光直射或遭雨淋；在通风良好的环境下使用设备；在进行任何操作之前，请根据车辆使用和保养手册确定空调系统所用的制冷剂型号；设备工作时，请勿靠近设备吸烟；避免在有热源、明火或火花附近使用设备。

无论何时关闭发动机，都要检查点火钥匙处于完全关闭的位置。在连接至汽车空调系统之前，始终关闭设备上的所有阀门。将设备红色软管通过红色快速接头连接到汽车空调系统的高压接头上，将设备蓝色软管通过蓝色快速接头连接到汽车空调系统的低压接头上。使连接软管远离类似冷却风扇、电机等转动部件，使连接软管远离类似发动机排气管、散热器等发热部件。空调系统中应注入汽车制造商推荐数量的制冷剂，不能超过该标准量。在每次操作之前，都要检查油位，始终加注恰当数量的油。设备通电之前，请检查供电电压与频率是否和设备铭牌中的规定值相符合。

为了保留一定的空间以吸收由于气体膨胀而增加的压力，注入钢瓶中的制冷剂量不能超过该钢瓶最大容量的 80%。

不要触碰安装在设备内的制冷剂钢瓶上的阀门。从汽车空调系统分离出来的旧油及真空泵中更换下来的旧油，应采用合适的容器储存、进行处理。

干燥过滤器应在规定的更换时间内按时更换，并请使用制造商推荐的同类产品。只能使用相关制造商推荐的相应油品。注意，不要将真空泵油用于空调系统内，反之亦然。不遵守上述任何一个安全防范措施将使本产品的所有保修条款无效。

操作与使用制冷剂时的防范措施

制冷剂液体在自然环境条件下膨胀为气体，为了便于运输和使用，制冷剂必须被压缩在合适的容器内。因此，我们要求在处理压力容器时要遵守所有有效的防范措施，特别是在 R134a 的情况下，我们要求遵循以下特别防范：即使是在短时间内，也避免吸入高浓度的制冷剂气体，因为会导致人失去知觉或死亡。R134a 气体不易燃烧，但是假如该气体遇到明火或发热体的表面，它会受热分解成酸性物质，分解的这些物质有辛辣、刺激的气味。因此，我们要求避免在明火与热源附近使用 R134a。没有证据显示通过皮肤吸收 R134a 对人的明显危险，然而，由于制冷剂液体的沸点较低，最好是穿上防护服以确保没有液态或气态制冷剂喷射到皮肤上。由于制冷剂液体或气体会导致眼睛冻伤，特别要求佩戴防护眼镜以避免眼睛接触到制冷剂。此外，我们强烈建议用户避免将设备中的 R134a 制冷剂扩散，因为它是能够使全球变暖的 1300 种污染物质之一。

工作原理

在每次一系列操作中，设备能够回收和再生制冷剂，并且不会使制冷剂释放到外界环境中，同时还能够清除空调系统中的湿气和冷冻油中的沉淀物。设备内配有一个内置的蒸发器/分离器，在回收空调系统内的制冷剂时，可以将混杂在制冷剂中的冷冻油及其它杂质分离出来，并将它们收集在一个容器里以做他用。然后，这些分离后的制冷剂再经过过滤、循环再生，最后储存在设备的钢瓶里。针对空调系统，设备还可以运行某几个操作及密封性测试。

安装

所供给的设备已经完全组装并测试通过。参考图 2 所示，将带有蓝色快接头的蓝色软管，连接在设备上蓝色低压标识的接口上；将带有红色快接头的红色软管，连接在设备上红色高压标识的接口上。参考图 3 所示，按照如下方法解除钢瓶电子秤的保护装置：

- 松开螺母[2]。
- 完全拧开螺杆[1]。
- 保留好拆卸出来的螺杆 [1]、螺母[2]和滚花止动垫圈[4]，以备后用。

注意：如果该设备要被运输，钢瓶电子秤应采取如下方式给予锁定：

- 取两个 10 号扳手。
- 将螺母[2]完全旋紧到螺杆[1]底部。
- 将滚花止动垫圈[4]套在螺杆[1]上。
- 将螺杆[1]适当拧入秤盘底部的压铆螺母[6]。
- 给设备上电开机。
- 逐步拧紧螺杆[1]，直到显示的重量值是 0 为止。
- 用力拧紧螺母[2]（用另一把扳手固定螺杆[1]）。
- 检查螺杆[1]是否确实拧紧，如有必要可从头重复一次操作。

设备

基本组成

参考图 4、5、6、7：

- | | |
|----------|-----------|
| a) 控制面板 | b) 高/低压阀 |
| c) 设备扶手 | d) 高/低压接口 |
| e) 新油瓶 | f) 钢瓶 |
| g) 干燥过滤器 | h) 电子秤 |
| i) 加热带 | j) 电源开关 |
| k) 电源插座 | l) 保险丝 |
| m) 旧油瓶 | n) 串行端口 |
| o) 液视镜 | p) 真空泵 |
| q) 脚轮 | |

控制系统

参考图 8

- (A1) 高压表
- (A2) 低压表
- (A3) 打印机（选配）
- (A4) 钢瓶压力表
- (A6) 报警指示区
- (A7) LED 显示屏
- (A8) 设备工作状态显示区
- (A9) 操作按钮

按键及指示灯功能

参考图 9

- (T1) 可用量指示灯：当指示灯亮，显示值表示钢瓶内的制冷剂量。
- (T2) 加注项目指示灯(加注过程中指示灯闪烁)。
- (T3) 回收项目指示灯(回收过程中指示灯闪烁)。
- (T4) 抽真空项目指示灯(抽真空过程中指示灯闪烁)。
- (T5) 排旧油项目指示灯(排旧油过程中指示灯闪烁)。
- (T6) SEL 键：功能选择，每次按此键，T1—T4 指示灯中的一个会顺次点亮；指示灯旁对应的功能可以被执行或正在执行(指示灯闪烁)。
- (T7) +键：在设置时间或数量值时，每次按此键，正在闪烁的位值将加 1。
- (T8) →键：在设置时间或数量值时，每次按此键，正在闪烁的位将移动到下一位。
- (T9) ENTER 键：当项目指示灯在亮而没有闪烁时(指示灯对于的项目没有运行)，按下此键将允许修改时间或数量值，(通过+和→键)修改完毕后，再次按下此键确认修改后的值。
- (T10) START 键：按此键将运行点亮指示灯对应的项目。
- (T11) STOP 键：按此键将停止闪烁指示灯对应的正在运行项目。
- (T12) 温度键：按此键将显示钢瓶内的温度，可切换显示摄氏度和华氏度。
- (T13) 显示区：根据选择的项目，显示相应的时间或数量值。

状态和报警区

参考图 10

- (C1) 启动加热：指示灯亮表示加热带正在加热钢瓶，以维持钢瓶内压力在 5.5—8.5bar。在回收过程中不会启动加热带加热。
- (C2) 高压报警：当管路中压力达到 17.5bar 时报警指示灯闪烁并且声音报警，回收功能会自动停止。
- (C3) 罐满报警：当钢瓶内制冷剂超过钢瓶 80%容量(在此为 10Kg)时报警指示灯闪烁并且声音报警，回收功能会自动停止。
- (C4) 罐空报警：当钢瓶内制冷剂低于 2Kg 时报警指示灯闪烁并且声音报警。为防止不可压缩气体的排放，根据日常保养维护中的指导进行制冷剂补充。

准备工作

检查电源开关(图 7 中 j)打到关闭状态。检查设备所有的接口阀门都为关闭状态。连接电源线，给设备上电。检查真空泵油位至少达到油位视窗一半。如果油位低于一半，按保养维护章节中的说明加油。检查新油瓶(图 6 中 e)中至少有 100CC 的油，此油类型必须是空调系统制造商推荐的类型。检查旧油瓶(图 7 中 m)中的油少于 200CC。检查钢瓶内制冷剂量，须至少 3Kg；若达不到，根据日常保养维护章节中的说明从外部罐补充适量制冷剂。

净化不可压缩气体

每次使用前检查钢瓶内是否存在空气。按如下操作：

按温度键(图 9 中 T12)读取钢瓶内温度值。将钢瓶压力表(图 8 中 A4)指示的压力值与下表对比，如果钢瓶内压力高于表中压力值，拉钢瓶安全阀拉环，让钢瓶内压力降到表中的压力值。例如：钢瓶内温度 20℃，钢瓶内压力必须降低到 5.2bar。

T (°C)	P (bar)	T (°C)	P (bar)	T (°C)	P (bar)	T (°C)	P (bar)	T (°C)	P (bar)	T (°C)	P (bar)
10	3.6	17.5	4.8	25	6.1	32.5	7.7	40	9.6	47.5	11.8
10.5	3.7	18	4.9	25.5	6.2	33	7.8	40.5	9.7	48	12
11	3.8	18.5	4.9	26	6.3	33.5	8	41	9.9	48.5	12.1
11.5	3.8	19	5	26.5	6.4	34	8.1	41.5	10	49	12.3
12	3.9	19.5	5.1	27	6.5	34.5	8.2	42	10.2	49.5	12.4
12.5	4	20	5.2	27.5	6.6	35	8.3	42.5	10.3	50	12.6
13	4.1	20.5	5.3	28	6.7	35.5	8.4	43	10.4	50.5	12.8
13.5	4.1	21	5.4	28.5	6.8	36	8.6	43.5	10.6	51	12.9
14	4.2	21.5	5.5	29	6.9	36.5	8.7	44	10.7	51.5	13.1
14.5	4.3	22	5.6	29.5	7.1	37	8.8	44.5	10.9	52	13.3
15	4.4	22.5	5.6	30	7.2	37.5	8.9	45	11	52.5	13.4
15.5	4.4	23	5.7	30.5	7.3	38	9.1	45.5	11.2	53	13.6
16	4.5	23.5	5.8	31	7.4	38.5	9.2	46	11.3	53.5	13.8
16.5	4.6	24	5.9	31.5	7.5	39	9.3	46.5	11.5	54	14
17	4.7	24.5	6	32	7.6	39.5	9.5	47	11.6	54.5	14.2

回收/循环过程

- 1) 用冷媒管和快速接头连接汽车空调，记住蓝色管连接低压端，红色管连接高压端。如果汽车空调只有一个高压或低压接口，则只连接相应的管。
- 2) 启动汽车发动机，开启汽车空调。将车内出风调到最高速度运行 10 分钟左右。
- 3) 关闭汽车发动机。如有可能，在整个回收过程中保持空调冷凝器风扇全速运行。
- 4) 打开高压阀和低压阀(若空调只有一个接口，则打开相应的阀)。
- 5) 按 SEL 键，选择回收功能，回收功能指示灯亮。接着按 START 键，这时开始回收/循环过程，回收项目指示灯会闪烁。在运行过程中，设备显示回收回来的制冷剂量，单位 Kg。回收过程完成后设备会停止并且自动排放在回收时从空调系统回收的旧冷冻油。排旧油过程会持续 4 分钟，在此时间内若空调系统中残留的制冷剂蒸发使压力上升，设备会自动重新开始回收。
- 6) 关闭空调冷凝器风扇，如有必要将汽车钥匙打到关闭位置。此时，空调系统内的所有制冷剂都会被回收和循环，残存的空气和水汽需要通过抽真空来抽取干净。

抽真空过程

- 1) 回收过程完成后，设备会自动进入抽真空过程。不过，仍然可以通过直接打开高压阀和低压阀，按 SEL 键选择抽真空项目，然后按 START 键开始运行抽真空过程。预先设定好的抽真空时间为 25 分钟(对大多数空调系统是合适的)，但可以按以下说明修改抽真空时间：按 SEL 键选择抽真空项目；然后按 ENTER 键，这时显示区左边第一个数码管数字会闪烁，通过+键调整到需要的数字，同样的通过→和+键调整数码管其他位的数字，设定好后按 ENTER 键确认所设抽真空时间值。
- 2) 抽真空过程中，设备显示剩余运行时间，当显示 0，设备停止运行，真空泵自动停止。
- 3) 关闭所有的阀门，从高压表(图 8 中 A1)、低压表(图 8 中 A2)中读取真空压力值。等待 2 分钟，在此期间确定压力值没有上升。如果压力值上升则表明空调系统有泄漏，检查排除泄漏后重新抽真空。

加注新油过程

- 1) 计量从空调系统回收回来的旧油量，检查新油瓶(图 6 中 e)中油量至少比此油量多 20CC。
- 2) 打开高压阀和低压阀(若空调只有一个接口，则打开相应的阀)。
- 3) 打开新油瓶的阀门，保持阀门开，直到加注了与回收回来的旧油量等量的新油。
- 4) 当正确量的新油加注完后关闭新油瓶阀门。

注意：新油瓶的液位会下降，因此要用减法来计算加油量。完成加注新油过程后可以继续下一步的制冷剂加注过程。

制冷剂加注过程

在此过程中，制冷剂被充注到空调系统管路中。

- 1) 按 SEL 键选择制冷剂加注项目。
- 2) 按如下说明设置制冷剂加注量
 - a) 按 ENTER 键，左边的第一个数码管会闪烁。通过+键调整到需要的数字，同样的通过→和+键调整数码管其他位的数字，设定好后按 ENTER 键确认设定值。空调系统所需加注的制冷剂量通常都标记在发动机的铭牌上。若不知道加注量，参考相关的操作和维修手册。
 - b) 若安装了数据库的可以使用数据库：
按→键，数码管左边第一位会闪烁，在数据库表中查找车型代码，通过→和+键输入车型代码，输入完成后按 ENTER 键确认。设备会显示数据库中的加注量，允许修改此值。

注意: 如果没有安装数据库, 按→键后设备会显示几秒” nodb”, 然后显示当前钢瓶内容量。如需要安装数据库, 请联系销售商。

3) 打开高压和低压阀(若之前是关闭的), 然后按 START 键。

注意: 如果钢瓶内压力高于 8bar, 为避免对空调系统可能的负作用, 只半打开低压阀(旋转 45°)加注。

4) 当设定量的制冷剂加注完毕后设备会自动停止。

5) 关闭高压阀和低压阀。

6) 启动汽车发动机, 启动汽车空调, 运行至少 3 分钟。此时系统在待机状态, 可以通过相应的压力表检查空调系统高、低压压力。

7) 只断开高压接口快速接头(如需要, 关闭发动机), 空调系统继续运转, 打开高压阀和低压阀, 让压缩机强制吸收冷媒管中的制冷剂。

8) 约 1 分钟后, 断开低压接口快速接头, 关闭发动机, 关闭设备电源开关(图 7 中 j)。

注意: 当钢瓶内压力不足以加注汽车空调时, 有必要用汽车空调的吸力来吸取制冷剂。接口还是连接着快速接头, 关闭高压阀, 打开低压阀, 启动汽车空调。在只有一个高压接口的空调系统时, 比空调需要的量多加注 100g, 因为在制冷剂加注过程结束时, 这多加的 100g 会存留在高压管里。

日常保养维护

制冷剂补充

当设备钢瓶中的制冷剂低于 3Kg, 或者任何情况下控制面板上“罐空”指示灯闪烁时, 则必须进行制冷剂补充。

重要提示: 不要随意动钢瓶上的阀门接口。

- 1) 取一罐 R134a 制冷剂;
- 2) 连接到设备的高压口上;
- 3) 打开外部罐的阀门和设备的高压阀;
- 4) 如果外部罐没有液态制冷剂接口(只有气态接口), 将外部罐倒立可提高补充速度;
- 5) 给设备上电, 通过 SEL 键选择回收功能, 按 START 键启动回收功能;
- 6) 设备会显示补充到钢瓶的制冷剂量;
- 7) 当补充到比预定补充量的少 0.5Kg 时, 关闭外部罐阀门, 让设备回收残留在软管中的制冷剂;
- 8) 当回收完软管中所有的制冷剂后, “排油”指示灯会亮, 排油完毕后设备会自动停止;

9) 关闭设备的高压阀，按 STOP 键，并断开外部连接罐。

真空泵

下列的日常基本操作是为了确保真空泵(图 11)性能良好。

M. 1) 加油

M. 2) 换油

加油和换油时只能用制造商推荐的真空泵油。从销售商那获得正确的油类型信息。

M. 1) 加油

当视窗(图 11 中 4)中油位低于一半时，须进行加油。注意：为了正确的检查真空泵的油位，先运行真空泵 1 分钟(连接着冷媒管运行抽真空功能 1 分钟)使真空泵油液化，真空泵停止后再观察油位。操作步骤按下列顺序执行。

- 1) 断开设备电源；
- 2) 找到加油盖(图 11 中 2)，并将它旋下；
- 3) 通过加油盖(图 11 中 2)位置的孔加油；
- 4) 每次加一点，每次等油位上升后再加，直到油位高过视窗(图 11 中 4)标记线 0.5cm 左右停止加油；
- 5) 装回加油盖(图 11 中 2)，旋紧。

M. 2) 换油

真空泵工作每 150 小时，或者每次干燥过滤器更换后必须更换真空泵油。任何时候若真空泵油由于吸收了水汽而变色，也都必须更换真空泵油。在更换前，取一个至少 300CC 容积的容器来收集用过的真空泵油。真空泵大约能容纳 280CC 油。只能用制造商推荐的油(咨询你的销售商)。

- 1) 断开设备电源；
- 2) 旋下加油盖(图 11 中 2)；
- 3) 旋松排油帽(图 11 中 3)；
- 4) 让所有的油流到一个容器(高度<10CM)中；
- 5) 拧紧排油帽(图 11 中 3)；
- 6) 通过加油盖(图 11 中 2)位置的孔加注新油，直到油位达到视窗(图 11 中 4)中线标记；
- 7) 旋紧加油盖(图 11 中 2)。

更换干燥过滤器

当操作前 10 秒设备给出[SERV]报警信息，或者液视镜指示有湿气(液视镜内圈为黄色)，则必须更换干燥过滤器。在更换操作前，检查代用的干燥过滤器须与设备上的相同类型。

步骤如下(图 12)：

- 1) 断开设备电源；
 - 2) **带手套和防护眼镜；**
 - 3) 拆下设备后盖板和右侧(液视镜一侧)板；
 - 4) 关闭设备油瓶的阀门，关闭设备高、低压接口阀门；
 - 5) 关闭钢瓶的两个阀门和干燥过滤器(图 12 中 4)的阀(图 12 中 1)；
 - 6) 将低压快速接头连接在干燥过滤器(图 12 中 4)的接口(图 12 中 2)上，用蓝色冷媒管连接快速接头和设备前板低压接口，打开快速接头；
 - 7) 给设备上电开机；
 - 8) 打开低压接口阀门，执行回收功能；
 - 9) 一旦压力表读数到 0，立刻关闭干燥过滤器(图 12 中 5)的阀(图 12 中 3)，然后按 STOP 或 RESET 键；
 - 10) 断开设备电源
 - 11) 断开干燥过滤器(图 12 中 4)的接口(图 12 中 2)上的低压快速接头；
 - 12) 更换新的干燥过滤器，注意箭头方向；
- 注意：为了避免大气环境中的水汽污染，更换干燥过滤器时要尽快操作。**
- 13) 打开干燥过滤器(图 12 中 4)的阀(图 12 中 1)和干燥过滤器(图 12 中 5)的阀(图 12 中 3)；
 - 14) 打开钢瓶上的两个阀门；
 - 15) 安装设备后盖板和右侧板；
 - 16) 连接设备电源，开机；
 - 17) 在 10 秒内(当出现[SERV]报警提示时)，按 SEL 键；
 - 18) 通过+和→键输入干燥过滤器代码来消除报警提示；
 - 19) 回收 500g 的制冷剂，让其循环充注在内部管路中；
 - 20) 关闭设备；
 - 21) 断开设备电源。

新油瓶加注新油

当新油瓶中液位低于 100CC 就加注新油是一个好的习惯，这样可以保证在操作过程中有足够的新油可以用。

油的类型：只能用合成油。参考制造商提供的信息。

步骤：断开油瓶上方的快速接头，将整个油瓶连带瓶盖一起取下；旋开瓶盖，向瓶里加注适量的，压缩机适用类型和等级的冷冻油；旋紧瓶盖，将油瓶重新连接在快速接头上。

旧油瓶清空

当旧油瓶内旧油容量超过 200CC 须进行旧油瓶清空处理。

步骤：从支架上取下旧油瓶，旋下瓶身(握住瓶盖)；将旧油倒入专门的旧油收集桶里；旋紧瓶身(握住瓶盖)，将油瓶重新挂在支架上。

特殊保养维护

电子秤标定

当电子秤显示值超出正常值范围时需要进行电子秤标定。以下的标定步骤要非常注意和小心

遵守本节提到的注意事项；a) 放置重物在秤盘上时要小心，一次一个的放置；b) 重物要放置在秤盘中心位置；

按如下说明进行标定(图 3)：

- 1) 断开电源；
- 2) 取一个已知重量的重物(16-18 Kg)；
- 3) 拆下设备的后盖板；
- 4) 关闭钢瓶的红色和蓝色阀门；
- 5) 旋下钢瓶定位螺钉(图 3 中 3)；
- 6) 从钢瓶上取下加热带(图 7 中 i)，不要接触或断开加热带的供电连接线；
- 7) 从秤盘上取下带有温度传感器的钢瓶(图 3 中 5)，将钢瓶放置在至少 40cm 高的台上；
- 8) 给设备上电开机，小心不要接触任何电线；
- 9) 等待至少 10 秒钟，同时按着+和→键，保持约 5 秒钟；
- 10) 这时设备显示值对应电子秤零点值；
- 11) 轻压秤盘，显示值会增大；如果没有增大，需更换电子秤；
- 12) 按 ENTER 确认此值(在此阶段，特别注意不能有任何东西接触秤盘)；
- 13) 小心的放置重物(16-18 Kg) 在秤盘中心，观察显示值应随之增加；
- 14) 按 SEL 键，然后通过+和→键输入 4 位数的重物重量值；
- 15) 按 ENTER 键，显示值应该为重物重量值减去空瓶重量值(约 6.1Kg)；
- 16) 取下重物；
- 17) 关闭设备，断开电源；
- 18) 将钢瓶放回到秤盘上；

- 19) 给设备上电开机, 小心不要接触任何电线;
- 20) 标定检查: 放一个已知 0.5Kg 或 1Kg 的参考重物在钢瓶上, 检查显示值与参考物重量值差值为参考重物重量值的 $\pm 2\%$;
- 21) 取下参考重物;
- 22) 关闭设备, 断开电源;
- 23) 拧紧钢瓶的锁紧螺母(图 3 中 3);
- 24) 打开钢瓶的红色和蓝色阀门;
- 25) 安装好设备后盖板;

附加设置

Kg 和 lbs 单位转换

同时按着 SEL、START 和 ENTER 三个键开机, 设备会在 Kg 和 lbs 单位转化。

打印机(选配)

如果安装了打印机, 每项操作之后会打印其概要情况。

图标

可用量:



回收:



抽真空:



加注:

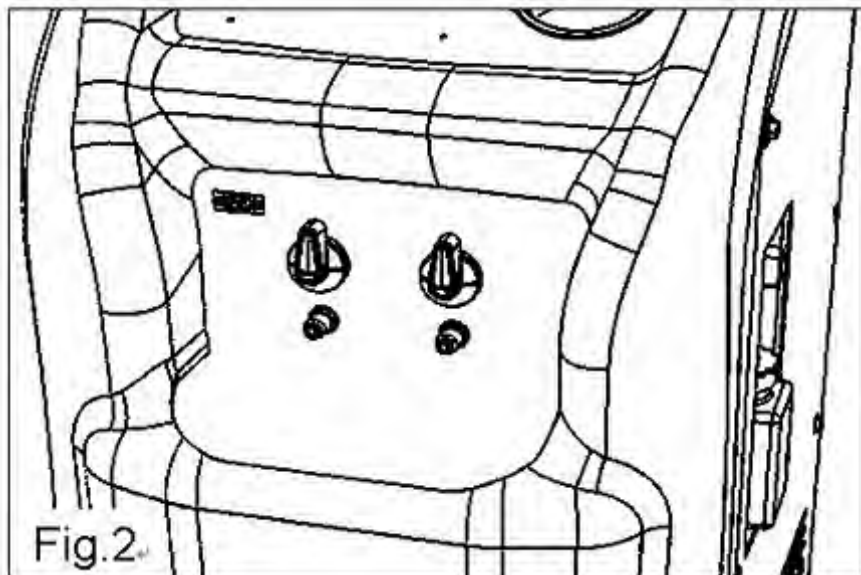


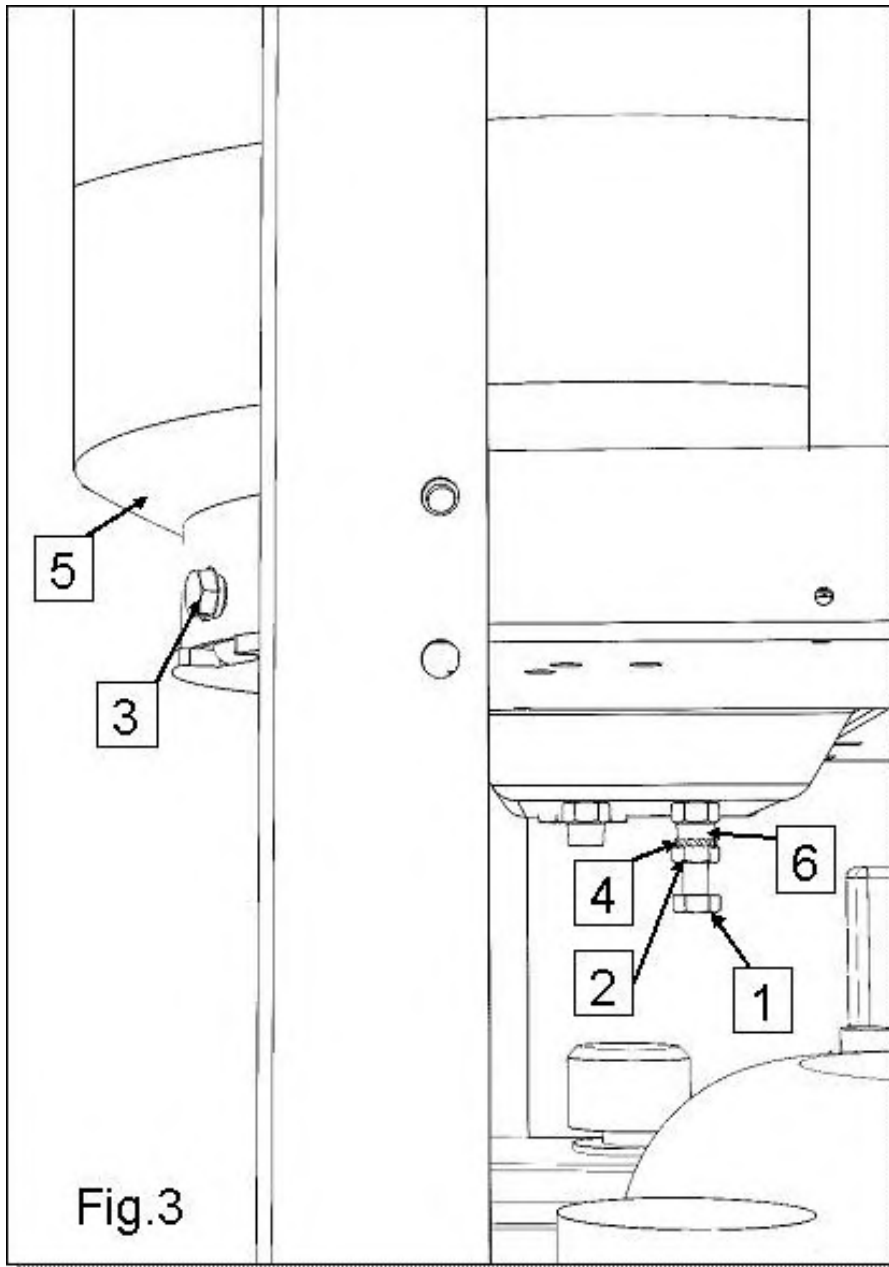
更换打印纸

只能使用下述型号的热敏打印纸

纸宽: 58mm

最大纸孔直径: 32mm





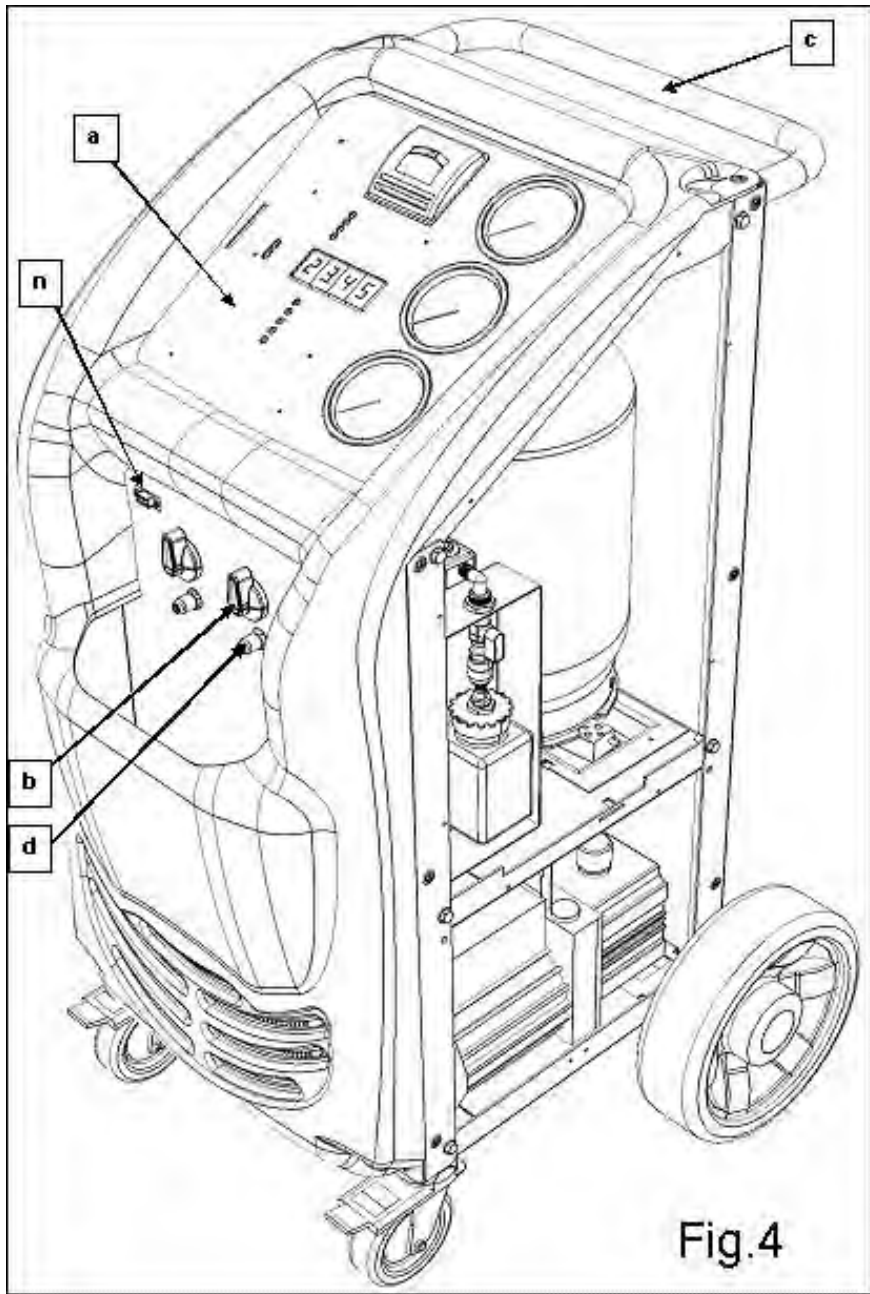


Fig.4

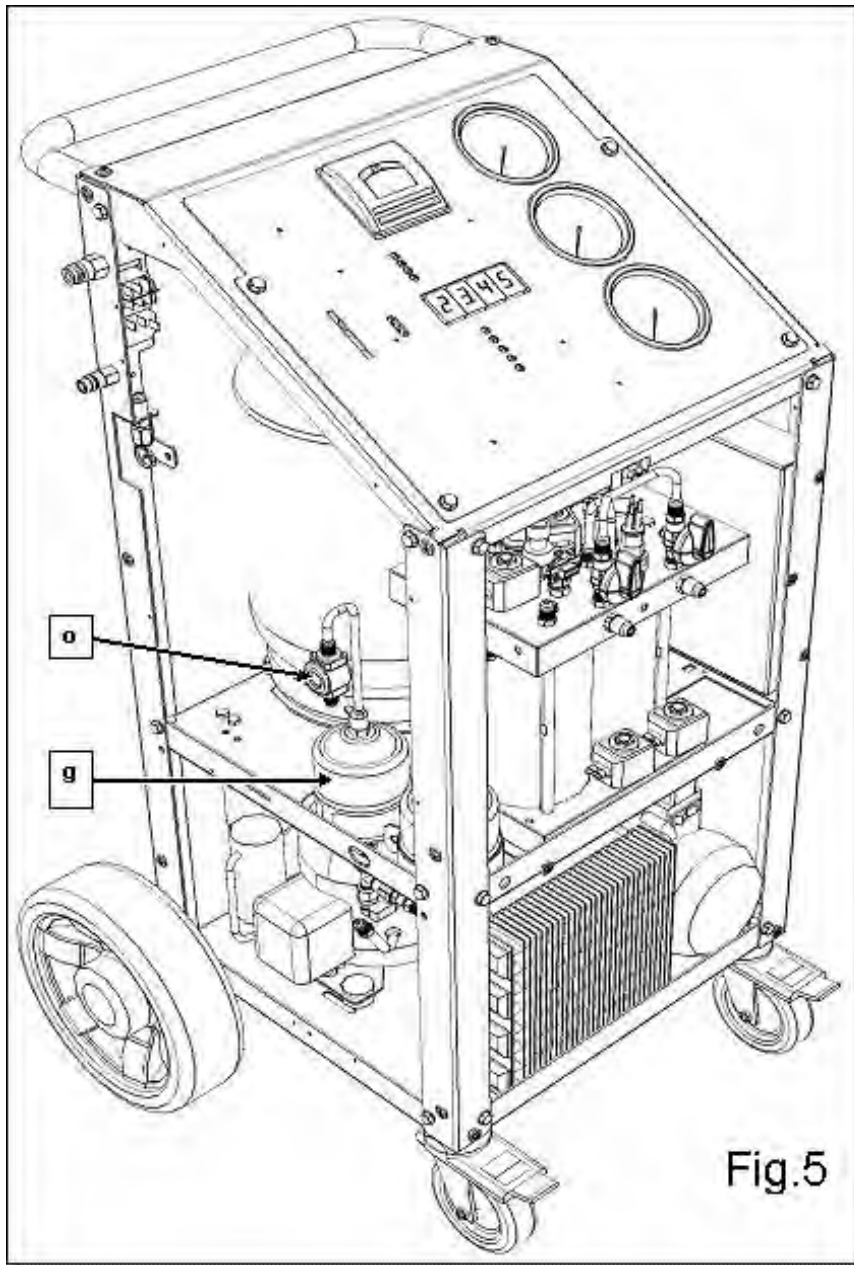


Fig.5

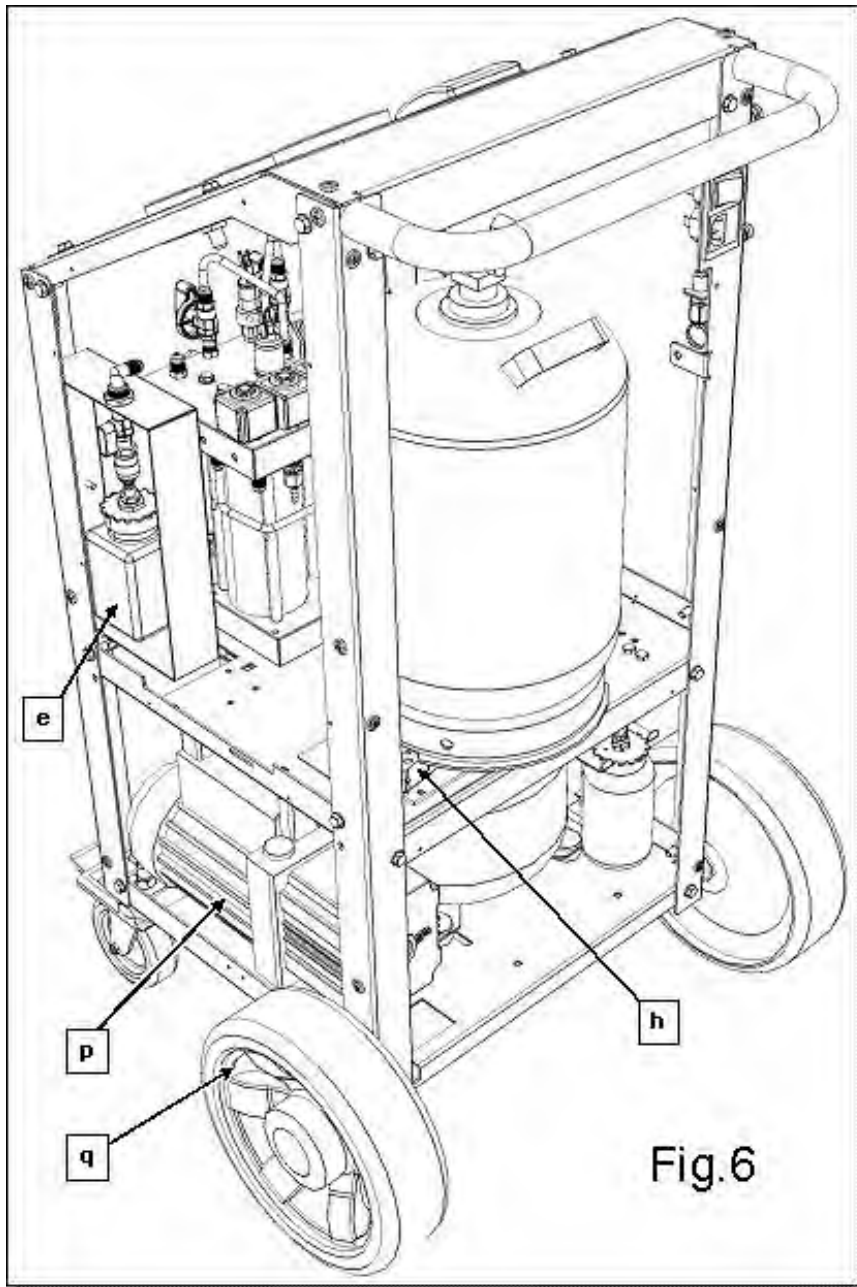


Fig.6

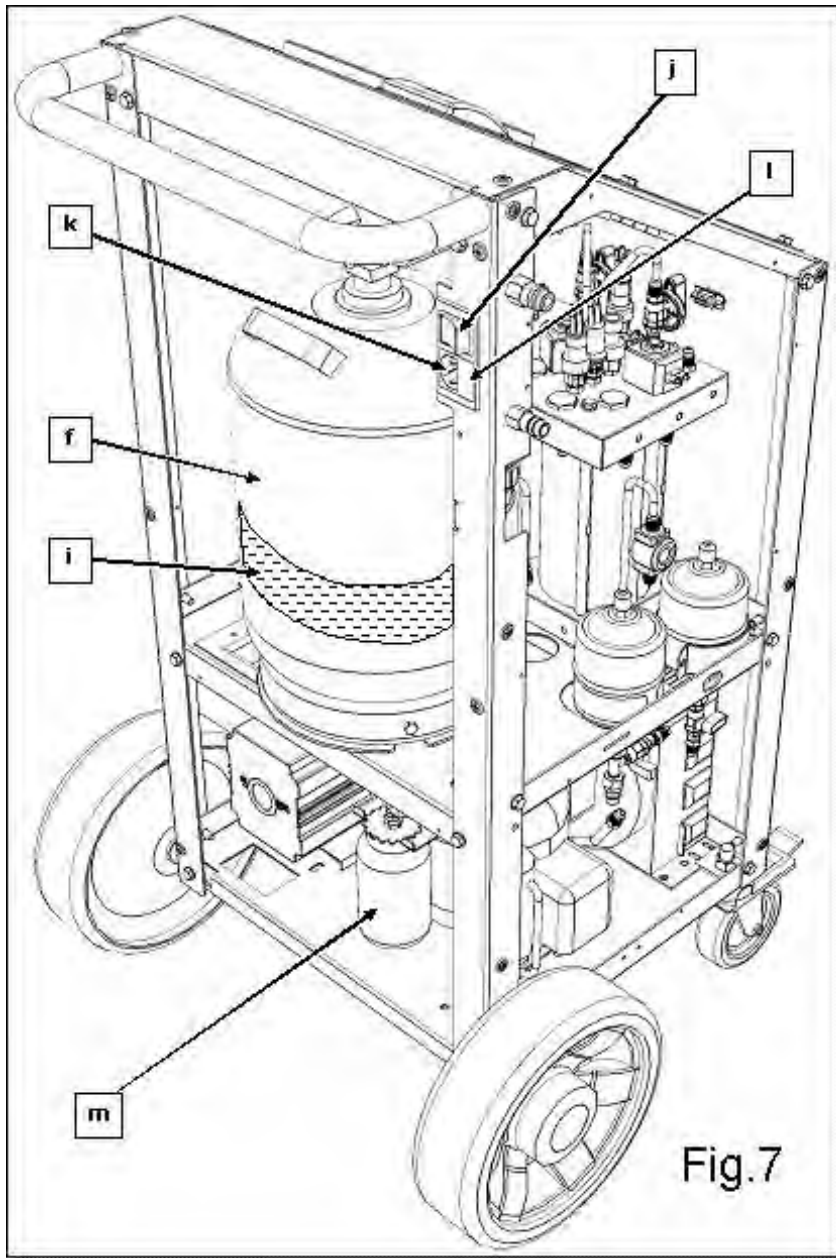


Fig.7

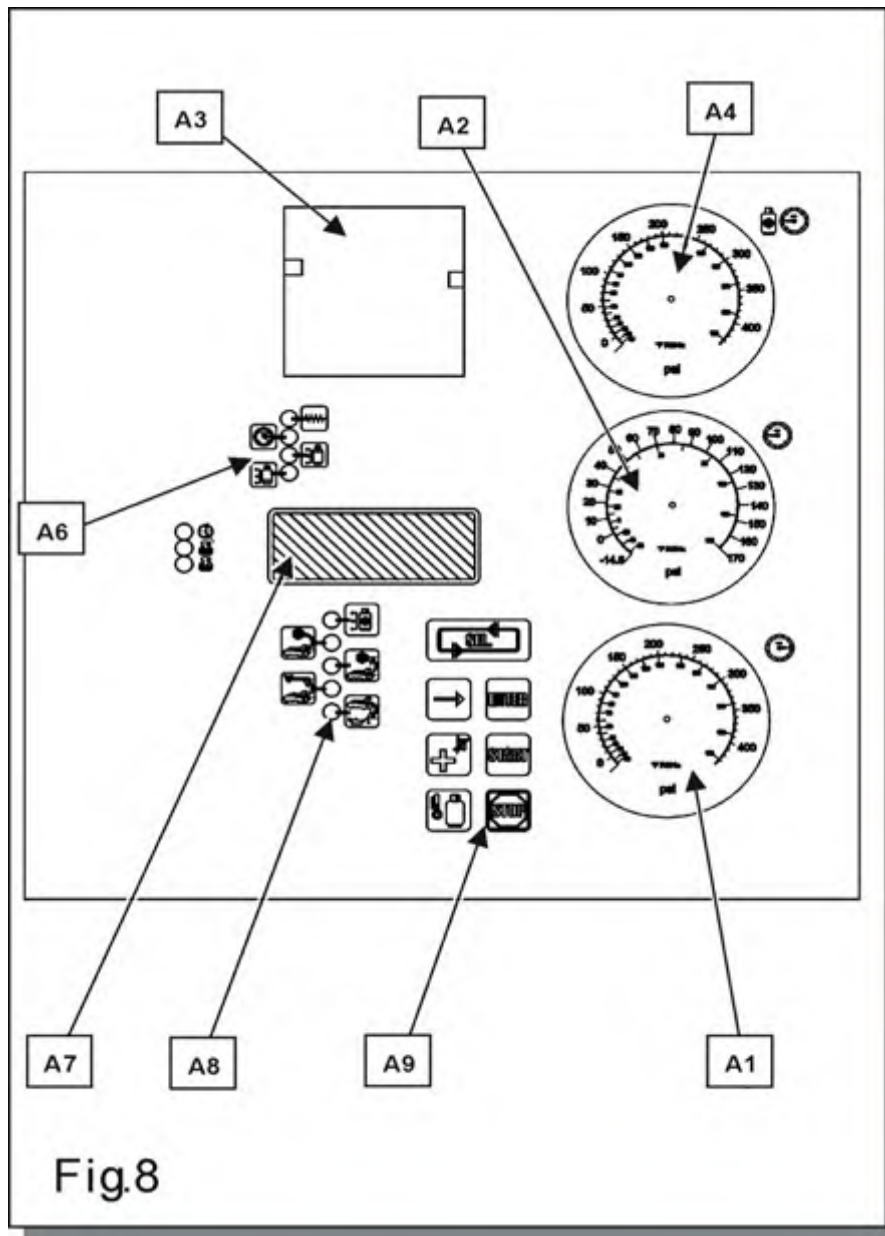


Fig.8

